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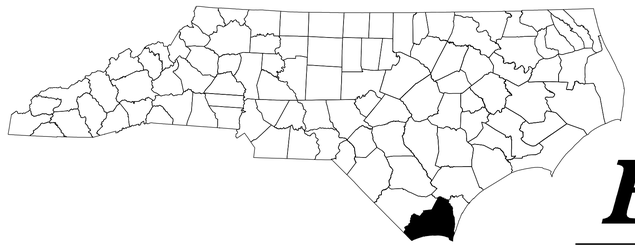
PROJECT NUMBER: 15BPR.25

CONTRACT: C204185



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

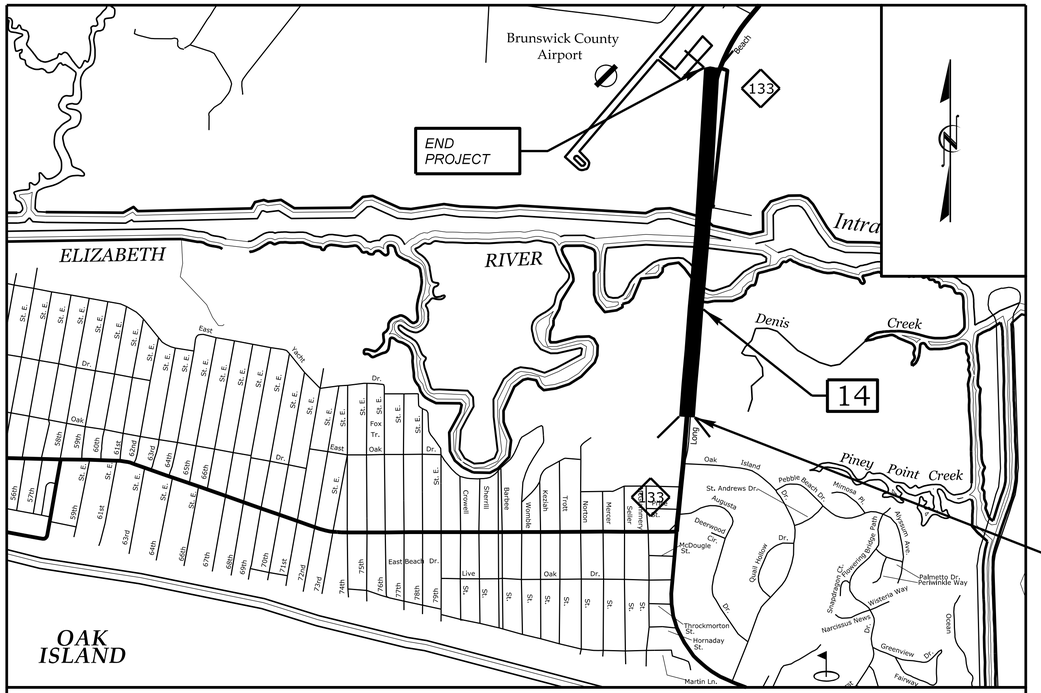
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15BPR.25	1	111

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
15BPR.25	–	P.E.
15BPR.25	–	CONST.

LOCATION: BRUNSWICK COUNTY

BRIDGE #14 ON NC 133 OVER THE INTRACOASTAL WATERWAY

TYPE OF WORK: ***BRIDGE PRESERVATION – SUPERSTRUCTURE REPLACEMENT AND REPAIR, SUBSTRUCTURE REPAIR AND CATHODIC PROTECTION AND JOINT REPAIR***



VICINITY MAP N.T.S.

STRUCTURES

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

BRUNSWICK COUNTY
#14 ADT 2015 = 12,000

PROJECT LENGTH

BRUNSWICK COUNTY
#14 = 0.80 MILE

2018 STANDARD SPECIFICATIONS

LETTING DATE :
MAY 15, 2018

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

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

SAMUEL L. CULLUM, P.E.
PROJECT ENGINEER

JACOB H. DUKE, P.E.
PROJECT DESIGN ENGINEER

PROJECT NUMBER: 15BPR.25

CONTRACT: C204185

INDEX OF SHEETS - STRUCTURES

1	TITLE SHEET	S-36	CHANNEL BENT FOOTING RESTORATION - ZINCE METALIZING DETAILS - BENTS 37-49, 52 & 53	S-75	SUBSTRUCTURE CONCRETE REPAIRS - BENT 37
1A	INDEX OF SHEETS	S-37	CHANNEL BENT FOOTING RESTORATION - BULK ANODE DETAILS - BENTS 50 & 51	S-76	SUBSTRUCTURE CONCRETE REPAIRS - BENT 38
2	SHEET NOT USED	S-38	SUBSTRUCTURE CONCRETE REPAIRS - END BENTS 1 & 2	S-77	SUBSTRUCTURE CONCRETE REPAIRS - BENT 39
S-1	SUMMARY OF QUANTITIES	S-39	SUBSTRUCTURE CONCRETE REPAIRS - BENT 1	S-78	SUBSTRUCTURE CONCRETE REPAIRS - BENT 40
S-2A	GENERAL NOTES	S-40	SUBSTRUCTURE CONCRETE REPAIRS - BENT 2	S-79	SUBSTRUCTURE CONCRETE REPAIRS - BENT 41
S-2B	GENERAL NOTES	S-41	SUBSTRUCTURE CONCRETE REPAIRS - BENT 3	S-80	SUBSTRUCTURE CONCRETE REPAIRS - BENT 42
S-3	GENERAL DRAWING	S-42	SUBSTRUCTURE CONCRETE REPAIRS - BENT 4	S-81	SUBSTRUCTURE CONCRETE REPAIRS - BENT 43
S-4	GENERAL DRAWING FOR SUPERSTRUCTURE REPLACEMENT	S-43	SUBSTRUCTURE CONCRETE REPAIRS - BENT 5	S-82	SUBSTRUCTURE CONCRETE REPAIRS - BENT 44
S-5	LRFR SUMMARY	S-44	SUBSTRUCTURE CONCRETE REPAIRS - BENT 6	S-83	SUBSTRUCTURE CONCRETE REPAIRS - BENT 45
S-6	OOI-CAD - PRESTRESSED CONCRETE CORED SLAB	S-45	SUBSTRUCTURE CONCRETE REPAIRS - BENT 7	S-84	SUBSTRUCTURE CONCRETE REPAIRS - BENT 46
S-7	OOI-CAD - PLAN OF 39'-10 1/2' UNIT 40'-0" CLEAR ROADWAY 90° SKEW	S-46	SUBSTRUCTURE CONCRETE REPAIRS - BENT 8	S-85	SUBSTRUCTURE CONCRETE REPAIRS - BENT 47
S-8	OOI-CAD - SCARIFICATION DETAILS	S-47	SUBSTRUCTURE CONCRETE REPAIRS - BENT 9	S-86	SUBSTRUCTURE CONCRETE REPAIRS - BENT 48
S-9	OOI-CAD - 3'-0" X 1'-6" PC CORED SLAB	S-48	SUBSTRUCTURE CONCRETE REPAIRS - BENT 10	S-87	SUBSTRUCTURE CONCRETE REPAIRS - BENT 49
S-10	STANDARD 2 BAR METAL RAIL - SPANS 1 THRU 28	S-49	SUBSTRUCTURE CONCRETE REPAIRS - BENT 11	S-88	SUBSTRUCTURE CONCRETE REPAIRS - BENT 50
S-11	STANDARD 2 BAR METAL RAIL - SPANS 1 THRU 28	S-50	SUBSTRUCTURE CONCRETE REPAIRS - BENT 12	S-89	SUBSTRUCTURE CONCRETE REPAIRS - BENT 51
S-12	STANDARD RAIL POST SPACINGS AND END OF RAIL DETAILS - SPANS 1 THRU 28	S-51	SUBSTRUCTURE CONCRETE REPAIRS - BENT 13	S-90	SUBSTRUCTURE CONCRETE REPAIRS - BENT 52
S-13	CONCRETE PARAPET AND END POST DETAILS	S-52	SUBSTRUCTURE CONCRETE REPAIRS - BENT 14	S-91	SUBSTRUCTURE CONCRETE REPAIRS - BENT 53
S-14	GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS	S-53	SUBSTRUCTURE CONCRETE REPAIRS - BENT 15	S-92	SUBSTRUCTURE CONCRETE REPAIRS - BENT 54
S-15	BEARING PLACEMENT DETAILS	S-54	SUBSTRUCTURE CONCRETE REPAIRS - BENT 16	S-93	SUBSTRUCTURE CONCRETE REPAIRS - BENT 55
S-16	PLAN OF SPAN - SPAN 29	S-55	SUBSTRUCTURE CONCRETE REPAIRS - BENT 17	S-94	SUBSTRUCTURE CONCRETE REPAIRS - BENT 56
S-17	PLAN OF SPAN - SPANS 30-37 & 63-65	S-56	SUBSTRUCTURE CONCRETE REPAIRS - BENT 18	S-95	SUBSTRUCTURE CONCRETE REPAIRS - BENT 57
S-18	PLAN OF SPAN - SPANS 38-49 & 53-62	S-57	SUBSTRUCTURE CONCRETE REPAIRS - BENT 19	S-96	SUBSTRUCTURE CONCRETE REPAIRS - BENT 58
S-19	PLAN OF SPAN - SPANS 50-52	S-58	SUBSTRUCTURE CONCRETE REPAIRS - BENT 20	S-97	SUBSTRUCTURE CONCRETE REPAIRS - BENT 59
S-20	PPC OVERLAY TYPICAL SECTIONS - SPANS 29-65	S-59	SUBSTRUCTURE CONCRETE REPAIRS - BENT 21	S-98	SUBSTRUCTURE CONCRETE REPAIRS - BENT 60
S-21	JOINT DETAILS - SPANS 29- 65, TABLE AND QUANTITIES	S-60	SUBSTRUCTURE CONCRETE REPAIRS - BENT 22	S-99	SUBSTRUCTURE CONCRETE REPAIRS - BENT 61
S-22	JOINT DETAILS - NORTH APPROACH SLAB & RAIL DETAILS	S-61	SUBSTRUCTURE CONCRETE REPAIRS - BENT 23	S-100	SUBSTRUCTURE CONCRETE REPAIRS - BENT 62
S-23	APPROACH - MILLING AND RESURFACING	S-62	SUBSTRUCTURE CONCRETE REPAIRS - BENT 24	S-101	SUBSTRUCTURE CONCRETE REPAIRS - BENT 63
S-24	APPROACH - GUARDRAIL REPLACEMENT	S-63	SUBSTRUCTURE CONCRETE REPAIRS - BENT 25	S-102	SUBSTRUCTURE CONCRETE REPAIRS - BENT 64
S-25	BRIDGE RAIL RETROFIT - SPANS 29 - 65	S-64	SUBSTRUCTURE CONCRETE REPAIRS - BENT 26	S-103	SUPERSTRUCTURE DEFICIENCIES (1 of 6)
S-26	BRIDGE RAIL RETROFIT RAIL POST SPACING AND END RAIL DETAILS - SPANS 29 - 65	S-65	SUBSTRUCTURE CONCRETE REPAIRS - BENT 27	S-104	SUPERSTRUCTURE DEFICIENCIES (2 of 6)
S-27	BRIDGE RAIL RETROFIT PARAPET AND END POST DETAILS - SPANS 29 - 65	S-66	SUBSTRUCTURE CONCRETE REPAIRS - BENT 28	S-105	SUPERSTRUCTURE DEFICIENCIES (3 of 6)
S-28	BRIDGE RAIL RETROFIT END POST DETAILS AND BILL OF MATERIALS - SPANS 29 - 65	S-67	SUBSTRUCTURE CONCRETE REPAIRS - BENT 29	S-106	SUPERSTRUCTURE DEFICIENCIES (4 of 6)
S-29	NAVIGATIONAL LIGHT SYSTEM	S-68	SUBSTRUCTURE CONCRETE REPAIRS - BENT 30	S-107	SUPERSTRUCTURE DEFICIENCIES (5 of 6)
S-30	CONCRETE RESTORATION DETAILS - SUPERSTRUCTURE (1 OF 2)	S-69	SUBSTRUCTURE CONCRETE REPAIRS - BENT 31	S-108	SUPERSTRUCTURE DEFICIENCIES (6 of 6)
S-31	CONCRETE RESTORATION DETAILS - SUPERSTRUCTURE (2 OF 2)	S-70	SUBSTRUCTURE CONCRETE REPAIRS - BENT 32	S-109	ROADWAY STANDARD DETAILS (1 OF 2)
S-32	CONCRETE RESTORATION DETAILS - SUBSTRUCTURE	S-71	SUBSTRUCTURE CONCRETE REPAIRS - BENT 33	S-110	ROADWAY STANDARD DETAILS (2 OF 2)
S-33	CP PILE JACKET DETAILS	S-72	SUBSTRUCTURE CONCRETE REPAIRS - BENT 34	S-111	STANDARD NOTES
S-34	CP PILE JACKET DETAILS	S-73	SUBSTRUCTURE CONCRETE REPAIRS - BENT 35		
S-35	CP PILE JACKET DETAILS	S-74	SUBSTRUCTURE CONCRETE REPAIRS - BENT 36		

INDEX OF SHEETS - TEMPORARY TRAFFIC CONTROL

TMP-1	TITLE SHEET	TMP-3	OFFSITE DETOUR SHEET 1	TMP-9	RESURFACING ADVANCE WARNING SIGNS
TMP-1A	ROADWAY STANDARD DRAWINGS AND LEGEND	TMP-4	OFFSITE DETOUR SHEET 2		
TMP-1B	GENERAL NOTES (1 OF 2)	TMP-5	OFFSITE DETOUR SHEET 3		
TMP-1C	GENERAL NOTES (2 OF 2)	TMP-6	OFFSITE DETOUR SHEET 4		
TMP-1D	PHASING NOTES	TMP-7	LANE SHIFT DETAIL		
TMP-2	OFFSITE DETOUR OVERVIEW	TMP-8	BRIDGE BARRIER PROTECTION DETAIL		

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15BPR.25	1A	111

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
15BPR.25	–	P.E.
15BPR.25	–	CONST.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15BPR.25	2	111

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
15BPR.25	–	P.E.
15BPR.25	–	CONST.

SHEET NOT USED

PROJECT NUMBER: 15BPR.25

CONTRACT: C204185

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
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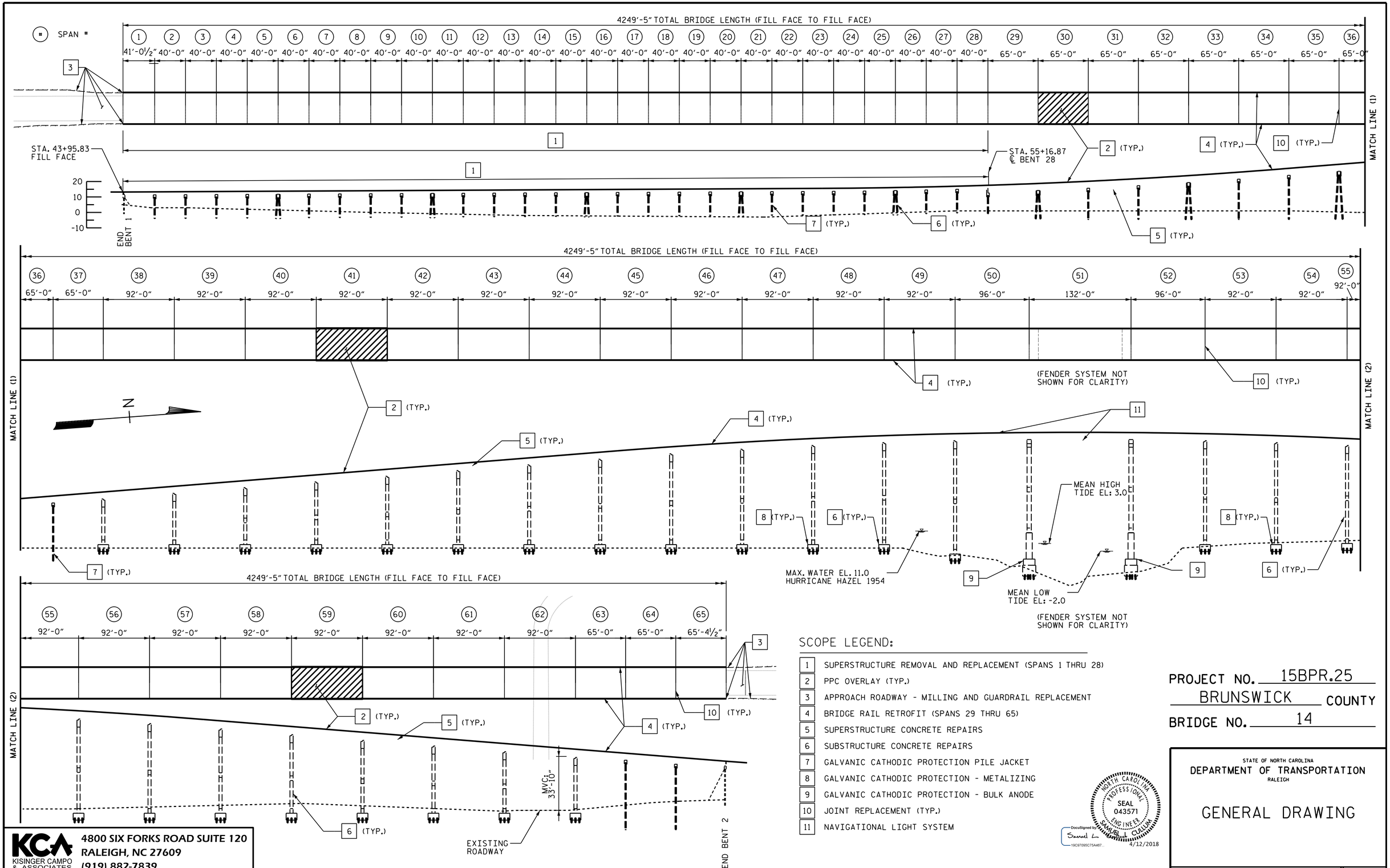

SCOPE LEGEND:

1	SUPERSTRUCTURE REMOVAL AND REPLACEMENT (SPANS 1 THRU 28)
2	PPC OVERLAY (TYP.)
3	APPROACH ROADWAY - MILLING AND GUARDRAIL REPLACEMENT
4	BRIDGE RAIL RETROFIT (SPANS 29 THRU 65)
5	SUPERSTRUCTURE CONCRETE REPAIRS
6	SUBSTRUCTURE CONCRETE REPAIRS
7	GALVANIC CATHODIC PROTECTION PILE JACKET
8	GALVANIC CATHODIC PROTECTION - METALIZING
9	GALVANIC CATHODIC PROTECTION - BULK ANODE
10	JOINT REPLACEMENT (TYP.)
11	NAVIGATIONAL LIGHT SYSTEM

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

DocuSigned by: Samuel L Cullum 19C97095C75A467...
4/12/2018

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.98	--	1.75	0.263	1.98	1 - 28	EL	19.6	0.289	2.31	1 - 28	EL	0.00	0.80	0.263	2.40	1 - 28	EL	11.6	
		HL-93 (OPERATING)	N/A		2.57	--	1.35	0.263	2.57	1 - 28	EL	19.6	0.289	3.00	1 - 28	EL	0.00	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	2.48	89.28	1.75	0.263	2.48	1 - 28	EL	19.6	0.289	2.71	1 - 28	EL	0.00	0.80	0.263	2.60	1 - 28	EL	11.6	
		HS-20 (OPERATING)	36.000		3.22	115.92	1.35	0.263	3.22	1 - 28	EL	19.6	0.289	3.52	1 - 28	EL	0.00	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.75	77.63	1.40	0.263	5.75	1 - 28	EL	19.6	0.289	7.38	1 - 28	EL	0.00	0.80	0.263	5.94	1 - 28	EL	11.6	
		SNGARBS2	20.000		4.60	92.00	1.40	0.263	4.74	1 - 28	EL	15.6	0.289	5.45	1 - 28	EL	0.00	0.80	0.263	4.60	1 - 28	EL	11.6	
		SNAGRIS2	22.000		4.43	97.46	1.40	0.263	4.63	1 - 28	EL	15.6	0.289	5.15	1 - 28	EL	0.00	0.80	0.263	4.43	1 - 28	EL	11.6	
		SNCOTTS3	27.250		2.88	78.48	1.40	0.263	2.88	1 - 28	EL	19.6	0.289	3.70	1 - 28	EL	0.00	0.80	0.263	2.99	1 - 28	EL	11.6	
		SNAGGRS4	34.925		2.59	90.46	1.40	0.263	2.59	1 - 28	EL	19.6	0.289	3.22	1 - 28	EL	0.00	0.80	0.263	2.70	1 - 28	EL	11.6	
		SNS5A	35.550		2.52	89.59	1.40	0.263	2.52	1 - 28	EL	19.6	0.289	3.35	1 - 28	EL	0.00	0.80	0.263	2.62	1 - 28	EL	11.6	
		SNS6A	39.950		2.39	95.48	1.40	0.263	2.39	1 - 28	EL	19.6	0.289	3.12	1 - 28	EL	0.00	0.80	0.263	2.47	1 - 28	EL	11.6	
		SNS7B	42.000	3	2.28	95.76	1.40	0.263	2.28	1 - 28	EL	19.6	0.289	3.16	1 - 28	EL	0.00	0.80	0.263	2.41	1 - 28	EL	11.6	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.94	97.02	1.40	0.263	2.94	1 - 28	EL	19.6	0.289	3.66	1 - 28	EL	0.00	0.80	0.263	3.27	1 - 28	EL	11.6	
		TNT4A	33.075		2.98	98.56	1.40	0.263	2.98	1 - 28	EL	19.6	0.289	3.49	1 - 28	EL	0.00	0.80	0.263	3.03	1 - 28	EL	11.6	
		TNT6A	41.600		2.53	105.25	1.40	0.263	2.53	1 - 28	EL	19.6	0.289	3.41	1 - 28	EL	0.00	0.80	0.263	2.69	1 - 28	EL	11.6	
		TNT7A	42.000		2.59	108.78	1.40	0.263	2.59	1 - 28	EL	19.6	0.289	3.15	1 - 28	EL	0.00	0.80	0.263	2.65	1 - 28	EL	11.6	
		TNT7B	42.000		2.65	111.30	1.40	0.263	2.65	1 - 28	EL	19.6	0.289	3.02	1 - 28	EL	0.00	0.80	0.263	2.65	1 - 28	EL	11.6	
		TNAGRIT4	43.000		2.53	108.79	1.40	0.263	2.58	1 - 28	EL	19.6	0.289	2.90	1 - 28	EL	0.00	0.80	0.263	2.53	1 - 28	EL	11.6	
		TNAGT5A	45.000		2.38	107.10	1.40	0.263	2.38	1 - 28	EL	19.6	0.289	2.99	1 - 28	EL	0.00	0.80	0.263	2.59	1 - 28	EL	11.6	
		TNAGT5B	45.000		2.32	104.4	1.40	0.263	2.32	1 - 28	EL	19.6	0.289	2.74	1 - 28	EL	0.00	0.80	0.263	2.36	1 - 28	EL	11.6	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

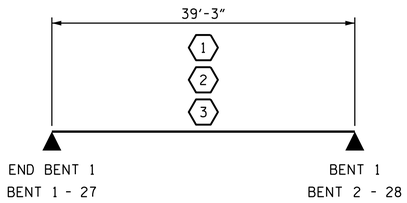
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

SPANS 1 THRU 28

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

4/12/2018
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User:jduke

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

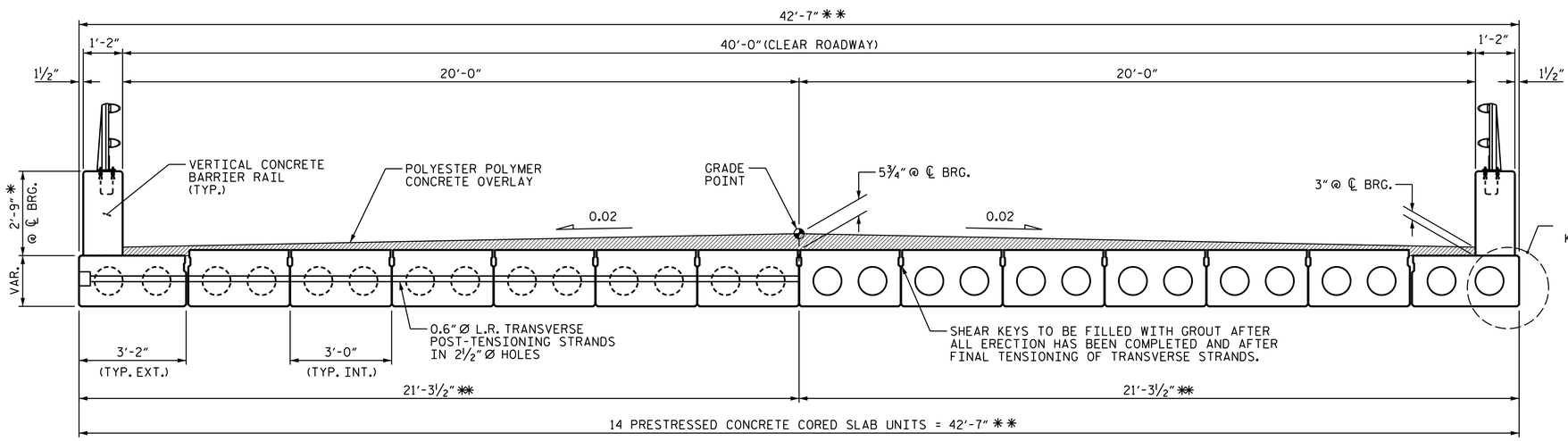
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			111

STD. NO. LRFR1



HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
(THROUGH VOIDS)

PROPOSED TYPICAL SECTION

(SPAN 1 THRU SPAN 28)

* THE MAXIMUM BARRIER RAIL HEIGHT AND PPC OVERLAY THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND PPC OVERLAY THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE.

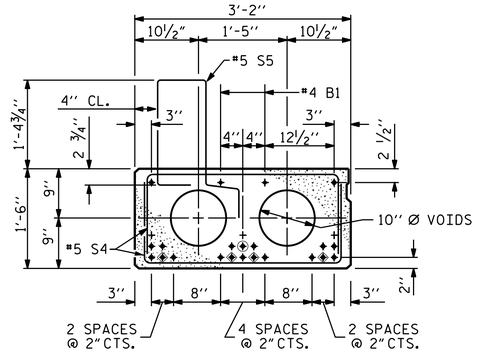
** OUT TO OUT DIMENSIONS BASED ON ASSUMED CORED SLAB WIDTHS WITH DIMENSIONAL TOLERANCE INCLUDED. CAST CORED SLAB UNITS AND INSTALL FIBER BOARD AT LATERAL KEEPER INTERFACE PER PLANS.

NOTES:

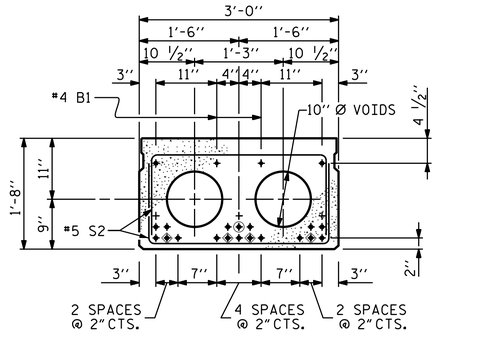
FOR BARRIER RAIL DETAILS, SEE 2-BAR METAL RAIL PARAPET DETAILS ON NEXT SHEET.

FOR SCARIFICATION DETAILS FOR POLYESTER POLYMER CONCRETE (PPC) OVERLAY, SEE 00I-CAD - SCARIFICATION DETAILS SHEET.

FOR SECTION AT BENT 28, SEE PPC OVERLAY JOINT DETAILS SHEET, SECTION A-A.



EXTERIOR SLAB SECTION (39'-10½" UNIT)
(20 STRANDS REQUIRED)

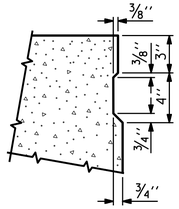


INTERIOR SLAB SECTION (39'-10½" UNIT)
(20 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT

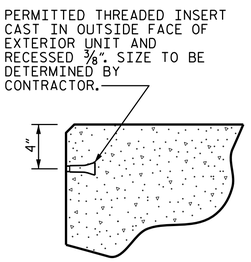
◈ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

◉ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

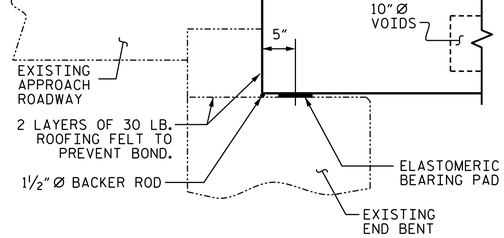


SHEAR KEY DETAIL

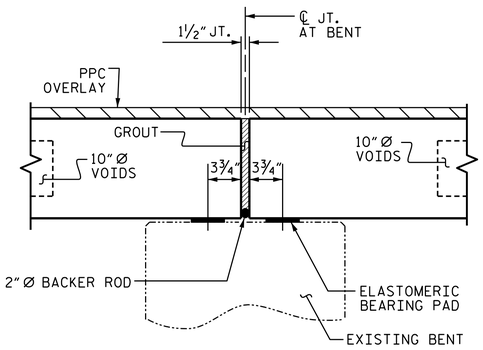
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



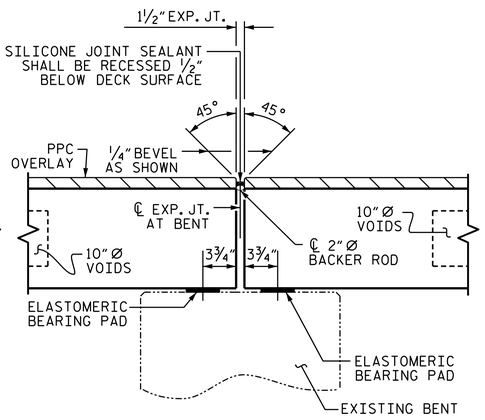
THREADED INSERT DETAIL



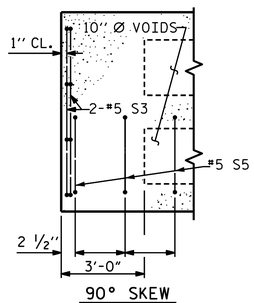
SECTION AT END BENT
(BT #: END BENT 1)



FIXED END SECTION AT BENT
(BT #: 1, 3, 4, 6, 7, 9, 10, 12, 13, 15, 16, 18, 19, 21, 22, 24, 25, 27)

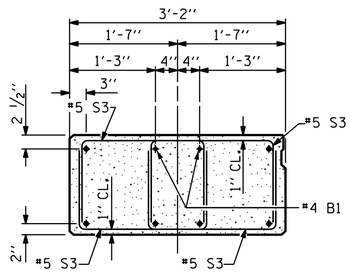


EXPANSION END SECTION AT BENT
(BT #: 2, 5, 8, 11, 14, 17, 20, 23, 26)

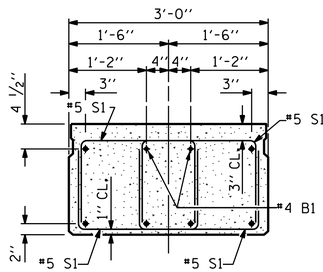


90° SKEW

PART PLAN-EXTERIOR SECTION
EXTERIOR SECTION SHOWN-INTERIOR SECTION SIMILAR EXCEPT OMIT S5 BARS AND REPLACE S3 WITH S1



END ELEVATION EXTERIOR SLAB
SHOWING PLACEMENT OF DOUBLE STIRRUPS (STRAND LAYOUT NOT SHOWN)



END ELEVATION INTERIOR SLAB
SHOWING PLACEMENT OF DOUBLE STIRRUPS (STRAND LAYOUT NOT SHOWN)

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

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User:jduke

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LEE CULLUM
DocuSigned by: Samuel Lee
19C97095C75A467...
4/12/2018

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PROJECT NO. 15BPR.25
BRUNSWICK COUNTY
BRIDGE NO. 14
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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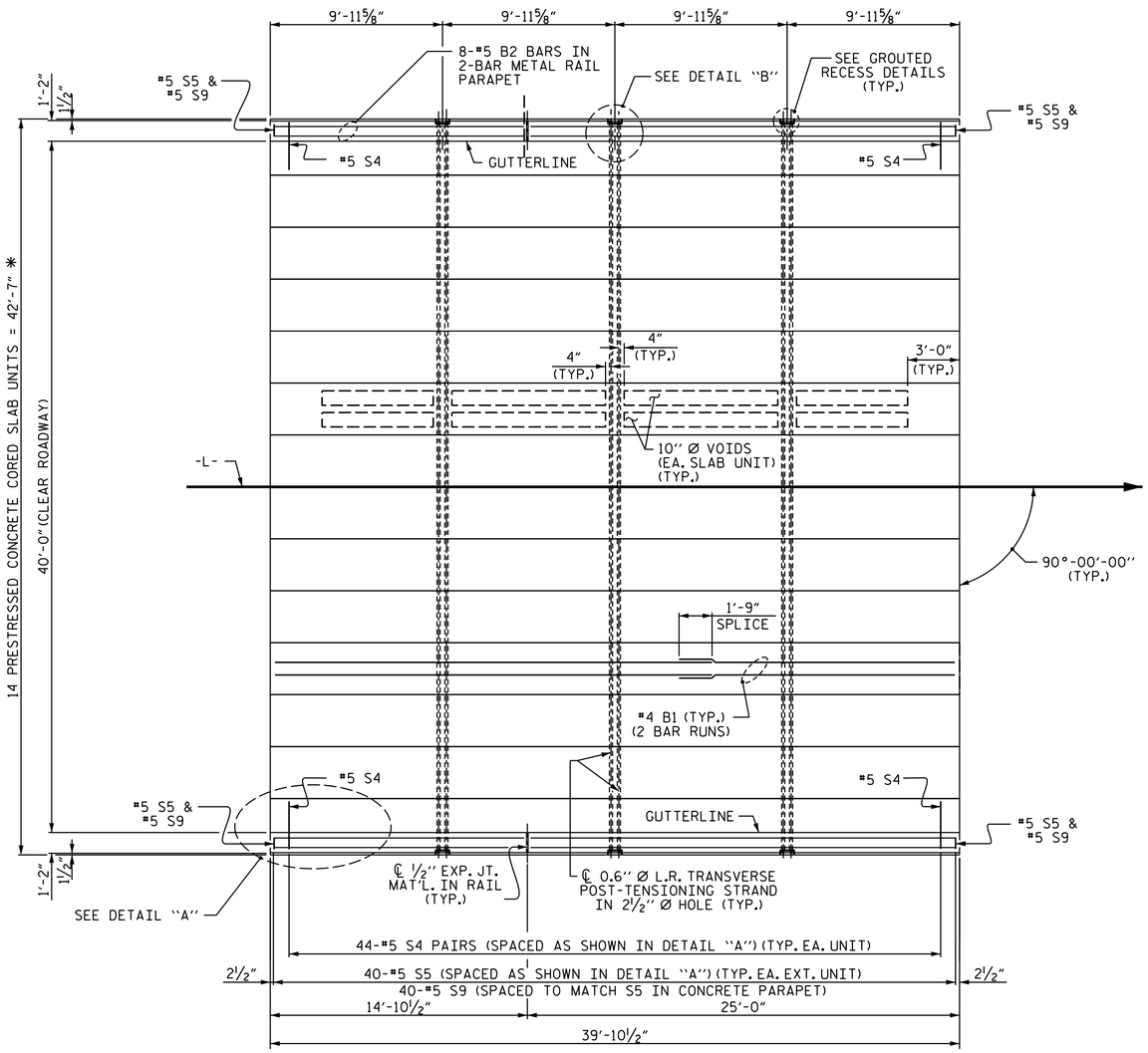
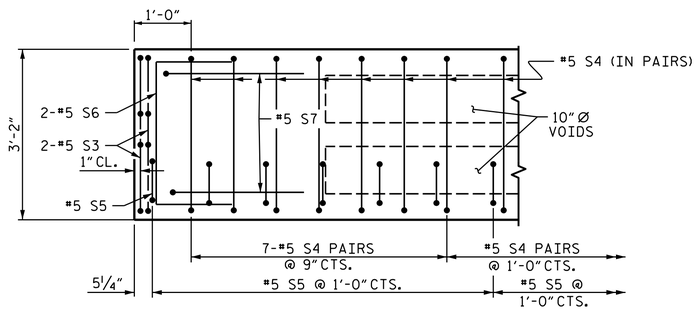
PRESTRESSED CONCRETE CORED SLAB UNIT



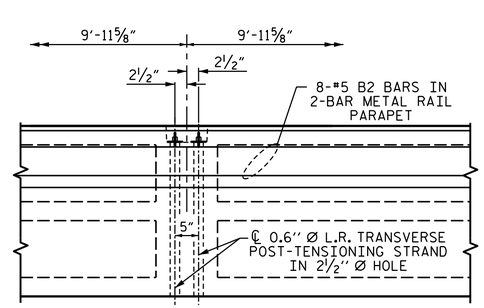
PLAN OF UNIT

(SPANS 1 THROUGH 28)
* SEE PROPOSED TYPICAL SECTION



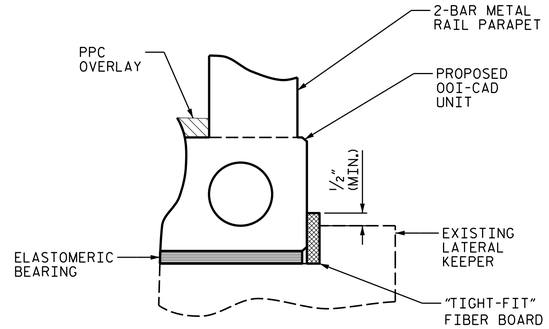
DETAIL "A"

(TYPICAL EACH END OF UNIT)
EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR
EXCEPT OMIT #5 S5 BARS AND REPLACE #5 S3 WITH #5 S1, #5 S4 WITH #5 S2, AND #5 S6 WITH #5 S8.



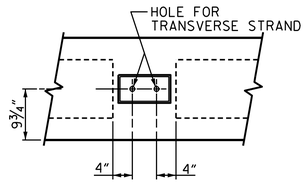
DETAIL "B"

#5 S4 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

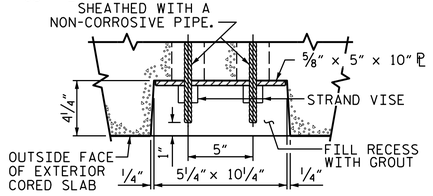


LATERAL KEEPER DETAIL

(TYP. ALL BENTS FOR CORED SLAB REPLACEMENT)
(COST OF FIBER BOARD IS INCIDENTAL TO COST OF CORED SLABS)



ELEVATION VIEW



PLAN VIEW

GROUTED RECESS AT END OF POST-TENSIONED STRAND-CORED SLABS

(3 LOCATIONS PER SPAN - SEE PLAN OF UNIT)

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4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

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DocuSigned by: Samuel L 19C97095C75A467...
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PROJECT NO. 15BPR.25
BRUNSWICK COUNTY
BRIDGE NO. 14

SHEET 2 OF 4

STATE OF NORTH CAROLINA
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RALEIGH
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PLAN OF 39'-10½" UNIT
40'-0" CLEAR ROADWAY
90° SKEW

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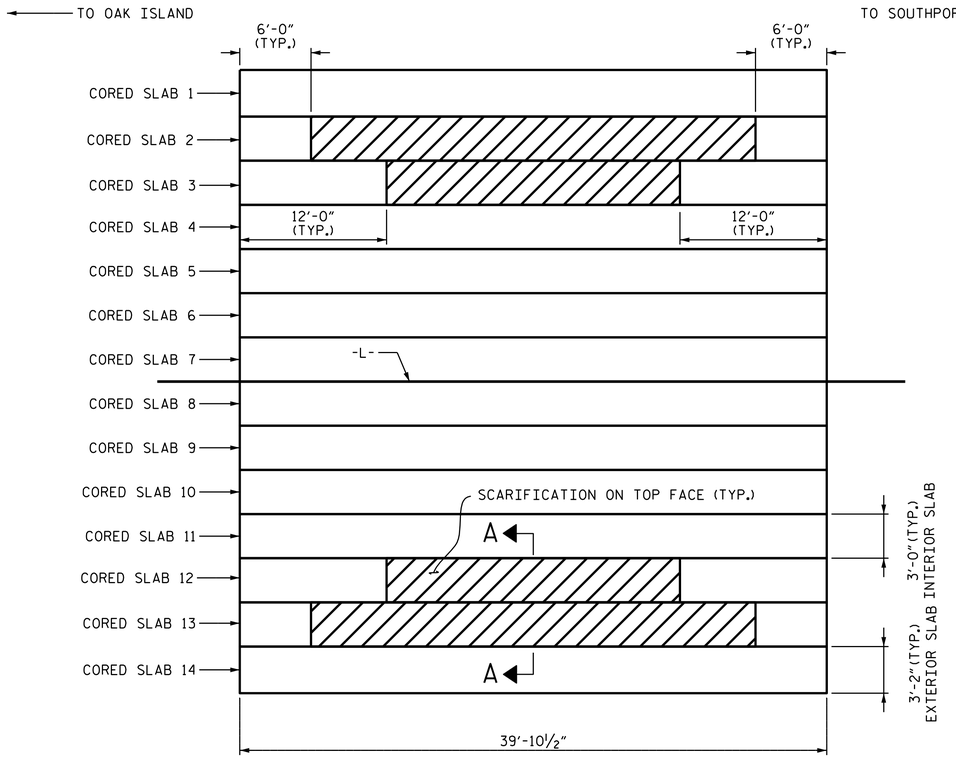


PLAN OF SCARIFICATION TO CORED SLABS UNITS

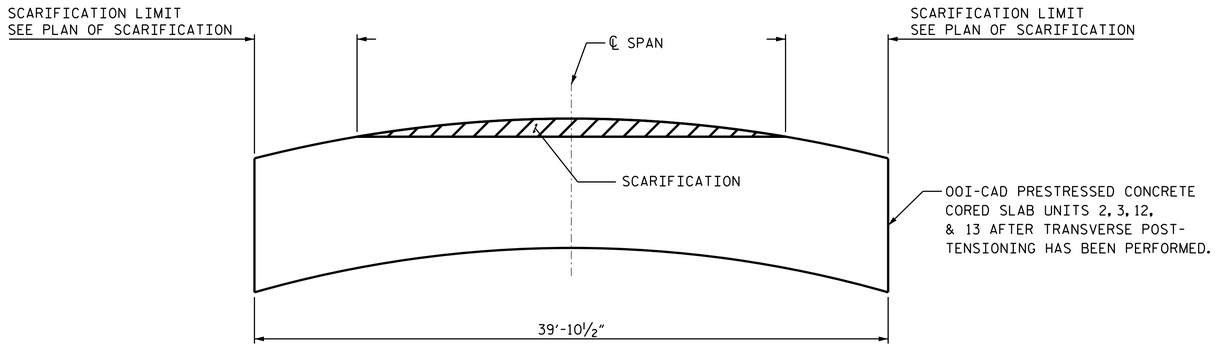
(TYPICAL IN SPANS 1 - 28)

SCARIFICATION LIMITS

BILL OF MATERIALS

SPANS 1 THRU 28

	SPAN 1	SPANS 2-28
SCARIFYING TOPS OF CORED SLABS	30 SY	30 SY
SHOTBLASTING TOPS OF CORED SLABS	178 SY	178 SY
PPC MATERIALS	18.8 CY	18.8 CY
PLACING & FINISHING PPC OVERLAY	178 SY	178 SY
BRIDGE DECK GROOVING	975 SF	975 SF

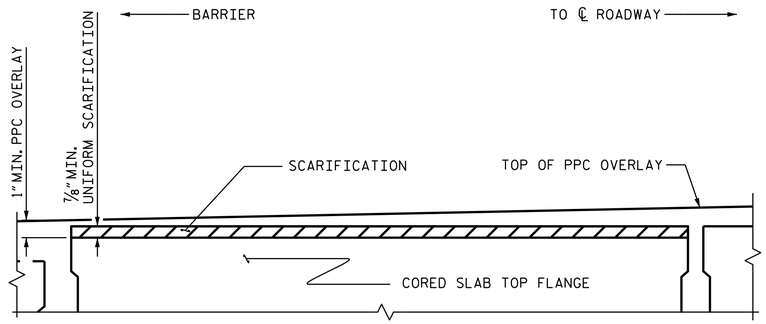


SCARIFICATION OF CORED SLAB UNITS ELEVATION DETAIL

(NOT TO SCALE)

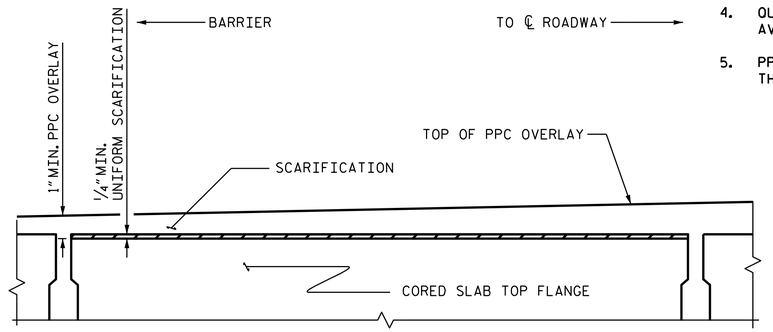
NOTES:

1. FOR THE TOP OF THE OOI-CAD PRESTRESSED CONCRETE CORED SLAB UNITS 1, 14, AND 4 THROUGH 11, THE FABRICATOR SHALL PROVIDE A ROUGHENED ¼" SURFACE (RAKED FINISH) TO AVOID SCARIFICATION.
2. FOR SCARIFICATION OF TOP OOI-CAD PRESTRESSED CONCRETE CORED SLAB UNITS 2, 3, 13 AND 12, SEE SPECIAL PROVISIONS FOR OVERLAY SURFACE PREPARATION FOR POLYESTER POLYMER CONCRETE.
3. SCARIFY TOP OF SLABS ONLY AFTER TRANSVERSE POST-TENSIONING HAS BEEN PERFORMED AND GROUT FOR SHEAR KEYS HAS BEEN PLACED AND THIS HAS CURED.
4. QUANTITES FOR THE AMOUNT OF PPC MATERIAL WAS BASED ON AN AVERAGE OVERLAY THICKNESS OF 3¾".
5. PPC OVERLAY THICKNESS SHALL BE AT LEAST 1" AT ANY POINT THROUGHOUT ANY SPAN.



SLAB UNIT 2 - MIN. SCARIFICATION

(SLAB UNIT 13 MIRRORED ABOUT ℄ ROADWAY)



SLAB UNIT 3 - MIN. SCARIFICATION

(SLAB UNIT 12 MIRRORED ABOUT ℄ ROADWAY)

SECTION A-A

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

OOI-CAD

PRESTRESSED CONCRETE CORED SLAB UNIT SCARIFICATION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

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4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
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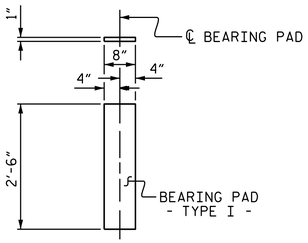


FIXED & EXPANSION END

(TYPE I - 784 REQUIRED)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS

(BEARING PAD TYPE I AT THE CONTRACTORS OPTION)
(SEE BEARING PLACEMENT DETAILS FOR CONTINUOUS PAD OPTION)

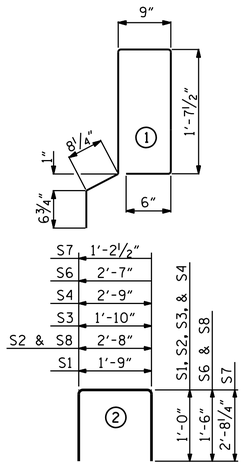
BILL OF MATERIAL FOR ONE 39'-10½" CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B1	4	#4	STR.	41'-2½"	55	41'-2½"	55
S1	8	#5	2	-	-	3'-9"	31
S2	84	#5	2	-	-	4'-8"	409
S3	8	#5	2	3'-10"	32	-	-
S4	84	#5	2	4'-9"	416	-	-
✱ S5	40	#5	1	5'-9"	240	-	-
S6	4	#5	2	5'-7"	23	-	-
S7	4	#5	2	6'-7"	27	6'-7"	27
S8	4	#5	2	-	-	5'-8"	24
REINFORCING STEEL LBS.					553		546
✱EPOXY COATED REINFORCING STEEL LBS.					240		
6500 P.S.I. CONCRETE CU. YDS.					5.7		6.0
0.6" Ø L.R. STRANDS No.					20		20

GUTTERLINE PPC THICKNESS & RAIL HEIGHT

	PPC OVERLAY THICKNESS @ MID-SPAN	PARAPET HEIGHT @ MID-SPAN
39'-10½" UNITS	1"	2'-7" (MIN.)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

GRADE 270 STRANDS

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

CORED SLABS REQ'D PER SPAN

39'-10½" UNIT	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	39'-10½"	79'-9"
INTERIOR C.S.	12	39'-10½"	478'-6"
TOTAL	14		558'-3"

(28 SPANS REQUIRED)

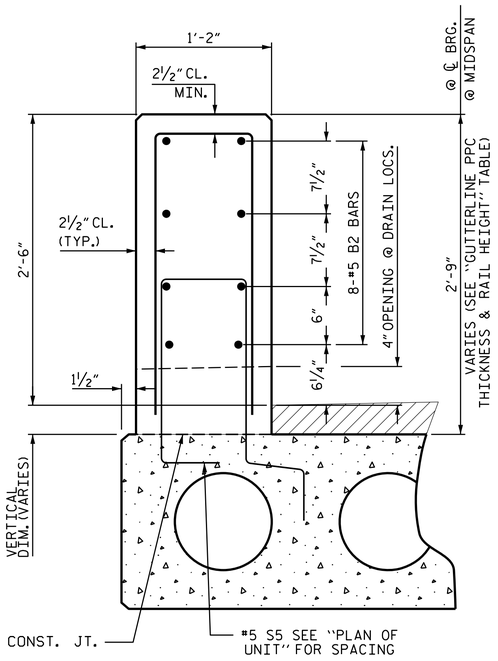
CONCRETE RELEASE STRENGTH

UNIT	PSI
39'-10½" UNITS	5000

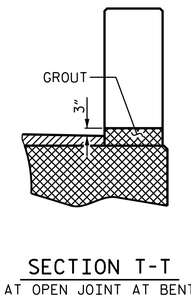
DEAD LOAD DEFLECTION AND CAMBER

	OOI-CAD
39-10½" CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1⅛" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✱✱	¼" ↓
FINAL CAMBER	⅞" ↑

✱✱ INCLUDES PPC OVERLAY

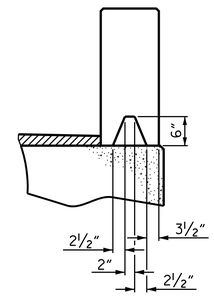


SECTION THRU RAIL



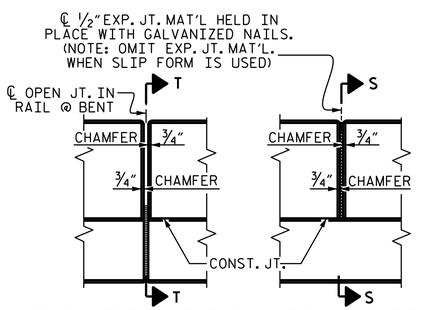
SECTION T-T

AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)



SECTION S-S

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



ELEVATION AT EXPANSION JOINTS

2-BAR METAL RAIL PARAPET DETAILS

(FOR ADDITIONAL DETAILS AND BILL OF MATERIALS SEE "CONCRETE PARAPET AND END POST DETAILS")

DECK DRAIN NOTES

THE DRAIN OPENING AT THE GUTTERLINE SHALL BE 4" X 8". THE HEIGHT OF THE BLOCKOUT IN THE CONCRETE PARAPET (2 BAR-METAL RAIL) SHALL EXTEND FROM THE TOP OF THE CORED SLAB UNIT TO THE TOP OF THE DRAIN OPENING.

APPLY EPOXY PROTECTIVE COATING TO EXTERIOR FACE OF THE EXTERIOR CORED SLAB UNITS THAT REQUIRE DRAINS IN THE BARRIER RAIL.

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 CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

ALL REINFORCING STEEL IN 2-BAR METAL RAIL CONCRETE PARAPETS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS & BOTTOMS.

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. A 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.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #5 S4 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

PRESTRESSED CONCRETE CORED SLAB UNITS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR. SEE SPECIAL PROVISIONS FOR CALCIUM NITRITE CORROSION INHIBITOR.

PRESTRESSED CONCRETE CORED SLABS ARE DESIGNED FOR 0 PSI TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

PROJECT NO. 15BPR.25

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SHEET 4 OF 4

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4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
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PRESTRESSED CONCRETE CORED SLAB UNIT DETAILS

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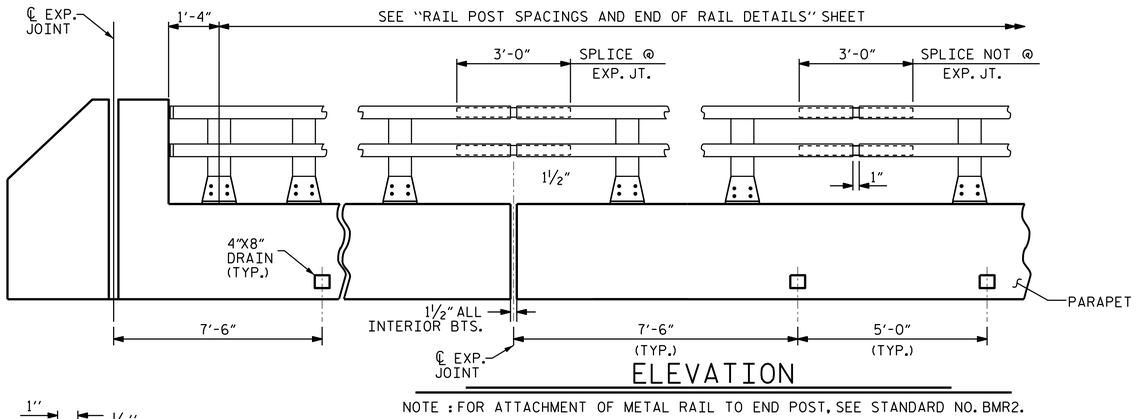
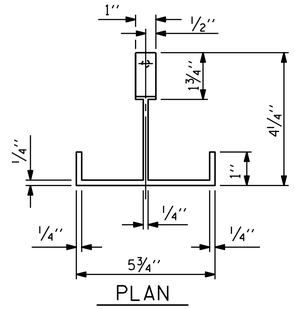
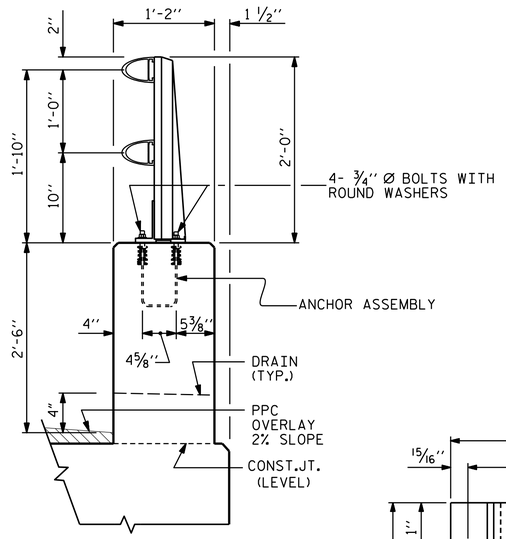


ELEVATION

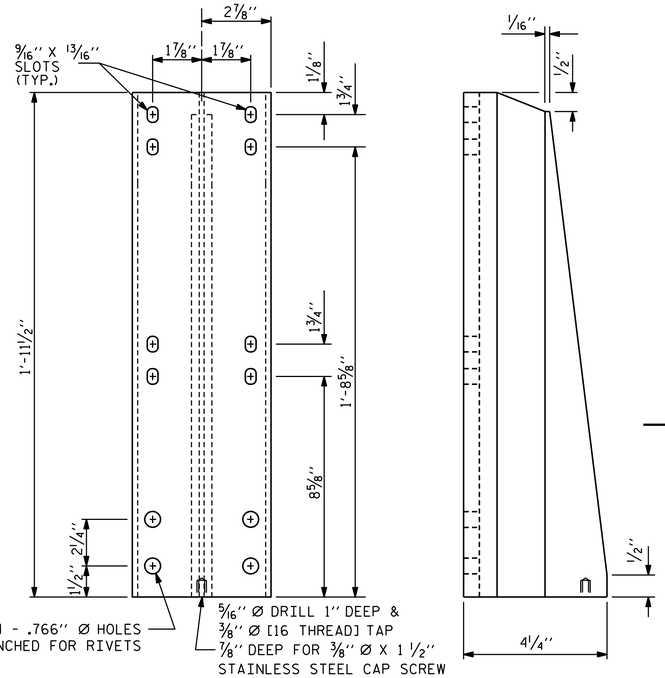
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



PLAN



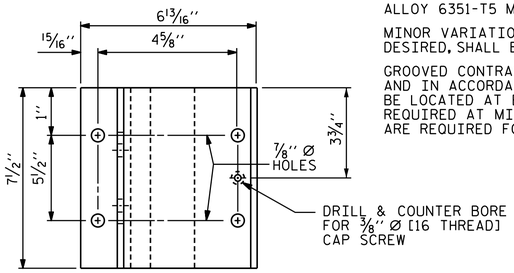
SECTION THRU PARAPET AND RAIL



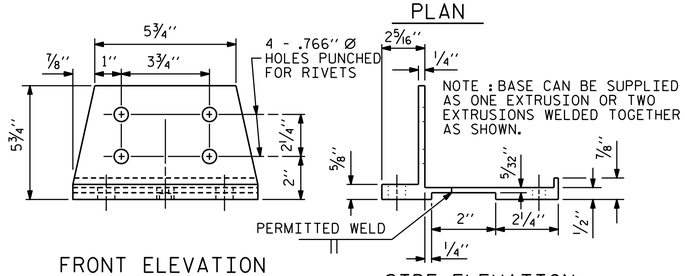
FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST



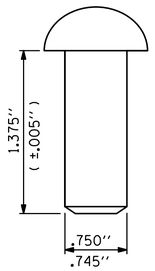
PLAN



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

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

UNLESS OTHERWISE REQUIRED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR HAS THE OPTION TO USE AN ALTERNATE TO THE 2 BAR METAL RAIL. THE ALTERNATE RAIL SHALL MEET THE REQUIREMENTS OF THE AASHTO LRFDBRIDGE DESIGN SPECIFICATIONS AND MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST (APL) UNDER "2 BAR METAL RAIL ALTERNATE". ADJUSTMENTS TO THE CONCRETE PARAPET WILL NOT BE ALLOWED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

PAY LENGTH = 2233 LIN. FT.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

SPANS 1 THRU 28

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL A. CULLUM
DocuSigned by: Samuel Cullum 19C97095C75A467...
4/12/2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			111

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STD. NO. BMR3

ASSEMBLED BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018

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

REV. 10/1/11 MAA/GM
REV. 6/13 MAA/GM
REV. 12/17 MAA/THC

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

4/12/2018
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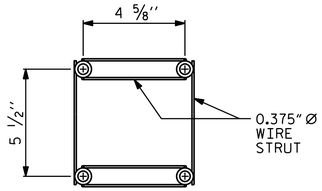
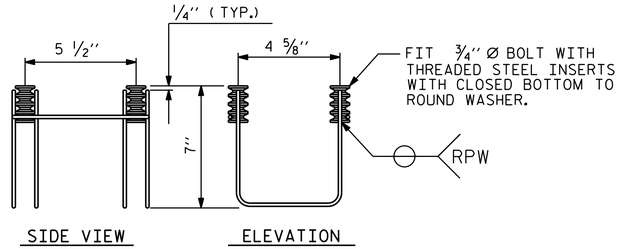
User:jduke



PLAN



SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(1 ASSEMBLY REQUIRED PER POST)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

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

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

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

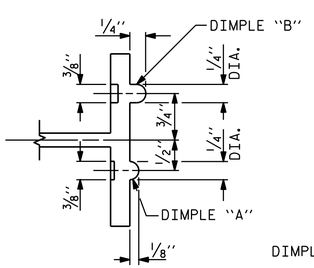
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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

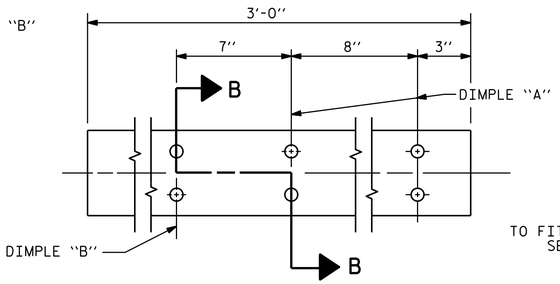
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

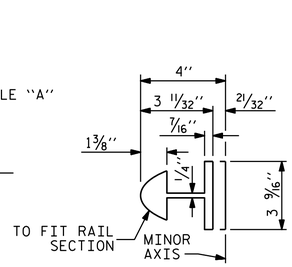
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4"Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

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



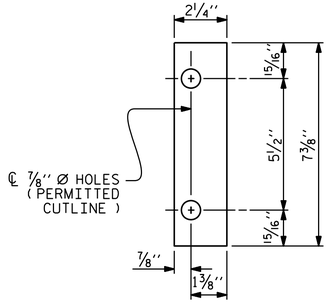
SECTION B - B



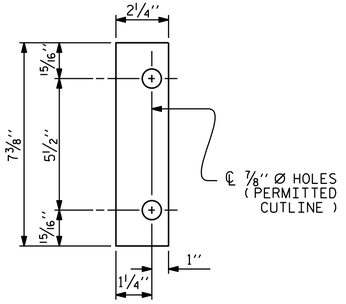


BAR SECTION

EXPANSION BAR DETAILS



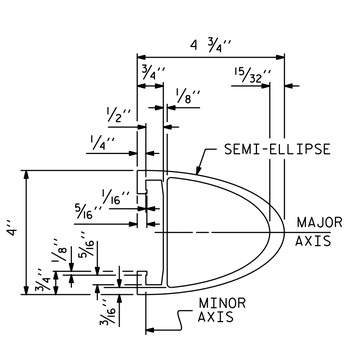
FRONT PLATE



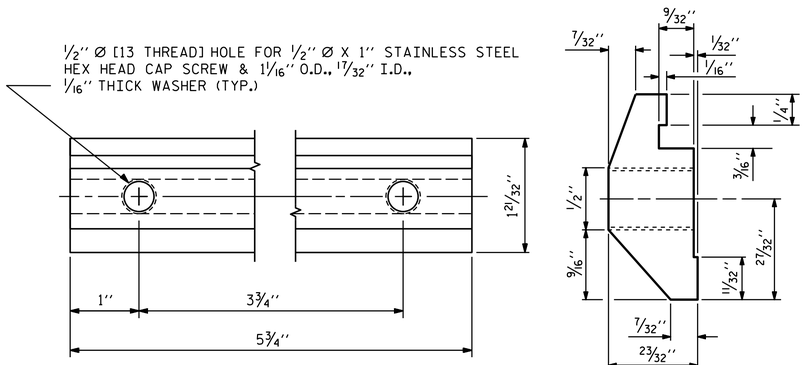
REAR PLATE

SHIM DETAILS

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

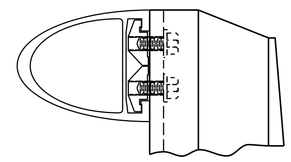


RAIL SECTION

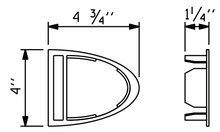


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

SPANS 1 THRU 28

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL ROBERT CULLUM

DocuSigned by: Samuel Lu 19C97095C75A467...

4/12/2018

ASSEMBLED BY : JACOB H. DUKE	DATE : 03-2018
CHECKED BY : DIEGO A. AGUIRRE	DATE : 03-2018
DRAWN BY : EEM 6/94	REV. 5/1/06R KMM/GM
CHECKED BY : RGW 6/94	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			111

STD. NO. BMR4

4/12/2018
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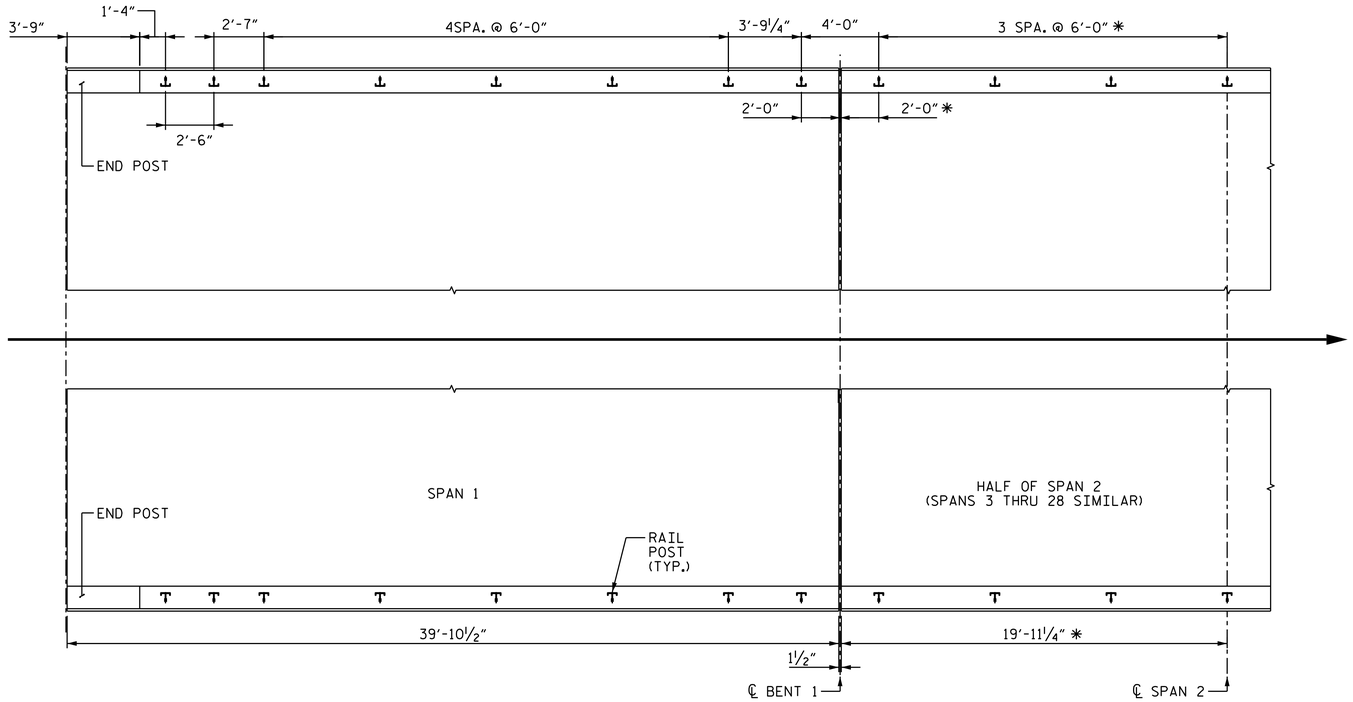
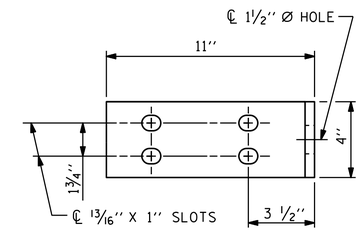
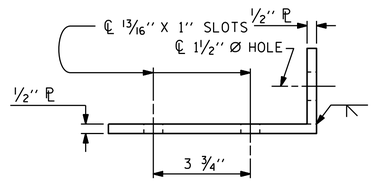


PLAN OF RAIL POST SPACINGS

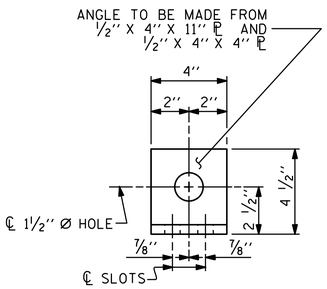
* FOR SPANS 2 THRU 28, DIMENSION SYMMETRICAL TO ℄ OF SPAN



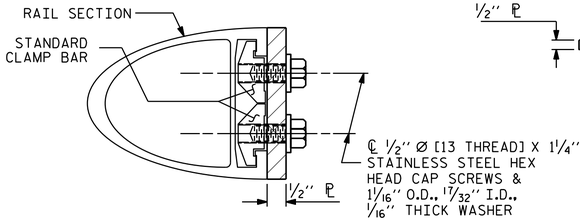
ELEVATION



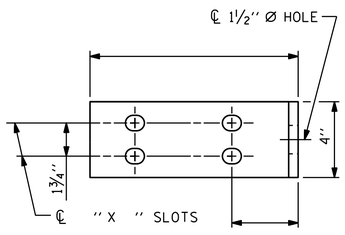
TOP VIEW



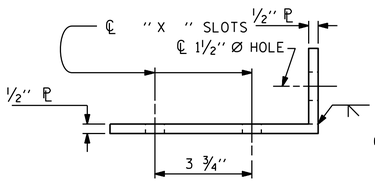
END VIEW (FIX AND EXP.)



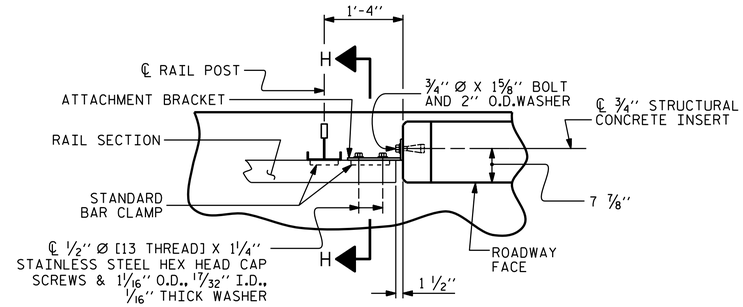
SECTION H-H (FIX)



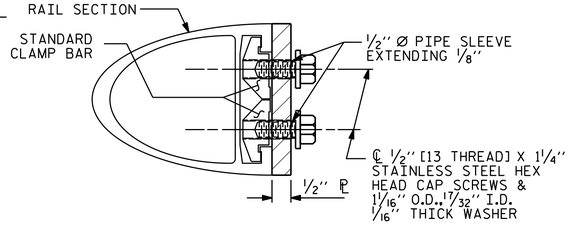
ELEVATION



TOP VIEW



PLAN - RAIL AND END POST



SECTION H-H (EXP.)

FIXED

EXPANSION

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

STRUCTURAL CONCRETE INSERT

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

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

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

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

NOTES

METAL RAIL TO END POST CONNECTION

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

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

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

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

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

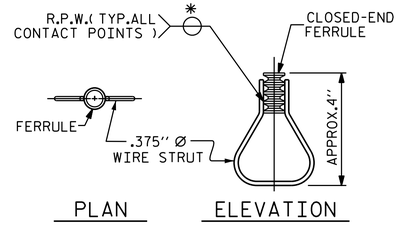
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

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

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

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾" Ø X 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾"Ø X 6½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾" Ø X 1⅝" BOLT SHALL APPLY TO THE ¾"Ø X 6 ½" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS

FOR ONE OR TWO BAR METAL RAILS SPANS 1 THRU 28

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			111

ASSEMBLED BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018

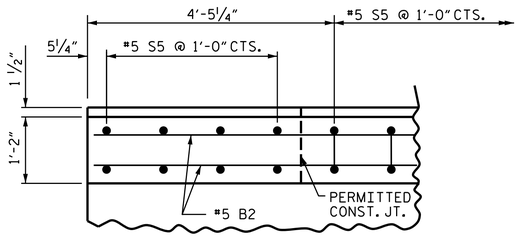
DRAWN BY : FCJ 1/88
CHECKED BY : CRK 3/89

REV. 5/1/06 TLA/GM
REV. 10/1/11 MAA/GM
REV. 12/17 MAA/THC

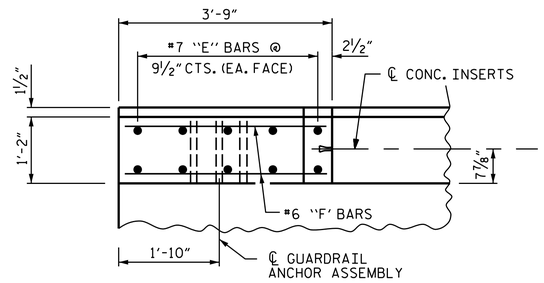
KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

4/12/2018
G:\4201720.xx-Brunswick-14\Structures\401_075_15BPR.25_SMU_BR03_S-12_090014.dgn
User:jduke

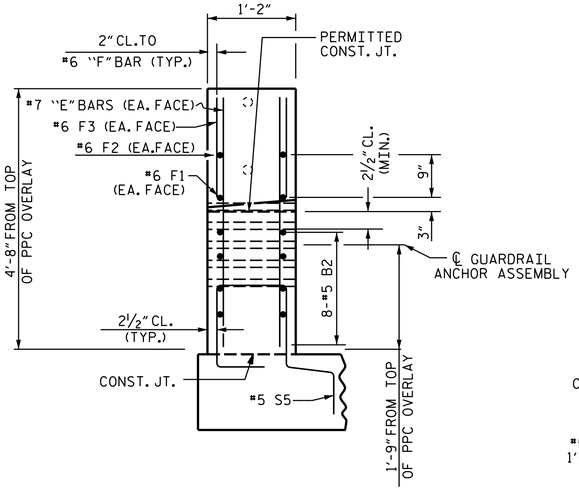
STD. NO. BMR2



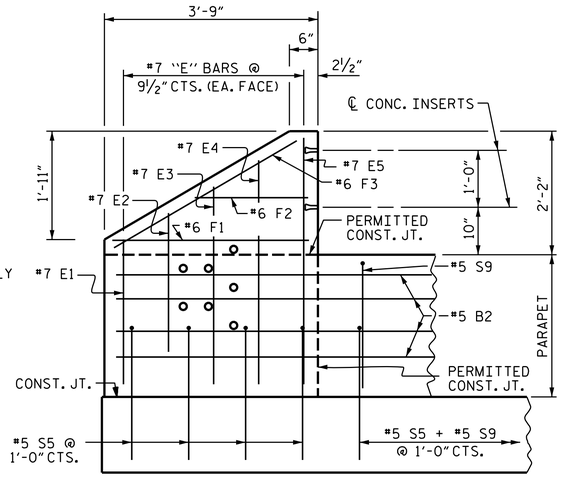
PLAN OF PARAPET



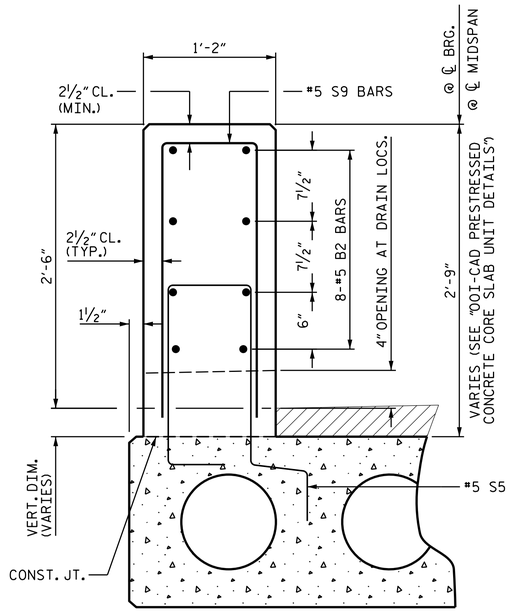
PLAN OF END POST



END VIEW

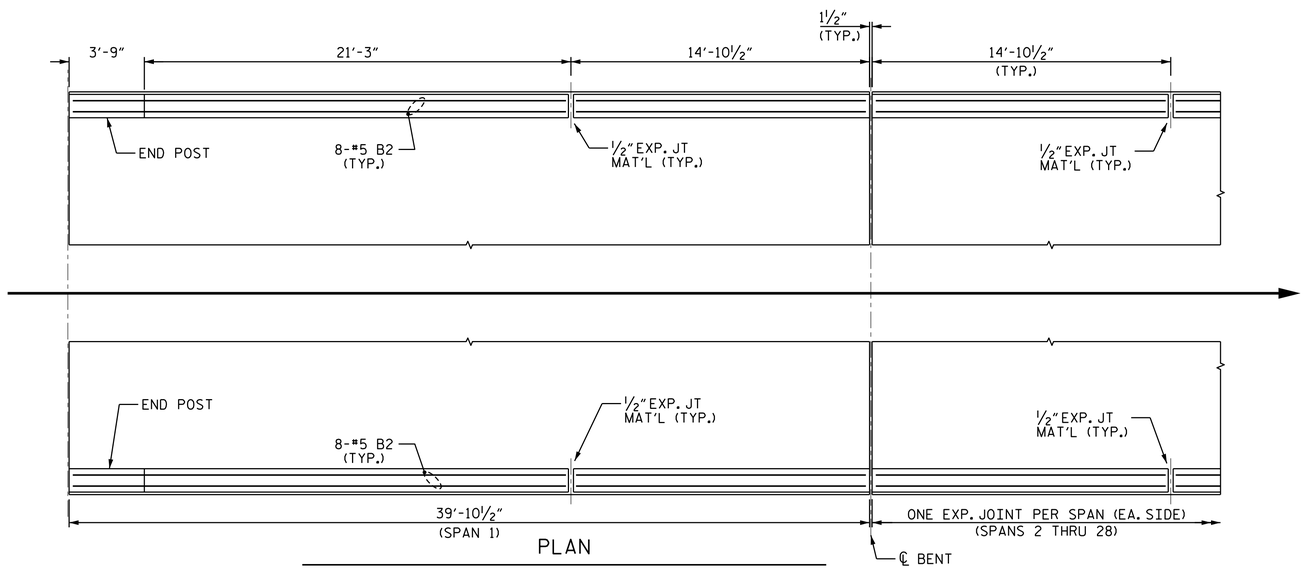


ELEVATION



SECTION THRU PARAPET

PARAPET AND END POST FOR TWO BAR RAIL



PLAN

✱✱ SEE "PLAN OF PARAPET" FOR SPACING OF #5 S5 BARS

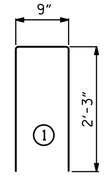
BILL OF MATERIAL FOR CONCRETE PARAPET FOR SPAN 1

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	39'-10½" OOI-CAD UNIT					
✱ B2	16	16	#5	STR.	14'-5½"	241
✱ B2	16	16	#5	STR.	24'-7"	410
✱ S9	72	72	#5	1	5'-3"	394
✱ EPOXY COATED REINFORCING STEEL				LBS.		1046
CLASS AA CONCRETE				CU.YDS.		9.0
TOTAL CONCRETE PARAPET FOR 2-BAR METAL RAIL				LN. FT.		82.08

BILL OF MATERIAL FOR CONCRETE PARAPET FOR ONE SPAN (SPANS 2 THRU 28)

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	39'-10½" OOI-CAD UNIT					
✱ B2	16	16	#5	STR.	14'-5½"	241
✱ B2	16	16	#5	STR.	24'-7"	410
✱ S9	80	80	#5	1	5'-3"	438
✱ EPOXY COATED REINFORCING STEEL				LBS.		1090
CLASS AA CONCRETE				CU.YDS.		9.0
TOTAL LENGTH OF PARAPET AND 2-BAR METAL RAIL				LN. FT.		80.0

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR END POSTS - SPAN 1

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
✱ E1	4	#7	STR.	2'-6"	20
✱ E2	4	#7	STR.	3'-0"	25
✱ E3	4	#7	STR.	3'-6"	29
✱ E4	4	#7	STR.	4'-0"	33
✱ E5	4	#7	STR.	4'-4"	35
✱ F1	4	#6	STR.	3'-0"	18
✱ F2	4	#6	STR.	1'-11"	19
✱ F3	4	#6	STR.	3'-7"	50
✱ EPOXY COATED REINFORCING STEEL			LBS.		229
CLAS AA CONCRETE			CU. YDS.		0.5
END POSTS			No.		2

NOTES:

ALL REINFORCING STEEL IN PARAPETS AND END POSTS SHALL BE EPOXY COATED.

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

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

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L. 19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE PARAPET AND END POST DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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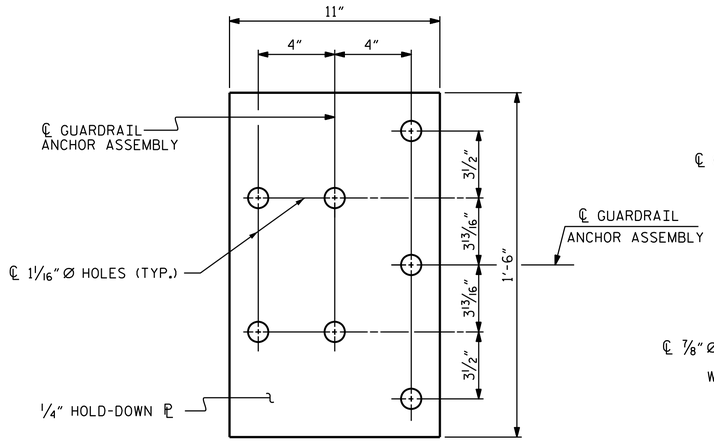
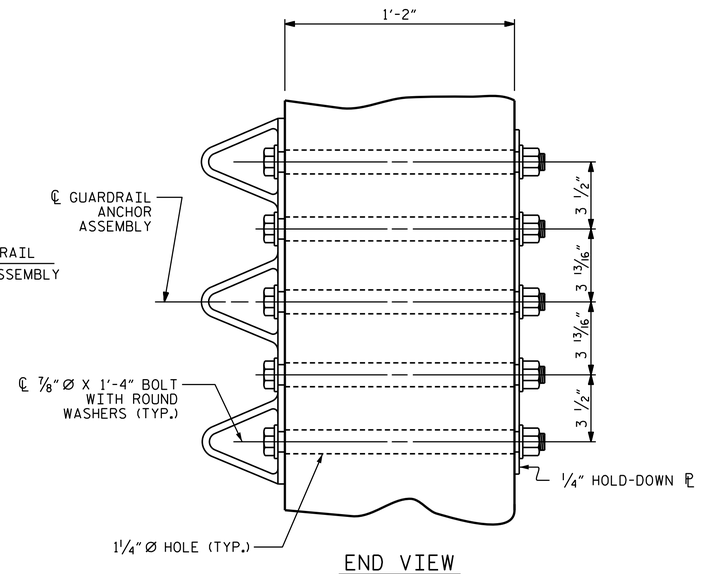
User:jduke



PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

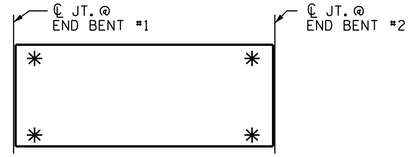
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

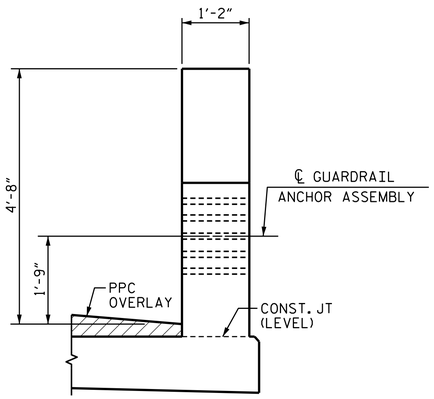
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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

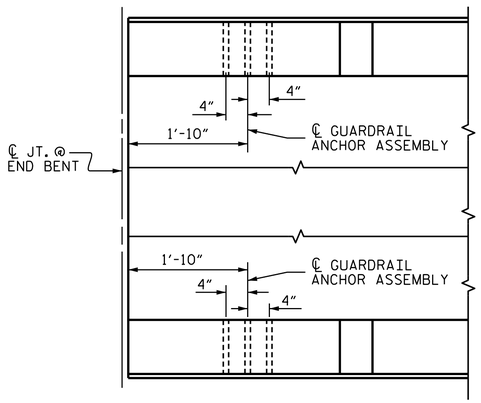


SKETCH SHOWING POINTS OF ATTACHMENT

✳ LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(TWO BAR METAL RAIL)



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. 15BPR.25
BRUNSWICK COUNTY
BRIDGE NO. 14

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LEE CULLUM
DocuSigned by: Samuel Lee 19C97095C75A467...
4/12/2018

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			111

ASSEMBLED BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018
DRAWN BY : MAA 5/10
CHECKED BY : GM 5/10

REV.	6/13	MAA/GM
REV.	1/15	MAA/TMG
REV.	12/17	MAA/THC

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

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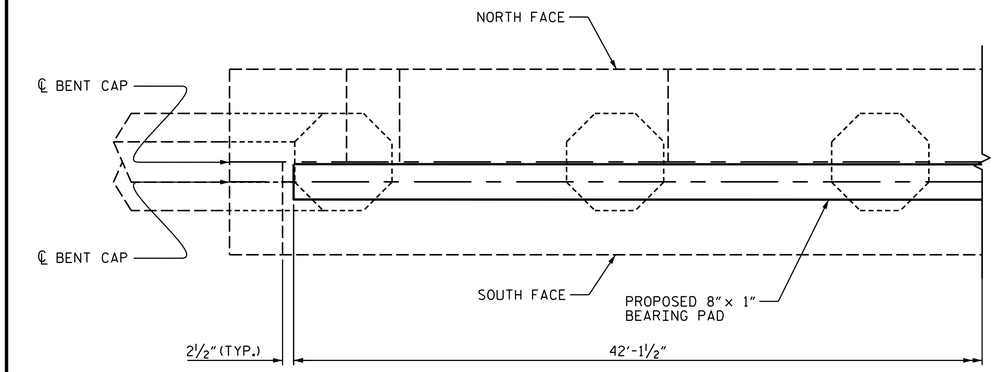
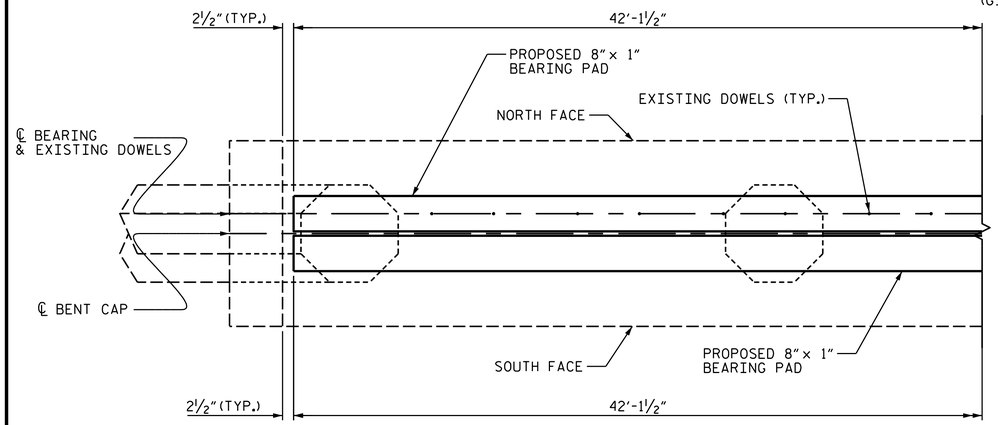
User:jduke

(SHT 2) STD. NO. GRA3



BENT 28

(GIRDERS NOT SHOWN FOR CLARITY)



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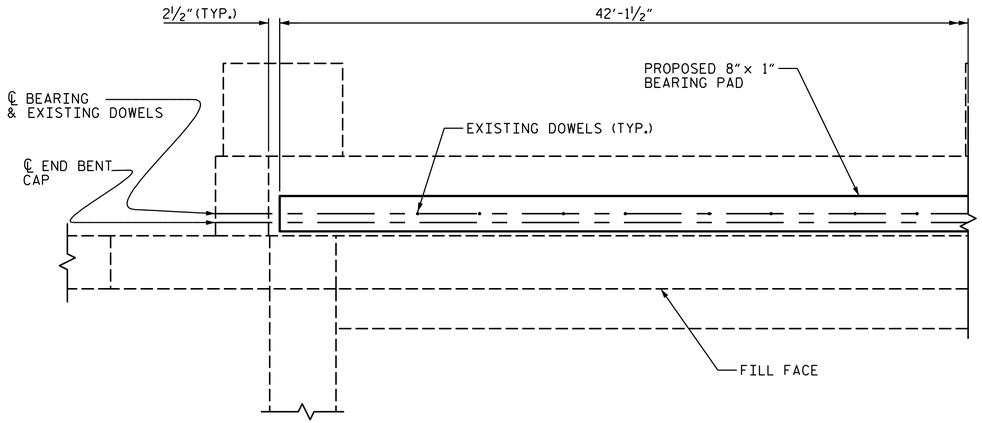
(GIRDERS NOT SHOWN FOR CLARITY)



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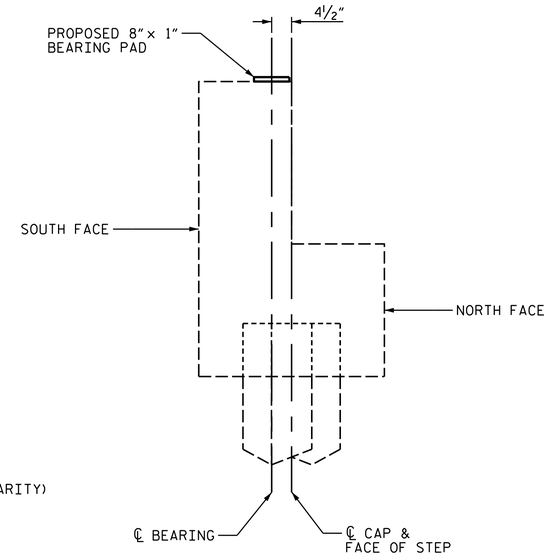
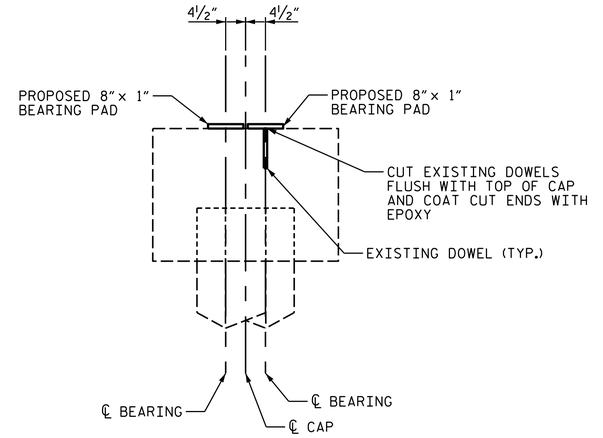
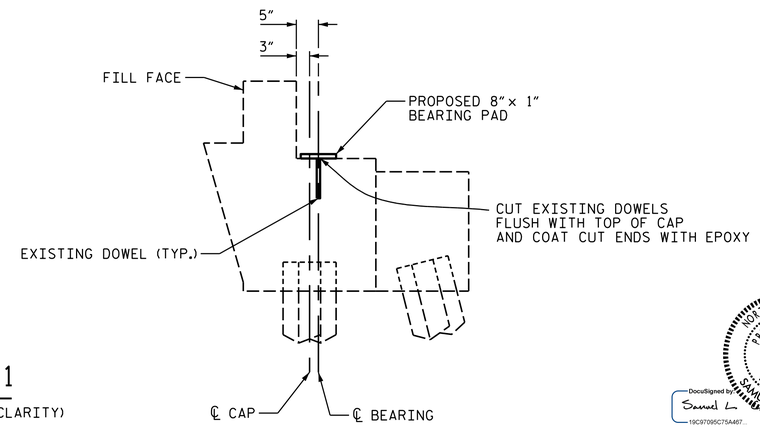
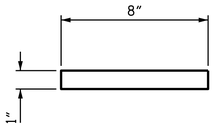






NOTES:

1. WORK THIS SHEET WITH THE SHEETS FOR THE PRECAST CONCRETE CORED SLABS.
2. AT THE CONTRACTOR'S OPTION, THE PROPOSED BEARING PADS MAY BE CONTINUOUS (SHOWN IN THIS SHEET) OR NON-CONTINUOUS (SHOWN IN THE PRECAST CONCRETE CORED SLAB SHEETS).
3. CONTINUOUS BEARING PADS ELASTOMER SHALL BE DUROMETER 60 HARDNESS.
4. THE CAPS SHALL BE THOROUGHLY CLEANED OF ALL DEBRIS BEFORE PROPOSED BEARING PADS ARE PLACED.
5. EXISTING DOWELS SHALL BE CUT FLUSH WITH THE TOP OF THE CAPS AND GROUND SMOOTH AS NOT TO TEAR PROPOSED BEARING PADS.
6. ONCE CUT FLUSH WITH THE CAP, COAT THE CUT ENDS OF THE DOWELS WITH EPOXY.
7. FOR ADDITIONAL BEARING NOTES, SEE PRECAST CONCRETE CORED SLABS SHEETS.
8. CLEANING THE CAPS, CUTTING THE DOWLS, AND THE APPLICATION OF EPOXY TO THE CUT DOWELS SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE PROPOSED BEARING PADS.



CONTINUOUS PAD DETAILS

(GIRDERS NOT SHOWN FOR CLARITY)
(56 REQ'D)

PROJECT NO. 15BPR.25
BRUNSWICK COUNTY
BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : AARON J. MCMILLAN DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L Cullum 19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BEARING PLACEMENT DETAILS

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1			3			TOTAL SHEETS
2			4			111

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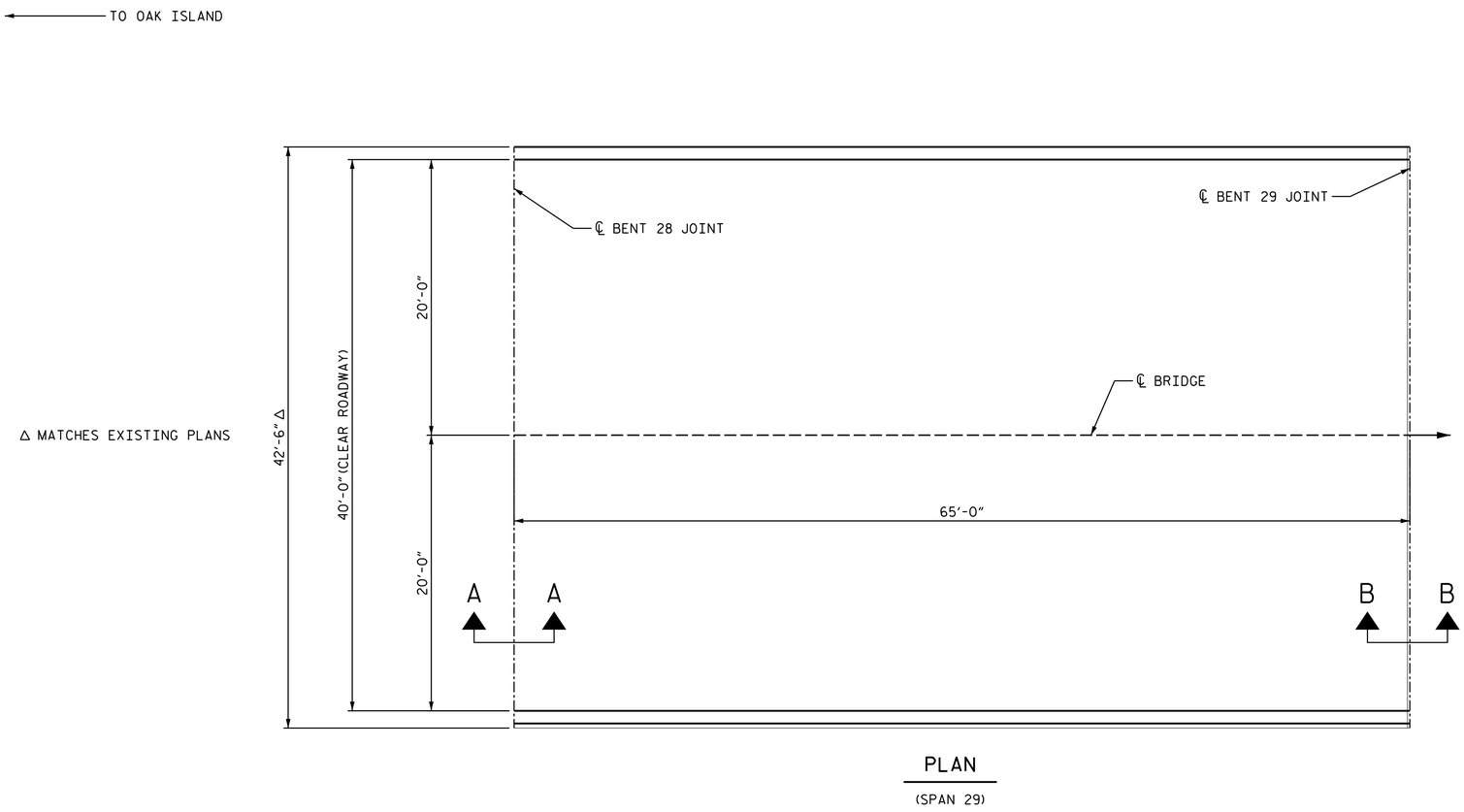
User:jduke



PLAN

(SPAN 29)

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPAN 29

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	289 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	289 SY	
PPC MATERIALS	8.3 CY	
PLACING & FINISHING PPC OVERLAY	289 SY	
BRIDGE DECK GROOVING	1600 SF	

NOTES:

WHERE MULTIPLE SPANS ARE LISTED, ESTIMATED QUANITITES ARE BASED ON THE ANTICIPATED VALUES FOR A SINGLE SPAN OF THAT CONFIGURATION.

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 1½" TO 2" BASED ON VISUAL INSPECTION.

* MINOR QUANTITIES OF CLASS II AREAS ARE ANTICIPATED, PARTICULARLY NEAR JOINTS. HOWEVER, DUE TO THEIR SMALL SIZE, THE CLASS II LOCATIONS HAVE NOT BEEN DELINEATED ON THESE PLANS. THE CLASS II QUANTITIES INDICATED ARE ANTICIPATED TO BE SUFFICIENT FOR THE ACTUAL QUANTITIES ENCOUNTERED.

BRIDGE DECK GROOVING QUANITITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LEE CULLUM

DocuSigned by: Samuel Lee Cullum 19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPAN
SPAN 29

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			111

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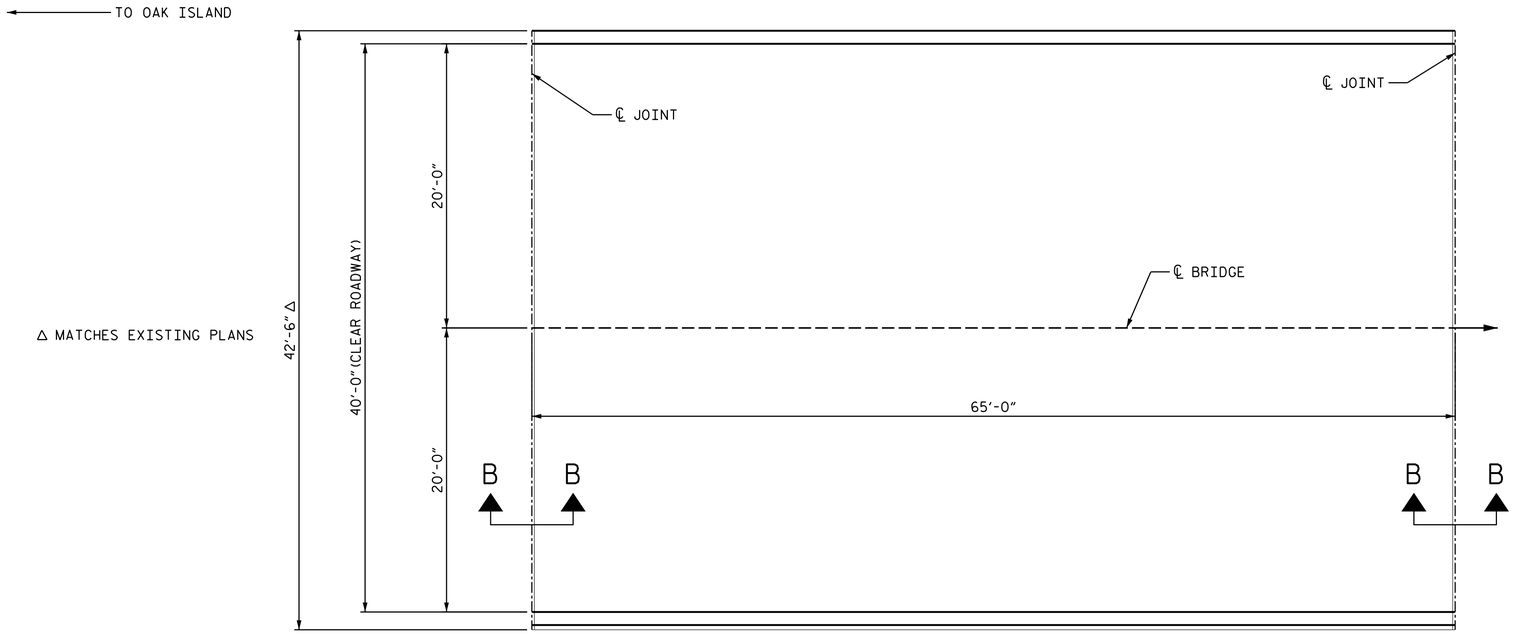


PLAN

(SPANS 30-37, 63 & 64)

Δ MATCHES EXISTING PLANS

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS
SPANS 30-37, 63 & 64

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	289 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	289 SY	
PPC MATERIALS	8.3 CY	
PLACING & FINISHING PPC OVERLAY	289 SY	
BRIDGE DECK GROOVING	1600 SF	

TOP OF DECK REPAIRS
SPAN 65

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	291 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	291 SY	
PPC MATERIALS	8.3 CY	
PLACING & FINISHING PPC OVERLAY	291 SY	
BRIDGE DECK GROOVING	1609 SF	

NOTES:

WHERE MULTIPLE SPANS ARE LISTED, ESTIMATED QUANTITIES ARE BASED ON THE ANTICIPATED VALUES FOR A SINGLE SPAN OF THAT CONFIGURATION.

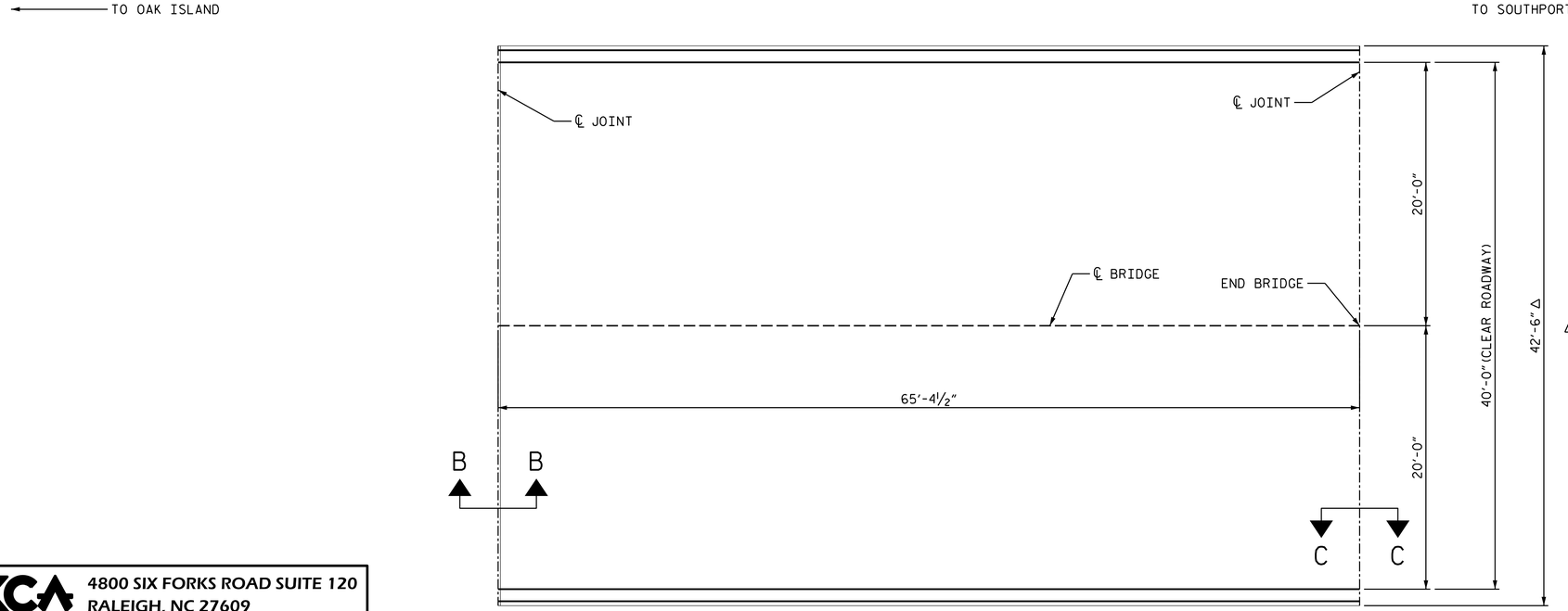
REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 1½" TO 2" BASED ON VISUAL INSPECTION.

* MINOR QUANTITIES OF CLASS II AREAS ARE ANTICIPATED, PARTICULARLY NEAR JOINTS. HOWEVER, DUE TO THEIR SMALL SIZE, THE CLASS II LOCATIONS HAVE NOT BEEN DELINEATED ON THESE PLANS. THE CLASS II QUANTITIES INDICATED ARE ANTICIPATED TO BE SUFFICIENT FOR THE ACTUAL QUANTITIES ENCOUNTERED.

BRIDGE DECK GROOVING QUANITITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.



PLAN

(SPAN 65)

Δ MATCHES EXISTING PLANS

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LEONARD CULLUM
DocuSigned by: Samuel L. Cullum 19C97095C75A467...
4/12/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPAN SPANS 30-37 & 63-65

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1			3			TOTAL SHEETS
2			4			111

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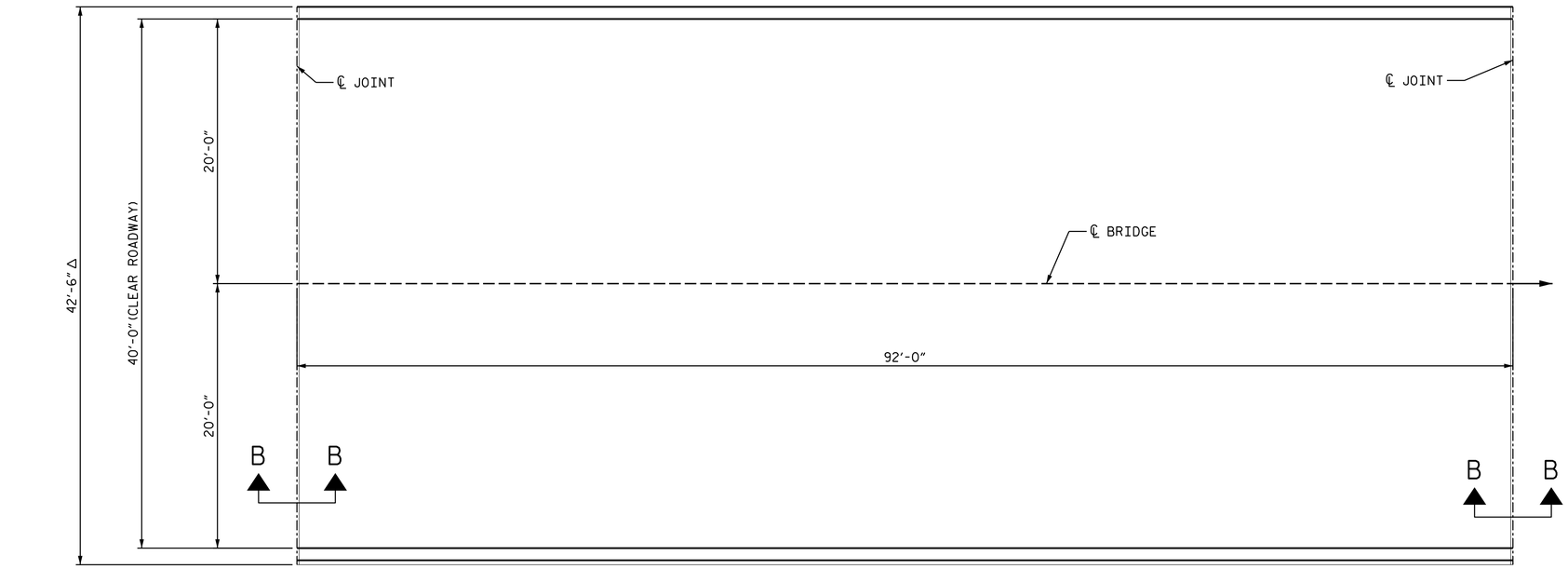

△ MATCHES EXISTING PLANS

PLAN

(SPANS 38-49 & 53-62)

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPANS 38-49 & 53-62

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	409 SY	
CLASS II SURFACE PREPARATION	0.2 SY ✱	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY ✱	
SHOTBLASTING BRIDGE DECK	409 SY	
PPC MATERIALS	11.6 CY	
PLACING & FINISHING PPC OVERLAY	409 SY	
BRIDGE DECK GROOVING	2275 SF	

NOTES:

WHERE MULTIPLE SPANS ARE LISTED, ESTIMATED QUANTITIES ARE BASED ON THE ANTICIPATED VALUES FOR A SINGLE SPAN OF THAT CONFIGURATION.

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 1½" TO 2" BASED ON VISUAL INSPECTION.

✱ MINOR QUANTITIES OF CLASS II AREAS ARE ANTICIPATED, PARTICULARLY NEAR JOINTS, HOWEVER, DUE TO THEIR SMALL SIZE, THE CLASS II LOCATIONS HAVE NOT BEEN DELINEATED ON THESE PLANS. THE CLASS II QUANTITIES INDICATED ARE ANTICIPATED TO BE SUFFICIENT FOR THE ACTUAL QUANTITIES ENCOUNTERED.

BRIDGE DECK GROOVING QUANITITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LEE CULLUM
DocuSigned by: Samuel Lee Cullum 19C97095C75A467...
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DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPAN
SPANS 38-49 & 53-62

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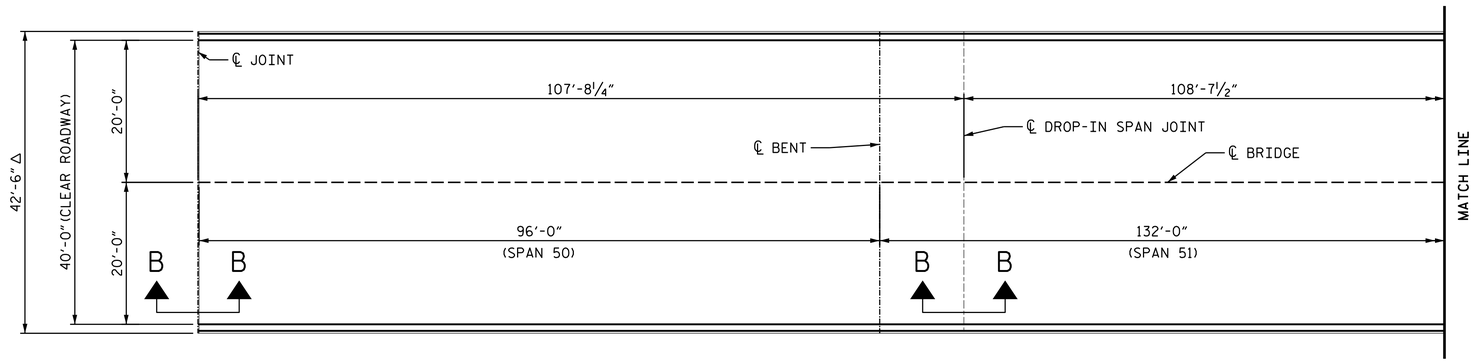
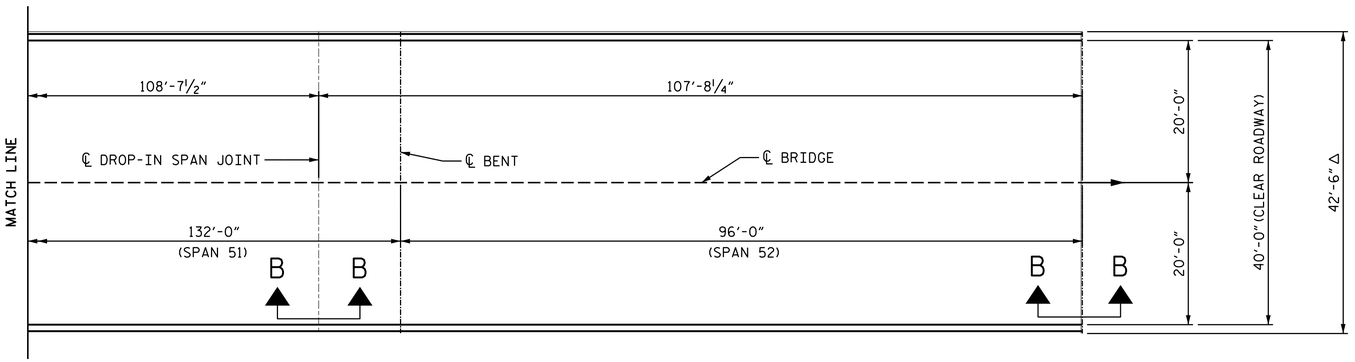
TO OAK ISLAND

TO SOUTHPORT

△ MATCHES EXISTING PLANS





△ MATCHES EXISTING PLANS

PLAN

(SPANS 50-52)

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPANS 50 & 52

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	479 SY	
CLASS II SURFACE PREPARATION	0.2 SY ✱	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY ✱	
SHOTBLASTING BRIDGE DECK	479 SY	
PPC MATERIALS	13.5 CY	
PLACING & FINISHING PPC OVERLAY	479 SY	
BRIDGE DECK GROOVING	2667 SF	

TOP OF DECK REPAIRS

SPAN 51

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	483 SY	
CLASS II SURFACE PREPARATION	0.2 SY ✱	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY ✱	
SHOTBLASTING BRIDGE DECK	483 SY	
PPC MATERIALS	13.7 CY	
PLACING & FINISHING PPC OVERLAY	483 SY	
BRIDGE DECK GROOVING	2691 SF	

NOTES:

WHERE MULTIPLE SPANS ARE LISTED, ESTIMATED QUANTITIES ARE BASED ON THE ANTICIPATED VALUES FOR A SINGLE SPAN OF THAT CONFIGURATION.

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2″ PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 1½″ TO 2″ BASED ON VISUAL INSPECTION.

✱ MINOR QUANTITIES OF CLASS II AREAS ARE ANTICIPATED, PARTICULARLY NEAR JOINTS. HOWEVER, DUE TO THEIR SMALL SIZE, THE CLASS II LOCATIONS HAVE NOT BEEN DELINEATED ON THESE PLANS. THE CLASS II QUANTITIES INDICATED ARE ANTICIPATED TO BE SUFFICIENT FOR THE ACTUAL QUANTITIES ENCOUNTERED.

BRIDGE DECK GROOVING QUANITITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6″ ON EACH SIDE.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LEE CULLUM
DocuSigned by: Samuel L
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RALEIGH

PLAN OF SPAN
SPANS 50-52

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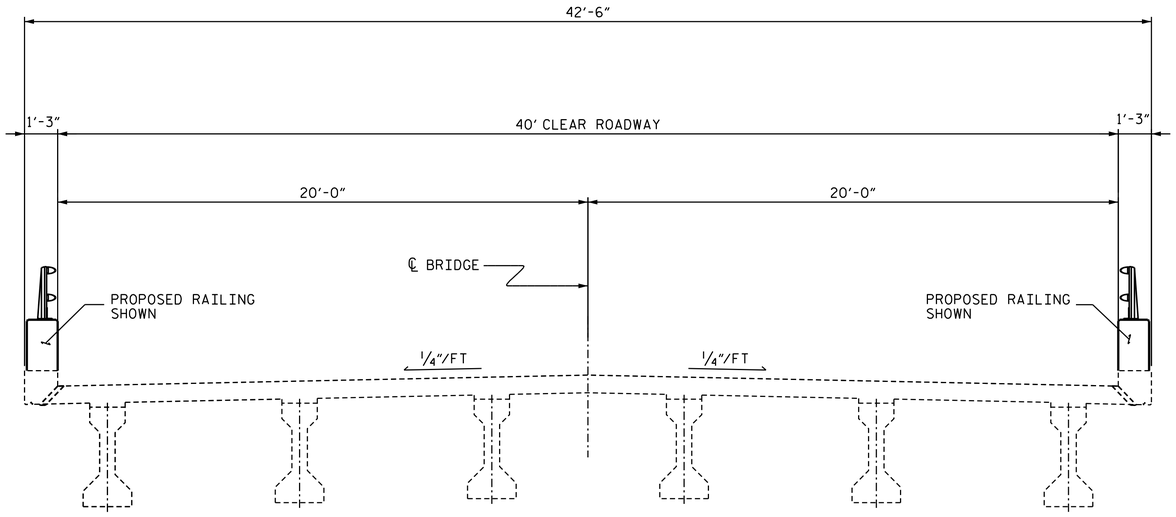
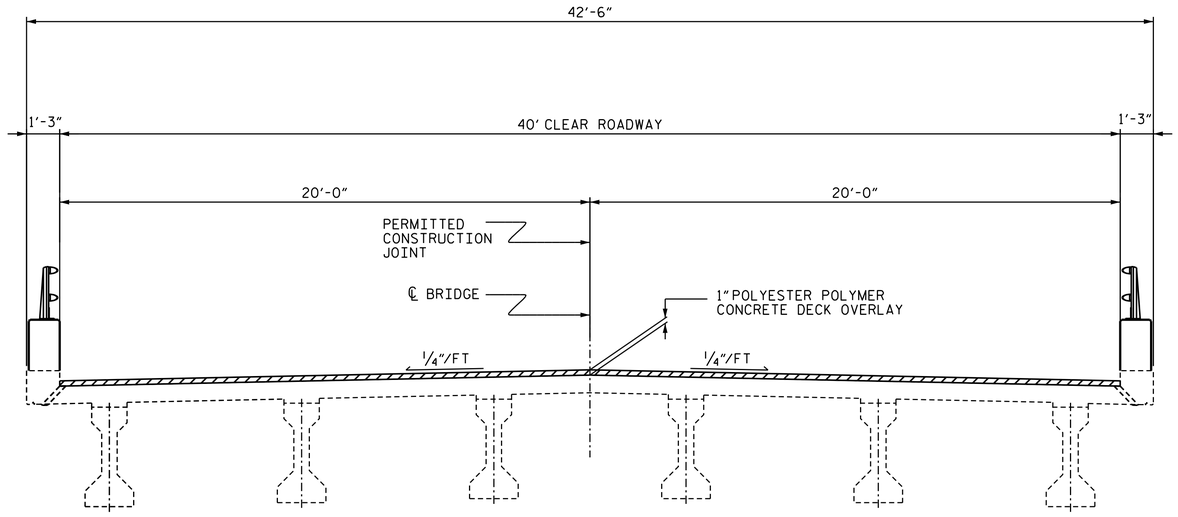


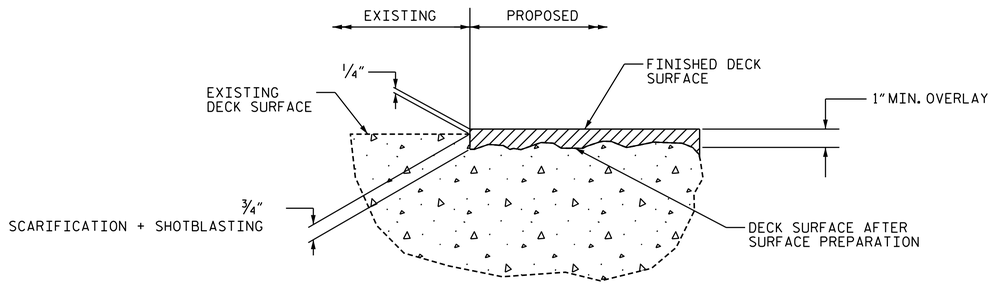
TYPICAL SECTION

(EXISTING SPANS 29 - 65)
(NOTE: NUMBER OF GIRDERS AND SPACING DIFFERENT THROUGHOUT)



TYPICAL SECTION

(PROPOSED SPANS 29 - 65)
(NOTE: NUMBER OF GIRDERS AND SPACING DIFFERENT THROUGHOUT)



DETAIL FOR PPC OVERLAY

NOTES:

ONLY LONGITUDINAL CONSTRUCTION JOINTS SHALL BE ALLOWED IN THE PPC OVERLAY AND ONLY AT THE PERMITTED LOCATION SHOWN.

PROJECT NO. 15BPR.25
BRUNSWICK COUNTY
BRIDGE NO. 14

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RALEIGH

PPC OVERLAY TYPICAL SECTIONS

SPANS 29-65

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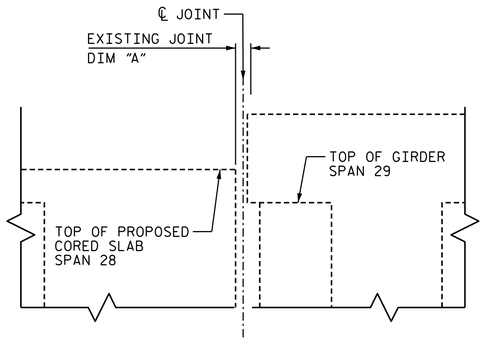
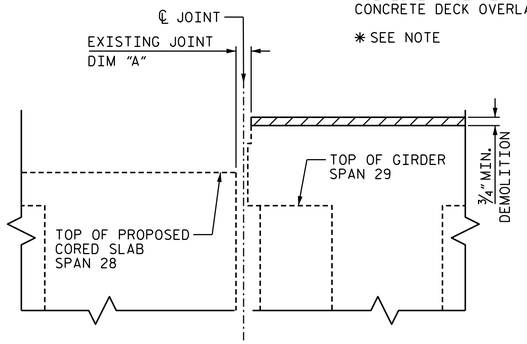


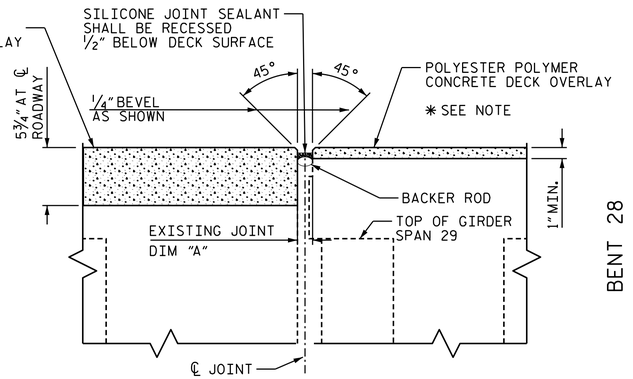
SECTION A-A

(EXISTING PRIOR TO PPC OVERLAY)



SECTION A-A

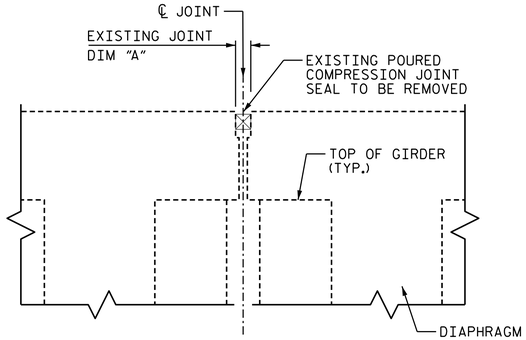
(MINIMUM EXISTING
JOINT DEMOLITION)



SECTION A-A

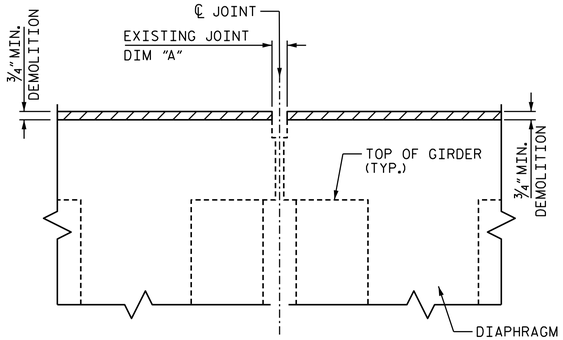
(PROPOSED JOINT SEAL)

BENT 28



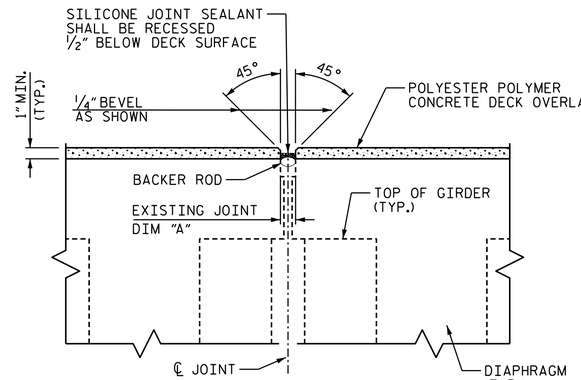
SECTION B-B

(EXISTING PRIOR TO PPC OVERLAY)



SECTION B-B

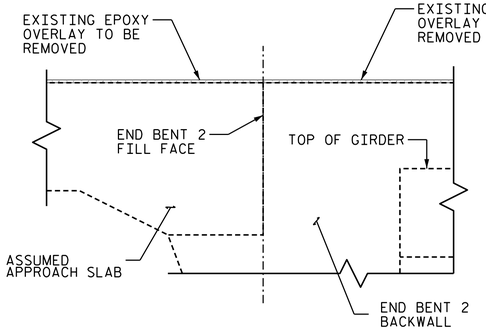
(MINIMUM EXISTING
JOINT DEMOLITION)



SECTION B-B

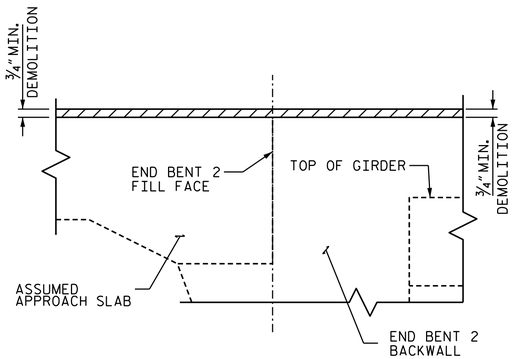
(PROPOSED JOINT SEAL)

BENTS 29-64



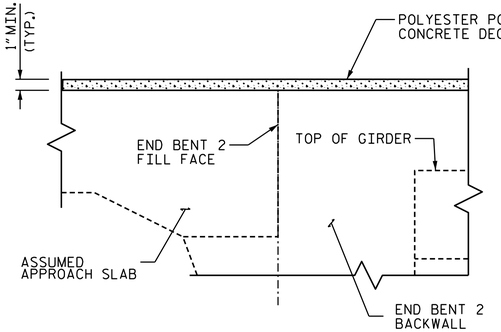
SECTION C-C

(EXISTIN PRIOR TO PPC OVERLAY)



SECTION C-C

(MINIMUM EXISTING
JOINT DEMOLITION)



SECTION C-C

(PROPOSED JOINT SEAL)

END BENT 2

REPAIR QUANTITY TABLE

JOINT PAY LENGTH

BENTS 28 - 64 & END BENT 2

	LIN. FT.	NO. JOINTS
SILICONE JOINT SEALANT	42.8 LF/JT	37
BRIDGE JOINT REMOVAL	42.8 LF/JT	36

TABLE 1 — Table Date 3-2018

DIM "A" @ 45°F	BENT/JOINTS (MEASUREMENTS FROM FIELD VISIT)
2" - 2.25"	BT #: 29 - 64
N/A	END BENT #2: INTEGRAL

NOTES:

1. FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.
2. SILICONE JOINT SEALANT AND BACKER ROD SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
3. FOR REMOVAL OF THE EXISTING BRIDGE JOINTS, SEE SPECIAL PROVISIONS.
4. FOR DIM "A", SEE TABLE 1.
5. NO EXISTING JOINTS END BENT 2 AND BENT 28, THEREFORE THEY ARE NOT INCLUDED IN THE QUANTITY FOR BRIDGE JOINT REMOVAL.
6. NO JOINT WORK TO TAKE PLACE AT END BENT 2, THEREFORE, END BENT 2 JOINT IS NOT INCLUDED IN THE QUANTITY FOR SILICONE JOINT SEALANT.

* PPC GRADE MAY BE ADJUSTED BY THE ENGINEER AT BENT 28 IN SPAN 29 TO ENSURE PROPER TIE-IN. DO NOT REDUCE THE AMOUNT OF PPC OVERLAY IN SPAN 28.

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

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PROJECT NO. 15BPR.25
BRUNSWICK COUNTY
BRIDGE NO. 14
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

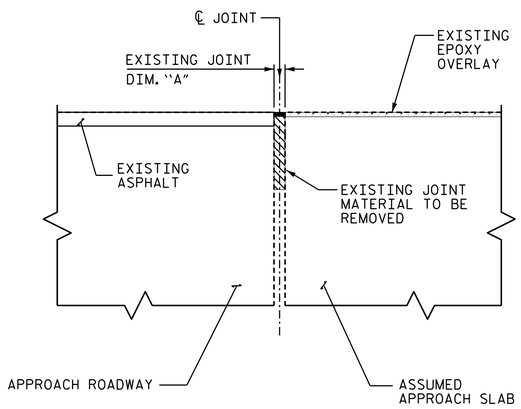
JOINT DETAILS
SPANS 29-65, TABLE AND QUANTITIES

AS-BUILT REPAIR QUANTITY TABLE		
JOINT PAY LENGTH		
NORTH APPROACH SLAB		
	LIN. FT.	NO. JOINTS
SILICONE JOINT SEALANT	40 LF/JT	1
BRIDGE JOINT REMOVAL	40 LF/JT	1

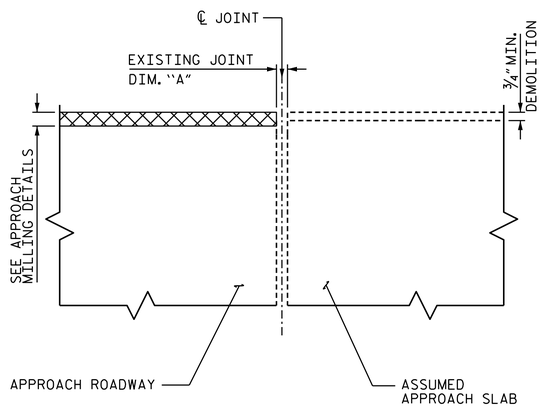
TABLE 1		Table Date 3-2018
DIM "A" @ 45°F	BENT/JOINTS	(MEASUREMENTS FROM FIELD VISIT)
1"-1½"	NORTH APPROACH SLAB & ROADWAY	

NOTES:

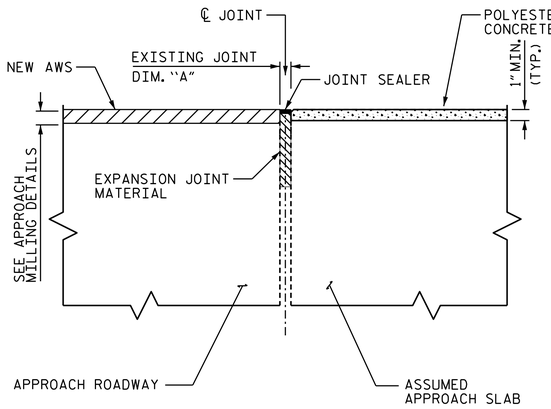
1. FOR SILICONE JOINT SEALANT , SEE SPECIAL PROVISIONS.
2. SILICONE JOINT SEALANT AND BACKER ROD SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
3. FOR REMOVAL OF THE EXISTING BRIDGE JOINTS, SEE SPECIAL PROVISIONS.
4. FOR DIM "A", SEE TABLE 1.



SECTION D-D
(EXISTING)



SECTION D-D
(MINIMUM EXISTING JOINT DEMOLITION)



SECTION D-D
(PROPOSED JOINT SEAL)

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

SHEET 2 OF 2

STATE OF NORTH CAROLINA
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RALEIGH

JOINT DETAILS
NORTH APPROACH SLAB & RAIL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
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4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
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DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

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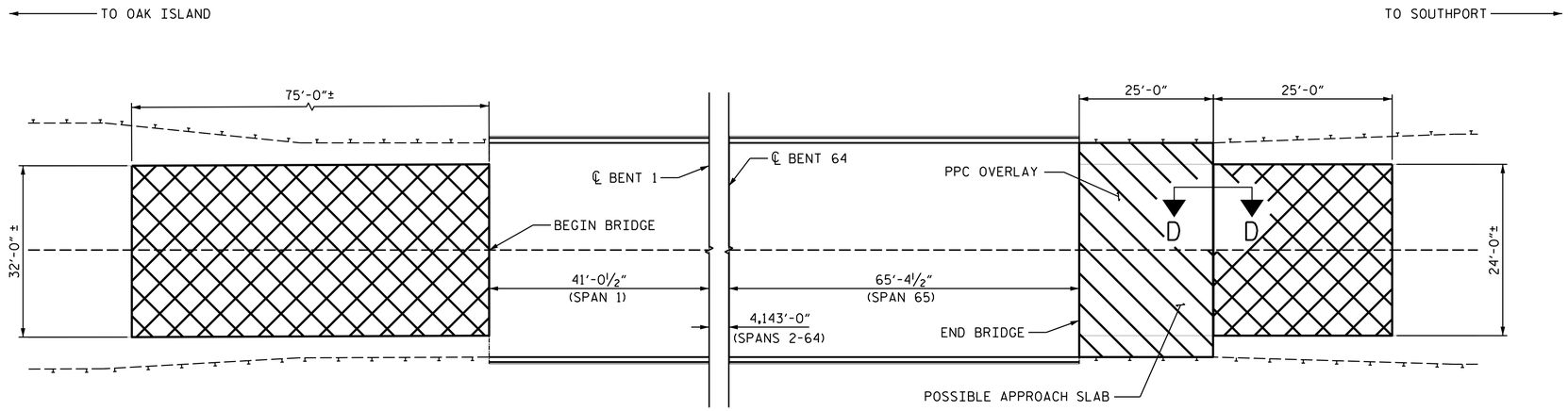
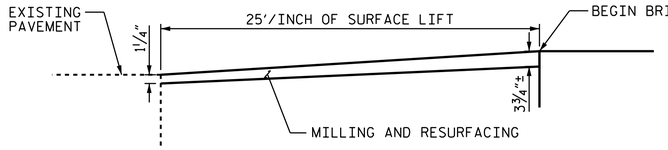
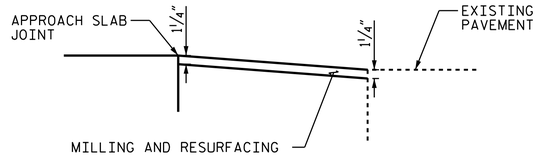


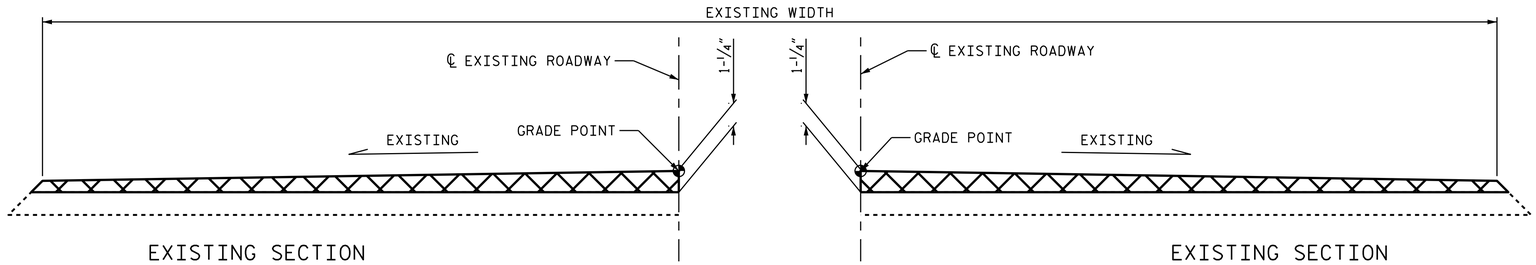
PLAN



END BENT 1 PAVEMENT KEY-IN DETAIL



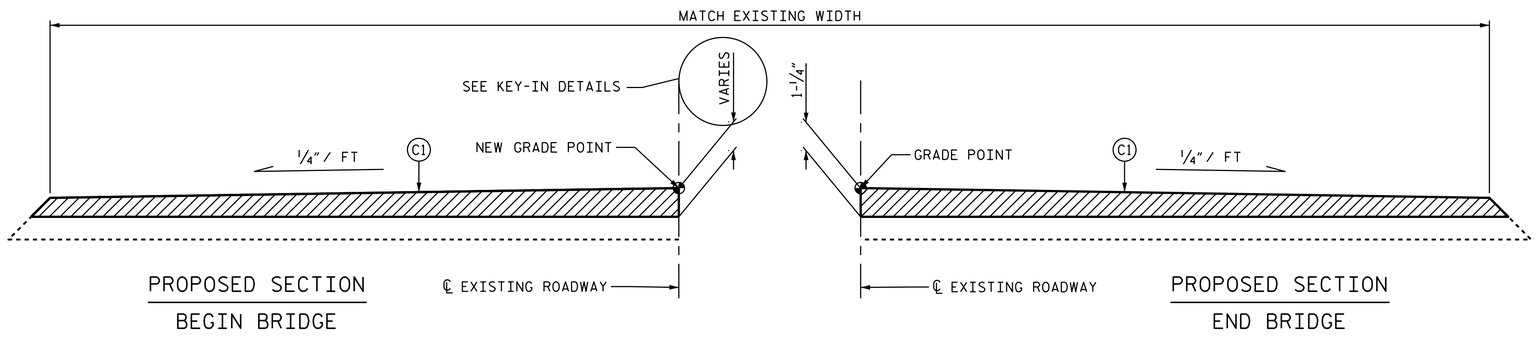
END BENT 2 PAVEMENT KEY-IN DETAIL



EXISTING SECTION
BEGIN BRIDGE

EXISTING SECTION
END BRIDGE

TYPICAL ROADWAY MILLING SECTION



PROPOSED SECTION
BEGIN BRIDGE

PROPOSED SECTION
END BRIDGE

TYPICAL ROADWAY SECTION

AS-BUILT QUANTITY TABLE

	ESTIMATE	ACTUAL
INCIDENTAL MILLING	335 SY	
ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C	45 TONS	

NORTH APPROACH SLAB

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	112 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
PPC MATERIALS	3.3 CY	
PLACING & FINISHING PPC OVERLAY	112 SY	
BRIDGE DECK GROOVING	600 SF	

NOTES:

1. INCIDENTAL MILLING - EXISTING APPROACH ASPHALT PAVEMENT TO BE MILLED AS NECESSARY TO ATTAIN MINIMUM 1"DEPTH OF NEW ASPHALT PAVEMENT. NEW ASPHALT PAVEMENT SHALL BE OF THICKNESS NECESSARY TO PROVIDE A SMOOTH TRANSITION BETWEEN THE ROADWAY AND THE BRIDGE DECK. THE NEW ASPHALT PAVEMENT THICKNESS MAY EXCEED 1"DUE TO SETTLEMENT OF THE EXISTING APPROACH.
2. FOR NEW ASPHALT PLACEMENT, SEE STANDARD SPECIFICATIONS.
3. GRADE MAY BE ADJUSTED BY THE ENGINEER TO ENSURE PROPER TIE-IN AT THE END BENT 1 APPROACH ROADWAY.
4. SEE JOINT DETAILS FOR SECTION D-D.

INCIDENTAL MILLING

ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C

PPC OVERLAY

C1	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1"DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1"OR GREATER THAN 2"IN DEPTH.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

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DRAWN BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : AARON J. MCMILLAN DATE : 03-2018
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APPROACH
MILLING AND RESURFACING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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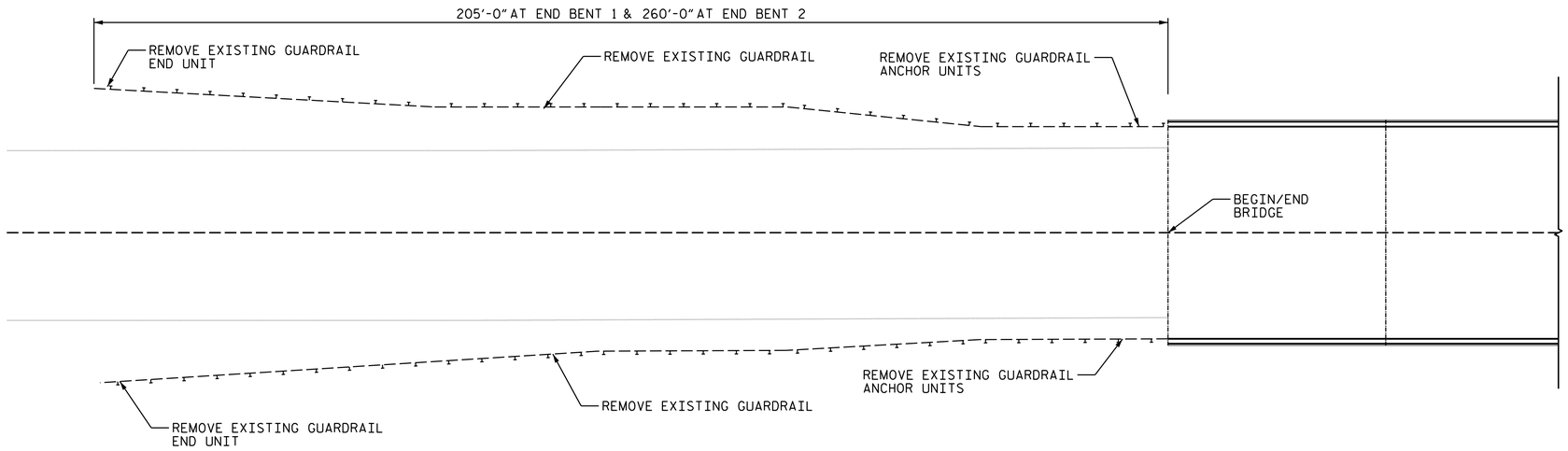
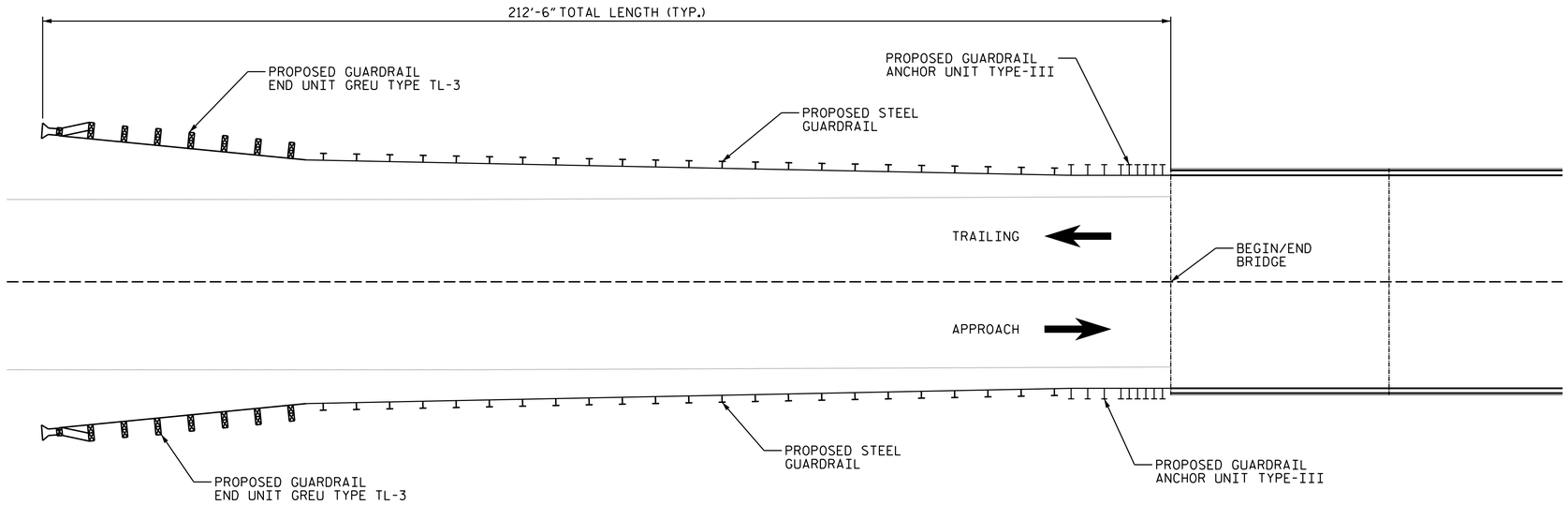
User:jduke



EXISTING GUARDRAIL DETAILS



PROPOSED GUARDRAIL DETAILS

AS-BUILT QUANTITY TABLE

	ESTIMATE	ACTUAL
GUARDRAIL REMOVAL	930 LF	
PROPOSED STEEL BEAM GUARDRAIL	575 LF	
PROPSED STEEL BEAM END UNITS GREU TYPE TL-3	4 EA	
PROPOSED GUARDRAIL ANCHOR UNIT TYPE-III	4 EA	

NOTES:

1. FOR PROPOSED GUARDRAIL ANCHOR UNITS TYPE-III, SEE ROADWAY STANDARD DETAILS SHEET 2 OF 2.
2. FOR PROPOSED GUARDRAIL END UNITS, SEE SECTION 862 OF THE STANDARD SPECIFICATION.
3. FOR PROPOSED GUARDRAIL PLACEMENT AT BRIDGE END, SEE RSD 862.01 SHEET 4 OF 11.
4. FOR GUARDRAIL INSTALLATION, SEE ROADWAY STANDARD DETAILS SHEET 1 OF 2.
5. REMOVAL OF THE EXISTING GUARDRAIL ANCHOR UNITS AND GUARDRAIL END UNITS SHALL BE INCIDENTAL TO THE COST OF GUARDRAIL REMOVAL.
6. PRIOR TO INSTALLATION OF THE PROPOSED GUARDRAIL ANCHOR UNITS, ALL PROPOSED BRIDGE RAILING SHALL BE INSTALLED. IF NECESSARY, REMOVE ANY EXISTING CONCRETE TRANISITION RAILING TO ENSURE PROPER GUARDRAIL ANCHOR UNIT INSTALLATION. PAYMENT FOR THE REMOVAL OF ANY CONCRETE TRANSITION RAILING SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE INSTALLATION OF THE PROPOSED GUARDRAIL ANCHOR UNITS.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

GUARDRAIL PLAN

(BEGIN BRIDGE DETAILS SHOWN, DETAILS AT END BRIDGE SIMILAR)

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : AARON J. MCMILLAN DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

4/12/2018
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User:jduke

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

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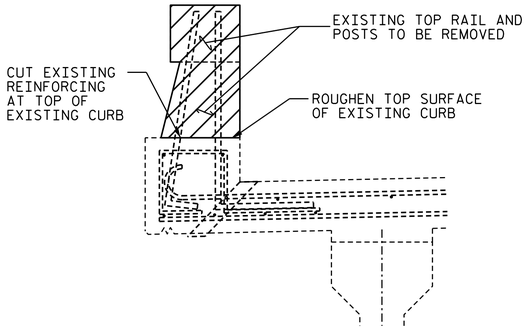
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

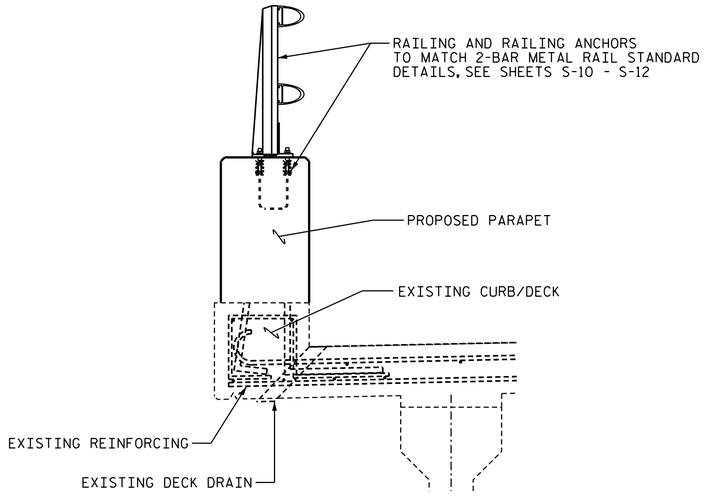
APPROACH

GUARDRAIL REPLACEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			111



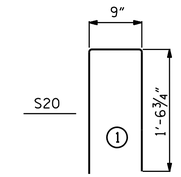
EXISTING RAIL SECTION

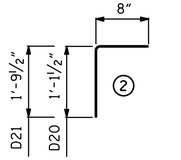


PROPOSED RAIL SECTION (1 OF 3)

(REINFORCING NOT SHOWN FOR CLARITY)

BAR TYPES





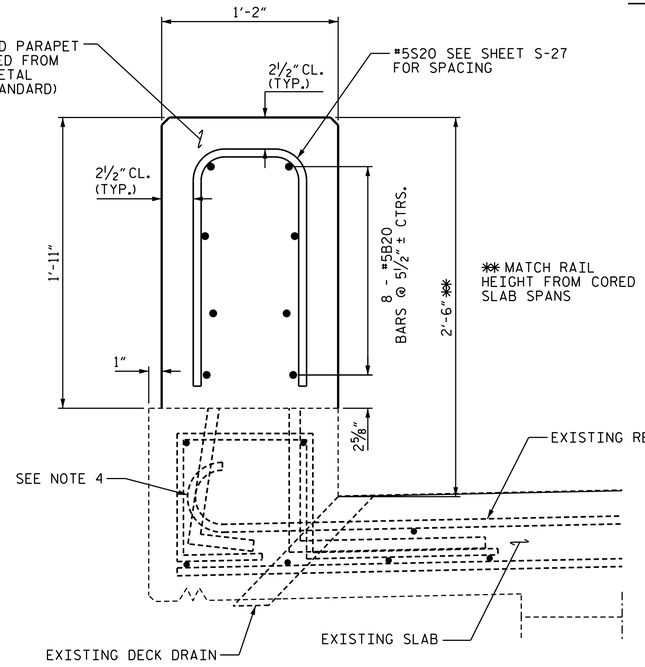
ALL BAR DIMENSIONS ARE OUT TO OUT

AS-BUILT QUANTITY TABLE

	ESTIMATE	ACTUAL
RAIL REMOVAL (SPANS 29-65)	6126 LF	

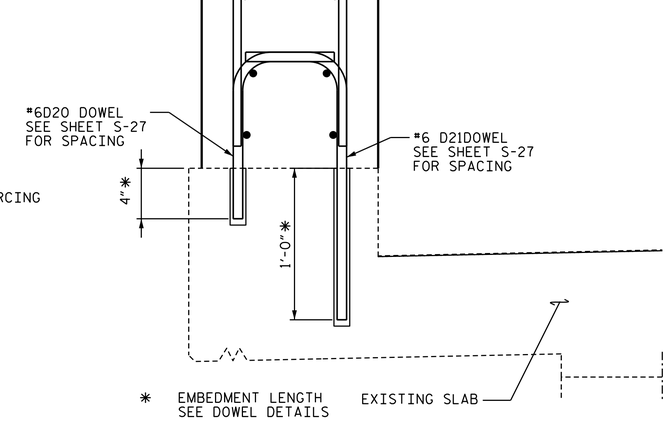
NOTES:

1. FOR 2-BAR METAL RAIL RETROFIT, SEE SPECIAL PROVISIONS.
2. COORDINATE THIS SHEET WITH INFO ONT THE SHEET FOR ELECTRICAL REPAIRS TO THE NAVIGATIONAL LIGHT SYSTEM, SHEET S-29.
3. COORDINATE THIS SHEET WITH INFO ON THE SHEETS FOR THE 2-BAR METAL RAIL IN SPANS 1-28, SHEETS S-10 THRU S-12.
4. CARE MUST BE TAKEN WHEN INSTALLING NEW DOWELS AS TO NOT DISTURB THE TRANSVERSE DECK BAR. TRANSVERSE DECK BARS ARE SPACED AT 5½" CENTERS BASED ON THE BEST INFORMATION AVAILABLE. IF REINFORCING IS ENCOUNTERED, SHIFT HOLE TO CLEAR.
5. ALL REINFORCING STEEL IN THE PROPOSED 2-BAR METAL RAIL PARAPET IN SPANS 29-65 SHALL BE EPOXY COATED.
6. 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. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINT. 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.
7. FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
8. FOR ADHESIVELY ANCHORED DOWELS, SEE ARTICLE 420-13 OF THE STANDARD SPECIFICATIONS.



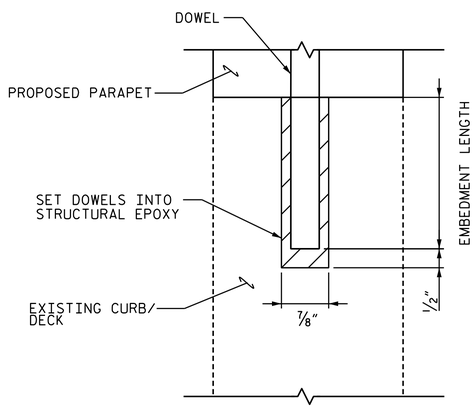
PROPOSED RAIL SECTION (2 OF 3)

(2-BAR RAIL NOT SHOWN FOR CLARITY)
(DOWELS NOT SHOWN FOR CLARITY)



PROPOSED RAIL SECTION (3 OF 3)

(2-BAR RAIL NOT SHOWN FOR CLARITY)
(EXISTING REINFORCING NOT SHOWN FOR CLARITY)



DOWEL DETAILS

PROJECT NO. 15BPR.25
BRUNSWICK COUNTY
BRIDGE NO. 14
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE RAIL RETROFIT

SPANS 29-65

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : AARON J. MCMILLAN DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LEE CULLUM
DocuSigned by: Samuel Lee
19C97095C75A467...
4/12/2018

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2			4			111

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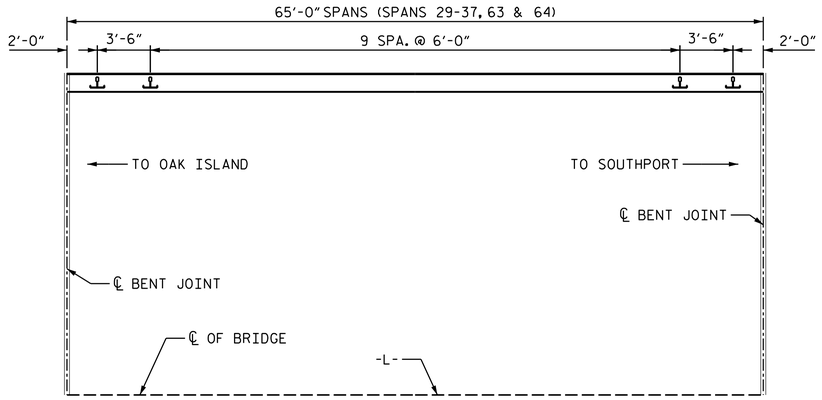
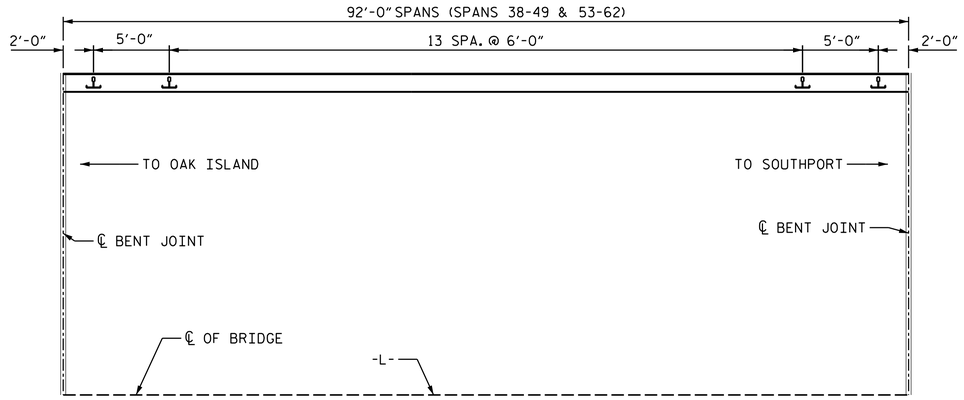
User:jduke



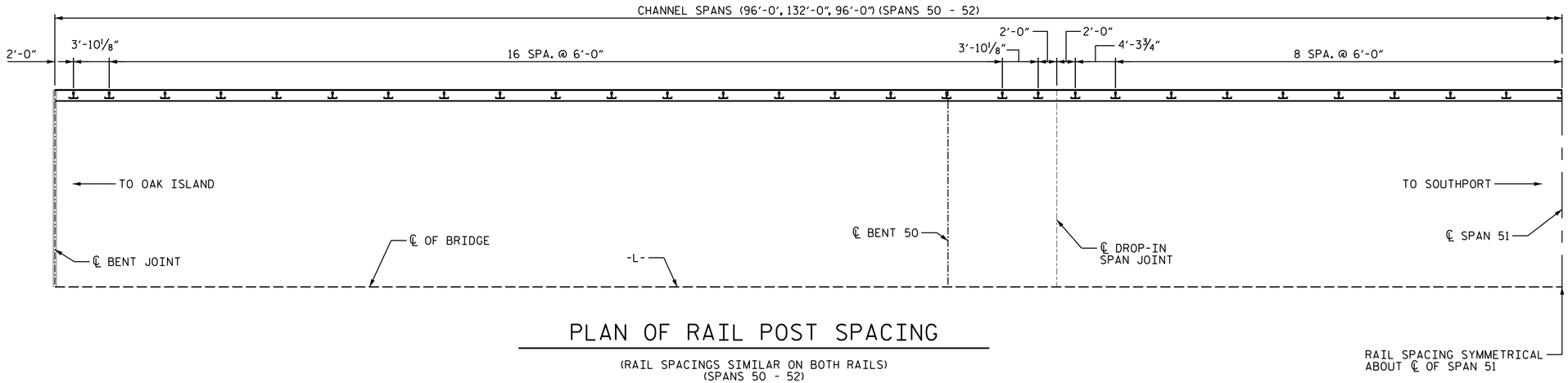
PLAN OF RAIL POST SPACING

(RAIL SPACINGS SIMILAR ON BOTH RAILS)
(SPANS 29-37, 63 & 64)



PLAN OF RAIL POST SPACING

(RAIL SPACINGS SIMILAR ON BOTH RAILS)
(SPANS 38-49 & 53-62)

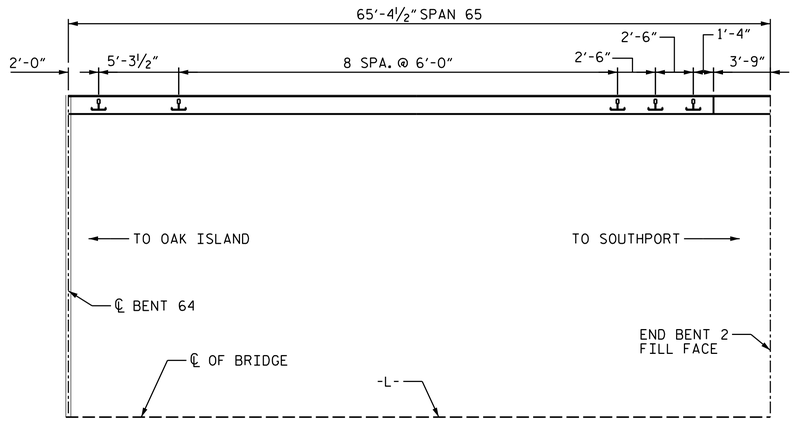


PLAN OF RAIL POST SPACING

(RAIL SPACINGS SIMILAR ON BOTH RAILS)
(SPANS 50 - 52)

NOTES:

1. FOR 2-BAR METAL RAIL RETROFIT, SEE SPECIAL PROVISIONS.
2. COORDINATE THIS SHEET WITH INFO ON THE SHEET FOR ELECTRICAL REPAIRS TO THE NAVIGATIONAL LIGHT SYSTEM, SHEET S-29.
3. COORDINATE THIS SHEET WITH INFO ON THE SHEETS FOR THE 2-BAR METAL RAIL IN SPANS 1-28, SHEETS S-10 THRU S-12.
4. ALL REINFORCING STEEL IN THE PROPOSED 2-BAR METAL RAIL PARAPET IN SPANS 29-65 SHALL BE EPOXY COATED.



PLAN OF RAIL POST SPACING

(RAIL SPACINGS SIMILAR ON BOTH RAILS)
(SPAN 65)

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

4/12/2018
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User:jduke

PROJECT NO. 15BPR.25
BRUNSWICK COUNTY
BRIDGE NO. 14

SHEET 2 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

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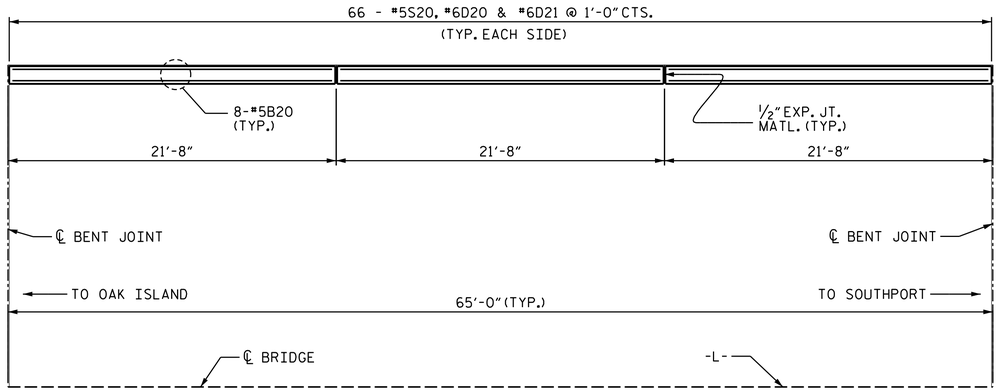
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE RAIL RETROFIT

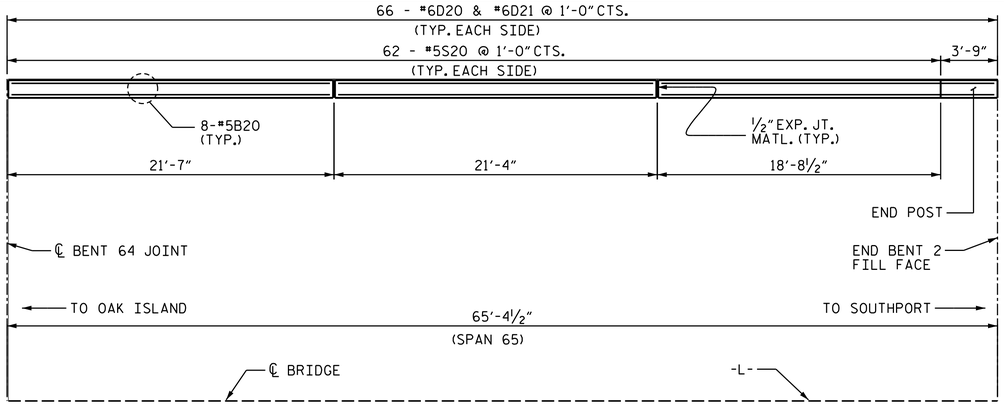
RAIL POST SPACING
AND END RAIL DETAILS
SPANS 29-65

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			111



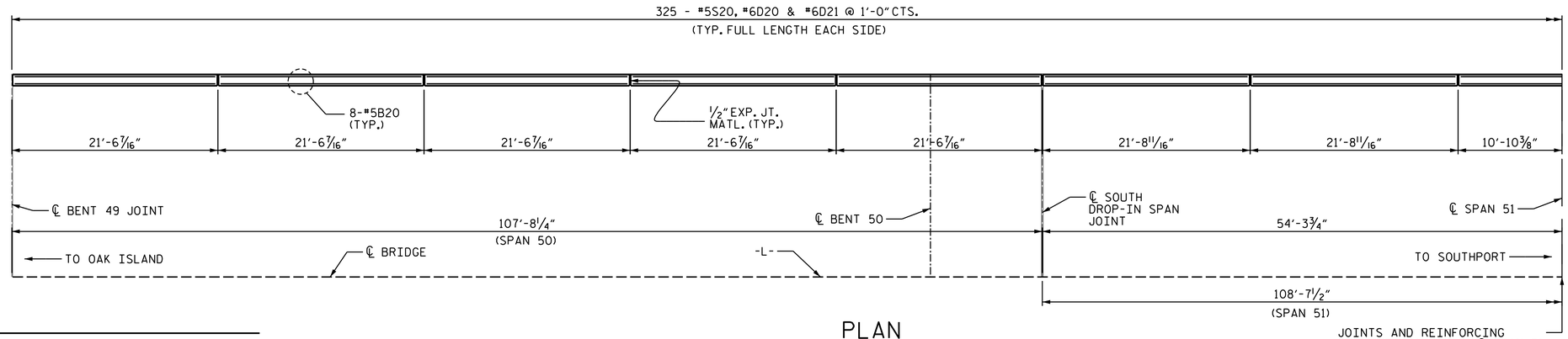
PLAN

(RAIL REINFORCING AND JOINTS SIMILAR ON BOTH RAILS)
(SPANS 29-37, 63 & 64)



PLAN

(RAIL REINFORCING AND JOINTS SIMILAR ON BOTH RAILS)
(SPAN 65)

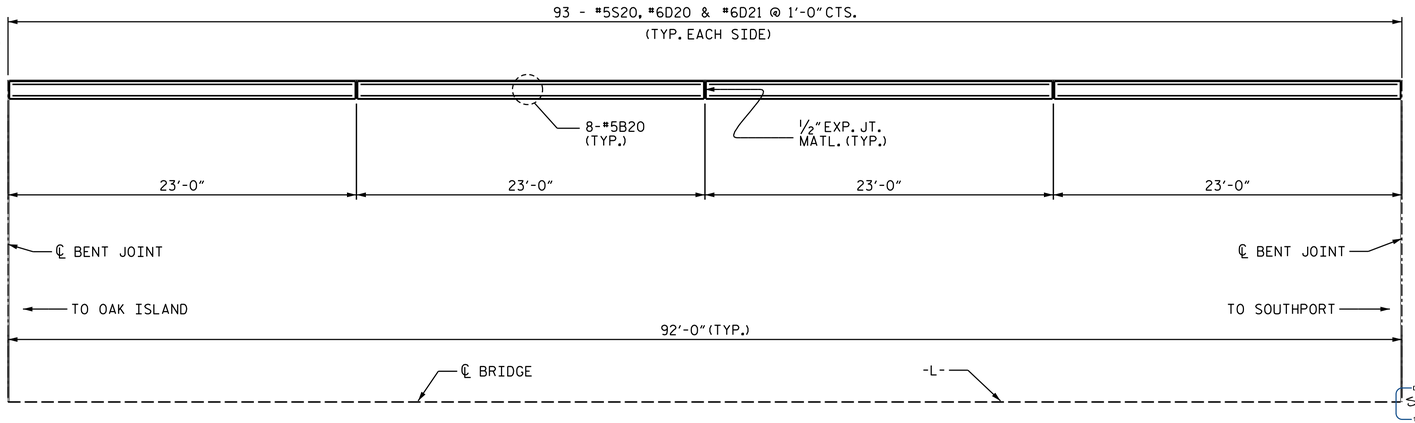


PLAN

(RAIL REINFORCING AND JOINTS SIMILAR ON BOTH RAILS)
(SPANS 50-52)

NOTES:

1. FOR 2-BAR METAL RAIL RETROFIT, SEE SPECIAL PROVISIONS.
2. COORDINATE THIS SHEET WITH INFO ON THE SHEET FOR ELECTRICAL REPAIRS TO THE NAVIGATIONAL LIGHT SYSTEM, SHEET S-29.
3. COORDINATE THIS SHEET WITH INFO ON THE SHEETS FOR THE 2-BAR METAL RAIL IN SPANS 1-28, SHEETS S-10 THRU S-12.
4. ALL REINFORCING STEEL IN THE PROPOSED 2-BAR METAL RAIL PARAPET IN SPANS 29-65 SHALL BE EPOXY COATED.
5. GROOVED CONTRACTION JOINTS, 1/2" 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. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINT. 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.



PLAN

(RAIL REINFORCING AND JOINTS SIMILAR ON BOTH RAILS)
(SPANS 38-49, 53-62)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY :	JACOB H. DUKE	DATE :	03-2018
CHECKED BY :	DIEGO A. AGUIRRE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

PROJECT NO. 15BPR.25
BRUNSWICK COUNTY
BRIDGE NO. 14
SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE RAIL RETROFIT
PARAPET AND END POST DETAILS SPANS 29-65

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			111

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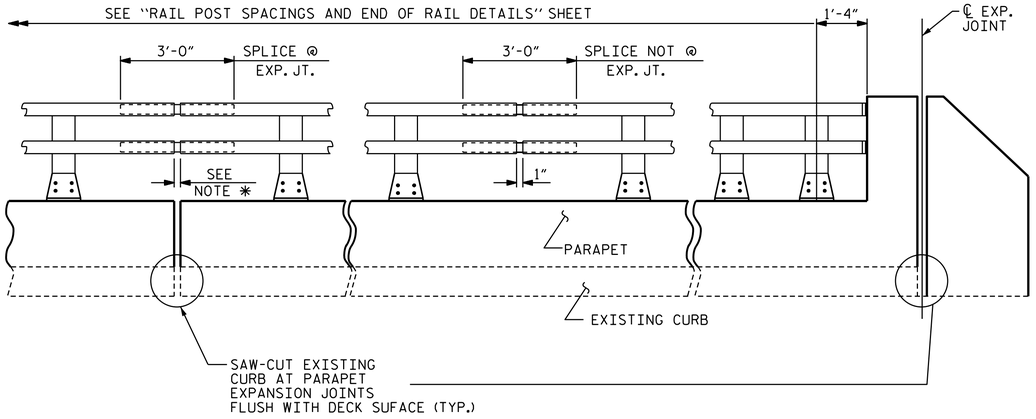
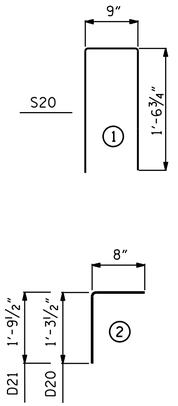


ELEVATION

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

✳ MATCH EXISTING JOINT OPENINGS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL 65'-0" SPANS (SPANS 29-37, 63 & 64)

FOR 2 PARAPETS AND RAILS

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
✳B20	48	#5	STR.	21'-1"	1056
✳S20	132	#5	1	3'-11"	540
✳D20	132	#6	2	1'-10"	364
✳D21	132	#6	2	2'-6"	496
✳EPOXY COATED REINFORCING STEEL			LBS.		2456
CLASS AA CONCRETE			CU. YDS.		10.8
2-BAR METAL RAIL			LIN. FT.		130
TOTAL LENGTH OF PARAPET			LIN. FT.		130

BILL OF MATERIAL CHANNEL SPANS (SPANS 50-52)

FOR 2 PARAPETS AND RAILS

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
✳B20	160	#5	STR.	21'-0"	3508
✳B20	80	#5	STR.	21'-2"	1768
✳S20	650	#5	1	3'-11"	2658
✳D20	650	#6	2	1'-10"	1791
✳D21	650	#6	2	2'-6"	2443
✳EPOXY COATED REINFORCING STEEL			LBS.		12167
CLASS AA CONCRETE			CU. YDS.		53.7
2-BAR METAL RAIL			LIN. FT.		648
TOTAL LENGTH OF PARAPET			LIN. FT.		648

BILL OF MATERIAL 92'-0" SPANS (SPANS 38-49, 53-62)

FOR 2 PARAPETS AND RAILS

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
✳B20	64	#5	STR.	22'-5"	1498
✳S20	186	#5	1	3'-11"	761
✳D20	186	#6	2	1'-10"	513
✳D21	186	#6	2	2'-6"	699
✳EPOXY COATED REINFORCING STEEL			LBS.		3470
CLASS AA CONCRETE			CU. YDS.		15.2
2-BAR METAL RAIL			LIN. FT.		184
TOTAL LENGTH OF PARAPET			LIN. FT.		184

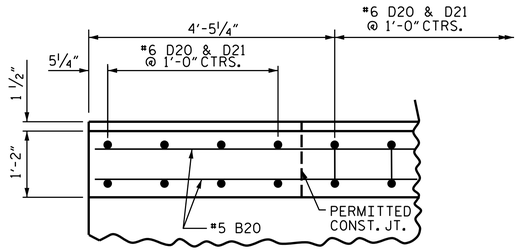
BILL OF MATERIAL SPAN 65

FOR 2 PARAPETS, RAILS & END POSTS

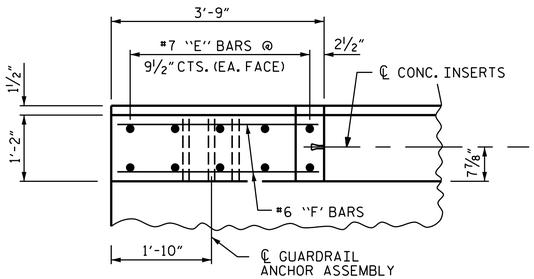
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
✳B20	16	#5	STR.	21'-0"	351
✳B20	16	#5	STR.	20'-9"	347
✳B20	16	#5	STR.	22'-0"	367
✳S20	124	#5	1	3'-11"	507
✳D20	132	#6	2	1'-10"	364
✳D21	132	#6	2	2'-6"	496
✳E1	4	#7	STR.	1'-11"	16
✳E2	4	#7	STR.	2'-5"	20
✳E3	4	#7	STR.	2'-11"	24
✳E4	4	#7	STR.	3'-5"	28
✳E5	4	#7	STR.	3'-9"	31
✳F1	4	#6	STR.	3'-0"	18
✳F2	4	#6	STR.	1'-11"	12
✳F3	4	#6	STR.	3'-7"	21
✳EPOXY COATED REINFORCING STEEL			LBS.		2601
CLASS AA CONCRETE			CU. YDS.		10.8
2-BAR METAL RAIL			LIN. FT.		123.25
TOTAL LENGTH OF PARAPET			LIN. FT.		123.25
END POSTS			NO.		2

NOTES:

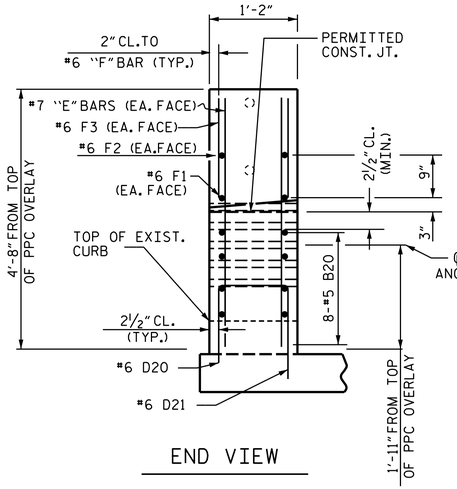
1. FOR 2-BAR METAL RAIL RETROFIT, SEE SPECIAL PROVISIONS.
2. COORDINATE THIS SHEET WITH INFO ON THE SHEET FOR ELECTRICAL REPAIRS TO THE NAVIGATIONAL LIGHT SYSTEM, SHEET S-29.
3. COORDINATE THIS SHEET WITH INFO ON THE SHEETS FOR THE 2-BAR METAL RAIL IN SPANS 1-28, SHEETS S-10 THRU S-12.
4. COORDINATE THIS SHEET WITH INFO ON THE SHEET FOR CONCRETE PARAPET AND END POST DETAILS AND ANCHORAGE DETAILS, SHEETS S-13 & S-14.
5. ALL REINFORCING STEEL IN THE PROPOSED 2-BAR METAL RAIL PARAPET IN SPANS 29-65 SHALL BE EPOXY COATED.
6. 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. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINT. 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.
7. FOR CONCRETE INSERTS, SEE SHEET S-12.



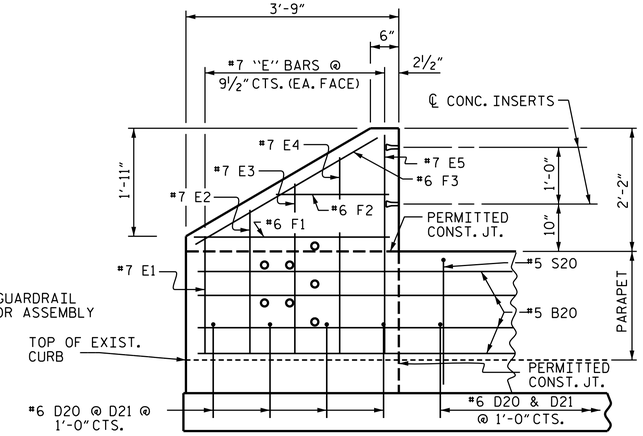
PLAN OF PARAPET



PLAN OF END POST



END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR RAIL

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE RAIL RETROFIT

END POSTS DETAILS & BILL OF MATERIALS SPANS 29-65

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

DocuSigned by: Samuel L Cullum 19C97095C75A467...

4/12/2018

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KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

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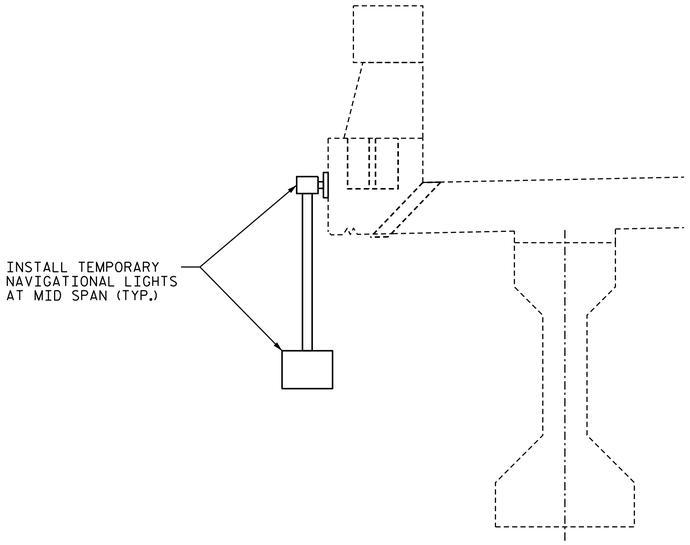
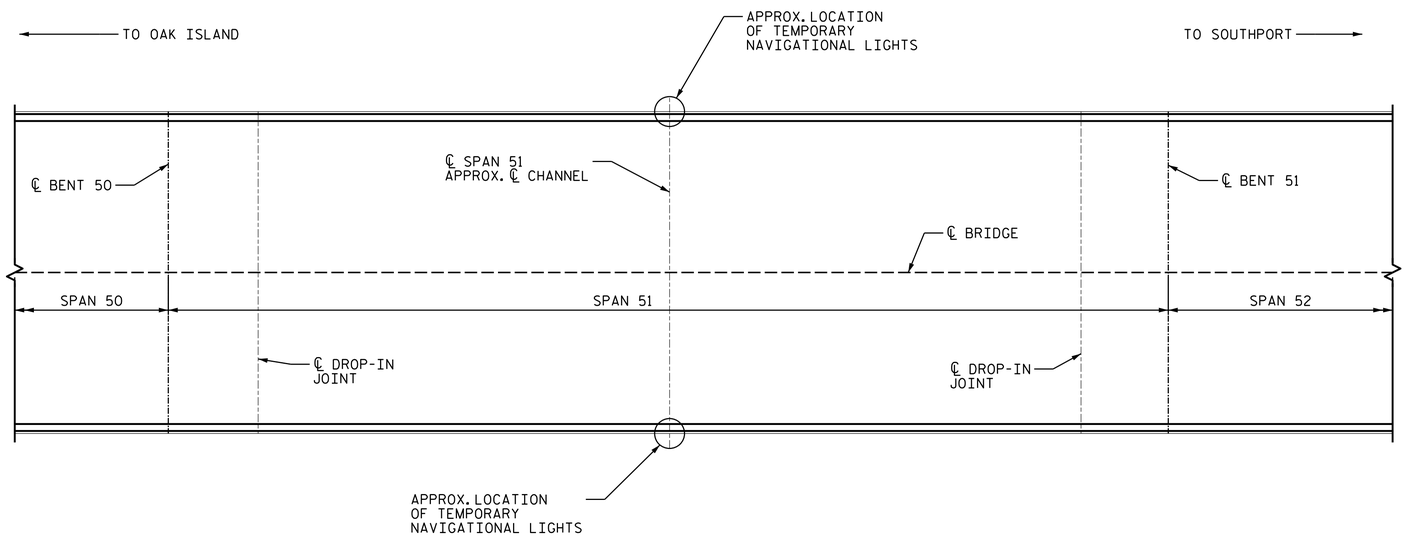


LIGHTING DETAILS

(TYPICAL AT ALL LIGHT LOCATIONS)



NOTES:

1. FOR NAVIGATIONAL LIGHT SYSTEM, SEE SPECIAL PROVISIONS FOR "NAVIGATIONAL LIGHT SYSTEM".
2. THE POWER SUPPLY SHALL BE TURNED OFF WHILE PROPOSED REPAIRS ARE MADE.
3. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN AND ENSURE ALL NAVIGATIONAL LIGHTS ARE OPERATIONAL FOR THE DURATION OF THE PROJECT.
4. ALL REPAIRS SHALL BE MADE PER NFPA 70 ELECTRIC CODE (NEC) BY A CURRENT LICENSED ELECTRICIAN.
5. FOR TEMPORARY NAVIGATIONAL LIGHTING, SEE SPECIAL PROVISION FOR "COORDINATION WITH THE U.S. COAST GUARD".
6. ALL ITEMS REQUIRED TO INSTALL THE TEMPORARY NAVIGATIONAL LIGHTS SHALL BE INCLUDED WITH THE PAY ITEM FOR ELECTRICAL REPAIRS.
7. THE CONTRACTORS ATTENTION IS BROUGHT TO NOTICE THE SOLAR ASSEMBLY WHICH IS ATTACHED TO THE RAILING ON THE LEFT SIDE OF SPAN 50. THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF THE SOLAR ASSEMBLY PRIOR TO THE REMOVAL OF THE EXISTING BRIDGE RAIL.
8. PROPOSED NAVIGATIONAL LIGHTS SHALL BE INSTALLED BY THE NCDOT AFTER THE PROPOSED BRIDGE RAILING IS IN PLACE.
9. THE CONTRACTOR SHALL NOTIFY THE NCDOT JOHN LANGE AT (910) 262-6319 (2) TWO WEEKS PRIOR THE CASTING THE PROPOSED BRIDGE RAILING IN SPAN 51 TO CORRODINATE THE INSTALLATION OF THE PROPOSED NAVIGATIONAL LIGHTS.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

NAVIGATIONAL LIGHT SYSTEM

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4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : AARON J. MCMILLAN DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

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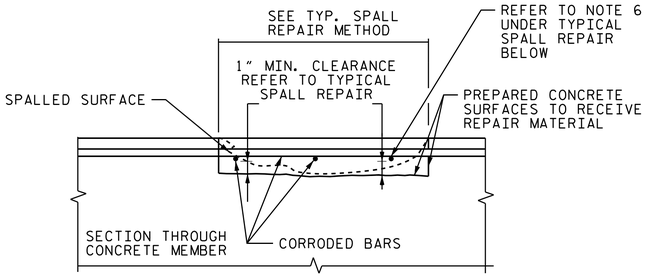
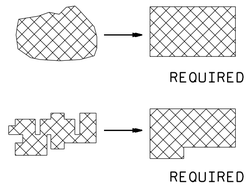


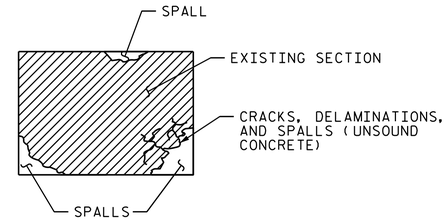
EXPOSING AND UNDERCUTTING REINFORCING STEEL

APPLICABLE TO HORIZONTAL, VERTICAL, AND OVERHEAD LOCATIONS



SIMPLE PATCH CONFIGURATION

AT CORNER LOCATIONS PROVIDE RIGHT ANGLE CUTS. PATCH CONFIGURATION SHALL BE KEPT AS SIMPLE AS POSSIBLE. INDIVIDUAL REPAIR AREAS WITHIN 2 FEET SHALL BE JOINED AT THE DIRECTION OF THE ENGINEER.



TYPICAL DELAMINATIONS AND SPALLS

TYPICAL SPALL REPAIR

1. FOR CONCRETE RESTORATION, REMOVE AND REPAIR UNSOUND CONCRETE FROM AREAS TO BE REPAIRED IN ACCORDANCE WITH THIS SHEET AND THE PROJECT SPECIAL PROVISIONS. AREAS WELL ADHERED TO EXISTING STRAND OR REINFORCEMENT SHALL REMAIN.
2. ALL UNSOUND CONCRETE MUST BE REMOVED. HOWEVER, PRESTRESSED STRANDS SHOULD NOT BE DISTURBED UNLESS ABSOLUTELY NECESSARY. USE EXTREME CARE TO NOT DAMAGE STRANDS.
3. ALL REPAIRS SHALL BE MARKED FOR APPROVAL OF APPROXIMATE PERIMETER PRIOR TO INITIATION OF WORK.
4. THE CONTRACTOR SHALL SUBMIT A PLAN FOR CONTROL AND DISPOSAL OF DEBRIS TO THE ENGINEER FOR APPROVAL.
5. ANY REINFORCEMENT WHICH IS LOOSE SHALL BE SECURED IN PLACE BY TYING TO OTHER SECURED BARS OR BY OTHER APPROVED METHODS. LAP SPLICES SHALL BE INSTALLED IN ACCORDANCE WITH THE TABLE BELOW. REFER TO GENERAL NOTES FOR DOWEL DETAIL (IF NECESSARY).
6. CLEAN EXPOSED REBARS AND ANY LOOSE CONCRETE OR ABRASIVES BY SANDBLASTING OR APPROVED ALTERNATE. CLEANED STEEL SHALL NOT BE LEFT EXPOSED FOR MORE THAN 72 HOURS PRIOR TO ENCAPSULATION OF CONCRETE.
7. AN APPROVED CEMENTITIOUS BASED BONDING AGENT SHALL BE USED ON ALL EXPOSED CONCRETE SURFACES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS BEFORE THE REPAIR MATERIAL IS APPLIED.
8. FILL VOIDS WITH REPAIR MATERIAL IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS AND NCDOT SPECIFICATIONS. NOTE THAT ANY REPAIR MATERIAL APPLIED TO OVERHEAD LOCATIONS SHALL BE SPECIFICALLY DESIGNATED FOR OVERHEAD USE BY THE MANUFACTURER'S SPECIFICATIONS.

LAP SPLICE TABLE	
REBAR SIZE	LAP SPLICE LENGTH
4	1'-9"
5	2'-2"
6	2'-7"
7	3'-6"
8	4'-6"
9	5'-10"
10	7'-4"

TYPICAL CRACK REPAIR METHOD

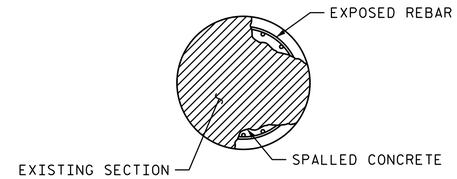
1. OBTAIN ENGINEER'S APPROVAL TO CARRY OUT CRACK REPAIR (IN LIEU OF SPALL REPAIR) FOR CASES WHERE ADJACENT CONCRETE IS OTHERWISE SOUND AND CRACKING IS NOT A RESULT OF CORRODING REINFORCEMENT.
2. ADDRESS CRACKS IN NEW CONSTRUCTION IN ACCORDANCE WITH PROJECT SPECIAL PROVISIONS. ADDRESS EXISTING CRACKS IN ACCORDANCE WITH THIS SHEET AND PROJECT SPECIAL PROVISIONS.
3. REMOVE UNSOUND CONCRETE FROM CRACK AREA.
4. THE CONTRACTOR SHALL SUBMIT A PLAN FOR CONTROL AND DISPOSAL OF DEBRIS TO THE ENGINEER FOR APPROVAL.
5. FOR CRACKS UP TO 1/8" USE AN EPOXY RESIN WITH MINIMUMS OF VISCOSITY OF 325 CPS, 28 DAY COMPRESSIVE STRENGTH OF 13000 PSI. FOR CRACKS 1/8" TO 1/4", USE AN INJECTION GEL OR EQUAL NON-SAG PASTE WITH 28 DAY COMPRESSIVE STRENGTH OF 10000 PSI.
6. TO SEAL CRACK SURFACES PRIOR TO CRACK INJECTION, USE INJECTION GEL WITH MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 12000 PSI.
7. ENGINEER TO APPROVE CRACK AND CAP SEAL MATERIAL PRIOR TO BEGINNING OF CONSTRUCTION.
8. APPLY CLASS II FINISH AT COMPLETION OF CRACK REPAIR TO REMOVE FINS OR KNOBS.

CONCRETE REPAIR SCHEDULE	
REPAIR AREA	APPROVED MATERIAL
BEAMS	CONCRETE REPAIRS (PPC GIRDERS)
PIER FOOTINGS	``FORM AND POUR" CONCRETE REPAIR
OTHER SUBSTRUCTURE	SHOTCRETE, OR CONTRACTOR OPTION

SEE PPC PLANS AND PSP FOR TOP OF DECK CONCRETE REPAIRS.

PRESTRESSED GIRDER REPAIR NOTES

IF AFTER UNSOUND CONCRETE REMOVAL ON GIRDERS, MORE THAN 50% SECTION LOSS IS NOTED ON THE PRESTRESSING STRANDS, OR A SEVERED PRESTRESSING STRAND IS ENCOUNTERED, NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONCRETE REPAIR.



TYPICAL SPALL WITH EXPOSED REBAR

CONCRETE REPAIR NOTES

1. PERFORM A SOUNDING SURVEY IN THE PRESENCE OF THE ENGINEER TO IDENTIFY ALL LOCATIONS IN NEED OF CONCRETE REPAIR.
2. GAIN CONCURRENCE ON ALL REPAIR AREAS AT EACH LOCATION PRIOR TO COMMENCING WORK AT THE BENT.
3. THE DETERIORATED AREAS SHOWN ON OTHER PAGES ARE BASED ON INFRARED SURVEYS, BRIDGE INSPECTION REPORT, AND PARTIAL FIELD REVIEWS OF THE STRUCTURE. AS SUCH, THEY ARE FOR INFORMATIONAL PURPOSES AND SUBJECT TO CHANGE BASED ON CONTINUED DETERIORATION.
4. GENERALLY EXTEND REPAIR AREAS 2"-3" INTO SOUND CONCRETE BEYOND EDGE OF SPALLS AND SQUARE OFF AREAS IN ACCORDANCE WITH DETAILS ON THIS SHEET.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

SHEET 1 OF 2

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE RESTORATION DETAILS

SUPERSTRUCTURE

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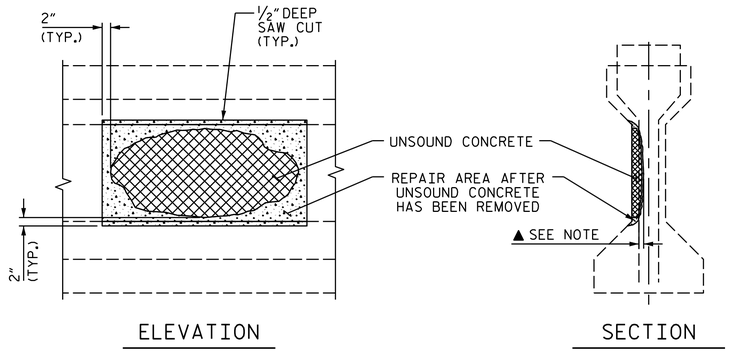
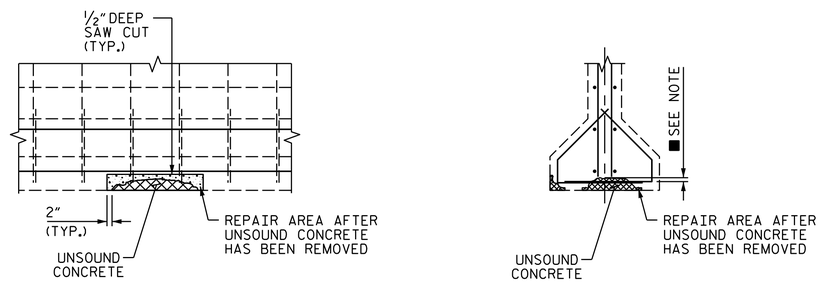


GIRDER WEB REPAIR



GIRDER FLANGE REPAIR

PRESTRESSED GIRDER REPAIR SEQUENCE:

1. SOUND CONCRETE TO DETERMINE EXTENTS OF REPAIR LOCATION (PHOTO REQUIRED).
2. REMOVE SURFACE CONCRETE TO VERIFY THAT SAW CUT DEPTH WILL NOT DAMAGE EXISTING REINFORCING STEEL. SAW CUT AROUND REPAIR AREA TO A NOMINAL DEPTH OF 1/2".
3. REMOVE CONCRETE WITHIN SAW CUT AREA TO MINIMUM DEPTH 1/2" DEPTH. IF CONCRETE IS DAMAGED BEYOND THE ORIGINAL SAW CUT, A NEW SAW CUT IS REQUIRED.
4. ▲ IF MORE THAN HALF THE CIRCUMFERENCE OF A REINFORCING BAR IS EXPOSED DURING THIS PROCESS, REMOVE ADDITIONAL CONCRETE TO 1" BEHIND THE BAR. THIS DOES NOT APPLY TO PRESTRESS STRANDS.
5. ■ ALL UNSOUND CONCRETE MUST BE REMOVED. HOWEVER, PRESTRESSED STRAND SHOULD NOT BE DISTURBED UNLESS ABSOLUTELY NECESSARY. USE EXTREME CARE TO NOT DAMAGE STRANDS.
6. CLEAN ALL EXPOSED REINFORCING BARS AND PRESTRESSED STRANDS. FOR BAR WITH MORE THAN 10% SECTION LOSS, SPLICE AND SECURELY TIE SUPPLEMENTAL REINFORCING BARS AS NEEDED. NOTE AND PROVIDE DETAILED DOCUMENTATION, INCLUDING LOCATION AND SEVERITY OF ALL DAMAGE TO PRESTRESSED STRANDS THAT EXCEEDS 10% SECTION LOSS. IF FIVE OR MORE STRANDS ARE DAMAGED, NOTIFY THE ENGINEER PRIOR TO PLACEMENT OF REPAIR MATERIAL.
7. REMOVE ALL LOOSE OR WEAKENED MATERIAL THEN CLEAN THE REPAIR AREA OF DIRT, GREASE, OIL, AND FOREIGN MATTER.
8. PREPARE SURFACE AND PLACE APPROVED MATERIAL ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. MAXIMUM AGGREGATE SIZE FOR REPAIR MATERIAL SHALL NOT EXCEED 2/3 THE MINIMUM REPAIR DEPTH.
9. FOR GIRDER REPAIRS, SEE PROJECT SPECIAL PROVISION FOR REPAIRS TO CONCRETE GIRDERS AND SEE SHEETS S-103 THRU S-108 FOR DEFICIENCIES.

NOTES:

PREPACKAGED MATERIAL IS REQUIRED.

FOR REPAIRS OVER TRAFFIC AND SHALLOW REPAIRS THAT DO NOT ENGAGE REINFORCEMENT, ANCHOR PATCH MATERIAL USING 1/4" GALVANIZED BOLTS, EPOXY ANCHORED WITH 2" EMBEDMENT. PLACE BOLTS IN A 6" GRID. USE A LATEX OR EPOXY PATH MATERIAL FOR IMPROVED BOND. USE EXTREME CARE TO NOT DAMAGE STRANDS.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

SHEET 2 OF 2

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LEE CULLUM
DocuSigned by: Samuel Lee 19C97095C75A467...
4/12/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE RESTORATION DETAILS

SUPERSTRUCTURE

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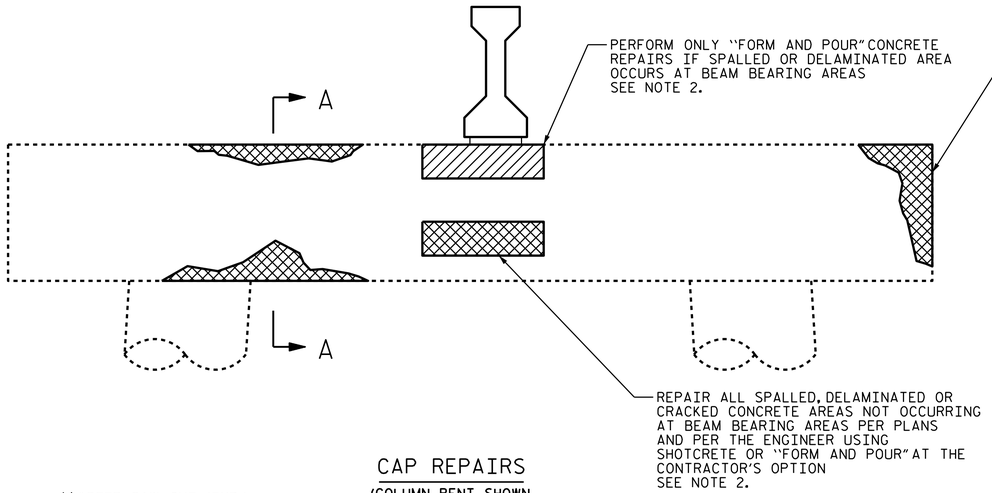
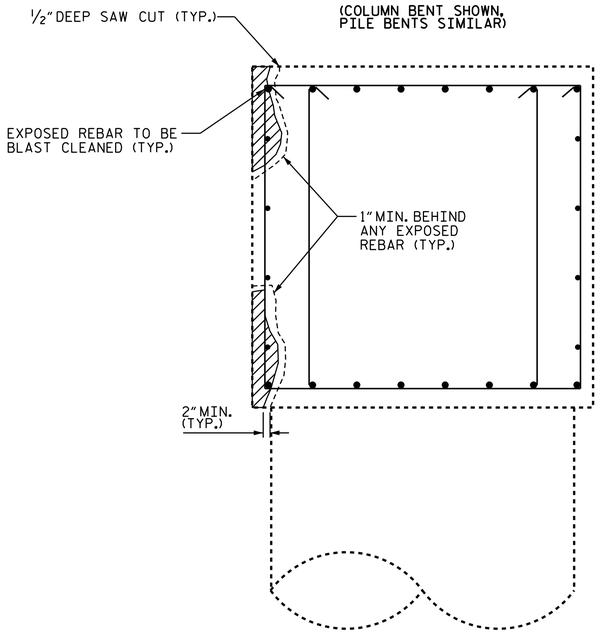


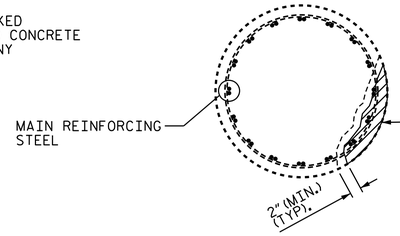
CAP REPAIRS

(COLUMN BENT SHOWN, PILE BENTS SIMILAR)

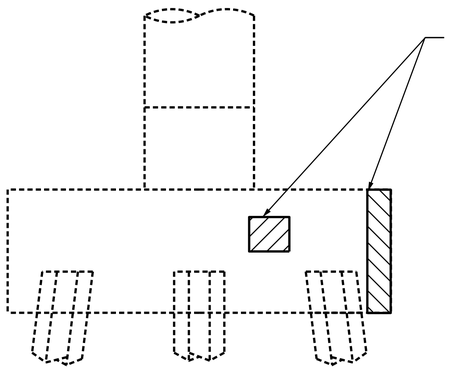


SECTION A-A

BENT CAP REPAIRS

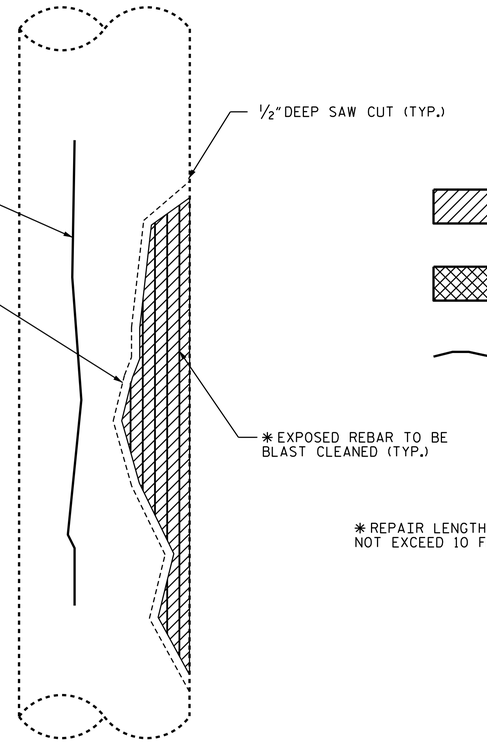


PLAN OF COLUMN



ELEVATION OF FOOTING

TYPICAL FOOTING REPAIRS



* REPAIR LENGTH SHALL NOT EXCEED 10 FEET AT ONCE.

ELEVATION OF COLUMN

COLUMN REPAIRS

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NOTES:

1. COORDINATE THIS SHEET WITH THE SUBSTRUCTURE REPAIR SHEETS.
2. IF ANY AREA IS DETERMINED TO BE UNSTABLE DURING THE REPAIR PROCESS AS DETERMINED BY THE ENGINEER, STOP THE CURRENT REPAIR PROCEDURE, SHORE THE AREA AND PERFORM A "FORM AND POUR" CONCRETE REPAIR.
3. IF IT IS DETERMINED THAT JACKING IS NEEDED TO ADEQUATELY REPAIR CONCRETE AREAS UNDER BEAM, A SUPPLEMENTAL AGREEMENT IS TO BE ANTICIPATED.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE RESTORATION DETAILS

SUBSTRUCTURE

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

DocuSigned by: Samuel L
19C97095C75A467...
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4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

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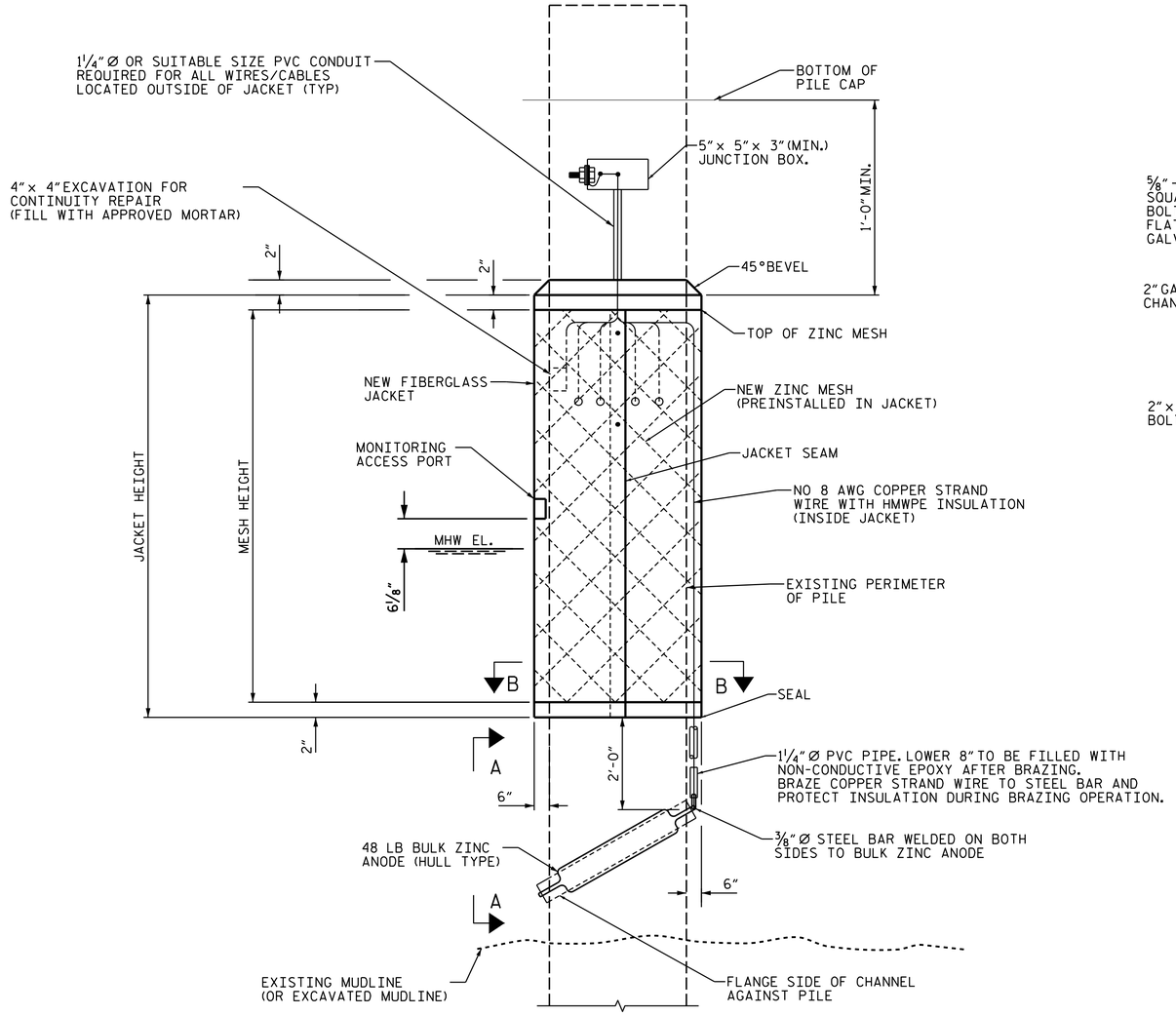
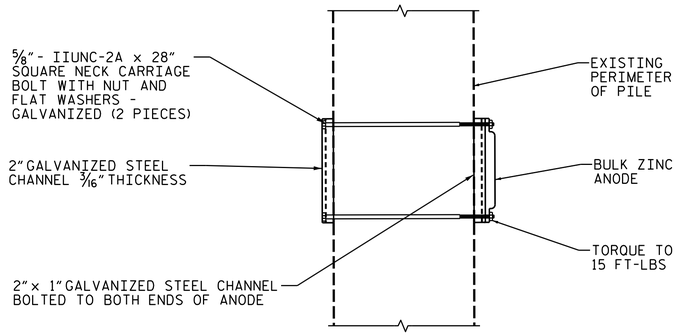
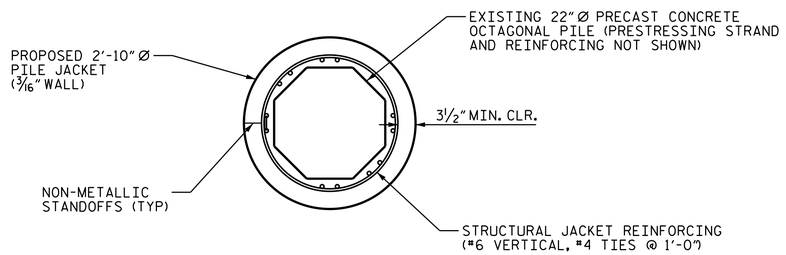


TYPICAL CP PILE JACKET

ELEVATION



VIEW A-A



SECTION B-B

TYPICAL STRUCTURAL JACKET SHOWN, NON-STRUCTURAL SIMILAR

PILE JACKET NOTES:

1. PROVIDE A PUMPING PORT WITHIN 4" OF THE PILE JACKET BOTTOM OR GROUNDLINE TO APPLY FILLER. IF ADDITIONAL PUMPING PORTS ARE REQUIRED TO ENSURE PROPER FILLING, THEY SHALL BE LOCATED ABOVE THE BOTTOM PORT HOLE, STAGGERED ON ALTERNATING SIDES.
2. ALL CONDUIT, BULK ZINC ANODES, JUNCTION BOXES, AND CONNECTIONS SHALL BE PLACED ON THE SOUTH FACE OF PILES NORTH OF THE CHANNEL AND THE NORTH FACE SOUTH OF THE CHANNEL.
3. SEE PILE JACKET TABLES FOR PROPOSED JACKET LOCATIONS.
4. AT LOCATIONS WHERE MUDLINE IS HIGH RELATIVE TO BOTTOM OF JACKET, ANODE MAY BE PLACED UP TO 12" INTO MUDLINE BY HAND EXCAVATION. OUTSIDE OF THIS, THE MUDLINE IS NOT TO BE DISTURBED.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

SHEET 1 OF 3

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : SAMUEL L. CULLUM DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 04-2018

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LEONARD CULLUM
DocuSigned by: Samuel Lee 19C97095C75A467...
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CP PILE JACKET DETAILS

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User:jduke

SEQUENCE OF CONSTRUCTION FOR PILE JACKETS

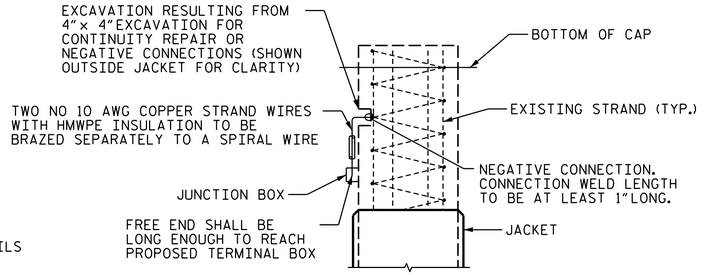
1. THE CONTRACTOR SHALL SURVEY AND LOCATE THE MEAN HIGH AND MEAN LOW WATER ELEVATIONS AT EACH PILE WITH SUBSEQUENT APPROVAL OF THE ENGINEER PRIOR TO THE INSTALLATION OF ANY JACKET.
2. CLEAN PILES IN ACCORDANCE WITH SPECIFICATIONS. THE CONTRACTOR SHALL SUBMIT A PLAN FOR CONTROL AND DISPOSAL OF DEBRIS TO THE ENGINEER FOR APPROVAL. ALL COSTS ASSOCIATED WITH DEBRIS REMOVAL SHALL BE INCIDENTAL TO JACKET COSTS.
3. PROVIDE CONTINUITY TEST FOR ALL PILES TO BE JACKETED IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS.
4. PERFORM INITIAL ELECTRICAL WORK AND ATTACH THE BULK ZINC ANODE TO THE PILE AS SHOWN IN VIEW A-A ON CP PILE JACKET DETAILS (1 OF 3) AND IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS.
5. POSITION SACRIFICIAL ZINC MESH/FIBERGLASS JACKET HALVES AROUND THE ENTIRE PILE PERIMETER FOR THE VERTICAL DISTANCE OF MESH HEIGHT AND SEAL HALVES TOGETHER IN PREPARATION FOR POUR AND ROUTE THE COPPER WIRES COMING OUT OF THE JACKET IN CONDUIT. INSTALL TEMPORARY HARDBACK BRACING AND CLAMP SYSTEM TO HOLD THE JACKET HALVES STABLE AND IN PLACE DURING FILL OPERATION.
6. THE TYPE OF JACKETS INSTALLED IS TO BE APPROVED BY THE ENGINEER AFTER THE REMOVAL OF UNSOUND CONCRETE AND PRIOR TO JACKET INSTALLATION. A STRUCTURAL JACKET IS REQUIRED WHEN EITHER OF THE TWO FOLLOWING IS PRESENT:
   1) 2 OR MORE STRANDS ON ONE SIDE OF A PILE EXHIBIT MORE THAN 30% CROSS-SECTIONAL AREA LOSS.
   2) THE TOTAL CROSS-SECTIONAL AREA OF STRANDS ON ONE SIDE OF THE BENT PILE EXHIBITS MORE THAN 10% SECTION LOSS.

   OTHERWISE, A NON-STRUCTURAL JACKET SHALL BE USED. AT THE ENGINEER'S DIRECTION, A #7 BAR MAY BE USED TO SUPPLEMENT AN INDIVIDUAL STRAND THAT HAS A SECTION LOSS OF MORE THAN 30% ON A PILE OTHERWISE SUITABLE FOR A NON-STRUCTURAL JACKET. THE NUMBER OF BARS SHALL BE LIMITED TO TWO PER PILE.
7. PLACE FILLER AS PER CONTRACT DOCUMENTS.
8. INSTALL JUNCTION BOX.
9. CONNECT THE FREE ENDS OF CABLES IN THE JUNCTION BOX TO THE ANODE OR CATHODE IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS.
10. PATCH AND FILL ANY REMAINING EXCAVATIONS WITH APPROVED MATERIAL.

CONTINUITY CORRECTIONS

GENERAL

LOCATIONS OF EXCAVATIONS FOR CONTINUITY CORRECTIONS SHALL BE SELECTED BASED ON THE ALTERNATIVE RESULTING IN THE LEAST REMOVAL OF CONCRETE. IF POSSIBLE, ALL EXCAVATIONS TO EXPOSED REINFORCING STEEL SHALL BE MADE INSIDE THE JACKET LIMITS. CONTINUITY TEST AND CONTINUITY CORRECTION EXCAVATIONS SHALL BE SEALED PRIOR TO PLACEMENT OF THE JACKET.

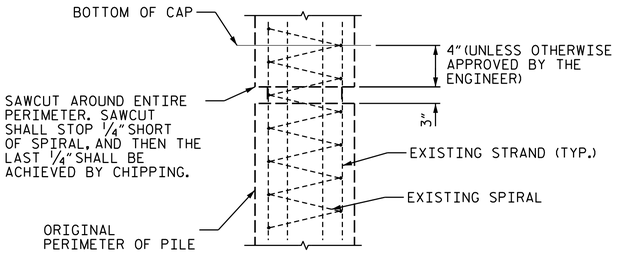


ELEVATION

(SCHEME 1)

SCHEME 1

1. EXCAVATE A 4"x 4"AREA AT EACH STRAND OF DISCONTINUITY SUCH THAT IT EXTENDS TO THE FIRST ADJACENT STRAND THAT IS CONTINUOUS. EXCAVATION AREA TO BE WITHIN THE TOP 2 FEET OF THE JACKET. EXCAVATION SHOWN OUTSIDE JACKET FOR CLARITY.
2. FOR ABOVE WATER INSTALLATION RESISTANCE WELD TWO MILD STEEL WIRES FROM ONE DISCONTINUOUS STRAND TO THE ADJACENT STRAND UNTIL A CONTINUOUS STRAND IS REACHED. COAT CONNECTION WITH NON-CONDUCTIVE EPOXY.
3. A MINIMUM OF TWO CONTINUITY CONNECTIONS SHALL BE MADE TO EACH DISCONTINUOUS STRAND.

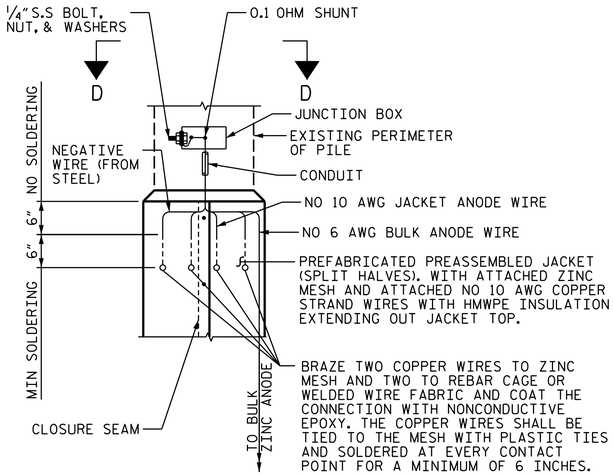


ELEVATION

(SCHEME 2)

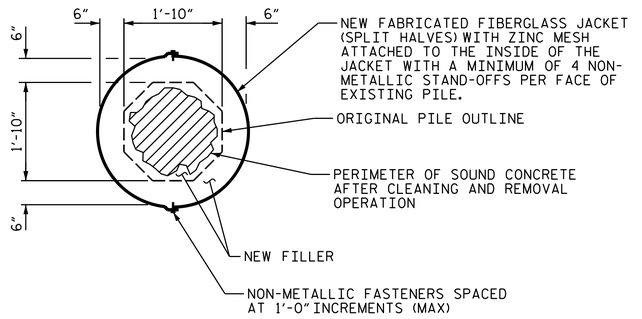
SCHEME 2

1. MAKE UNIFORM DEPTH AND HEIGHT SAW CUTS AROUND ENTIRE PILE PERIMETER KEEPING CLEAR OF EXISTING STRANDS. AFTER SAWCUTTING, CHIP AS NECESSARY TO EXPOSE STRANDS AND SPIRALS. AREA TO BE LOCATED WITHIN THE TOP 2 FEET OF THE JACKET. CLEAN AND PREPARE SAWCUTTING/CHIPPED AREA.
2. RESISTANCE WELD TWO MILD STEEL WIRES FROM ONE DISCONTINUOUS STRAND TO THE ADJACENT STRAND UNTIL A CONTINUOUS STRAND IS REACHED. COAT CONNECTION WITH NON-CONDUCTIVE EPOXY.
3. A MINIMUM OF TWO CONTINUITY CONNECTIONS SHALL BE MADE TO EACH DISCONTINUOUS STRAND.



JACKET DETAIL

(NON-STRUCTURAL SHOWN, STRUCTURAL SIMILAR)



VIEW D-D

PRESTRESSING STRANDS AND REINFORCING STEEL NOT SHOWN FOR CLARITY

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

SHEET 2 OF 3

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : SAMUEL L. CULLUM DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

DocuSigned by: Samuel L. 19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CP PILE JACKET DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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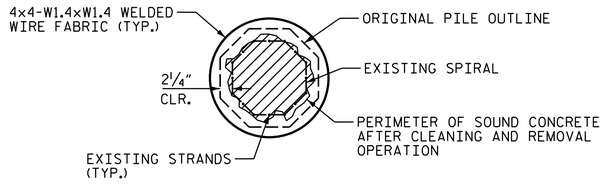
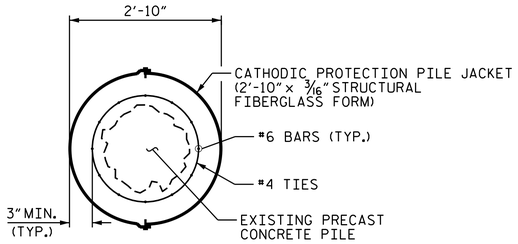
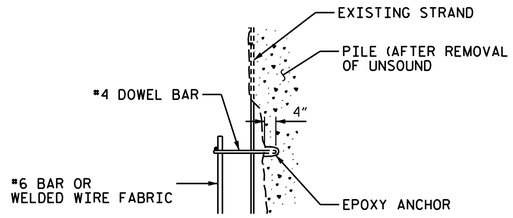
User:jduke



SECTION E-E



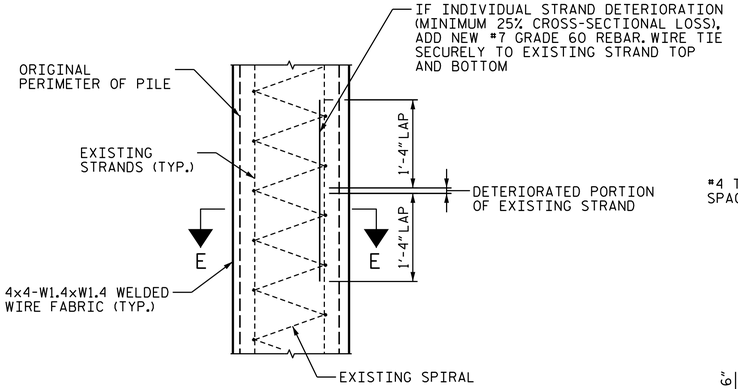
SECTION F-F



DETAIL A - DOWEL CONNECTION

1. EMBED DOWEL WITH EPOXY AT A POINT WHERE STRAND IS INTACT AND CONTINUOUS WITH THE PILE LENGTH EXTENDING FROM THAT PARTICULAR END OF THE JACKET. MAINTAIN ELECTRICAL ISOLATION BETWEEN DOWEL AND EXISTING PILE REINFORCEMENT.
2. RESISTANCE WELD DOWEL AT #7 BAR OR WELDED WIRE FABRIC TO ESTABLISH CONDUCTIVE CONNECTION. FOR BELOW WATER JACKET USE MECHANICAL CONNECTION. CONTRACTOR TO SUBMIT DETAIL TO ENGINEER FOR APPROVAL.
3. COAT ALL RESISTANCE WELD CONNECTIONS WITH TWO COATS OF 100% SOLIDS NON-CONDUCTIVE EPOXY.
4. WIRE TIE ALL INTERSECTIONS OF REINFORCING CAGE.
5. FILLER FOR JACKETS SHALL BE IN ACCORDANCE WITH CONTRACT DOCUMENTS. REINFORCING FOR JACKETS SHALL BE AS DETAILED ON THIS SHEET.

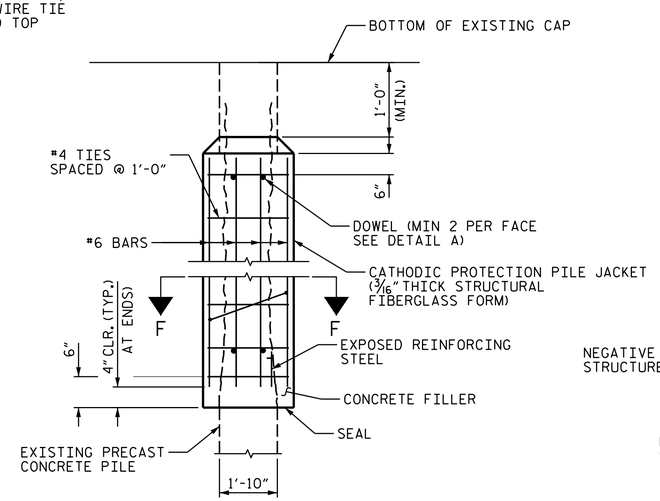
NOTE:
PROVIDE ELECTRICAL CONTINUITY BETWEEN THE NEW AND EXISTING STEEL AT THE CONNECTION JUNCTION BOX (SEE JUNCTION BOX DETAIL).



SCHEME 3

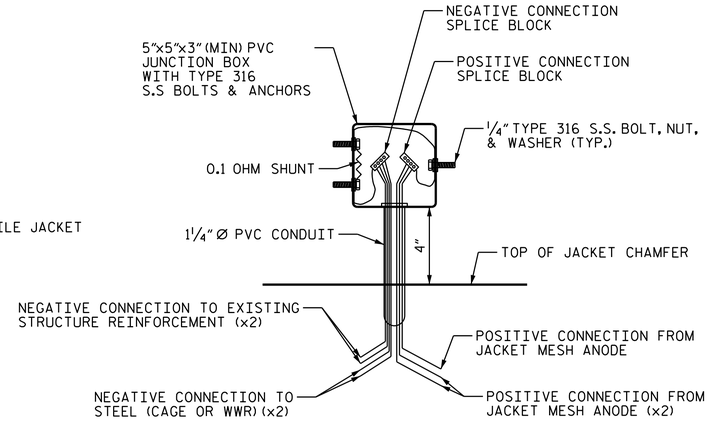
NON-STRUCTURAL CATHODIC PILE JACKET
(JACKET AND GROUT FILLER NOT SHOWN FOR CLARITY)

NOTE:
MINIMUM STEEL AREA REQUIREMENTS FOR NON-STRUCTURAL CASE 4x4-W1.4xW1.4 WELDED WIRE FABRIC OR GREATER.



SCHEME 4

STRUCTURAL CATHODIC PILE JACKET
(CATHODIC COMPONENTS NOT SHOWN FOR CLARITY)



JUNCTION BOX DETAIL

PROJECT NO. 15BPR.25
BRUNSWICK COUNTY
BRIDGE NO. 14

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CP PILE JACKET DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L. 19C97095C75A467...
4/12/2018

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2			4			111

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : SAMUEL L. CULLUM DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

4/12/2018
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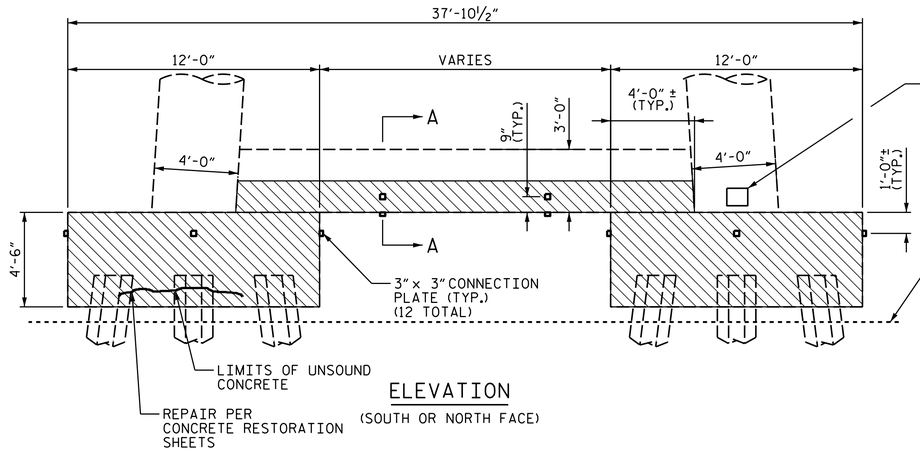
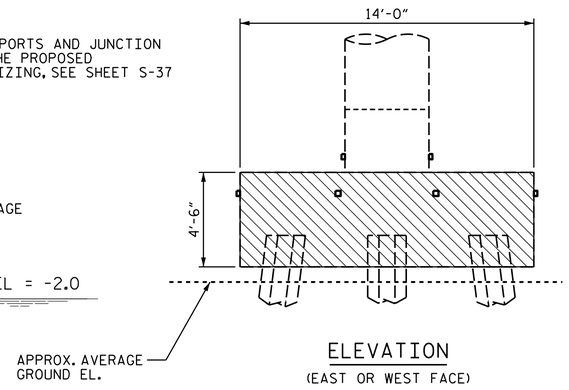
User:jduke



ELEVATION

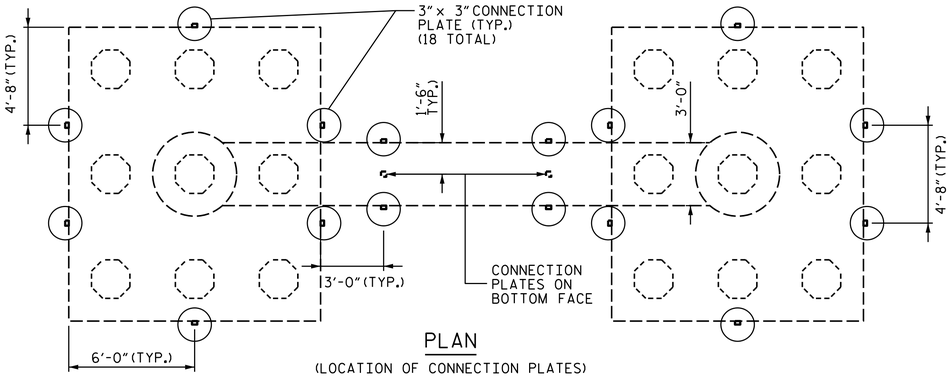
(SOUTH OR NORTH FACE)

MLW EL = -2.0



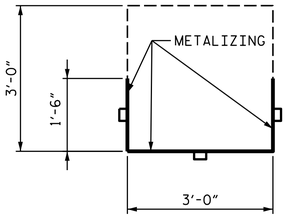
ELEVATION

(EAST OR WEST FACE)



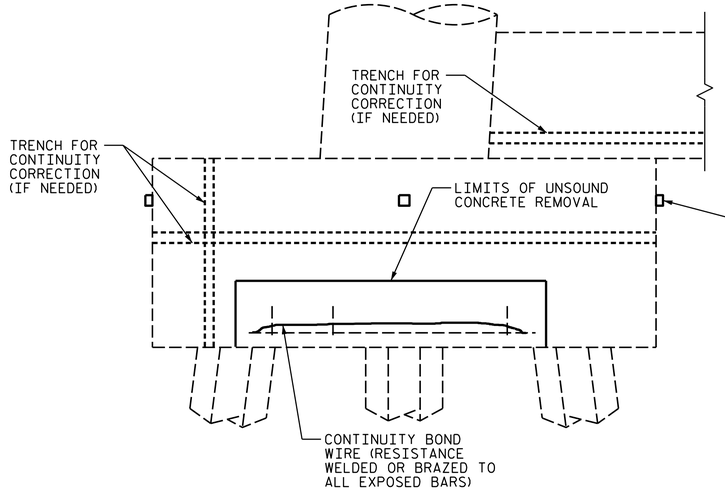
PLAN

(LOCATION OF CONNECTION PLATES)

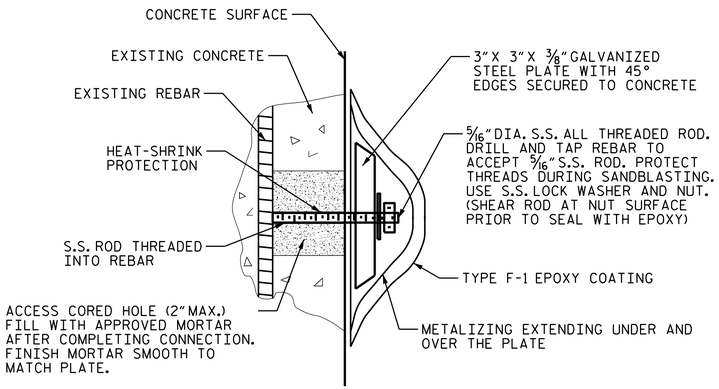


SECTION A-A

(LIMITS OF METALIZING)



CONTINUITY DETAIL



CONNECTION PLATE DETAIL FOR REBARS

METALIZING NOTES:

1. NO METALIZING SHALL BE PERFORMED UNTIL THE CONCRETE RESTORATION HAS BEEN APPROVED BY THE ENGINEER. METALIZE AT NO LESS THAN 10 (TEN) DAYS AFTER PLACING CONCRETE, BUT NO MORE THAN 90 (NINETY) DAYS. CONNECT METALIZING CONNECTION PLATE IMMEDIATELY AFTER COMPLETING METALIZING.
2. APPLY A ZINC SILICATE OVERCOAT AT NO MORE THAN 72 HOURS AFTER METALIZING.
3. COAT CONNECTION PLATE WITH EPOXY AT NO MORE THAN 96 HOURS AFTER APPLICATION OF ZINC SILICATE OVERCOAT.

NOTES:

1. REMOVE ALL UNSOUND CONCRETE FROM THE BENT FOOTINGS IN ACCORDANCE WITH CONCRETE RESTORATION DETAILS AND PROJECT SPECIAL PROVISIONS FOR CONCRETE REPAIR.
2. THE CONTRACTOR SHALL SUBMIT A PLAN FOR CONTROL AND DISPOSAL OF DEBRIS TO THE ENGINEER FOR APPROVAL.
3. FOR SPALLS OR DELAMINATIONS ON THE FOOTINGS GREATER THAN 2'-0" WIDE OR LONG AND GREATER THAN 1" DEEP, RESTORE CONCRETE TO ORIGINAL PROFILE IN ACCORDANCE WITH CONCRETE RESTORATION DETAILS SHEET AND PROJECT SPECIAL PROVISIONS FOR CONCRETE REPAIR.
4. FOR ANY CONCRETE AREAS THAT WOULD BE ISOLATED FROM PROPOSED CONTINUITY BY EXISTING SUPERFICIAL CRACKING, FILL CRACKS WITH EPOXY PRIOR TO METALIZING PER PROJECT SPECIAL PROVISIONS FOR EPOXY INJECTION OF CRACKS.
5. ALL VERTICAL FACES OF THE FOOTING SHALL BE METALIZED. CONNECTION BETWEEN PLATE AND REINFORCING STEEL SHALL BE PROVIDED VIA A ⅝" DIAMETER STAINLESS STEEL ALL THREADED ROD AS DESCRIBED IN THE CONNECTION PLATE DETAIL. THE CONNECTION PLATES SHALL BE LOCATED IN AREAS OF SOUND CONCRETE AS DETAILED IN THE PROJECT SPECIAL PROVISIONS FOR CATHODIC PROTECTION AND SHALL BE INSTALLED ON DIFFERENT BARS.
6. CHECK INTERBAR CONTINUITY. REINFORCING BARS REQUIRING CONTINUITY CORRECTION SHALL BE MADE CONTINUOUS USING STEEL WIRE RESISTANCE WELDED OR BRAZED TO EVERY REBAR. ALL EXPOSED BARS SHALL BE MADE CONTINUOUS. COAT ALL CONTINUITY CORRECTION WELDS WITH NON-CONDUCTIVE EPOXY.
7. CHECK ELECTRICAL CONTINUITY BETWEEN ALL PLATES IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS FOR CATHODIC PROTECTION.
8. METALIZE AND PLACE CONNECTION PLATES IN ACCORDANCE WITH PROJECT SPECIAL PROVISIONS FOR CATHODIC PROTECTION.
9. APPLY A ZINC SILICATE OVERCOAT TO THE METALIZED AREAS AS DESCRIBED IN THE PROJECT SPECIAL PROVISIONS FOR CATHODIC PROTECTION-INTERMEDIATE BENT METALIZING. THE ENGINEER MUST APPROVE THE METALIZING PRIOR TO THE OVERCOAT APPLICATION.
10. SEE PROJECT SPECIAL PROVISIONS FOR ADDITIONAL METALIZING REQUIREMENTS AND ACCEPTANCE CRITERIA. (PSP: CATHODIC PROTECTION-INTERMEDIATE BENT METALIZING)
11. SEQUENCE CLEANING AND COATING IN ORDER TO AVOID DELETERIOUS SUBSTANCES INHIBITING PROPOSED COATINGS.
12. ALL HARDWARE AND MATERIAL ITEMS ON THIS SHEET ARE INCIDENTAL TO PAY ITEM FOR ZINC ALUMINUM SPRAY.
13. THOROUGHLY CLEAR THE ALL VERTICAL FACES OF THE FOOTINGS OF ANY MARINE GROWTH AND DEBRIS BEFORE ALL PERFOMING ANY OF THE ASSOCIATED WORK FOR FOOTING METALIZATION.

LEGEND:

TO BE METALIZED

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LEE CULLUM
DocuSigned by: Samuel Lee
19C97095C75A467...
4/12/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CHANNEL BENT FOOTING RESTORATION

ZINC METALIZING DETAILS
BENTS 37-49, 52 & 53

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			111

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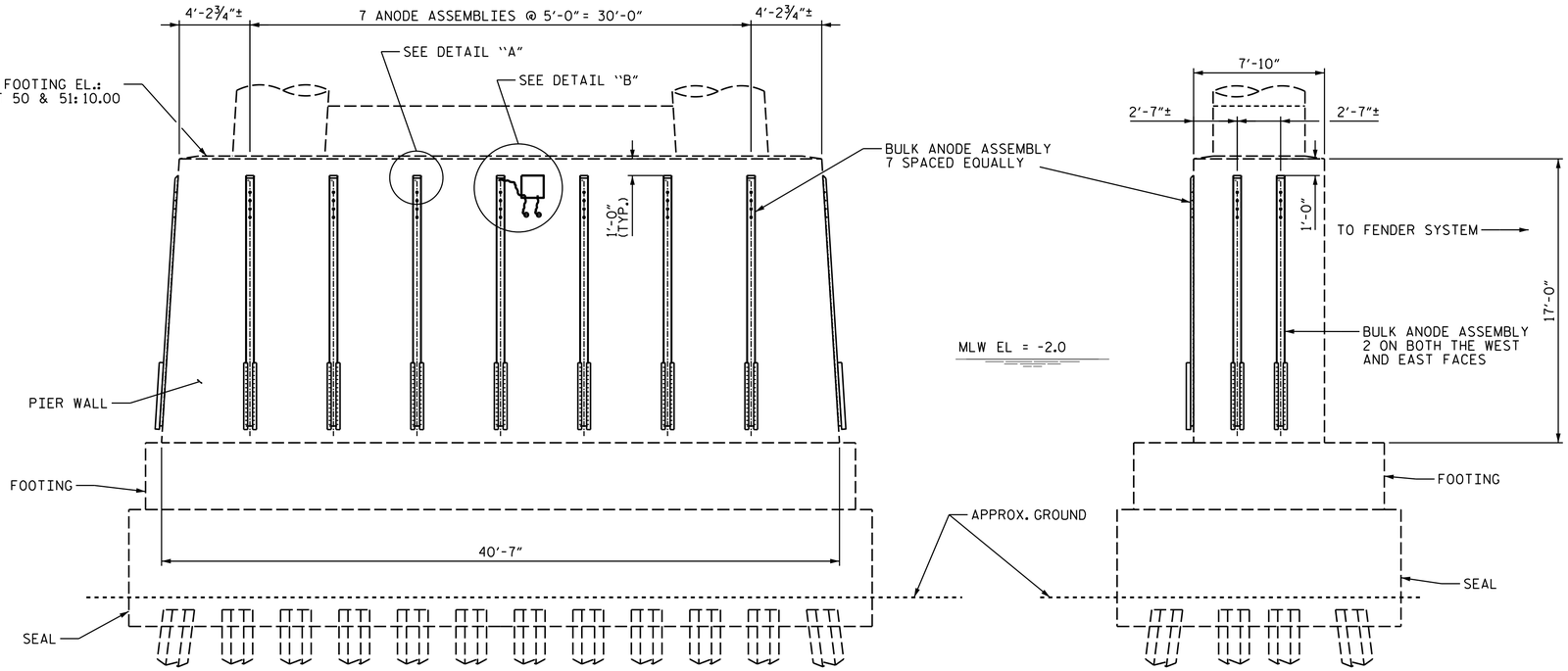
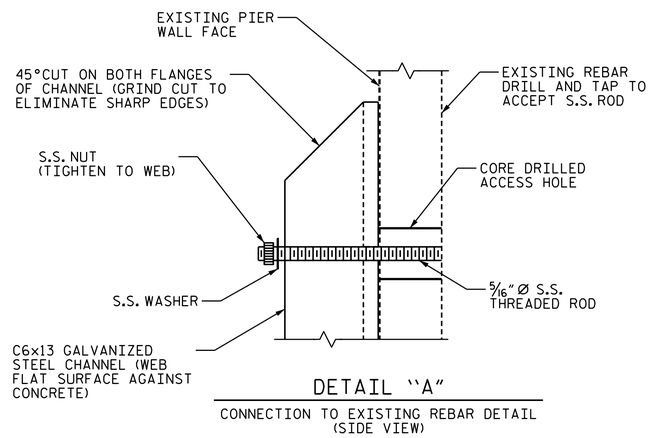


ELEVATION

(SOUTH FACE OF BENT 50)
(NORTH FACE OF BENT 51)

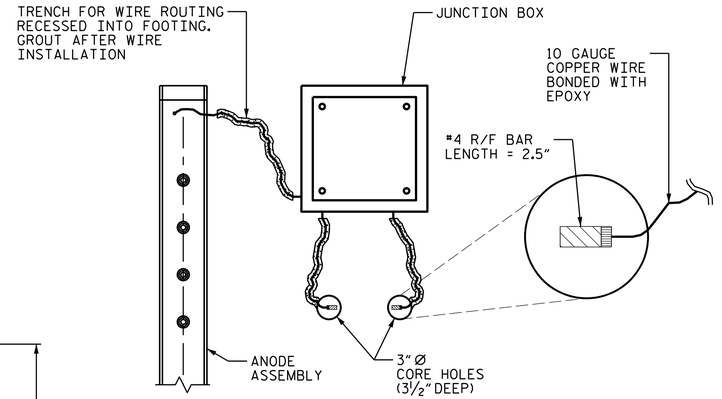
ELEVATION

(WEST OR EAST FACES OF BENT 50 & 51)



DETAIL "A"

CONNECTION TO EXISTING REBAR DETAIL
(SIDE VIEW)



DETAIL 'B"

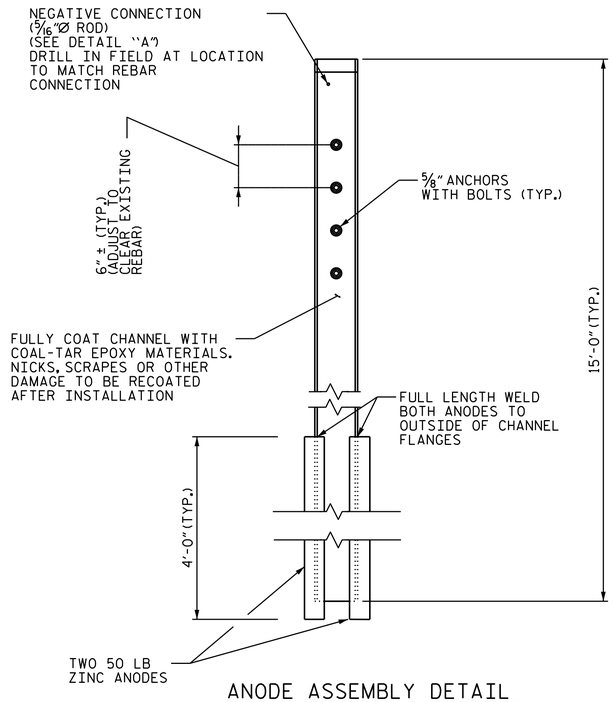
MONITORING JUNCTION BOX DETAIL
(FRONT VIEW)

ANODE PLACEMENT

SEE DETAIL "A" FOR CONNECTION TO EXISTING REBAR
SEE DETAIL "B" FOR MONITORING JUNCTION BOX

NOTES:

1. ANODES SHALL BE ASTM B418-01 TYPE I.
2. EXCEPT FOR ANODE WELDING, ALL CHANNEL MANUFACTURING SHALL BE PERFORMED PRIOR TO GALVANIZING.
3. ANCHORS TO BE DROP-IN TYPE 5/8" x 27/32" GALVANIZED HILTI HDI 243262 OR APPROVED EQUAL.
4. SEAL ACCESS HOLE WITH APPROVED EPOXY GROUT MATERIAL AFTER S.S. ROD INSTALLATION.
5. ANODE ASSEMBLIES SHALL BE PLACED SUCH THAT THE ANODE BE SUBMERGED A MINIMUM OF 3'-0" BELOW MEAN LOW WATER ELEVATION AT ALL TIMES. SPACING AND ELEVATION ADJUSTMENTS SHALL BE APPROVED BY THE ENGINEER.
6. PER EXISTING PLANS, TYPICAL CONCRETE COVER ON EXISTING PIER WALL IS 4".
7. WELDING OF S.S. ROD TO THE REBAR IN LIEU OF DRILL AND TAP MAY BE APPROVED AT THE DISCRETION OF THE ENGINEER.
8. ELECTRICAL CONTINUITY OF REINFORCING STEEL BETWEEN AT LEAST TWO OTHER CONNECTIONS SHALL BE PERFORMED PER CONNECTION PRIOR TO AND AFTER ANODE ASSEMBLY INSTALLATION.
9. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE REINFORCING STEEL AND PATCH ALL CORES WITH APPROVED CONCRETE REPAIR MATERIAL.
10. PAYMENT FOR ALL WORK AND HARDWARE DESCRIBED ASSOCIATED WITH FURNISHING AND INSTALLING OF THE ZINC ANODES SHALL BE INCIDENTAL TO THE PAY ITEM FOR "CATHODIC PROTECTION - ZINC BULK ANODES".
11. THOROUGHLY CLEAR THE FOOTINGS OF MARINE GROWTH AND DEBRIS BEFORE PERFORMING ANY WORK ASSOCIATED WITH THE INSTALLATION OF THE PROPOSED BULK ANODES.



ANODE ASSEMBLY DETAIL

(FRONT VIEW)

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY :	JACOB H. DUKE	DATE :	03-2018
CHECKED BY :	DIEGO A. AGUIRRE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

4/12/2018
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User:jduke

PROJECT NO. 15BPR.25
BRUNSWICK COUNTY
BRIDGE NO. 14

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CHANNEL BENT FOOTING RESTORATION

BULK ANODE DETAILS BENT 50 & 51

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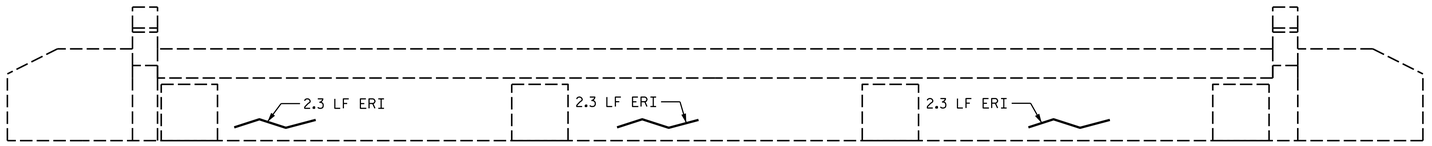
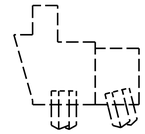
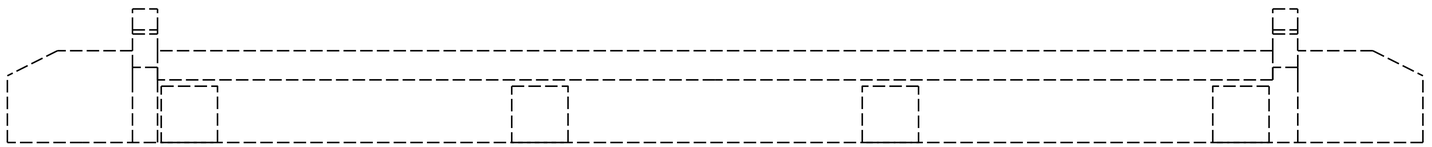
1			3			TOTAL SHEETS
2			4			111



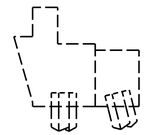
END BENT 1



ELEVATION



END BENT 2



ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

END BENTS	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	N/A	N/A		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		6.9		
COLUMN/PILE		N/A		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS END BENTS 1 & 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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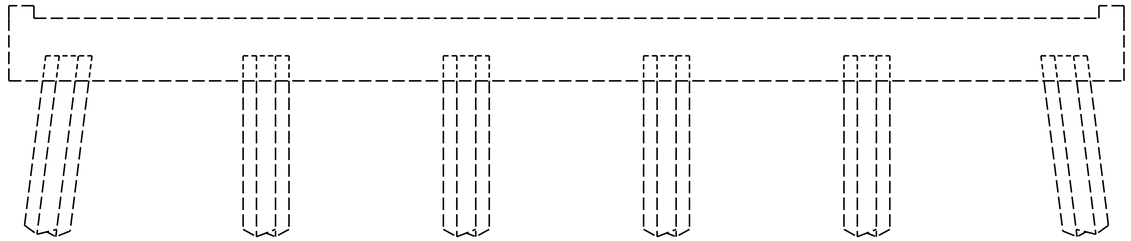

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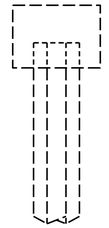

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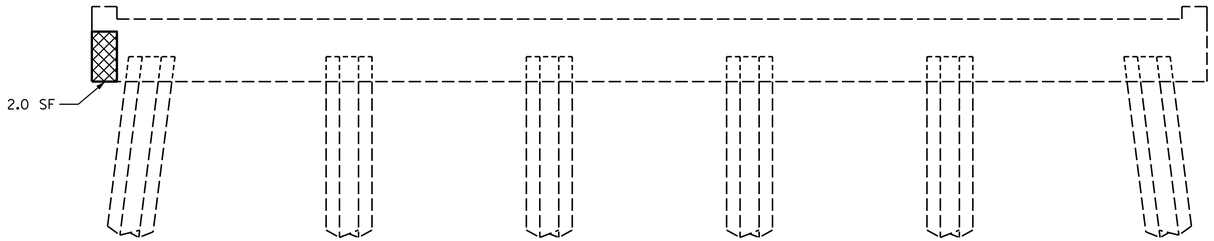
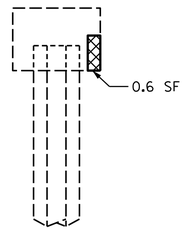


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	2.0	1.0		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.3	0.2		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		-		

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BRUNSWICK COUNTY

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DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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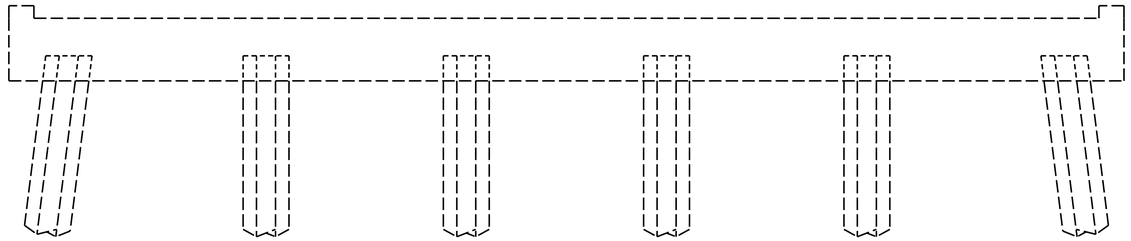
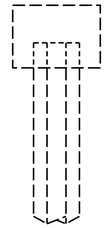
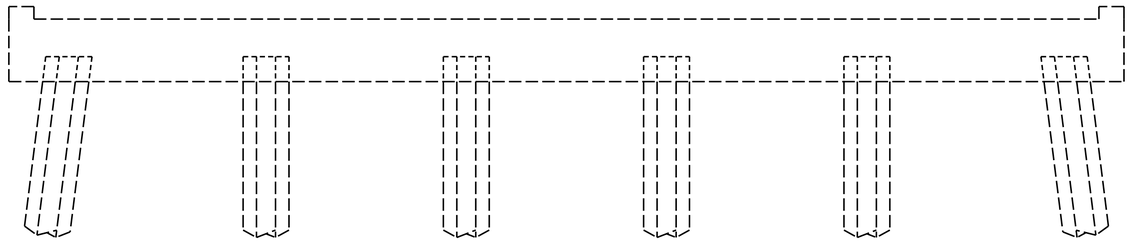


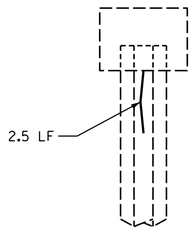
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		2.5		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		-		

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

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4800 SIX FORKS ROAD SUITE 120
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(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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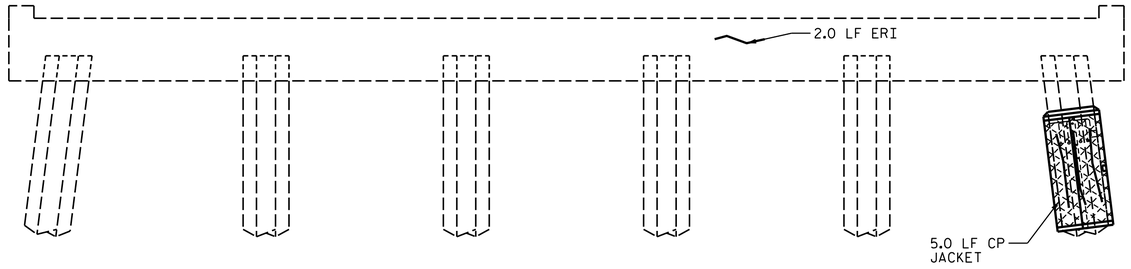
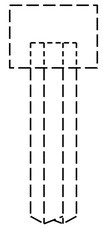
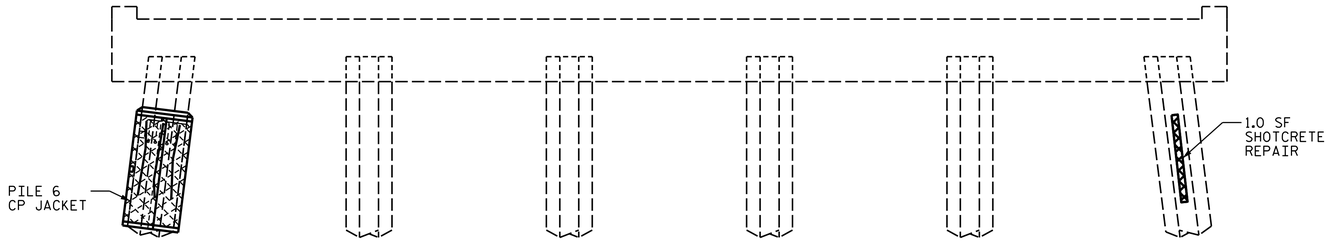


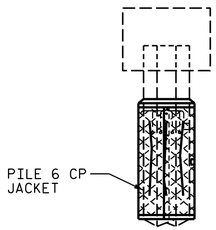
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 3	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	1.0	0.5		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		2.0		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		5.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

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DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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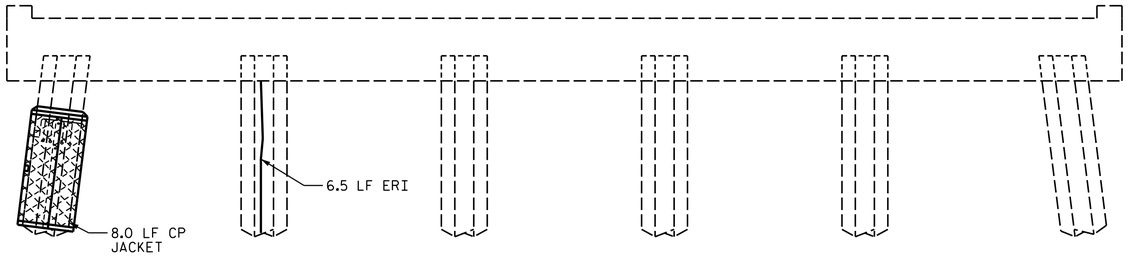
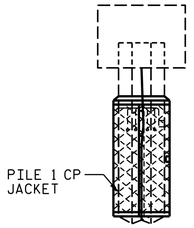


SOUTH ELEVATION



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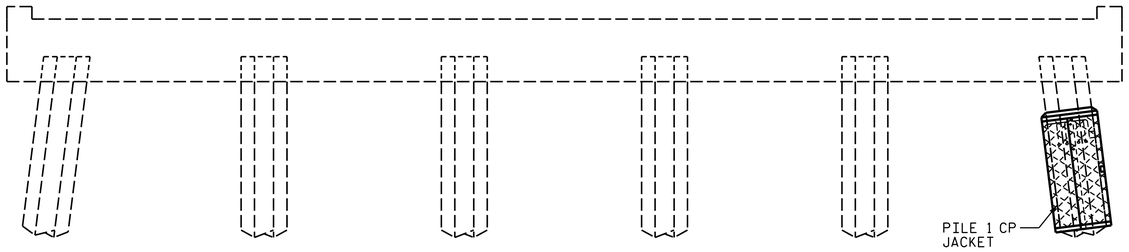

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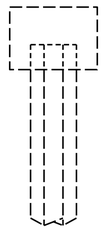

EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 4	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		6.5		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		8.0		

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CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
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DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 4

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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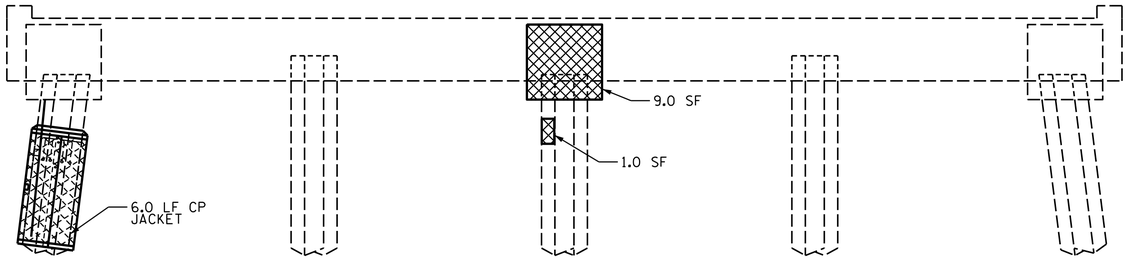
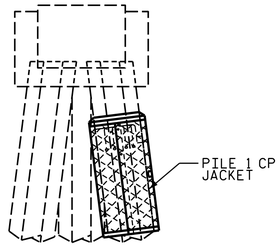


SOUTH ELEVATION



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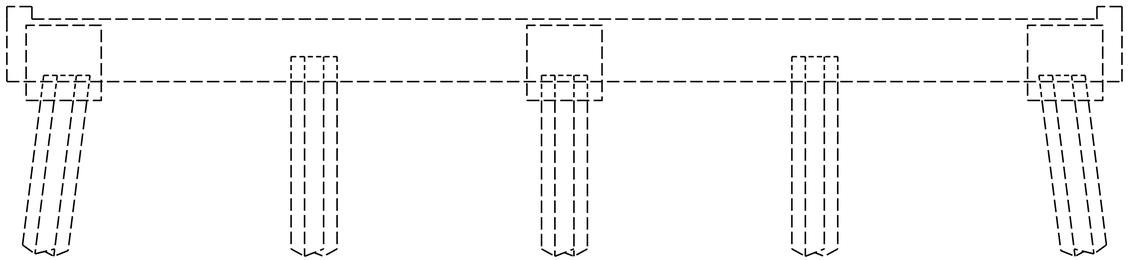
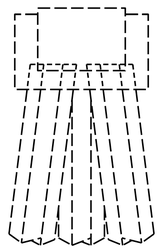


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 5	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	9.0	4.5		
COLUMN/PILE	1.0	0.5		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	1.4	0.7		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		6.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L Cullum 19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 5

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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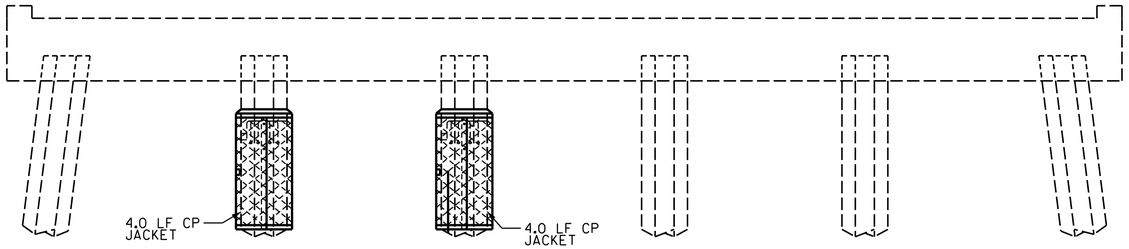
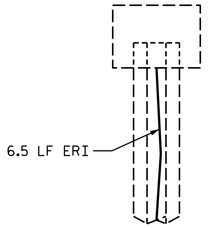


SOUTH ELEVATION



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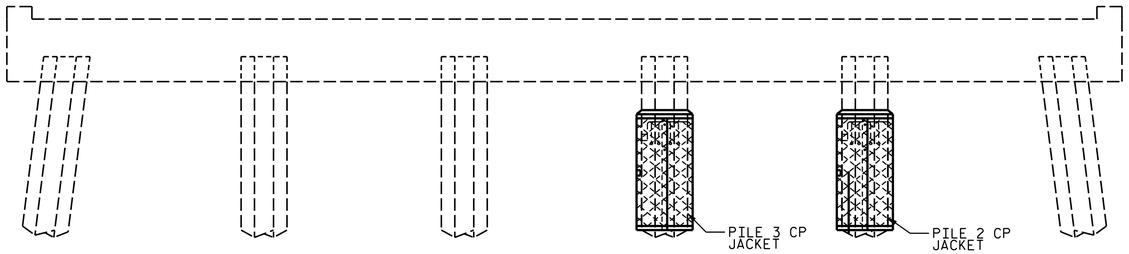
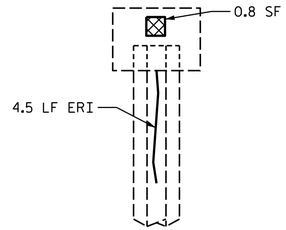


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 6	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.8	0.4		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.1	0.1		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		11.0		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		8.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L Cullum 19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 6

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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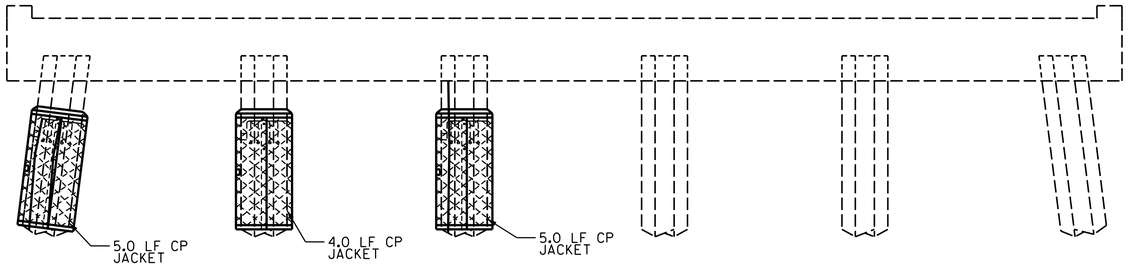
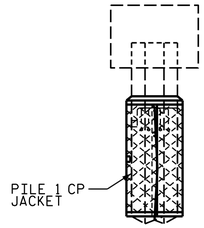


SOUTH ELEVATION



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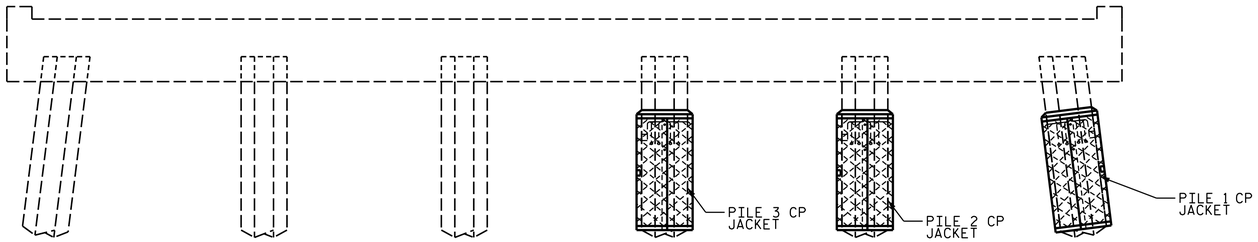
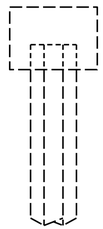


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 7	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		14.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

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ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 7

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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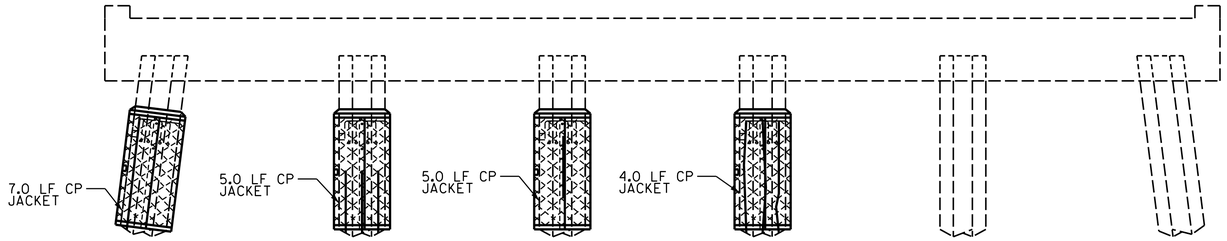
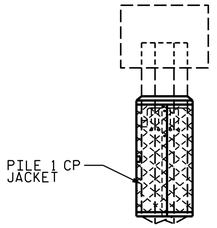
User:jduke



SOUTH ELEVATION



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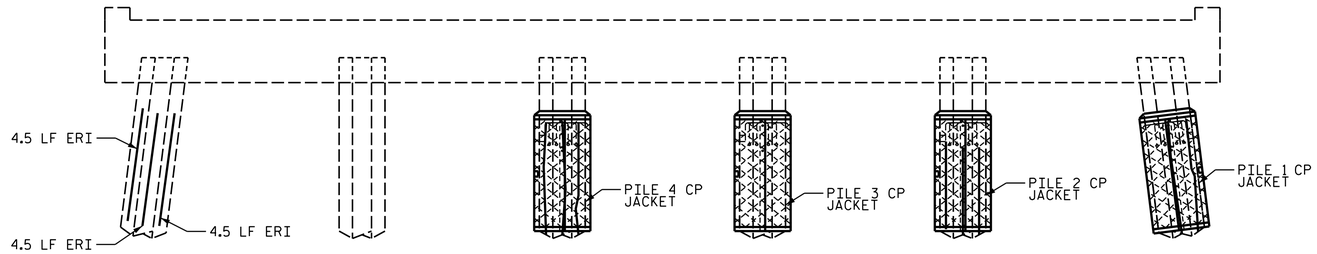
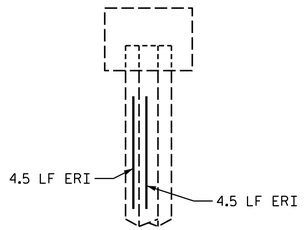


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 8	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		22.5		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		21.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

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SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 8

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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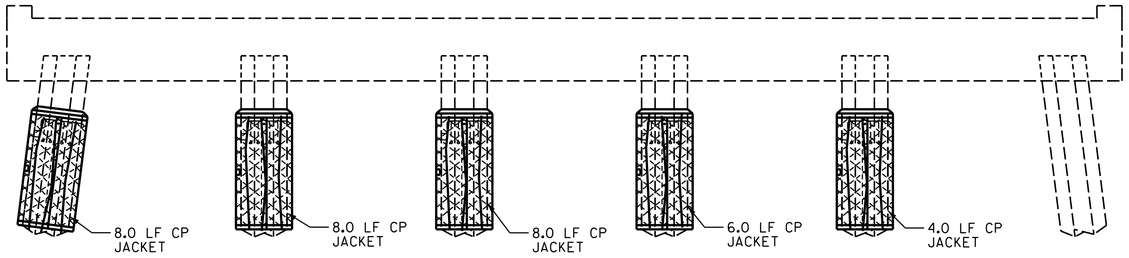
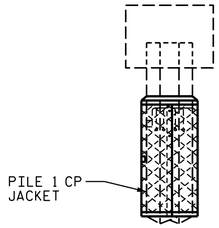
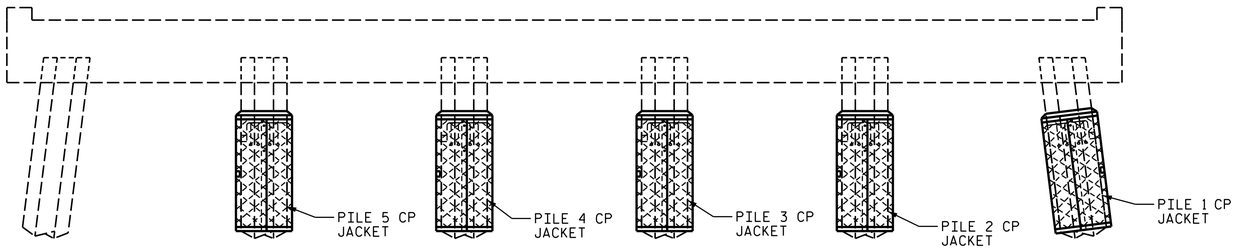


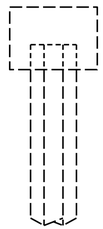
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 9	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		34.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 9

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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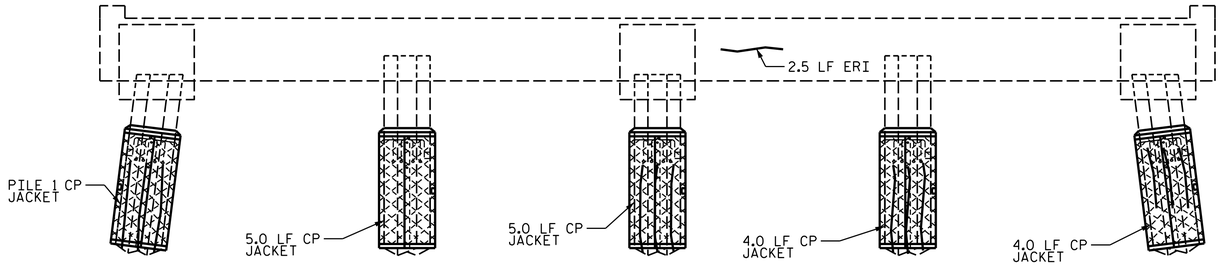
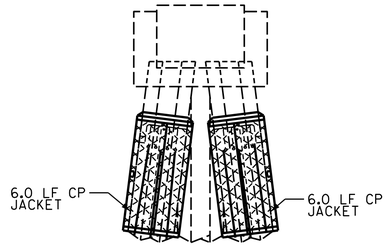


SOUTH ELEVATION



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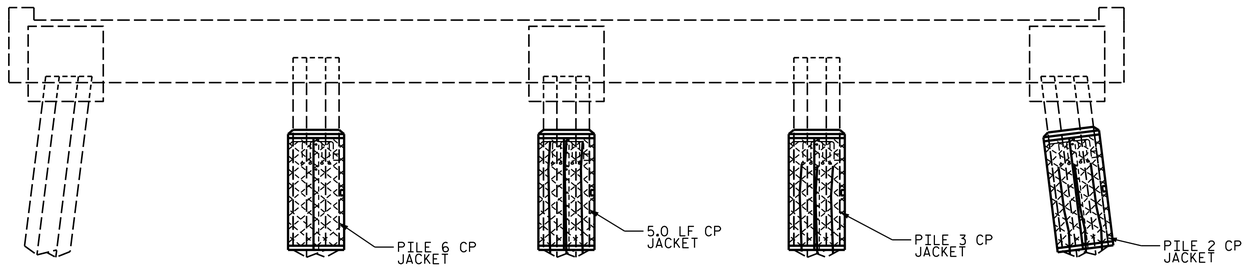

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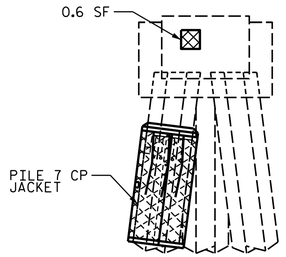

EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 10	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.6	0.3		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.1	0.1		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		2.5		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		35.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

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DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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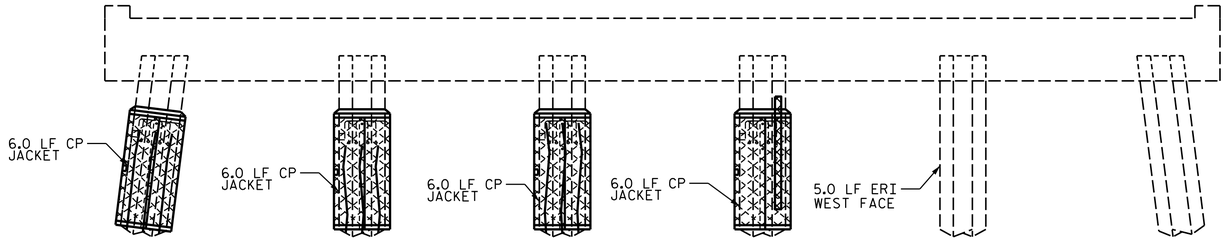
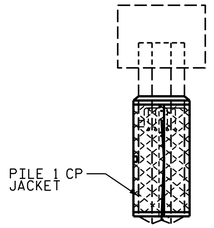
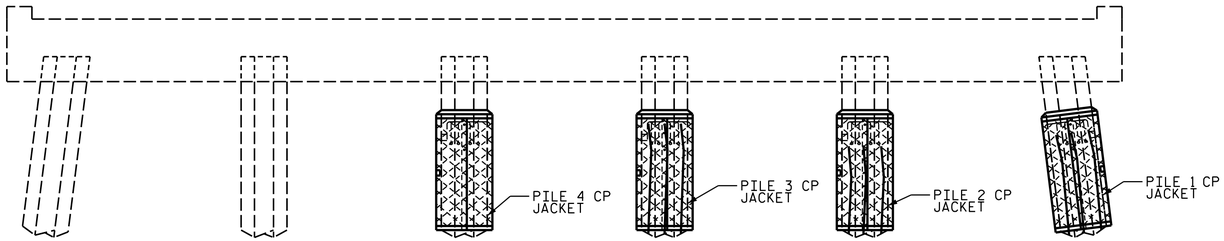


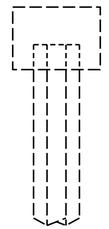
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 11	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		5.0		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		24.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

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SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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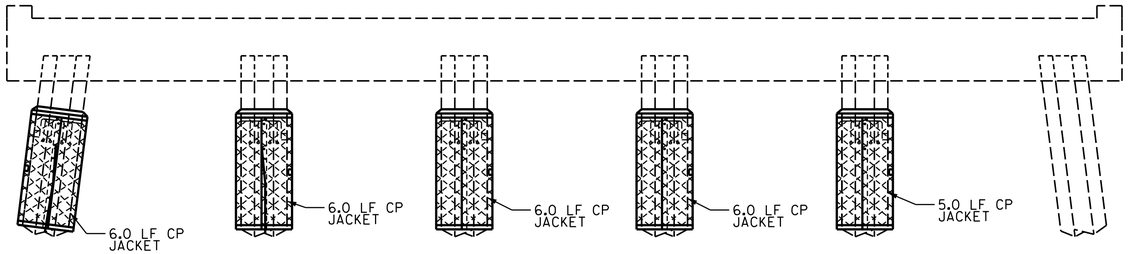
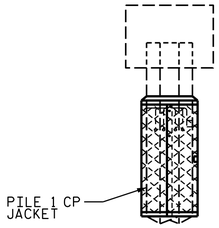


SOUTH ELEVATION



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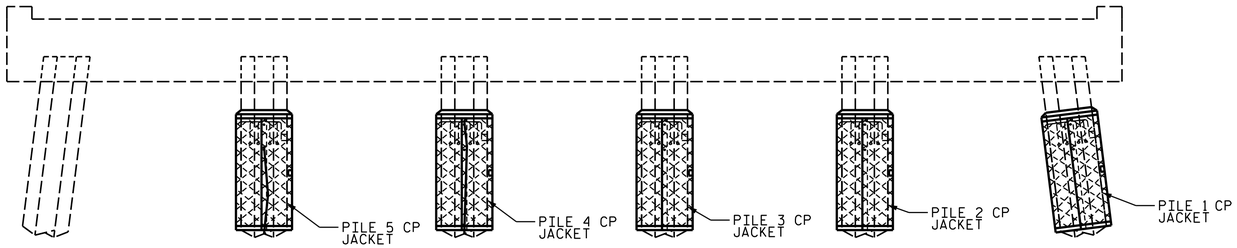
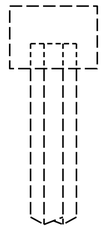


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 12	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		29.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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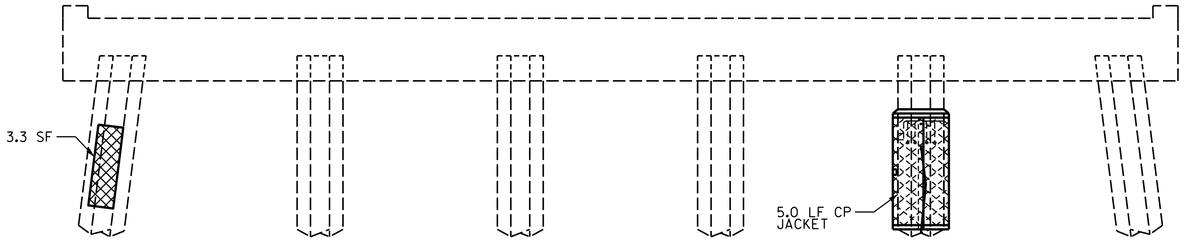
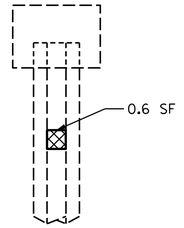
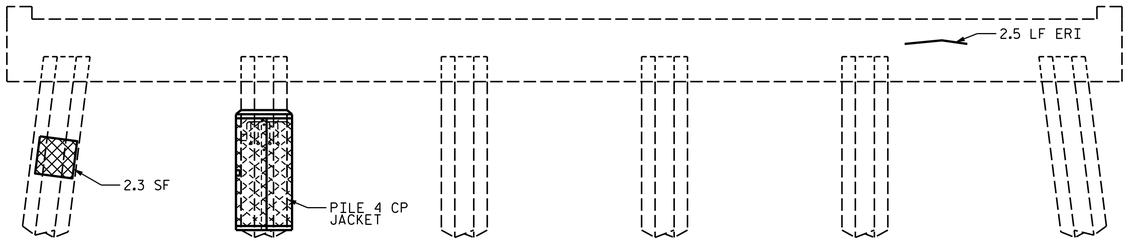
User:jduke



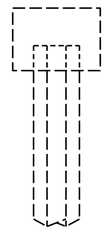
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 13	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	6.2	3.1		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		2.5		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		5.0		

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

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DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
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DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA | SHOTCRETE REPAIR AREA | EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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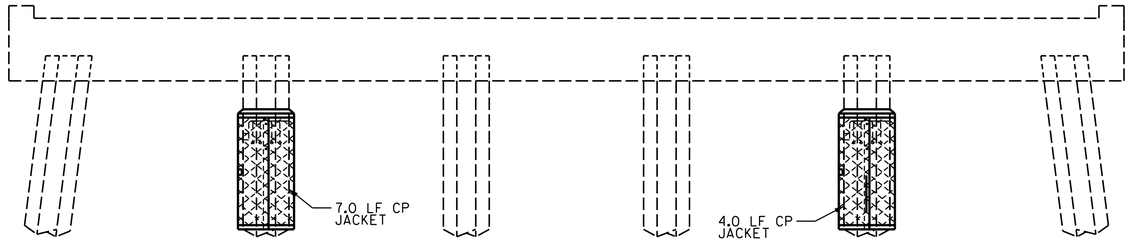

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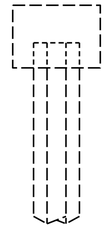

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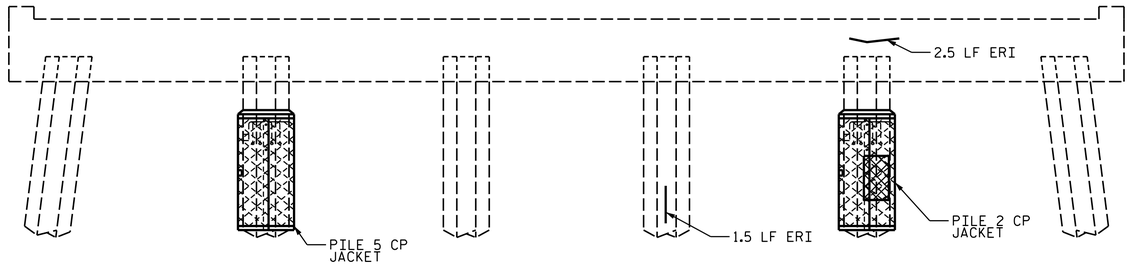

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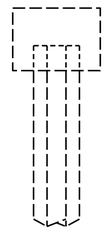

EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 14	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	2.6	1.3		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		2.5		
COLUMN/PILE		1.5		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		11.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L Cullum 19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 14

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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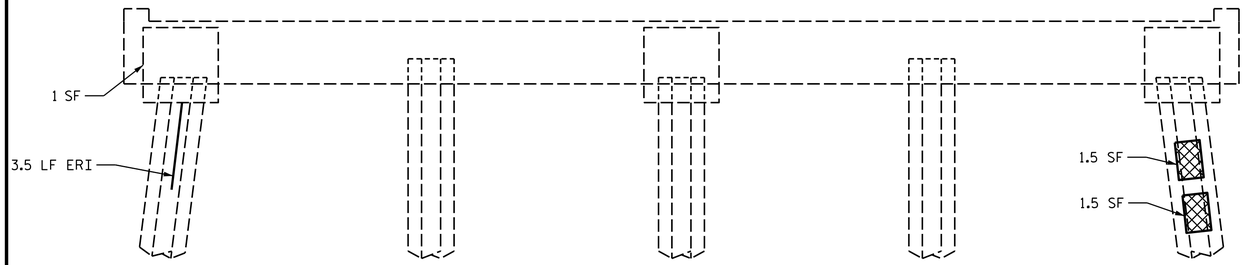
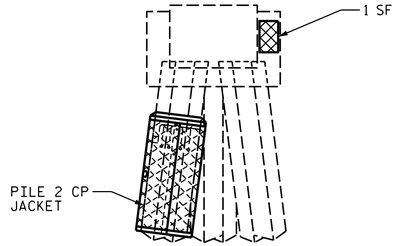


SOUTH ELEVATION



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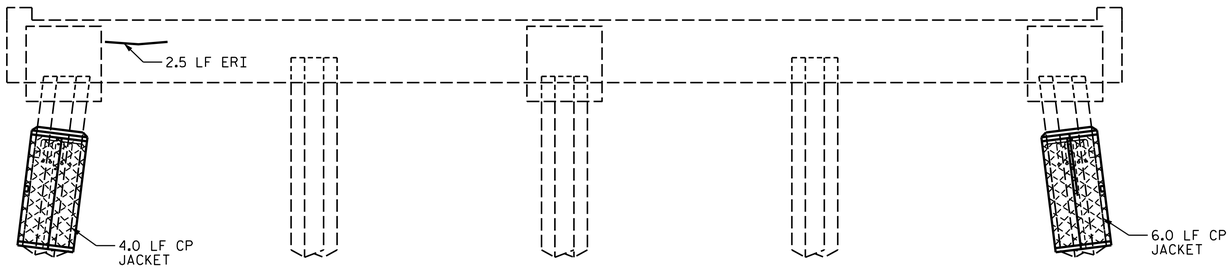

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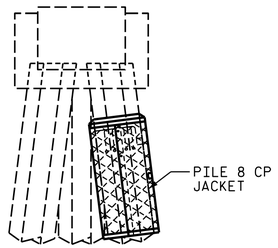

EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 15	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	1.0	0.5		
COLUMN/PILE	3.0	1.5		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.2	0.1		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		3.5		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		10.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 15

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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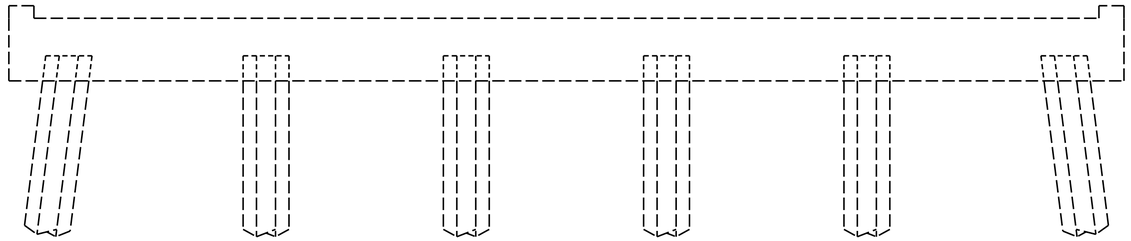
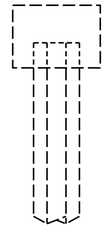


SOUTH ELEVATION



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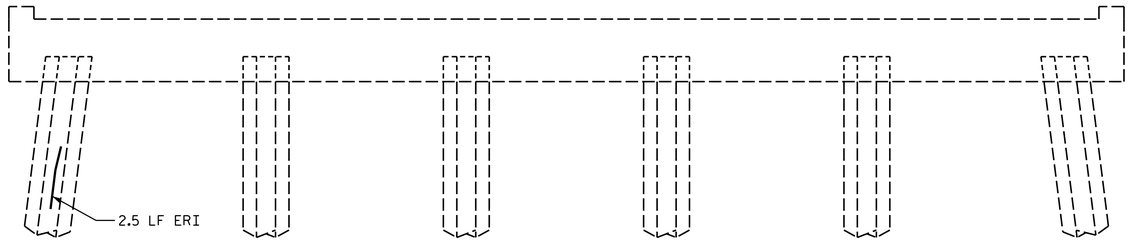
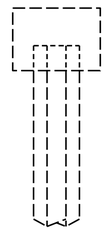


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 16	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		2.5		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		-		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

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SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 16

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-54
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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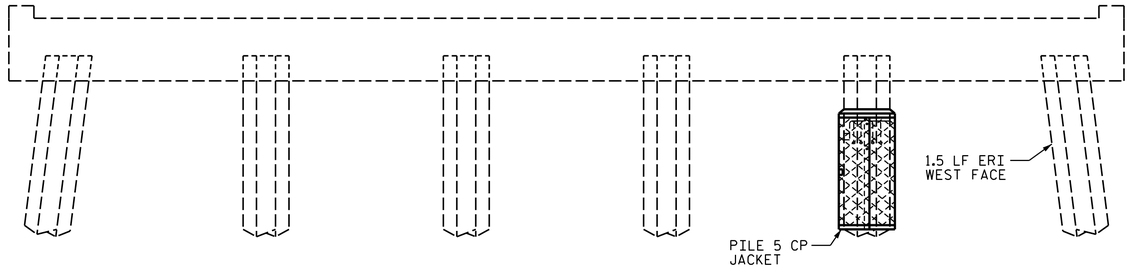
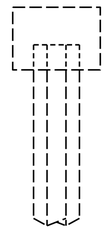
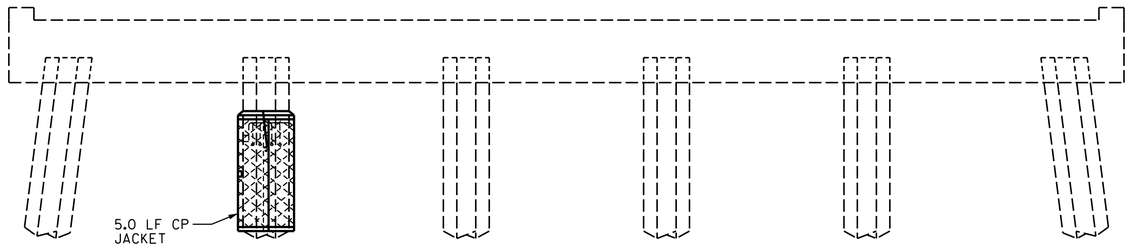
User:jduke



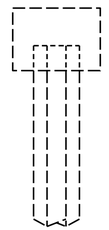
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 17	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		1.5		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		5.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 17

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-55
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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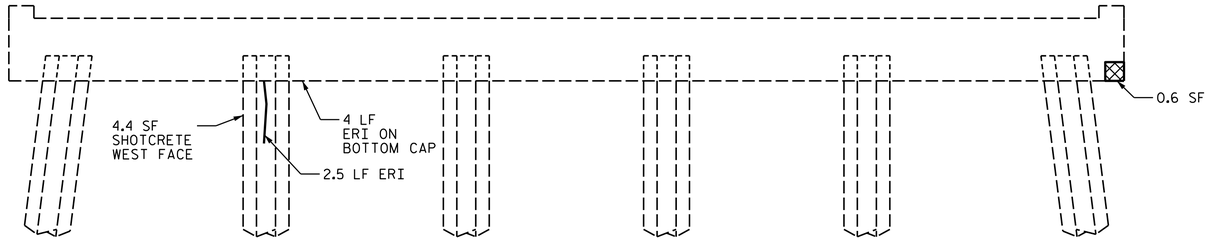
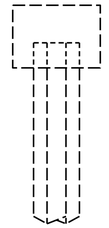
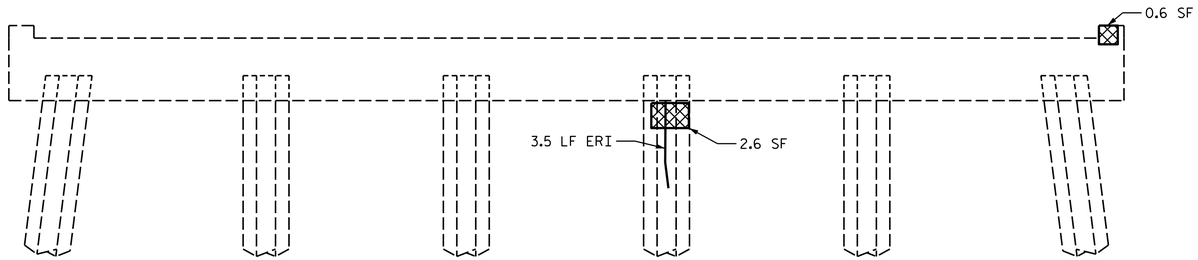
User:jduke



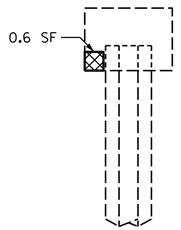
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 18	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	1.3	0.9		
COLUMN/PILE	7.0	3.5		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.3	0.1		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		6.0		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		-		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 18

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-56
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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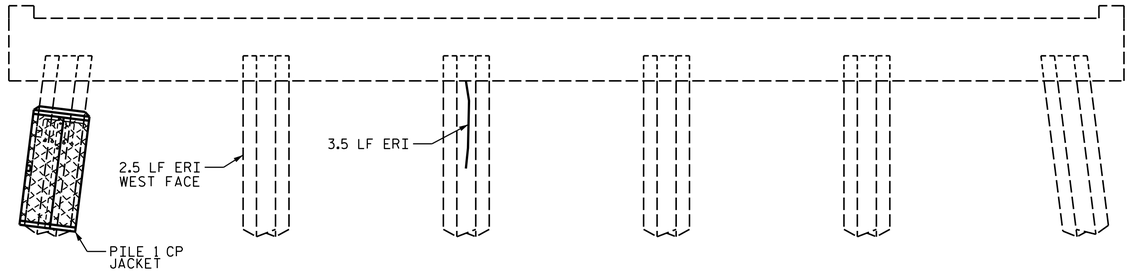
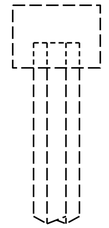


SOUTH ELEVATION



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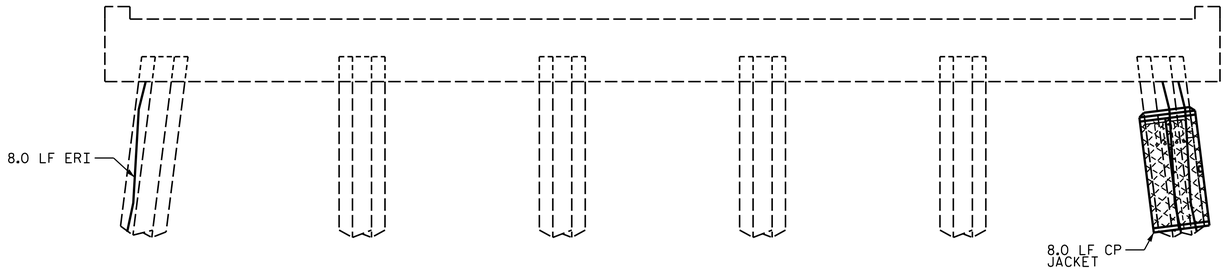
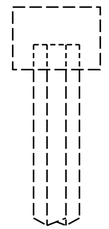


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 19	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		14.0		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		8.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

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ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

DocuSigned by: Samuel L
19C97095C75A467...

4/12/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 19

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-57
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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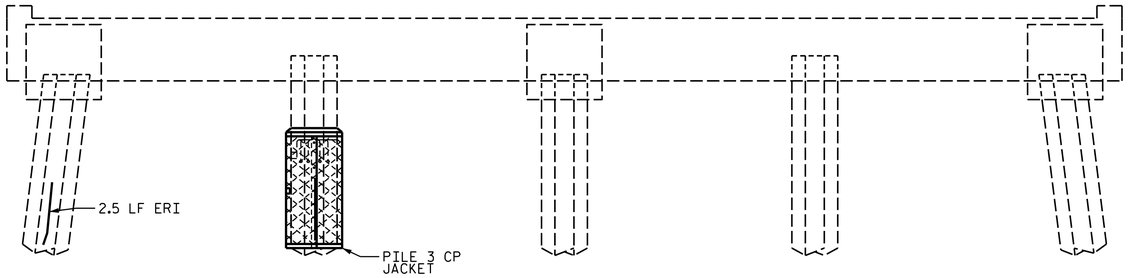
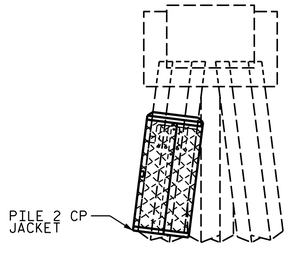
User:jduke



SOUTH ELEVATION



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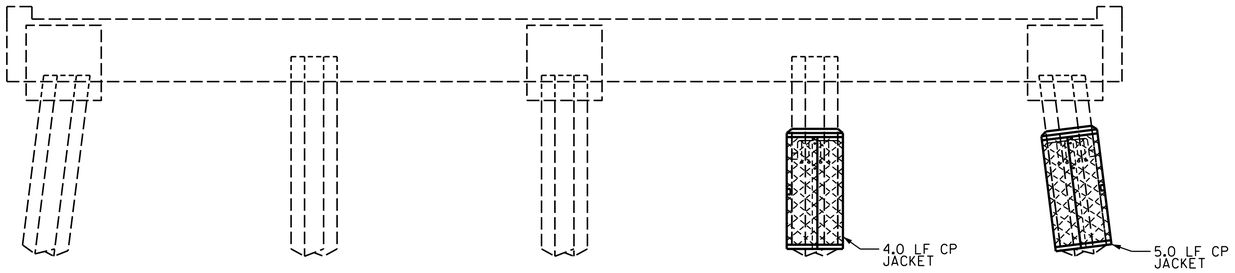
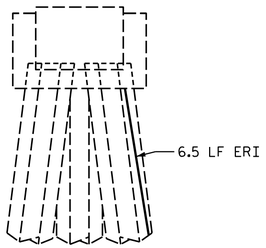


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 20	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		9.0		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		9.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

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ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 20

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-58
1			3			TOTAL SHEETS
2			4			111

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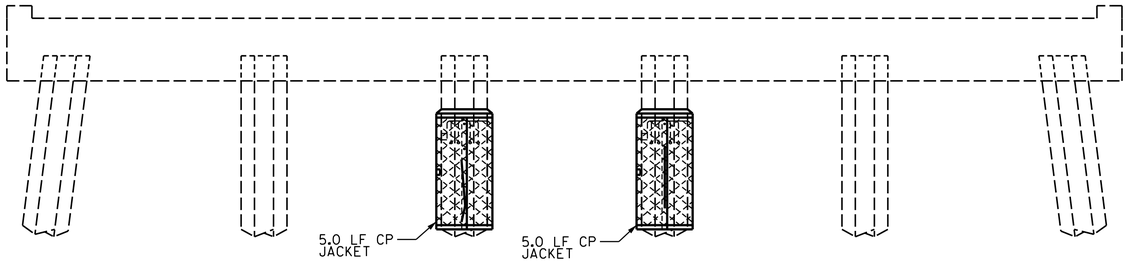
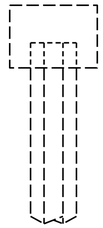


SOUTH ELEVATION



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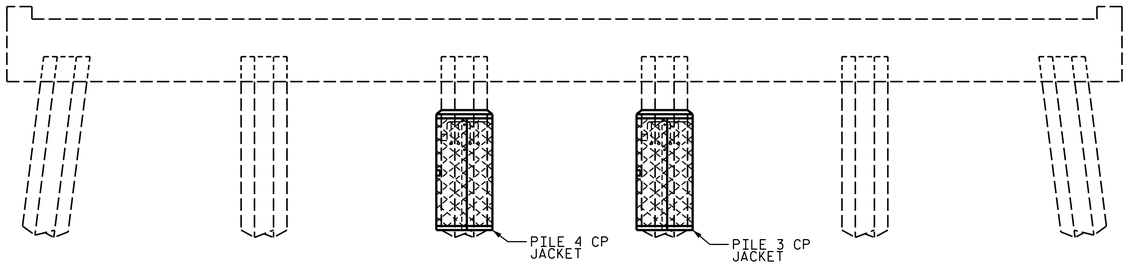
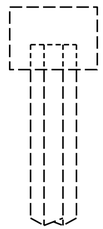


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 21	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		10.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

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ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L Cullum 19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 21

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-59
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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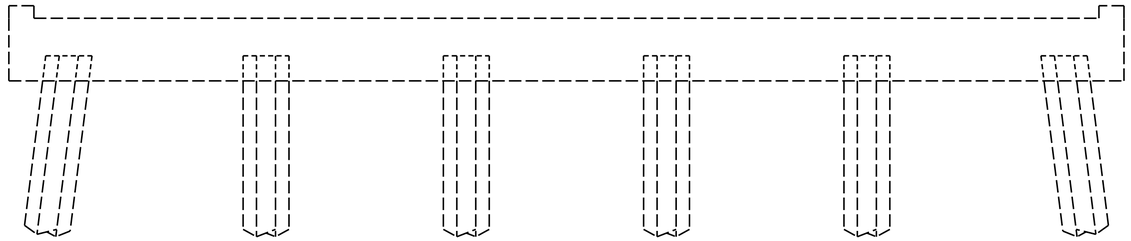
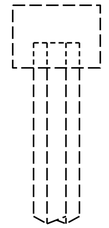


SOUTH ELEVATION



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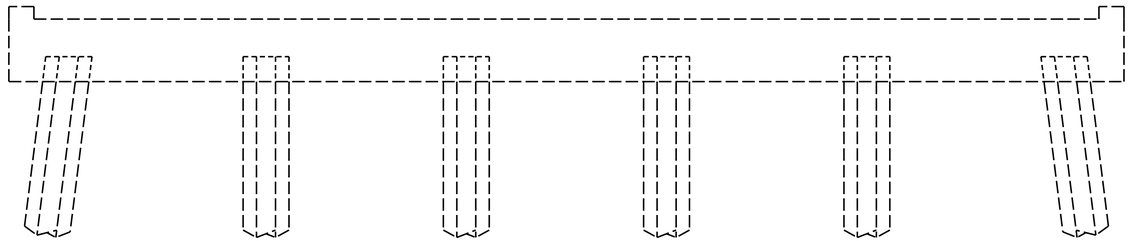
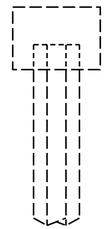


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 22	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		-		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

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SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
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DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 22

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-60
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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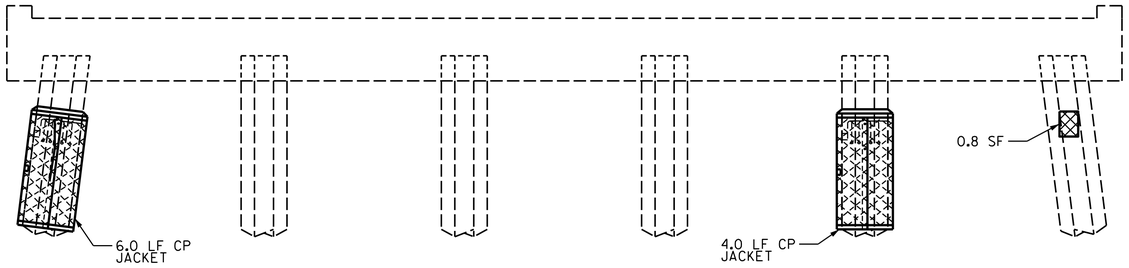
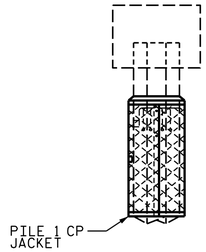
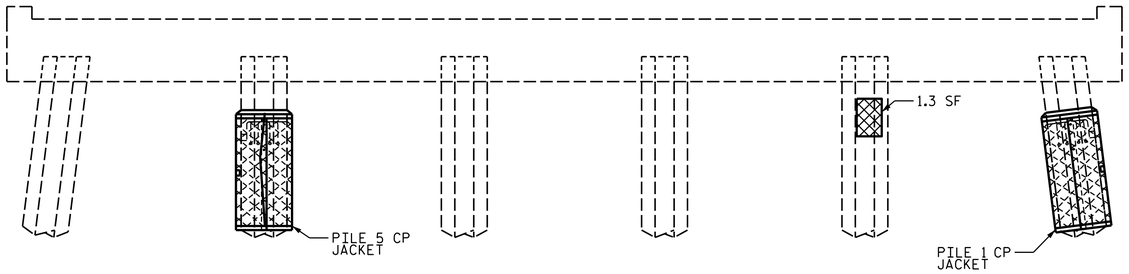
User:jduke



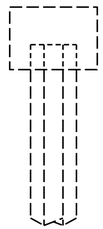
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 23	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	2.1	1.1		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		10.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 23

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-61
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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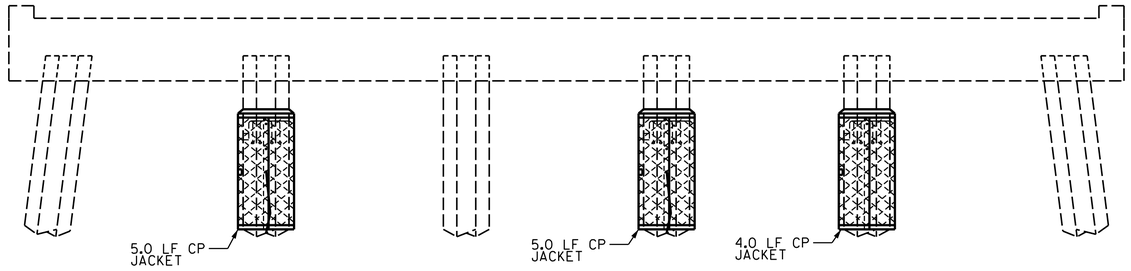
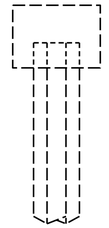


SOUTH ELEVATION



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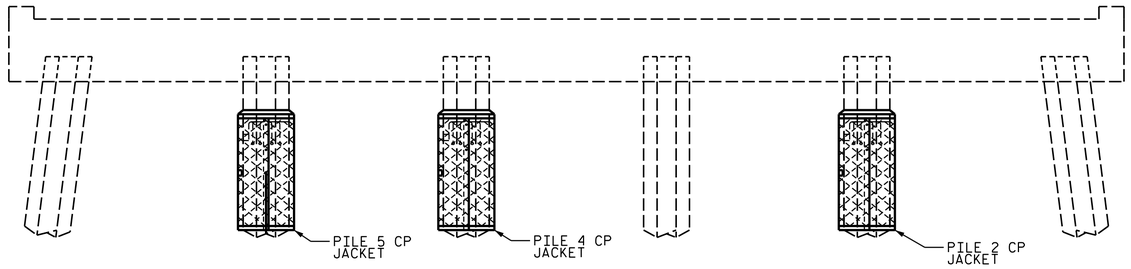
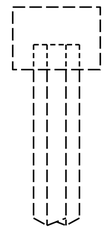


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 24	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		14.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L Cullum 19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 24

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-62
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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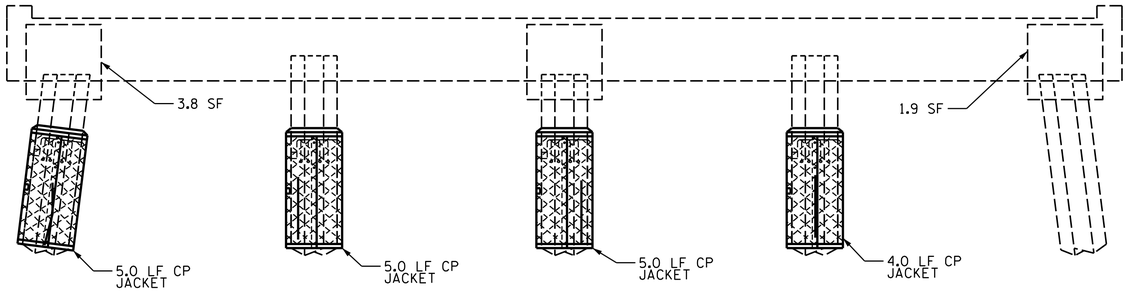
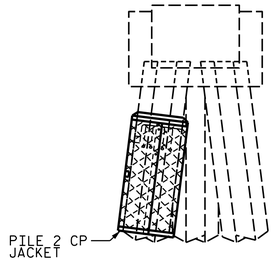


SOUTH ELEVATION



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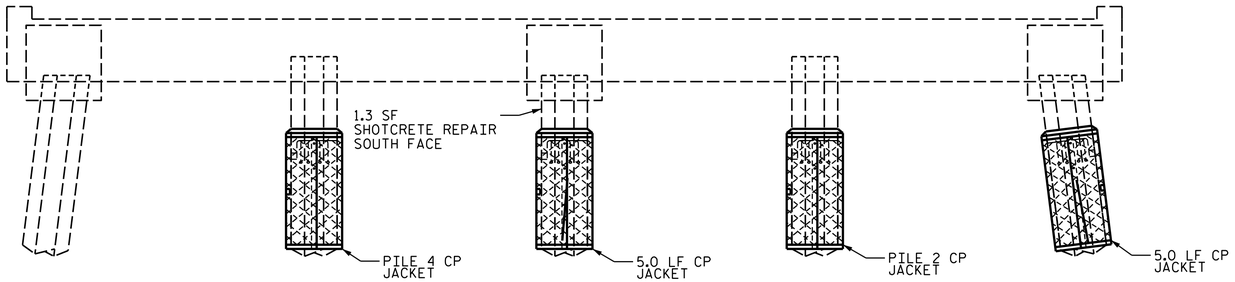
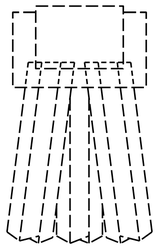


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 25	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	5.7	2.9		
COLUMN/PILE	1.3	0.7		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.9	0.4		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		29.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

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ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 25

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-63
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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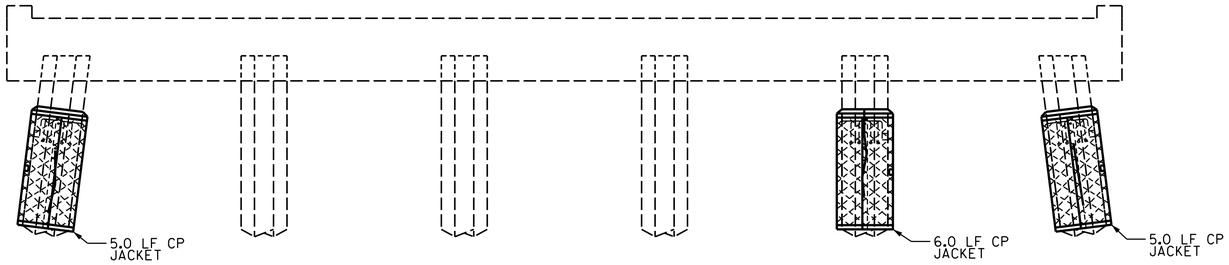
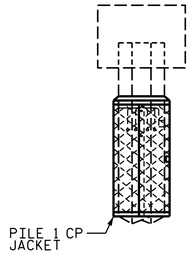
User:jduke



SOUTH ELEVATION



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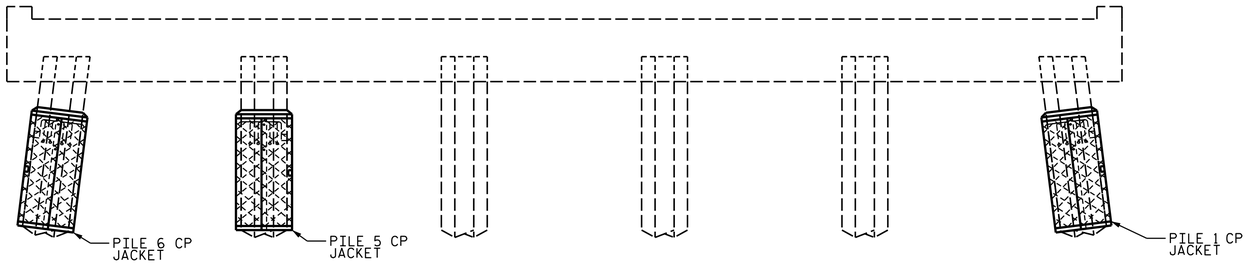
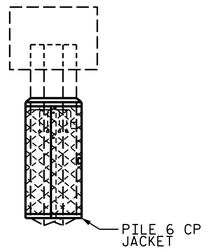


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 26	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		16.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

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SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 26

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-64
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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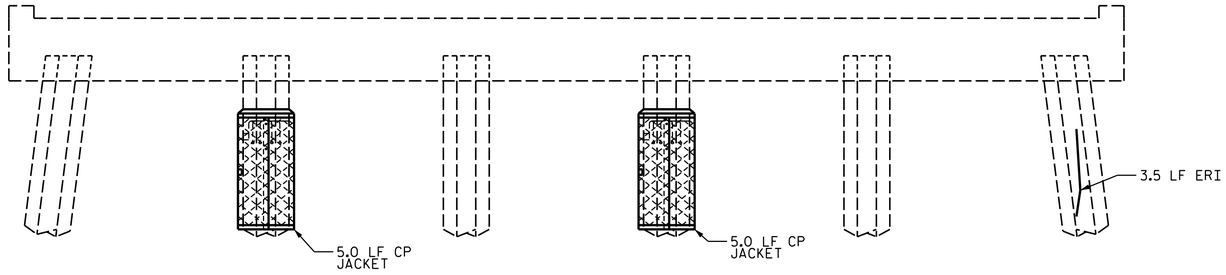
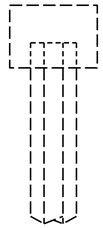
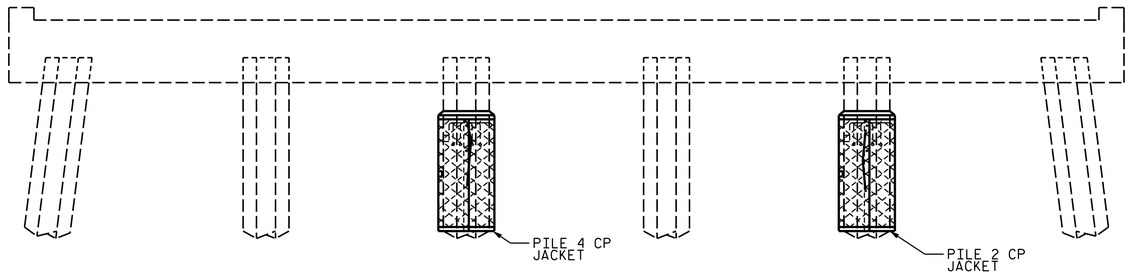


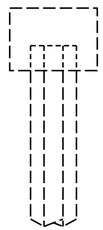
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 27	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		3.5		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		10.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L Cullum 19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 27

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-65
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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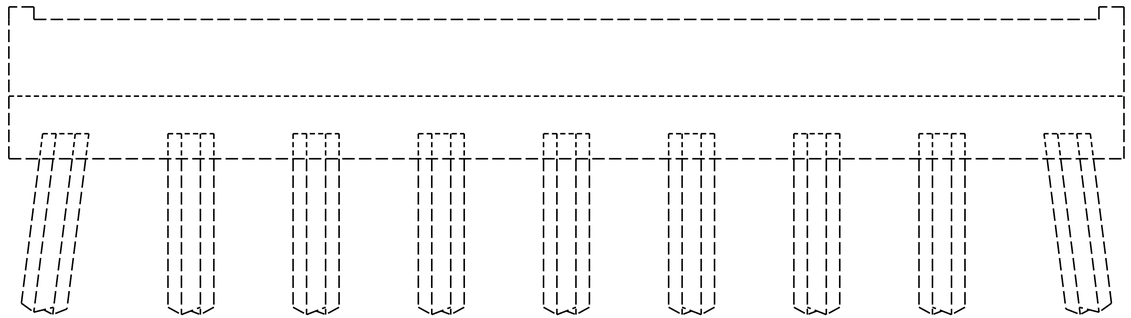
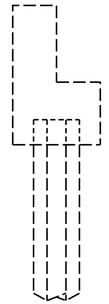


SOUTH ELEVATION



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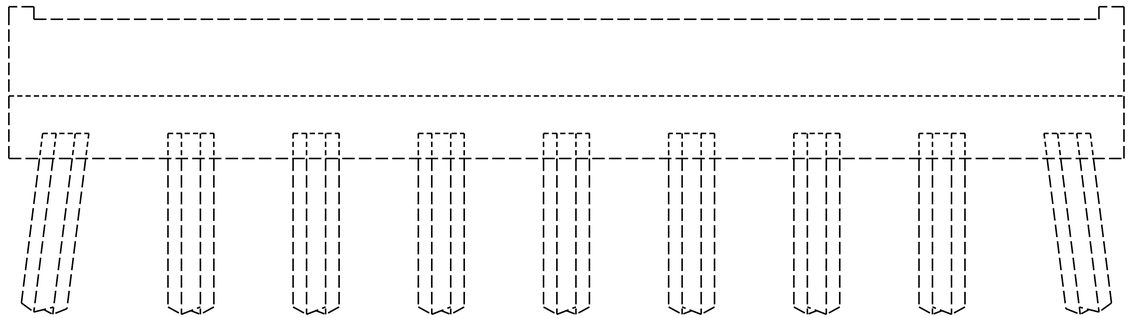
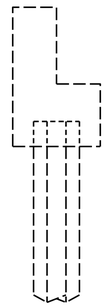


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 28	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		-		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
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DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 28

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-66
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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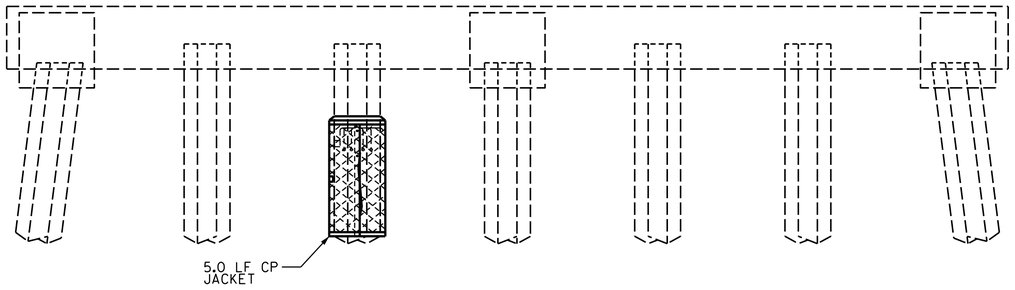
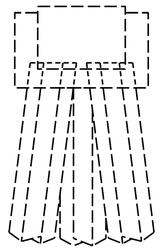
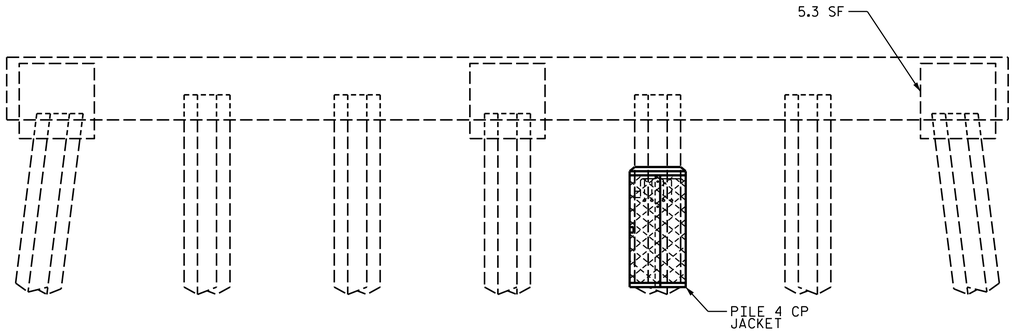


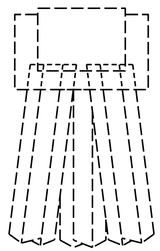
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 29	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	5.3	2.7		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.8	0.4		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		5.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

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DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 29

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-67
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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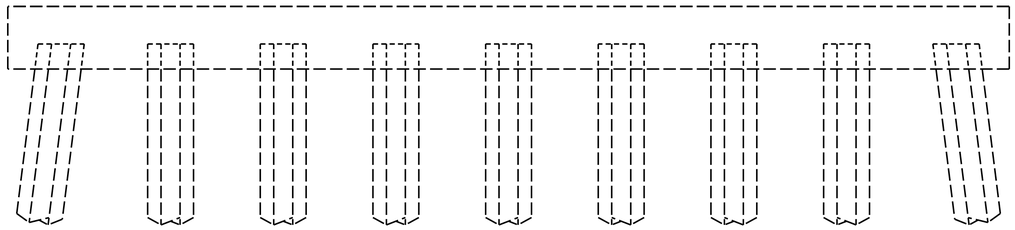
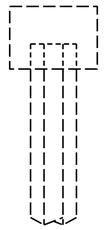


SOUTH ELEVATION



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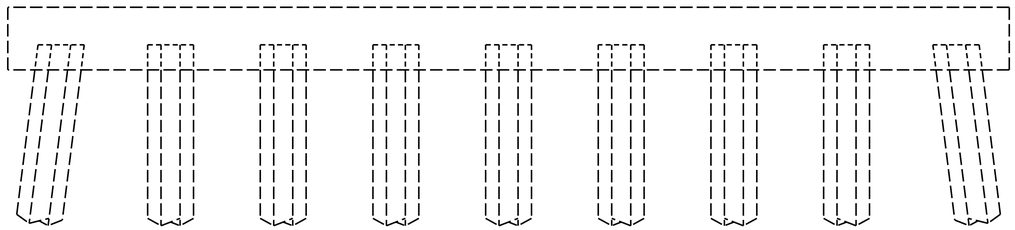
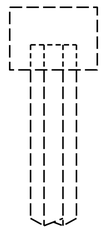


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 30	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		-		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

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SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 30

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-68
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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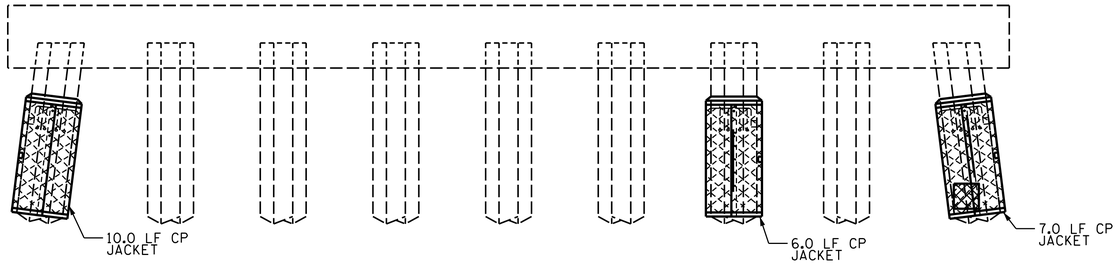
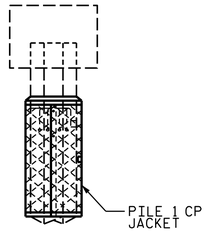
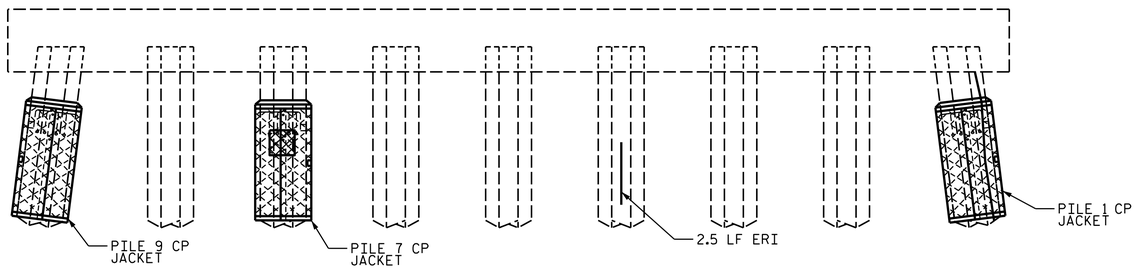


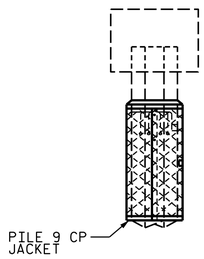
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 31	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		2.5		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		23.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 31

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-69
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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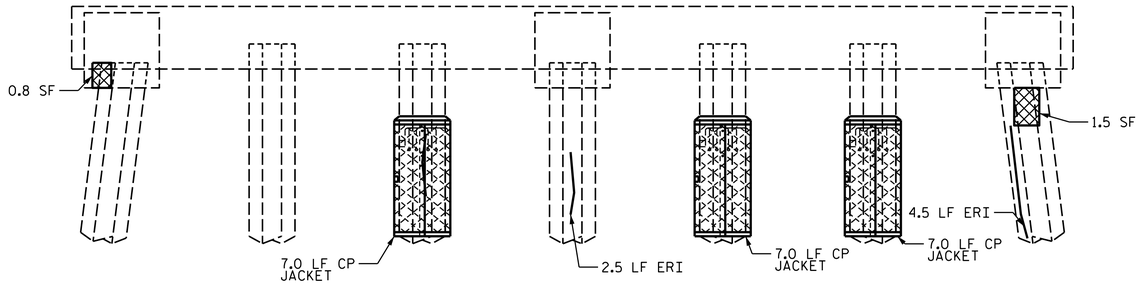
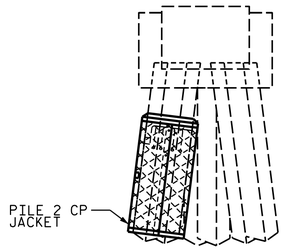
User:jduke



SOUTH ELEVATION



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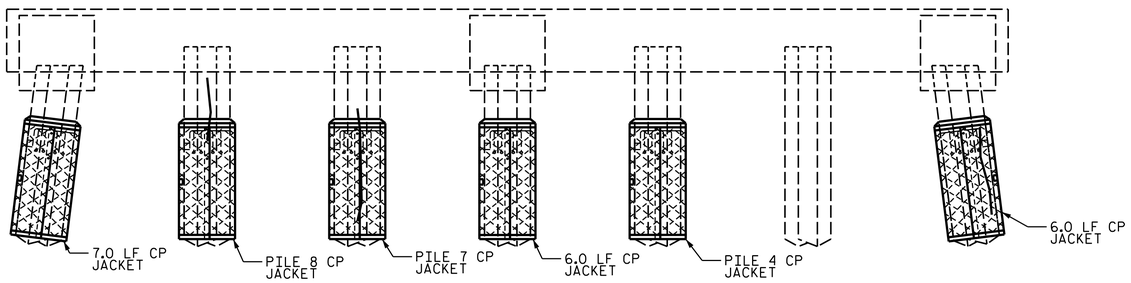
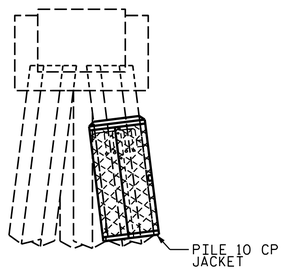


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 32	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.8	0.4		
COLUMN/PILE	1.5	0.8		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.1	0.1		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		7.0		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		40.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

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DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 32

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-70
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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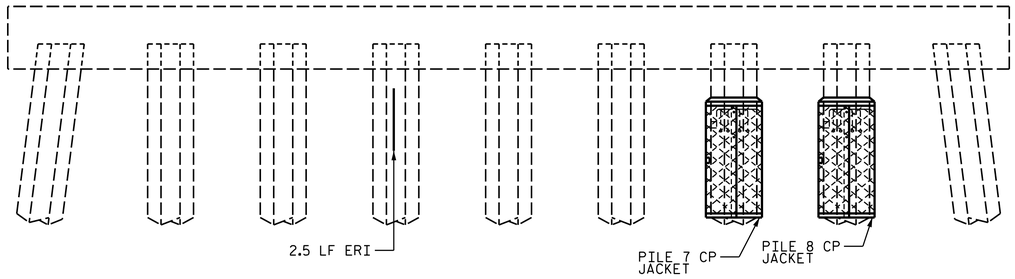
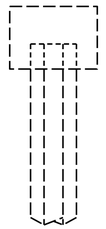
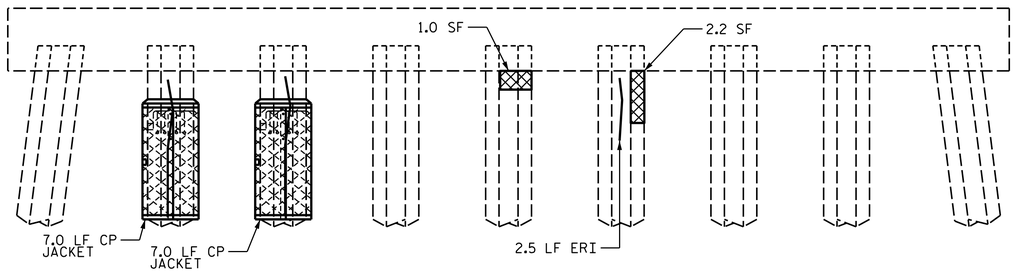


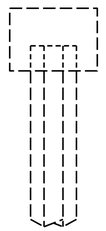
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 33	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	3.2	1.6		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		5.0		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		14.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
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DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 33

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-71
1			3			TOTAL SHEETS
2			4			111

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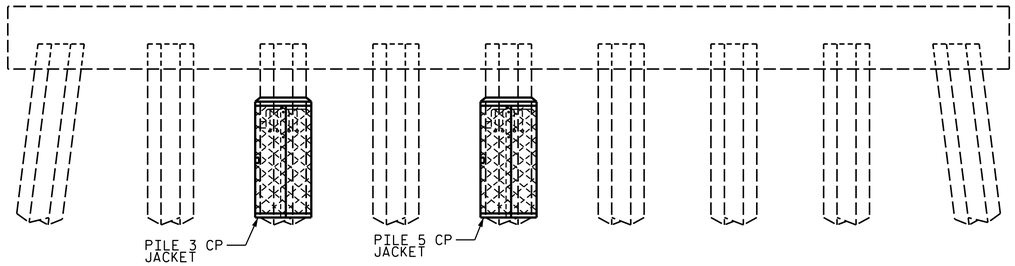
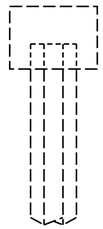
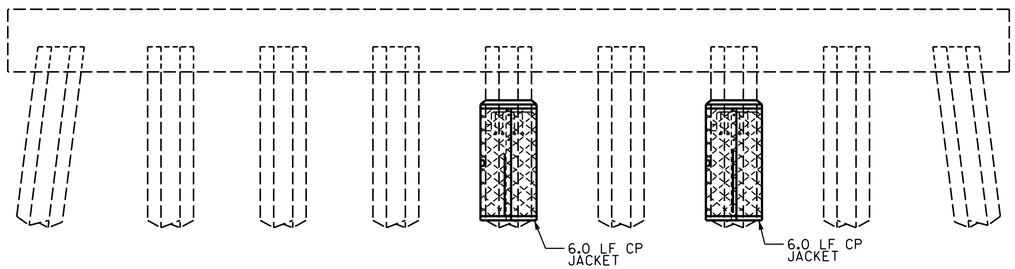


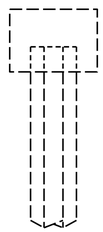
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 34	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		12.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

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SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
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(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 34

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-72
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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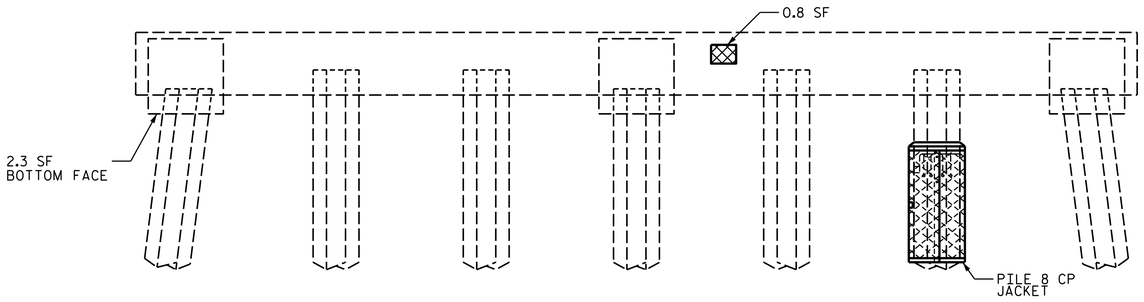
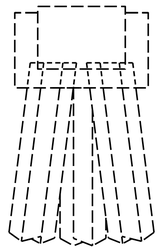
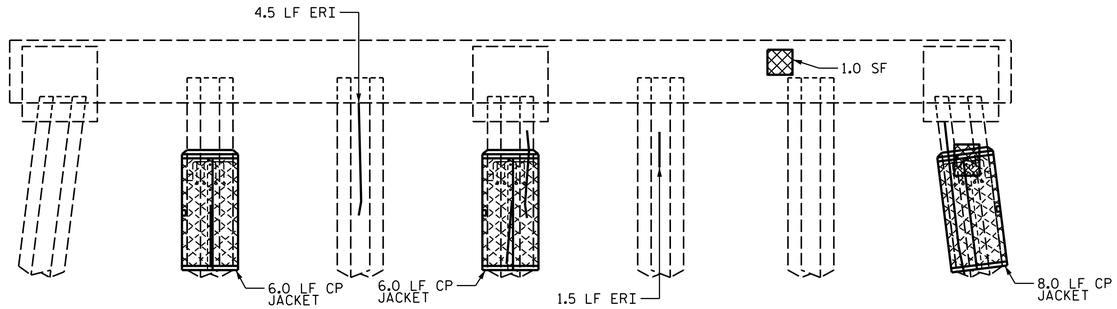


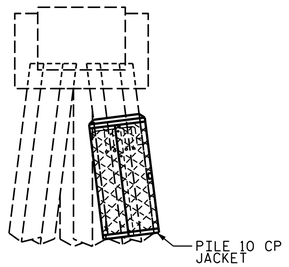
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 35	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	4.1	2.1		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.6	0.3		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		6.0		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		20.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

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CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L Cullum 19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 35

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-73
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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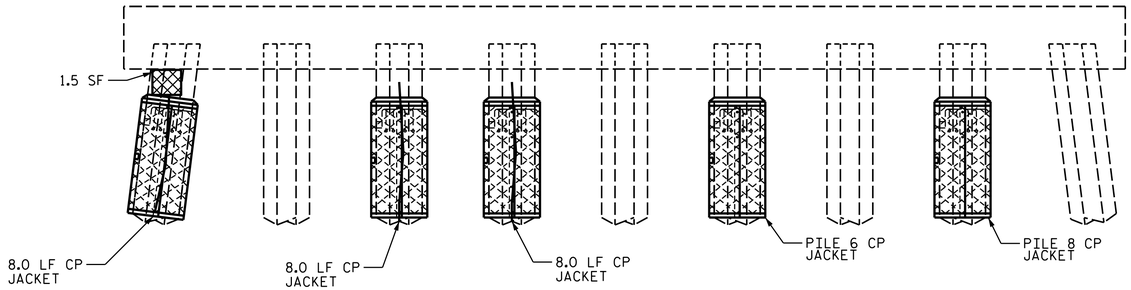
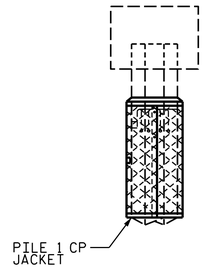
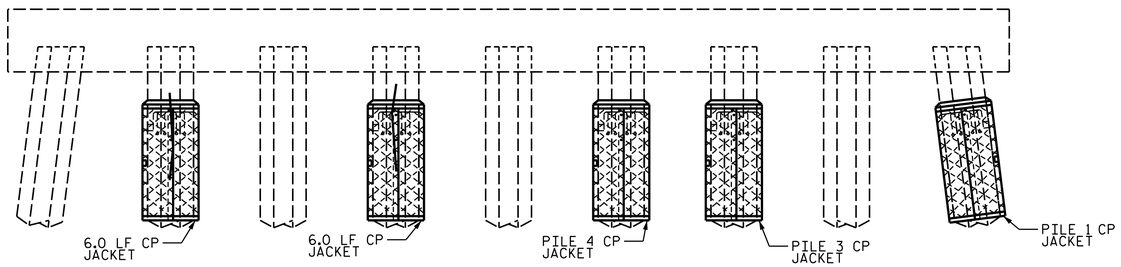
User:jduke



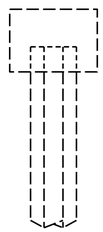
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 36	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	1.5	0.8		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		36.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 36

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-74
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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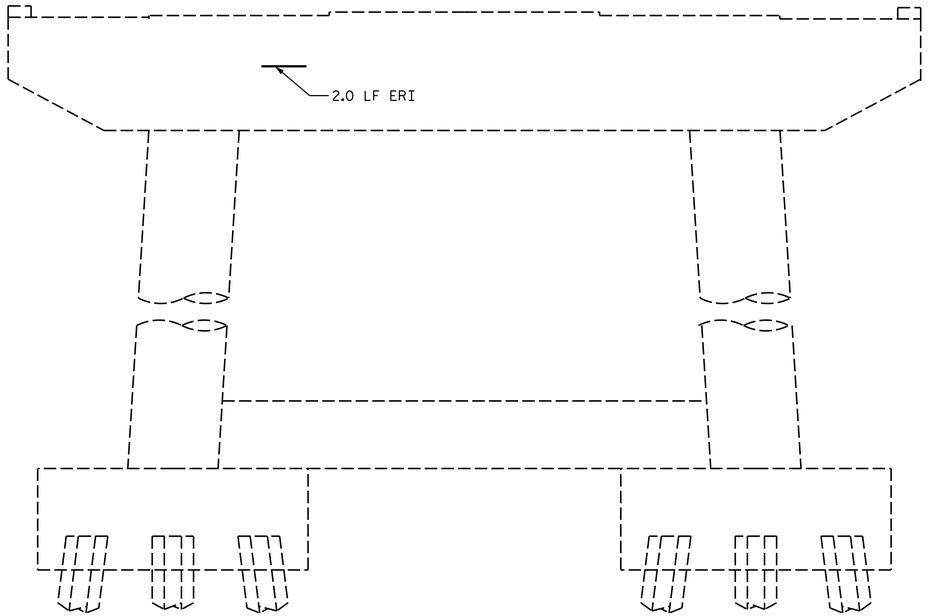
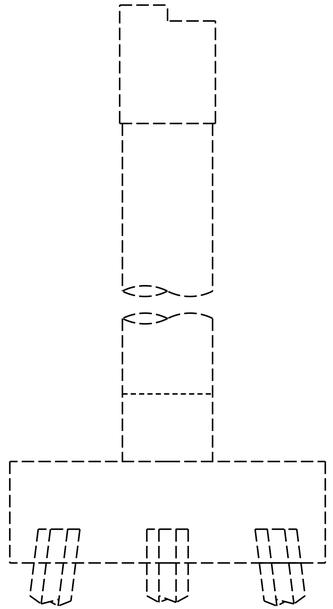
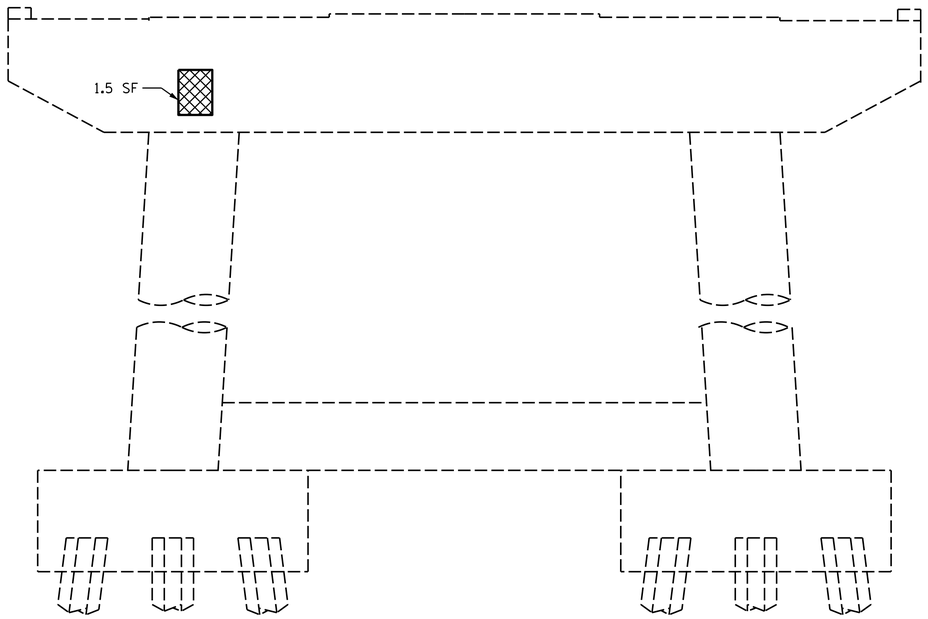


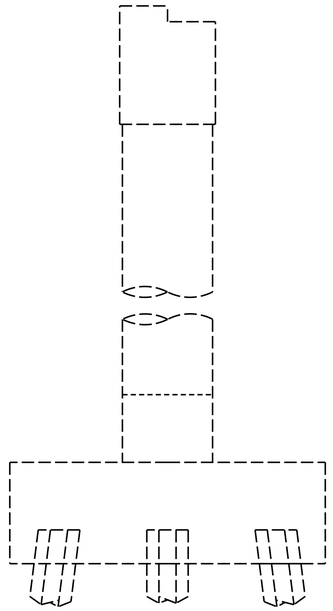
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 37	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	1.5	0.8		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.2	0.1		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		2.0		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

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FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L Cullum 19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 37

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-75
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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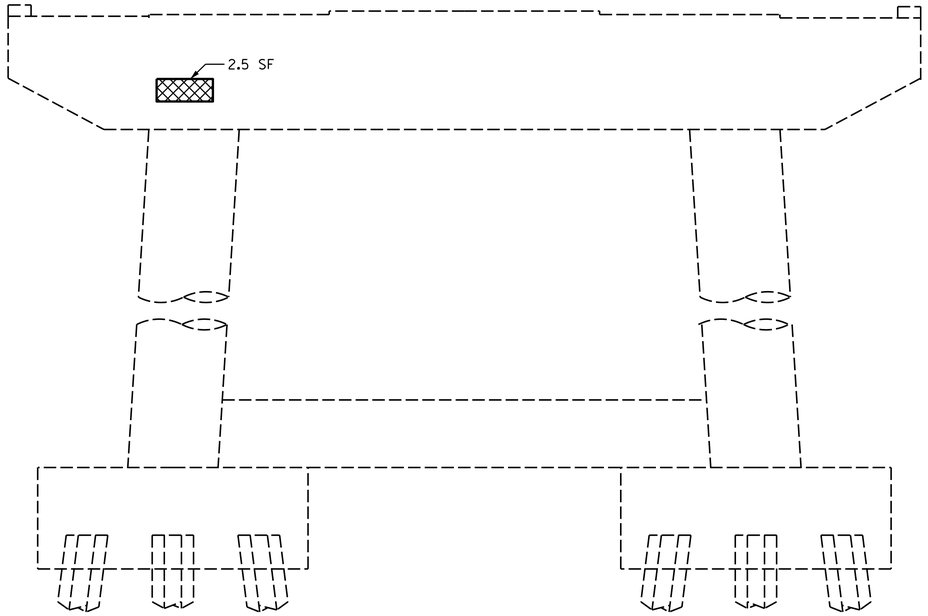
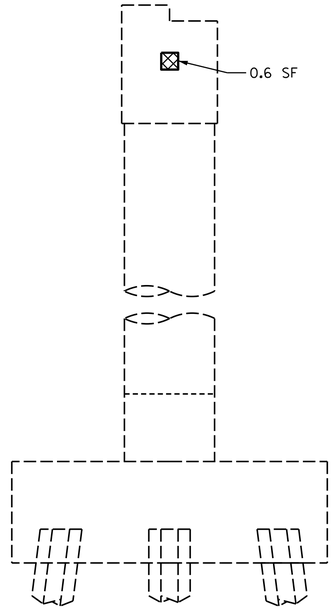
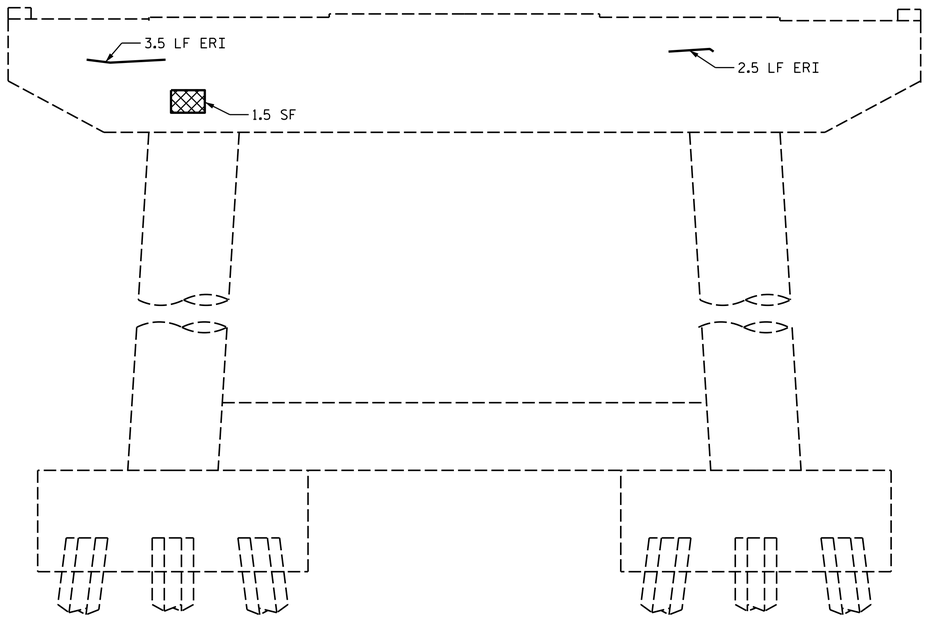
User:jduke



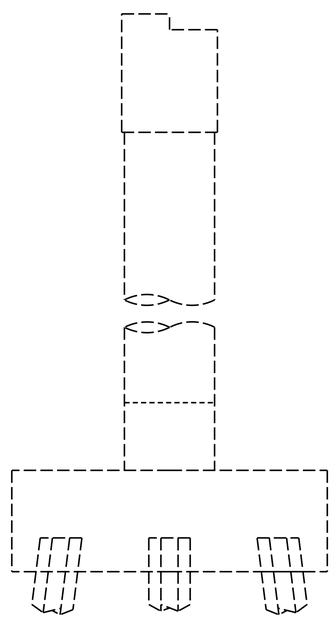
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 38	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	4.6	2.3		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.7	0.3		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		6.0		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

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ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA | SHOTCRETE REPAIR AREA | EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 38

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-76
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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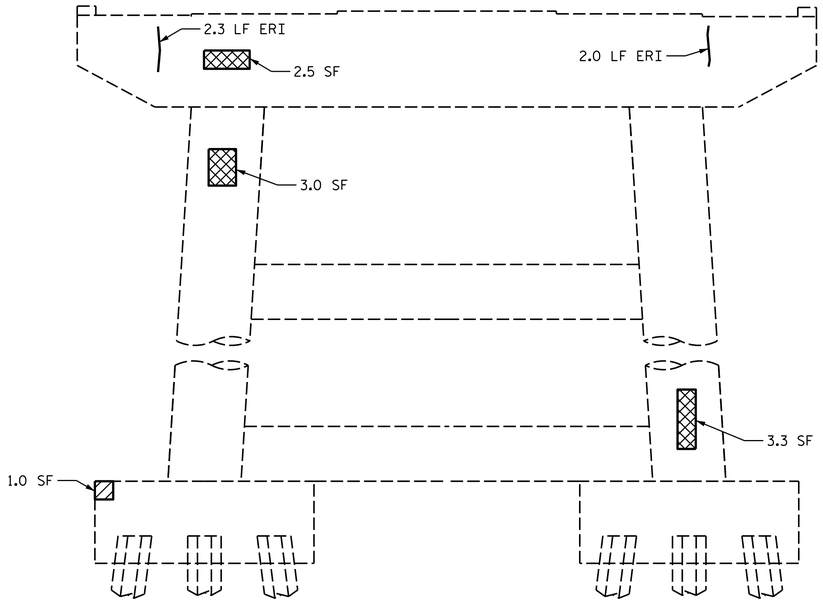
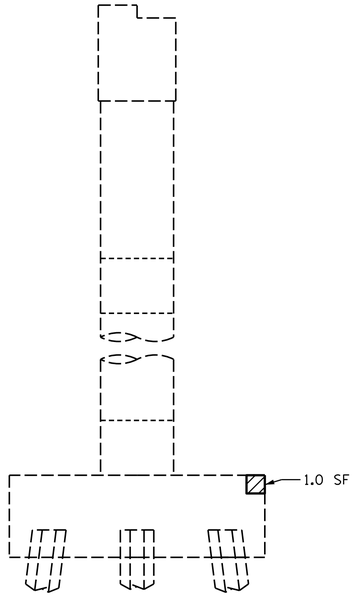
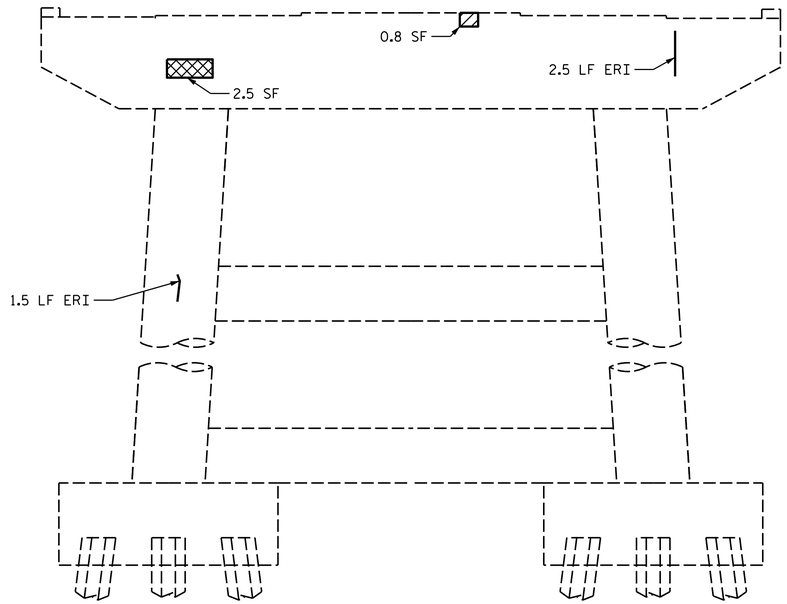


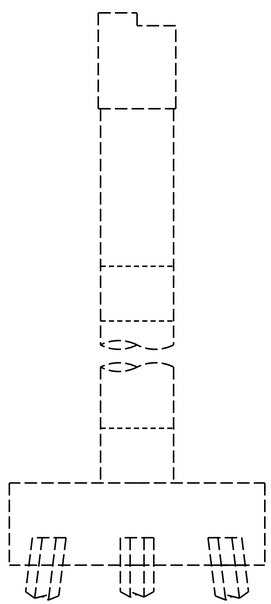
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 39	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	5.0	2.5		
COLUMN/PILE	6.3	3.2		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	2.8	1.4		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		6.8		
COLUMN/PILE		1.5		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 39

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-77
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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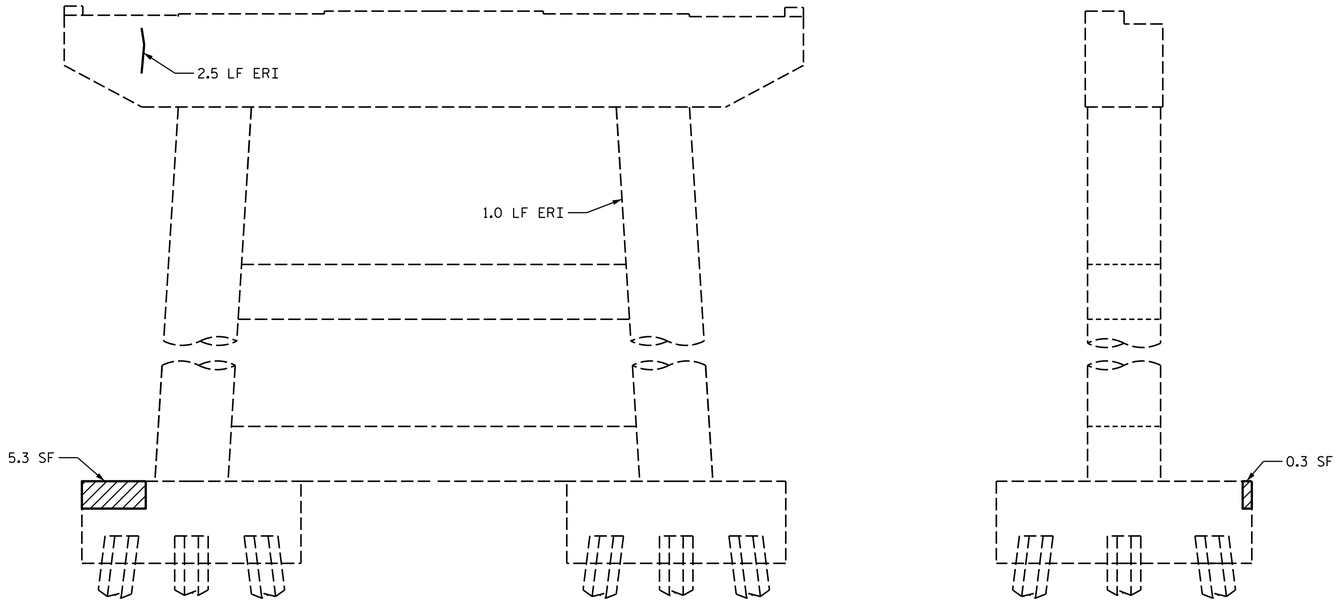
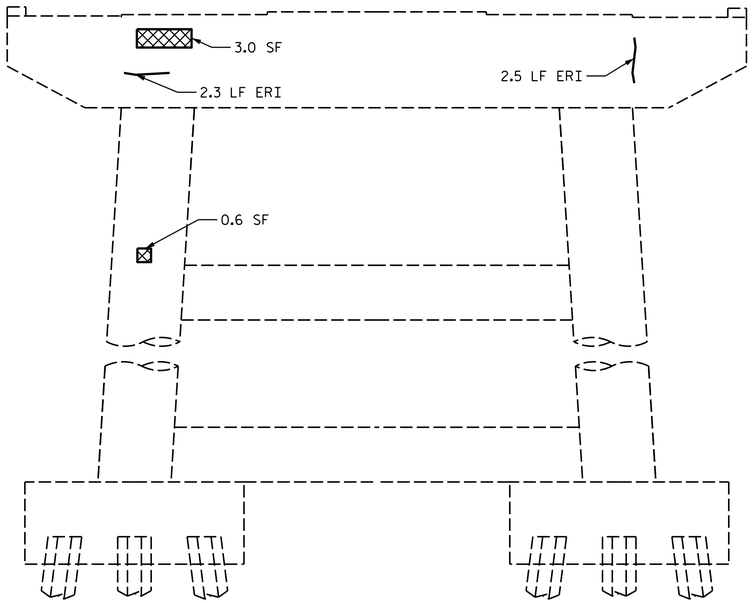
User:jduke

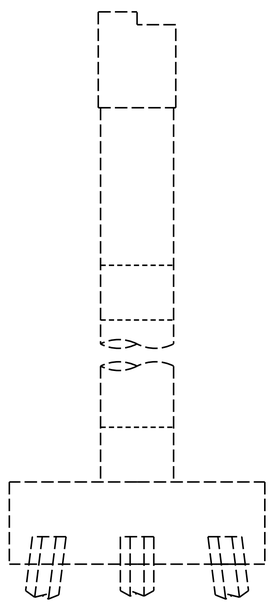


SOUTH ELEVATION

WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 40	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	3.0	1.5		
COLUMN/PILE	0.6	0.3		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	5.3	2.7		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		7.3		
COLUMN/PILE		1.0		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 40

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-78
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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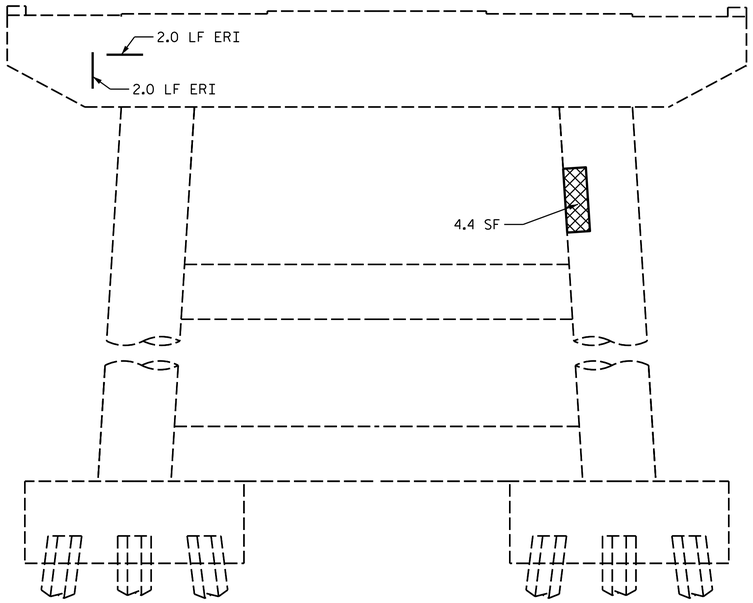
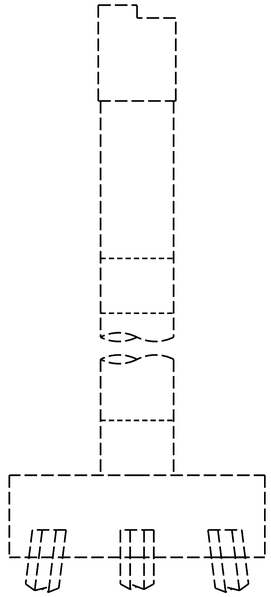
User:jduke



SOUTH ELEVATION



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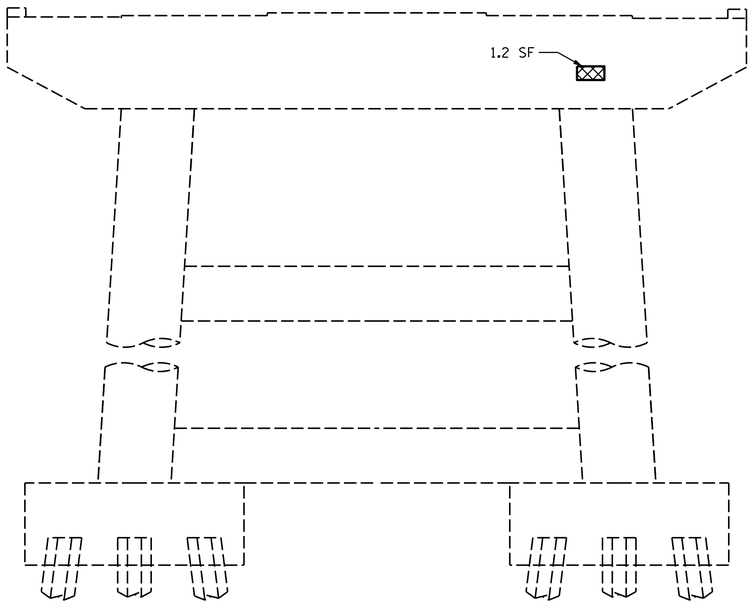
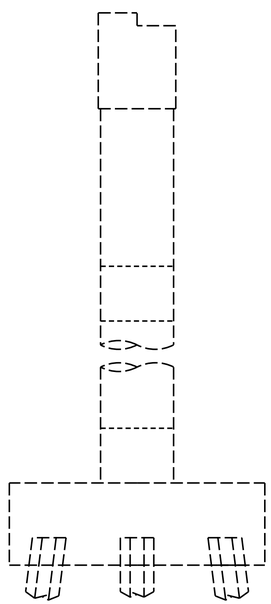


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 41	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	1.2	0.6		
COLUMN/PILE	4.4	2.2		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.2	0.1		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		4.0		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

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4800 SIX FORKS ROAD SUITE 120
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(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 41

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-79
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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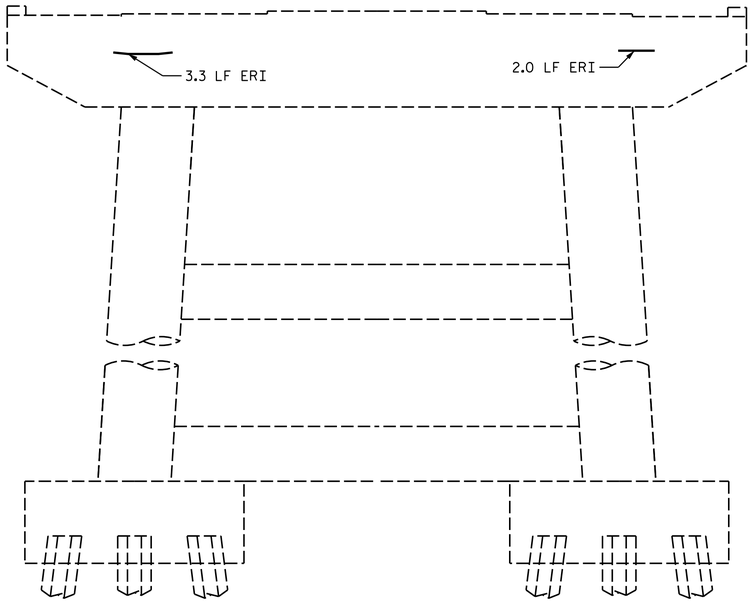
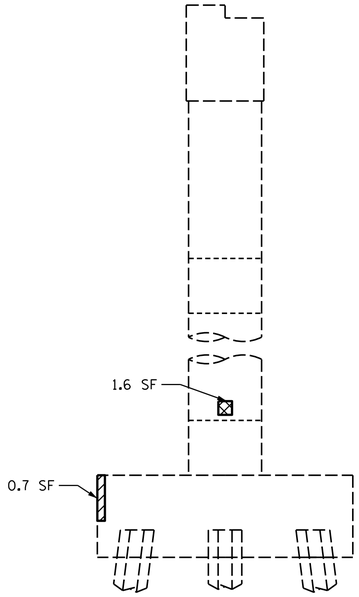
User:jduke



SOUTH ELEVATION



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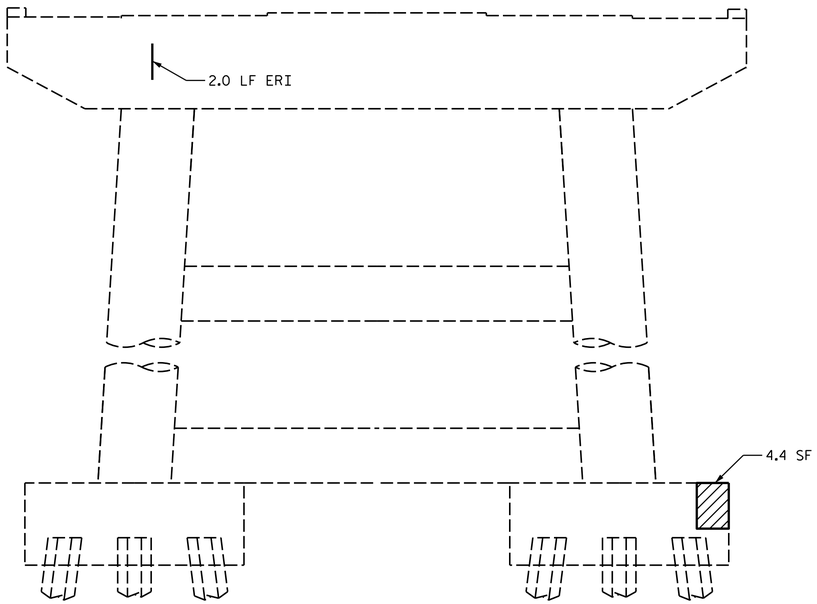
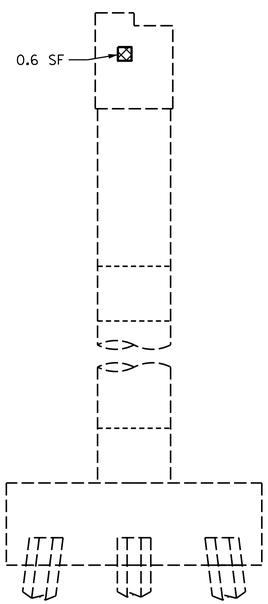


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 42	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.6	0.3		
COLUMN/PILE	1.6	0.8		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	4.4	2.2		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		7.3		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

DocuSigned by: Samuel L
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4/12/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 42

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-80
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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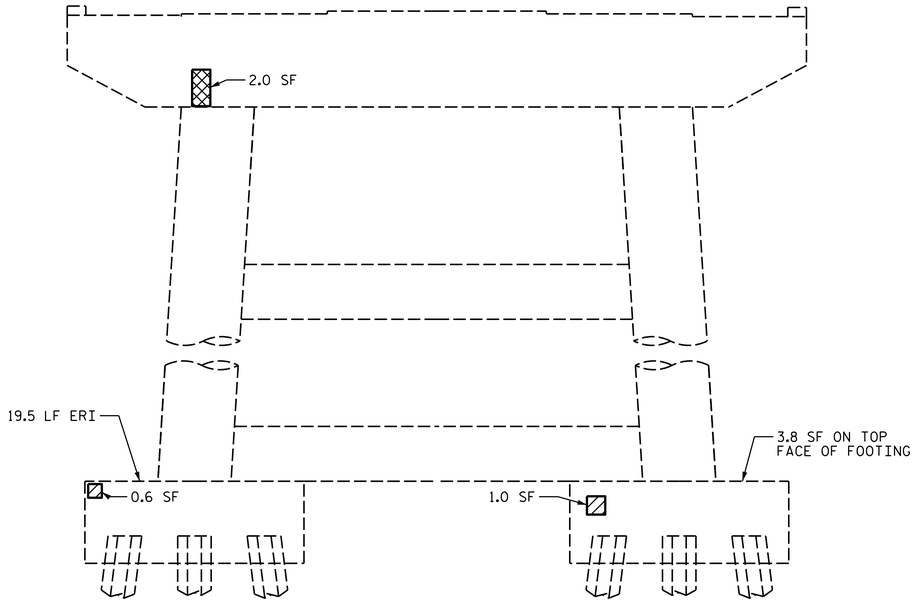
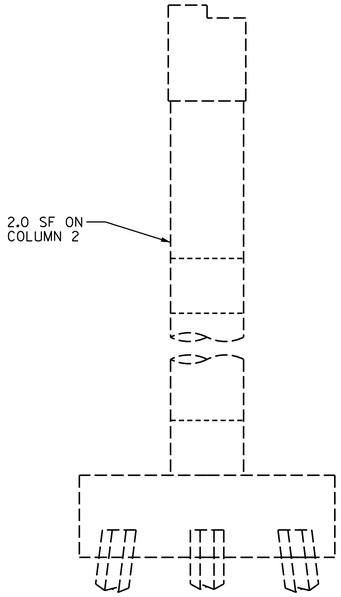
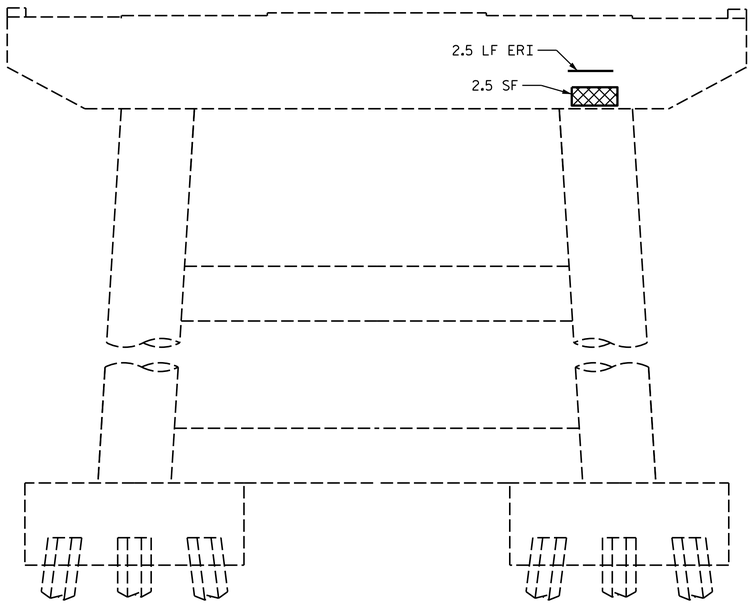


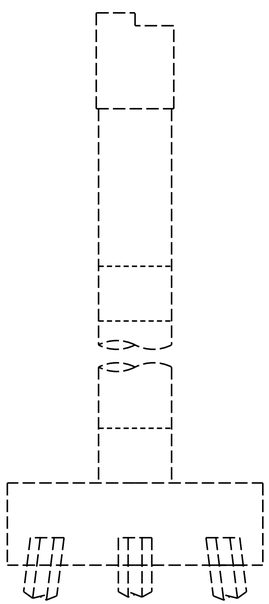
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 43	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	4.5	2.3		
COLUMN/PILE	2.0	1.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	5.4	2.7		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		22.0		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

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SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 43

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-81
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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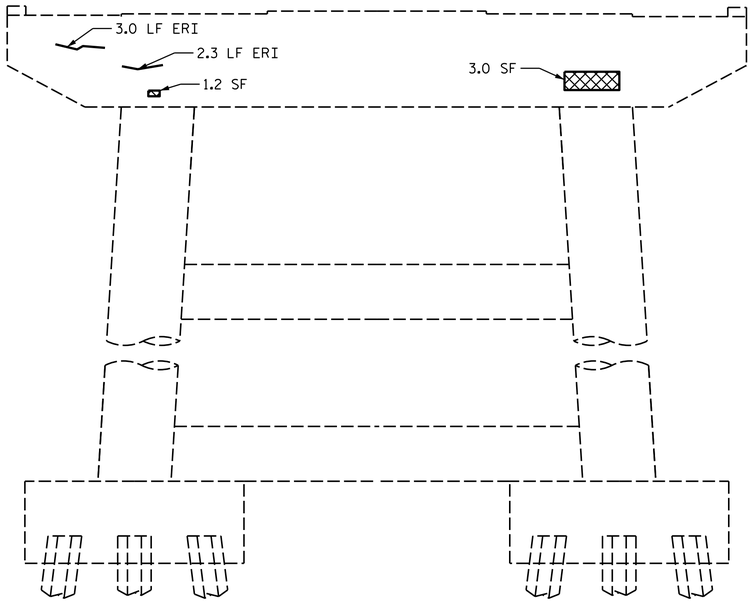
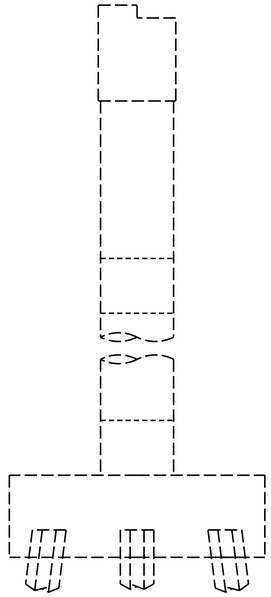
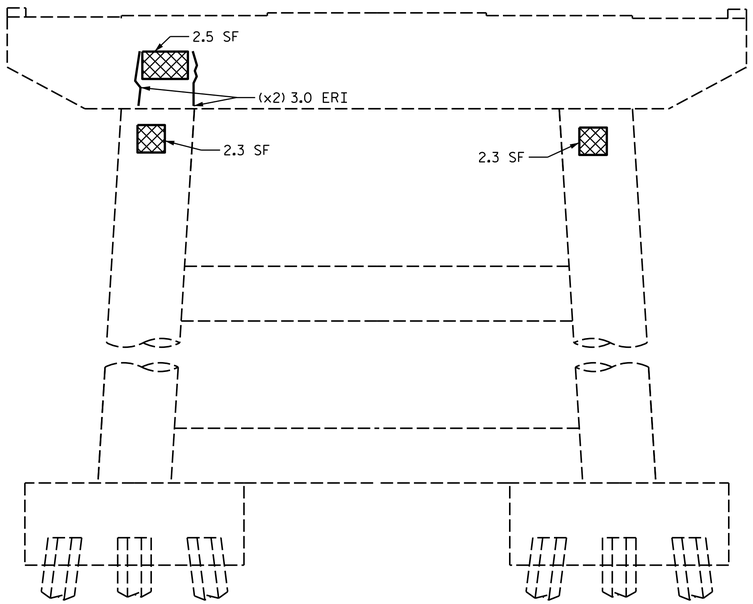


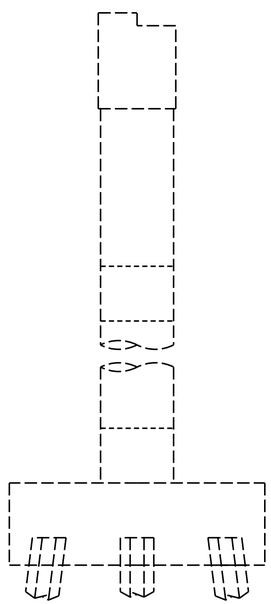
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 44	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	6.7	3.4		
COLUMN/PILE	4.6	2.3		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	1.0	0.5		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		11.3		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

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DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
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DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 44

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-82
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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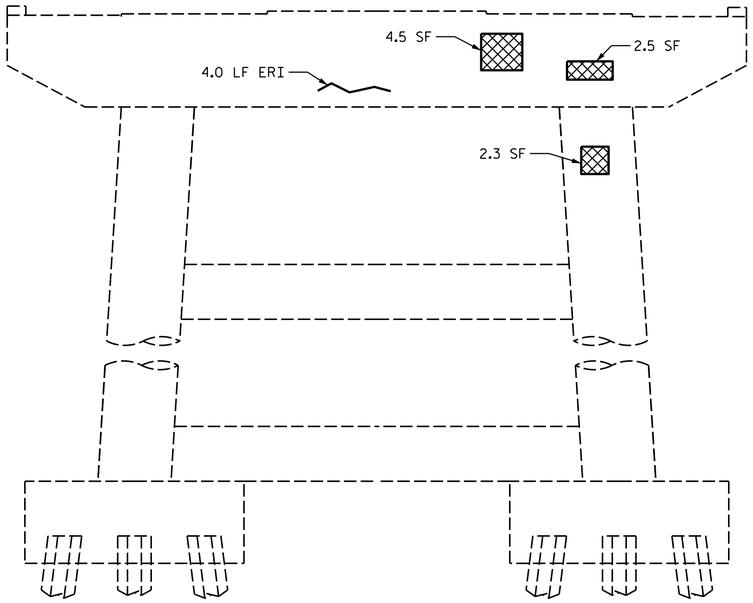
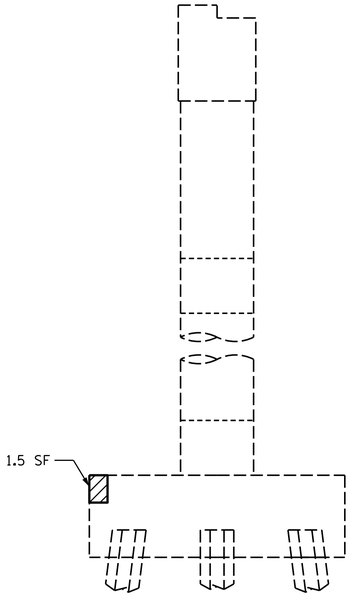
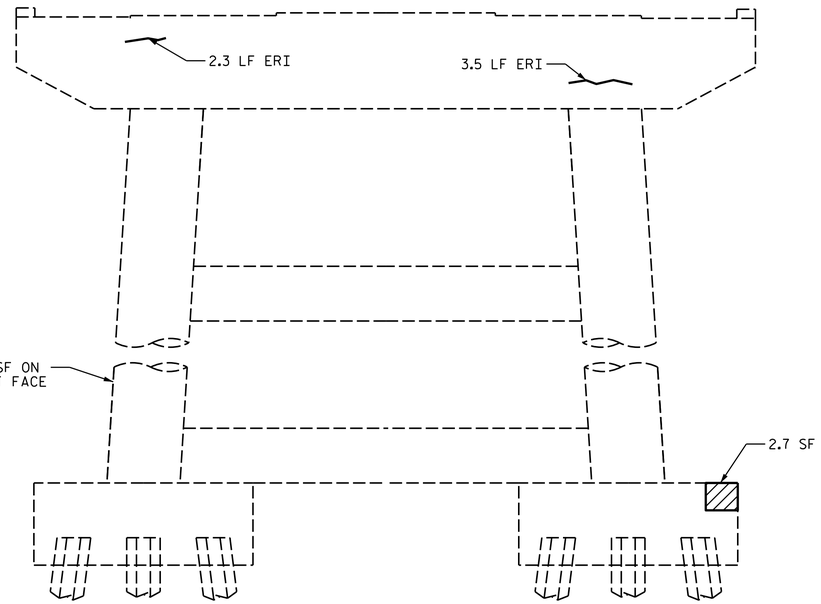


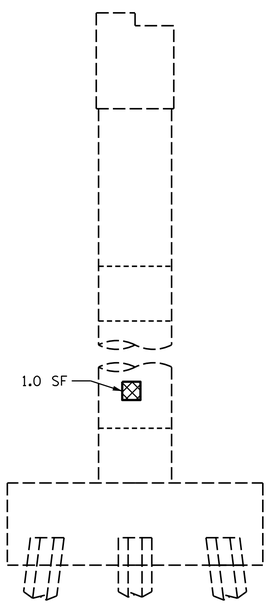
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 45	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	7.0	3.5		
COLUMN/PILE	4.3	2.2		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	5.4	2.7		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		9.8		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LEE CULLUM
DocuSigned by: Samuel L. 19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 45

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-83
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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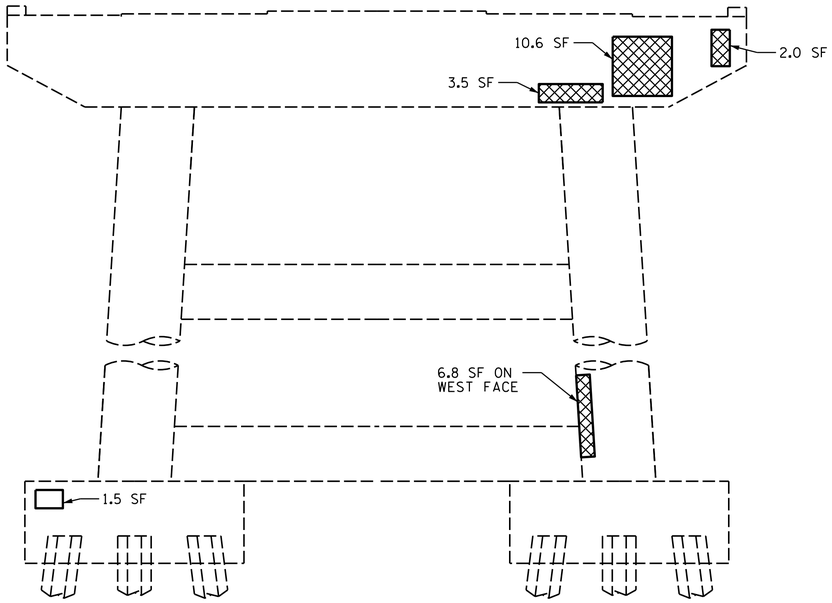
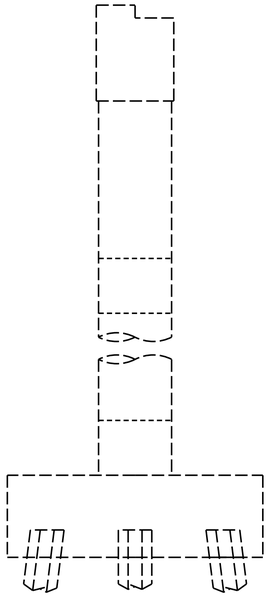
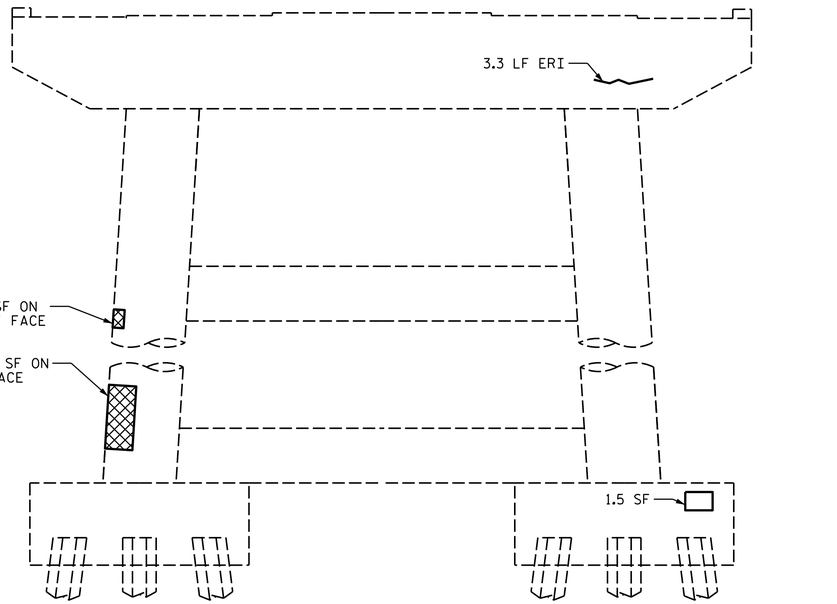
User:jduke



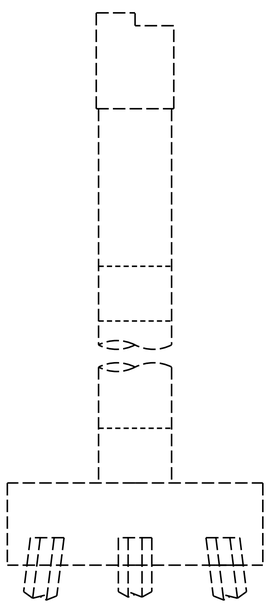
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 46	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	16.1	8.1		
COLUMN/PILE	18.7	9.4		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	3.0	1.5		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		3.3		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 46

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-84
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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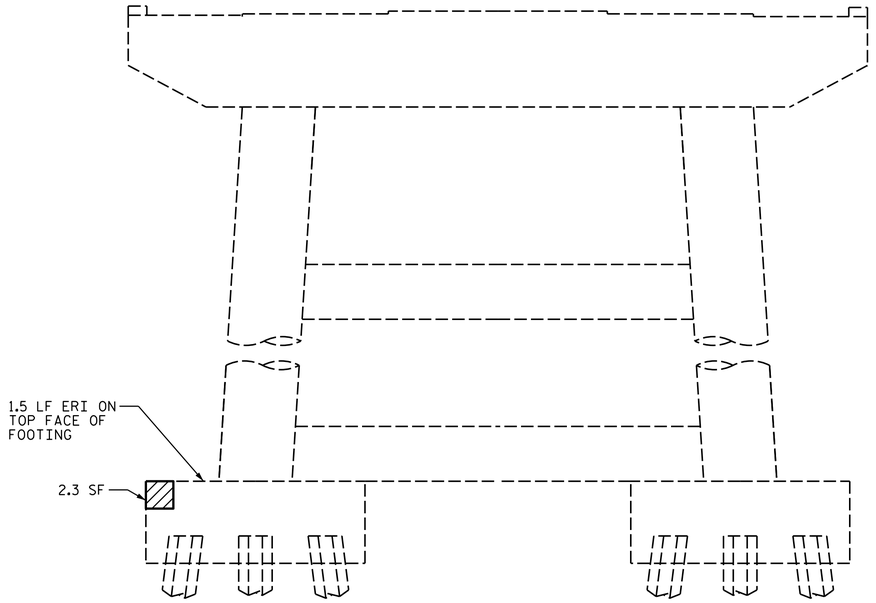
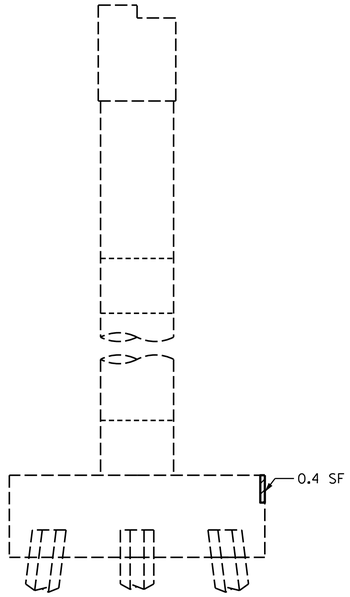
User:jduke



SOUTH ELEVATION



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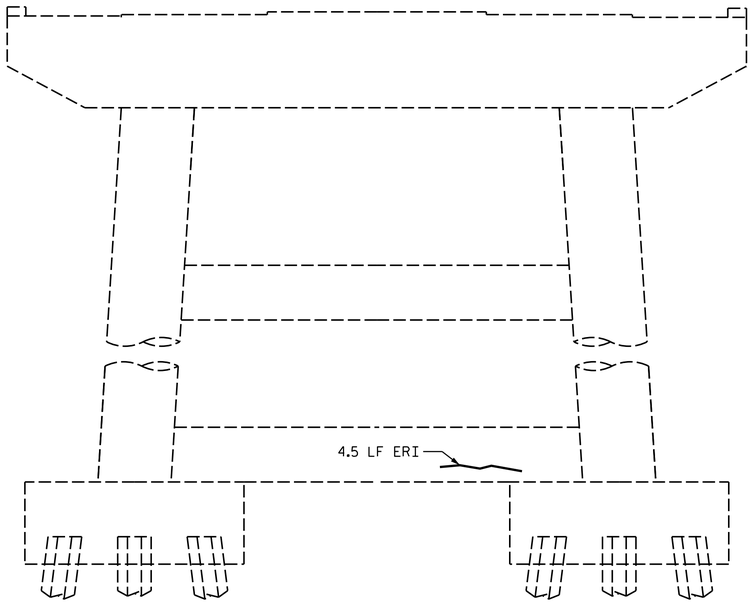
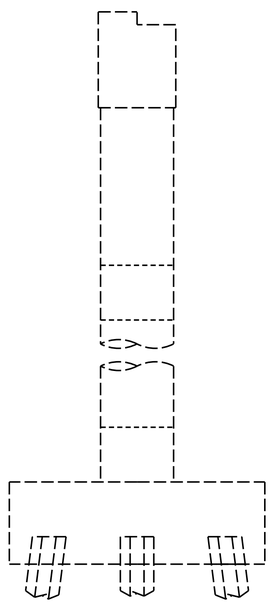


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 47	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	2.7	1.4		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		6.0		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

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ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 47

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-85
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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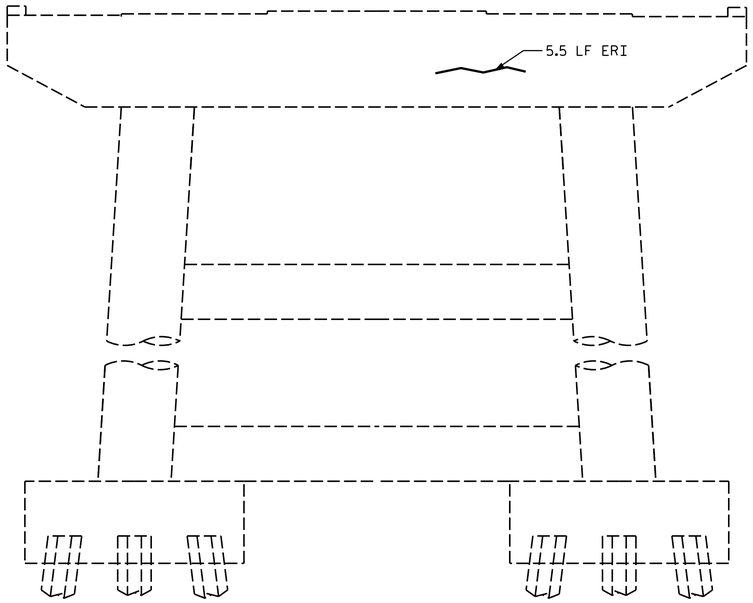
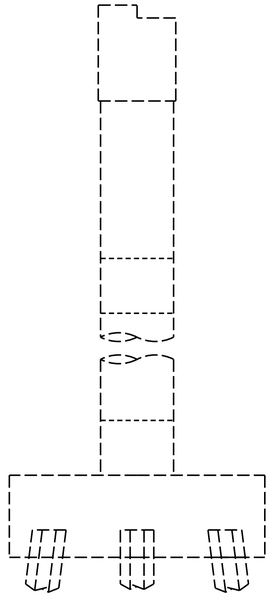
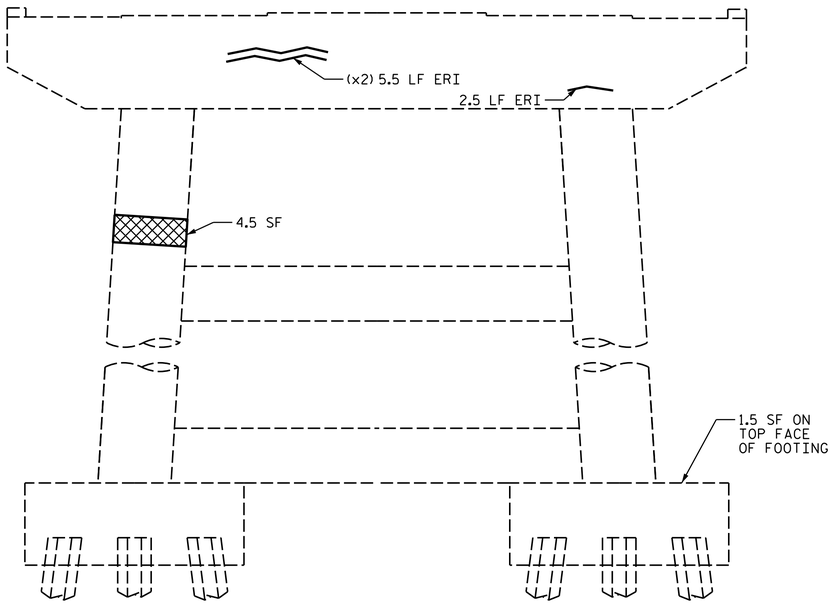


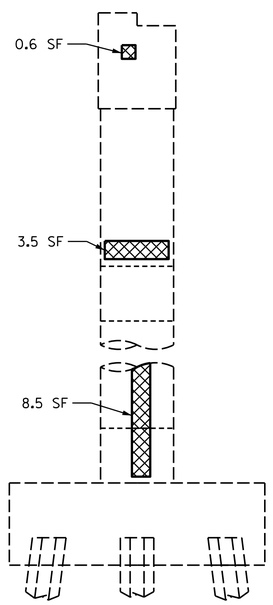
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 48	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.6	0.3		
COLUMN/PILE	16.5	8.3		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	1.5	0.8		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		19.0		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

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ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

DocuSigned by: Samuel L
19C97095C75A467...

4/12/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 48

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-86
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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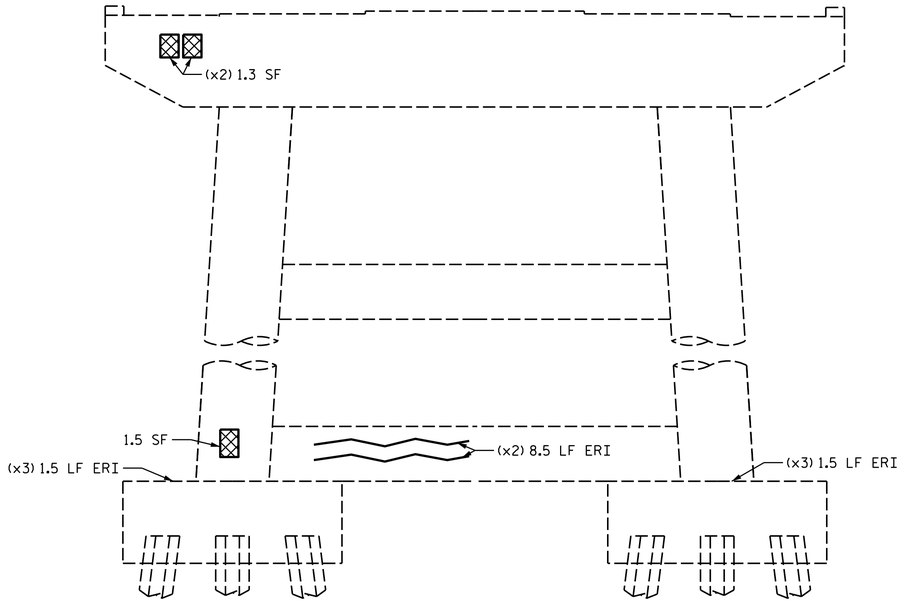
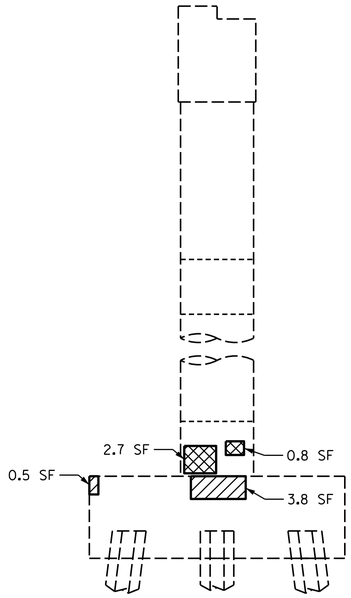
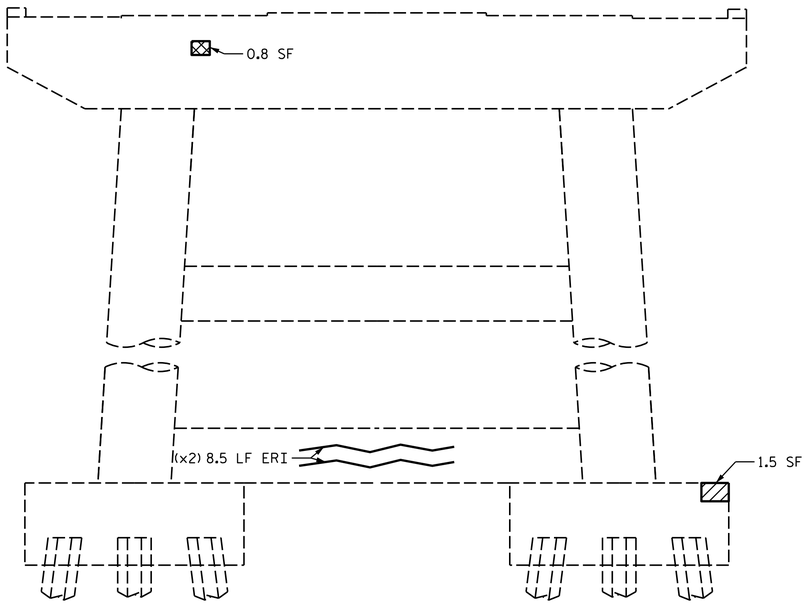
User:jduke



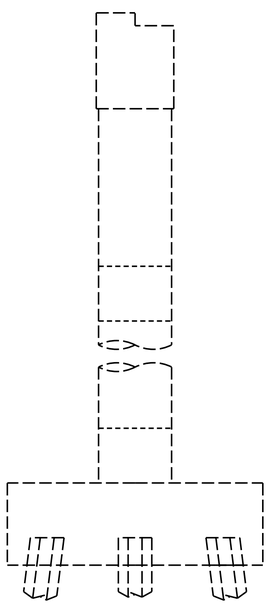
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 49	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	3.4	1.7		
COLUMN/PILE	5.0	2.5		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	5.3	2.7		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		43.0		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 49

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA | SHOTCRETE REPAIR AREA | EPOXY RESIN INJECTION (ERI)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-87
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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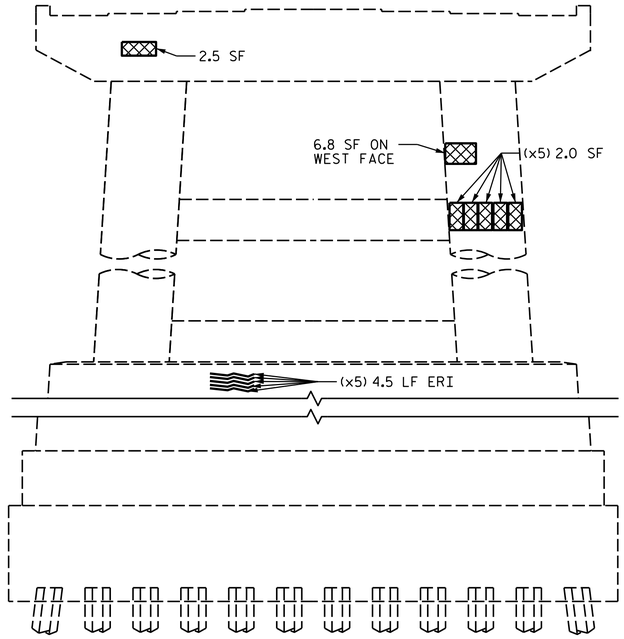
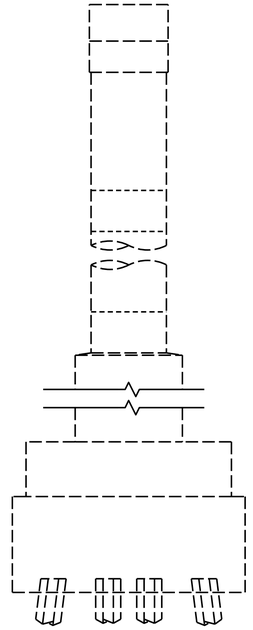
User:jduke



SOUTH ELEVATION



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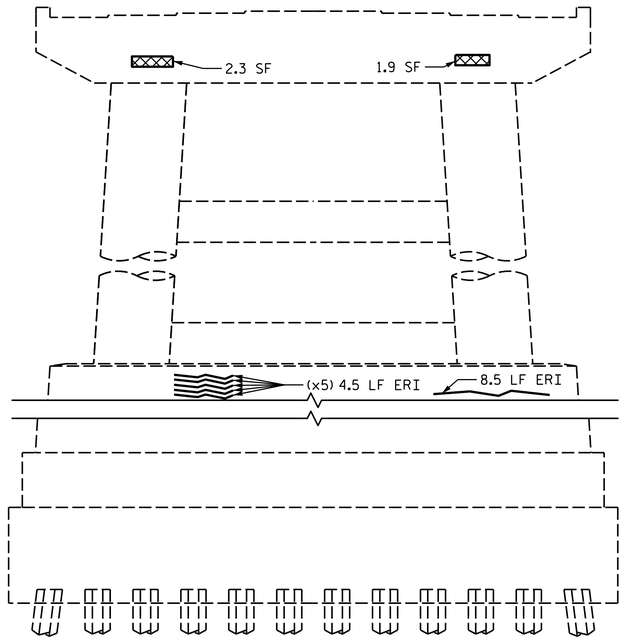

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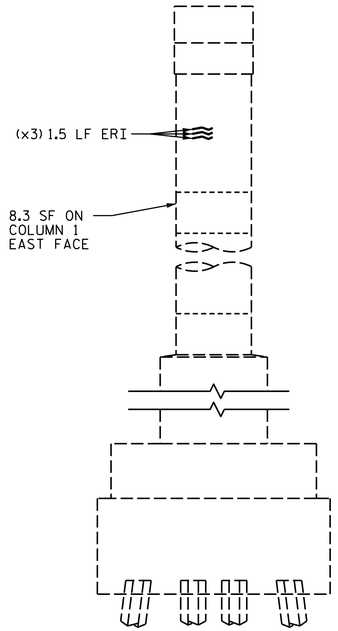

EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 50	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	6.7	3.4		
COLUMN/PILE	25.1	12.6		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	1.0	0.5		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		53.5		
COLUMN/PILE		4.5		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L Cullum 19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 50

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-88
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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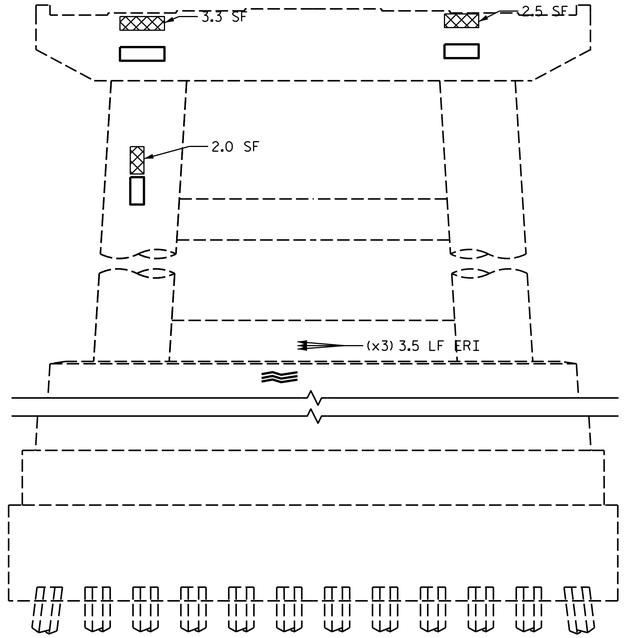
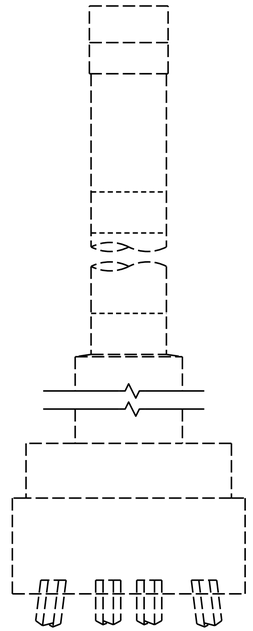
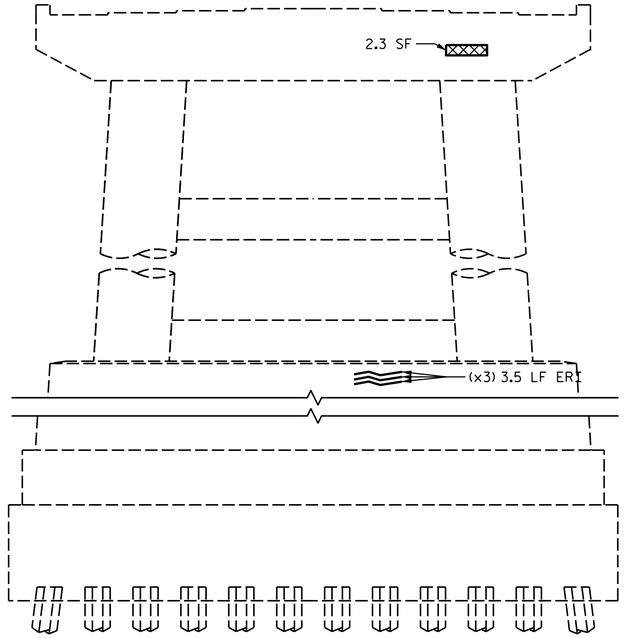
User:jduke



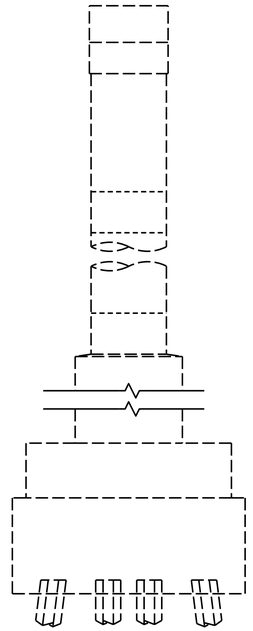
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

AS-BUILT REPAIR QUANTITY TABLE

BENT 51	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	8.1	4.1		
COLUMN/PILE	2.0	1.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	1.2	0.6		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		21.0		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 51

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-89
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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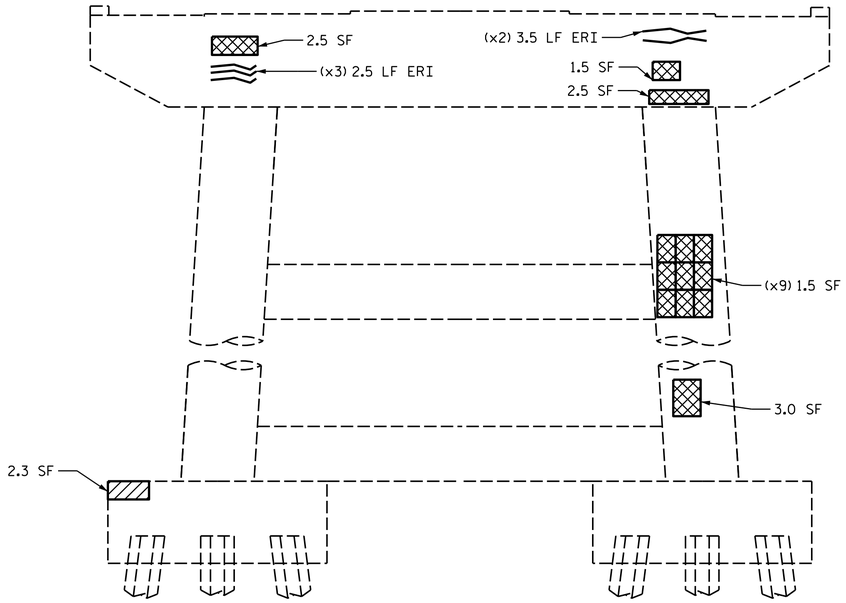
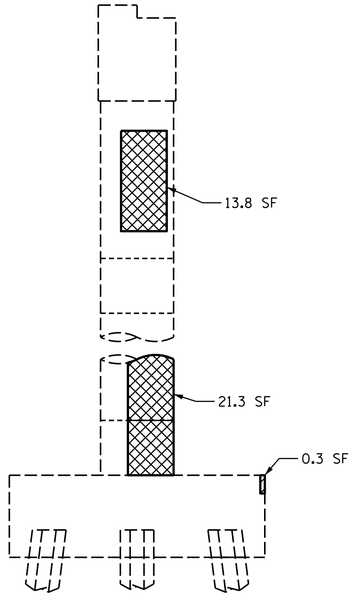
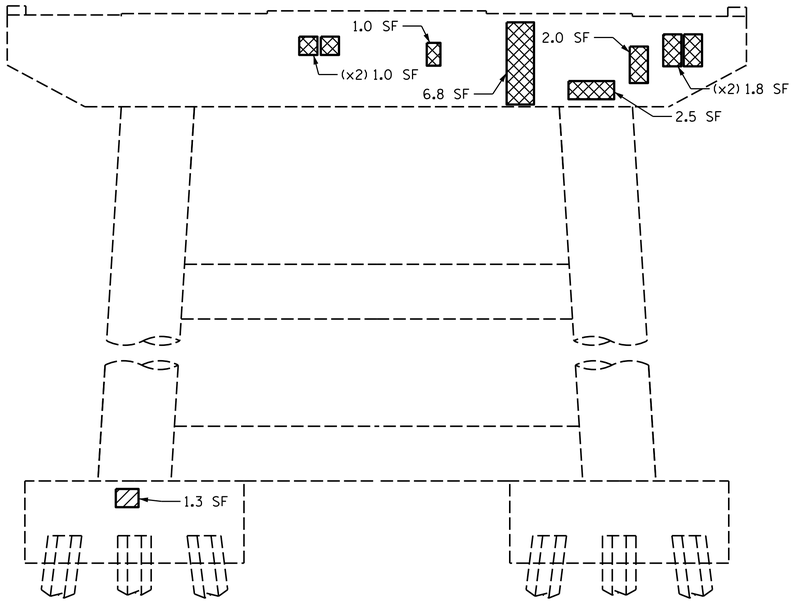


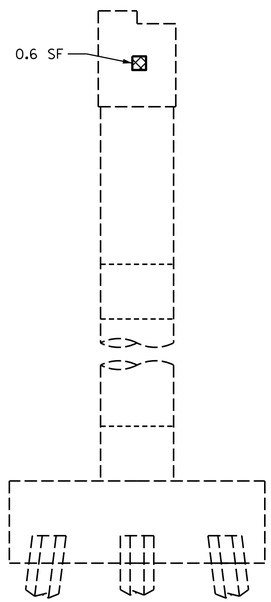
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 52	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	25.0	12.5		
COLUMN/PILE	51.6	25.8		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	3.8	1.9		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		14.5		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LEWIS CULLUM
DocuSigned by: Samuel L. 19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 52

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-90
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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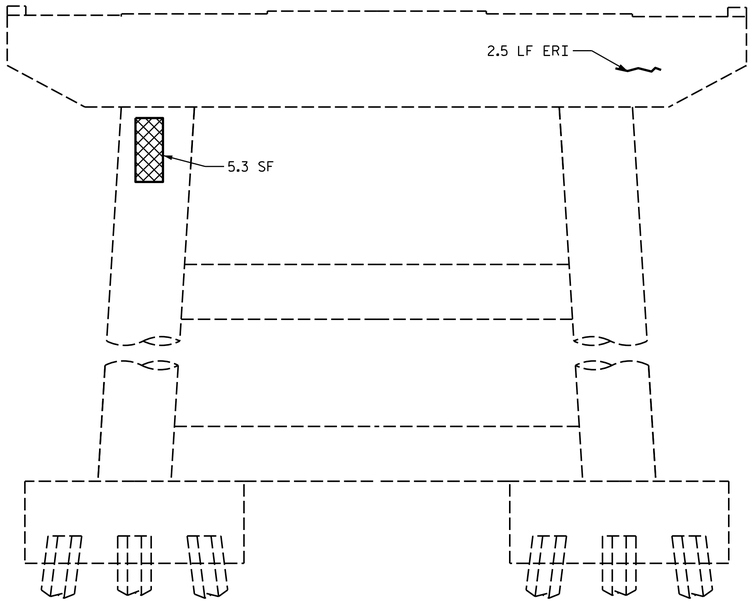
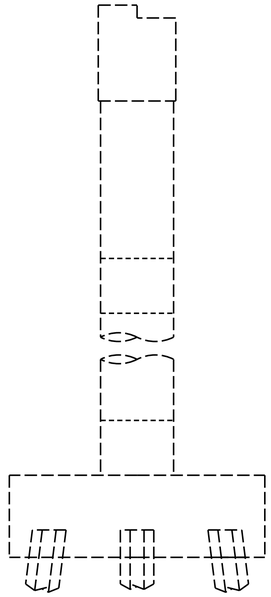
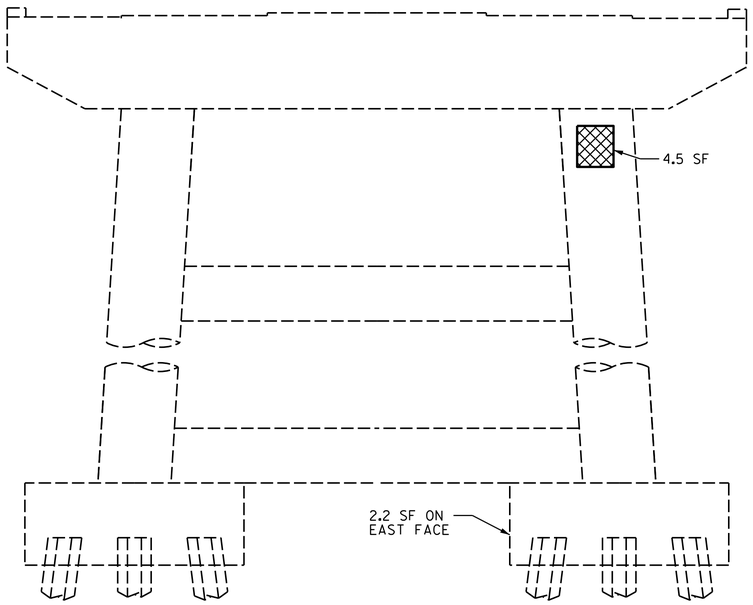
User:jduke



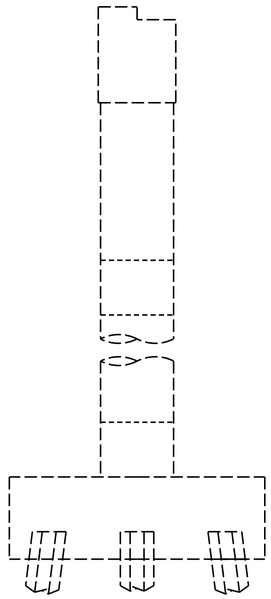
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 53	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	9.8	4.9		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	2.2	1.1		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		2.5		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

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DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LEWIS CULLUM
DocuSigned by: Samuel L. Cullum 19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 53

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-91
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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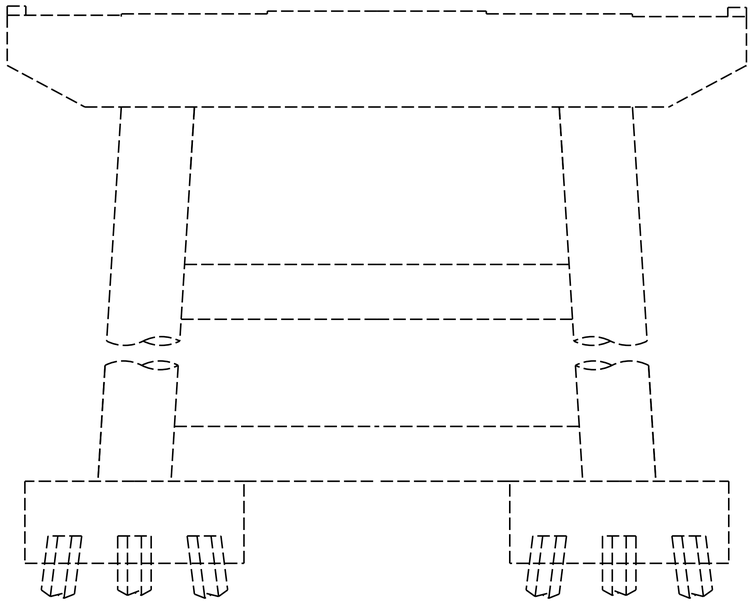
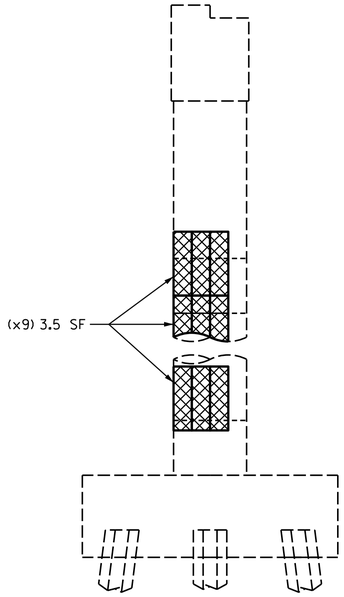
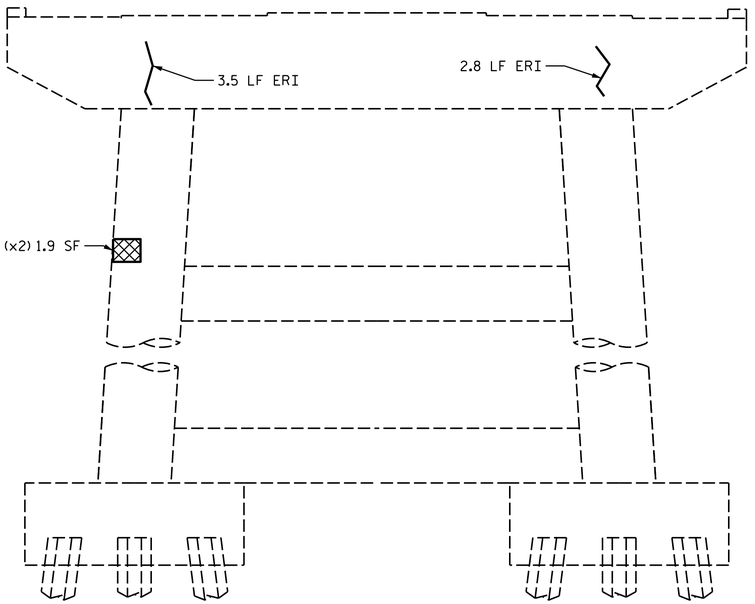


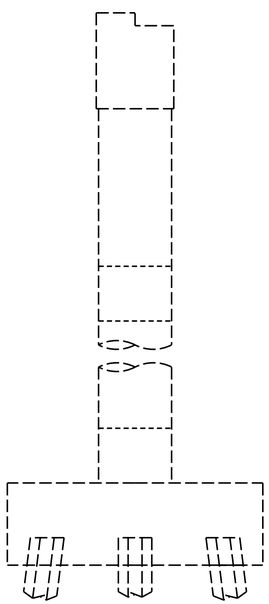
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 54	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	35.3	17.7		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		6.3		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 54

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-92
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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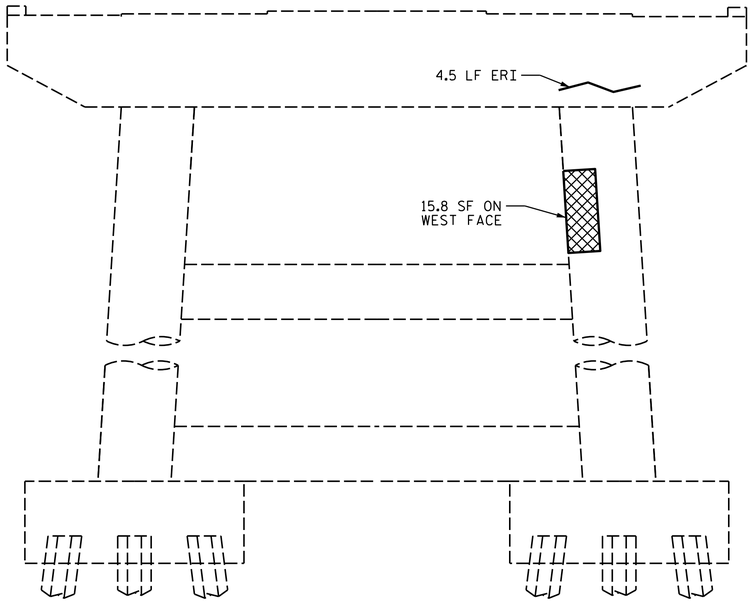
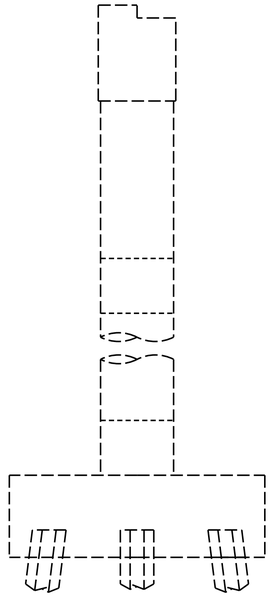
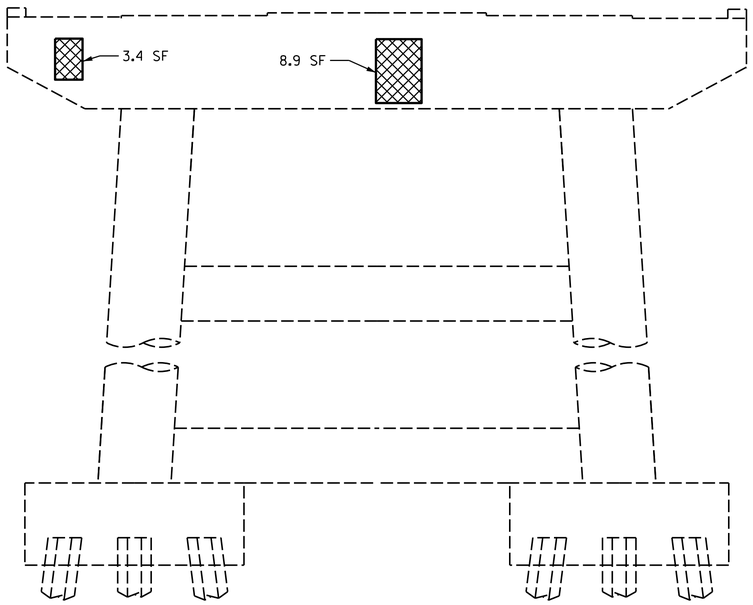


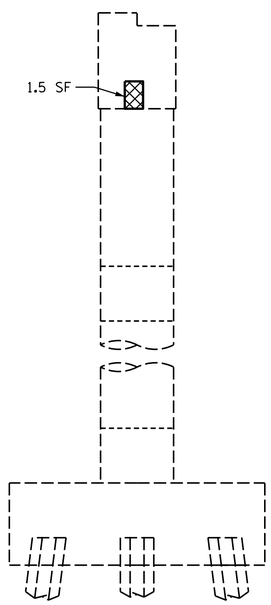
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 55	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	13.8	6.9		
COLUMN/PILE	15.8	7.9		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	2.1	1.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		4.5		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

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DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 55

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-93
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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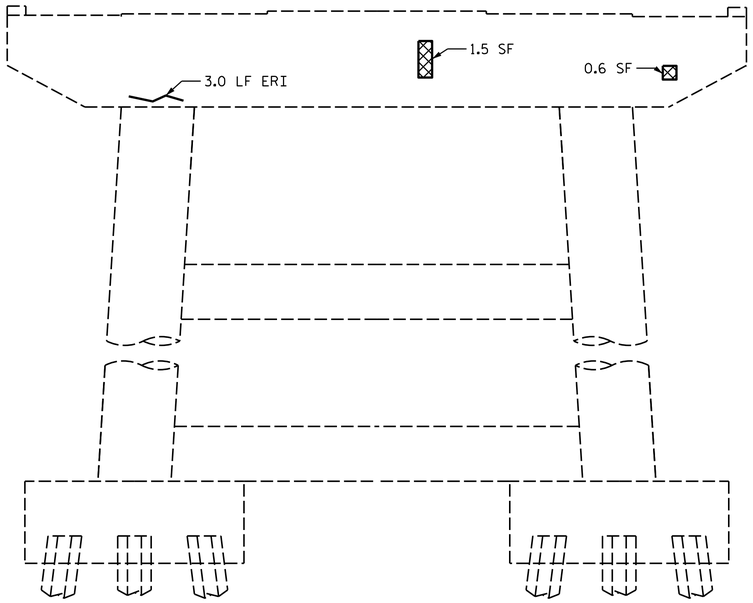
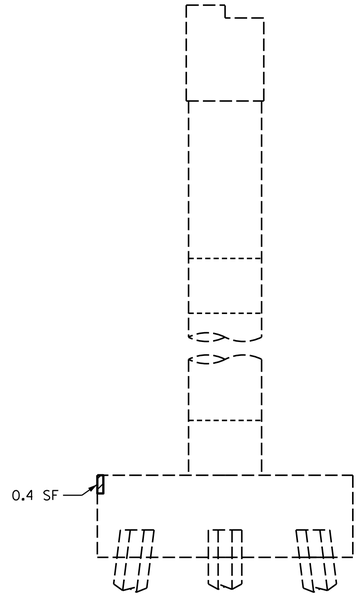
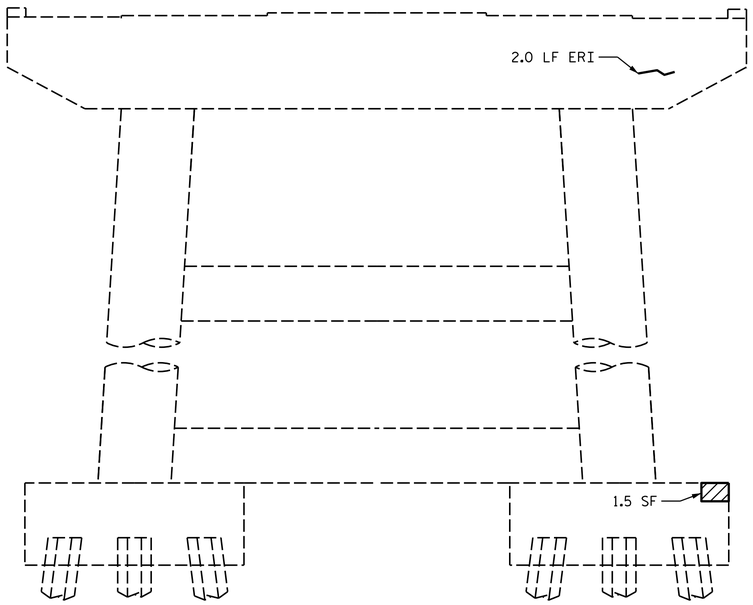


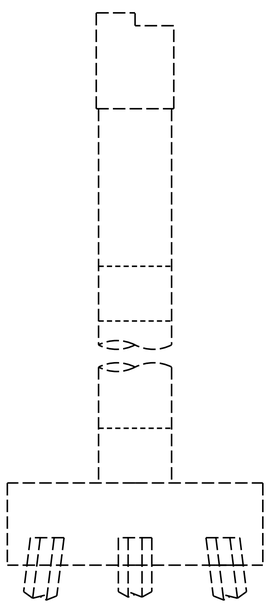
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 56	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	2.1	1.1		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	1.5	0.8		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		5.0		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LEE CULLUM
DocuSigned by: Samuel L. Cullum 19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 56

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-94
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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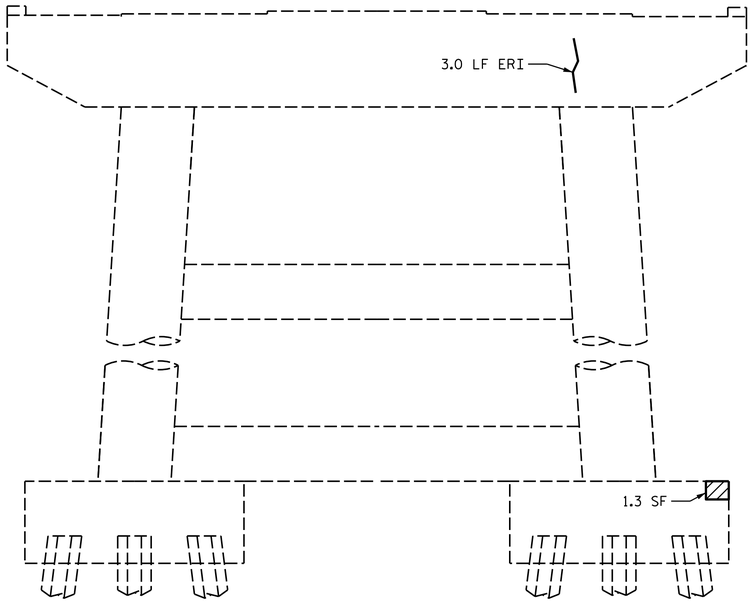
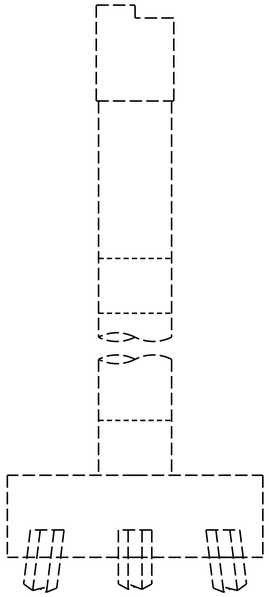
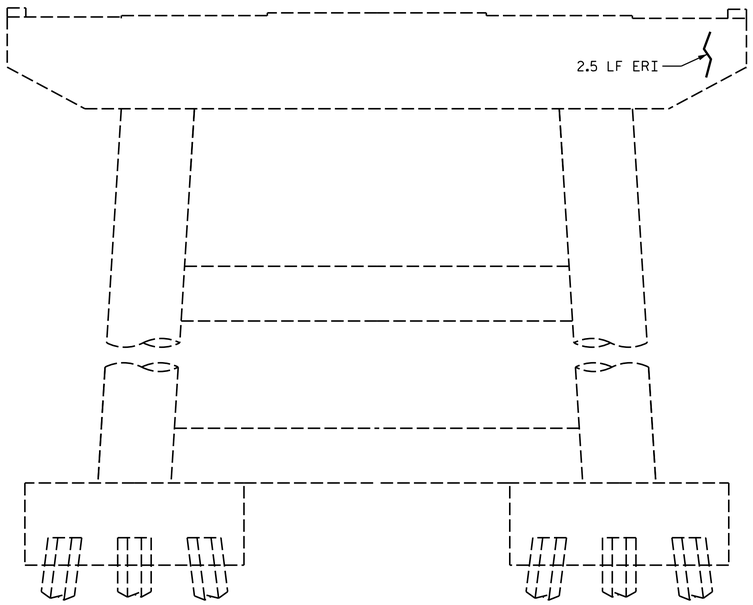
User:jduke



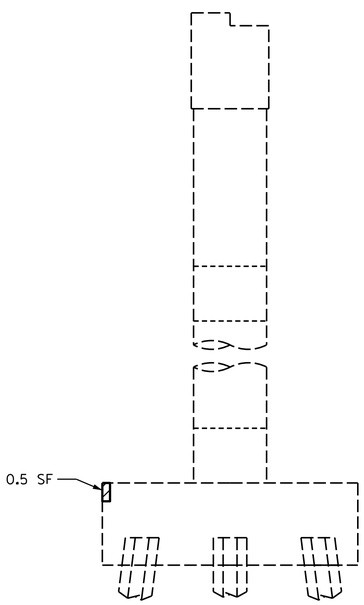
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 57	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	1.3	0.7		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		5.5		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
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DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 57

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-95
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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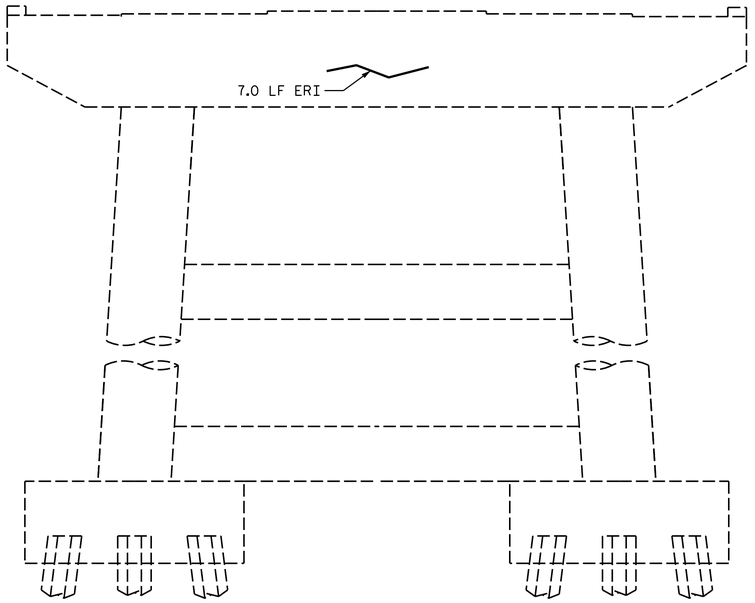
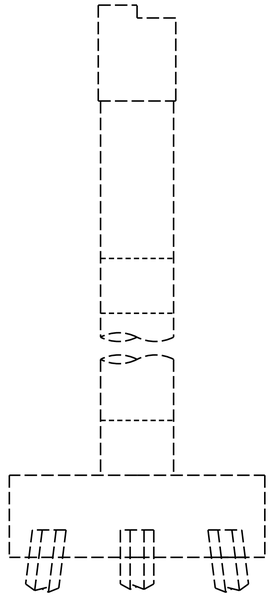
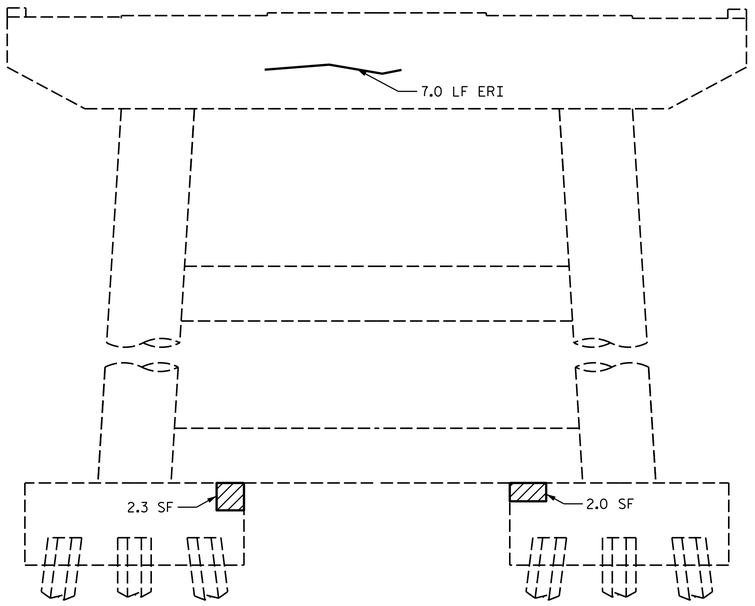
User:jduke



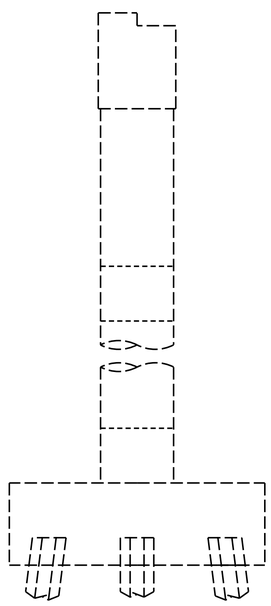
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 58	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	4.3	2.2		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		14.0		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LEE CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 58

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-96
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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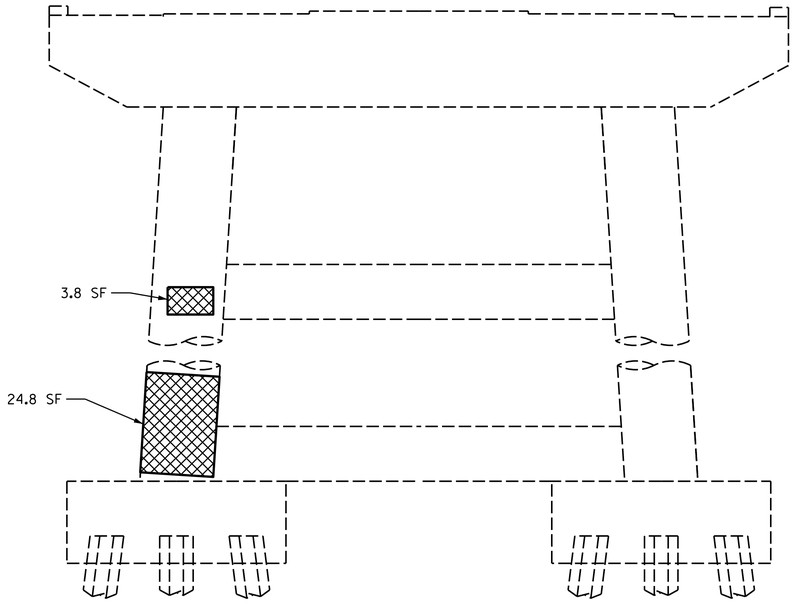
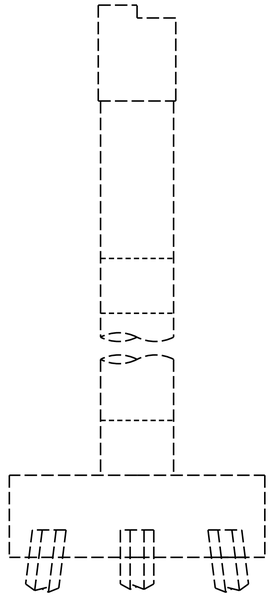
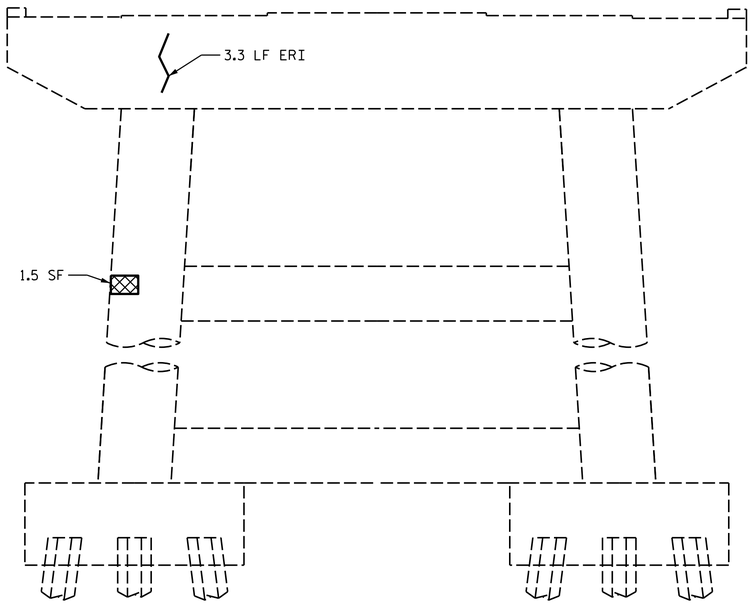


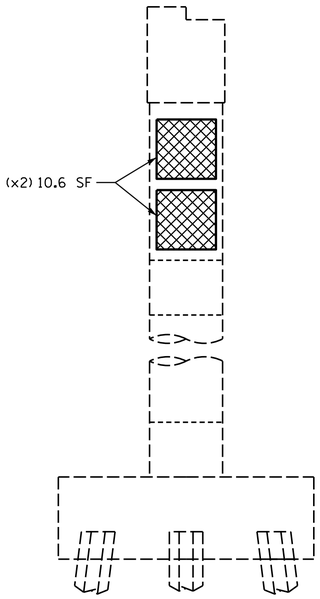
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 59	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	51.3	25.7		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		3.3		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 59

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-97
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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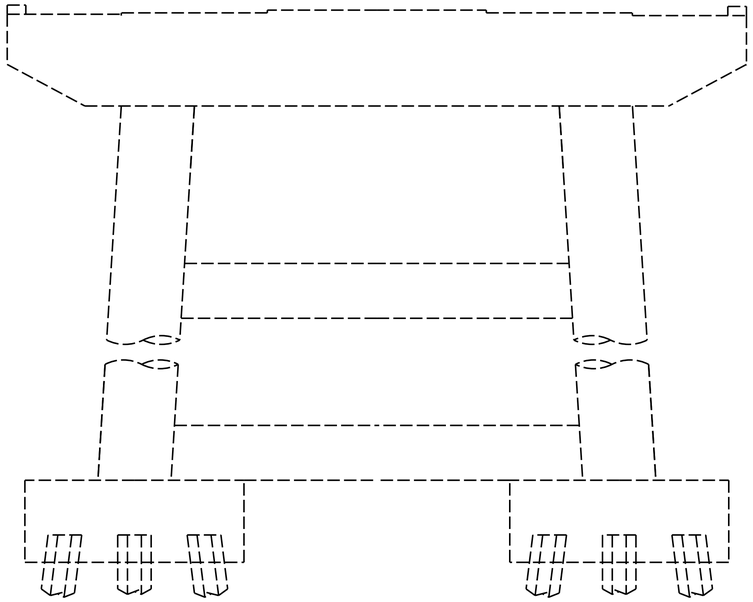
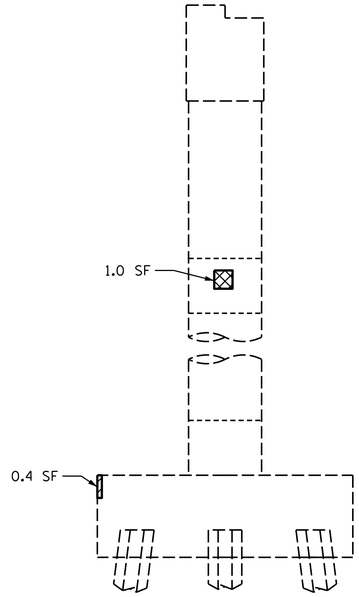
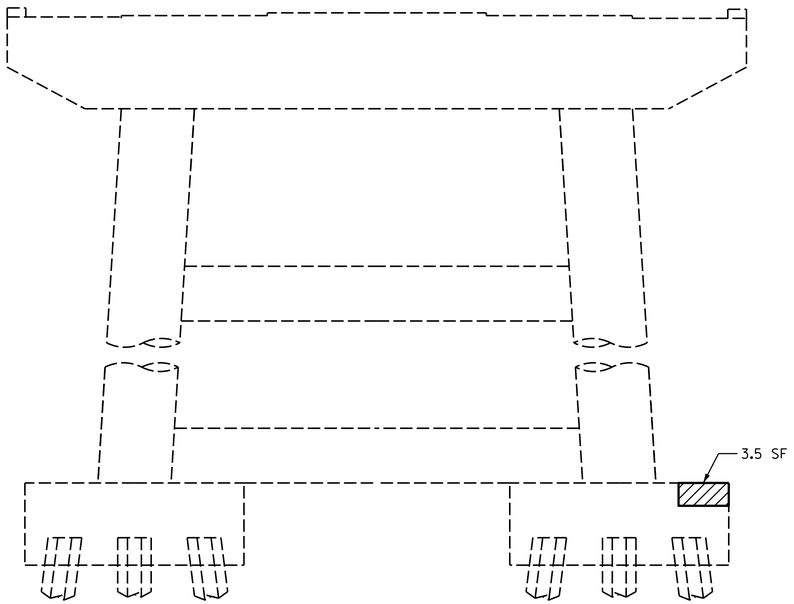
User:jduke



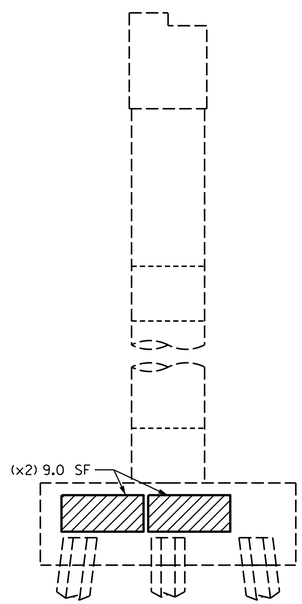
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 60	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	1.0	0.5		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	21.5	10.8		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

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FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

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ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 60

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-98
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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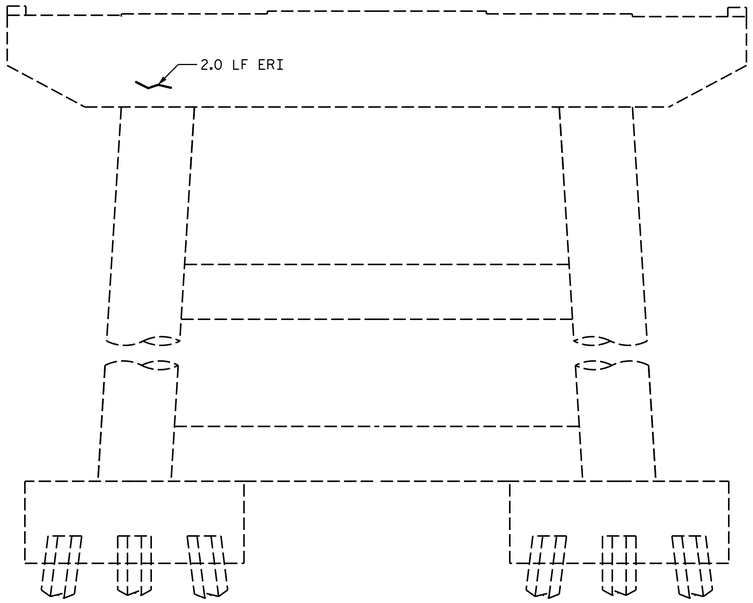
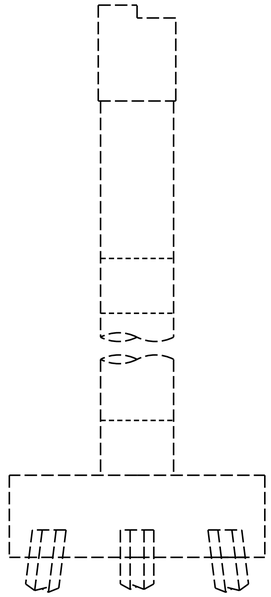
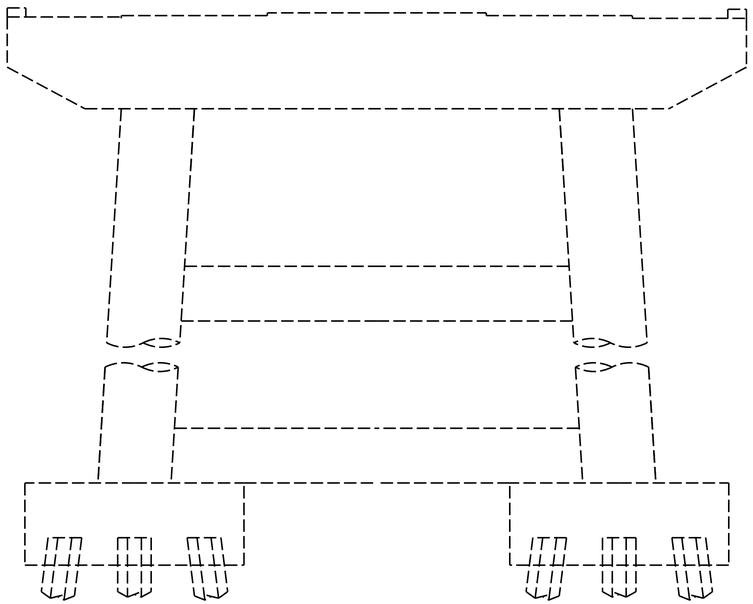


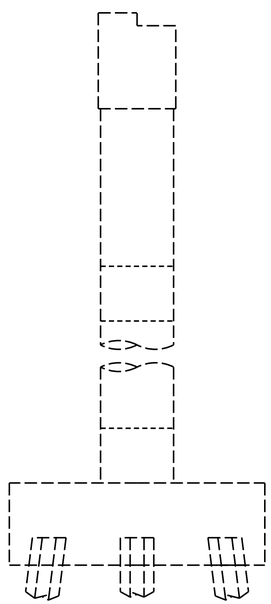
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 61	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		2.0		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

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ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 61

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-99
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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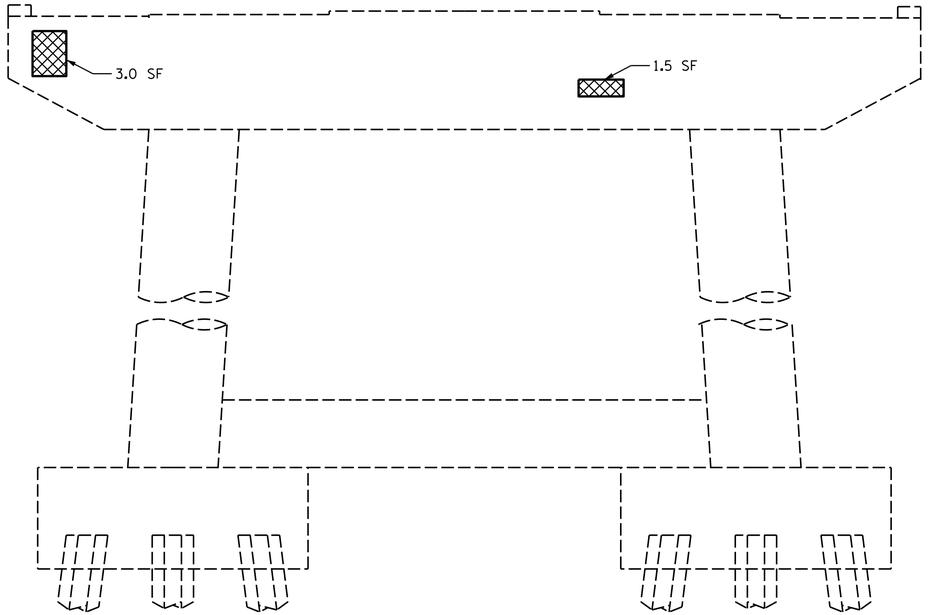
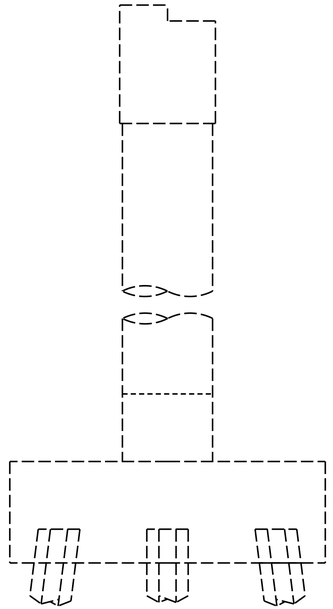
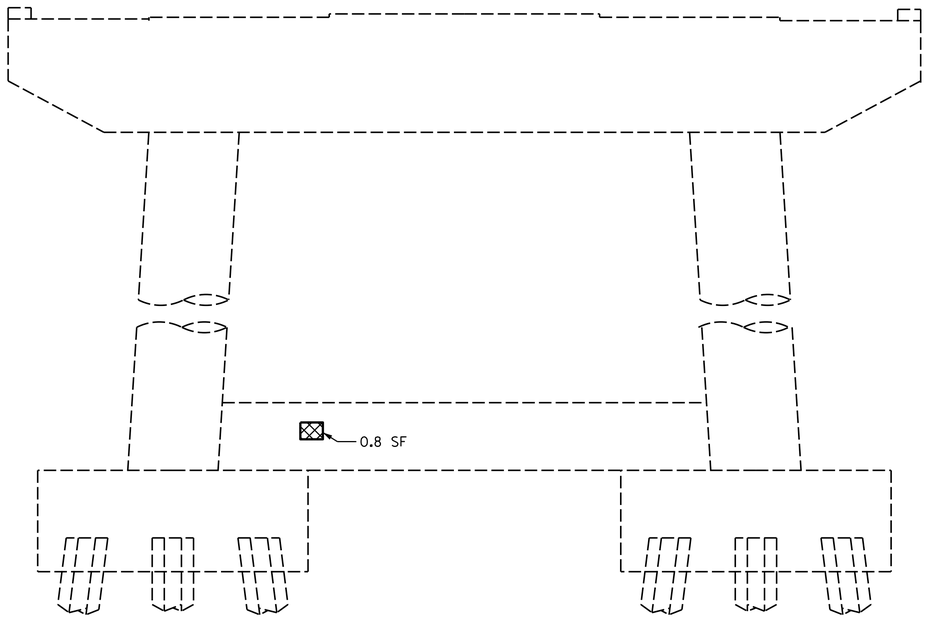
User:jduke



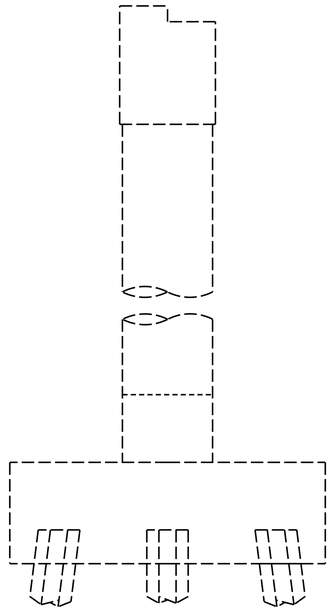
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 62	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	5.3	2.7		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.8	0.4		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		N/A		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

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PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L Cullum 19C97095C75A467...
4/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 62

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-100
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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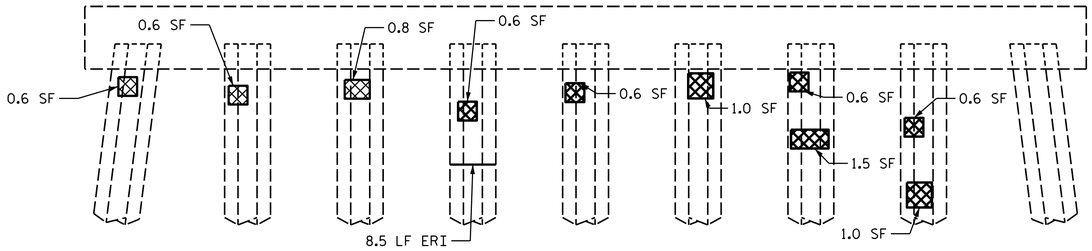
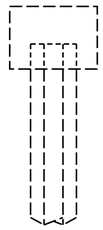


SOUTH ELEVATION



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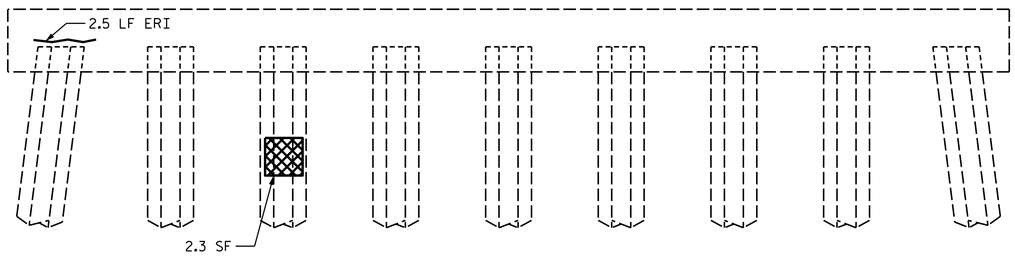
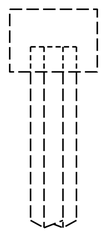


NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 63	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	10.2	5.1		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		2.5		
COLUMN/PILE		8.5		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		-		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS - SUBSTRUCTURE" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

FOR PILE CP JACKET REPAIRS, PRIOR TO ORDERING JACKETS, PERFORM A PILE JACKET SURVEY WITH THE ENGINEER AND THE ENGINEER OF RECORD TO DETERMINE PILE JACKET LOCATIONS AND LENGTHS.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2½" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

KCA KISINGER CAMPO & ASSOCIATES
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(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
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DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

CONCRETE REPAIR AREA | SHOTCRETE REPAIR AREA | EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 63

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-101
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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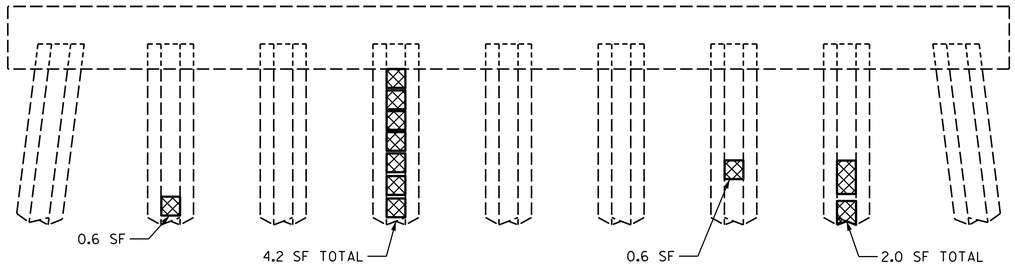
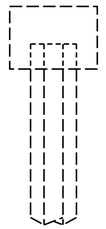
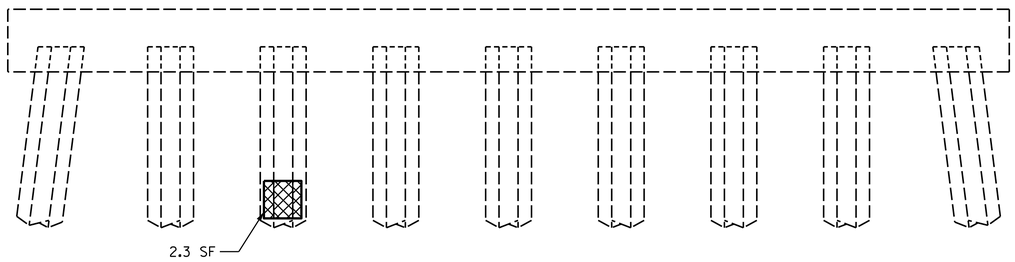
User:jduke



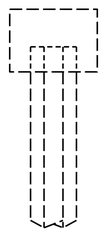
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 64	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	9.7	4.9		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		
PILE REPAIR JACKET		LIN. FT.		LIN. FT.
GALVANIC STRUCTURAL C.P. JACKET		-		

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CONCRETE REPAIR AREA

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM
DocuSigned by: Samuel L
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RALEIGH

SUBSTRUCTURE CONCRETE REPAIRS BENT 64

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-102
1			3			TOTAL SHEETS
2			4			111

4/12/2018
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User:jduke

Brunswick #14									As-Built Quantities	
Span #	Component		Location (ft. from nearest bent, etc)	Bent #	Amount	Defect Description	Length(ft.)	Width(ft.)	Assumed Depth (ft.)	Actual (C.F.)	Actual Depth (ft.)
29	Lt. Deck Overhang		Deck underside, 13' from Bent	29	1	Spall	2	1.5	0.5		
29	Rt. Deck Overhang		Deck underside, right overhang, 9' from Bent	29	1	Delam	1.5	1.5			
29	Lt. Deck Overhang		Deck underside, at random throughout	29	1	Delam	2.25	2.25			
29	Beam	1	Exposed reinforcing, bottom of beam, 13' from Bent	29	1	Spall	1.5	1.5	0.5		
29	Beam	1	West face, North intermediate diaphragm		1	Unsound Patch	1	1			
29	Beam	2	West face, 3' from Bent	28	1	Cracking	1.5				
29	Beam	2	with exposed reinforcing, East face at Bent	29	1	Spall	1	0.75			
29	Beam	2	with exposed reinforcing, West face, 1' from Bent	29	1	Exposed Rebar	0.75	0.75			
29	Beam	3	Bottom of beam, 16' from Bent	28	1	Unsound Patch	3	1.25			
30	Beam	1	East face at Bent	30	1	Spall	1.25	0.75			
30	Beam	1	West face, South intermediate diaphragm		1	Unsound Patch	1	1			
30	Beam	2	Bottom of beam, 1' from Bent	30	1	Spall	1.5	2.5			
30	Beam	2	West face at Bent	30	1	Spall	1.25	0.75			
30	Beam	2	West face at Bent	29	1	Spall	1	0.75			
30	Beam	4	West face at Bent	30	1	Spall	1	1			
30	Beam	4	Bottom of Beam	30	1	Spall	0.75	1			
31	Rt. Deck Overhang		deck underside, at Bent	30	1	Spall	2	2			
31	Beam	1	West face, North intermediate diaphragm		1	Unsound Patch	1	1			
31	Beam	2	Bottom of beam at mid-span		1	Spall	1.5	1			
31	Beam	6	East face, South face intermediate diaphragm		1	Unsound Patch	1	1			
32	Beam	1	Bottom of beam, 1' from Bent	31	2	Spall	1	1			
32	Beam	4	East face, at Bent	32	1	Spall	1	0.75			
32	Beam	5	East face at Bent	32	1	Cracking	1				
32	Beam	5	South face at Bent	31	1	Spall	0.75	1.25			
32	Beam	5	West face at Bent	32	1	Spall	0.75	0.75			
32	Beam	5	Bottom of cap, 1' from Bent	31	1	Spall	1	0.75			
33	Rt. Deck Overhang		deck underside, at Bent	32	1	Delam	1.5	2.5			
33	Beam	1	Bottom of beam at Bent	32	1	Spall	1	1.25			
33	Beam	2	Bottom of beam, 16' from Bent	33	5	Unsound Patch	2	1.25			
33	Beam	2	Bottom of beam, 17' from Bent	33	1	Delam	0.75	0.75			
33	Beam	3	with exposed reinforcing, East face at Bent	32	1	Spall	1	0.75			
33	Beam	4	West face at Bent	32	1	Spall	0.75	1			
33	Beam	6	with exposed strand, at bottom of beam, 7' from Bent	33	1	Spall	2.5	1.25			
33	Beam	6	West face at Bent	32	1	Spall	0.75	0.75			
34	Beam	3	with exposed reinforcing, West face at Bent	34	1	Spall	1	0.75			
34	Beam	6	with exposed reinforcing, West face at Bent	34	1	Spall	1	0.75			
35	Lt. Deck Overhang		deck underside at Bent	35	1	Spall	2	1	0.75		
36	Lt. Deck Overhang		deck underside at Bent	35	1	Spall	2.5	2.5			
36	Beam	1	with exposed strand, South face, at Bent	35	1	Spall	0.75	1.25			
36	Beam	2	West face at Bent	36	1	Spall	0.75	0.75			
36	Beam	2	Exposed reinforcing, bottom of beam, 1' from Bent	36	1	Spall	0.75	1			
36	Beam	3	Vertical & longitudinal cracks, East face at Bent	36	1	Cracking	1				
36	Beam	4	with exposed strand, East face at Bent	35	1	Spall	1.25	1.25			
36	Beam	5	with exposed strand, East & West faces at Bent	35	2	Spall	1.5	1.25	0.5		
36	Beam	5	North face at Bent	36	1	Spall	0.75	1			
36	Beam	6	Vertical cracks, East face at Bent	36	1	Rust Staining	0.75				
36	Beam	6	with exposed strand, North face at Bent	36	1	Spall	0.75	0.75			
37	Lt. Deck Overhang		deck underside at Bent	36	1	Unsound Patch	2.5	1.25			
37	Beam	1	Vertical crack, East face at Bent	37	1	Cracking	1				
37	Beam	4	with exposed strand, South face at Bent	36	1	Spall	1	1			

Brunswick #14										As-Built Quantities	
Span #	Component		Location (ft. from nearest bent, etc)	Bent #	Amount	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	Actual (C.F.)	Actual Depth (ft.)
37	Beam	4	with exposed reinforcing, West face at Bent	37	1	Spall	0.75	0.75			
37	Beam	5	with exposed strand, North face at Bent	37	1	Spall	1.25	1.25			
37	Beam	5	with exposed reinforcing, bottom of beam, 1' from Bent	37	1	Spall	0.75	1			
38	Beam	1	West face, at intermediate diaphragm locations		2	Unsound Patch	1	1			
38	Beam	1	at random throughout East & West faces of beam		2	Exposed Rebar	1.5	1.5			
38	Beam	1	Bottom of beam at mid-span		2	Exposed Rebar	1	1			
38	Beam	2	exposed reinforcing, East face, 4' from Bent	37	1	Exposed Rebar	1.5	1.5			
38	Beam	2	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1	1			
38	Beam	3	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1	1			
38	Beam	4	longitudinal crack, East face, 4' from Bent	38	1	Cracking	1.25				
38	Beam	4	Bottom of beam at Bent	38	1	Spall	1	1.25			
38	Beam	4	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1	1			
38	Beam	4	exposed reinforcing, at random, on East & West faces		3	Exposed Rebar	1.75	1.75			
38	Beam	5	exposed reinforcing, bottom of beam at mid-span		4	Exposed Rebar	1.5	1.5			
38	Beam	5	Bottom of beam, 25' from Bent	37	1	Exposed Rebar	0.75	0.75			
38	Beam	6	longitudinal crack, East face, starts at Bent	38	1	Cracking	6.5				
38	Beam	6	East face, South intermediate Diaphragm		1	Unsound Patch	1	1			
38	Beam	6	exposed reinforcing, bottom of beam at mid-span		1	Exposed Rebar	1.25	1.25			
39	Concrete Deck		with exposed reinforcing, deck underside, 18' from Bent	38	1	Spall	2	2	0.5		
39	Beam	1	exposed reinforcing, at random throughout West face		4	Exposed Rebar	1.5	1.5			
39	Beam	1	exposed reinforcing, bottom of beam at mid-span		4	Exposed Rebar	1	1			
39	Beam	2	North face at Bent	39	1	Spall	0.75	0.75			
39	Beam	2	exposed reinforcing, bottom of beam at mid-span		4	Exposed Rebar	1	1			
39	Beam	3	Vertical crack, East face at Bent	39	1	Cracking	1.25				
39	Beam	3	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
39	Beam	3	exposed reinforcing, at random on East & West faces		3	Exposed Rebar	1.5	1.5			
39	Beam	4	West face at Bent	39	1	Spall	0.75	0.75			
39	Beam	4	exposed reinforcing, East face, 25' from Bent	38	1	Exposed Rebar	0.75	0.75			
39	Beam	4	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.5	1.5			
39	Beam	5	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
39	Beam	6	longitudinal crack, East face, starts at Bent	39	1	Cracking	5.5				
39	Beam	6	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
40	Rt. Deck Overhang		deck underside at Bent	39	1	Unsound Patch	2	0.75			
40	Lt. Deck Overhang		with exposed reinforcing, deck underside, 9' from Bent	40	1	Spall	0.75	0.75			
40	Beam	1	West face at South intermediate diaphragm		1	Unsound Patch	1	1			
40	Beam	1	Bottom of beam at Bent	39	1	Spall	1	1			
40	Beam	1	exposed reinforcing, at random on West face		2	Exposed Rebar	1.5	1.5			
40	Beam	1	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
40	Beam	2	South face at Bent	39	1	Spall	0.75	1			
40	Beam	2	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
40	Beam	2	exposed reinforcing, bottom of beam, 1' from Bent	39	1	Exposed Rebar	0.75	0.75			
40	Beam	3	with exposed reinforcing, bottom of beam at Bent	40	1	Spall	1	1.5			
40	Beam	3	Vertical crack, East face, 3' from Bent	40	1	Rust Staining	0.75				
40	Beam	3	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
40	Beam	3	exposed reinforcing, at random throughout West face		9	Exposed Rebar	1.5	1.5			
40	Beam	4	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
40	Beam	4	exposed reinforcing, at random on East & West faces		3	Exposed Rebar	1.5	1.5			
40	Beam	5	longitudinal cracks, East face, 6' from Bent	40	3	Cracking	1.5				
40	Beam	5	longitudinal crack,West face, 4' from Bent	39	1	Cracking	1.5				
40	Beam	5	longitudinal cracks, bottom of beam at Bent	40	2	Cracking	1.5				

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

SHEET 1 OF 6

NOTES:

ALL DEFECTS WERE TAKEN FROM THE 2017 BRIDGE INSPECTION REPORT.

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LAWRENCE CULLUM

DocuSigned by: Samuel Cullum 19C97095C75A467...

4/12/2018

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STATE OF NORTH CAROLINA
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SUPERSTRUCTURE DEFICIENCIES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-103
1			3			TOTAL SHEETS
2			4			111

KCA KISINGER CAMPO & ASSOCIATES
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User:jduke

Brunswick #14

Span #	Component		Location (ft. from nearest bent, etc)	Bent #	Amount	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	As-Built Quantities: Actual (C.F.)	As-Built Quantities: Actual Depth (ft.)
40	Beam	5	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
40	Beam	5	exposed reinforcing, at random on East & West faces		8	Exposed Rebar	1.5	1.5			
40	Beam	6	at intermediate diaphragms		2	Unsound Patch	1.5	1.5			
40	Beam	6	exposed reinforcing, bottom of beam at mid-span		4	Exposed Rebar	1	1			
40	Beam	6	exposed reinforcing, at random on East & West faces		8	Exposed Rebar	1.5	1.5			
41	Beam	1	exposed reinforcing, at random on East & West faces		12	Exposed Rebar	1.5	1.5			
41	Beam	1	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
41	Beam	2	longitudinal cracks, East face, 4' from Bent	41	2	Cracking	1.5				
41	Beam	2	with exposed strand, North end at Bent	41	1	Spall	0.75	1	0.5		
41	Beam	2	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
41	Beam	2	exposed reinforcing, East face, 3' from Bent	40	2	Exposed Rebar	1.25	1.25			
41	Beam	3	longitudinal crack, West face, 4' from Bent	41	1	Cracking	1.5				
41	Beam	3	Vertical crack, East face, 25' from Bent	40	1	Rust Staining	0.75				
41	Beam	3	East face, 14' from Bent	41	1	Spall	0.75	1			
41	Beam	3	exposed reinforcing, bottom of beam at mid-span		4	Exposed Rebar	1	1			
41	Beam	3	exposed reinforcing, at random on East face		5	Exposed Rebar	1	1			
41	Beam	4	South face at Bent	40	1	Spall	0.75	1	0.5		
41	Beam	4	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
41	Beam	5	Bottom of beam at Bent	40	1	Spall	0.75	0.75			
41	Beam	5	exposed reinforcing, West face, 30' from Bent	40	1	Exposed Rebar	1.5	1.5			
41	Beam	5	exposed reinforcing, bottom of beamat mid-span		2	Exposed Rebar	1.25	1.25			
41	Beam	6	exposed reinforcing, bottom of beamat mid-span		2	Exposed Rebar	1.25	1.25			
42	Beam	1	with exposed strand, South face at Bent	41	1	Spall	0.75	1	0.75		
42	Beam	1	exposed reinforcing, at random on East face		3	Exposed Rebar	1.5	1.5			
42	Beam	1	exposed reinforcing, bottom of beam at mid-span		4	Exposed Rebar	1	1			
42	Beam	2	exposed reinforcing, East face, 3' from Bent	41	1	Exposed Rebar	1.5	1.5			
42	Beam	2	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
42	Beam	3	longitudinal crack, West face, starts 3' from Bent	41	1	Cracking	3.5				
42	Beam	3	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
42	Beam	4	longitudinal cracks, bottom of beam, starts at Bent	42	2	Cracking	3.25				
42	Beam	4	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
42	Beam	5	with exposed reinforcing, bottom of beam at Bent	41	1	Spall	0.75	1.75			
42	Beam	5	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
42	Beam	6	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
42	Beam	6	exposed reinforcing, at random on East face		3	Exposed Rebar	1.5	1.5			
43	Lt. Deck Overhang		deck underside, at random throughout		2	Delam	1.5	1.5			
43	Beam	1	with exposed reinforcing, bottom of beam, 2' from Bent	43	1	Spall	0.75	0.75			
43	Beam	1	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
43	Beam	1	exposed reinforcing, West face at mid-span		5	Exposed Rebar	1.5	1.5			
43	Beam	2	exposed strand, North face at Bent	43	1	Spall	0.75	1.5	0.5		
43	Beam	2	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
43	Beam	3	with exposed reinforcing, bottom of beam at Bent	43	1	Spall	0.75	2			
43	Beam	3	exposed reinforcing, bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
43	Beam	4	with exposed reinforcing, bottom of beam at Bent	43	1	Spall	1	2			
43	Beam	4	Vertical crack with rust staining, West face, 20' from Bent	42	1	Rust Staining	0.75				
43	Beam	4	West face, 3' from Bent	42	1	Exposed Rebar	1.5	1.5			
43	Beam	4	Bottom of beam, 35' from Bent	42	2	Exposed Rebar	1.25	1.25			
43	Beam	5	with exposed reinforcing, bottom of beam at Bent	42	2	Spall	1.25	1.25			
43	Beam	5	with exposed reinforcing, bottom of beam at mid-span	43	1	Spall	1	2			
43	Beam	5	Bottom of beam at mid-span		4	Exposed Rebar	1	1			

Brunswick #14

Span #	Component		Location (ft. from nearest bent, etc)	Bent #	Amount	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	As-Built Quantities: Actual (C.F.)	As-Built Quantities: Actual Depth (ft.)
43	Beam	5	with exposed reinforcing, East face, 2' from Bent	43	1	Exposed Rebar	0.75	0.75			
43	Beam	6	with exposed reinforcing, West face, 2' from Bent	42	1	Spall	1	0.75			
43	Beam	6	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
44	Lt. Deck Overhang		Deck underside, 33' from Bent	43	1	Spall	2	2			
44	Lt. Deck Overhang		deck underside, at random throughout		2	Delam	1	1			
44	Beam	1	longitudinal cracks, East face, starts 2' from Bent	44	1	Cracking	3.5				
44	Beam	1	Bottom of beam at mid-span		4	Exposed Rebar	1	1			
44	Beam	2	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
44	Beam	2	at random throughout East face of beam		3	Exposed Rebar	1.5	1.5			
44	Beam	3	East face at Bent	44	1	Spall	1.25	1			
44	Beam	3	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
44	Beam	4	with exposed reinforcing, bottom of beam at Bent	43	1	Spall	0.75	1.5			
44	Beam	4	Bottom of beam, 35' from Bent	43	1	Exposed Rebar	1.5	1.5			
44	Beam	4	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
44	Beam	5	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
44	Beam	5	at random throughout West face of beam		3	Exposed Rebar	1.5	1.5			
44	Beam	6	Longitudinal crack, West face, starts 3' from Bent	43	1	Cracking	3.5				
44	Beam	6	with exposed reinforcing, West face, 25' from Bent	43	1	Spall	1	1			
44	Beam	6	at random throughout East & West faces of beam		15	Exposed Rebar	1.5	1.5			
44	Beam	6	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
45	Beam	1	West face, at diaphragm locations		2	Unsound Patch	1	1			
45	Beam	1	longitudinal crack, East face, starts 2' from Bent	45	1	Cracking	6.5				
45	Beam	1	Bottom of beam at mid-span		4	Exposed Rebar	1	1			
45	Beam	1	at random throughout East & West faces of beam		7	Exposed Rebar	1.5	1.5			
45	Beam	2	Bottom of beam, 26' from Bent	44	1	Unsound Patch	2	1.5			
45	Beam	2	Longitudinal cracking, East & West faces, starts at Bent	45	1	Cracking	4.5				
45	Beam	2	Bottom of beam, 17' from Bent	44	1	Delam	4.5	1.5			
45	Beam	2	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
45	Beam	3	with exposed reinforcing, bottom of beam at Bent	44	1	Spall	1	1.5			
45	Beam	3	Longitudinal cracking, East & West faces, 2' from Bent	45	1	Cracking	5.5				
45	Beam	3	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
45	Beam	4	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
45	Beam	4	West face, 2' from Bent	44	1	Exposed Rebar	1	0.75			
45	Beam	5	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
45	Beam	6	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
45	Beam	6	at random throughout East & West faces of beam		7	Exposed Rebar	1.5	1.5			
46	Beam	1	Diagonal crack, East face of bottom flange at Bent	46	1	Cracking	1				
46	Beam	1	West face, at diaphragm locations		2	Unsound Patch	1	1			
46	Beam	1	at random throughout East & West faces of beam		1	Exposed Rebar	1.5	1.5			
46	Beam	1	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
46	Beam	2	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
46	Beam	2	at random throughout East & West faces of beam		4	Exposed Rebar	1.5	1.5			
46	Beam	3	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
46	Beam	3	at random throughout West face of beam		5	Exposed Rebar	1.5	1.5			
46	Beam	4	Beam end at Bent	46	1	Spall	0.75	1			
46	Beam	4	with exposed reinforcing, bottom of beam at Bent	46	1	Spall	0.75	1			
46	Beam	4	at random throughout East face of beam		2	Exposed Rebar	1.5	1.5			
46	Beam	4	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
46	Beam	5	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
46	Beam	5	at random throughout East & West faces of beam		8	Exposed Rebar	1.5	1.5			

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

SHEET 2 OF 6

NOTES:

ALL DEFECTS WERE TAKEN FROM THE 2017 BRIDGE INSPECTION REPORT.

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

DocuSigned by: Samuel L Cullum 19C97095C75A467...

4/12/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DEFICIENCIES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-104
1			3			TOTAL SHEETS
2			4			111

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KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

4/12/2018
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User:jduke

Brunswick #14										As-Built Quantities	
Span #	Component		Location (ft. from nearest bent, etc)	Bent #	Amount	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	Actual (C.F.)	Actual Depth (ft.)
46	Beam	6	South face at Bent	46	1	Spall	0.75	1.25			
46	Beam	6	Bottom of beam at mid-span		4	Exposed Rebar	1	1			
46	Beam	6	at random throughout East & West faces of beam		6	Exposed Rebar	1.5	1.5			
47	Beam	1	at random throughout East & West faces		22	Exposed Rebar	1.5	1.5			
47	Beam	1	Bottom of beam at mid-span		3	Exposed Rebar	1	1			
47	Beam	2	Bottom of beam at Bent	46	1	Spall	1.25	1			
47	Beam	2	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
47	Beam	2	at random throughout West face		4	Exposed Rebar	1.5	1.5			
47	Beam	3	Bottom of beam, 2' from Bent	47	1	Exposed Rebar	1.5	1.5			
47	Beam	3	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
47	Beam	3	at random throughout East & West faces of beam		8	Exposed Rebar	1.5	1.5			
47	Beam	3	East face, 3' from Bent	47	1	Exposed Rebar	1	1			
47	Beam	4	with exposed reinforcing, bottom of beam at Bent	46	2	Spall	1	1			
47	Beam	4	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
47	Beam	5	South face at Bent	46	1	Spall	0.75	1	0.75		
47	Beam	5	North face at Bent	47	1	Spall	0.75	1	0.5		
47	Beam	5	South face at Bent	46	1	Spall	0.75	1			
47	Beam	5	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
47	Beam	6	with exposed reinforcing, bottom of beam at Bent	46	1	Spall	1	1			
47	Beam	6	Longitudinal crack, bottom of beam, starts at Bent	47	1	Cracking	2.5				
47	Beam	6	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
47	Beam	6	at random throughout East face of beam		3	Exposed Rebar	1.5	1.5			
48	Beam	1	with exposed reinforcing, bottom of beam at Bent	47	1	Spall	1	2.25			
48	Beam	1	West face, 30' from Bent	47	1	Unsound Patch	1	1			
48	Beam	1	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
48	Beam	1	with exposed reinforcing, East face, 2' from Bent	47	1	Exposed Rebar	0.75	0.75			
48	Beam	2	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
48	Beam	2	with exposed reinforcing, East face, 3' from Bent	47	2	Exposed Rebar	0.75	0.75			
48	Beam	3	with exposed reinforcing, bottom of beam at Bent	47	1	Spall	1	1			
48	Beam	3	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
48	Beam	3	East face, near Bent	47	2	Exposed Rebar	1.5	1.5			
48	Beam	3	East face, 2' from Bent	48	1	Exposed Rebar	0.75	0.75			
48	Beam	4	with exposed reinforcing, bottom of beam at Bent	47	2	Spall	1	1.25			
48	Beam	4	at random throughout East & West faces		14	Exposed Rebar	0.75	0.75			
48	Beam	4	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
48	Beam	5	with exposed reinforcing, bottom of beam at Bent	47	1	Spall	0.75	1.25			
48	Beam	5	at random throughout East & West face		13	Exposed Rebar	0.75	0.75			
48	Beam	5	Bottom of beam at mid-span		4	Exposed Rebar	1	1			
48	Beam	6	at random throughout, East & West faces		11	Exposed Rebar	0.75	0.75			
48	Beam	6	Bottom of beam at mid-span		4	Exposed Rebar	1	1			
49	Beam	1	East face at Bent	48	1	Spall	0.75	0.75			
49	Beam	2	with exposed reinforcing, bottom of beam at Bent	49	1	Spall	0.75	0.75			
49	Beam	3	Beam end at Bent	48	1	Spall	0.75	1.25			
49	Beam	3	with exposed reinforcing, bottom of beam at Bent	49	2	Spall	0.75	0.75			
49	Beam	3	West face, 6' from Bent	49	1	Spall	1	0.75			
49	Beam	4	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
49	Beam	5	with exposed reinforcing, bottom of beam at Bent	49	1	Spall	1	1.5			
49	Beam	5	Beam end at Bent	49	1	Spall	0.75	1			
49	Beam	5	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			
49	Beam	6	Bottom of beam at mid-span		2	Exposed Rebar	1.25	1.25			

Brunswick #14										As-Built Quantities	
Span #	Component		Location (ft. from nearest bent, etc)	Bent #	Amount	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	Actual (C.F.)	Actual Depth (ft.)
50	Lt. Deck Overhang		Deck underside, at random throughout		3	Delam	2	1.5			
50	Rt. Deck Overhang		Deck underside, at random throughout		5	Delam	2	2			
50	Concrete Deck		at random throughout		1	Efflorescence	7.75				
50	Beam	1	with exposed reinforcing, East face at Bent	49	1	Spall	0.75	0.75			
50	Beam	1	with exposed reinforcing, bottom of beam, 5' from Bent	50	1	Spall	1	1			
50	Beam	2	with exposed reinforcing, bottom of beam, 25' from Bent	50	1	Spall	1	1.25			
50	Beam	2	with exposed reinforcing, West face, 2' from Bent	49	2	Spall	0.75	0.75			
50	Beam	2	at random throughout bottom of beam		8	Exposed Rebar	1	1			
50	Beam	3	with exposed reinforcing, beam end at Bent	49	1	Spall	0.75	1.5	0.5		
50	Beam	3	Bottom of beam, at 1/4 points		9	Exposed Rebar	1	1			
50	Beam	4	with exposed strand, beam end at Bent	49	1	Spall	0.75	1	0.75		
50	Beam	4	with exposed reinforcing, bottom of beam, 18' from Bent	50	1	Spall	0.75	1.25			
50	Beam	4	Longitundinal crack, West face, 6' from Bent	50	1	Cracking	3				
50	Beam	4	with exposed reinforcing, at random on bottom of beam		2	Exposed Rebar	0.75	1			
50	Beam	5	East face at Bent	49	1	Spall	0.75	0.75			
50	Beam	6	with exposed strand, beam end at Bent	49	1	Spall	0.75	2			
50	Beam	6	with exposed reinforcing, bottom of beam, 1' from Bent	50	1	Spall	1	1.25			
50	Beam	6	with exposed reinforcing, at random on bottom of beam		2	Spall	0.75	1			
50	Beam	7	with exposed reinforcing, bottom of beam, 39' from Bent	49	1	Spall	0.75	1.25			
50	Beam	7	with exposed reinforcing, at random on bottom of beam		4	Spall	0.75	1			
50	Beam	8	Longitudinal crak, West face, starts at Bent	49	1	Cracking	1.25				
50	Beam	8	with exposed reinforcing, at random on bottom of beam		2	Spall	1	1			
50	Beam	8	with exposed reinforcing, at random on bottom of beam		8	Exposed Rebar	1	1			
51	Lt. Deck Overhang		with exposed reinforcing, deck underside, 12' from Bent	50	1	Spall	1.5	1.5			
51	Lt. Deck Overhang		Deck underside, at random throughout		5	Delam	1.5	1.5			
51	Rt. Deck Overhang		Deck underside, 6' from Bent	50	1	Delam	1.75	1.5			
51	Beam	1	Longitudinal cracks, West face, 13' from Bent	51	2	Cracking	2				
51	Beam	1	Longitudinal cracks, West face, starts 12' from Bent	50	2	Cracking	2.25				
51	Beam	1	Longitudinal cracks, East face & West, starts 8' from Bent	51	3	Cracking	3.5				
51	Beam	1	Cracks, West face, starts 8' from Bent	50	1	Cracking	3.5				
51	Beam	1	with exposed reinforcing, North face, 12' from Bent	51	1	Spall	0.75	2.75			
51	Beam	1	with exposed strand, East face, 11' from Bent	51	1	Spall	1.25	1.5	0.5		
51	Beam	1	with exposed strand, 12' from Bent	50	1	Spall	1.25	1.5	0.5		
51	Beam	1	with exposed strand, South face, 12' from Bent	50	1	Unsound Patch	2.75	1.5			
51	Beam	1	Diagonal cracks, West face, 12' from Bent	50	2	Cracking	1.5				
51	Beam	1	Longitudinal crack, East face, starts at Bent	50	1	Cracking	6.5				
51	Beam	1	Bottom of beam, at 1/4 points	51	6	Exposed Rebar	1.5	1.5			
51	Beam	2	with exposed reinforcing, North face, 12' from Bent	51	1	Spall	0.75	1.25			
51	Beam	2	with exposed reinforcing, bottom of beam, 30' from Bent	51	1	Spall	1	1.5			
51	Beam	2	with exposed strand, bottom of beam, 11' from Bent	50	1	Spall	1	1	0.5		
51	Beam	2	with exposed strand, East face, 11' from Bent	51	1	Spall	1	1.25	0.5		
51	Beam	2	with exposed reinforcing, South face, 12' from Bent	50	1	Unsound Patch	1.5	1.5			
51	Beam	2	West face, 11' from Bent	51	2	Cracking	2				
51	Beam	2	Bottom of beam at 1/4 points		6	Exposed Rebar	1.5	1.5			
51	Beam	2	with exposed reinforcing, 35' from Bent	51	1	Exposed Rebar	0.75	0.75			
51	Beam	3	Longitudinal crack, East face, starts at Bent	51	1	Cracking	6.5				
51	Beam	3	with exposed strand, East & West faces, 11' from Bent	50	2	Spall	1	1.25	0.5		
51	Beam	3	with exposed reinforcing, bottom of beam, 30' from Bent	51	1	Spall	1.5	0.75			
51	Beam	3	with exposed reinforcing, bottom of beam, 30' from Bent	51	1	Spall	0.75	1.5			
51	Beam	3	East face, 12' from Bent	51	1	Unsound Patch	0.75	1.25			

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

SHEET 3 OF 6

NOTES:

ALL DEFECTS WERE TAKEN FROM THE 2017 BRIDGE INSPECTION REPORT.

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LAMONT CULLUM

DocuSigned by: Samuel Lamont Cullum 19C97095C75A467... 4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DEFICIENCIES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-105
1			3			TOTAL SHEETS
2			4			111

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

4/12/2018
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User:jduke

Brunswick #14										As-Built Quantities	
Span #	Component		Location (ft. from nearest bent, etc)	Bent #	Amount	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	Actual (C.F.)	Actual Depth (ft.)
51	Beam	3	West face, 11' from Bent	51	2	Cracking	2				
51	Beam	3	Bottom of beam, at 1/4 points		6	Exposed Rebar	1.5	1.5			
51	Beam	3	at random throughout bottom of beam		6	Exposed Rebar	1	1			
51	Beam	4	Vertical cracks, West face, starts 10' from Bent	50	3	Cracking	1.75				
51	Beam	4	with exposed reinforcing, bottom of beam, 15' from Bent	50	1	Spall	1.5	1.5			
51	Beam	4	with exposed strand, East face, 11' from Bent	50	1	Spall	1.25	1.25			
51	Beam	4	East face, 12' from Bent	51	1	Unsound Patch	1.25	1			
51	Beam	4	East & West face, 11' from Bent	51	2	Cracking	1.5				
51	Beam	4	Bottom of beam, at 1/4 points		6	Exposed Rebar	1.5	1.5			
51	Beam	4	Bottom of beam, 25' from Bent	50	1	Exposed Rebar	1	1			
51	Beam	5	Longitudinal crack, East & West faces,starts 10' from Ben	50	1	Cracking	1.5				
51	Beam	5	with exposed reinforcing, 12' from Bent	50	1	Spall	1	2			
51	Beam	5	with exposed strand, East face, 11' from Bent	51	1	Spall	1	1.25	0.75		
51	Beam	5	East face, starts 12' from Bent	51	1	Unsound Patch	2.75	1			
51	Beam	5	West face, 11' from Bent	51	1	Cracking	2				
51	Beam	5	Bottom of beam, at 1/4 points		6	Exposed Rebar	1.5	1.5			
51	Beam	6	with exposed strand, East & West faces, 11' from Bent	51	2	Spall	1	1.25	1		
51	Beam	6	with exposed reinforcing, West face, 15' from Bent	50	1	Spall	1	1.5			
51	Beam	6	with exposed strand, West face, 11' from Bent	50	1	Spall	1	0.75	0.5		
51	Beam	6	South face, 12' from Bent	50	1	Unsound Patch	2.75	1.5			
51	Beam	6	with exposed reinforcing, North face, 12' from Bent	51	1	Unsound Patch	2.75	1			
51	Beam	6	East & West faces, 10' from Bent	50	2	Cracking	2				
51	Beam	6	Longitudinal crack, West face, starts at Bent	50	1	Cracking	8.5				
51	Beam	6	Bottom of beam, at 1/4 points		6	Exposed Rebar	1.5	1.5			
51	Beam	7	Diagonal crack, East face, 10' from Bent	50	1	Cracking	1.75				
51	Beam	7	with exposed reinforcing, bottom of beam, 14' from Bent	50	2	Spall	1	1			
51	Beam	7	with exposed strand, East & West faces, 11' from Bent	50	2	Spall	1	1.25	0.75		
51	Beam	7	South face, 12' from Bent	50	1	Unsound Patch	1.75	1			
51	Beam	7	North face, 12' from Bent	51	1	Unsound Patch	2.75	1.5			
51	Beam	7	East & West face, 10' from Bent	51	1	Cracking	2				
51	Beam	7	Bottom of beam, at 1/4 points		6	Exposed Rebar	1.5	1.5			
51	Beam	8	Longitudinal cracks, East face, starts 8' from Bent	51	3	Cracking	2.25				
51	Beam	8	Longitudinal cracks, East face, starts 12' from Bent	51	3	Cracking	2.75				
51	Beam	8	Diagonal cracks, East face, starts 8' from Bent	50	1	Cracking	4.5				
51	Beam	8	with exposed strand, East & west faces, 11' from Bent	51	2	Spall	1.25	1.25	0.75		
51	Beam	8	with exposed reinforcing, East face, 4' from Bent	51	3	Spall	2	1.25			
51	Beam	8	with exposed reinforcing, West face, 5' from Bent	51	1	Spall	1.5	0.75			
51	Beam	8	with exposed reinforcing, East face, 3' from Bent	51	1	Spall	1.5	1.25			
51	Beam	8	with exposed strand, West face, 12' from Bent	50	1	Spall	1	0.75	0.5		
51	Beam	8	with exposed strand, South face, 12' from Bent	50	1	Unsound Patch	2.75	1.5			
51	Beam	8	with exposed reinforcing, North face, 12' from Bent	51	1	Unsound Patch	2.75	1.5			
51	Beam	8	Diagonal cracks, East & West face, 10' from Bent	50	2	Cracking	2				
51	Beam	8	Longitudinal cracks, East face, 13' from Bent	50	2	Cracking	2.25				
51	Beam	8	Longitudinal crack, East face, starts 4' from Bent	50	1	Cracking	3.5				
51	Beam	8	Bottom of beam, at 1/4 points		6	Exposed Rebar	1.5	1.5			
52	Rt. Deck Overhang		with exposed reinforcing, deck underside, near mid-span		1	Spall	1.5	1.5			
52	Lt. Deck Overhang		Deck underside, at random throughout		3	Delam	2	2			
52	Rt. Deck Overhang		Deck underside, 30' from Bent	51	1	Delam	1.5	1.5			
52	Rt. Deck Overhang		Deck underside, at random throughout	51	3	Efflorescence	2.5				
52	Lt. Deck Overhang		Deck underside, 18' from Bent	51	1	Efflorescence	2				

Brunswick #14										As-Built Quantities	
Span #	Component		Location (ft. from nearest bent, etc)	Bent #	Amount	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	Actual (C.F.)	Actual Depth (ft.)
52	Concrete Deck		Transverse cracks, at random throughout deck underside		1	Efflorescence	0.75	0.75			
52	Beam	1	at random throughout bottom of beam		3	Exposed Rebar	0.75	0.75			
52	Beam	3	North face at Bent	52	2	Unsound Patch	1.25	0.75			
52	Beam	3	with exposed reinforcing, bottom of beam, 1' from Bent	52	1	Spall	0.75	1			
52	Beam	4	with exposed reinforcing, bottom of beam, 2' from Bent	52	1	Spall	1	1.25			
52	Beam	6	at random throughout bottom of beam		14	Exposed Rebar	0.75	0.75			
52	Beam	7	with exposed reinforcing, bottom of beam at mid-span		1	Spall	1	1.5			
52	Beam	8	with exposed reinforcing, bottom of beam, 2' from Bent	52	1	Spall	1	1.25			
52	Beam	8	at random throughout bottom of beam		10	Exposed Rebar	0.75	0.75			
53	Lt. Deck Overhang		with exposed reinforcing, deck underside, at Bent	52	1	Spall	1.5	2			
53	Rt. Deck Overhang		with exposed reinforcing, deck underside, 25' from Bent	52	1	Spall	1.75	1.5			
53	Concrete Deck		Deck underside, 3' from Bent	52	1	Delam	1.5	1.5			
53	Beam	1	West face at Bent	52	1	Unsound Patch	0.75	1.25			
53	Beam	1	East face at Bent	52	1	Unsound Patch	1	1.5			
53	Beam	1	East face at Bent	53	1	Unsound Patch	1	1.25			
53	Beam	2	with exposed reinforcing, bottom of beam, 1' from Bent	53	1	Spall	1.25	1.5			
53	Beam	2	with exposed strand, South face at Bent	52	1	Spall	1.25	1.25			
53	Beam	2	West face at Bent	52	1	Delam	1.5	1.5			
53	Beam	3	with exposed strand, West face at Bent	52	1	Spall	1	1.25	0.5		
53	Beam	3	Bottom of beam, 1' from Bent	52	1	Delam	1.5	1.5			
53	Beam	5	with exposed strand, South face at Bent	52	2	Spall	1.5	1.5			
53	Beam	5	with exposed reinforcing, 1' from Bent	53	1	Spall	0.75	1.25			
53	Beam	6	East face, 30' from Bent	53	1	Unsound Patch	1	1			
53	Beam	6	Bottom of beam, 25' from Bent	52	1	Delam	2.5	1			
54	Beam	1	East face at Bent	53	1	Unsound Patch	1	1.5			
54	Beam	1	West face, 30' from Bent	54	1	Unsound Patch	1	1			
54	Beam	1	Bottom of beam at Bent	54	1	Spall	1	1			
54	Beam	1	Bottom of beam, near mid-span		2	Exposed Prestressing	1.5	1.5			
54	Beam	2	West face at Bent	53	1	Unsound Patch	1	1.25			
54	Beam	2	East face at Bent	54	1	Unsound Patch	1	1.25			
54	Beam	2	Longitudinal crack, East face, starts 4' from Bent	54	1	Cracking	5.5				
54	Beam	2	Bottom of beam, near mid-span		2	Exposed Rebar	1.5	1.5			
54	Beam	2	Bottom of beam, 1' from Bent	54	1	Exposed Rebar	0.75	0.75			
54	Beam	3	East & West face at Bent	53	1	Unsound Patch	0.75	1.25			
54	Beam	3	Bottom of beam, near mid-span		2	Exposed Rebar	1.5	1.5			
54	Beam	3	Bottom of beam, 1' from Bent	54	1	Exposed Rebar	0.75	0.75			
54	Beam	4	with exposed reinforcing, bottom of beam, 1' from Bent	54	2	Spall	0.75	2.25			
54	Beam	4	with exposed strand, East face at Bent	53	1	Spall	1.75	1	0.5		
54	Beam	4	East face at Bent	54	1	Unsound Patch	1	1.5			
54	Beam	4	Bottom of beam, near mid-span		4	Exposed Rebar	1	1			
54	Beam	5	West face at Bent	54	1	Unsound Patch	0.75	1.5			
54	Beam	5	East face at Bent	54	1	Unsound Patch	1	1.5			
54	Beam	5	West face at Bent	53	1	Unsound Patch	1	1.25			
54	Beam	5	Bottom of beam, near mid-span		2	Exposed Rebar	1.5	1.5			
54	Beam	5	East face, 4' from Bent	54	1	Exposed Rebar	0.75	1.5			
54	Beam	5	Bottom of beam, 3' from Bent	53	1	Exposed Rebar	0.75	0.75			
54	Beam	6	West face at Bent	53	1	Unsound Patch	1	1.5			
54	Beam	6	Bottom of beam, near mid-span		2	Exposed Rebar	1.5	1.5			
55	Beam	1	with exposed reinforcing, bottom of beam at Bent	55	1	Spall	1	1.25			
55	Beam	2	East face at Bent	54	1	Unsound Patch	1	1.5			

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

SHEET 4 OF 6

NOTES:

ALL DEFECTS WERE TAKEN FROM THE 2017 BRIDGE INSPECTION REPORT.

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL LAMONT CULLUM

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4/12/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DEFICIENCIES

REVISIONS						SHEET NO.
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2			4			111

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

4/12/2018
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User:jduke

Brunswick #14										As-Built Quantities	
Span #	Component		Location (ft. from nearest bent, etc)	Bent #	Amount	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	Actual (C.F.)	Actual Depth (ft.)
55	Beam	2	Bottom of beam, near mid-span		2	Exposed Rebar	1.25	1.25			
55	Beam	3	East face at Bent	54	1	Spall	0.75	0.75	0.5		
55	Beam	3	West face at Bent	54	1	Unsound Patch	0.75	1.25			
55	Beam	3	Bottom of beam, near mid-span		2	Exposed Rebar	1.25	1.25			
55	Beam	4	East face, at Bent	54	1	Spall	1	1	0.5		
55	Beam	4	West face at Bent	55	1	Unsound Patch	1	1.25			
55	Beam	4	East face at Bent	54	1	Unsound Patch	1	1.5			
55	Beam	4	Bottom of beam, near mid-span		2	Exposed Rebar	1.25	1.25			
55	Beam	5	West face at Bent	55	1	Unsound Patch	0.75	1.5			
55	Beam	5	East face at Bent	55	1	Unsound Patch	1	1.25			
55	Beam	5	Bottom of beam, near mid-span		2	Exposed Rebar	1.25	1.25			
55	Beam	6	Bottom of beam, 1' from Bent	55	2	Spall	1.25	1.5			
55	Beam	6	West face at Bent	55	1	Unsound Patch	0.75	1			
55	Beam	6	East face, bottom of beam at Bent	55	1	Unsound Patch	0.75	1.25			
55	Beam	6	West face at Bent	54	1	Unsound Patch	1.25	0.75			
55	Beam	6	Bottom of beam, near mid-span		2	Exposed Rebar	1.25	1.25			
56	Beam	1	East face at Bent	56	1	Unsound Patch	1	1.25			
56	Beam	1	East face at Bent	55	1	Unsound Patch	1	1.5			
56	Beam	2	West face at Bent	56	1	Unsound Patch	0.75	1.25			
56	Beam	2	East face at Bent	55	1	Unsound Patch	1	1			
56	Beam	2	West face at Bent	55	1	Unsound Patch	1	1.5			
56	Beam	3	East face at Bent	56	1	Unsound Patch	1	0.75			
56	Beam	3	East face at Bent	55	1	Unsound Patch	1	1			
56	Beam	4	with exposed reinforcing, bottom of beam, 1' from Bent	56	2	Spall	1	1.5			
56	Beam	4	West face at Bent	55	1	Unsound Patch	1	1.5			
56	Beam	4	West face at Bent	56	1	Delam	1.5	1			
56	Beam	5	East face at Bent	55	1	Unsound Patch	1	1.25			
56	Beam	6	with exposed strand, West face at Bent	55	1	Spall	1	1.25	0.75		
56	Beam	6	West face at Bent	56	1	Unsound Patch	0.75	1			
57	Beam	1	West face at Bent	56	1	Delam	1	1.5			
57	Beam	2	East face at Bent	57	1	Unsound Patch	0.75	1.25			
57	Beam	2	40' from Bent	56	1	Spall	1	1			
57	Beam	4	East face, at Bent	56	1	Unsound Patch	1	1.25			
57	Beam	4	East & West faces at Bent	57	1	Unsound Patch	1	1.25			
57	Beam	6	West face at Bent	56	1	Unsound Patch	0.75	1			
57	Beam	6	East face at Bent	56	1	Unsound Patch	0.75	1.25			
57	Beam	6	with exposed reinforcing, bottom of beam at Bent	57	2	Spall	1	1			
58	Rt. Deck Overhang		Deck underside, at mid-span		1	Delam	1	1			
58	Beam	1	West face, 2' from Bent	57	1	Exposed Rebar	1.5	1.5			
58	Beam	2	East face at Bent	57	1	Unsound Patch	1	1.5			
58	Beam	3	East face at Bent	57	1	Unsound Patch	1	1.25			
58	Beam	3	Bottom of beam, 40' from Bent	57	1	Spall	1	0.5			
58	Beam	4	East face at Bent	58	1	Unsound Patch	1	1.25			
58	Beam	5	West face at Bent	57	1	Unsound Patch	1	1.5			
58	Beam	5	East face, 10' from Bent	57	1	Exposed Rebar	1.5	1.5			
58	Beam	6	East face at Bent	57	1	Unsound Patch	0.75	1.5			
58	Beam	6	East face at Bent	57	1	Unsound Patch	1.25	1.25			
59	Concrete Deck		12' from Bent	58	1	Delam	1.5	1.5			
59	Beam	1	East face, at Bent	59	1	Unsound Patch	1	1			
59	Beam	2	with exposed strand at Bent	58	1	Spall	1	2.75	0.75		

Brunswick #14										As-Built Quantities	
Span #	Component		Location (ft. from nearest bent, etc)	Bent #	Amount	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	Actual (C.F.)	Actual Depth (ft.)
59	Beam	2	East face at Bent	59	1	Unsound Patch	1	1.5			
59	Beam	2	West face at Bent	59	1	Unsound Patch	1	0.75			
59	Beam	3	East face at Bent	59	1	Unsound Patch	0.75	0.75			
59	Beam	3	East face at Bent	58	1	Unsound Patch	0.75	1			
59	Beam	3	West face at Bent	59	1	Unsound Patch	1	1.75			
59	Beam	4	Top flange, East face, 1' from Bent	58	1	Unsound Patch	2.25	1.75			
59	Beam	4	East face at Bent	58	1	Delam	1.5	1.75			
59	Beam	5	with exposed reinforcing, bottom of beam, at Bent	59	2	Spall	0.75	2.25			
59	Beam	5	West face at Bent	59	1	Unsound Patch	1	1.25			
59	Beam	6	East face at Bent	58	1	Unsound Patch	0.75	1.5			
59	Beam	6	West face at Bent	59	1	Unsound Patch	0.75	1			
59	Beam	6	with exposed reinforcing, bottom of beam at Bent	59	2	Spall	0.75	1			
60	Lt. Deck Overhang		with exposed reinforcing, deck underside, at Bent	60	1	Spall	1.5	1.25			
60	Rt. Deck Overhang		Deck underside, 1' from Bent	60	1	Delam	0.75	1			
60	Beam	1	East face at Bent	59	1	Unsound Patch	1	1.5			
60	Beam	2	with exposed reinforcing, West face, 3' from Bent	59	2	Spall	1.25	1			
60	Beam	2	East face, at Bent	60	1	Unsound Patch	0.75	1.25			
60	Beam	2	East face at Bent	59	1	Unsound Patch	1	1.5			
60	Beam	3	East face at Bent	60	1	Unsound Patch	0.75	1.25			
60	Beam	3	East face at Bent	59	1	Unsound Patch	0.75	1.25			
60	Beam	3	Bottom of beam, 40' from Bent	60	1	Spall	1	1			
60	Beam	4	Longitudinal crack, East face, starts 3' from Bent	60	1	Cracking	3.5				
60	Beam	4	West face at Bent	59	1	Unsound Patch	0.75	1.5			
60	Beam	4	Bottom of beam, 40' from Bent	59	1	Spall	1	1			
60	Beam	5	East face at Bent	59	1	Unsound Patch	0.75	1			
60	Beam	5	West face at Bent	59	1	Unsound Patch	0.75	1.25			
60	Beam	6	West face at Bent	59	1	Unsound Patch	0.75	1			
61	Rt. Deck Overhang		Deck underside, 1' from Bent	60	1	Delam	0.75	1			
61	Beam	1	Longitudinal crack, East face, starts 3' from Bent	61	1	Cracking	5.5				
61	Beam	2	with exposed reinforcing, bottom of beam, 1' from Bent	61	3	Spall	1	1.25			
61	Beam	2	with exposed strand, East face at Bent	61	1	Spall	1	1.25			
61	Beam	2	West face at Bent	60	1	Unsound Patch	1	1.25			
61	Beam	2	Longitudinal crack, East face, starts 2' from Bent	61	1	Cracking	11.5				
61	Beam	2	East face, 3' from Bent	61	2	Exposed Rebar	1.5	1.5			
61	Beam	3	East face, at Bent	61	1	Spall	0.75	1	0.5		
61	Beam	3	Longitudinal crack, East face, starts 3' from Bent	61	1	Cracking	5.5				
61	Beam	4	Longitudinal crack, East & West faces, starts 3' from Bent	61	1	Cracking	3.5				
61	Beam	5	with exposed reinforcing, bottom of beam, at Bent	61	3	Spall	0.75	1.25			
61	Beam	6	Longitudinal crack, East & West face, starts 3' from Bent	60	1	Cracking	15.5				
61	Beam	6	with exposed reinforcing, bottom of beam at Bent	61	1	Spall	0.75	0.75			
62	Beam	1	Longitudinal crack, East face, starts 2' from Bent	62	1	Cracking	4.5				
62	Beam	1	East face at Bent	61	1	Spall	0.75	1	0.5		
62	Beam	2	Longitudinal crack, West face, starts 4' from Bent	61	1	Cracking	1.75				
62	Beam	2	Long. & vert. cracks, East & West face, starts 1' from Bent	62	1	Cracking	2				
62	Beam	3	Longitudinal crack, East & West faces, starts 3' from Bent	62	1	Cracking	5.5				
62	Beam	3	East face , 4.5' from Bent	62	1	Unsound Patch	1	0.75	0.5		
62	Beam	4	Longitudinal crack, East face, starts 5' from Bent	62	1	Cracking	3.5				
62	Beam	4	with exposed reinforcing, bottom of beam at Bent	62	1	Spall	0.75	1			
62	Beam	5	with exposed reinforcing, bottom of beam at Bent	62	2	Spall	0.75	0.75			
62	Beam	6	East face, at Bent	61	1	Delam	1	1.25			

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

SHEET 5 OF 6

NOTES:

ALL DEFECTS WERE TAKEN FROM THE 2017 BRIDGE INSPECTION REPORT.

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE DEFICIENCIES

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2			4			111

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

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Brunswick #14										As-Built Quantities	
Span #	Component		Location (ft. from nearest bent, etc)	Bent #	Amount	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	Actual (C.F.)	Actual Depth (ft.)
64	Lt. Deck Overhang		Deck underside, at random throughout		2	Efflorescence	2.5				
64	Rt. Deck Overhang		Deck underside, 8' from Bent	63	1	Exposed Rebar	1	1			
64	Beam	5	at Bent	63	1	Spall	1	0.75	0.5		
65	Lt. Deck Overhang		Deck underside, 20' from Bent	64	1	Efflorescence	2.5				

Brunswick #14										As-Built Quantities	
Span #	Component		Location (ft. from nearest bent, etc)	Bent #	Amount	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	Actual (C.F.)	Actual Depth (ft.)

PROJECT NO. 15BPR.25

BRUNSWICK COUNTY

BRIDGE NO. 14

SHEET 6 OF 6

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KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

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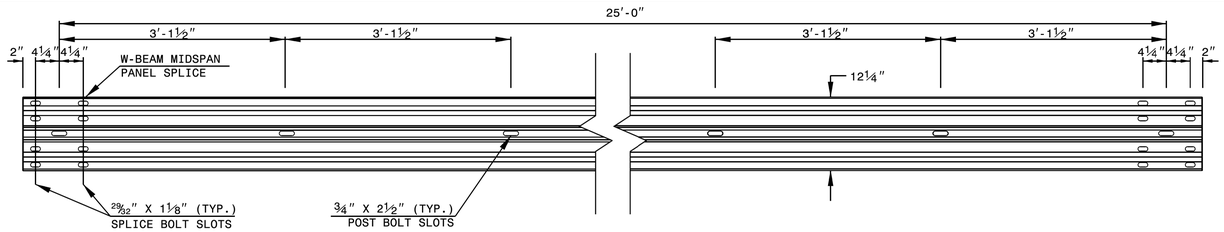
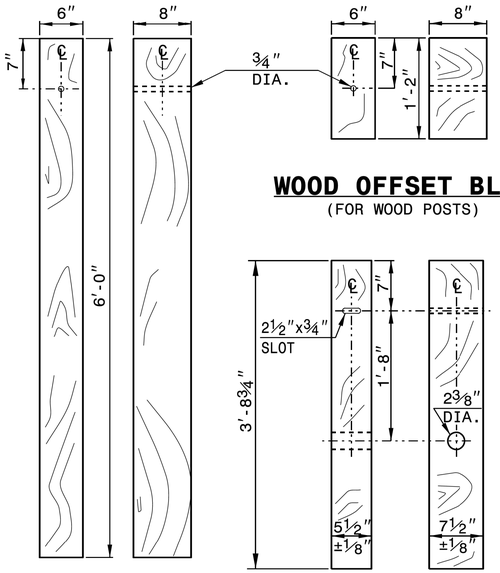
User:jduke

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



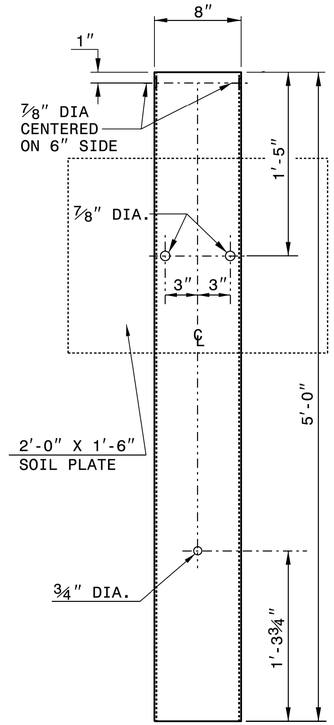
STANDARD W-BEAM GUARDRAIL



STANDARD LINE POST

WOOD OFFSET BLOCK
(FOR WOOD POSTS)

SHORT WOOD BREAKAWAY POST



STEEL TUBE
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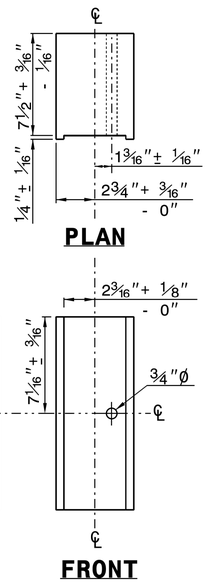
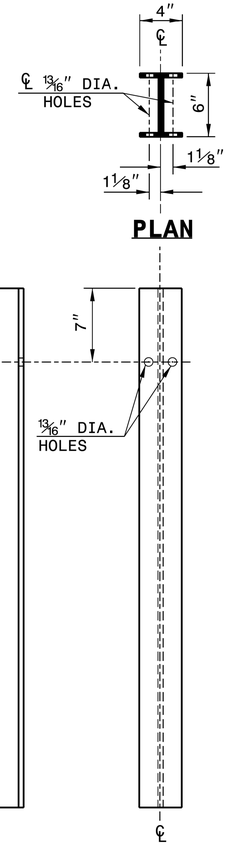


ROUTED OFFSET BLOCK



"W6" STEEL POST

SYSTEM PARTS

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

SHEET 6 OF 8
862D02

PROJECT NO. 15BPR.25
BRUNSWICK COUNTY
BRIDGE NO. 14

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ROADWAY STANDARD DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON

DocuSigned by: Joel S. Howerton
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4/11/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-109
1			3			TOTAL SHEETS
2			4			111

KCA KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY :	JACOB H. DUKE	DATE : 03-2018
CHECKED BY :	AARON J. MCMILLAN	DATE : 03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE : 03-2018

4/11/2018
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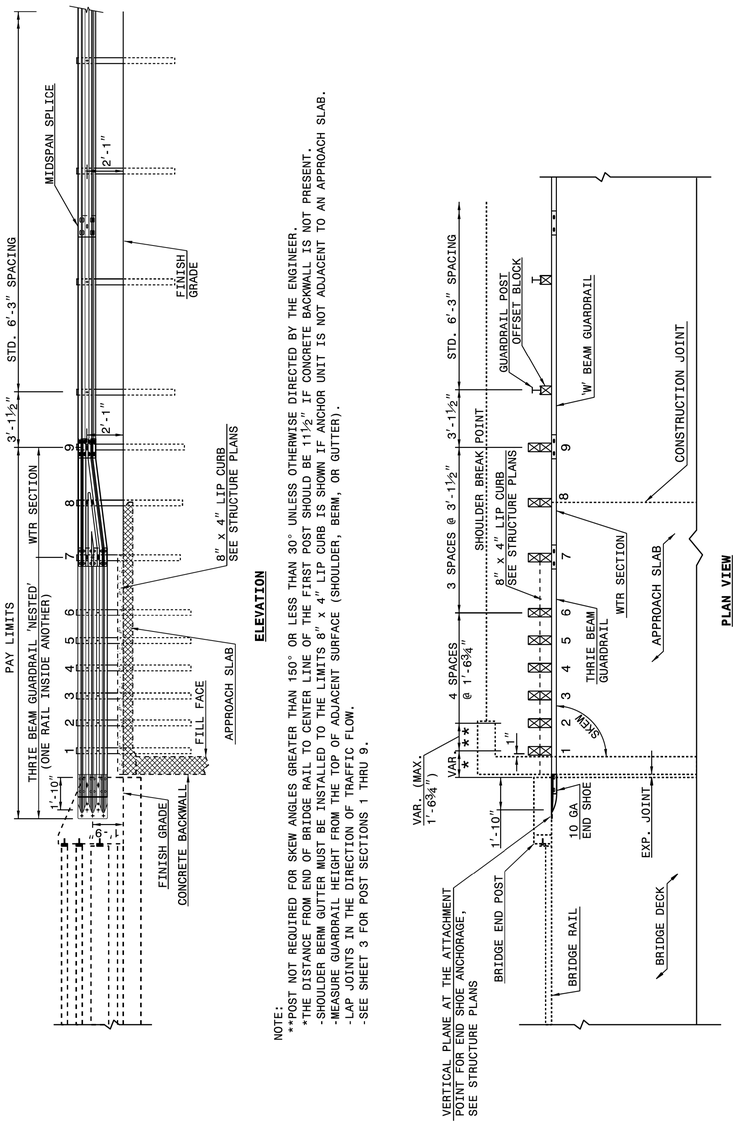
User:jduke

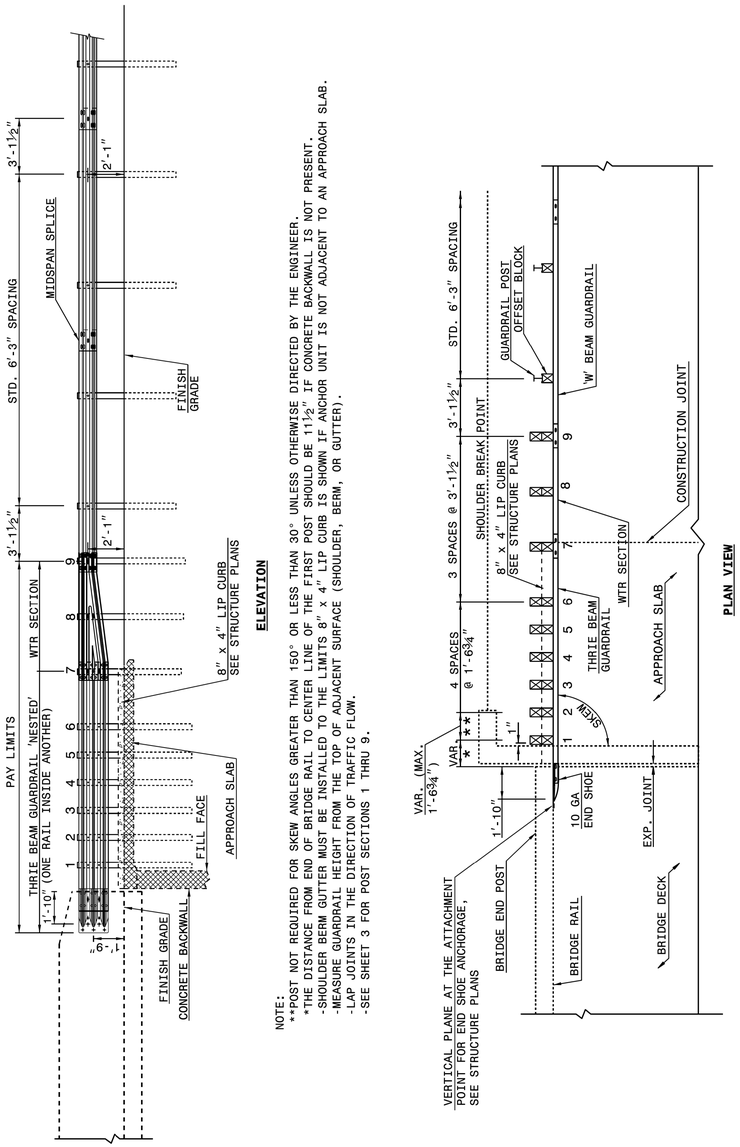


ELEVATION

PLAN VIEW

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE



ELEVATION

PLAN VIEW

NOTE:
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-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : AARON J. MCMILLAN DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

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User:jduke

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON

DocuSigned by:
Joel S. Howerton
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4/11/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. 15BPR.25
BRUNSWICK COUNTY
BRIDGE NO. 14
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ROADWAY STANDARD DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-110
1			3			TOTAL SHEETS
2			4			111

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞"Ø SHEAR STUDS FOR THE ¾"Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞"Ø STUDS FOR 4 - ¾"Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞"Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾"Ø STUDS BASED ON THE RATIO OF 3 - ⅞"Ø STUDS FOR 4 - ¾"Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM (/) RGW REV. 5-7-03 RWW (/) JTE REV. 10-1-11 MAA (/) GM
REV. 8-16-99 RWW (/) LES REV. 5-1-06 TLA (/) GM REV. 12-17 MAA (/) THC

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