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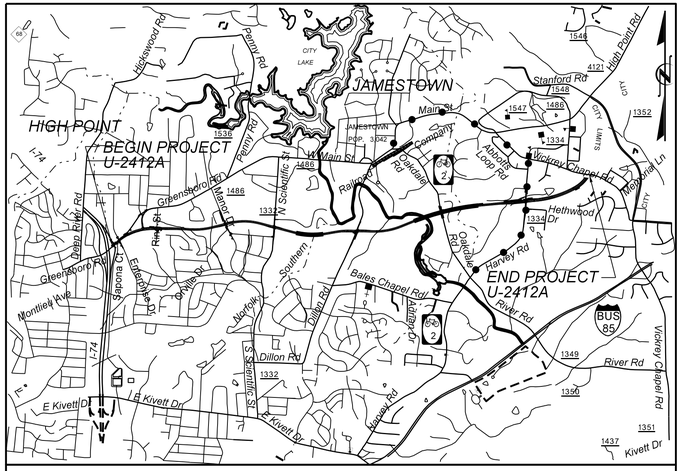
TIP PROJECT: U-2412A

CONTRACT: C204103



VICINITY MAP

DETOUR FOR OAKDALE ROAD BRIDGE CONSTRUCTION

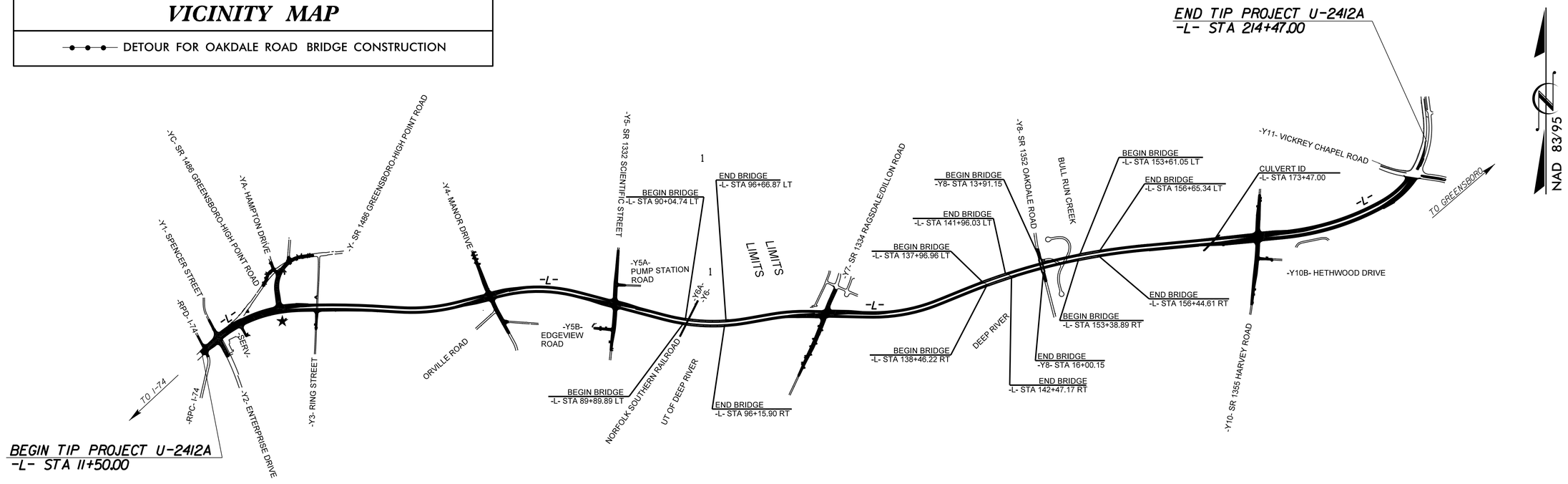
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
GUILFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2412A		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34802.1.1	STP-4121(3)	PE
34802.2.2	STP-4121(3)	R/W & UTL.
34802.3.3	STP-4121(3)	CONSTR

LOCATION: *SR-1486 /SR-4121 (JAMESTOWN PARKWAY) FROM I-74 TO WEST OF SR 1480 (VICKREY CHAPEL ROAD)*

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



STRUCTURES

DESIGN DATA

ADT 2018 = 35,880
ADT 2038 = 44,720
K = 9 %
D = 55 %
T = 4 % *
V = 60 MPH
* TTST =1% DUAL 3%
FUNC CLASS =
URBAN ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2412A = 3.589 MILES
LENGTH STRUCTURE TIP PROJECT U-2412A = .255 MILES

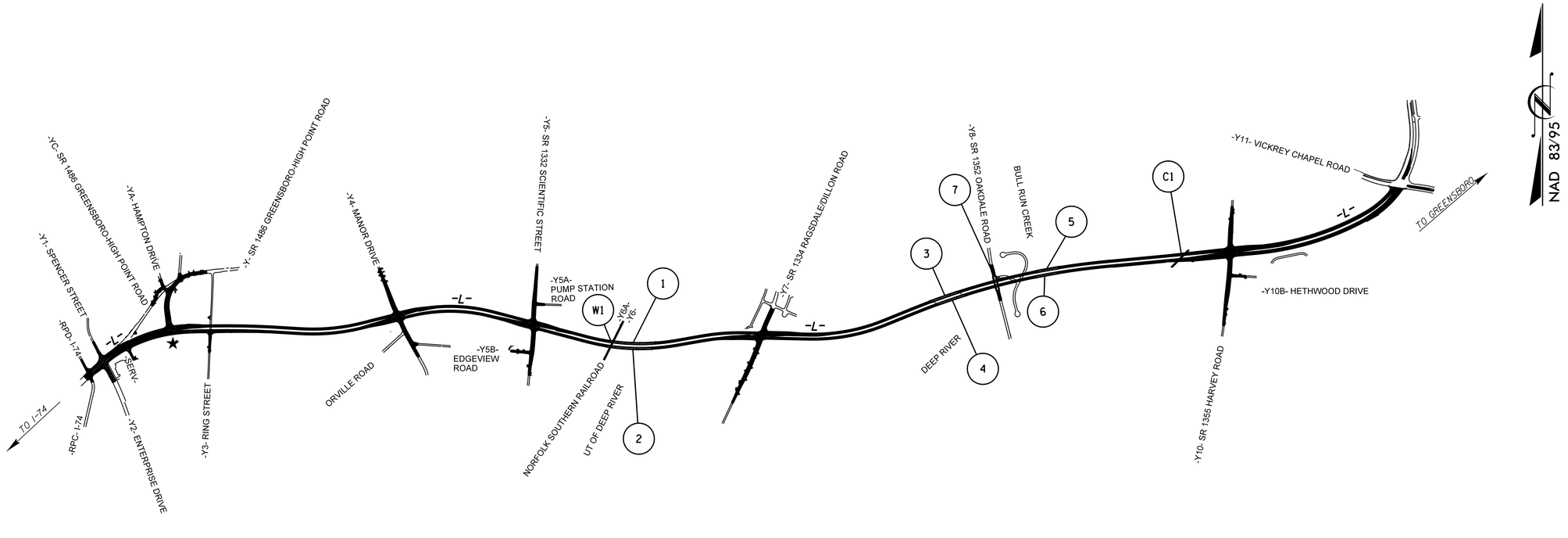
TOTAL LENGTH TIP PROJECT U-2412A = 3.844 MILES

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

2018 STANDARD SPECIFICATIONS

LETTING DATE :

JUNE 19, 2018



INDEX

STR. No.	STATION	DESCRIPTION	SHEETS
1	93+43.36 -L-	LEFT LANE BRIDGE OVER NSRR & DEEP RIVER TRIBUTARY ON SR 4121 BETWEEN SR 1332 AND SR 1334	S1-1 THRU S1-62
2	93+23.34 -L-	RIGHT LANE BRIDGE OVER NSRR & DEEP RIVER TRIBUTARY ON SR 4121 BETWEEN SR 1332 AND SR 1334	S2-1 THRU S2-63
3	140+21.50 -L-	LEFT LANE BRIDGE OVER DEEP RIVER ON SR 4121 BETWEEN SR 1334 AND SR 1352	S3-1 THRU S3-45
4	140+21.50 -L-	RIGHT LANE BRIDGE OVER DEEP RIVER ON SR 4121 BETWEEN SR 1334 AND SR 1352	S4-1 THRU S4-46
5	155+02.50 -L-	LEFT LANE BRIDGE OVER BULL RUN CREEK ON SR 4121 BETWEEN SR 1352 AND SR 1355	S5-1 THRU S5-36
6	155+02.50 -L-	RIGHT LANE BRIDGE OVER BULL RUN CREEK ON SR 4121 BETWEEN SR 1352 AND SR 1355	S6-1 THRU S6-37
7	147+48.15 -L- 14+97.65 -Y8-	BRIDGE OVER SR 1486/SR 4121 (GREENSBORO/HIGH POINT RD.) ON SR 1352 (OAKDALE RD.) BETWEEN SR 1486 AND SR 1355	S7-1 THRU S7-35
C1	173+47.00 -L-	SINGLE 6 FT. X 6 FT. RCBC	C-1 THRU C-5
W1	18+50.00 -Y17-	MSE RETAINING WALL NO. 1	W-1 THRU W-4

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION:

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

INDEX SHEET

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

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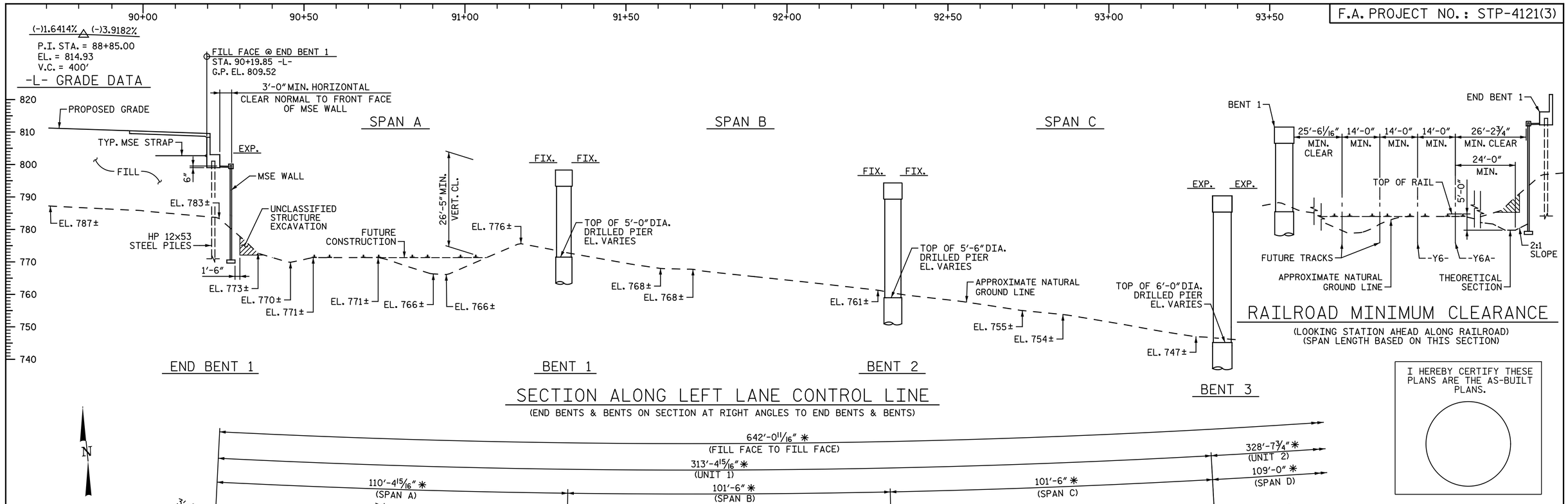
jpadams

F.A. PROJECT NO.: STP-4121(3)



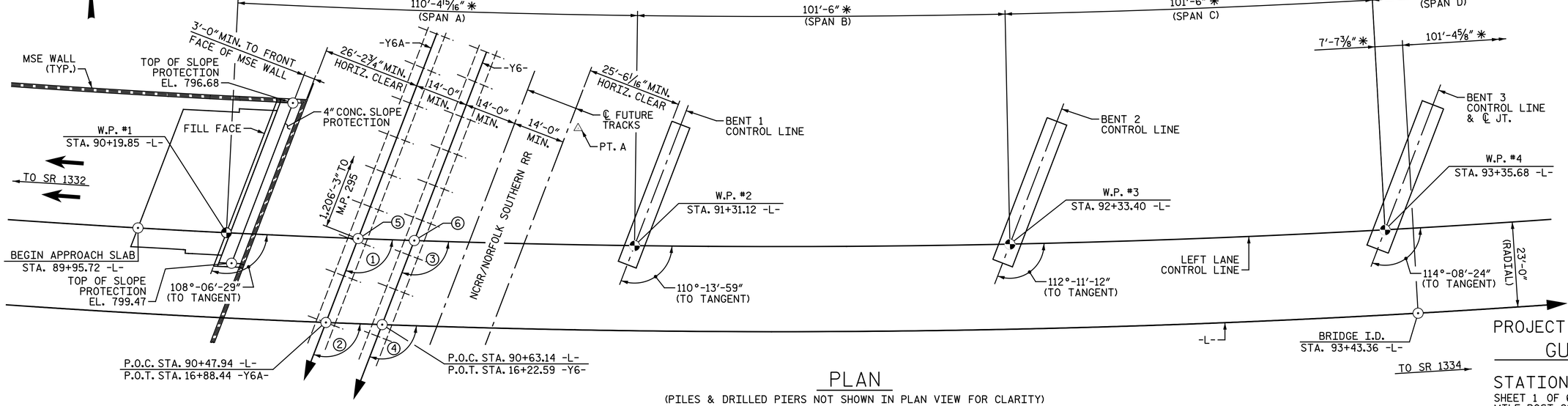
SECTION ALONG LEFT LANE CONTROL LINE

(END BENTS & BENTS ON SECTION AT RIGHT ANGLES TO END BENTS & BENTS)

RAILROAD MINIMUM CLEARANCE

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

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS.



PLAN

(PILES & DRILLED PIERS NOT SHOWN IN PLAN VIEW FOR CLARITY)

* DIMENSION MEASURED ALONG ARC

-L- HORIZONTAL CURVE DATA

P.I. STA. 93+42.25
△ = 20°-57'-26.2" (LT)
D = 1°-54'-35.5"
L = 1,097.32'
T = 554.86'
R = 3,000.00'

POINT	TOP OF RAIL ELEVATION
A	771.35

△ DENOTES POINT OF MINIMUM VERTICAL CLEARANCE

① - 108°-49'-07" (TO TANGENT)
② - 108°-40'-08" (TO TANGENT)
③ - 109°-05'-13" (TO TANGENT)
④ - 108°-56'-06" (TO TANGENT)
⑤ - P.O.C. STA. 90+55.78 -L- P.O.T. STA. 16+64.15 -Y6A-
⑥ - P.O.C. STA. 90+71.09 -L- P.O.T. STA. 15+98.27 -Y6-

TOP OF RAIL ELEVATIONS -Y6A-

STATION	LEFT RAIL ELEV	RIGHT RAIL ELEV
16+00.00	770.78	770.75
16+50.00	771.22	771.18
17+00.00	771.66	771.64
17+50.00	772.10	772.08
18+00.00	772.54	772.52

TOP OF RAIL ELEVATIONS -Y6-

STATION	LEFT RAIL ELEV	RIGHT RAIL ELEV
15+50.00	770.88	770.88
16+00.00	771.34	771.35
16+50.00	771.80	771.81
17+00.00	772.24	772.27
17+50.00	772.70	772.74

DRAWN BY : M. D. MAYHEW DATE : 2-13-18
CHECKED BY : B. J. BELL DATE : 2-13-18

PROJECT NO. U-2412A
GUILFORD COUNTY
STATION: 93+43.36 -L-
SHEET 1 OF 6
MILE POST 295.23 BRIDGE NO. 401270

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL
DocuSigned by: Bradley J. Bell 5/7/2018
C41A3F8ECA3C434...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

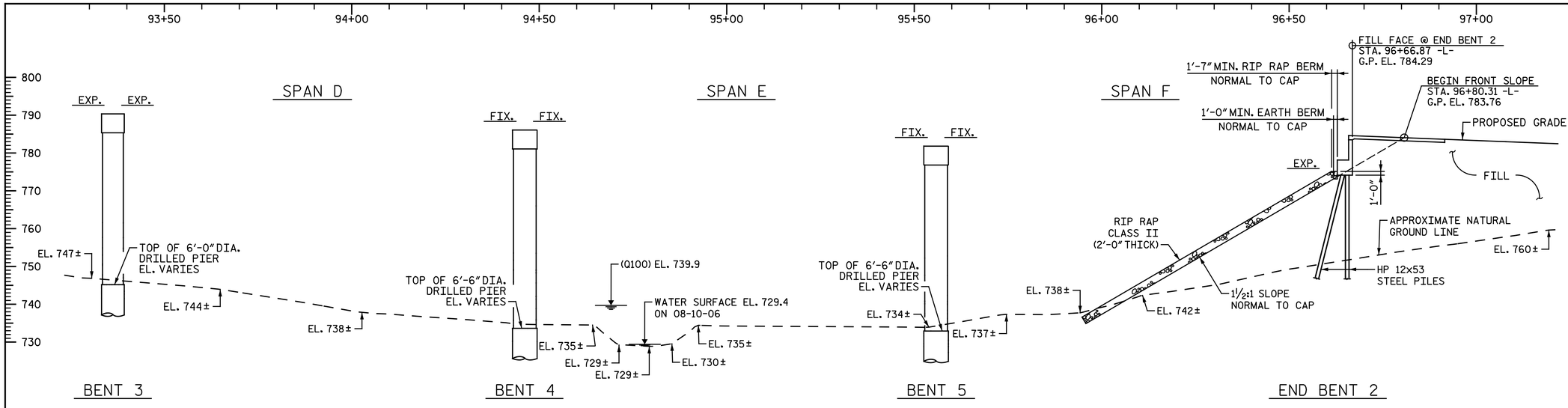
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NCRR/NSRR & DEEP RIVER TRIBUTARY 1 ON SR 4121 BETWEEN SR 1332 AND SR 1334

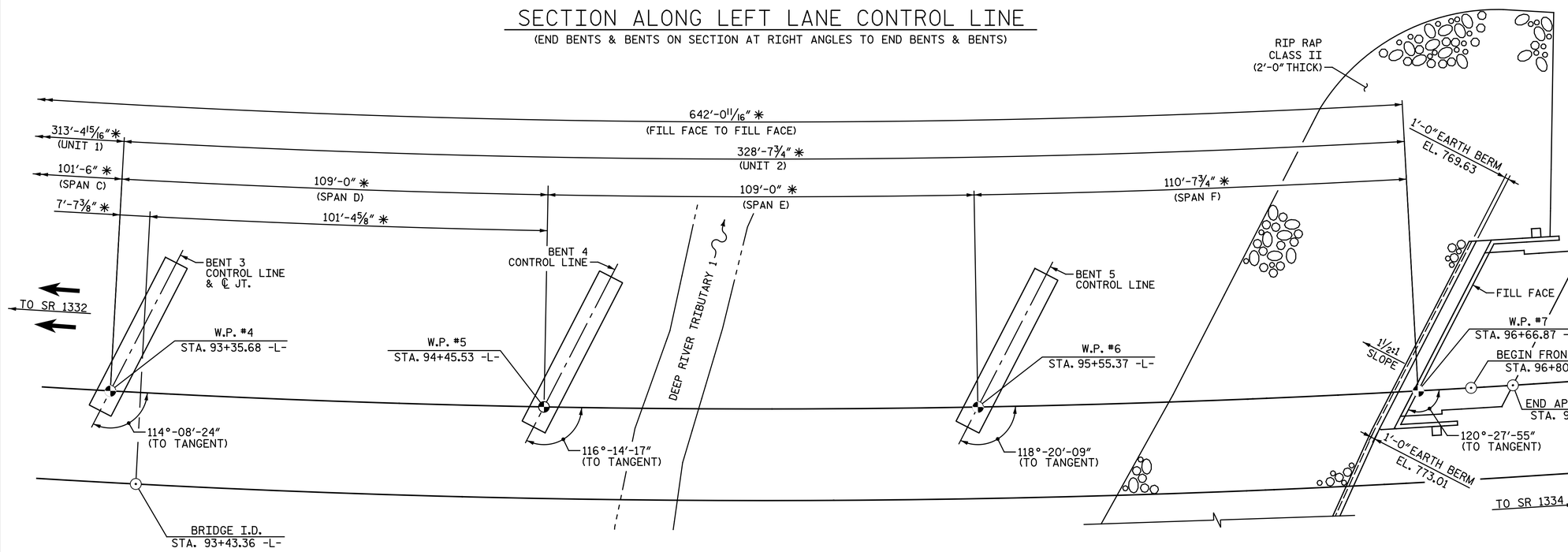
LEFT LANE

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



SECTION ALONG LEFT LANE CONTROL LINE

(END BENTS & BENTS ON SECTION AT RIGHT ANGLES TO END BENTS & BENTS)



PLAN

(PILES & DRILLED PIERS NOT SHOWN IN PLAN VIEW FOR CLARITY)

✱ DIMENSION MEASURED ALONG ARC

-L- HORIZONTAL CURVE DATA

P.I. STA. 93+42.25
△ = 20°-57'-26.2" (LT)
D = 1°-54'-35.5"
L = 1,097.32'
T = 554.86'
R = 3,000.00'

DRAWN BY : M. D. MAYHEW DATE : 2-1-18
CHECKED BY : B. J. BELL DATE : 2-13-18

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018
C41A3F8ECA3C434...

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Michael Baker INTERNATIONAL
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8000 Regency Parkway, Suite 600
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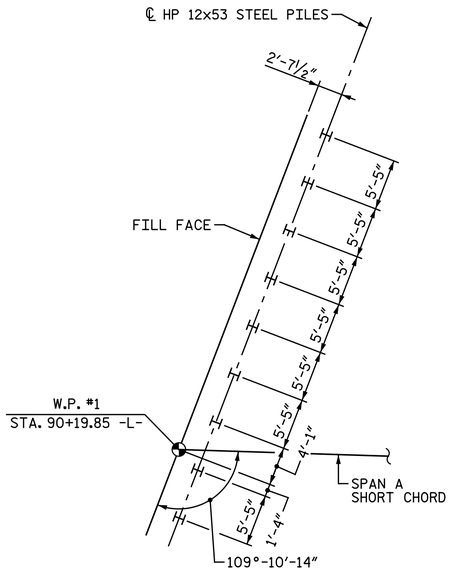
NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER NCRR/NSRR & DEEP RIVER TRIBUTARY 1 ON SR 4121 BETWEEN SR 1332 AND SR 1334
LEFT LANE

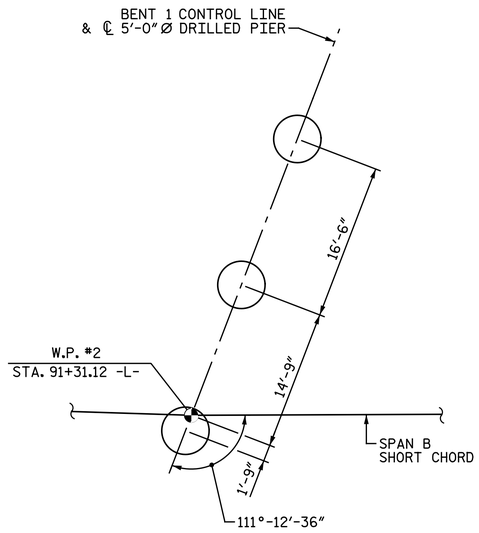
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-2
1			3			TOTAL SHEETS
2			4			62

PROJECT NO. U-2412A
GUILFORD COUNTY
STATION: 93+43.36 -L-
SHEET 2 OF 6

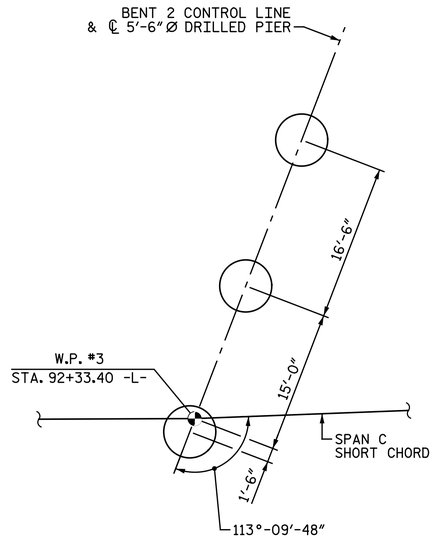


END BENT 1

I VERTICAL HP 12x53 STEEL PILE



BENT 1



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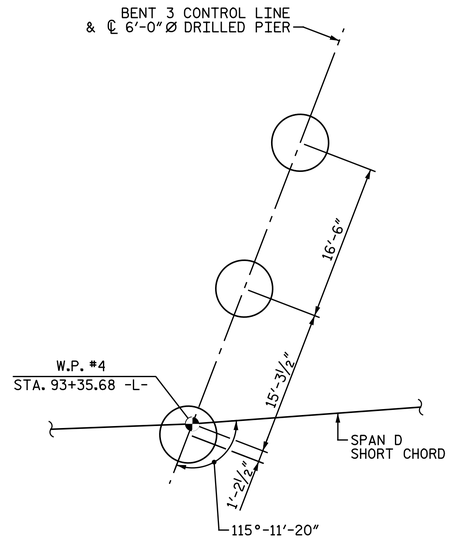


BENT 3

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.
DIMENSIONS LOCATING DRILLED PIERS ARE SHOWN TO THE DRILLED PIER CENTERLINE.

NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

DRILLED-IN PILES ARE REQUIRED FOR END BENT NO. 1. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 757 FT. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

DRILL-IN AND INSTALL PILES AT END BENT NO. 1 PRIOR TO CONSTRUCTING MSE WALL.

CONCRETE IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO. 1.

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

DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 675 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 80 TSF.

INSTALL DRILLED PIERS AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 745 FT (LT), 746 FT (CTR), AND 747 FT (RT) WITH THE REQUIRED TIP RESISTANCE .

DRILLED PIERS AT BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 630 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 65 TSF.

INSTALL DRILLED PIERS AT BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN 728 FT (LT), 725 FT (CTR), AND 722 FT (RT) WITH THE REQUIRED TIP RESISTANCE.

DRILLED PIERS AT BENT NO. 3 ARE DESIGNED FOR A FACTORED RESISTANCE OF 580 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 45 TSF (LT) AND 50 TSF (RT).

INSTALL DRILLED PIERS AT BENT NO. 3 TO A TIP ELEVATION NO HIGHER THAN 712 FT WITH THE REQUIRED TIP RESISTANCE.

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.

PROJECT NO. U-2412A
GUILFORD COUNTY
STATION: 93+43.36 -L-

SHEET 3 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

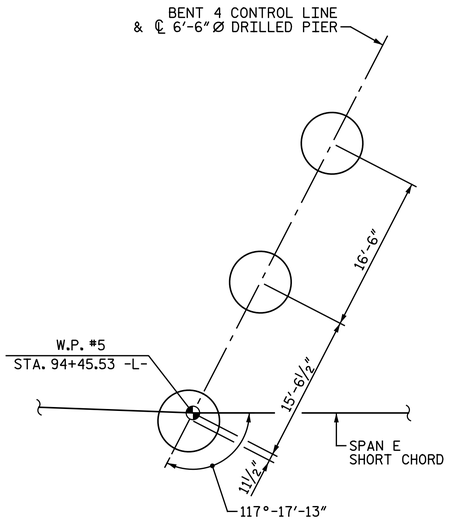
GENERAL DRAWING

FOR BRIDGE OVER NCRR/NSRR & DEEP RIVER TRIBUTARY 1 ON SR 4121 BETWEEN SR 1332 AND SR 1334
LEFT LANE

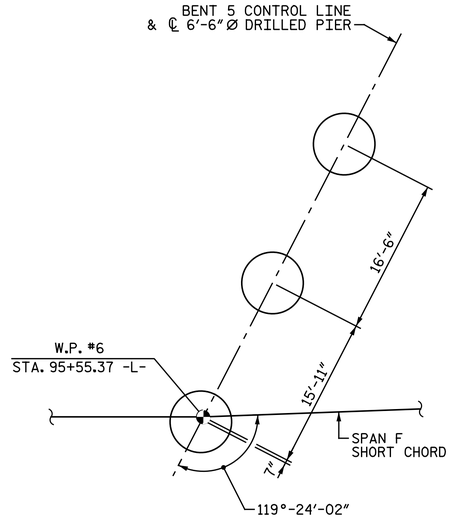
Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

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

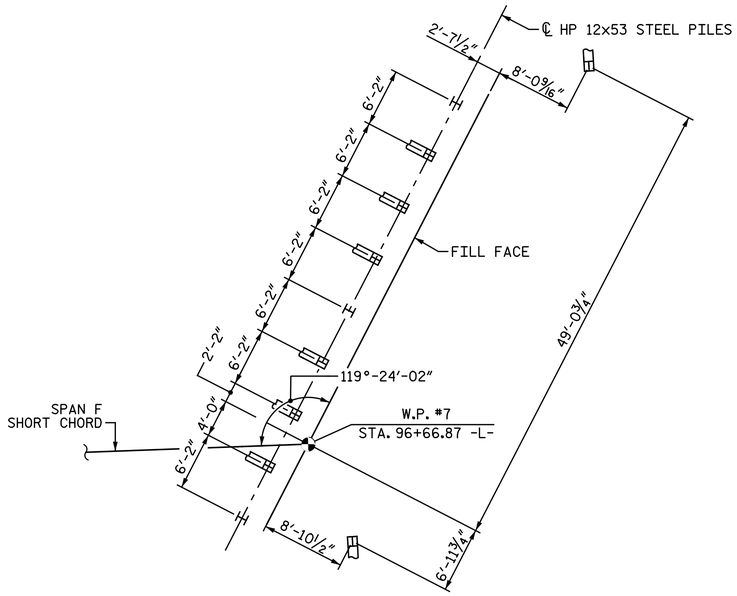
DRAWN BY : C. E. MAYHEW DATE : 5-21-18
CHECKED BY : B. J. BELL DATE : 5-21-18



BENT 4



BENT 5



END BENT 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.
DIMENSIONS LOCATING DRILLED PIERS ARE SHOWN TO THE DRILLED PIER CENTERLINE.

I VERTICAL HP 12x53 STEEL PILE

3:12 BATTERED HP 12x53 STEEL PILE

NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.

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

DRILLED PIERS AT BENT NO. 4 ARE DESIGNED FOR A FACTORED RESISTANCE OF 640 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 55 TSF (LT) AND 50 TSF (RT).

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 4. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 721 FT (LT), 722.5 FT (CTR), AND 724 FT (RT) WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

INSTALL PERMANENT STEEL CASINGS AT BENT NO. 4 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 723 FT (LT) AND 725 FT (RT).

INSTALL DRILLED PIERS AT BENT NO. 4 TO A TIP ELEVATION NO HIGHER THAN 708 FT WITH THE REQUIRED TIP RESISTANCE.

DRILLED PIERS AT BENT NO. 5 ARE DESIGNED FOR A FACTORED RESISTANCE OF 640 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 50 TSF.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 5. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 726 FT (LT), 727 FT (CTR), AND 728 FT (RT) WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

INSTALL PERMANENT STEEL CASINGS AT BENT NO. 5 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 728 FT (LT) AND 729 FT (RT).

INSTALL DRILLED PIERS AT BENT NO. 5 TO A TIP ELEVATION NO HIGHER THAN 712 FT (LT), 714 FT (CTR), AND 715 FT (RT) WITH THE REQUIRED TIP RESISTANCE.

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.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 4 IS ELEVATION 720 FT (LT), 721.5 FT (CTR), AND 723 FT (RT). SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 5 IS ELEVATION 725 FT (LT), 726 FT (CTR), AND 727 FT (RT). SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 4 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NCRR/NSRR & DEEP RIVER TRIBUTARY 1 ON SR 4121 BETWEEN SR 1332 AND SR 1334

LEFT LANE

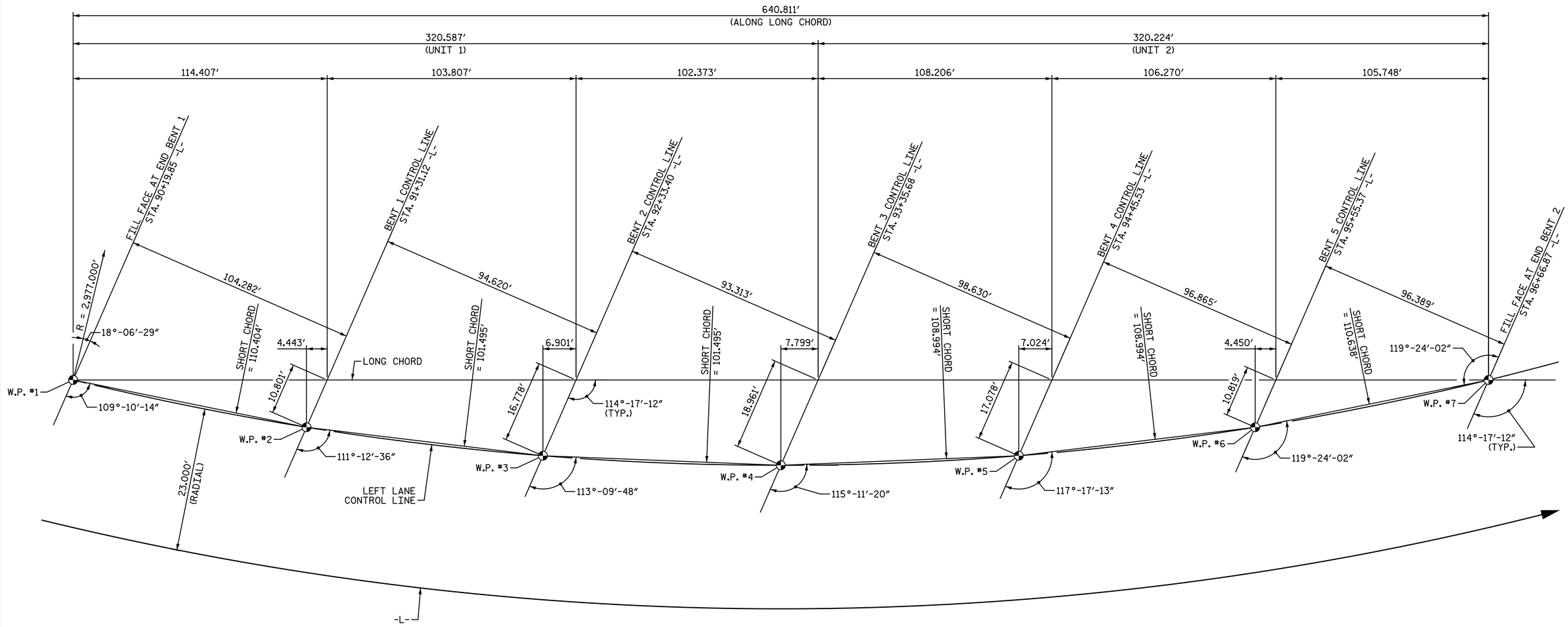
Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

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

DRAWN BY : C. E. MAYHEW DATE : 5-21-18

CHECKED BY : B. J. BELL DATE : 5-21-18



LONG CHORD LAYOUT

ALL END BENTS & BENTS ARE PARALLEL

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 5 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER NCRR/NSRR & DEEP RIVER TRIBUTARY 1
ON SR 4121 BETWEEN
SR 1332 AND SR 1334
LEFT LANE

Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-5
1			3			TOTAL SHEETS
2			4			62

DRAWN BY : C. E. MAYHEW DATE : 2-13-18
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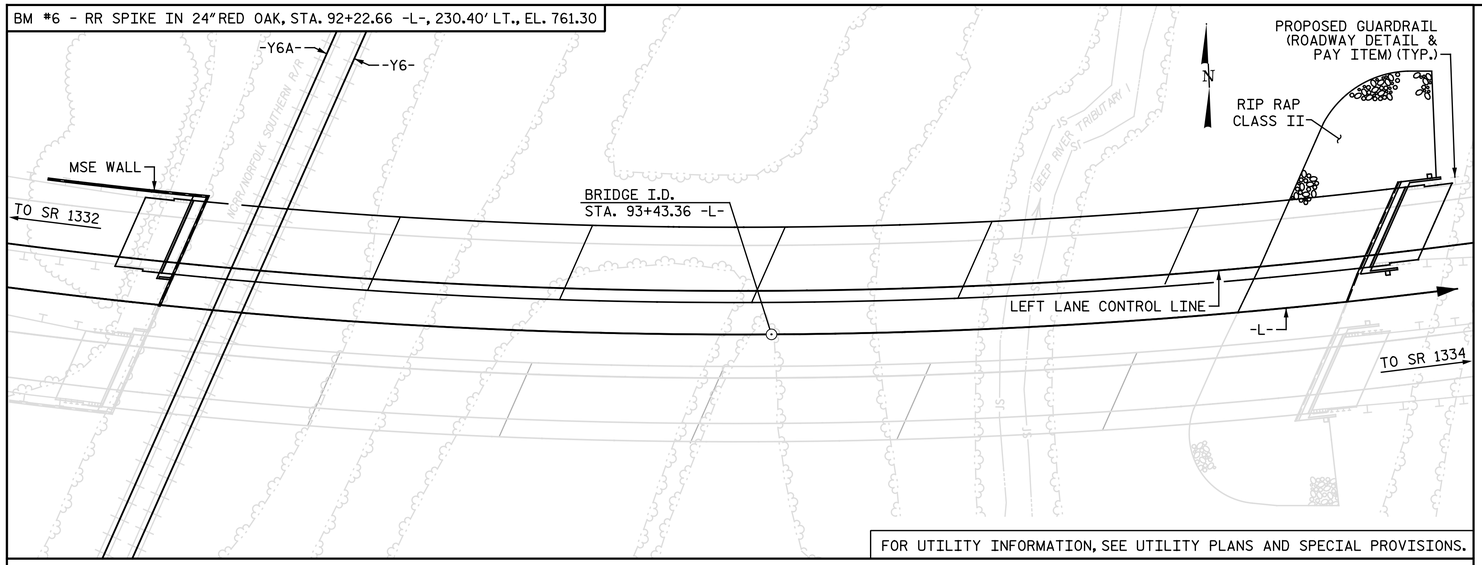

LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF 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.

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

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

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

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

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 36'-9"EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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 PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

TOTAL BILL OF MATERIAL

LOCATION	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	5'-0" DIA. DRILLED PIERS IN SOIL	5'-0" DIA. DRILLED PIERS NOT IN SOIL	5'-6" DIA. DRILLED PIERS IN SOIL	5'-6" DIA. DRILLED PIERS NOT IN SOIL	6'-0" DIA. DRILLED PIERS IN SOIL	6'-0" DIA. DRILLED PIERS NOT IN SOIL	6'-6" DIA. DRILLED PIERS IN SOIL	6'-6" DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 6'-6" DIA. DRILLED PIER	SID INSPECTIONS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB
	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EA.	EA.	LUMP SUM	SQ. FT.
SUPERSTRUCTURE															25,434
END BENT 1	6	89												LUMP SUM	
BENT 1			36.00	39.00								1	1		
BENT 2					62.50	38.00						1	1		
BENT 3							56.17	41.00				1	1		
BENT 4									29.00	47.00	35.50	1	1		
BENT 5									19.42	41.00	23.42	1	1		
END BENT 2															
TOTAL	6	89	36.00	39.00	62.50	38.00	56.17	41.00	48.42	88.00	58.92	5	5	LUMP SUM	25,434

TOTAL BILL OF MATERIAL (CONT'D)

LOCATION	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	HP 12x53 STEEL PILES		CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	EA.	NO.	LIN. FT.	LIN. FT.	SQ. YDS.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	22,961					24	2,525.94				1,320.55				LUMP SUM	LUMP SUM
END BENT 1		42.7		7,687					9	425		12				
BENT 1		84.0		19,090	4,635											
BENT 2		116.1		26,535	7,110											
BENT 3		161.8		31,889	9,050											
BENT 4		206.6		36,480	9,950											
BENT 5		192.7		33,331	8,586											
END BENT 2		61.4		9,861				11	11	420			925	1,025		
TOTAL	22,961	865.3	LUMP SUM	164,873	39,331	24	2,525.94	11	20	845	1,320.55	12	925	1,025	LUMP SUM	LUMP SUM

HYDRAULIC DATA

DESIGN DISCHARGE	= 2,000 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 50 YEARS
DESIGN HIGH WATER ELEVATION	= 739.6
DRAINAGE AREA	= 2.5 SQ. MI.
BASE DISCHARGE (Q100)	= 2,200 C.F.S.
BASE HIGH WATER ELEVATION	= 739.9

OVERTOPPING DATA

OVERTOPPING DISCHARGE	= 3,500+ C.F.S.
FREQUENCY OF OVERTOPPING	= 500+ YEARS
OVERTOPPING ELEVATION	= 763+

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 6 OF 6

DRAWN BY : M. D. MAYHEW DATE : 5-24-18

CHECKED BY : B. J. BELL DATE : 5-24-18

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/24/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER NCRR/NSRR & DEEP RIVER TRIBUTARY 1 ON SR 4121 BETWEEN SR 1332 AND SR 1334
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-6
1			3			TOTAL SHEETS
2			4			62

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS $\gamma_{(LL)}$	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS $\gamma_{(LL)}$	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.00	--	1.75	1.13	1.32	A,D,E,F	ER	53.10	1.23	1.27	A,D,E,F	ER	74.70	1.00	1.13	1.00	A,D,E,F	ER	53.10	1,2
		HL-93 (OPERATING)	N/A		1.71	--	1.35	1.13	1.71	A,D,E,F	ER	53.10	1.23	1.89	A,D,E,F	ER	85.40	N/A	--	--	--	--	--	2
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.42	51.12	1.75	1.13	1.87	A,D,E,F	ER	53.10	1.23	1.93	A,D,E,F	ER	85.40	1.00	1.13	1.42	A,D,E,F	ER	53.10	1,2
		HS-20 (OPERATING)	36.000		2.42	87.12	1.35	1.13	2.42	A,D,E,F	ER	53.10	1.23	2.57	A,D,E,F	ER	85.40	N/A	--	--	--	--	--	2
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.40	45.90	1.40	1.13	5.58	A,D,E,F	ER	53.10	1.23	6.38	A,D,E,F	ER	85.40	1.00	1.13	3.40	A,D,E,F	ER	53.10	1,2
		SNGARBS2	20.000		2.45	49.00	1.40	1.13	4.02	A,D,E,F	ER	53.10	1.23	4.41	A,D,E,F	ER	85.40	1.00	1.13	2.45	A,D,E,F	ER	53.10	1,2
		SNAGRIS2	22.000		2.29	50.38	1.40	1.13	3.75	A,D,E,F	ER	53.10	1.23	4.05	A,D,E,F	ER	85.40	1.00	1.13	2.29	A,D,E,F	ER	53.10	1,2
		SNCOTTS3	27.250		1.69	46.05	1.40	1.13	2.77	A,D,E,F	ER	53.10	1.23	3.06	A,D,E,F	ER	85.40	1.00	1.13	1.69	A,D,E,F	ER	53.10	1,2
		SNAGGRS4	34.925		1.38	48.20	1.40	1.13	2.26	A,D,E,F	ER	53.10	1.23	2.46	A,D,E,F	ER	85.40	1.00	1.13	1.38	A,D,E,F	ER	53.10	1,2
		SNS5A	35.550		1.35	47.99	1.40	1.13	2.22	A,D,E,F	ER	53.10	1.23	2.47	A,D,E,F	ER	85.40	1.00	1.13	1.35	A,D,E,F	ER	53.10	1,2
		SNS6A	39.950		1.23	49.14	1.40	1.13	2.01	A,D,E,F	ER	53.10	1.23	2.22	A,D,E,F	ER	85.40	1.00	1.13	1.23	A,D,E,F	ER	53.10	1,2
		SNS7B	42.000		1.17	49.14	1.40	1.13	1.92	A,D,E,F	ER	53.10	1.23	2.16	A,D,E,F	ER	85.40	1.00	1.13	1.17	A,D,E,F	ER	53.10	1,2
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.49	49.17	1.40	1.13	2.45	A,D,E,F	ER	53.10	1.23	2.70	A,D,E,F	ER	85.40	1.00	1.13	1.49	A,D,E,F	ER	53.10	1,2
		TNT4A	33.075		1.50	49.61	1.40	1.13	2.45	A,D,E,F	ER	53.10	1.23	2.64	A,D,E,F	ER	85.40	1.00	1.13	1.50	A,D,E,F	ER	53.10	1,2
		TNT6A	41.600		1.21	50.34	1.40	1.13	1.98	A,D,E,F	ER	53.10	1.23	2.28	A,D,E,F	ER	85.40	1.00	1.13	1.21	A,D,E,F	ER	53.10	1,2
		TNT7A	42.000		1.21	50.82	1.40	1.13	1.98	A,D,E,F	ER	53.10	1.23	2.23	A,D,E,F	ER	85.40	1.00	1.13	1.21	A,D,E,F	ER	53.10	1,2
		TNT7B	42.000		1.24	52.08	1.40	1.13	2.03	A,D,E,F	ER	53.10	1.23	2.12	A,D,E,F	ER	85.40	1.00	1.13	1.24	A,D,E,F	ER	53.10	1,2
		TNAGRIT4	43.000		1.19	51.17	1.40	1.13	1.95	A,D,E,F	ER	53.10	1.23	2.05	A,D,E,F	ER	85.40	1.00	1.13	1.19	A,D,E,F	ER	53.10	1,2
		TNAGT5A	45.000		1.13	50.85	1.40	1.13	1.85	A,D,E,F	ER	53.10	1.23	2.01	A,D,E,F	ER	85.40	1.00	1.13	1.13	A,D,E,F	ER	53.10	1,2
		TNAGT5B	45.000	⟨3⟩	1.12	50.40	1.40	1.13	1.83	A,D,E,F	ER	53.10	1.23	1.94	A,D,E,F	ER	85.40	1.00	1.13	1.12	A,D,E,F	ER	53.10	1,2

LOAD FACTORS:

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

NOTES:

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

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

GIRDERS ARE RATED AS SIMPLY SUPPORTED ELEMENTS.

COMMENTS:

1. A SERVICE III LIVE LOAD FACTOR OF 1.0 WAS USED IN ORDER TO BE CONSISTENT WITH THE VALUE USED DURING DESIGN.
2. DISTANCE FROM LEFT END OF SPAN IS GIVEN WITH RESPECT TO THE CENTERLINE OF BEARING AND IS MEASURED ALONG THE CONTROLLING GIRDER.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

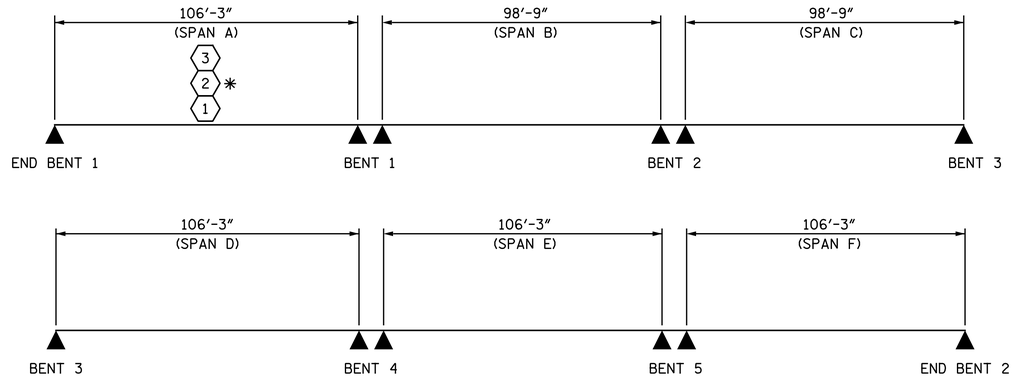
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

* TYPICAL SPANS A, D, E AND F

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8ECA3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

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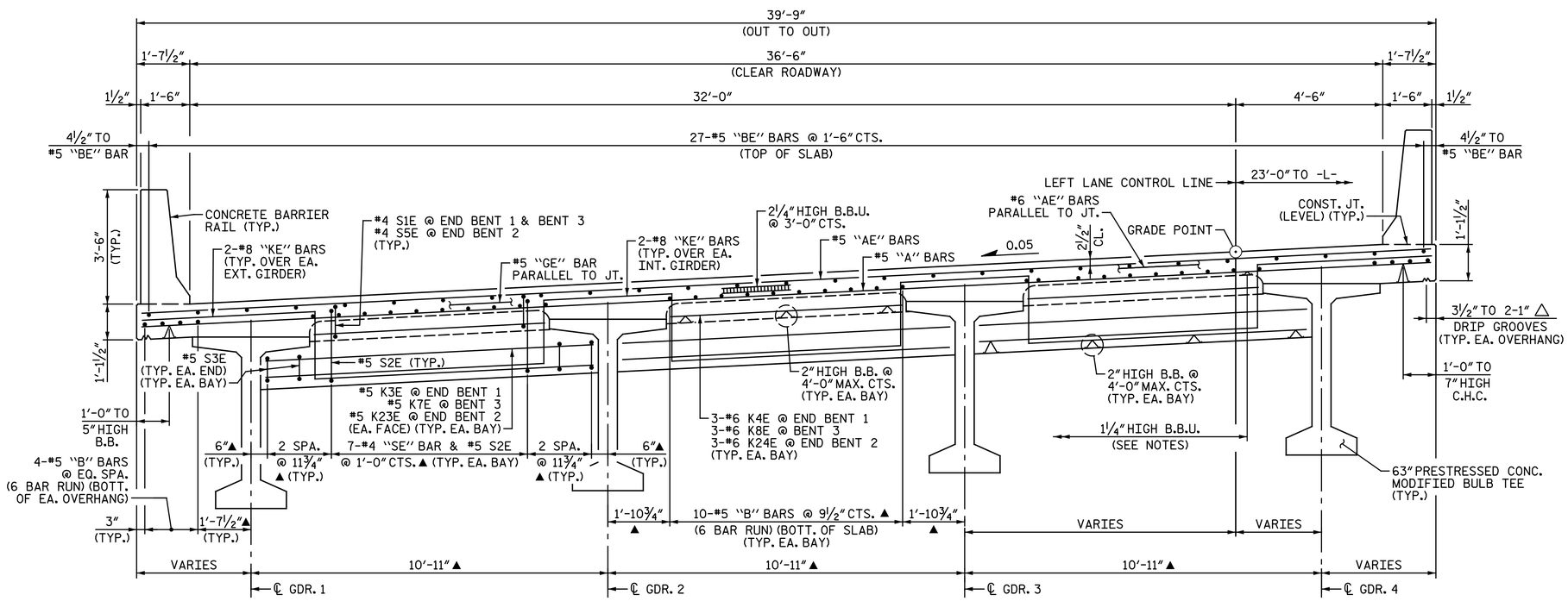
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-7
1			3			TOTAL SHEETS
2			4			62

STD. NO. LRFR1

ASSEMBLED BY : N.B. SPEAKS	DATE : 4-17-18	
CHECKED BY : A. H. SHARPE	DATE : 4-18-18	
DRAWN BY : MAA 1/08	REV. 11/12/08RR	MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11	MAA/GM
	REV. 12/17	MAA/THC



TYPICAL SECTION AT END BENT AND BENT 3 DIAPHRAGMS

ALL HORIZONTAL DIMENSIONS ARE RADIAL U.N.O.

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.

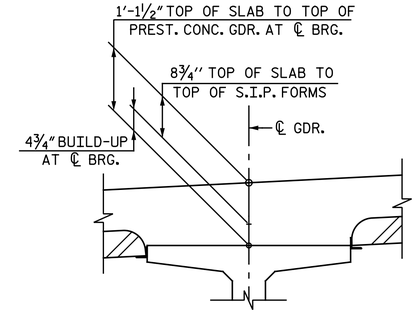
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS AND TO FACILITATE INSTALLATION OF CONCRETE BARRIER RAIL REINFORCEMENT.

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.

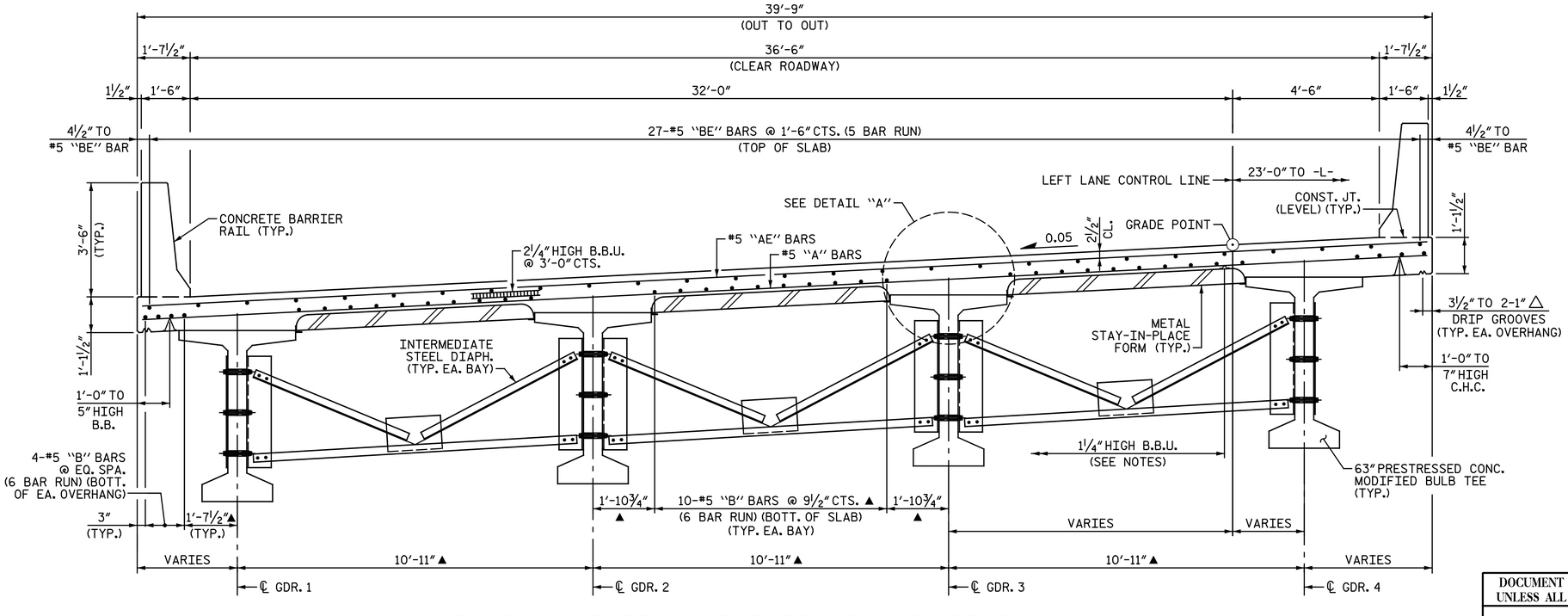
FOR CONCRETE BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR DETAILS OF INTERMEDIATE DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.

▲ MEASURED PERPENDICULAR TO GIRDERS



DETAIL A



TYPICAL SECTION AT INTERMEDIATE DIAPHRAGMS

ALL HORIZONTAL DIMENSIONS ARE RADIAL U.N.O.

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

LEFT LANE

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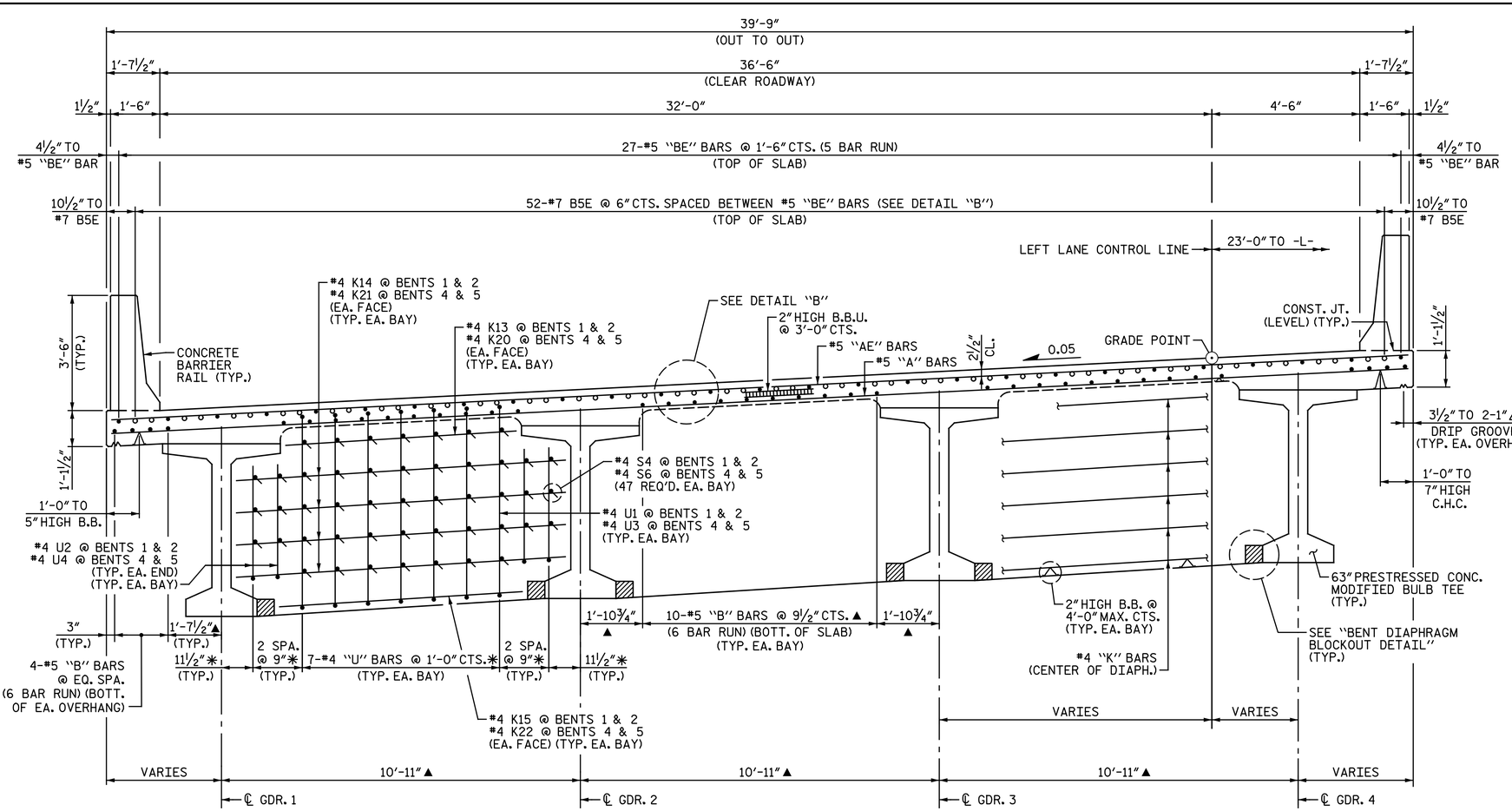
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-8
1			3			TOTAL SHEETS
2			4			62

DRAWN BY : M. D. MAYHEW DATE : 2-8-18

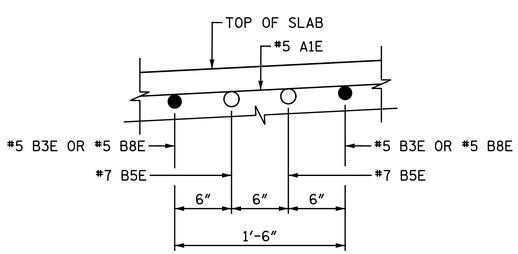
CHECKED BY : B. J. BELL DATE : 4-13-18



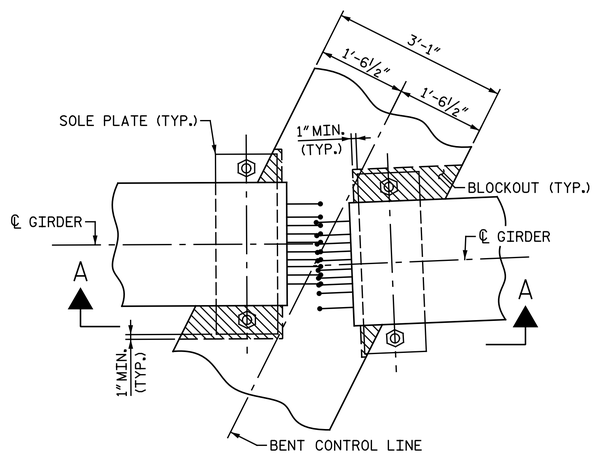
TYPICAL SECTION AT CONTINUOUS BENT DIAPHRAGM

BENTS 1, 2, 4 & 5
ALL HORIZONTAL DIMENSIONS ARE RADIAL U.N.O.

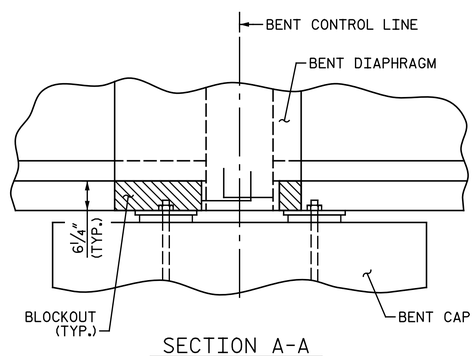
▲ MEASURED PERPENDICULAR TO GIRDERS
✳ SEE "PLAN OF SPANS" SHEETS FOR SPACING DETAILS



DETAIL "B"



PLAN

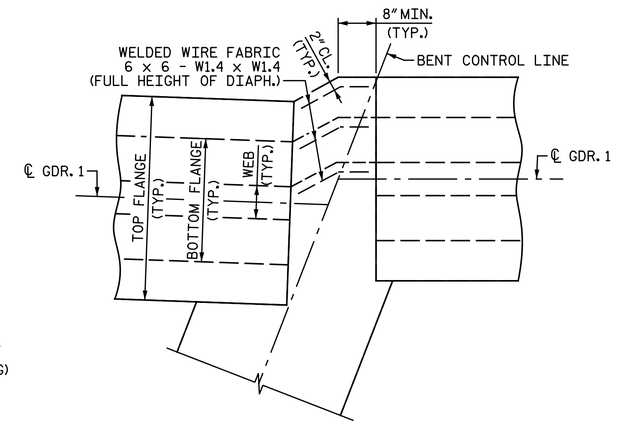


SECTION A-A

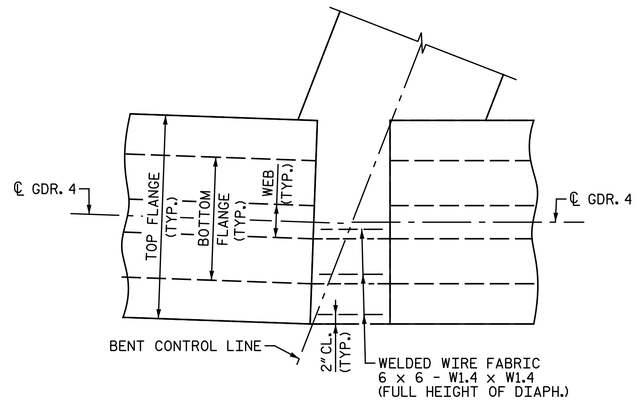
BENT DIAPHRAGM BLOCKOUT DETAIL

NOTES:

THE COST OF THE WELDED WIRE FABRIC SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



PLAN AT GIRDER 1



PLAN AT GIRDER 4

BENT DIAPHRAGM DETAIL

PROJECT NO. U-2412A
GUILFORD COUNTY
STATION: 93+43.36 -L-
SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL
DocuSigned by: Bradley J. Bell 5/7/2018
C41A3F8ECA3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

TYPICAL SECTION

LEFT LANE

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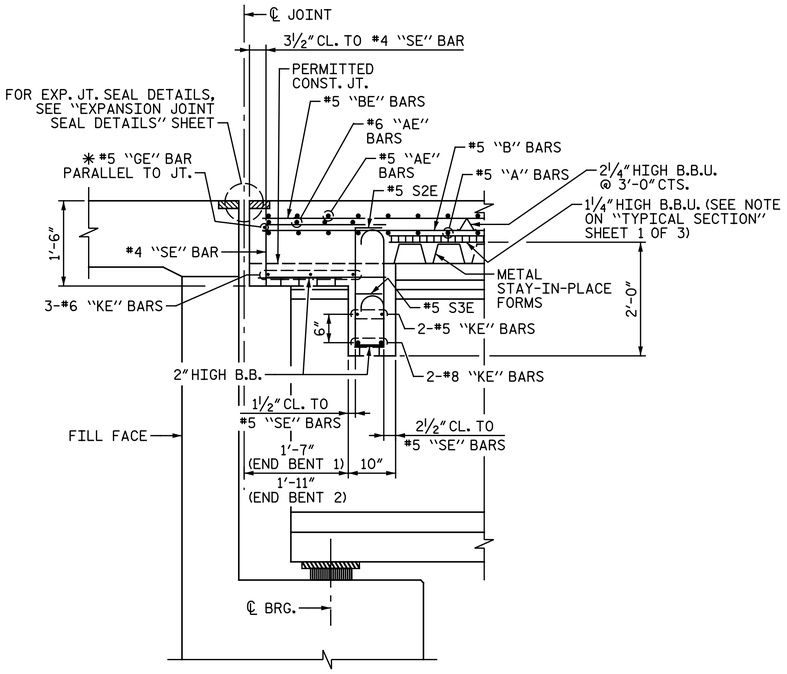
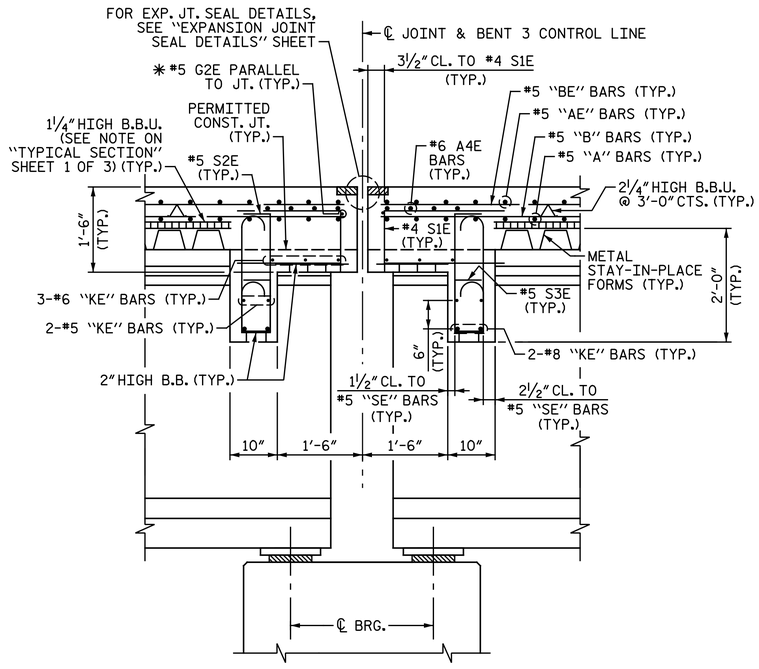
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-9
1			3			TOTAL SHEETS
2			4			62

DRAWN BY : M. D. MAYHEW DATE : 1-3-18
CHECKED BY : B. J. BELL DATE : 4-13-18



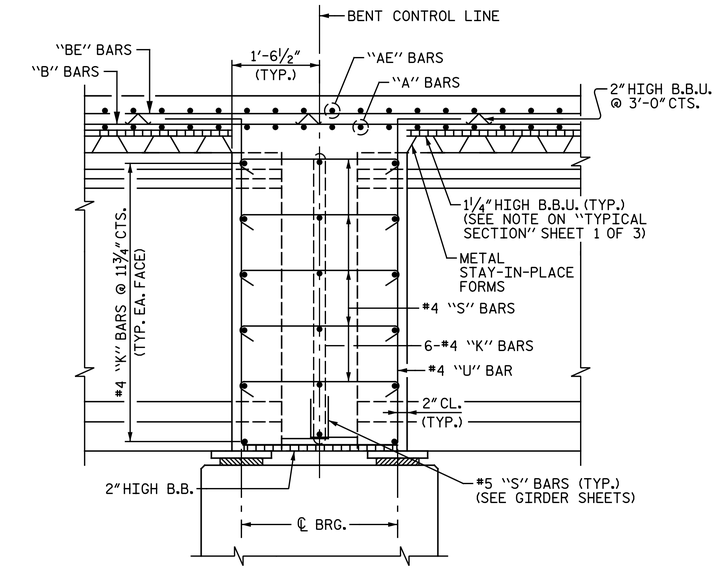
SECTION THRU END BENT DIAPHRAGM

END BENT 1 SHOWN, END BENT 2 SIMILAR



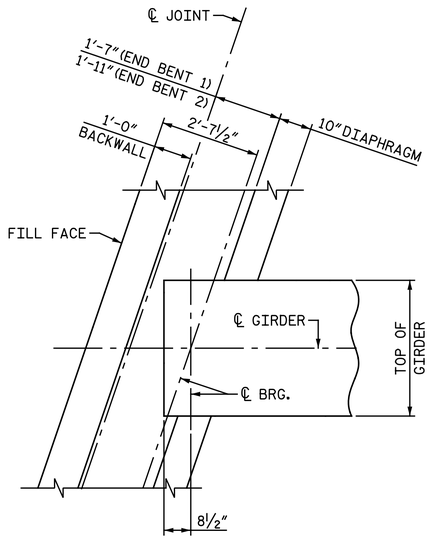
SECTION THRU EXPANSION BENT DIAPHRAGM

BENT 3



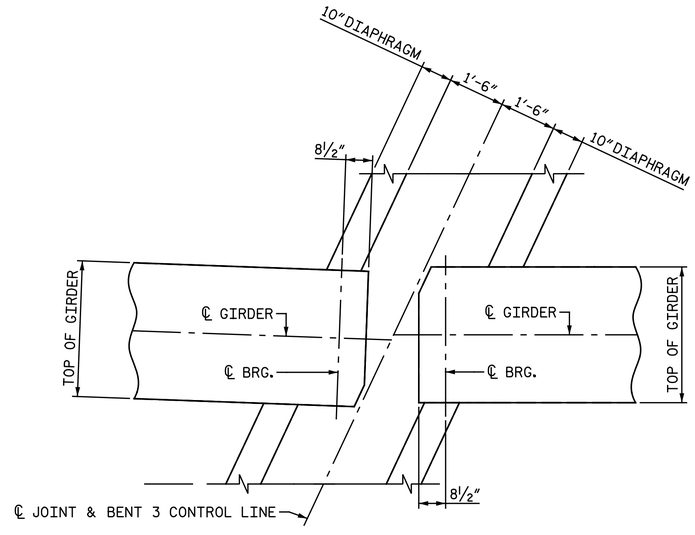
SECTION THRU CONTINUOUS BENT DIAPHRAGM

BENTS 1, 2, 4 & 5



PLAN AT END BENT DIAPHRAGM

END BENT 1 SHOWN, END BENT 2 SIMILAR



PLAN AT EXPANSION BENT DIAPHRAGM

BENT 3

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

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

LEFT LANE

DRAWN BY : M. D. MAYHEW DATE : 1-3-18
CHECKED BY : B. J. BELL DATE : 4-13-18

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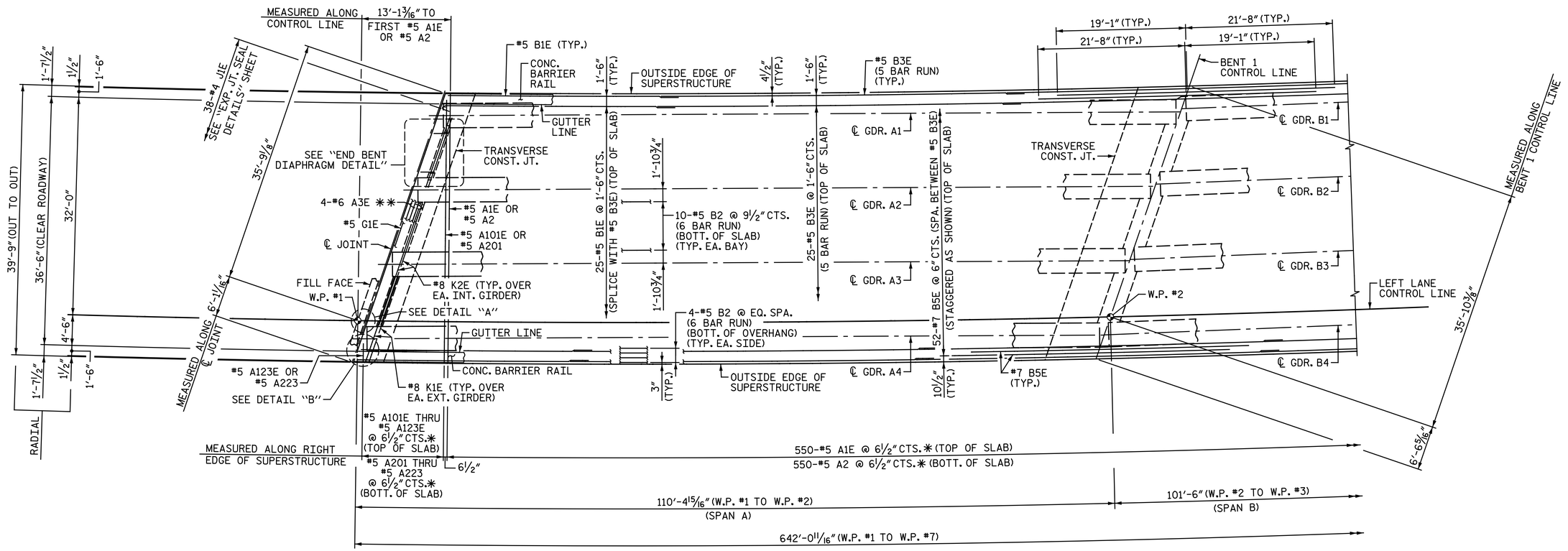
2			4			62



* BARS TO BE PLACED RADIALLY AS SHOWN

** #6 A3E BARS TO BE PLACED PARALLEL TO SKEW AND BELOW "BE" BARS

SPAN A

PARTIAL PLAN OF SPANS - UNIT 1

SPAN B

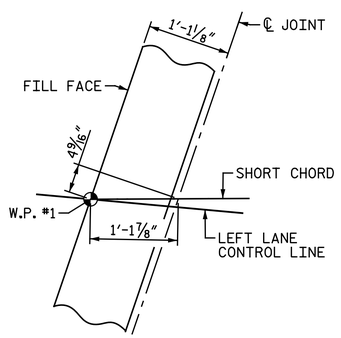
NOTES:

FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

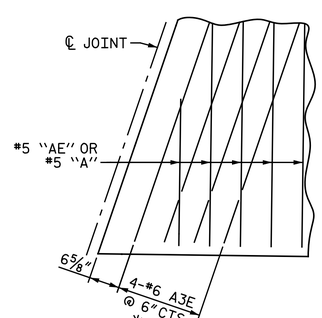
FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "CONCRETE DECK POUR DETAILS" SHEET.

FOR "TRANSVERSE CONSTRUCTION JOINT DETAIL", SEE "PLAN OF SPANS" SHEET 2 OF 6.

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#5	2'-6"	2'-2"

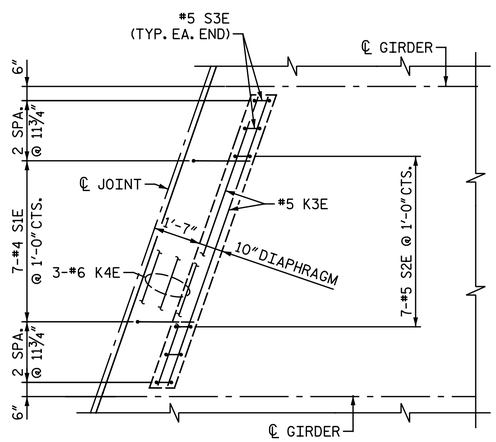


DETAIL "A"



DETAIL "B"

#5 G1E, "BE" BARS & "B" BARS NOT SHOWN FOR CLARITY



END BENT DIAPHRAGM DETAIL

#8 "KE" BARS NOT SHOWN FOR CLARITY (TYP. EA. BAY)

DRAWN BY : M. D. MAYHEW DATE : 2-5-18
CHECKED BY : B. J. BELL DATE : 4-5-18

PROJECT NO. U-2412A
GUILFORD COUNTY
STATION: 93+43.36 -L-

SHEET 1 OF 6

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

LEFT LANE

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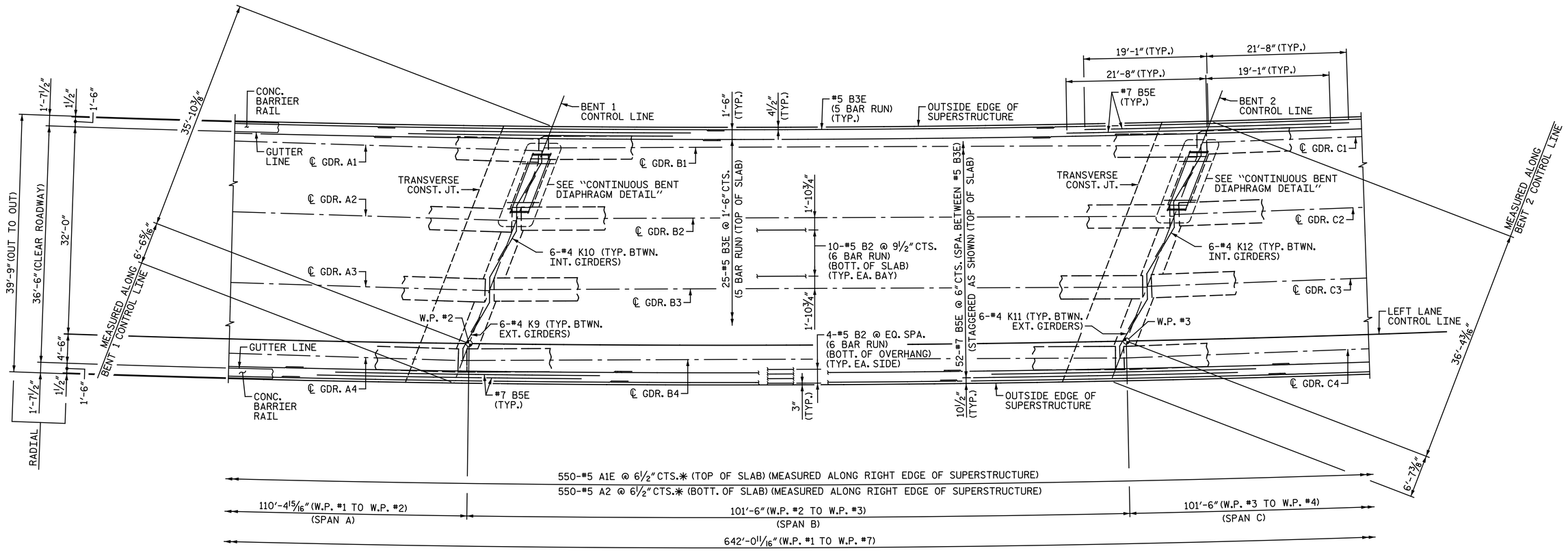
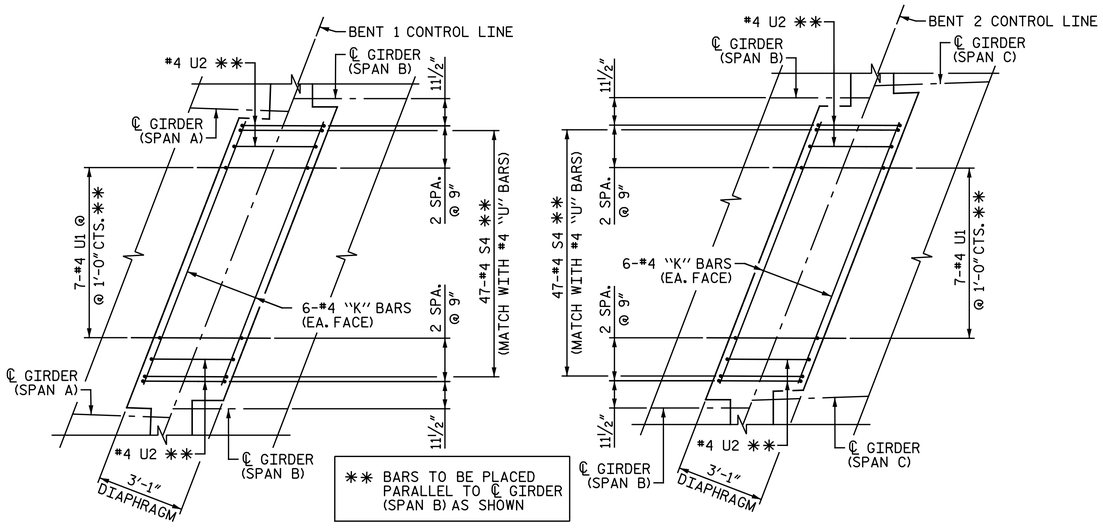
1			3			TOTAL SHEETS
2			4			62



* BARS TO BE PLACED RADIALLY AS SHOWN

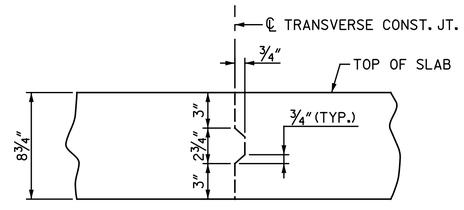
PARTIAL PLAN OF SPANS - UNIT 1



** BARS TO BE PLACED PARALLEL TO ℄ GIRDER (SPAN B) AS SHOWN

CONTINUOUS BENT DIAPHRAGM DETAIL

#4 "K" BARS ALONG CENTER OF DIAPHRAGM NOT SHOWN FOR CLARITY (TYP. EA. BAY)



TRANSVERSE CONST. JT. DETAIL

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

NOTES:

FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "CONCRETE DECK POUR DETAILS" SHEET.

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4 "K"	—	2'-5"
#5	2'-6"	2'-2"

PROJECT NO. U-2412A
GUILFORD COUNTY
STATION: 93+43.36 -L-

SHEET 2 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

LEFT LANE

DRAWN BY : M. D. MAYHEW DATE : 2-6-18
CHECKED BY : B. J. BELL DATE : 4-5-18

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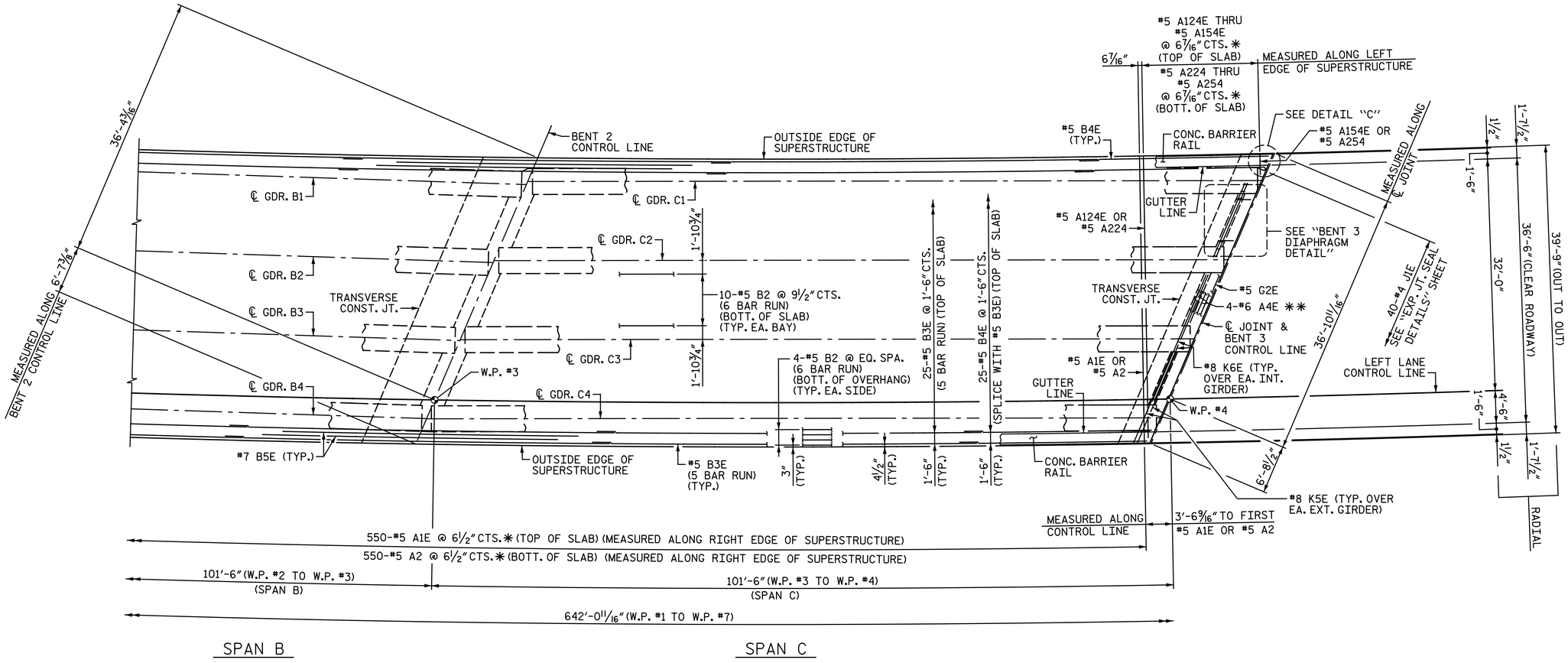
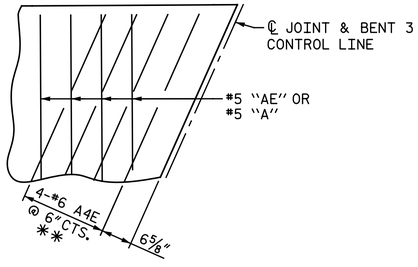


PARTIAL PLAN OF SPANS - UNIT 1

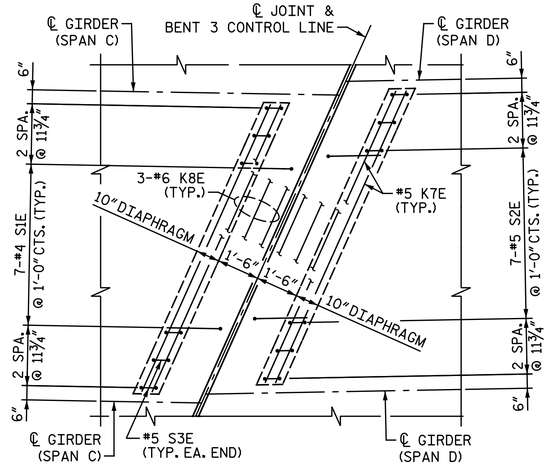
✱ BARS TO BE PLACED RADIALLY AS SHOWN

✱✱ #6 A4E BARS TO BE PLACED PARALLEL TO SKEW AND BELOW "BE" BARS



DETAIL "C"

#5 G2E, "BE" BARS & "B" BARS NOT SHOWN FOR CLARITY



BENT 3 DIAPHRAGM DETAIL

#8 "KE" BARS NOT SHOWN FOR CLARITY (TYP. EA. BAY)

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#5	2'-6"	2'-2"

NOTES:

FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "CONCRETE DECK POUR DETAILS" SHEET.

FOR "TRANSVERSE CONSTRUCTION JOINT DETAIL", SEE "PLAN OF SPANS" SHEET 2 OF 6.

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 3 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

LEFT LANE

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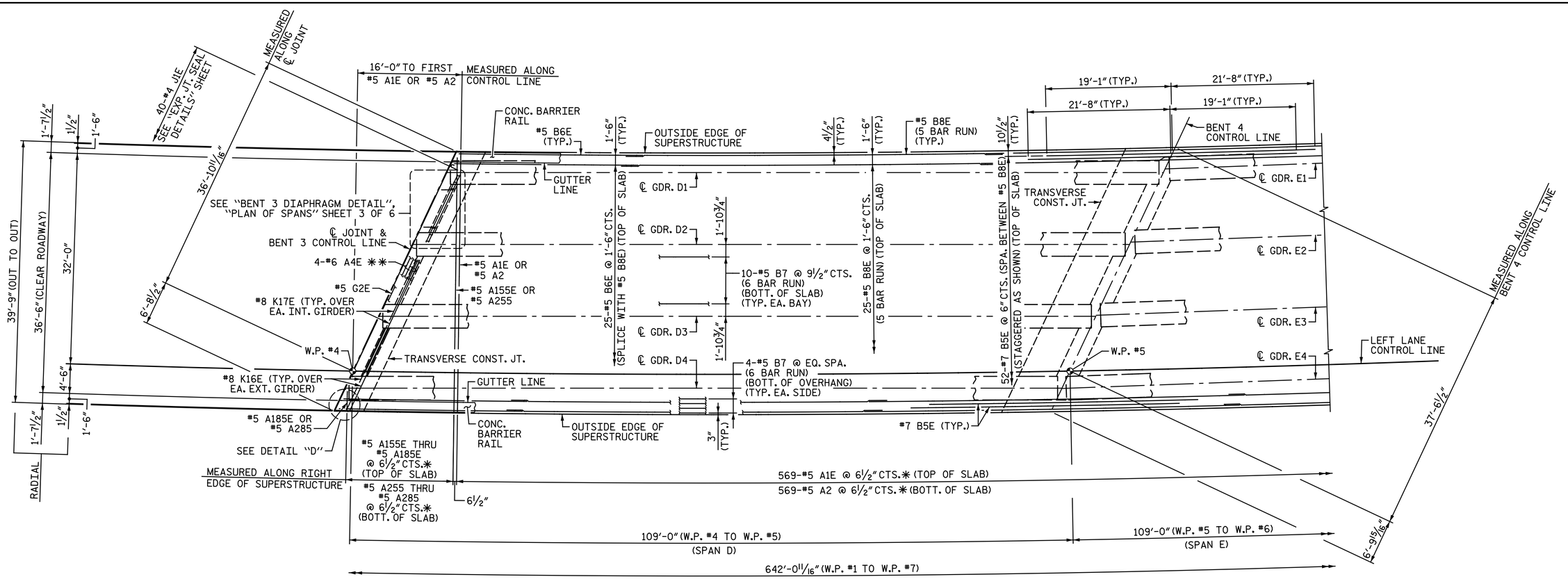
2			4			62

DRAWN BY : M. D. MAYHEW DATE : 2-6-18
CHECKED BY : B. J. BELL DATE : 4-5-18



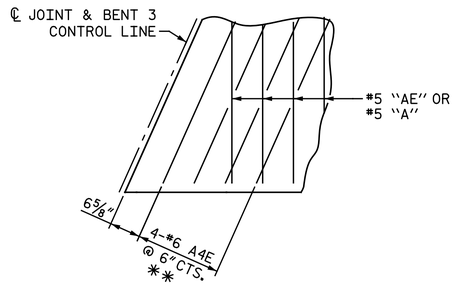
SPAN D

SPAN E

PARTIAL PLAN OF SPANS - UNIT 2

* BARS TO BE PLACED RADIALLY AS SHOWN

** #6 A4E BARS TO BE PLACED PARALLEL TO SKEW AND BELOW "BE" BARS



DETAIL "D"

#5 G2E, "BE" BARS & "B" BARS NOT SHOWN FOR CLARITY

NOTES:

FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "CONCRETE DECK POUR DETAILS" SHEET.

FOR "TRANSVERSE CONSTRUCTION JOINT DETAIL", SEE "PLAN OF SPANS" SHEET 2 OF 6.

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#5	2'-6"	2'-2"

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 4 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
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SUPERSTRUCTURE

PLAN OF SPANS

LEFT LANE

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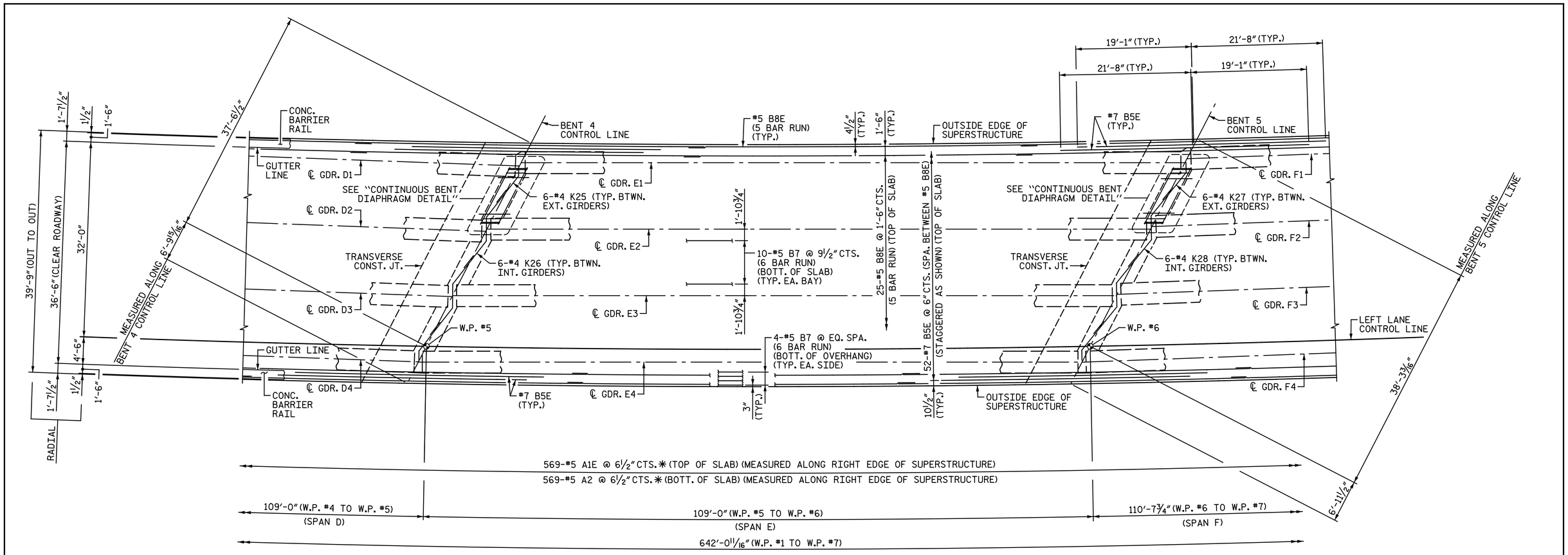
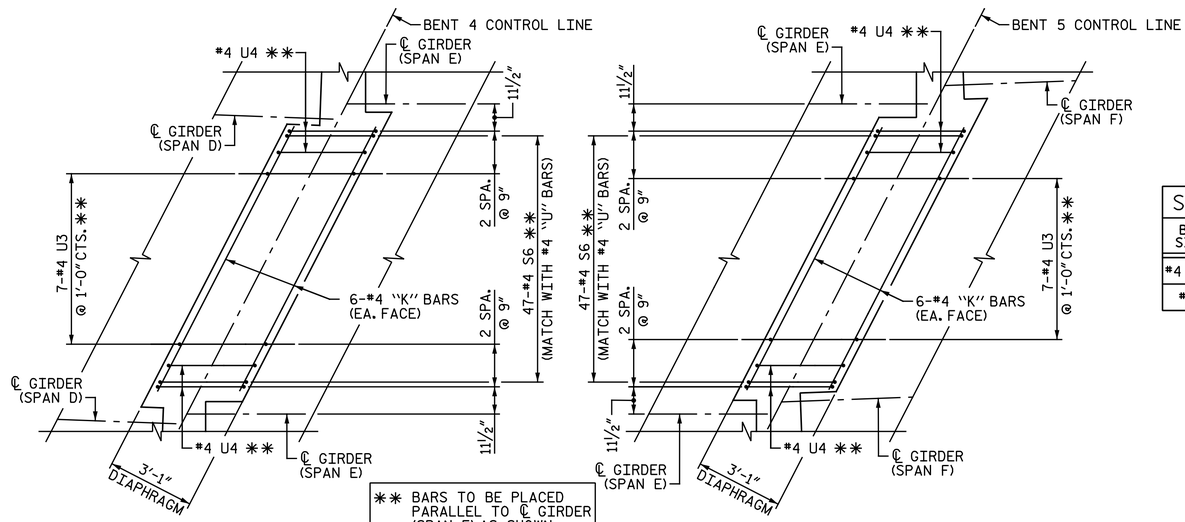


✱ BARS TO BE PLACED RADIALLY AS SHOWN

PARTIAL PLAN OF SPANS - UNIT 2



✱✱ BARS TO BE PLACED PARALLEL TO ℄ GIRDER (SPAN E) AS SHOWN.

CONTINUOUS BENT DIAPHRAGM DETAIL

#4 "K" BARS ALONG CENTER OF DIAPHRAGM NOT SHOWN FOR CLARITY (TYP. EA. BAY)

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4 "K"	—	2'-5"
#5	2'-6"	2'-2"

NOTES:

FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "CONCRETE DECK POUR DETAILS" SHEET.

FOR "TRANSVERSE CONSTRUCTION JOINT DETAIL", SEE "PLAN OF SPANS" SHEET 2 OF 6.

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 5 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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SUPERSTRUCTURE

PLAN OF SPANS

LEFT LANE

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DRAWN BY : M. D. MAYHEW DATE : 1-18-18
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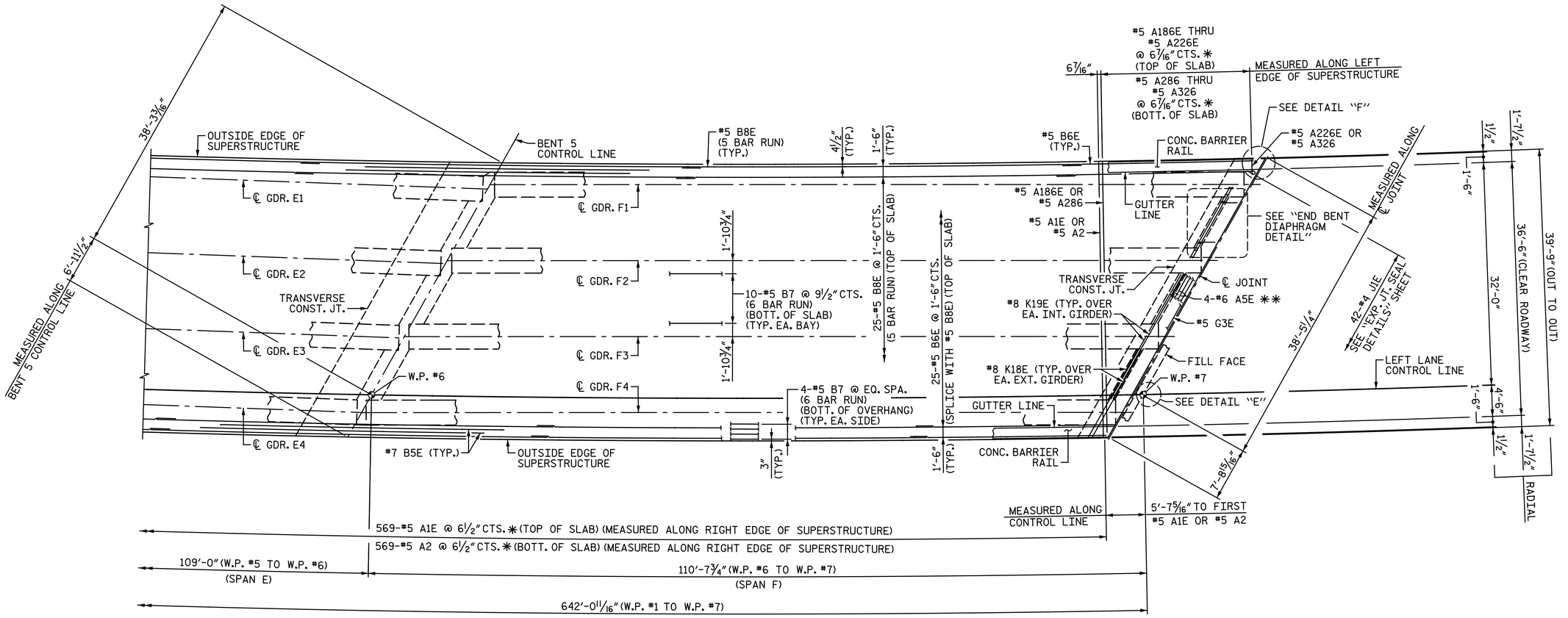
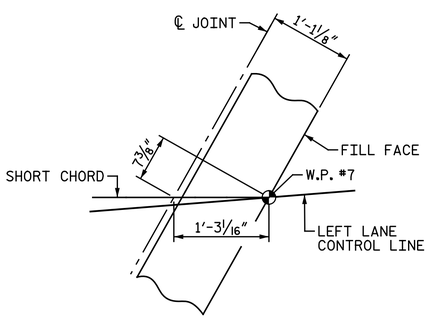


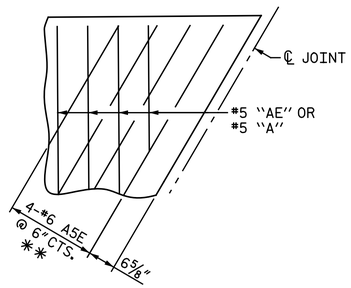
PARTIAL PLAN OF SPANS - UNIT 2

* BARS TO BE PLACED RADIALLY AS SHOWN

** #6 A5E BARS TO BE PLACED PARALLEL TO SKEW AND BELOW "BE" BARS

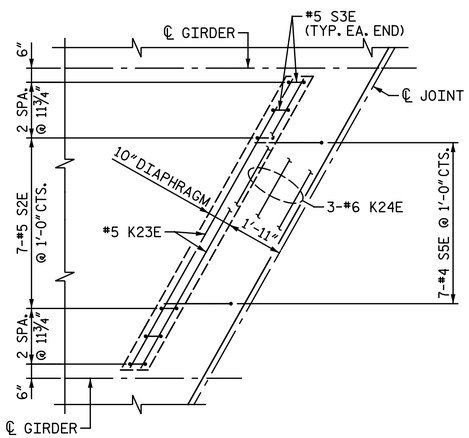


DETAIL "E"



DETAIL "F"

#5 G3E, "BE" BARS & "B" BARS NOT SHOWN FOR CLARITY



END BENT DIAPHRAGM DETAIL

#8 "KE" BARS NOT SHOWN FOR CLARITY (TYP. EA. BAY)

NOTES:

FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

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FOR "TRANSVERSE CONSTRUCTION JOINT DETAIL", SEE "PLAN OF SPANS" SHEET 2 OF 6.

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#5	2'-6"	2'-2"

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 6 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
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RALEIGH
SUPERSTRUCTURE

PLAN OF SPANS

LEFT LANE

DRAWN BY : M. D. MAYHEW DATE : 1-17-18
CHECKED BY : B. J. BELL DATE : 4-5-18

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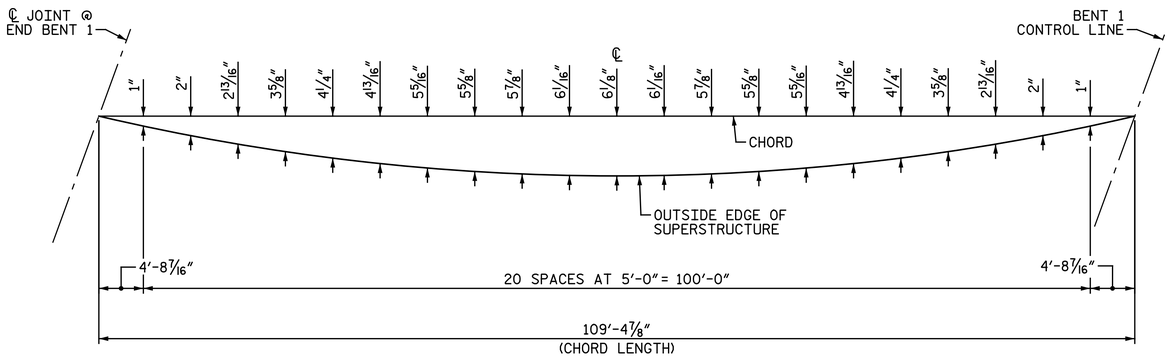
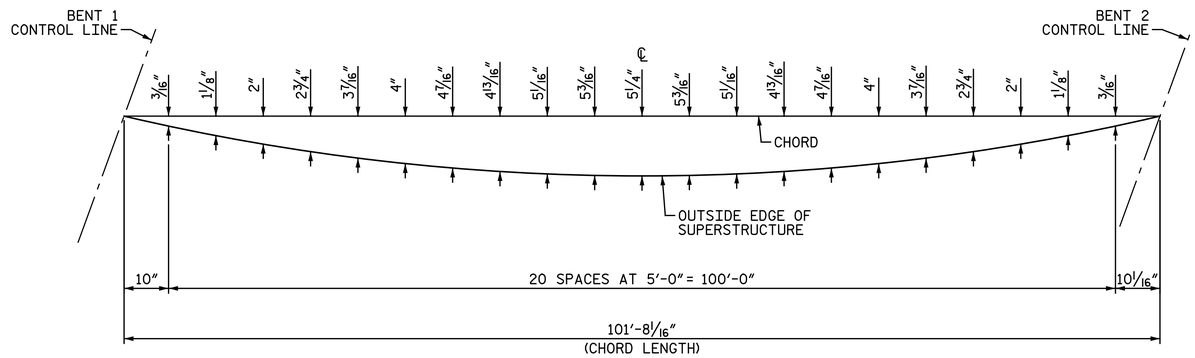
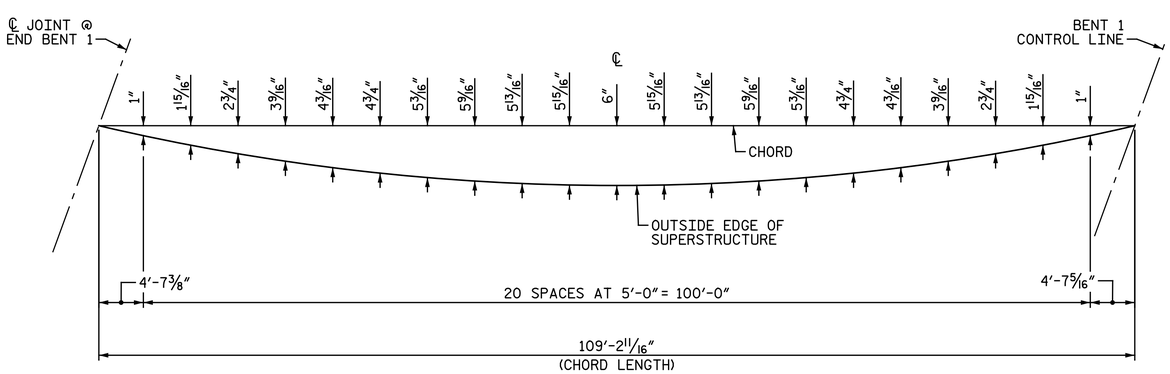


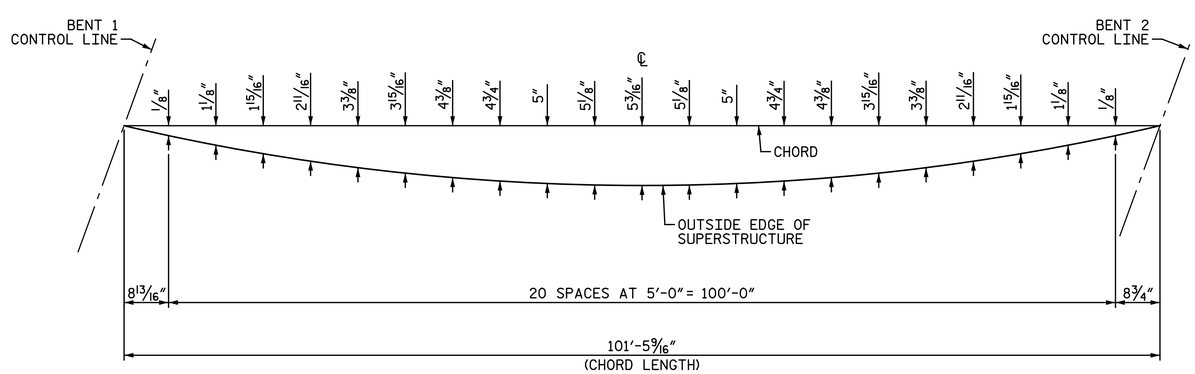
LEFT SIDE SPAN A



LEFT SIDE SPAN B



RIGHT SIDE SPAN A



RIGHT SIDE SPAN B

ARC OFFSETS - SPANS A AND B

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

ARC OFFSETS

LEFT LANE

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NC License No.: F-1084

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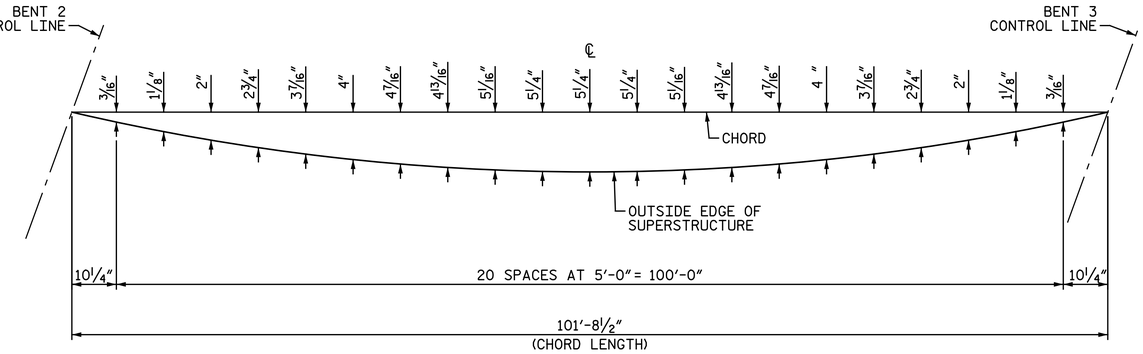
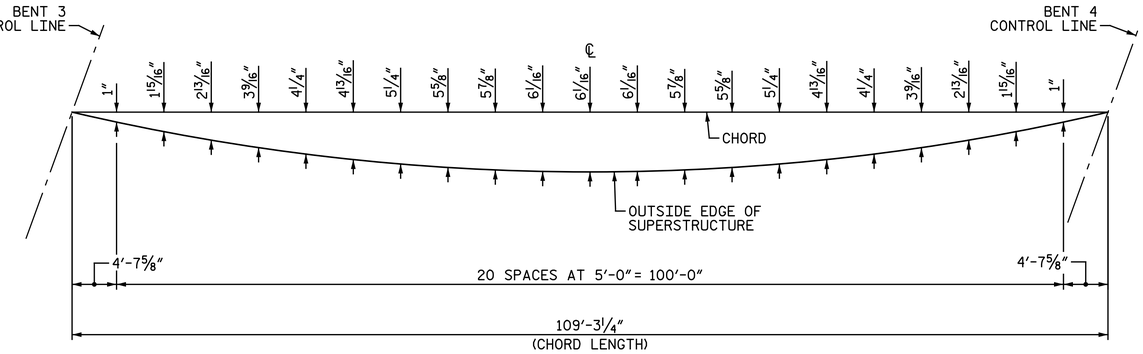
2			4			62

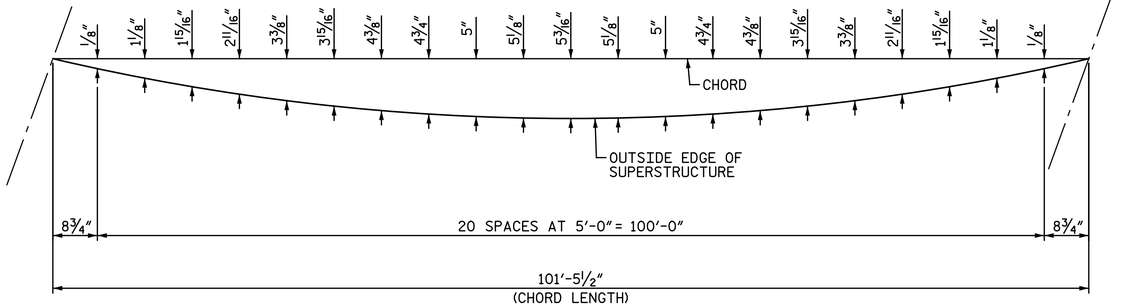
DRAWN BY : C. E. MAYHEW DATE : 1-10-18
CHECKED BY : B. J. BELL DATE : 2-7-18



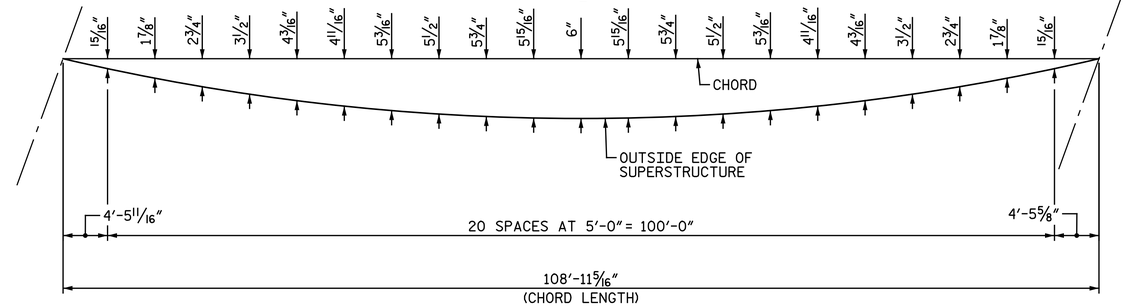
LEFT SIDE SPAN C



LEFT SIDE SPAN D



RIGHT SIDE SPAN C



RIGHT SIDE SPAN D

ARC OFFSETS - SPANS C AND D

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 2 OF 3

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STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE

ARC OFFSETS

LEFT LANE

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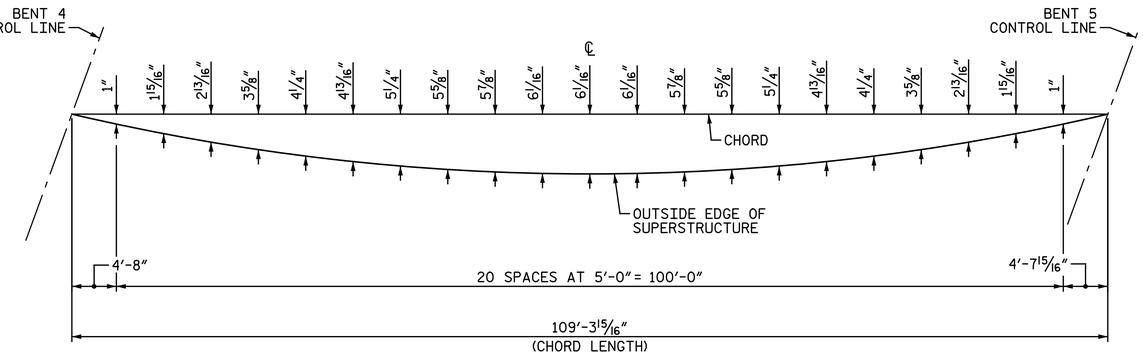
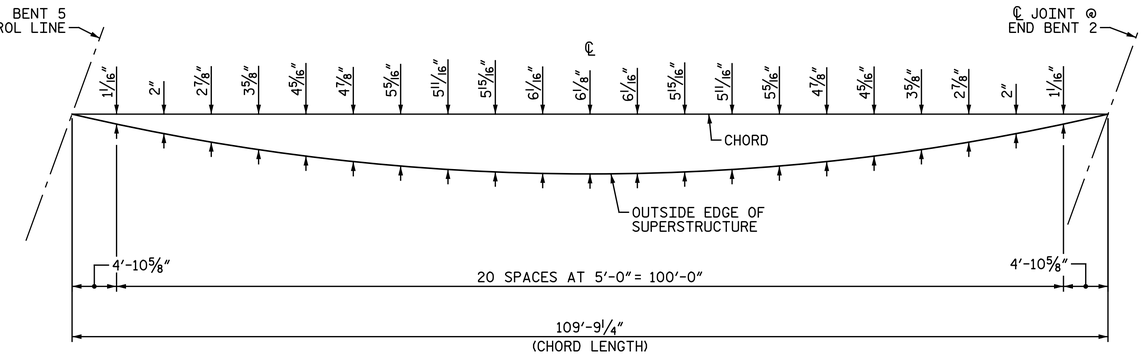
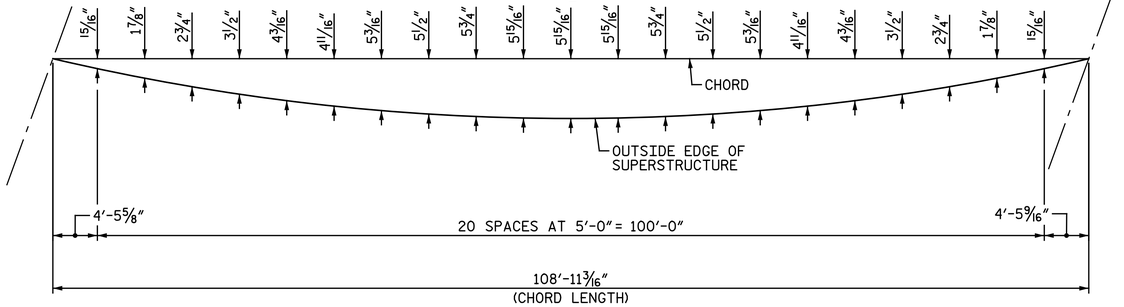


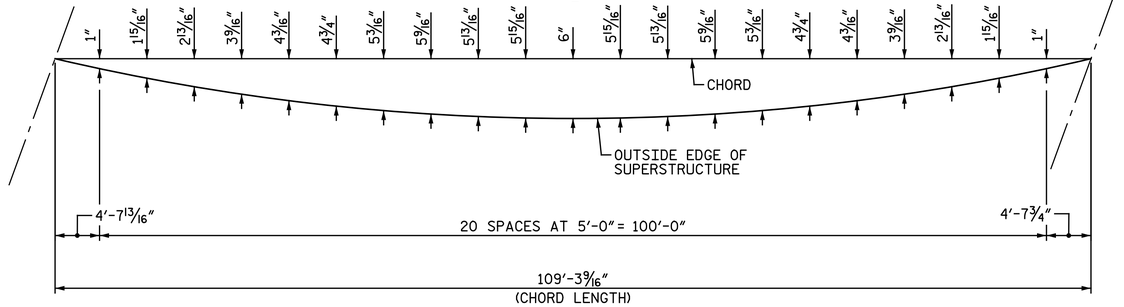
LEFT SIDE SPAN E



LEFT SIDE SPAN F



RIGHT SIDE SPAN E



RIGHT SIDE SPAN F

ARC OFFSETS - SPANS E AND F

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018
C41A3F8ECA3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

ARC OFFSETS

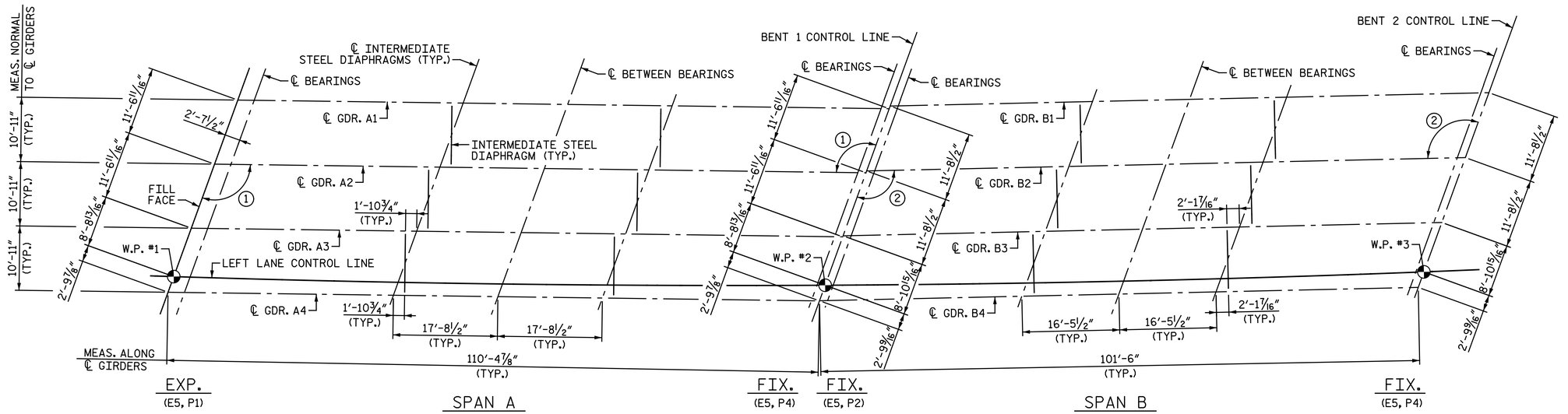
LEFT LANE

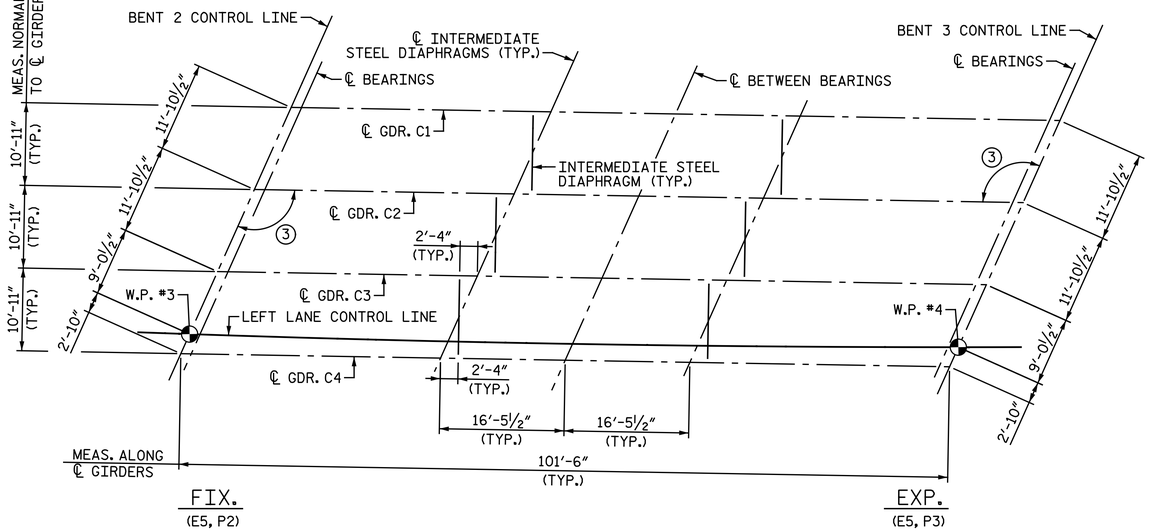
Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-19
1			3			TOTAL SHEETS
2			4			62

DRAWN BY : C. E. MAYHEW DATE : 1-10-18
CHECKED BY : B. J. BELL DATE : 2-7-18





GIRDER LAYOUT - UNIT 1

GIRDER ANGLES	
①	109°-10'-14"
②	111°-12'-36"
③	113°-09'-48"

NOTE:

FOR INTERMEDIATE STEEL DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.

GIRDERS ARE PARALLEL TO SPAN SHORT CHORDS.

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

GIRDER LAYOUT
UNIT 1

LEFT LANE

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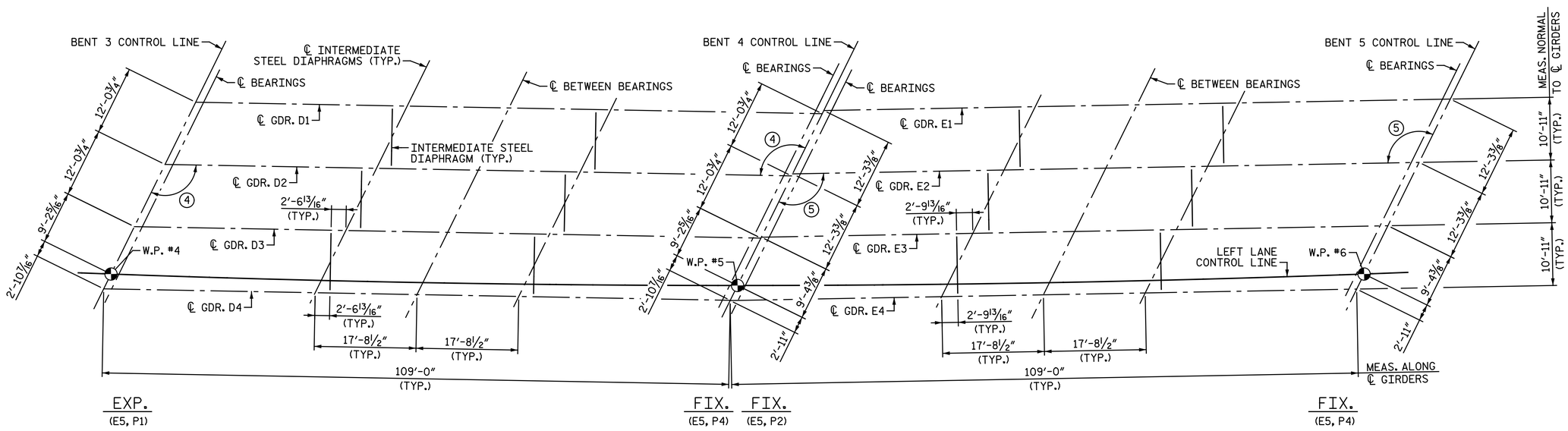
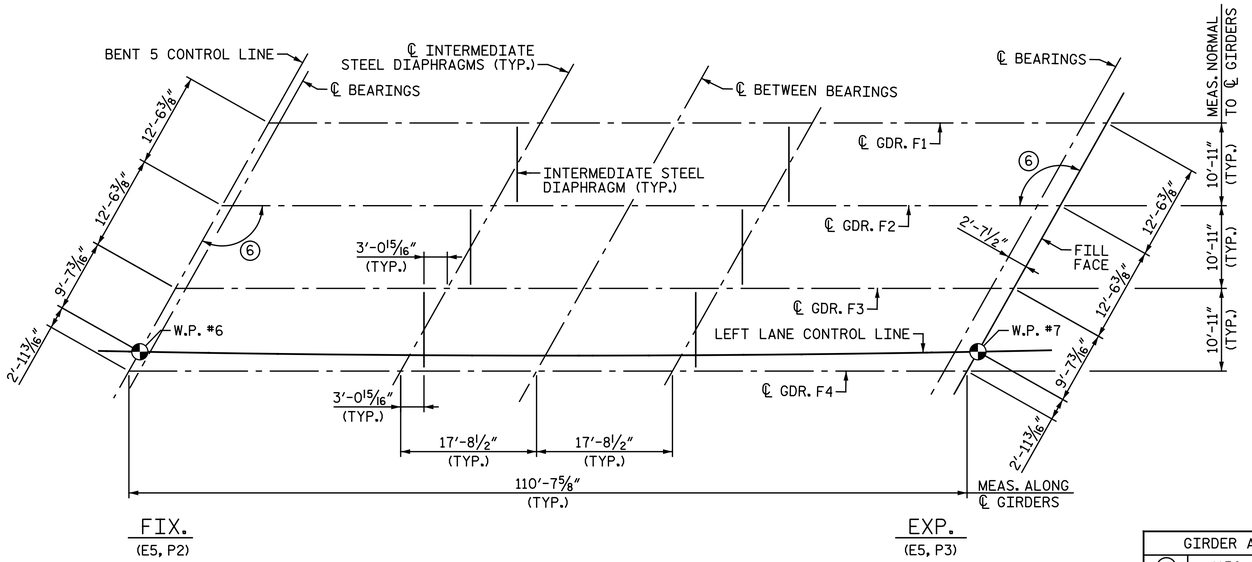
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-20
1			3			TOTAL SHEETS
2			4			62

DRAWN BY : M. D. MAYHEW DATE : 1-10-18
CHECKED BY : T. M. GARRISON DATE : 2-16-18





GIRDER ANGLES	
④	115°-11'-20"
⑤	117°-17'-13"
⑥	119°-24'-02"

NOTE:

FOR INTERMEDIATE STEEL DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.

GIRDERS ARE PARALLEL TO THE SPAN SHORT CHORDS.

GIRDER LAYOUT - UNIT 2

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

GIRDER LAYOUT
UNIT 2

LEFT LANE

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Michael Baker Engineering
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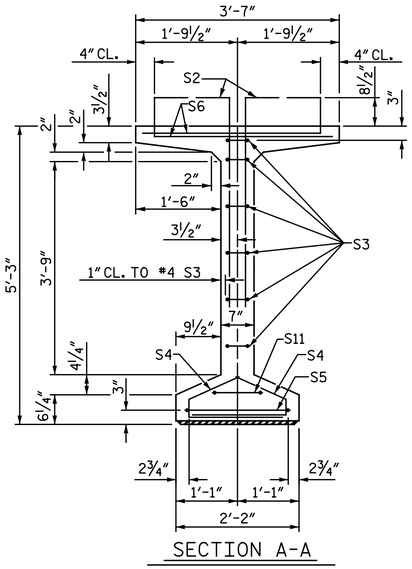
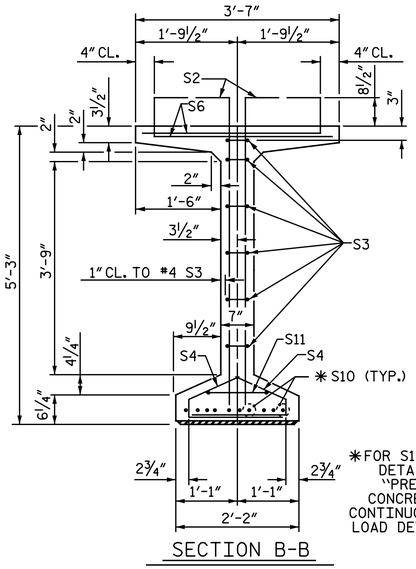
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-21
1			3			TOTAL SHEETS
2			4			62

DRAWN BY : M. D. MAYHEW DATE : 1-10-18
CHECKED BY : T. M. GARRISON DATE : 2-16-18

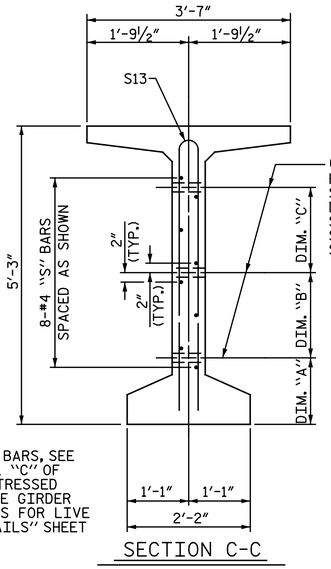


SECTION A-A



SECTION B-B

✱FOR S10 BARS, SEE DETAIL "C" OF "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET

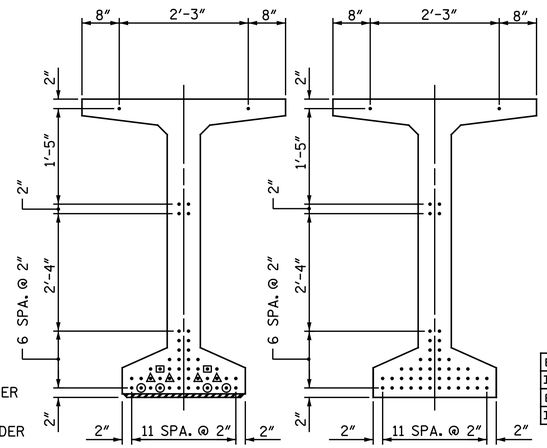


SECTION C-C

(S1 AND S9 BARS NOT SHOWN)

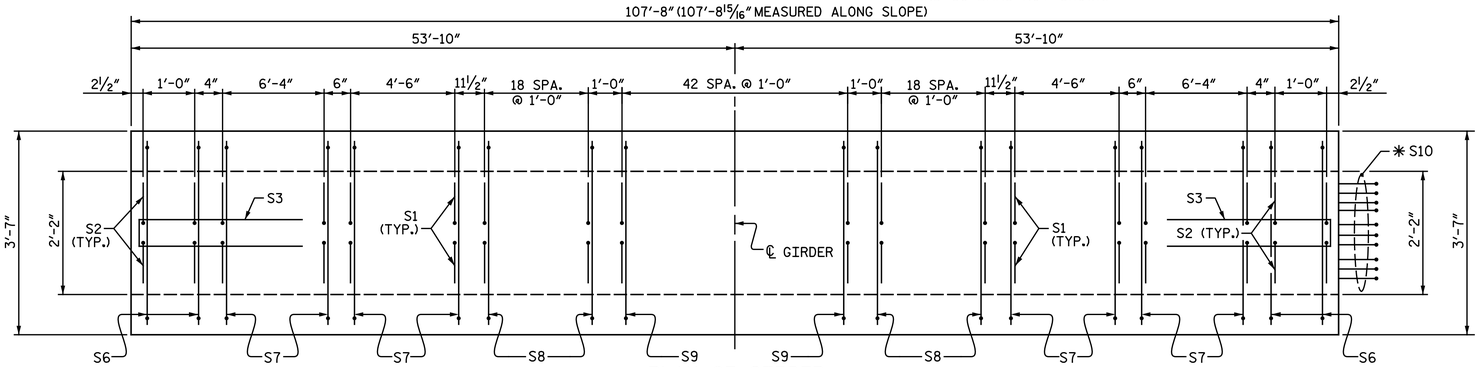
DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 6′-0″ FROM END OF GIRDER
- ▲ STRANDS DEBONDED FOR 10′-0″ FROM END OF GIRDER
- ◉ STRANDS DEBONDED FOR 14′-0″ FROM END OF GIRDER

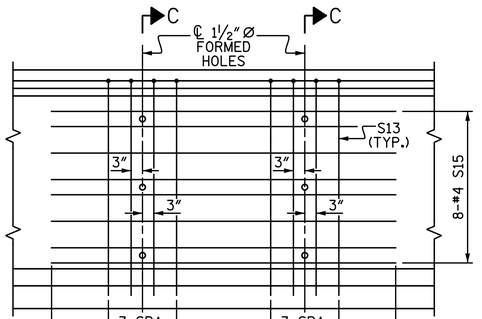


AT END OF GIRDER AT ℄ OF GIRDER

0.6″Ø LOW RELAXATION STRAND LAYOUT

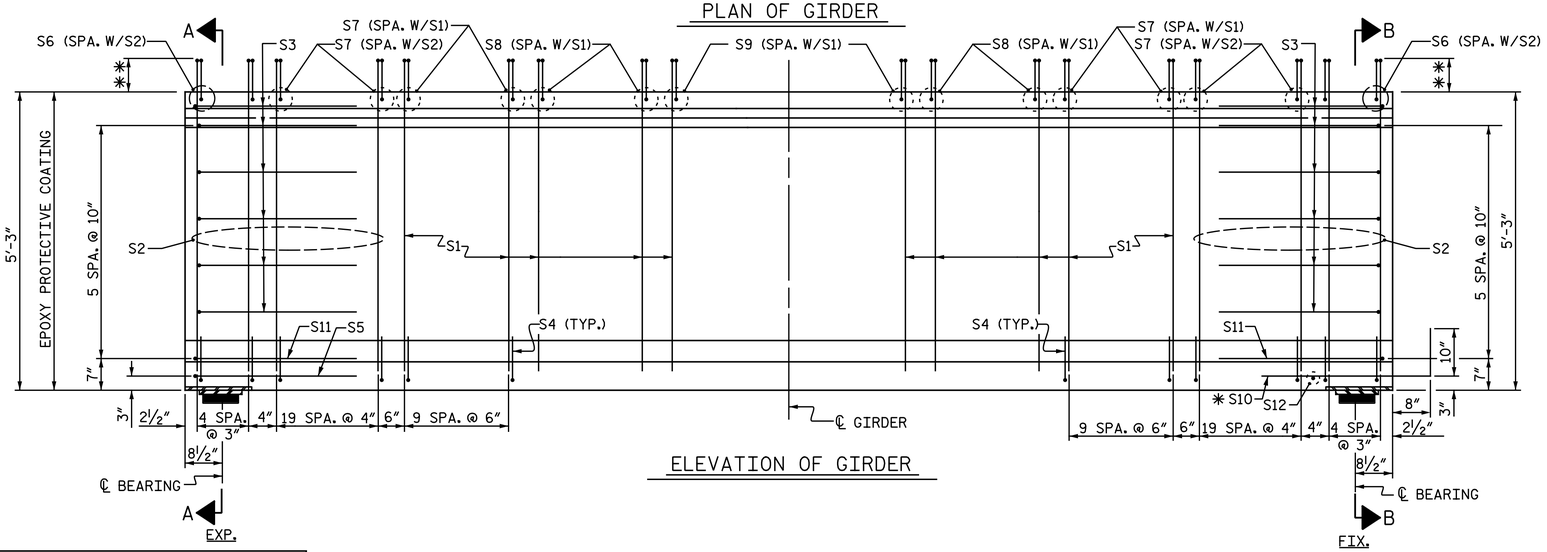


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR INTERIOR GIRDERS. (SEE SHEET 2 OF 6 FOR EXTERIOR GIRDER DETAILS)



ELEVATION OF GIRDER

✱✱BAR PROJECTION	
S6	8½″
S7	7½″
S8	6½″
S9	6″

0.6″Ø L. R. GRADE 270 STRANDS

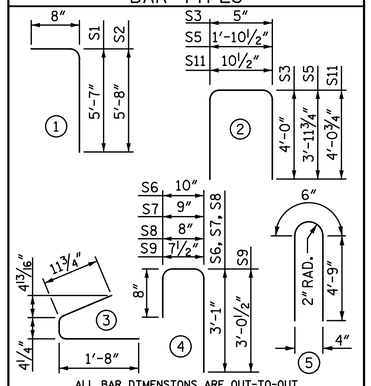
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	202	#4	1	6′-3″	843
	S2	100	#5	1	6′-4″	661
	S3	12	#4	2	8′-5″	67
	S4	140	#4	3	3′-0″	281
	S5	1	#5	2	9′-10″	10
	S6	20	#5	4	4′-7″	96
	S7	120	#5	4	4′-6″	563
	S8	76	#5	4	4′-5″	350
	S9	86	#5	4	4′-4″	389
	✱S10	10	#5	STR.	3′-8″	38
	S11	2	#5	2	9′-0″	19
	S12	1	#3	STR.	1′-10″	1
EXTERIOR GDR.	S13	8	#5	5	10′-0″	83
INTERIOR GDR.	S13	16	#5	5	10′-0″	167
EXTERIOR GDR.	S14	16	#4	STR.	8′-0″	86
INTERIOR GDR.	S15	16	#4	STR.	14′-2″	151

✱NOTE: S10 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	10,000 PSI CONCRETE C.Y.	0.6″Ø L.R. STRANDS No.
EXTERIOR GIRDER	3,487	21.3	48
INTERIOR GIRDER	3,636	21.3	48

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	107.74′	430.98′

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 1 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8ECA3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

63″ PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN A LEFT LANE

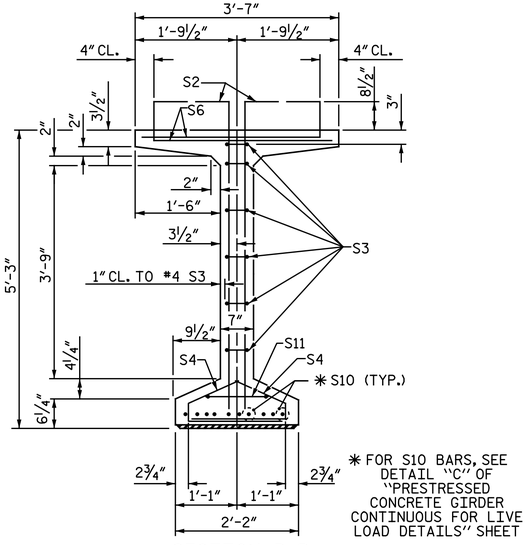
ASSEMBLED BY : N.B. SPEAKS	DATE : 3-26-17
CHECKED BY : B.J. BELL	DATE : 4-11-18
DRAWN BY : EEM 2/6/97	REV. 6/13 MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

Michael Baker INTERNATIONAL

Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No. : F-1084

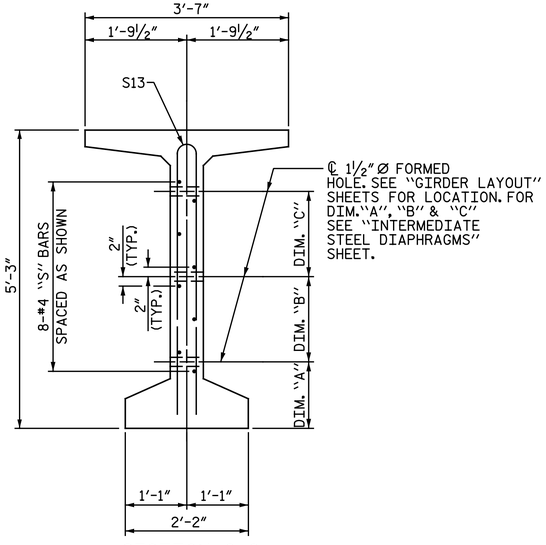
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-22
1			3			TOTAL SHEETS
2			4			62

STD. NO. PCG7



✱ FOR S10 BARS, SEE DETAIL "C" OF "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET

SECTION B-B

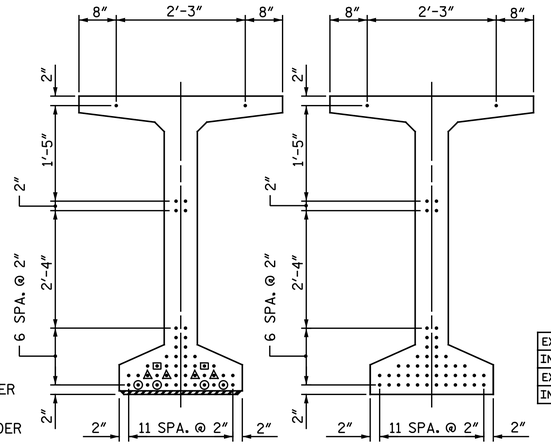


SECTION C-C

(S1 AND S9 BARS NOT SHOWN)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 6′-0″ FROM END OF GIRDER
- ◭ STRANDS DEBONDED FOR 10′-0″ FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 14′-0″ FROM END OF GIRDER



AT END OF GIRDER AT ℄ OF GIRDER

0.6″Ø LOW RELAXATION STRAND LAYOUT

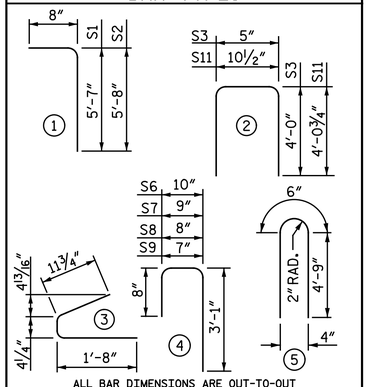
0.6″Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	190	#4	1	6′-3″	793
	S2	92	#5	1	6′-4″	608
	S3	12	#4	2	8′-5″	67
	S4	132	#4	3	3′-0″	265
	S6	20	#5	4	4′-7″	96
	S7	112	#5	4	4′-6″	526
	S8	44	#5	4	4′-5″	203
	S9	106	#5	4	4′-4″	479
	✱S10	20	#5	STR.	3′-8″	76
	S11	2	#5	2	9′-0″	19
	S12	2	#3	STR.	1′-10″	1
EXTERIOR GDR.	S13	8	#5	5	10′-0″	83
INTERIOR GDR.	S13	16	#5	5	10′-0″	167
EXTERIOR GDR.	S14	16	#4	STR.	8′-0″	86
INTERIOR GDR.	S15	16	#4	STR.	14′-2″	151

✱NOTE: S10 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

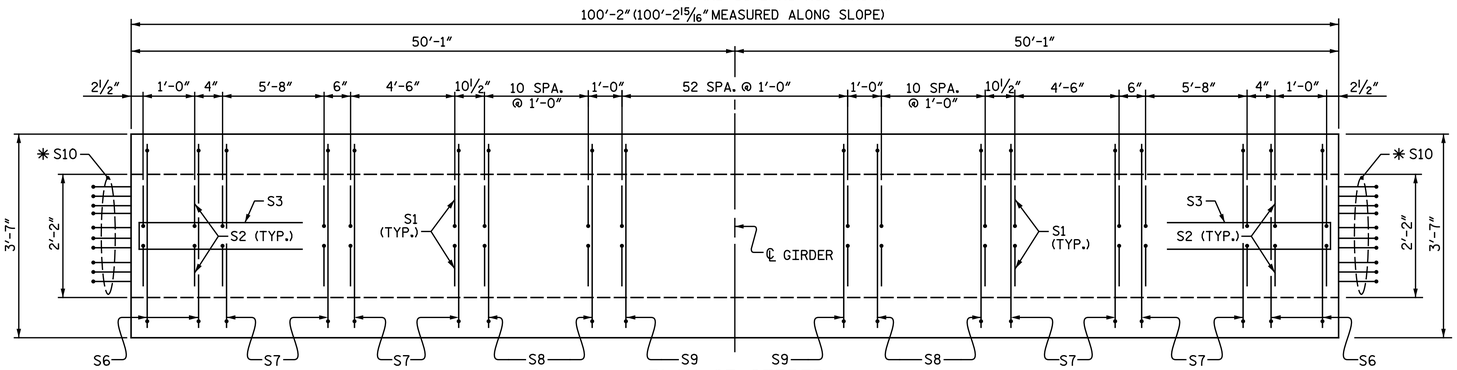
QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	10,000 PSI CONCRETE	0.6″Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	3,302	19.9	48
INTERIOR GIRDER	3,451	19.9	48

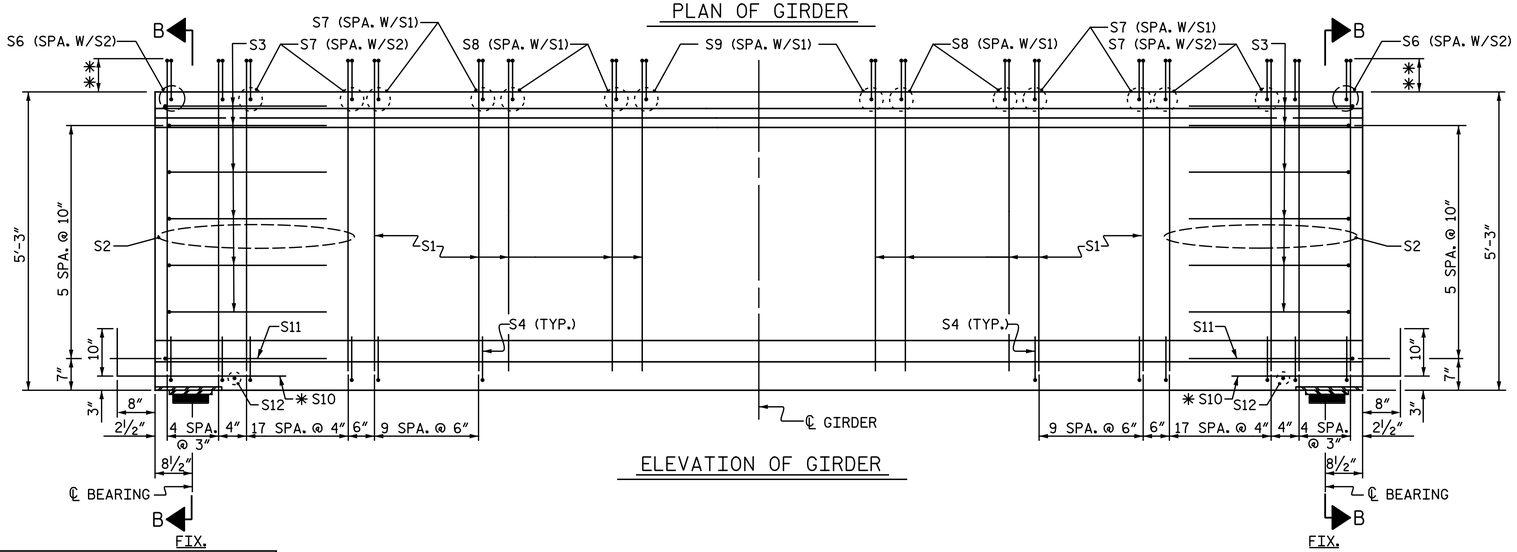
GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	100.24′	400.98′

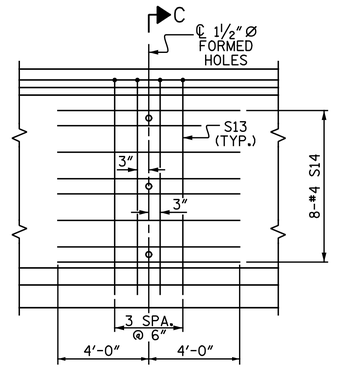
100′-2″ (100′-2¹⁵⁄₁₆″ MEASURED ALONG SLOPE)



PLAN OF GIRDER



ELEVATION OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR EXTERIOR GIRDERS. (SEE SHEET 1 OF 6 FOR INTERIOR GIRDER DETAILS)

✱✱BAR PROJECTION	
S6	8½″
S7	7½″
S8	6½″
S9	5½″

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

63″ PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN B LEFT LANE

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8ECA3C434...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

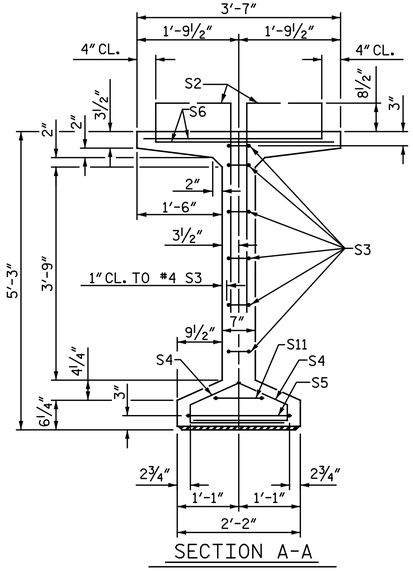
Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

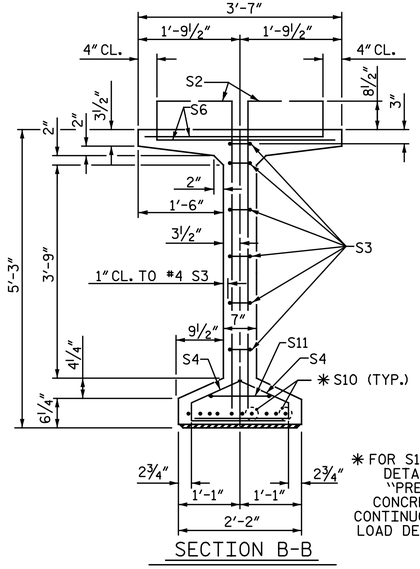
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-23
1			3			TOTAL SHEETS
2			4			62

ASSEMBLED BY : N.B. SPEAKS	DATE : 3-27-18	
CHECKED BY : B.J. BELL	DATE : 4-11-18	
DRAWN BY : EEM 2/6/97	REV. 6/13	MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15	MAA/TMG
	REV. 12/17	MAA/THC

STD. NO. PCG7

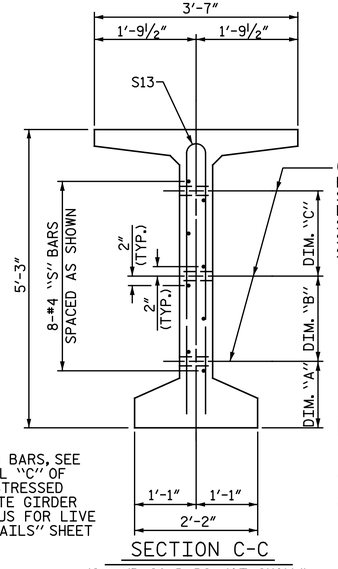


SECTION A-A



SECTION B-B

✳ FOR S10 BARS, SEE DETAIL "C" OF "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET



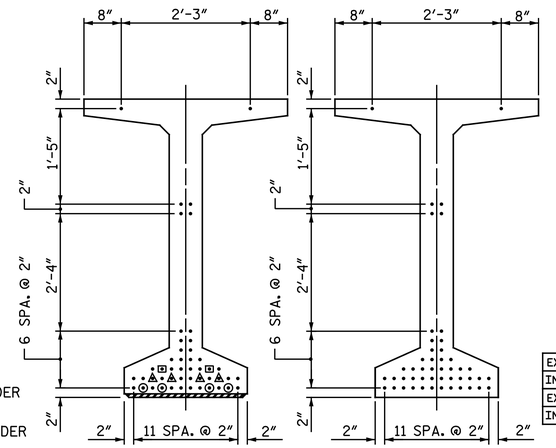
SECTION C-C

(S1 AND S9 BARS NOT SHOWN)

(SEE SHEET 1 OF 6 & 2 OF 6 FOR SECTION CUT LOCATION)

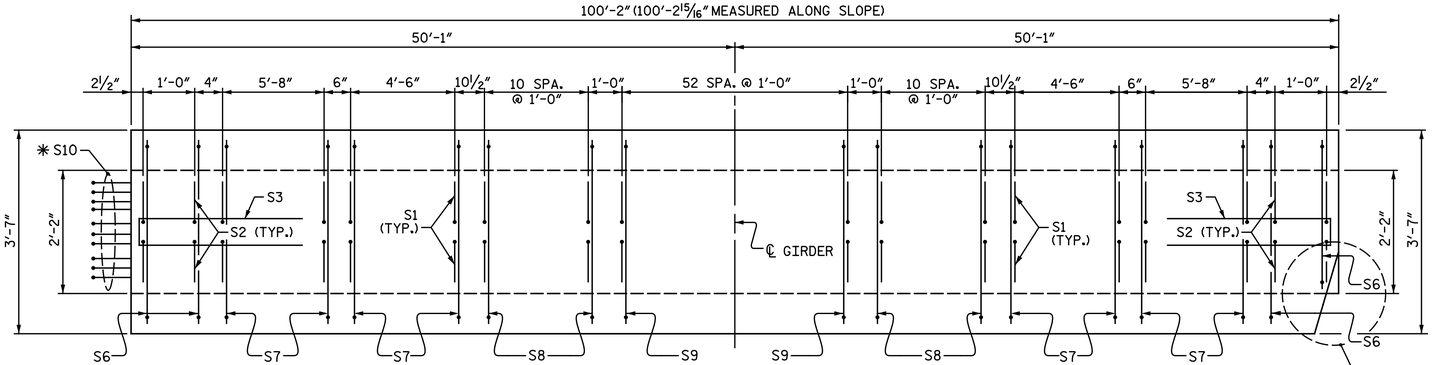
DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 6′-0″ FROM END OF GIRDER
- ◭ STRANDS DEBONDED FOR 10′-0″ FROM END OF GIRDER
- ◉ STRANDS DEBONDED FOR 14′-0″ FROM END OF GIRDER

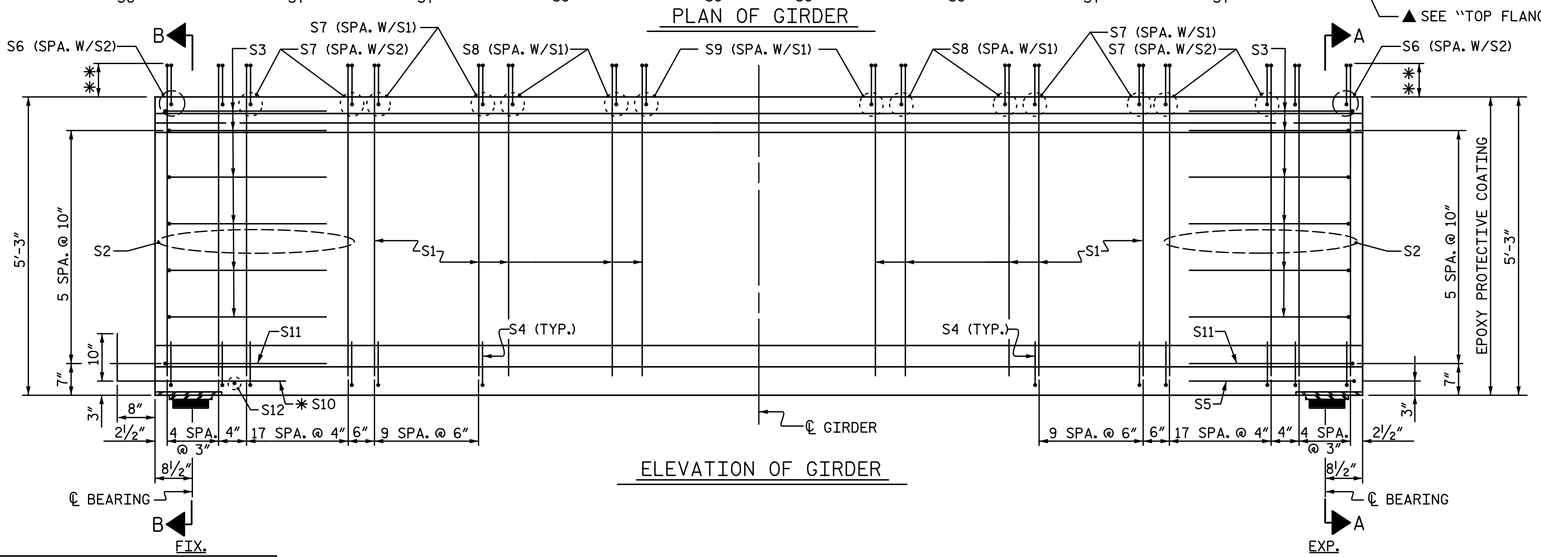


AT END OF GIRDER AT ℄ OF GIRDER

0.6″Ø LOW RELAXATION STRAND LAYOUT

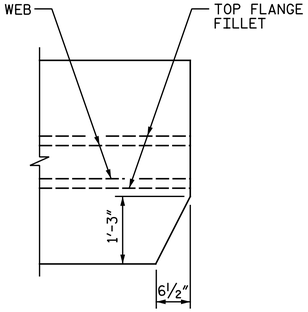


PLAN OF GIRDER



ELEVATION OF GIRDER

✳✳BAR PROJECTION	
S6	8½″
S7	7½″
S8	6½″
S9	5½″



TOP FLANGE CLIP DETAIL

▲ HORIZONTAL LEG OF FIRST S6 BARS CAN BE TRIMMED TO FIT

0.6″Ø L. R. GRADE 270 STRANDS

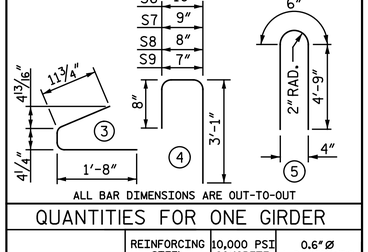
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	190	#4	1	6′-3″	793
	S2	92	#5	1	6′-4″	608
	S3	12	#4	2	8′-5″	67
	S4	132	#4	3	3′-0″	265
	S5	1	#5	2	9′-10″	10
	S6	20	#5	4	4′-7″	96
	S7	112	#5	4	4′-6″	526
	S8	44	#5	4	4′-5″	203
	S9	106	#5	4	4′-4″	479
	✳S10	10	#5	STR.	3′-8″	38
	S11	2	#5	2	9′-0″	19
	S12	1	#3	STR.	1′-10″	1
EXTERIOR GDR.	S13	8	#5	5	10′-0″	83
INTERIOR GDR.	S13	16	#5	5	10′-0″	167
EXTERIOR GDR.	S14	16	#4	STR.	8′-0″	86
INTERIOR GDR.	S15	16	#4	STR.	14′-2″	151

✳NOTE: S10 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	10,000 PSI CONCRETE	0.6″Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	3,274	19.9	48
INTERIOR GIRDER	3,423	19.9	48

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	100.24′	400.98′

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 3 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8ECA3C434...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Michael Baker INTERNATIONAL

Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

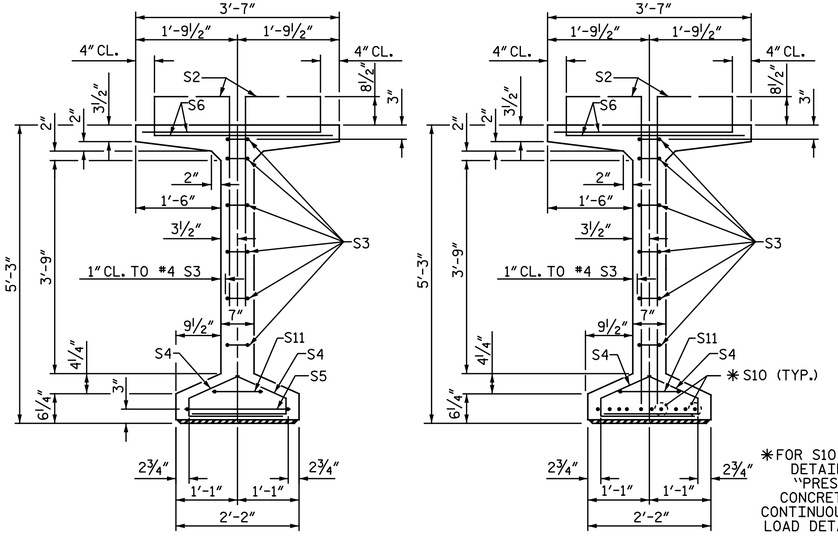
STANDARD

63″ PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN C LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-24
1			3			TOTAL SHEETS
2			4			62

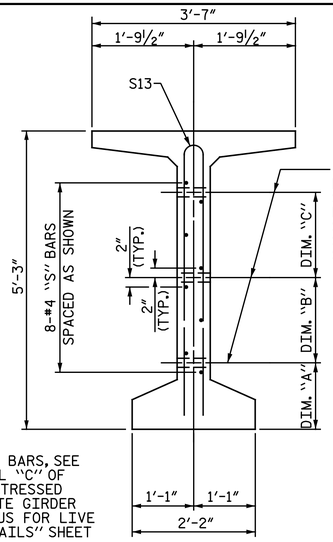
STD. NO. PCG7

ASSEMBLED BY : N.B. SPEAKS	DATE : 3-27-18	
CHECKED BY : B.J. BELL	DATE : 4-11-18	
DRAWN BY : EEM 2/6/97	REV. 6/13	MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15	MAA/TMG
	REV. 12/17	MAA/THC



SECTION A-A

SECTION B-B



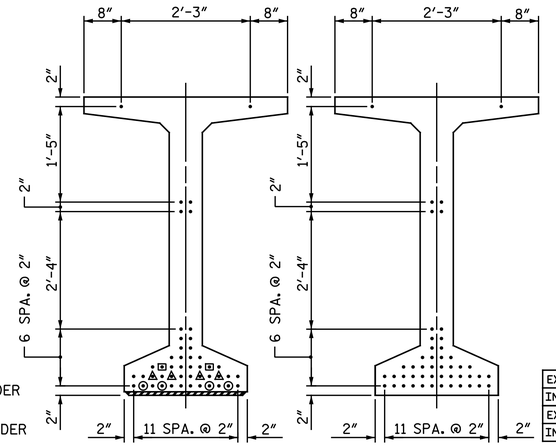
SECTION C-C

✱FOR S10 BARS, SEE DETAIL "C" OF "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET

(S1 AND S9 BARS NOT SHOWN)
(SEE SHEET 1 OF 6 & 2 OF 6 FOR SECTION CUT LOCATION)

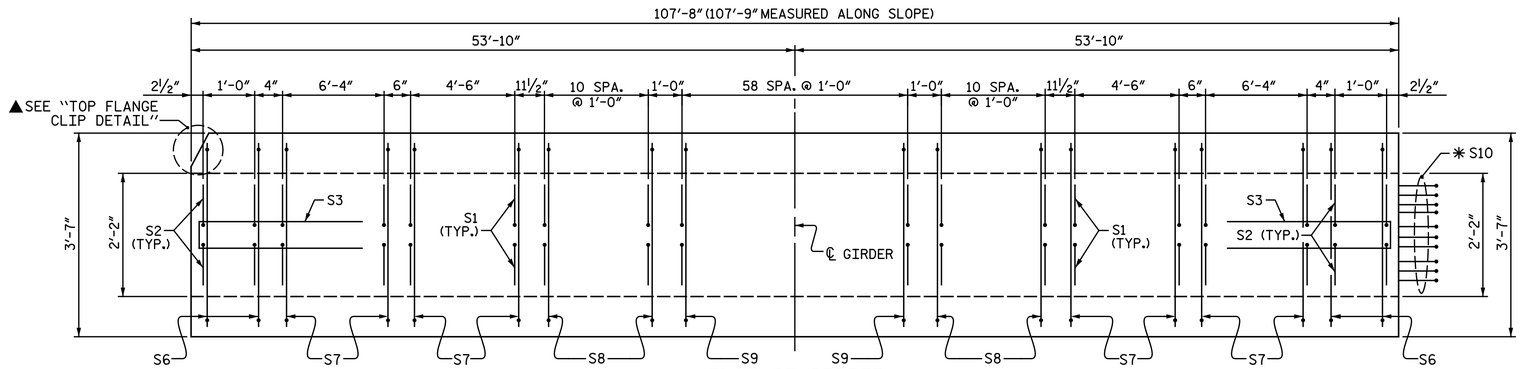
DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 6′-0″ FROM END OF GIRDER
- ▲ STRANDS DEBONDED FOR 10′-0″ FROM END OF GIRDER
- ⦿ STRANDS DEBONDED FOR 14′-0″ FROM END OF GIRDER

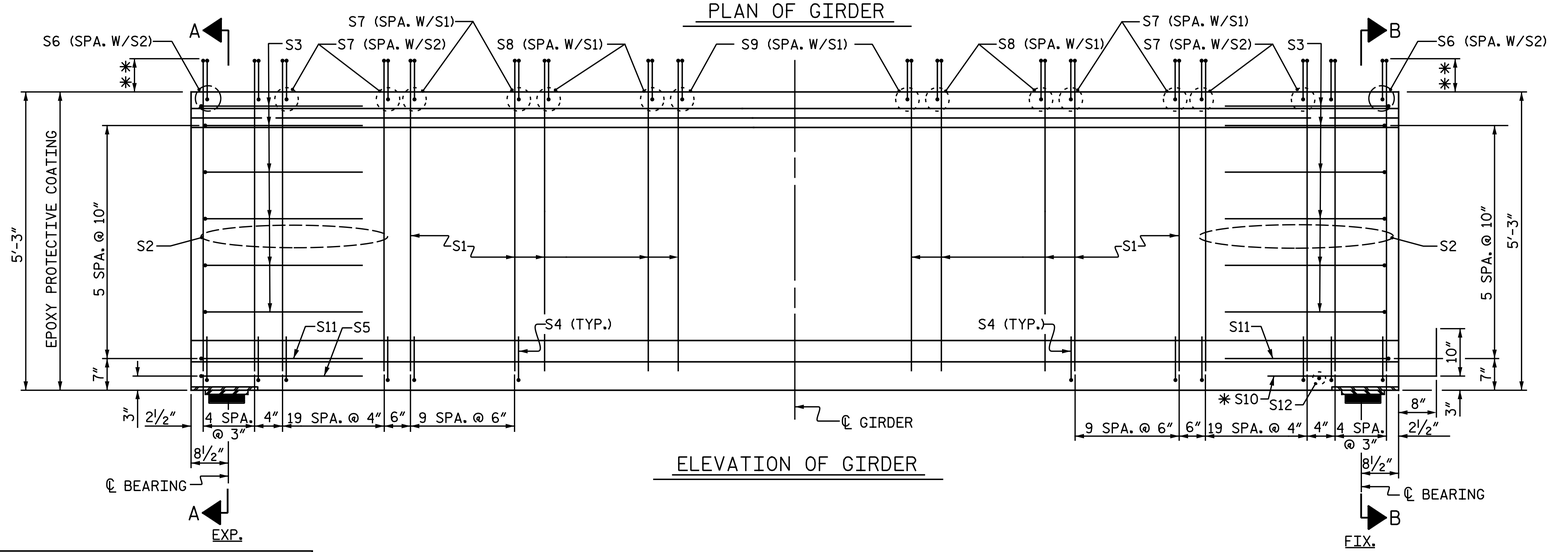


AT END OF GIRDER AT ℄ OF GIRDER

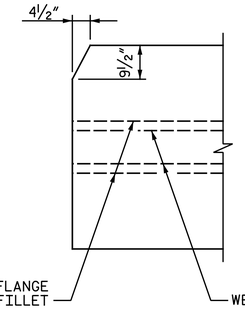
0.6″Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER



TOP FLANGE CLIP DETAIL

▲HORIZONTAL LEG OF FIRST S6 BAR CAN BE TRIMMED TO FIT

✱✱BAR PROJECTION	
S6	8½″
S7	7½″
S8	6½″
S9	5½″

0.6″Ø L. R. GRADE 270 STRANDS

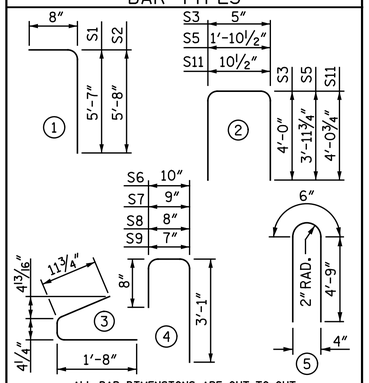
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	202	#4	1	6′-3″	843
	S2	100	#5	1	6′-4″	661
	S3	12	#4	2	8′-5″	67
	S4	140	#4	3	3′-0″	281
	S5	1	#5	2	9′-10″	10
	S6	20	#5	4	4′-7″	96
	S7	120	#5	4	4′-6″	563
	S8	44	#5	4	4′-5″	203
	S9	118	#5	4	4′-4″	533
	✱S10	10	#5	STR.	3′-8″	38
	S11	2	#5	2	9′-0″	19
	S12	1	#3	STR.	1′-10″	1
EXTERIOR GDR.	S13	8	#5	5	10′-0″	83
INTERIOR GDR.	S13	16	#5	5	10′-0″	167
EXTERIOR GDR.	S14	16	#4	STR.	8′-0″	86
INTERIOR GDR.	S15	16	#4	STR.	14′-2″	151

✱NOTE: S10 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	10,000 PSI CONCRETE C.Y.	0.6″Ø L.R. STRANDS No.
EXTERIOR GIRDER	3,484	21.3	48
INTERIOR GIRDER	3,633	21.3	48

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	107.75′	431.00′

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 4 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018
C41A3F8ECA3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

63″ PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN D LEFT LANE

ASSEMBLED BY : N.B. SPEAKS	DATE : 3-28-18
CHECKED BY : B.J. BELL	DATE : 4-11-18
DRAWN BY : EEM 2/6/97	REV. 6/13 MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

Michael Baker INTERNATIONAL
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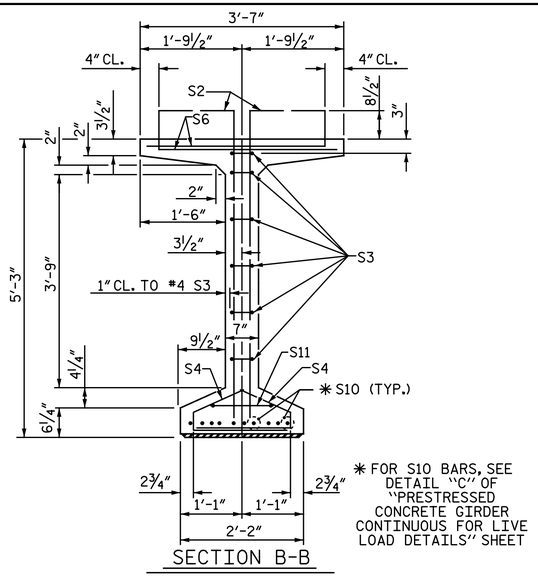
NC License No. : F-1084

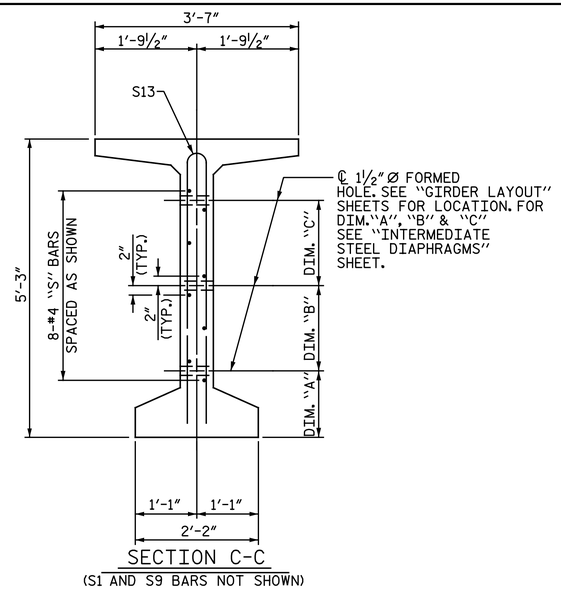
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-25
1			3			TOTAL SHEETS
2			4			62

STD. NO. PCG7



✳ FOR S10 BARS, SEE DETAIL "C" OF "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET

SECTION B-B



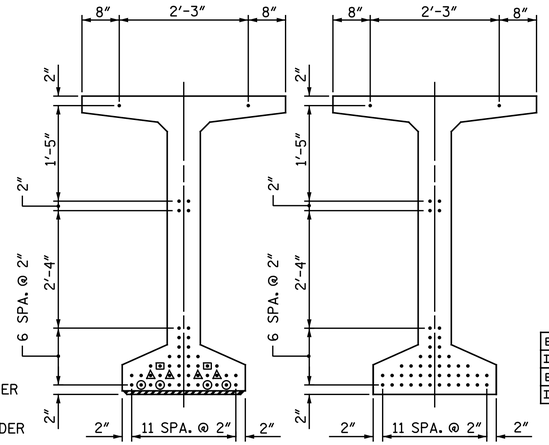
SECTION C-C

(S1 AND S9 BARS NOT SHOWN)

(SEE SHEET 1 OF 6 & 2 OF 6 FOR SECTION CUT LOCATION)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 6′-0″ FROM END OF GIRDER
- ◭ STRANDS DEBONDED FOR 10′-0″ FROM END OF GIRDER
- ◉ STRANDS DEBONDED FOR 14′-0″ FROM END OF GIRDER



AT END OF GIRDER AT ℄ OF GIRDER

0.6″Ø LOW RELAXATION STRAND LAYOUT

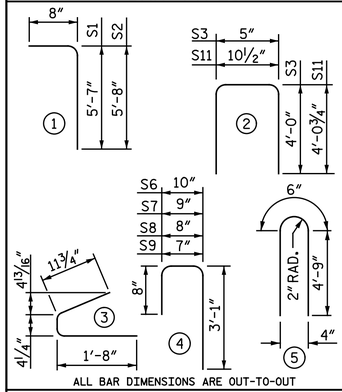
0.6″Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	202	#4	1	6′-3″	843
	S2	100	#5	1	6′-4″	661
	S3	12	#4	2	8′-5″	67
	S4	140	#4	3	3′-0″	281
	S6	20	#5	4	4′-7″	96
	S7	120	#5	4	4′-6″	563
	S8	44	#5	4	4′-5″	203
	S9	118	#5	4	4′-4″	533
	✳S10	20	#5	STR.	3′-8″	76
	S11	2	#5	2	9′-0″	19
	S12	2	#3	STR.	1′-10″	1
EXTERIOR GDR.	S13	8	#5	5	10′-0″	83
INTERIOR GDR.	S13	16	#5	5	10′-0″	167
EXTERIOR GDR.	S14	16	#4	STR.	8′-0″	86
INTERIOR GDR.	S15	16	#4	STR.	14′-2″	151

✳NOTE: S10 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



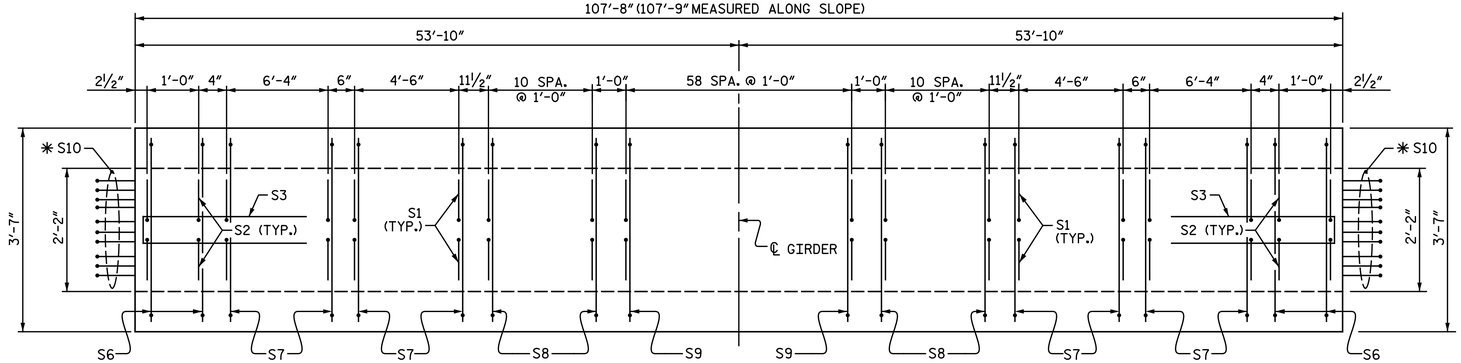
ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

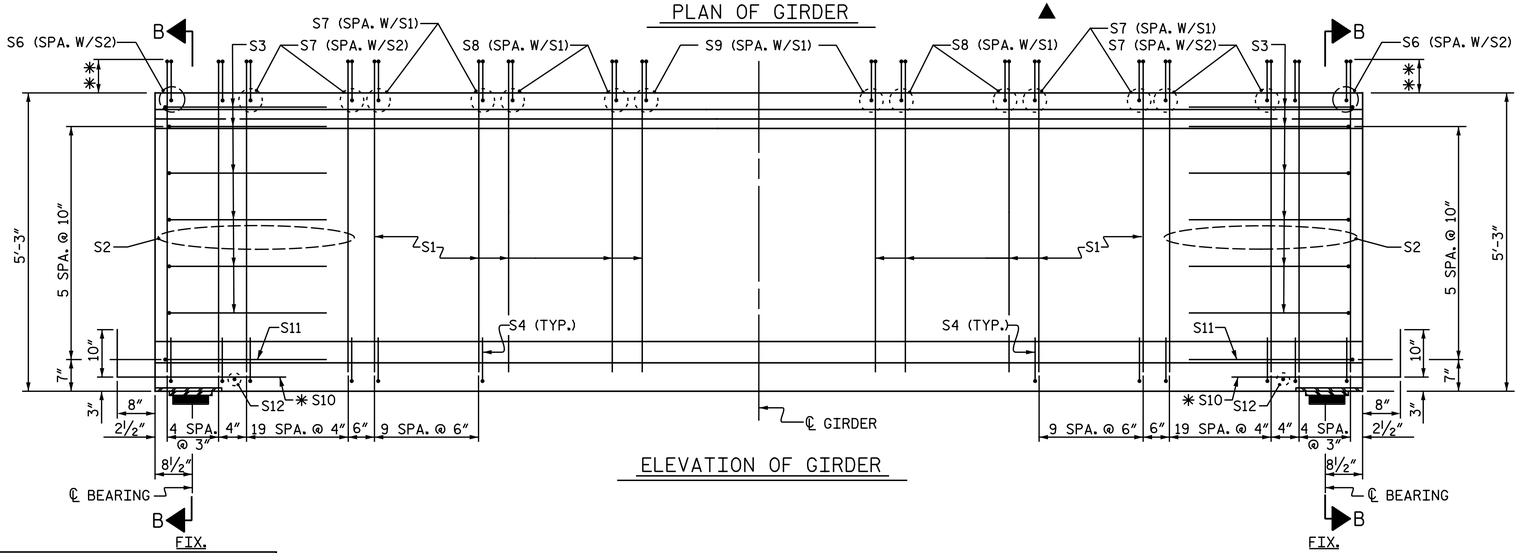
	REINFORCING STEEL	10,000 PSI CONCRETE	0.6″Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	3,512	21.3	48
INTERIOR GIRDER	3,661	21.3	48

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	107.75′	431.00′



PLAN OF GIRDER



ELEVATION OF GIRDER

✳✳BAR	PROJECTION
S6	8½″
S7	7½″
S8	6½″
S9	5½″

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 5 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8ECA3C434...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

63″ PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN E LEFT LANE

ASSEMBLED BY : N.B. SPEAKS	DATE : 3-28-18
CHECKED BY : B.J. BELL	DATE : 4-11-18
DRAWN BY : EEM 2/6/97	REV. 6/13 MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

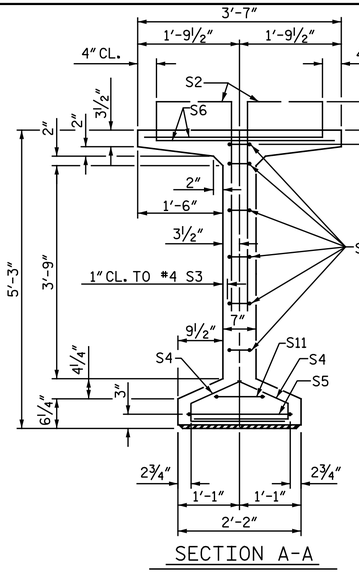
REVISIONS

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

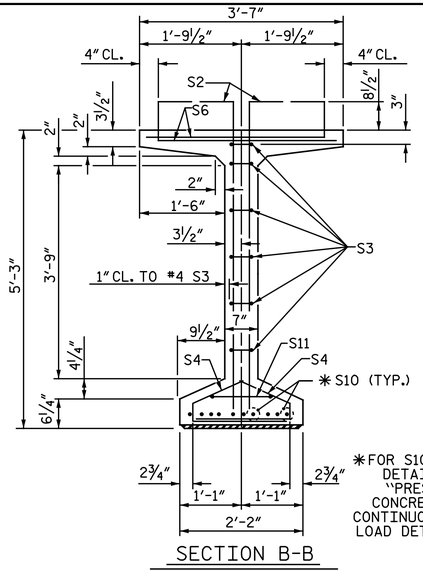
SHEET NO. SI-26

TOTAL SHEETS 62

STD. NO. PCG7

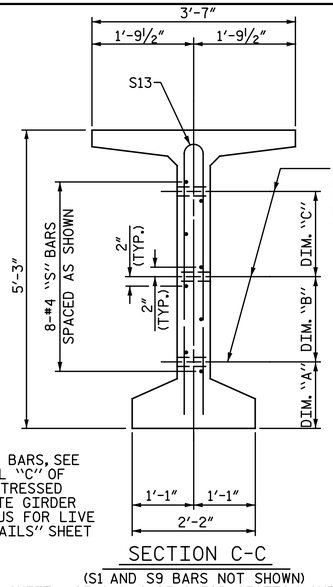


SECTION A-A



SECTION B-B

✱FOR S10 BARS, SEE DETAIL "C" OF "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET

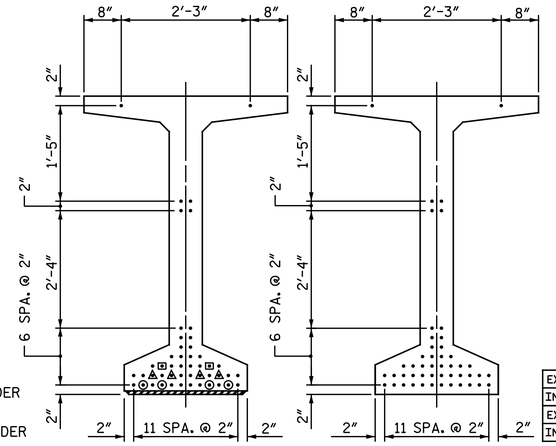


SECTION C-C

(S1 AND S9 BARS NOT SHOWN)
(SEE SHEET 1 OF 6 & 2 OF 6 FOR SECTION CUT LOCATION)

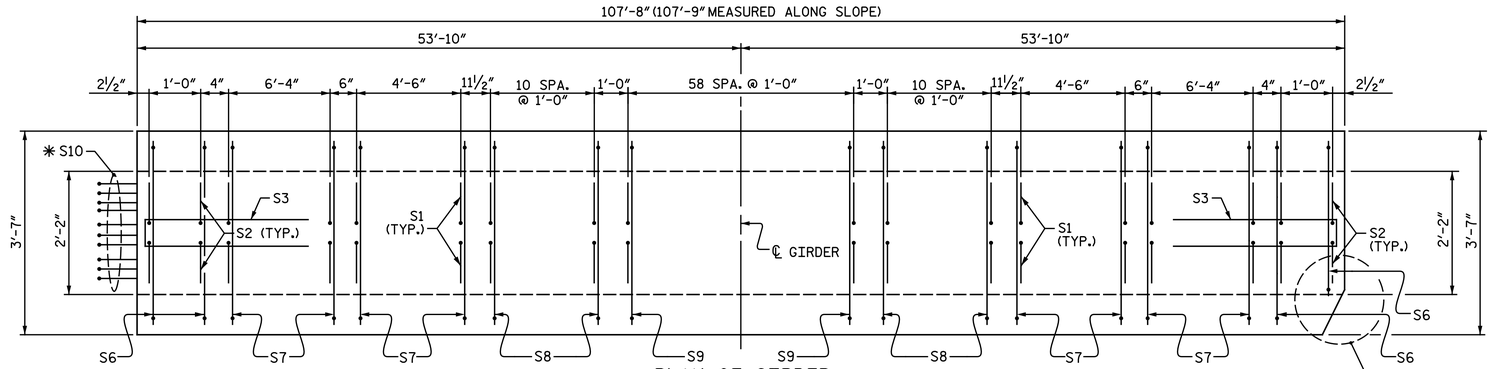
DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- ▲ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
- ⦿ STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER

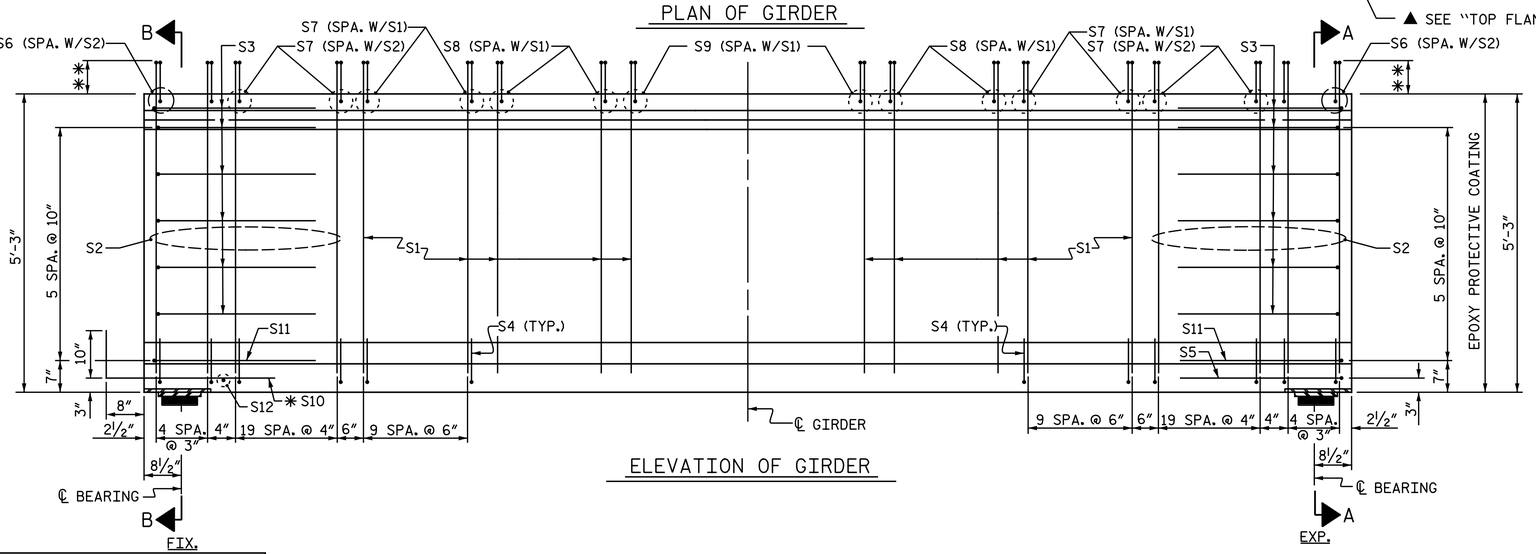


AT END OF GIRDER AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

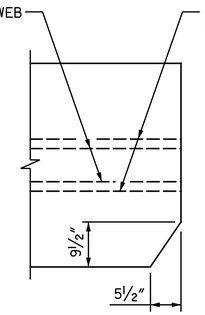


PLAN OF GIRDER



ELEVATION OF GIRDER

✱✱BAR PROJECTION	
S6	8½"
S7	7½"
S8	6½"
S9	5½"



TOP FLANGE CLIP DETAIL

▲ HORIZONTAL LEG OF FIRST S6 BARS CAN BE TRIMMED TO FIT

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
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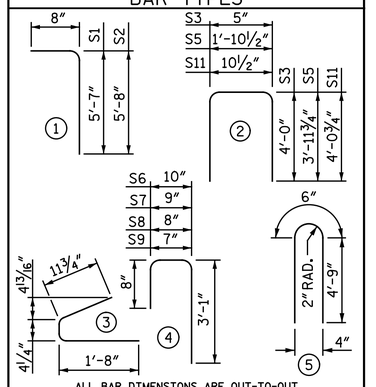
	S4	140	#4	3	3'-0"	281
	S5	1	#5	2	9'-10"	10
	S6	20	#5	4	4'-7"	96
	S7	120	#5	4	4'-6"	563
	S8	44	#5	4	4'-5"	203
	S9	118	#5	4	4'-4"	533
	✱S10	10	#5	STR.	3'-8"	38
	S11	2	#5	2	9'-0"	19
	S12	1	#3	STR.	1'-10"	1
EXTERIOR GDR.	S13	8	#5	5	10'-0"	83
INTERIOR GDR.	S13	16	#5	5	10'-0"	167
EXTERIOR GDR.	S14	16	#4	STR.	8'-0"	86
INTERIOR GDR.	S15	16	#4	STR.	14'-2"	151

✱NOTE: S10 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	10,000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
EXTERIOR GIRDER	3,484	21.3	48
INTERIOR GIRDER	3,633	21.3	48

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	107.75'	431.00'

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 6 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8ECA3C434...

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Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

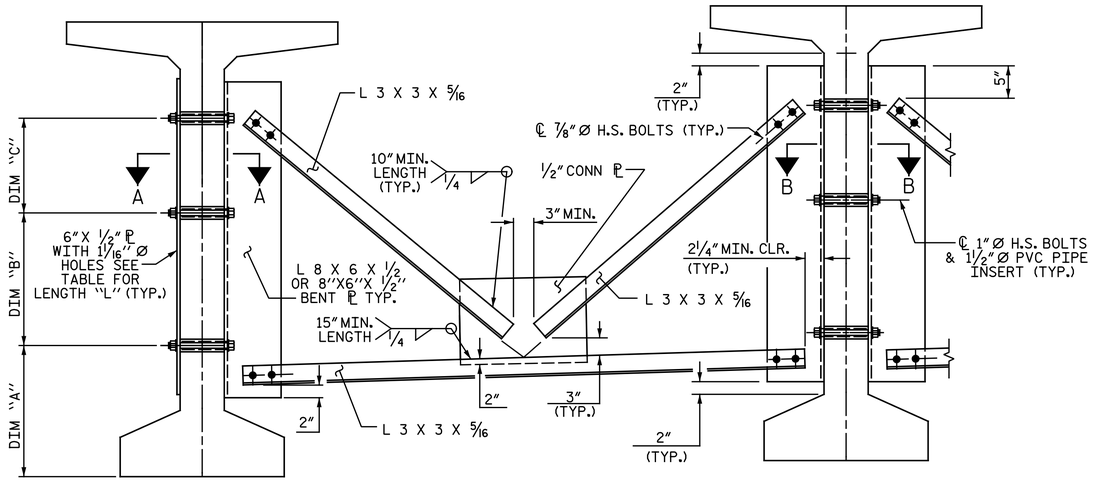
STANDARD

63" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN F LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-27
1			3			TOTAL SHEETS
2			4			62

STD. NO. PCG7

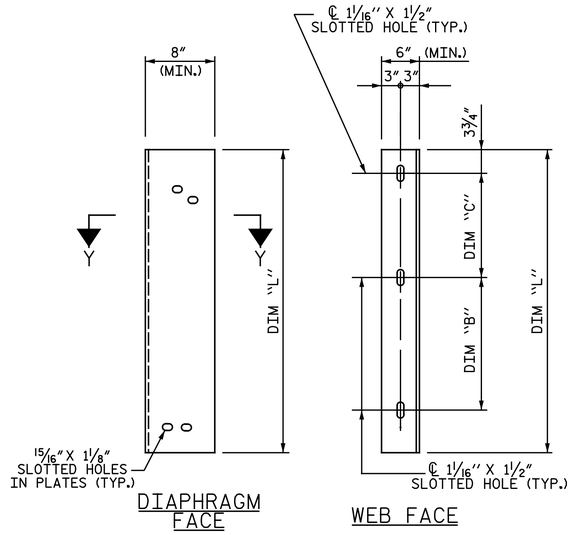
ASSEMBLED BY : N.B. SPEAKS	DATE : 3-28-18	
CHECKED BY : B.J. BELL	DATE : 4-11-18	
DRAWN BY : EEM 2/6/97	REV. 6/13	MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15	MAA/TMG
	REV. 12/17	MAA/THC



EXTERIOR GIRDER

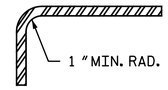
INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



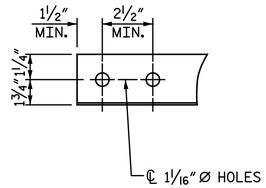
DIAPHRAGM FACE

WEB FACE



SECTION Y-Y

CONNECTOR PLATE DETAIL



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

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 A THERMAL SPRAYED COATING WITH A SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM, 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.

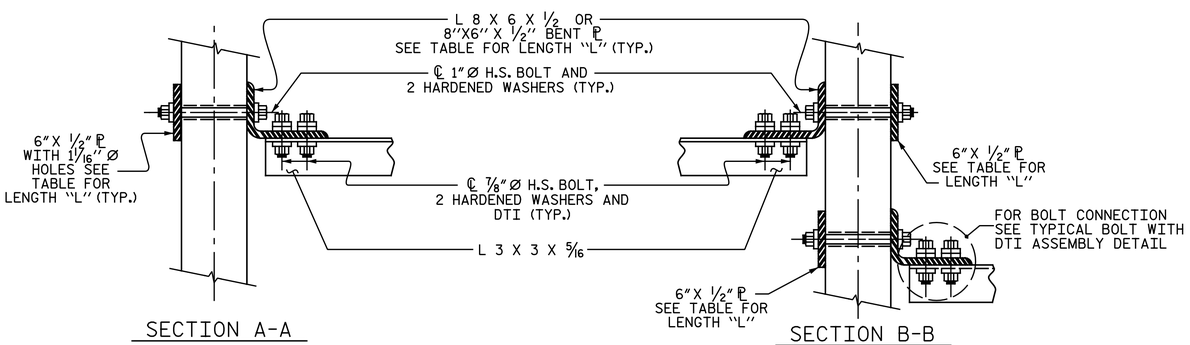
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.

TABLE

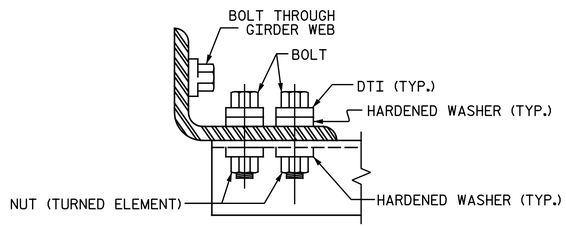
GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-6"	1'-4"	1'-3 3/4"	3'-5"



SECTION A-A

SECTION B-B

CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

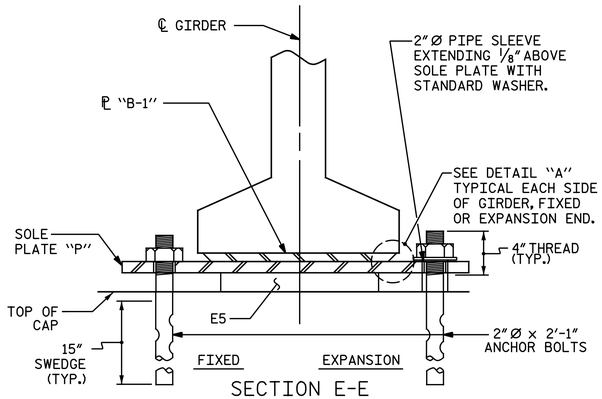
STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS LEFT LANE

Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

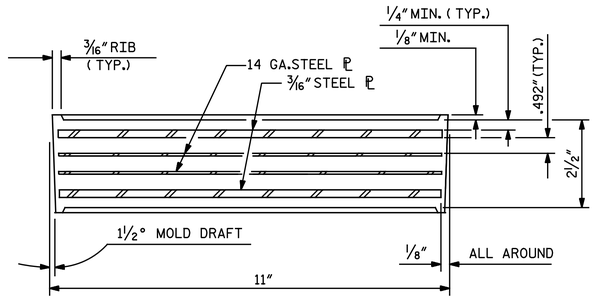
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-28
1			3			TOTAL SHEETS
2			4			62

ASSEMBLED BY : N.B. SPEAKS	DATE : 11-7-17
CHECKED BY : B.J. BELL	DATE : 4-11-18
DRAWN BY : RWW 11/09	REV. 10/1/11 MAA/GM
CHECKED BY : GM 11/09	REV. 12/17 MAA/THC

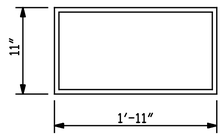
STD. NO. PCG11



SECTION E-E



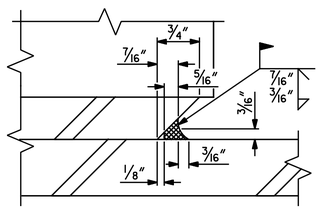
TYPICAL SECTION OF ELASTOMERIC BEARINGS



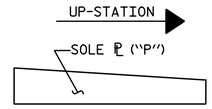
E5 (48 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

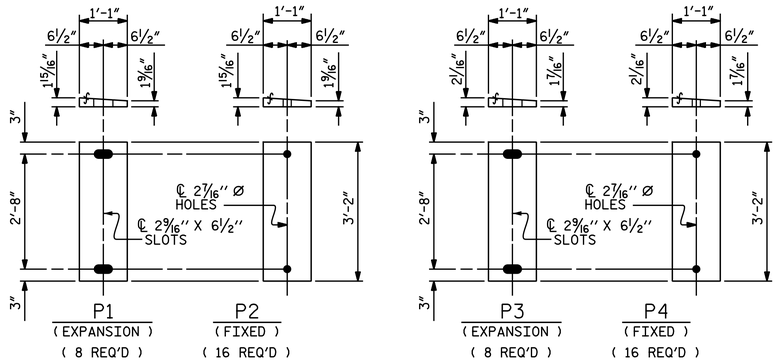
TYPE VI



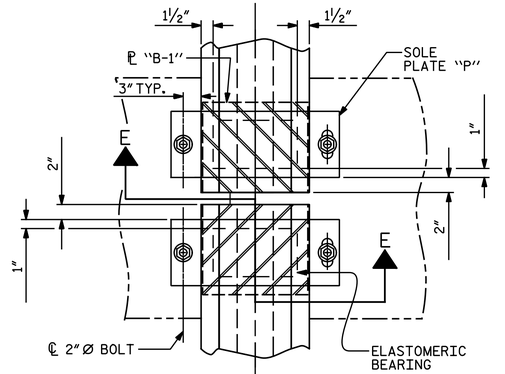
DETAIL "A"



SOLE ℄ PLACEMENT DETAIL



SOLE PLATE DETAILS ("P")



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN (SHOWING EXPANSION BENT AND END BENT)

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE VI	420 k

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.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

ASSEMBLED BY : N.B SPEAKS		DATE : 1-23-18	
CHECKED BY : T.M. GARRISON		DATE : 1-26-18	
DRAWN BY : EEM 2/97	REV. 6/13	AAC/MAA	
CHECKED BY : VAP 2/97	REV. 1/15	MAA/TMG	
	REV. 12/17	MAA/THC	

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8ECA3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
ELASTOMERIC BEARING DETAILS
PRESTRESSED CONCRETE GIRDER
SUPERSTRUCTURE
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-29
1			3			TOTAL SHEETS
2			4			62

STD. NO. EB4

DEAD LOAD DEFLECTION TABLE FOR SPANS A, D, E & F

0.6"Ø LOW RELAXATION	GIRDER 1																				
TWENTIETH POINTS	0.00	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	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.049	0.096	0.141	0.182	0.219	0.250	0.274	0.292	0.303	0.307	0.303	0.292	0.274	0.250	0.219	0.182	0.141	0.096	0.049	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.000	0.027	0.050	0.077	0.098	0.120	0.136	0.150	0.160	0.166	0.168	0.166	0.160	0.150	0.136	0.120	0.098	0.077	0.050	0.027	0.000
FINAL CAMBER ↑	0''	1/4''	9/16''	3/4''	1''	1 3/16''	1 3/8''	1 1/2''	1 3/16''	1 5/8''	1 11/16''	1 5/8''	1 9/16''	1 1/2''	1 3/8''	1 3/16''	1''	3/4''	9/16''	1/4''	0''

0.6"Ø LOW RELAXATION	GIRDERS 2, 3 & 4																				
TWENTIETH POINTS	0.00	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	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.049	0.096	0.141	0.182	0.219	0.250	0.274	0.292	0.303	0.307	0.303	0.292	0.274	0.250	0.219	0.182	0.141	0.096	0.049	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.000	0.029	0.054	0.083	0.105	0.128	0.145	0.161	0.171	0.178	0.180	0.178	0.171	0.161	0.145	0.128	0.105	0.083	0.054	0.029	0.000
FINAL CAMBER ↑	0''	1/4''	1/2''	11/16''	15/16''	1 1/16''	1 1/4''	1 3/8''	1 7/16''	1 1/2''	1 1/2''	1 1/2''	1 7/16''	1 3/8''	1 1/4''	1 1/16''	15/16''	11/16''	1/2''	1/4''	0''

DEAD LOAD DEFLECTION TABLE FOR SPANS B & C

0.6"Ø LOW RELAXATION	GIRDER 1																				
TWENTIETH POINTS	0.00	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	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.044	0.088	0.129	0.166	0.199	0.227	0.250	0.266	0.276	0.280	0.276	0.266	0.250	0.227	0.199	0.166	0.129	0.088	0.044	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.000	0.020	0.037	0.058	0.073	0.090	0.102	0.113	0.120	0.124	0.126	0.124	0.120	0.113	0.102	0.090	0.073	0.058	0.037	0.020	0.000
FINAL CAMBER ↑	0''	5/16''	5/8''	7/8''	1 1/8''	1 5/16''	1 1/2''	1 5/8''	1 3/4''	1 13/16''	1 7/8''	1 13/16''	1 3/4''	1 5/8''	1 1/2''	1 5/16''	1 1/8''	7/8''	5/8''	5/16''	0''

0.6"Ø LOW RELAXATION	GIRDERS 2, 3 & 4																				
TWENTIETH POINTS	0.00	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	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.044	0.088	0.129	0.166	0.199	0.227	0.250	0.266	0.276	0.280	0.276	0.266	0.250	0.227	0.199	0.166	0.129	0.088	0.044	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.000	0.021	0.040	0.062	0.078	0.096	0.109	0.120	0.128	0.133	0.134	0.133	0.128	0.120	0.109	0.096	0.078	0.062	0.040	0.021	0.000
FINAL CAMBER ↑	0''	1/4''	9/16''	13/16''	1 1/16''	1 1/4''	1 7/16''	1 9/16''	1 11/16''	1 3/4''	1 3/4''	1 3/4''	1 11/16''	1 9/16''	1 7/16''	1 1/4''	1 1/16''	13/16''	9/16''	1/4''	0''

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

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.

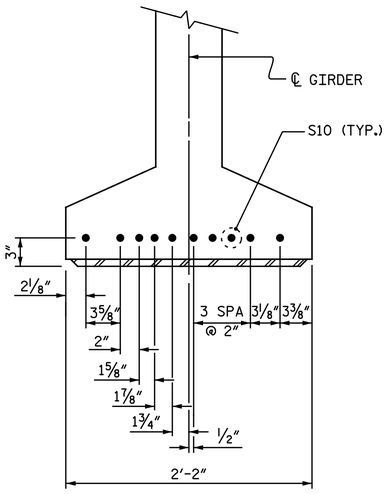
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 8,000 PSI.

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

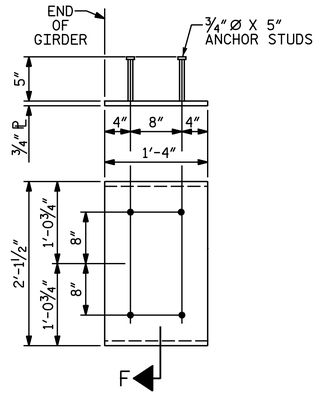
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

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

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

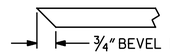


DETAIL "C"



EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

LEFT LANE

ASSEMBLED BY : N.B. SPEAKS	DATE : 4-3-18
CHECKED BY : B.J. BELL	DATE : 4-11-18
DRAWN BY : ELR 11/91	REV. 1/15 MAA/TMG
CHECKED BY : GRP 11/91	REV. 2/15 MAA/TMG
	REV. 12/17 MAA/THC

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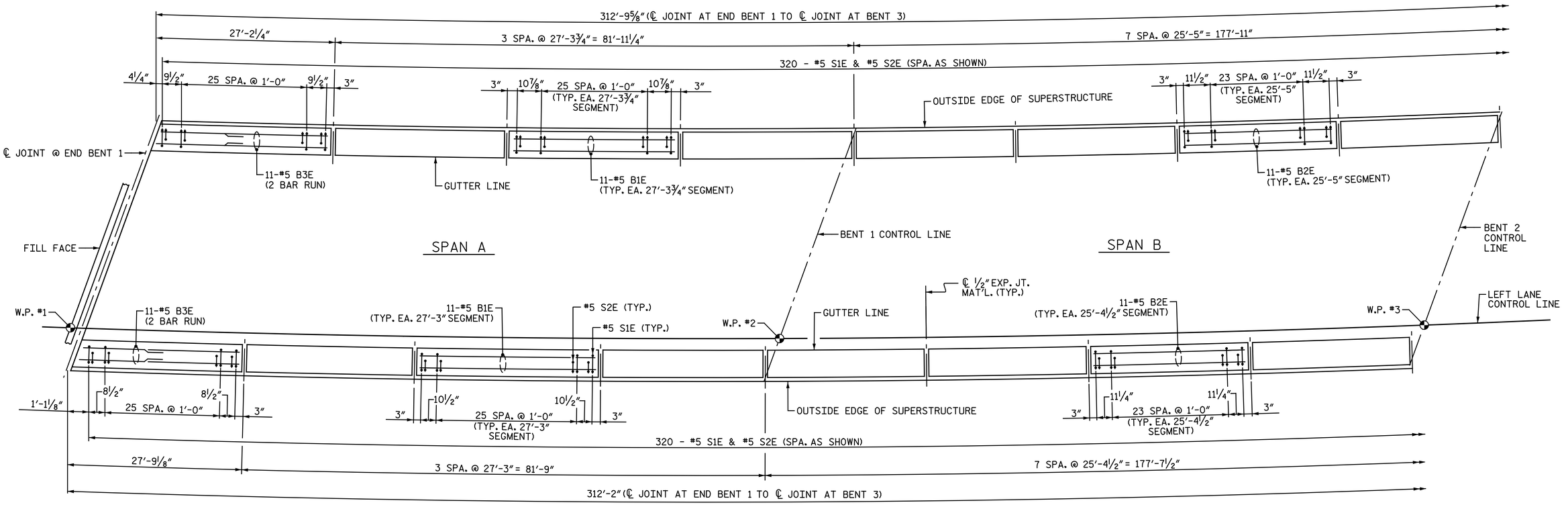
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-30
1			3			TOTAL SHEETS
2			4			62

STD. NO. PCG9



PARTIAL PLAN OF BARRIER RAIL - UNIT 1

NOTE: ALL BARRIER RAIL DIMENSIONS ARE MEASURED ALONG THE ARC AT THE BACK FACE OF THE BARRIER RAIL.

SPLICE LENGTH	
BAR SIZE	EPOXY COATED
#5	3'-5"

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 1 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Ball 5/7/2018 C41A3F8ECA3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

LEFT LANE

Michael Baker INTERNATIONAL

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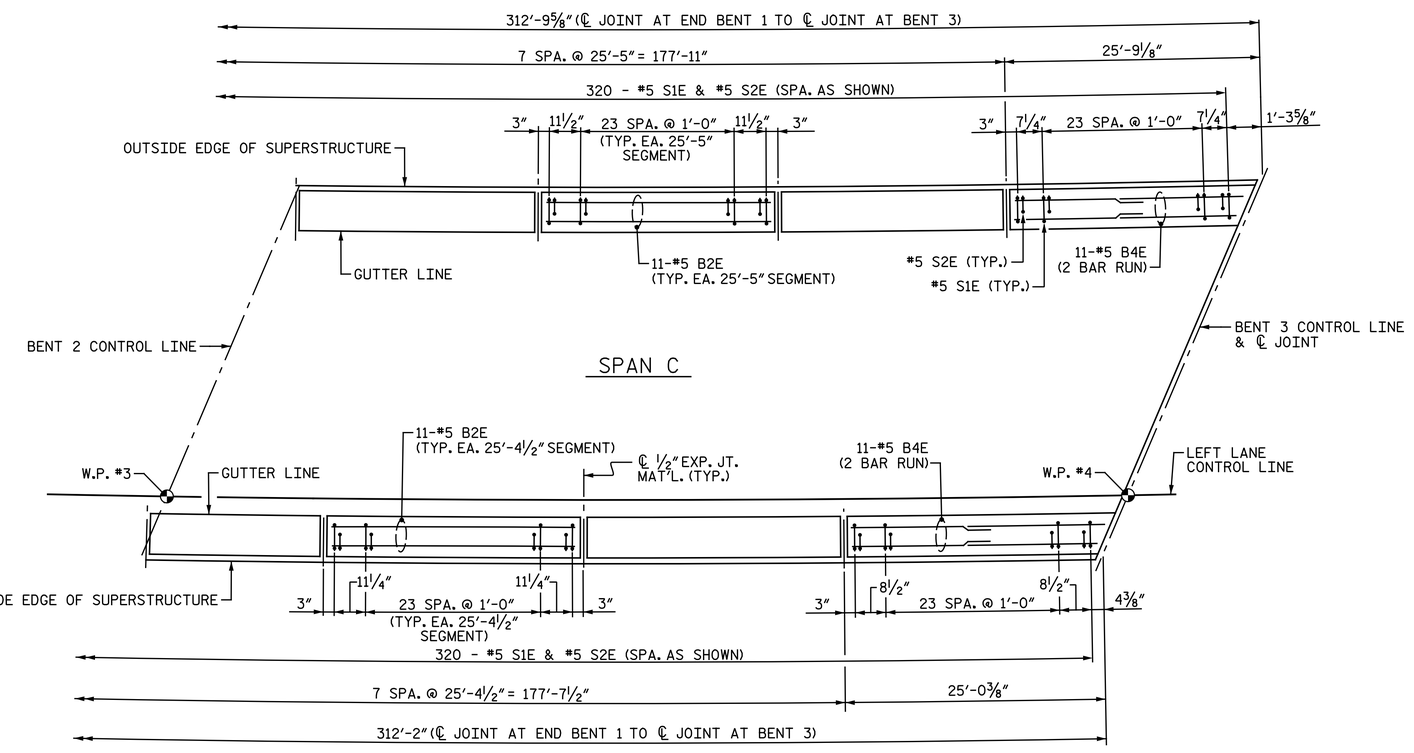
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-31
1			3			TOTAL SHEETS
2			4			62

DRAWN BY : N. B. SPEAKS DATE : 2-7-18
CHECKED BY : T. M. GARRISON DATE : 2-16-18



PARTIAL PLAN OF BARRIER RAIL - UNIT 1

NOTE: ALL BARRIER RAIL DIMENSIONS ARE MEASURED ALONG THE ARC AT THE BACK FACE OF THE BARRIER RAIL.

SPLICE LENGTH	
BAR SIZE	EPOXY COATED
#5	3′-5″

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 2 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018
C41A3F8ECA3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

LEFT LANE

Michael Baker INTERNATIONAL

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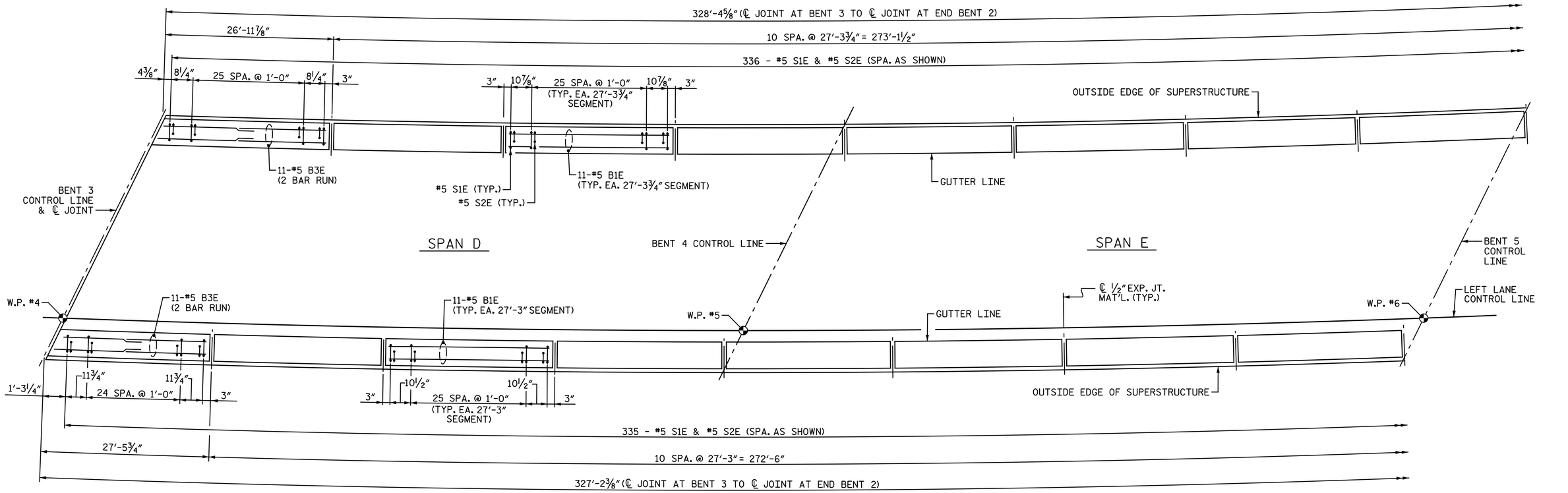
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-32
1			3			TOTAL SHEETS
2			4			62

DRAWN BY : N. B. SPEAKS DATE : 2-7-18
CHECKED BY : T. M. GARRISON DATE : 2-16-18



PARTIAL PLAN OF BARRIER RAIL - UNIT 2

NOTE: ALL BARRIER RAIL DIMENSIONS ARE MEASURED ALONG THE ARC AT THE BACK FACE OF THE BARRIER RAIL.

SPLICE LENGTH	
BAR SIZE	EPOXY COATED
#5	3′-5″

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 3 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

LEFT LANE

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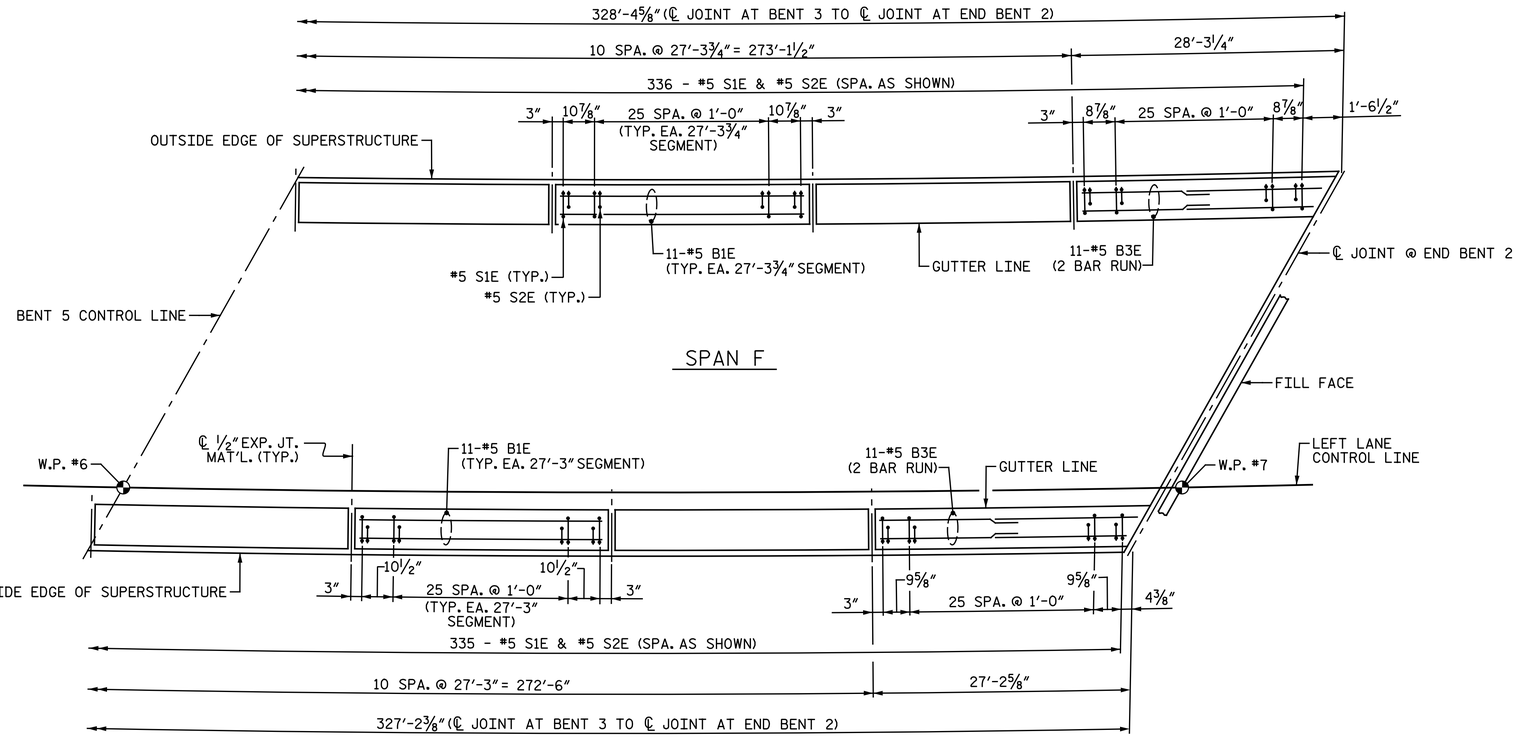
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-33
1			3			TOTAL SHEETS
2			4			62

DRAWN BY : N. B. SPEAKS DATE : 2-7-18
CHECKED BY : T. M. GARRISON DATE : 2-16-18



SPAN F

PARTIAL PLAN OF BARRIER RAIL - UNIT 2

NOTE: ALL BARRIER RAIL DIMENSIONS ARE MEASURED ALONG THE ARC AT THE BACK FACE OF THE BARRIER RAIL.

SPLICE LENGTH	
BAR SIZE	EPOXY COATED
#5	3′-5″

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 4 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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C41A3F8ECA3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

LEFT LANE

Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-34
1			3			TOTAL SHEETS
2			4			62

DRAWN BY : N. B. SPEAKS DATE : 2-7-18

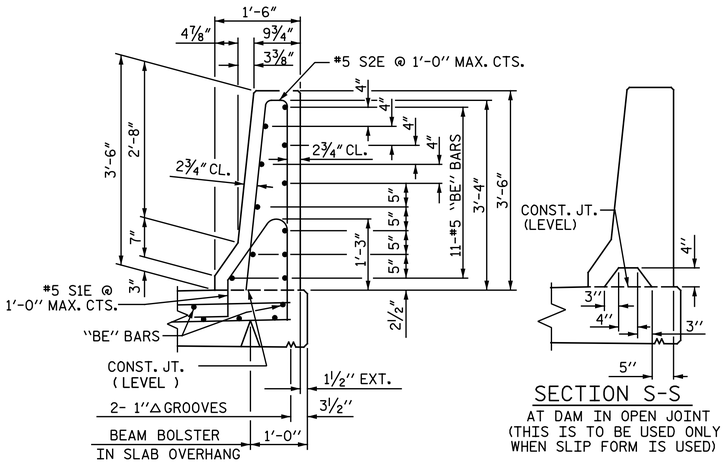
CHECKED BY : T. M. GARRISON DATE : 2-16-18

NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

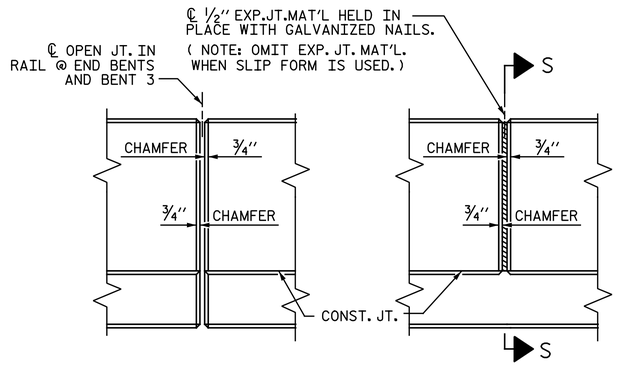
GROOVED CONTRACTION JOINTS, ½″ IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED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



SECTION THRU RAIL

SECTION S-S

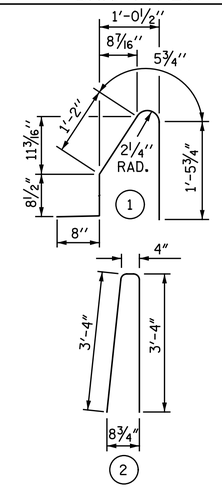
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1E	286	#5	STR.	26′ - 10″	8,004
B2E	154	#5	STR.	25′ - 0″	4,016
B3E	132	#5	STR.	15′ - 8″	2,157
B4E	44	#5	STR.	14′ - 5″	662
S1E	1,311	#5	1	4′ - 6″	6,153
S2E	1,311	#5	2	7′ - 0″	9,572

EPOXY COATED REINFORCING STEEL ✱	LBS.	30,564
CLASS AA CONCRETE ✱	C.Y.	174.2
CONCRETE BARRIER RAIL ✱	L.F.	1,280.55

✱QUANTITIES DO NOT INCLUDE BARRIER RAILS ON THE APPROACH SLABS. FOR BARRIER RAILS ON THE APPROACH SLABS, SEE ″BRIDGE APPROACH SLAB DETAILS″ SHEET.

″E″ SUFFIX DENOTES EPOXY COATED REINFORCING STEEL

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 5 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

CONCRETE BARRIER RAIL

LEFT LANE

Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

REVISIONS						SHEET NO.
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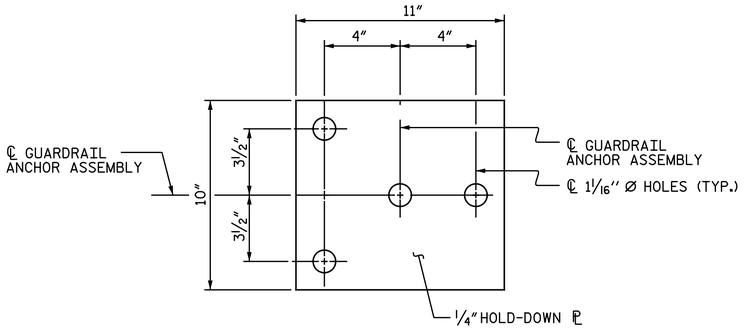
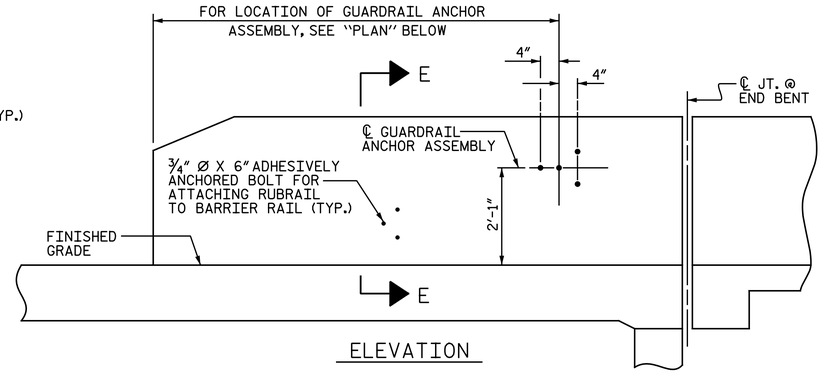
1			3			TOTAL SHEETS
2			4			62

ASSEMBLED BY : N. B. SPEAKS		DATE : 2-7-18
CHECKED BY : T. M. GARRISON		DATE : 2-16-18
DRAWN BY : ARB 5/87	REV. 7/12	MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13	MAA/GM
	REV. 12/17	MAA/THC

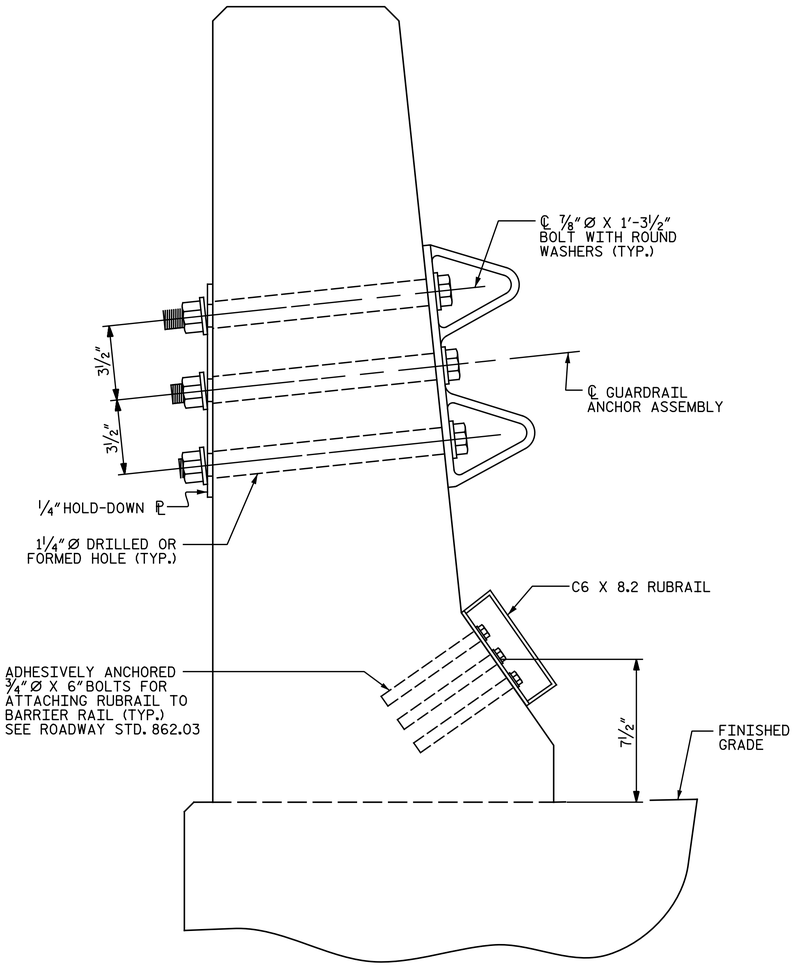
STD. NO. CBR1



PLAN

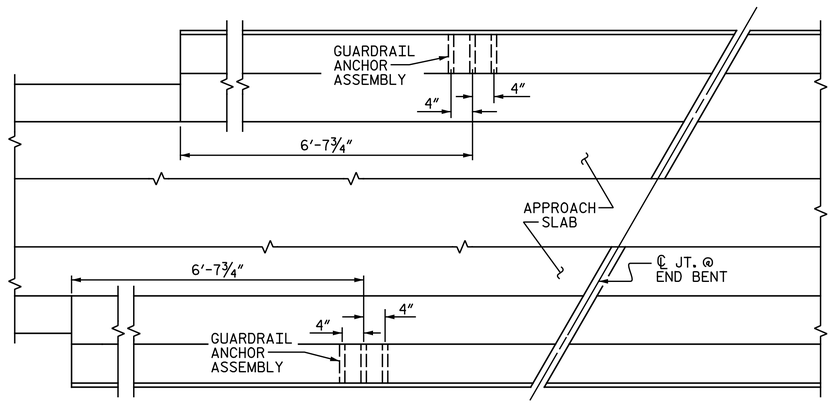


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

NOTES

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

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

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

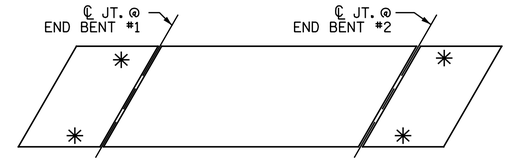
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8ECA3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

LEFT LANE

ASSEMBLED BY : N.B. SPEAKS	DATE : 11-7-17
CHECKED BY : B.J. BELL	DATE : 4-11-18
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
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NC License No. : F-1084

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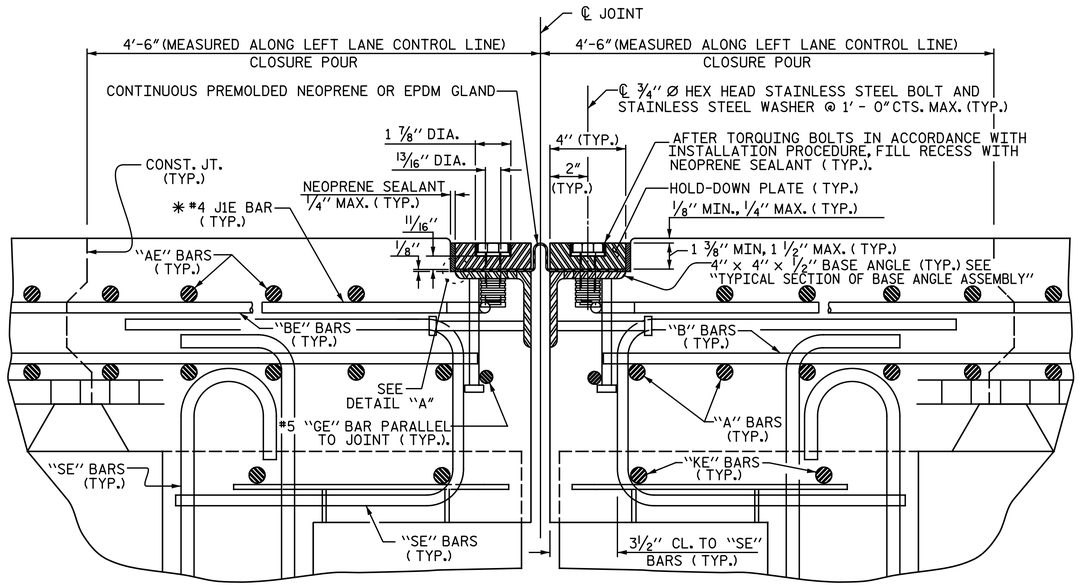
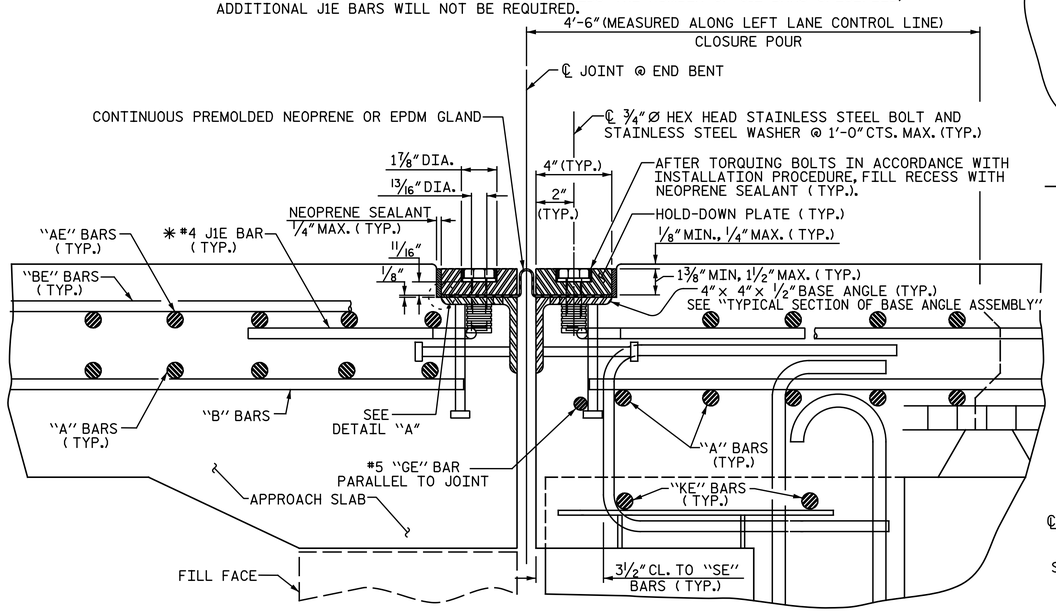
STD. NO. GRA2



EXPANSION JOINT DETAILS AT BENT 3

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE
#6 "AE" BARS NOT SHOWN FOR CLARITY

* THE QUANTITY OF #4 J1E BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1E BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1E BARS SPECIFIED, ADDITIONAL J1E BARS WILL NOT BE REQUIRED.



EXPANSION JOINT DETAILS AT END BENTS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE
#6 "AE" BARS NOT SHOWN FOR CLARITY

* THE QUANTITY OF #4 J1E BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1E BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1E BARS SPECIFIED, ADDITIONAL J1E BARS WILL NOT BE REQUIRED.

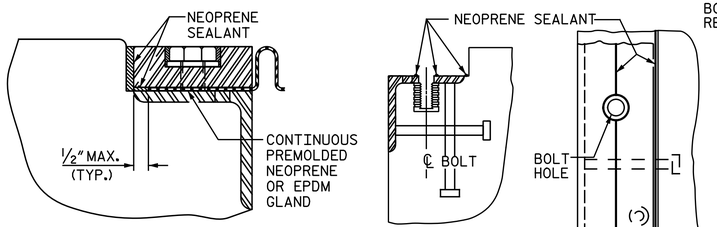
ASSEMBLED BY : N.B. SPEAKS		DATE : 11-7-17			
CHECKED BY : B.J. BELL		DATE : 4-11-18			
DRAWN BY : REK 9/87	REV. 5/1/06R	TLA/GM			
CHECKED BY : CRK 10/87	REV. 10/1/11	MAA/GM			
	REV. 12/17	MAA/THC			

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 ⅞" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

GENERAL NOTES

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



DETAIL "A"

CROSS SECTION

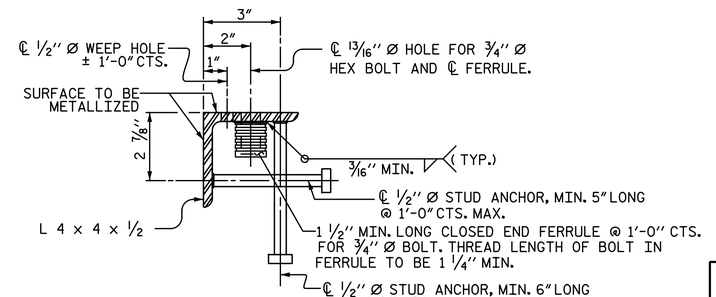
PLAN VIEW

INSTALLATION SKETCH

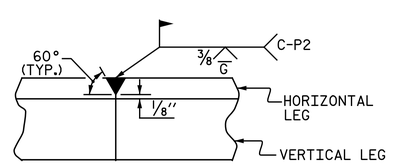
MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	108°-06'-29"	15/16"	2 7/16"	2 1/4"	1 15/16"
BENT 3	114°-08'-24"	1 15/16"	2 9/16"	2 1/4"	1 5/8"
END BENT 2	120°-27'-55"	1"	2 3/8"	2 1/4"	1 15/16"

SKEW ANGLE IS MEASURED BETWEEN FILL FACE AND TANGENT TO LEFT LANE CONTROL LINE AT END BENTS.

SKEW ANGLE IS MEASURED BETWEEN BENT CONTROL LINE AND TANGENT TO LEFT LANE CONTROL LINE AT BENT 3.



TYPICAL SECTION OF BASE ANGLE ASSEMBLY



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS

LEFT LANE

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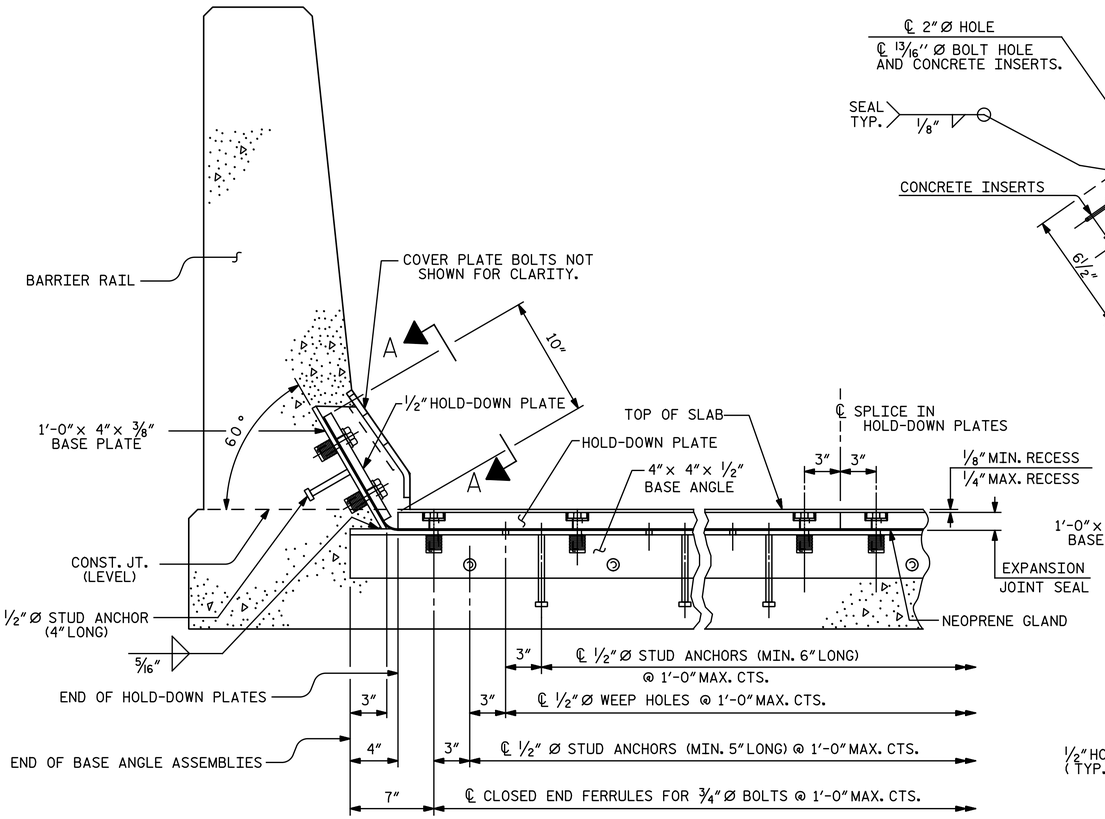
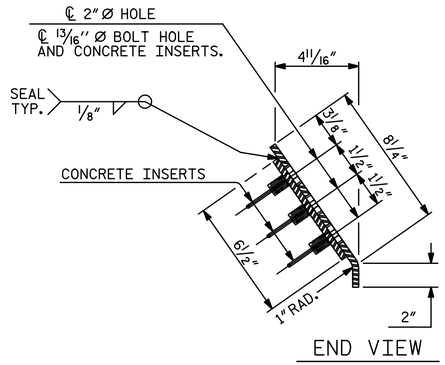
1			3			TOTAL SHEETS
2			4			62

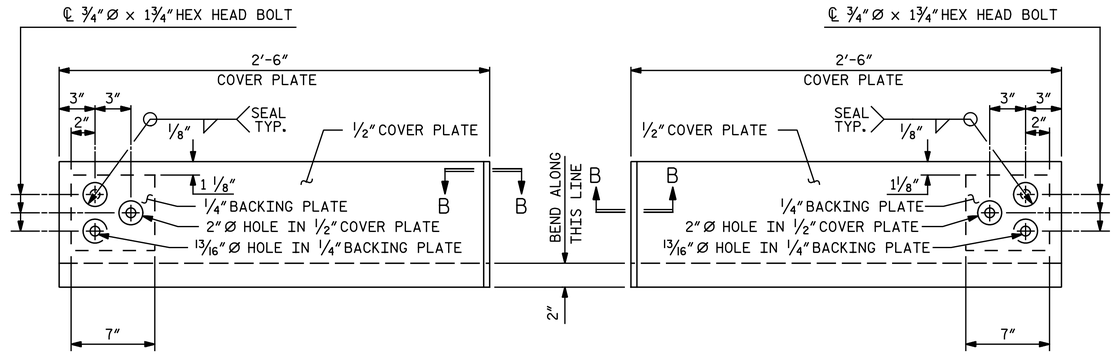
STD. NO. EJS1



SECTION THRU RAIL NORMAL TO JOINT



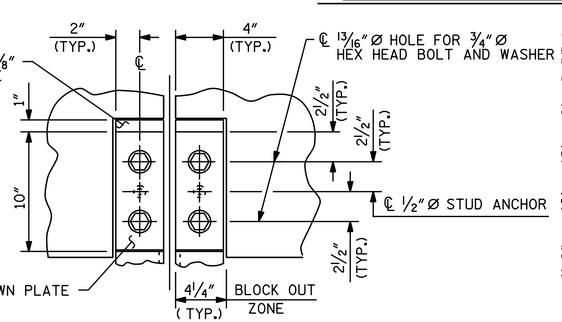
END VIEW



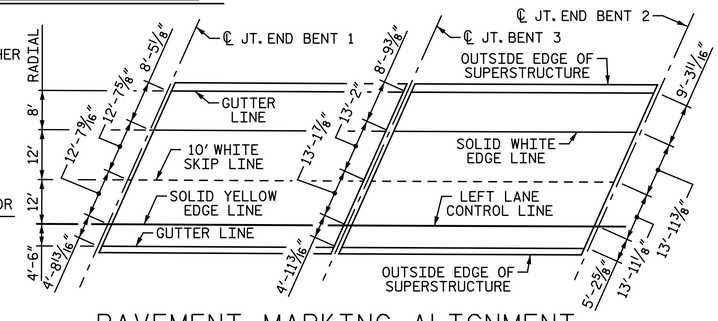
TYPE I - ELEVATION VIEW

TYPE II - ELEVATION VIEW

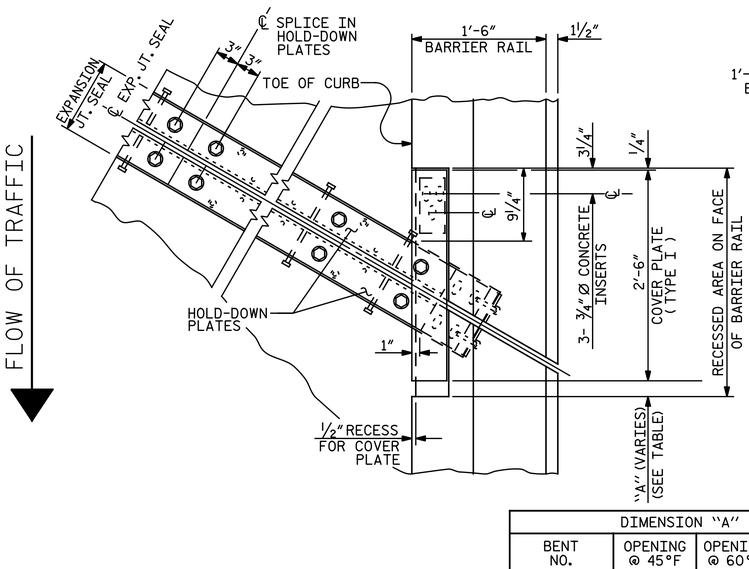
COVER PLATE DETAILS



SECTION A - A

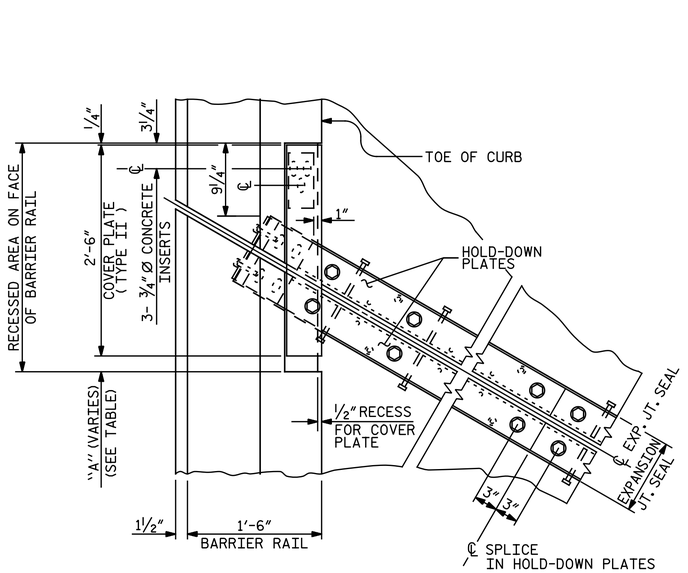


PAVEMENT MARKING ALIGNMENT

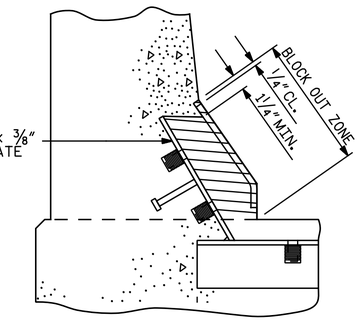


PLAN OF EXPANSION JOINT SEAL

FLOW OF TRAFFIC

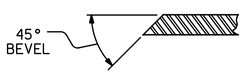


DIMENSION "A"			
BENT NO.	OPENING @ 45°F	OPENING @ 60°F	OPENING @ 90°F
END BENT 1	2 9/16"	2 3/8"	2"
BENT 3	2 13/16"	2 7/16"	1 3/4"
END BENT 2	2 13/16"	2 5/8"	2 1/4"

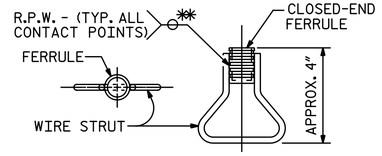


BLOCK OUT DETAIL

SEE " SECTION A - A " FOR OTHER DETAILS.



SECTION B - B



PLAN ELEVATION

CONCRETE INSERT

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

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

C41A3F8ECA3C434...

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Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

LEFT LANE

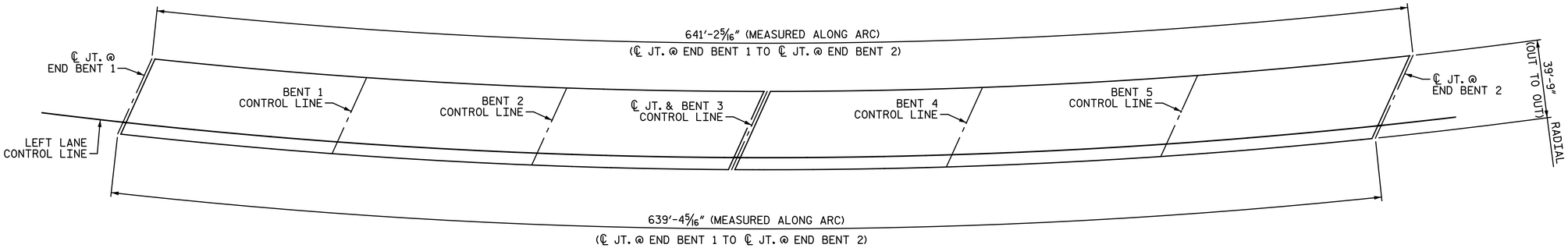
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-38
1			3			TOTAL SHEETS
2			4			62

ASSEMBLED BY : N.B. SPEAKS DATE : 11-8-17
CHECKED BY : B.J. BELL DATE : 4-11-18

DRAWN BY : REK 9/87
CHECKED BY : CRK 10/87

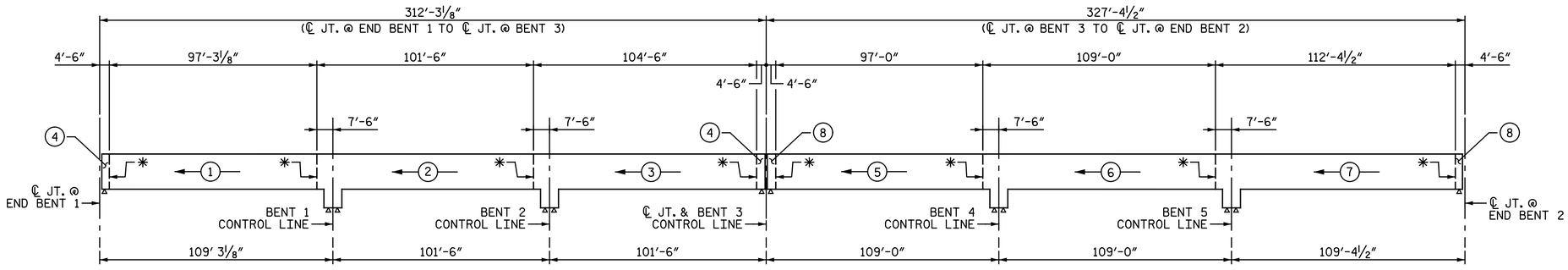
REV. 7/12 MAA/GM
REV. 6/13 MAA/GM
REV. 12/17 MAA/THC

STD. NO. EJS2



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 25,434)

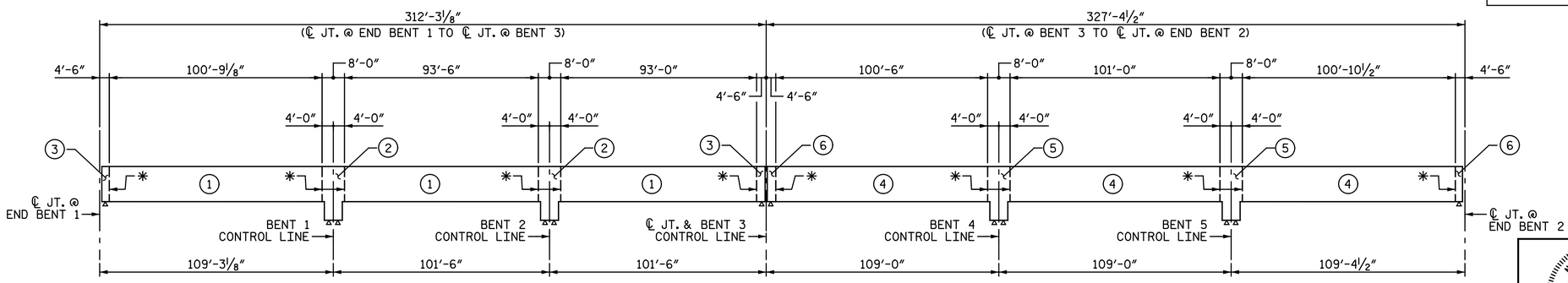


POURING SEQUENCE

DIMENSIONS GIVEN ALONG ARC OF LEFT LANE CONTROL LINE

✱ TRANSVERSE CONSTRUCTION JOINT

(#) DENOTES POUR NUMBER AND DIRECTION



OPTIONAL POURING SEQUENCE

DIMENSIONS GIVEN ALONG ARC OF LEFT LANE CONTROL LINE

POUR (2) CAN NOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3,000 PSI

POUR (5) CAN NOT BE STARTED UNTIL BOTH ADJACENT (4) POURS REACH A MINIMUM OF 3,000 PSI

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE DECK POUR DETAILS

LEFT LANE

DRAWN BY : M. D. MAYHEW DATE : 2-7-18

CHECKED BY : B. J. BELL DATE : 4-3-18

Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-39
1			3			TOTAL SHEETS
2			4			62

REINFORCING BAR SCHEDULE

UNIT 1 (SPANS A, B & C)

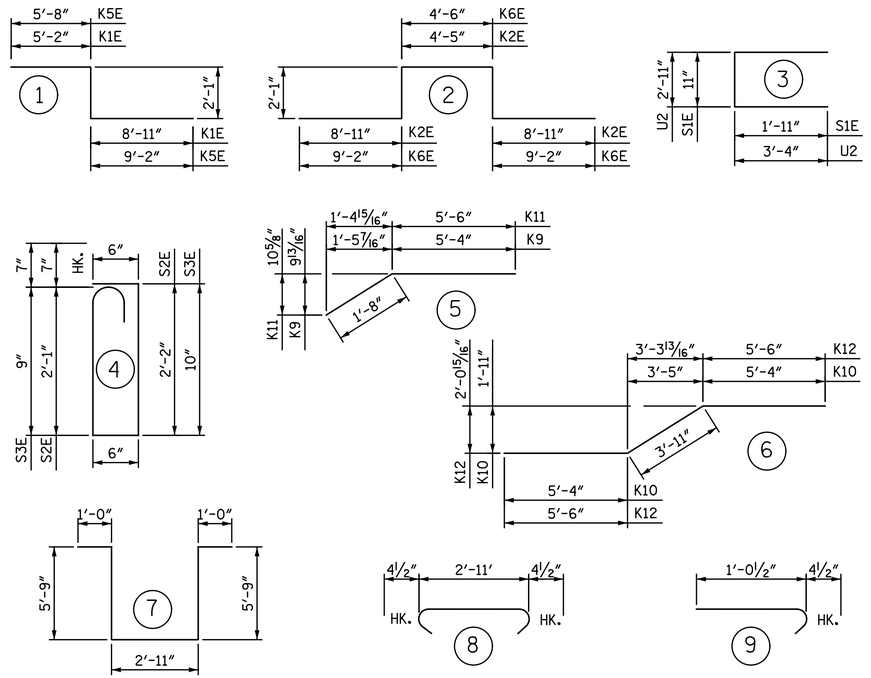
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	550	#5	STR.	39′ - 5″	22,611	A145E	1	#5	STR.	13′ - 5″	14	A240	1	#5	STR.	19′ - 4″	20
A2	550	#5	STR.	39′ - 5″	22,611	A146E	1	#5	STR.	12′ - 2″	13	A241	1	#5	STR.	18′ - 2″	19
A3E	4	#6	STR.	41′ - 6″	249	A147E	1	#5	STR.	11′ - 0″	11	A242	1	#5	STR.	17′ - 0″	18
A4E	4	#6	STR.	43′ - 2″	259	A148E	1	#5	STR.	9′ - 10″	10	A243	1	#5	STR.	15′ - 9″	16
						A149E	1	#5	STR.	8′ - 7″	9	A244	1	#5	STR.	14′ - 7″	15
A101E	1	#5	STR.	38′ - 5″	40	A150E	1	#5	STR.	7′ - 5″	8	A245	1	#5	STR.	13′ - 5″	14
A102E	1	#5	STR.	36′ - 10″	38	A151E	1	#5	STR.	6′ - 3″	7	A246	1	#5	STR.	12′ - 2″	13
A103E	1	#5	STR.	35′ - 3″	37	A152E	1	#5	STR.	5′ - 1″	5	A247	1	#5	STR.	11′ - 0″	11
A104E	1	#5	STR.	33′ - 7″	35	A153E	1	#5	STR.	3′ - 10″	4	A248	1	#5	STR.	9′ - 10″	10
A105E	1	#5	STR.	32′ - 0″	33	A154E	1	#5	STR.	2′ - 8″	3	A249	1	#5	STR.	8′ - 7″	9
A106E	1	#5	STR.	30′ - 4″	32	A201	1	#5	STR.	38′ - 5″	40	A250	1	#5	STR.	7′ - 5″	8
A107E	1	#5	STR.	28′ - 9″	30	A202	1	#5	STR.	36′ - 10″	38	A251	1	#5	STR.	6′ - 3″	7
A108E	1	#5	STR.	27′ - 1″	28	A203	1	#5	STR.	35′ - 3″	37	A252	1	#5	STR.	5′ - 1″	5
A109E	1	#5	STR.	25′ - 6″	27	A204	1	#5	STR.	33′ - 7″	35	A253	1	#5	STR.	3′ - 10″	4
A110E	1	#5	STR.	23′ - 10″	25	A205	1	#5	STR.	32′ - 0″	33	A254	1	#5	STR.	2′ - 8″	3
A111E	1	#5	STR.	22′ - 3″	23	A206	1	#5	STR.	30′ - 4″	32						
A112E	1	#5	STR.	20′ - 7″	21	A207	1	#5	STR.	28′ - 9″	30	B1E	27	#5	STR.	33′ - 10″	953
A113E	1	#5	STR.	19′ - 0″	20	A208	1	#5	STR.	27′ - 1″	28	B2	228	#5	STR.	53′ - 10″	12,802
A114E	1	#5	STR.	17′ - 4″	18	A209	1	#5	STR.	25′ - 6″	27	B3E	135	#5	STR.	53′ - 5″	7,521
A115E	1	#5	STR.	15′ - 8″	16	A210	1	#5	STR.	23′ - 10″	25	B4E	27	#5	STR.	26′ - 1″	735
A116E	1	#5	STR.	14′ - 1″	15	A211	1	#5	STR.	22′ - 3″	23	B5E	104	#7	STR.	40′ - 9″	8,662
A117E	1	#5	STR.	12′ - 5″	13	A212	1	#5	STR.	20′ - 7″	21						
A118E	1	#5	STR.	10′ - 9″	11	A213	1	#5	STR.	19′ - 0″	20	G1E	1	#5	STR.	41′ - 6″	43
A119E	1	#5	STR.	9′ - 2″	10	A214	1	#5	STR.	17′ - 4″	18	G2E	1	#5	STR.	43′ - 2″	45
A120E	1	#5	STR.	7′ - 6″	8	A215	1	#5	STR.	15′ - 8″	16						
A121E	1	#5	STR.	5′ - 10″	6	A216	1	#5	STR.	14′ - 1″	15	J1E	78	#4	9	1′ - 5″	74
A122E	1	#5	STR.	4′ - 2″	4	A217	1	#5	STR.	12′ - 5″	13						
A123E	1	#5	STR.	2′ - 6″	3	A218	1	#5	STR.	10′ - 9″	11	K1E	4	#8	1	16′ - 2″	173
A124E	1	#5	STR.	38′ - 8″	40	A219	1	#5	STR.	9′ - 2″	10	K2E	4	#8	2	26′ - 5″	282
A125E	1	#5	STR.	37′ - 6″	39	A220	1	#5	STR.	7′ - 6″	8	K3E	6	#5	STR.	10′ - 7″	66
A126E	1	#5	STR.	36′ - 3″	38	A221	1	#5	STR.	5′ - 10″	6	K4E	9	#6	STR.	7′ - 4″	99
A127E	1	#5	STR.	35′ - 0″	37	A222	1	#5	STR.	4′ - 2″	4	K5E	4	#8	1	16′ - 11″	181
A128E	1	#5	STR.	33′ - 10″	35	A223	1	#5	STR.	2′ - 6″	3	K6E	4	#8	2	27′ - 0″	288
A129E	1	#5	STR.	32′ - 7″	34	A224	1	#5	STR.	38′ - 8″	40	K7E	6	#5	STR.	10′ - 10″	68
A130E	1	#5	STR.	31′ - 5″	33	A225	1	#5	STR.	37′ - 6″	39	K8E	9	#6	STR.	7′ - 7″	103
A131E	1	#5	STR.	30′ - 2″	31	A226	1	#5	STR.	36′ - 3″	38	K9	12	#4	5	7′ - 0″	56
A132E	1	#5	STR.	29′ - 0″	30	A227	1	#5	STR.	35′ - 0″	37	K10	12	#4	6	14′ - 7″	117
A133E	1	#5	STR.	27′ - 9″	29	A228	1	#5	STR.	33′ - 10″	35	K11	12	#4	5	7′ - 2″	57
A134E	1	#5	STR.	26′ - 7″	28	A229	1	#5	STR.	32′ - 7″	34	K12	12	#4	6	14′ - 11″	120
A135E	1	#5	STR.	25′ - 4″	26	A230	1	#5	STR.	31′ - 5″	33	K13	12	#4	STR.	7′ - 4″	59
A136E	1	#5	STR.	24′ - 2″	25	A231	1	#5	STR.	30′ - 2″	31	K14	48	#4	STR.	10′ - 7″	339
A137E	1	#5	STR.	23′ - 0″	24	A232	1	#5	STR.	29′ - 0″	30	K15	12	#4	STR.	7′ - 8″	61
A138E	1	#5	STR.	21′ - 9″	23	A233	1	#5	STR.	27′ - 9″	29						
A139E	1	#5	STR.	20′ - 7″	21	A234	1	#5	STR.	26′ - 7″	28	S1E	42	#4	3	4′ - 9″	133
A140E	1	#5	STR.	19′ - 4″	20	A235	1	#5	STR.	25′ - 4″	26	S2E	42	#5	4	5′ - 10″	256
A141E	1	#5	STR.	18′ - 2″	19	A236	1	#5	STR.	24′ - 2″	25	S3E	24	#5	4	3′ - 2″	79
A142E	1	#5	STR.	17′ - 0″	18	A237	1	#5	STR.	23′ - 0″	24	S4	282	#4	8	3′ - 8″	691
A143E	1	#5	STR.	15′ - 9″	16	A238	1	#5	STR.	21′ - 9″	23						
A144E	1	#5	STR.	14′ - 7″	15	A239	1	#5	STR.	20′ - 7″	21	U1	42	#4	7	16′ - 5″	461
												U2	24	#4	3	9′ - 7″	154

REINFORCING STEEL	LBS.	38,686
EPOXY COATED REINF. STEEL	LBS.	44,038

GROOVING BRIDGE FLOORS (SPANS A, B & C)

APPROACH SLAB @ END BENT 1	803	SQ. FT.
BRIDGE DECK (SPANS A, B & C)	10,424	SQ. FT.
TOTAL	11,227	SQ. FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
SPANS A, B & C	-	38,686	44,038
POUR 1	136.0	-	-
POUR 2	163.3	-	-
POUR 3	167.8	-	-
POUR 4	15.2	-	-
SPANS A, B & C TOTALS*	482.3	38,686	44,038

"E" SUFFIX DENOTES EPOXY COATED REINFORCING * QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

BILL OF MATERIAL

LEFT LANE

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NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-40
1			3			TOTAL SHEETS
2			4			62

DRAWN BY : M. D. MAYHEW DATE : 5-2-18
CHECKED BY : B. J. BELL DATE : 5-2-18

REINFORCING BAR SCHEDULE

UNIT 2 (SPANS D, E & F)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	569	#5	STR.	39′ - 5″	23,392	A194E	1	#5	STR.	31′ - 4″	33	A266	1	#5	STR.	25′ - 6″	27	A310	1	#5	STR.	16′ - 8″	17
A2	569	#5	STR.	39′ - 5″	23,392	A195E	1	#5	STR.	30′ - 5″	32	A267	1	#5	STR.	24′ - 4″	25	A311	1	#5	STR.	15′ - 9″	16
A4E	4	#6	STR.	43′ - 2″	259	A196E	1	#5	STR.	29′ - 6″	31	A268	1	#5	STR.	23′ - 2″	24	A312	1	#5	STR.	14′ - 10″	15
A5E	4	#6	STR.	45′ - 9″	275	A197E	1	#5	STR.	28′ - 7″	30	A269	1	#5	STR.	22′ - 0″	23	A313	1	#5	STR.	13′ - 11″	15
						A198E	1	#5	STR.	27′ - 8″	29	A270	1	#5	STR.	20′ - 9″	22	A314	1	#5	STR.	13′ - 0″	14
A155E	1	#5	STR.	38′ - 7″	40	A199E	1	#5	STR.	26′ - 9″	28	A271	1	#5	STR.	19′ - 7″	20	A315	1	#5	STR.	12′ - 1″	13
A156E	1	#5	STR.	37′ - 4″	39	A200E	1	#5	STR.	25′ - 10″	27	A272	1	#5	STR.	18′ - 5″	19	A316	1	#5	STR.	11′ - 2″	12
A157E	1	#5	STR.	36′ - 2″	38	A201E	1	#5	STR.	24′ - 11″	26	A273	1	#5	STR.	17′ - 2″	18	A317	1	#5	STR.	10′ - 3″	11
A158E	1	#5	STR.	35′ - 0″	37	A202E	1	#5	STR.	24′ - 0″	25	A274	1	#5	STR.	16′ - 0″	17	A318	1	#5	STR.	9′ - 5″	10
A159E	1	#5	STR.	33′ - 10″	35	A203E	1	#5	STR.	23′ - 1″	24	A275	1	#5	STR.	14′ - 10″	15	A319	1	#5	STR.	8′ - 6″	9
A160E	1	#5	STR.	32′ - 8″	34	A204E	1	#5	STR.	22′ - 2″	23	A276	1	#5	STR.	13′ - 7″	14	A320	1	#5	STR.	7′ - 7″	8
A161E	1	#5	STR.	31′ - 6″	33	A205E	1	#5	STR.	21′ - 3″	22	A277	1	#5	STR.	12′ - 5″	13	A321	1	#5	STR.	6′ - 8″	7
A162E	1	#5	STR.	30′ - 3″	32	A206E	1	#5	STR.	20′ - 4″	21	A278	1	#5	STR.	11′ - 2″	12	A322	1	#5	STR.	5′ - 9″	6
A163E	1	#5	STR.	29′ - 1″	30	A207E	1	#5	STR.	19′ - 5″	20	A279	1	#5	STR.	10′ - 0″	10	A323	1	#5	STR.	4′ - 10″	5
A164E	1	#5	STR.	27′ - 11″	29	A208E	1	#5	STR.	18′ - 6″	19	A280	1	#5	STR.	8′ - 10″	9	A324	1	#5	STR.	3′ - 11″	4
A165E	1	#5	STR.	26′ - 9″	28	A209E	1	#5	STR.	17′ - 7″	18	A281	1	#5	STR.	7′ - 7″	8	A325	1	#5	STR.	3′ - 1″	3
A166E	1	#5	STR.	25′ - 6″	27	A210E	1	#5	STR.	16′ - 8″	17	A282	1	#5	STR.	6′ - 5″	7	A326	1	#5	STR.	2′ - 2″	2
A167E	1	#5	STR.	24′ - 4″	25	A211E	1	#5	STR.	15′ - 9″	16	A283	1	#5	STR.	5′ - 2″	5						
A168E	1	#5	STR.	23′ - 2″	24	A212E	1	#5	STR.	14′ - 10″	15	A284	1	#5	STR.	4′ - 0″	4	B5E	104	#7	STR.	40′ - 9″	8,662
A169E	1	#5	STR.	22′ - 0″	23	A213E	1	#5	STR.	13′ - 11″	15	A285	1	#5	STR.	2′ - 9″	3	B6E	54	#5	STR.	28′ - 6″	1,605
A170E	1	#5	STR.	20′ - 9″	22	A214E	1	#5	STR.	13′ - 0″	14	A286	1	#5	STR.	38′ - 9″	40	B7	228	#5	STR.	56′ - 5″	13,416
A171E	1	#5	STR.	19′ - 7″	20	A215E	1	#5	STR.	12′ - 1″	13	A287	1	#5	STR.	37′ - 10″	39	B8E	135	#5	STR.	57′ - 2″	8,049
A172E	1	#5	STR.	18′ - 5″	19	A216E	1	#5	STR.	11′ - 2″	12	A288	1	#5	STR.	36′ - 10″	38						
A173E	1	#5	STR.	17′ - 2″	18	A217E	1	#5	STR.	10′ - 3″	11	A289	1	#5	STR.	35′ - 11″	37	G2E	1	#5	STR.	43′ - 2″	45
A174E	1	#5	STR.	16′ - 0″	17	A218E	1	#5	STR.	9′ - 5″	10	A290	1	#5	STR.	35′ - 0″	37	G3E	1	#5	STR.	45′ - 9″	48
A175E	1	#5	STR.	14′ - 10″	15	A219E	1	#5	STR.	8′ - 6″	9	A291	1	#5	STR.	34′ - 1″	36						
A176E	1	#5	STR.	13′ - 7″	14	A220E	1	#5	STR.	7′ - 7″	8	A292	1	#5	STR.	33′ - 2″	35	J1E	82	#4	9	1′ - 5″	78
A177E	1	#5	STR.	12′ - 5″	13	A221E	1	#5	STR.	6′ - 8″	7	A293	1	#5	STR.	32′ - 3″	34						
A178E	1	#5	STR.	11′ - 2″	12	A222E	1	#5	STR.	5′ - 9″	6	A294	1	#5	STR.	31′ - 4″	33	K7E	6	#5	STR.	10′ - 10″	68
A179E	1	#5	STR.	10′ - 0″	10	A223E	1	#5	STR.	4′ - 10″	5	A295	1	#5	STR.	30′ - 5″	32	K8E	9	#6	STR.	7′ - 7″	103
A180E	1	#5	STR.	8′ - 10″	9	A224E	1	#5	STR.	3′ - 11″	4	A296	1	#5	STR.	29′ - 6″	31	K16E	4	#8	1	16′ - 8″	178
A181E	1	#5	STR.	7′ - 7″	8	A225E	1	#5	STR.	3′ - 1″	3	A297	1	#5	STR.	28′ - 7″	30	K17E	4	#8	2	27′ - 5″	293
A182E	1	#5	STR.	6′ - 5″	7	A226E	1	#5	STR.	2′ - 2″	2	A298	1	#5	STR.	27′ - 8″	29	K18E	4	#8	1	17′ - 11″	191
A183E	1	#5	STR.	5′ - 2″	5	A255	1	#5	STR.	38′ - 7″	40	A299	1	#5	STR.	26′ - 9″	28	K19E	4	#8	2	28′ - 5″	303
A184E	1	#5	STR.	4′ - 0″	4	A256	1	#5	STR.	37′ - 4″	39	A300	1	#5	STR.	25′ - 10″	27	K20	12	#4	STR.	7′ - 8″	61
A185E	1	#5	STR.	2′ - 9″	3	A257	1	#5	STR.	36′ - 2″	38	A301	1	#5	STR.	24′ - 11″	26	K21	48	#4	STR.	11′ - 0″	353
A186E	1	#5	STR.	38′ - 9″	40	A258	1	#5	STR.	35′ - 0″	37	A302	1	#5	STR.	24′ - 0″	25	K22	12	#4	STR.	8′ - 0″	64
A187E	1	#5	STR.	37′ - 10″	39	A259	1	#5	STR.	33′ - 10″	35	A303	1	#5	STR.	23′ - 1″	24	K23E	6	#5	STR.	11′ - 5″	71
A188E	1	#5	STR.	36′ - 10″	38	A260	1	#5	STR.	32′ - 8″	34	A304	1	#5	STR.	22′ - 2″	23	K24E	9	#6	STR.	8′ - 0″	108
A189E	1	#5	STR.	35′ - 11″	37	A261	1	#5	STR.	31′ - 6″	33	A305	1	#5	STR.	21′ - 3″	22	K25	12	#4	5	7′ - 5″	59
A190E	1	#5	STR.	35′ - 0″	37	A262	1	#5	STR.	30′ - 3″	32	A306	1	#5	STR.	20′ - 4″	21	K26	12	#4	6	15′ - 5″	124
A191E	1	#5	STR.	34′ - 1″	36	A263	1	#5	STR.	29′ - 1″	30	A307	1	#5	STR.	19′ - 5″	20	K27	12	#4	5	7′ - 6″	60
A192E	1	#5	STR.	33′ - 2″	35	A264	1	#5	STR.	27′ - 11″	29	A308	1	#5	STR.	18′ - 6″	19	K28	12	#4	6	15′ - 7″	125
A193E	1	#5	STR.	32′ - 3″	34	A265	1	#5	STR.	26′ - 9″	28	A309	1	#5	STR.	17′ - 7″	18						

S1E	21	#4	3	4′ - 7″	64
S2E	42	#5	4	5′ - 10″	256
S3E	24	#5	4	3′ - 2″	79
S5E	21	#4	3	5′ - 7″	78
S6	282	#4	8	3′ - 10″	722
U3	42	#4	7	16′ - 7″	465
U4	24	#4	3	9′ - 9″	156

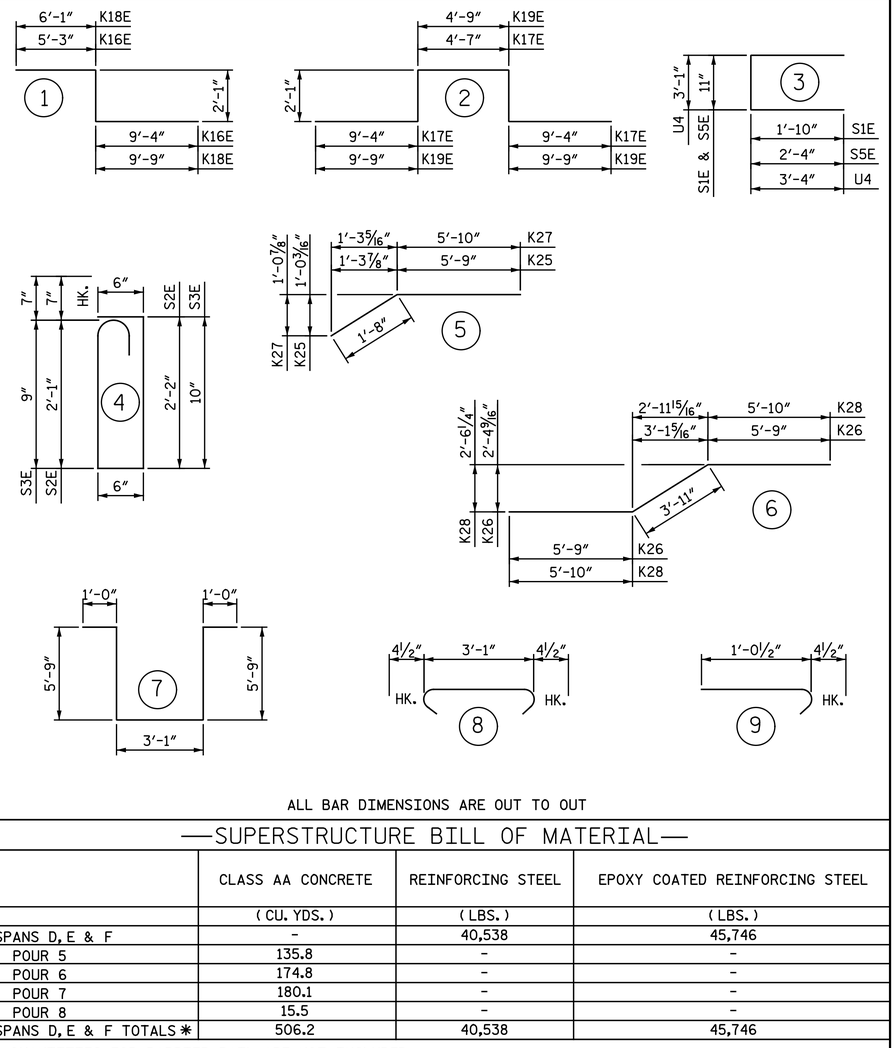
REINFORCING STEEL	LBS.	40,538
EPOXY COATED REINF. STEEL	LBS.	45,746

"E" SUFFIX DENOTES EPOXY COATED REINFORCING

GROOVING BRIDGE FLOORS (SPANS D, E & F)

APPROACH SLAB @ END BENT 2	800	SQ. FT.
BRIDGE DECK (SPANS D, E & F)	10,934	SQ. FT.
TOTAL	11,734	SQ. FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
SPANS D, E & F	-	40,538	45,746
POUR 5	135.8	-	-
POUR 6	174.8	-	-
POUR 7	180.1	-	-
POUR 8	15.5	-	-
SPANS D, E & F TOTALS *	506.2	40,538	45,746

* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

C41A3F8ECA3C43A...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

BILL OF MATERIAL

LEFT LANE

Michael Baker INTERNATIONAL

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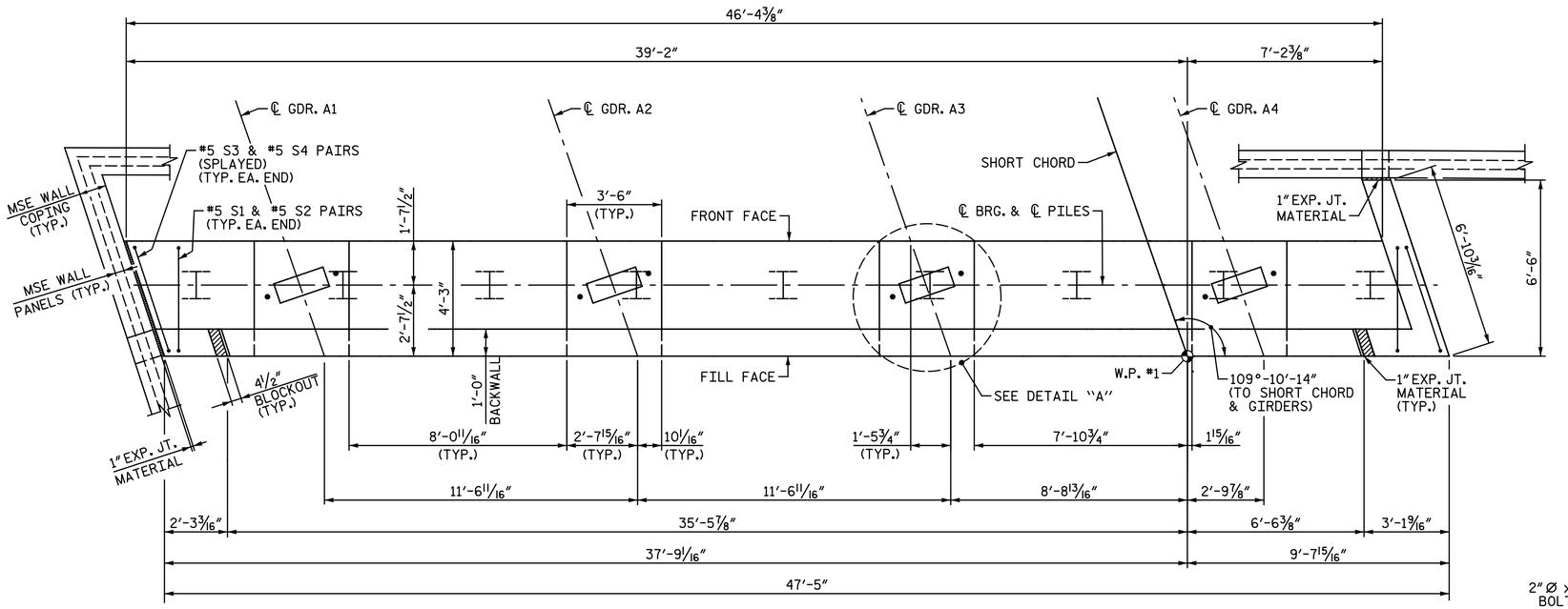
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-41
1			3			TOTAL SHEETS
2			4			62

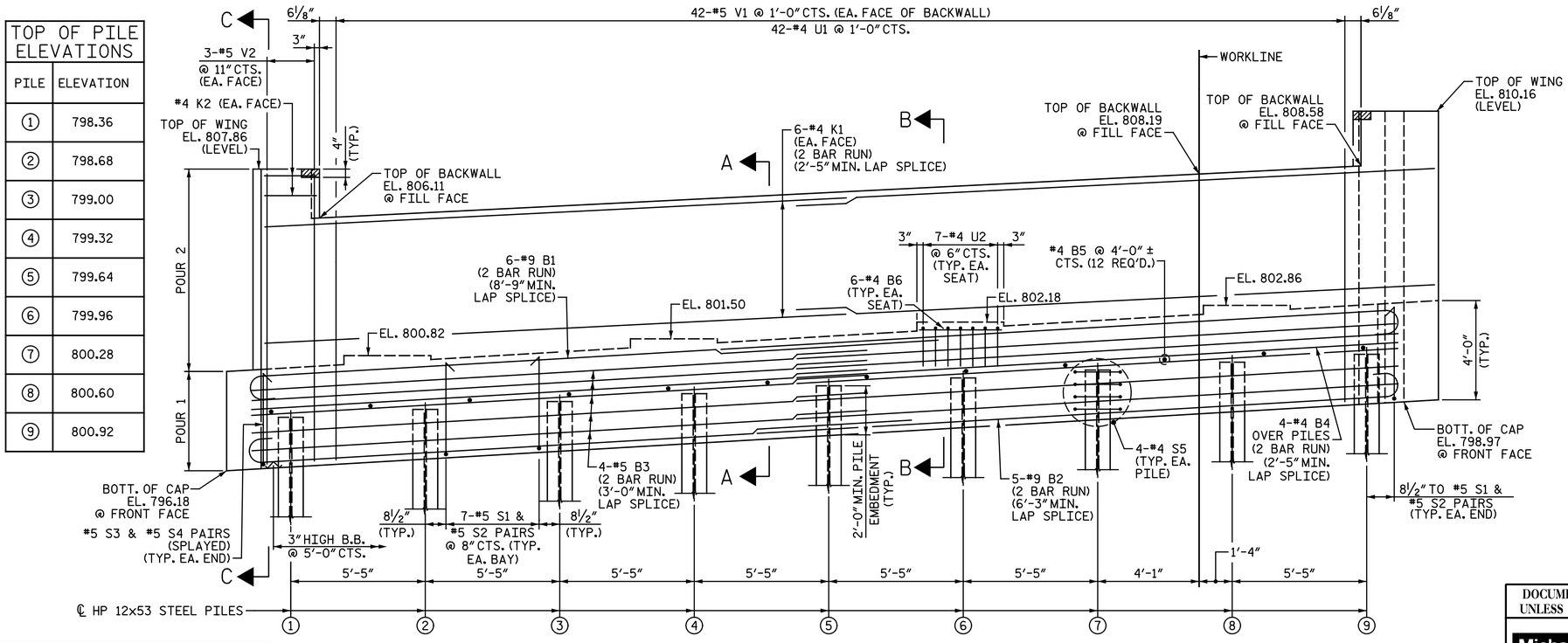
DRAWN BY : M. D. MAYHEW DATE : 5-2-18

CHECKED BY : B. J. BELL DATE : 5-2-18

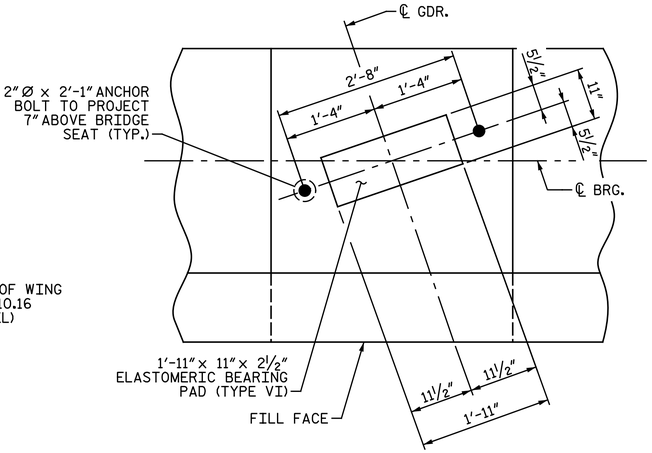


PLAN

TOP OF PILE ELEVATIONS	
PILE	ELEVATION
①	798.36
②	798.68
③	799.00
④	799.32
⑤	799.64
⑥	799.96
⑦	800.28
⑧	800.60
⑨	800.92



ELEVATION



DETAIL ″A″
(TYP. EA. BRIDGE SEAT)

NOTES:

FOR ″SECTION A-A″, ″SECTION B-B″ AND ″SECTION C-C″, SEE ″END BENT 1 DETAILS″ SHEET.

STIRRUPS & U2 BARS 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 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 FRONT FACE AT A RATE OF 2%.

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

FOR MSE WALLS, SEE SPECIAL PROVISIONS.

FOR LOCATION OF MSE WALL, SEE MSE WALL PLANS.

LENGTH OF CAP AND EACH WING SHALL BE FIELD ADJUSTED AS REQUIRED TO PROVIDE 1″ EXPANSION JOINT MATERIAL AS SHOWN BETWEEN THESE COMPONENTS AND THE MSE WALL COPING.

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

LEFT LANE

Michael Baker INTERNATIONAL
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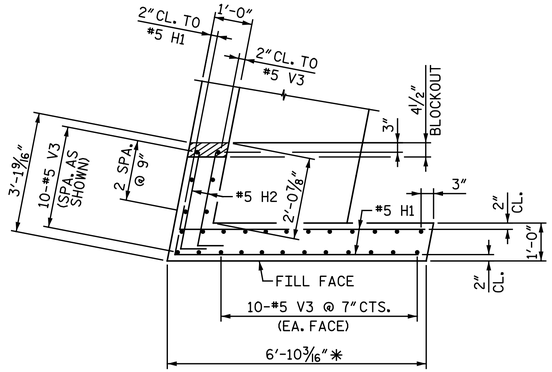
NC License No.: F-1084

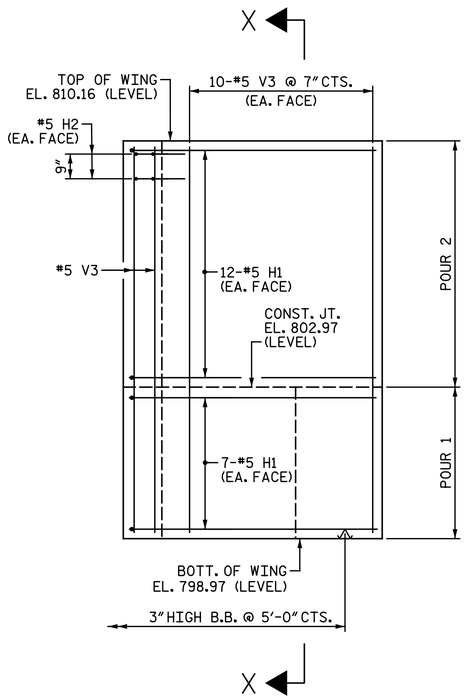
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-42
1			3			TOTAL SHEETS
2			4			62

DRAWN BY : N. B. SPEAKS DATE : 5-21-18
CHECKED BY : T. M. GARRISON DATE : 5-21-18

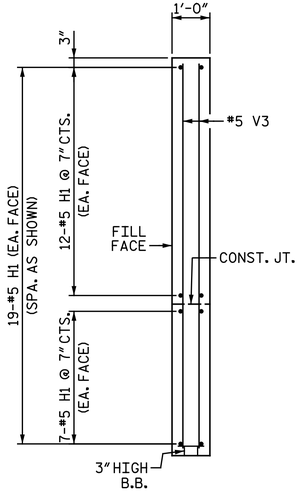


PLAN OF RIGHT WING

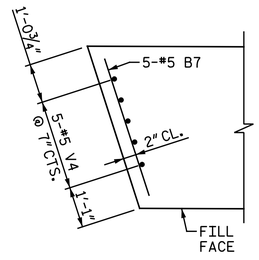
*SEE NOTE REGARDING LENGTH OF WING ON "END BENT 1" SHEET 1 OF 2.



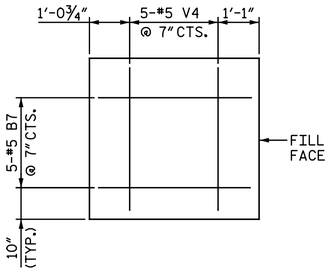
ELEVATION OF RIGHT WING



SECTION X-X



PLAN



END VIEW

LEFT END OF CAP

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

LEFT LANE

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

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Michael Baker INTERNATIONAL

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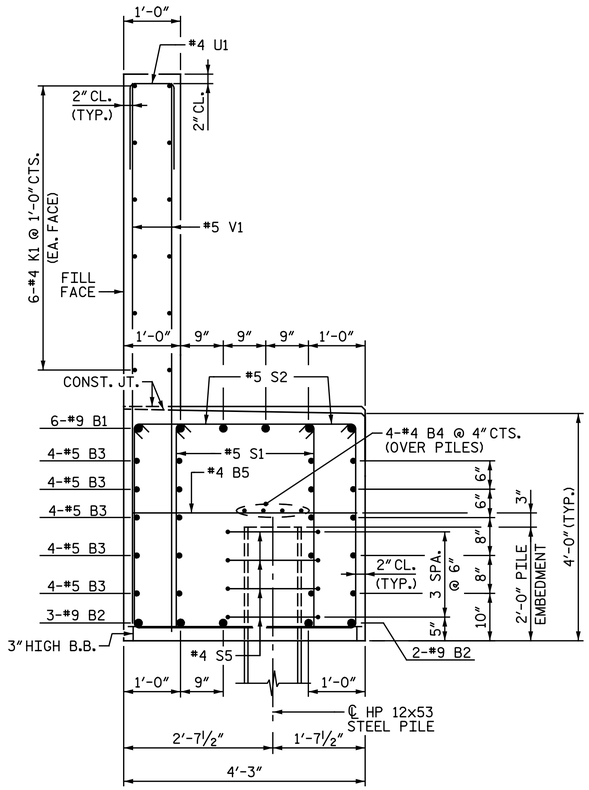
Cary, North Carolina 27518
NC License No.: F-1084

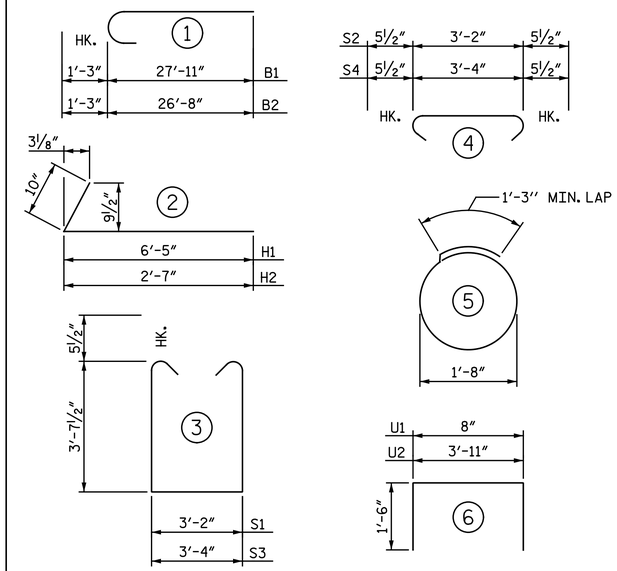
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-43
1			3			TOTAL SHEETS
2			4			62

DRAWN BY : N. B. SPEAKS DATE : 5-21-18
CHECKED BY : T. M. GARRISON DATE : 5-21-18



SECTION A-A

BAR TYPES



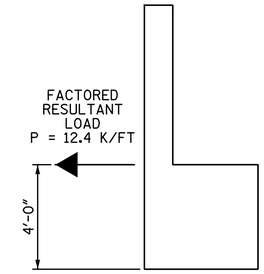
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	29' - 2"	1,190
B2	10	#9	1	27' - 11"	949
B3	40	#5	STR.	25' - 1"	1,046
B4	8	#4	STR.	24' - 9"	132
B5	12	#4	STR.	3' - 11"	31
B6	24	#4	STR.	3' - 2"	51
B7	5	#5	STR.	4' - 1"	21
H1	38	#5	2	7' - 3"	287
H2	4	#5	2	3' - 5"	14
K1	24	#4	STR.	24' - 9"	397
K2	4	#4	STR.	1' - 10"	5
S1	116	#5	3	11' - 4"	1,371
S2	116	#5	4	4' - 1"	494
S3	4	#5	3	11' - 6"	48
S4	4	#5	4	4' - 3"	18
S5	36	#4	5	6' - 6"	156
U1	42	#4	6	3' - 8"	103
U2	28	#4	6	6' - 11"	129
V1	84	#5	STR.	9' - 4"	818
V2	6	#5	STR.	11' - 1"	69
V3	30	#5	STR.	10' - 10"	339
V4	5	#5	STR.	3' - 8"	19

REINFORCING STEEL	LBS.	7,687
CLASS A CONCRETE		
POUR 1 - CAP & LOWER PART OF WINGS	C.Y.	30.8
POUR 2 - BACKWALL & UPPER PART OF WINGS	C.Y.	11.9
TOTAL	C.Y.	42.7
PILE EXCAVATION IN SOIL	LIN. FT.	6
PILE EXCAVATION NOT IN SOIL	LIN. FT.	89
HP 12x53 STEEL PILES NO. 9	LIN. FT.	425

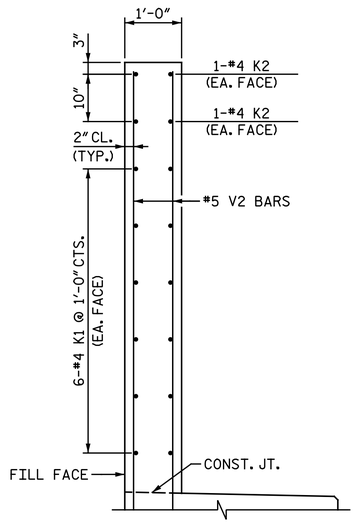


MSE REINFORCING STRAP LOAD DETAIL

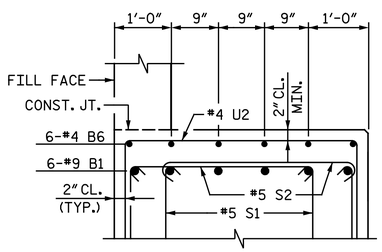
MSE REINFORCING STRAPS SHALL BE ATTACHED TO THE END BENT CAP AND/OR BACKWALL. FOR DESIGN CRITERIA AND DETAILS, SEE MSE WALL SHEETS AND SPECIAL PROVISIONS.

NOTES:

FOR PILE SPLICE DETAILS, SEE "END BENT 2 DETAILS" SHEET.



PARTIAL SECTION C-C



PARTIAL SECTION B-B

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/24/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 DETAILS

LEFT LANE

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Michael Baker INTERNATIONAL
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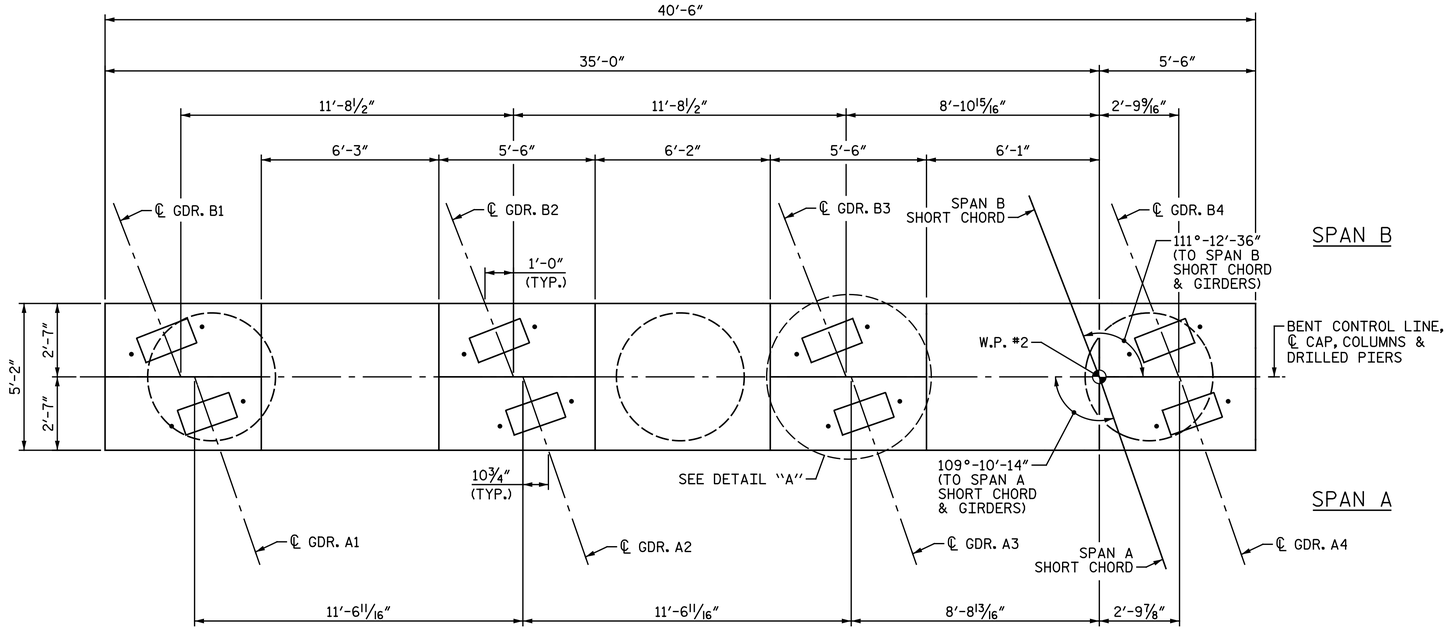
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-44
1			3			TOTAL SHEETS
2			4			62

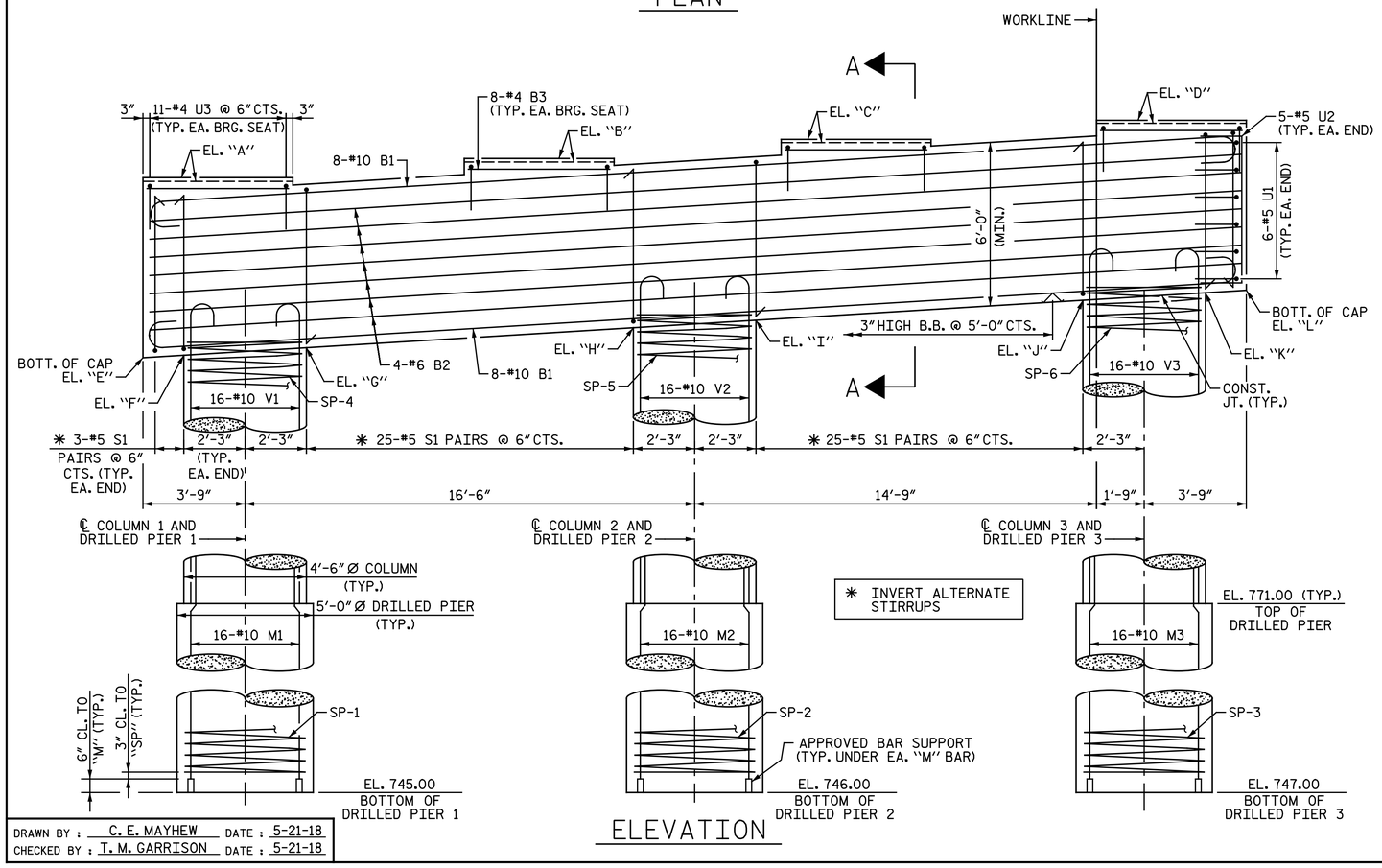
DRAWN BY : N. B. SPEAKS DATE : 5-24-18
CHECKED BY : T. M. GARRISON DATE : 5-24-18



SPAN B

SPAN A

PLAN



ELEVATION

✱ INVERT ALTERNATE STIRRUPS

DRAWN BY : C. E. MAYHEW DATE : 5-21-18
CHECKED BY : T. M. GARRISON DATE : 5-21-18

NOTES:

STIRRUPS AND ″U″ BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR SECTION A-A, SEE ″BENT 1 DETAILS″ SHEET.

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

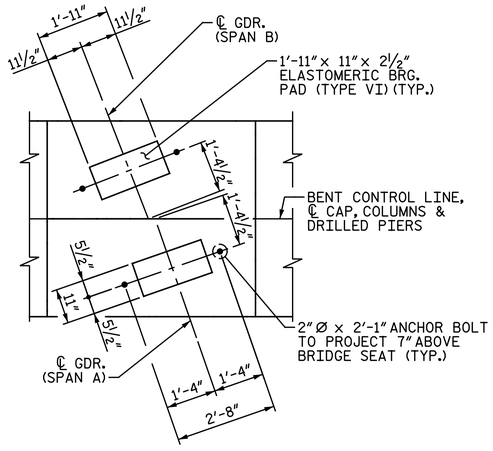
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR ″REINFORCING STEEL″ AND ″SPIRAL COLUMN REINFORCING STEEL″.

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.

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

LOCATION	ELEVATION SPAN A	ELEVATION SPAN B
A	796.68	796.54
B	797.38	797.25
C	798.08	797.96
D	798.78	798.67

LOCATION	ELEVATION
E	790.07
F	790.16
G	790.44
H	791.17
I	791.44
J	792.18
K	792.45
L	792.54



DETAIL ″A″
(TYP. EA. BRIDGE SEAT)

PROJECT NO. U-2412A
GUILFORD COUNTY
STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

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Michael Baker Engineering
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Cary, North Carolina 27518
NC License No. : F-1084

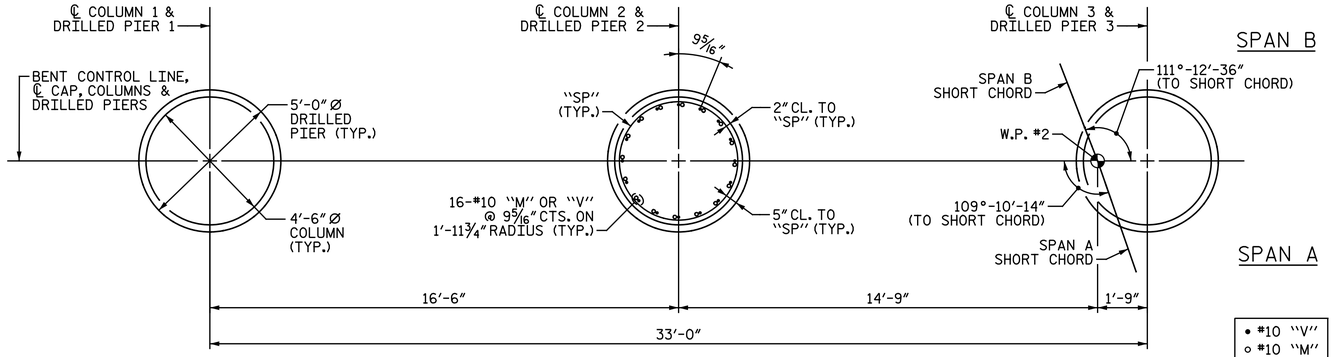
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

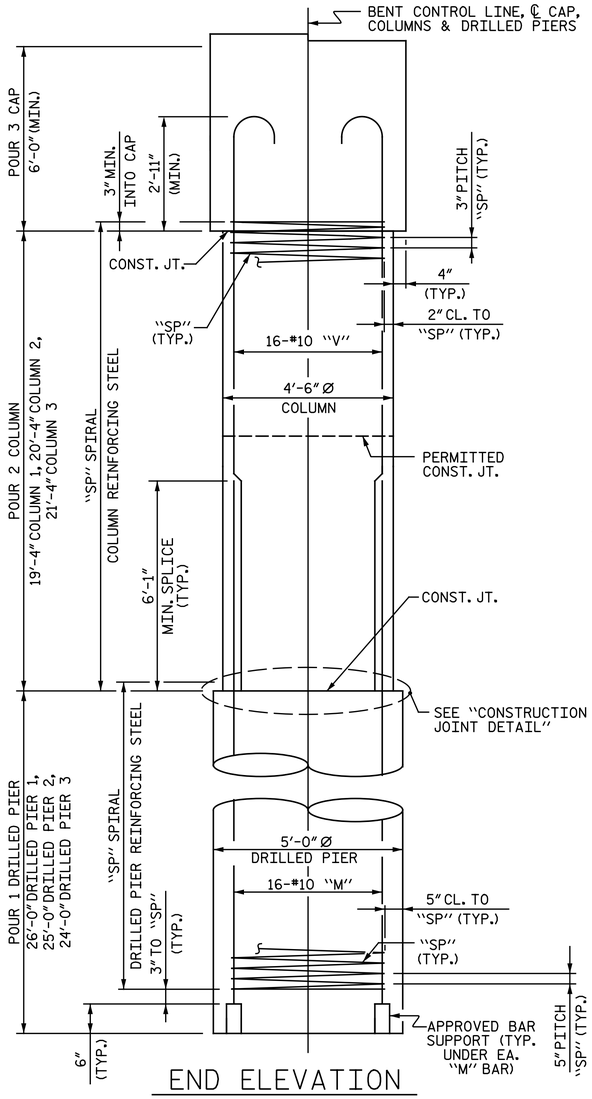
BENT 1

LEFT LANE

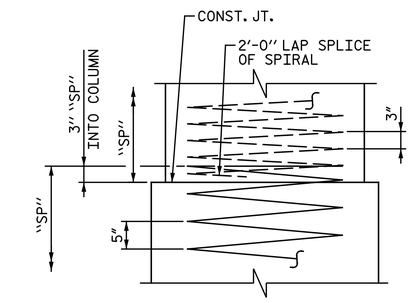
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-45
1			3			TOTAL SHEETS
2			4			62



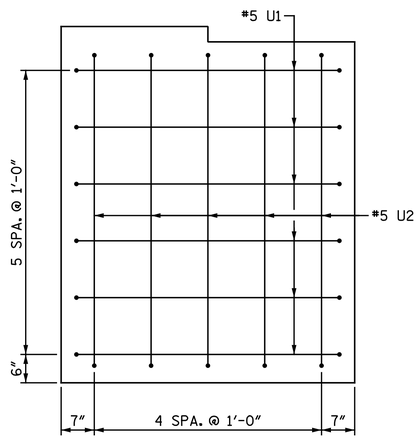
PLAN OF COLUMNS & DRILLED PIERS



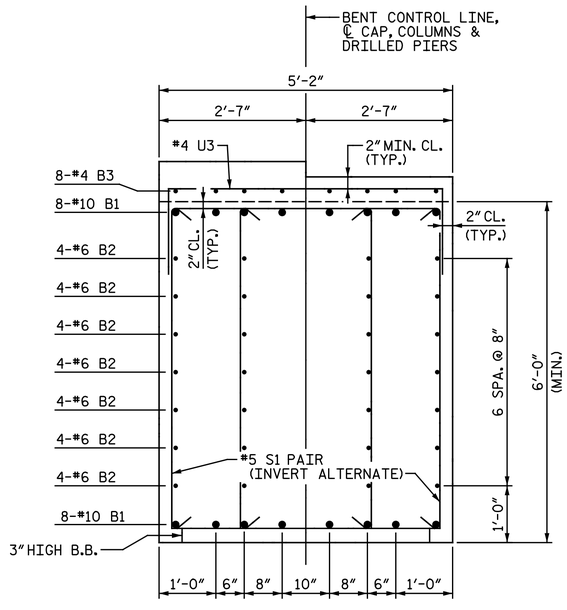
END ELEVATION



CONSTRUCTION JOINT DETAIL

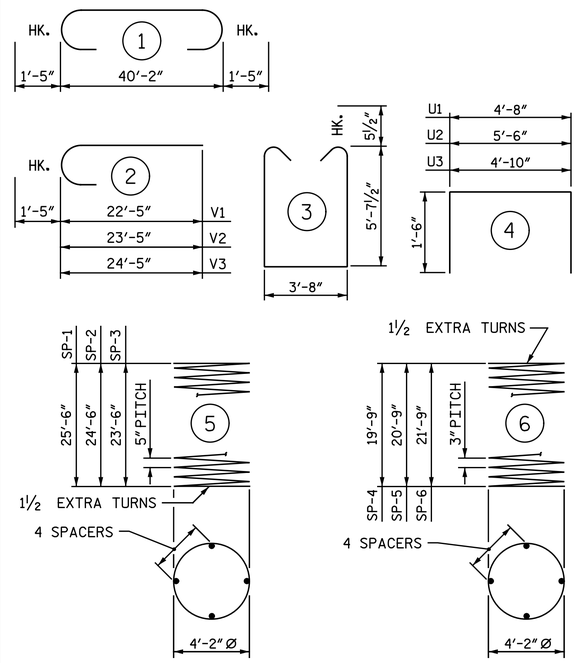


END VIEW



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

✳ THE SP-1 THRU SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

✳✳ THE SP-4 THRU SP-6 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#10	1	43′ - 0″	2,960
B2	28	#6	STR.	40′ - 2″	1,689
B3	32	#4	STR.	5′ - 2″	110
M1	16	#10	STR.	34′ - 7″	2,381
M2	16	#10	STR.	33′ - 7″	2,312
M3	16	#10	STR.	32′ - 7″	2,243
S1	112	#5	3	15′ - 10″	1,850
U1	12	#5	4	7′ - 8″	96
U2	10	#5	4	8′ - 6″	89
U3	44	#4	4	7′ - 10″	230
V1	16	#10	2	23′ - 10″	1,641
V2	16	#10	2	24′ - 10″	1,710
V3	16	#10	2	25′ - 10″	1,779
REINFORCING STEEL				LBS.	19,090
SP-1	1	✳	5	810′ - 11″	846
SP-2	1	✳	5	779′ - 10″	813
SP-3	1	✳	5	748′ - 10″	781
SP-4	1	✳✳	6	1043′ - 5″	697
SP-5	1	✳✳	6	1095′ - 3″	732
SP-6	1	✳✳	6	1147′ - 1″	766
SPIRAL COLUMN REINFORCING STEEL				LBS.	4,635

CLASS A CONCRETE		
POUR 2 - COLUMNS	C.Y.	35.9
POUR 3 - CAP	C.Y.	48.1
TOTAL CLASS A CONCRETE	C.Y.	84.0
DRILLED PIER CONCRETE		
POUR 1 - DRILLED PIERS	C.Y.	54.6
5′-0″DIA. DRILLED PIERS IN SOIL	LIN. FT.	36.00
5′-0″DIA. DRILLED PIERS NOT IN SOIL	LIN. FT.	39.00
SID INSPECTIONS	EA.	1
CSL TESTING	EA.	1
CSL TUBES	LIN. FT.	397.50

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1 DETAILS

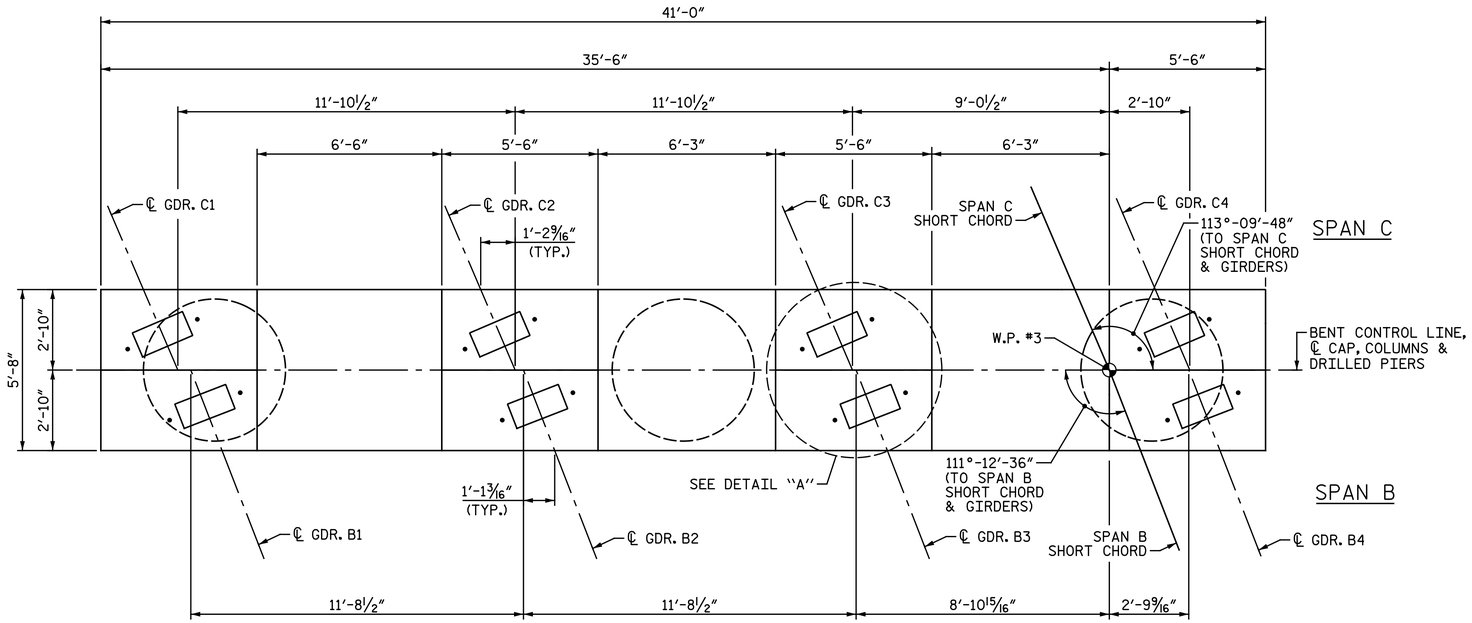
LEFT LANE

DRAWN BY : C. E. MAYHEW DATE : 5-21-18
CHECKED BY : T. M. GARRISON DATE : 5-21-18

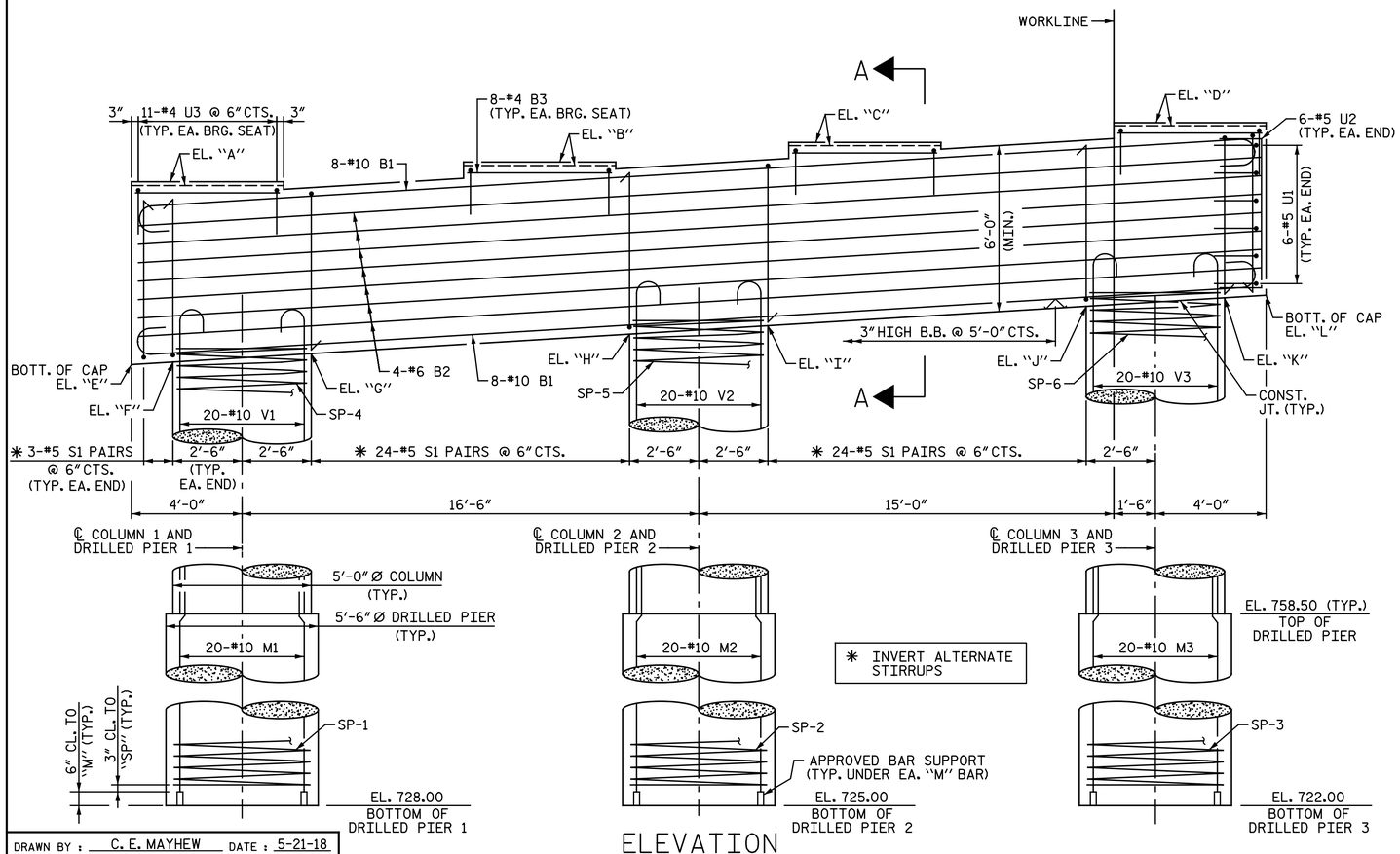
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-46
1			3			TOTAL SHEETS
2			4			62



PLAN



✱ INVERT ALTERNATE STIRRUPS

ELEVATION

DRAWN BY : C. E. MAYHEW DATE : 5-21-18
CHECKED BY : T. M. GARRISON DATE : 5-21-18

NOTES:

STIRRUPS AND ″U″ BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR SECTION A-A, SEE ″BENT 2 DETAILS″ SHEET.

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

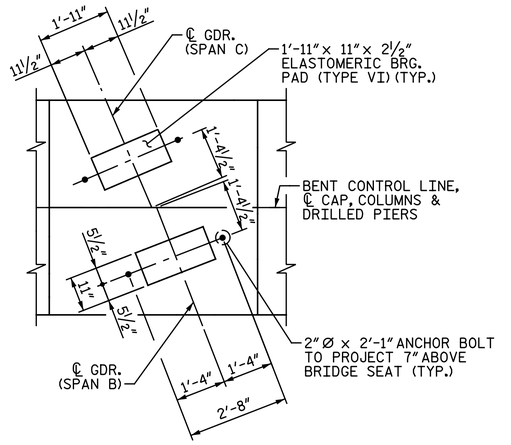
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR ″REINFORCING STEEL″ AND ″SPIRAL COLUMN REINFORCING STEEL″.

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.

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

LOCATION	ELEVATION SPAN B	ELEVATION SPAN C
A	792.62	792.48
B	793.34	793.21
C	794.06	793.94
D	794.77	794.67

LOCATION	ELEVATION
E	786.01
F	786.10
G	786.41
H	787.12
I	787.43
J	788.14
K	788.45
L	788.54



DETAIL ″A″
(TYP. EA. BRIDGE SEAT)

PROJECT NO. U-2412A
GUILFORD COUNTY
STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

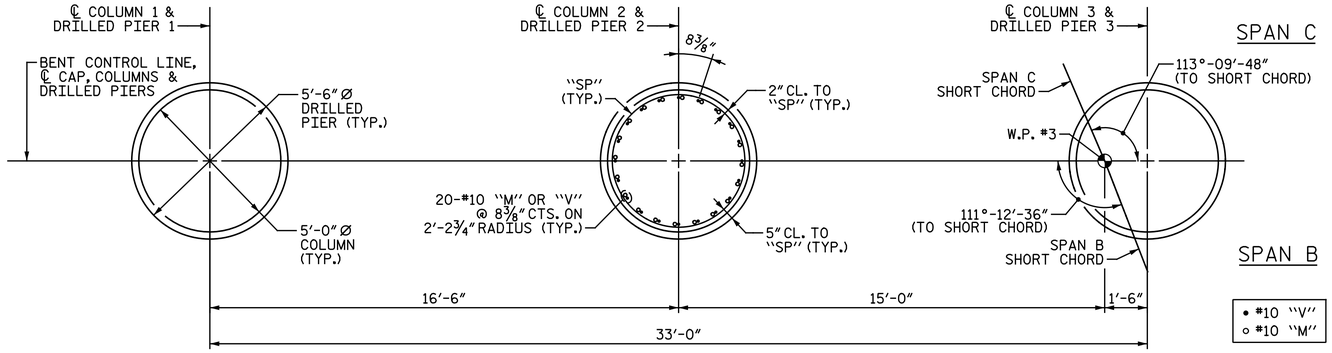
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

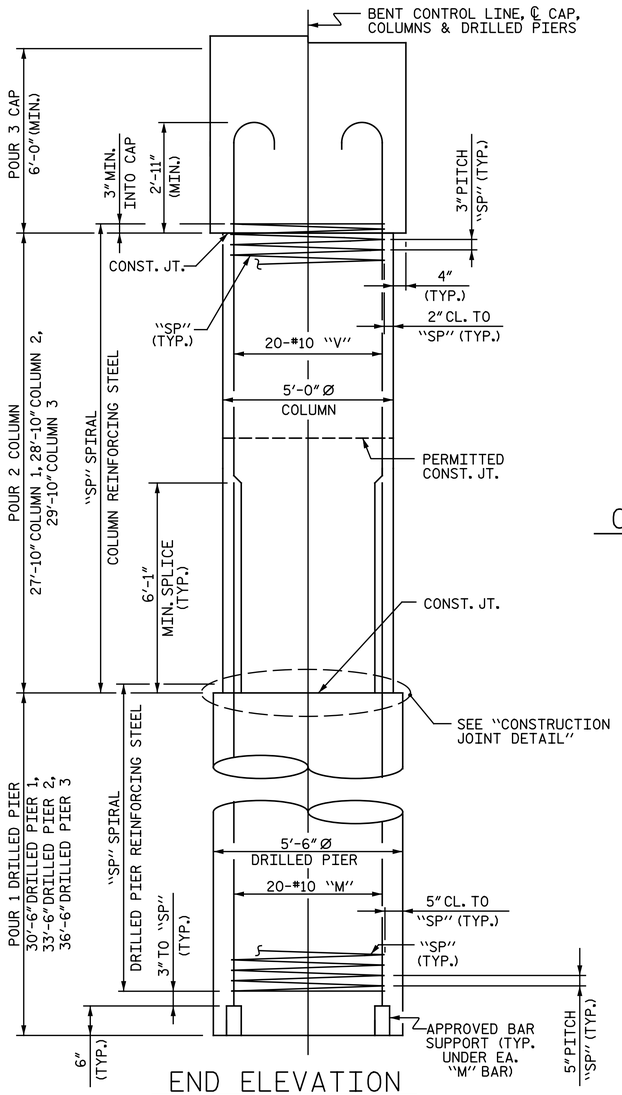
BENT 2

LEFT LANE

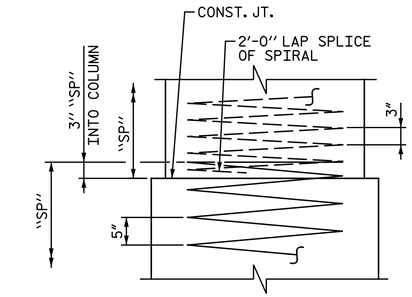
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-47
1			3			TOTAL SHEETS
2			4			62



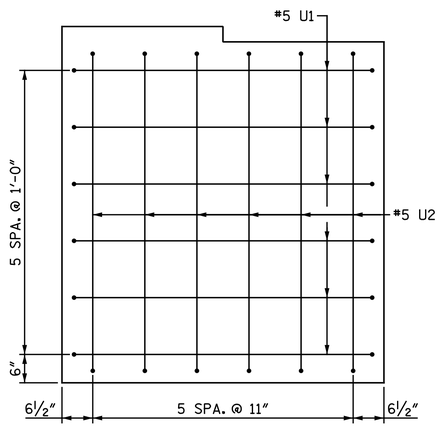
PLAN OF COLUMNS & DRILLED PIERS



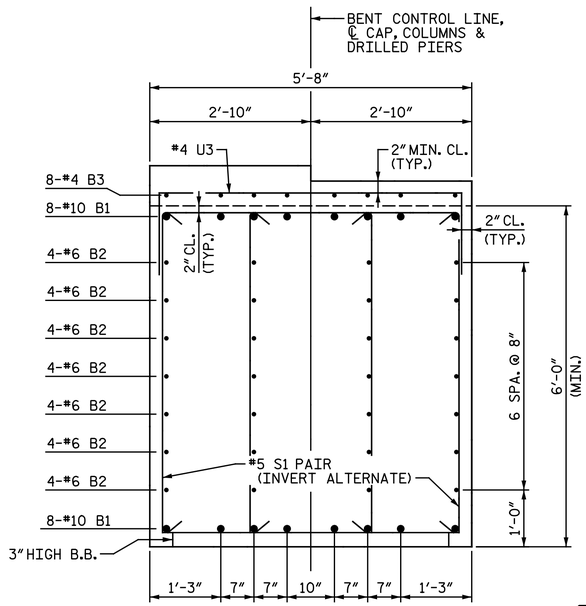
END ELEVATION



CONSTRUCTION JOINT DETAIL

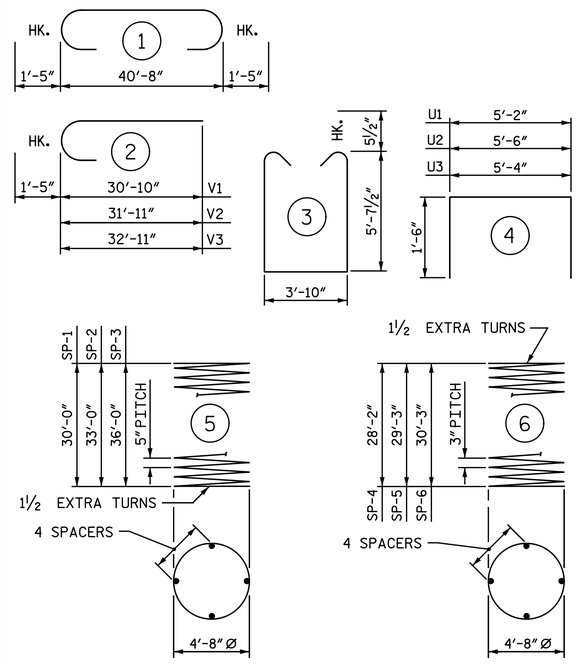


END VIEW



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

✳ THE SP-1 THRU SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

✳✳ THE SP-4 THRU SP-6 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL

BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#10	1	43′ - 6″	2,995
B2	28	#6	STR.	40′ - 8″	1,710
B3	32	#4	STR.	5′ - 2″	110
M1	20	#10	STR.	39′ - 1″	3,364
M2	20	#10	STR.	42′ - 1″	3,622
M3	20	#10	STR.	45′ - 1″	3,880
S1	108	#5	3	16′ - 0″	1,802
U1	12	#5	4	8′ - 2″	102
U2	12	#5	4	8′ - 6″	106
U3	44	#4	4	8′ - 4″	245
V1	20	#10	2	32′ - 3″	2,775
V2	20	#10	2	33′ - 4″	2,869
V3	20	#10	2	34′ - 4″	2,955

REINFORCING STEEL				LBS.	26,535
SP-1	1	✳	5	1066′ - 0″	1,112
SP-2	1	✳	5	1170′ - 5″	1,221
SP-3	1	✳	5	1274′ - 10″	1,330
SP-4	1	✳✳	6	1659′ - 1″	1,108
SP-5	1	✳✳	6	1722′ - 1″	1,150
SP-6	1	✳✳	6	1780′ - 2″	1,189

SPIRAL COLUMN REINFORCING STEEL	LBS.	7,110	
CLASS A CONCRETE			
POUR 2 - COLUMNS	C.Y.	62.8	
POUR 3 - CAP	C.Y.	53.3	
TOTAL CLASS A CONCRETE	C.Y.	116.1	
DRILLED PIER CONCRETE			
POUR 1 - DRILLED PIERS	C.Y.	88.5	
5′-6″DIA. DRILLED PIERS IN SOIL	LIN. FT.	62.50	
5′-6″DIA. DRILLED PIERS NOT IN SOIL	LIN. FT.	38.00	
SID INSPECTIONS	EA.	1	
CSL TESTING	EA.	1	
CSL TUBES	LIN. FT.	630.00	

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

DRAWN BY : C.E.M./N.B.S. DATE : 5-21-18

CHECKED BY : T. M. GARRISON DATE : 5-21-18

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

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Michael Baker INTERNATIONAL

Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No. : F-1084

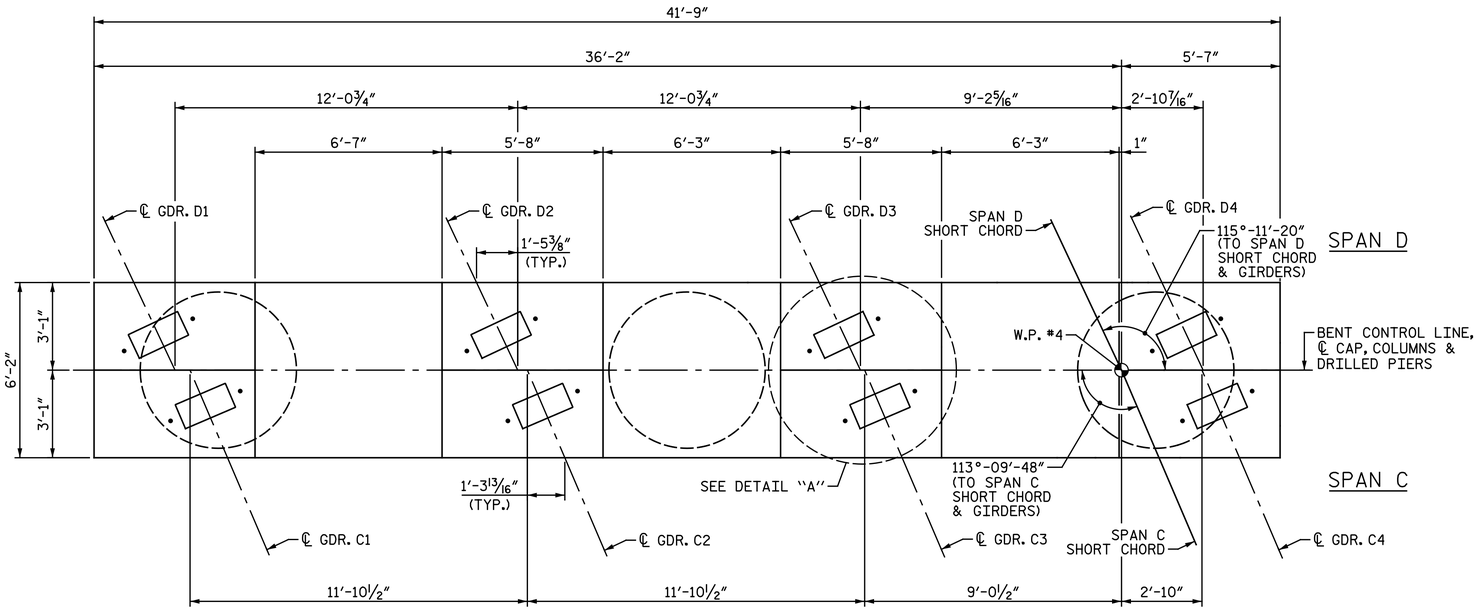
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

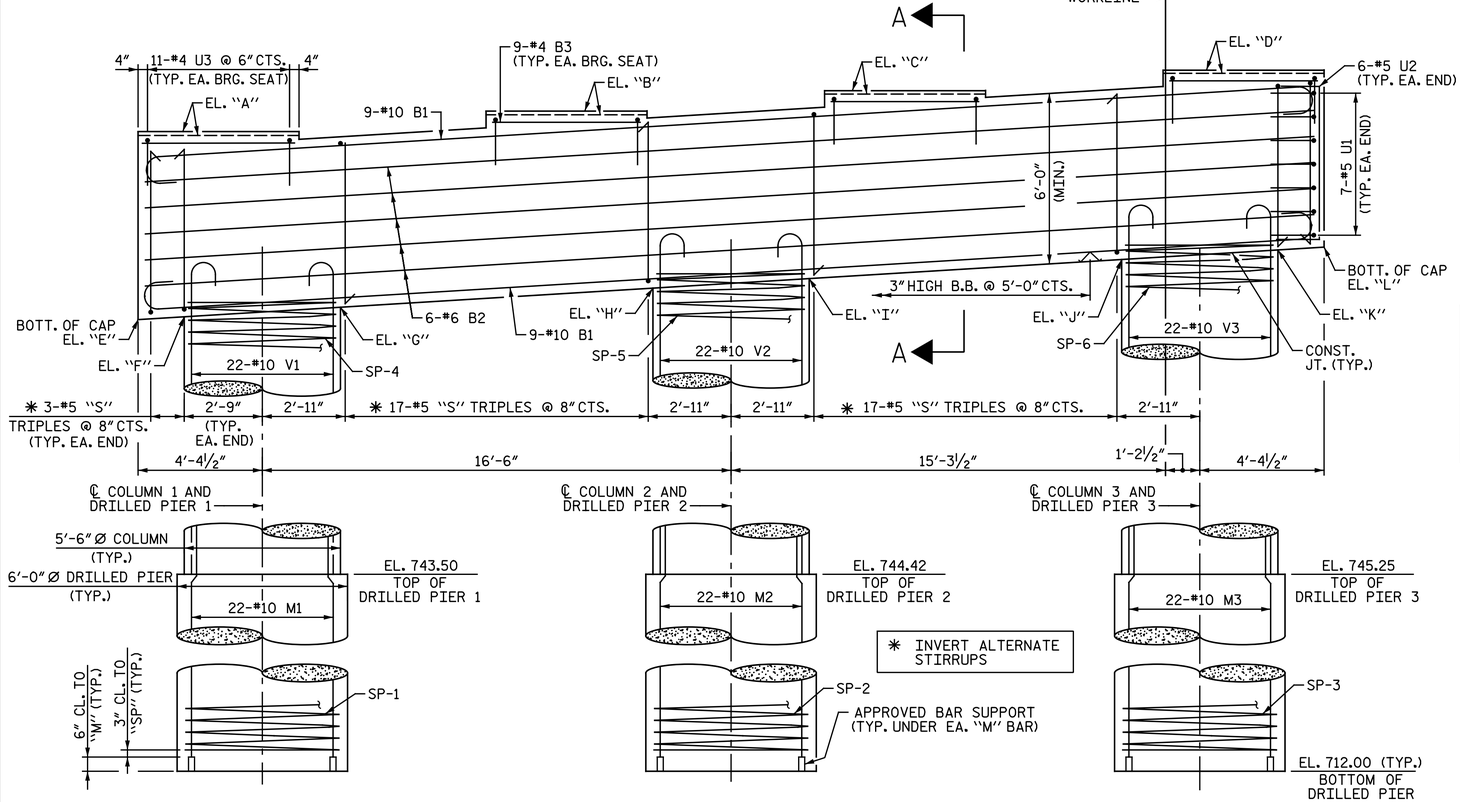
BENT 2 DETAILS

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-48
1			3			TOTAL SHEETS
2			4			62



PLAN



✱ INVERT ALTERNATE STIRRUPS

ELEVATION

NOTES:

STIRRUPS AND ″U″ BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR SECTION A-A, SEE ″BENT 3 DETAILS″ SHEET.

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

THE TOP SURFACE AREAS OF THE BENT 3 CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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.

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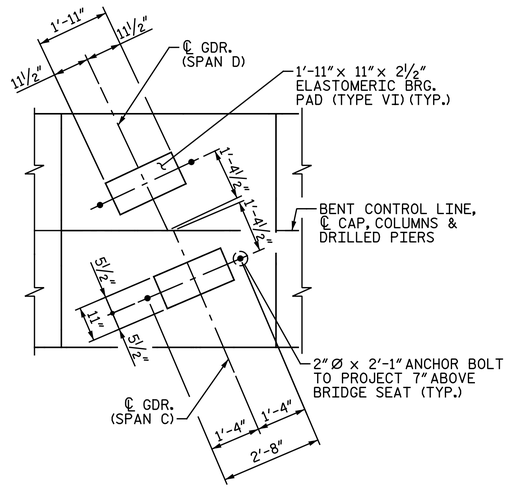
FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.



DETAIL ″A″

(TYP. EA. BRIDGE SEAT)

LOCATION	ELEVATION SPAN C	ELEVATION SPAN D
A	788.57	788.42
B	789.30	789.17
C	790.04	789.92
D	790.77	790.66

LOCATION	ELEVATION
E	781.93
F	782.03
G	782.37
H	783.06
I	783.40
J	784.09
K	784.43
L	784.53

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 3

LEFT LANE

Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

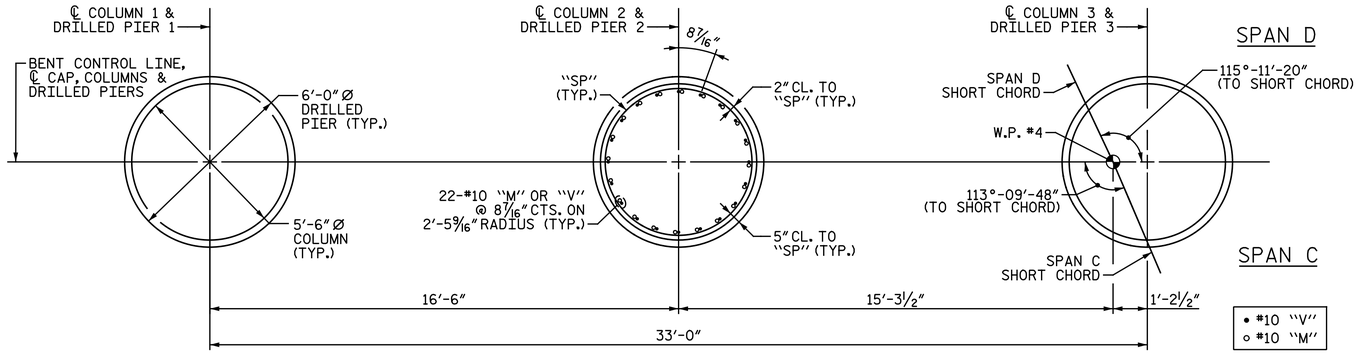
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-49

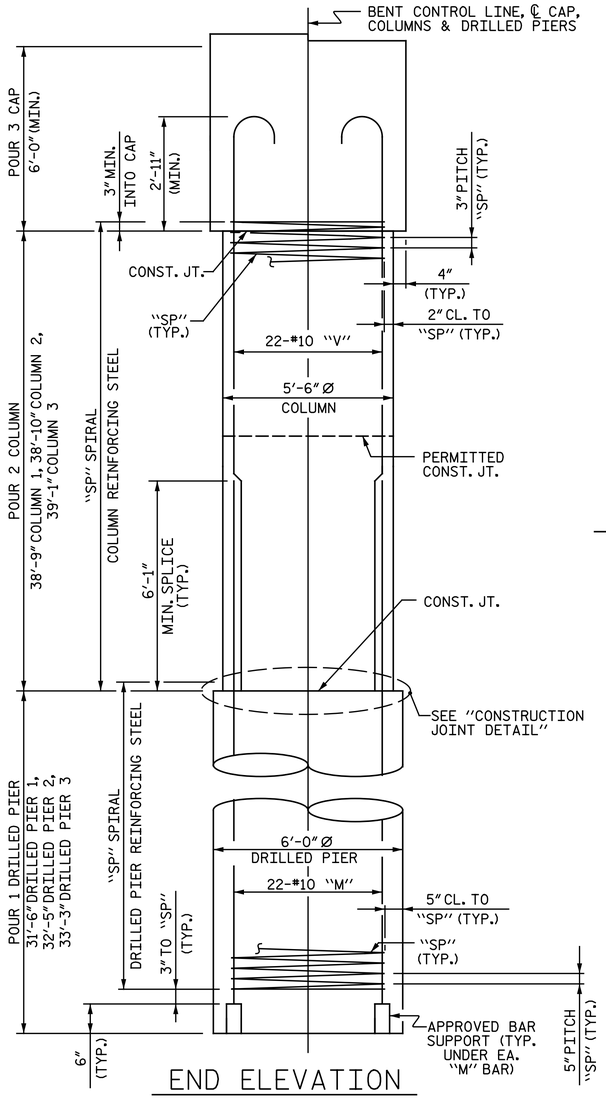
TOTAL SHEETS 62

DRAWN BY : C. E. MAYHEW DATE : 5-21-18

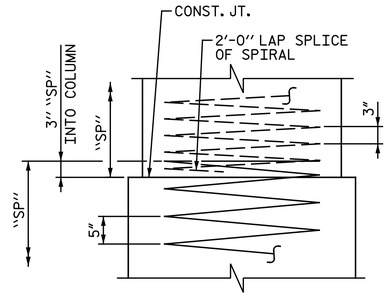
CHECKED BY : A. H. SHARPE DATE : 5-21-18



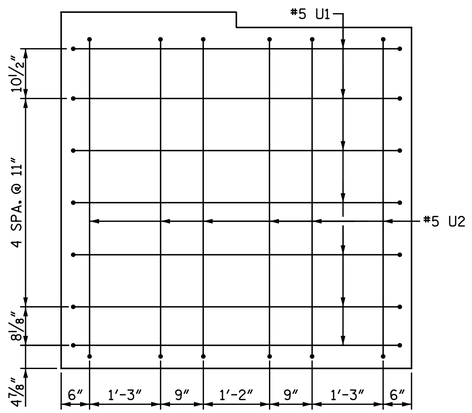
PLAN OF COLUMNS & DRILLED PIERS



END ELEVATION



CONSTRUCTION JOINT DETAIL



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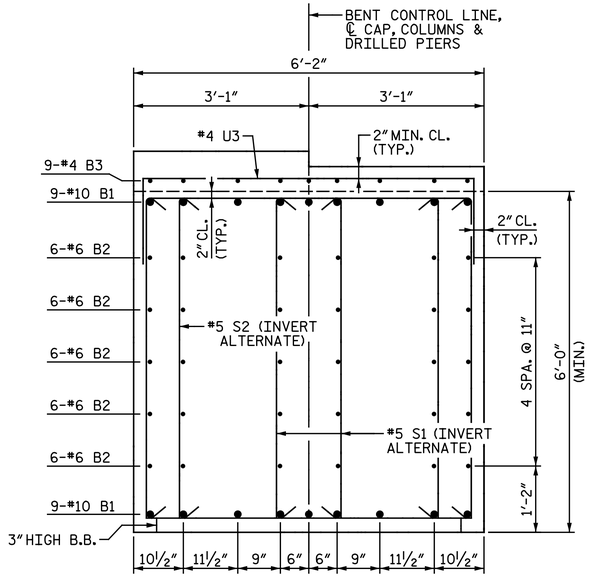
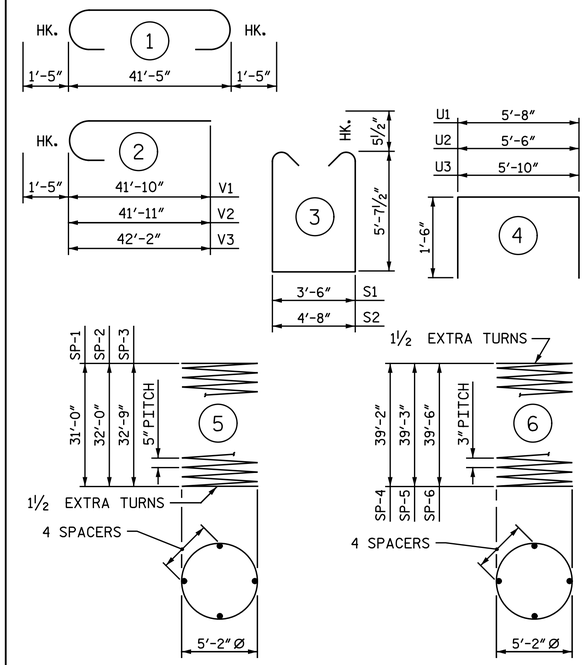


SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

✱ THE SP-1 THRU SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

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

BILL OF MATERIAL

BENT 3

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	18	#10	1	44' - 3"	3,427
B2	30	#6	STR.	41' - 5"	1,866
B3	36	#4	STR.	5' - 4"	128
M1	22	#10	STR.	40' - 1"	3,795
M2	22	#10	STR.	41' - 1"	3,889
M3	22	#10	STR.	41' - 10"	3,960
S1	80	#5	3	15' - 8"	1,307
S2	40	#5	3	16' - 10"	702
U1	14	#5	4	8' - 8"	127
U2	12	#5	4	8' - 6"	106
U3	44	#4	4	8' - 10"	260
V1	22	#10	2	43' - 3"	4,094
V2	22	#10	2	43' - 4"	4,102
V3	22	#10	2	43' - 7"	4,126
REINFORCING STEEL				LBS.	31,889
SP-1	1	✱	5	1220' - 0"	1,272
SP-2	1	✱	5	1258' - 7"	1,313
SP-3	1	✱	5	1287' - 6"	1,343
SP-4	1	✱✱	6	2546' - 11"	1,701
SP-5	1	✱✱	6	2552' - 3"	1,705
SP-6	1	✱✱	6	2568' - 4"	1,716
SPIRAL COLUMN REINFORCING STEEL				LBS.	9,050
CLASS A CONCRETE					
POUR 2 - COLUMNS				C.Y.	102.6
POUR 3 - CAP				C.Y.	59.2
TOTAL CLASS A CONCRETE				C.Y.	161.8
DRILLED PIER CONCRETE					
POUR 1 - DRILLED PIERS				C.Y.	101.8
6'-0" DIA. DRILLED PIERS IN SOIL				LIN. FT.	56.17
6'-0" DIA. DRILLED PIERS NOT IN SOIL				LIN. FT.	41.00
SID INSPECTIONS				EA.	1
CSL TESTING				EA.	1
CSL TUBES				LIN. FT.	610.00

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

DRAWN BY : C. E. MAYHEW DATE : 5-21-18

CHECKED BY : T. M. GARRISON DATE : 5-21-18

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

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NC License No.: F-1084

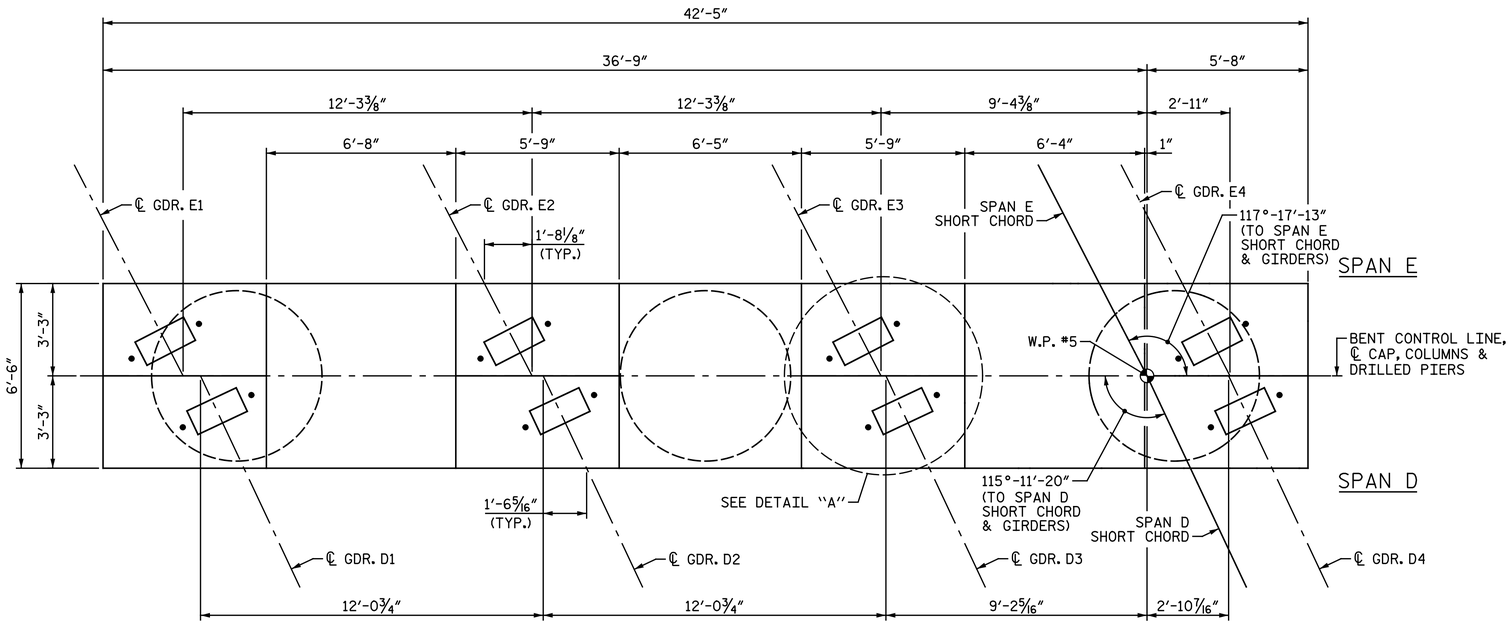
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

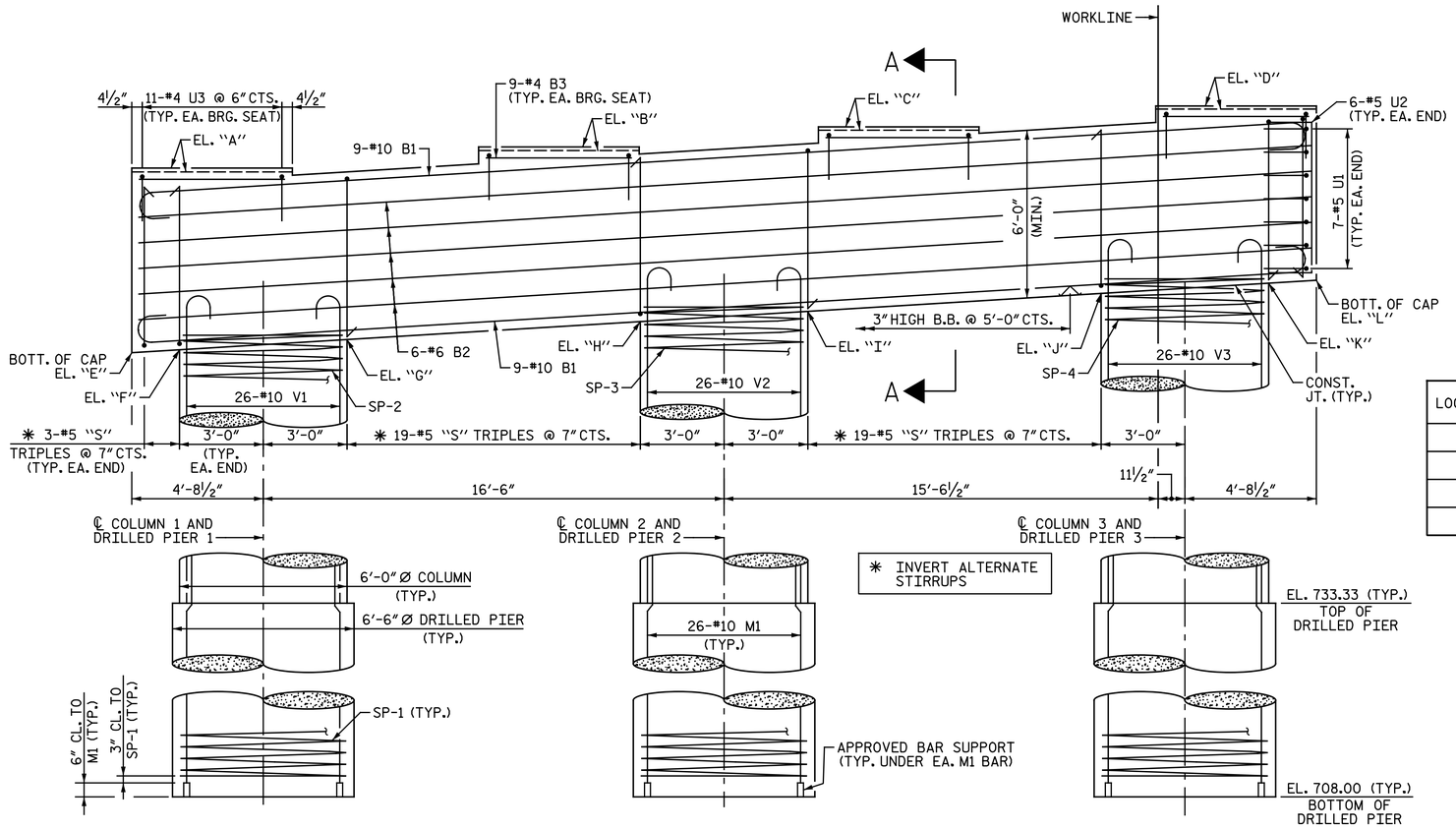
BENT 3 DETAILS

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-50
1			3			TOTAL SHEETS
2			4			62



PLAN



ELEVATION

✱ INVERT ALTERNATE STIRRUPS

LOCATION	ELEVATION SPAN D	ELEVATION SPAN E
A	784.21	784.06
B	784.97	784.83
C	785.72	785.60
D	786.47	786.37

LOCATION	ELEVATION
E	777.56
F	777.67
G	778.05
H	778.71
I	779.09
J	779.75
K	780.13
L	780.23

NOTES:

STIRRUPS AND ″U″ BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR SECTION A-A, SEE ″BENT 4 DETAILS″ SHEET.

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.

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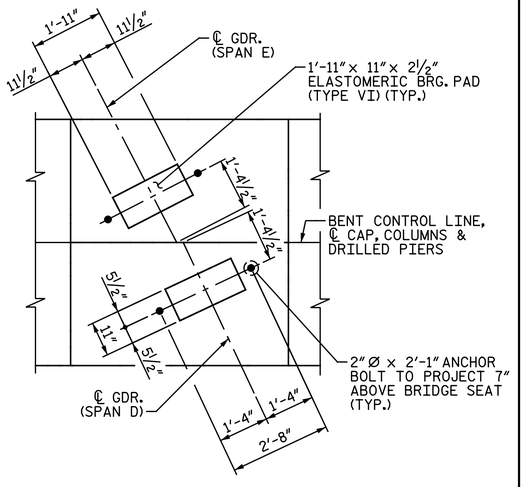
FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.



DETAIL ″A″

(TYP. EA. BRIDGE SEAT)

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 4

LEFT LANE

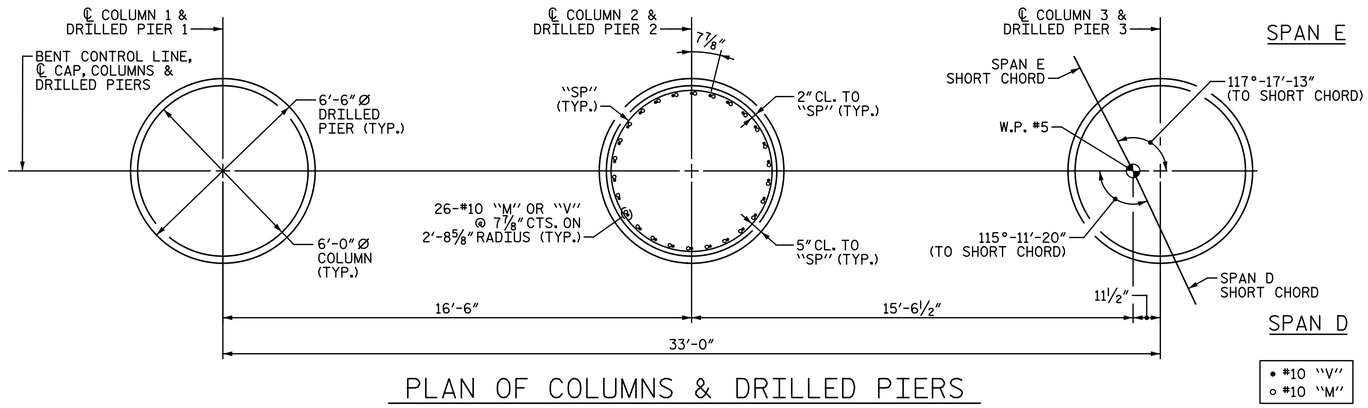
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Michael Baker INTERNATIONAL

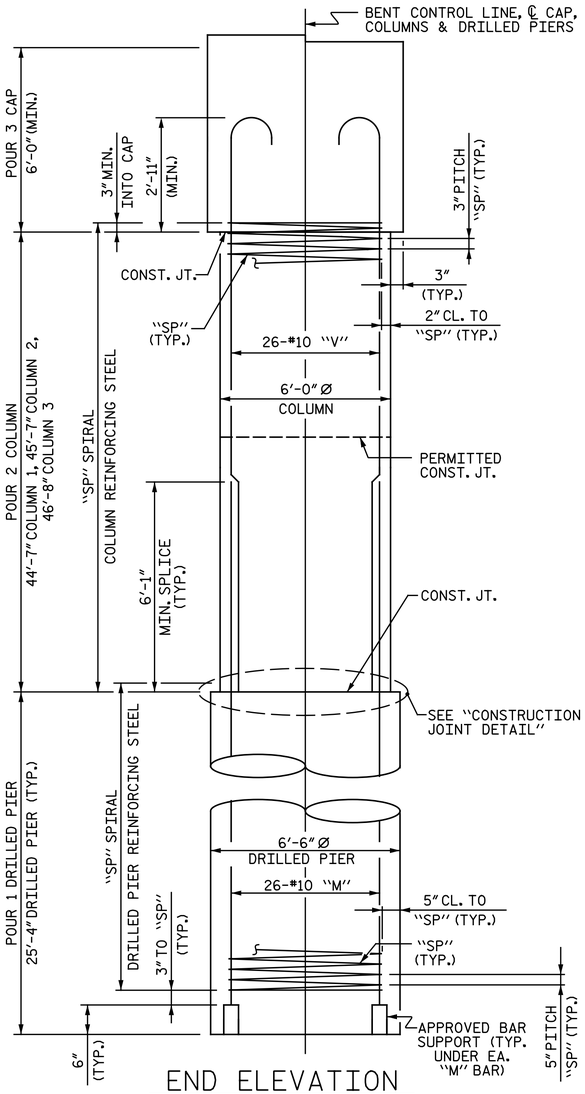
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-51
1			3			TOTAL SHEETS
2			4			62

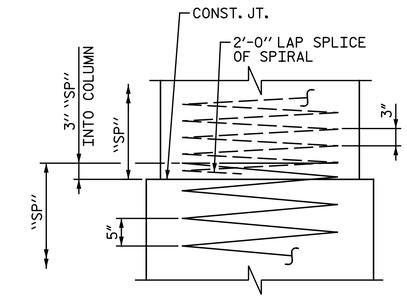
DRAWN BY : N. B. SPEAKS DATE : 5-21-18
CHECKED BY : A. H. SHARPE DATE : 5-21-18



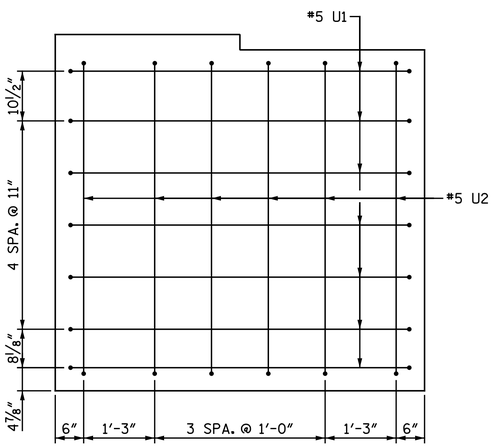
PLAN OF COLUMNS & DRILLED PIERS



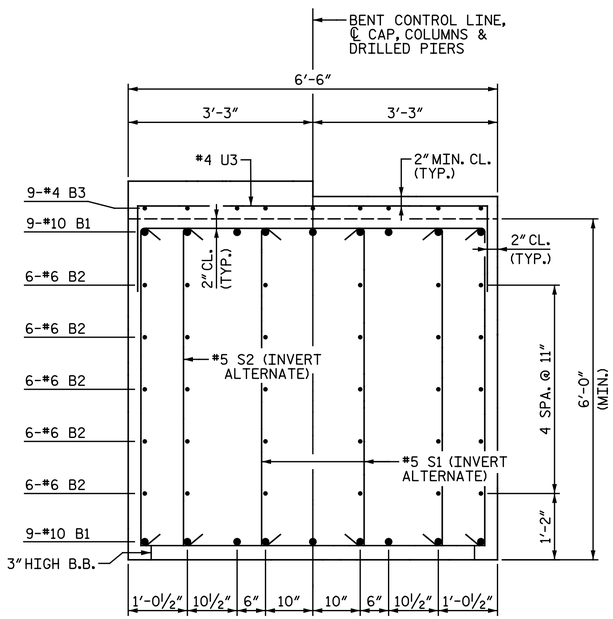
END ELEVATION



CONSTRUCTION JOINT DETAIL

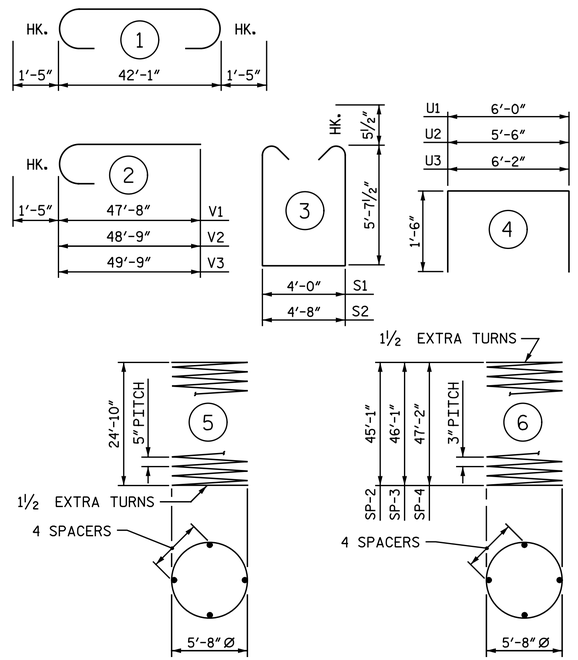


END VIEW



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

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

BILL OF MATERIAL

BENT 4

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	18	#10	1	44' - 11"	3,479
B2	30	#6	STR.	42' - 1"	1,896
B3	36	#4	STR.	5' - 5"	130
M1	78	#10	STR.	33' - 11"	11,384
S1	88	#5	3	16' - 2"	1,484
S2	44	#5	3	16' - 10"	773
U1	14	#5	4	9' - 0"	131
U2	12	#5	4	8' - 6"	106
U3	44	#4	4	9' - 2"	269
V1	26	#10	2	49' - 1"	5,491
V2	26	#10	2	50' - 2"	5,613
V3	26	#10	2	51' - 2"	5,724
REINFORCING STEEL				LBS.	36,480
SP-1	3	✳	5	1078' - 0"	3,372
SP-2	1	✳✳	6	3207' - 8"	2,143
SP-3	1	✳✳	6	3284' - 3"	2,194
SP-4	1	✳✳	6	3355' - 0"	2,241
SPIRAL COLUMN REINFORCING STEEL				LBS.	9,950

CLASS A CONCRETE		
POUR 2 - COLUMNS	C.Y.	143.2
POUR 3 - CAP	C.Y.	63.4
TOTAL CLASS A CONCRETE	C.Y.	206.6
DRILLED PIER CONCRETE		
POUR 1 - DRILLED PIERS	C.Y.	93.4
6'-6" DIA. DRILLED PIERS IN SOIL	LIN. FT.	29.00
6'-6" DIA. DRILLED PIERS NOT IN SOIL	LIN. FT.	47.00
PERMANENT STEEL CASING FOR 6'-6" DIA. DRILLED PIER	LIN. FT.	35.50
SID INSPECTIONS	EA.	1
CSL TESTING	EA.	1
CSL TUBES	LIN. FT.	563.50

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

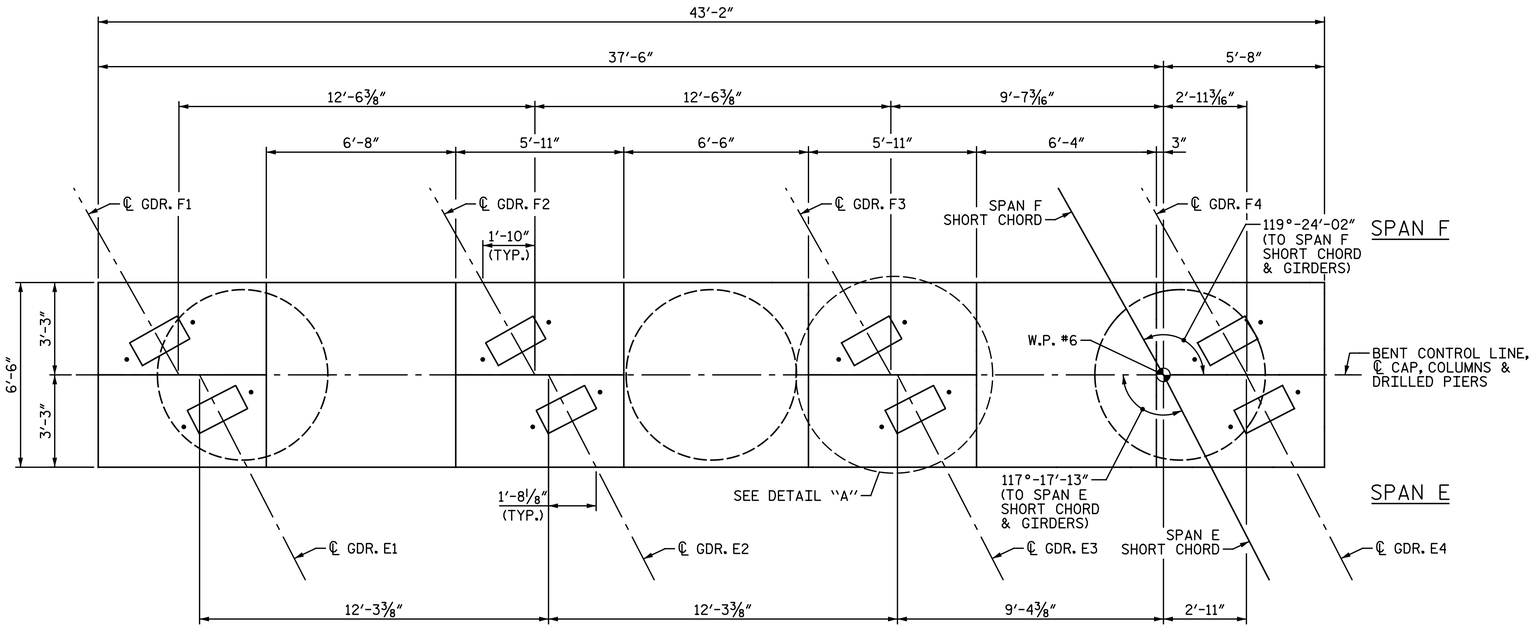
BENT 4 DETAILS

LEFT LANE

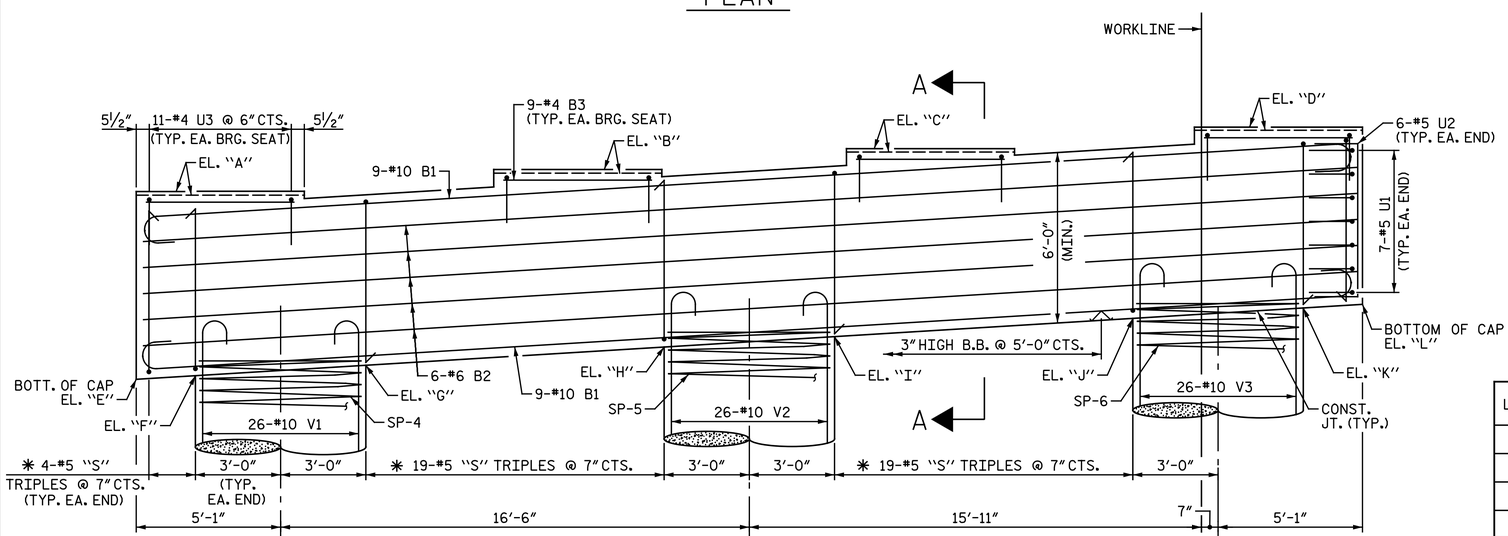
DRAWN BY : C. E. MAYHEW DATE : 5-21-18
CHECKED BY : A. H. SHARPE DATE : 5-21-18

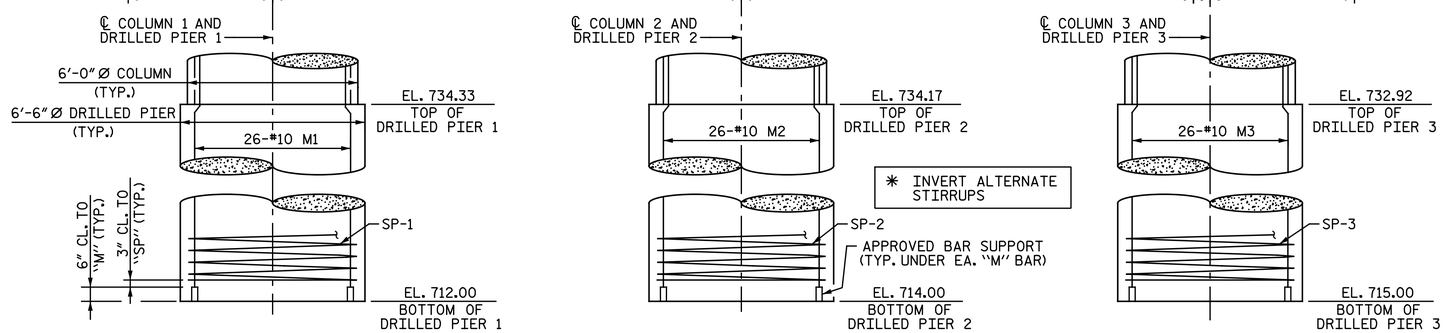
Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-52
1			3			TOTAL SHEETS
2			4			62



PLAN





✱ INVERT ALTERNATE STIRRUPS

APPROVED BAR SUPPORT (TYP. UNDER EA. ″M″ BAR)

ELEVATION

NOTES:

STIRRUPS AND ″U″ BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR SECTION A-A, SEE ″BENT 5 DETAILS″ SHEET.

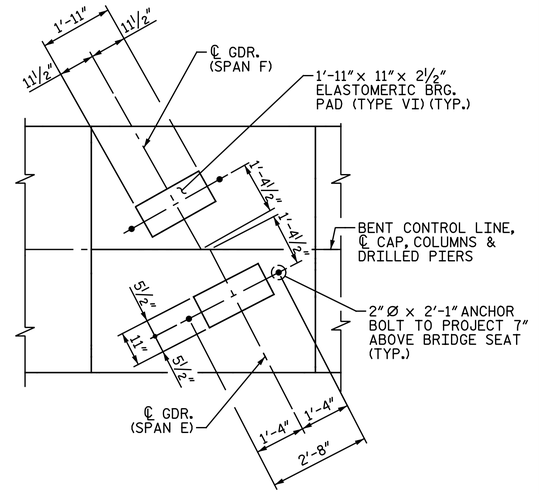
HOOKS ON ″V″ BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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.

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

FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.



DETAIL ″A″

(TYP. EA. BRIDGE SEAT)

LOCATION	ELEVATION SPAN E	ELEVATION SPAN F
A	779.85	779.70
B	780.63	780.49
C	781.40	781.28
D	782.17	782.06

LOCATION	ELEVATION
E	773.19
F	773.32
G	773.70
H	774.37
I	774.75
J	775.41
K	775.79
L	775.92

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 5

LEFT LANE

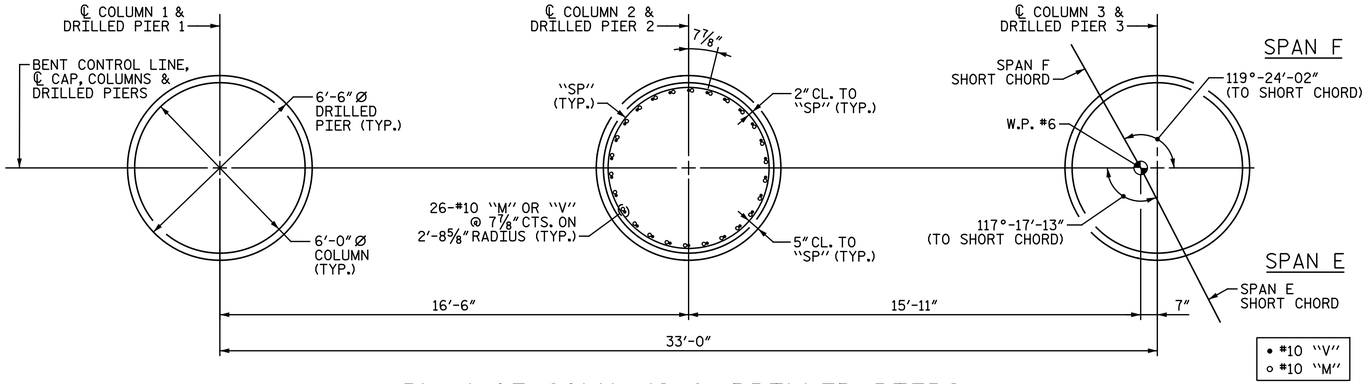
Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

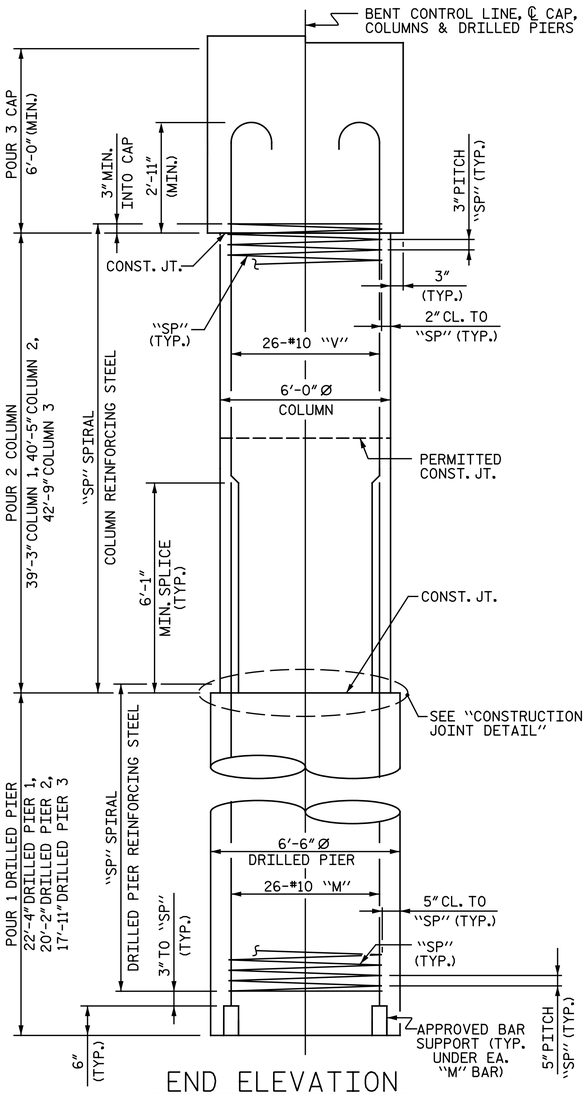
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-53
1			3			TOTAL SHEETS
2			4			62

DRAWN BY : C. E. MAYHEW DATE : 5-21-18

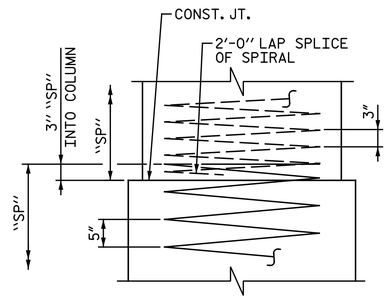
CHECKED BY : A. H. SHARPE DATE : 5-21-18



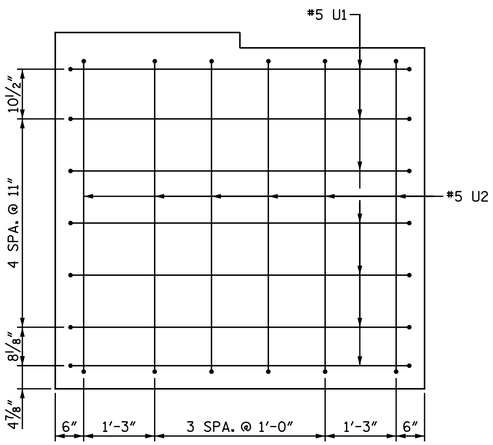
PLAN OF COLUMNS & DRILLED PIERS



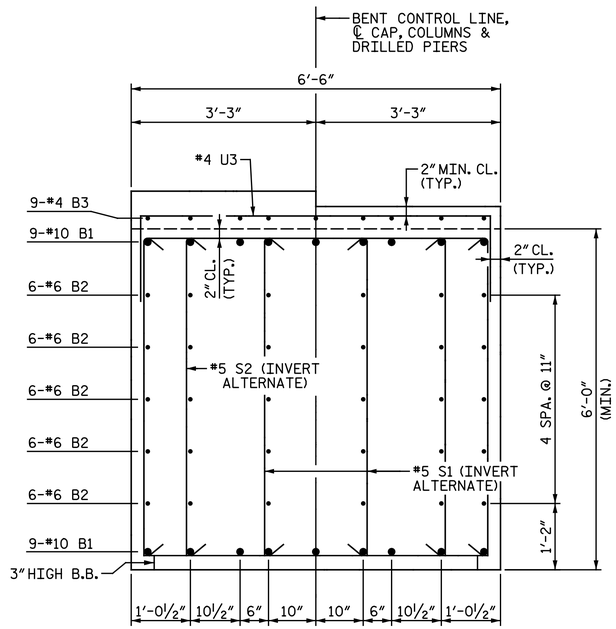
END ELEVATION



CONSTRUCTION JOINT DETAIL

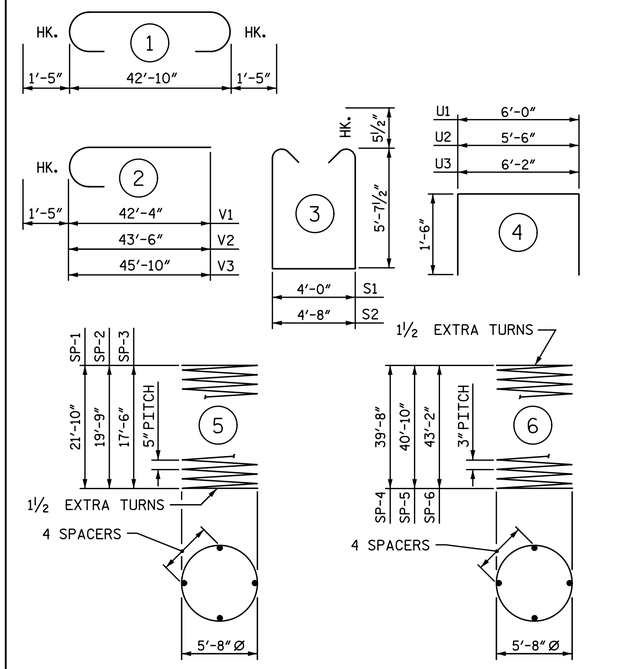


END VIEW



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

✱ THE SP-1 THRU SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

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

BILL OF MATERIAL

BENT 5

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	18	#10	1	45' - 8"	3,537
B2	30	#6	STR.	42' - 10"	1,930
B3	36	#4	STR.	5' - 7"	134
M1	26	#10	STR.	30' - 11"	3,459
M2	26	#10	STR.	28' - 10"	3,226
M3	26	#10	STR.	26' - 7"	2,974
S1	92	#5	3	16' - 2"	1,551
S2	46	#5	3	16' - 10"	808
U1	14	#5	4	9' - 0"	131
U2	12	#5	4	8' - 6"	106
U3	44	#4	4	9' - 2"	269
V1	26	#10	2	43' - 9"	4,895
V2	26	#10	2	44' - 11"	5,025
V3	26	#10	2	47' - 3"	5,286
REINFORCING STEEL				LBS.	33,331
SP-1	1	✱	5	951' - 0"	992
SP-2	1	✱	5	862' - 9"	900
SP-3	1	✱	5	767' - 6"	801
SP-4	1	✱✱	6	2830' - 8"	1,891
SP-5	1	✱✱	6	2913' - 2"	1,946
SP-6	1	✱✱	6	3078' - 1"	2,056
SPIRAL COLUMN REINFORCING STEEL				LBS.	8,586
CLASS A CONCRETE					
POUR 2 - COLUMNS				C.Y.	128.1
POUR 3 - CAP				C.Y.	64.6
TOTAL CLASS A CONCRETE				C.Y.	192.7
DRILLED PIER CONCRETE					
POUR 1 - DRILLED PIERS				C.Y.	74.3
6'-6" DIA. DRILLED PIERS IN SOIL				LIN. FT.	19.42
6'-6" DIA. DRILLED PIERS NOT IN SOIL				LIN. FT.	41.00
PERMANENT STEEL CASING FOR 6'-6" DIA. DRILLED PIER				LIN. FT.	23.42
SID INSPECTIONS				EA.	1
CSL TESTING				EA.	1
CSL TUBES				LIN. FT.	454.42

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

DRAWN BY : M.D. MAYHEW DATE : 5-21-18

CHECKED BY : A. H. SHARPE DATE : 5-21-18

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

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Michael Baker INTERNATIONAL

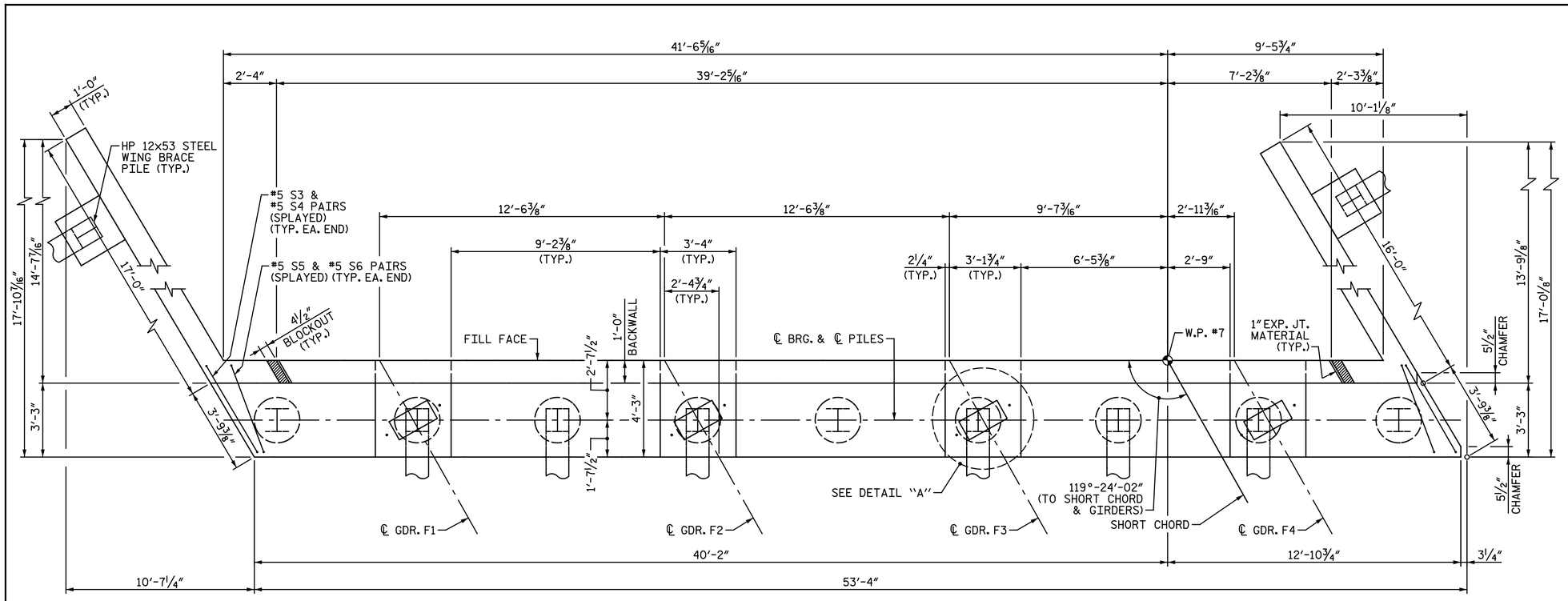
Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

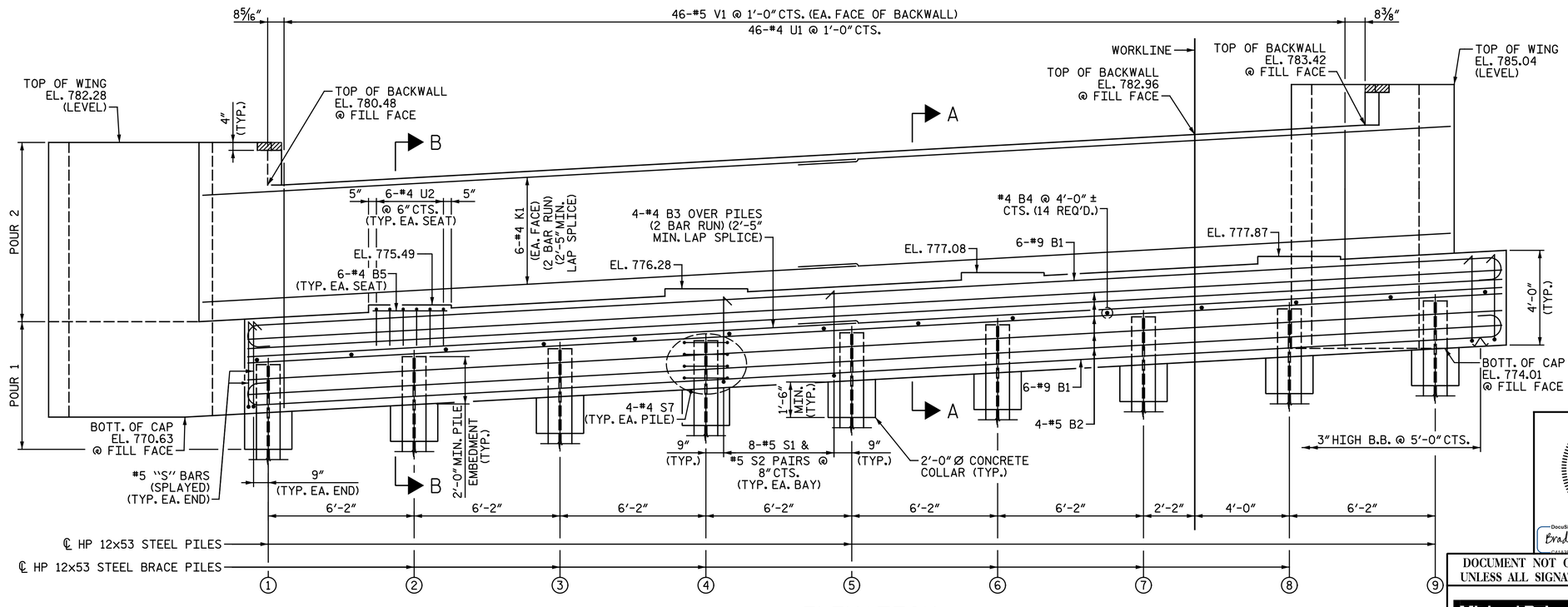
BENT 5 DETAILS

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-54
1			3			TOTAL SHEETS
2			4			62



PLAN



ELEVATION

(BRACE PILES AND PILE CAPS IN WINGS NOT SHOWN FOR CLARITY)

NOTES:

SEE ″GENERAL DRAWING″ SHEET 4 OF 6 FOR LOCATIONS OF BRACE PILES IN WINGS.

FOR ″SECTION A-A″ AND ″SECTION B-B″, SEE ″END BENT 2 DETAILS″ SHEET.

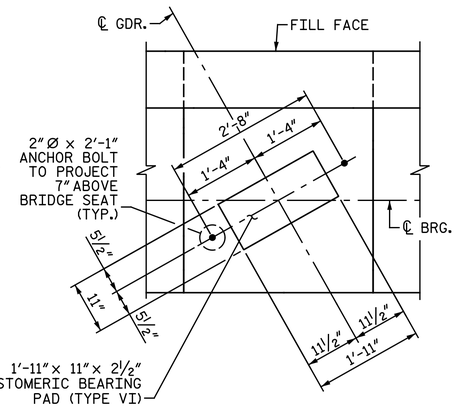
STIRRUPS & U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREAS OF THE END BENT 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 FRONT FACE AT A RATE OF 2%.

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



DETAIL ″A″

(TYP. EA. BRIDGE SEAT)

TOP OF PILE ELEVATIONS	
PILE	ELEVATION
①	772.89
②	773.28
③	773.67
④	774.06
⑤	774.45
⑥	774.84
⑦	775.23
⑧	775.62
⑨	776.01

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

LEFT LANE

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Michael Baker Engineering
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Cary, North Carolina 27518
NC License No.: F-1084

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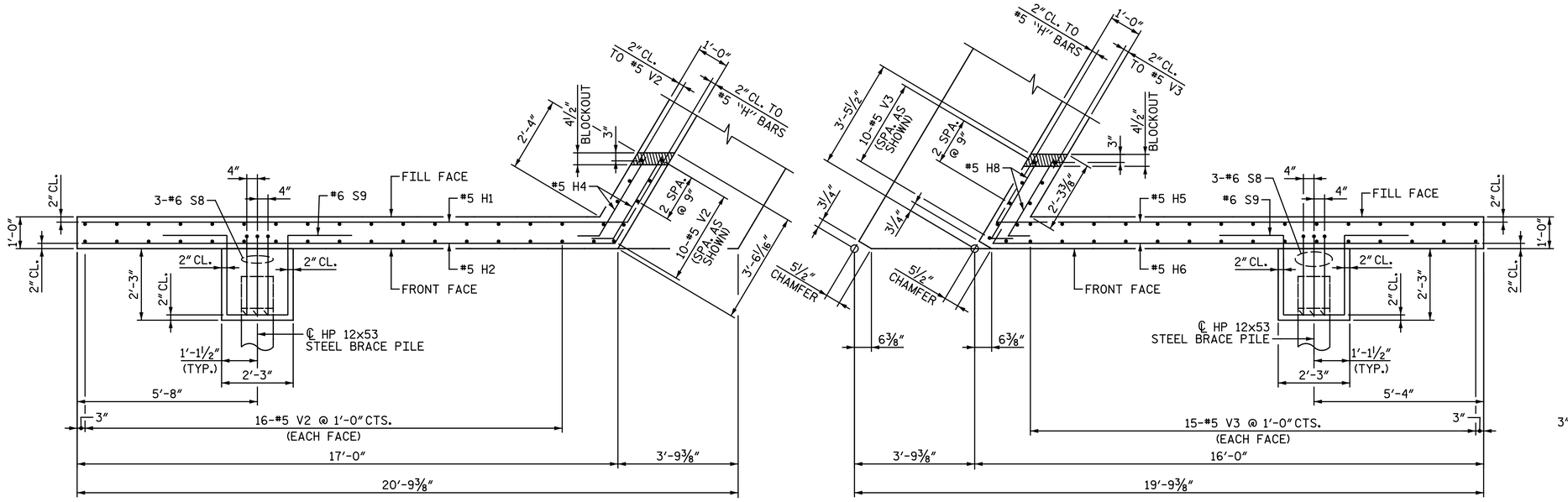
2			4			62

DRAWN BY : C. E. MAYHEW DATE : 5-21-18
CHECKED BY : T. M. GARRISON DATE : 5-21-18

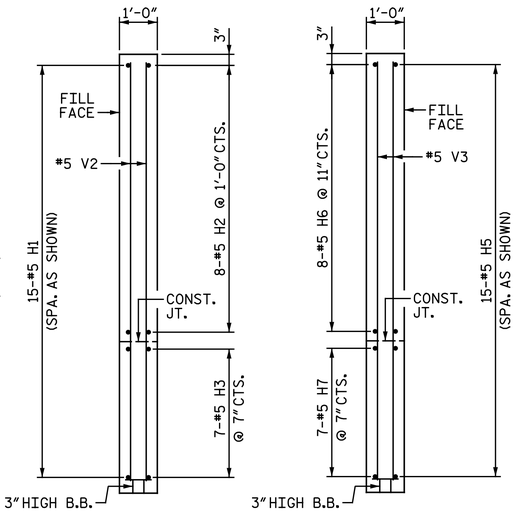


PLAN OF LEFT WING

(H3 & V4 BARS NOT SHOWN FOR CLARITY)

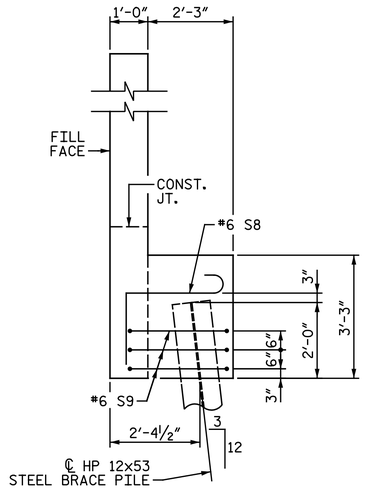
PLAN OF RIGHT WING

(H7 & V4 BARS NOT SHOWN FOR CLARITY)

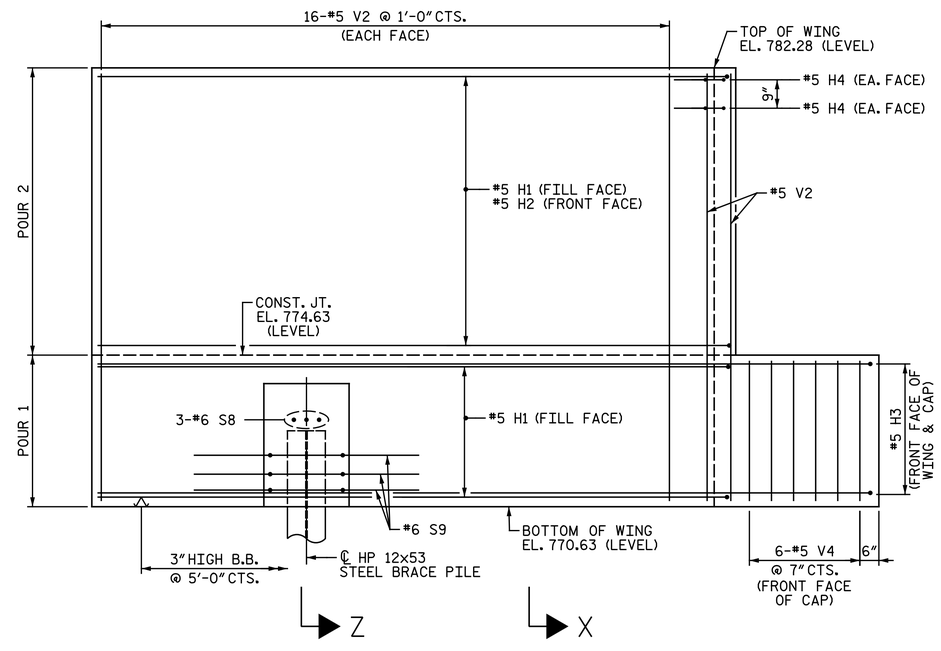


SECTION X-X

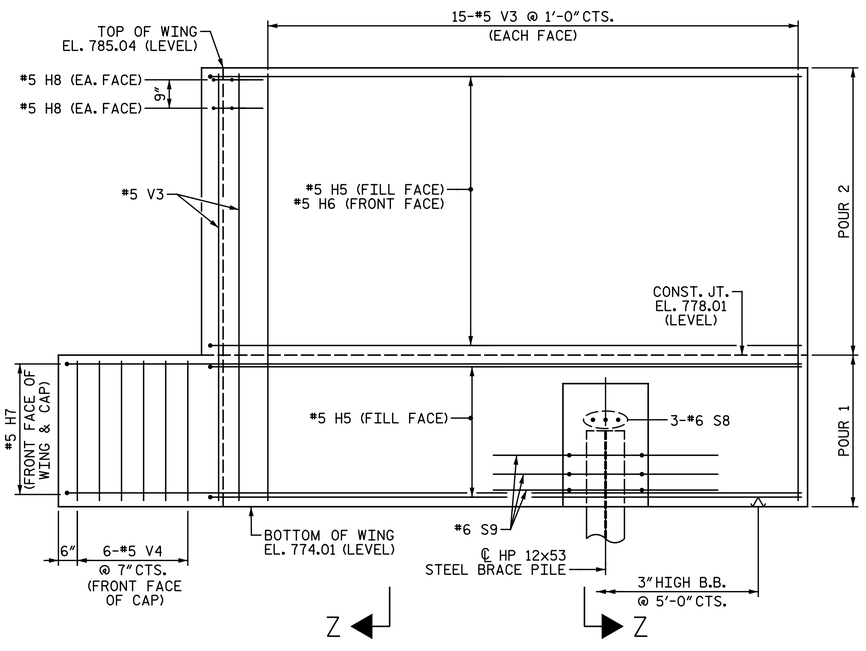
SECTION Y-Y



SECTION Z-Z



ELEVATION OF LEFT WING



ELEVATION OF RIGHT WING

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

LEFT LANE

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Michael Baker INTERNATIONAL
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Cary, North Carolina 27518
NC License No. : F-1084

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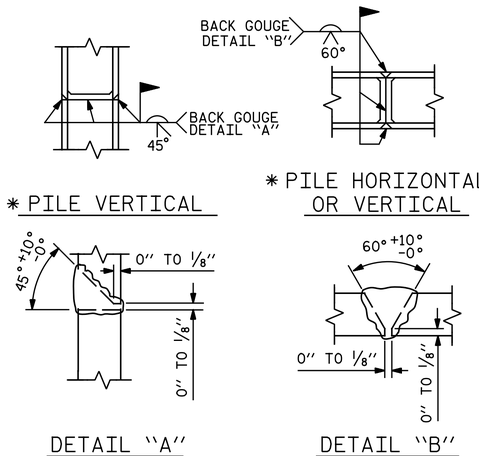
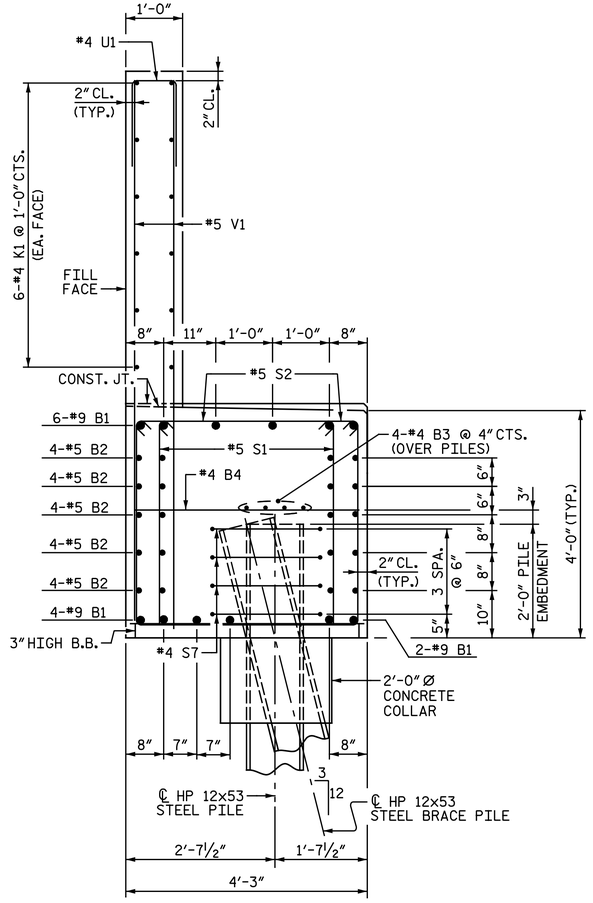
1			3			TOTAL SHEETS
2			4			62

DRAWN BY : C. E. MAYHEW DATE : 5-21-18
CHECKED BY : T. M. GARRISON DATE : 5-21-18

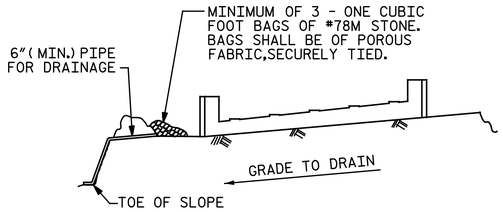


PILE SPLICE DETAILS

*POSITION OF PILE DURING WELDING



SECTION A-A

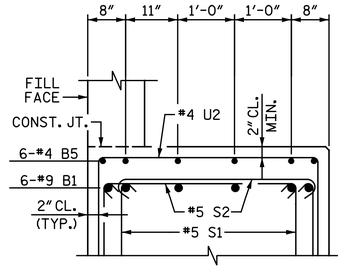


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

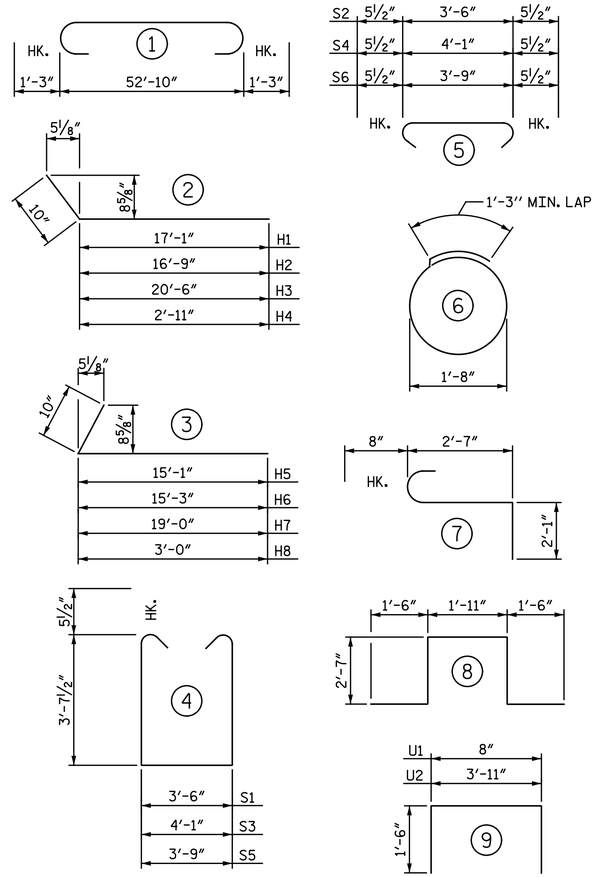
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



PARTIAL SECTION B-B

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' - 4"	2,258
B2	20	#5	STR.	52' - 10"	1,102
B3	8	#4	STR.	27' - 9"	148
B4	14	#4	STR.	3' - 11"	37
B5	24	#4	STR.	3' - 0"	48
H1	15	#5	2	17' - 11"	280
H2	8	#5	2	17' - 7"	147
H3	7	#5	2	21' - 4"	156
H4	4	#5	2	3' - 9"	16
H5	15	#5	3	15' - 11"	249
H6	8	#5	3	16' - 1"	134
H7	7	#5	3	19' - 10"	145
H8	4	#5	3	3' - 10"	16
K1	24	#4	STR.	27' - 9"	445
S1	128	#5	4	11' - 8"	1,558
S2	128	#5	5	4' - 5"	590
S3	4	#5	4	12' - 3"	51
S4	4	#5	5	5' - 0"	21
S5	4	#5	4	11' - 11"	50
S6	4	#5	5	4' - 8"	19
S7	36	#4	6	6' - 6"	156
S8	6	#6	7	5' - 4"	48
S9	6	#6	8	10' - 1"	91
U1	46	#4	9	3' - 8"	113
U2	24	#4	9	6' - 11"	111
V1	92	#5	STR.	9' - 3"	888
V2	42	#5	STR.	11' - 3"	493
V3	40	#5	STR.	10' - 8"	445
V4	12	#5	STR.	3' - 8"	46

REINFORCING STEEL LBS. 9,861

CLASS A CONCRETE
- POUR 1 - CAP, COLLARS, LOWER PART OF WINGS, & PILE CAPS IN WINGS C.Y. 41.5
- POUR 2 - BACKWALL & UPPER PART OF WINGS C.Y. 19.9
- TOTAL C.Y. 61.4

PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES EA. 11

HP 12x53 STEEL PILES NO. 11 LIN. FT. 420

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 DETAILS

LEFT LANE

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8000 Regency Parkway, Suite 600
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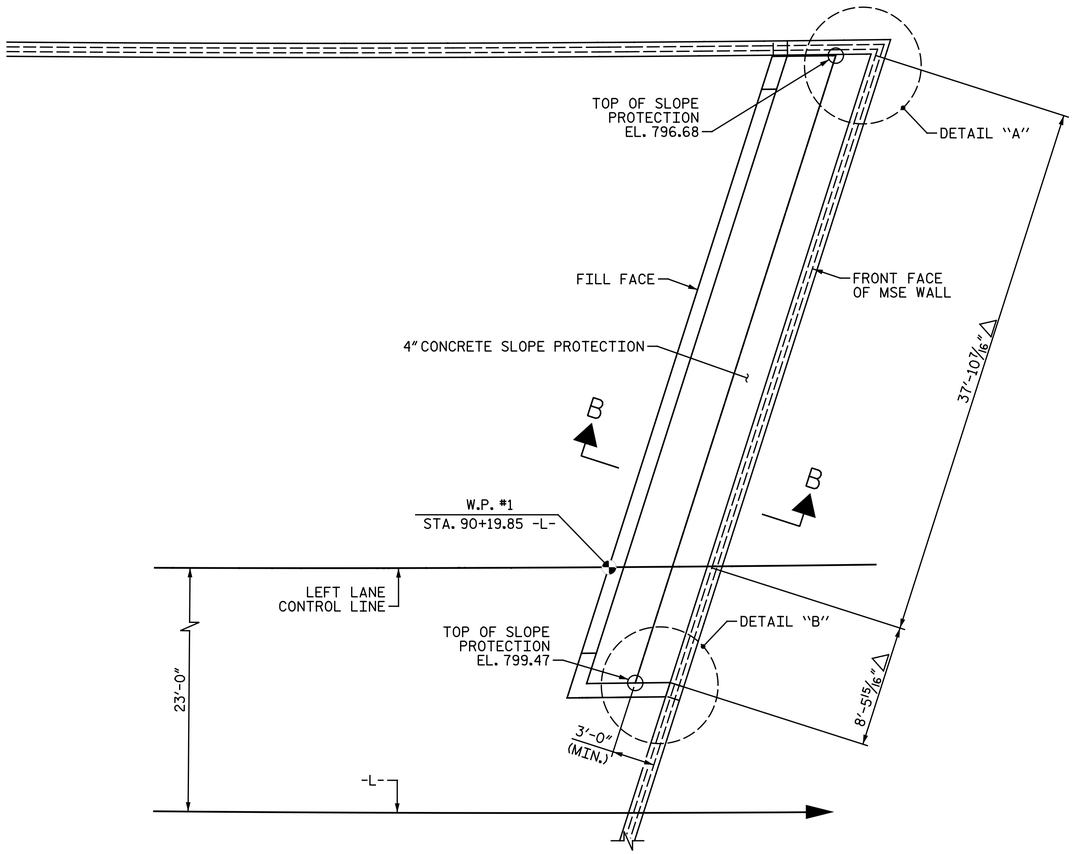
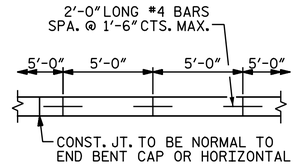
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-57
1			3			TOTAL SHEETS
2			4			62

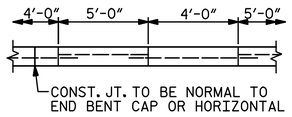
DRAWN BY : C. E. MAYHEW DATE : 5-21-18
CHECKED BY : T. M. GARRISON DATE : 5-21-18



PLAN AT END BENT 1



POURING DETAIL



OPTIONAL POURING DETAIL

POUR A 4'-0" STRIP FIRST.

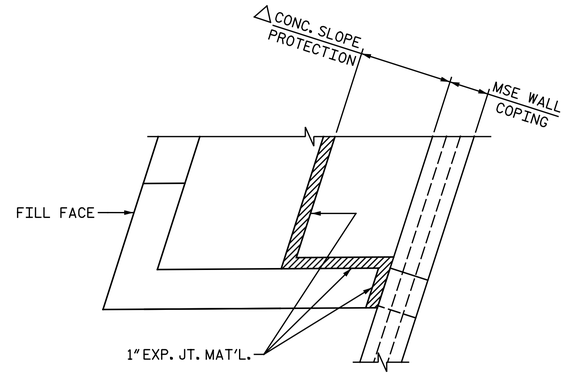
NOTES:

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.

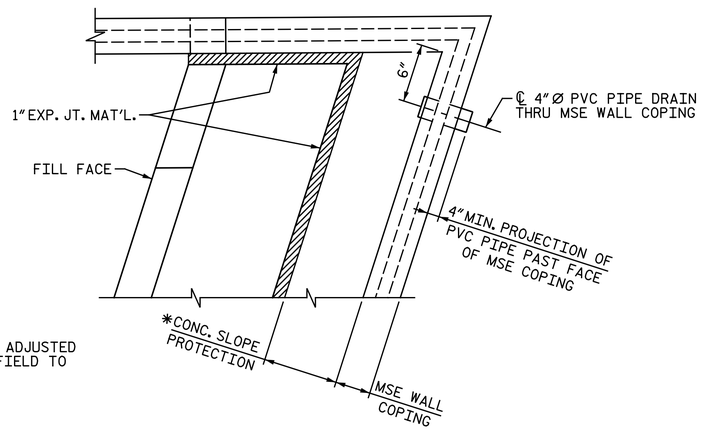
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL 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. 93+43.36 -L- (LEFT LANE)	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	12	25

* QUANTITY SHOWN IS BASED ON 5' POURS.

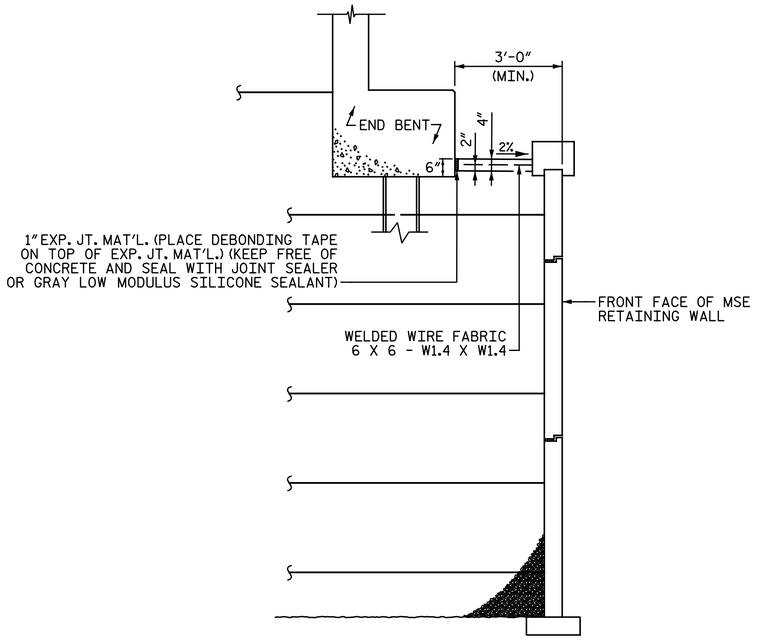


DETAIL "B"



△ DIMENSION TO BE ADJUSTED AS REQUIRED IN FIELD TO MATCH MSE WALL.

DETAIL "A"



SECTION B-B

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8ECA3C434...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

LEFT LANE

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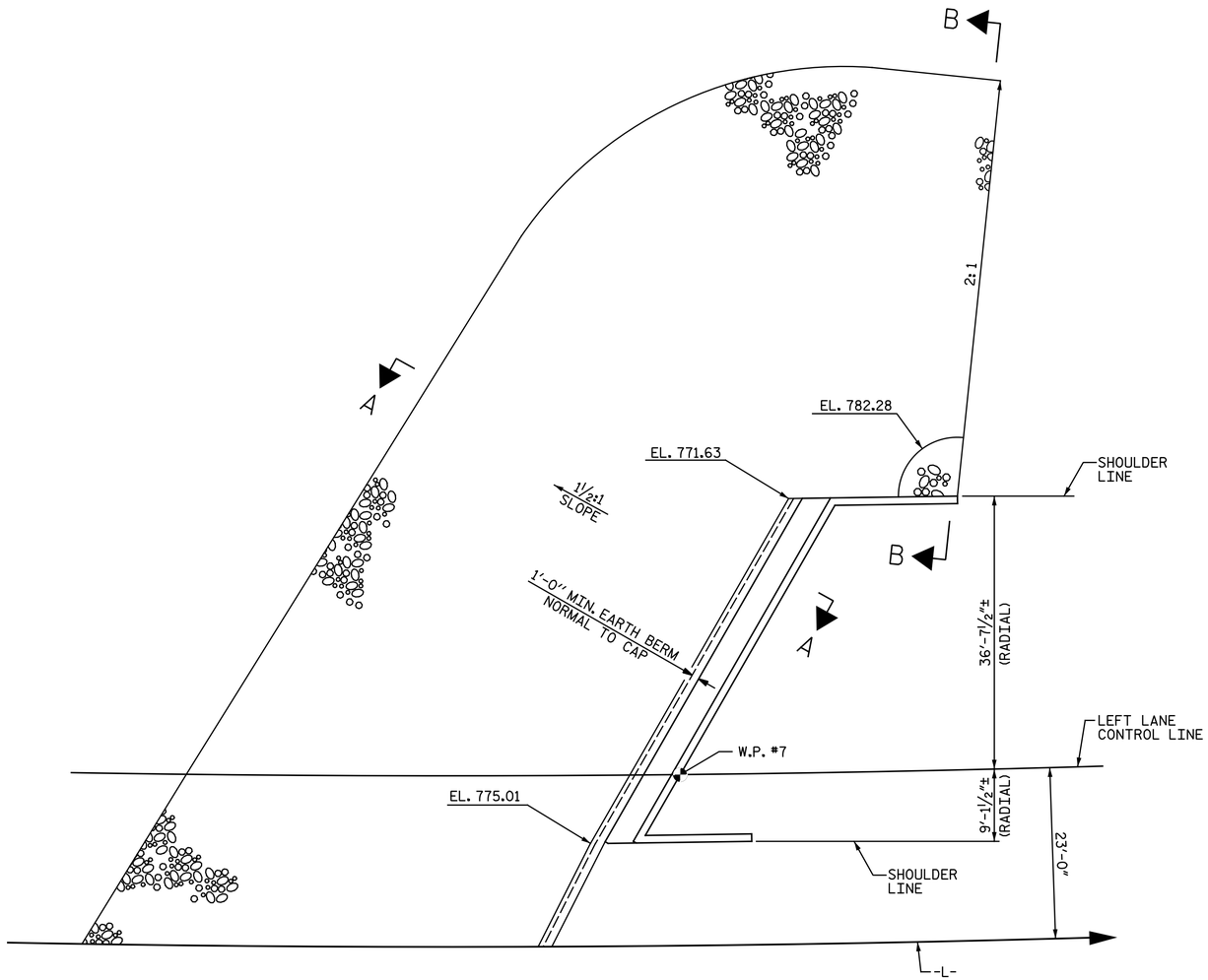
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-58
1			3			TOTAL SHEETS
2			4			62

DRAWN BY : C. E. MAYHEW DATE : 2-2-18
CHECKED BY : T. M. GARRISON DATE : 2-2-18

NOTES :

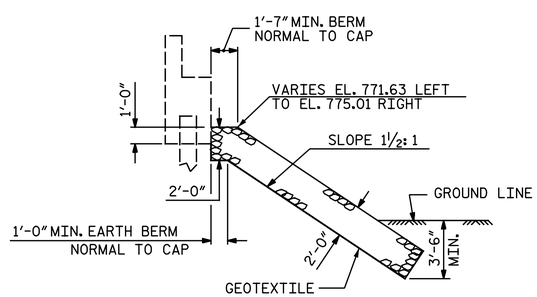
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

ESTIMATED QUANTITIES		
BRIDGE @ STA. 93+43.36 -L- (LEFT LANE)	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 2	925	1,025

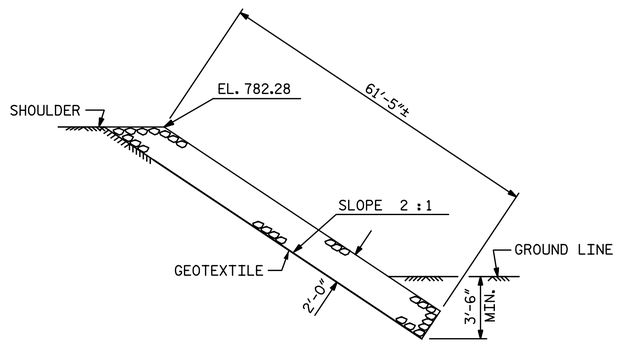


END BENT 2

SHOULDER RIP RAP IS HIGHER THAN BERM RIP RAP



SECTION A-A



SECTION B-B

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Ball 5/7/2018 C41A3F8ECA3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

LEFT LANE

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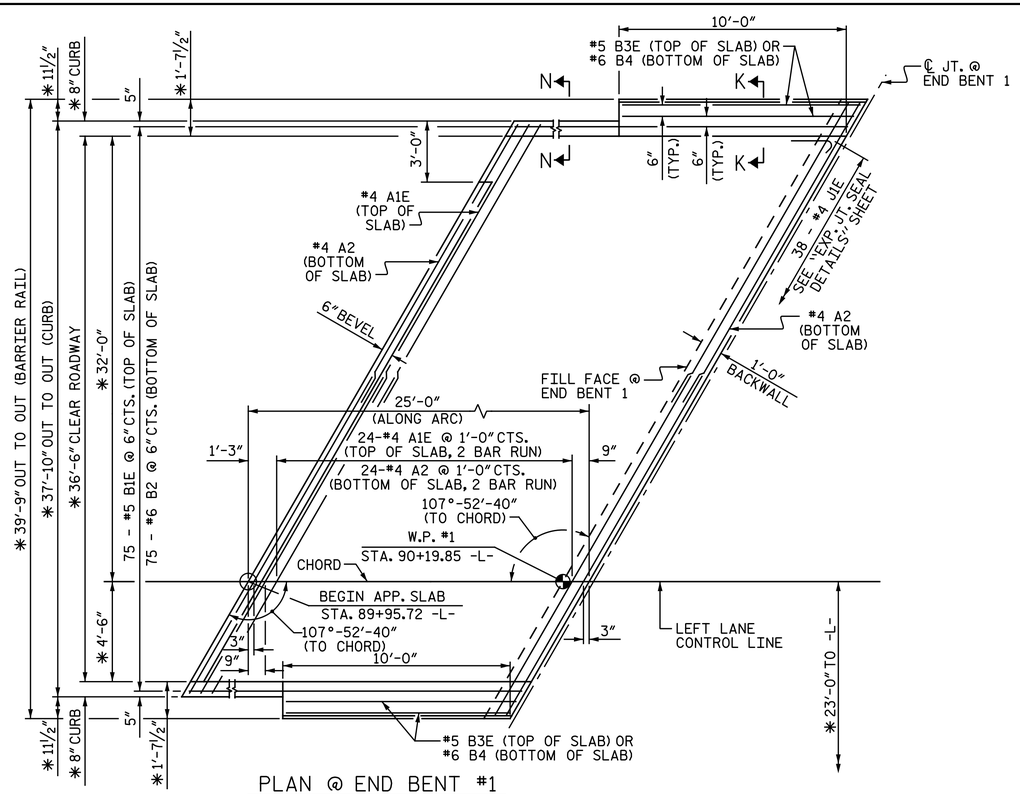
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-59
1			3			TOTAL SHEETS
2			4			62

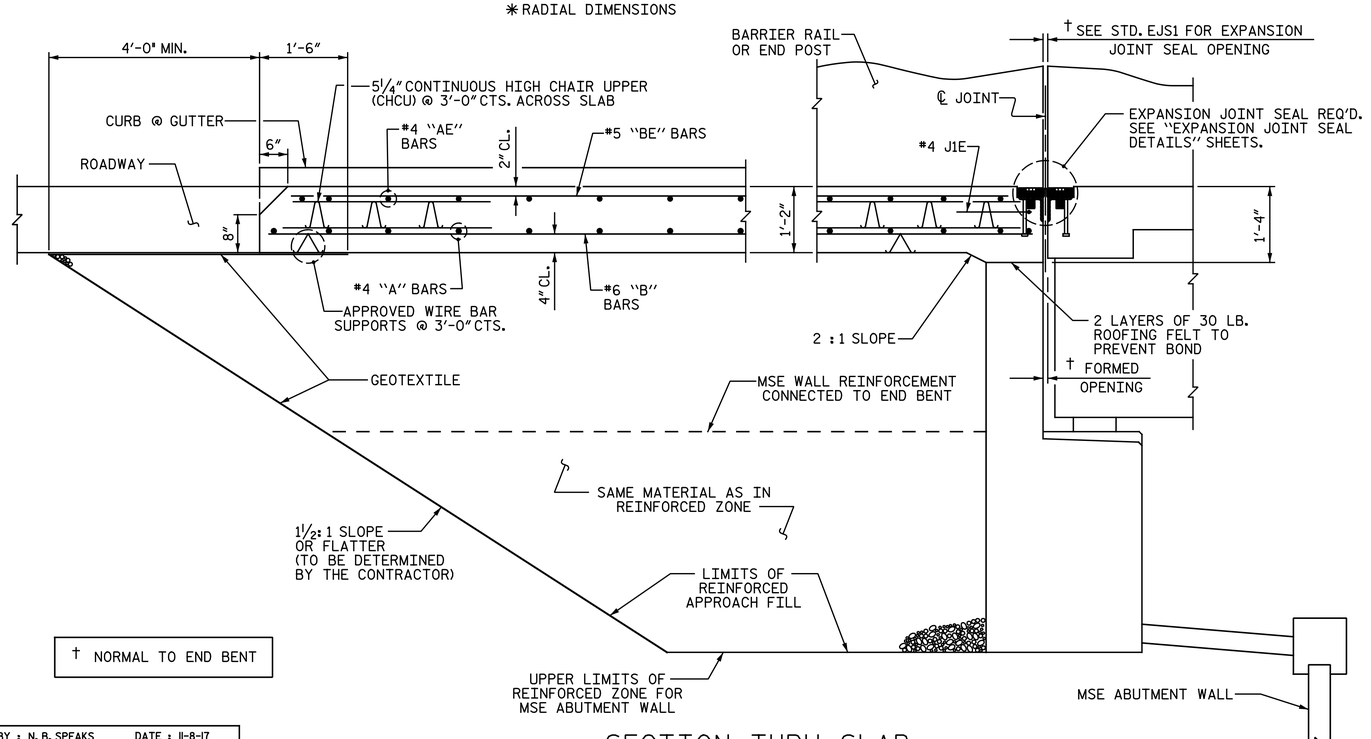
DRAWN BY : N. B. SPEAKS DATE : 1-30-18

CHECKED BY : T. M. GARRISON DATE : 1-31-18



PLAN @ END BENT #1

*RADIAL DIMENSIONS



† NORMAL TO END BENT

SECTION THRU SLAB

(TYPE III - REINFORCED APPROACH FILL)

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, MSE WALL REINFORCEMENT AND BACKFILL MATERIAL SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

BACKFILL MATERIAL SHALL BE THE SAME MATERIAL USED IN THE MSE REINFORCED ZONE.

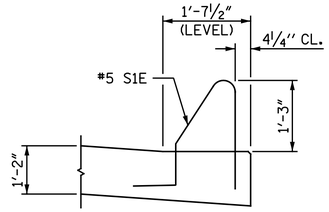
APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

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

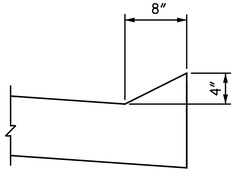
FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

ARC OFFSETS ARE NEGLIGIBLE AND THEREFORE NOT SHOWN.

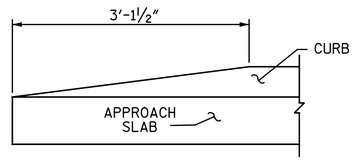
THE QUANTITY OF #4 J1E BARS ON THE BILL OF MATERIAL IS BASED ON 1′-0″ CENTERS. J1E BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1E BARS SPECIFIED, ADDITIONAL J1E BARS WILL NOT BE REQUIRED.



SECTION K-K



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

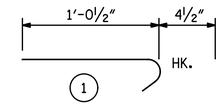
CURB DETAILS

BILL OF MATERIAL

APPROACH SLAB AT BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	50	#4	STR.	21′ - 9″	726
A2	52	#4	STR.	21′ - 8″	753
B1E	75	#5	STR.	23′ - 8″	1,851
B2	75	#6	STR.	24′ - 7″	2,769
B3E	4	#5	STR.	9′ - 7″	40
B4	4	#6	STR.	9′ - 7″	58
J1E	38	#4	1	1′ - 5″	36
REINFORCING STEEL				LBS.	3,580
EPOXY COATED REINFORCING STEEL				LBS.	2,653
CLASS AA CONCRETE				C.Y.	42.0

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

"E" SUFFIX DENOTES EPOXY COATED REINFORCING STEEL.

QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE "BRIDGE APPROACH SLAB DETAILS".

SPLICE LENGTHS

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

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

LEFT LANE

Michael Baker INTERNATIONAL

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8000 Regency Parkway, Suite 600
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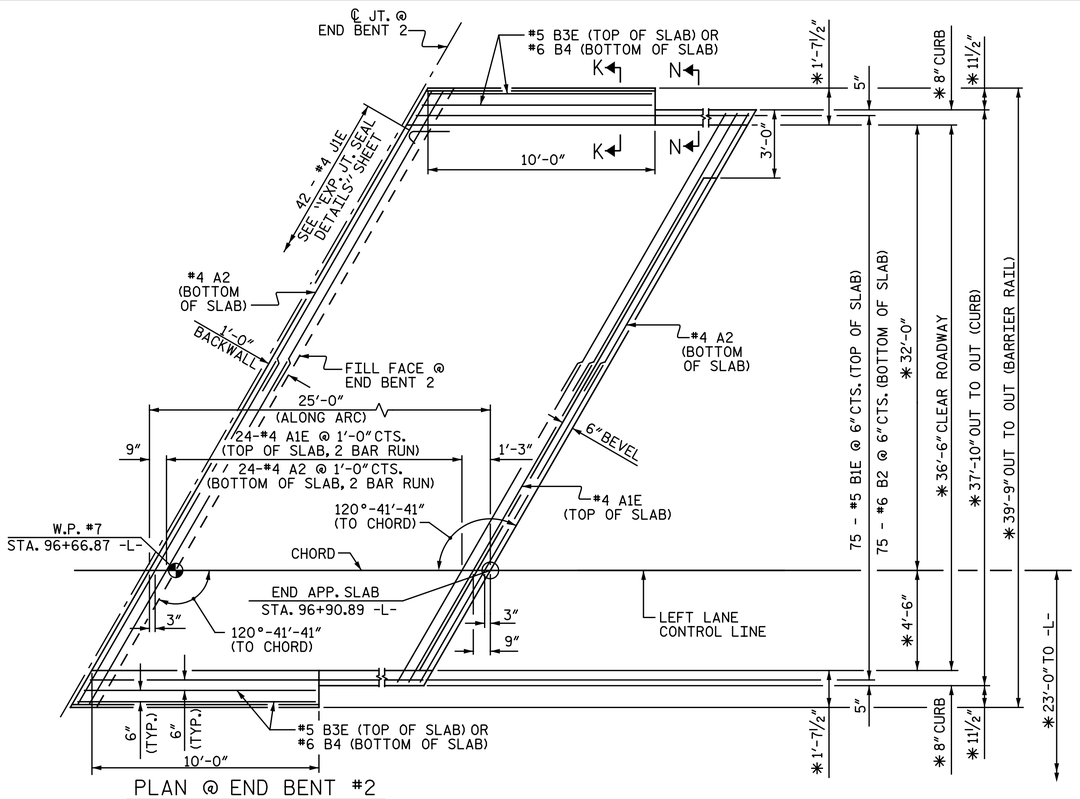
NC License No. : F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-60
1			3			TOTAL SHEETS
2			4			62

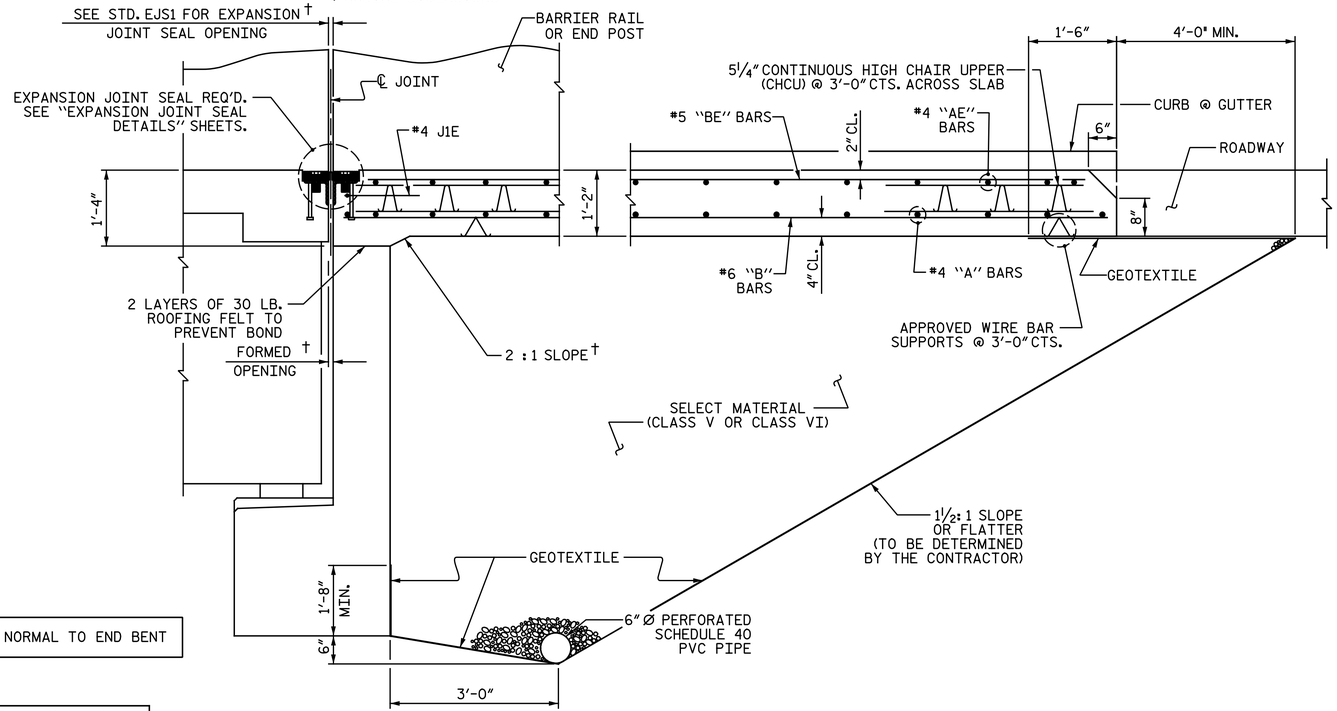
ASSEMBLED BY : N. B. SPEAKS		DATE : 11-8-17	
CHECKED BY : V. A. PATEL		DATE : 4-11-18	
DRAWN BY : EEM 3/95	REV. 12/21/11		MAA/GM
CHECKED BY : VAP 3/95	REV. 6/13		MAA/GM
	REV. 12/17		MAA/THC

STD. NO. BAS2



PLAN @ END BENT #2

*RADIAL DIMENSIONS



† NORMAL TO END BENT

SECTION THRU SLAB

(TYPE I - STANDARD APPROACH FILL)

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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

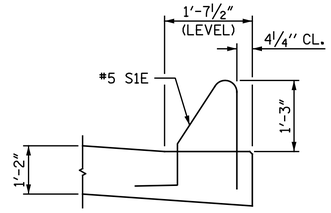
FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

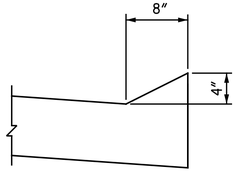
FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

ARC OFFSETS ARE NEGLIGIBLE AND THEREFORE NOT SHOWN.

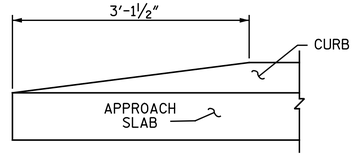
THE QUANTITY OF #4 J1E BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1E BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1E BARS SPECIFIED, ADDITIONAL J1E BARS WILL NOT BE REQUIRED.



SECTION K-K



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

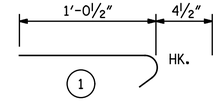
CURB DETAILS

BILL OF MATERIAL

APPROACH SLAB AT BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	50	#4	STR.	23' - 11"	799
A2	52	#4	STR.	23' - 9"	825
B1E	75	#5	STR.	23' - 8"	1,851
B2	75	#6	STR.	24' - 7"	2,769
B3E	4	#5	STR.	9' - 7"	40
B4	4	#6	STR.	9' - 7"	58
J1E	42	#4	1	1' - 5"	40
REINFORCING STEEL				LBS.	3,652
EPOXY COATED REINFORCING STEEL				LBS.	2,730
CLASS AA CONCRETE				C.Y.	42.0

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

"E" SUFFIX DENOTES EPOXY COATED REINFORCING STEEL.

QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE "BRIDGE APPROACH SLAB DETAILS".

SPLICE LENGTHS

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

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

LEFT LANE

Michael Baker INTERNATIONAL

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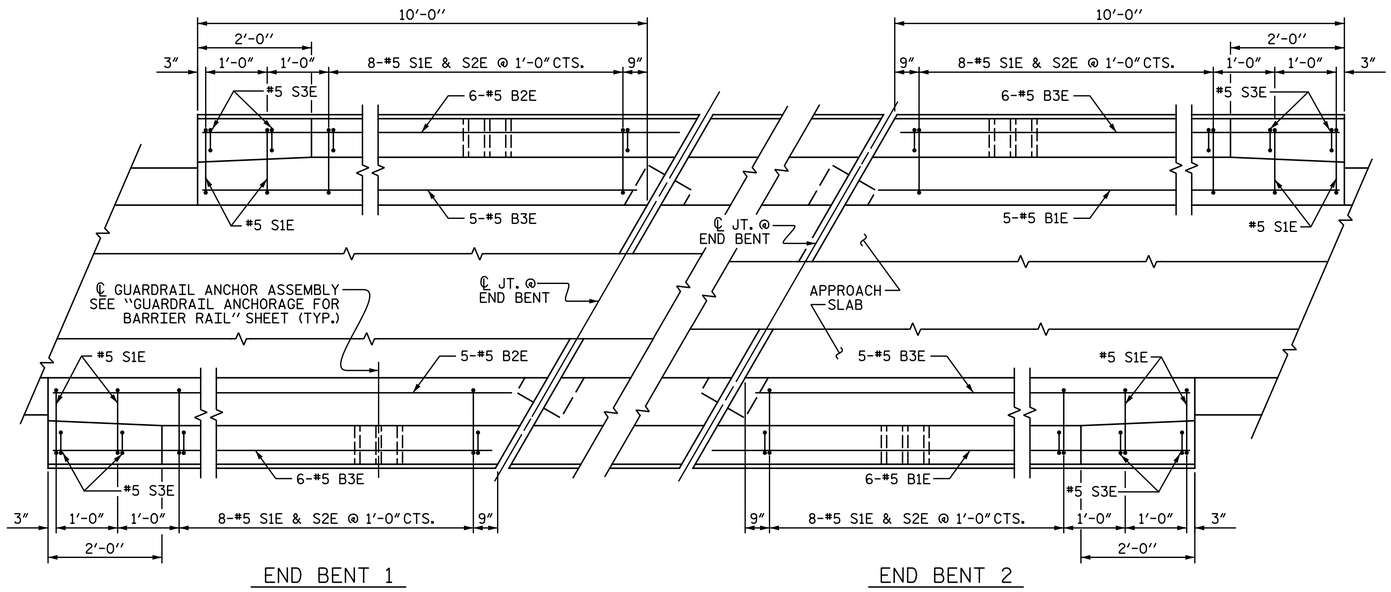
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-61
1			3			TOTAL SHEETS
2			4			62

ASSEMBLED BY : N. B. SPEAKS	DATE : 11-8-17	
CHECKED BY : V. A. PATEL	DATE : 4-11-18	
DRAWN BY : EEM 3/95	REV. 12/21/11	MAA/GM
CHECKED BY : VAP 3/95	REV. 6/13	MAA/GM
	REV. 12/17	MAA/THC

STD. NO. BAS2



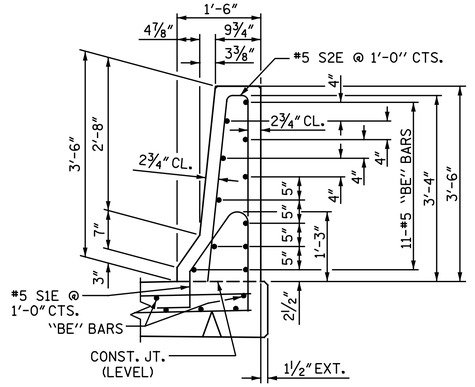
PLAN OF BARRIER RAIL

NOTES

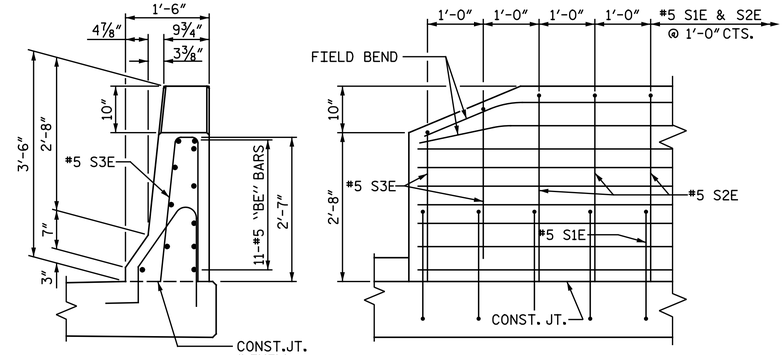
THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.



SECTION THRU RAIL

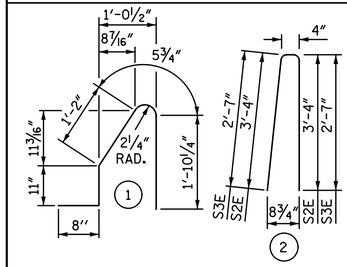


END VIEW

SIDE VIEW

END OF RAIL DETAILS

BAR TYPES



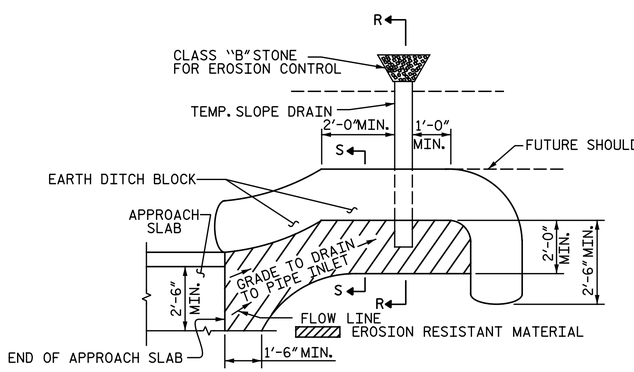
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BARRIER RAIL ONLY

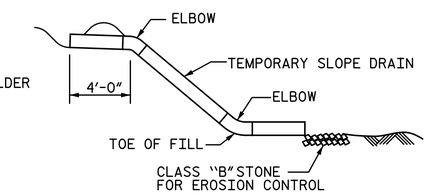
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1E	11	#5	STR.	10′ - 3″	118
B2E	11	#5	STR.	10′ - 0″	115
B3E	22	#5	STR.	9′ - 8″	222
S1E	40	#5	1	5′ - 1″	212
S2E	32	#5	2	7′ - 0″	234
S3E	8	#5	2	5′ - 6″	46
EPOXY COATED REINFORCING STEEL				LBS.	947
CLASS AA CONCRETE				C.Y.	5.4
CONCRETE BARRIER RAIL				LIN. FT.	40.0

"E" SUFFIX DENOTES EPOXY COATED REINFORCING STEEL.

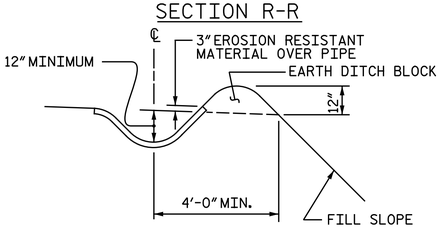


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

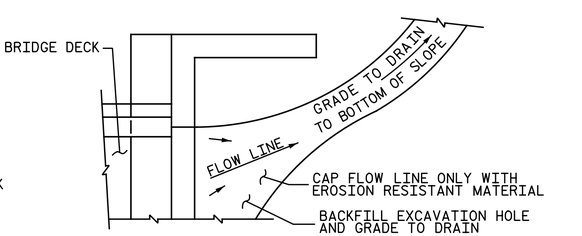
PLAN VIEW



SECTION R-R



SECTION S-S



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

TEMPORARY DRAINAGE DETAIL

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

ASSEMBLED BY : N. B. SPEAKS		DATE : 11-9-17	
CHECKED BY : V. A. PATEL		DATE : 4-11-18	
DRAWN BY : FCJ 11/88	REV. 7/12	MAA/GM	
CHECKED BY : ARB 11/88	REV. 6/13	MAA/GM	
	REV. 12/17	MAA/THC	

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+43.36 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8ECA3C434...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

LEFT LANE

Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

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

STD. NO. BAS4(SHT 3b)

F.A. PROJECT NO.: STP-4121(3)

-L- GRADE DATA

(-)1.6414% (-)3.9182%

P.I. STA. = 88+85.00
EL. = 814.93
V.C. = 400'

90+00 90+50 91+00 91+50 92+00 92+50 93+00

820 810 800 790 780 770 760 750 740

FILL FACE @ END BENT 1
STA. 90+04.77 -L-
G.P. EL. 810.05

3'-1⅞" TYP. HORIZONTAL CLEAR NORMAL TO FRONT FACE OF MSE WALL

PROPOSED GRADE
TYP. MSE STRAP
EXP.
FILL
6"
MSE WALL
UNCLASSIFIED STRUCTURE EXCAVATION
EL. 783±
EL. 785±
HP 12x53 STEEL PILES
1'-6"
EL. 773±
EL. 772±
EL. 770±
FUTURE CONSTRUCTION
EL. 772±
EL. 767±
EL. 767±
28'-1" MIN. VERT. CL.
EL. 776±
FIX. FIX.
TOP OF 5'-0" DIA. DRILLED PIER EL. VARIES
EL. 767±
EL. 764±
FIX. FIX.
TOP OF 5'-6" DIA. DRILLED PIER EL. VARIES
APPROXIMATE NATURAL GROUND LINE
EL. 760±
TOP OF 6'-0" DIA. DRILLED PIER EL. VARIES
EL. 753±
EL. 749±
EXP. EXP.

SPAN A SPAN B SPAN C

END BENT 1 BENT 1 BENT 2 BENT 3

SECTION ALONG RIGHT LANE CONTROL LINE

(END BENTS & BENTS ON SECTION AT RIGHT ANGLES TO END BENTS & BENTS)

RAILROAD MINIMUM CLEARANCE

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

BENT 1
END BENT 1
25'-6⅜" MIN. CLEAR
14'-0" MIN.
14'-0" MIN.
14'-0" MIN.
26'-2¼" MIN. CLEAR
24'-0" MIN.
TOP OF RAIL
5'-0"
2:1 SLOPE
FUTURE TRACKS
APPROXIMATE NATURAL GROUND LINE
-Y6-
-Y6A-
THEORETICAL SECTION

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS.

N

642'-0¼"* (FILL FACE TO FILL FACE)
313'-4⅞"* (UNIT 1)
110'-4⅞"* (SPAN A)
101'-6"* (SPAN B)
101'-6"* (SPAN C)
328'-7⅜"* (UNIT 2)
109'-0"* (SPAN D)
7'-7¼"*
101'-4¾"*

TO SR 1332

TOP OF SLOPE PROTECTION EL. 798.88
W.P. #1 STA. 90+04.77 -L-
BEGIN APPROACH SLAB STA. 89+81.00 -L-
P.O.C. STA. 90+63.14 -L-
P.O.T. STA. 16+22.59 -Y6-
1254'-10" TO M.P. 295
NCRR/NORFOLK SOUTHERN RR
PT. A
W.P. #2 STA. 91+14.34 -L-
W.P. #3 STA. 92+15.06 -L-
BRIDGE I.D. STA. 93+23.34 -L-
W.P. #4 STA. 93+15.79 -L-
-L-
23'-0" (RADIAL)
RIGHT LANE CONTROL LINE
TO SR 1334
FILL FACE
107°-49'-13" (TO TANGENT)
109°-54'-46" (TO TANGENT)
111°-50'-11" (TO TANGENT)
113°-45'-37" (TO TANGENT)
-Y6A-
-Y6-
4" CONC. SLOPE PROTECTION
℄ FUTURE TRACKS
MSE WALL (TYP.)
TOP OF SLOPE PROTECTION EL. 801.63
26'-2¼" MIN. HORIZ. CLEAR
14'-0" MIN.
14'-0" MIN.
14'-0" MIN.
25'-6⅜" MIN. HORIZ. CLEAR
3'-1⅞" TYP. TO FRONT FACE OF MSE WALL (TYP.)
BENT 1 CONTROL LINE
BENT 2 CONTROL LINE
BENT 3 CONTROL LINE & ℄ JT.

-L- HORIZONTAL CURVE DATA

P.I. STA. 93+42.25
△ = 20°-57'-26.2" (LT)
D = 1°-54'-35.5"
L = 1,097.32'
T = 554.86'
R = 3,000.00'

PLAN

(PILES & DRILLED PIERS NOT SHOWN IN PLAN VIEW FOR CLARITY)

* DIMENSION MEASURED ALONG ARC

POINT	TOP OF RAIL ELEVATION
A	772.06

△ DENOTES POINT OF MINIMUM VERTICAL CLEARANCE

① - 108°-40'-08" (TO TANGENT)
② - 108°-31'-18" (TO TANGENT)
③ - 108°-56'-06" (TO TANGENT)
④ - 108°-47'-08" (TO TANGENT)
⑤ - P.O.C. STA. 90+47.94 -L- P.O.T. STA. 16+88.44 -Y6A-
⑥ - P.O.C. STA. 90+40.24 -L- P.O.T. STA. 17+12.70 -Y6A-
⑦ - P.O.C. STA. 90+55.31 -L- P.O.T. STA. 16+46.90 -Y6-

TOP OF RAIL ELEVATIONS -Y6A-

STATION	LEFT RAIL ELEV	RIGHT RAIL ELEV
16+00.00	770.78	770.75
16+50.00	771.22	771.18
17+00.00	771.66	771.64
17+50.00	772.10	772.08
18+00.00	772.54	772.52

TOP OF RAIL ELEVATIONS -Y6-

STATION	LEFT RAIL ELEV	RIGHT RAIL ELEV
15+50.00	770.88	770.88
16+00.00	771.34	771.35
16+50.00	771.80	771.81
17+00.00	772.24	772.27
17+50.00	772.70	772.74

DRAWN BY : C. E. MAYHEW DATE : 2-13-18
CHECKED BY : B. J. BELL DATE : 2-13-18

PROJECT NO. U-2412A
GUILFORD COUNTY
STATION: 93+23.34 -L-
SHEET 1 OF 6
MILE POST 295.24 BRIDGE NO. 401271

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL
DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8ECA3C434...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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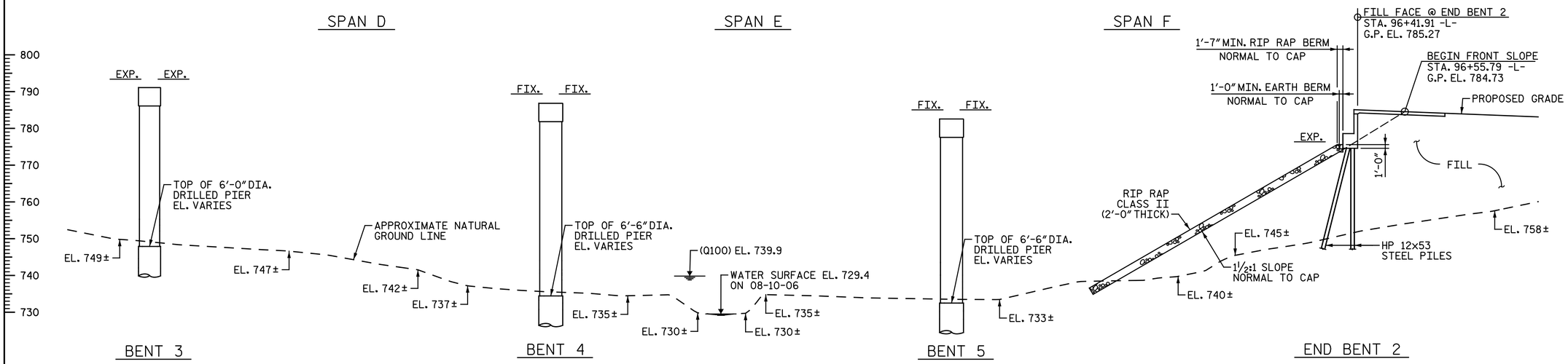
NC License No.: F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER NCRR/NSRR & DEEP RIVER TRIBUTARY 1 ON SR 4121 BETWEEN SR 1332 AND SR 1334
RIGHT LANE

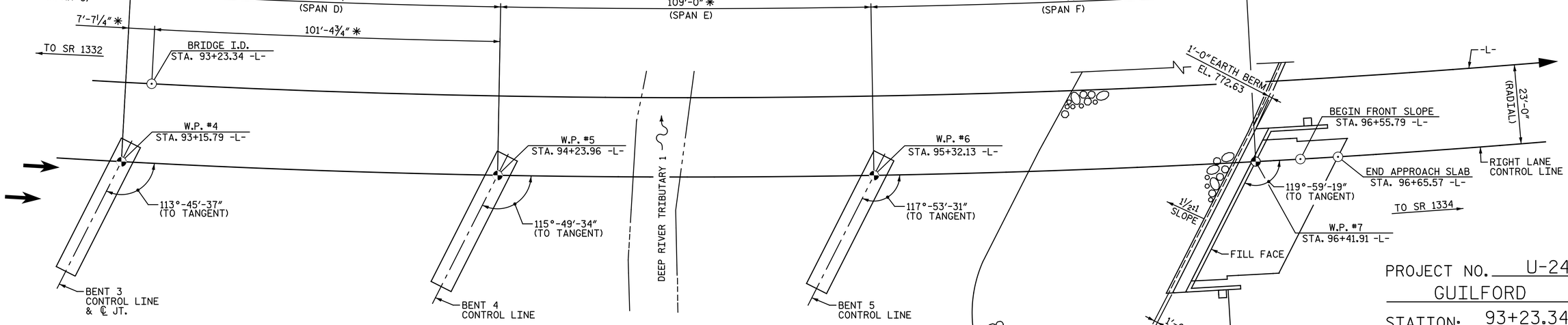
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-1
1			3			TOTAL SHEETS
2			4			63

93+00 93+50 94+00 94+50 95+00 95+50 96+00 96+50 97+00



SECTION ALONG RIGHT LANE CONTROL LINE

(END BENTS & BENTS ON SECTION AT RIGHT ANGLES TO END BENTS & BENTS)



PLAN

(PILES & DRILLED PIERS NOT SHOWN IN PLAN VIEW FOR CLARITY)

* DIMENSION MEASURED ALONG ARC

N

-L- HORIZONTAL CURVE DATA

P.I. STA. 93+42.25
△ = 20°-57'-26.2" (LT)
D = 1°-54'-35.5"
L = 1,097.32'
T = 554.86'
R = 3,000.00'

PROJECT NO. U-2412A
GUILFORD COUNTY
STATION: 93+23.34 -L-

SHEET 2 OF 6

DRAWN BY : C. E. MAYHEW DATE : 2-1-18
CHECKED BY : B. J. BELL DATE : 4-12-18

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8EC43C434...

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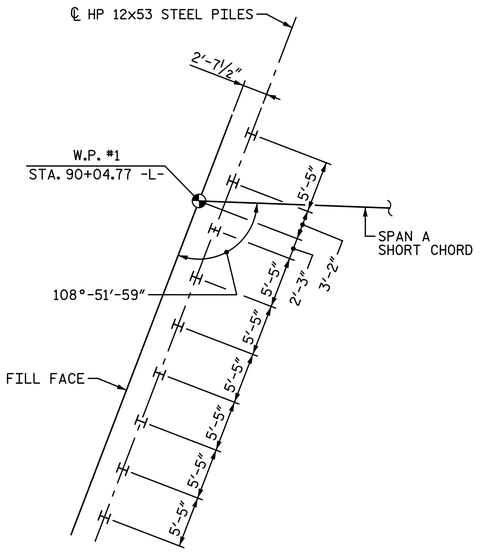
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

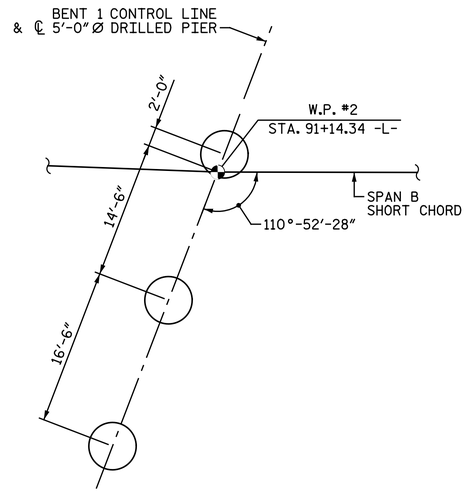
GENERAL DRAWING
FOR BRIDGE OVER NCRR/NSRR & DEEP RIVER TRIBUTARY 1 ON SR 4121 BETWEEN SR 1332 AND SR 1334
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-2
1			3			TOTAL SHEETS
2			4			63

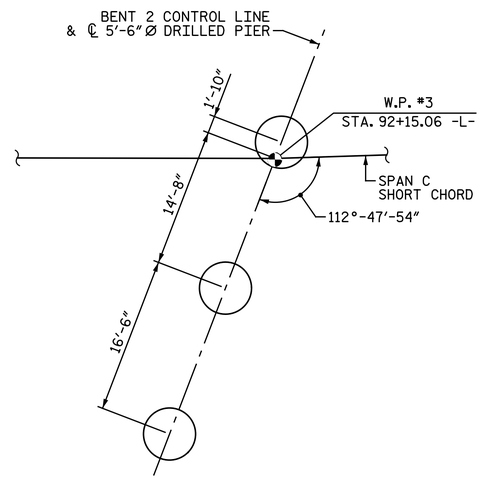


END BENT 1

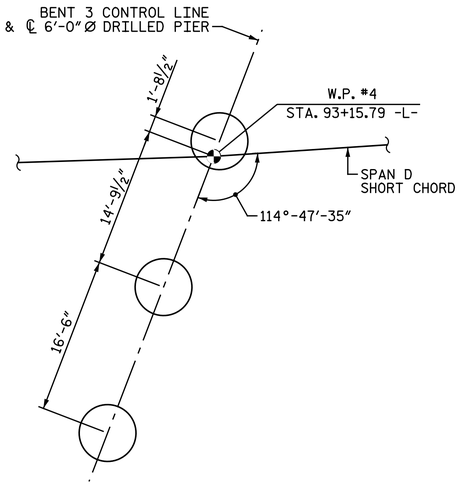
I VERTICAL HP 12x53 STEEL PILE



BENT 1



BENT 2



BENT 3

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.
DIMENSIONS LOCATING DRILLED PIERS ARE SHOWN TO THE DRILLED PIER CENTERLINE.

NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

DRILLED-IN PILES ARE REQUIRED FOR END BENT NO. 1. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 758 FT. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

DRILL-IN AND INSTALL PILES AT END BENT NO. 1 PRIOR TO CONSTRUCTING MSE WALL.

CONCRETE IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO. 1.

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

DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 675 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 80 TSF.

INSTALL DRILLED PIERS AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 735 FT (LT), 737 FT (CTR), AND 739 FT (RT) WITH THE REQUIRED TIP RESISTANCE.

DRILLED PIERS AT BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 630 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 65 TSF.

INSTALL DRILLED PIERS AT BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN 729 FT WITH THE REQUIRED TIP RESISTANCE.

DRILLED PIERS AT BENT NO. 3 ARE DESIGNED FOR A FACTORED RESISTANCE OF 580 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 50 TSF.

INSTALL DRILLED PIERS AT BENT NO. 3 TO A TIP ELEVATION NO HIGHER THAN 717 FT (LT), 724 FT (CTR), AND 731 FT (RT) WITH THE REQUIRED TIP RESISTANCE.

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.

PROJECT NO. U-2412A
GUILFORD COUNTY
STATION: 93+23.34 -L-

SHEET 3 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

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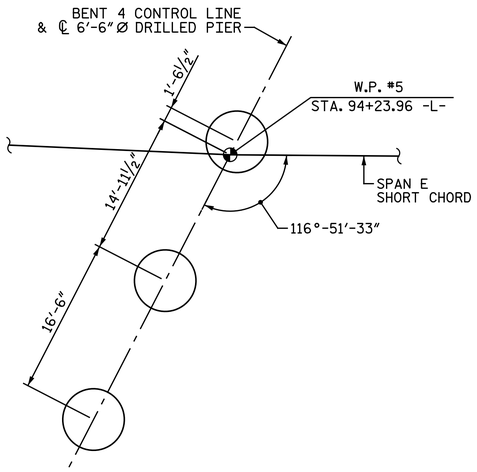
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

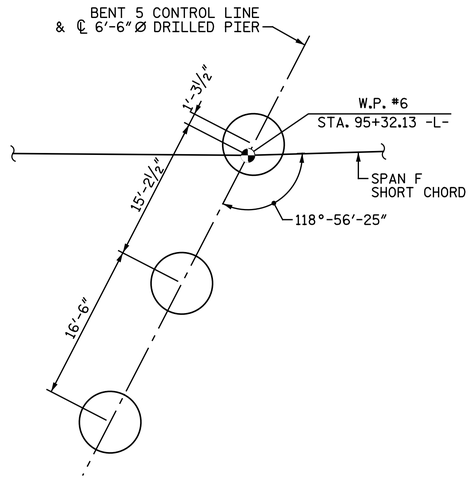
GENERAL DRAWING
FOR BRIDGE OVER NCRR/NSRR & DEEP RIVER TRIBUTARY 1 ON SR 4121 BETWEEN SR 1332 AND SR 1334
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-3
1			3			TOTAL SHEETS
2			4			63

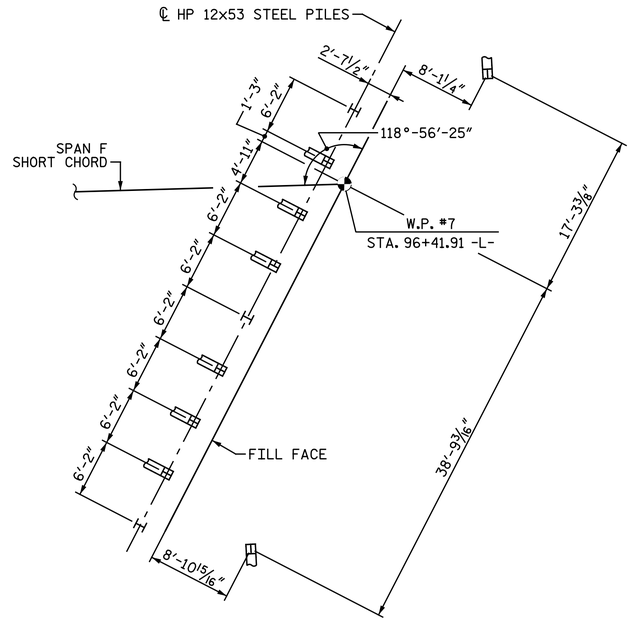
DRAWN BY : C. E. MAYHEW DATE : 5-21-18
CHECKED BY : B. J. BELL DATE : 5-21-18



BENT 4



BENT 5



END BENT 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.
DIMENSIONS LOCATING DRILLED PIERS ARE SHOWN TO THE DRILLED PIER CENTERLINE.

I VERTICAL HP 12x53 STEEL PILE

3:12 BATTERED HP 12x53 STEEL PILE

NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.

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

DRILLED PIERS AT BENT NO. 4 ARE DESIGNED FOR A FACTORED RESISTANCE OF 640 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 50 TSF.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 4. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 725 FT (LT), 726 FT (CTR), AND 728 FT (RT) WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

INSTALL PERMANENT STEEL CASINGS AT BENT NO. 4 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 726 FT (LT) AND 730 FT (RT).

INSTALL DRILLED PIERS AT BENT NO. 4 TO A TIP ELEVATION NO HIGHER THAN 712 FT WITH THE REQUIRED TIP RESISTANCE.

DRILLED PIERS AT BENT NO. 5 ARE DESIGNED FOR A FACTORED RESISTANCE OF 640 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 50 TSF.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 5. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 724 FT (LT), 726 FT (CTR), AND 728 FT (RT) WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

INSTALL PERMANENT STEEL CASINGS AT BENT NO. 5 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 725 FT (LT) AND 729 FT (RT).

INSTALL DRILLED PIERS AT BENT NO. 5 TO A TIP ELEVATION NO HIGHER THAN 711 FT WITH THE REQUIRED TIP RESISTANCE.

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.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 4 IS ELEVATION 725 FT (LT), 726.5 FT (CTR), AND 728 FT (RT). SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 5 IS ELEVATION 724 FT (LT), 726 FT (CTR), AND 728 FT (RT). SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 4 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NCRR/NSRR & DEEP RIVER TRIBUTARY 1 ON SR 4121 BETWEEN SR 1332 AND SR 1334

RIGHT LANE

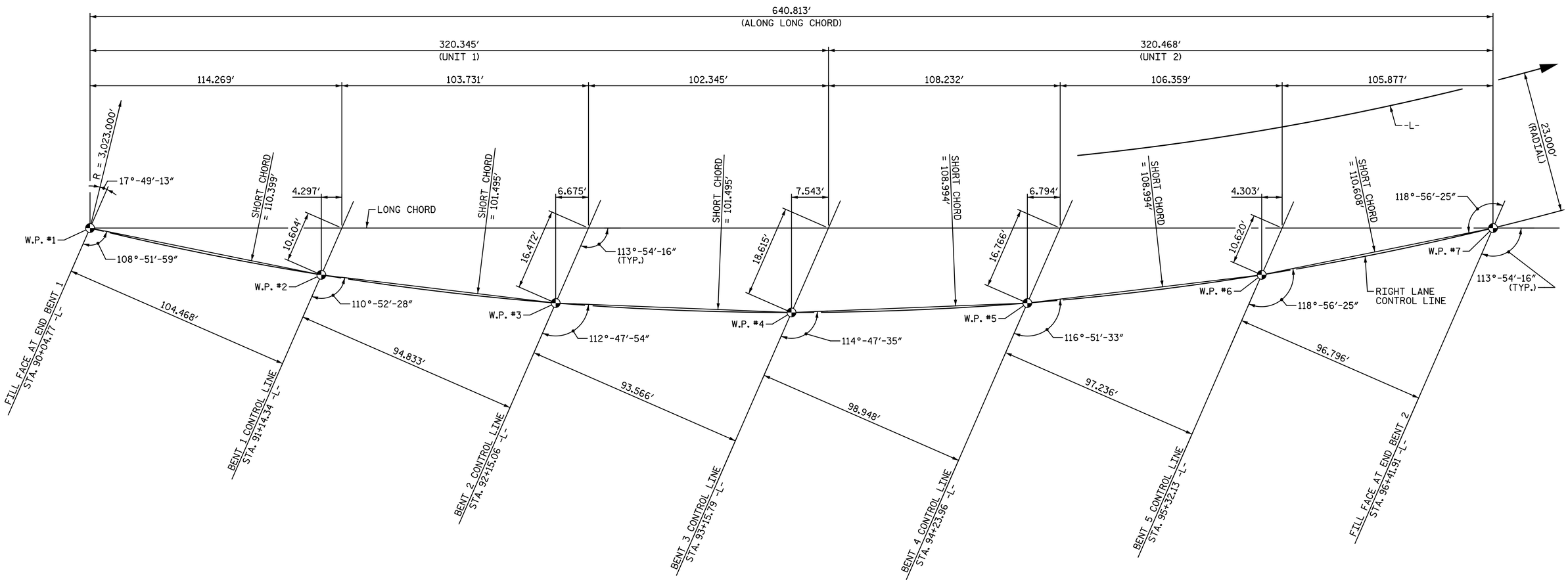
Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-4
1			3			TOTAL SHEETS
2			4			63

DRAWN BY : C. E. MAYHEW DATE : 5-21-18

CHECKED BY : B. J. BELL DATE : 5-21-18



LONG CHORD LAYOUT

ALL END BENTS & BENTS ARE PARALLEL

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 5 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018
C41A3FBEC43C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NCRR/NSRR & DEEP RIVER TRIBUTARY 1 ON SR 4121 BETWEEN SR 1332 AND SR 1334

RIGHT LANE

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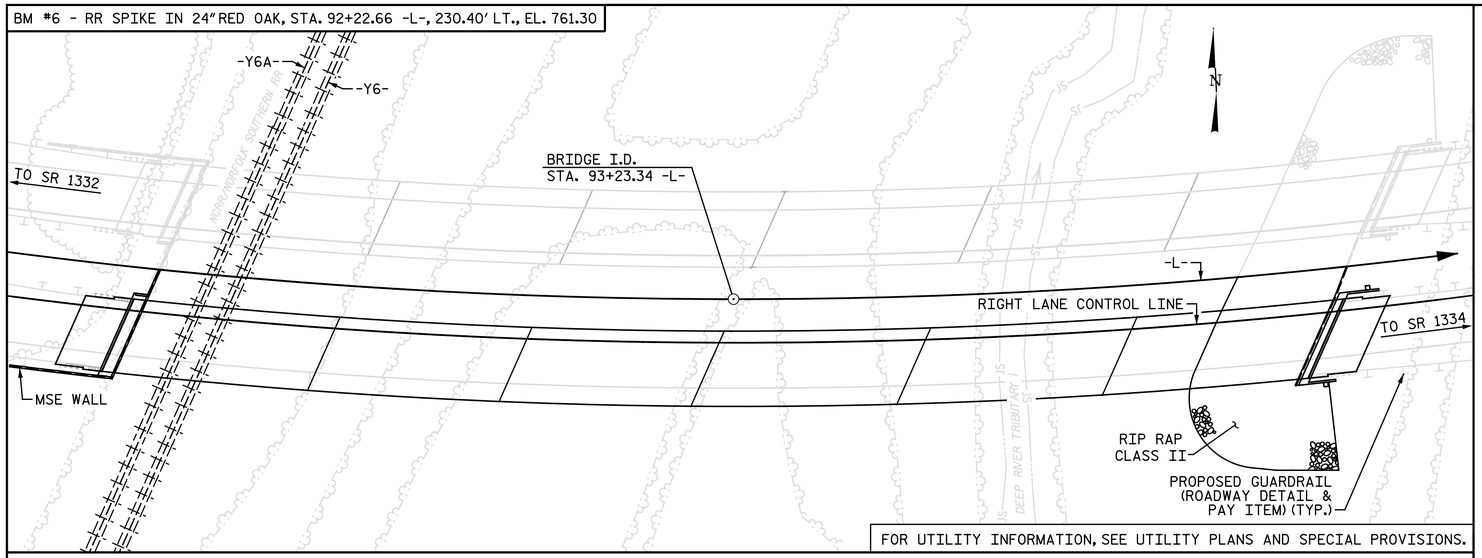
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-5
1			3			TOTAL SHEETS
2			4			63

DRAWN BY : C. E. MAYHEW DATE : 2-13-18
CHECKED BY : B. J. BELL DATE : 2-14-18



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF 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.

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

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

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

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

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 36'-9" EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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 PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

TOTAL BILL OF MATERIAL

LOCATION	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	5'-0" DIA. DRILLED PIERS IN SOIL	5'-0" DIA. DRILLED PIERS NOT IN SOIL	5'-6" DIA. DRILLED PIERS IN SOIL	5'-6" DIA. DRILLED PIERS NOT IN SOIL	6'-0" DIA. DRILLED PIERS IN SOIL	6'-0" DIA. DRILLED PIERS NOT IN SOIL	6'-6" DIA. DRILLED PIERS IN SOIL	6'-6" DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 6'-6" DIA. DRILLED PIER	SID INSPECTIONS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB
	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EA.	EA.	LUMP SUM	SQ. FT.
SUPERSTRUCTURE															25,385
END BENT 1	53	38												LUMP SUM	
BENT 1			68.50	38.00								1	1		
BENT 2					61.50	36.00						1	1		
BENT 3							38.75	39.00				1	1		
BENT 4									22.25	45.00	27.26	1	1		
BENT 5									14.50	50.00	22.50	1	1		
END BENT 2															
TOTAL	53	38	68.50	38.00	61.50	36.00	38.75	39.00	36.75	95.00	49.76	5	5	LUMP SUM	25,385

TOTAL BILL OF MATERIAL (CONT'D)

LOCATION	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	HP 12x53 STEEL PILES		CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS	ELECTRICAL CONDUIT SYSTEM FOR SIGNALS	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)
	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	EA.	NO.	LIN. FT.	LIN. FT.	SQ. YDS.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	EA.
SUPERSTRUCTURE	22,916					24	2,525.88				1,318.06				LUMP SUM	LUMP SUM		
END BENT 1		42.9		7,745					9	425		13						
BENT 1		85.6		21,448	5,750													
BENT 2		115.1		26,155	6,946													
BENT 3		154.1		29,231	7,895													
BENT 4		211.8		36,089	9,811													
BENT 5		205.7		35,177	9,352													
END BENT 2		61.4		9,883				11	11	475			890	985				
TOTAL	22,916	876.6	LUMP SUM	165,728	39,754	24	2,525.88	11	20	900	1,318.06	13	890	985	LUMP SUM	LUMP SUM	LUMP SUM	2

HYDRAULIC DATA

DESIGN DISCHARGE	= 2,000 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 50 YEARS
DESIGN HIGH WATER ELEVATION	= 739.6
DRAINAGE AREA	= 2.5 SQ. MI.
BASE DISCHARGE (Q100)	= 2,200 C.F.S.
BASE HIGH WATER ELEVATION	= 739.9

OVERTOPPING DATA

OVERTOPPING DISCHARGE	= 3,500+ C.F.S.
FREQUENCY OF OVERTOPPING	= 500+ YEARS
OVERTOPPING ELEVATION	= 763+

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 6 OF 6

DRAWN BY : M. D. MAYHEW DATE : 5-24-18

CHECKED BY : B. J. BELL DATE : 5-24-18

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/24/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER NCRR/NSRR & DEEP RIVER TRIBUTARY 1 ON SR 4121 BETWEEN SR 1332 AND SR 1334 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-6
1			3			TOTAL SHEETS
2			4			63

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS $\gamma_{(LL)}$	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS $\gamma_{(LL)}$	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.00	--	1.75	1.13	1.32	A,D,E,F	ER	53.10	1.23	1.27	A,D,E,F	ER	74.70	1.00	1.13	1.00	A,D,E,F	ER	53.10	1,2
		HL-93 (OPERATING)	N/A		1.71	--	1.35	1.13	1.71	A,D,E,F	ER	53.10	1.23	1.89	A,D,E,F	ER	85.40	N/A	--	--	--	--	--	2
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.42	51.12	1.75	1.13	1.87	A,D,E,F	ER	53.10	1.23	1.93	A,D,E,F	ER	85.40	1.00	1.13	1.42	A,D,E,F	ER	53.10	1,2
		HS-20 (OPERATING)	36.000		2.42	87.12	1.35	1.13	2.42	A,D,E,F	ER	53.10	1.23	2.57	A,D,E,F	ER	85.40	N/A	--	--	--	--	--	2
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.40	45.90	1.40	1.13	5.58	A,D,E,F	ER	53.10	1.23	6.38	A,D,E,F	ER	85.40	1.00	1.13	3.40	A,D,E,F	ER	53.10	1,2
		SNGARBS2	20.000		2.45	49.00	1.40	1.13	4.02	A,D,E,F	ER	53.10	1.23	4.41	A,D,E,F	ER	85.40	1.00	1.13	2.45	A,D,E,F	ER	53.10	1,2
		SNAGRIS2	22.000		2.29	50.38	1.40	1.13	3.75	A,D,E,F	ER	53.10	1.23	4.05	A,D,E,F	ER	85.40	1.00	1.13	2.29	A,D,E,F	ER	53.10	1,2
		SNCOTTS3	27.250		1.69	46.05	1.40	1.13	2.77	A,D,E,F	ER	53.10	1.23	3.06	A,D,E,F	ER	85.40	1.00	1.13	1.69	A,D,E,F	ER	53.10	1,2
		SNAGGRS4	34.925		1.38	48.20	1.40	1.13	2.26	A,D,E,F	ER	53.10	1.23	2.46	A,D,E,F	ER	85.40	1.00	1.13	1.38	A,D,E,F	ER	53.10	1,2
		SNS5A	35.550		1.35	47.99	1.40	1.13	2.22	A,D,E,F	ER	53.10	1.23	2.47	A,D,E,F	ER	85.40	1.00	1.13	1.35	A,D,E,F	ER	53.10	1,2
		SNS6A	39.950		1.23	49.14	1.40	1.13	2.01	A,D,E,F	ER	53.10	1.23	2.22	A,D,E,F	ER	85.40	1.00	1.13	1.23	A,D,E,F	ER	53.10	1,2
		SNS7B	42.000		1.17	49.14	1.40	1.13	1.92	A,D,E,F	ER	53.10	1.23	2.16	A,D,E,F	ER	85.40	1.00	1.13	1.17	A,D,E,F	ER	53.10	1,2
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.49	49.17	1.40	1.13	2.45	A,D,E,F	ER	53.10	1.23	2.70	A,D,E,F	ER	85.40	1.00	1.13	1.49	A,D,E,F	ER	53.10	1,2
		TNT4A	33.075		1.50	49.61	1.40	1.13	2.45	A,D,E,F	ER	53.10	1.23	2.64	A,D,E,F	ER	85.40	1.00	1.13	1.50	A,D,E,F	ER	53.10	1,2
		TNT6A	41.600		1.21	50.34	1.40	1.13	1.98	A,D,E,F	ER	53.10	1.23	2.28	A,D,E,F	ER	85.40	1.00	1.13	1.21	A,D,E,F	ER	53.10	1,2
		TNT7A	42.000		1.21	50.82	1.40	1.13	1.98	A,D,E,F	ER	53.10	1.23	2.23	A,D,E,F	ER	85.40	1.00	1.13	1.21	A,D,E,F	ER	53.10	1,2
		TNT7B	42.000		1.24	52.08	1.40	1.13	2.03	A,D,E,F	ER	53.10	1.23	2.12	A,D,E,F	ER	85.40	1.00	1.13	1.24	A,D,E,F	ER	53.10	1,2
		TNAGRIT4	43.000		1.19	51.17	1.40	1.13	1.95	A,D,E,F	ER	53.10	1.23	2.05	A,D,E,F	ER	85.40	1.00	1.13	1.19	A,D,E,F	ER	53.10	1,2
		TNAGT5A	45.000		1.13	50.85	1.40	1.13	1.85	A,D,E,F	ER	53.10	1.23	2.01	A,D,E,F	ER	85.40	1.00	1.13	1.13	A,D,E,F	ER	53.10	1,2
		TNAGT5B	45.000	⟨3⟩	1.12	50.40	1.40	1.13	1.83	A,D,E,F	ER	53.10	1.23	1.94	A,D,E,F	ER	85.40	1.00	1.13	1.12	A,D,E,F	ER	53.10	1,2

LOAD FACTORS:

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

NOTES:

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

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

GIRDERS ARE RATED AS SIMPLY SUPPORTED ELEMENTS.

COMMENTS:

1. A SERVICE III LIVE LOAD FACTOR OF 1.0 WAS USED IN ORDER TO BE CONSISTENT WITH THE VALUE USED DURING DESIGN.
2. DISTANCE FROM LEFT END OF SPAN IS GIVEN WITH RESPECT TO THE CENTERLINE OF BEARING AND IS MEASURED ALONG THE CONTROLLING GIRDER.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

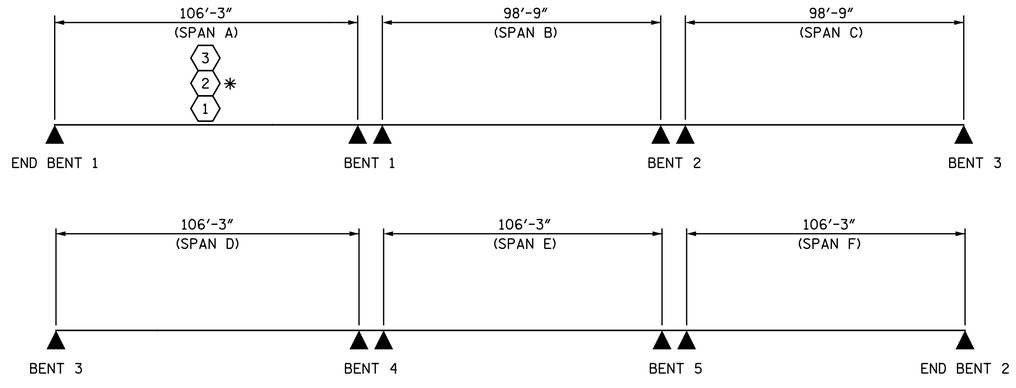
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

* TYPICAL SPANS A, D, E AND F

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8EC3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

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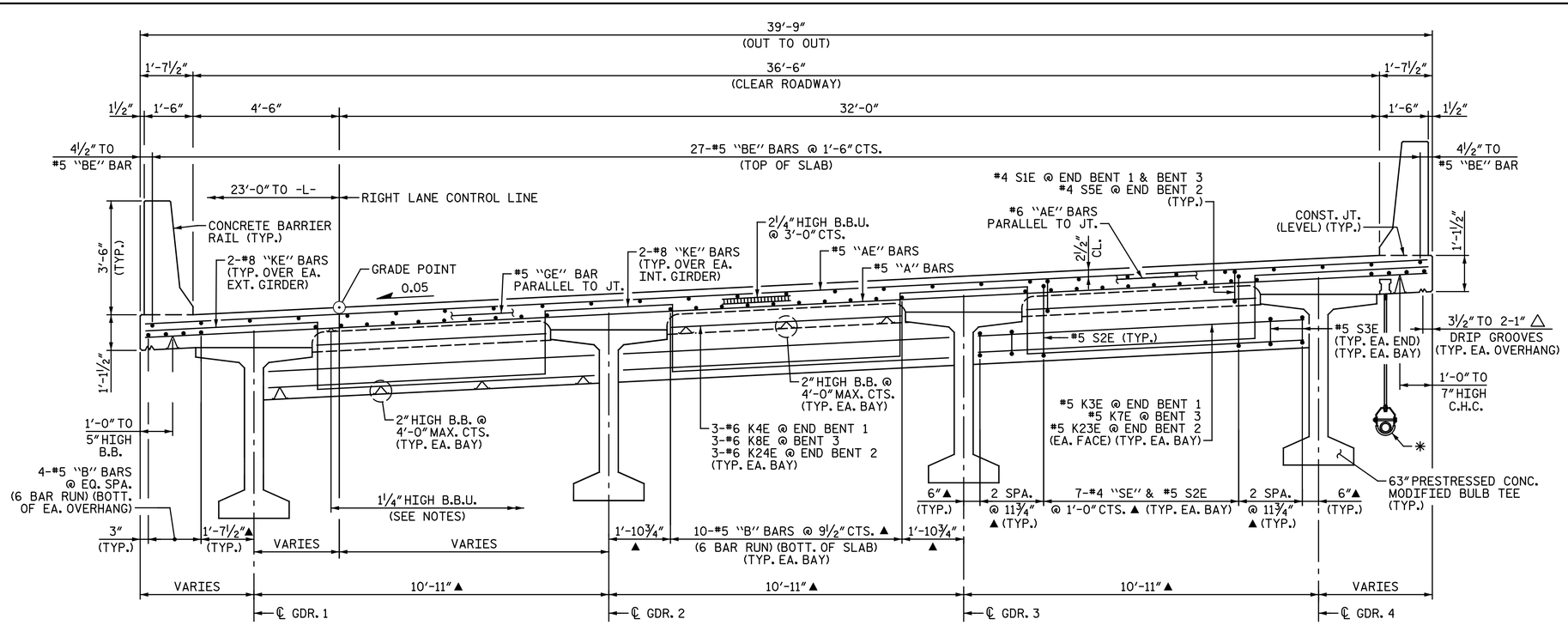
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-7
1			3			TOTAL SHEETS
2			4			63

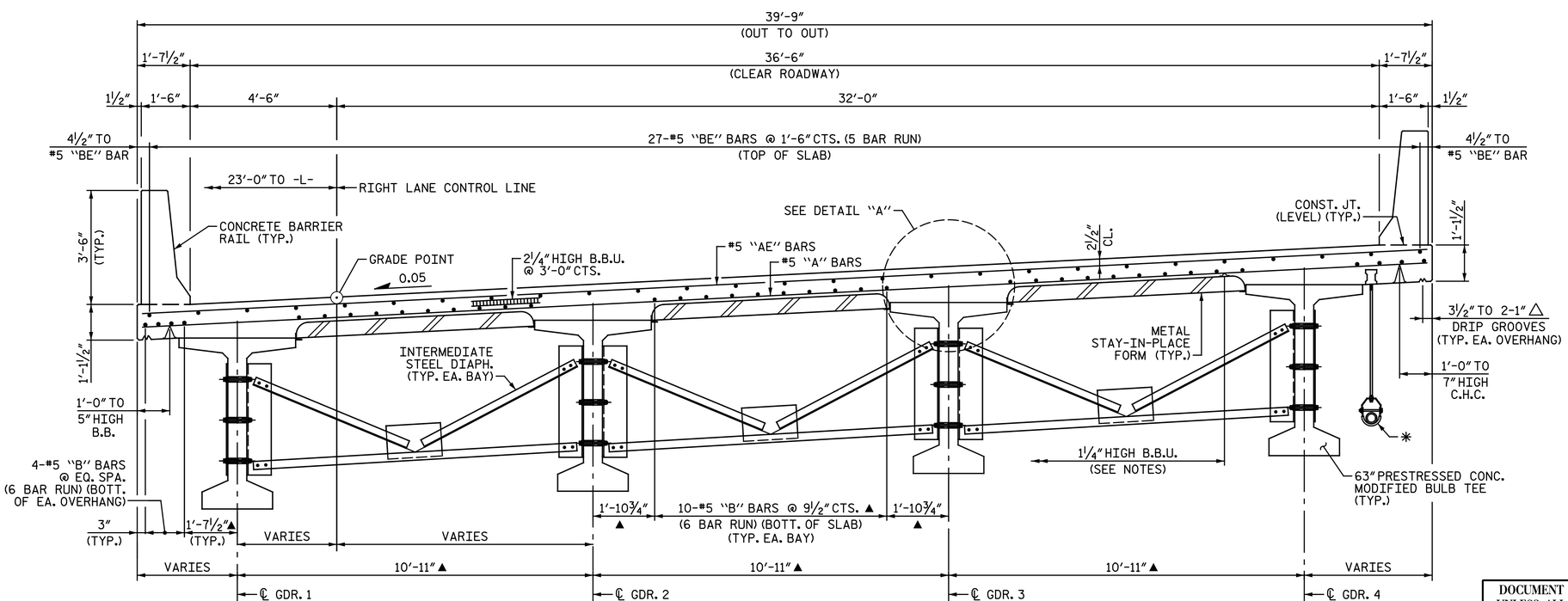
STD. NO. LRFR1

ASSEMBLED BY : N.B. SPEAKS	DATE : 4-17-18
CHECKED BY : A. H. SHARPE	DATE : 4-18-18
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC



TYPICAL SECTION AT END BENT AND BENT 3 DIAPHRAGMS

ALL HORIZONTAL DIMENSIONS ARE RADIAL U.N.O.



TYPICAL SECTION AT INTERMEDIATE DIAPHRAGMS

ALL HORIZONTAL DIMENSIONS ARE RADIAL U.N.O.

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.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS AND TO FACILITATE INSTALLATION OF CONCRETE BARRIER RAIL REINFORCEMENT.

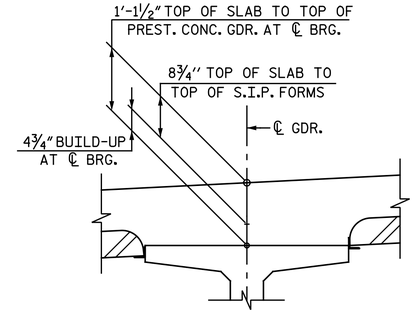
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

FOR CONCRETE BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR DETAILS OF INTERMEDIATE DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.

▲ MEASURED PERPENDICULAR TO GIRDERS

✳ FOR ELECTRICAL CONDUIT SYSTEM FOR SIGNALS, SEE "ELECTRICAL CONDUIT SYSTEM FOR SIGNALS" SHEET



DETAIL A

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 1 OF 3

DRAWN BY : M. D. MAYHEW DATE : 2-8-18

CHECKED BY : B. J. BELL DATE : 4-17-18

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3FBEC43C434...

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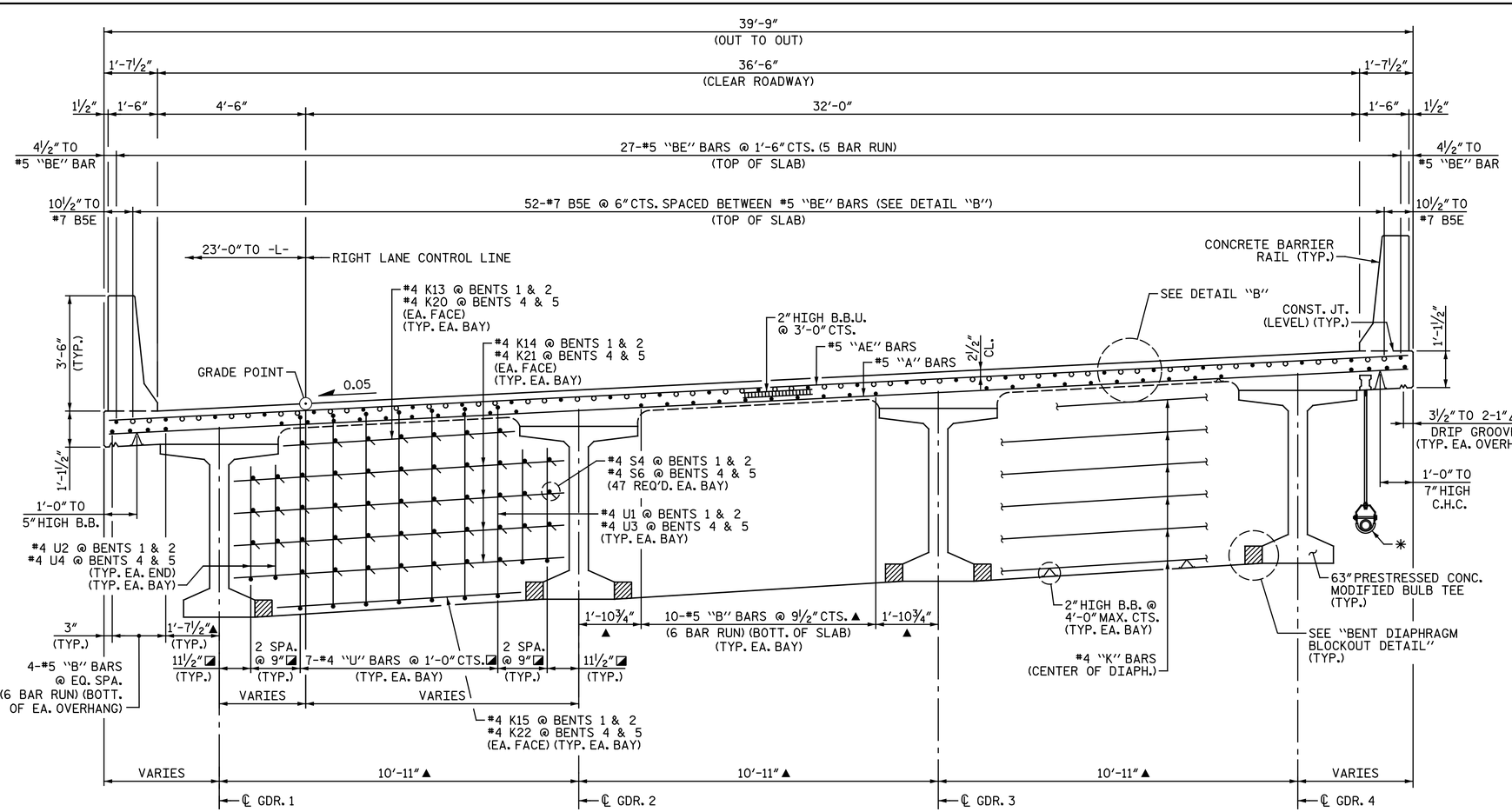
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-8
1			3			TOTAL SHEETS
2			4			63



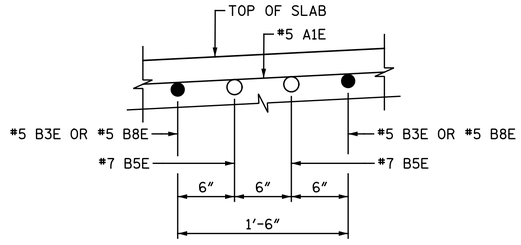
TYPICAL SECTION AT CONTINUOUS BENT DIAPHRAGM

BENTS 1, 2, 4 & 5
ALL HORIZONTAL DIMENSIONS ARE RADIAL U.N.O.

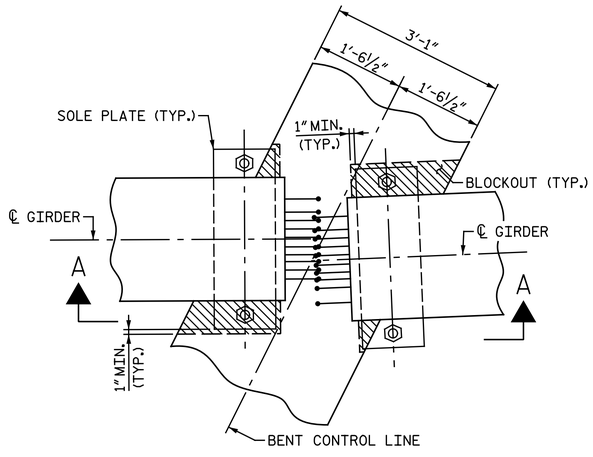
▲ MEASURED PERPENDICULAR TO GIRDERS

◪ SEE "PLAN OF SPANS" SHEETS FOR SPACING DETAILS

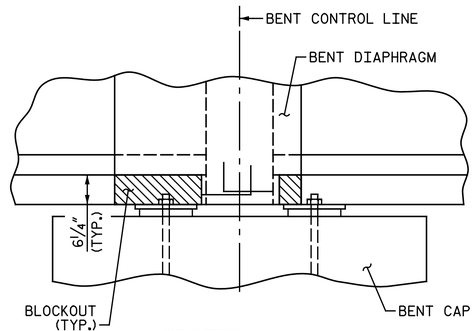
✳ FOR ELECTRICAL CONDUIT SYSTEM FOR SIGNALS, SEE "ELECTRICAL CONDUIT SYSTEM FOR SIGNALS" SHEET



DETAIL "B"



PLAN

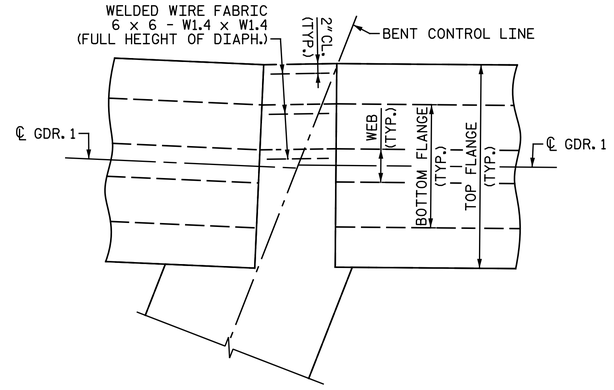


SECTION A-A

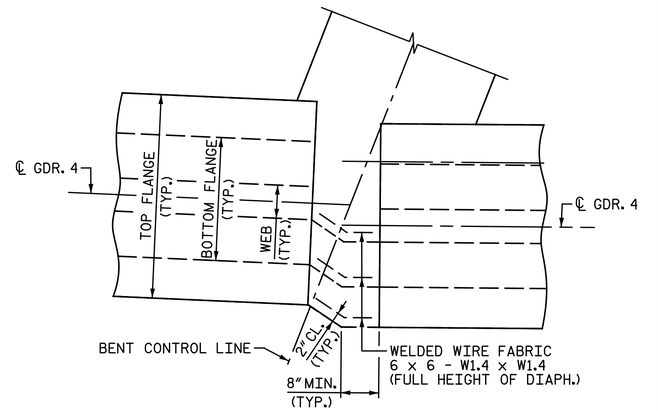
BENT DIAPHRAGM BLOCKOUT DETAIL

NOTES:

THE COST OF THE WELDED WIRE FABRIC SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



PLAN AT GIRDER 1



PLAN AT GIRDER 4

BENT DIAPHRAGM DETAIL

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

RIGHT LANE

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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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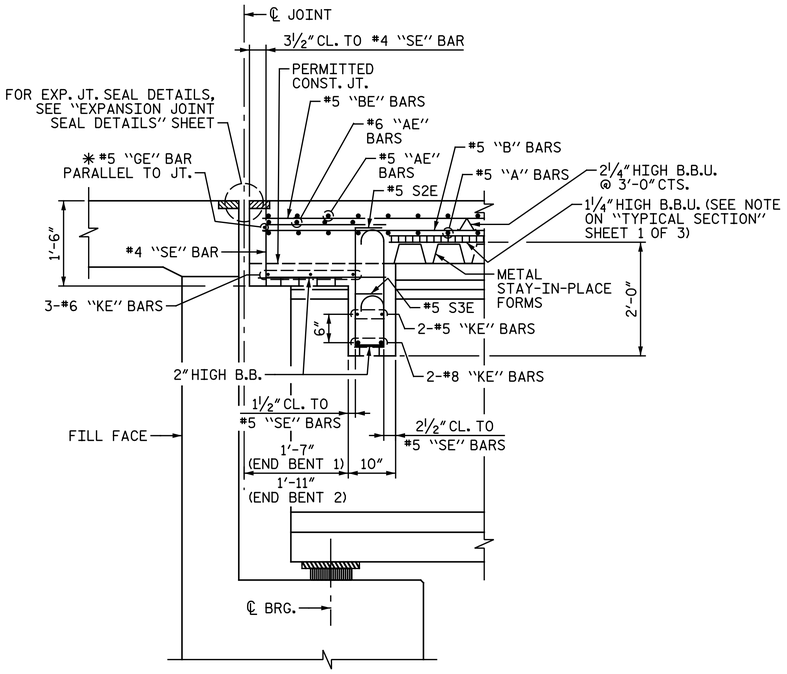
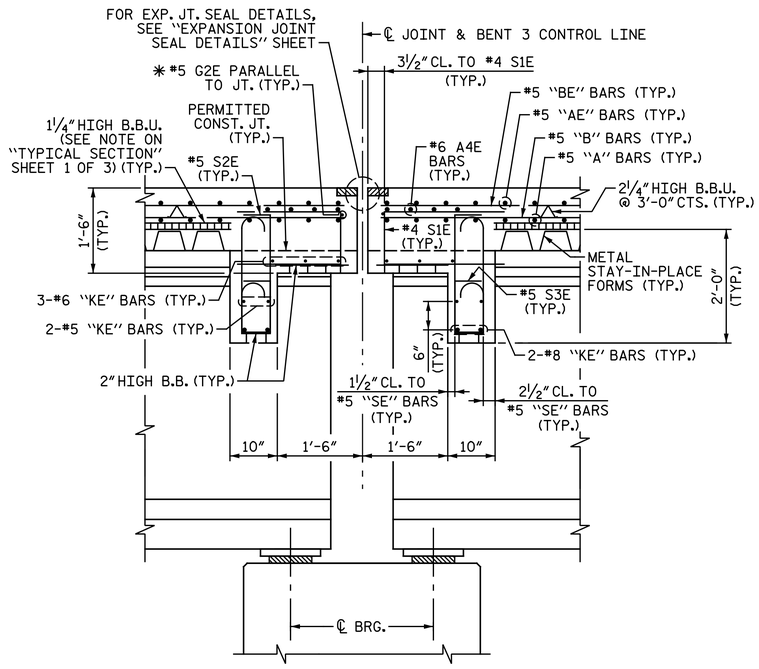
DRAWN BY : M. D. MAYHEW DATE : 2-8-18
CHECKED BY : B. J. BELL DATE : 4-17-18



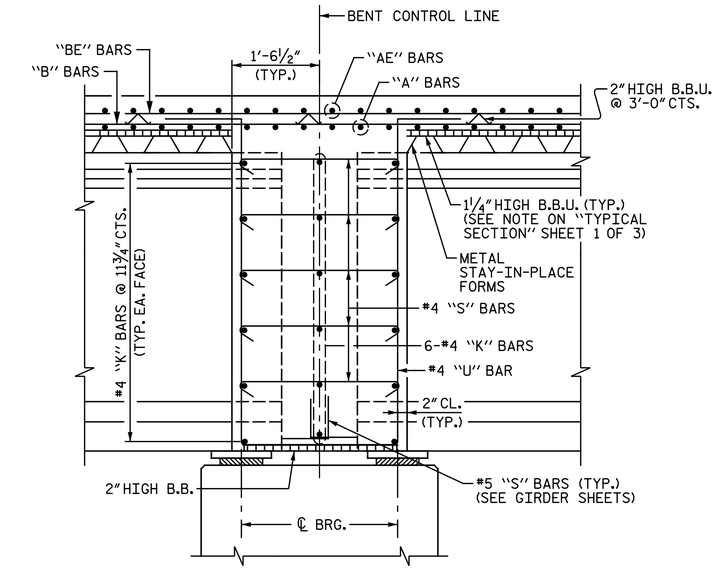
SECTION THRU END BENT DIAPHRAGM

END BENT 1 SHOWN, END BENT 2 SIMILAR



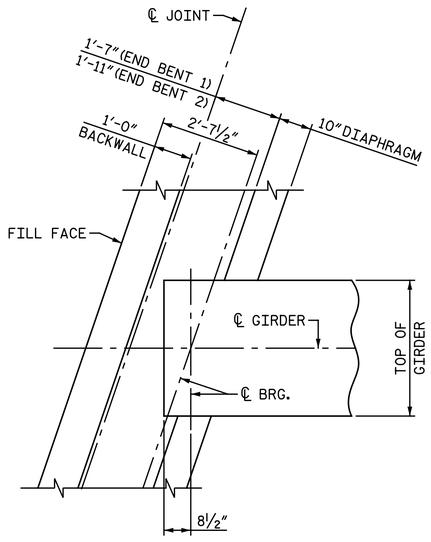
SECTION THRU EXPANSION BENT DIAPHRAGM

BENT 3



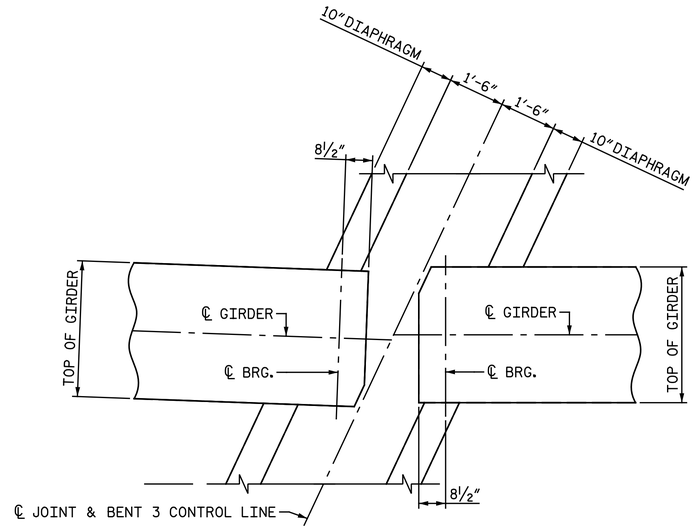
SECTION THRU CONTINUOUS BENT DIAPHRAGM

BENTS 1, 2, 4 & 5



PLAN AT END BENT DIAPHRAGM

END BENT 1 SHOWN, END BENT 2 SIMILAR



PLAN AT EXPANSION BENT DIAPHRAGM

BENT 3

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

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

RIGHT LANE

DRAWN BY : M. D. MAYHEW DATE : 2-8-18
CHECKED BY : B. J. BELL DATE : 4-17-18

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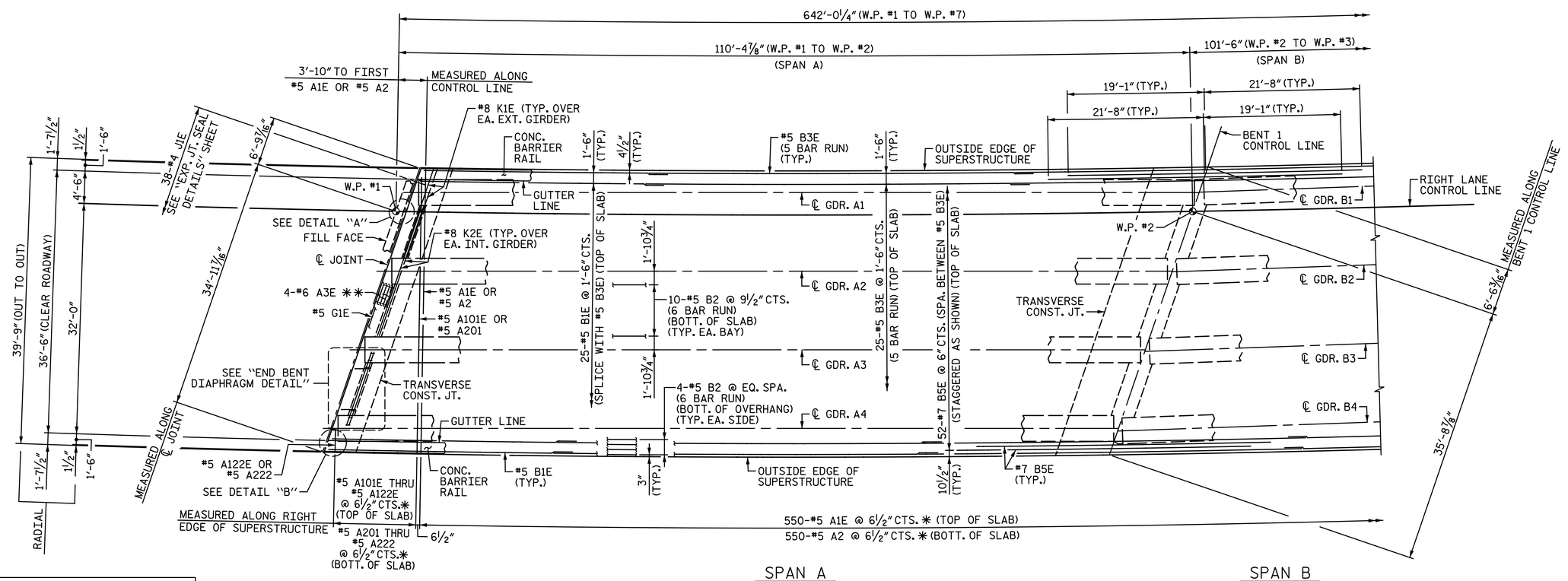
2			4			63



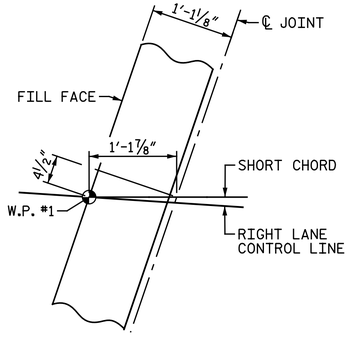
SPAN A

SPAN B

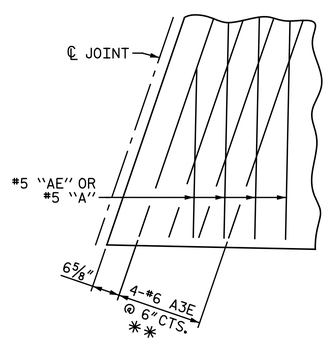
PARTIAL PLAN OF SPANS - UNIT 1

* BARS TO BE PLACED RADIALLY AS SHOWN

** #6 A3E BARS TO BE PLACED PARALLEL TO SKEW AND BELOW "BE" BARS

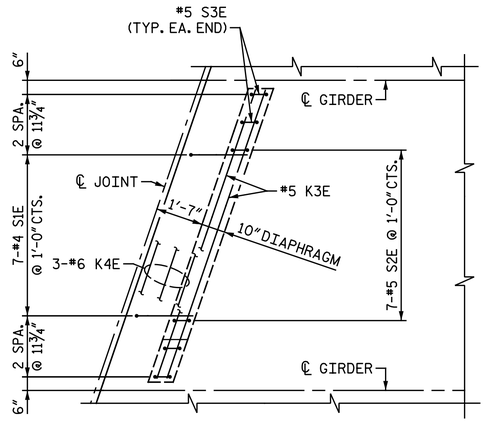


DETAIL "A"



DETAIL "B"

#5 G1E, "BE" BARS & "B" BARS NOT SHOWN FOR CLARITY



END BENT DIAPHRAGM DETAIL

#8 "KE" BARS NOT SHOWN FOR CLARITY (TYP. EA. BAY)

NOTES:

FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE 'CONCRETE DECK POUR DETAILS" SHEET.

FOR "TRANSVERSE CONSTRUCTION JOINT DETAIL", SEE "PLAN OF SPANS" SHEET 2 OF 6.

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#5	2'-6"	2'-2"

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 1 OF 6

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SUPERSTRUCTURE

PLAN OF SPANS

RIGHT LANE

DRAWN BY : M. D. MAYHEW DATE : 4-17-18

CHECKED BY : B. J. BELL DATE : 4-17-18

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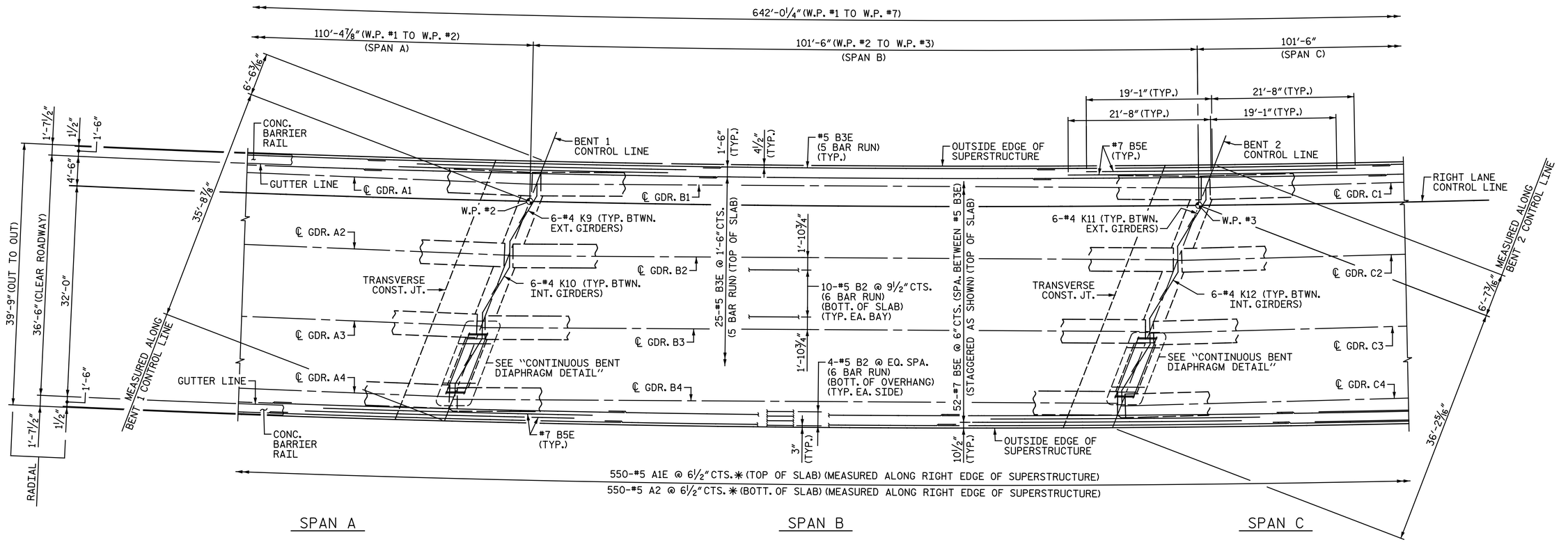
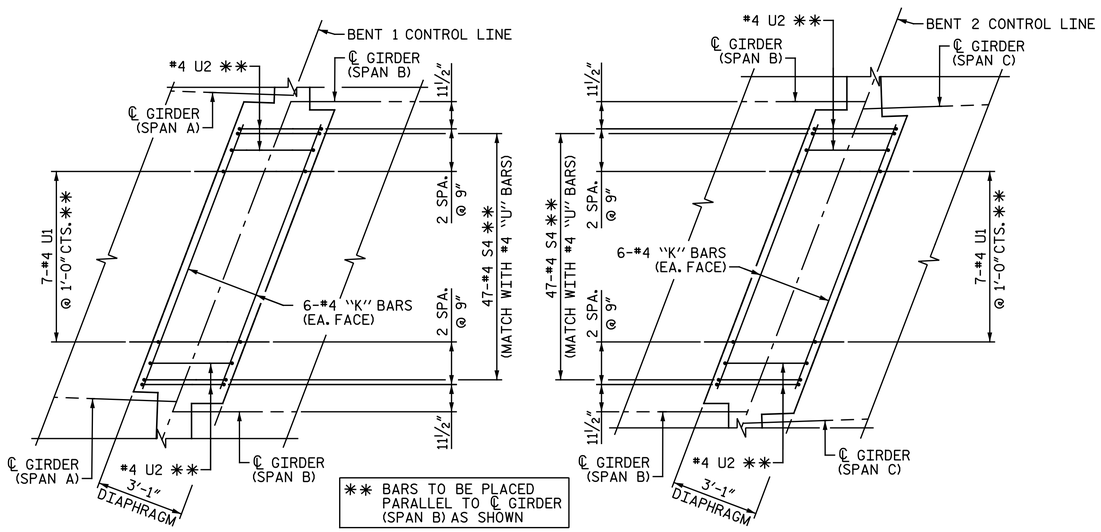


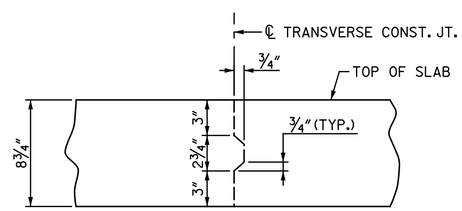
PARTIAL PLAN OF SPANS - UNIT 1

✱ BARS TO BE PLACED RADIALLY AS SHOWN



CONTINUOUS BENT DIAPHRAGM DETAIL

#4 "K" BARS ALONG CENTER OF DIAPHRAGM NOT SHOWN FOR CLARITY (TYP. EA. BAY)



TRANSVERSE CONST. JT. DETAIL

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

NOTES:

FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "CONCRETE DECK POUR DETAILS" SHEET.

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4 "K"	—	2'-5"
#5	2'-6"	2'-2"

PROJECT NO. U-2412A
GUILFORD COUNTY
STATION: 93+23.34 -L-
SHEET 2 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL
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PLAN OF SPANS

RIGHT LANE

DRAWN BY : M. D. MAYHEW DATE : 4-17-18
CHECKED BY : B. J. BELL DATE : 4-18-18

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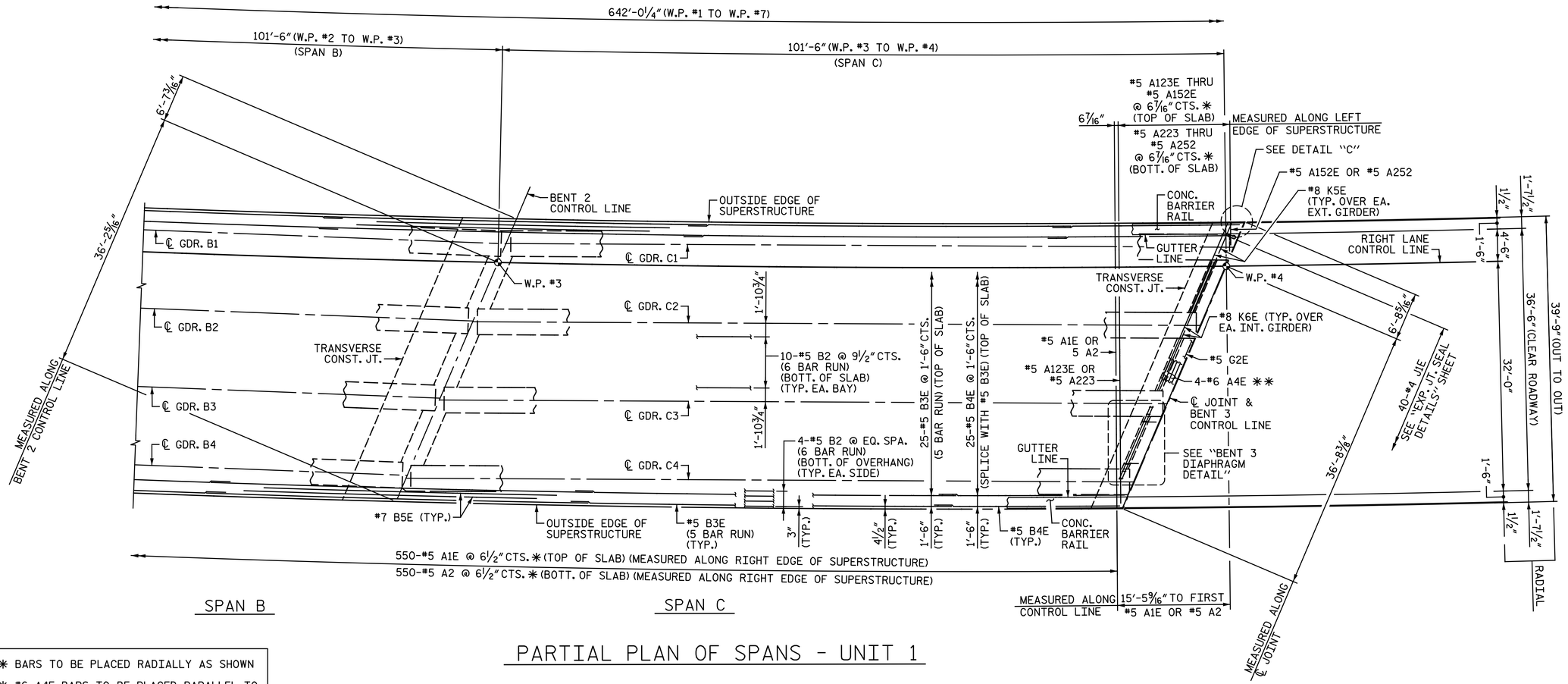
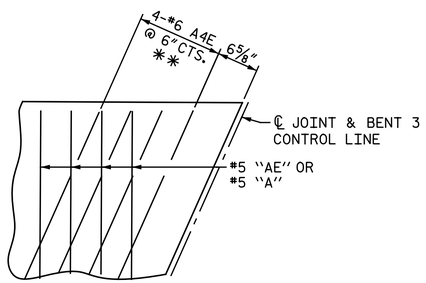


PARTIAL PLAN OF SPANS - UNIT 1

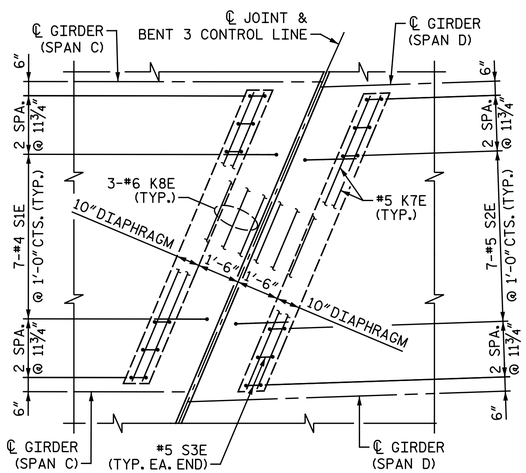
✱ BARS TO BE PLACED RADIALLY AS SHOWN

✱✱ #6 A4E BARS TO BE PLACED PARALLEL TO SKEW AND BELOW "BE" BARS



"DETAIL C"

#5 G2E, "BE" BARS & "B" BARS NOT SHOWN FOR CLARITY



BENT 3 DIAPHRAGM DETAIL

#8 "KE" BARS NOT SHOWN FOR CLARITY (TYP. EA. BAY)

NOTES:

FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "CONCRETE DECK POUR DETAILS" SHEET.

FOR "TRANSVERSE CONSTRUCTION JOINT DETAIL", SEE "PLAN OF SPANS" SHEET 2 OF 6.

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#5	2'-6"	2'-2"

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 3 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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SUPERSTRUCTURE

PLAN OF SPANS

RIGHT LANE

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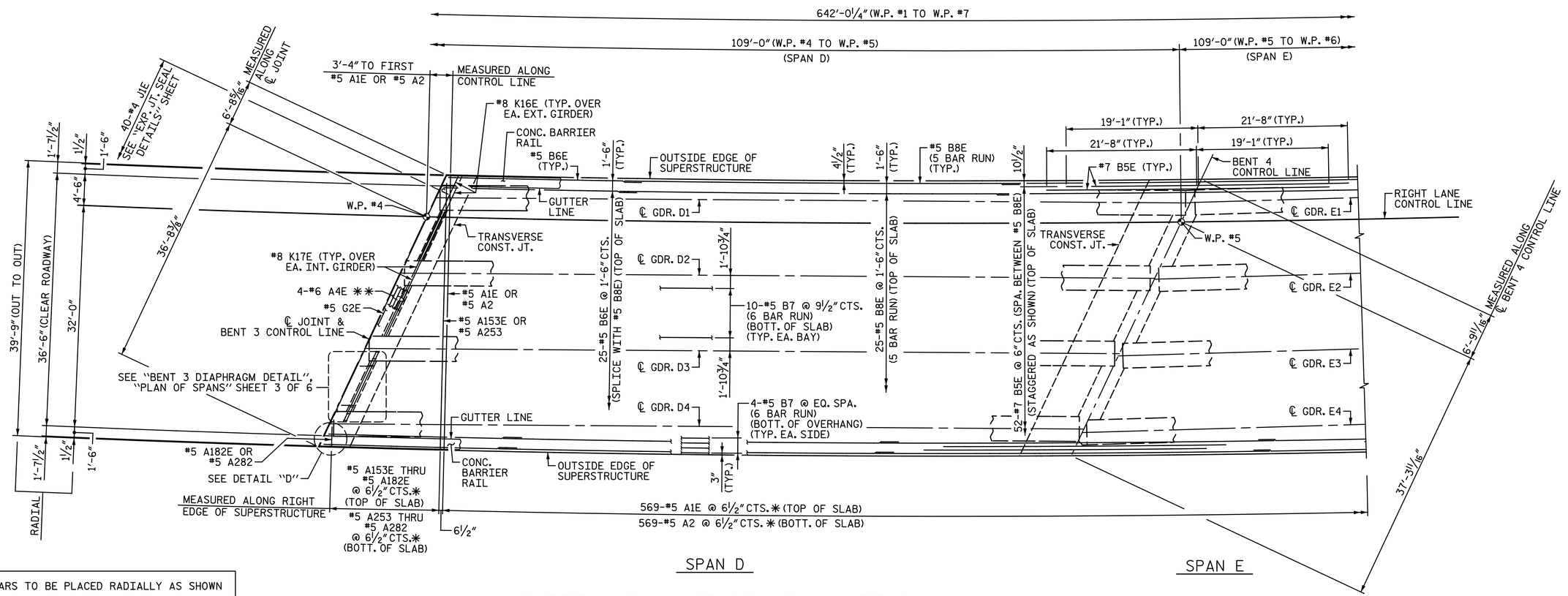
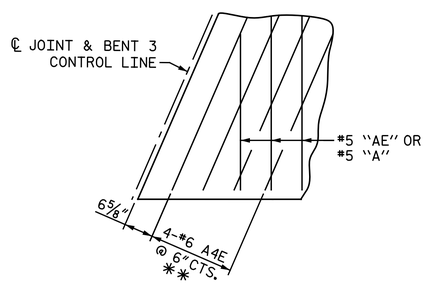


PARTIAL PLAN OF SPANS - UNIT 2

* BARS TO BE PLACED RADIALLY AS SHOWN

** #6 A4E BARS TO BE PLACED PARALLEL TO SKEW AND BELOW "BE" BARS



DETAIL "D"

*5 G2E, "BE" BARS & "B" BARS NOT SHOWN FOR CLARITY

NOTES:

FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "CONCRETE DECK POUR DETAILS" SHEET.

FOR "TRANSVERSE CONSTRUCTION JOINT DETAIL", SEE "PLAN OF SPANS" SHEET 2 OF 6.

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
*5	2'-6"	2'-2"

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 4 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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RIGHT LANE

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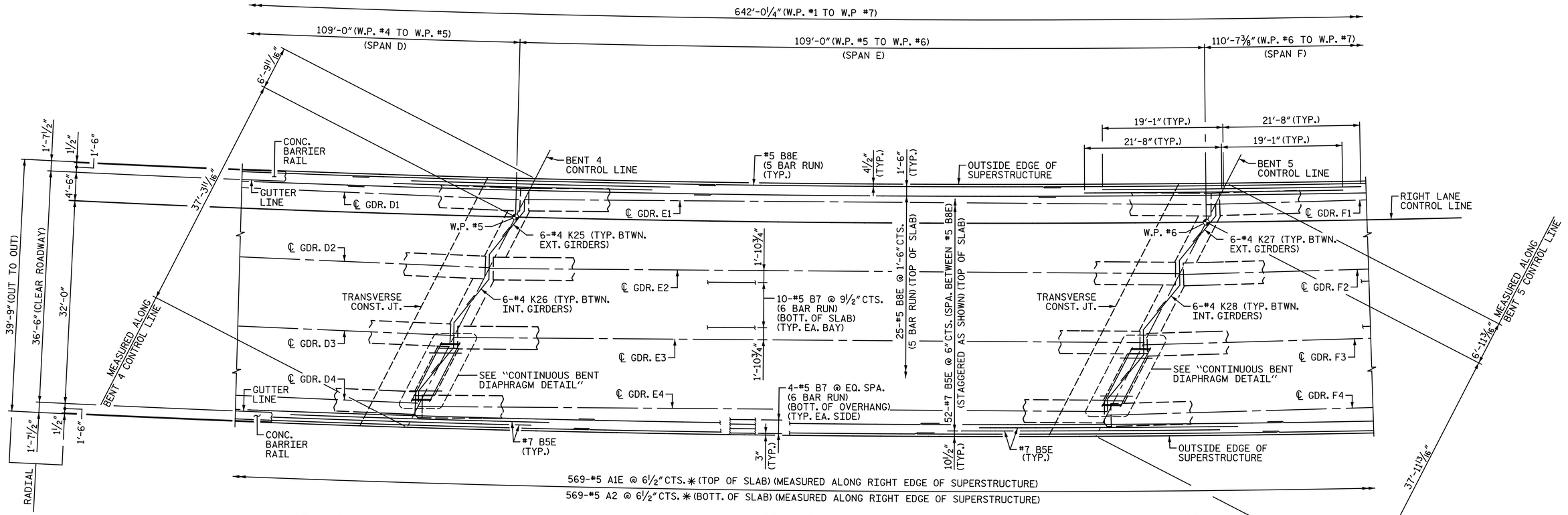
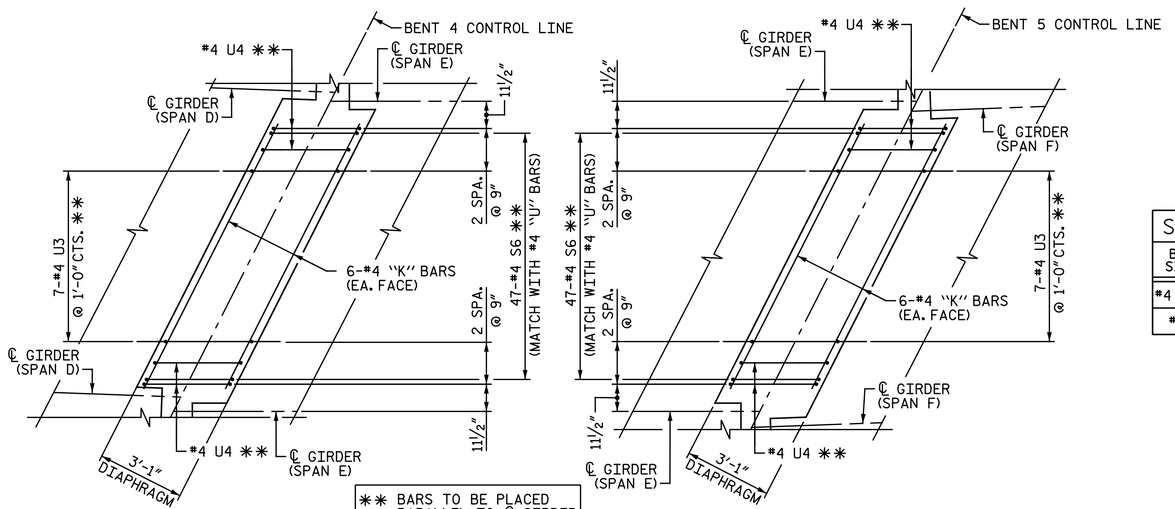


* BARS TO BE PLACED RADIALLY AS SHOWN

PARTIAL PLAN OF SPANS - UNIT 2



** BARS TO BE PLACED PARALLEL TO ℄ GIRDER (SPAN E) AS SHOWN

CONTINUOUS BENT DIAPHRAGM DETAIL

#4 "K" BARS ALONG CENTER OF DIAPHRAGM NOT SHOWN FOR CLARITY (TYP. EA. BAY)

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4 "K"	—	2'-5"
#5	2'-6"	2'-2"

NOTES:

FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "CONCRETE DECK POUR DETAILS" SHEET.

FOR "TRANSVERSE CONSTRUCTION JOINT DETAIL", SEE "PLAN OF SPANS" SHEET 2 OF 6.

PROJECT NO. U-2412A
GUILFORD COUNTY
STATION: 93+23.34 -L-

SHEET 5 OF 6

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PLAN OF SPANS

RIGHT LANE

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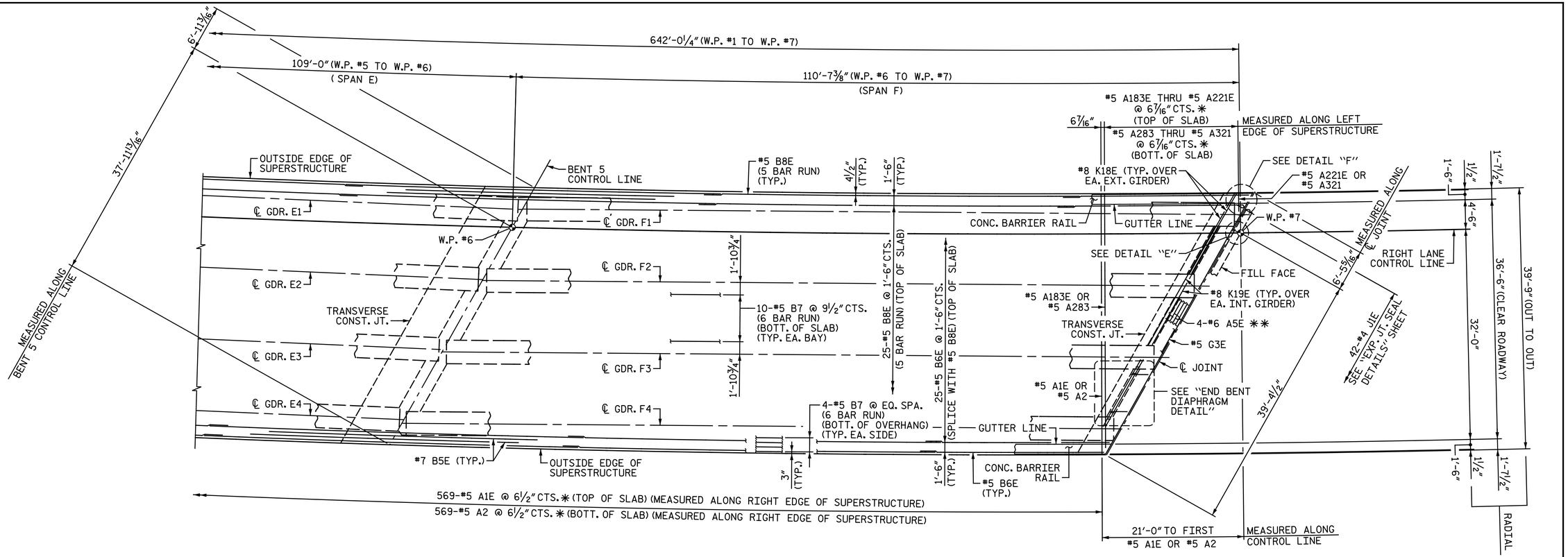


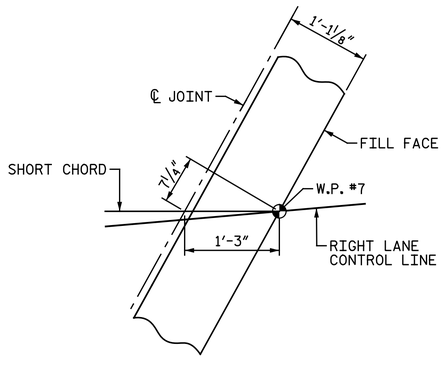
SPAN E

SPAN F

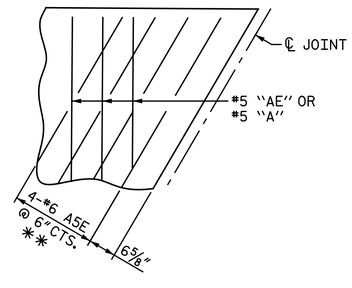
PARTIAL PLAN OF SPANS - UNIT 2

✳ BARS TO BE PLACED RADIALLY AS SHOWN

✳✳ #6 A5E BARS TO BE PLACED PARALLEL TO SKEW AND BELOW "BE" BARS

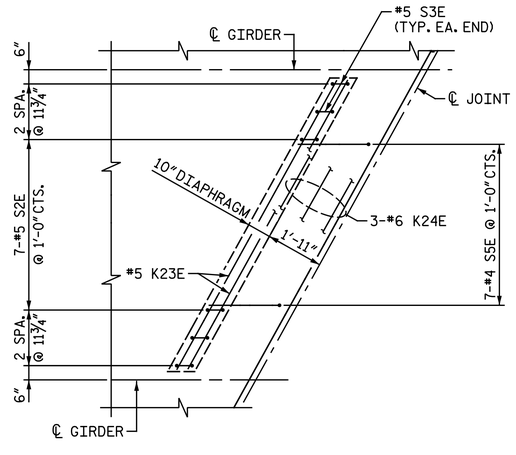


DETAIL "E"



DETAIL "F"

#5 G3E, "BE" BARS & "B" BARS NOT SHOWN FOR CLARITY



END BENT DIAPHRAGM DETAIL

#8 "KE" BARS NOT SHOWN FOR CLARITY (TYP. EA. BAY)

NOTES:

FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "CONCRETE DECK POUR DETAILS" SHEET.

FOR "TRANSVERSE CONSTRUCTION JOINT DETAIL", SEE "PLAN OF SPANS" SHEET 2 OF 6.

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#5	2'-6"	2'-2"

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 6 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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PLAN OF SPANS

RIGHT LANE

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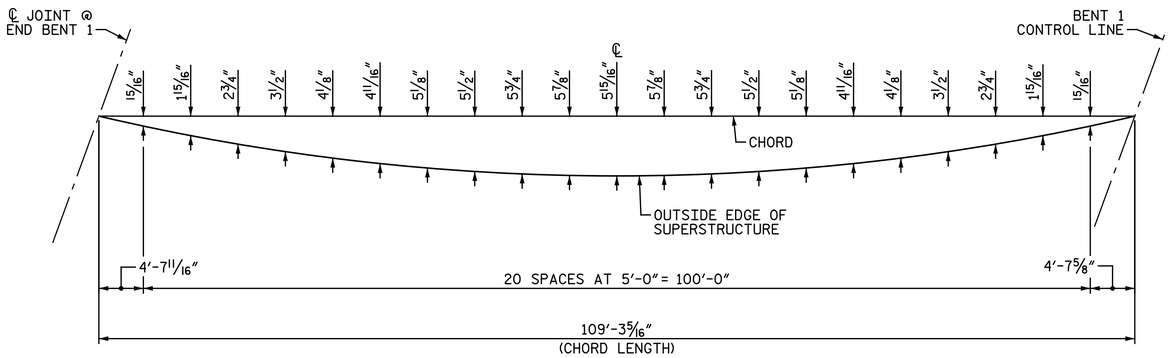
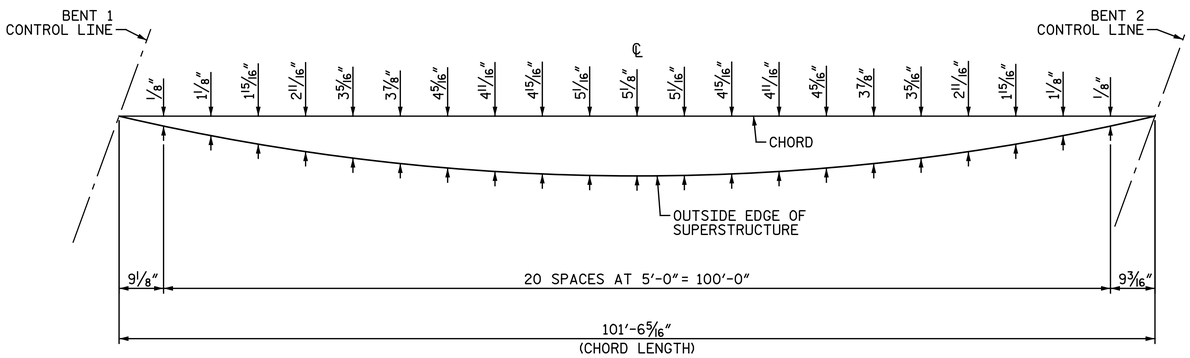
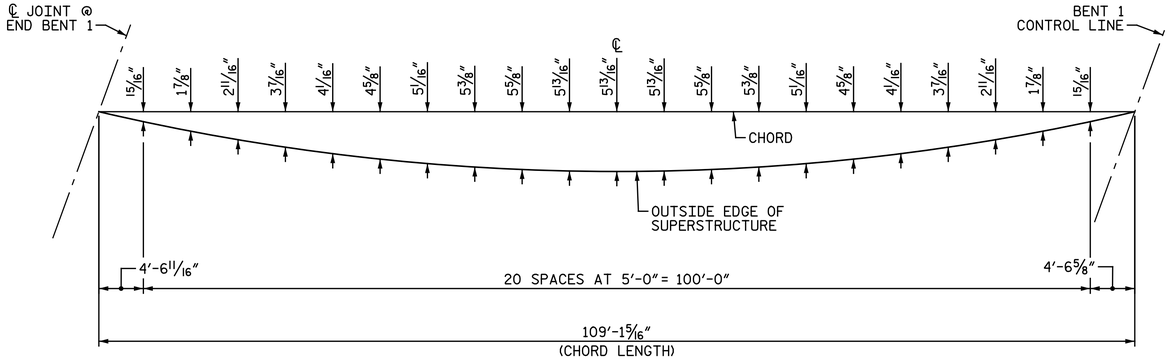


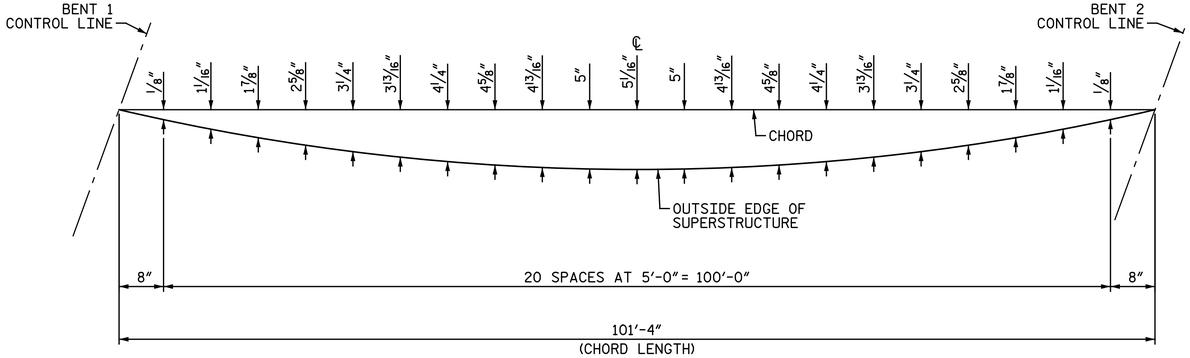
LEFT SIDE SPAN A



LEFT SIDE SPAN B



RIGHT SIDE SPAN A



RIGHT SIDE SPAN B

ARC OFFSETS - SPANS A AND B

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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ARC OFFSETS

RIGHT LANE

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2			4			63

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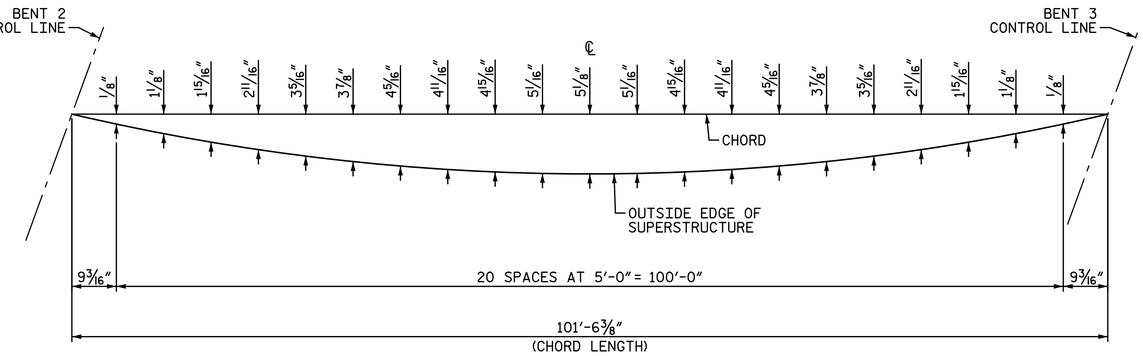
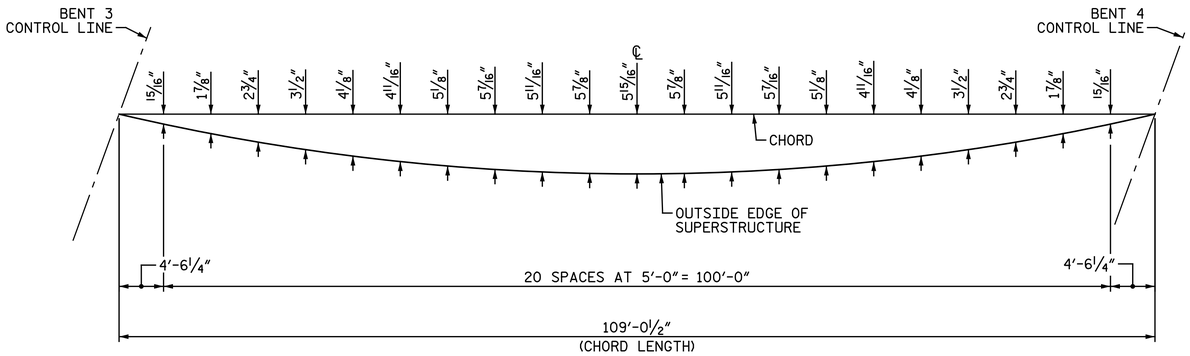
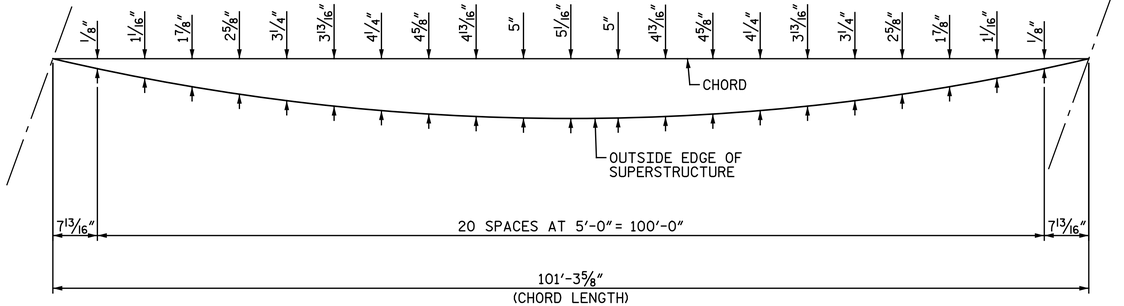
CHECKED BY : B. J. BELL DATE : 2-7-18



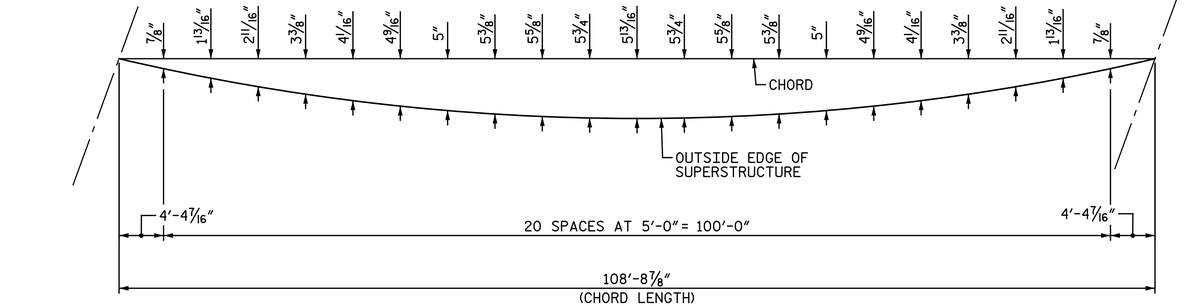
LEFT SIDE SPAN C



LEFT SIDE SPAN D



RIGHT SIDE SPAN C



RIGHT SIDE SPAN D

ARC OFFSETS - SPANS C AND D

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

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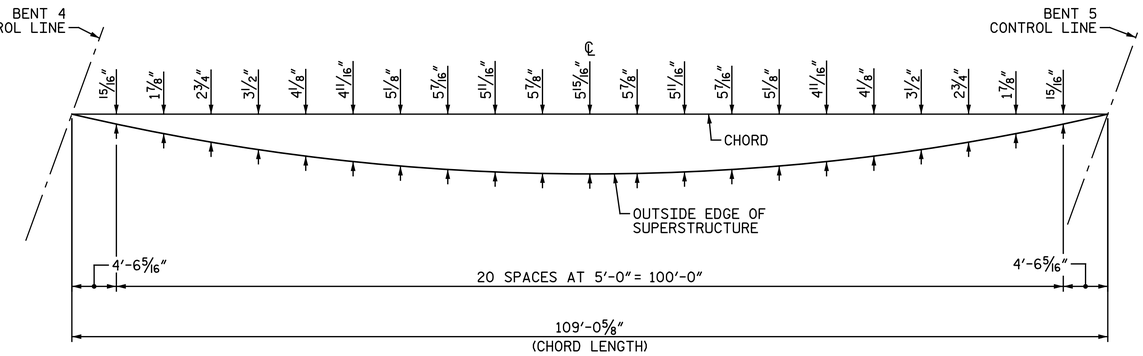
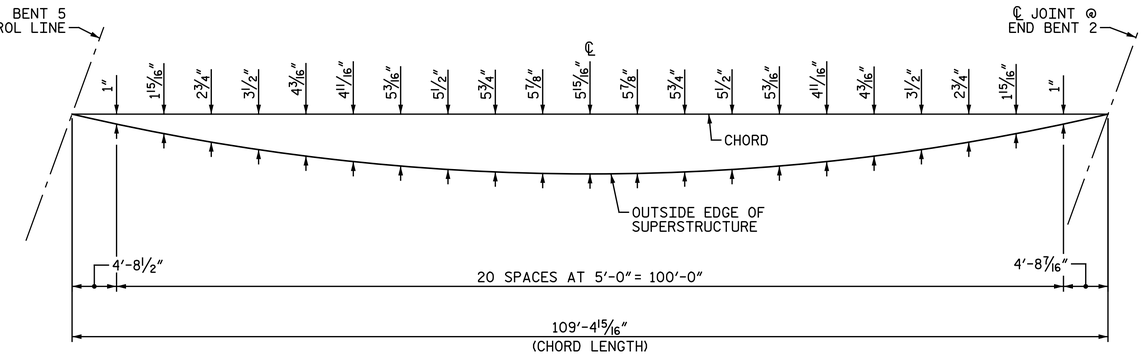
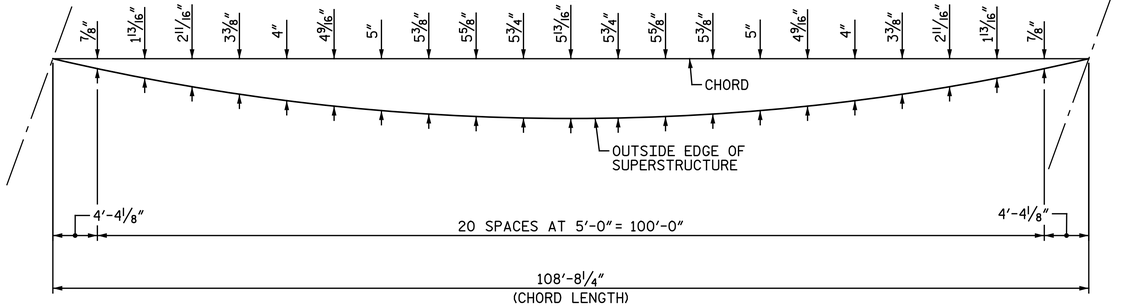
DRAWN BY : C. E. MAYHEW DATE : 1-11-18
CHECKED BY : B. J. BELL DATE : 2-7-18



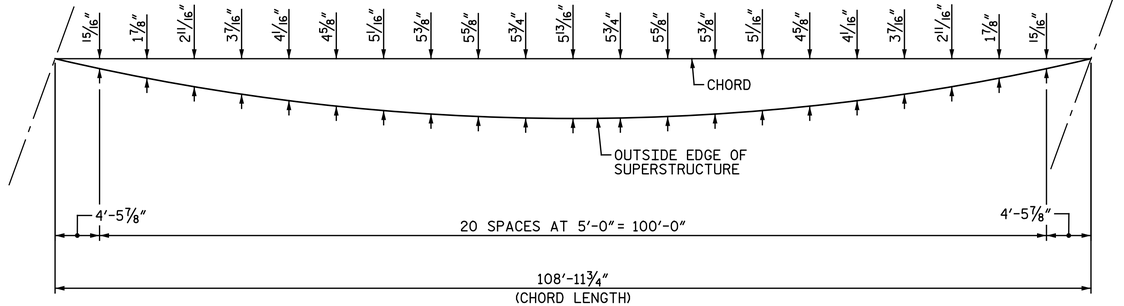
LEFT SIDE SPAN E



LEFT SIDE SPAN F



RIGHT SIDE SPAN E



RIGHT SIDE SPAN F

ARC OFFSETS - SPANS E AND F

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018
C41A3F8ECA3C434...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

ARC OFFSETS

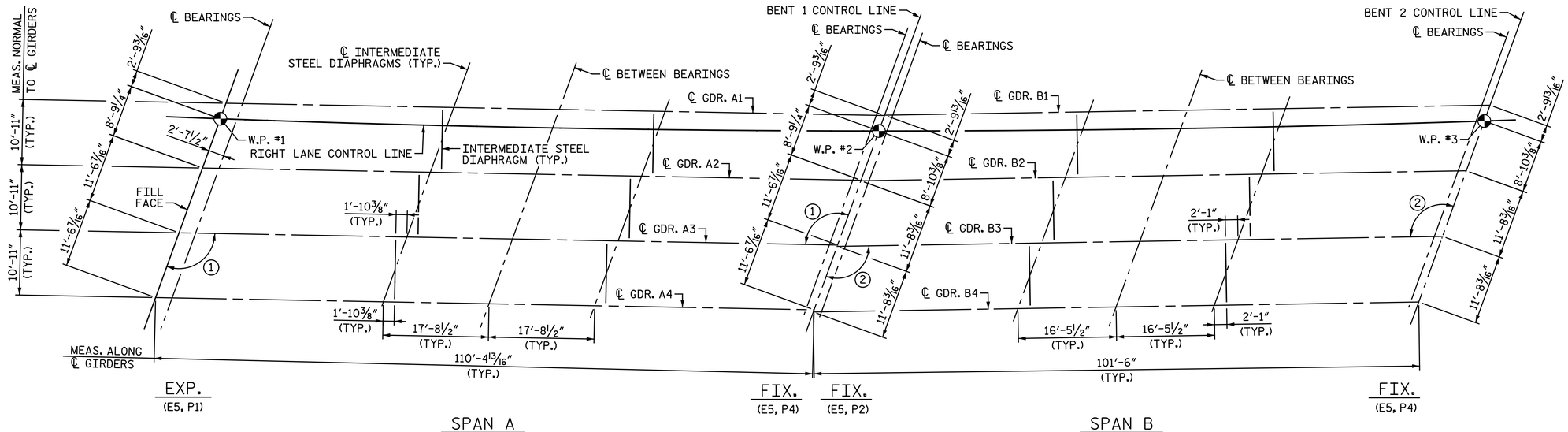
RIGHT LANE

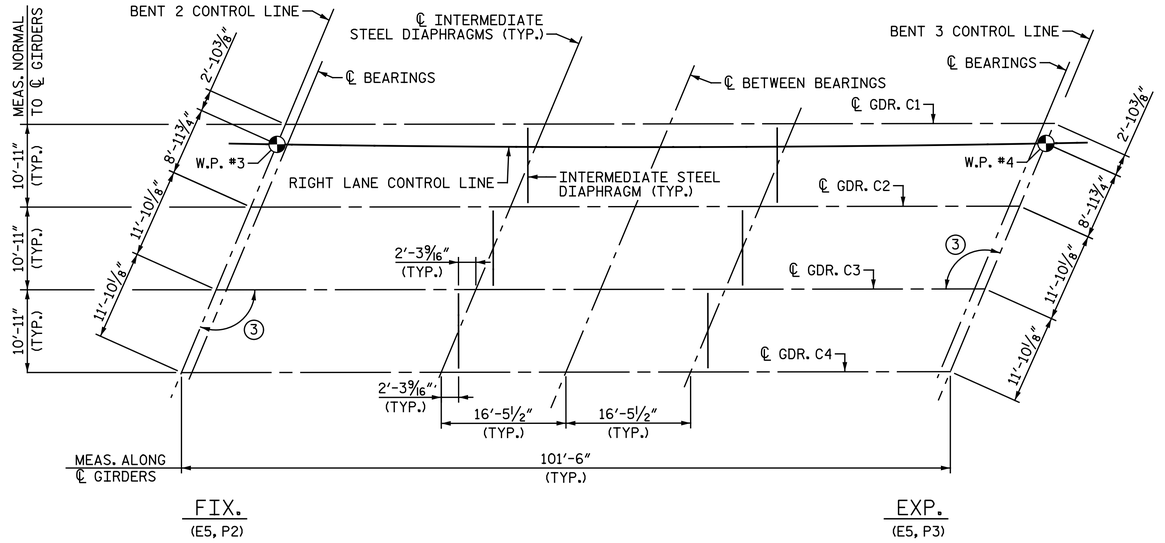
Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-19
1			3			TOTAL SHEETS
2			4			63

DRAWN BY : C. E. MAYHEW DATE : 1-11-18
CHECKED BY : B. J. BELL DATE : 2-7-18





GIRDER LAYOUT - UNIT 1

GIRDER ANGLES	
①	108°-51′-59″
②	110°-52′-28″
③	112°-47′-54″

NOTE:

FOR INTERMEDIATE STEEL DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.

GIRDERS ARE PARALLEL TO SPAN SHORT CHORDS.

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8ECA3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

GIRDER LAYOUT
UNIT 1

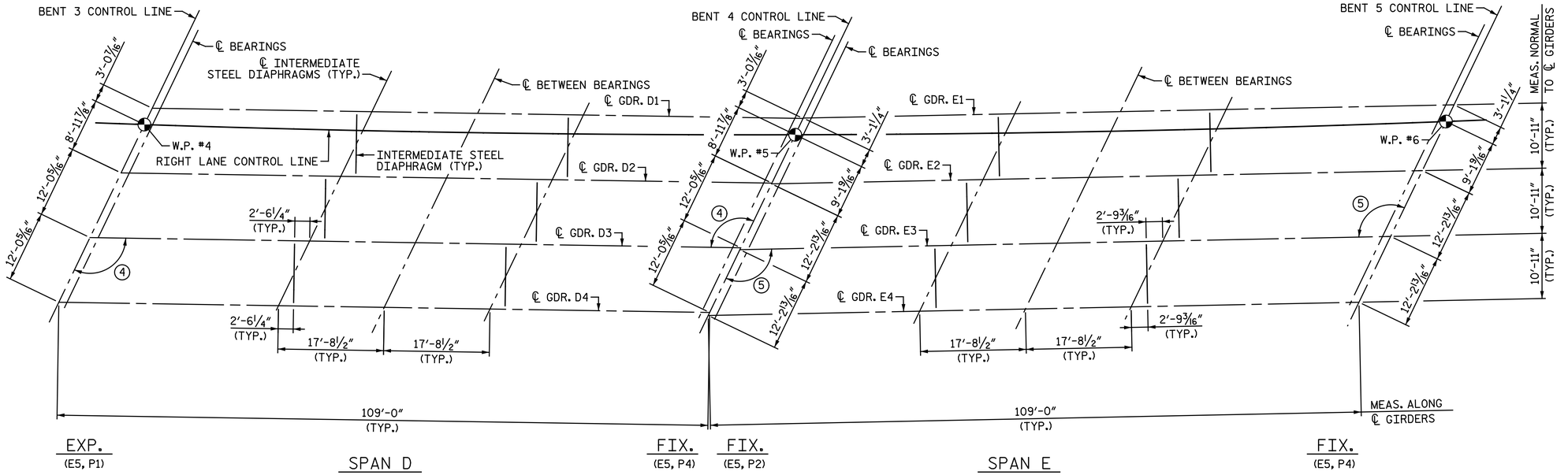
RIGHT LANE

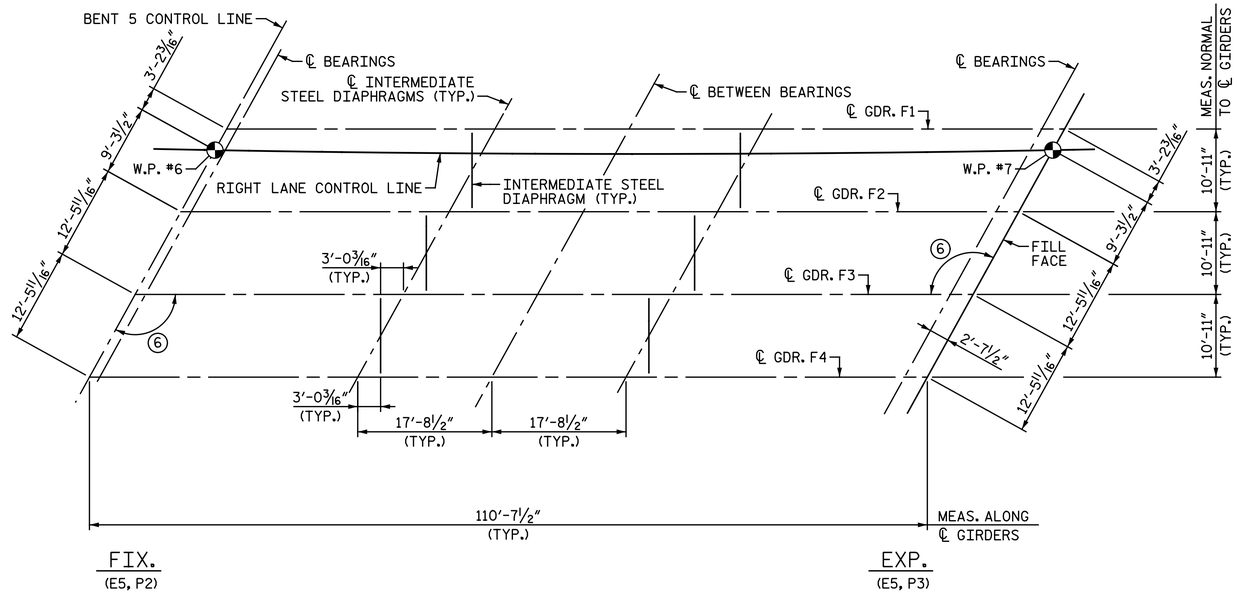
Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-20
1			3			TOTAL SHEETS
2			4			63

DRAWN BY : M. D. MAYHEW DATE : 2-7-18
CHECKED BY : T.M. GARRISON DATE : 2-15-18





GIRDER ANGLES	
④	114°-47'-35"
⑤	116°-51'-33"
⑥	118°-56'-25"

NOTE:

FOR INTERMEDIATE STEEL DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.

GIRDERS ARE PARALLEL TO SPAN SHORT CHORDS.

GIRDER LAYOUT - UNIT 2

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

GIRDER LAYOUT
UNIT 2

RIGHT LANE

Michael Baker INTERNATIONAL

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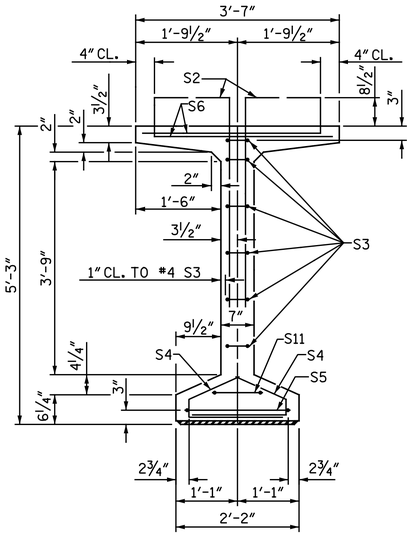
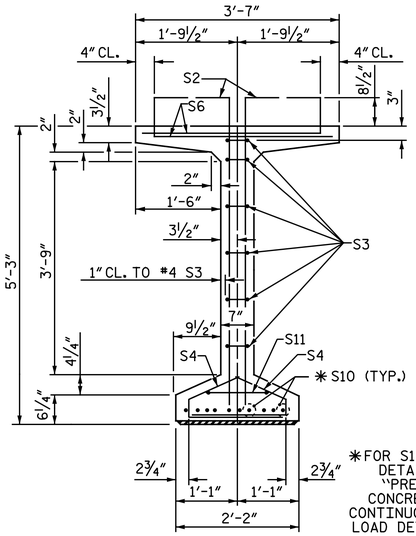
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-21
1			3			TOTAL SHEETS
2			4			63

DRAWN BY : M. D. MAYHEW DATE : 1-7-18
CHECKED BY : T. M. GARRISON DATE : 2-15-18

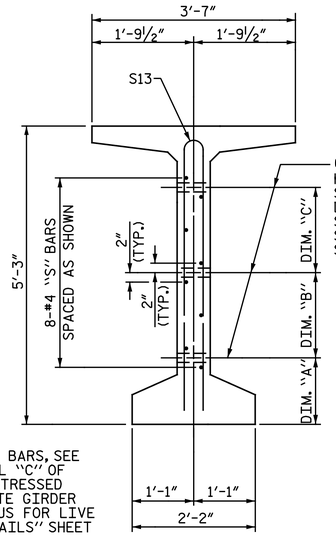


SECTION A-A



SECTION B-B

✱FOR S10 BARS, SEE DETAIL "C" OF "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET

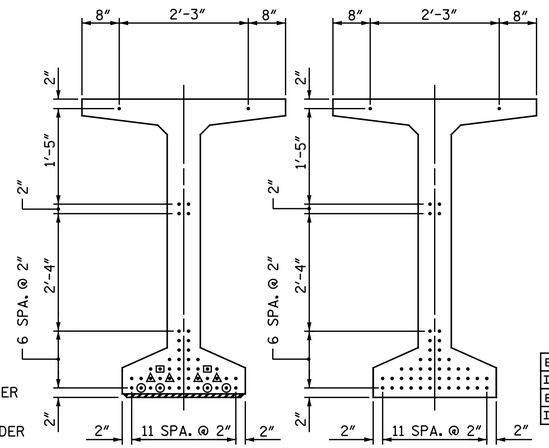


SECTION C-C

(S1 AND S9 BARS NOT SHOWN)

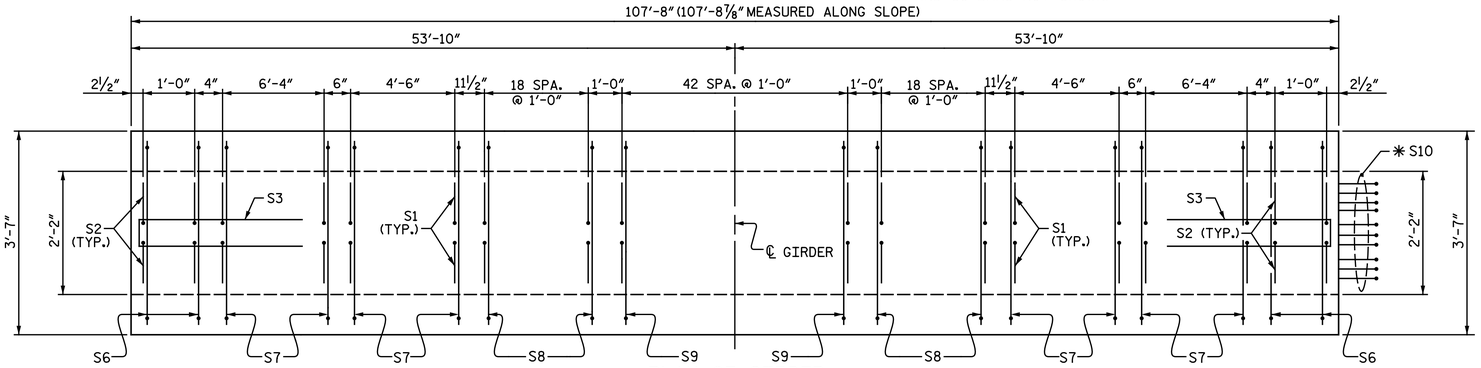
DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 6′-0″ FROM END OF GIRDER
- ▲ STRANDS DEBONDED FOR 10′-0″ FROM END OF GIRDER
- ◉ STRANDS DEBONDED FOR 14′-0″ FROM END OF GIRDER

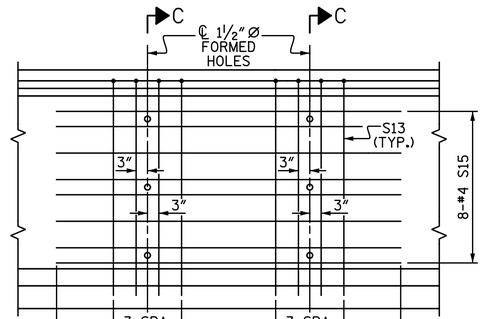


AT END OF GIRDER AT ℄ OF GIRDER

0.6″Ø LOW RELAXATION STRAND LAYOUT

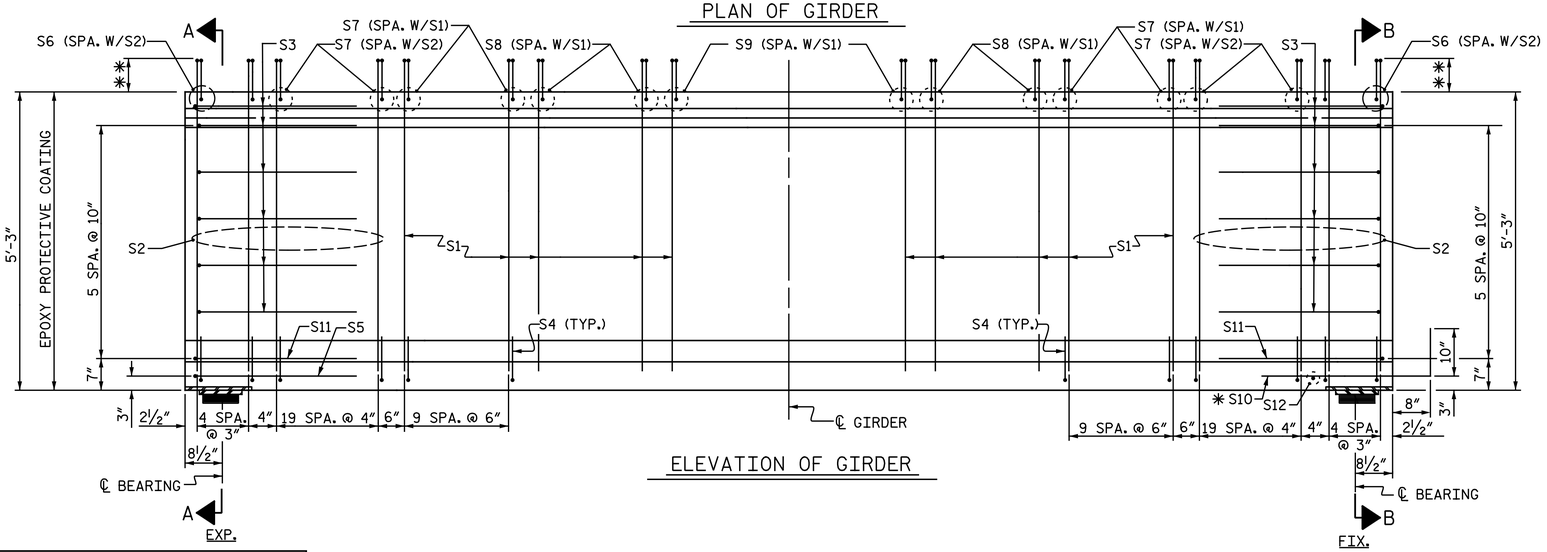


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR INTERIOR GIRDERS. (SEE SHEET 2 OF 6 FOR EXTERIOR GIRDER DETAILS)



ELEVATION OF GIRDER

✱✱BAR PROJECTION	
S6	8½″
S7	7½″
S8	6½″
S9	6″

0.6″Ø L. R. GRADE 270 STRANDS

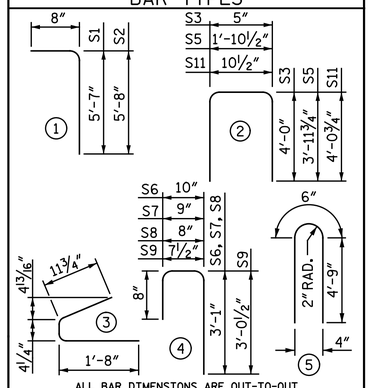
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	202	#4	1	6′-3″	843
	S2	100	#5	1	6′-4″	661
	S3	12	#4	2	8′-5″	67
	S4	140	#4	3	3′-0″	281
	S5	1	#5	2	9′-10″	10
	S6	20	#5	4	4′-7″	96
	S7	120	#5	4	4′-6″	563
	S8	76	#5	4	4′-5″	350
	S9	86	#5	4	4′-4″	389
	✱S10	10	#5	STR.	3′-8″	38
	S11	2	#5	2	9′-0″	19
	S12	1	#3	STR.	1′-10″	1
EXTERIOR GDR.	S13	8	#5	5	10′-0″	83
INTERIOR GDR.	S13	16	#5	5	10′-0″	167
EXTERIOR GDR.	S14	16	#4	STR.	8′-0″	86
INTERIOR GDR.	S15	16	#4	STR.	14′-2″	151

✱NOTE: S10 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	10,000 PSI CONCRETE	0.6″Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	3,487	21.3	48
INTERIOR GIRDER	3,636	21.3	48

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	107.74′	430.96′

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 1 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

63″ PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN A RIGHT LANE

ASSEMBLED BY : N.B. SPEAKS	DATE : 3-30-18		
CHECKED BY : B.J. BELL	DATE : 4-11-18		
DRAWN BY : EEM 2/6/97	REV. 6/13	MAA/GM	
CHECKED BY : VAP 2/6/97	REV. 1/15	MAA/TMG	
	REV. 12/17	MAA/THC	

Michael Baker INTERNATIONAL

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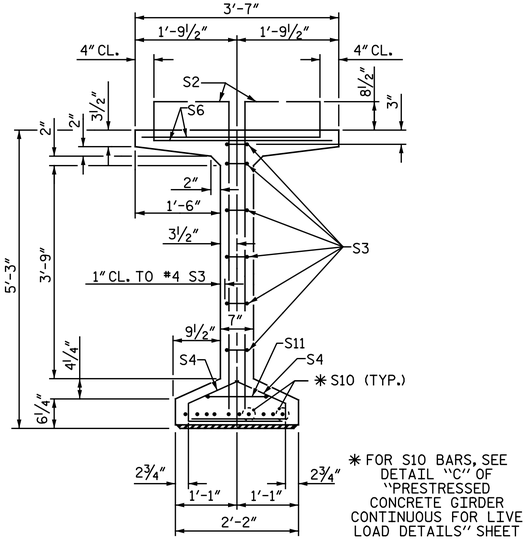
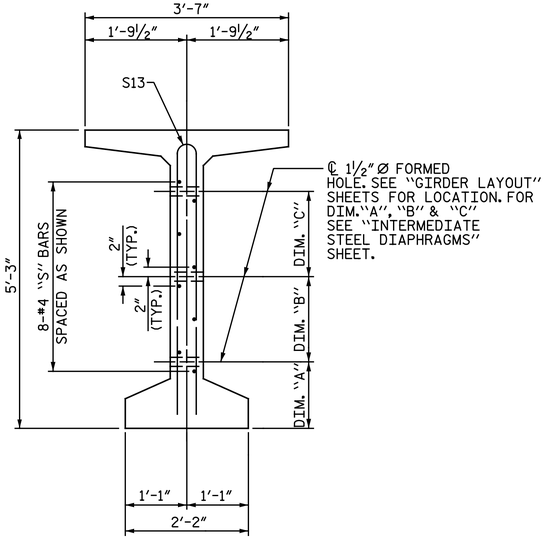
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-22
1			3			TOTAL SHEETS
2			4			63

STD. NO. PCG7



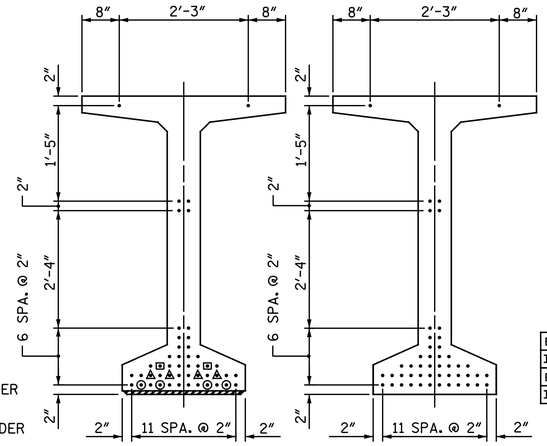
✱ FOR S10 BARS, SEE DETAIL "C" OF "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET

SECTION B-B



SECTION C-C

(S1 AND S9 BARS NOT SHOWN)



AT END OF GIRDER AT ℄ OF GIRDER

0.6″Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 6′-0″ FROM END OF GIRDER
- ▲ STRANDS DEBONDED FOR 10′-0″ FROM END OF GIRDER
- ◉ STRANDS DEBONDED FOR 14′-0″ FROM END OF GIRDER

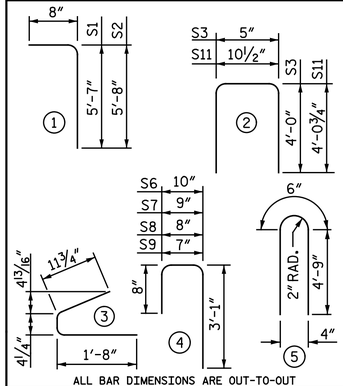
0.6″Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	190	#4	1	6′-3″	793
	S2	92	#5	1	6′-4″	608
	S3	12	#4	2	8′-5″	67
	S4	132	#4	3	3′-0″	265
	S6	20	#5	4	4′-7″	96
	S7	112	#5	4	4′-6″	526
	S8	44	#5	4	4′-5″	203
	S9	106	#5	4	4′-4″	479
	✱S10	20	#5	STR.	3′-8″	76
	S11	2	#5	2	9′-0″	19
	S12	2	#3	STR.	1′-10″	1
EXTERIOR GDR.	S13	8	#5	5	10′-0″	83
INTERIOR GDR.	S13	16	#5	5	10′-0″	167
EXTERIOR GDR.	S14	16	#4	STR.	8′-0″	86
INTERIOR GDR.	S15	16	#4	STR.	14′-2″	151

✱NOTE: S10 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

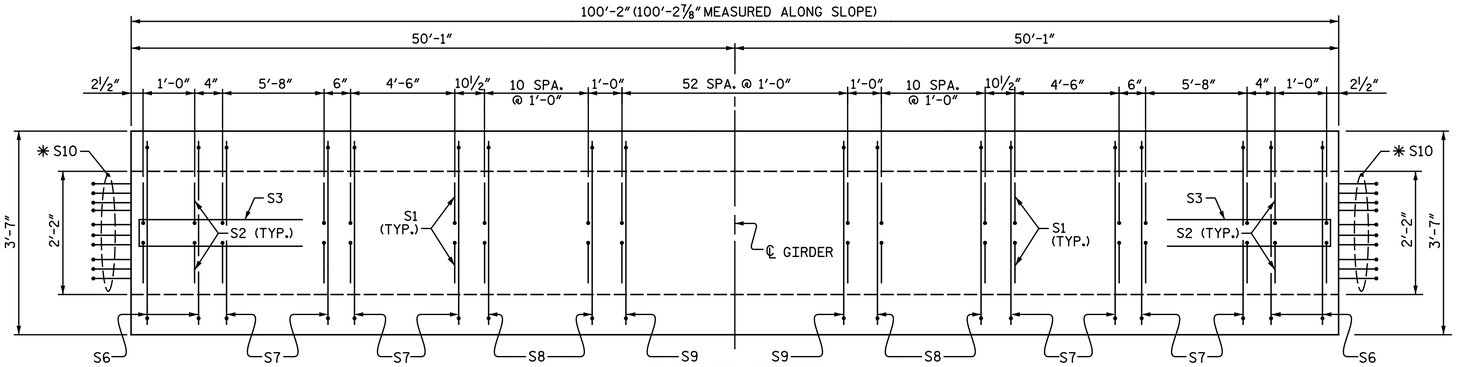
QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	10,000 PSI CONCRETE	0.6″Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	3,302	19.9	48
INTERIOR GIRDER	3,451	19.9	48

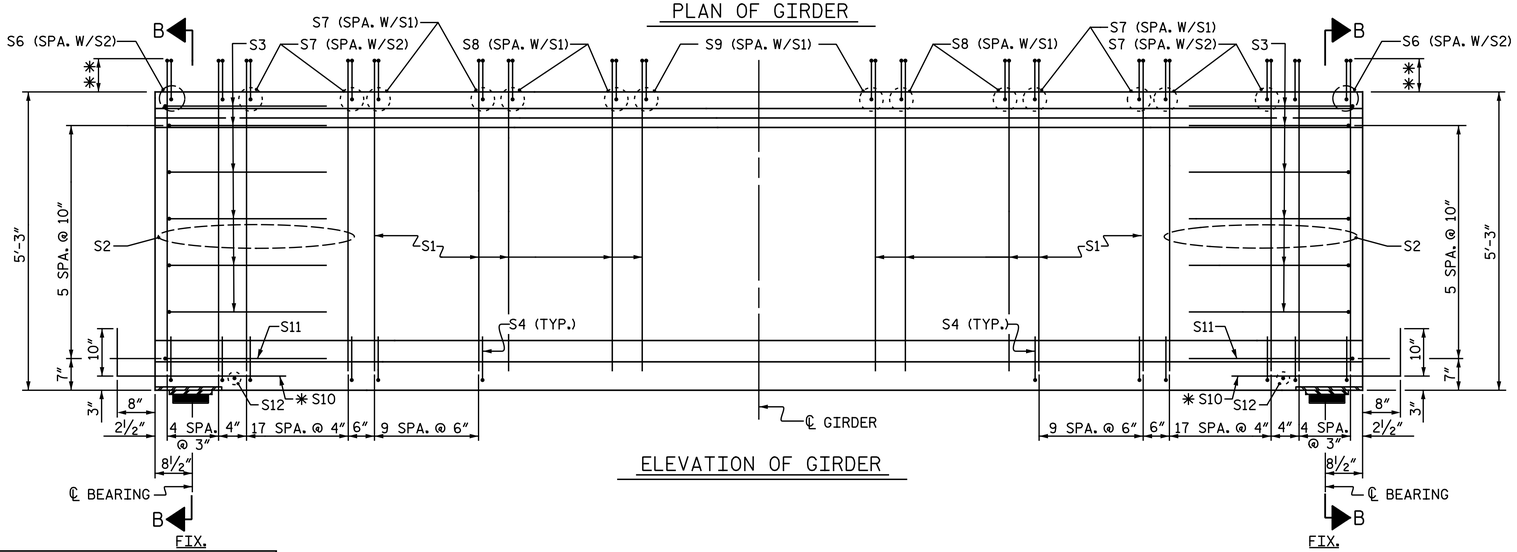
GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	100.24′	400.96′

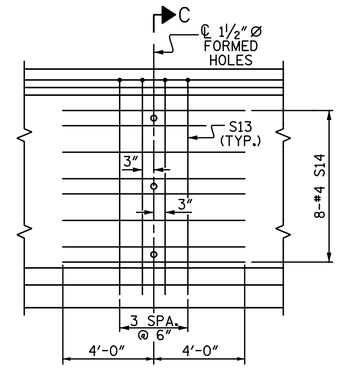
100′-2″ (100′-2⅞″ MEASURED ALONG SLOPE)



PLAN OF GIRDER



ELEVATION OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR EXTERIOR GIRDERS. (SEE SHEET 1 OF 6 FOR INTERIOR GIRDER DETAILS)

✱✱BAR PROJECTION	
S6	8½″
S7	7½″
S8	6½″
S9	5½″

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

63″ PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN B RIGHT LANE

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8EC43C434...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

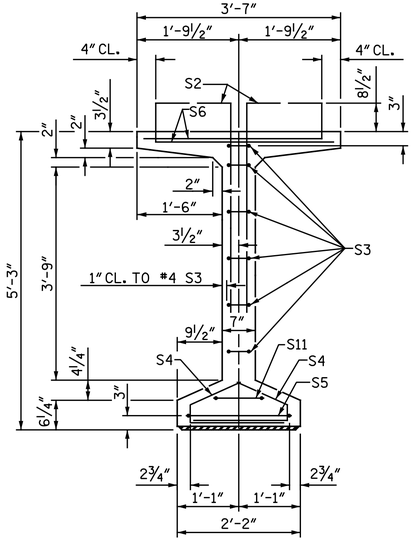
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S2-23

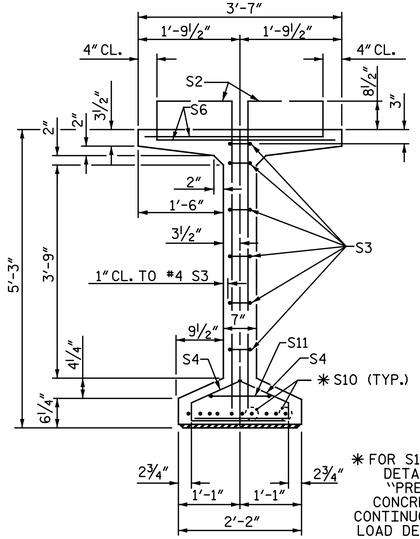
TOTAL SHEETS 63

ASSEMBLED BY : N.B. SPEAKS		DATE : 3-30-18
CHECKED BY : B.J. BELL		DATE : 4-11-18
DRAWN BY : EEM 2/6/97	REV. 6/13	MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15	MAA/TMG
	REV. 12/17	MAA/THC

STD. NO. PCG7

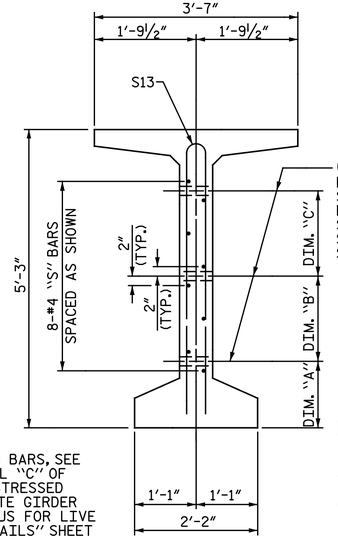


SECTION A-A



SECTION B-B

✳ FOR S10 BARS, SEE DETAIL "C" OF "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET



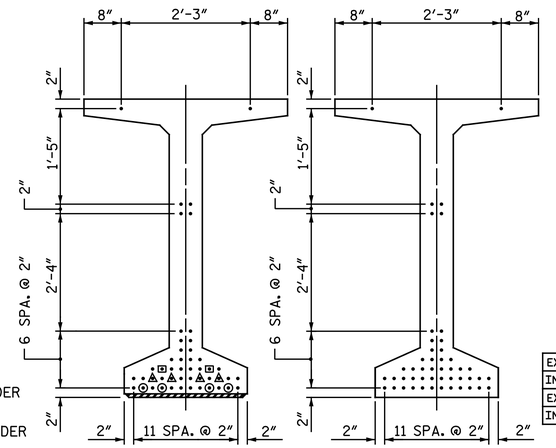
SECTION C-C

(S1 AND S9 BARS NOT SHOWN)

(SEE SHEET 1 OF 6 & 2 OF 6 FOR SECTION CUT LOCATION)

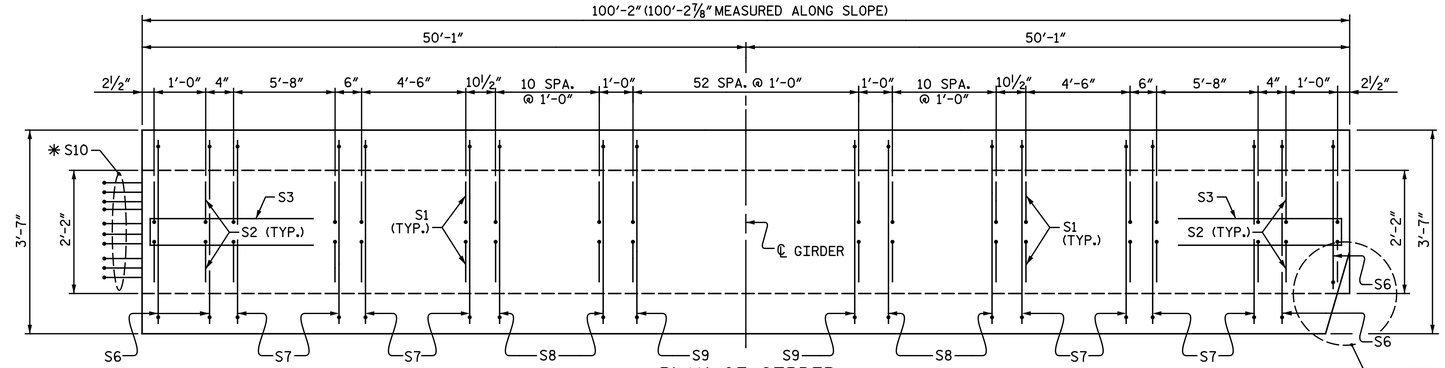
DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 6′-0″ FROM END OF GIRDER
- ◭ STRANDS DEBONDED FOR 10′-0″ FROM END OF GIRDER
- ◉ STRANDS DEBONDED FOR 14′-0″ FROM END OF GIRDER

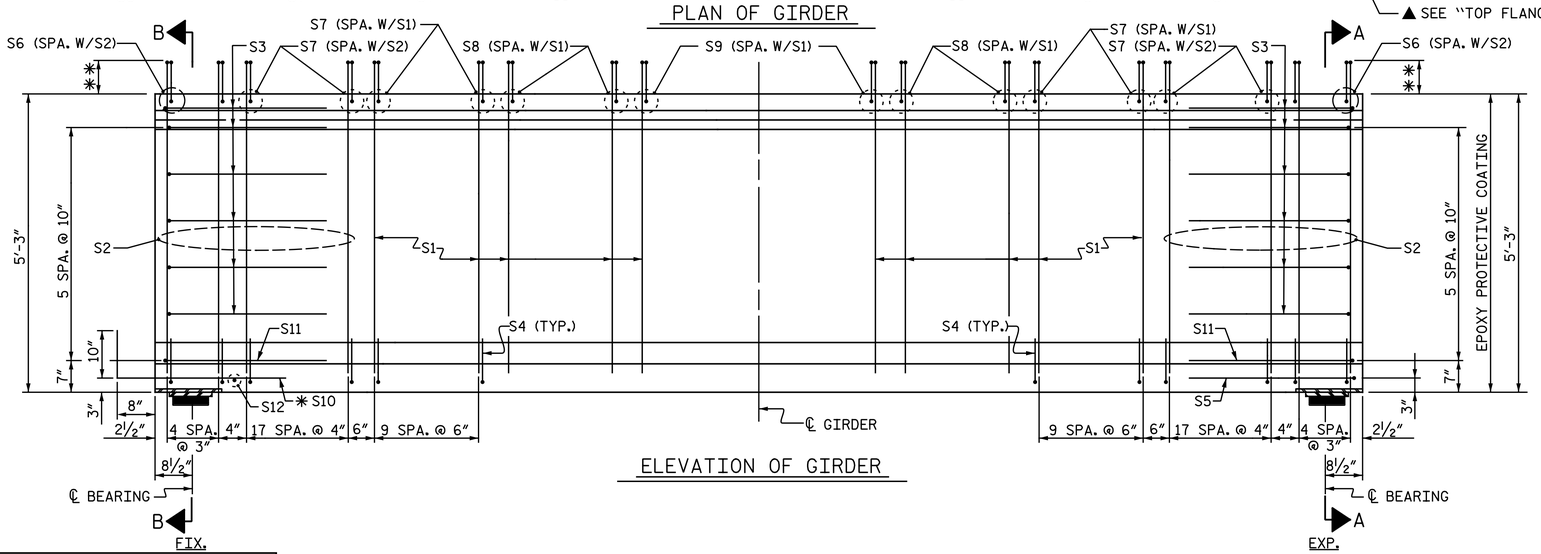


AT END OF GIRDER AT ℄ OF GIRDER

0.6″Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

✳✳BAR PROJECTION	
S6	8½″
S7	7½″
S8	6½″
S9	5½″

TOP FLANGE CLIP DETAIL

▲ HORIZONTAL LEG OF FIRST S6 BARS CAN BE TRIMMED TO FIT

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	190	#4	1	6′-3″	793
	S2	92	#5	1	6′-4″	608
	S3	12	#4	2	8′-5″	67
	S4	132	#4	3	3′-0″	265
	S5	1	#5	2	9′-10″	10
	S6	20	#5	4	4′-7″	96
	S7	112	#5	4	4′-6″	526
	S8	44	#5	4	4′-5″	203
	S9	106	#5	4	4′-4″	479
	✳S10	10	#5	STR.	3′-8″	38
	S11	2	#5	2	9′-0″	19
	S12	1	#3	STR.	1′-10″	1
EXTERIOR GDR.	S13	8	#5	5	10′-0″	83
INTERIOR GDR.	S13	16	#5	5	10′-0″	167
EXTERIOR GDR.	S14	16	#4	STR.	8′-0″	86
INTERIOR GDR.	S15	16	#4	STR.	14′-2″	151

✳NOTE: S10 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL (LB.)	10,000 PSI CONCRETE (C.Y.)	0.6″Ø L.R. STRANDS (No.)
EXTERIOR GIRDER	3,274	19.9	48
INTERIOR GIRDER	3,423	19.9	48

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	100.24′	400.96′

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 3 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8EC43C434...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

63″ PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN C RIGHT LANE

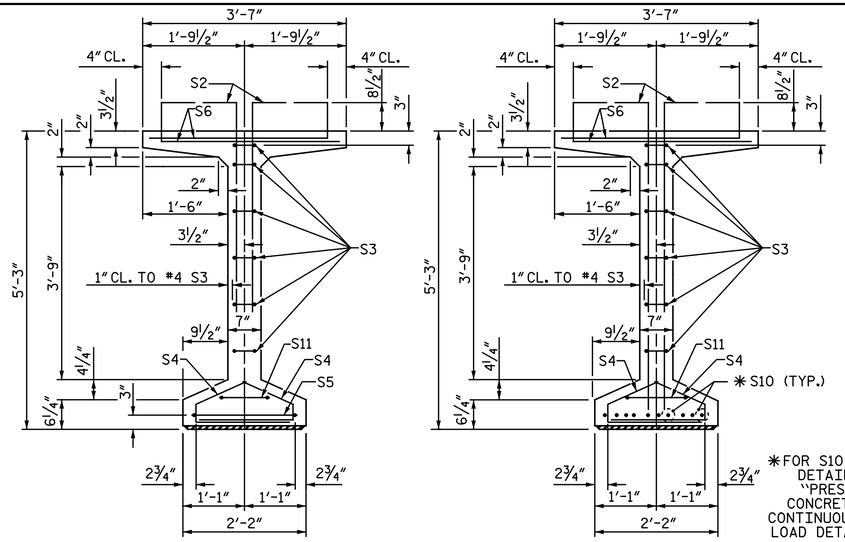
Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-24
1			3			TOTAL SHEETS
2			4			63

STD. NO. PCG7

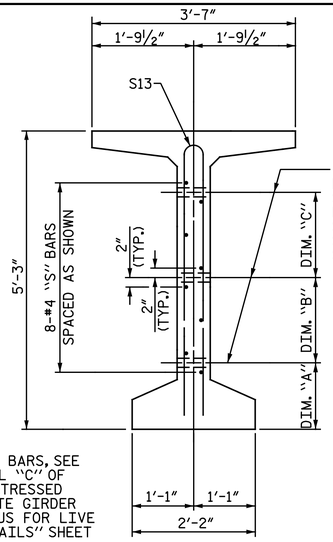
ASSEMBLED BY : N.B. SPEAKS	DATE : 3-30-18	
CHECKED BY : B.J. BELL	DATE : 4-11-18	
DRAWN BY : EEM 2/6/97	REV. 6/13	MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15	MAA/TMG
	REV. 12/17	MAA/THC



SECTION A-A

SECTION B-B

✱FOR S10 BARS, SEE DETAIL "C" OF "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET

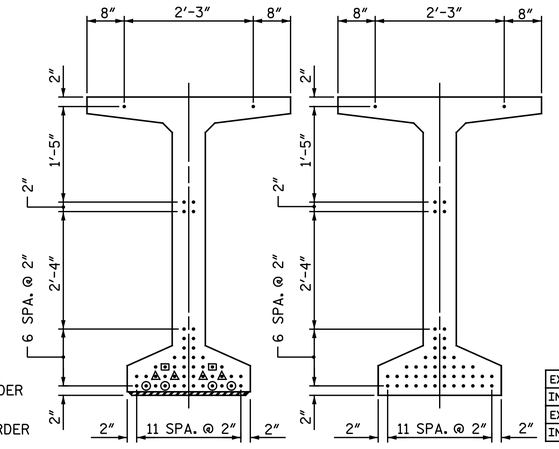


SECTION C-C

(S1 AND S9 BARS NOT SHOWN)
(SEE SHEET 1 OF 6 & 2 OF 6 FOR SECTION CUT LOCATION)

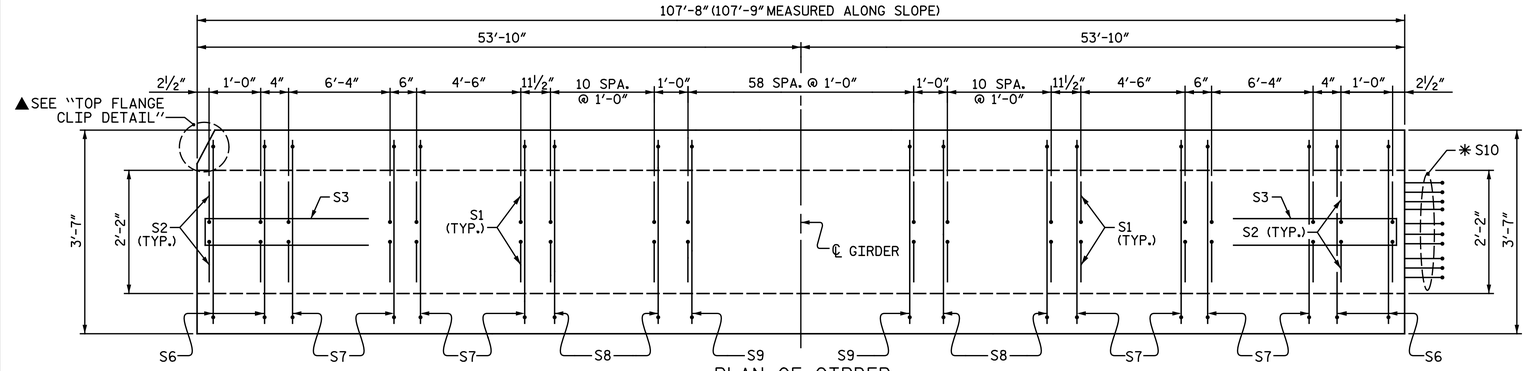
DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- ◬ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
- ⦿ STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER

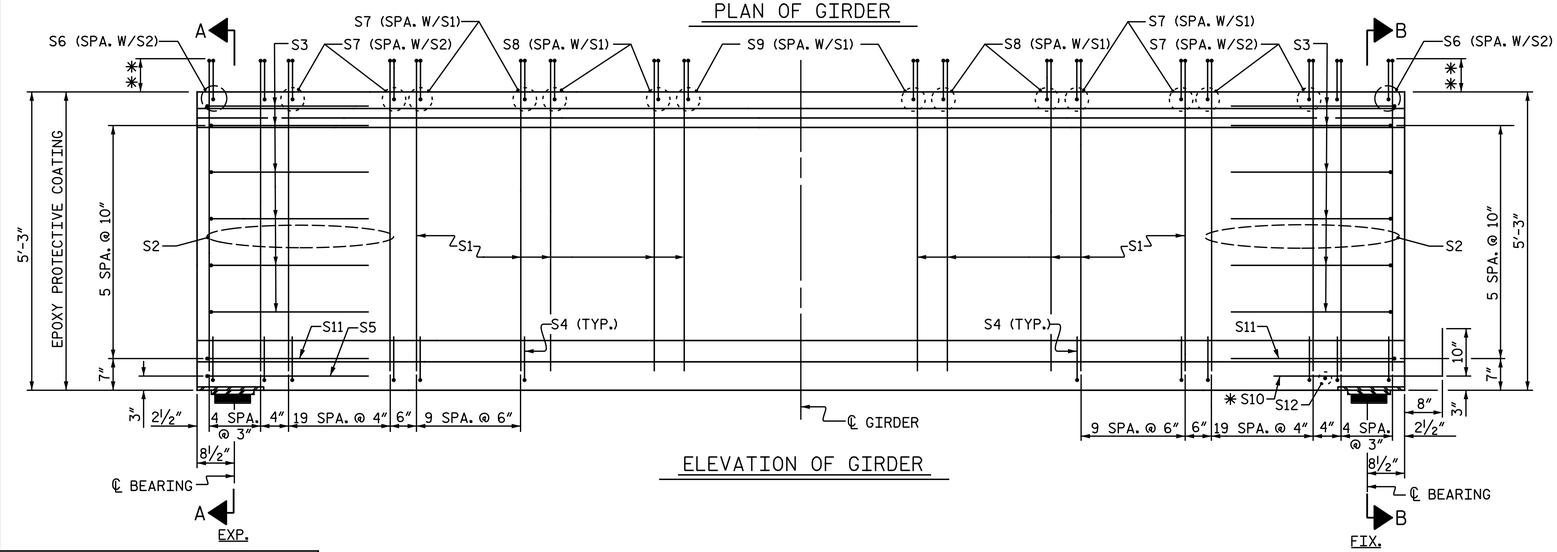


AT END OF GIRDER AT ℄ OF GIRDER

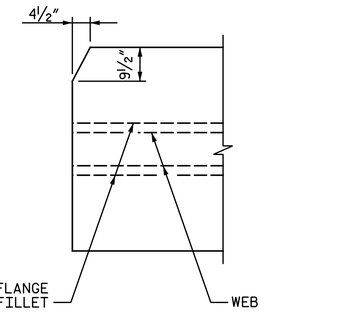
0.6"Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER



TOP FLANGE CLIP DETAIL

▲HORIZONTAL LEG OF FIRST S6 BAR CAN BE TRIMMED TO FIT

✱✱BAR PROJECTION	
S6	8½"
S7	7½"
S8	6½"
S9	5½"

0.6"Ø L. R. GRADE 270 STRANDS

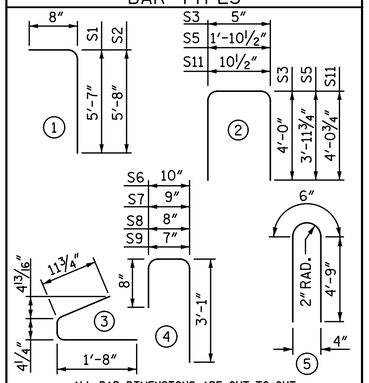
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	202	#4	1	6'-3"	843
	S2	100	#5	1	6'-4"	661
	S3	12	#4	2	8'-5"	67
	S4	140	#4	3	3'-0"	281
	S5	1	#5	2	9'-10"	10
	S6	20	#5	4	4'-7"	96
	S7	120	#5	4	4'-6"	563
	S8	44	#5	4	4'-5"	203
	S9	118	#5	4	4'-4"	533
	✱S10	10	#5	STR.	3'-8"	38
	S11	2	#5	2	9'-0"	19
	S12	1	#3	STR.	1'-10"	1
EXTERIOR GDR.	S13	8	#5	5	10'-0"	83
INTERIOR GDR.	S13	16	#5	5	10'-0"	167
EXTERIOR GDR.	S14	16	#4	STR.	8'-0"	86
INTERIOR GDR.	S15	16	#4	STR.	14'-2"	151

✱NOTE: S10 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	10,000 PSI CONCRETE C.Y.	0.6"Ø L.R. STRANDS No.
EXTERIOR GIRDER	3,484	21.3	48
INTERIOR GIRDER	3,633	21.3	48

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	107.75'	431.00'

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 4 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018
C41A3F8ECA3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

63" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN D RIGHT LANE

ASSEMBLED BY : N.B. SPEAKS	DATE : 3-30-18
CHECKED BY : B.J. BELL	DATE : 4-11-18
DRAWN BY : EEM 2/6/97	REV. 6/13 MAA/CM
CHECKED BY : VAP 2/6/97	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

Michael Baker INTERNATIONAL
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8000 Regency Parkway, Suite 600
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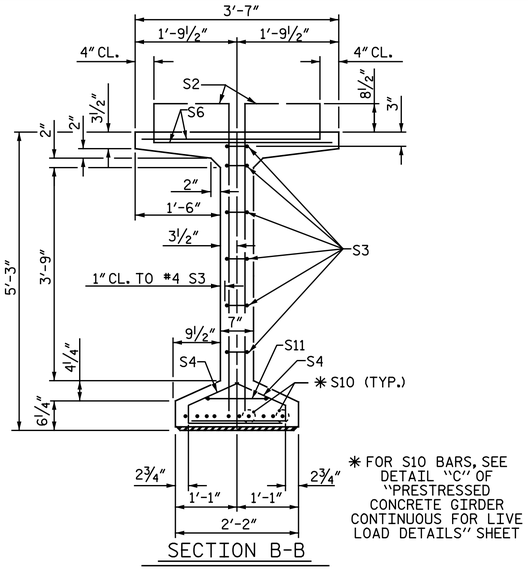
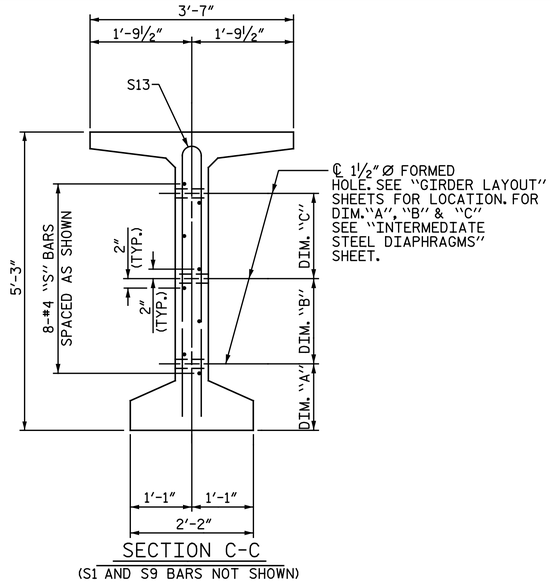
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-25
1			3			TOTAL SHEETS
2			4			63

STD. NO. PCG7



✳ FOR S10 BARS, SEE DETAIL "C" OF "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET

SECTION B-B



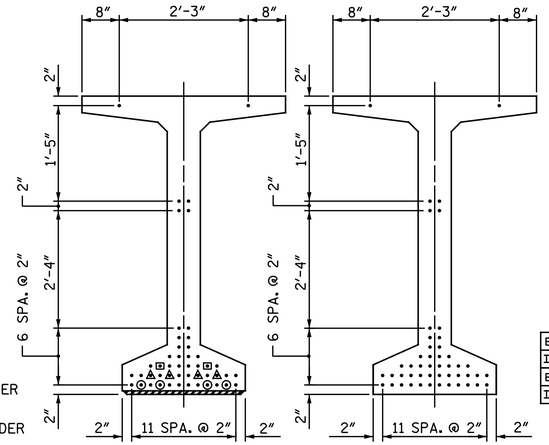
SECTION C-C

(S1 AND S9 BARS NOT SHOWN)

(SEE SHEET 1 OF 6 & 2 OF 6 FOR SECTION CUT LOCATION)

DEBONDING LEGEND

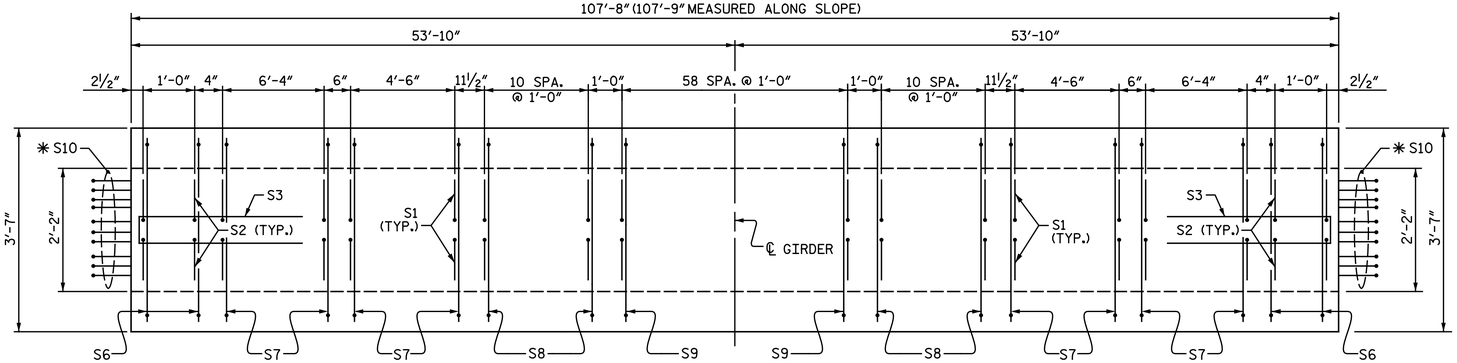
- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 6′-0″ FROM END OF GIRDER
- ◭ STRANDS DEBONDED FOR 10′-0″ FROM END OF GIRDER
- ◉ STRANDS DEBONDED FOR 14′-0″ FROM END OF GIRDER



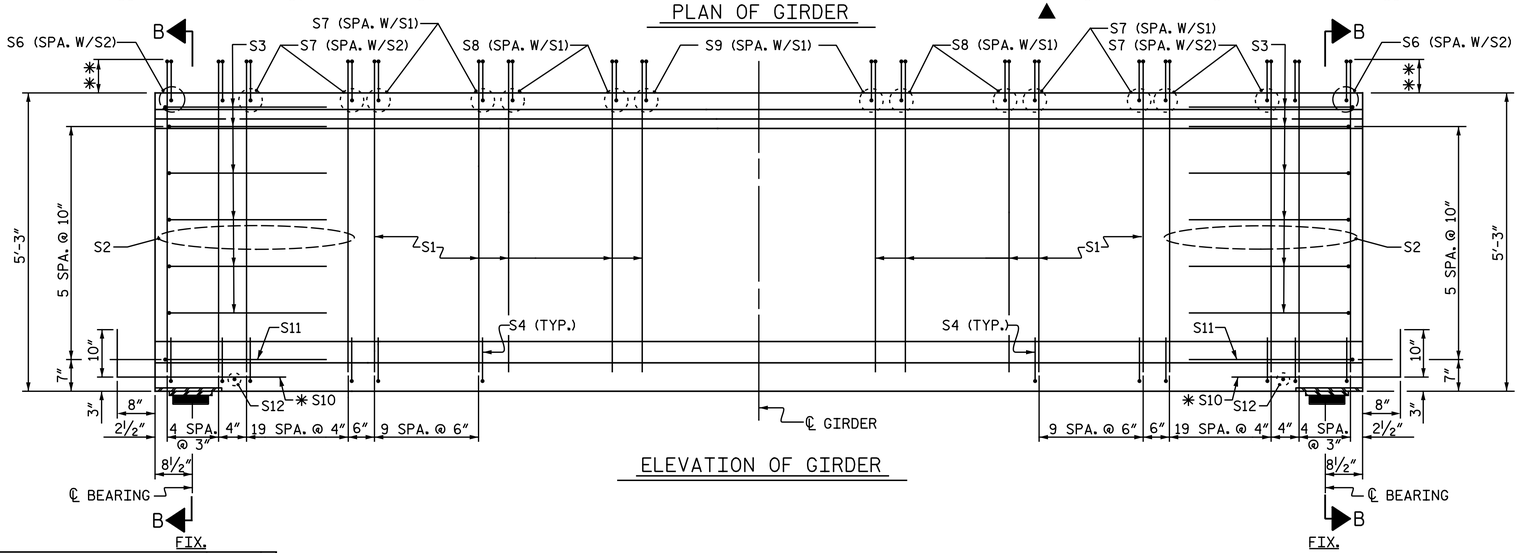
AT END OF GIRDER AT ℄ OF GIRDER

0.6″Ø LOW RELAXATION STRAND LAYOUT

107′-8″ (107′-9″ MEASURED ALONG SLOPE)



PLAN OF GIRDER



ELEVATION OF GIRDER

✳✳BAR PROJECTION	
S6	8½″
S7	7½″
S8	6½″
S9	5½″

0.6″Ø L. R. GRADE 270 STRANDS

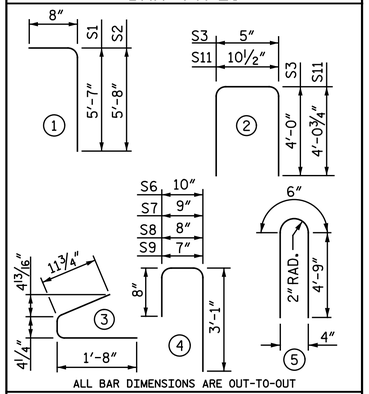
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	202	#4	1	6′-3″	843
	S2	100	#5	1	6′-4″	661
	S3	12	#4	2	8′-5″	67
	S4	140	#4	3	3′-0″	281
	S6	20	#5	4	4′-7″	96
	S7	120	#5	4	4′-6″	563
	S8	44	#5	4	4′-5″	203
	S9	118	#5	4	4′-4″	533
	✳S10	20	#5	STR.	3′-8″	76
	S11	2	#5	2	9′-0″	19
	S12	2	#3	STR.	1′-10″	1
EXTERIOR GDR.	S13	8	#5	5	10′-0″	83
INTERIOR GDR.	S13	16	#5	5	10′-0″	167
EXTERIOR GDR.	S14	16	#4	STR.	8′-0″	86
INTERIOR GDR.	S15	16	#4	STR.	14′-2″	151

✳NOTE: S10 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	10,000 PSI CONCRETE	0.6″Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	3,512	21.3	48
INTERIOR GIRDER	3,661	21.3	48

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	107.75′	431.00′

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 5 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

63″ PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN E RIGHT LANE

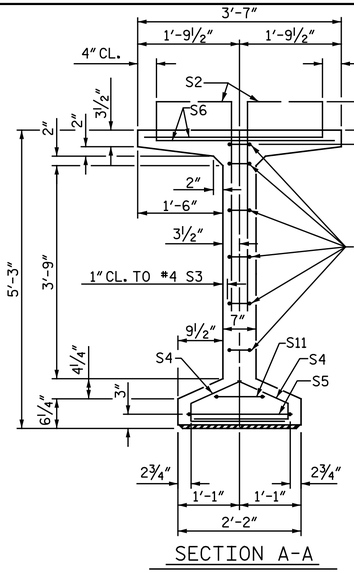
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-26
1			3			TOTAL SHEETS
2			4			63

Michael Baker INTERNATIONAL

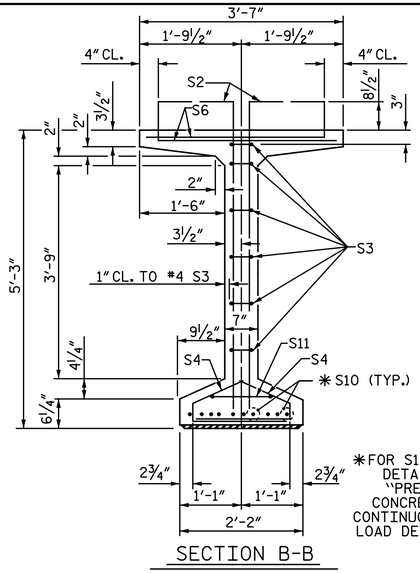
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

ASSEMBLED BY : N.B. SPEAKS		DATE : 3-30-18	
CHECKED BY : B.J. BELL		DATE : 4-11-18	
DRAWN BY : EEM 2/6/97	REV. 6/13		MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15		MAA/TMG
	REV. 12/17		MAA/THC

STD. NO. PCG7

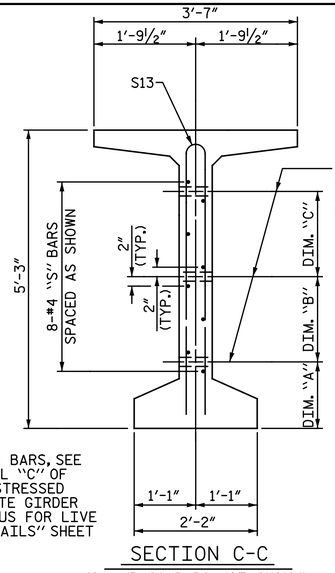


SECTION A-A



SECTION B-B

✱FOR S10 BARS, SEE DETAIL "C" OF "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET



SECTION C-C

(S1 AND S9 BARS NOT SHOWN)
(SEE SHEET 1 OF 6 & 2 OF 6 FOR SECTION CUT LOCATION)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- ▲ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
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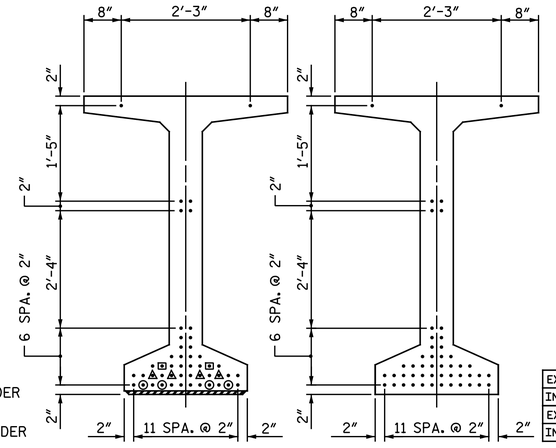
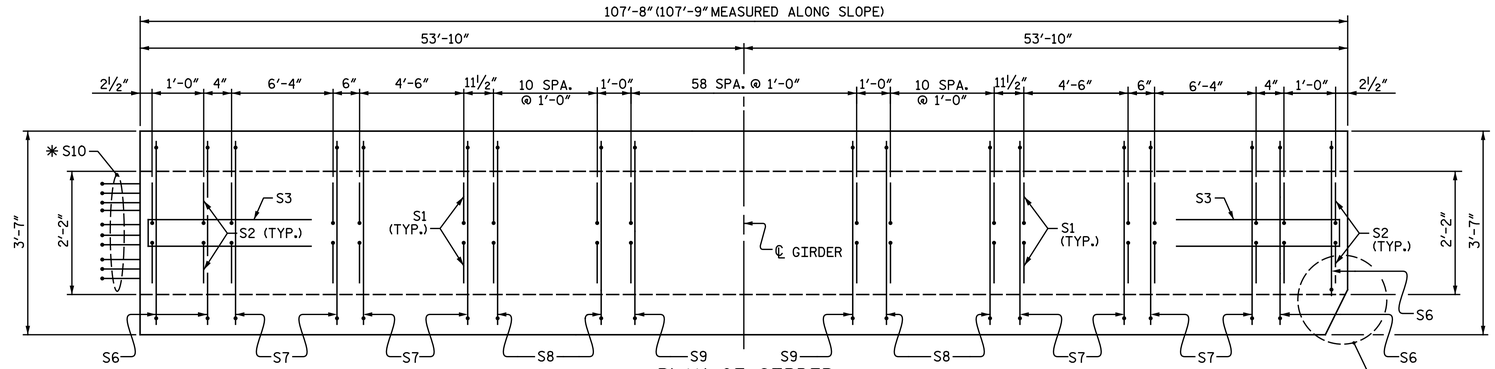
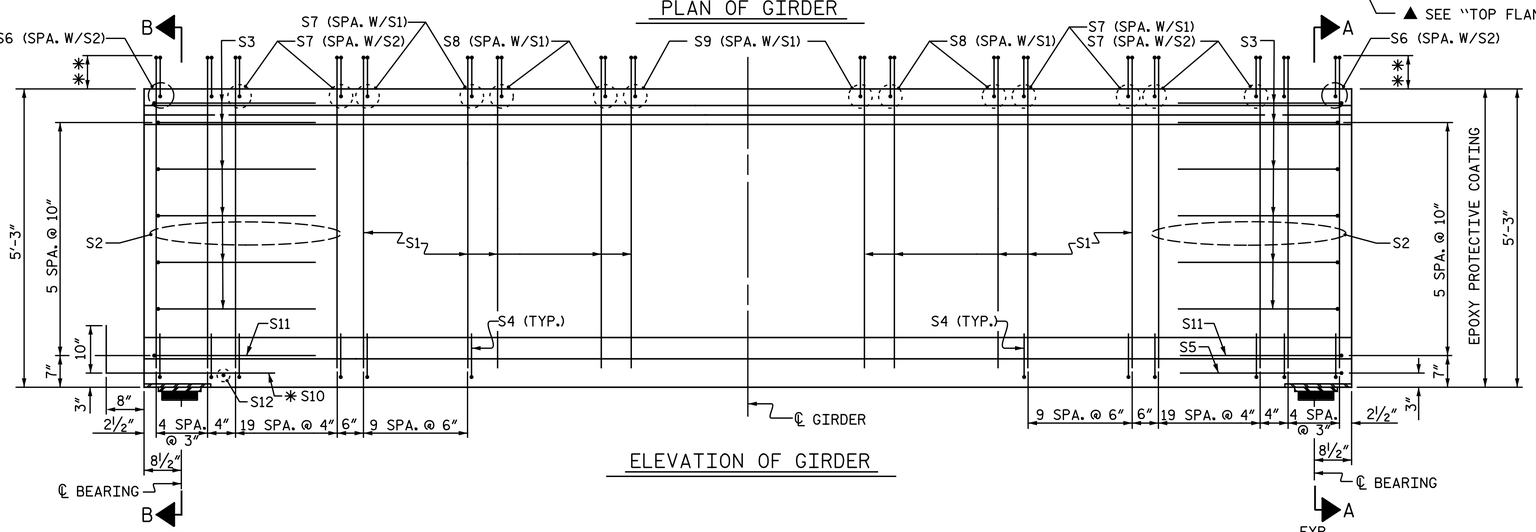


AT END OF GIRDER AT ℄ OF GIRDER

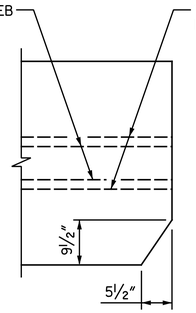
0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER



TOP FLANGE CLIP DETAIL

▲ HORIZONTAL LEG OF FIRST S6 BARS CAN BE TRIMMED TO FIT

✱✱ BAR PROJECTION	
S6	8½"
S7	7½"
S8	6½"
S9	5½"

0.6" Ø L. R. GRADE 270 STRANDS

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REINFORCING STEEL FOR ONE GDR

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	S8	44	#5	4	4'-5"	203
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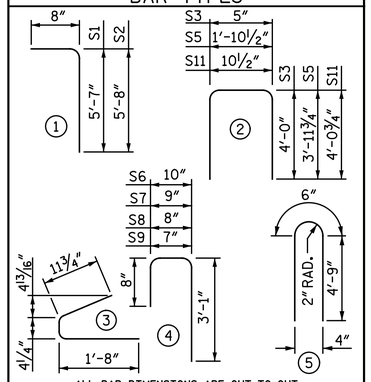
✱NOTE: S10 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	10,000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
EXTERIOR GIRDER	3,484	21.3	48
INTERIOR GIRDER	3,633	21.3	48

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	107.75'	431.00'

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 6 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8EC43C434...

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Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
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NC License No.: F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

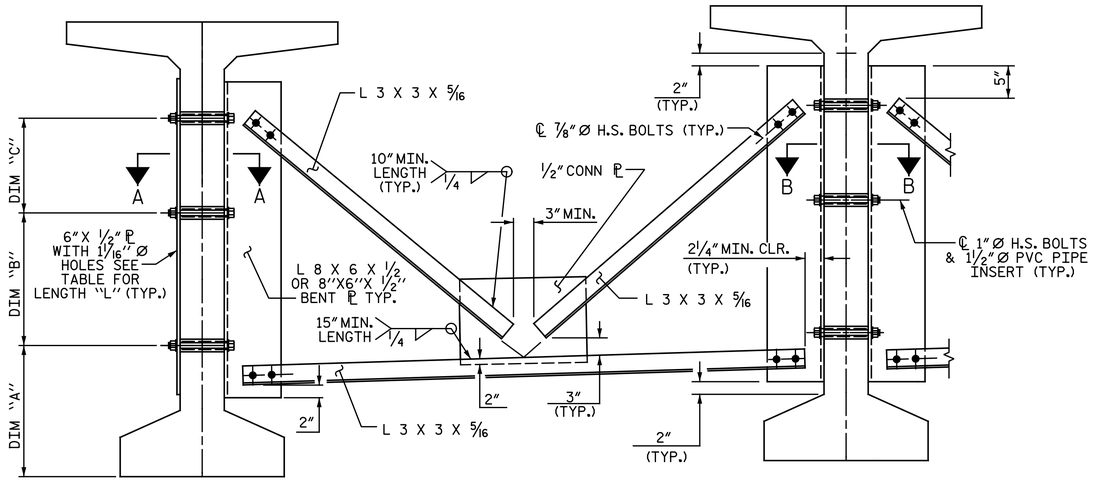
STANDARD

63" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN F RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-27
1			3			TOTAL SHEETS
2			4			63

STD. NO. PCG7

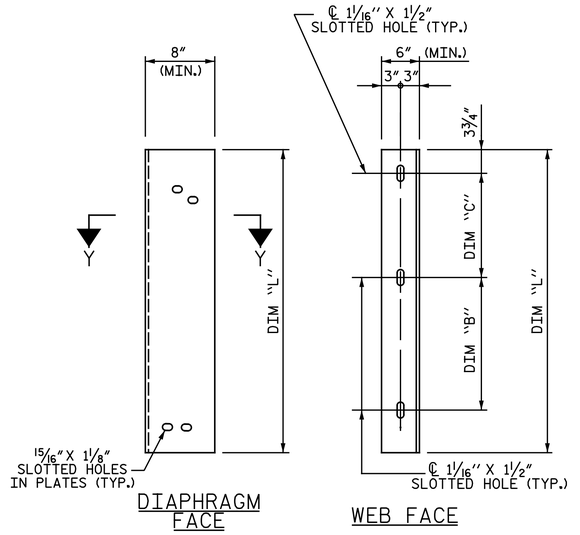
ASSEMBLED BY : N.B. SPEAKS	DATE : 3-30-18	
CHECKED BY : B.J. BELL	DATE : 4-11-18	
DRAWN BY : EEM 2/6/97	REV. 6/13	MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15	MAA/TMG
	REV. 12/17	MAA/THC



EXTERIOR GIRDER

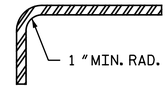
INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



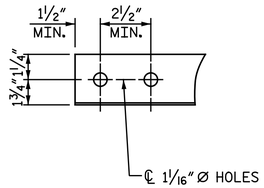
DIAPHRAGM FACE

WEB FACE



SECTION Y-Y

CONNECTOR PLATE DETAIL



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

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 A THERMAL SPRAYED COATING WITH A SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM, 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.

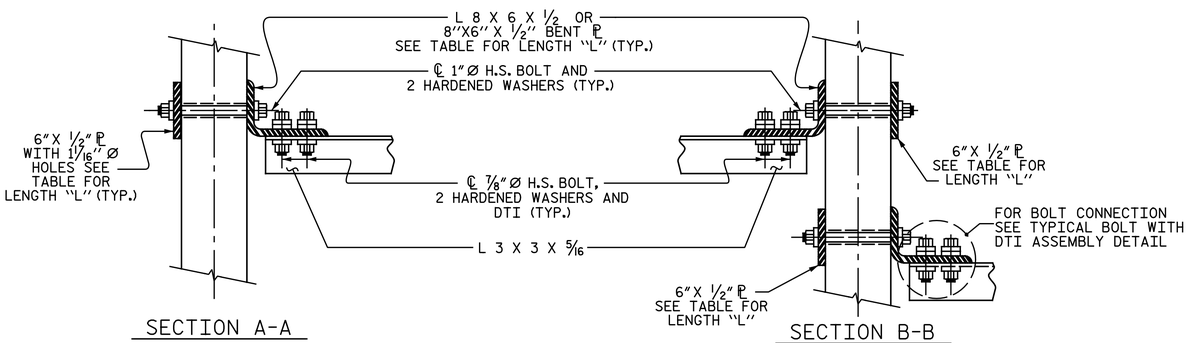
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.

TABLE

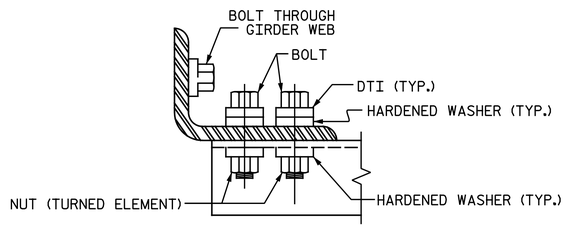
GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-6"	1'-4"	1'-3 3/4"	3'-5"



SECTION A-A

SECTION B-B

CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

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Michael Baker INTERNATIONAL

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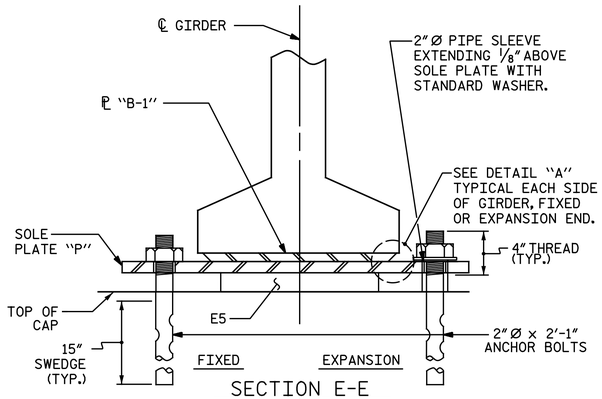
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS RIGHT LANE

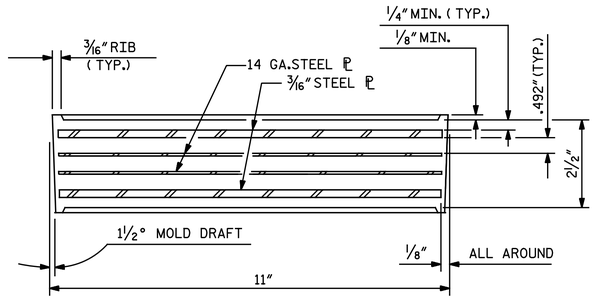
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-28
1			3			TOTAL SHEETS
2			4			63

ASSEMBLED BY : N.B. SPEAKS	DATE : 1-23-18	
CHECKED BY : B.J. BELL	DATE : 4-11-18	
DRAWN BY : RWW 11/09	REV. 10/1/11	MAA/GM
CHECKED BY : GM 11/09	REV. 12/17	MAA/THC

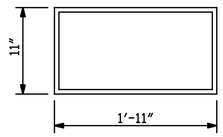
STD. NO. PCG11



SECTION E-E



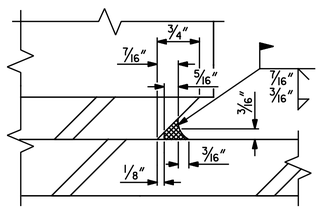
TYPICAL SECTION OF ELASTOMERIC BEARINGS



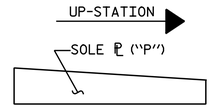
E5 (48 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

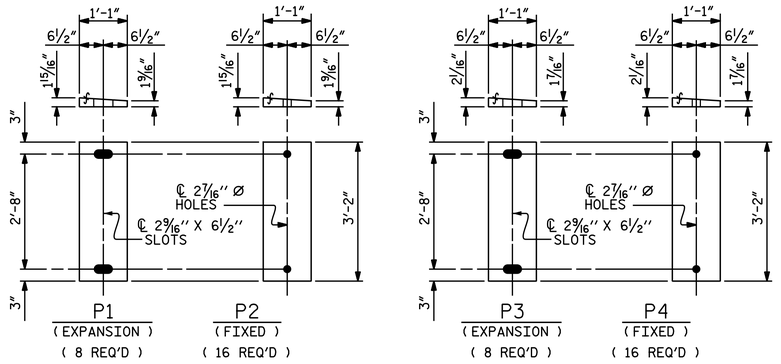
TYPE VI



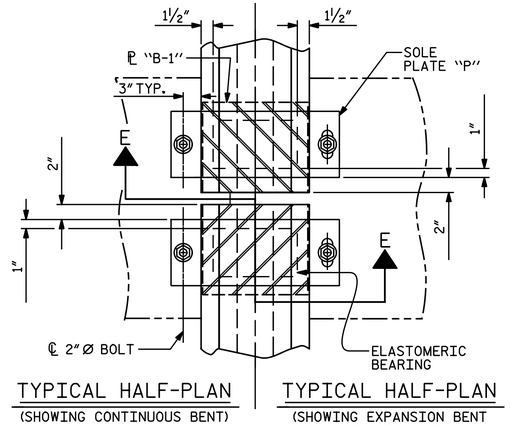
DETAIL "A"



SOLE ℄ PLACEMENT DETAIL



SOLE PLATE DETAILS ("P")



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN (SHOWING EXPANSION BENT AND END BENT)

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE VI	420 k

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.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

ASSEMBLED BY : N.B SPEAKS	DATE : 1-25-18
CHECKED BY : T.M. GARRISON	DATE : 1-26-18
DRAWN BY : EEM 2/97	REV. 6/13 AAC/MAA
CHECKED BY : VAP 2/97	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8ECA3C434...

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Michael Baker INTERNATIONAL

Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No. : F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
ELASTOMERIC BEARING DETAILS
PRESTRESSED CONCRETE GIRDER
SUPERSTRUCTURE
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-29
1			3			TOTAL SHEETS
2			4			63

STD. NO. EB4

DEAD LOAD DEFLECTION TABLE FOR SPANS A, D, E & F

0.6"Ø LOW RELAXATION	GIRDER 1																				
TWENTIETH POINTS	0.00	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	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.049	0.096	0.141	0.182	0.219	0.250	0.274	0.292	0.303	0.307	0.303	0.292	0.274	0.250	0.219	0.182	0.141	0.096	0.049	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.000	0.027	0.050	0.077	0.098	0.120	0.136	0.150	0.160	0.166	0.168	0.166	0.160	0.150	0.136	0.120	0.098	0.077	0.050	0.027	0.000
FINAL CAMBER ↑	0''	1/4''	9/16''	3/4''	1''	1 3/16''	1 3/8''	1 1/2''	1 5/16''	1 5/8''	1 11/16''	1 5/8''	1 9/16''	1 1/2''	1 3/8''	1 3/16''	1''	3/4''	9/16''	1/4''	0''

0.6"Ø LOW RELAXATION	GIRDERS 2, 3 & 4																				
TWENTIETH POINTS	0.00	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	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.049	0.096	0.141	0.182	0.219	0.250	0.274	0.292	0.303	0.307	0.303	0.292	0.274	0.250	0.219	0.182	0.141	0.096	0.049	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.000	0.029	0.054	0.083	0.105	0.128	0.145	0.161	0.171	0.178	0.180	0.178	0.171	0.161	0.145	0.128	0.105	0.083	0.054	0.029	0.000
FINAL CAMBER ↑	0''	1/4''	1/2''	11/16''	15/16''	1 1/16''	1 1/4''	1 3/8''	1 7/16''	1 1/2''	1 1/2''	1 1/2''	1 7/16''	1 3/8''	1 1/4''	1 1/16''	15/16''	11/16''	1/2''	1/4''	0''

DEAD LOAD DEFLECTION TABLE FOR SPANS B & C

0.6"Ø LOW RELAXATION	GIRDER 1																				
TWENTIETH POINTS	0.00	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	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.044	0.088	0.129	0.166	0.199	0.227	0.250	0.266	0.276	0.280	0.276	0.266	0.250	0.227	0.199	0.166	0.129	0.088	0.044	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.000	0.020	0.037	0.058	0.073	0.090	0.102	0.113	0.120	0.124	0.126	0.124	0.120	0.113	0.102	0.090	0.073	0.058	0.037	0.020	0.000
FINAL CAMBER ↑	0''	5/16''	5/8''	7/8''	1 1/8''	1 5/16''	1 1/2''	1 5/8''	1 3/4''	1 13/16''	1 7/8''	1 13/16''	1 3/4''	1 5/8''	1 1/2''	1 5/16''	1 1/8''	7/8''	5/8''	5/16''	0''

0.6"Ø LOW RELAXATION	GIRDERS 2, 3 & 4																				
TWENTIETH POINTS	0.00	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	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.044	0.088	0.129	0.166	0.199	0.227	0.250	0.266	0.276	0.280	0.276	0.266	0.250	0.227	0.199	0.166	0.129	0.088	0.044	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.000	0.021	0.040	0.062	0.078	0.096	0.109	0.120	0.128	0.133	0.134	0.133	0.128	0.120	0.109	0.096	0.078	0.062	0.040	0.021	0.000
FINAL CAMBER ↑	0''	1/4''	9/16''	13/16''	1 1/16''	1 1/4''	1 7/16''	1 9/16''	1 11/16''	1 3/4''	1 3/4''	1 3/4''	1 11/16''	1 9/16''	1 7/16''	1 1/4''	1 1/16''	13/16''	9/16''	1/4''	0''

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

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.

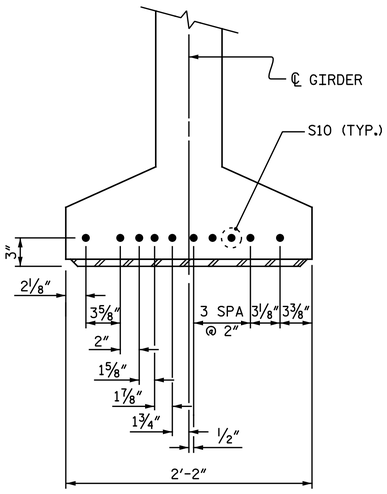
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 8,000 PSI.

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

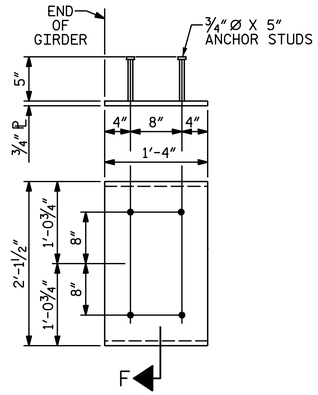
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

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

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

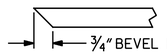


DETAIL "C"



EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

RIGHT LANE

ASSEMBLED BY : N.B. SPEAKS	DATE : 4-3-18
CHECKED BY : B.J. BELL	DATE : 4-11-18
DRAWN BY : ELR 11/91	REV. 1/15 MAA/TMG
CHECKED BY : GRP 11/91	REV. 2/15 MAA/TMG
	REV. 12/17 MAA/THC

Michael Baker INTERNATIONAL
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8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
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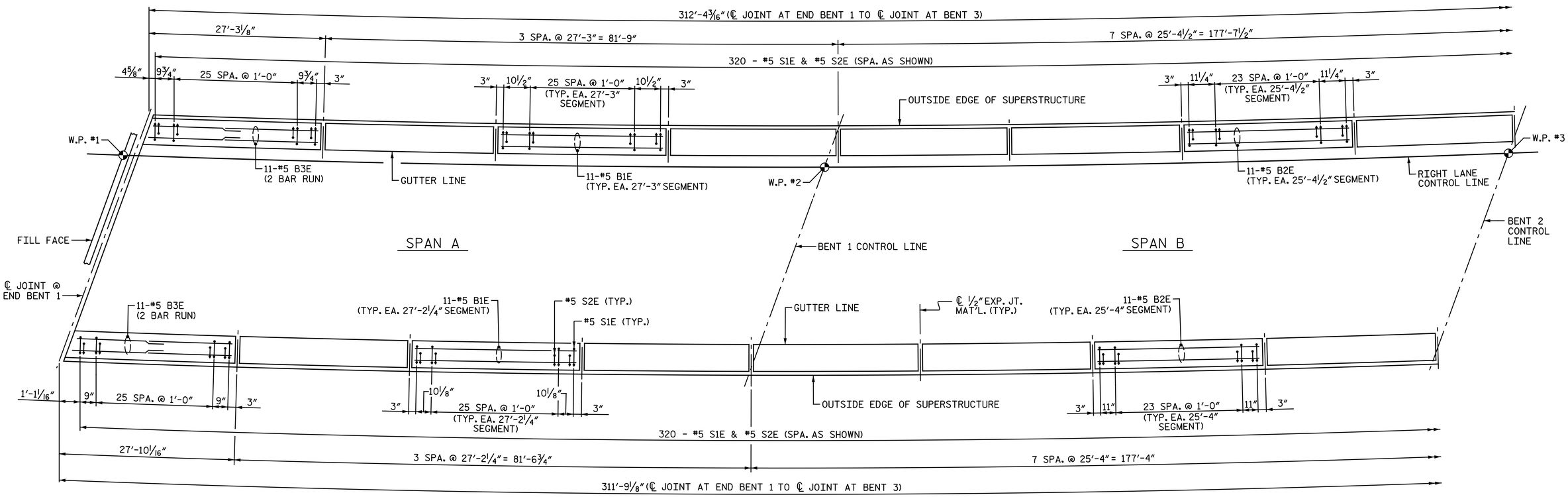
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-30
1			3			TOTAL SHEETS
2			4			63

STD. NO. PCG9



PARTIAL PLAN OF BARRIER RAIL - UNIT 1

NOTE: ALL BARRIER RAIL DIMENSIONS ARE MEASURED ALONG THE ARC AT THE BACK FACE OF THE BARRIER RAIL.

SPLICE LENGTH	
BAR SIZE	EPOXY COATED
#5	3′-5″

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 1 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

RIGHT LANE

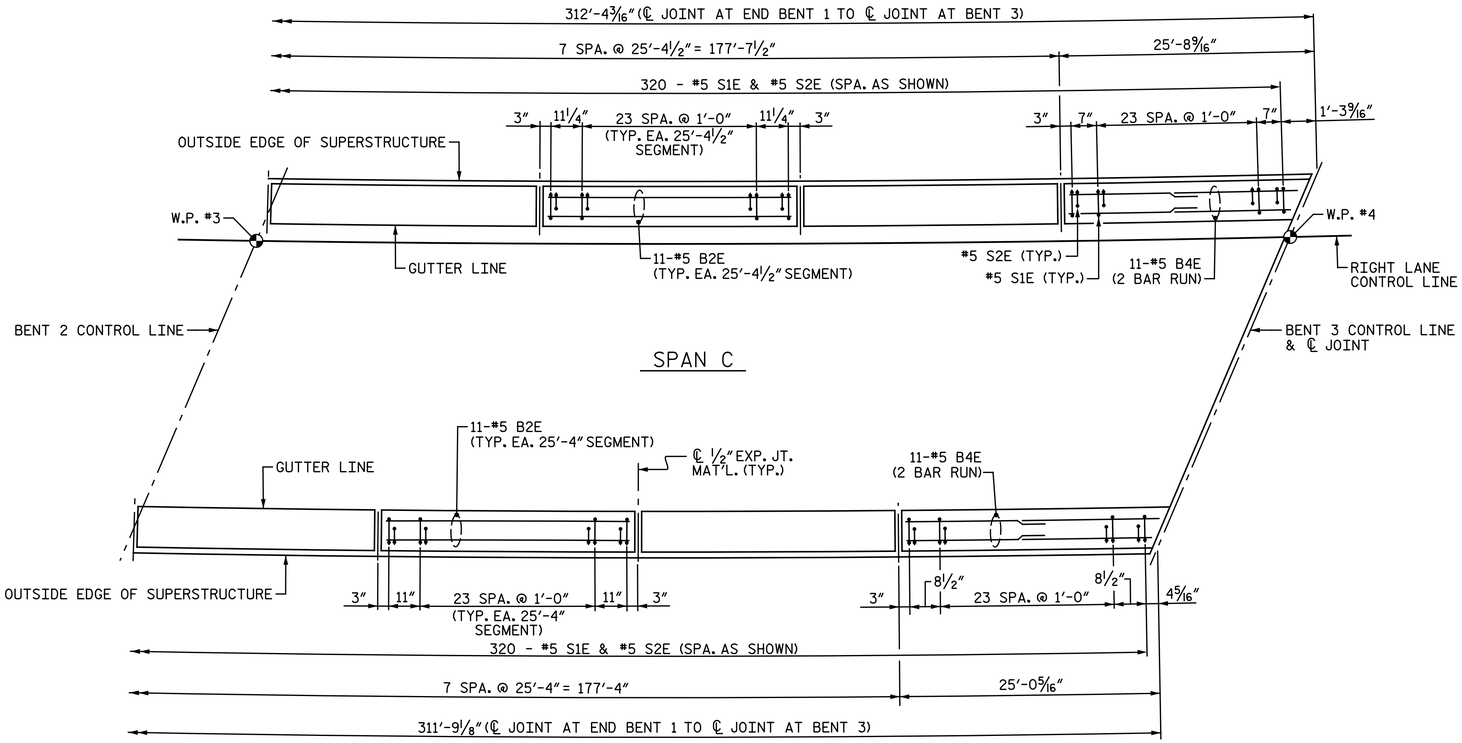
Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-31
1			3			TOTAL SHEETS
2			4			63

DRAWN BY : N. B. SPEAKS DATE : 2-8-18

CHECKED BY : T. M. GARRISON DATE : 2-16-18



PARTIAL PLAN OF BARRIER RAIL - UNIT 1

NOTE: ALL BARRIER RAIL DIMENSIONS ARE MEASURED ALONG THE ARC AT THE BACK FACE OF THE BARRIER RAIL.

SPLICE LENGTH	
BAR SIZE	EPOXY COATED
#5	3′-5″

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 2 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

C41A3F8ECA3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

RIGHT LANE

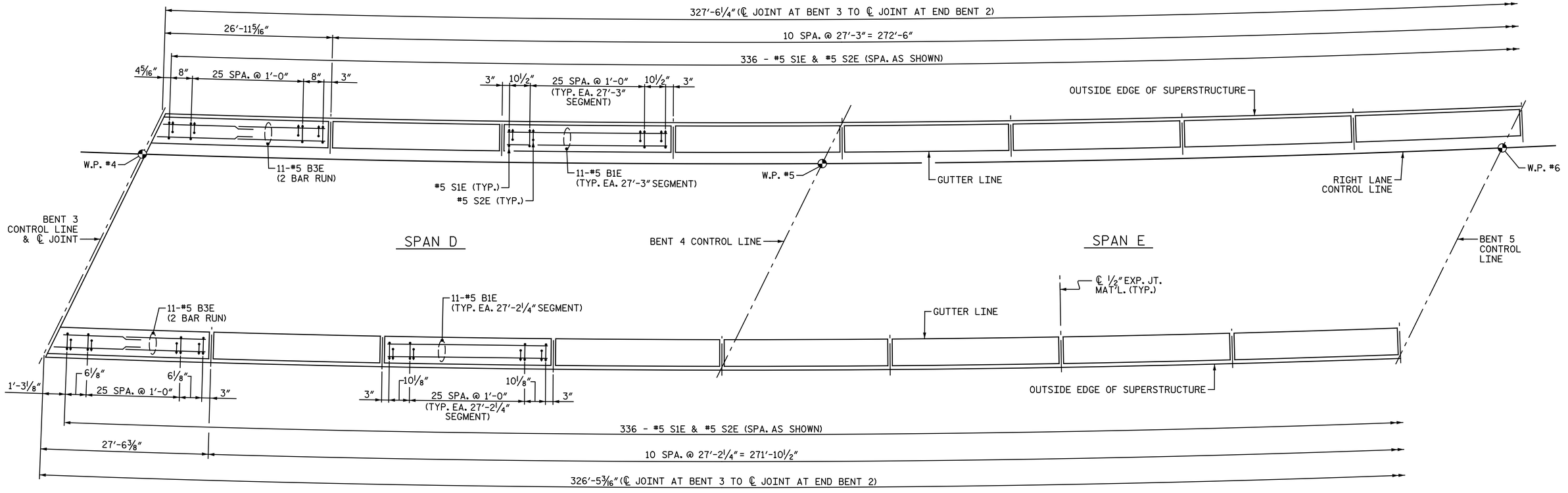
Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-32
1			3			TOTAL SHEETS
2			4			63

DRAWN BY : N. B. SPEAKS DATE : 2-8-18

CHECKED BY : T. M. GARRISON DATE : 2-16-18



PARTIAL PLAN OF BARRIER RAIL - UNIT 2

NOTE: ALL BARRIER RAIL DIMENSIONS ARE MEASURED ALONG THE ARC AT THE BACK FACE OF THE BARRIER RAIL.

SPLICE LENGTH	
BAR SIZE	EPOXY COATED
#5	3′-5″

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 3 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

RIGHT LANE

Michael Baker INTERNATIONAL

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8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
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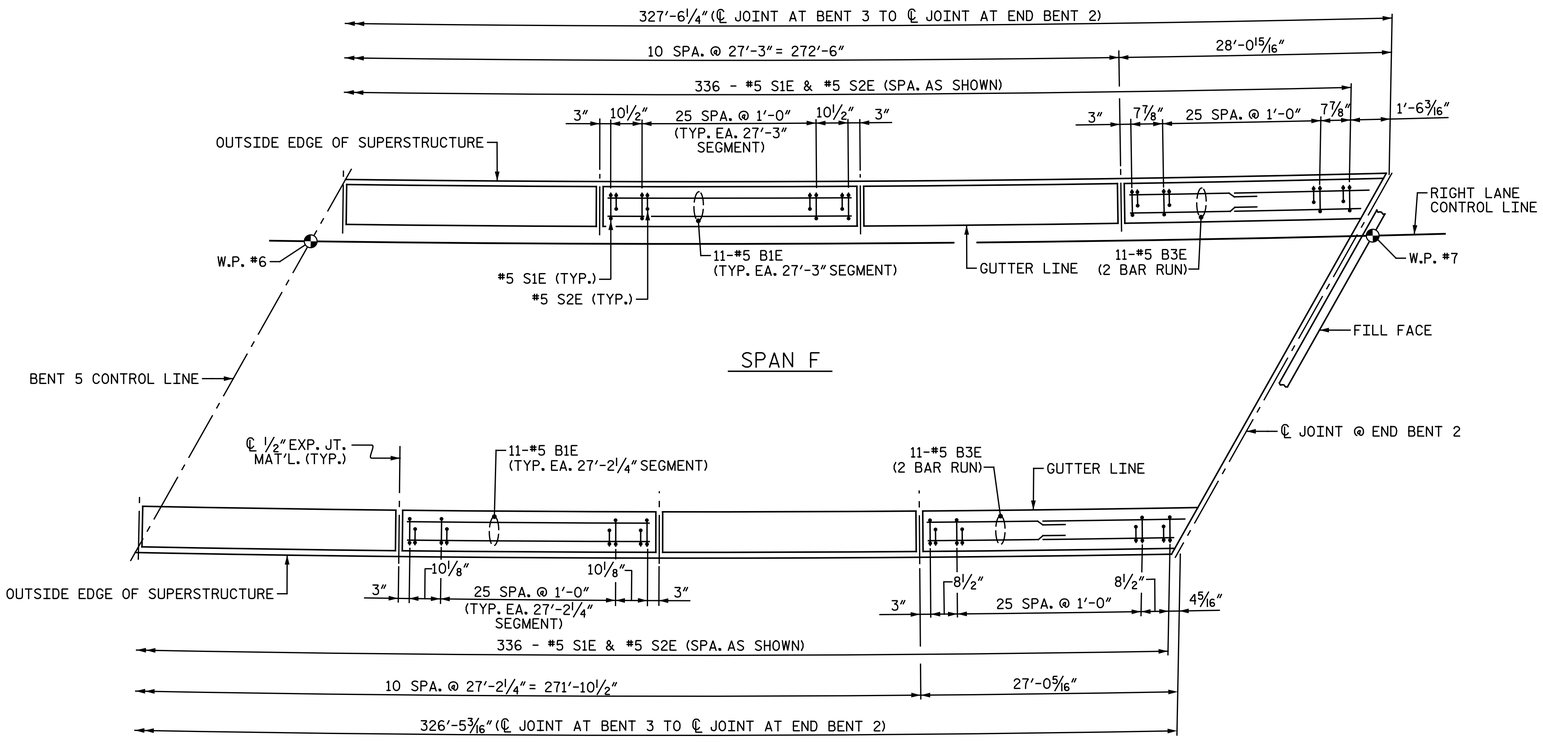
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-33
1			3			TOTAL SHEETS
2			4			63

DRAWN BY : N. B. SPEAKS DATE : 2-8-18
CHECKED BY : T. M. GARRISON DATE : 2-16-18



PARTIAL PLAN OF BARRIER RAIL - UNIT 2

NOTE: ALL BARRIER RAIL DIMENSIONS ARE MEASURED ALONG THE ARC AT THE BACK FACE OF THE BARRIER RAIL.

SPLICE LENGTH	
BAR SIZE	EPOXY COATED
#5	3′-5″

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 4 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

RIGHT LANE

Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-34
1			3			TOTAL SHEETS
2			4			63

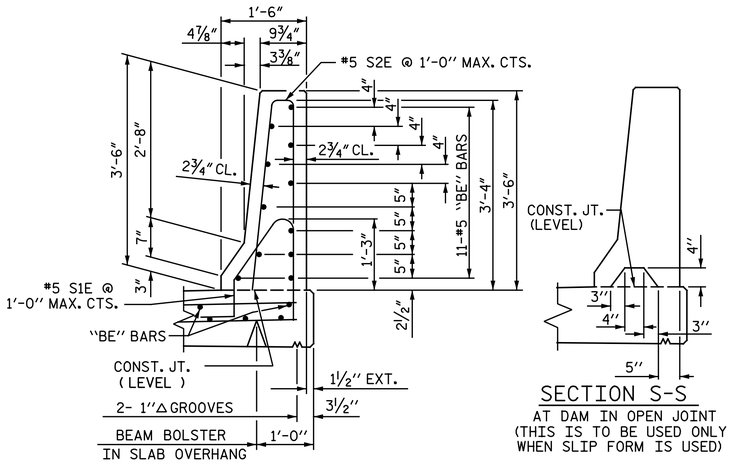
DRAWN BY : N. B. SPEAKS DATE : 2-8-18
CHECKED BY : T. M. GARRISON DATE : 2-16-18

NOTES

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

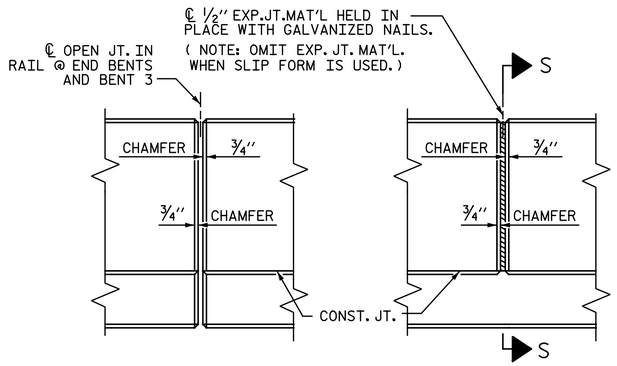
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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



SECTION THRU RAIL

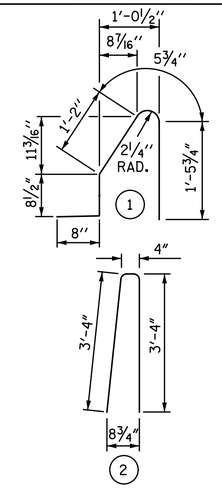
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1E	286	#5	STR.	26' - 9"	7,979
B2E	154	#5	STR.	24' - 11"	4,002
B3E	132	#5	STR.	15' - 7"	2,145
B4E	44	#5	STR.	14' - 5"	662
S1E	1,312	#5	1	4' - 6"	6,158
S2E	1,312	#5	2	7' - 0"	9,579
EPOXY COATED REINFORCING STEEL *				LBS.	30,525
CLASS AA CONCRETE *				C.Y.	173.8
CONCRETE BARRIER RAIL *				L.F.	1,278.06

*QUANTITIES DO NOT INCLUDE BARRIER RAILS ON THE APPROACH SLABS. FOR BARRIER RAILS ON THE APPROACH SLABS, SEE "BRIDGE APPROACH SLAB DETAILS" SHEET.

"E" SUFFIX DENOTES EPOXY COATED REINFORCING STEEL

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 5 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE
BARRIER RAIL

RIGHT LANE

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8000 Regency Parkway, Suite 600
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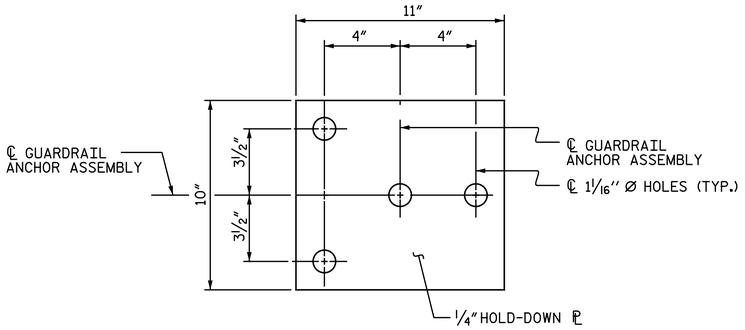
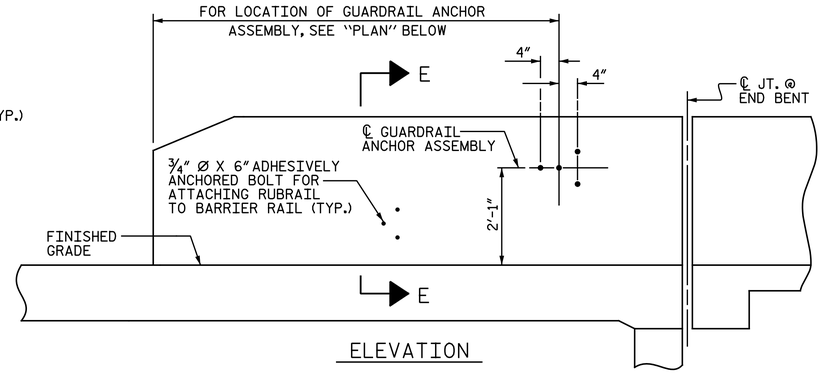
NC License No.: F-1084

ASSEMBLED BY : N. B. SPEAKS	DATE : 2-8-18	
CHECKED BY : T. M. GARRISON	DATE : 2-16-18	
DRAWN BY : ARB 5/87	REV. 7/12	MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13	MAA/GM
	REV. 12/17	MAA/THC

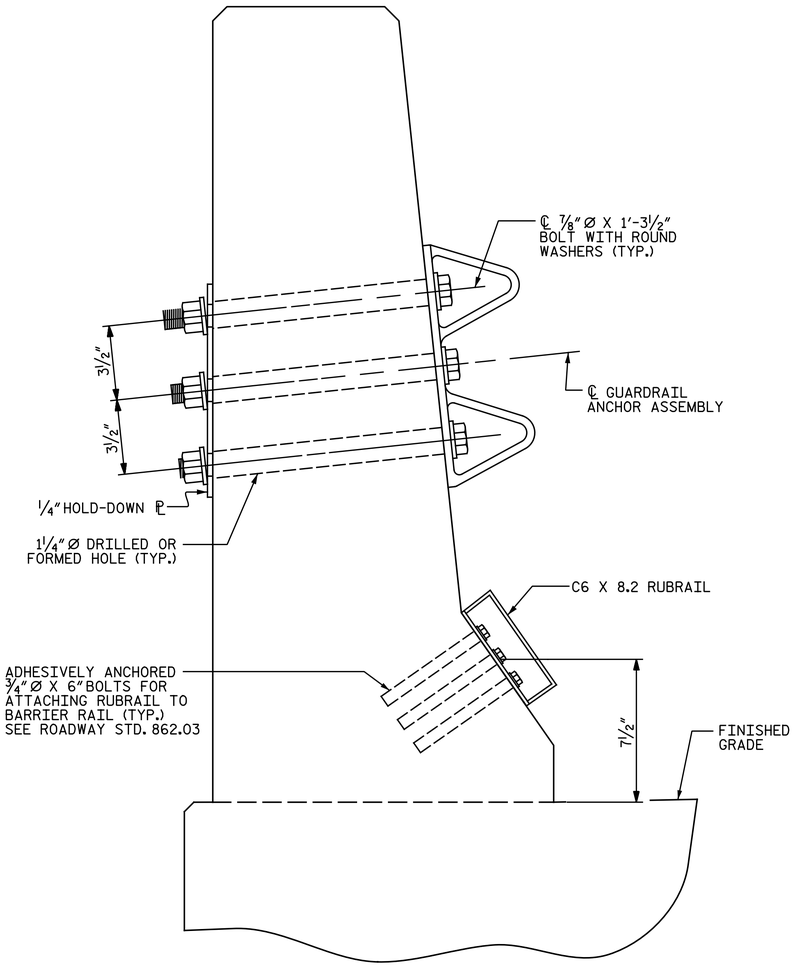
STD. NO. CBR1



PLAN

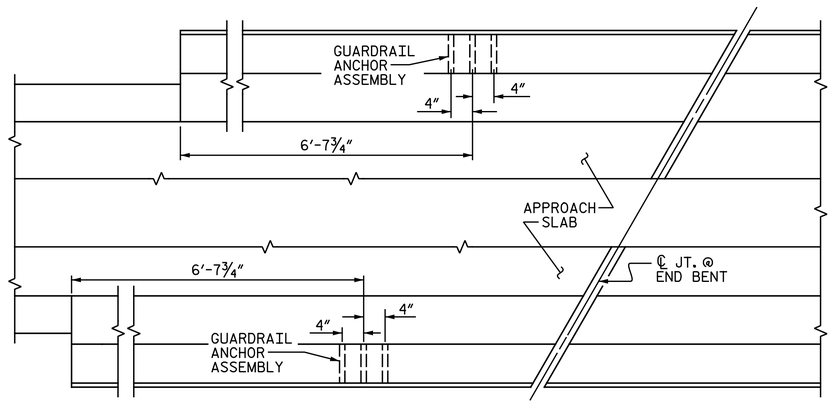


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

NOTES

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

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

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

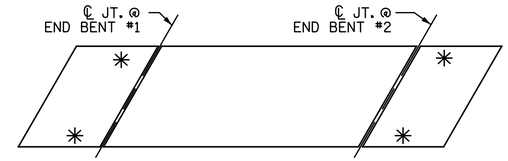
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018 C41A3F8EC43C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

RIGHT LANE

ASSEMBLED BY : N.B. SPEAKS	DATE : 1-23-18
CHECKED BY : B.J. BELL	DATE : 4-11-18
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

Michael Baker INTERNATIONAL

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8000 Regency Parkway, Suite 600
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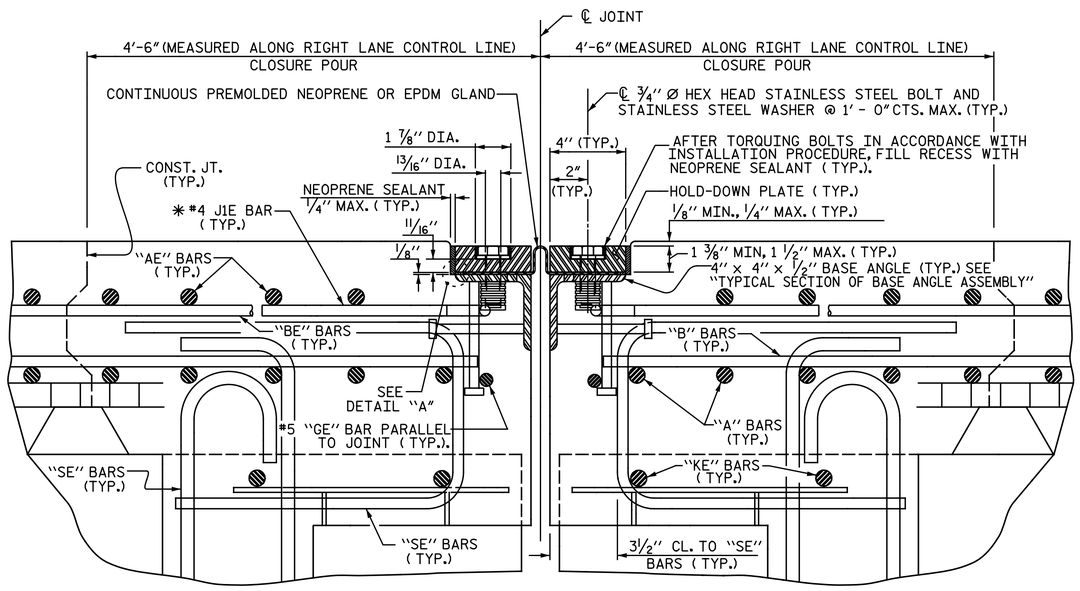
2			4			63

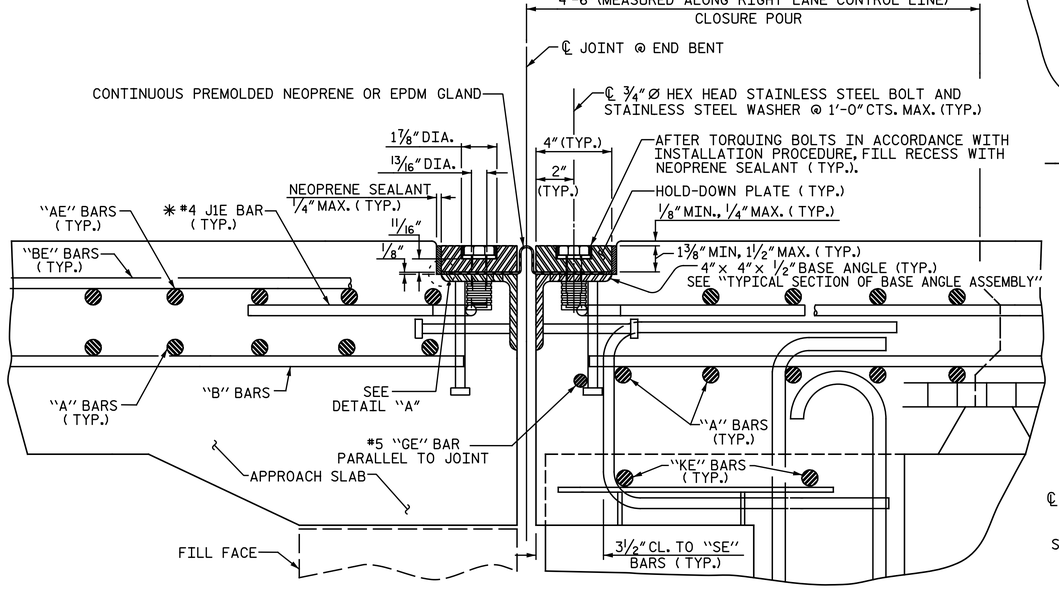
STD. NO. GRA2



EXPANSION JOINT DETAILS AT BENT 3

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE
#6 "AE" BARS NOT SHOWN FOR CLARITY

✱ THE QUANTITY OF #4 J1E BARS ON THE BILL OF MATERIAL IS BASED ON 1′-0″CENTERS. J1E BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1E BARS SPECIFIED, ADDITIONAL J1E BARS WILL NOT BE REQUIRED.



EXPANSION JOINT DETAILS AT END BENTS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE
#6 "AE" BARS NOT SHOWN FOR CLARITY

✱ THE QUANTITY OF #4 J1E BARS ON THE BILL OF MATERIAL IS BASED ON 1′-0″CENTERS. J1E BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1E BARS SPECIFIED, ADDITIONAL J1E BARS WILL NOT BE REQUIRED.

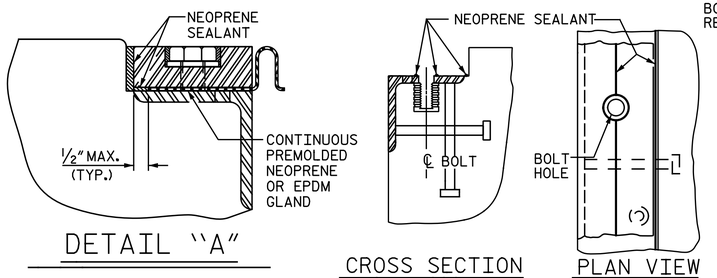
ASSEMBLED BY : N.B. SPEAKS	DATE : 1-23-18
CHECKED BY : B.J. BELL	DATE : 4-11-18
DRAWN BY : REK 9/87	REV. 5/1/06R TLA/GM
CHECKED BY : CRK 10/87	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

INSTALLATION PROCEDURE

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

GENERAL NOTES

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

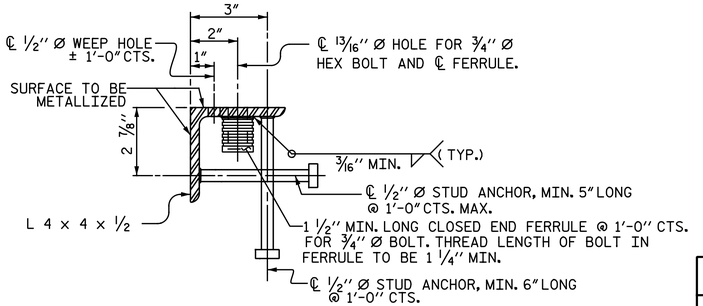


INSTALLATION SKETCH

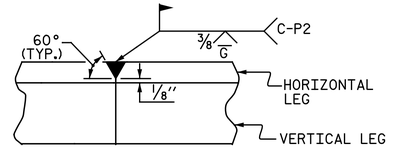
MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	107°-49′-13″	15/16″	2 7/16″	2 1/4″	1 15/16″
BENT 3	113°-45′-37″	1 15/16″	2 9/16″	2 1/4″	1 5/8″
END BENT 2	119°-59′-19″	1″	2 3/8″	2 1/4″	1 15/16″

SKEW ANGLE IS MEASURED BETWEEN FILL FACE AND TANGENT TO RIGHT LANE CONTROL LINE AT END BENTS.

SKEW ANGLE IS MEASURED BETWEEN BENT CONTROL LINE AND TANGENT TO RIGHT LANE CONTROL LINE AT BENT 3.



TYPICAL SECTION OF BASE ANGLE ASSEMBLY



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-37
1			3			TOTAL SHEETS
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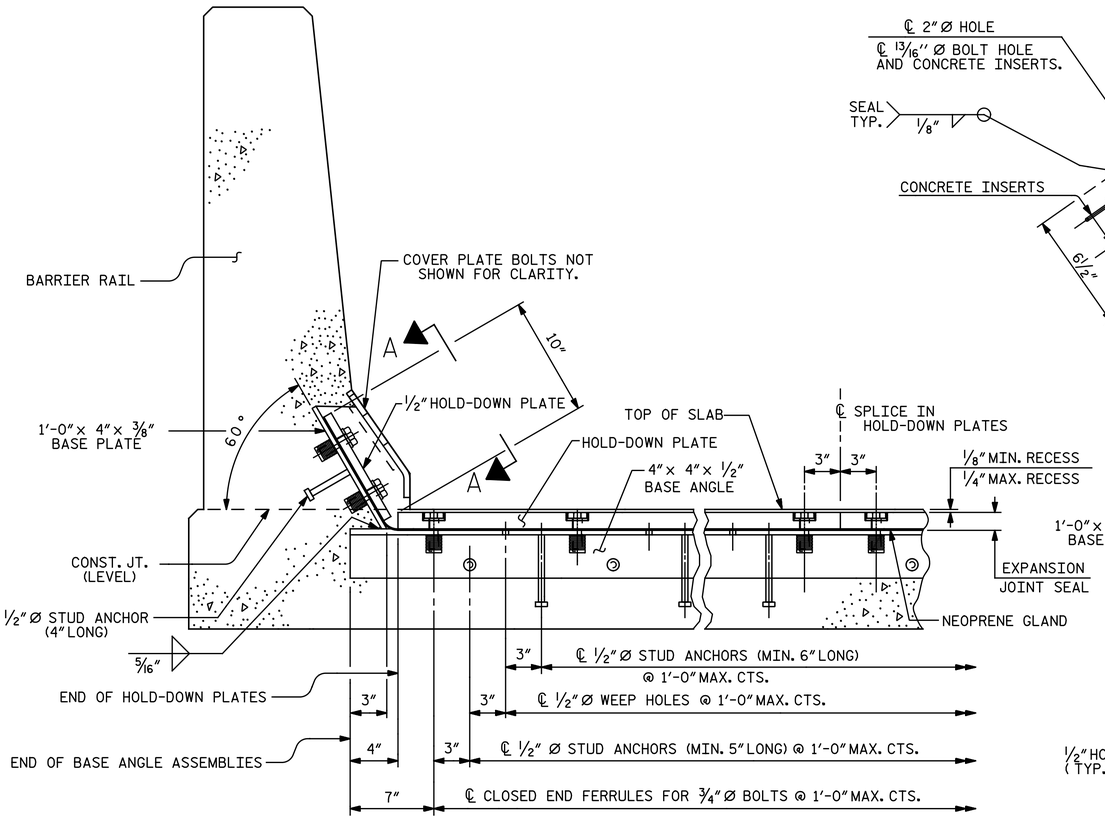
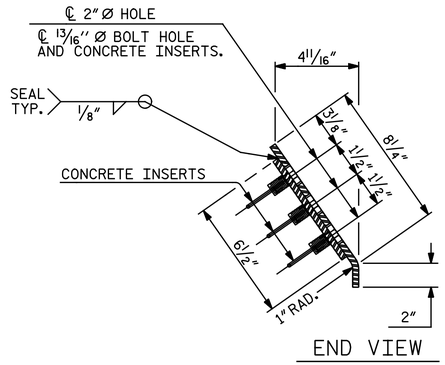
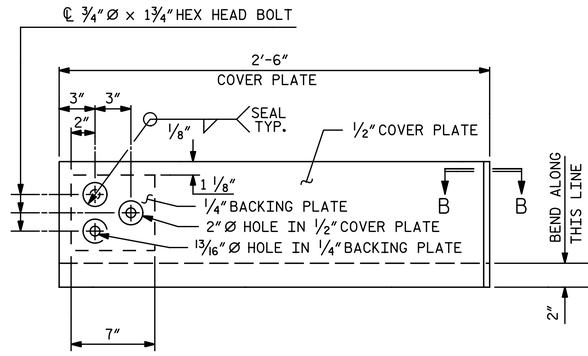
STD. NO. EJS1



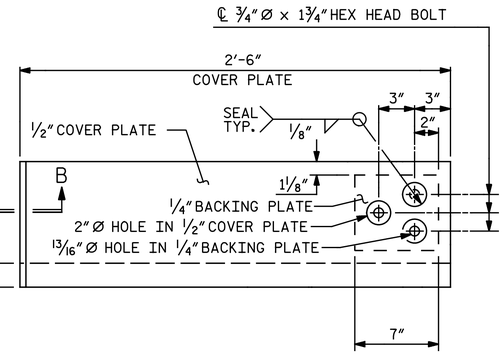
SECTION THRU RAIL NORMAL TO JOINT



END VIEW

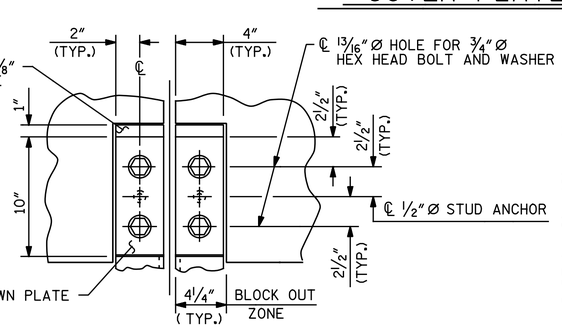


TYPE I - ELEVATION VIEW

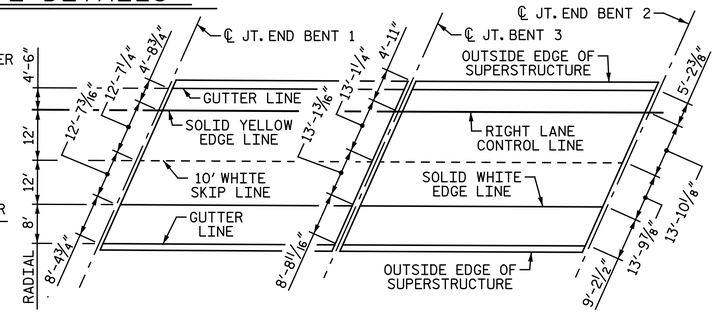


TYPE II - ELEVATION VIEW

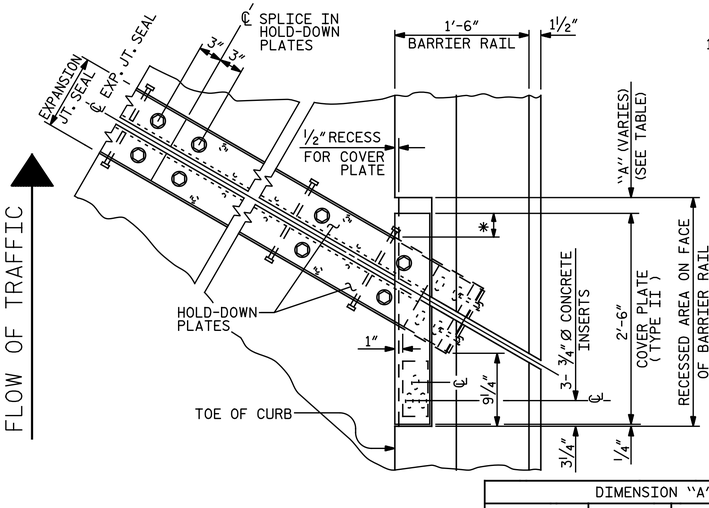
COVER PLATE DETAILS



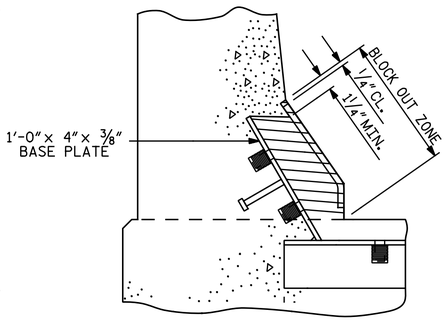
SECTION A - A



PAVEMENT MARKING ALIGNMENT

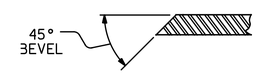


PLAN OF EXPANSION JOINT SEAL

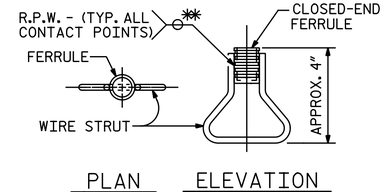


BLOCK OUT DETAIL

SEE " SECTION A - A " FOR OTHER DETAILS.



SECTION B - B



PLAN ELEVATION

CONCRETE INSERT

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

DIMENSION "A"			
BENT NO.	OPENING @ 45°F	OPENING @ 60°F	OPENING @ 90°F
END BENT 1	2½"	2⅜"	2"
BENT 3	2 13/16"	2 7/16"	1¾"
END BENT 2	2¾"	2 9/16"	2¼"

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018

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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

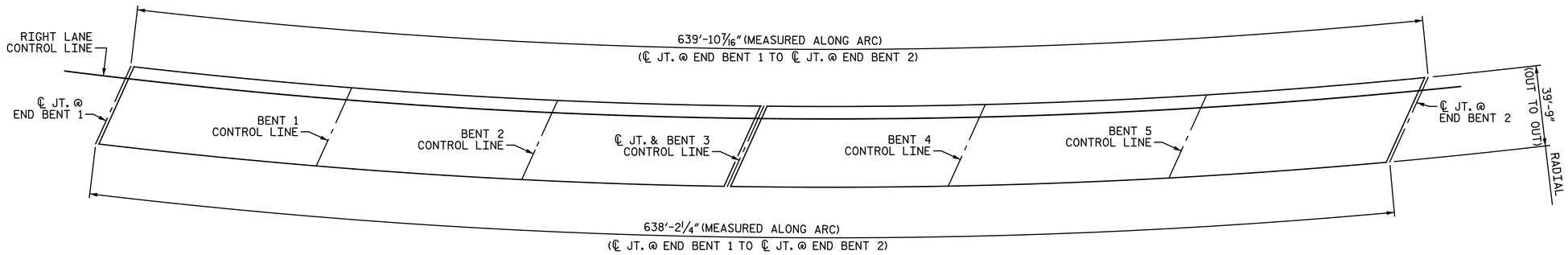
RIGHT LANE

Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-38
1			3			TOTAL SHEETS
2			4			63

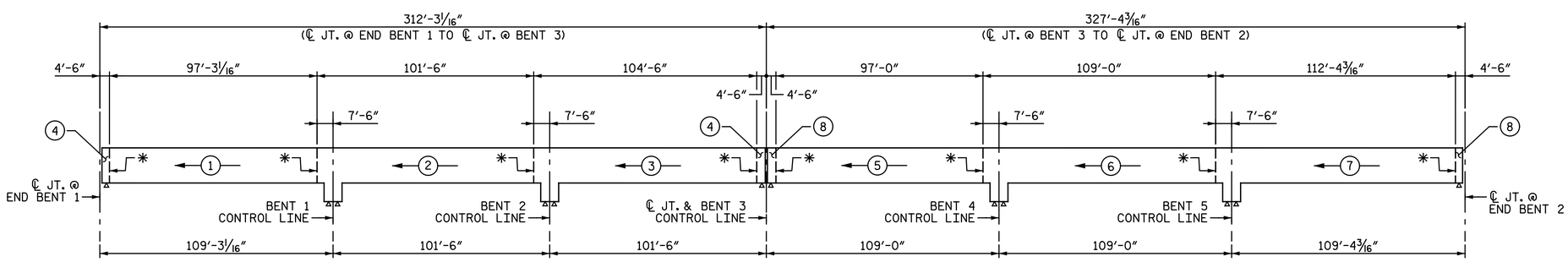
ASSEMBLED BY : N.B. SPEAKS	DATE : 1-22-18	
CHECKED BY : B.J. BELL	DATE : 4-11-18	
DRAWN BY : REK 9/87	REV. 7/12	MAA/GM
CHECKED BY : CRK 10/87	REV. 6/13	MAA/GM
	REV. 12/17	MAA/THC

STD. NO. EJS2



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 25,385)

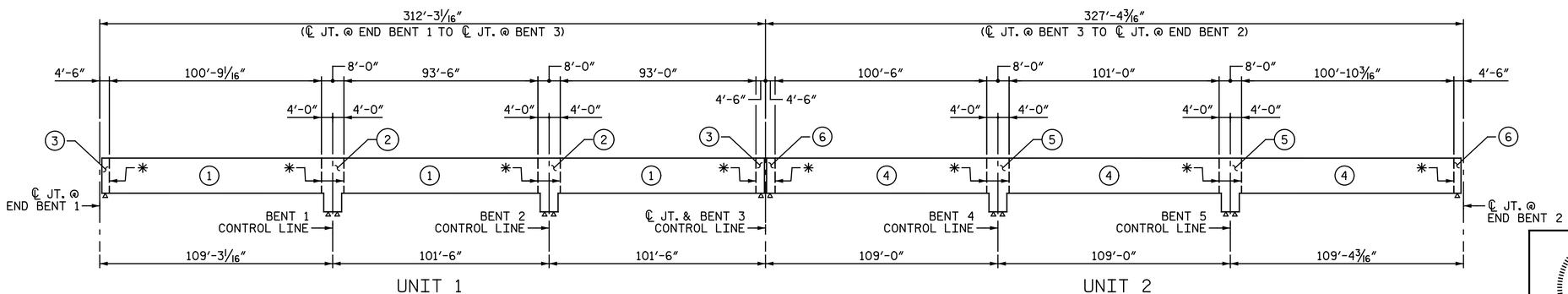


POURING SEQUENCE

DIMENSIONS GIVEN ALONG ARC OF RIGHT LANE CONTROL LINE

✳ TRANSVERSE CONSTRUCTION JOINT

(#) DENOTES POUR NUMBER AND DIRECTION



OPTIONAL POURING SEQUENCE

DIMENSIONS GIVEN ALONG ARC OF RIGHT LANE CONTROL LINE

POUR (2) CAN NOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3,000 PSI

POUR (5) CAN NOT BE STARTED UNTIL BOTH ADJACENT (4) POURS REACH A MINIMUM OF 3,000 PSI

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

CONCRETE DECK POUR DETAILS

RIGHT LANE

Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-39
1			3			TOTAL SHEETS
2			4			63

DRAWN BY : M. D. MAYHEW DATE : 2-7-18

CHECKED BY : B. J. BELL DATE : 4-2-18

REINFORCING BAR SCHEDULE

UNIT 1 (SPANS A, B & C)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	550	#5	STR.	39′ - 5″	22,611	A144E	1	#5	STR.	12′ - 9″	13	A240	1	#5	STR.	17′ - 8″	18
A2	550	#5	STR.	39′ - 5″	22,611	A145E	1	#5	STR.	11′ - 6″	12	A241	1	#5	STR.	16′ - 5″	17
A3E	4	#6	STR.	41′ - 4″	248	A146E	1	#5	STR.	10′ - 3″	11	A242	1	#5	STR.	15′ - 2″	16
A4E	4	#6	STR.	43′ - 0″	258	A147E	1	#5	STR.	9′ - 1″	9	A243	1	#5	STR.	14′ - 0″	15
						A148E	1	#5	STR.	7′ - 10″	8	A244	1	#5	STR.	12′ - 9″	13
A101E	1	#5	STR.	38′ - 2″	40	A149E	1	#5	STR.	6′ - 7″	7	A245	1	#5	STR.	11′ - 6″	12
A102E	1	#5	STR.	36′ - 6″	38	A150E	1	#5	STR.	5′ - 5″	6	A246	1	#5	STR.	10′ - 3″	11
A103E	1	#5	STR.	34′ - 10″	36	A151E	1	#5	STR.	4′ - 2″	4	A247	1	#5	STR.	9′ - 1″	9
A104E	1	#5	STR.	33′ - 2″	35	A152E	1	#5	STR.	2′ - 11″	3	A248	1	#5	STR.	7′ - 10″	8
A105E	1	#5	STR.	31′ - 6″	33	A201	1	#5	STR.	38′ - 2″	40	A249	1	#5	STR.	6′ - 7″	7
A106E	1	#5	STR.	29′ - 10″	31	A202	1	#5	STR.	36′ - 6″	38	A250	1	#5	STR.	5′ - 5″	6
A107E	1	#5	STR.	28′ - 2″	29	A203	1	#5	STR.	34′ - 10″	36	A251	1	#5	STR.	4′ - 2″	4
A108E	1	#5	STR.	26′ - 6″	28	A204	1	#5	STR.	33′ - 2″	35	A252	1	#5	STR.	2′ - 11″	3
A109E	1	#5	STR.	24′ - 10″	26	A205	1	#5	STR.	31′ - 6″	33						
A110E	1	#5	STR.	23′ - 2″	24	A206	1	#5	STR.	29′ - 10″	31	B1E	27	#5	STR.	33′ - 10″	953
A111E	1	#5	STR.	21′ - 6″	22	A207	1	#5	STR.	28′ - 2″	29	B2	228	#5	STR.	53′ - 9″	12,782
A112E	1	#5	STR.	19′ - 10″	21	A208	1	#5	STR.	26′ - 6″	28	B3E	135	#5	STR.	53′ - 4″	7,510
A113E	1	#5	STR.	18′ - 1″	19	A209	1	#5	STR.	24′ - 10″	26	B4E	27	#5	STR.	26′ - 0″	732
A114E	1	#5	STR.	16′ - 5″	17	A210	1	#5	STR.	23′ - 2″	24	B5E	104	#7	STR.	40′ - 9″	8,662
A115E	1	#5	STR.	14′ - 9″	15	A211	1	#5	STR.	21′ - 6″	22						
A116E	1	#5	STR.	13′ - 1″	14	A212	1	#5	STR.	19′ - 10″	21	G1E	1	#5	STR.	41′ - 4″	43
A117E	1	#5	STR.	11′ - 5″	12	A213	1	#5	STR.	18′ - 1″	19	G2E	1	#5	STR.	43′ - 0″	45
A118E	1	#5	STR.	9′ - 8″	10	A214	1	#5	STR.	16′ - 5″	17						
A119E	1	#5	STR.	8′ - 0″	8	A215	1	#5	STR.	14′ - 9″	15	J1E	78	#4	9	1′ - 5″	74
A120E	1	#5	STR.	6′ - 4″	7	A216	1	#5	STR.	13′ - 1″	14						
A121E	1	#5	STR.	4′ - 7″	5	A217	1	#5	STR.	11′ - 5″	12	K1E	4	#8	1	16′ - 3″	174
A122E	1	#5	STR.	2′ - 11″	3	A218	1	#5	STR.	9′ - 8″	10	K2E	4	#8	2	26′ - 5″	282
A123E	1	#5	STR.	38′ - 9″	40	A219	1	#5	STR.	8′ - 0″	8	K3E	6	#5	STR.	10′ - 6″	66
A124E	1	#5	STR.	37′ - 6″	39	A220	1	#5	STR.	6′ - 4″	7	K4E	9	#6	STR.	7′ - 4″	99
A125E	1	#5	STR.	36′ - 3″	38	A221	1	#5	STR.	4′ - 7″	5	K5E	4	#8	1	16′ - 9″	179
A126E	1	#5	STR.	35′ - 0″	37	A222	1	#5	STR.	2′ - 11″	3	K6E	4	#8	2	27′ - 0″	288
A127E	1	#5	STR.	33′ - 9″	35	A223	1	#5	STR.	38′ - 9″	40	K7E	6	#5	STR.	10′ - 10″	68
A128E	1	#5	STR.	32′ - 6″	34	A224	1	#5	STR.	37′ - 6″	39	K8E	9	#6	STR.	7′ - 7″	103
A129E	1	#5	STR.	31′ - 3″	33	A225	1	#5	STR.	36′ - 3″	38	K9	12	#4	5	7′ - 1″	57
A130E	1	#5	STR.	30′ - 0″	31	A226	1	#5	STR.	35′ - 0″	37	K10	12	#4	6	14′ - 5″	116
A131E	1	#5	STR.	28′ - 10″	30	A227	1	#5	STR.	33′ - 9″	35	K11	12	#4	5	7′ - 3″	58
A132E	1	#5	STR.	27′ - 7″	29	A228	1	#5	STR.	32′ - 6″	34	K12	12	#4	6	14′ - 9″	118
A133E	1	#5	STR.	26′ - 4″	27	A229	1	#5	STR.	31′ - 3″	33	K13	12	#4	STR.	7′ - 4″	59
A134E	1	#5	STR.	25′ - 1″	26	A230	1	#5	STR.	30′ - 0″	31	K14	48	#4	STR.	10′ - 6″	337
A135E	1	#5	STR.	23′ - 10″	25	A231	1	#5	STR.	28′ - 10″	30	K15	12	#4	STR.	7′ - 7″	61
A136E	1	#5	STR.	22′ - 7″	24	A232	1	#5	STR.	27′ - 7″	29						
A137E	1	#5	STR.	21′ - 4″	22	A233	1	#5	STR.	26′ - 4″	27	S1E	42	#4	3	4′ - 7″	129
A138E	1	#5	STR.	20′ - 2″	21	A234	1	#5	STR.	25′ - 1″	26	S2E	42	#5	4	5′ - 10″	256
A139E	1	#5	STR.	18′ - 11″	20	A235	1	#5	STR.	23′ - 10″	25	S3E	24	#5	4	3′ - 2″	79
A140E	1	#5	STR.	17′ - 8″	18	A236	1	#5	STR.	22′ - 7″	24	S4	282	#4	8	3′ - 8″	691
A141E	1	#5	STR.	16′ - 5″	17	A237	1	#5	STR.	21′ - 4″	22						
A142E	1	#5	STR.	15′ - 2″	16	A238	1	#5	STR.	20′ - 2″	21	U1	42	#4	7	16′ - 5″	461
A143E	1	#5	STR.	14′ - 0″	15	A239	1	#5	STR.	18′ - 11″	20	U2	24	#4	3	9′ - 7″	154

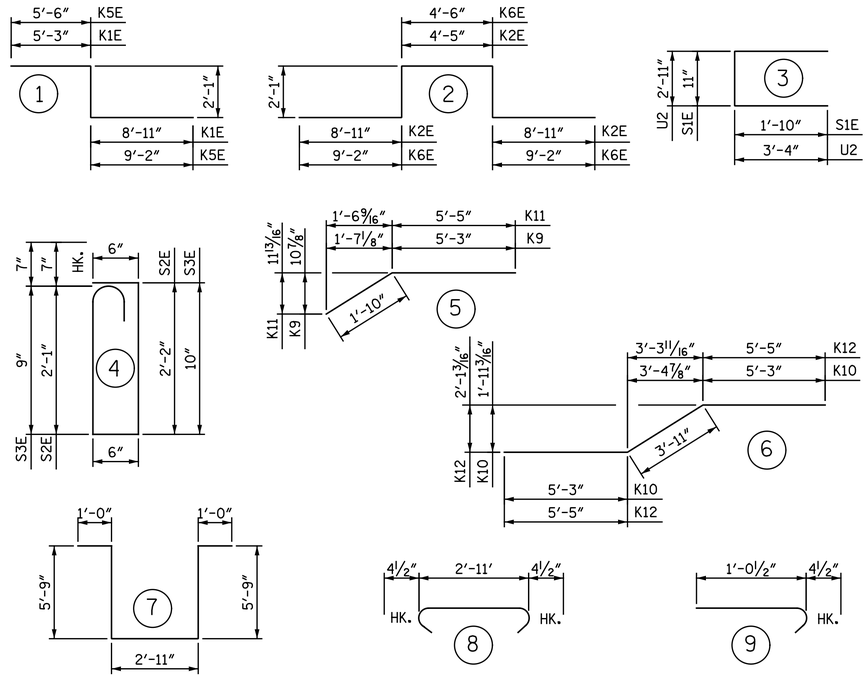
REINFORCING STEEL	LBS.	38,628
EPOXY COATED REINF. STEEL	LBS.	43,982

"E" SUFFIX DENOTES EPOXY COATED REINFORCING

GROOVING BRIDGE FLOORS (SPANS A, B & C)

APPROACH SLAB @ END BENT 1	802	SQ. FT.
BRIDGE DECK (SPANS A, B & C)	10,410	SQ. FT.
TOTAL	11,212	SQ. FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
SPANS A, B & C	-	38,628	43,982
POUR 1	135.9	-	-
POUR 2	163.5	-	-
POUR 3	167.9	-	-
POUR 4	15.2	-	-
SPANS A, B & C TOTALS *	482.5	38,628	43,982

* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

RIGHT LANE

Michael Baker INTERNATIONAL

Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-40
1			3			TOTAL SHEETS
2			4			63

DRAWN BY : M. D. MAYHEW DATE : 5-3-18
CHECKED BY : B. J. BELL DATE : 5-4-18

REINFORCING BAR SCHEDULE

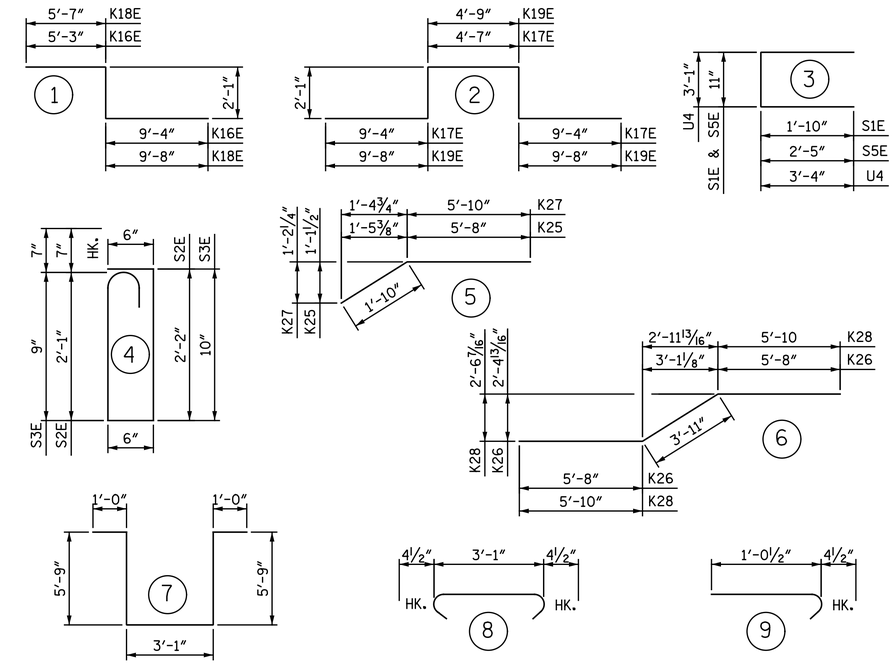
UNIT 2 (SPANS D, E & F)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	569	#5	STR.	39′ - 5″	23,392	A192E	1	#5	STR.	29′ - 10″	31	A267	1	#5	STR.	21′ - 3″	22	A311	1	#5	STR.	11′ - 11″	12
A2	569	#5	STR.	39′ - 5″	23,392	A193E	1	#5	STR.	28′ - 11″	30	A268	1	#5	STR.	20′ - 0″	21	A312	1	#5	STR.	11′ - 0″	11
A4E	4	#6	STR.	43′ - 0″	258	A194E	1	#5	STR.	28′ - 0″	29	A269	1	#5	STR.	18′ - 9″	20	A313	1	#5	STR.	10′ - 1″	11
A5E	4	#6	STR.	45′ - 5″	273	A195E	1	#5	STR.	27′ - 0″	28	A270	1	#5	STR.	17′ - 6″	18	A314	1	#5	STR.	9′ - 2″	10
						A196E	1	#5	STR.	26′ - 1″	27	A271	1	#5	STR.	16′ - 4″	17	A315	1	#5	STR.	8′ - 2″	9
A153E	1	#5	STR.	38′ - 4″	40	A197E	1	#5	STR.	25′ - 2″	26	A272	1	#5	STR.	15′ - 1″	16	A316	1	#5	STR.	7′ - 3″	8
A154E	1	#5	STR.	37′ - 1″	39	A198E	1	#5	STR.	24′ - 2″	25	A273	1	#5	STR.	13′ - 10″	14	A317	1	#5	STR.	6′ - 4″	7
A155E	1	#5	STR.	35′ - 10″	37	A199E	1	#5	STR.	23′ - 3″	24	A274	1	#5	STR.	12′ - 7″	13	A318	1	#5	STR.	5′ - 5″	6
A156E	1	#5	STR.	34′ - 8″	36	A200E	1	#5	STR.	22′ - 3″	23	A275	1	#5	STR.	11′ - 4″	12	A319	1	#5	STR.	4′ - 6″	5
A157E	1	#5	STR.	33′ - 5″	35	A201E	1	#5	STR.	21′ - 4″	22	A276	1	#5	STR.	10′ - 2″	11	A320	1	#5	STR.	3′ - 6″	4
A158E	1	#5	STR.	32′ - 3″	34	A202E	1	#5	STR.	20′ - 5″	21	A277	1	#5	STR.	8′ - 11″	9	A321	1	#5	STR.	2′ - 7″	3
A159E	1	#5	STR.	31′ - 0″	32	A203E	1	#5	STR.	19′ - 6″	20	A278	1	#5	STR.	7′ - 8″	8						
A160E	1	#5	STR.	29′ - 9″	31	A204E	1	#5	STR.	18′ - 6″	19	A279	1	#5	STR.	6′ - 5″	7	B5E	104	#7	STR.	40′ - 9″	8,662
A161E	1	#5	STR.	28′ - 7″	30	A205E	1	#5	STR.	17′ - 7″	18	A280	1	#5	STR.	5′ - 2″	5	B6E	54	#5	STR.	28′ - 3″	1,591
A162E	1	#5	STR.	27′ - 4″	29	A206E	1	#5	STR.	16′ - 8″	17	A281	1	#5	STR.	3′ - 11″	4	B7	228	#5	STR.	56′ - 3″	13,376
A163E	1	#5	STR.	26′ - 1″	27	A207E	1	#5	STR.	15′ - 8″	16	A282	1	#5	STR.	2′ - 8″	3	B8E	135	#5	STR.	57′ - 1″	8,038
A164E	1	#5	STR.	24′ - 11″	26	A208E	1	#5	STR.	14′ - 9″	15	A283	1	#5	STR.	38′ - 5″	40						
A165E	1	#5	STR.	23′ - 8″	25	A209E	1	#5	STR.	13′ - 10″	14	A284	1	#5	STR.	37′ - 6″	39	G2E	1	#5	STR.	43′ - 0″	45
A166E	1	#5	STR.	22′ - 5″	23	A210E	1	#5	STR.	12′ - 11″	13	A285	1	#5	STR.	36′ - 6″	38	G3E	1	#5	STR.	45′ - 5″	47
A167E	1	#5	STR.	21′ - 3″	22	A211E	1	#5	STR.	11′ - 11″	12	A286	1	#5	STR.	35′ - 7″	37						
A168E	1	#5	STR.	20′ - 0″	21	A212E	1	#5	STR.	11′ - 0″	11	A287	1	#5	STR.	34′ - 8″	36	J1E	82	#4	9	1′ - 5″	78
A169E	1	#5	STR.	18′ - 9″	20	A213E	1	#5	STR.	10′ - 1″	11	A288	1	#5	STR.	33′ - 8″	35						
A170E	1	#5	STR.	17′ - 6″	18	A214E	1	#5	STR.	9′ - 2″	10	A289	1	#5	STR.	32′ - 9″	34	K7E	6	#5	STR.	10′ - 10″	68
A171E	1	#5	STR.	16′ - 4″	17	A215E	1	#5	STR.	8′ - 2″	9	A290	1	#5	STR.	31′ - 9″	33	K8E	9	#6	STR.	7′ - 7″	103
A172E	1	#5	STR.	15′ - 1″	16	A216E	1	#5	STR.	7′ - 3″	8	A291	1	#5	STR.	30′ - 10″	32	K16E	4	#8	1	16′ - 8″	178
A173E	1	#5	STR.	13′ - 10″	14	A217E	1	#5	STR.	6′ - 4″	7	A292	1	#5	STR.	29′ - 10″	31	K17E	4	#8	2	27′ - 5″	293
A174E	1	#5	STR.	12′ - 7″	13	A218E	1	#5	STR.	5′ - 5″	6	A293	1	#5	STR.	28′ - 11″	30	K18E	4	#8	1	17′ - 4″	185
A175E	1	#5	STR.	11′ - 4″	12	A219E	1	#5	STR.	4′ - 6″	5	A294	1	#5	STR.	28′ - 0″	29	K19E	4	#8	2	28′ - 3″	302
A176E	1	#5	STR.	10′ - 2″	11	A220E	1	#5	STR.	3′ - 6″	4	A295	1	#5	STR.	27′ - 0″	28	K20	12	#4	STR.	7′ - 8″	61
A177E	1	#5	STR.	8′ - 11″	9	A221E	1	#5	STR.	2′ - 7″	3	A296	1	#5	STR.	26′ - 1″	27	K21	48	#4	STR.	11′ - 0″	353
A178E	1	#5	STR.	7′ - 8″	8	A253	1	#5	STR.	38′ - 4″	40	A297	1	#5	STR.	25′ - 2″	26	K22	12	#4	STR.	7′ - 11″	63
A179E	1	#5	STR.	6′ - 5″	7	A254	1	#5	STR.	37′ - 1″	39	A298	1	#5	STR.	24′ - 2″	25	K23E	6	#5	STR.	11′ - 5″	71
A180E	1	#5	STR.	5′ - 2″	5	A255	1	#5	STR.	35′ - 10″	37	A299	1	#5	STR.	23′ - 3″	24	K24E	9	#6	STR.	7′ - 11″	107
A181E	1	#5	STR.	3′ - 11″	4	A256	1	#5	STR.	34′ - 8″	36	A300	1	#5	STR.	22′ - 3″	23	K25	12	#4	5	7′ - 6″	60
A182E	1	#5	STR.	2′ - 8″	3	A257	1	#5	STR.	33′ - 5″	35	A301	1	#5	STR.	21′ - 4″	22	K26	12	#4	6	15′ - 3″	122
A183E	1	#5	STR.	38′ - 5″	40	A258	1	#5	STR.	32′ - 3″	34	A302	1	#5	STR.	20′ - 5″	21	K27	12	#4	5	7′ - 8″	61
A184E	1	#5	STR.	37′ - 6″	39	A259	1	#5	STR.	31′ - 0″	32	A303	1	#5	STR.	19′ - 6″	20	K28	12	#4	6	15′ - 7″	125
A185E	1	#5	STR.	36′ - 6″	38	A260	1	#5	STR.	29′ - 9″	31	A304	1	#5	STR.	18′ - 6″	19						
A186E	1	#5	STR.	35′ - 7″	37	A261	1	#5	STR.	28′ - 7″	30	A305	1	#5	STR.	17′ - 7″	18	S1E	21	#4	3	4′ - 7″	64
A187E	1	#5	STR.	34′ - 8″	36	A262	1	#5	STR.	27′ - 4″	29	A306	1	#5	STR.	16′ - 8″	17	S2E	42	#5	4	5′ - 10″	256
A188E	1	#5	STR.	33′ - 8″	35	A263	1	#5	STR.	26′ - 1″	27	A307	1	#5	STR.	15′ - 8″	16	S3E	24	#5	4	3′ - 2″	79
A189E	1	#5	STR.	32′ - 9″	34	A264	1	#5	STR.	24′ - 11″	26	A308	1	#5	STR.	14′ - 9″	15	S5E	21	#4	3	5′ - 9″	81
A190E	1	#5	STR.	31′ - 9″	33	A265	1	#5	STR.	23′ - 8″	25	A309	1	#5	STR.	13′ - 10″	14	S6	282	#4	8	3′ - 10″	722
A191E	1	#5	STR.	30′ - 10″	32	A266	1	#5	STR.	22′ - 5″	23	A310	1	#5	STR.	12′ - 11″	13						
																		U3	42	#4	7	16′ - 7″	465
																		U4	24	#4	3	9′ - 9″	156
																		REINFORCING STEEL				LBS.	40,428
																		EPOXY COATED REINF. STEEL				LBS.	45,643

GROOVING BRIDGE FLOORS (SPANS D, E & F)

APPROACH SLAB @ END BENT 2	797	SQ. FT.
BRIDGE DECK (SPANS D, E & F)	10,907	SQ. FT.
TOTAL	11,704	SQ. FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
SPANS D, E & F	-	40,428	45,643
POUR 5	135.5	-	-
POUR 6	174.8	-	-
POUR 7	179.8	-	-
POUR 8	15.4	-	-
SPANS D, E & F TOTALS *	505.5	40,428	45,643

"E" SUFFIX DENOTES EPOXY COATED REINFORCING * QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/7/2018
C41A3F8ECA3C434...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

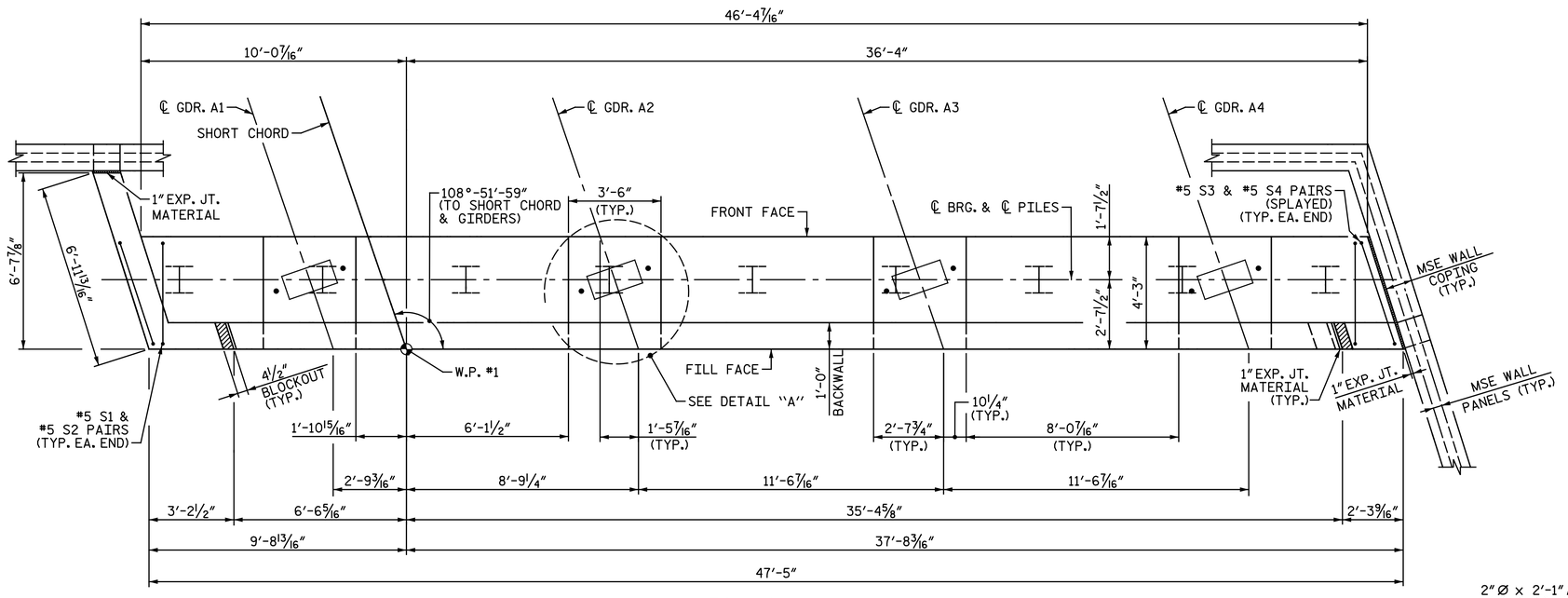
BILL OF MATERIAL

RIGHT LANE

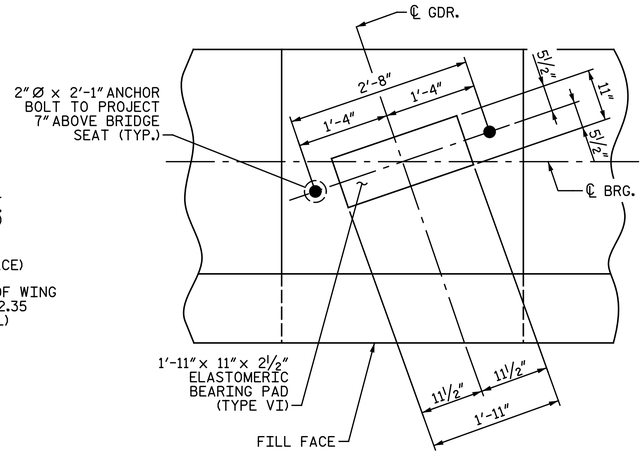
Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-41
1			3			TOTAL SHEETS
2			4			63

DRAWN BY : M. D. MAYHEW DATE : 5-3-18
CHECKED BY : B. J. BELL DATE : 5-4-18

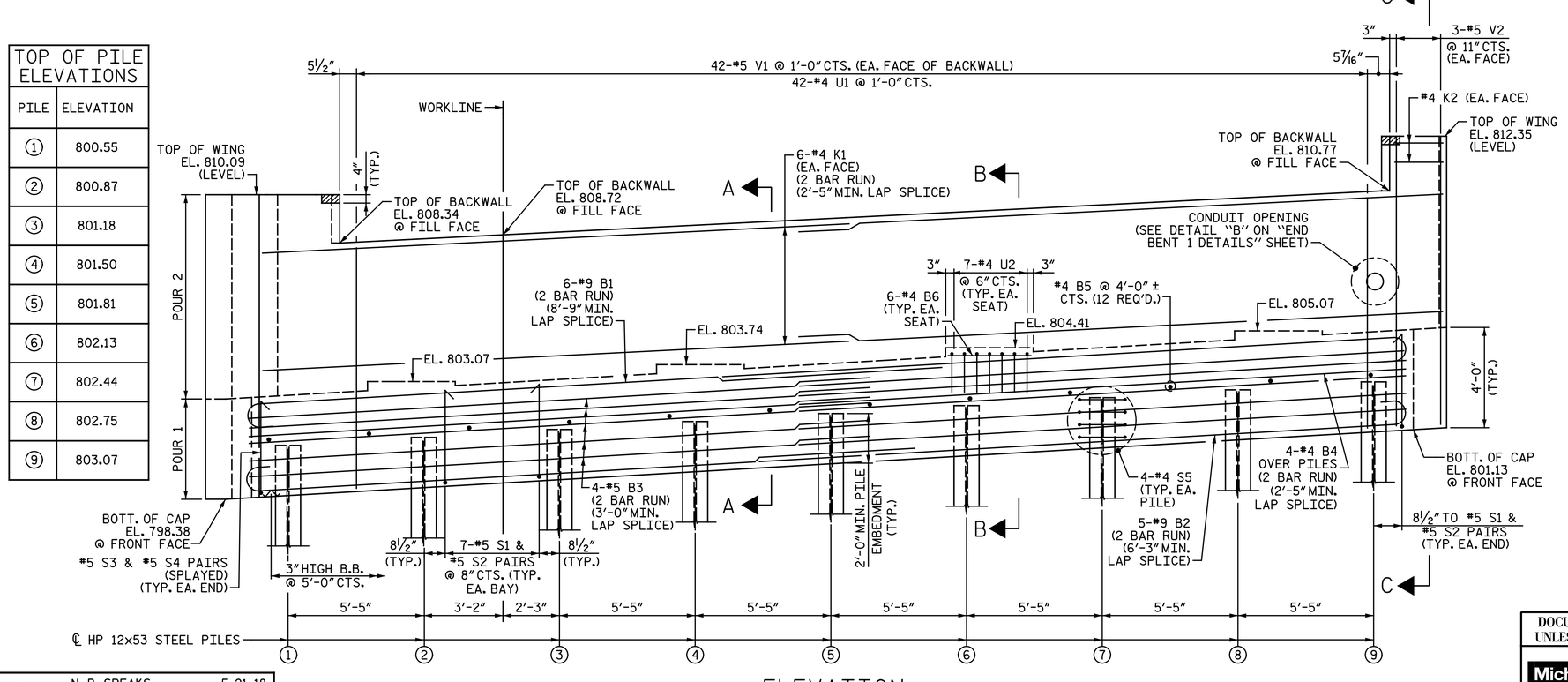


PLAN



DETAIL ″A″
(TYP. EA. BRIDGE SEAT)

TOP OF PILE ELEVATIONS	
PILE	ELEVATION
①	800.55
②	800.87
③	801.18
④	801.50
⑤	801.81
⑥	802.13
⑦	802.44
⑧	802.75
⑨	803.07



ELEVATION

NOTES:

FOR ″SECTION A-A″, ″SECTION B-B″ AND ″SECTION C-C″, SEE ″END BENT 1 DETAILS″ SHEET.

STIRRUPS & U2 BARS 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 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 FRONT FACE AT A RATE OF 2%.

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

V1 & K1 BARS IN BACKWALL MAY BE SHIFTED AS NECESSARY TO CLEAR CONDUIT OPENING.

FOR MSE WALLS, SEE SPECIAL PROVISIONS.

FOR LOCATION OF MSE WALL, SEE MSE WALL PLANS.

LENGTH OF CAP AND EACH WING SHALL BE FIELD ADJUSTED AS REQUIRED TO PROVIDE 1″ EXPANSION JOINT MATERIAL AS SHOWN BETWEEN THESE COMPONENTS AND THE MSE WALL COPING.

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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RALEIGH

SUBSTRUCTURE

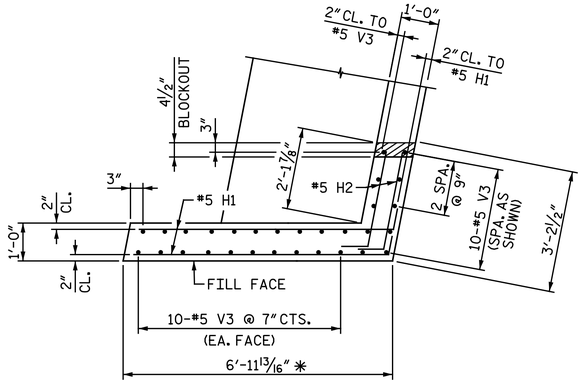
END BENT 1

RIGHT LANE

DRAWN BY : N. B. SPEAKS DATE : 5-21-18
CHECKED BY : T. M. GARRISON DATE : 5-21-18

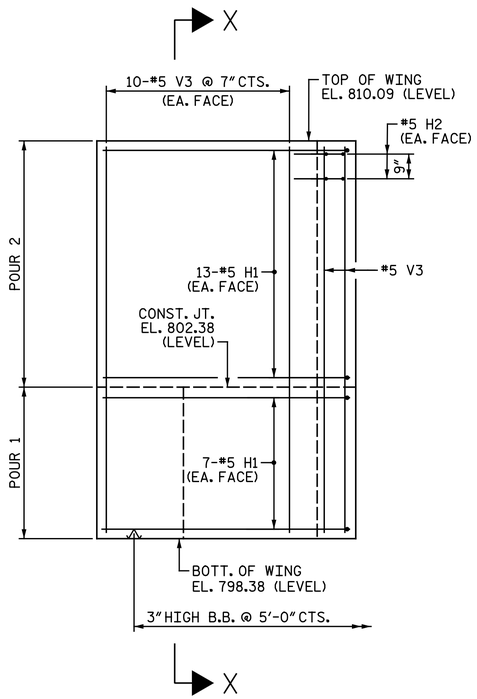
Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No. : F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-42
1			3			TOTAL SHEETS
2			4			63

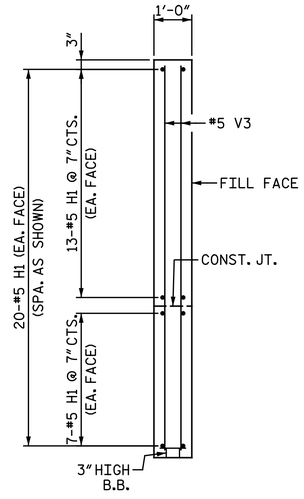


PLAN OF LEFT WING

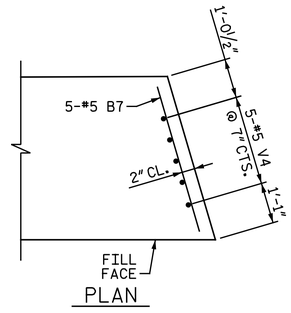
✳ SEE NOTE REGARDING LENGTH OF WING ON "END BENT 1" SHEET 1 OF 2.



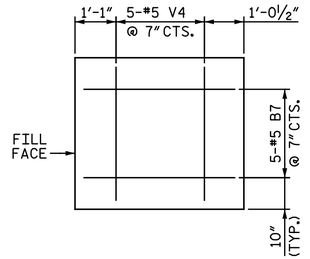
ELEVATION OF LEFT WING



SECTION X-X



PLAN



END VIEW

RIGHT END OF CAP

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

RIGHT LANE

Michael Baker INTERNATIONAL

Michael Baker Engineering
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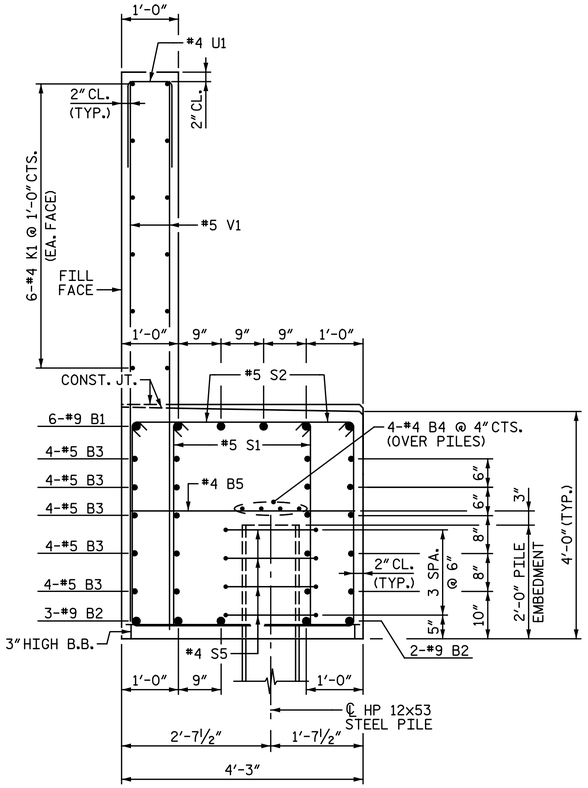
Cary, North Carolina 27518
NC License No. : F-1084

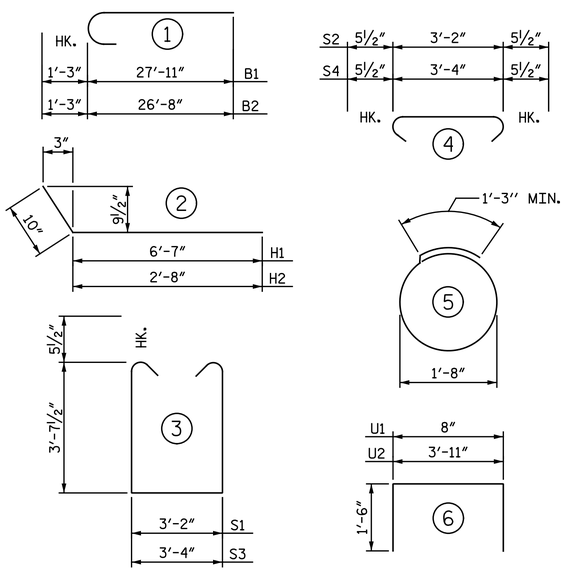
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-43
1			3			TOTAL SHEETS
2			4			63

DRAWN BY : N. B. SPEAKS DATE : 5-21-18
CHECKED BY : T. M. GARRISON DATE : 5-21-18



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

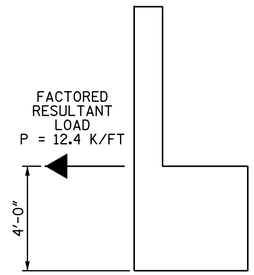
END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	29' - 2"	1,190
B2	10	#9	1	27' - 11"	949
B3	40	#5	STR.	25' - 1"	1,046
B4	8	#4	STR.	24' - 9"	132
B5	12	#4	STR.	3' - 11"	31
B6	24	#4	STR.	3' - 2"	51
B7	5	#5	STR.	4' - 1"	21
H1	40	#5	2	7' - 5"	309
H2	4	#5	2	3' - 6"	15
K1	24	#4	STR.	24' - 9"	397
K2	4	#4	STR.	1' - 11"	5
K3	8	#4	STR.	3' - 8"	20
S1	116	#5	3	11' - 4"	1,371
S2	116	#5	4	4' - 1"	494
S3	4	#5	3	11' - 6"	48
S4	4	#5	4	4' - 3"	18
S5	36	#4	5	6' - 6"	156
U1	42	#4	6	3' - 8"	103
U2	28	#4	6	6' - 11"	129
V1	84	#5	STR.	9' - 4"	818
V2	6	#5	STR.	10' - 11"	68
V3	30	#5	STR.	11' - 4"	355
V4	5	#5	STR.	3' - 8"	19

REINFORCING STEEL	LBS.	7,745
CLASS A CONCRETE		
POUR 1 - CAP & LOWER PART OF WINGS	C.Y.	30.8
POUR 2 - BACKWALL & UPPER PART OF WINGS	C.Y.	12.1
TOTAL	C.Y.	42.9
PILE EXCAVATION IN SOIL	LIN. FT.	53
PILE EXCAVATION NOT IN SOIL	LIN. FT.	38
HP 12x53 STEEL PILES NO. 9	LIN. FT.	425

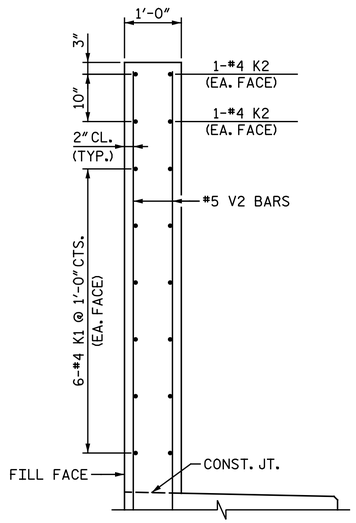
NOTES:

FOR PILE SPLICE DETAILS, SEE "END BENT 2 DETAILS" SHEET.

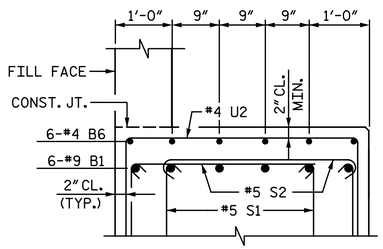


MSE REINFORCING STRAP LOAD DETAIL

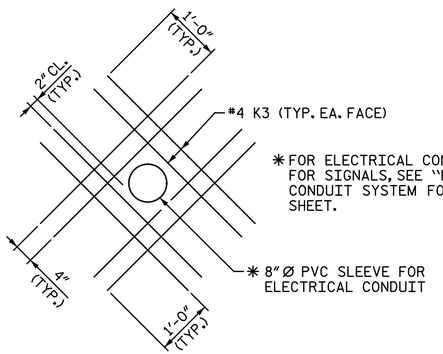
MSE REINFORCING STRAPS SHALL BE ATTACHED TO THE END BENT CAP AND/OR BACKWALL. FOR DESIGN CRITERIA AND DETAILS, SEE MSE WALL SHEETS AND SPECIAL PROVISIONS.



PARTIAL SECTION C-C



PARTIAL SECTION B-B



DETAIL "B"

THE PVC SLEEVE THROUGH THE BACKWALL SHALL BE LOCATED BY THE ENGINEER. THE K3 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR TOP OF CAP.

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

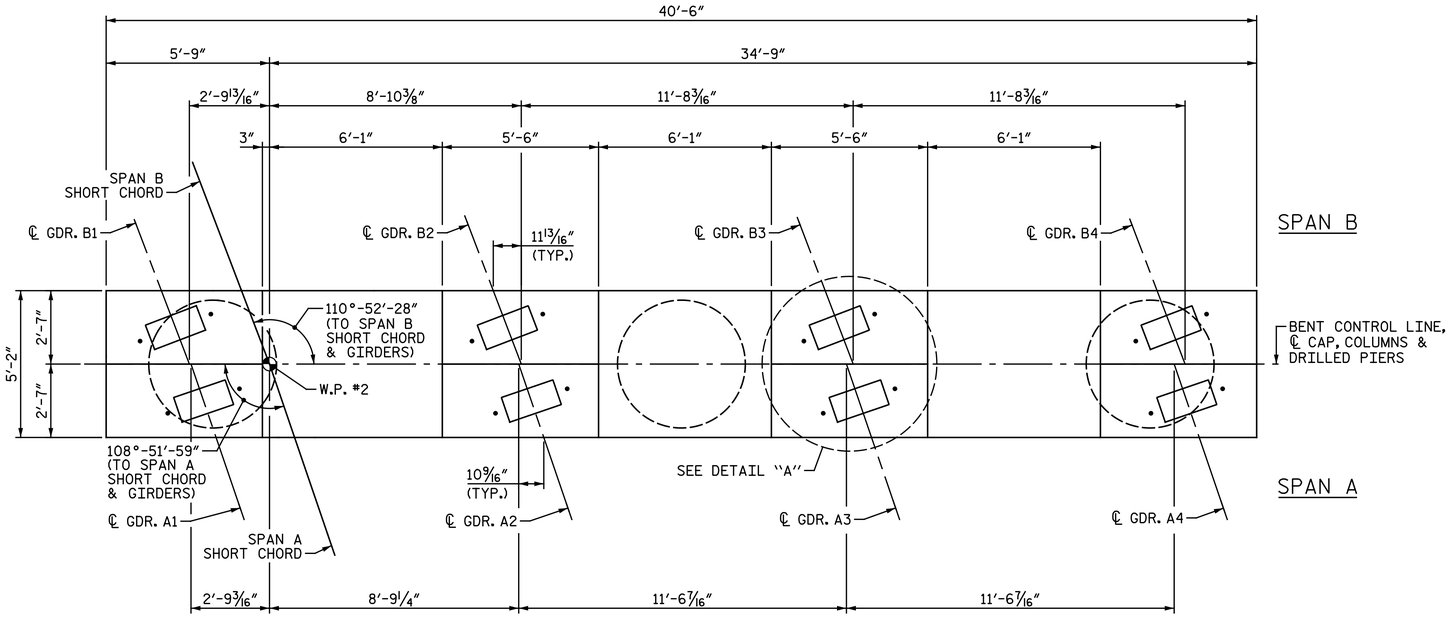
END BENT 1 DETAILS

RIGHT LANE

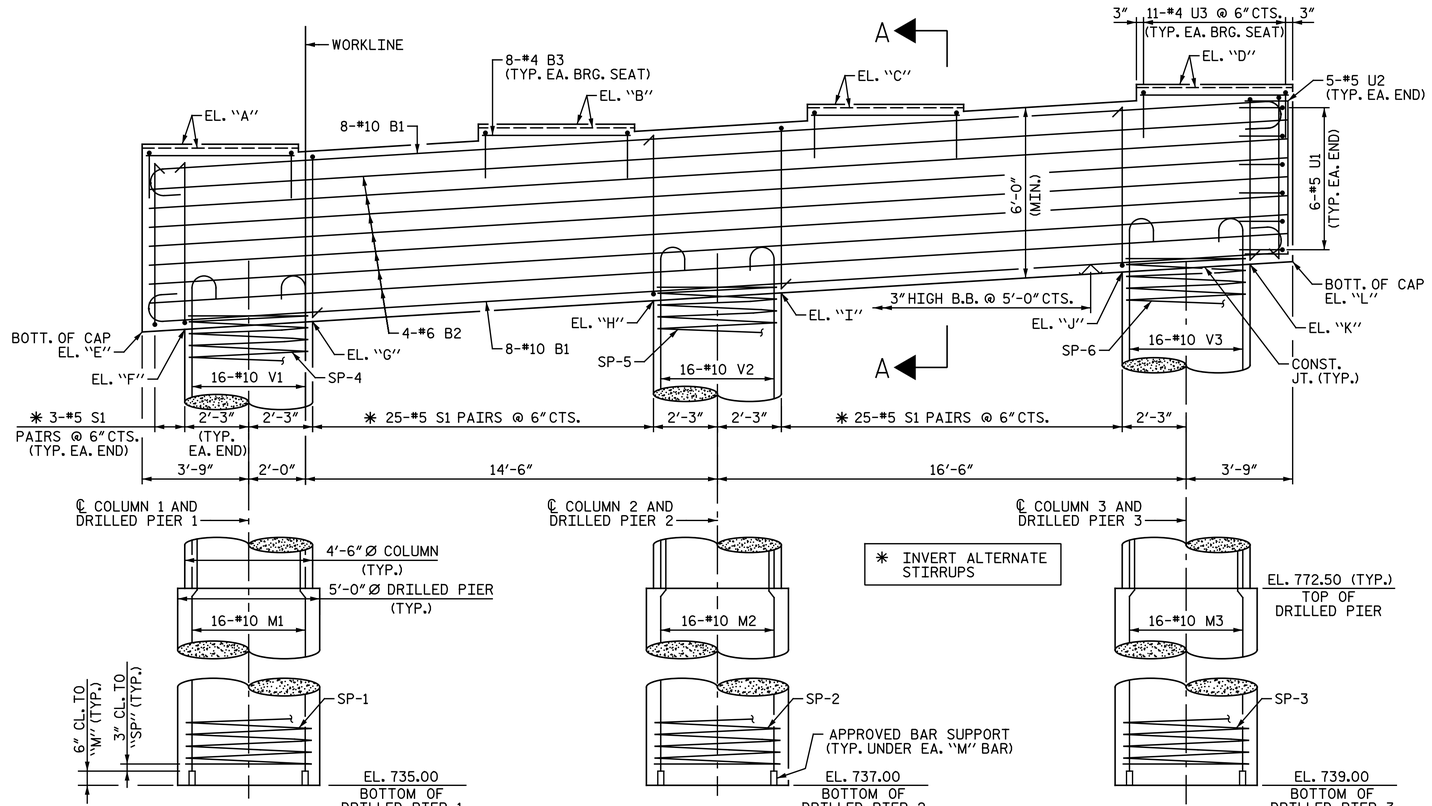
Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-44
1			3			TOTAL SHEETS
2			4			63

DRAWN BY : N. B. SPEAKS DATE : 5-24-18
CHECKED BY : T. M. GARRISON DATE : 5-24-18



PLAN



ELEVATION

✱ INVERT ALTERNATE STIRRUPS

LOCATION	ELEVATION SPAN A	ELEVATION SPAN B
A	799.10	798.99
B	799.80	799.69
C	800.49	800.40
D	801.18	801.10

LOCATION	ELEVATION
E	792.52
F	792.61
G	792.88
H	793.61
I	793.88
J	794.61
K	794.88
L	794.97

NOTES:

STIRRUPS AND ″U″ BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

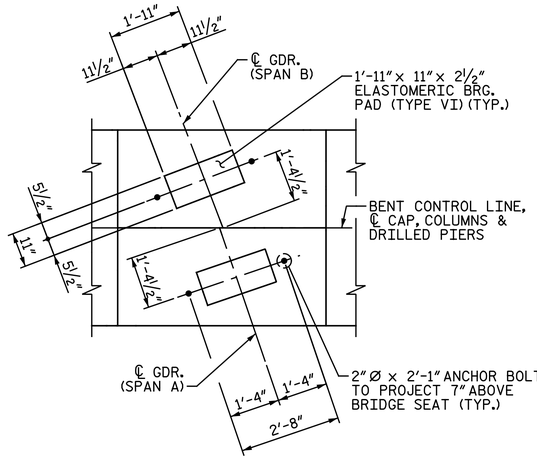
FOR SECTION A-A, SEE ″BENT 1 DETAILS″ SHEET.

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.

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



DETAIL ″A″
(TYP. EA. BRIDGE SEAT)

PROJECT NO. U-2412A
GUILFORD COUNTY
STATION: 93+23.34 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

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DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

RIGHT LANE

DRAWN BY : C. E. MAYHEW DATE : 5-21-18
CHECKED BY : T. M. GARRISON DATE : 5-21-18

Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
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REVISIONS						SHEET NO.
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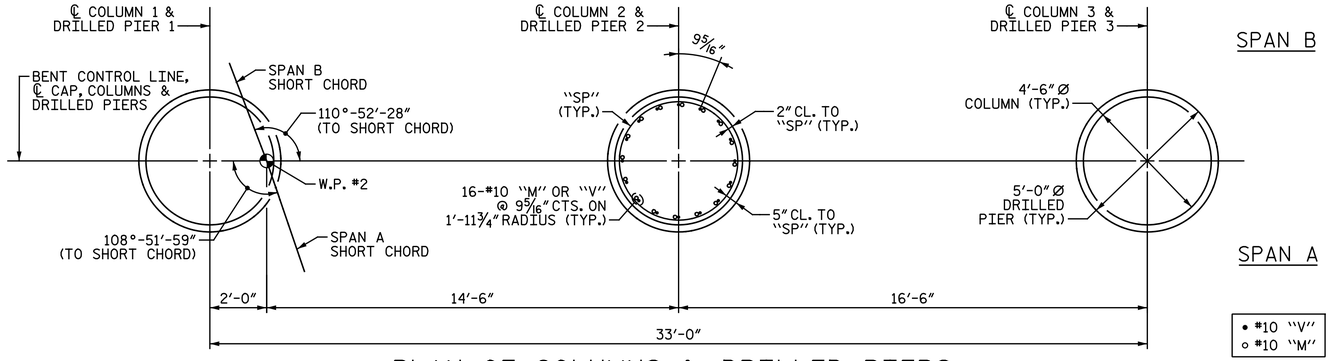
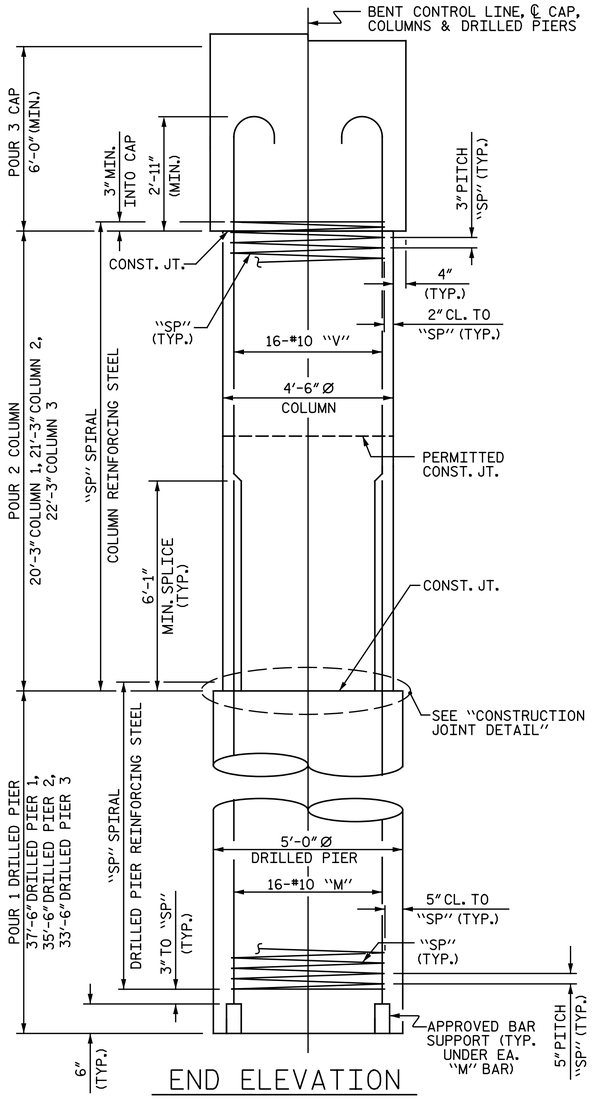
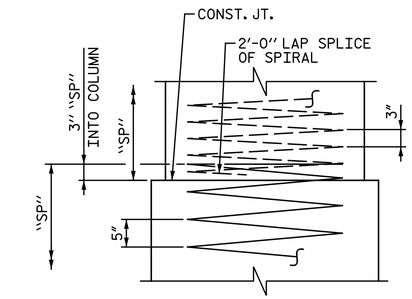
1			3			TOTAL SHEETS
2			4			63



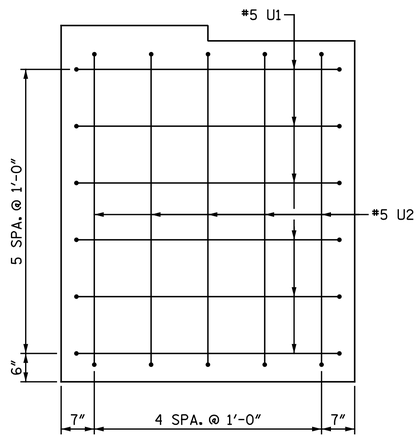
PLAN OF COLUMNS & DRILLED PIERS



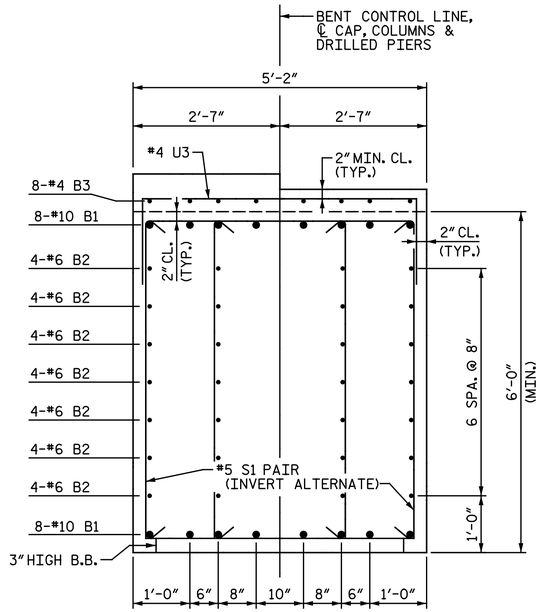
END ELEVATION



CONSTRUCTION JOINT DETAIL

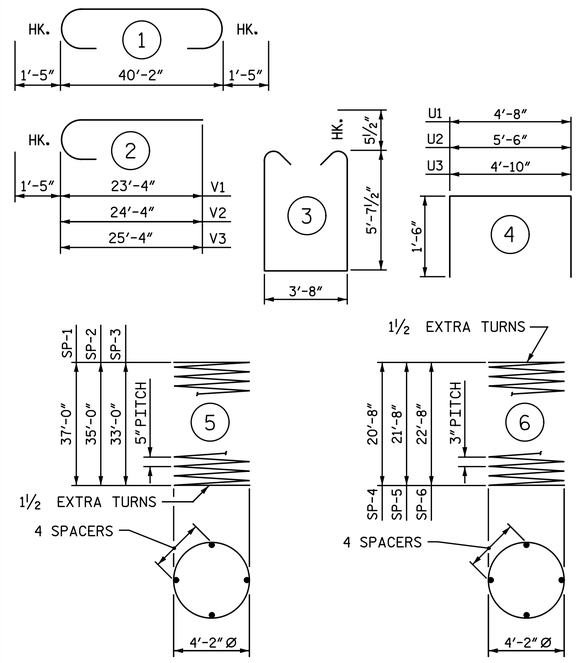


END VIEW



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

✱ THE SP-1 THRU SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

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

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#10	1	43′ - 0″	2,960
B2	28	#6	STR.	40′ - 2″	1,689
B3	32	#4	STR.	5′ - 2″	110
M1	16	#10	STR.	46′ - 1″	3,173
M2	16	#10	STR.	44′ - 1″	3,035
M3	16	#10	STR.	42′ - 1″	2,897
S1	112	#5	3	15′ - 10″	1,850
U1	12	#5	4	7′ - 8″	96
U2	10	#5	4	8′ - 6″	89
U3	44	#4	4	7′ - 10″	230
V1	16	#10	2	24′ - 9″	1,704
V2	16	#10	2	25′ - 9″	1,773
V3	16	#10	2	26′ - 9″	1,842

REINFORCING STEEL				LBS.	21,448
SP-1	1	✱	5	1167′ - 10″	1,218
SP-2	1	✱	5	1105′ - 9″	1,153
SP-3	1	✱	5	1043′ - 8″	1,089
SP-4	1	✱✱	6	1090′ - 11″	729
SP-5	1	✱✱	6	1142′ - 9″	763
SP-6	1	✱✱	6	1194′ - 7″	798
SPIRAL COLUMN REINFORCING STEEL				LBS.	5,750

CLASS A CONCRETE		
POUR 2 - COLUMNS	C.Y.	37.6
POUR 3 - CAP	C.Y.	48.0
TOTAL CLASS A CONCRETE	C.Y.	85.6
DRILLED PIER CONCRETE		
POUR 1 - DRILLED PIERS	C.Y.	77.5
5′-0″ DIA. DRILLED PIERS IN SOIL	LIN. FT.	68.50
5′-0″ DIA. DRILLED PIERS NOT IN SOIL	LIN. FT.	38.00
SID INSPECTIONS	EA.	1
CSL TESTING	EA.	1
CSL TUBES	LIN. FT.	555.00

PROJECT NO. U-2412A

GUILFORD COUNTY

STATION: 93+23.34 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

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RALEIGH
SUBSTRUCTURE

BENT 1 DETAILS

RIGHT LANE

Michael Baker INTERNATIONAL
Michael Baker Engineering
8000 Regency Parkway, Suite 600
Cary, North Carolina 27518
NC License No.: F-1084

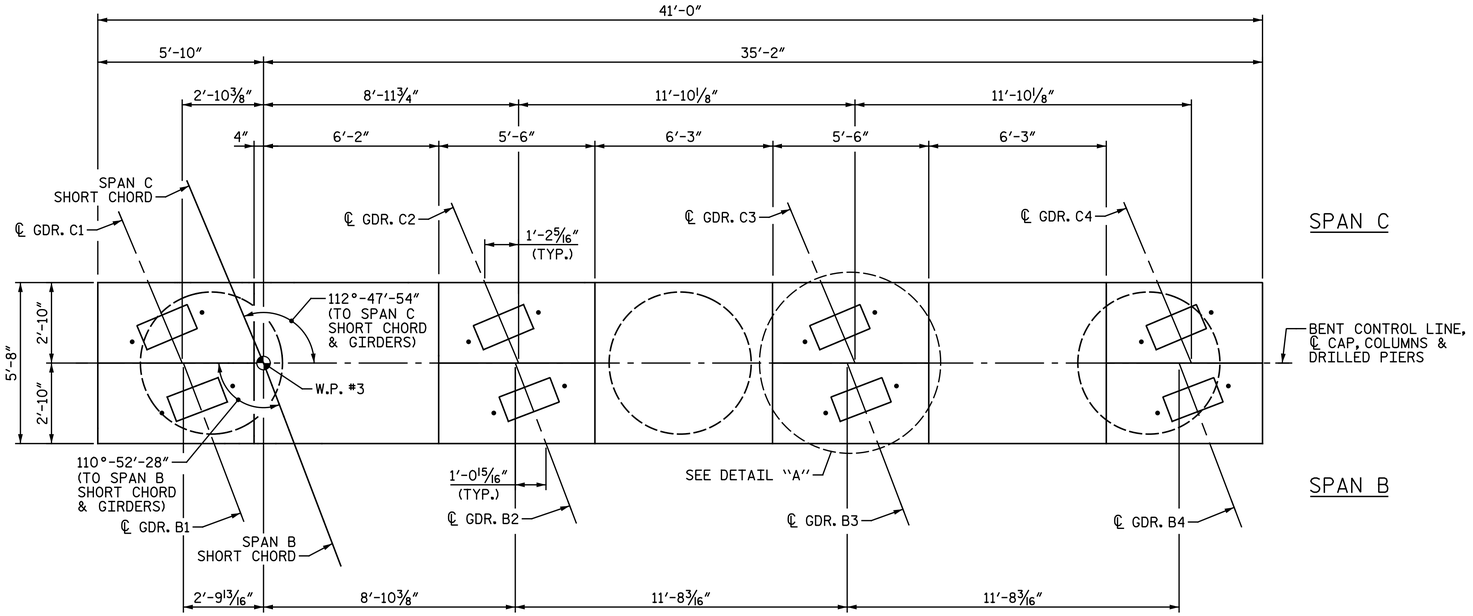
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S2-46

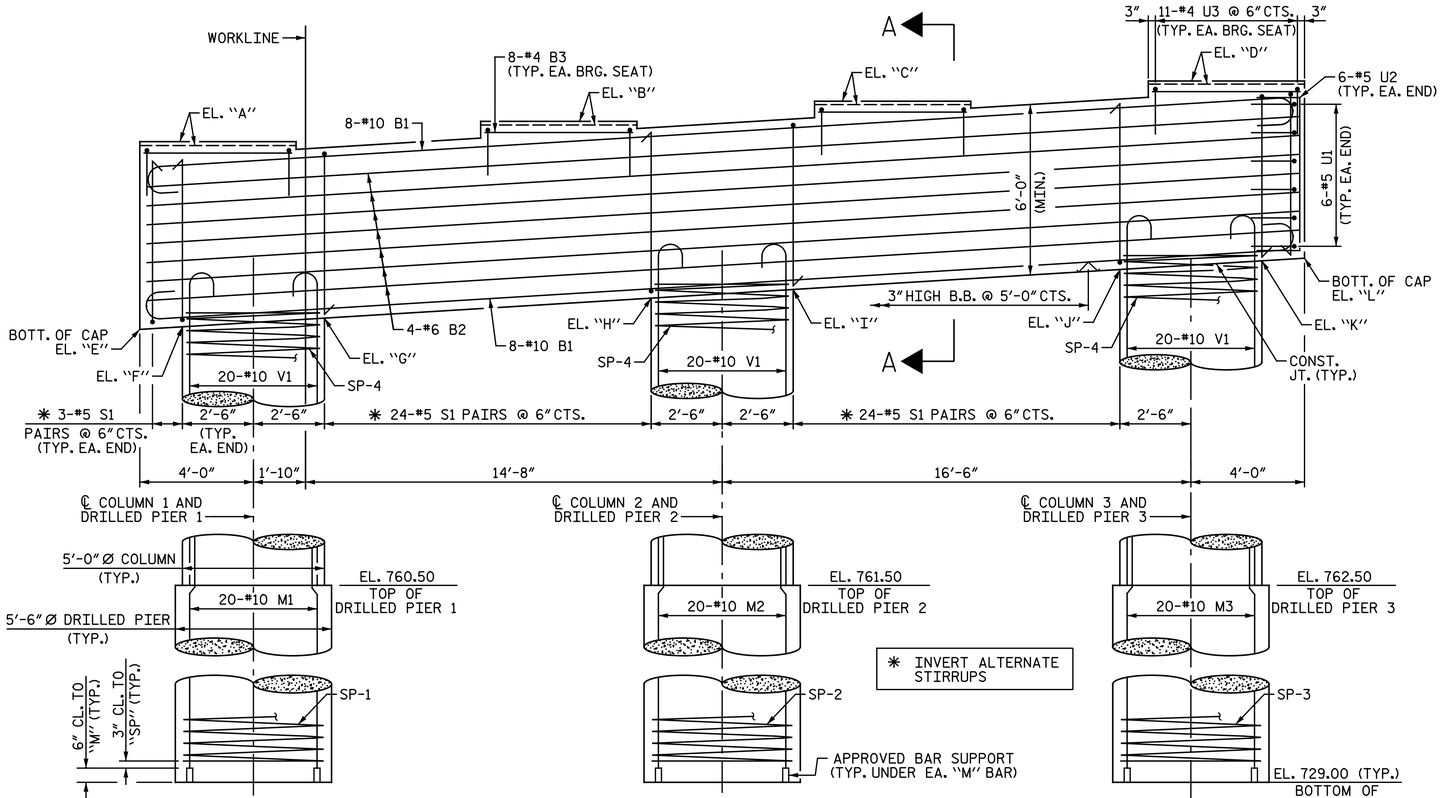
TOTAL SHEETS 63

DRAWN BY : C. E. MAYHEW DATE : 5-21-18

CHECKED BY : T. M. GARRISON DATE : 5-21-18



PLAN



✱ INVERT ALTERNATE STIRRUPS

ELEVATION

DRAWN BY : C. E. MAYHEW DATE : 5-21-18
CHECKED BY : T. M. GARRISON DATE : 5-21-18

NOTES:

STIRRUPS AND ″U″ BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR SECTION A-A, SEE ″BENT 2 DETAILS″ SHEET.

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

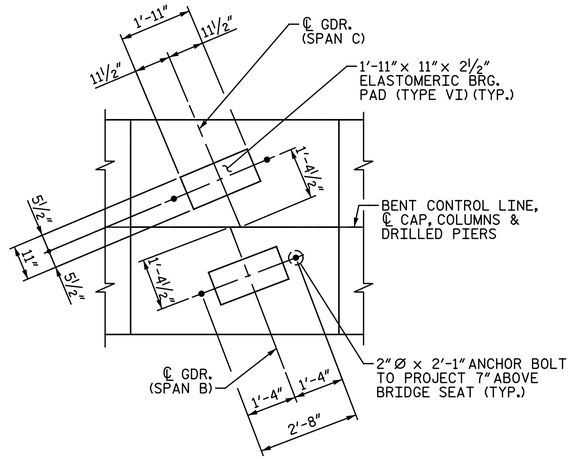
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR ″REINFORCING STEEL″ AND ″SPIRAL COLUMN REINFORCING STEEL″.

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.

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

LOCATION	ELEVATION SPAN B	ELEVATION SPAN C
A	795.15	795.04
B	795.86	795.76
C	796.57	796.48
D	797.28	797.20

LOCATION	ELEVATION
E	788.56
F	788.66
G	788.96
H	789.67
I	789.97
J	790.68
K	790.98
L	791.07



DETAIL ″A″
(TYP. EA. BRIDGE SEAT)

PROJECT NO. U-2412A
GUILFORD COUNTY
STATION: 93+23.34 -L-

NORTH CAROLINA PROFESSIONAL SEAL 042399 ENGINEER BRADLEY J. BELL

DocuSigned by: Bradley J. Bell 5/22/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Cary, North Carolina 27518
NC License No.: F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-47
1			3			TOTAL SHEETS
2			4			63