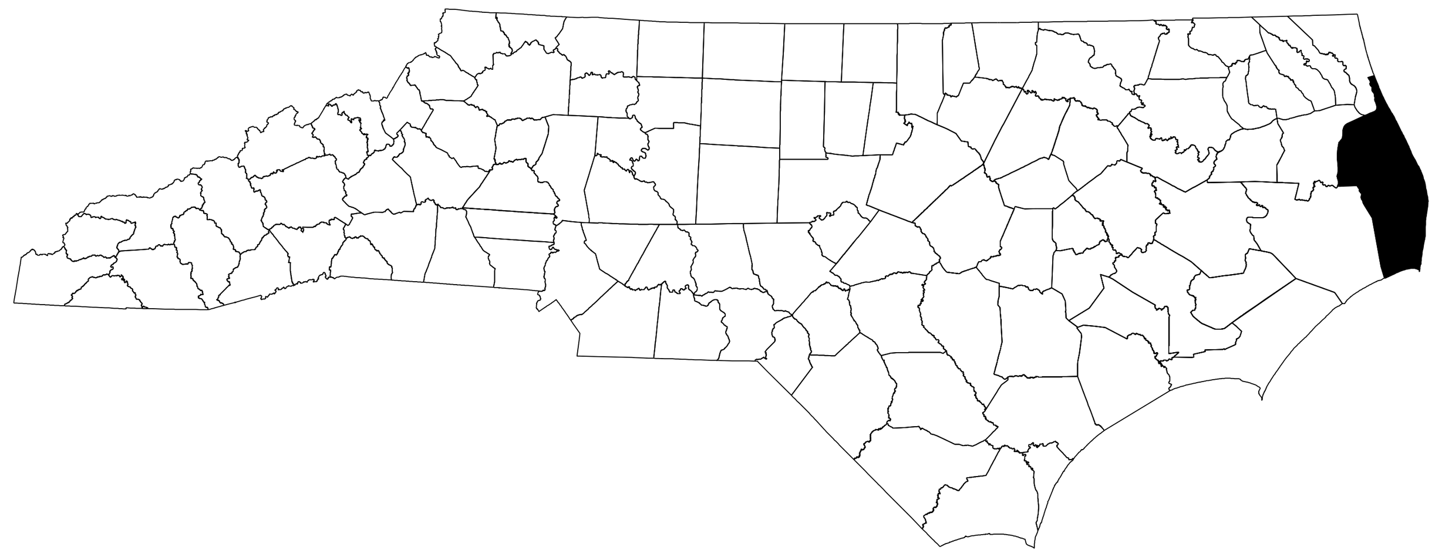
PROJECT NUMBER: 15BPR.46

CONTRACT: C204568



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DARE COUNTY

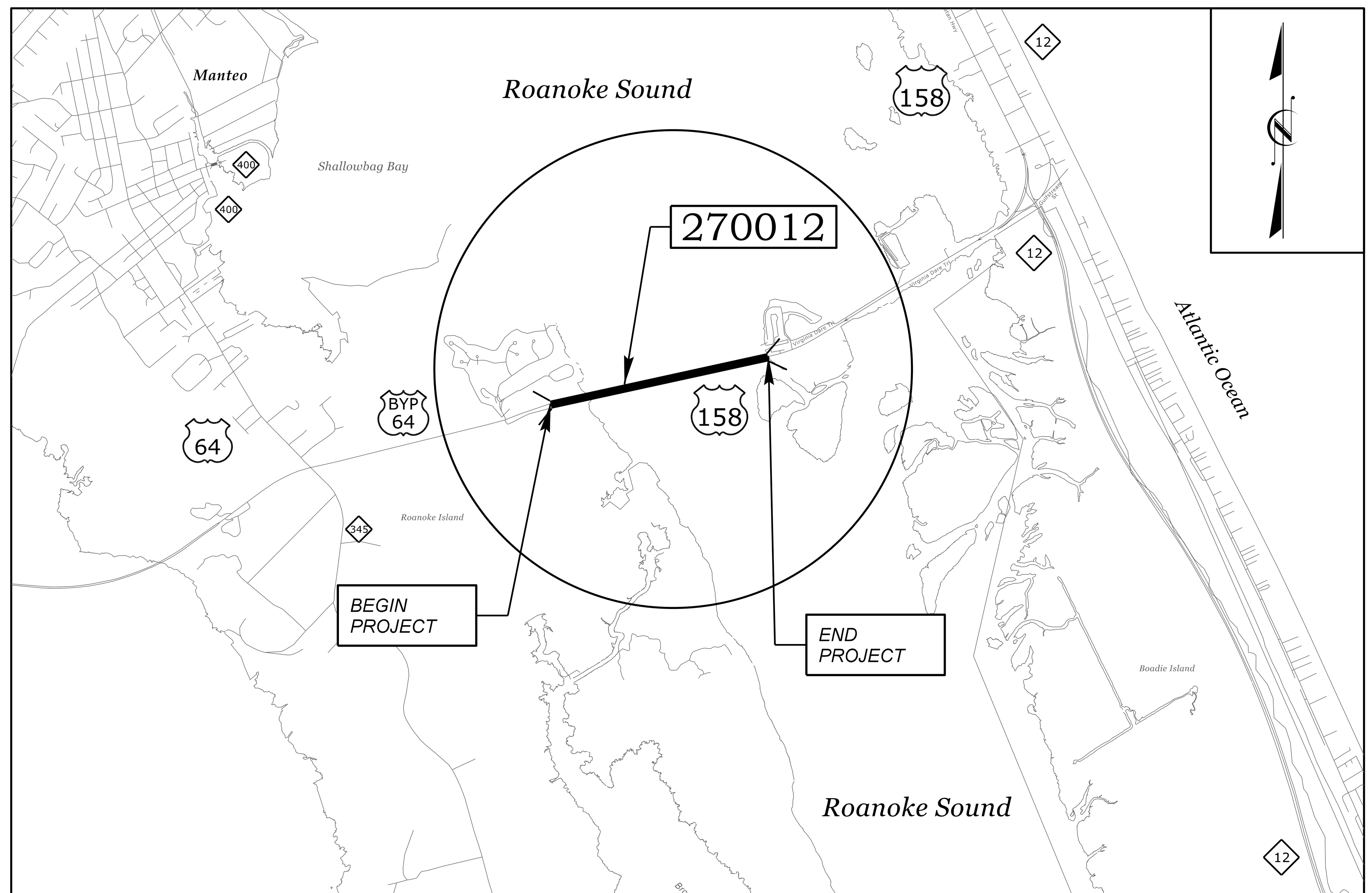
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15BPR.46	1	137

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
15BPR.46	–	P.E.
15BPR.46	–	CONST.

LOCATION: ***DARE COUNTY***

BRIDGE #270012 ON US64 BYP/US 158 OVER THE INTRACOASTAL WATERWAY (ROANOKE SOUND)

TYPE OF WORK: ***BRIDGE PRESERVATION – POLYMER CONCRETE DECK OVERLAY WITH RIDEABILITY CORRECTION, EXPANSION JOINT INSTALLATION/REPAIR/REPLACEMENT, APPROACH ROADWAY MILLING AND RESURFACING, SHOULDER BERM GUTTER REPLACEMENT, PRESTRESSED CONCRETE GIRDER REPAIR, SUPERSTRUCTURE AND SUBSTRUCTURE CONCRETE REPAIRS, BEARING REPLACEMENT, CATHODIC PROTECTION, BEARING REPLACEMENT, PILE JACKETS.***



VICINITY MAP N.T.S.

STRUCTURES

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

DARE COUNTY
#12 ADT 2015 = 18,000

PROJECT LENGTH

DARE COUNTY
#12 = 1.05 MILE

2018 STANDARD SPECIFICATIONS

LETTING DATE :
JANUARY 18, 2022

Prepared for the Office of:

DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
LICENSE #: C-1506

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE
12/21/2021

JACOB H. DUKE, P.E.
PROJECT ENGINEER

DIEGO A. AGUIRRE, P.E.
PROJECT DESIGN ENGINEER

PROJECT NUMBER: 15BPR.46

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15BPR.46	1A	137

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
15BPR.46	–	P.E.
15BPR.46	–	CONST.

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
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LICENSE #: C-1506

INDEX OF SHEETS - STRUCTURES

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1A	INDEX OF SHEETS	S-39	SUPERSTRUCTURE REPAIRS SPANS 53 THRU 56	S-78	SUBSTRUCTURE REPAIRS - BENT 13	S-117	SUBSTRUCTURE REPAIRS - BENT 52
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ROADWAY

TOTAL BILL OF MATERIAL

	BORROW EXCAVATION	AGGREGATE BASE COURSE	MILLING ASPHALT PAVEMENT, 1½" TO 3"	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	ASPHALT BINDER FOR PLANT MIX	SHOULDER BERM GUTTER	REMOVE & RESET EXISTING GUARDRAIL	WORK ZONE SIGNS (PORTABLE)	WORK ZONE SIGNS (BARRICADE MOUNTED)	FLASHING ARROW BOARD	PORTABLE CHANGEABLE MESSAGE SIGN	DRUMS	BARRICADES (TYPE III)	TMA	TEMPORARY RAISED PAVEMENT MARKERS	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL
	CU. YD.	TON	SQ. YD.	TON	TON	LIN. FT.	LIN. FT.	SQ. FT.	SQ. FT.	EA.	EA.	EA.	LIN. FT.	EA.	EA.	LIN. FT.	EA.
TOTAL	25	45	5101	660	40	240	240	690	102	9	2	880	128	2	4555	13332	12

	PAINT PAVEMENT MARKING LINES (4")	POLYUREA PAVEMENT MARKING LINES (4", 30 MILS)	REMOVAL OF PAVEMENT MARKING LINES (4")	REMOVAL OF PAVEMENT MARKING LINES (8")	THERMO-PLASTIC RUMBLE BARS	PERMANENT RAISED PAVEMENT MARKERS	SEEDING & MULCHING
	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EA.	ACR
TOTAL	78396	36305	21560	3984	3253	582	0.2

STRUCTURES

TOTAL BILL OF MATERIAL

	FLOWABLE FILL	UNCLASSIFIED STRUCTURE EXCAVATION STA. -L- 65+52.10	RIP RAP, CLASS B	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	SHOTCRETE REPAIRS	EPOXY RESIN INJECTION	CONCRETE REPAIR	TSA FULL LENGTH (NON-MONITORING)	TSA FULL LENGTH (MONITORING)	EPOXY COATING	GROOVING BRIDGE FLOORS	CP SYSTEM - ZINC ALUMINUM SPRAY	2-BAR METAL RAIL REPAIRS	FOAM JOINT SEALS FOR PRESERVATION	CP INTEGRAL PILE JACKET (STRUCTURAL) 16 TO 30 IN.
	CU. YD.	LUMP SUM	TON	SQ. YD.	LUMP SUM	CU. FT.	LIN. FT.	CU. FT.	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.	SQ. FT.	LIN. FT.	LIN. FT.	LIN. FT.
TOTAL	7.6	LUMP SUM	30	65	LUMP SUM	37	4043	3.0	29173	1862	24628	314624	14820	200	4545	300

	POLYESTER POLYMER CONCRETE MATERIALS	EPOXY POLYMER CONCRETE MATERIALS	BRIDGE JOINT REMOVAL	REPAIRS TO PRESTRESSED CONCRETE GIRDERS	SCARIFYING BRIDGE DECK	SHOT-BLASTING BRIDGE DECK	PLACING AND FINISHING POLYMER CONCRETE OVERLAY	TYPE I BRIDGE JACKING BRIDGE NO. 12	SPLICING OF PRESTRESSING STRAND	CATHODIC PROTECTION SYSTEM-SUBMERGED ZINC BULK ANODE
	CU. YD.	CU. YD.	LIN. FT.	CU. FT.	SQ. YD.	SQ.YD.	SQ.YD.	EA.	EA.	EA.
TOTAL	3322	3322	366	201	36967	36967	36967	165	15	382

△ SEE NOTE

GENERAL NOTES

FOR MAINTENANCE OF WATER TRAFFIC, SEE SPECIAL PROVISIONS.

FOR COORDINATION WITH THE US COAST GUARD, SEE SPECIAL PROVISIONS.

FOR WORK IN, OVER OR ADJACENT TO NAVIGABLE WATERS, SEE SPECIAL PROVISIONS.

FOR BRIDGE DECK RIDEABILITY AND GROOVING, SEE SPECIAL PROVISIONS.

FOR OVERLAY SURFACE PREPARATION FOR POLYMER CONCRETE, SEE SPECIAL PROVISIONS.

FOR POLYMER CONCRETE BRIDGE DECK OVERLAY, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE PLAN DETAILS AND SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

FOR EPOXY COATING AND DEBRIS REMOVAL, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEALS FOR PRESERVATION, SEE SPECIAL PROVISIONS.

FOR BRIDGE JOINT REMOVAL, SEE SPECIAL PROVISIONS.

△ FOR ALL PRESTRESSED CONCRETE GIRDER REPAIRS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE" (THIS INCLUDES GIRDERS WITH AND WITHOUT A THERMAL SPRAY APPLICATION).

FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

THE CONTRACTOR IS REQUIRED TO SUBMIT JACKING PLANS PRIOR TO BEGINNING WORK.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

FOR CATHODIC PROTECTION INTEGRAL PILE JACKETS, SEE SPECIAL PROVISIONS.

FOR CATHODIC PROTECTION SYSTEM - SUBMERGED ZINC BULK ANODE, SEE SPECIAL PROVISIONS.

FOR CATHODIC PROTECTION SYSTEM - ZINC ALUMINUM SPRAY, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE, SEE SPECIAL PROVISIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

PAYMENT FOR CLEANING GUTTER FLUMES SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS FOR THIS PROJECT.

PAYMENT FOR INCIDENTAL ITEMS NOT SPECIFICALLY COVERED IN THE INDIVIDUAL BID ITEMS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR THE VARIOUS BID ITEMS CONTAINED IN THE CONTRACT.

REMOVAL OF EXISTING SHOULDER BERM GUTTER SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS IN THE CONTRACT.

FOR OTHER GENERAL NOTES, SEE GENERAL DRAWING SHEET 7 OF 7.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE EXISTING FISHING PIERS AT BENTS 9 - 12. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING AND REPLACING ANY BOARDWALK MATERIAL THAT INTERFERES WITH THE INSTALLATION OF THE PROPOSED ANODES, OR ANY PROPOSED WORK AT THESE LOCATIONS. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS IN THE CONTRACT. THE CONTRACTOR SHALL PHASE THE WORK AND LIMIT THE CLOSURE TO A SINGLE NORTH-SOUTH FINGER OF THE BOARDWALK AT ANY ONE TIME, SUCH THAT THE LONGER PORTION OF FISHING PIER ON THE NORTH SIDE OF THE BRIDGE AT THE WEST APPROACH REMAINS ACCESSIBLE FOR RECREATIONAL USE. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MAINTAINING PEDESTRIAN ACCESS AROUND THE OTHER PORTIONS OF THE FISHING PIER DURING THE LIFE OF THE PROJECT.

AT THE TIME OF PREPARATION OF THESE PLANS, IT WAS NOT ANTICIPATED THAT ITEM(S) LISTED BELOW WOULD BE REQUIRED. HOWEVER, IT MAY BE DETERMINED IN THE FIELD THAT THE FOLLOWING ITEM(S) LISTED, OR OTHER WORK WILL BE NECESSARY TO PROPERLY COMPLETE THE INTENDED BRIDGE PRESERVATION/REHABILITATION WORK. THE CONTRACTOR SHALL BE PREPARED TO PERFORM SUCH WORK IN A TIMELY MANNER, AS DETERMINED IN THE FIELD. SUCH WORK SHALL BE CONSIDERED EXTRA WORK AND SHALL BE ADDRESSED AS PER ARTICLE 104-7 OF THE STANDARD SPECIFICATIONS. PROJECT SPECIAL PROVISIONS THAT OUTLINE REQUIREMENTS FOR THESE POTENTIAL ADDITIONAL WORK ITEMS HAVE BEEN PROVIDED IN THE PROJECT DOCUMENTS, BUT NO QUANTITIES HAVE BEEN LISTED. ACTUAL PAY ITEMS, QUANTITIES, AND COSTS WILL BE ESTABLISHED, AS REQUIRED, IF EXTRA WORK IS ENCOUNTERED. UNANTICIPATED ITEMS:

CONCRETE DECK REPAIR FOR POLYMER CONCRETE OVERLAY CLASS II SURFACE PREPARATION

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

SEAL 043777 — NORTH CAROLINA PROFESSIONAL ENGINEER — JACOB H. DUKE — 11/1/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BILL OF MATERIALS

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-1
1			3				TOTAL SHEETS
2			4				137

DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

11/1/2021
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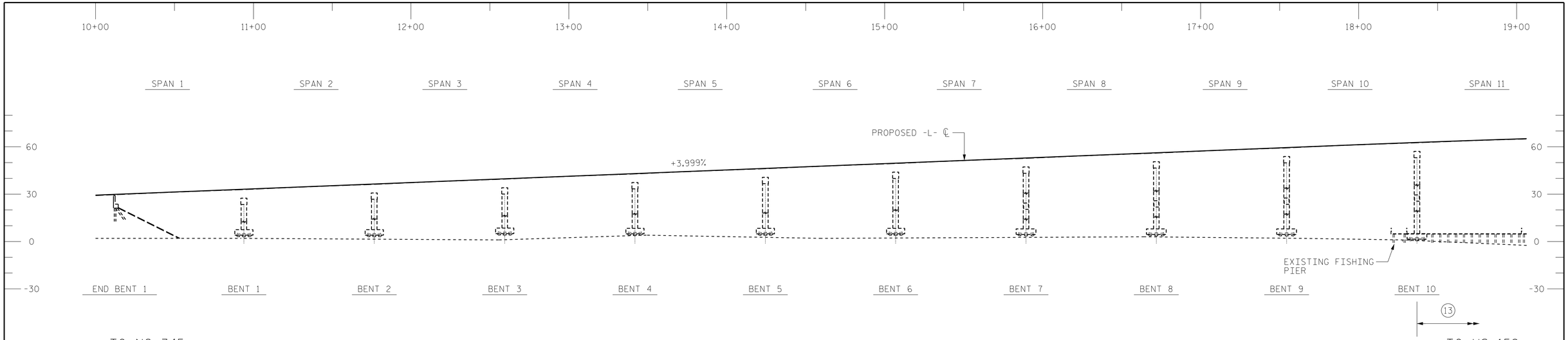
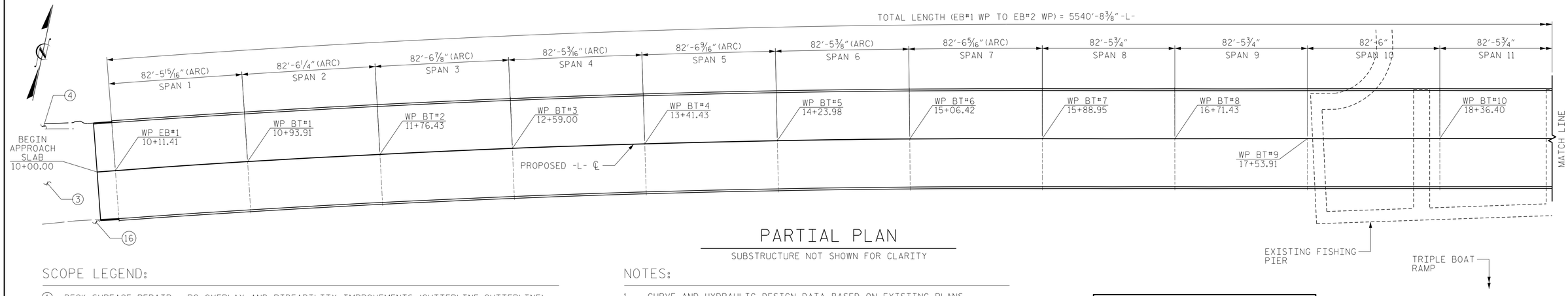
jduke



PARTIAL SECTION ALONG ℄ ROADWAY



PARTIAL PLAN

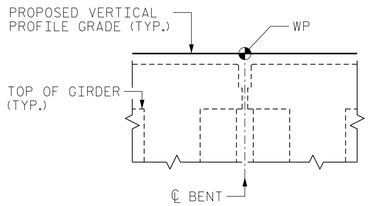
SUBSTRUCTURE NOT SHOWN FOR CLARITY

SCOPE LEGEND:

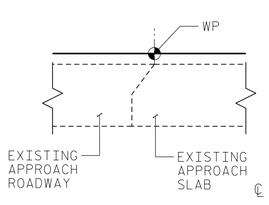
1. DECK SURFACE REPAIR - PC OVERLAY AND RIDEABILITY IMPROVEMENTS (GUTTERLINE-GUTTERLINE)
2. EXPANSION JOINT INSTALLATION/REPAIR/REPLACEMENT (TYP.)
3. APPROACH ROADWAY MILLING AND RESURFACING
4. SHOULDER BERM GUTTER REPLACEMENT (NW CORNER ONLY)
5. SUPERSTRUCTURE CONCRETE REPAIRS (TYP.)
6. PRESTRESSED CONCRETE BEAM REPAIRS (TYP.)
7. EPOXY COATING BEAM ENDS (TYP.)
8. CATHODIC PROTECTION - METALIZING OF BEAMS (SPANS 34-73)
9. BEARING REPLACEMENT AND RETROFIT (TYP.)
10. SUBSTRUCTURE CONCRETE REPAIRS (TYP.)
11. EPOXY COATING TOP OF BENT CAPS (TYP.)
12. CATHODIC PROTECTION - METALIZING OF BENT CAPS (BENTS 34-72)
13. CATHODIC PROTECTION - BULK ANODE (BENTS 10-35)
14. CATHODIC PROTECTION - PILE JACKETS (TYP.)
15. END BENT 2 EROSION REMEDIATION
16. CLEAR DEBRIS FROM DRAINS

NOTES:

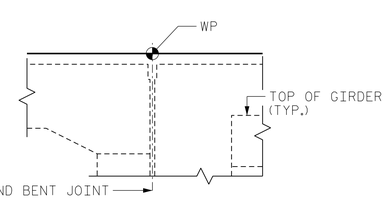
1. CURVE AND HYDRAULIC DESIGN DATA BASED ON EXISTING PLANS DATED 10/1987.
2. STATIONING, WORK POINTS AND SPAN LENGTHS BASED ON SURVEY DATED 05/2019.
3. SPAN AND BENT NUMBERS BASED ON CURRENT BRIDGE INSPECTION REPORT AND ORIGINAL PLANS DATED 10/1987.
4. EXISTING ELEVATIONS ARE NGVD'29 VERTICAL DATUM UNLESS OTHERWISE NOTED AND TAKEN FROM THE EXISTING PLANS DATED 10/1987.



WP LOCATIONS AT BENTS



WP LOCATIONS AT APPROACH SLABS



WP LOCATIONS AT END BENTS

I HEREBY CERTIFY THAT THIS STRUCTURE WAS REHABILITATED ACCORDING TO THESE PLANS OR AS NOTED HEREIN.

RESIDENT ENGINEER DATE

DocuSigned by: JACOB H. DUKE — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 — JACOB H. DUKE — 10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

SHEET 1 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 64 BYP OVER THE INTRACOASTAL WATERWAY (ROANOKE SOUND)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : DIEGO A. AGUIRRE DATE : 9/30/2020
CHECKED BY : FIDEL L. FLORES DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
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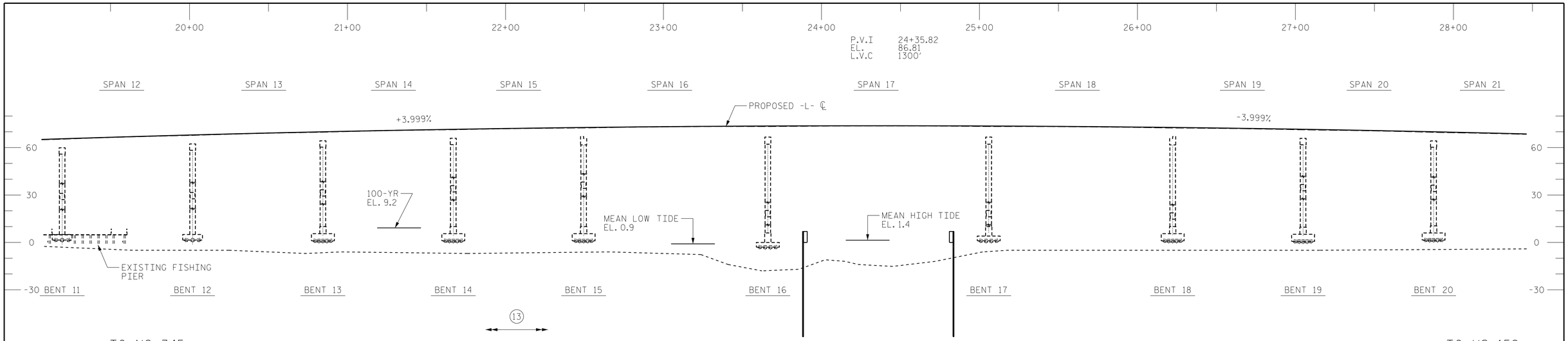
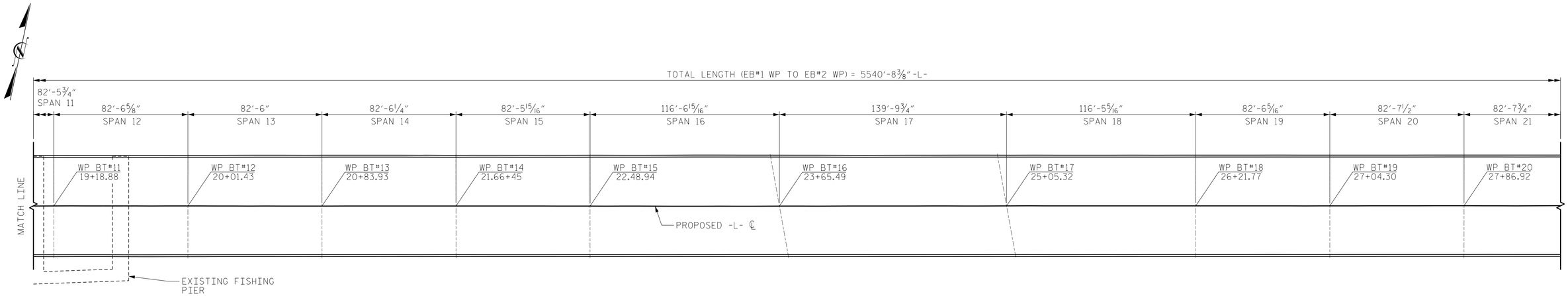
jduke



PARTIAL SECTION ALONG ℄ ROADWAY



PARTIAL PLAN

SUBSTRUCTURE NOT SHOWN FOR CLARITY

SCOPE LEGEND:

1. DECK SURFACE REPAIR - PC OVERLAY AND RIDEABILITY IMPROVEMENTS (GUTTERLINE-GUTTERLINE)
2. EXPANSION JOINT INSTALLATION/REPAIR/REPLACEMENT (TYP.)
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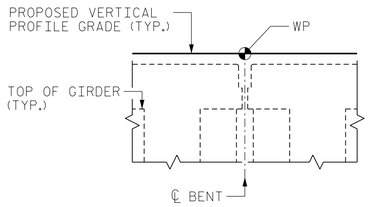
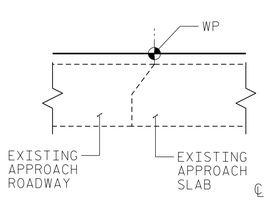
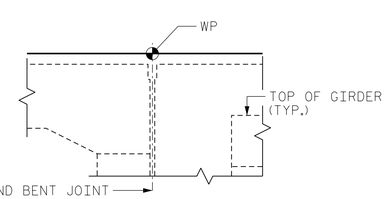


WP LOCATIONS AT BENTS



WP LOCATIONS AT APPROACH SLABS



WP LOCATIONS AT END BENTS

DRAWN BY : DIEGO A. AGUIRRE DATE : 9/30/2020
CHECKED BY : FIDEL L. FLORES DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
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jduke

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KCA
KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

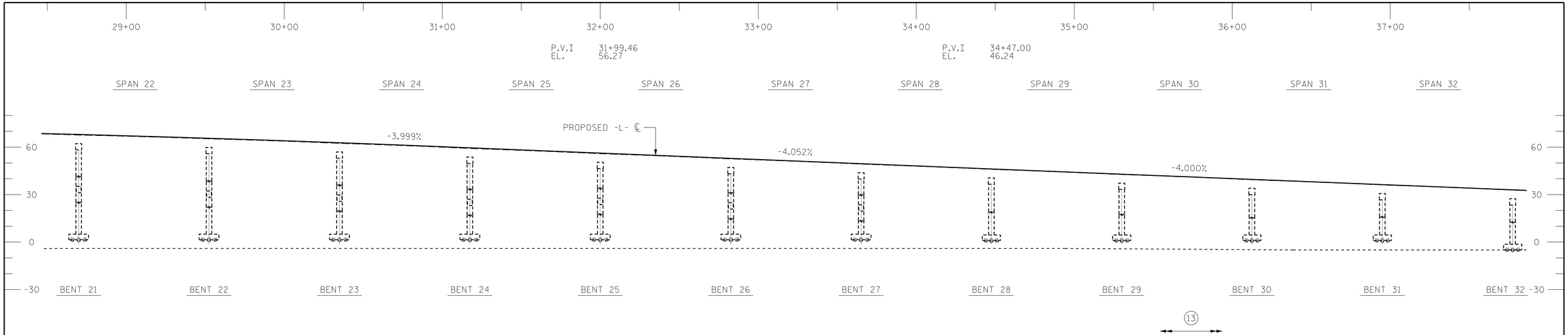
SHEET 2 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

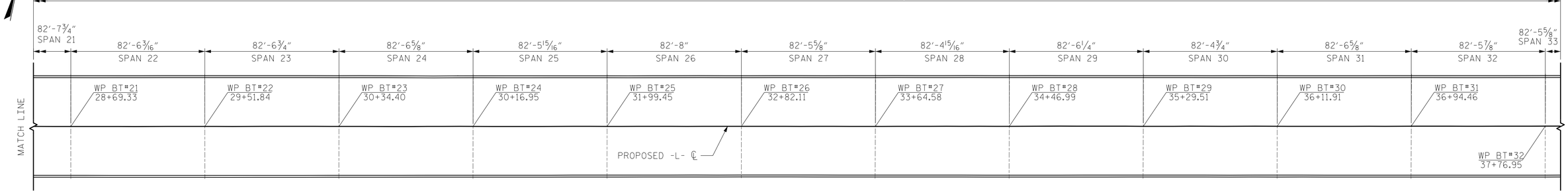
GENERAL DRAWING

FOR BRIDGE ON US 64 BYP OVER THE INTRACOASTAL WATERWAY (ROANOKE SOUND)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			137



PARTIAL SECTION ALONG ℄ ROADWAY



PARTIAL PLAN

SUBSTRUCTURE NOT SHOWN FOR CLARITY

SCOPE LEGEND:

1. DECK SURFACE REPAIR - PC OVERLAY AND RIDEABILITY IMPROVEMENTS (GUTTERLINE-GUTTERLINE)
2. EXPANSION JOINT INSTALLATION/REPAIR/REPLACEMENT (TYP.)
3. APPROACH ROADWAY MILLING AND RESURFACING
4. SHOULDER BERM GUTTER REPLACEMENT (NW CORNER ONLY)
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7. EPOXY COATING BEAM ENDS (TYP.)
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14. CATHODIC PROTECTION - PILE JACKETS (TYP.)
15. END BENT 2 EROSION REMEDIATION
16. CLEAR DEBRIS FROM DRAINS

NOTES:

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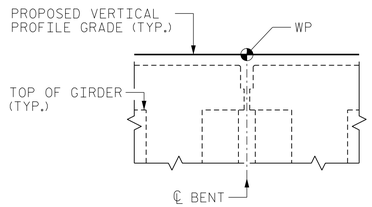
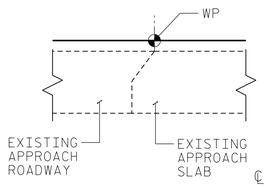
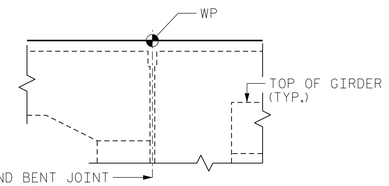


WP LOCATIONS AT BENTS



WP LOCATIONS AT APPROACH SLABS



WP LOCATIONS AT END BENTS

DRAWN BY : DIEGO A. AGUIRRE DATE : 9/30/2020
CHECKED BY : FIDEL L. FLORES DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_GD03_270012.dgn
jduke

DocuSigned by: Jacob Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE
10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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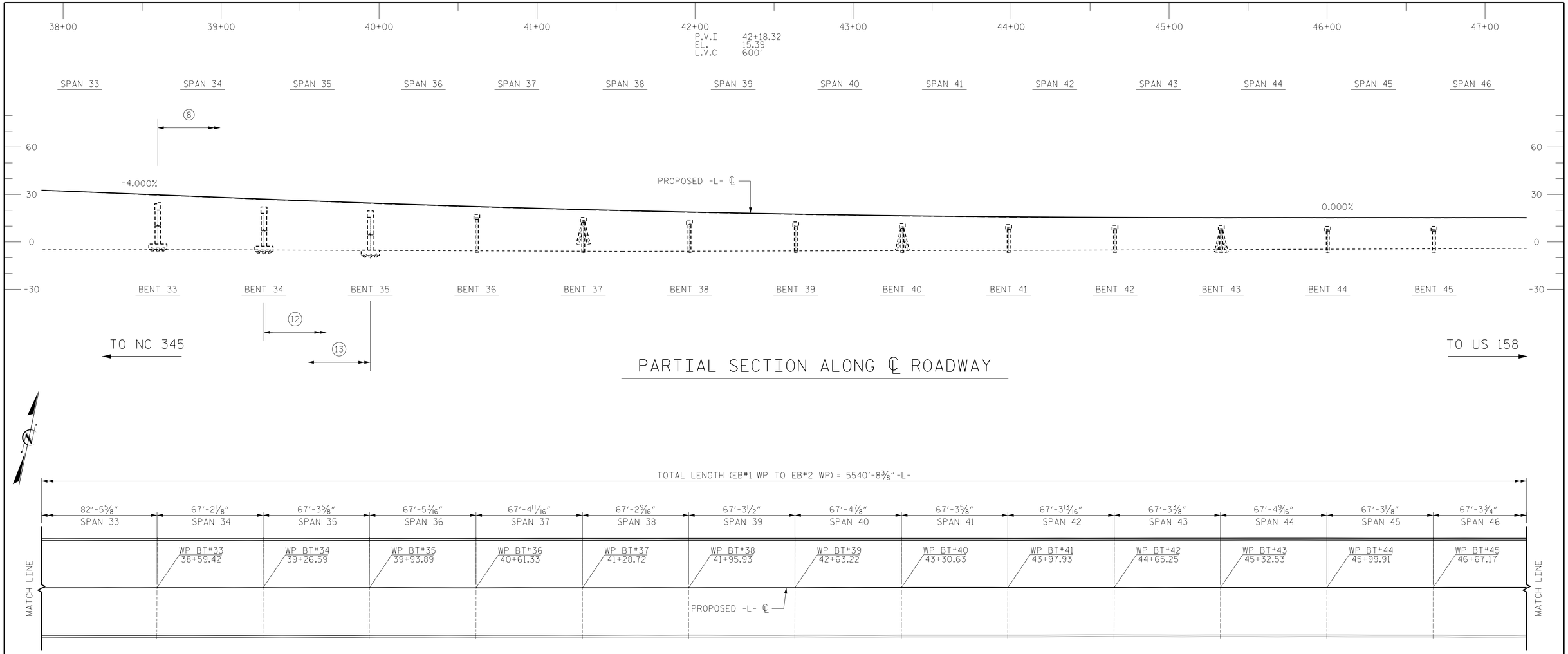
PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012
SHEET 3 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 64 BYP OVER THE INTRACOASTAL WATERWAY (ROANOKE SOUND)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			137



PARTIAL SECTION ALONG ℄ ROADWAY

PARTIAL PLAN

SUBSTRUCTURE NOT SHOWN FOR CLARITY

SCOPE LEGEND:

1. DECK SURFACE REPAIR - PC OVERLAY AND RIDEABILITY IMPROVEMENTS (GUTTERLINE-GUTTERLINE)
2. EXPANSION JOINT INSTALLATION/REPAIR/REPLACEMENT (TYP.)
3. APPROACH ROADWAY MILLING AND RESURFACING
4. SHOULDER BERM GUTTER REPLACEMENT (NW CORNER ONLY)
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NOTES:

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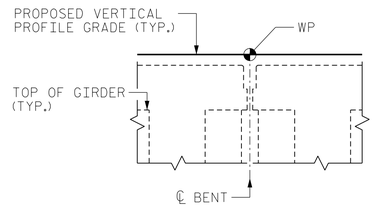
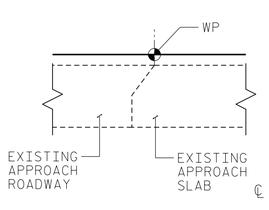
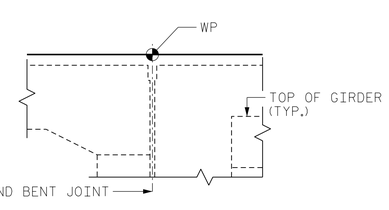


WP LOCATIONS AT BENTS



WP LOCATIONS AT APPROACH SLABS



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DRAWN BY : DIEGO A. AGUIRRE DATE : 9/30/2020
CHECKED BY : FIDEL L. FLORES DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

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jduke

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NC FIRM LICENSE: C-1506

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

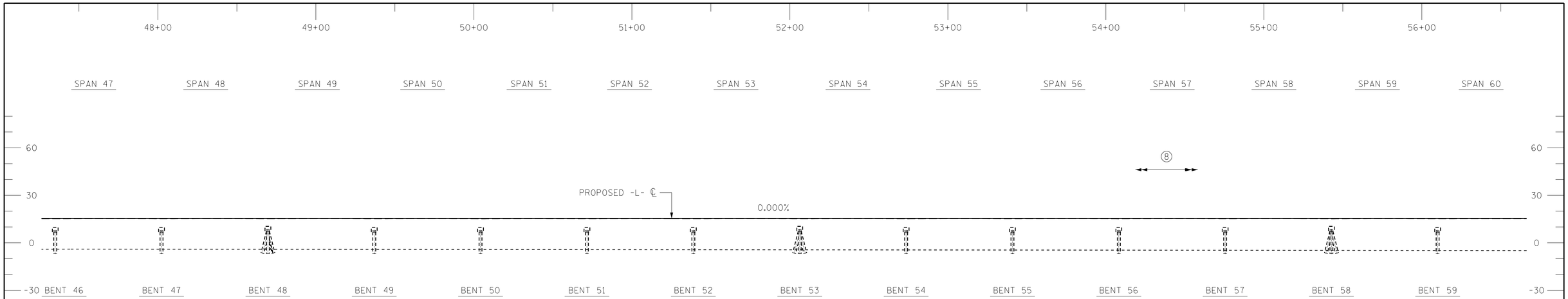
SHEET 4 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

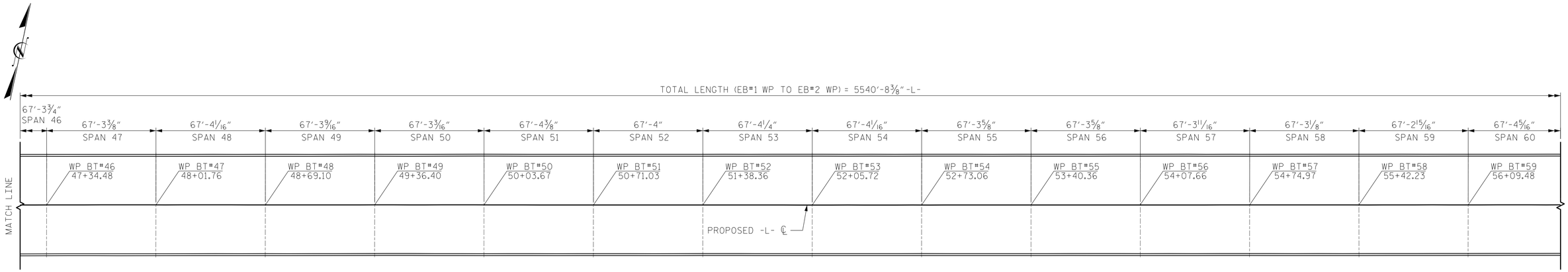
GENERAL DRAWING

FOR BRIDGE ON US 64 BYP OVER THE INTRACOASTAL WATERWAY (ROANOKE SOUND)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			137



PARTIAL SECTION ALONG ℄ ROADWAY



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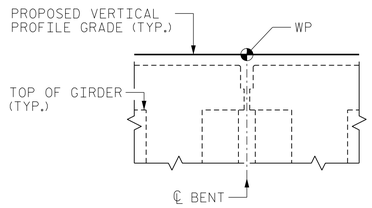

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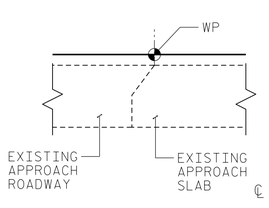
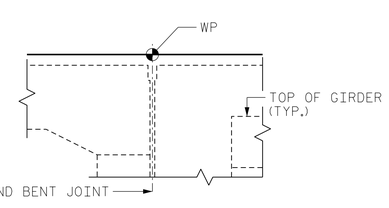


WP LOCATIONS AT APPROACH SLABS



WP LOCATIONS AT END BENTS

DRAWN BY : DIEGO A. AGUIRRE DATE : 9/30/2020
CHECKED BY : FIDEL L. FLORES DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

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NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
10/19/2021

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PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

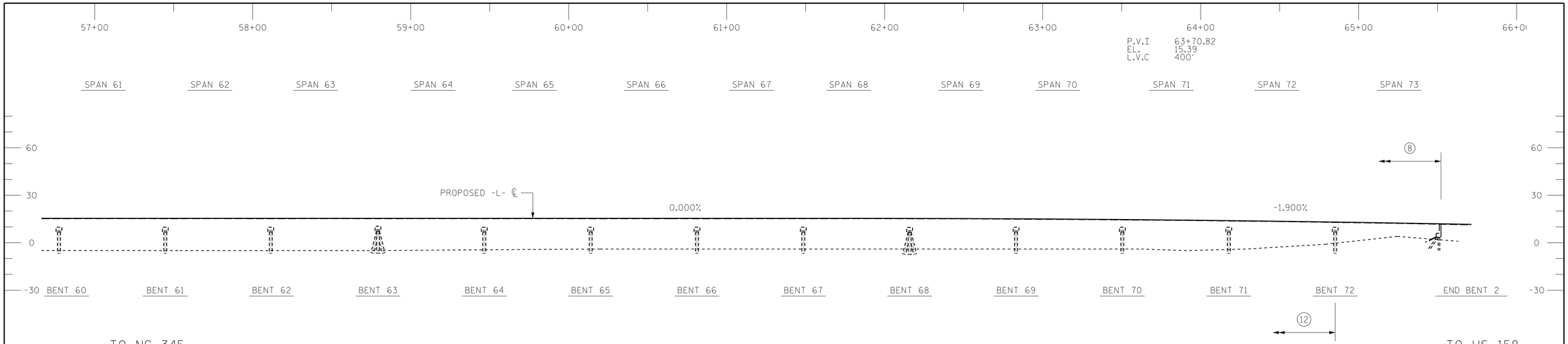
SHEET 5 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 64 BYP OVER THE INTRACOASTAL WATERWAY (ROANOKE SOUND)

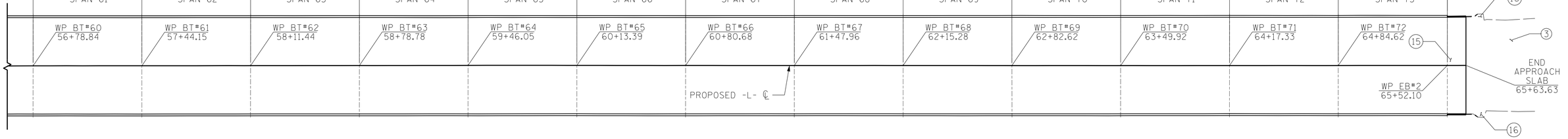
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			137



TO NC 345

TO US 158

PARTIAL SECTION ALONG ℄ ROADWAY



PARTIAL PLAN

SUBSTRUCTURE NOT SHOWN FOR CLARITY

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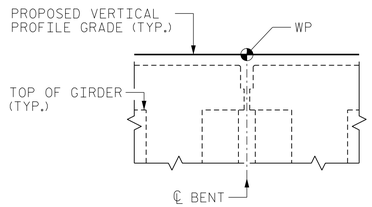
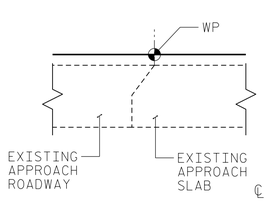
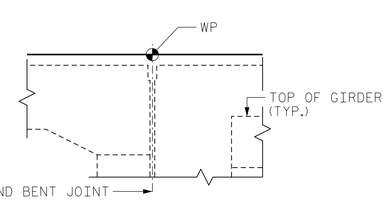


WP LOCATIONS AT BENTS



WP LOCATIONS AT APPROACH SLABS



WP LOCATIONS AT END BENTS

DRAWN BY : DIEGO A. AGUIRRE DATE : 9/30/2020
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PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

SHEET 6 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 64 BYP OVER THE INTRACOASTAL WATERWAY (ROANOKE SOUND)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			137

LOCATION SKETCH

INFORMATION INDICATED ON THE LOCATION SKETCH SHALL BE CONSIDERED GENERAL INFORMATION ONLY. THE CONTRACTOR SHALL CONFIRM, THROUGH OTHER SOURCES, SPECIFIC INFORMATION REGARDING BRIDGES, ROADWAYS, UTILITIES, THE SURROUNDING AREA, AND ANY OTHER ASPECTS THAT MAY BE NECESSARY TO PERFORM AND COMPLETE THE PROJECT.

2019 SURVEY DATUM

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NGS FOR MONUMENT "1 1"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 796876.50(ft) EASTING: 2987337.92(ft)
ELEVATION: 2.90(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99994128
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "1 1" TO -L- STATION IS

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88
ELEVATIONS BASED ON NGS MONUMENT "DAR-20"
ELEVATION: 6.20 (ft)

NOTE: EXISTING PLANS - NVGD '29 DATUM

BRIDGE COORDINATES	
LATITUDE	LONGITUDE
35°53' 42.16"	75°37' 51.58"

BL

POINT	DESC.	NORTH	EAST	ELEVATION
1	BL-1	REB/CAP SET	796576.6045	2993485.6670	2.34
2	BL-2	REB/CAP SET	796354.8045	2992584.1090	2.36
3	BL-3	REB/CAP SET	798215.5426	3000554.8050	8.85
4	BL-4	REB/CAP SET	798536.6506	3001394.0050	5.19

GENERAL NOTES (CONT.)

EXISTING JOINTS AND DECK DRAINS SHALL BE SEALED PRIOR TO BEGINNING SURFACE PREPARATIONS OF THE BRIDGE DECK. THE CONTRACTOR SHALL TAKE CARE THAT ANY CONSTRUCTION DEBRIS THAT COLLECTS IN THE DRAINS IS CONTAINED. DRAINS IN SHOULDERS OF ADJACENT TRAVEL LANE(S) SHALL BE KEPT FREE AND CLEAR OF DEBRIS.

LONGITUDINAL CONSTRUCTION JOINTS OF OVERLAYS SHALL BE LOCATED AS SHOWN ON THE TYPICAL SECTION SHEETS.

ALL METALIZED SURFACES SHALL RECEIVE A SEAL COATING AS SPECIFIED IN TABLE 2 OF THE DEPARTMENT'S THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM. FOR THERMAL SPRAYED COATINGS, SEE SPECIAL PROVISIONS.

CONSTRUCTION JOINTS ARE PERMITTED ONLY AT LOCATIONS SPECIFIED IN THE PLANS. ADDITIONAL CONSTRUCTION JOINTS OR ALTERATIONS TO THOSE SHOWN REQUIRE THE ENGINEER'S APPROVAL.

ALL SURVEYING AND STAKING NECESSARY TO COMPLETE THE PROPOSED WORK IS INCIDENTAL TO ALL OTHER PAY ITEMS FOR THIS PROJECT.

FOR IN-WATER WORK, INCLUDING THE USE OF A BARGE, ONLY IN AREAS OVER SUBMERGED AQUATIC VEGETATION (SAV) OR OTHER SUBMERGED PROTECTED RESOURCES TO OCCUR, ENSURE THERE IS SUFFICIENT CLEARANCE FROM THE BOTTOM OF THE BARGE SUCH THAT NO DAMAGE TO EXISTING SAV OR RESOURCES WILL OCCUR WITHIN THE CONSTRUCTION LIMITS. WHEN USING A BARGE DURING CONSTRUCTION, ROTATE OR MOVE THE LOCATION OF THE BARGE EVERY TEN TO FOURTEEN DAYS TO ALLOW SUNLIGHT TO REACH THE EXISTING SAV BENEATH THE BARGE. THE BARGE SHALL NOT MOVE BACK TO THE PREVIOUS LOCATION FOR A MINIMUM OF FOUR DAYS.

HABITAT BEYOND THE LIMITS OF CONSTRUCTION SHALL NOT BE DISTURBED.

STANDARD CONSTRUCTION CONDITIONS SHALL BE IMPLEMENTED FOR THE FOLLOWING PROTECTED/ENDANGERED SPECIES AS APPLICABLE AND INCLUDED IN CONTRACT DOCUMENTS:

NORTHERN LONG-EARED BAT
PIPING PLOVER
ROSEATE TERN
KEMP'S RIDLEY SEA TURTLE
SEABEACH AMARANTH
WEST INDIAN MANATEE
RED KNOT
GREEN SEA TURTLE
LEATHERBACK SEA TURTLE
EASTERN BLACK RAIL
RED-COCKATED WOODPECKER
HAWKSBILL SEA TURTLE
LOGGERHEAD SEA TURTLE

FOR WORK ADJACENT TO THE PUBLIC, THE CONTRACTOR IS RESPONSIBLE TO ADEQUATELY PROTECT THE TRAVELING PUBLIC. THIS INCLUDES, BUT IS NOT LIMITED TO FENCING OFF OPERATION, SIDEWALK CLOSURES, LANE CLOSURES, DEBRIS SHIELDS, ETC.

ACCESS TO THE BOAT LAUNCH AND PARKING LOT SHALL REMAIN OPEN TO THE PUBLIC THROUGHOUT THE LIFE OF THE PROJECT.

COORDINATE ANY FACILITY CLOSURES IN ACCORDANCE WITH THE TRANSPORTATION MANAGEMENT PLAN AND SPECIAL PROVISIONS.

FOR ICT, SEE CONTRACT DOCUMENTS.

FOR ADDITIONAL NOTES, SEE BILL OF MATERIALS SHEET.

GENERAL NOTES

ALL DIMENSIONS ARE IN FEET AND INCHES.

DO NOT SCALE DRAWINGS FOR DIMENSIONS NOT GIVEN.

ASSUMED LIVE LOAD FOR REPAIRS = HS20-44. DESIGN BASED OFF ORIGINAL DESIGN PLANS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

ALL BAR SUPPORTS USED IN THE PARAPET, PILES, AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

SEE TRANSPORTATION MANAGEMENT PLANS FOR LANE WIDTHS, SEQUENCING AND OTHER TRAFFIC CONTROL MEASURES FOR STAGING OF OVERLAY SURFACE PREPARATION AND POLYMER CONCRETE PLACEMENT.

GENERAL DRAWING INFORMATION IS TAKEN FROM THE ORIGINAL PLANS AND THE ROUTINE INSPECTION REPORT DATED 10/18/2018.

BRIDGE ORIENTATION CONFORMS TO THE EXISTING BRIDGE PLANS/ROUTINE INSPECTION.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT DUE TO THE NATURE OF PRESERVATION PROJECTS, THE EXTENT OF WORK CANNOT ALWAYS BE ACCURATELY DETERMINED PRIOR TO COMMENCEMENT OF WORK. REPAIR LOCATIONS AND ESTIMATES OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS.

EXISTING DIMENSIONS AND BRIDGE CONDITION ARE FROM THE BEST INFORMATION AVAILABLE. THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.

THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN WHAT IS SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL STATE AND FEDERAL SAFETY REQUIREMENTS.

WORK ON BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL BELOW, EXCEPT WHERE THE CONTRACTOR'S PLAN USES PLATFORMS, NETS, SCREENS OR OTHER PROTECTIVE DEVICES TO CATCH THE MATERIAL. THE CONTRACTOR SHALL SUBMIT PLANS FOR CONSTRUCTION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS AND THE PROJECT SPECIAL PROVISIONS.

THE CONTRACTOR SHALL PERFORM ALL WORK WITH CARE SO THAT THE EXISTING STRUCTURE WHICH IS TO REMAIN IN PLACE WILL NOT BE DAMAGED. IF THE CONTRACTOR DAMAGES ANY PART OF THE EXISTING STRUCTURE WHICH IS TO REMAIN IN PLACE, THE DAMAGED AREA SHALL BE REPAIRED OR REPLACED IN A MANNER SATISFACTORY TO THE ENGINEER AT NO ADDITIONAL COST TO THE DEPARTMENT.

ANY DAMAGE TO EXISTING REINFORCING STEEL, DURING CONTRACTOR'S OPERATIONS, SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER AND PERFORMED AT NO ADDITIONAL COST TO THE DEPARTMENT.

FOR CONTROL OF TRAFFIC AND LIMITS ON PHASING OF CONSTRUCTION, SEE TRANSPORTATION MANAGEMENT PLANS.

PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL, A COMPLETE SEQUENCE OF TASKS FOR EACH OPERATION AFFECTING THE BRIDGE SURFACE AND/OR VEHICLE/MARINE TRAFFIC.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS. FORMS MUST BE SUPPORTED BY THE EXISTING STRUCTURE. FULL DEPTH COFFERDAMS WILL NOT BE ACCEPTED.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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

FOR SECURING OF VESSELS, SEE SPECIAL PROVISIONS.

ALL PAVEMENT MARKING WILL BE IN ACCORDANCE WITH THE TRANSPORTATION MANAGEMENT PLANS.

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

SHEET 7 OF 7

KCA KISINGER CAMPO & ASSOCIATES
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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 64 BYP OVER THE INTRACOASTAL WATERWAY (ROANOKE SOUND)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : DIEGO A. AGUIRRE DATE : 9/30/2020
CHECKED BY : FIDEL L. FLORES DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
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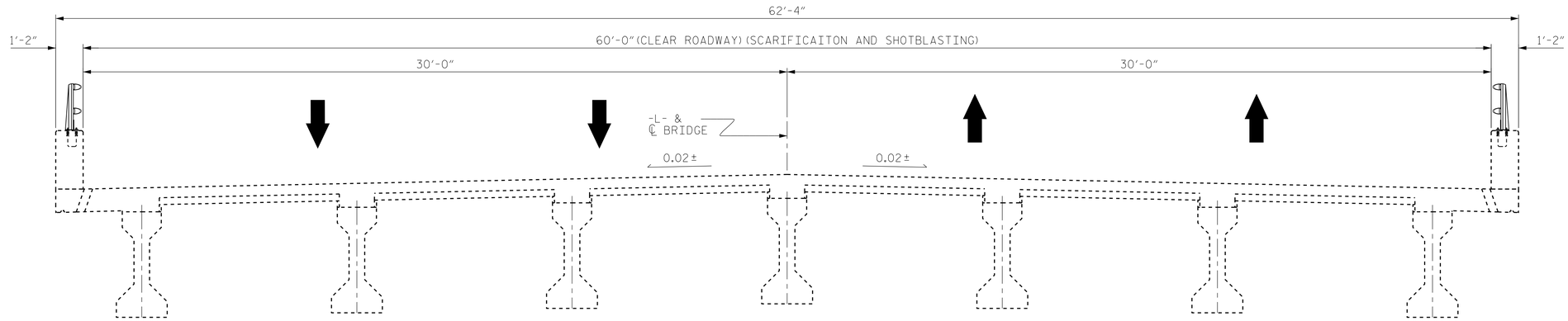
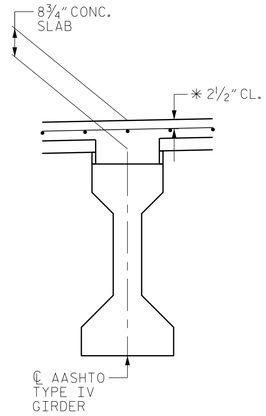
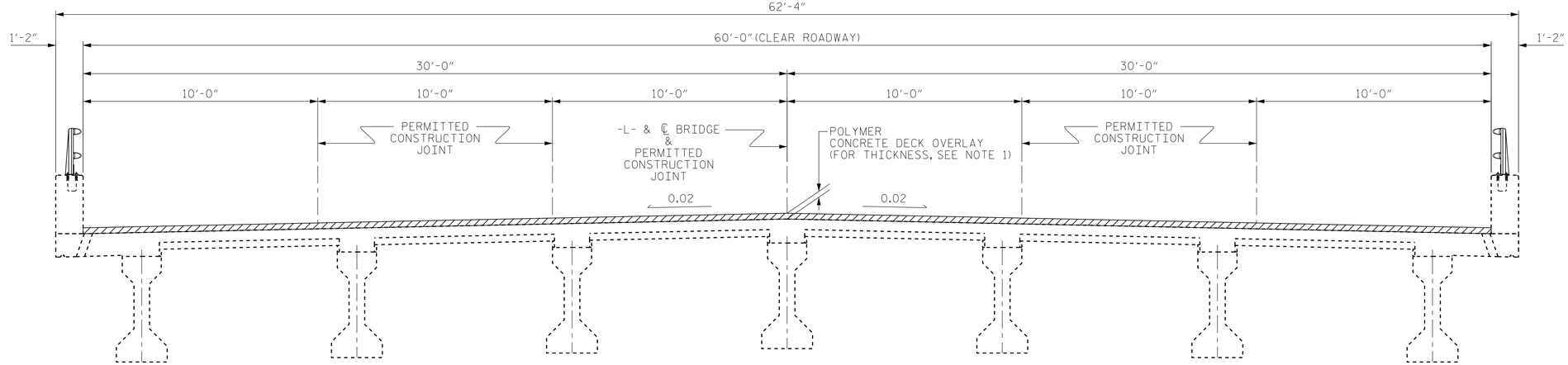
User:jduke



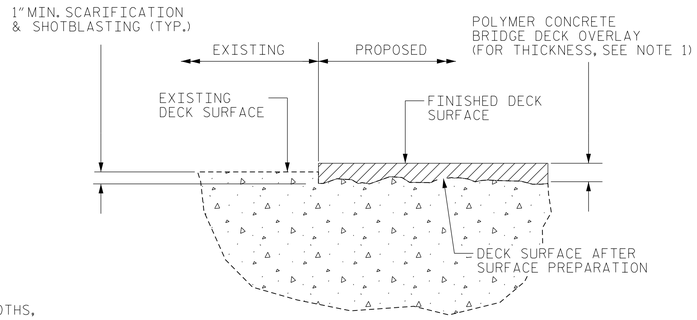
EXISTING SECTION
(SPANS 1-15 & 19-33)



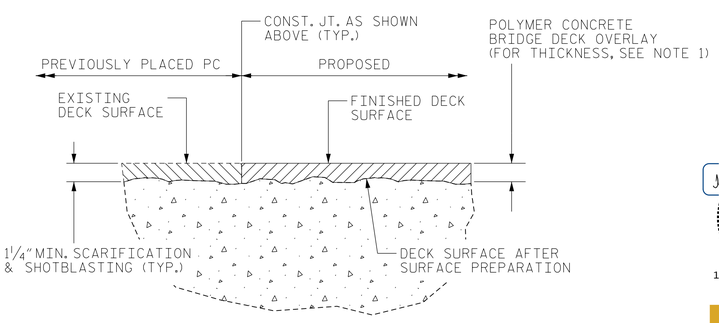
EXISTING SLAB SECTION
(SPANS 1-15 & 19-33)
* CONCRETE COVER PER EXISTING PLANS DATED 10/1987



PROPOSED SECTION
(SPANS 1-15 & 19-33)



DETAIL FOR PC OVERLAY



DETAIL FOR STAGED PC OVERLAY

NOTES:

1. PC BRIDGE DECK OVERLAY IS TO BE APPLIED ON ALL SPANS USING A VARIABLE THICKNESS TO IMPROVE RIDEABILITY, AS SHOWN IN THE "DECK SURFACE REPAIR" SHEETS.
2. LONGITUDINAL CONSTRUCTION JOINTS OF OVERLAYS SHALL BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.
3. SEE TRANSPORTATION MANAGEMENT PLANS FOR LANE WIDTHS, SEQUENCING, AND OTHER TRAFFIC CONTROL MEASURES FOR STAGING OF POLYMER CONCRETE (PC) SYSTEM AND SURFACE PREPARATION.

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

DocuSigned by: Jacob Duke
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H. DUKE
10/19/2021

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RALEIGH

TYPICAL SECTION
SPANS 1-15 & 19-33

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : DIEGO A. AGUIRRE DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
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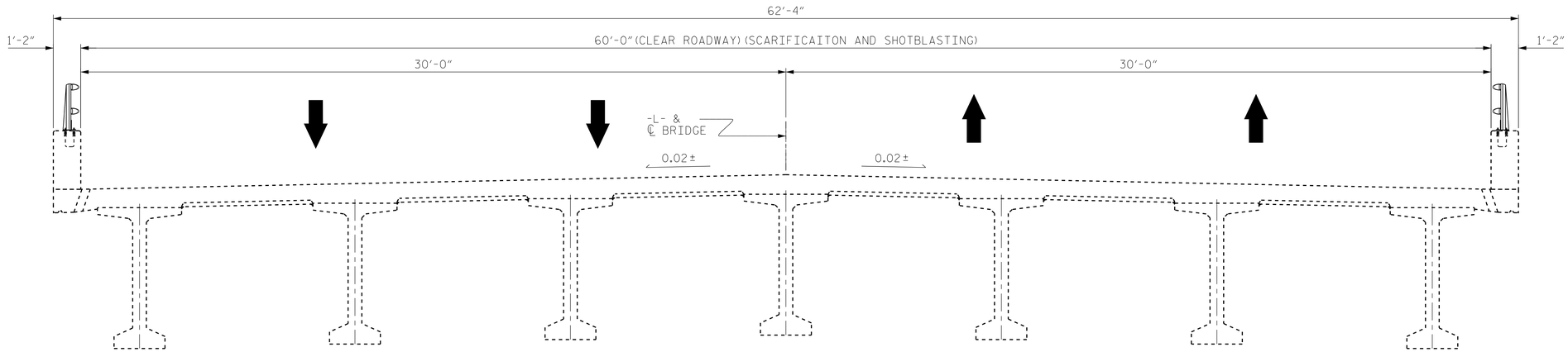
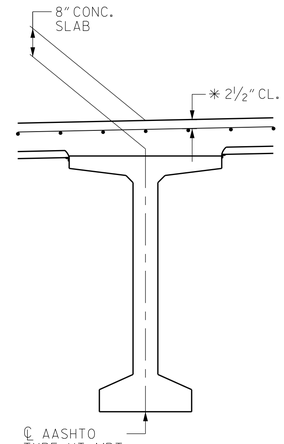
jduke



EXISTING SECTION

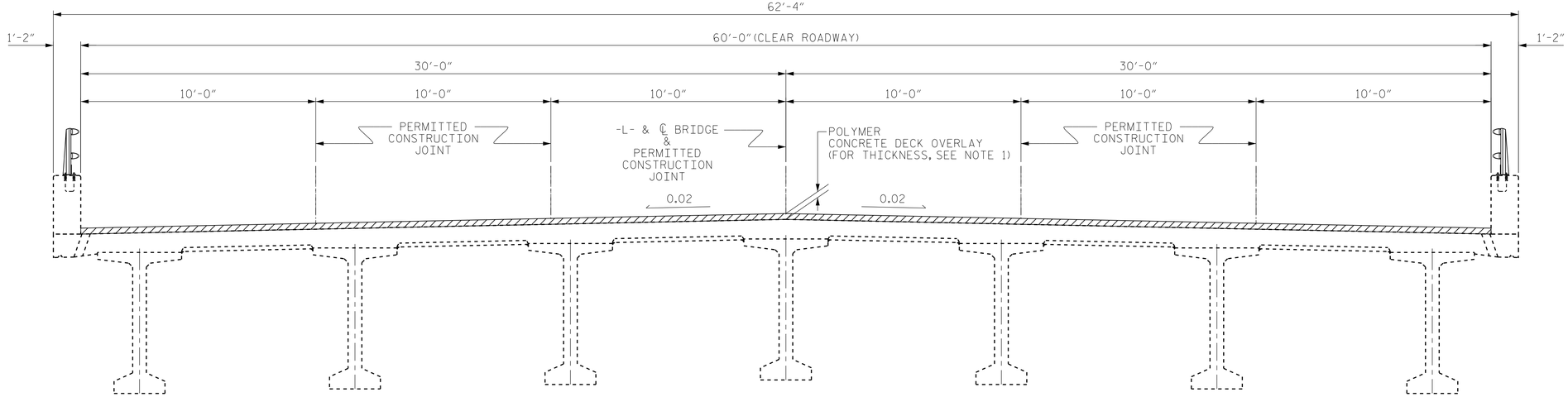
(SPANS 16 & 18, SPAN 17 SIMILAR)



EXISTING SLAB SECTION

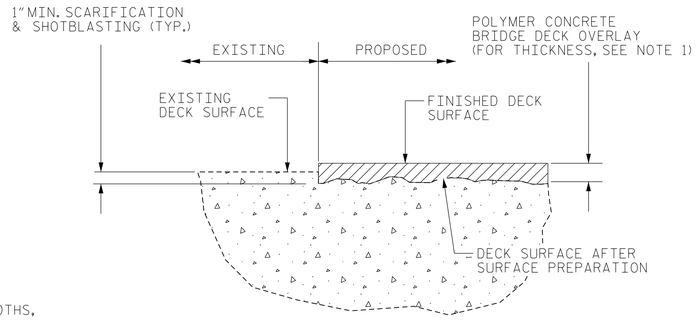
(SPANS 16 & 18, SPAN 17 SIMILAR)

* CONCRETE COVER PER EXISTING PLANS DATED 10/1987

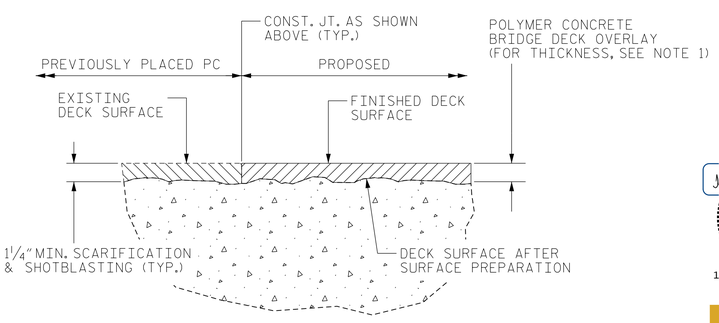


PROPOSED SECTION

(SPANS 16 & 18, SPAN 17 SIMILAR)



DETAIL FOR PC OVERLAY



DETAIL FOR STAGED PC OVERLAY

NOTES:

1. PC BRIDGE DECK OVERLAY IS TO BE APPLIED ON ALL SPANS USING A VARIABLE THICKNESS TO IMPROVE RIDEABILITY, AS SHOWN IN THE "DECK SURFACE REPAIR" SHEETS.
2. LONGITUDINAL CONSTRUCTION JOINTS OF OVERLAYS SHALL BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.
3. SEE TRANSPORTATION MANAGEMENT PLANS FOR LANE WIDTHS, SEQUENCING, AND OTHER TRAFFIC CONTROL MEASURES FOR STAGING OF POLYMER CONCRETE (PC) SYSTEM AND SURFACE PREPARATION.

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

DocuSigned by: Jacob Duke
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10/19/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION

SPANS 16-18

DRAWN BY :	DIEGO A. AGUIRRE	DATE :	9/30/2020
CHECKED BY :	JACOB H. DUKE	DATE :	10/1/2020
DESIGN ENGINEER OF RECORD:	JACOB H. DUKE	DATE :	10/1/2020

10/19/2021
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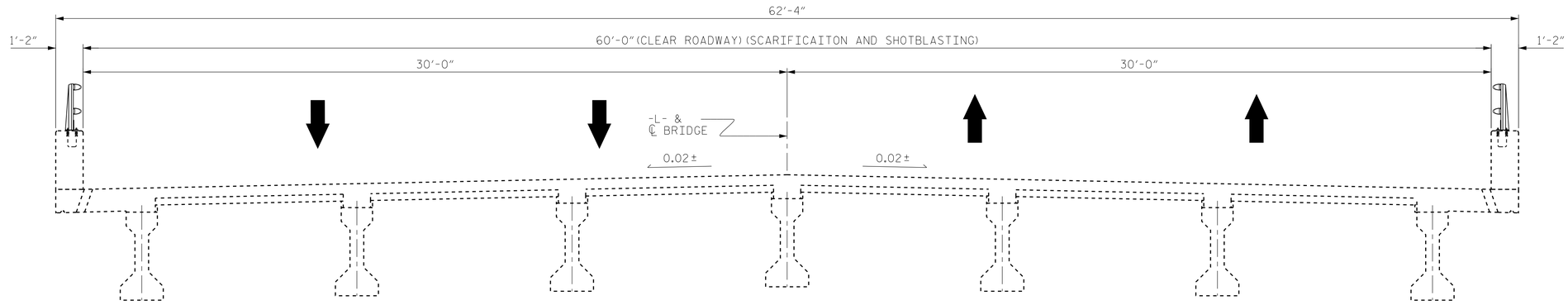
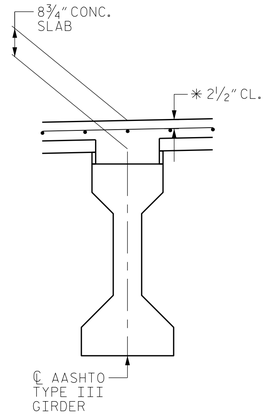
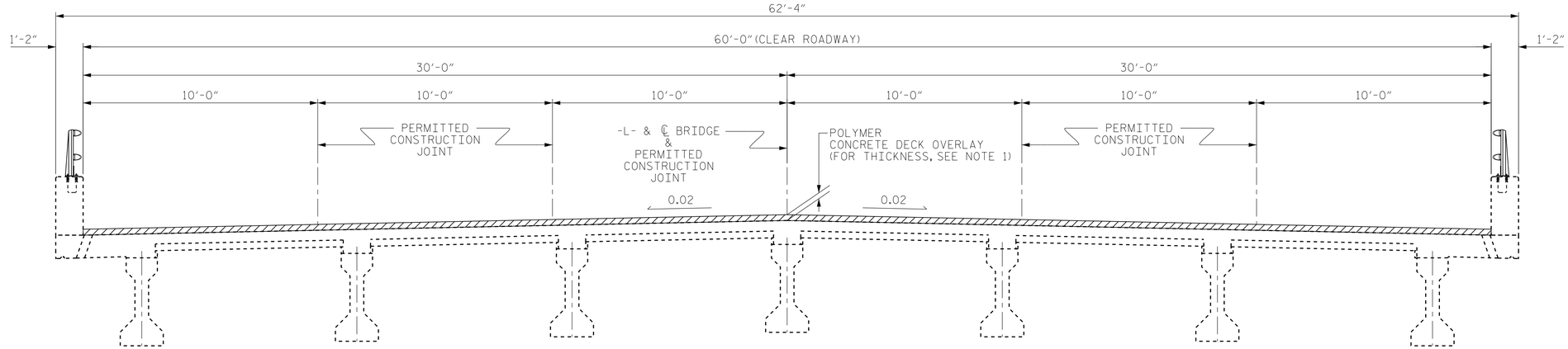
1			3			TOTAL SHEETS
2			4			137



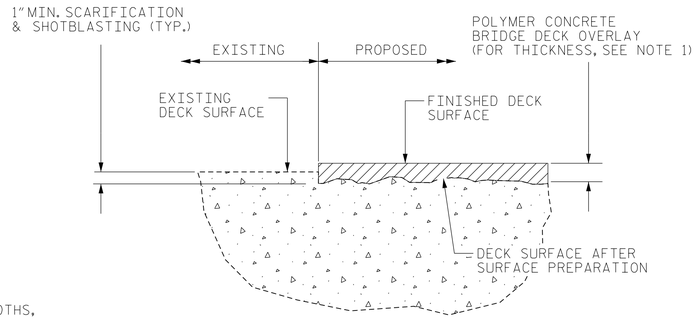
EXISTING SECTION
(SPANS 34 THRU 73)



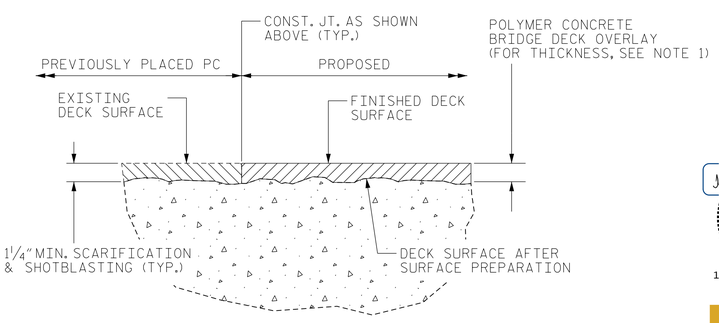
EXISTING SLAB SECTION
(SPANS 34 THRU 73)
* CONCRETE COVER PER EXISTING PLANS DATED 10/1987



PROPOSED SECTION
(SPANS 34 THRU 73)



DETAIL FOR PC OVERLAY



DETAIL FOR STAGED PC OVERLAY

NOTES:

1. PC BRIDGE DECK OVERLAY IS TO BE APPLIED ON ALL SPANS USING A VARIABLE THICKNESS TO IMPROVE RIDEABILITY, AS SHOWN IN THE "DECK SURFACE REPAIR" SHEETS.
2. LONGITUDINAL CONSTRUCTION JOINTS OF OVERLAYS SHALL BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.
3. SEE TRANSPORTATION MANAGEMENT PLANS FOR LANE WIDTHS, SEQUENCING, AND OTHER TRAFFIC CONTROL MEASURES FOR STAGING OF POLYMER CONCRETE (PC) SYSTEM AND SURFACE PREPARATION.

DRAWN BY : DIEGO A. AGUIRRE DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
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jduke

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H. DUKE
10/19/2021

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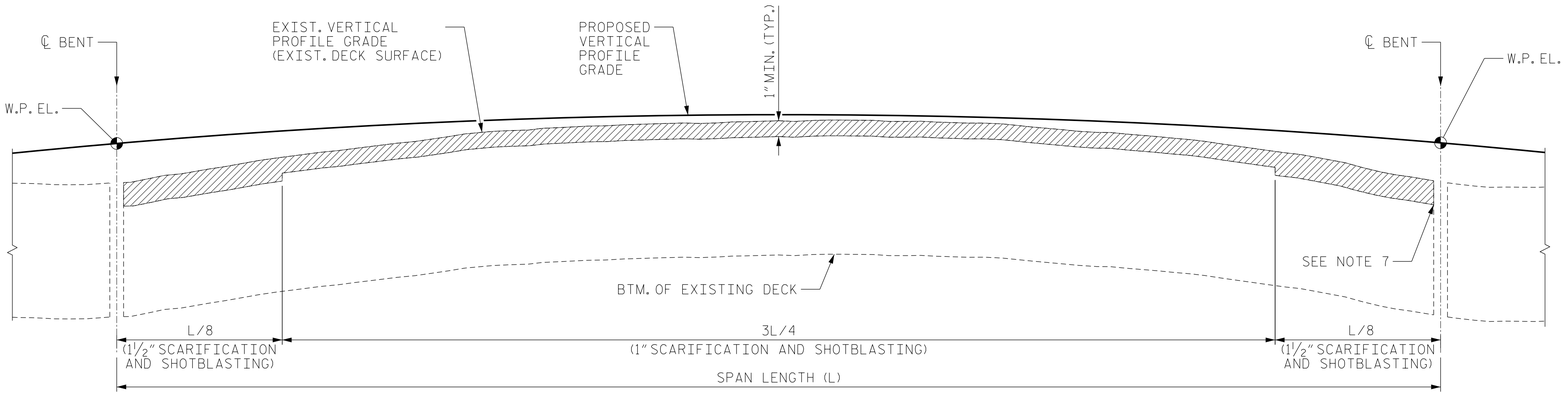
PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

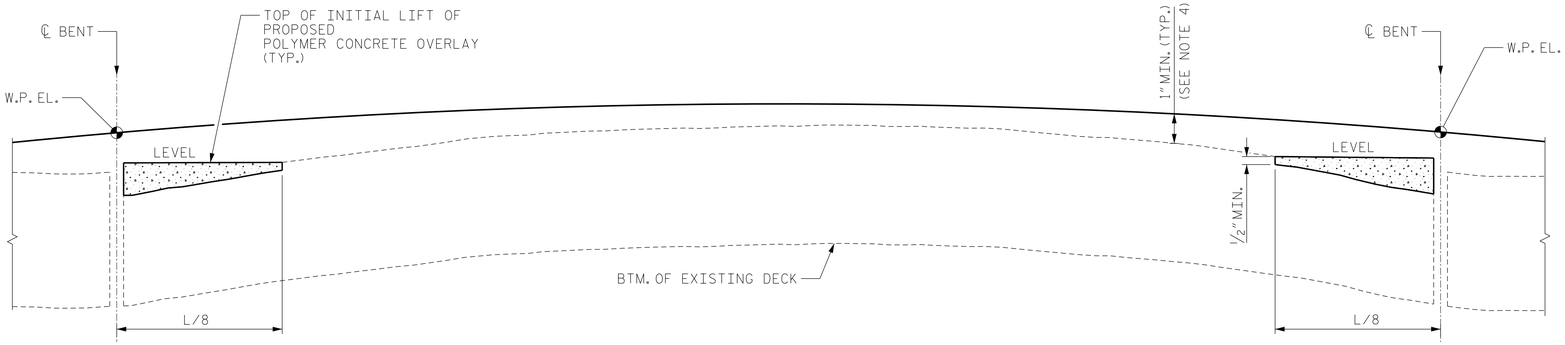
TYPICAL SECTION
SPANS 34-73

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			137



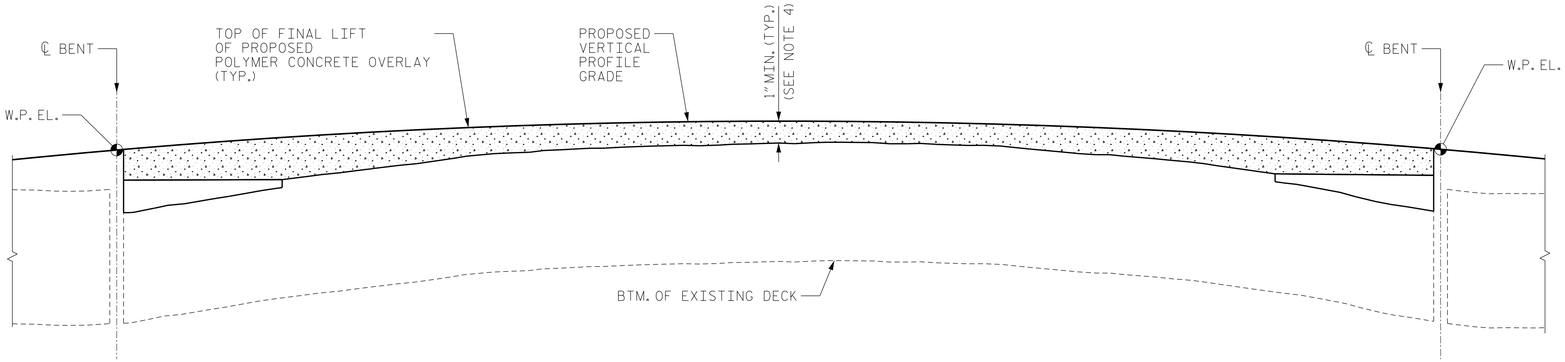
SCARIFICATION PRIOR TO PC OVERLAY

(ELEVATION ALONG ℄ - NOT TO SCALE)



INITIAL LIFT OF PC OVERLAY

(ELEVATION ALONG ℄ - NOT TO SCALE)



FINAL LIFT OF PC OVERLAY

(ELEVATION ALONG ℄ - NOT TO SCALE)

TYPICAL POLYMER CONCRETE (PC) OVERLAY FOR RIDEABILITY CORRECTION

(SPAN 17 SHOWN - SIMILAR FOR OTHER SPANS)
(GIRDERS AND REINFORCING NOT SHOWN FOR CLARITY)

NOTES:

1. EXISTING VERTICAL PROFILE GRADE WAS DETERMINED BASED ON DATA FROM FINAL SURVEY.
2. FOR WORK POINT (W.P.) STATION AND ELEVATION DATA OF PROPOSED VERTICAL PROFILE GRADE, SEE "GENERAL DRAWINGS" SHEETS AND CONSTRUCTION ELEVATIONS.
3. FOR JOINT DETAILS, SEE "JOINT DETAILS" SHEETS.
4. PC OVERLAY THICKNESS VARIES THROUGHOUT THE ENTIRE LENGTH OF THE BRIDGE. THE FINAL LIFT OF PC OVERLAY SHALL HAVE A MINIMUM THICKNESS OF 1". FINAL CONSTRUCTION ELEVATIONS WILL BE MADE AVAILABLE PRIOR TO CONTRACT AVAILABILITY.
5. BRIDGE DECK SCARIFICATION LIMITS SHOWN IN THIS SHEET ARE REQUIRED AND FOR THE FULL CLEAR ROADWAY WIDTH (INSIDE FACE OF EACH BRIDGE RAIL). MULTIPLE LIFT METHOD DEPICTED IS INTENDED AS A CONCEPT, BUT IS NOT REQUIRED OR EXCLUSIVE OF OTHER METHODS. REGARDLESS OF THE METHOD, IT IS REQUIRED THAT A "RIDEABILITY CORRECTION PLAN" IS SUBMITTED TO AND APPROVED BY THE ENGINEER PRIOR TO MOBILIZING WORK ZONE TRAFFIC CONTROL ON THE BRIDGE DECK.
6. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE FINAL DECK SURFACE MEETS THE ELEVATIONS PROVIDED.
7. IF SOUND CONCRETE IS NOT ENCOUNTERED AT THE DEPTHS SPECIFIED IN THESE PLANS, REPAIR THE HEADER BY UTILIZING CLASS II SURFACE PREPARATION. LEAVE EXISTING R/F STEEL IN PLACE AND PATCH WITH PC MATERIALS, AS DIRECTED BY THE ENGINEER.
8. CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2½" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION. BASED ON VISUAL INSPECTION AVERAGE COVER IS EXPECTED TO BE FROM 1½" TO 2".
9. FOR BRIDGE DECK RIDEABILITY, SEE SPECIAL PROVISIONS.
10. FOR OVERLAY SURFACE PREPARATION FOR POLYMER CONCRETE, SEE SPECIAL PROVISIONS.
11. FOR POLYMER CONCRETE BRIDGE DECK OVERLAY, SEE SPECIAL PROVISIONS.

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE
12/16/2021

KCA KISINGER CAMPO & ASSOCIATES
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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK SURFACE REPAIR
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			137

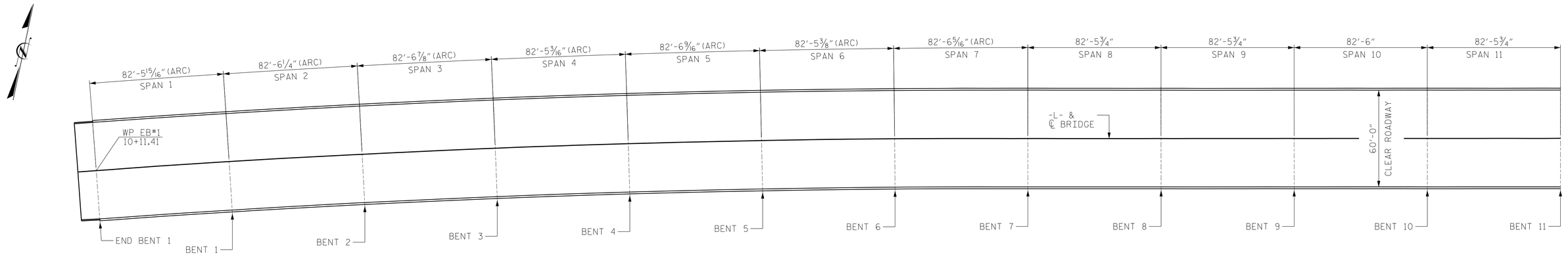
DRAWN BY : DIEGO A. AGUIRRE DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

12/16/2021
15BPR.46_SMU_DSR_270012.dgn
jduke

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

	SPAN 1		SPAN 2		SPAN 3		SPAN 4		SPAN 5		SPAN 6		SPAN 7		SPAN 8		SPAN 9		SPAN 10		SPAN 11	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	550 SY		550 SY		550 SY		550 SY		550 SY		550 SY		550 SY		550 SY		550 SY		550 SY		550 SY	
CLASS II SURFACE PREPARATION	- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY	
CONCRETE DECK REPAIR FOR PC OVERLAY	- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY	
SHOTBLASTING BRIDGE DECK	550 SY		550 SY		550 SY		550 SY		550 SY		550 SY		550 SY		550 SY		550 SY		550 SY		550 SY	
PC MATERIALS	49.3 CY		48.3 CY		44.9 CY		43.9 CY		44.9 CY		45.2 CY		45.5 CY		49.4 CY		46.0 CY		43.4 CY		47.0 CY	
PLACING & FINISHING PC OVERLAY	550 SY		550 SY		550 SY		550 SY		550 SY		550 SY		550 SY		550 SY		550 SY		550 SY		550 SY	
GROOVING BRIDGE FLOORS	4684 SF		4685 SF		4687 SF		4680 SF		4686 SF		4681 SF		4685 SF		4682 SF		4682 SF		4684 SF		4682 SF	



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.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2½" 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.

BRIDGE DECK GROOVING QUANTITY BASED ON LIMITS REQUIRED IN SECTION 420-14(B) OF THE STANDARD SPECIFICATIONS.

BRIDGE DECK SCARIFICATION LIMITS ARE THE FULL CLEAR ROADWAY WIDTH (INSIDE FACE OF EACH BRIDGE RAIL).

FOR BRIDGE DECK RIDEABILITY AND GROOVING, SEE SPECIAL PROVISIONS.
COORDINATE THIS SHEET WITH THE SHEETS FOR JOINT DETAILS.

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
12/16/2021

KCA KISINGER CAMPO & ASSOCIATES
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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK SURFACE REPAIR

SPANS 1 - 11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

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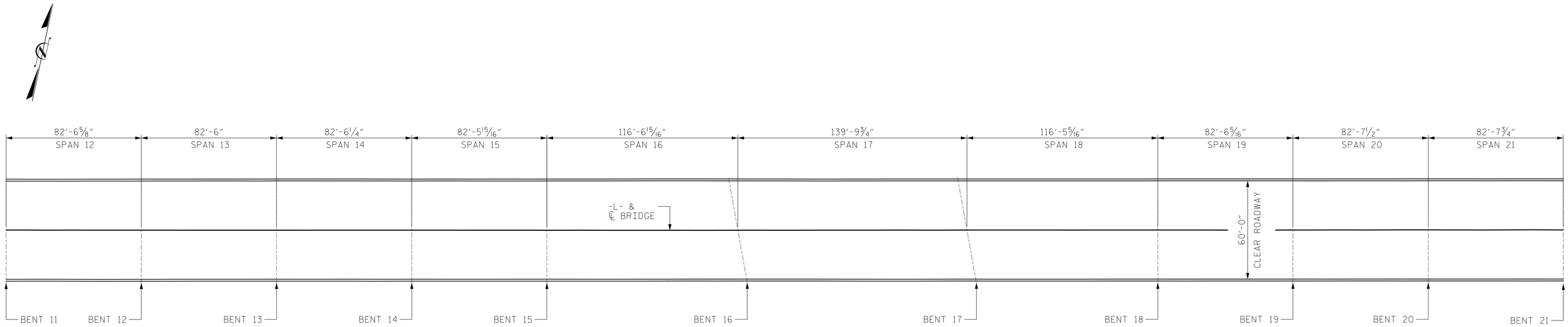
12/16/2021
15BPR.46_SMU_DSR01_270012.dgn
jduke

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

	SPAN 12		SPAN 13		SPAN 14		SPAN 15		SPAN 16		SPAN 17		SPAN 18		SPAN 19		SPAN 20		SPAN 21	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	550 SY		550 SY		550 SY		550 SY		777 SY		932 SY		776 SY		550 SY		551 SY		549 SY	
CLASS II SURFACE PREPARATION	- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY	
CONCRETE DECK REPAIR FOR PC OVERLAY	- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY	
SHOTBLASTING BRIDGE DECK	550 SY		550 SY		550 SY		550 SY		777 SY		932 SY		776 SY		550 SY		551 SY		549 SY	
PC MATERIALS	43.6 CY		42.6 CY		40.5 CY		52.7 CY		90.4 CY		131.1 CY		108.1 CY		64.2 CY		66.9 CY		69.2 CY	
PLACING & FINISHING PC OVERLAY	550 SY		550 SY		550 SY		550 SY		777 SY		932 SY		776 SY		550 SY		551 SY		549 SY	
GROOVING BRIDGE FLOORS	4686 SF		4683 SF		4685 SF		4683 SF		6626 SF		7950 SF		6618 SF		4685 SF		4690 SF		4678 SF	



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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BRIDGE DECK SCARIFICATION LIMITS ARE THE FULL CLEAR ROADWAY WIDTH (INSIDE FACE OF EACH BRIDGE RAIL).

FOR BRIDGE DECK RIDEABILITY AND GROOVING, SEE SPECIAL PROVISIONS.
COORDINATE THIS SHEET WITH THE SHEETS FOR JOINT DETAILS.

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
12/16/2021

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NC FIRM LICENSE: C-1506

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DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK SURFACE REPAIR

SPANS 12-21

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			137

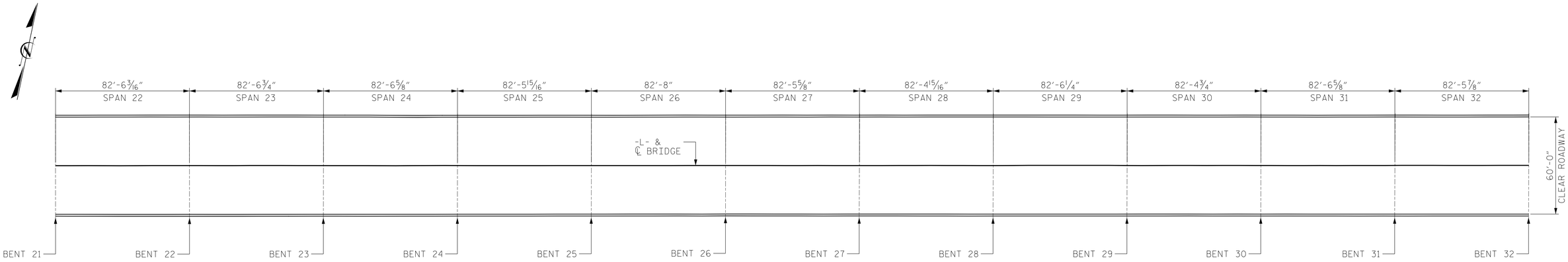
DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

12/16/2021
15BPR.46_SMU_DSR02_270012.dgn
jduke

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

	SPAN 22		SPAN 23		SPAN 24		SPAN 25		SPAN 26		SPAN 27		SPAN 28		SPAN 29		SPAN 30		SPAN 31		SPAN 32	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	550 SY		550 SY		550 SY		550 SY		551 SY		550 SY		549 SY		550 SY		549 SY		550 SY		550 SY	
CLASS II SURFACE PREPARATION	- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY	
CONCRETE DECK REPAIR FOR PC OVERLAY	- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY	
SHOTBLASTING BRIDGE DECK	550 SY		550 SY		550 SY		550 SY		551 SY		550 SY		549 SY		550 SY		549 SY		550 SY		550 SY	
PC MATERIALS	74.5 CY		73.8 CY		74.1 CY		79.4 CY		73.1 CY		59.9 CY		54.4 CY		46.2 CY		40.4 CY		40.3 CY		39.9 CY	
PLACING & FINISHING PC OVERLAY	550 SY		550 SY		550 SY		550 SY		551 SY		550 SY		549 SY		550 SY		549 SY		550 SY		550 SY	
GROOVING BRIDGE FLOORS	4685 SF		4687 SF		4686 SF		4684 SF		4693 SF		4682 SF		4678 SF		4685 SF		4677 SF		4686 SF		4683 SF	



NOTES:

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CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2½" 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.

BRIDGE DECK GROOVING QUANTITY BASED ON LIMITS REQUIRED IN SECTION 420-14(B) OF THE STANDARD SPECIFICATIONS.

BRIDGE DECK SCARIFICATION LIMITS ARE THE FULL CLEAR ROADWAY WIDTH (INSIDE FACE OF EACH BRIDGE RAIL).

FOR BRIDGE DECK RIDEABILITY AND GROOVING, SEE SPECIAL PROVISIONS.
COORDINATE THIS SHEET WITH THE SHEETS FOR JOINT DETAILS.

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H DUKE
12/16/2021

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK SURFACE REPAIR

SPANS 22-32

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

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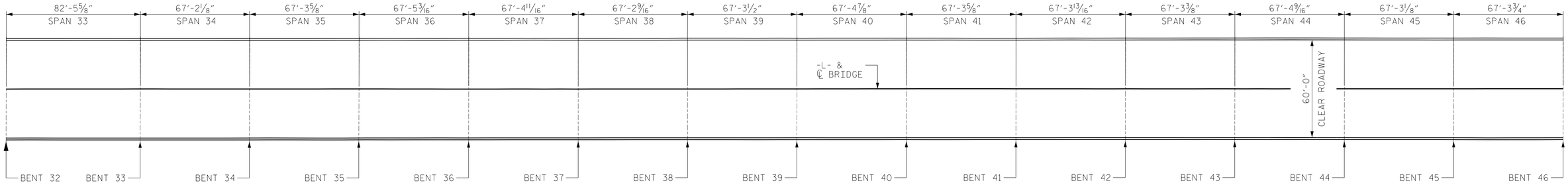
12/16/2021
15BPR.46_SMU_DSR03_270012.dgn
jduke

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

	SPAN 33		SPAN 34		SPAN 35		SPAN 36		SPAN 37		SPAN 38		SPAN 39		SPAN 40		SPAN 41		SPAN 42		SPAN 43		SPAN 44		SPAN 45	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	550 SY		448 SY		449 SY		450 SY		449 SY		448 SY		449 SY		449 SY		449 SY		449 SY		448 SY		449 SY		448 SY	
CLASS II SURFACE PREPARATION	- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY	
CONCRETE DECK REPAIR FOR PC OVERLAY	- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY	
SHOTBLASTING BRIDGE DECK	550 SY		448 SY		449 SY		450 SY		449 SY		448 SY		449 SY		449 SY		449 SY		449 SY		448 SY		449 SY		448 SY	
PC MATERIALS	40.9 CY		35.1 CY		34.1 CY		37.5 CY		34.8 CY		35.0 CY		32.2 CY		30.4 CY		28.7 CY		27.0 CY		31.8 CY		29.9 CY		31.9 CY	
PLACING & FINISHING PC OVERLAY	550 SY		448 SY		449 SY		450 SY		449 SY		448 SY		449 SY		449 SY		449 SY		449 SY		448 SY		449 SY		448 SY	
GROOVING BRIDGE FLOORS	4682 SF		3810 SF		3817 SF		3825 SF		3822 SF		3812 SF		3817 SF		3823 SF		3818 SF		3819 SF		3815 SF		3822 SF		3815 SF	

	SPAN 46	
	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	449 SY	
CLASS II SURFACE PREPARATION	- SY	
CONCRETE DECK REPAIR FOR PC OVERLAY	- SY	
SHOTBLASTING BRIDGE DECK	449 SY	
PC MATERIALS	33.5 CY	
PLACING & FINISHING PC OVERLAY	449 SY	
GROOVING BRIDGE FLOORS	3818 SF	



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CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2½" PER THE 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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BRIDGE DECK GROOVING QUANTITY BASED ON LIMITS REQUIRED IN SECTION 420-14(B) OF THE STANDARD SPECIFICATIONS.

BRIDGE DECK SCARIFICATION LIMITS ARE THE FULL CLEAR ROADWAY WIDTH (INSIDE FACE OF EACH BRIDGE RAIL).

FOR BRIDGE DECK RIDEABILITY AND GROOVING, SEE SPECIAL PROVISIONS.
COORDINATE THIS SHEET WITH THE SHEETS FOR JOINT DETAILS.

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

DocuSigned by: Jacob Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
12/16/2021

KCA KISINGER CAMPO & ASSOCIATES
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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK SURFACE REPAIR

SPANS 33-46

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

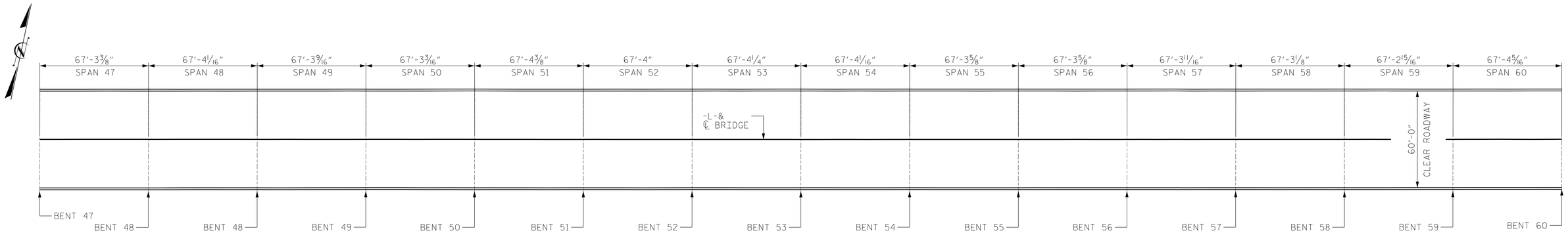
12/16/2021
15BPR.46_SMU_DSR04_270012.dgn
jduke

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

	SPAN 47		SPAN 48		SPAN 49		SPAN 50		SPAN 51		SPAN 52		SPAN 53		SPAN 54		SPAN 55		SPAN 56		SPAN 57		SPAN 58		SPAN 59	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	449 SY		449 SY		449 SY		448 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		448 SY		448 SY	
CLASS II SURFACE PREPARATION	- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY	
CONCRETE DECK REPAIR FOR PC OVERLAY	- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY	
SHOTBLASTING BRIDGE DECK	449 SY		449 SY		449 SY		448 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		448 SY		448 SY	
PC MATERIALS	32.4 CY		32.4 CY		31.6 CY		33.5 CY		35.7 CY		34.6 CY		31.8 CY		33.2 CY		34.0 CY		32.4 CY		32.3 CY		32.9 CY		33.8 CY	
PLACING & FINISHING PC OVERLAY	449 SY		449 SY		449 SY		448 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		448 SY		448 SY	
GROOVING BRIDGE FLOORS	3817 SF		3819 SF		3817 SF		3815 SF		3821 SF		3819 SF		3820 SF		3819 SF		3817 SF		3818 SF		3818 SF		3815 SF		3814 SF	

	SPAN 60	
	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	449 SY	
CLASS II SURFACE PREPARATION	- SY	
CONCRETE DECK REPAIR FOR PC OVERLAY	- SY	
SHOTBLASTING BRIDGE DECK	449 SY	
PC MATERIALS	36.5 CY	
PLACING & FINISHING PC OVERLAY	449 SY	
GROOVING BRIDGE FLOORS	3821 SF	



NOTES:

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

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BRIDGE DECK SCARIFICATION LIMITS ARE THE FULL CLEAR ROADWAY WIDTH (INSIDE FACE OF EACH BRIDGE RAIL).

FOR BRIDGE DECK RIDEABILITY AND GROOVING, SEE SPECIAL PROVISIONS.
COORDINATE THIS SHEET WITH THE SHEETS FOR JOINT DETAILS.

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

DocuSigned by: Jacob Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
12/16/2021

KCA KISINGER CAMPO & ASSOCIATES
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NC FIRM LICENSE: C-1506

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK SURFACE REPAIR

SPANS 47-60

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			137

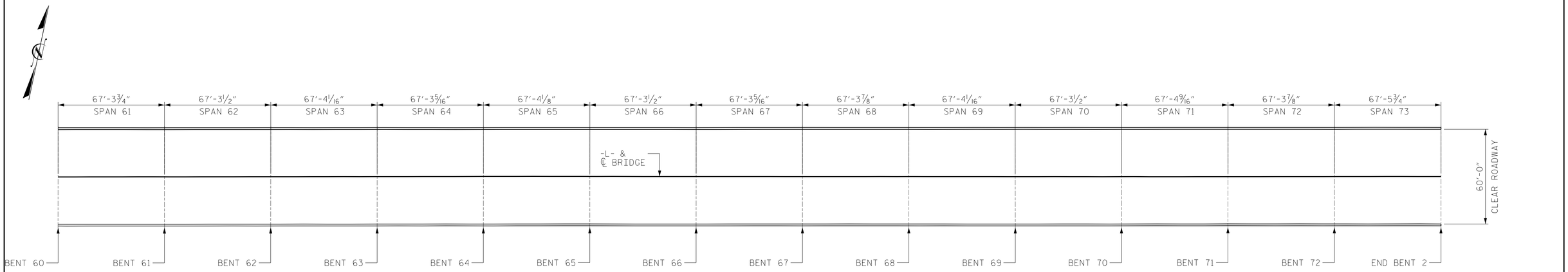
DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

12/16/2021
15BPR.46_SMU_DSR05_270012.dgn
jduke

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

	SPAN 61		SPAN 62		SPAN 63		SPAN 64		SPAN 65		SPAN 66		SPAN 67		SPAN 68		SPAN 69		SPAN 70		SPAN 71		SPAN 72		SPAN 73	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		450 SY	
CLASS II SURFACE PREPARATION	- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY	
CONCRETE DECK REPAIR FOR PC OVERLAY	- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY		- SY	
SHOTBLASTING BRIDGE DECK	449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		450 SY	
PC MATERIALS	35.1 CY		36.4 CY		37.7 CY		37.2 CY		37.7 CY		42.2 CY		41.3 CY		38.6 CY		40.5 CY		43.1 CY		40.6 CY		39.9 CY		48.0 CY	
PLACING & FINISHING PC OVERLAY	449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		449 SY		450 SY	
GROOVING BRIDGE FLOORS	3818 SF		3817 SF		3819 SF		3816 SF		3819 SF		3817 SF		3816 SF		3818 SF		3819 SF		3817 SF		3822 SF		3818 SF		3827 SF	



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FOR BRIDGE DECK RIDEABILITY AND GROOVING, SEE SPECIAL PROVISIONS.
COORDINATE THIS SHEET WITH THE SHEETS FOR JOINT DETAILS.

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H DUKE
12/16/2021

KCA KISINGER CAMPO & ASSOCIATES
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NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK SURFACE REPAIR

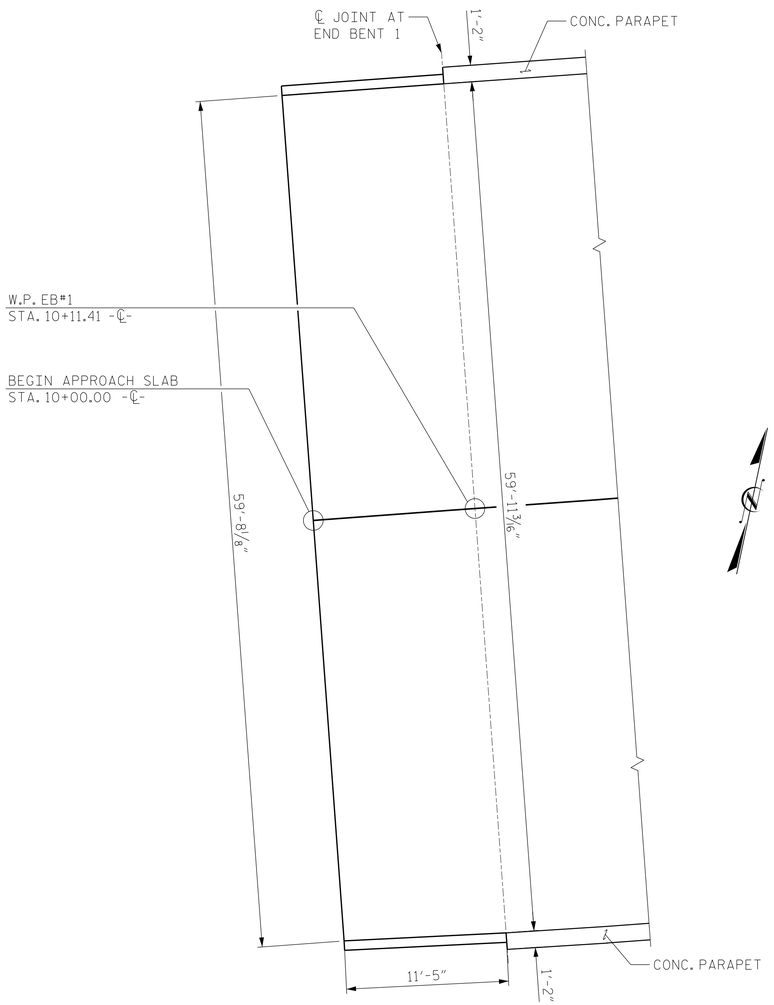
SPANS 61-73

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			137

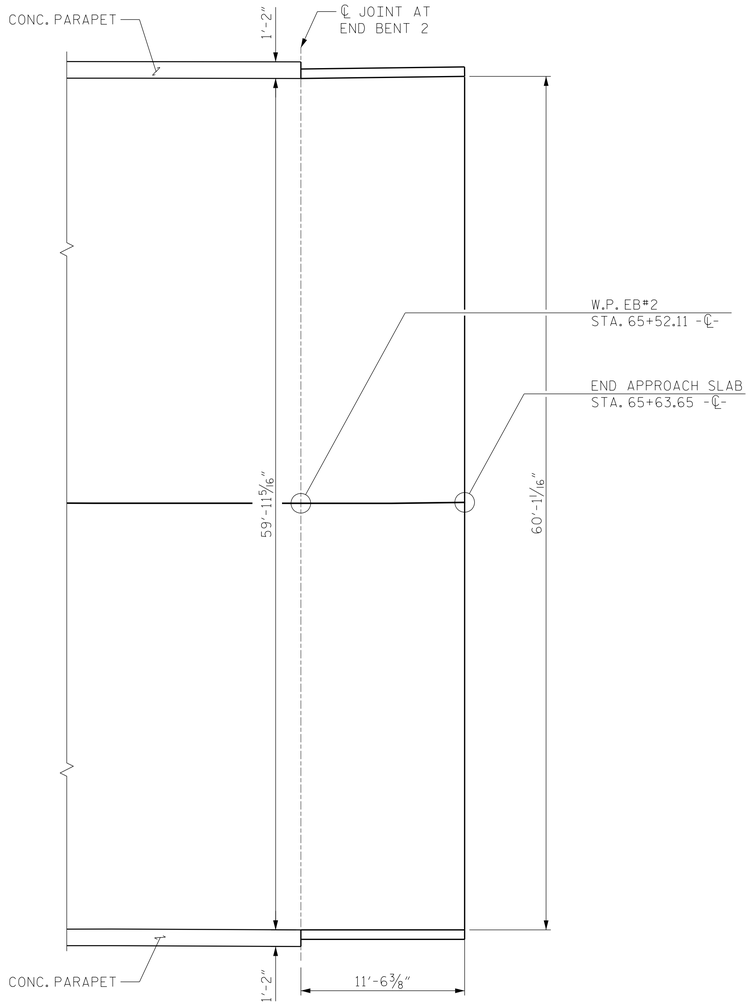
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

12/16/2021
15BPR.46_SMU_DSR06_270012.dgn
jduke



PLAN - WEST END



PLAN - EAST END

NOTES:

ESTIMATED QUANITITES ARE BASED ON THE ANTICIPATED VALUES FOR A SINGLE APPROACH SLAB 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 SLAB IS 2½" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

ACTUAL 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.

FOR CLASS II SURFACE PREPARATION LOCATIONS AT BRIDGE JOINTS, SEE "JOINT DETAILS SHEETS".

BRIDGE DECK GROOVING QUANTITY BASED ON LIMITS REQUIRED IN SECTION 420-14(B) OF THE STANDARD SPECIFICATIONS.

APPROACH SLAB SCARIFICATION LIMITS ARE THE FULL CLEAR ROADWAY WIDTH (INSIDE FACE OF CURB).

FOR BRIDGE DECK RIDEABILITY AND GROOVING, SEE SPECIAL PROVISIONS.

STATIONING, WORK POINTS AND SPAN LENGTHS BASED ON SURVEY DATED 05/2019.

AS-BUILT REPAIR QUANTITY TABLE

	WEST END		EAST END	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	14 SY		15 SY	
CLASS II SURFACE PREPARATION	- SY		- SY	
CONCRETE DECK REPAIR FOR PC OVERLAY	- SY		- SY	
SHOTBLASTING BRIDGE DECK	14 SY		15 SY	
PC MATERIALS	0.4 CY		0.4 CY	
PLACING & FINISHING PC OVERLAY	14 SY		15 SY	
GROOVING BRIDGE FLOORS	95 SF		97 SF	

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H. DUKE
10/19/2021

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NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH SLAB REPAIR

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : FIDEL L. FLORES DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

10/19/2021
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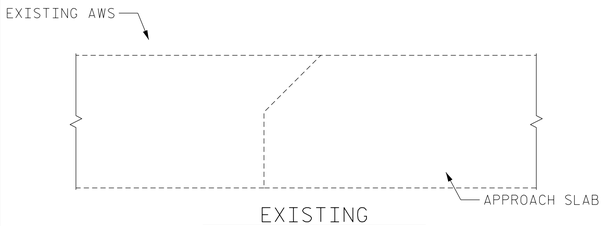

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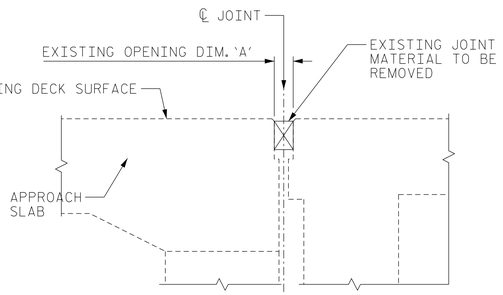

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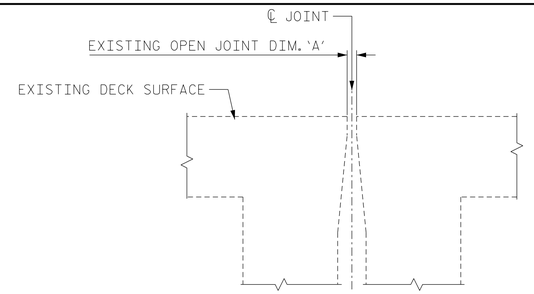

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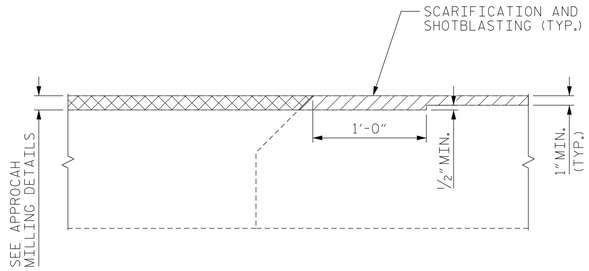
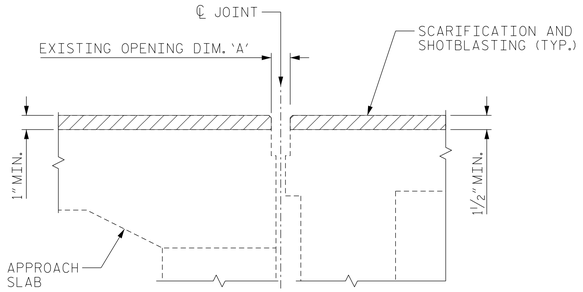
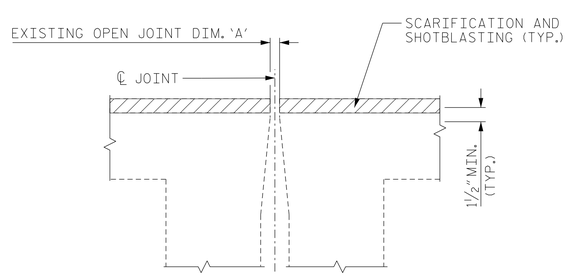


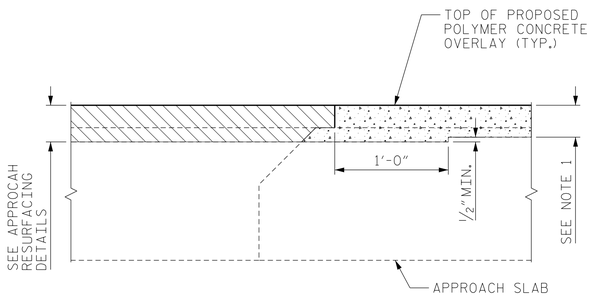
SURFACE PREPARATION
(SCARIFICATION AND SHOTBLASTING)



SURFACE PREPARATION
(SCARIFICATION AND SHOTBLASTING)

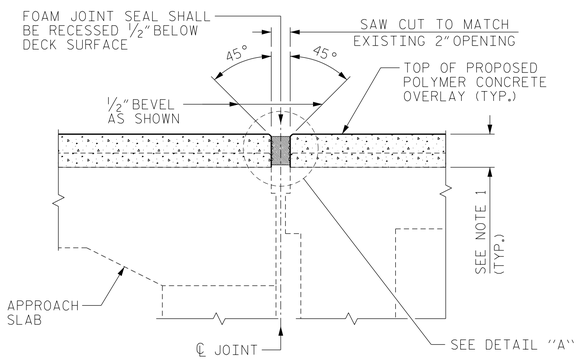


SURFACE PREPARATION
(SCARIFICATION AND SHOTBLASTING)



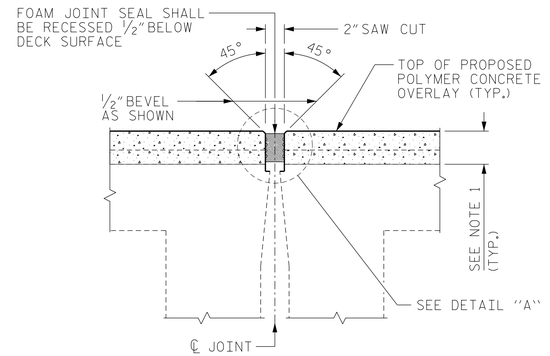
PROPOSED JOINT

APPROACH SLABS



PROPOSED JOINT
(FOAM JOINT SEAL)

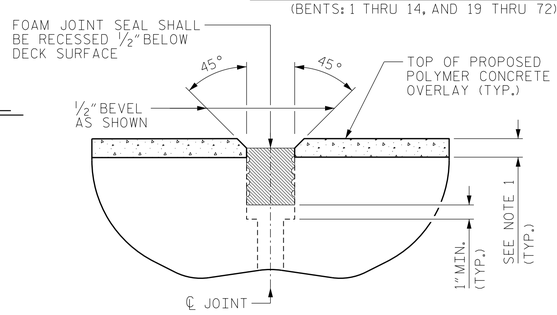
END BENTS



PROPOSED JOINT
(FOAM JOINT SEAL)

INTERMEDIATE BENTS
(BENTS: 1 THRU 14, AND 19 THRU 72)

TYPICAL JOINT DETAILS



DETAIL "A"
(PROPOSED JOINT SEAL)

NOTES:

THE EXISTING PROFILE GRADE HAS BEEN MODIFIED FOR RIDEABILITY CORRECTION. AS, SUCH THE PC OVERLAY THICKNESS VARIES ALONG THE LENGTH OF THE BRIDGE. FOR PC OVERLAY THICKNESS, SEE "DECK SURFACE REPAIR" SHEETS.

IF ENCONUNTERED, RETAIN ALL EXISTING REINFORCING STEEL. CLEAN AND REPAIR IF NECESSARY.

THE CONTRACTOR SHALL FIELD VERIFY THE EXISTING JOINT OPENING PRIOR TO ORDERING JOINT SEAL MATERIAL. IF THE ACTUAL OPENING VARIES FROM THE OPENING INDICATED IN THE DETAIL BY MORE THAN 1/4", NOTIFY THE ENGINEER. REVISION OF THE JOINT SEAL SIZE MIGHT BE NECESSARY.

THE MANUFACTURER IS TO PROVIDE THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL FOR THE SIZE OF THE OPENING ON THE PLANS AND ACCOMODATE THE MINIMUM EXPANSION SHOWN ON THE PLANS.

FOAM JOINTS SHALL BE INSTALLED AS PER THE MANUFACTURER'S RECOMMENDATIONS.

THE CONTRACTOR SHALL TAKE CARE DURING JOINT REHAB OPERATIONS NOT TO DROP ANY MATERIAL THAT FALLS BELOW THE BRIDGE, WITHOUT PROTECTIVE DEVICES BELOW TO CATCH THE MATERIAL. ANY MATERIAL THAT FALLS BELOW THE BRDIGE SHALL BE CONTAINED, REMOVED AND DISPOSED OF BY THE CONTRATCTOR AT NO EXTRA COST TO THE DEPARTMENT. IF THE ENGINEER DETERMINES THAT THE PROTECTIVE DEVICES ARE NOT ADEQUATE OR NOT BEING EMPLOYED, THE WORK SHALL BE SUSPENDED UNTIL ADEQUATE PROTECTION IS PROVIDED.

THE CONTRACTOR WILL NOT BE PERMITTED TO FORM THE JOINTS IN LIEU OF SAWING THE JOINT.

THE INSTALLED FOAM JOINT SHALL BE WATER TIGHT.

QUANTITIES SHOWN IN THE ELASTOMERIC CONCRETE FOR PRESERVATION TABLE BASED ON THE MINIMUM JOINT DEMOLITION SHOWN.

FOR EXCAVATION BELOW THE BOTTOM OF THE PLANNED JOINT DECK DEMOLITION, CONCRETE FOR DECK REPAIRS SHALL BE PLACED IN THE EXCAVATED AREA TO THE ELEVATION AT BOTTOM OF THE PROPOSED ELASTOMERIC CONCRETE FOR PRESERVATION HEADERS SHOWN.

FOR BRIDGE JOINT DEMOLITION, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEALS FOR PRESERVATION, SEE SPECIAL PROVISIONS.

FOR CONCRETE FOR DECK REPAIR, SEE SPECIAL PROVISIONS.

IF THE EMBEDDED PORTION OF THE EXISTING PLASTIC WATERSTOP IS EXPOSED DURING REMOVAL OF UNSOUND CONCRETE, OR IF UNSOUND CONCRETE IS REMOVED WITHIN 2" OF THE WATERSTOP, THE ENTIRE CONCRETE DEPTH TO THE WATERSTOPS SHALL BE REMOVED. IF SUCH EXCAVATION EXTENDS MORE THAN 2" BELOW THE BOTTOM OF THE PLANNED ELASTOMERIC CONCRETE HEADER, AS SHOWN, APPROVED REPAIR CONCRETE SHALL BE PLACED IN THE EXCAVATED AREA TO THE ELEVATION AT THE BOTTOM OF THE ELASTOMETIC CONCRETE.

DEMOLISH BRIDGE JOINT AREA SUCH THAT THE BOTTOM OF THE EXCAVATION SHALL BE REASONABLY FLAT AND LEVEL AND TO THE NECESSARY DEPTH, SUCH THAT ELASTOMERIC CONCRETE SHALL BE FOUNDED ON CONCRETE OR REPAIR CONCRETE SUBSTRATE.

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

SHEET 1 OF 2

DocuSigned by: JACOB H. DUKE — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 — JACOB H DUKE
10/19/2021

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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			137

DRAWN BY DIEGO A. AGUIRRE DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

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10/19/2021
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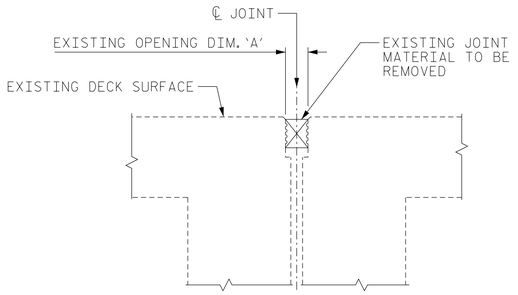
jduke



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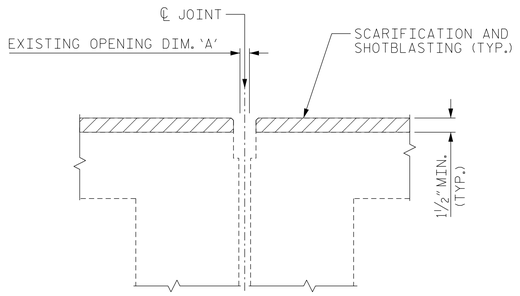
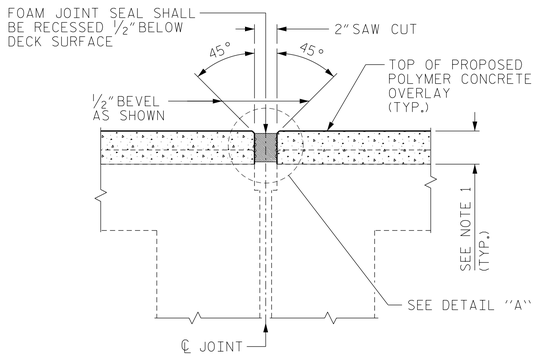


SURFACE PREPARATION
(SCARIFICATION AND SHOTBLASTING)

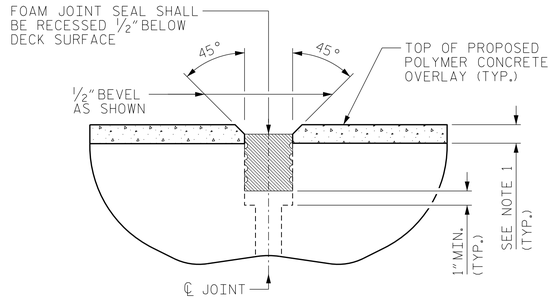


PROPOSED JOINT
(FOAM JOINT SEAL)

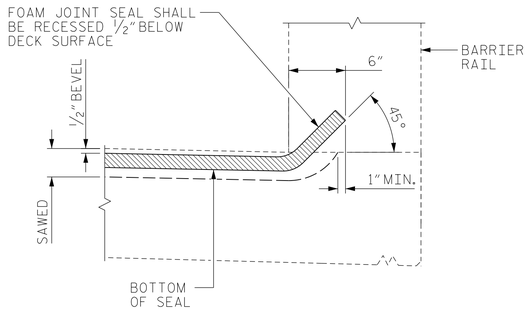
INTERMEDIATE BENTS
(BENTS: 15 THRU 18)

JOINT REPAIR QUANTITY

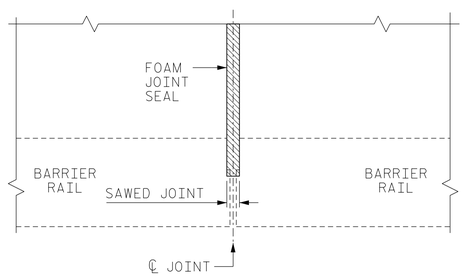
	ESTIMATE	ACTUAL
FOAM JOINT SEALS FOR PRESERVATION	4545 LF	
BRIDGE JOINT REMOVAL	366 LF	



DETAIL "A"
(PROPOSED JOINT SEAL)



SECTION A-A
(PROPOSED JOINT SEAL)



PLAN
(PROPOSED JOINT SEAL)

DETAILS AT BARRIER

EXISTING DIM. 'A' JOINT OPENING

RECORDED AT 77°	DIM. 'A'		DIM. 'A'
END BENT 1	1⅝"	BENT 40	1"
BENT 1	½"	BENT 41	⅞"
BENT 2	¾"	BENT 42	⅞"
BENT 3	1"	BENT 43	⅞"
BENT 4	¾"	BENT 44	¾"
BENT 5	¾"	BENT 45	⅝"
BENT 6	1⅜"	BENT 46	¾"
BENT 7	⅝"	BENT 47	¾"
BENT 8	¾"	BENT 48	¾"
BENT 9	½"	BENT 49	¾"
BENT 10	½"	BENT 50	1⅛"
BENT 11	¾"	BENT 51	⅞"
BENT 12	1½"	BENT 52	⅞"
BENT 13	⅝"	BENT 53	⅞"
BENT 14	⅞"	BENT 54	¾"
BENT 15	2⅛"	BENT 55	⅝"
BENT 16	1¾"	BENT 56	⅞"
BENT 17	1¾"	BENT 57	½"
BENT 18	2½"	BENT 58	⅝"
BENT 19	⅞"	BENT 59	½"
BENT 20	¾"	BENT 60	⅝"
BENT 21	¾"	BENT 61	⅞"
BENT 22	¾"	BENT 62	⅞"
BENT 23	⅞"	BENT 63	1"
BENT 24	½"	BENT 64	⅞"
BENT 25	⅝"	BENT 65	1"
BENT 26	1"	BENT 66	¾"
BENT 27	¾"	BENT 67	1"
BENT 28	⅝"	BENT 68	⅞"
BENT 29	⅞"	BENT 69	1⅛"
BENT 30	⅞"	BENT 70	1"
BENT 31	⅞"	BENT 71	1¼"
BENT 32	⅞"	BENT 72	⅞"
BENT 33	⅞"	END BENT 2	1⅞"
BENT 34	1⅛"		
BENT 35	1"		
BENT 36	⅞"		
BENT 37	1"		
BENT 38	1"		
BENT 39	1⅛"		

NOTES:

THE EXISTING PROFILE GRADE HAS BEEN MODIFIED FOR RIDEABILITY CORRECTION. AS, SUCH THE PC OVERLAY THICKNESS VARIES ALONG THE LENGTH OF THE BRIDGE. FOR PC OVERLAY THICKNESS, SEE "DECK SURFACE REPAIR" SHEETS.

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PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

SHEET 2 OF 2

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE
10/19/2021

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JOINT DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			137

TYPICAL JOINT DETAILS

DRAWN BY : DIEGO A. AGUIRRE DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
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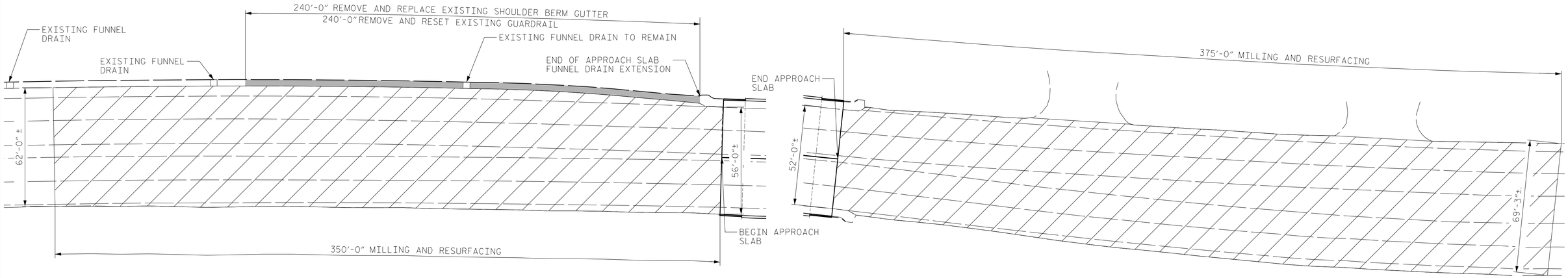
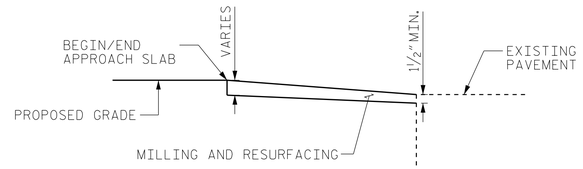


APPROACH ROADWAY @ END BENT 1

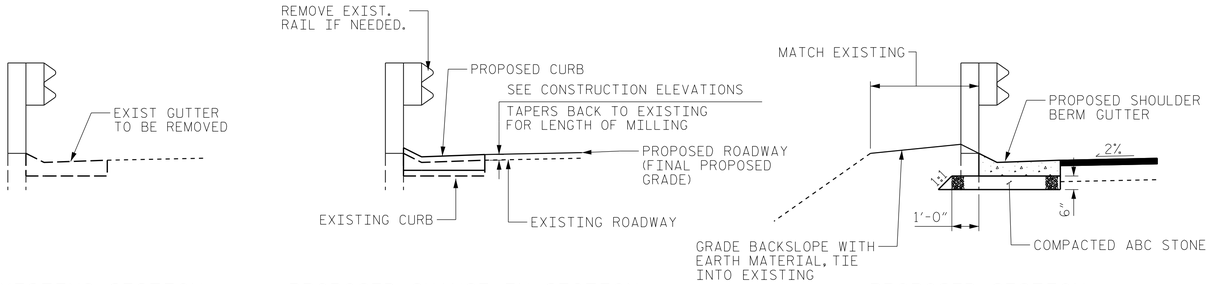
APPROACH ROADWAY @ END BENT 2



PAVEMENT KEY-IN DETAIL FOR BOTH END BENTS

NOTES:

1. ASPHALT MILLING - EXISTING APPROACH ASPHALT PAVEMENT TO BE MILLED AS NECESSARY TO ATTAIN MINIMUM 1½" 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.
2. FOR NEW ASPHALT PLACEMENT, SEE STANDARD SPECIFICATIONS.
3. GRADE MAY BE ADJUSTED BY THE ENGINEER TO ENSURE PROPER TIE-IN OF THE BRIDGE AND APPROACH ROADWAY.
4. REMOVAL OF THE EXISTING SHOULDER BERM GUTTER IS CONSIDERED INCIDENTAL TO THE PROPOSED SHOULDER BERM GUTTER.
5. FOR PROPOSED APPROACH ROADWAY ELEVATIONS, SEE CONSTRUCTION ELEVATIONS.
6. EXISTING FUNNEL DRAIN GRADES MAY NEED TO BE FIELD ADJUSTED. THE COST OF ADJUSTING THE EXISTING FUNNEL DRAINS SHALL BE INCLUDED IN THE COST OF THE PROPOSED SHOULDER BERM GUTTER.



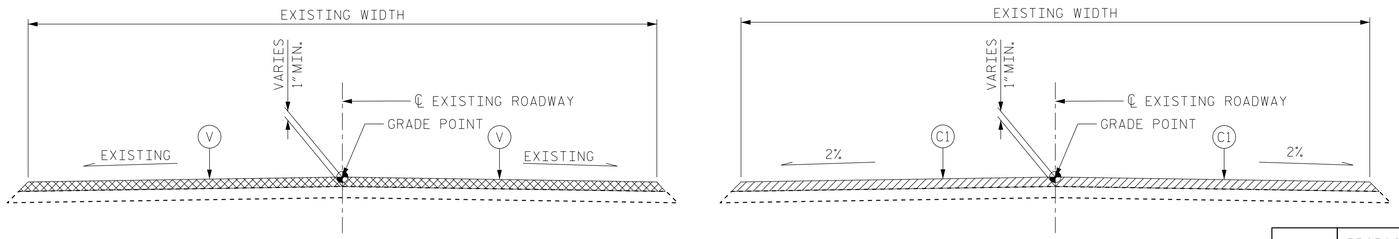
EXISTING SECTION

PROPOSED CHANGE IN SECTION

PROPOSED SECTION

SEE RSD 846.03 SHEET 2 OF 2 FOR MORE DETAILS

SHOULDER BERM GUTTER DETAILS



EXISTING SECTION

BEGIN APPROACH SLAB

PROPOSED SECTION

BEGIN APPROACH SLAB

TYPICAL ROADWAY MILLING SECTION

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.
V	MILLING ASPHALT PAVEMENT VARIABLE DEPTH.

AS-BUILT QUANTITY TABLE

APPROACH ROADWAY

	TOTAL	
	ESTIMATE	ACTUAL
AGGREGATE BASE COURSE (ABC)	45 TONS	
SHOULDER BERM GUTTER	240 L.F.	
BORROW EXCAVATION	25 C.Y.	
SEEDING AND MULCHING	0.2 ACRE	
MILLING ASPHALT PAVEMENT VARIABLE DEPTH	5101 S.Y.	
ASPHALT CONCRETE SURFACE COURSE, TYPE 9.5C	660 TONS	
ASPHALT BINDER FOR PLANT MIX	40.0 TONS	
REMOVE AND RESET EXISTING GUARDRAIL	240 L.F.	

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

DocuSigned by: JACOB H. DUKE — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 — JACOB H. DUKE — 10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH ROADWAY
MILLING, RESURFACING SHOULDER BERM GUTTER REPLACEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : FIDEL L. FLORES DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_AR01_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2 1/2"
GIRDERS: 2 1/2" TO REBAR AND 1 1/2" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

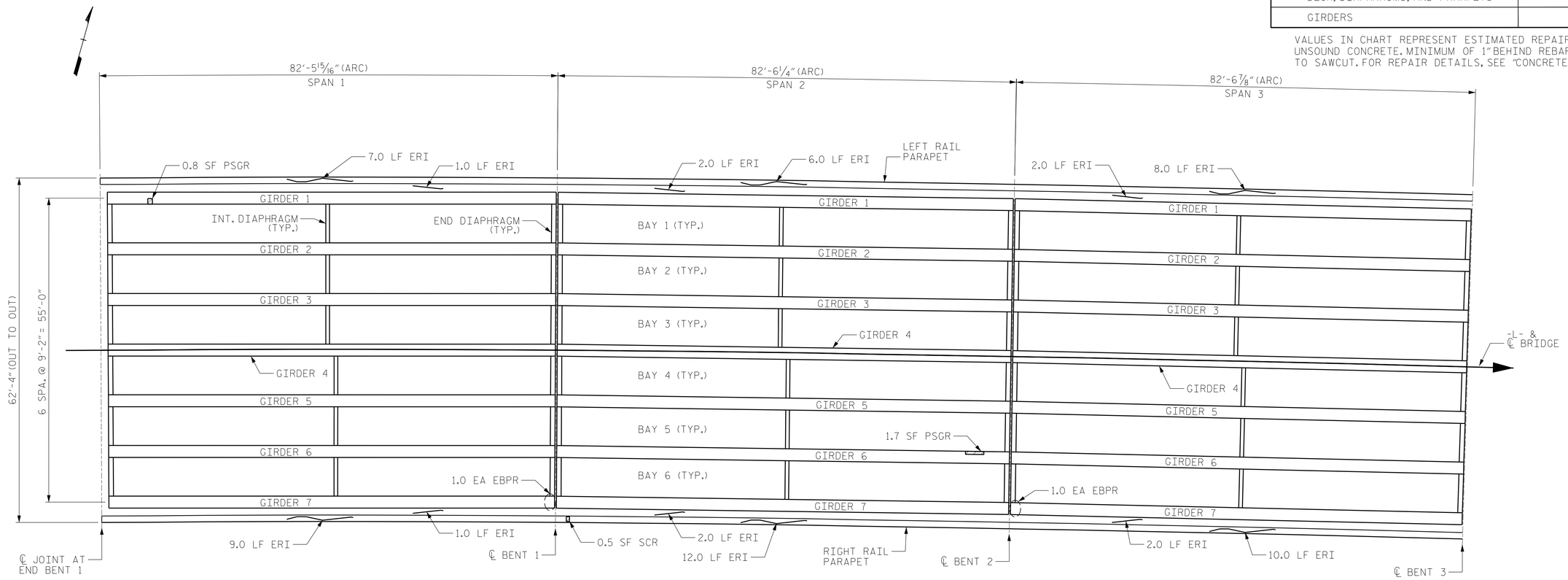
LEGEND

	P/S CONC. GIRDER REPAIR (PSGR)
	SHOTCRETE REPAIR (SCR)
	EPOXY RESIN INJECTION (ERI)
	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS	0.5	0.3		
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	2.5	1.3		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	62.0			
GIRDERS				

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 1 THRU 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

10/19/2021
15BPR.46_SMU_DUR01_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2 1/2"
GIRDERS: 2 1/2" TO REBAR AND 1 1/2" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

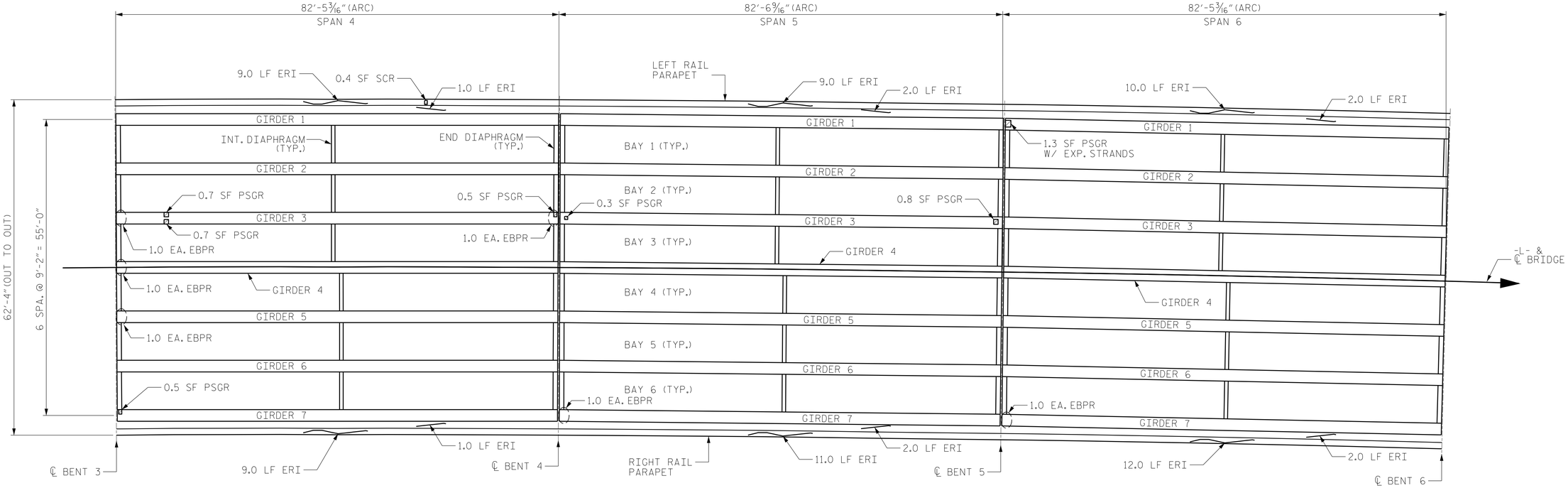
LEGEND

	P/S CONC. GIRDER REPAIR (PSGR)
	SHOTCRETE REPAIR (SCR)
	EPOXY RESIN INJECTION (ERI)
	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS	0.4	0.2		
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	4.8	2.4		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	70.0			
GIRDERS				

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

DocuSigned by: Jacob Duke
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H DUKE
10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 4 THRU 6

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

10/19/2021
15BPR.46_SMU_DUR02_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2 1/2"
GIRDERS: 2 1/2" TO REBAR AND 1 1/2" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

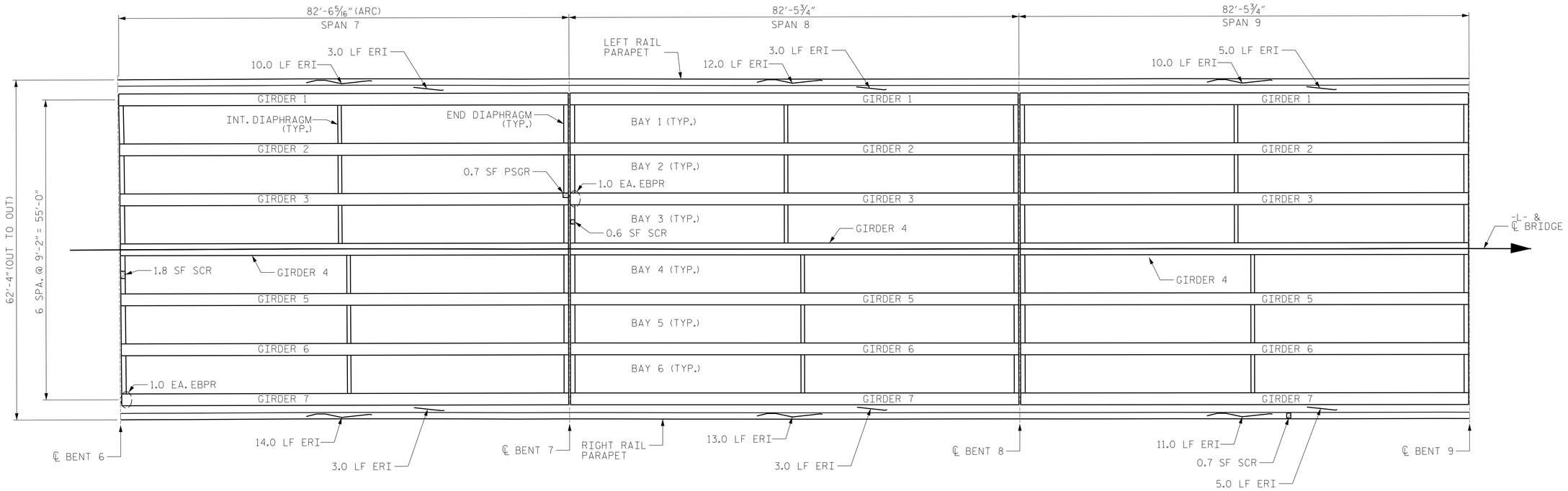
LEGEND

	P/S CONC. GIRDER REPAIR (PSGR)
	SHOTCRETE REPAIR (SCR)
	EPOXY RESIN INJECTION (ERI)
	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS	2.4	1.2		
RAILS	0.7	0.4		
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	0.7	0.4		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	92.0			
GIRDERS				

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

DocuSigned by: Jacob H. Duke
10/19/2021

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H DUKE

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 7 THRU 9

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

10/19/2021
15BPR.46_SMU_DUR03_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2 1/2"
GIRDERS: 2 1/2" TO REBAR AND 1 1/2" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

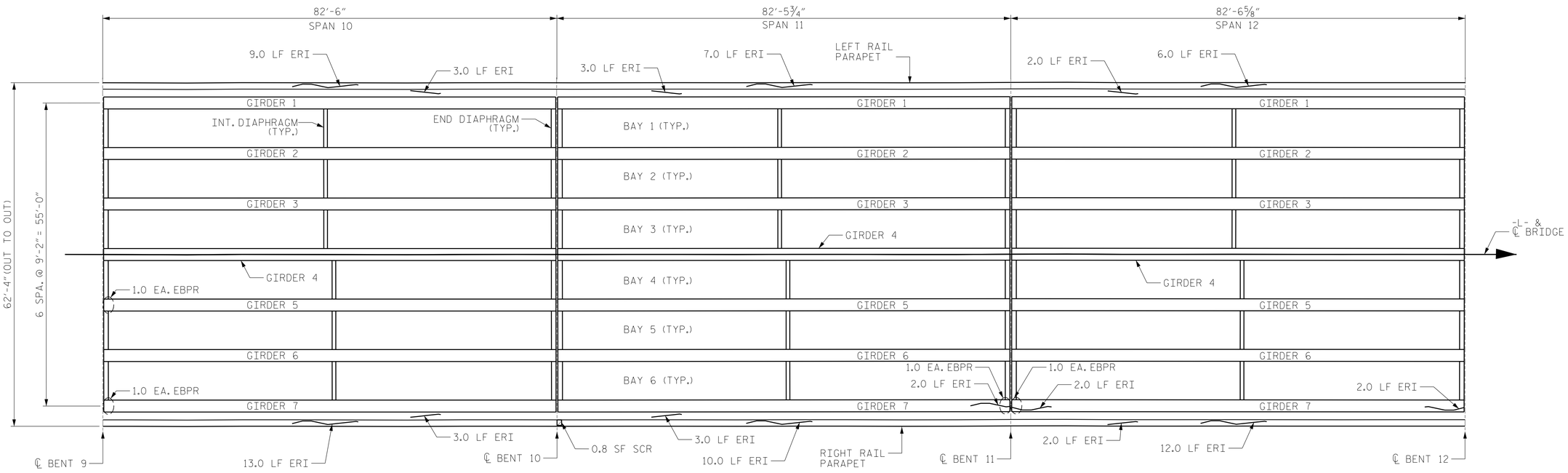
LEGEND

	P/S CONC. GIRDER REPAIR (PSGR)
	SHOTCRETE REPAIR (SCR)
	EPOXY RESIN INJECTION (ERI)
	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS	0.8	0.4		
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS				
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	73.0			
GIRDERS	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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H DUKE
10/19/2020

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 10 THRU 12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

10/19/2021
15BPR.46_SMU_DUR04_270012.dgn
jduke

NOTES:

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CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2 1/2"
GIRDERS: 2 1/2" TO REBAR AND 1 1/2" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

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CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

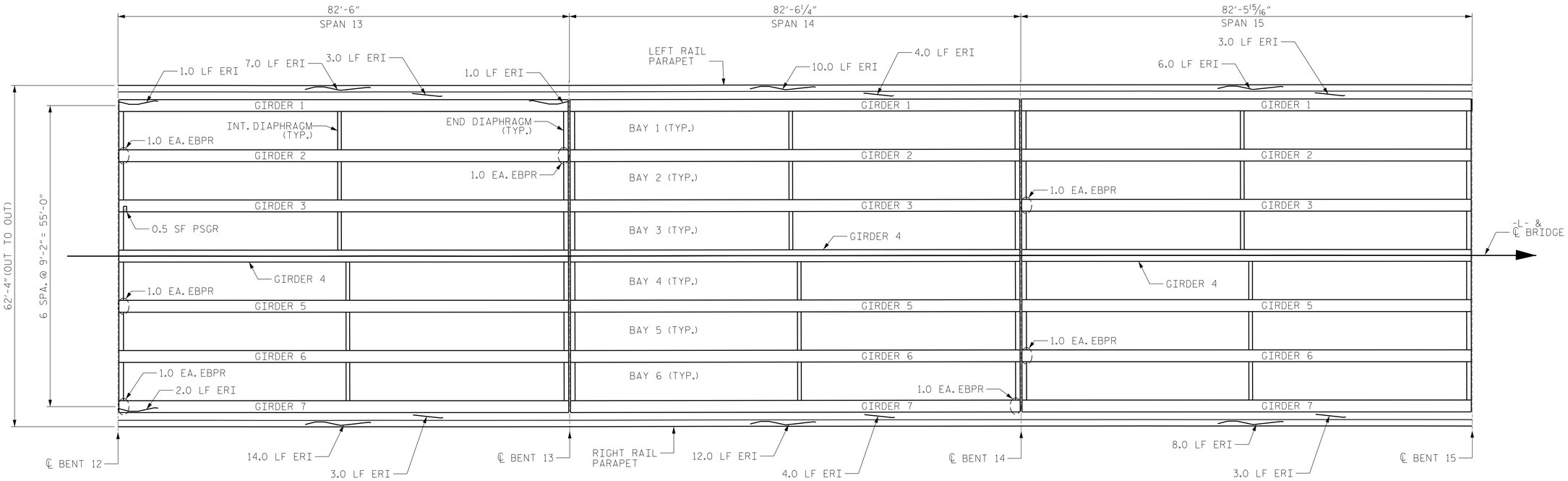
LEGEND

	P/S CONC. GIRDER REPAIR (PSGR)
	SHOTCRETE REPAIR (SCR)
	EPOXY RESIN INJECTION (ERI)
	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS				
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	0.5	0.3		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	77.0			
GIRDERS	4.0			

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

DocuSigned by: Jacob H. Duke
10/19/2021

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

KCA KISINGER CAMPO & ASSOCIATES
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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 13 THRU 15

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			137

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_DUR05_270012.dgn
jduke

NOTES:

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AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2 1/2"
GIRDERS: 2 1/2" TO REBAR AND 1 1/2" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

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CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

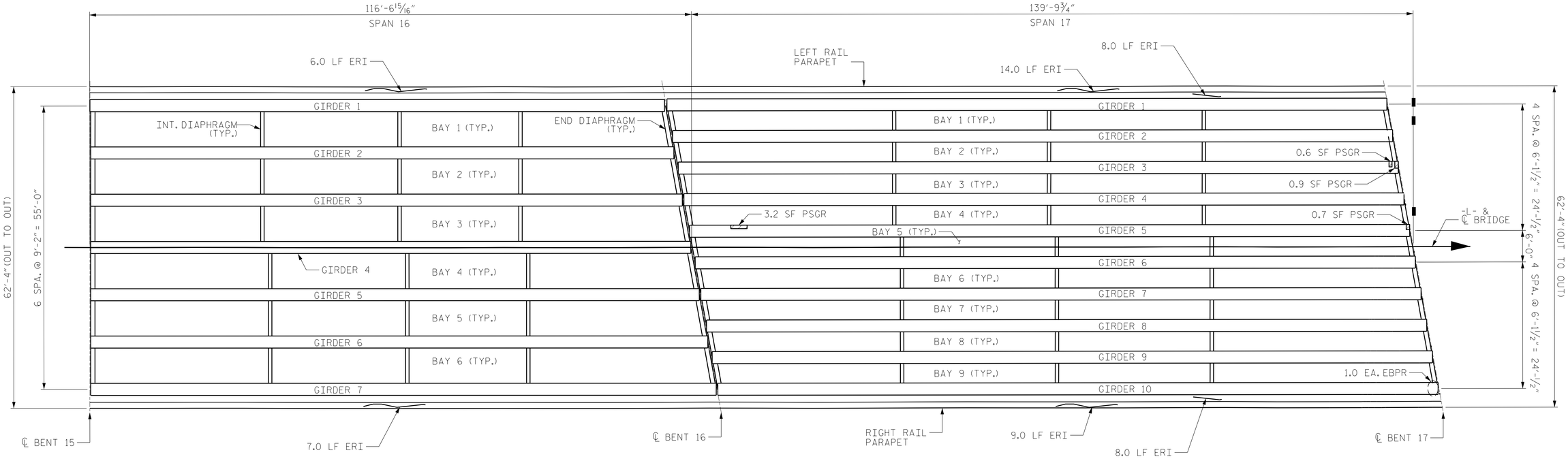
LEGEND

	P/S CONC. GIRDER REPAIR (PSGR)
	SHOTCRETE REPAIR (SCR)
	EPOXY RESIN INJECTION (ERI)
	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS				
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	5.4	2.7		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	52.0			
GIRDERS				

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE
10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 16 & 17

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

10/19/2021
15BPR.46_SMU_DUR06_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2 1/2"
GIRDERS: 2 1/2" TO REBAR AND 1 1/2" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

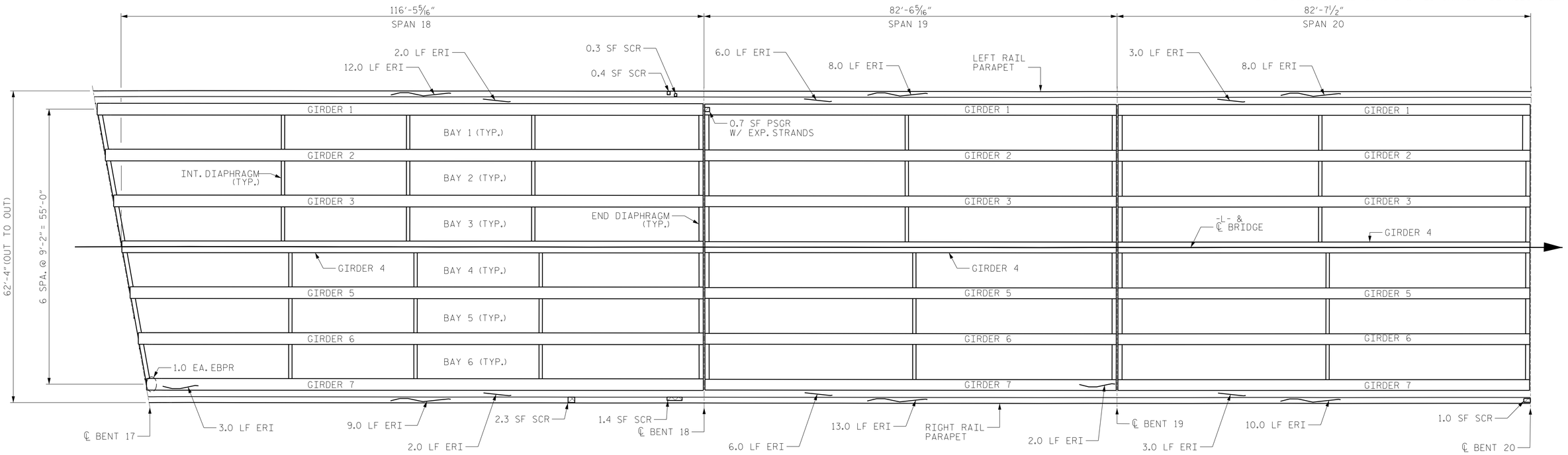
LEGEND

	P/S CONC. GIRDER REPAIR (PSGR)
	SHOTCRETE REPAIR (SCR)
	EPOXY RESIN INJECTION (ERI)
	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS	5.4	2.7		
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	0.7	0.4		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	82.0			
GIRDERS	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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 18 THRU 20

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

10/19/2021
15BPR.46_SMU_DUR07_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
- DECK & DIAPHRAGMS: 2½"
- GIRDERS: 2½" TO REBAR AND 1½" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

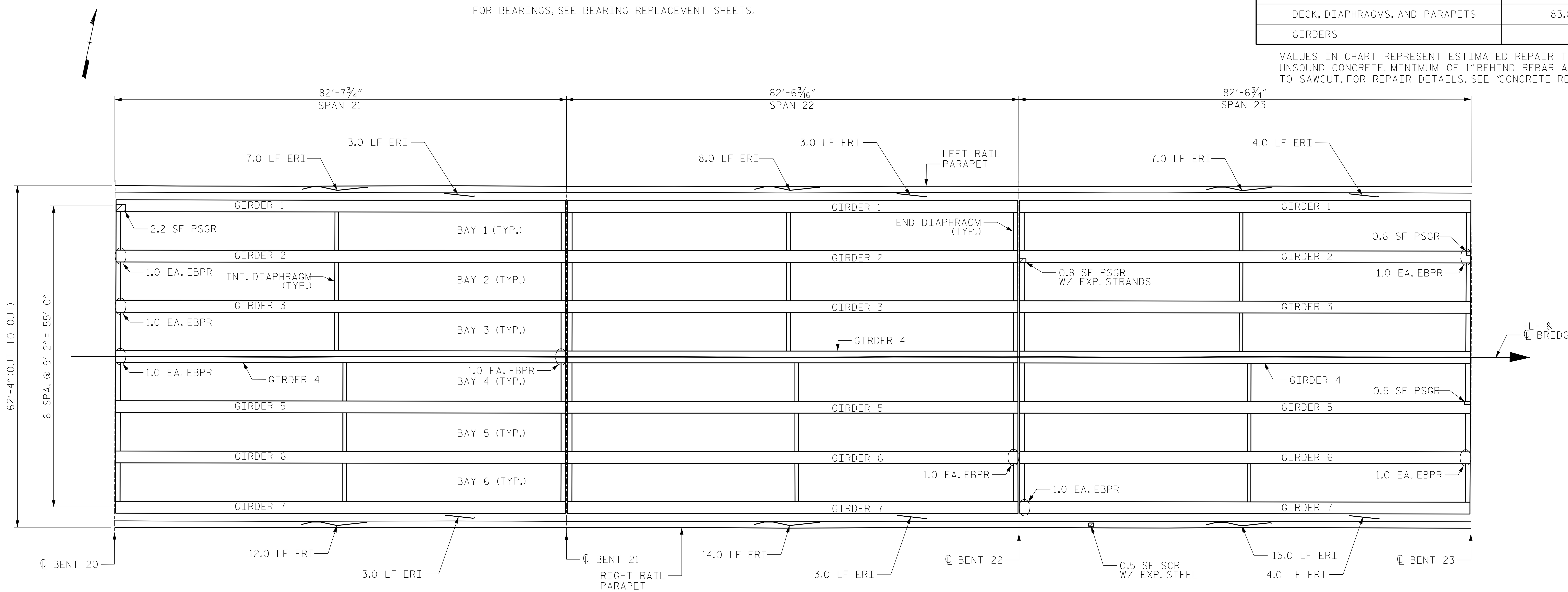
LEGEND

Symbol	Description
(hatched box)	P/S CONC. GIRDER REPAIR (PSGR)
(cross-hatched box)	SHOTCRETE REPAIR (SCR)
(wavy line)	EPOXY RESIN INJECTION (ERI)
(dashed oval)	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS	0.5	0.3		
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	4.1	2.1		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	83.0			
GIRDERS				

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 21 THRU 23

SEAL 043777 — NORTH CAROLINA PROFESSIONAL ENGINEER — JACOB H. DUKE — 10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SHEET NO. S-30
TOTAL SHEETS 137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_DUR08_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2 1/2"
GIRDERS: 2 1/2" TO REBAR AND 1 1/2" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

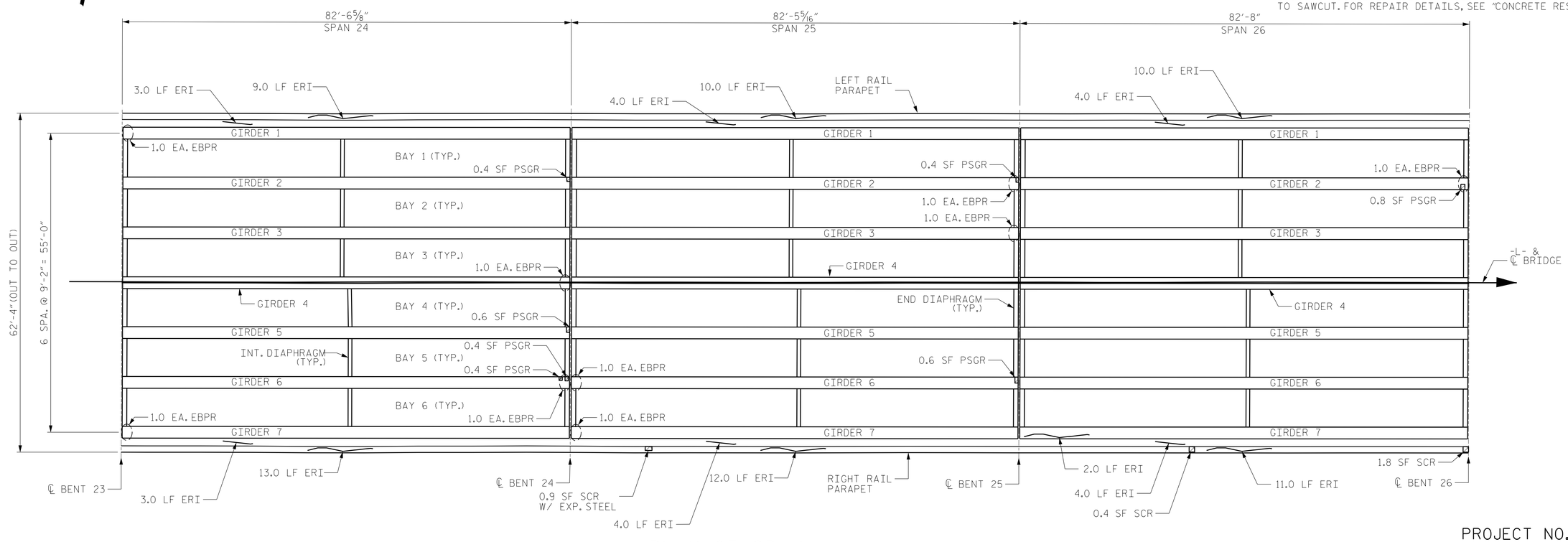
LEGEND

	P/S CONC. GIRDER REPAIR (PSGR)
	SHOTCRETE REPAIR (SCR)
	EPOXY RESIN INJECTION (ERI)
	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS	3.1	1.6		
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	3.6	1.8		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	87.0			
GIRDERS	2.0			

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 ENGINEER JACOB H DUKE
10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 24 THRU 26

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

10/19/2021
15BPR.46_SMU_DUR09_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2 1/2"
GIRDERS: 2 1/2" TO REBAR AND 1 1/2" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

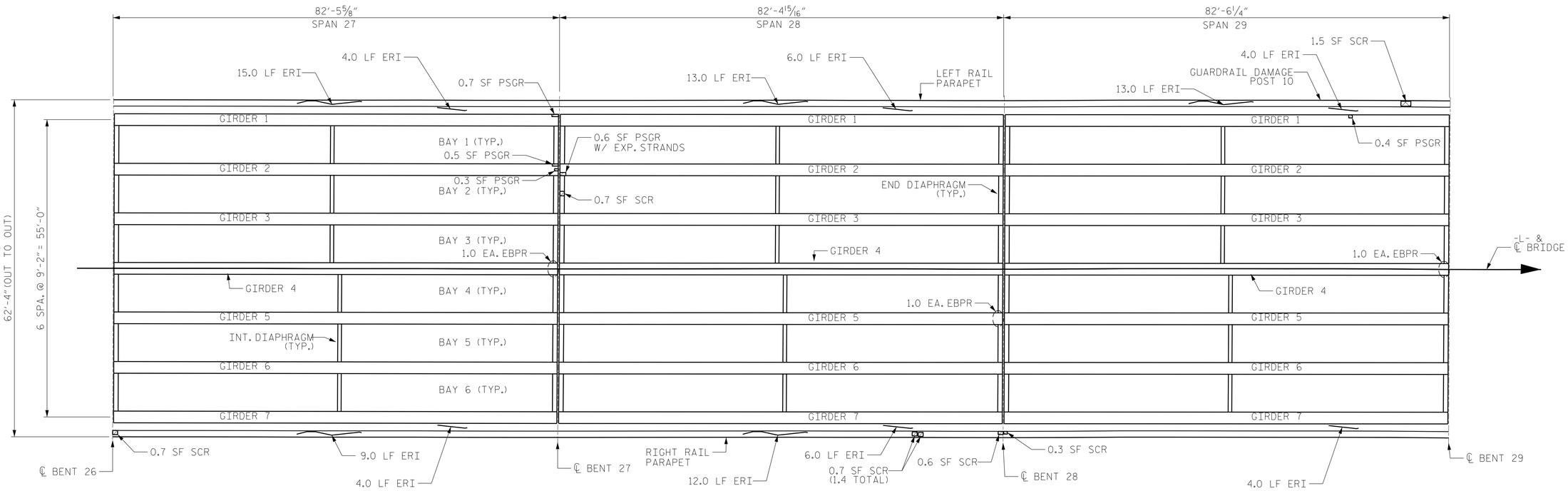
LEGEND

	P/S CONC. GIRDER REPAIR (PSGR)
	SHOTCRETE REPAIR (SCR)
	EPOXY RESIN INJECTION (ERI)
	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS	0.7	0.4		
RAILS	4.5	2.3		
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	1.8	0.9		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	90.0			
GIRDERS				

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 27 THRU 29

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

10/19/2021
15BPR.46_SMU_DUR10_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
- DECK & DIAPHRAGMS: 2½"
- GIRDERS: 2½" TO REBAR AND 1½" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

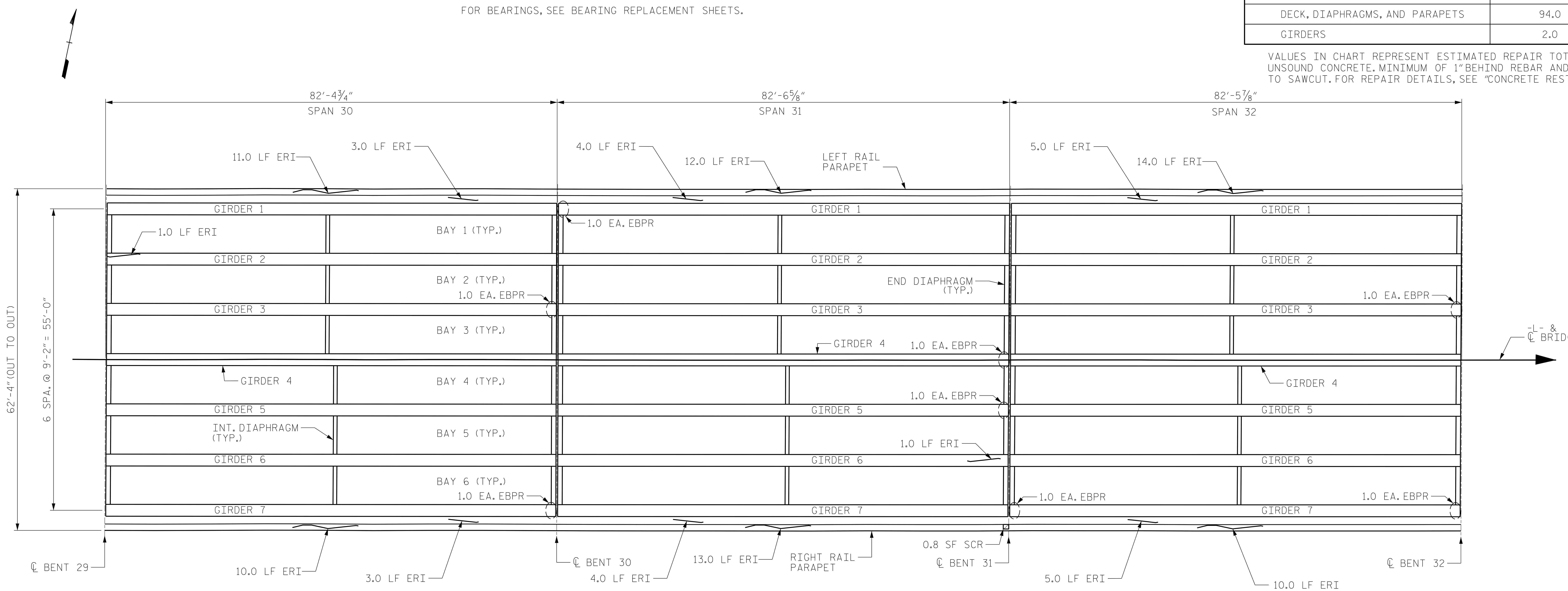
LEGEND

Symbol	Description
(hatched box)	P/S CONC. GIRDER REPAIR (PSGR)
(cross-hatched box)	SHOTCRETE REPAIR (SCR)
(line)	EPOXY RESIN INJECTION (ERI)
(dashed oval)	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS	0.8	0.4		
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS				
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	94.0			
GIRDERS	2.0			

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 30 THRU 32

SEAL 043777 JACOB H. DUKE, PROFESSIONAL ENGINEER, NORTH CAROLINA
10/19/2021

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO. BY:	DATE:		NO. BY:	DATE:		S-33
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_DUR11_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
- DECK & DIAPHRAGMS: 2½"
- GIRDERS: 2½" TO REBAR AND 1½" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

LEGEND

Symbol	Description
(hatched)	P/S CONC. GIRDER REPAIR (PSGR)
(cross-hatched)	SHOTCRETE REPAIR (SCR)
(line)	EPOXY RESIN INJECTION (ERI)
(oval)	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS	2.5	1.3		
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	2.5	1.3		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	103.0			
GIRDERS				

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" SHEETS.

PLAN OF SPAN

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 33 THRU 36

SEAL 043777 — PROFESSIONAL ENGINEER — JACOB H. DUKE — NORTH CAROLINA — 10/19/2021

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_DUR12_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2½"
GIRDERS: 2½" TO REBAR AND 1½" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

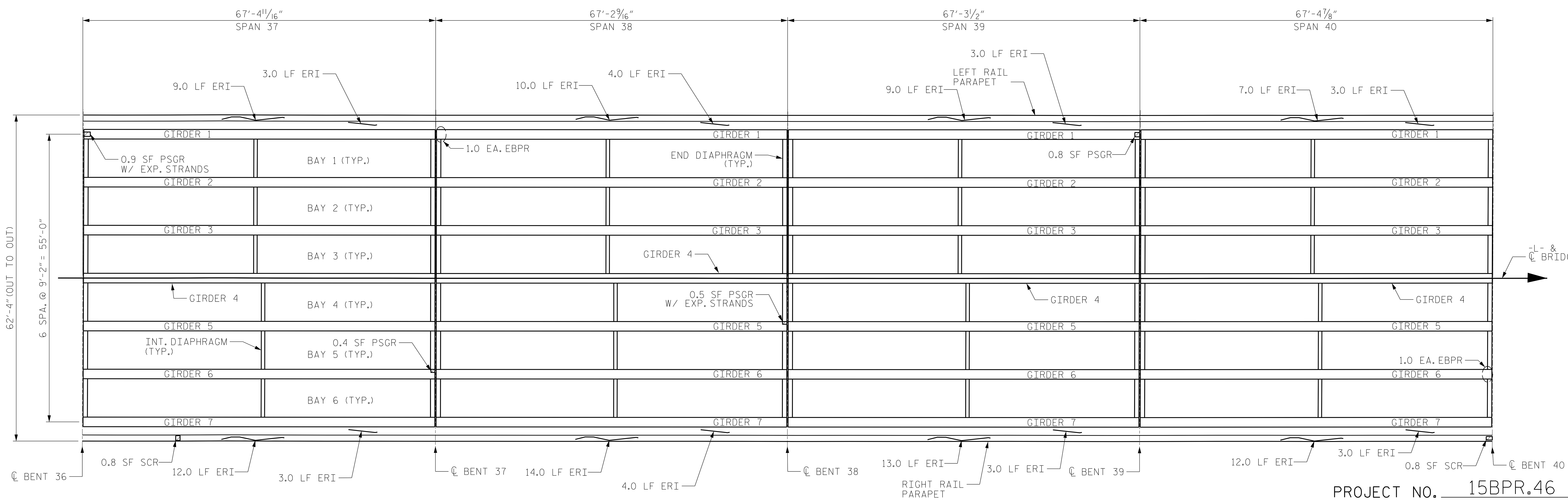
LEGEND

(hatched)	P/S CONC. GIRDER REPAIR (PSGR)
(cross-hatched)	SHOTCRETE REPAIR (SCR)
(line)	EPOXY RESIN INJECTION (ERI)
(circle)	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS	1.6	0.8		
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	2.6	1.3		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	112.0			
GIRDERS				

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H. DUKE
10/19/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 37 THRU 40

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_DUR13_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2 1/2"
GIRDERS: 2 1/2" TO REBAR AND 1 1/2" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

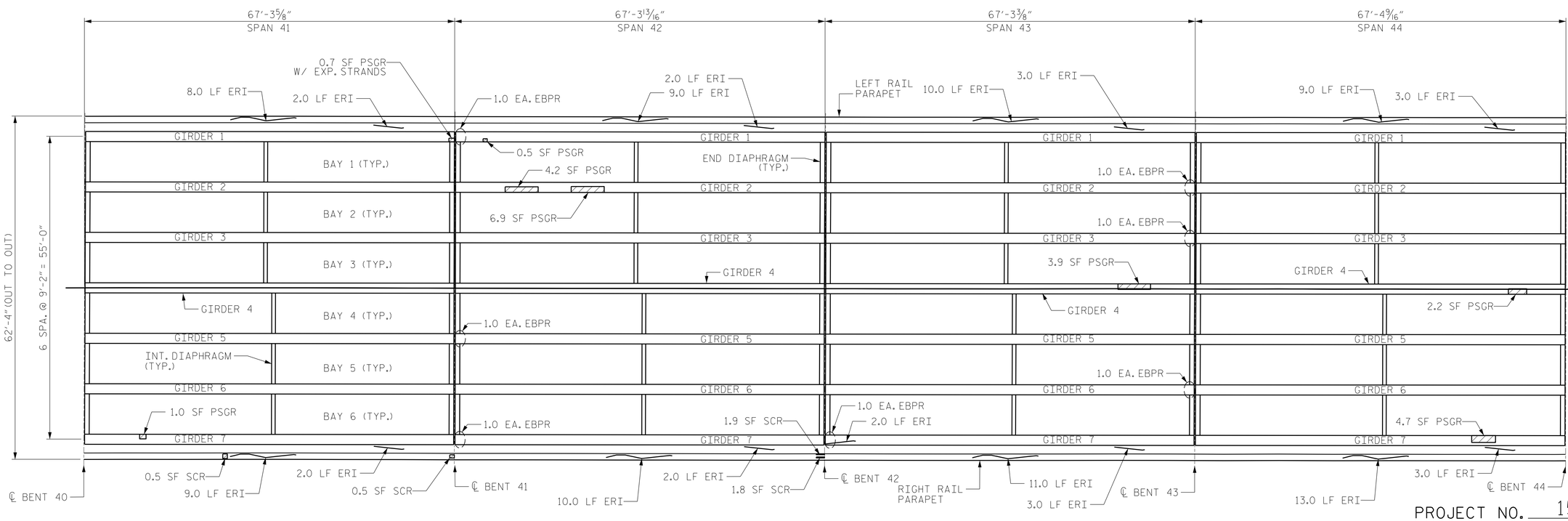
LEGEND

	P/S CONC. GIRDER REPAIR (PSGR)
	SHOTCRETE REPAIR (SCR)
	EPOXY RESIN INJECTION (ERI)
	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS	4.7	2.4		
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	24.1	12.0		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	99.0			
GIRDERS	2.0			

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

DocuSigned by: Jacob Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 41 THRU 44

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_DUR14_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2 1/2"
GIRDERS: 2 1/2" TO REBAR AND 1 1/2" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

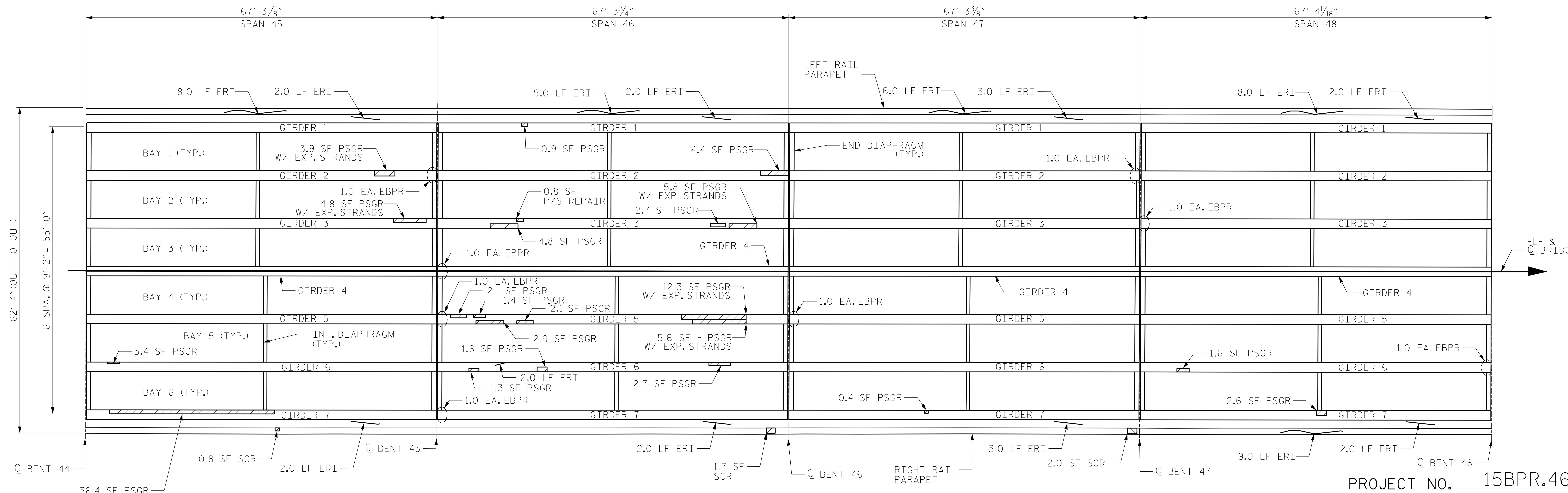
LEGEND

Symbol	Description
(hatched)	P/S CONC. GIRDER REPAIR (PSGR)
(cross-hatched)	SHOTCRETE REPAIR (SCR)
(line)	EPOXY RESIN INJECTION (ERI)
(dashed ellipse)	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS	4.5	2.3		
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	106.7	53.4		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	58.0			
GIRDERS	2.0			

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 45 THRU 48

SEAL 043777 — NORTH CAROLINA PROFESSIONAL ENGINEER — JACOB H. DUKE — 10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_DUR15_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2½"
GIRDERS: 2½" TO REBAR AND 1½" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

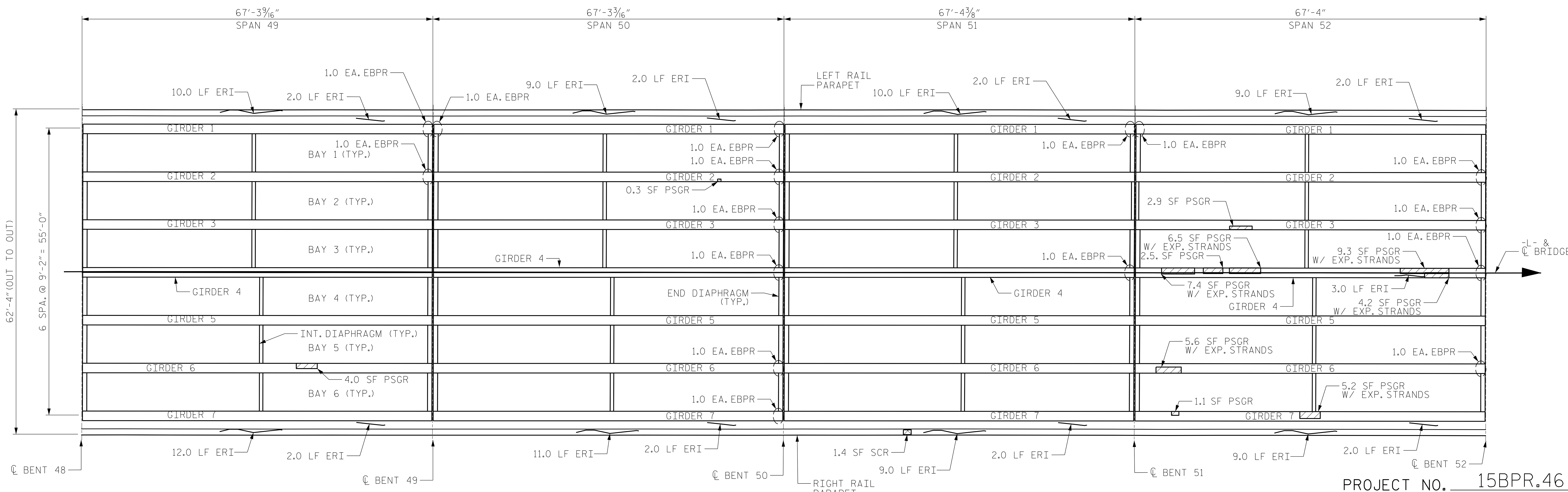
LEGEND

Symbol	Description
(hatched)	P/S CONC. GIRDER REPAIR (PSGR)
(cross-hatched)	SHOTCRETE REPAIR (SCR)
(line)	EPOXY RESIN INJECTION (ERI)
(oval)	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS	1.4	0.7		
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	49.0	24.5		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	95.0			
GIRDERS	3.0			

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 49 THRU 52

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H. DUKE
10/19/2021

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_DUR16_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
- DECK & DIAPHRAGMS: 2 1/2"
- GIRDERS: 2 1/2" TO REBAR AND 1 1/2" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

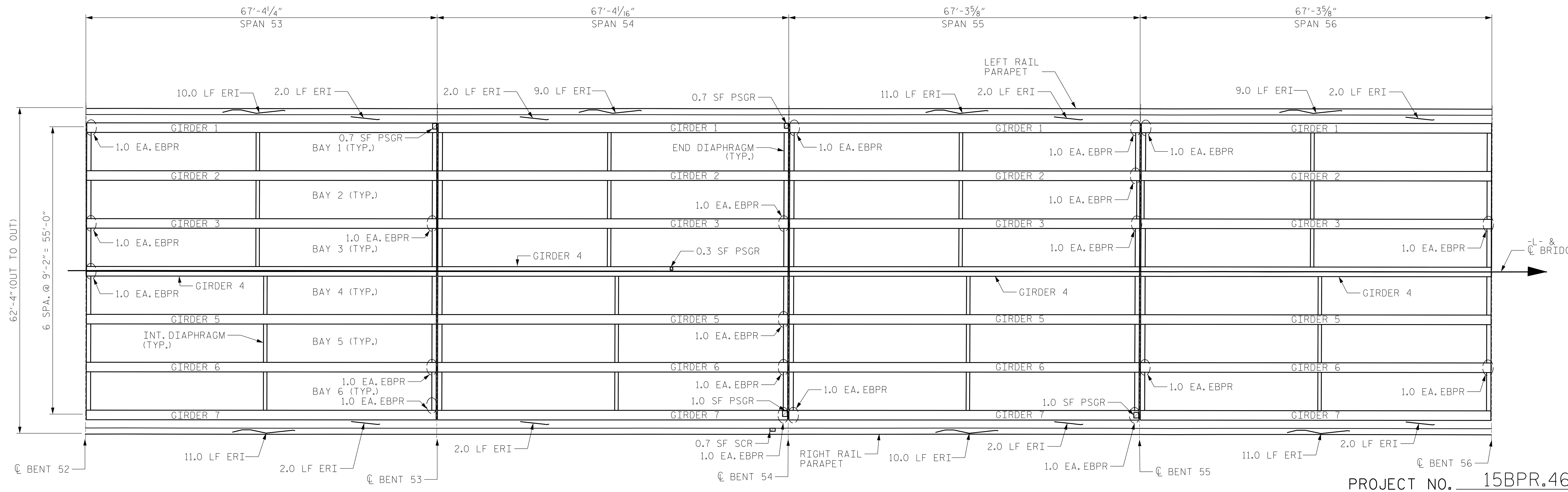
LEGEND

Symbol	Description
(hatched)	P/S CONC. GIRDER REPAIR (PSGR)
(cross-hatched)	SHOTCRETE REPAIR (SCR)
(line)	EPOXY RESIN INJECTION (ERI)
(circle)	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS	0.7	0.3		
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	3.7	1.9		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	87.0			
GIRDERS				

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 53 THRU 56

SEAL 043777 — JACOB H. DUKE — PROFESSIONAL ENGINEER — NORTH CAROLINA — 10/19/2021

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_DUR17_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2½"
GIRDERS: 2½" TO REBAR AND 1½" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

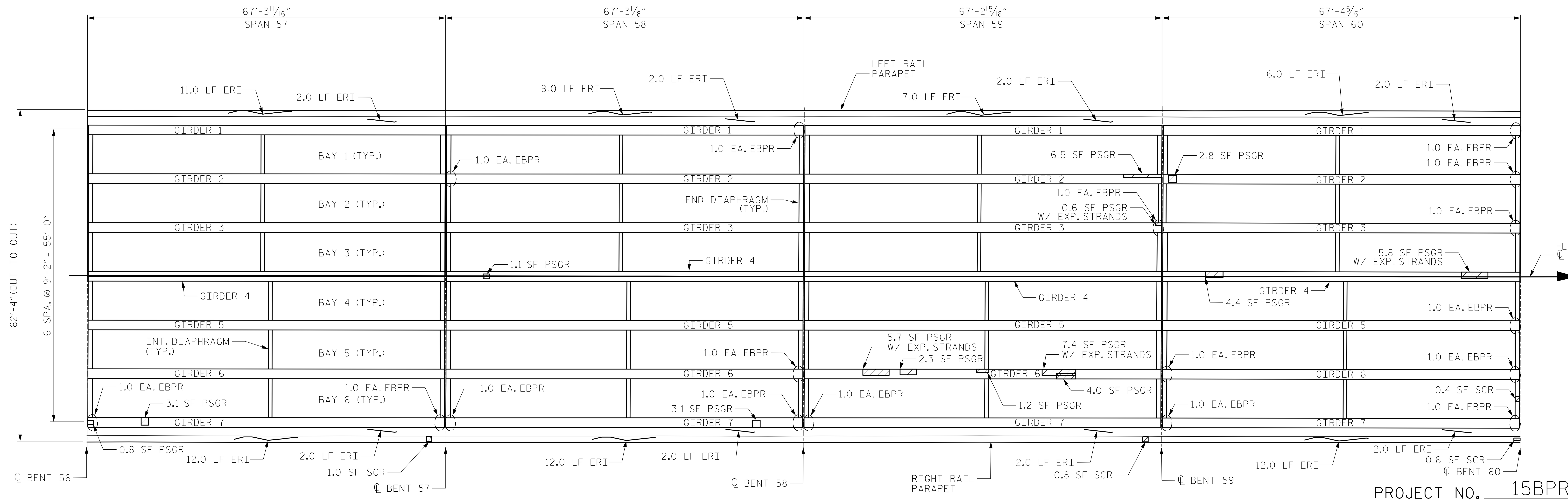
LEGEND

Symbol	Description
(hatched box)	P/S CONC. GIRDER REPAIR (PSGR)
(cross-hatched box)	SHOTCRETE REPAIR (SCR)
(wavy line)	EPOXY RESIN INJECTION (ERI)
( )	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS	0.4	0.2		
RAILS	2.4	1.2		
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	49.3	24.7		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	85.0			
GIRDERS				

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 57 THRU 60

SEAL 043777 — JACOB H. DUKE — PROFESSIONAL ENGINEER — NORTH CAROLINA — 10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_DUR18_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2½"
GIRDERS: 2½" TO REBAR AND 1½" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

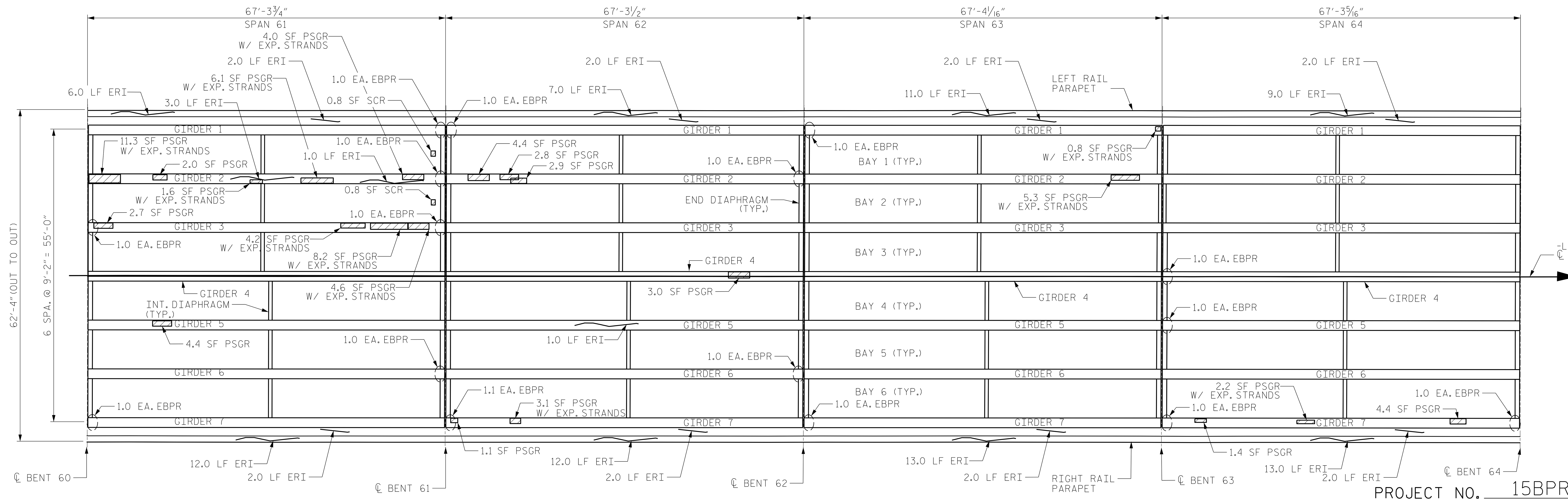
LEGEND

Symbol	Description
(hatched)	P/S CONC. GIRDER REPAIR (PSGR)
(cross-hatched)	SHOTCRETE REPAIR (SCR)
(wavy line)	EPOXY RESIN INJECTION (ERI)
(brackets)	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG	1.6	0.8		
DIAPHRAGMS				
RAILS				
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	81.0	40.5		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	99.0			
GIRDERS	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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 61 THRU 64

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H. DUKE 10/19/2021

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
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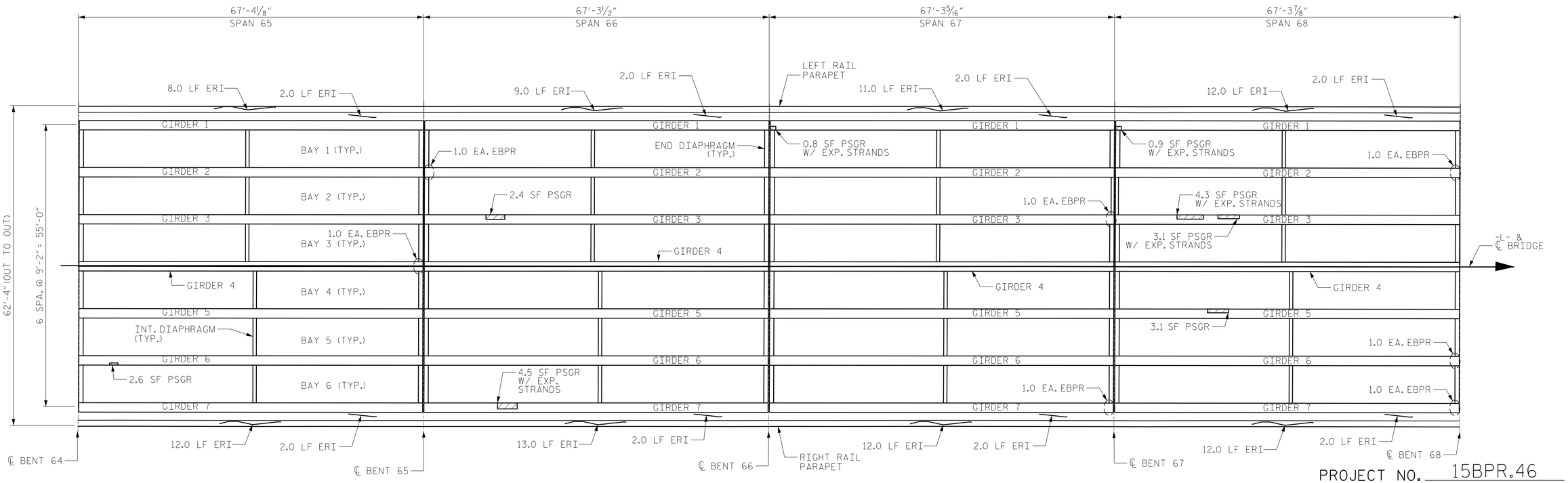
User:jduke



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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2½"
GIRDERS: 2½" TO REBAR AND 1½" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS FOR "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE".

ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND/OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

LEGEND

▨	P/S CONC. GIRDER REPAIR (PSGR)
▩	SHOTCRETE REPAIR (SCR)
〰	EPOXY RESIN INJECTION (ERI)
◯	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS				
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	21.7	10.9		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	105.0			
GIRDERS				

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" SHEETS.

PLAN OF SPAN

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

Jacob H. Duke
SEAL 043777
JACOB H. DUKE
10/19/2021

KCA
KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 65 THRU 68

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

SHEET NO. S-42
TOTAL SHEETS 137

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_DUR20_270012.dgn
jduke

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS $\geq \frac{1}{16}$" AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: $2\frac{1}{2}$"
GIRDERS: $2\frac{1}{2}$" TO REBAR AND $1\frac{1}{2}$" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

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FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

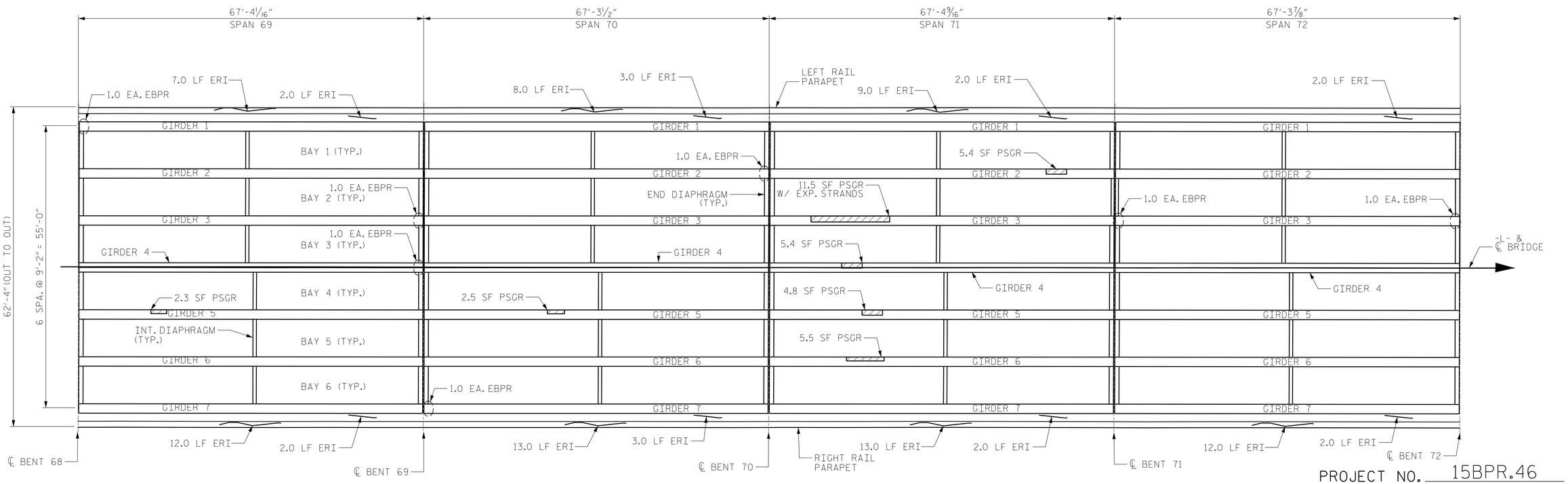
LEGEND

▨	P/S CONC. GIRDER REPAIR (PSGR)
▩	SHOTCRETE REPAIR (SCR)
∼	EPOXY RESIN INJECTION (ERI)
◯	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS				
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS	37.4	18.7		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	92.0			
GIRDERS				

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

Jacob H. Duke
SEAL 043777
10/19/2021

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

SPANS 69 THRU 72

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			137

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_DUR21_270012.dgn
jduke

NOTES:

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AVERAGE CONCRETE COVER IS EXPECTED AS FOLLOWS;
DECK & DIAPHRAGMS: 2 1/2"
GIRDERS: 2 1/2" TO REBAR AND 1 1/2" TO P/S STRANDS

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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FOR 2-BAR METAL RAIL REPAIRS, SEE SPECIAL PROVISIONS.

FOR BEARINGS, SEE BEARING REPLACEMENT SHEETS.

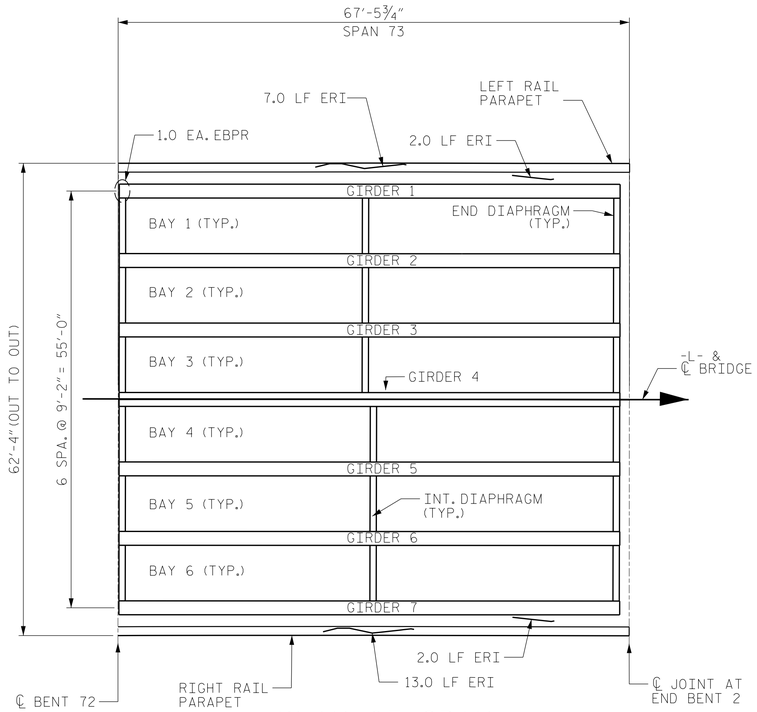
LEGEND

	P/S CONC. GIRDER REPAIR (PSGR)
	SHOTCRETE REPAIR (SCR)
	EPOXY RESIN INJECTION (ERI)
	ELASTOMERIC BEARING PAD REPLACEMENT (EBPR)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK & OVERHANG				
DIAPHRAGMS				
RAILS				
P/S CONC. GIRDER REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
GIRDERS				
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
DECK, DIAPHRAGMS, AND PARAPETS	24.0			
GIRDERS				

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" SHEETS.



PLAN OF SPAN

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

DocuSigned by: Jacob Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

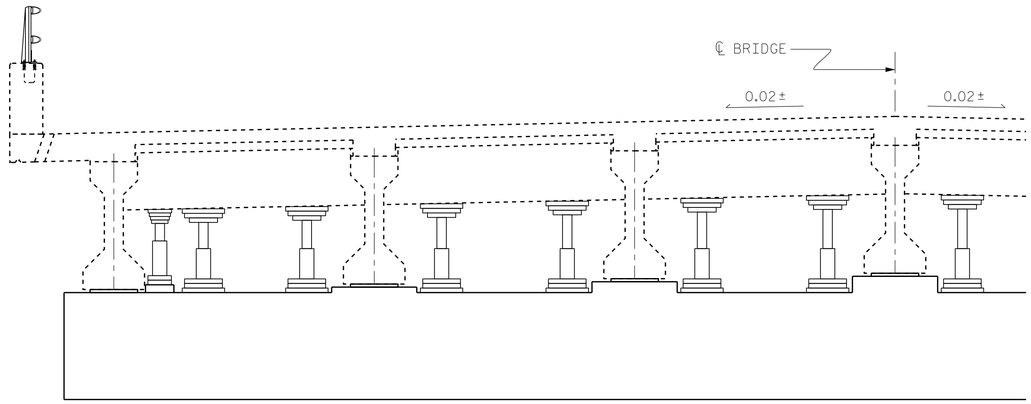
SPAN 73

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : ALLEN J. MCSWAIN DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

10/19/2021
15BPR.46_SMU_DUR22_270012.dgn
jduke



TYPICAL SECTION

PRELIMINARY JACKING LOADS

	BEAM	FACTORED DEAD LOAD (KIPS)	FACTORED LIVE LOAD NO IMPACT (KIPS)	MIN. JACK CAPACITY LIVE & DEAD LOAD (TONS)
SPAN 1 THRU 15 & 19 THRU 33	EXTERIOR	85	93	120
	INTERIOR	120	118	150
SPANS 33 THRU 72	BEAM	FACTORED DEAD LOAD (KIPS)	FACTORED LIVE LOAD NO IMPACT (KIPS)	MIN. JACK CAPACITY LIVE & DEAD LOAD (TONS)
	EXTERIOR	101	96	130
	INTERIOR	117	120	150
SPANS 16 & 18	BEAM	FACTORED DEAD LOAD (KIPS)	FACTORED LIVE LOAD NO IMPACT (KIPS)	MIN. JACK CAPACITY LIVE & DEAD LOAD (TONS)
	EXTERIOR	162	110	165
	INTERIOR	174	135	190
SPAN 17	BEAM	FACTORED DEAD LOAD (KIPS)	FACTORED LIVE LOAD NO IMPACT (KIPS)	MIN. JACK CAPACITY LIVE & DEAD LOAD (TONS)
	EXTERIOR	106	106	170
	INTERIOR	121	121	180

NOTES:
DL FACTOR: 1.25
LL FACTOR: 1.35

JACKING NOTES:

1. THIS DETAIL IS A GENERIC EXAMPLE OF A JACKING SCHEME AND DOES NOT NECESSARILY REPRESENT SPECIFIC CONDITIONS AT A PARTICULAR BRIDGE. ACTUAL BRIDGE GEOMETRIES, DIMENSIONS AND CONDITIONS MAY DIFFER FROM THIS DETAIL, PRIOR TO BEGINNING WORK, THE CONCTRACTOR SHALL INVESTIGATE THE BRIDGE AND DEVELOP A PROPER STRENGTH JACKING SCHEME TO BE SUBMITTED FOR REVIEW.
2. PRIOR TO BRIDGE JACKING OPERATIONS, THE ENGINEER AND CONTRACTOR SHALL INSPECT THE STRUCTURE FOR ANY NOTABLE DEFECTS TO THE PRIMARY AND SECONDARY STRUCTURAL MEMBERS. ALL NOTABLE DEFECTS SHALL BE DOCUMENTED AND REPORTED TO THE AREA BRIDGE MAINTENANCE ENGINEER PRIOR TO THE COMMENCEMENT OF BRIDGE JACKING. THE CONTRACTOR SHALL PROVIDE SAFE AND SUFFICIENT ACCESS TO ALL STRUCTURAL MEMBERS FOR THE ENGINEER TO ESTABLISH PROPER DOCUMENTATION.
3. PRIOR TO JACKING, THE CONTRACTOR SHALL ENSURE THERE ARE NO OBSTACLES PREVENTING THE BEAM FROM BEING LIFTED.
4. THE BEAMS SHALL BE LIFTED ENOUGH THAT THE BEAM CLEARS THE BEARINGS AND ALL LOAD IS SUPPORTED BY THE JACKS. AFTER JACKING IS COMPLETE, THE CONTRACTOR SHALL PROVIDE FOR A METHOD TO REMOVE THE JACKS AND SUPPORT THE BEAM FOR DEAD AND LIVE LOAD DURING THE REPAIR OPERATIONS IF THE JACKS REMAIN IN PLACE DURING THE ENTIRE JACKING AND REPAIR OPERATION, THEY SHALL HAVE MECHANICAL LOCK OFF CAPABILITIES.
5. IF, DURING THE JACKING PROCESS, OR WHILE THE BEAM IS BEING SUPPORTED, THE BEAM SHIFTS FROM ITS ORIGINAL POSITION, ALL WORK SHALL CEASE AND THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
6. BEARINGS ADJACENT TO THE BEAM BEING JACKED MAY BE LOOSENED TO DECREASE THE RESISTANCE OF THE DECK SLAB DURING JACKING. ALL BEARINGS LOOSENED SHALL BE TIGHTENED BACK AFTER REPAIR OPERATIONS ARE COMPLETED AND THE JACKS AND BLOCKING HAVE BEEN REMOVED.
7. THE MAXIMUM DIFFERENTIAL BETWEEN ADJACENT BEAMS THAT ARE BEING JACKED IS $\frac{1}{8}$".
8. LOADS PROVIDED IN THE "BRIDGE JACKING TABLE" ARE SHOWN FOR INFORMATION PURPOSES ONLY, THE CONTRACTOR'S ENGINEER SHALL DETERMINE THE EXPECTED LOADS TO BE LIFTED DURING THE BRIDGE JACKING OPERATIONS.
9. THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS AND CALCULATIONS OF THE JACKING PROCEDURE(S) SEALED BY A PROFESSIONAL ENGINEER IN THE STATE OF NORTH CAROLINA TO THE ENGINEER FOR APPROVAL PRIOR TO BRIDGE JACKING OPERATIONS.
10. FOR TYPE I OR TYPE II BRIDGE JACKING, SEE SPECIAL PROVISONS.
11. FOR WORKING DRAWING SUBMITTALS, SEE SPECIAL PROVISIONS.
12. TYPE II BRIDGE JACKING SHALL BE DONE WITH A HYDRAULIC JACKING SYSTEM THAT LIFTS EACH BEAM ALONG ENTIRE SPAN END WITH EQUAL FORCE AND AT AN EQUAL RATE.
13. THE CONTRACTOR SHALL BE RESPOSNIBLE FOR REPAIRING ANY DAMAGE CAUSED TO THE EXISTING STRUCTURE BY BRIDGE JACKING OPERATIONS AT NO ADDITIONAL COST TO THE DEPARTMENT.
14. PRIOR TO JACKING, LOOSEN ANY ATTACHMENTS TO ALLOW MOVEMENT.
15. JACKS SHALL BE IN FULL COMPLIANCE WITH ANSI B30.1.

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE
10/19/2021

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NC FIRM LICENSE: C-1506

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JACKING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : FIDEL L. FLORES DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
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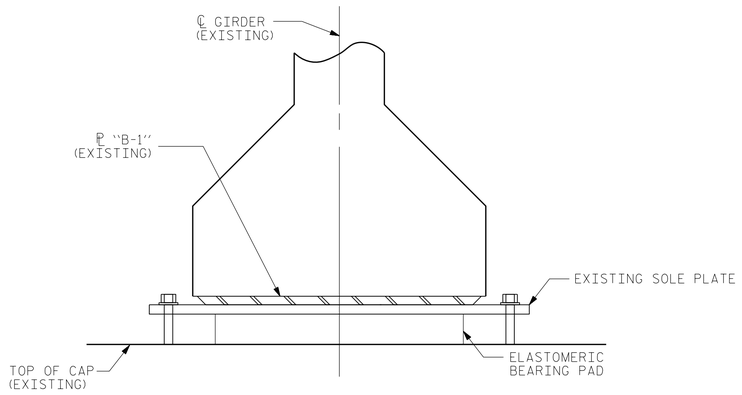
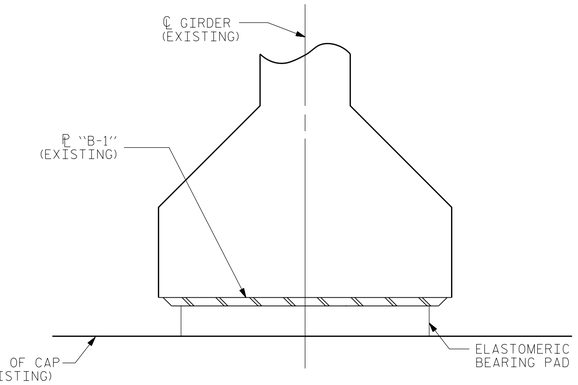
jduke



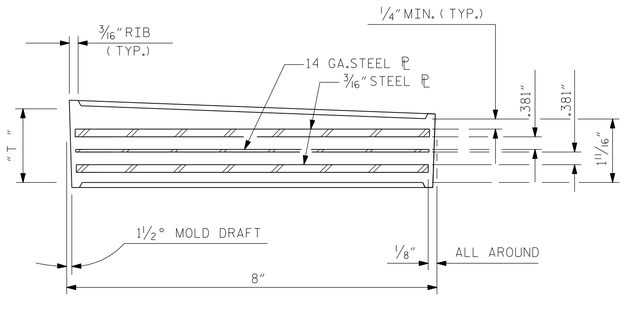
TYPICAL ELEVATION VIEW OF ELASTOMERIC BEARING

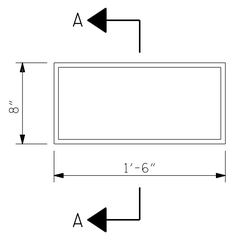
(45" PRESTRESSED CONCRETE GIRDER- SPANS 34-36, INT. GIRDERS G2 THRU G6 ONLY)



TYPICAL ELEVATION VIEW OF ELASTOMERIC BEARING

(ALL OTHER 45" PRESTRESSED CONCRETE GIRDERS)





SECTION "A-A"

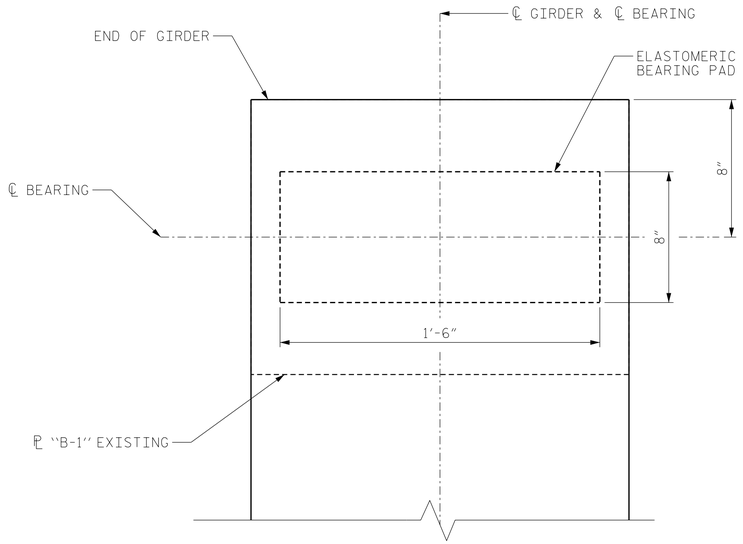
PLAN VIEW OF ELASTOMERIC BEARING

BEARING TYPE	THICKNESS "T"	GIRDER GRADE (%)	NUMBER REQUIRED
P1	1 11/16"	0.00 - 1.00	96
P2	1 13/16"	1.00 - 2.25	4
P3	1 15/16"	2.25 - 3.50	1
P4	2 1/16"	3.50 - 5.50	9

LOCATION (SPANS)	BEARING TYPES
34, 35	P-4
36-38	P-3
39-41 & 71-73	P-2
42-70	P-1

ELASTOMERIC BEARING DETAIL

(45" PRESSTRESSED CONCRETE GIRDERS)



TYPICAL PLAN VIEW OF ELASTOMERIC BEARING

(45" PRESTRESSED CONCRETE GIRDERS)

NOTES:

1. ELASTOMER IN THE STEEL REINFORCED BEARING SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORANCE WITH AASHTO M251.
2. FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE STANDARD SPECIFICATIONS AND PROJECT SPECIAL PROVISIONS.
3. FOR BRIDGE JACKING, SEE JACKING DETAIL SHEETS.
4. TABLES SHOW EXISTING ELASTOMERIC BEARING SIZES & LOCATIONS, SEE SUPERSTRUCTURE REPAIR SHEETS FOR REPLACEMENT LOCATIONS.

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

SHEET 1 OF 3

DocuSigned by: Jacob Duke

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

10/19/2021

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DEPARTMENT OF TRANSPORTATION
RALEIGH

BEARING REPLACEMENT

45" PRESTRESSED CONCRETE GIRDER DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : FIDEL L. FLORES DATE : 9/30/2020
CHECKED BY : SAMUEL L. CULLUM DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
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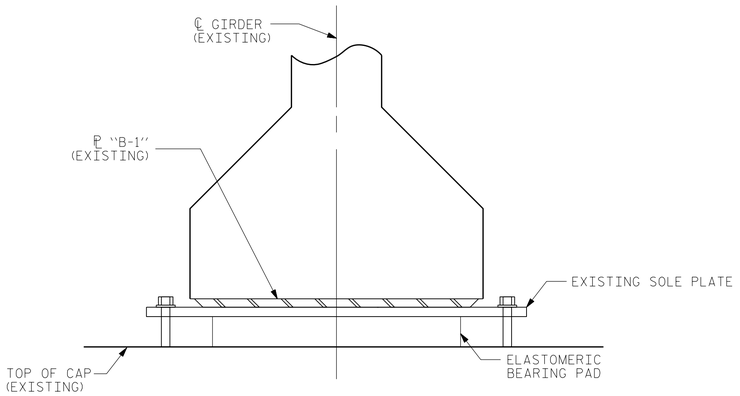
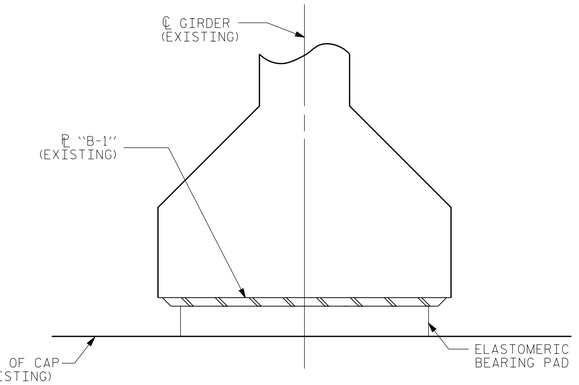


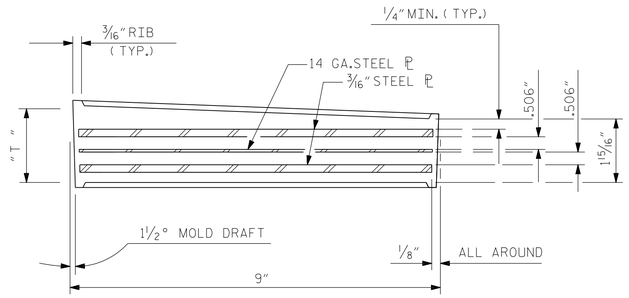
TYPICAL ELEVATION VIEW OF ELASTOMERIC BEARING

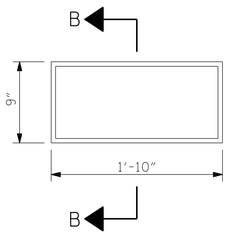
(54"PRESTRESSED CONCRETE GIRDER- SPANS 1-14 & 20-33, INT. GIRDERS G2-G6 ONLY)



TYPICAL ELEVATION VIEW OF ELASTOMERIC BEARING

(ALL OTHER 54"PRESTRESSED CONCRETE GIRDERS)





SECTION "B-B"

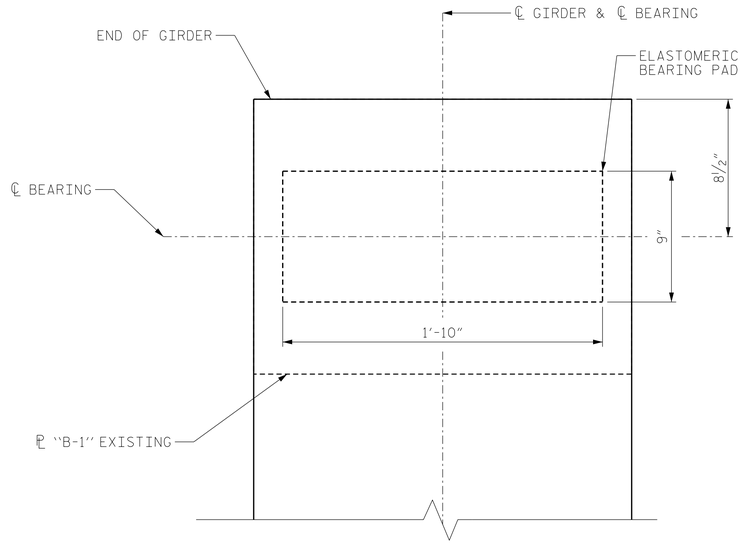
PLAN VIEW OF ELASTOMERIC BEARING

BEARING TYPE	THICKNESS "T"	GIRDER GRADE (%)	NUMBER REQUIRED
P2	2 1/16"	1.00 - 2.25	3
P3	2 3/16"	2.25 - 3.50	14
P4	2 5/16"	3.50 - 5.00	36

LOCATION (SPANS)	BEARING TYPES
1-10 & 24-33	P-4
11-13 & 21-23	P-3
14, 15, 19, & 20	P-2

ELASTOMERIC BEARING DETAIL

(54"PRESTRESSED CONCRETE GIRDERS)



TYPICAL PLAN VIEW OF ELASTOMERIC BEARING

(54"PRESTRESSED CONCRETE GIRDERS)

NOTES:

1. ELASTOMER IN THE STEEL REINFORCED BEARING SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORANCE WITH AASHTO M251.
2. FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE STANDARD SPECIFICATIONS AND PROJECT SPECIAL PROVISIONS.
3. FOR BRIDGE JACKING, SEE JACKING DETAIL SHEETS.
4. TABLES SHOW EXISTING ELASTOMERIC BEARING SIZES & LOCATIONS, SEE SUPERSTRUCTURE REPAIR SHEETS FOR REPLACEMENT LOCATIONS.

DRAWN BY : FIDEL L. FLORES DATE : 9/30/2020
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10/19/2021

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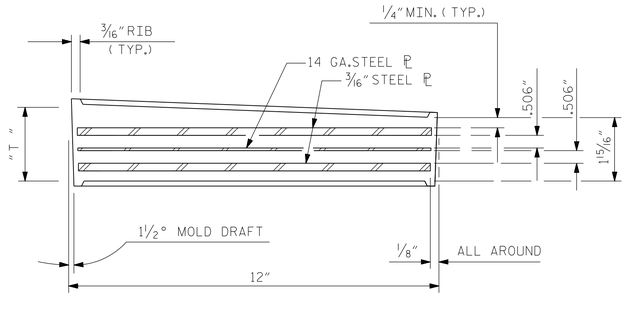
PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

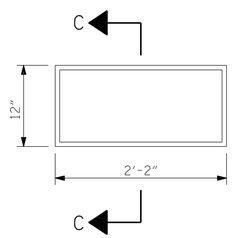
BEARING REPLACEMENT

54"PRESTRESSED CONCRETE GIRDER DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			137



SECTION "C-C"



PLAN VIEW OF ELASTOMERIC BEARING

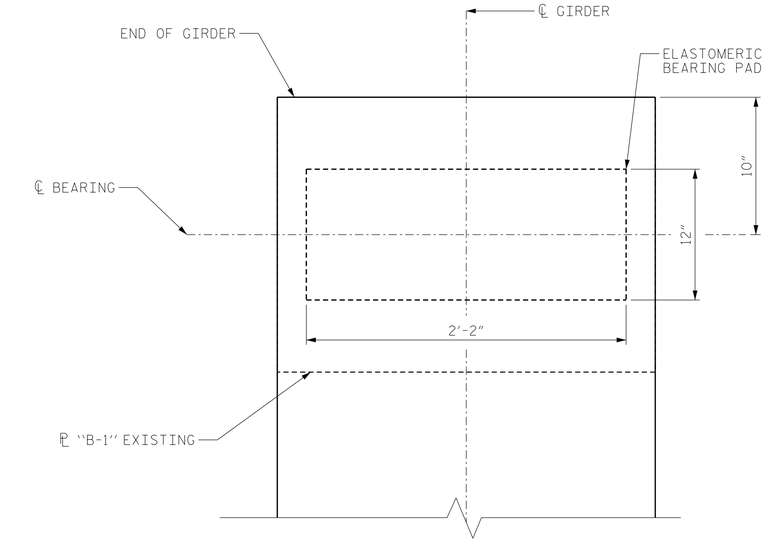
BEARING TYPE	THICKNESS "T"	GIRDER GRADE (%)	NUMBER REQUIRED
P1	1 15/16"	0.00 - 1.00	2

ELASTOMERIC BEARING DETAIL

(72" PRESTRESSED CONCRETE GIRDER- SPANS 16 THRU 18)

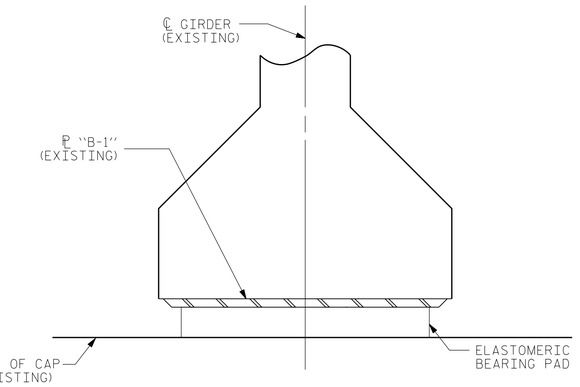
NOTES:

1. ELASTOMER IN THE STEEL REINFORCED BEARING SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORANCE WITH AASHTO M251.
2. FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE STANDARD SPECIFICATIONS AND PROJECT SPECIAL PROVISIONS.
3. FOR BRIDGE JACKING, SEE JACKING DETAIL SHEETS.
4. TABLES SHOW EXISTING ELASTOMERIC BEARING SIZES & LOCATIONS, SEE SUPERSTRUCTURE REPAIR SHEETS FOR REPLACEMENT LOCATIONS.



TYPICAL PLAN VIEW OF ELASTOMERIC BEARING

(72" PRESTRESSED CONCRETE GIRDER)



TYPICAL ELEVATION VIEW OF ELASTOMERIC BEARING

(72" PRESTRESSED CONCRETE GIRDER)

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

SHEET 3 OF 3

DocuSigned by: Jacob H. Duke
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10/19/2021

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DEPARTMENT OF TRANSPORTATION
RALEIGH

BEARING REPLACEMENT

72" PRESTRESSED CONCRETE GIRDER DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : FIDEL L. FLORES DATE : 9/30/2020
CHECKED BY : SAMUEL L. CULLUM DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

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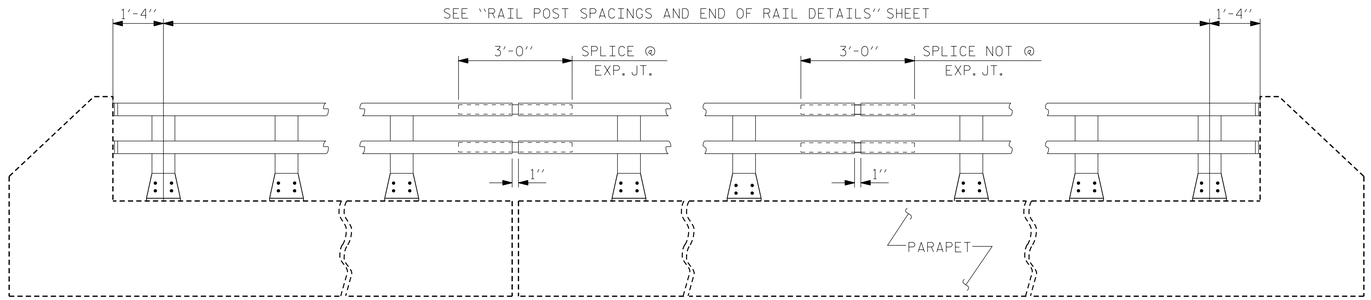
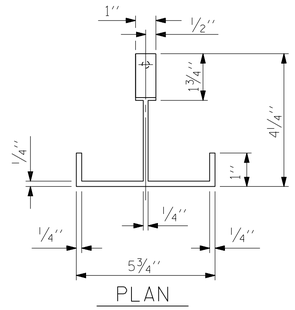
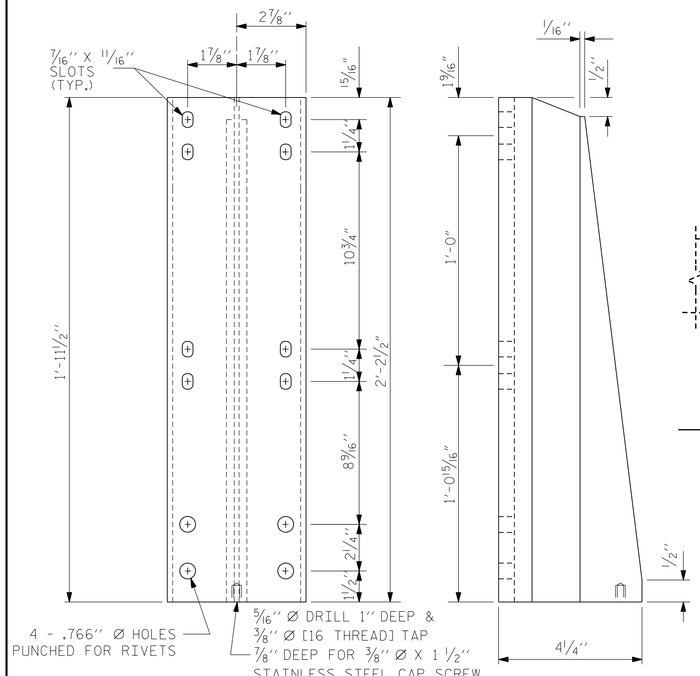


ELEVATION



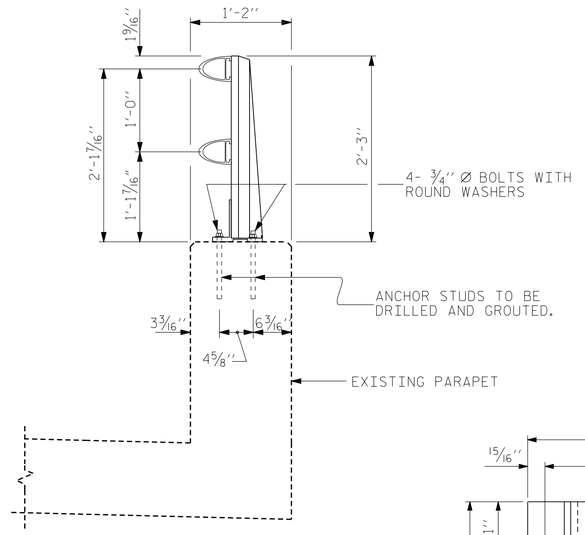
PLAN



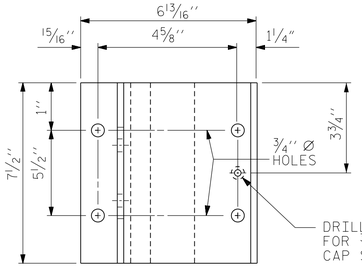
FRONT ELEVATION

SIDE ELEVATION

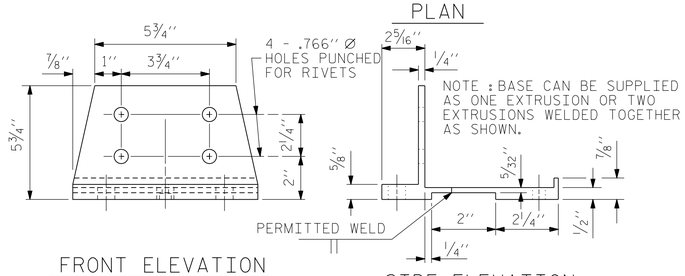
DETAILS OF POST



SECTION THRU PARAPET AND RAIL



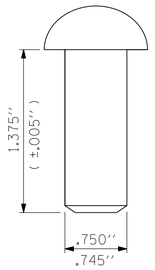
PLAN



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

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

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:

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

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

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

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

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

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET 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.

THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL MISSING AND /OR DAMAGED RAIL COMPONENTS, AS WELL AS TIGHTENING ALL LOOSE RAIL CONNECTIONS.

THE CONTRACTOR SHALL UTILIZE THESE SHEETS AS NECESSARY TO COMPLETE ALL REPAIRS

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MODIFIED STANDARD

2 BAR METAL RAIL REPAIRS

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE
10/19/2021

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DRAWN BY : FIDEL L. FLORES DATE : 9/30/2020
CHECKED BY : ALLEN J. MCSWAIN DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

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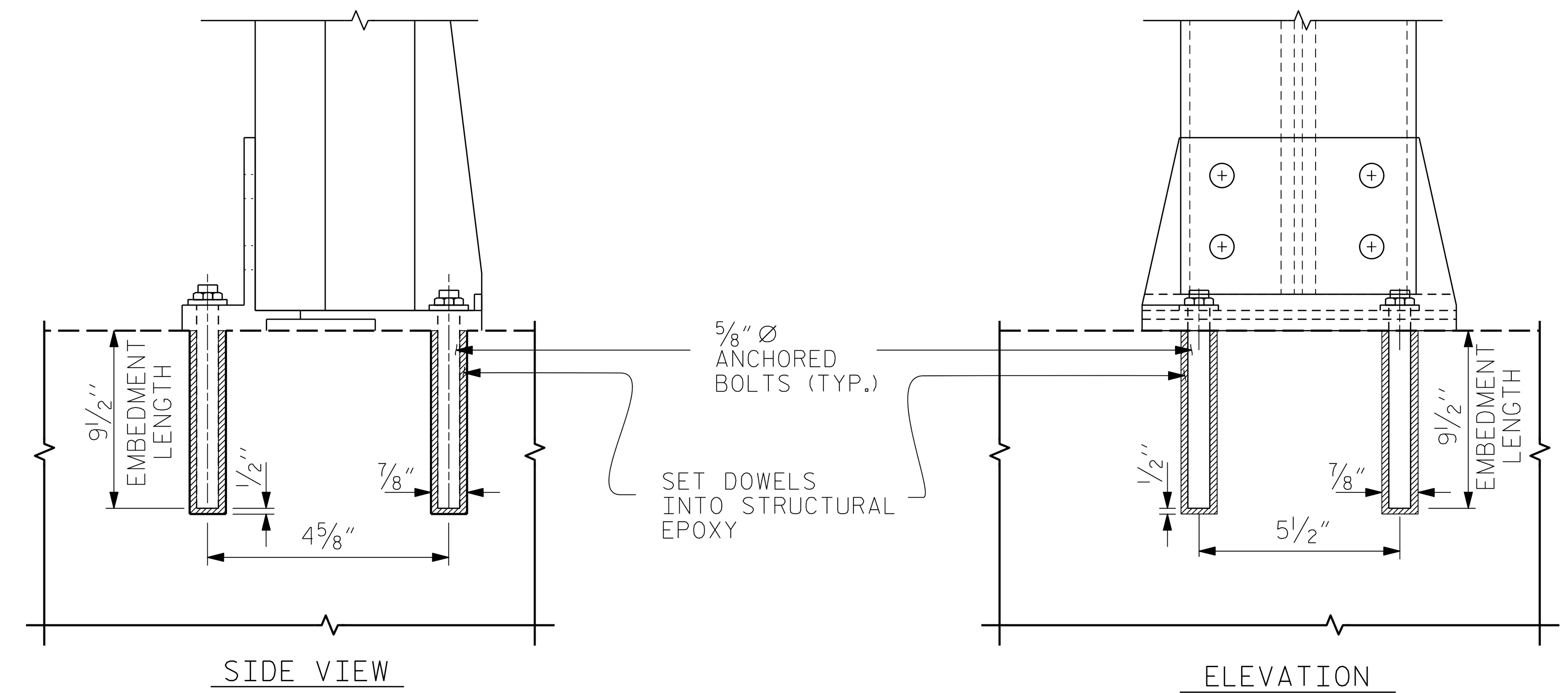
STD. NO. BMR3



ADHESIVELY ANCHORED BOLTS

FOR USE WHEN A REPLACEMENT POST IS NEEDED AS DEEMED NECESSARY BY THE ENGINEER.

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

MATERIAL FOR ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF F593 ALLOW WITH MINIMUM 75,000 PSI TENSILE STRENGTH.

MATERIAL FOR NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY.

MARTERIAL FOR WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY.

FOR ADHESIVELY ANCHORED BOLTS AND DOWELS, SEE SECTION 420-13 OF THE STANDARD SPECIFICATIONS.

ANCHOR BOLTS, NUTS, AND WASHERS, SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS AND SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M111.

THE COST OF THE METAL RAIL ANCHOR SYSTEM WITH BOLTS AND WASHER COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE FOR LINEAR FEET OF RAIL REPLACEMENT (2- BAR METAL RAIL).

FOR ANCHOR STUD REPLACEMENT SEE C420 OF STANDARD SPECIFICATIONS.

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

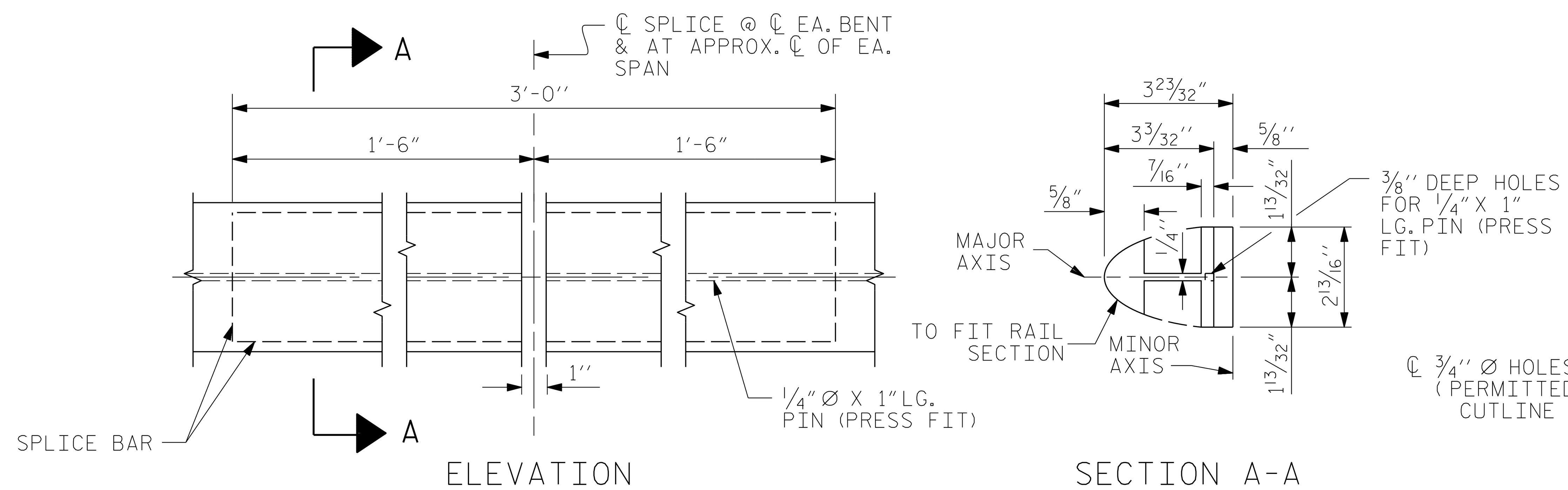
CERTIFIED MILL REPORTS ARE REQUIRED FOR ALL MATERIALS OF THE ANCHOR SYSTEM.

LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 5/8" Ø ANCHOR BOLTS IS 10 KIPS.

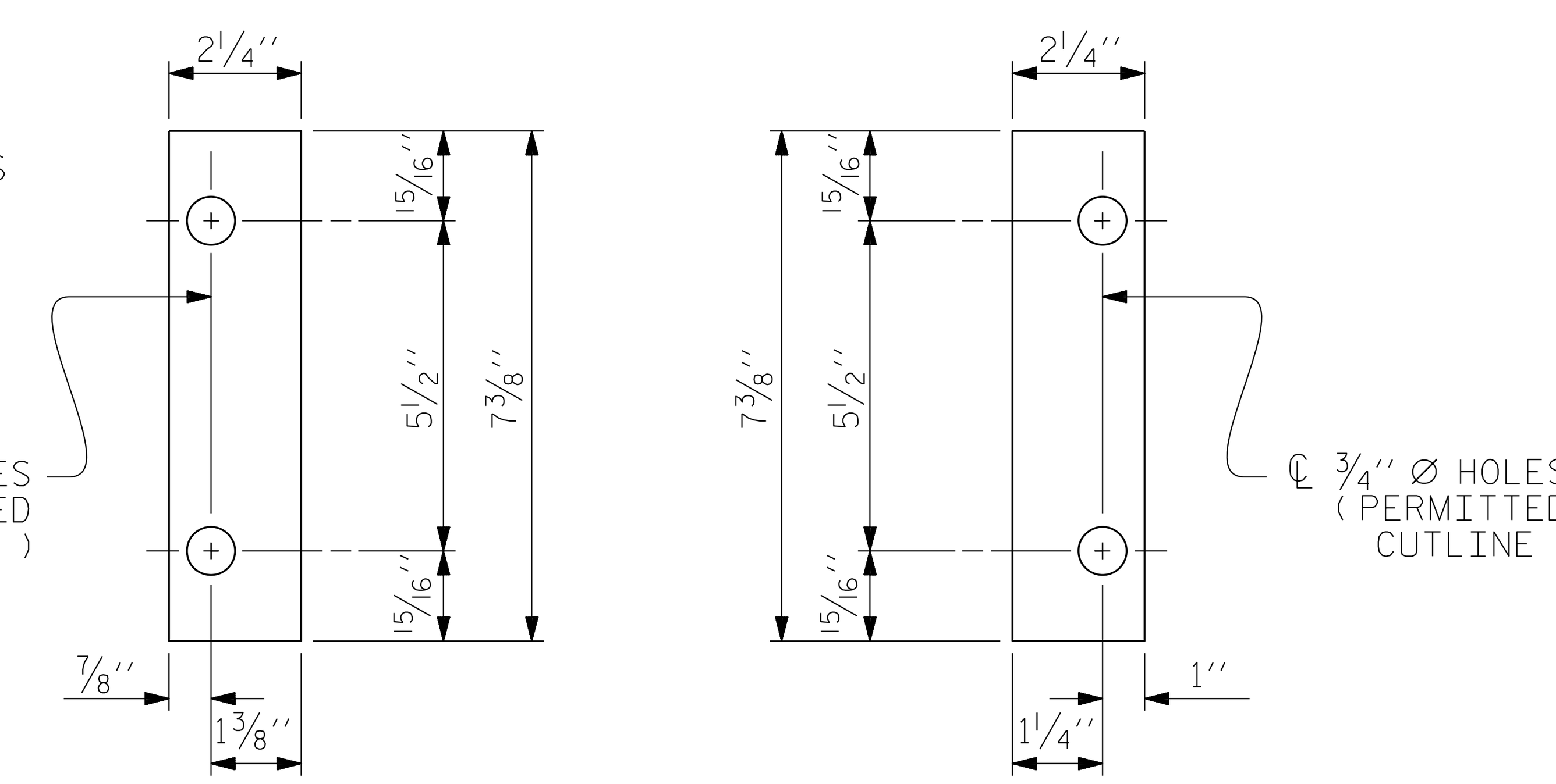
GENERAL NOTES

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.

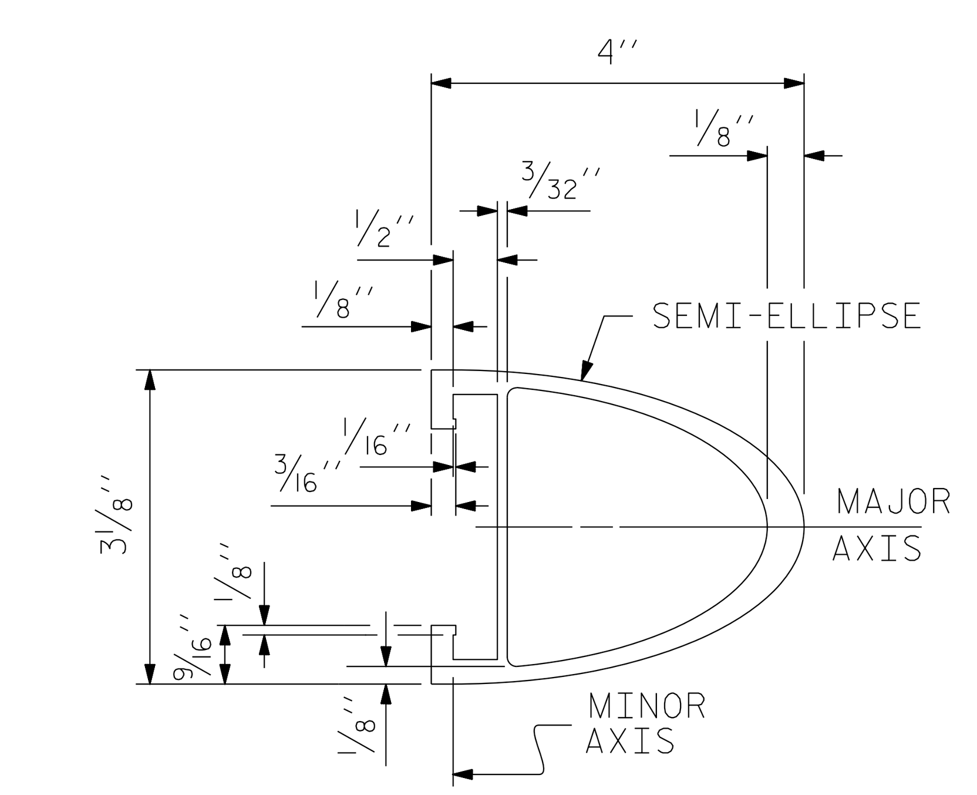


RAIL SPLICE DETAIL

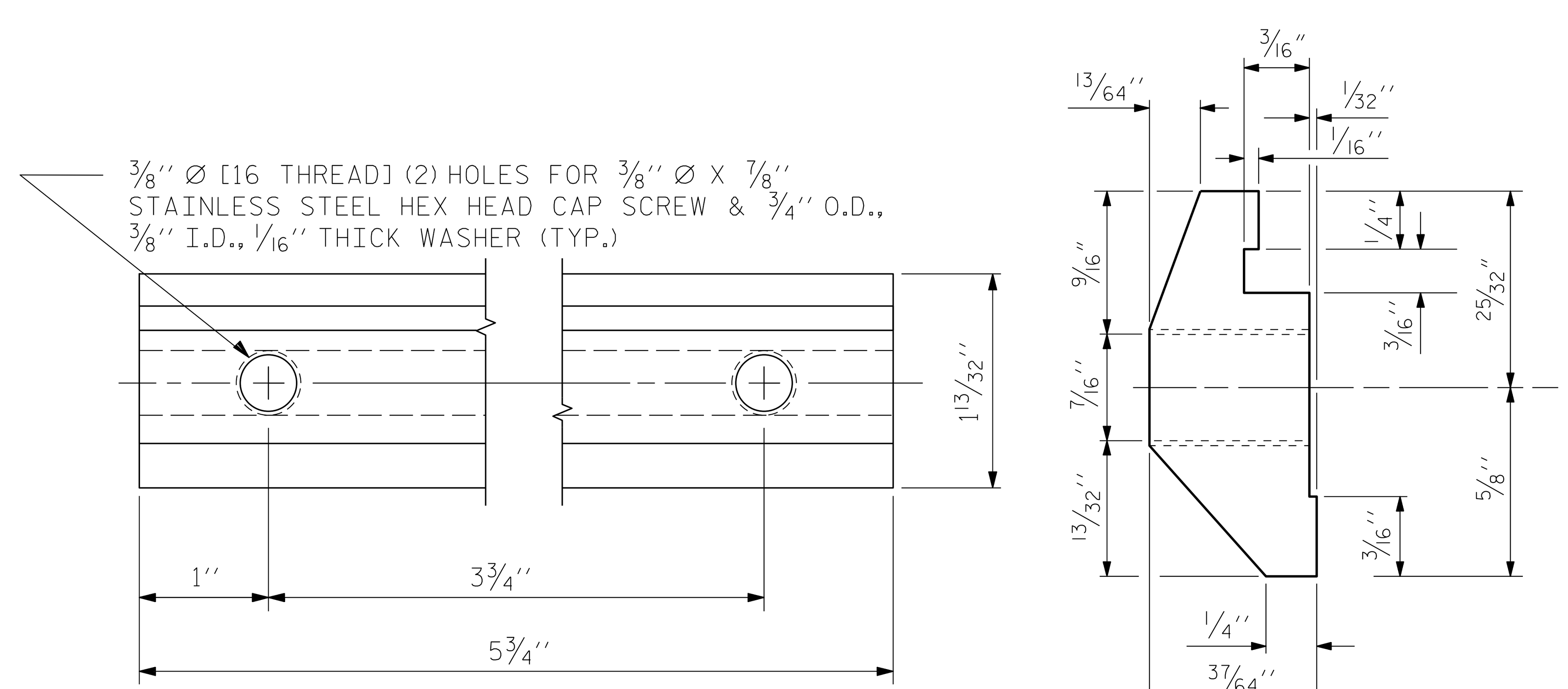


SHIM DETAILS

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

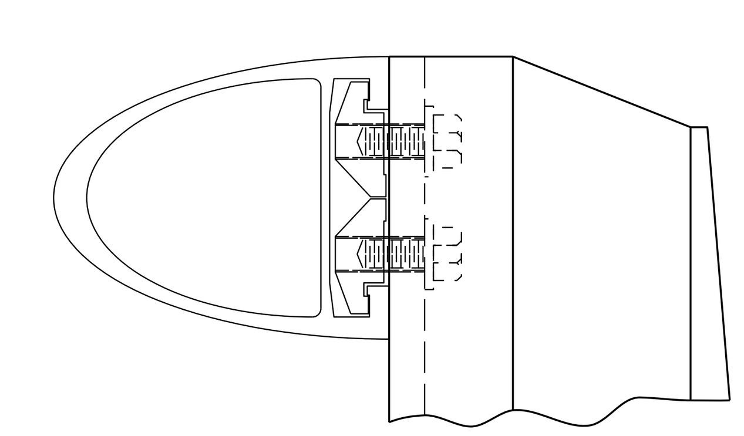


RAIL SECTION

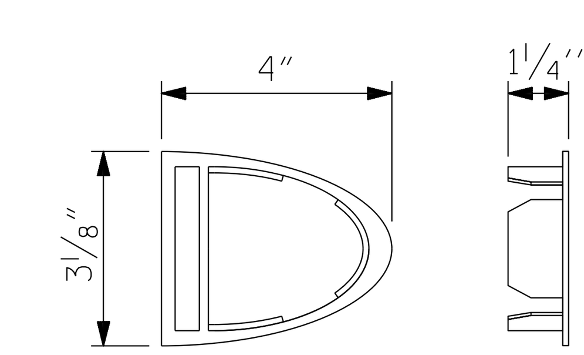


CLAMP BAR DETAIL

(2 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MODIFIED STANDARD
2 BAR METAL RAIL REPAIRS

SEAL 043777 — JACOB H. DUKE — 10/19/2021

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
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NC FIRM LICENSE: C-1506

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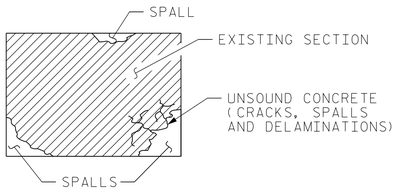
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S-50
1			3			TOTAL SHEETS	137
2			4				

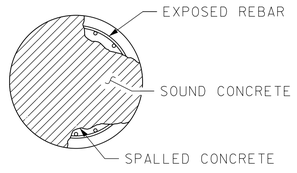
DRAWN BY : FIDEL L. FLORES DATE : 9/30/2020
CHECKED BY : ALLEN J. MCSWAIN DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_2BMR02_270012.dgn
jduke

STD. NO. BMR4



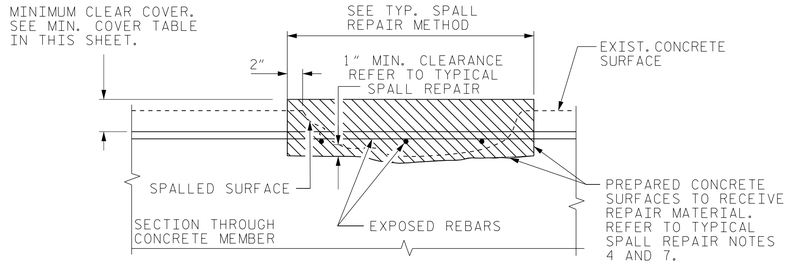
TYPICAL
DELAMINATIONS AND SPALLS



TYPICAL
SPALL WITH EXPOSED REBAR

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.



EXPOSING AND UNDERCUTTING REINFORCING STEEL

APPLICABLE TO HORIZONTAL, VERTICAL, AND OVERHEAD LOCATIONS

MIN. CONCRETE COVER TABLE

STRUCTURE ELEMENT	COVER	
	ALL OTHER SITES	CORROSIVE SITES
Bridge Deck		
to top of slab	2½" (65mm)	2½" (65mm)
to bottom of slab	1¼" (32mm)	1¼" (32mm)*
Footings and Pile Caps		
to top face	2" (50mm)	4" (100mm)
to all other faces	3" (75mm)	4" (100mm)
Bent Caps		
to bottom of cap	3" (75mm)	4" (100mm)
to ends of cap	2" (50mm)	3" (75mm)
to top of cap	2" (50mm)	3" (75mm)
to sides of cap	2" (50mm)	3" (75mm)
Columns (spiral)	2" (50mm)	3" (75mm)
Drilled Piers (spiral)	5" (125mm)**	6" (150mm)**
Culverts		
to bottom of bootom slabs and footings	3" (75mm)	3" (75mm)
to all other faces	2" (50mm)	2" (50mm)
Approach Slabs	2" (50mm)	2" (50mm)

* WHEN USING REMOVEABLE FORMS, COVER SHALL BE INCREASED TO 2½"

** IN THE EVENT THE DRILLED PIER EXTENDS INTO A BENT CAP OR PILE CAP, THE COVER MAY BE REDUCED TO 4"

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.

TYPICAL CRACK REPAIR

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 ⅛" USE AN EPOXY RESIN WITH MINIMUMS OF VISCOSITY OF 325 CPS, 28 DAY COMPRESSIVE STRENGTH OF 13000 PSI. FOR CRACKS ⅛" TO ¼", 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.

DOWEL DETAILS & NOTES

DOWEL DIMENSIONS (UNLESS OTHERWISE NOTED)

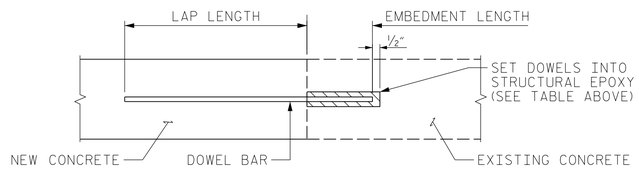
DOWEL SIZE	HOLE DIAMETER	EMBEDMENT LENGTH	MIN LAP LENGTH
4	⅝"	8"	1'-9"
5	¾"	9"	2'-2"
6	⅞"	11"	2'-7"
8	1⅛"	1'-4"	4'-6"

NOTES:

ANY REQUIRED DOWEL HOLES SHALL BE DRILLED INTO EXISTING CONCRETE ACCORDING TO THE DETAIL AND NCDOT SPECIFICATIONS.

NOTIFY THE ENGINEER OF ANY BROKEN BARS OR BARS WHICH ARE DETERMINED TO HAVE A SECTION LOSS OF 25% OR GREATER.

INSTALL DOWELS IN ACCORDANCE WITH NCDOT SPECIFICATIONS.



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 SHEETS ARE BASED ON THE BRIDGE INSPECTION REPORT, AND PARTIAL FIELD REVIEWS OF THE STRUCTURE. AS SUCH, THEY ARE FOR INFORMATIONAL PURPOSES, SUBJECT TO CHANGE BASED ON CONTINUING 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.
5. THE METHOD USED TO DELINEATE THE AREAS OF UNSOUND CONCRETE TO BE REPAIRED SHALL NOT PERMANENTLY MARK THE CONCRETE, LEAVE ANY RESIDUE AFTER REMOVAL, OR REQUIRE HARS CHEMICALS TO REMOVE.
6. THE CONTRACTOR SHALL REMOVE THE DETIRIORATED CONCRETE IN ACCORDANCE WITH THE GUIDELINES SET IN THESE NOTES, IN THE PROJECT SPECIAL PROVISIONS, AND THE STANDARD SPECIFICATIONS.
7. REMOVE UNSOUND CONCRETE TO THE EXTENT NECESSARY. MINIMMUM OF 1" BEHIND REBAR AND MINIMUM OF 2" CLEARANCE TO SAWCUT.
8. REINFORCING STEEL, WHICH IS DETERMINED BY THE ENGINEER TO BE REPLACED, SHALL BE REMOVED TO A POINT WHERE IT IS SOUND. THE PATCH SHALL EXTEND A SUFFICIENT DISTANCE BEYOND THIS POINT TO DEVELOP A SPLICE LENGTH SPECIFIED IN THE TABLE ON THIS SHEET.
9. FOR REPAIRS OVER TRAFFIC AND SHALLOW REPAIRS THAT DO NOT ENGAGE REINFORCEMENT, ANCHOR PATCH MATERIAL USING ¼" GALVANIZED BOLTS, EPOXY ANCHORED WITH 2" EMBEDMENT. PLACE BOLTS IN A 6" GRID. USE A LATEX OR EPOXY PATCH MATERIAL FOR IMPROVED BOND.
10. CONCRETE COVER SHOWN IN THE PLANS DOES NOT INCLUDE PLACEMENT OR FABRICATION TOLERANCES UNLESS SHOWN AS "MINIMUM COVER". SEE NCDOT SPECIFICATIONS FOR ALLOWABLE REINFORCEMENT PLACEMENT TOLERANCES.
11. WHEN PROPOSED CONCRETE REPAIRS (OR DETERMINED LOCATIONS) ARE ADJACENT TO A CORNER, REPAIR ON THE ADJACENT EDGE SHOULD BE ANTICIPATED IN ADDITION TO THE AREA SHOWN ON SUBSTRUCTURE CONCRETE REPAIR SHEETS. THE CONTRACTOR IS RESPONSIBLE FOR THIS REPAIR AT ALL LOCATIONS REGARDLESS OF CALL-OUT(S) ON RESPECTIVE SHEET(S).
12. FINISH CONCRETE SURFACES IN ACCORDANCE WITH THE LATEST NCDOT SPECIFICATIONS. MATCH EXISTING FINISH ON ALL EXPOSED EDGES UNLESS OTHERWISE NOTED. A CLASS 5 FINISH COATING SHALL BE APPLIED TO THE BEAM ENDS WHERE CONCRETE REPAIRS HAVE BEEN PERFORMED, MATCHING THE COLOR OF SURROUNDING CONCRETE.
13. ALL REINFORCING STEEL SHALL BE ASTM A615-96, GRADE 60. REINFORCEMENT DETAIL DIMENSIONS ARE OUT-TO-OUT OF BARS. ALL DIMENSIONS PERTAINING TO LOCATION OF REINFORCEMENT ARE TO CENTERLINE OF BARS EXCEPT WHERE THE CLEAR DIMENSION IS SHOWN TO FACE OF CONCRETE. ANY DAMAGE TO EXISTING REINFORCING STEEL, DURING CONTRACTOR'S OPERATIONS, SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER AND PERFORMED AT NO ADDITIONAL COST TO THE DEPARTMENT.
14. WHEN PROPOSED CONCRETE REPAIRS (OR DETERMINED LOCATIONS) ARE ADJACENT TO A CORNER, REPAIR ON THE ADJACENT EDGE SHOULD BE ANTICIPATED IN ADDITION TO THE AREA SHOWN ON THE REPAIR SHEETS. THE CONTRACTOR IS RESPONSIBLE FOR THIS REPAIR AT ALL LOCATIONS REGARDLESS OF CALL-OUT ON RESPECTIVE SHEETS.
15. FOR ADHESIVELY ANCHORED DOWELS OR ANCHOR BOLTS, SE STANDARD SPECIFICATIONS.
16. FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.
17. FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.
18. FOR EPOXY RESIN INJECTION (ERI), SEE SPECIAL PROVISIONS.

LAP SPLICE TABLE

BAR 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"

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

SHEET 1 OF 4

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE RESTORATION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
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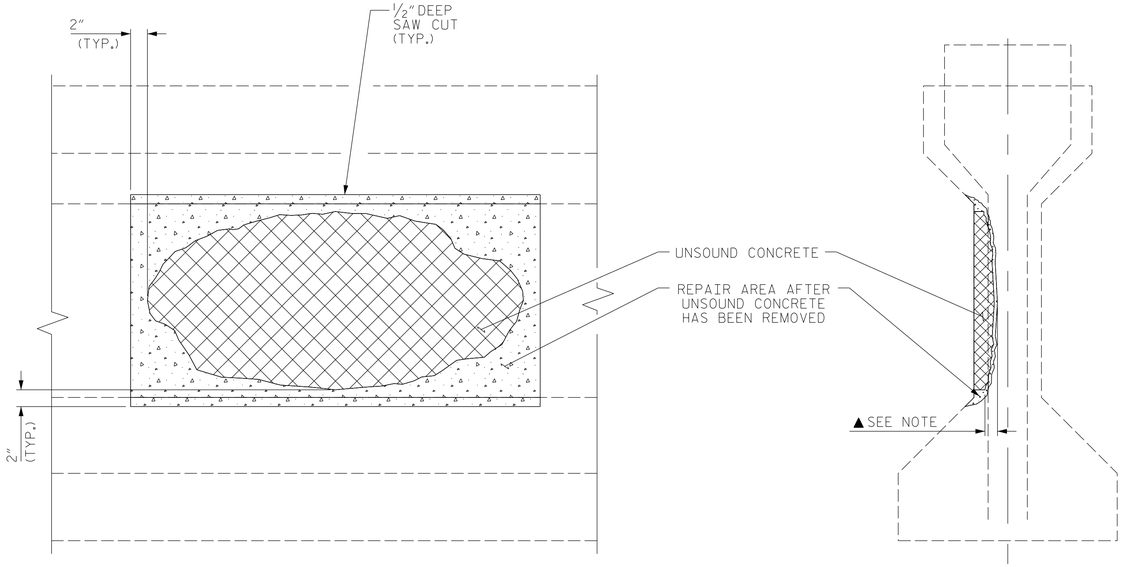
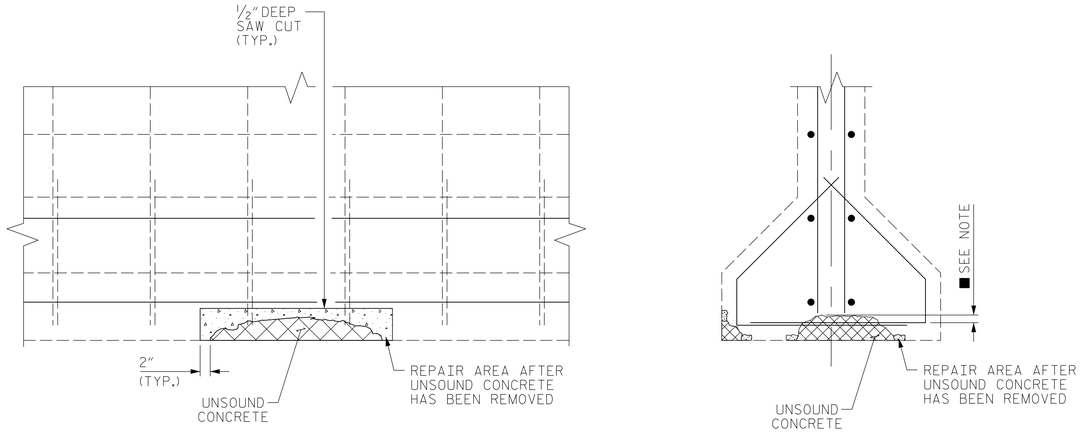
jduke



ELEVATION SECTION

GIRDER WEB REPAIR



ELEVATION SECTION

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 BARS 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 PRESTRESSED CONCRETE GIRDERS AND SEE "SUPERSTRUCTURE DEFICIENCIES" SHEETS.

NOTES:

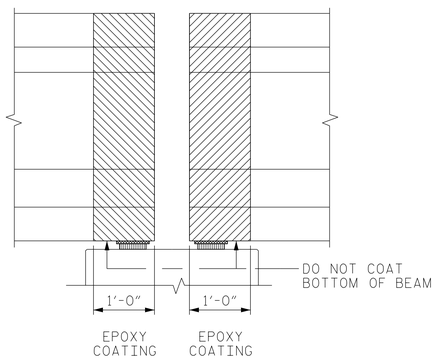
PREPACKAGED MATERIAL IS REQUIRED.

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.

AS-BUILT REPAIR QUANTITY TABLE

EPOXY COATING BEAM ENDS

	BMS/SPAN	SF/BEAM	TOTAL	
ELEMENT(S)	NO.	RATE	ESTIMATE	ACTUAL
54" PCG (SPANS 1-15 & 19-33)	7	20.1 SF	4221 SF	
72" MBT (SPANS 16 & 18)	7	31.1 SF	435 SF	
72" MBT (SPAN 17)	10	31.1 SF	311 SF	
45" PCG (SPANS 34-73)	7	16.7 SF	4676 SF	
TOTALS			9,643 SF	



EPOXY COATING END OF GIRDERS

(GIRDER AT END BENT SHOWN)

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

SHEET 2 OF 4

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE
10/19/2021

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RALEIGH

CONCRETE RESTORATION DETAILS

P/S CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
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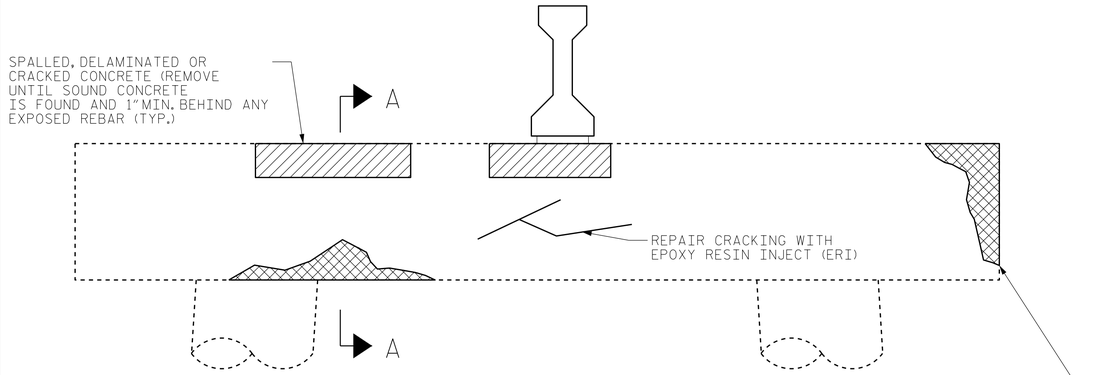
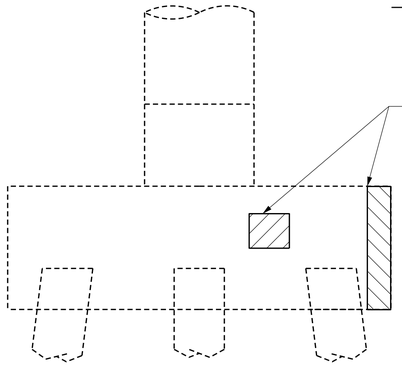
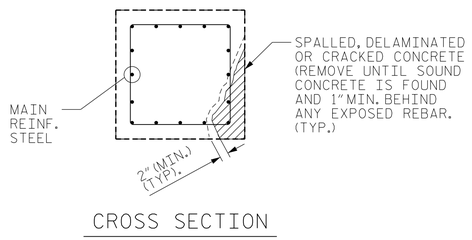
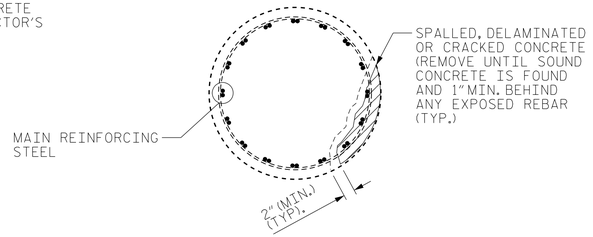
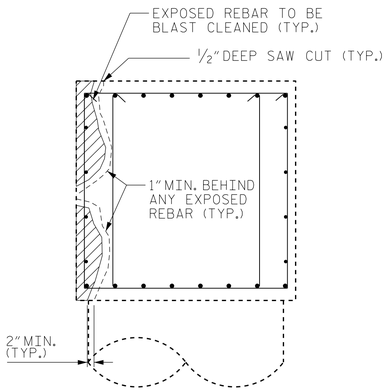
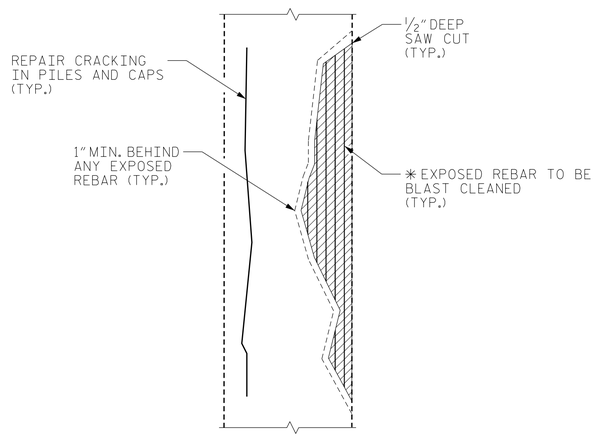


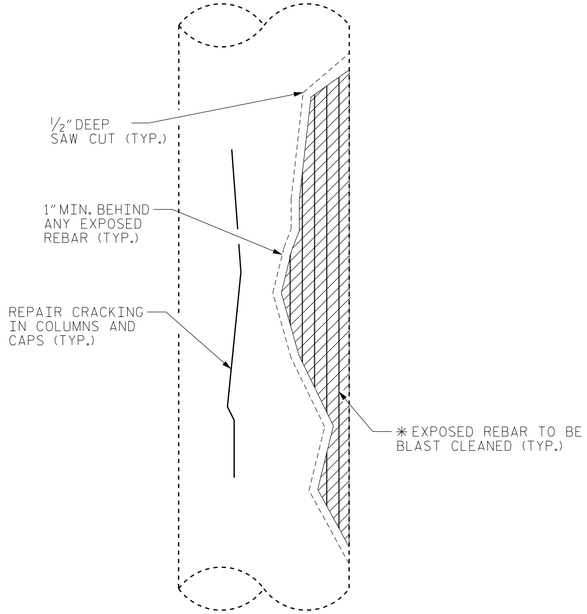












CAP REPAIRS

(COLUMN BENT SHOWN
PILE BENTS SIMILAR)

REPAIR ALL SPALLED, DELAMINATED OR CRACKED CONCRETE AREAS NOT OCCURRING AT BEAM BEARING AREAS PER PLANS AND PER THE ENGINEER USING SHOTCRETE OR "FORM AND POUR" AT THE CONTRACTOR'S OPTION (SEE NOTES)

TYPICAL FOOTING REPAIRS

CROSS SECTION

PLAN OF COLUMN

SECTION A-A

BENT CAP REPAIRS

ELEVATION

PILE REPAIRS

* REPAIR LENGTH SHALL NOT EXCEED 10 VERTICAL FEET AT ONCE OR 1/2 PILE DIAMETER.

ELEVATION OF COLUMN

* REPAIR LENGTH SHALL NOT EXCEED 10 VERTICAL FEET AT ONCE OR 1/2 COLUMN DIAMETER.

COLUMN REPAIRS

SUBSTRUCTURE REPAIR NOTES:

1. WORK THIS SHEET WITH REPAIR METHODS AND CONCRETE REPAIR NOTES IN "CONCRETE RESTORATION DETAILS" SHEET 1.
2. TYPICAL BENT CAP REPAIRS ARE SHOWN IN THIS SHEET. REPAIR DETAILS SIMILAR FOR END BENT CAPS.
3. THE METHOD USED TO DELINEATE THE AREAS OF UNSOUND CONCRETE TO BE REPAIRED SHALL NOT PERMANENTLY MARK THE CONCRETE, LEAVE ANY RESIDUE AFTER REMOVAL, OR REQUIRE HARSH CHEMICALS TO REMOVE.
4. THE CONTRACTOR SHALL REMOVE THE DETERIORATED CONCRETE IN ACCORDANCE WITH THE GUIDELINES SET IN THESE NOTES, IN THE SPECIAL PROVISIONS, AND THE STANDARD SPECIFICATIONS.
5. REMOVE UNSOUND CONCRETE TO THE EXTENT NECESSARY, A MINIMUM OF 1" BEHIND REBAR AND MINIMUM CLEARANCE OF 2" TO SAWCUT.
6. REINFORCING STEEL WHICH IS DETERMINED BY THE ENGINEER TO BE REPLACED, SHALL BE REMOVED TO A POINT WHERE IT IS SOUND. THE PATCH SHALL EXTEND A SUFFICIENT DISTANCE BEYOND THIS POINT TO DEVELOP A SPLICE LENGTH SPECIFIED IN THE TABLE ON THIS SHEET.
7. 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.
8. NO MORE THAN ⅓ OF THE CAP OR PILE CROSS SECTIONAL AREA SHALL BEREMOVED AT ONE TIME. SHOULD IT BECOME NECESSARY TO REMOVE MORE THAN 30% OF THE CROSS SECTIONAL AREA, NOTIFY THE ENGINEER PRIOR TO PROCEEDING.
9. SIMULTANEOUS REMOVAL OF UNSOUND CONCRETE MAY BE PERMITTED ON MORE THAN ONE FACE OF A CAP AND/OR PILE, BUT NO MORE THAN ⅓ OF THE CIRCUMFERENCE SHALL BE REMOVED AT A TIME. IF REMOVAL EXTENDS MORE THAN 1-1/2" BEHIND THE MAIN REINFORCING BARS, NOTIFY THE ENGINEER PRIOR TO PROCEEDING.
10. COAT ALL THE FREE SURFACE AREA ON THE TOP OF CAPS, INCLUDING CHAMFERS, WITH EPOXY PROTECTIVE COATING. DO NOT COAT AREA UNDER BEARINGS.
11. REPAIRS TO THE BENT CAPS MAY REQUIRE BRIDGE JACKING. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.
12. FOR SUBSTRUCTURE REPAIRS, SEE "SUBSTRUCTURE REPAIRS" SHEETS.

LEGEND	
▨	CONCRETE REPAIR AREA
▩	SHOTCRETE REPAIR AREA
～	EPOXY RESIN INJECTION (ERI)

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012
SHEET 3 OF 4

DocuSigned by:
Jacob Duke
29580C8054E94D9...

SEAL
043777
JACOB H DUKE
10/19/2021

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE RESTORATION DETAILS

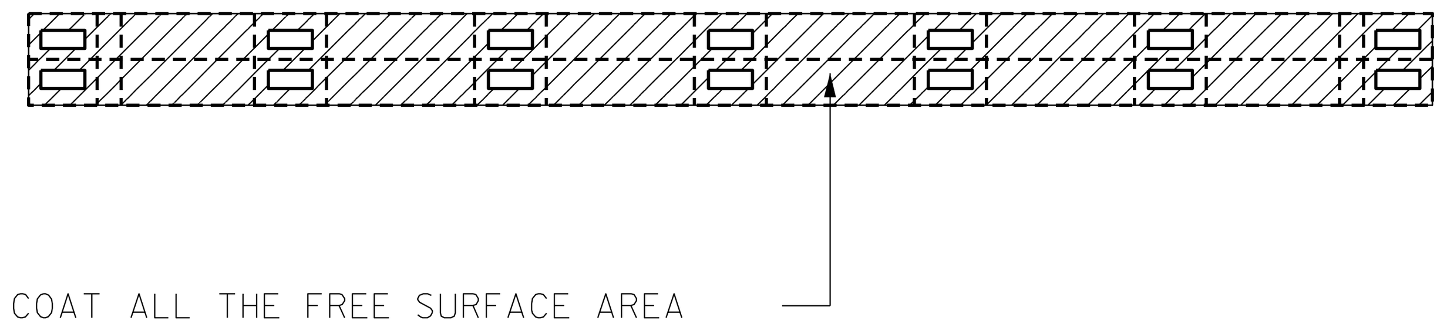
SUBSTRUCTURE

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

SHEET NO. S-53
TOTAL SHEETS 137

DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_CR03_270012.dgn
jduke

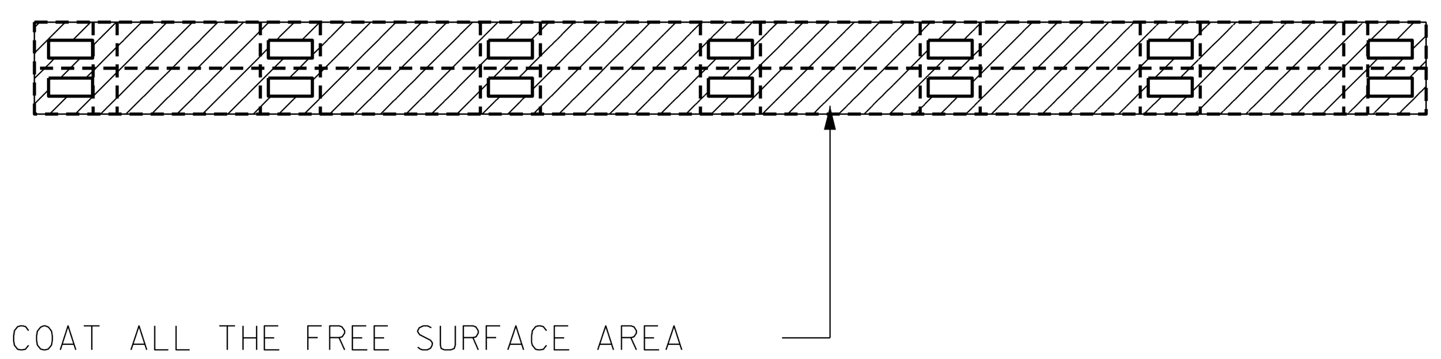


BENTS 1-15 & 18-35

(APPROX 205 S.F./BENT)

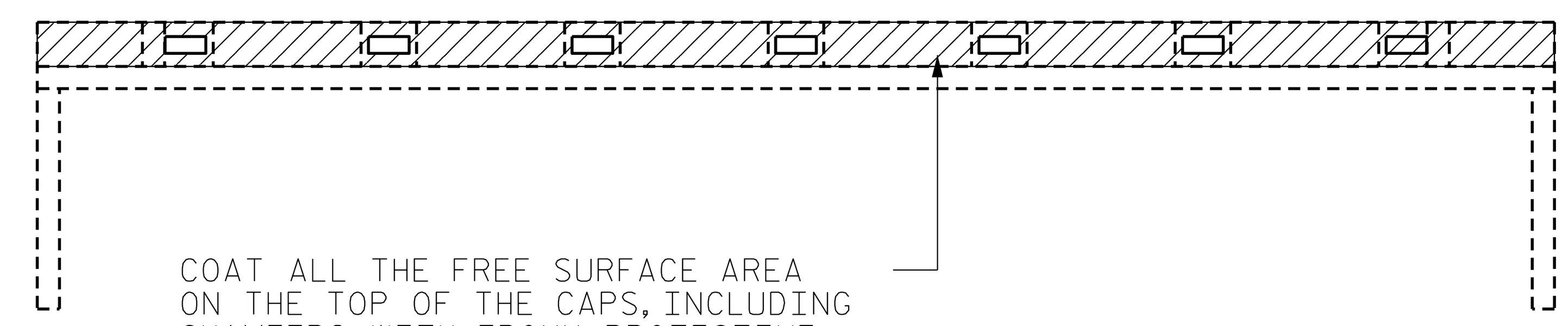
BENTS 16 & 17

(APPROX 207 S.F./BENT)



BENTS 36-72

(APPROX 204 S.F./BENT)



END BENTS

(APPROX 129 S.F./BENT)

EPOXY COATING TOPS OF BENT CAPS

AS-BUILT REPAIR QUANTITY TABLE

EPOXY COATING BENTS CAPS AND BEAM ENDS

			TOTAL	
ELEMENT(S)	NO.	RATE	ESTIMATE	ACTUAL
BENT CAPS 1-15 & 18-35	33 EA	205 SF	6765 SF	
BENT CAPS 16 & 17	2 EA	207 SF	414 SF	
BENT CAPS 36-72	37 EA	204 SF	7548 SF	
END BENTS 1 & 2	2 EA	129 SF	258 SF	
TOTALS			14,985 SF	

NOTES:

1. COORDINATE THIS SHEET WITH OTHER SHEETS FOR "CONCRETE RESTORATION DETAILS".
2. PERFORM ALL CONCRETE REPAIRS PRIOR TO APPLYING THE EPOXY PROTECTIVE COATING.
3. THE TOPS OF THE CAPS SHOULD BE CLEAN AND CLEAR OF ALL DEBRIS PROIOR TO THE APPLICATION OF THE EPOXY PROTECTIVE COATING.
4. FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS AND STANDARD SPECIFICAIONS SECTION 420-18.

LEGEND	
(hatched)	EPOXY COATING AREA

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

SHEET 4 OF 4

SEAL 043777 — NORTH CAROLINA PROFESSIONAL ENGINEER — JACOB H. DUKE — 10/19/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE RESTORATION DETAILS

SUBSTRUCTURE

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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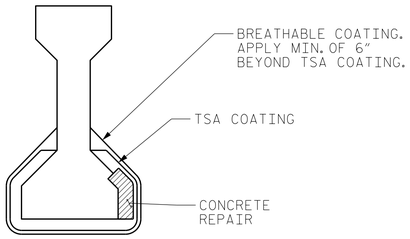
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-54
1			3			TOTAL SHEETS
2			4			137

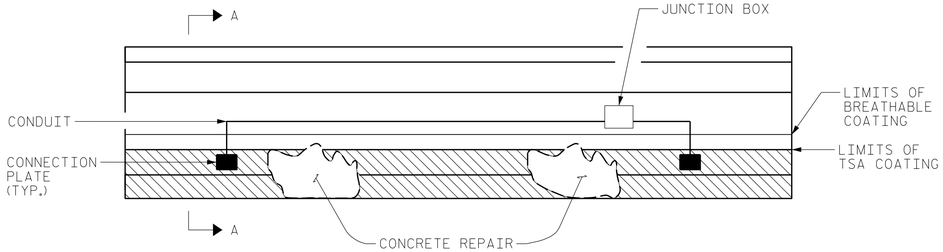
DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_CR04_270012.dgn
jduke

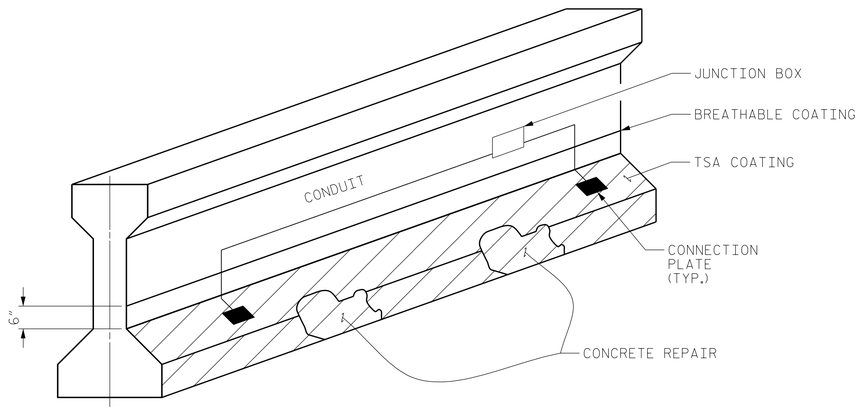


SECTION A-A

CONDUIT, JUNCTION BOX, AND CONNECTION PLATES NOT SHOWN FOR CLARITY



ELEVATION



CP MONITORING ZONE

MONITORING NOTES:

1. FOR NON-MONITORING, NO CONDUITS OR JUNCTION BOX IS REQUIRED.
2. FOR MONITORING, TWO REFERENCE ELECTRODES SHALL BE INSTALLED PER GIRDER. ONE WITHIN THE FIRST 5 FT. OF THE GIRDER END, AND THE OTHER NEAR THE CONCRETE REPAIR AREA. THE EXACT LOCATIONS SHALL BE DECIDED BY THE CATHODIC PROTECTION SPECIALIST IN THE FIELD.
3. ALWAYS EXTEND TSA COATING AREA 24" BEYOND CONCRETE DAMAGE AREA. EXTEND BREATHABLE COATING 6" BEYOND THE EDGE OF TSA COATING.
4. FOR JUNCTION BOX DETAILS, SEE DETAIL 3 ON SHEET 2.

AS-BUILT REPAIR QUANTITY TABLE

TSA COATING FOR BEAMS

ESTIMATED TSA PER BEAM: 310.35 SF

		TOTAL			TOTAL			TOTAL
SPAN	BEAM	ACTUAL	SPAN	BEAM	ACTUAL	SPAN	BEAM	ACTUAL
36	7		46	2		60	7	
37	7		46	3		61	(1)	
38	7		46	4		61	2	
39	7		46	5		61	3	
41	7		46	6		61	4	
42	1		46	(7)		61	5	
42	(2)		47	7		61	6	
42	3		48	7		61	7	
42	4		49	1		62	1	
42	5		49	2		62	2	
42	6		49	3		62	3	
42	7		49	4		62	4	
43	1		49	5		62	5	
43	2		49	6		62	6	
43	3		49	7		62	7	
43	4		52	1		63	2	
43	5		52	2		64	5	
43	6		52	3		64	7	
43	7		52	4		65	6	
44	1		52	5		65	7	
44	2		52	(6)		66	7	
44	3		52	7		67	7	
44	(4)		54	4		68	3	
44	5		54	7		69	3	
44	6		57	1		71	1	
44	7		58	7		71	2	
45	1		59	2		71	(3)	
45	2		59	6		71	4	
45	3		60	1		71	5	
45	4		60	2		71	6	
45	5		60	3		71	7	
45	6		60	4		73	7	
45	7		60	5				
46	1		60	6				
TOTAL (NON-MONITORING):						29,173 SF		
TOTAL (MONITORING):						1,862 SF		

(#) BEAM REQUIRING MONITORING

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 BEAMS 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 BEAMS 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 GIRDERS IN THE INDICATED SPANS SHALL BE METAILIZED TO THE LIMITS SHOWN ON THE PLANS. CONNECTION BETWEEN PLATE AND REINFORCING STEEL SHALL BE PROVIDED VIA A 5/16" 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. THE ENGINEER MUST APPROVE THE METALIZING PRIOR TO THE OVERCOAT APPLICATION.
10. SEE PROJECT SPECIAL PROVISIONS FOR ADDITIONAL METALIZING REQUIREMENTS AND ACCEPTANCE CRITERIA.
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 FACES OF THE PIER/PILE CAPS OF ANY MARINE GROWTH AND DEBRIS BEFORE ALL PERFORMING ANY OF THE ASSOCIATED WORK FOR BEAM METALIZATION.
14. FOR PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE, SEE SPECIAL PROVISIONS.

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

SHEET 1 OF 2

DocuSigned by: Jacob H. Duke
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H. DUKE
10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
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NC FIRM LICENSE: C-1506

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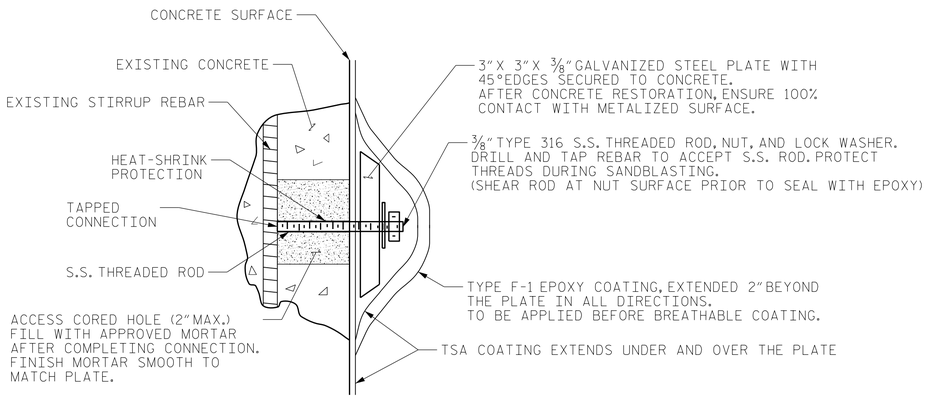
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CATHODIC PROTECTION
TSA COATING FOR BEAMS (SPANS 34-73)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-55
1			3			TOTAL SHEETS
2			4			137

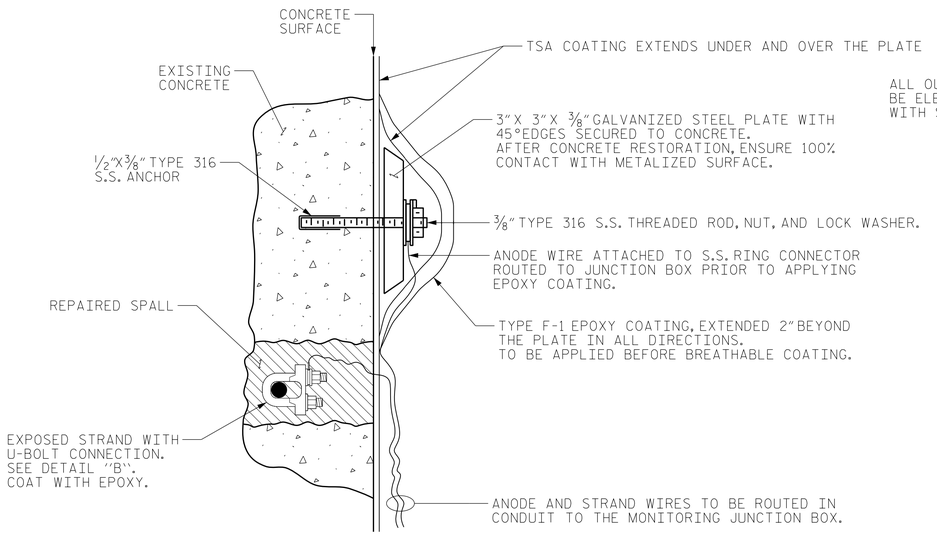
DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_CP01.1_270012.dgn
jduke



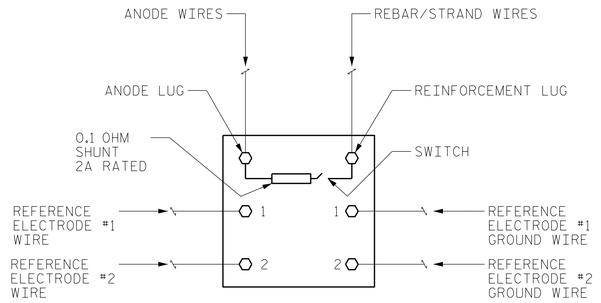
DETAIL 1 - ANODE CONNECTION PLATE DETAIL (CP NON-MONITORING)

(BREATHABLE COATING NOT SHOWN FOR CLARITY)



DETAIL 1 - ANODE CONNECTION PLATE DETAIL (CP MONITORING)

(BREATHABLE COATING NOT SHOWN FOR CLARITY)



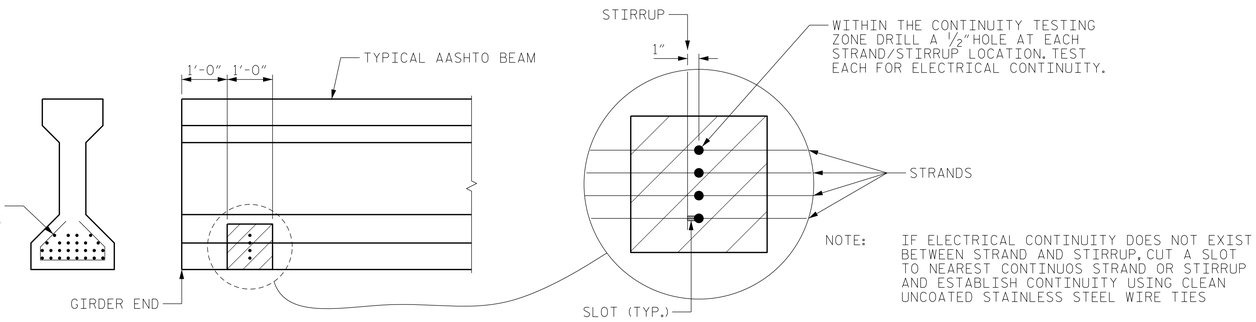
DETAIL 3 - MONITORING JUNCTION BOX DIAGRAM

STRAND SPLICE/CONTINUITY REPAIR NOTES:

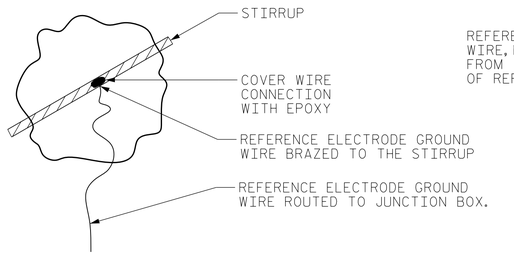
1. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION NOT TO DAMAGE THE EXISTING PRESTRESSING STRANDS. IF EXISTING STRANDS ARE DAMAGED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER FOR ADDITIONAL INSTRUCTIONS ON THE APPLICABLE REPAIR METHOD.
2. STRAND LOAA GREATER THAN 50% SHALL BE TREATED AS BROKEN.

REFERENCE ELECTRODE NOTES:

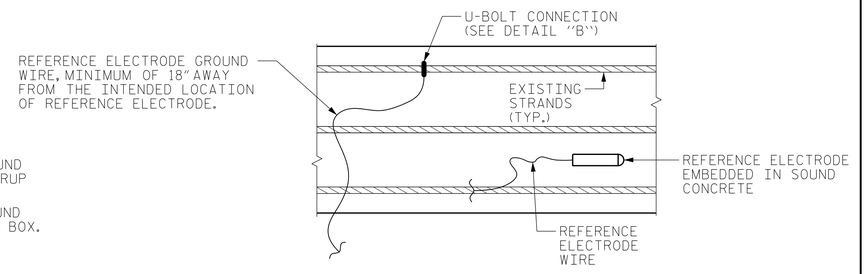
1. THE REFERENCE ELECTRODE GROUND WIRE IS ALLOWED TO BE BRACED TO A STIRRUP, PROVIDED THE BRACING CONNECTION IS A MINIMUM OF 18" AWAY FROM THE INTENDED REFERENCED ELECTRODE INSTALLATION LOCATION (SEE DETAIL 6).
2. DO NOT EXPOSE STRAND/REBAR/STIRRUP WHILE INSTALLING REFERENCE ELECTRODE.
3. THE REFERENCE ELECTRODE SHALL BE INSTALLED PARALLEL TO STRANDS. FILL THE EXCAVATION HOLE WITH APPROVED PORTLAND CEMENT PATCHING GROUT WITH 15,000 OHM-CM RESISTIVITY OR LESS. THE REFERENCE ELECTRODE SHALL BE FULLY ENCAPSULATED WITH CEMENTICIOUS BACKFILL MATERIAL. NO VOIDS SHALL BE PERMITTED.
4. THE WIRES FOR THE REFERENCE ELECTRODE SHALL BE ROUTED INSIDE THE CONDUIT TO THE JUNCTION BOX WITHOUT SPLICING.



DETAIL 4 - TYPICAL CONTINUITY TESTING AND CORRECTION ZONE

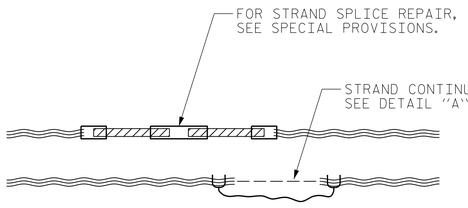


DETAIL 5 - REFERENCE ELECTRODE GROUNDING DETAIL

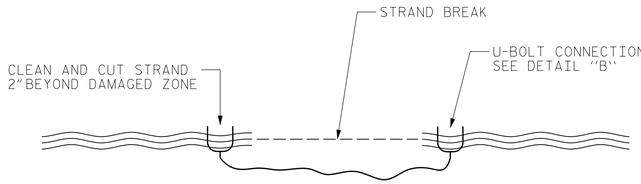


DETAIL 6 - REFERENCE ELECTRODE INSTALLATION

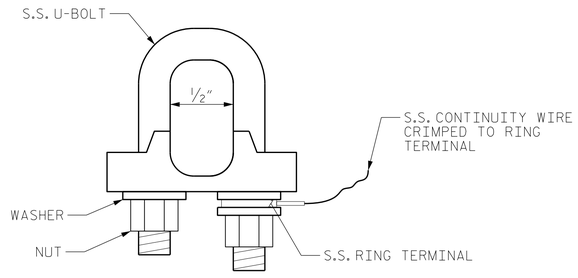
(MONITORING GIRDER)



STRAND SPLICE/CONTINUITY REPAIR



DETAIL "A" STRAND CONTINUITY REPAIR



DETAIL "B" U-BOLT CONNECTION DETAIL

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CATHODIC PROTECTION

ZINC ALUMINUM SPRAY FOR BEAMS (SPANS 34-73)

DocuSigned by: Jacob Duke — NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE — 10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-56
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

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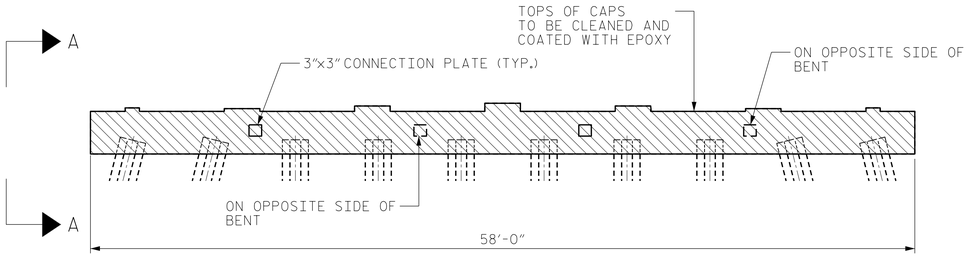
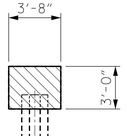
10/19/2021
15BPR.46_SMU_CP01.2_270012.dgn
jduke

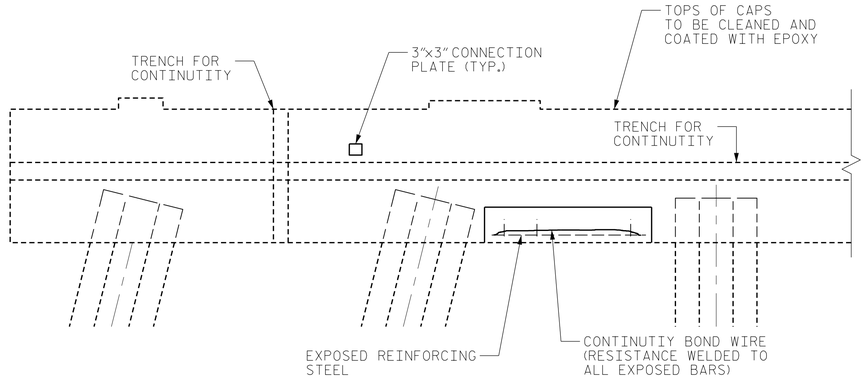


ELEVATION

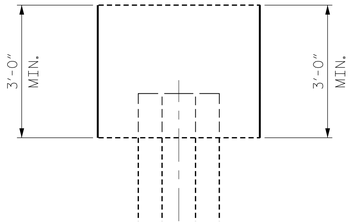
NUMBER OF CONNECTION PLATES REQUIRED PER BENT: 3



VIEW A-A



CONTINUITY DETAIL



LIMITS OF METALIZATION

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.

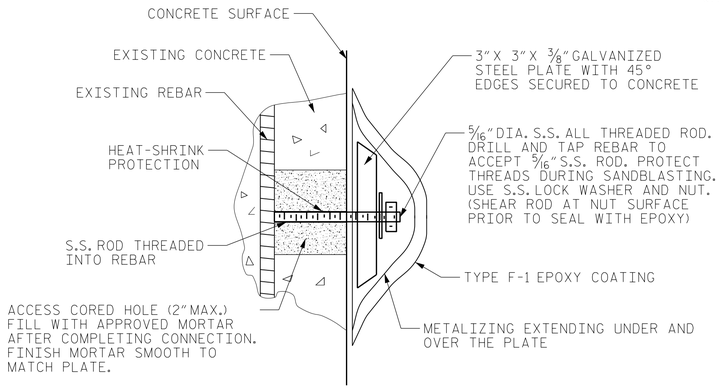
NOTES:

1. REMOVE ALL UNSOUND CONCRETE FROM THE BENT CAPS 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 BENT CAPS 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 CAPS SHALL BE METALIZED. CONNECTION BETWEEN PLATE AND REINFORCING STEEL SHALL BE PROVIDED VIA A 5/16" 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-ZINC ALUMINUM SPRAY. THE ENGINEER MUST APPROVE THE METALIZING PRIOR TO THE OVERCOAT APPLICATION.
10. SEE PROJECT SPECIAL PROVISIONS FOR ADDITIONAL METALIZING REQUIREMENTS AND ACCEPTANCE CRITERIA.
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 CAPS OF ANY MARINE GROWTH AND DEBRIS BEFORE ALL PERFOMING ANY OF THE ASSOCIATED WORK FOR CAP METALIZATION.

AS-BUILT REPAIR QUANTITY TABLE

ZINC ALUMINUM SPRAY FOR BENT CAPS

		SF/BENT	TOTAL	
ELEMENT(S)	NO.	RATE	ESTIMATE	ACTUAL
BENTS 34-72	39	380 SF	14,820 SF	



CONNECTION PLATE DETAIL FOR REBARS

LEGEND	
	TO BE METALIZED

DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/5/2020
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PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

DocuSigned by: Jacob Duke
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JACOB H DUKE
10/19/2020

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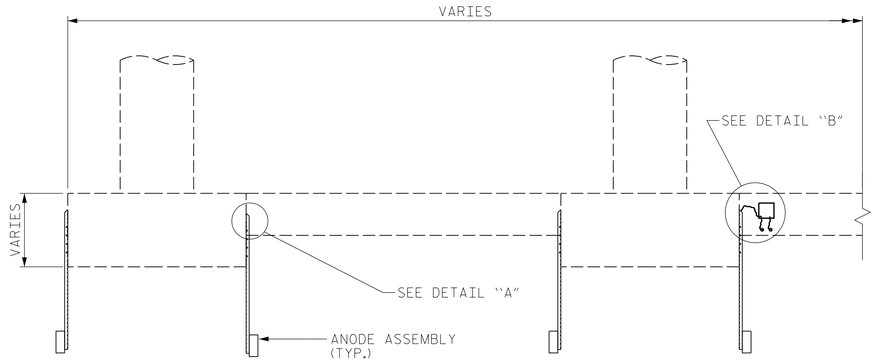
DEPARTMENT OF TRANSPORTATION
RALEIGH

CATHODIC PROTECTION

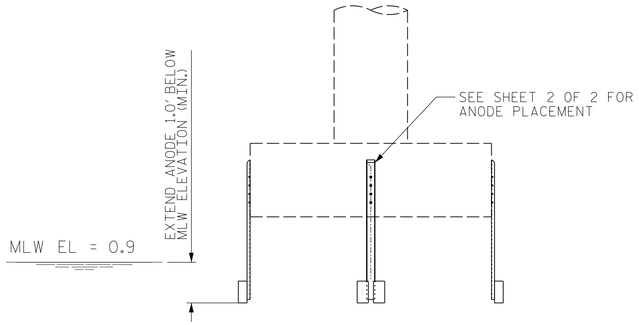
ZINC ALUMINUM SPRAY
FOR BENTS 34-72

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-57
1			3			TOTAL SHEETS
2			4			137



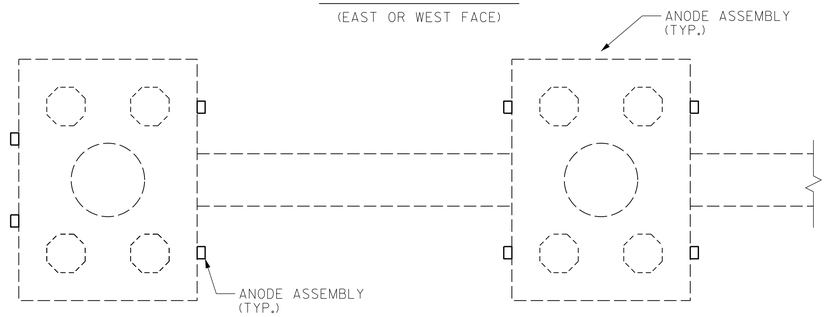
ELEVATION

(EAST OR WEST FACE)



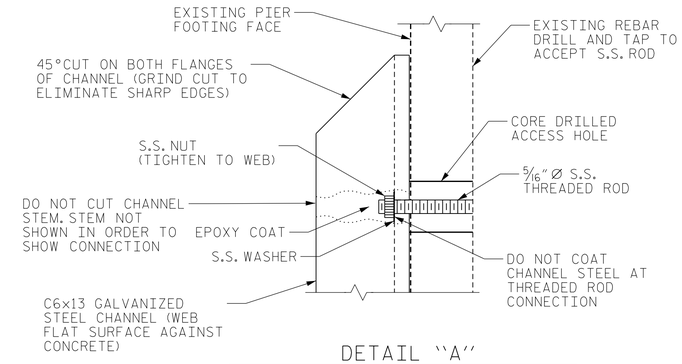
ELEVATION

(NORTH OR SOUTH FACE)



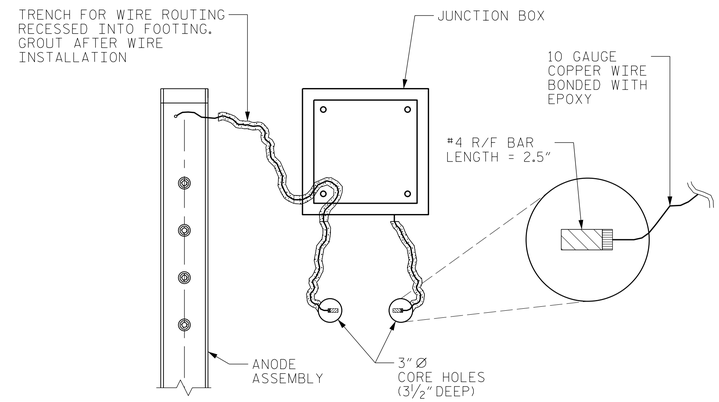
PLAN

(FOR LOCATIONS OF ANODE ASSEMBLIES
SEE SHEET 2 OF 2)



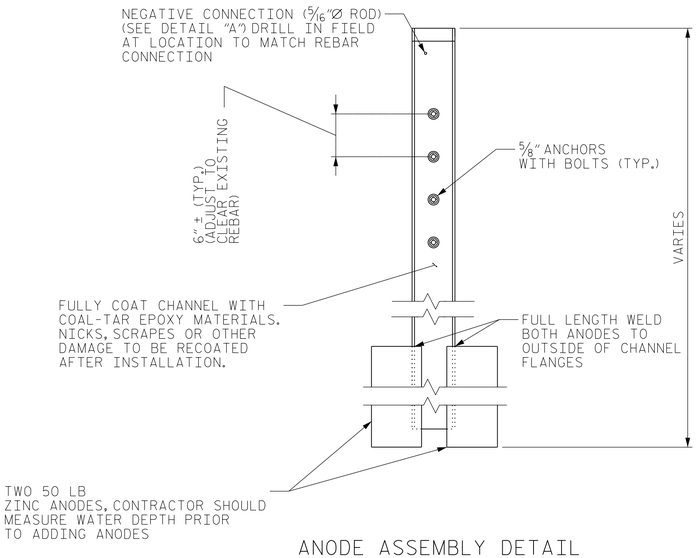
DETAIL "A"

ANODE ASSEMBLY CONNECTION



DETAIL "B"

MONITORING JUNCTION BOX DETAIL
(FRONT VIEW)



ANODE ASSEMBLY DETAIL

(FRONT VIEW)

NOTES:

1. THOROUGHLY CLEAN THE FOOTINGS OF MARINE GROWTH AND DEBRIS BEFORE PERFORMING ANY WORK ASSOCIATED WITH THE INSTALLATION OF THE PROPOSED BULK ANODES.
2. ANODES SHALL BE ASTM B418-01 TYPE I.
3. EXCEPT FOR ANODE WELDING, ALL CHANNEL MANUFACTURING SHALL BE PERFORMED PRIOR TO GALVANIZING.
4. ANCHORS TO BE DROP-IN TYPE 5/8" x 2 7/32" GALVANIZED HILTI HDI 243262 OR APPROVED EQUAL.
5. SEAL ACCESS HOLE WITH APPROVED EPOXY GROUT MATERIAL AFTER S.S. ROD INSTALLATION.
6. ANODE ASSEMBLIES SHALL BE PLACED SUCH THAT THE ANODE BE SUBMERGED A MINIMUM OF 1'-0" BELOW MEAN LOW WATER ELEVATION AT ALL TIMES. SPACING AND ELEVATION ADJUSTMENTS SHALL BE APPROVED BY THE ENGINEER.
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 CONTRACTOR'S RESPONSIBILITY TO LOCATE REINFORCING STEEL AND PATCH ALL CORES WITH APPROVED CONCRETE REPAIR MATERIAL.
10. DIMENSIONS AND ELEVATIONS SHOWN ON THIS SHEET ARE BASED ON LIMITED AVAILABLE DATA. DIFFERENT DIMENSIONS AND TYPES OF ANODE SYSTEM MAY BE USED BASED ON ACTUAL FIELD CONDITIONS.
11. 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 SYSTEM - SUBMERGED ZINC BULK ANODES".
12. SEE PROJECT SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS AND ACCEPTANCE CRITERIA. (PSP: CATHODIC PROTECTION - SUBMERGED BULK ANODE)
13. 1 OUT OF EVERY 3 FOOTINGS WILL REQUIRE PLACEMENT OF DETAIL "B" AS SHOWN ON THIS SHEET.
14. SEE SHEET 2 OF 2 FOR ANODE LOCATIONS FOR EACH BENT FOOTING TYPE.

DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

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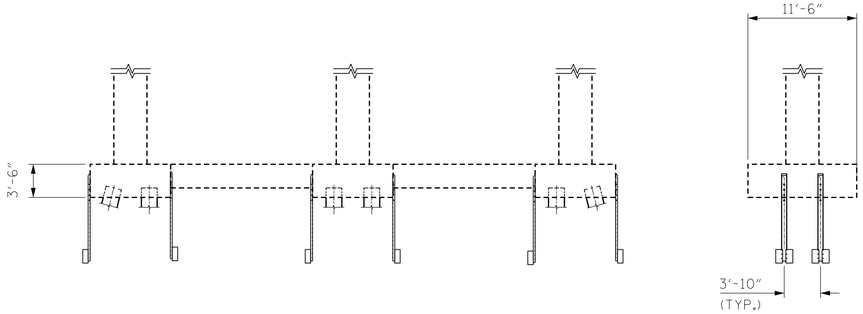
PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CATHODIC PROTECTION

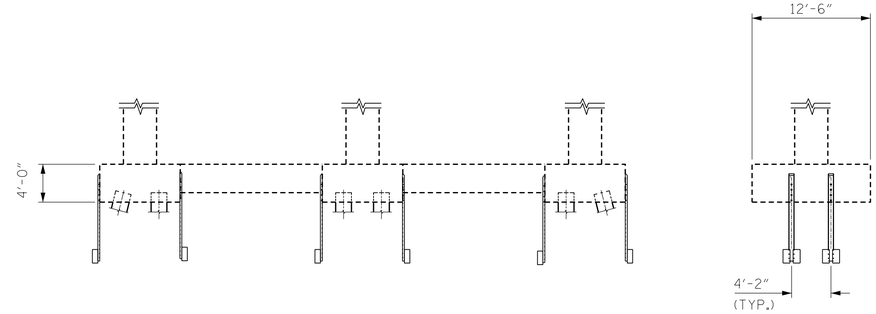
BULK ANODE FOR BENTS 10-35

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-58
1			3			TOTAL SHEETS
2			4			137



BENTS 28-34

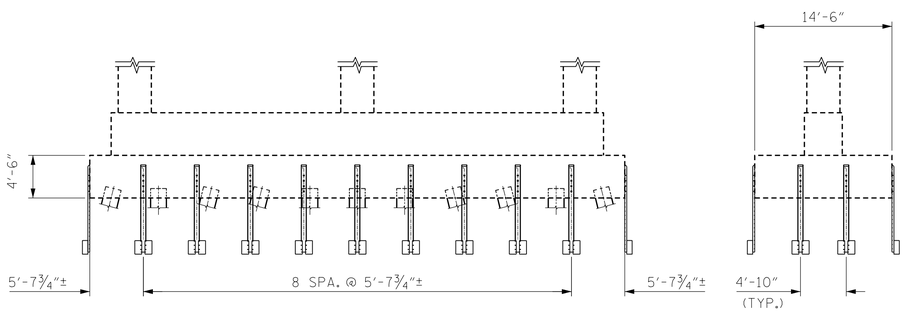
NUMBER OF ANDODE ASSEBMLIES REQUIRED PER BENT: 12



BENTS 10-12 & 21-27

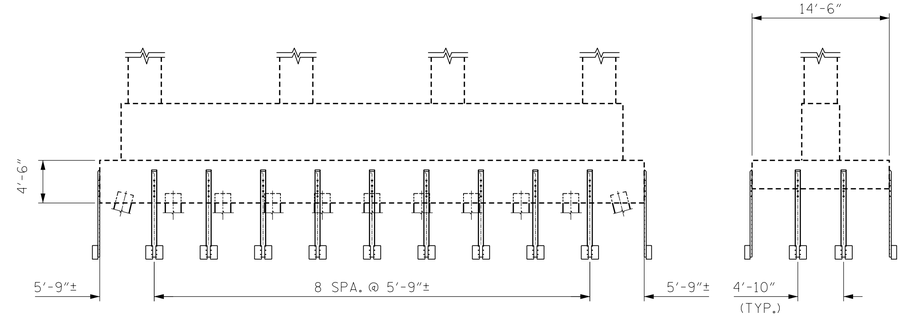
NUMBER OF ANDODE ASSEBMLIES REQUIRED PER BENT: 12

AS-BUILT QUANTITY TABLE			
BULK ANODES			
	ANODES/BT	#BTS	
BENTS	NO.	NO.	TOTAL
BENTS 28-34	12	7	84 EA
BENTS 10-12 & 21-27	12	10	120 EA
BENTS 13-15 & 18-20	22	6	132 EA
BENTS 16 & 17	22	2	44 EA
TOTALS			382 EA



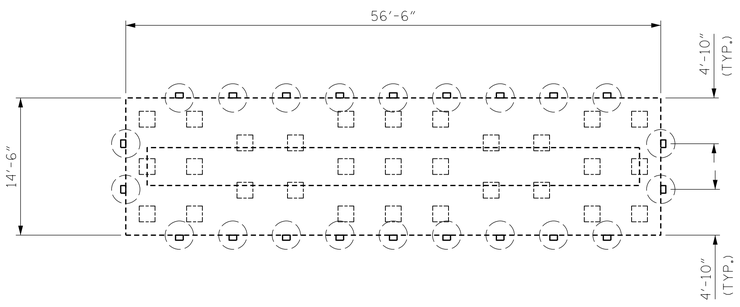
BENTS 13-15 & 18-20

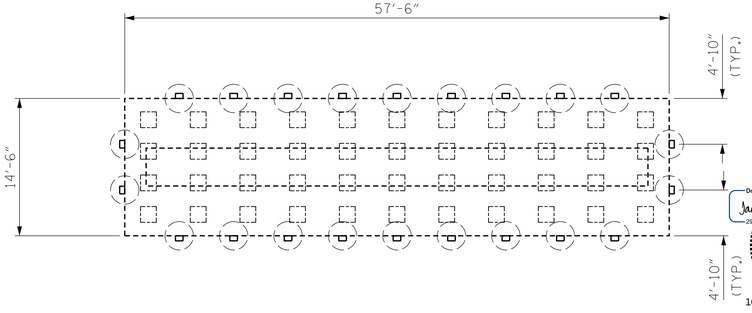
NUMBER OF ANDODE ASSEBMLIES REQUIRED PER BENT: 22



BENTS 16 & 17

NUMBER OF ANDODE ASSEBMLIES REQUIRED PER BENT: 22





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PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CATHODIC PROTECTION

BULK ANODE FOR BENTS 10-35

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-59
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

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PLAN VIEW ANODE ASSEMBLY LOCATION

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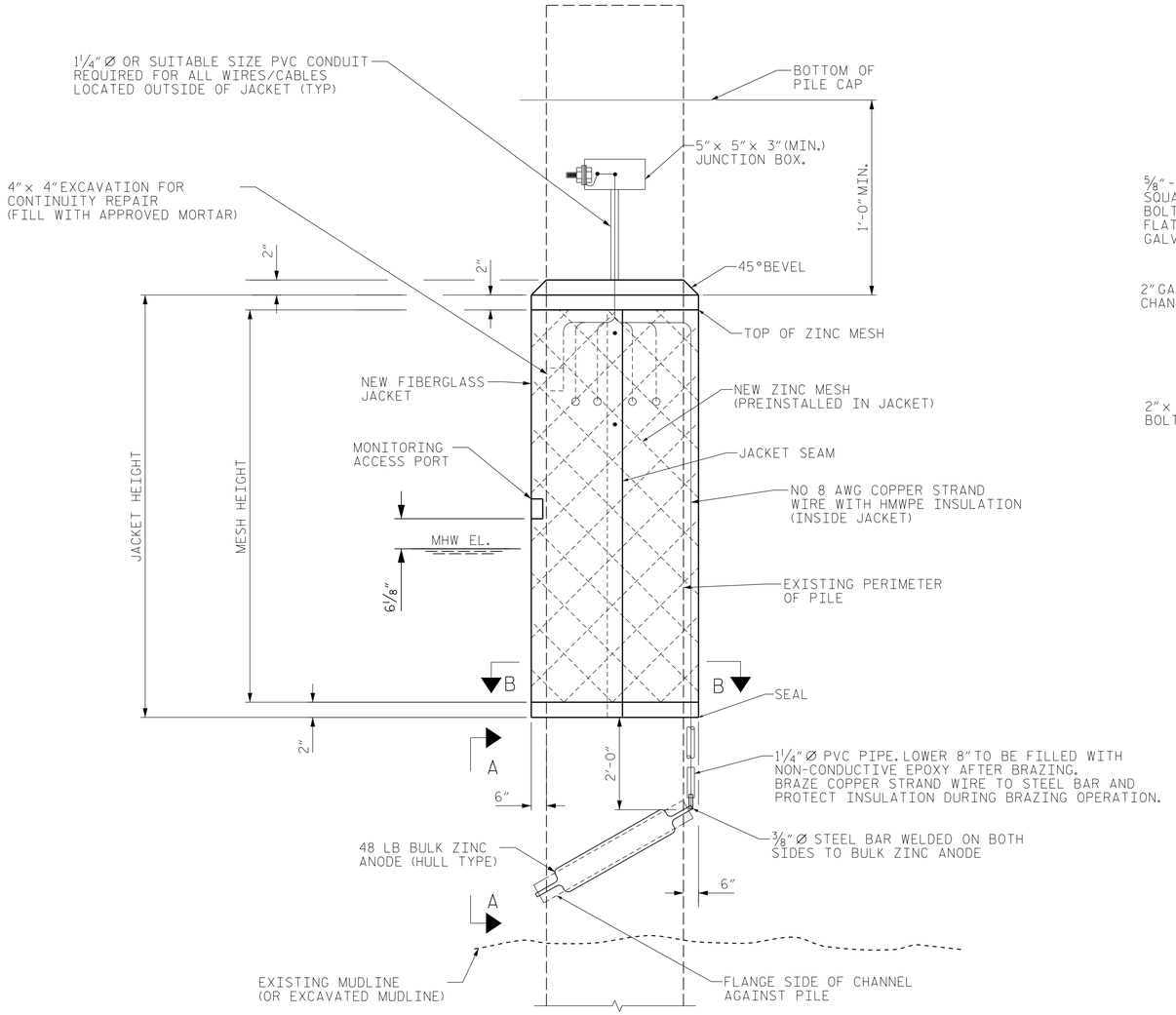
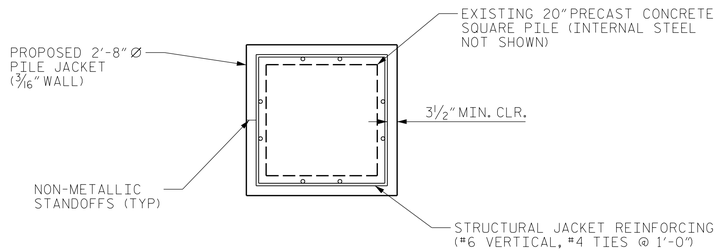


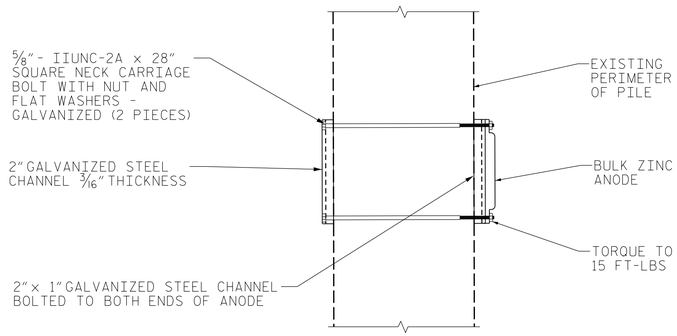
TYPICAL CP PILE JACKET

ELEVATION



SECTION B-B

TYPICAL STRUCTURAL JACKET SHOWN, NON-STRUCTURAL SIMILAR



VIEW A-A

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 SUBSTRUCTURE REPAIR SHEETS FOR PILE 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.46

DARE COUNTY

BRIDGE NO. 270012

SHEET 1 OF 3

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CATHODIC PROTECTION PILE JACKETS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-60
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : DIEGO A. AGUIRRE DATE : 9/30/2020
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SEQUENCE OF CONSTRUCTION FOR PILE JACKETS

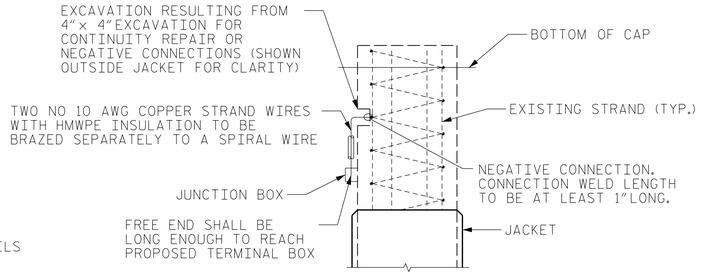
1. THE CONTRACTOR SHALL SURVEY AND LOCATE THE MEAN HIGH AND MEAN LOW WATER ELEVATIONS AT EACH PILE WITH SUBSEQUENT APPROVAL OF THE ENGINEER PRIOR TO THE INSTALLATION OF ANY JACKET.
2. CLEAN PILES IN ACCORDANCE WITH SPECIFICATIONS. THE CONTRACTOR SHALL SUBMIT A PLAN FOR CONTROL AND DISPOSAL OF DEBRIS 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 JACKET 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.

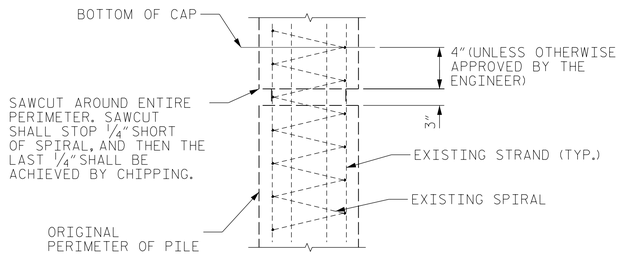


ELEVATION

(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.

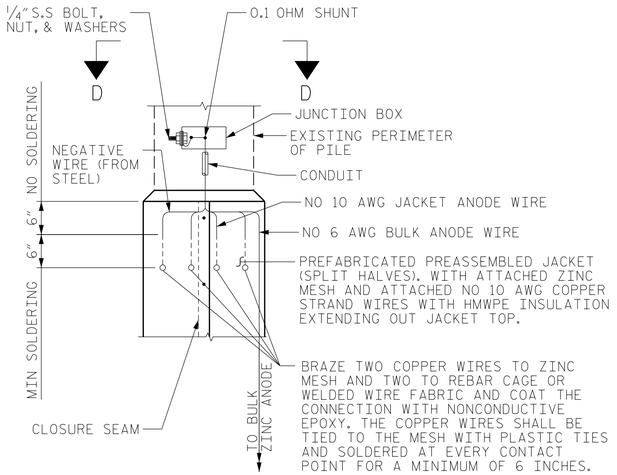


ELEVATION

(SCHEME 2)

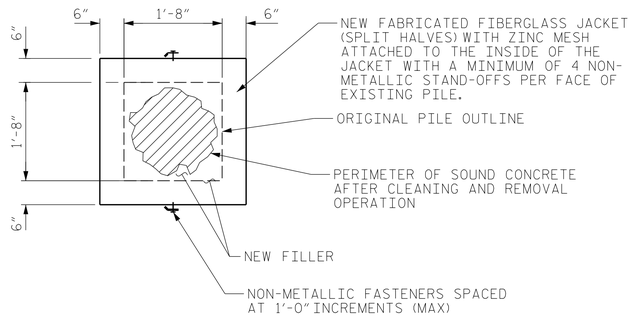
SCHEME 2

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.46

DARE COUNTY

BRIDGE NO. 270012

SHEET 2 OF 3

DocuSigned by: Jacob H. Duke

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10/19/2021

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RALEIGH

CATHODIC PROTECTION PILE JACKETS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-61
1			3			TOTAL SHEETS
2			4			137

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DRAWN BY : DIEGO A. AGUIRRE DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
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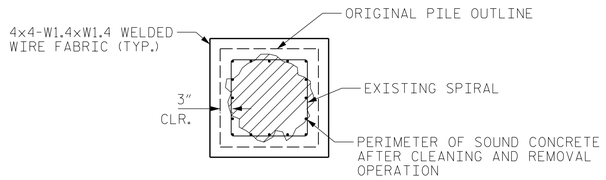
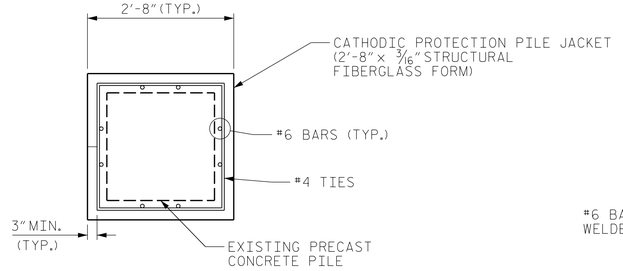
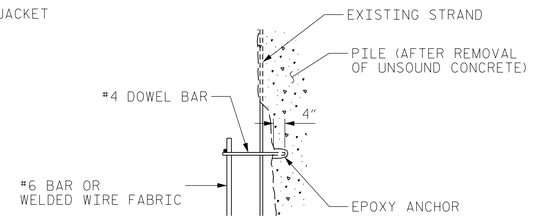


SECTION E-E



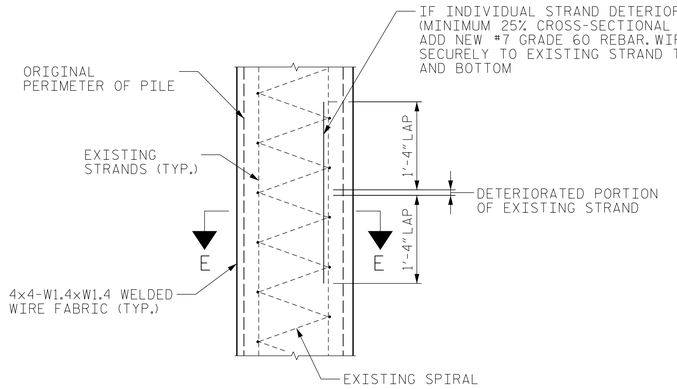
SECTION F-F

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



DETAIL A - DOWEL CONNECTION

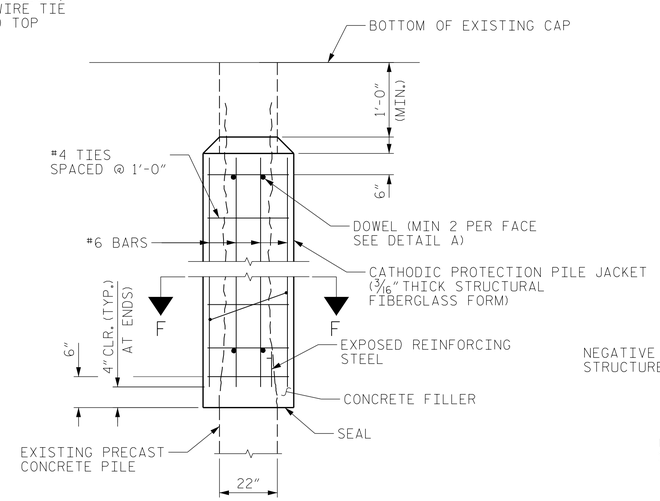
1. EMBED DOWEL WITH EPOXY AT A POINT WHERE STRAND IS INTACT AND CONTINUOUS WITH THE PILE LENGTH EXTENDING FROM THAT PARTICULAR END OF THE JACKET. MAINTAIN ELECTRICAL ISOLATION BETWEEN DOWEL AND EXISTING PILE REINFORCEMENT.
2. RESISTANCE WELD DOWEL AT #7 BAR OR WELDED WIRE FABRIC TO ESTABLISH CONDUCTIVE 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.



SCHEME 3

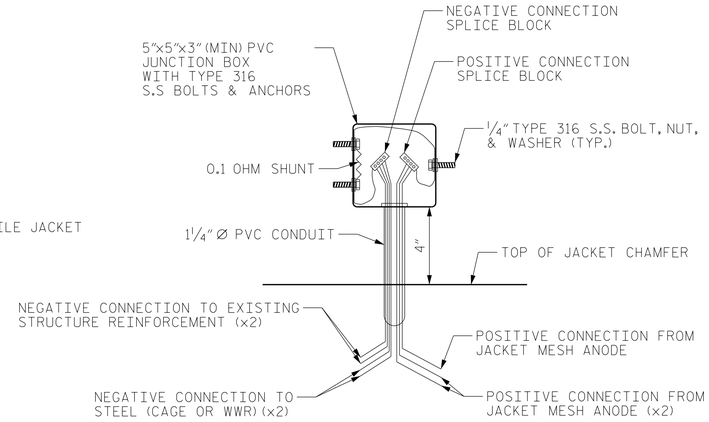
NON-STRUCTURAL CATHODIC PILE JACKET
(JACKET AND GROUT FILLER NOT SHOWN FOR CLARITY)

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.46
DARE COUNTY
BRIDGE NO. 270012
SHEET 3 OF 3

DocuSigned by: Jacob Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
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NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CATHODIC PROTECTION PILE JACKETS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-62
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : DIEGO A. AGUIRRE DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

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10/19/2021
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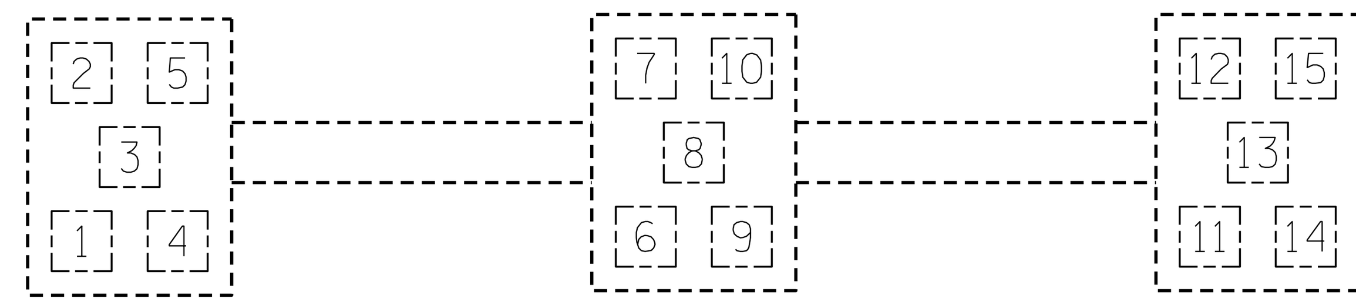
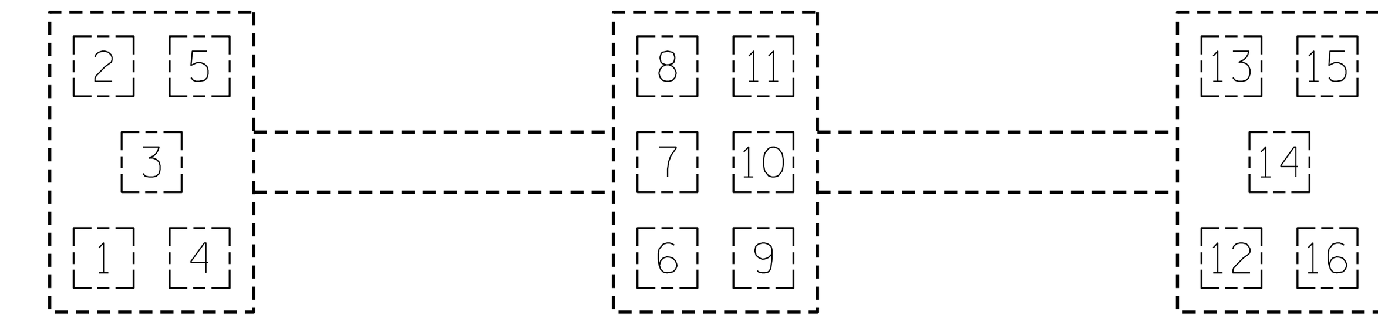
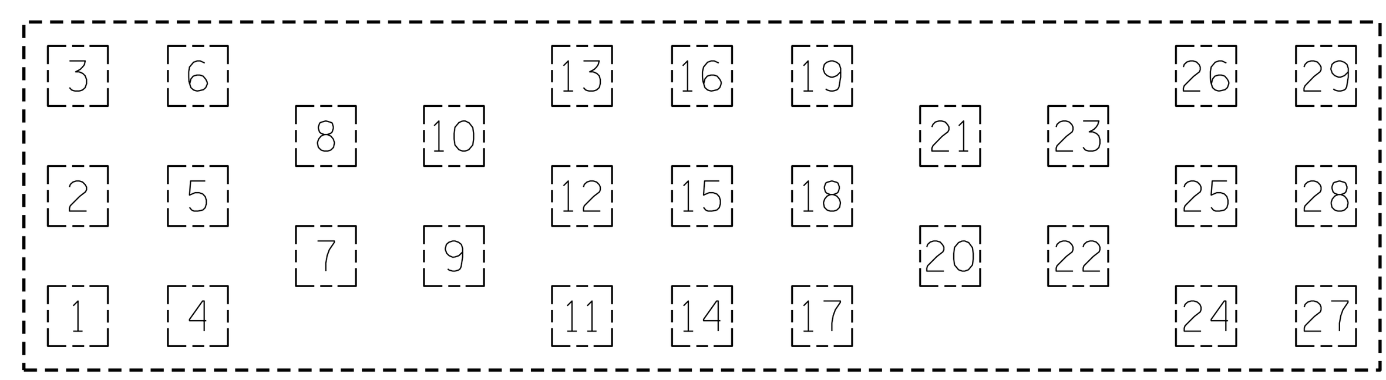
jduke



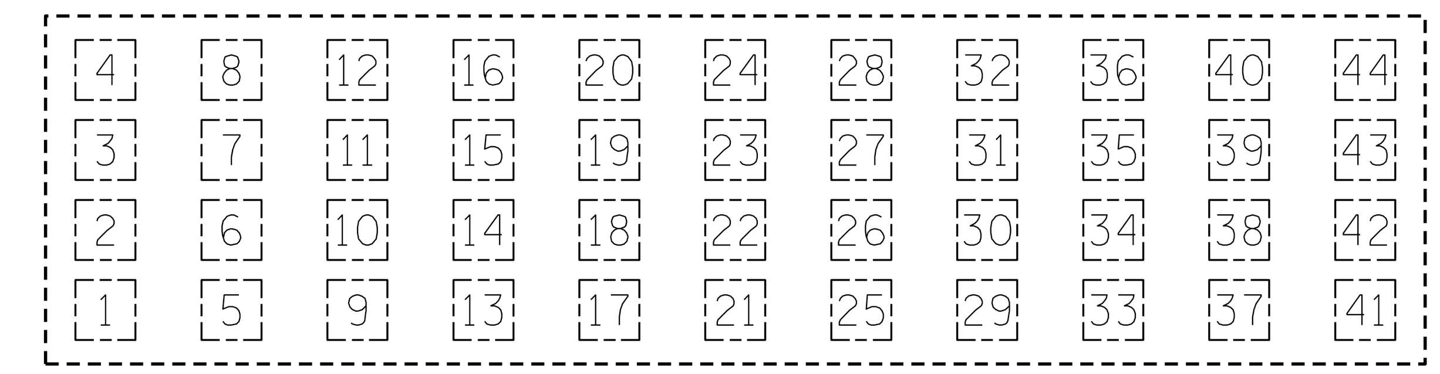
BENTS 1-6 & 28-35



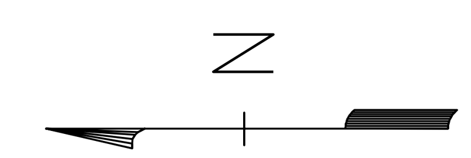
BENTS 7-12 & 21-27

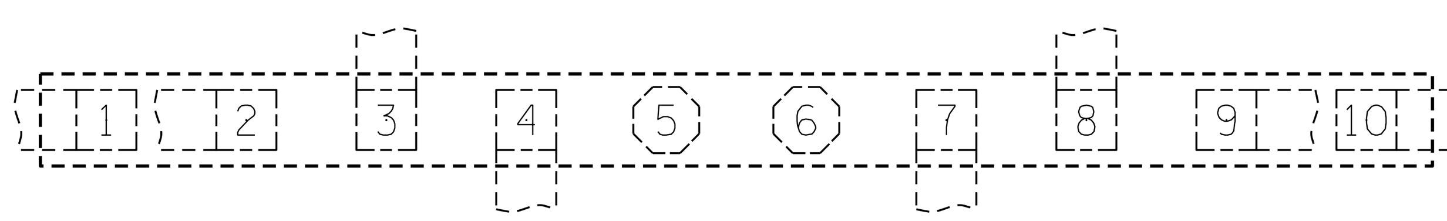


BENTS 13-15 & 18-20

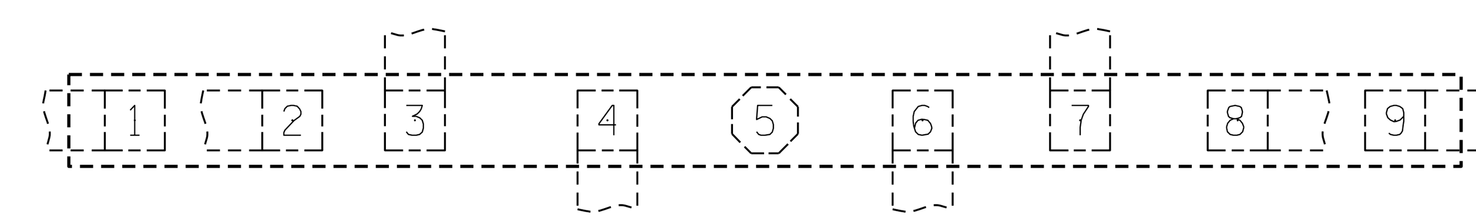


BENTS 16 & 17

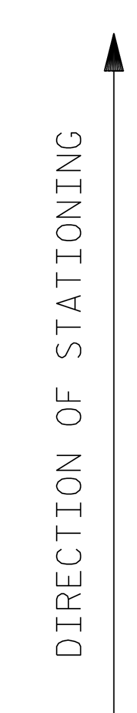


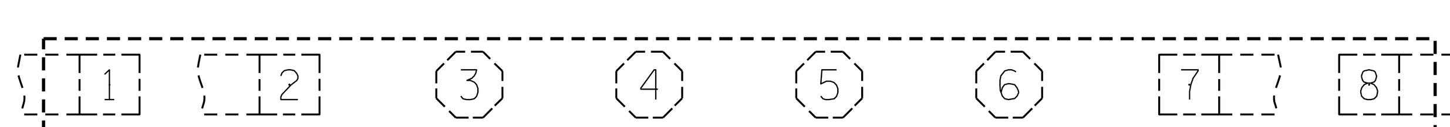


BENTS 36-38

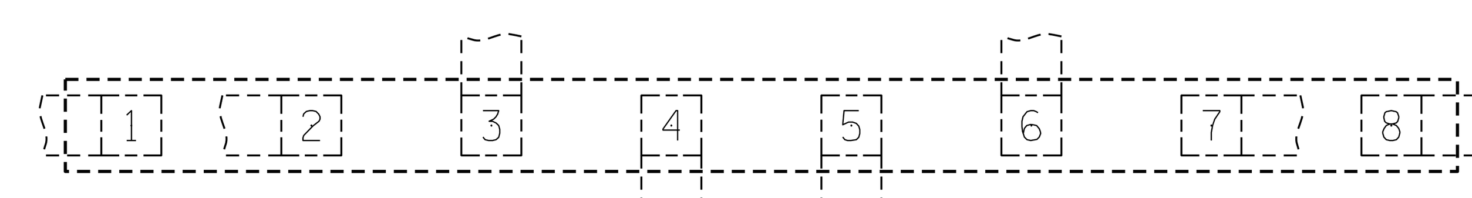


BENTS 39-41





BENTS 42, 44-47, 49-52, 54-57, 59-62, 64-67, 69-72



BENT 43, 48, 53, 58, 63, 68

PILE NUMBERING SCHEME

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE NUMBERING SEQUENCE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H. DUKE
10/19/2021

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-63
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : JACOB H. DUKE DATE : 9/30/2020
CHECKED BY : DIEGO AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
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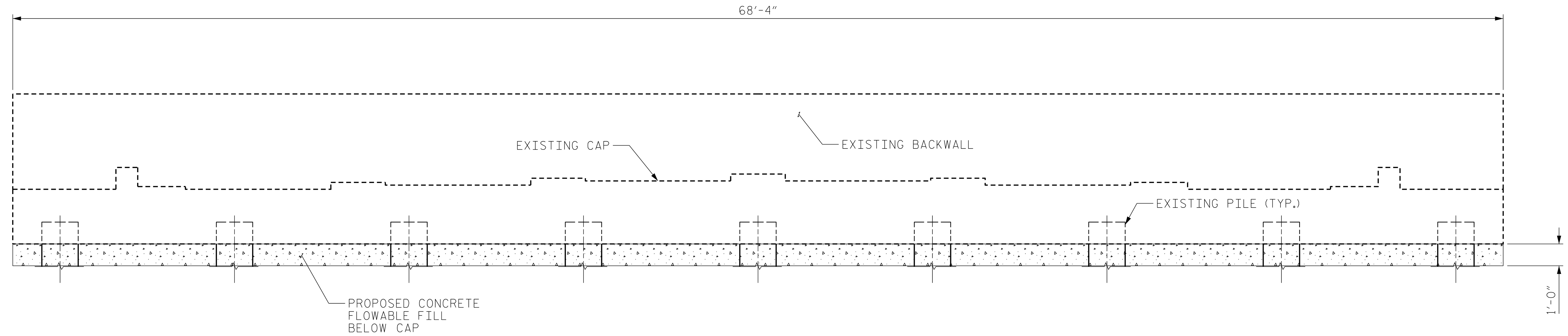
jduke

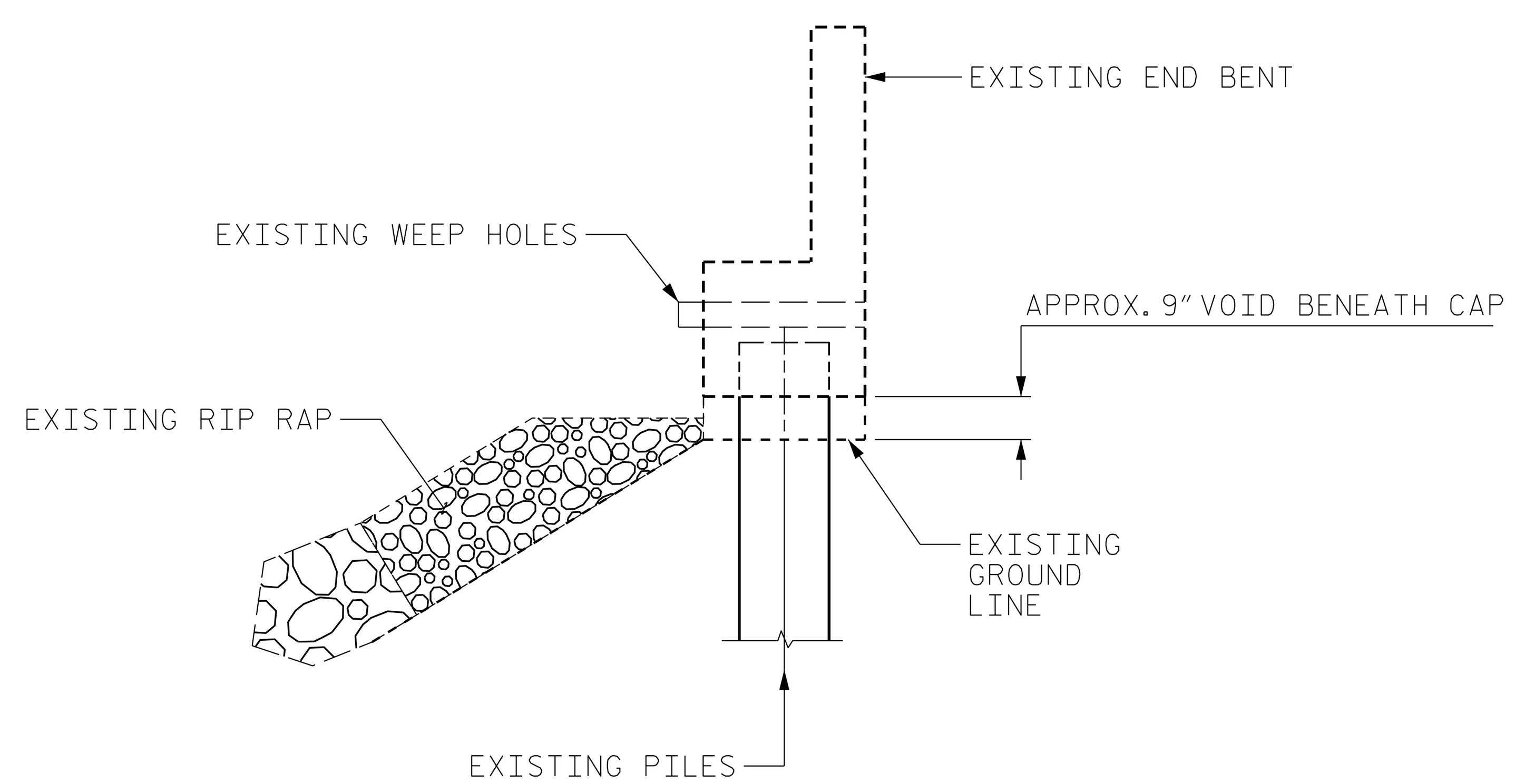


END BENT 2 ELEVATION

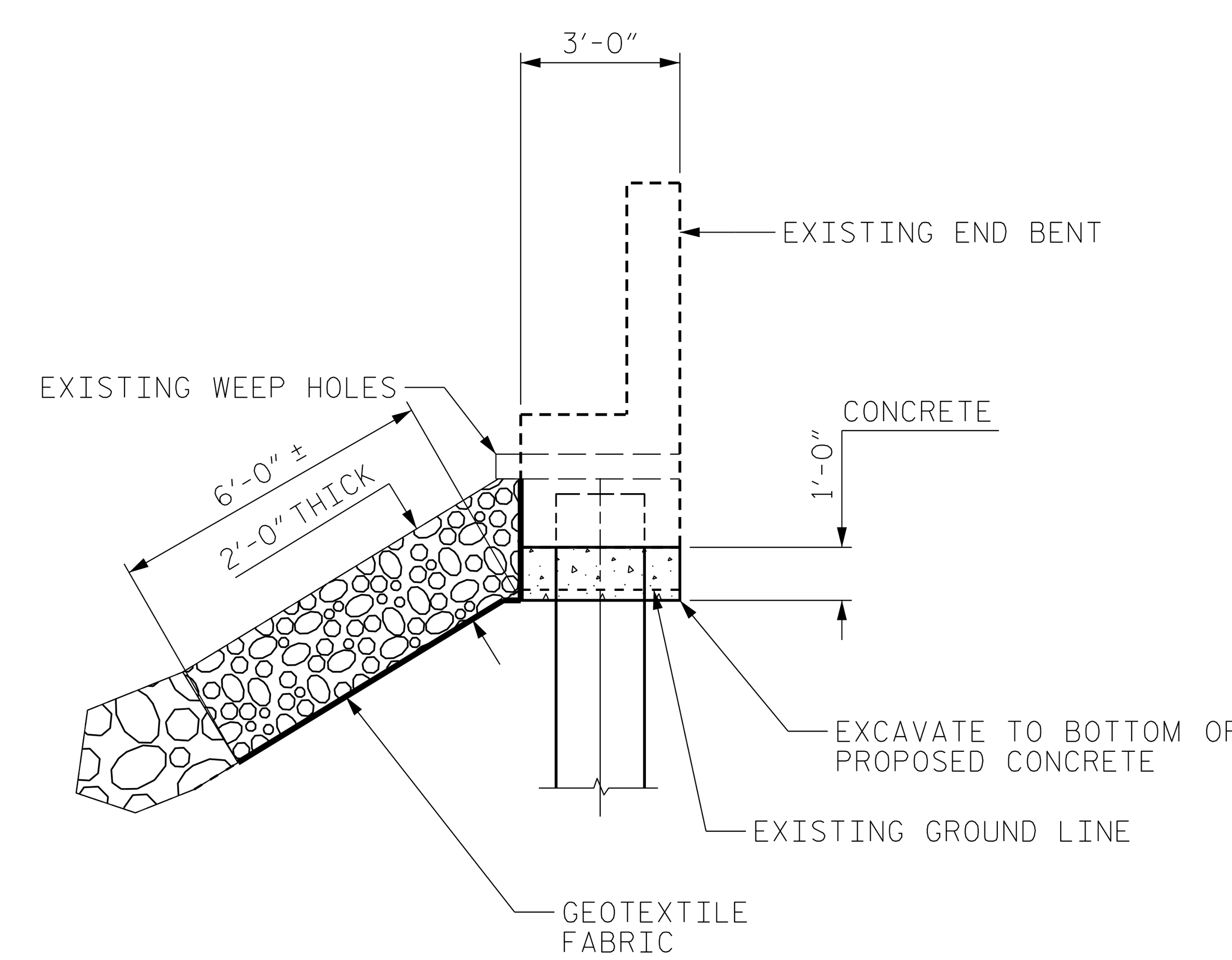
(RIP RAP AND WEEP HOLES NOT SHOWN FOR CLARITY)

NOTES:

1. TEMPORARILY REMOVE EXISTING RIP RAP APPROX. 6.0FT FROM CAP TO PLACE GEOTEXTILE.
2. EXCAVATE BELOW THE EXISTING CAP TO 1'-0" MINIMUN.
3. PLACE CONCRETE THE FULL WIDTH OF THE CAP, FULLY ENGAGING THE PILES.
4. PLACE GEOTEXTILE TO THE LIMITS SHOWN IN THE PLAN, UP THE FACE OF THE CAP TO THE BOTTOM OF THE EXISTING WEEP HOLES.
5. REPLACE REMOVED EXISTING RIP RAP ON GEOTEXTILE AND PLACE PROPOSED RIP RAP TO THE LIMITS SHOWN IN THE PLANS.
6. EXCAVATION BELOW THE CAP IS TO BE PAID FOR AS "UNCLASSIFIED STRUCTURE EXCAVATION".



EXISTING



PROPOSED

END BENT 2 SIDE VIEW

AS-BUILT REPAIR QUANTITY TABLE		
END BENT 2 EROSION REMEDIATION		
	ESTIMATE	ACTUAL
EXCAVATION BELOW CAP	51.3 CF	
FLOWABLE FILL CONCRETE	7.6 CY	
RIP RAP CLASS B	30 TON	
GEOTEXTILE FOR DRAINAGE	65 SY	

PROJECT NO. 15BPR.46
DARE COUNTY
BRIDGE NO. 270012

SEAL 043777 — NORTH CAROLINA PROFESSIONAL ENGINEER — JACOB H. DUKE — 10/19/2021

KISINGER CAMPO & ASSOCIATES
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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 2
EROSION REMEDIATION

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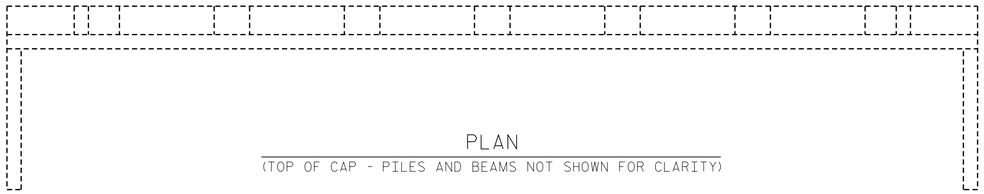
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-64
1			3			TOTAL SHEETS
2			4			137

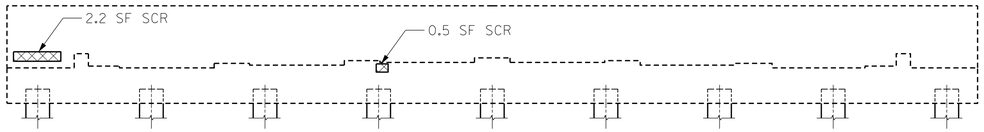
DRAWN BY : FIDEL L. FLORES DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/5/2020
15BPR.46_SMU_SP01_270012.dgn
jduke



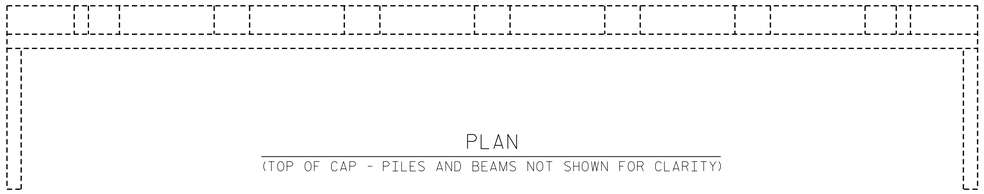
PLAN

(TOP OF CAP - PILES AND BEAMS NOT SHOWN FOR CLARITY)



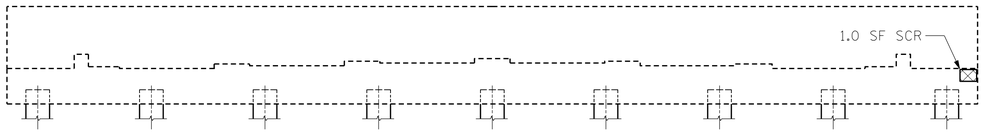
EAST FACE

END BENT 1



PLAN

(TOP OF CAP - PILES AND BEAMS NOT SHOWN FOR CLARITY)



WEST FACE

END BENT 2

LEGEND	
	CONCRETE REPAIR AREA (CR)
	SHOTCRETE REPAIR AREA (SCR)
	EPOXY RESIN INJECTION (ERI)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	3.7	1.9		
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	-			
FOOTING	-			
CP INTEGRAL PILE JACKETS	LIN. FT.		LIN. FT.	
PILE	-			

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" SHEETS.

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS ''SCATTERED THROUGHOUT'' IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS AT EACH BENT.

AVERAGE CONCRETE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 1 1/2" TO 2" ON THE PILES. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

SHOTCRETE REPAIRS TO THE BENT CAP MAY REQUIRE BRIDGE JACKING. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS AND STANDARD SPECIFICATIONS SECTION 420-18.

✳ ADDITIONAL QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

DocuSigned by:
Jacob H. Duke
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H. DUKE
9/30/2020

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NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIRS

END BENTS 1 & 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-65
1			3			TOTAL SHEETS
2			4			137

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DRAWN BY : FIDEL F. FLORES DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

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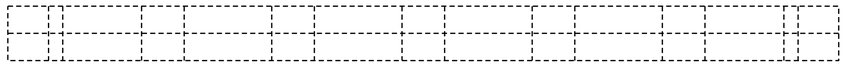
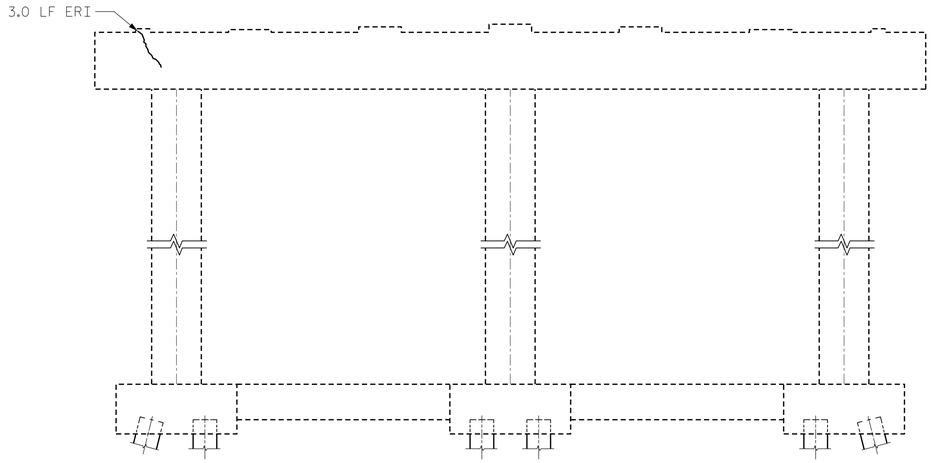
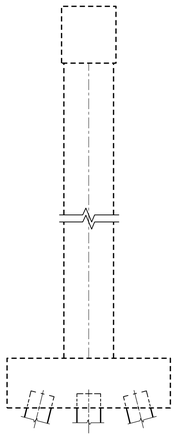


PLAN

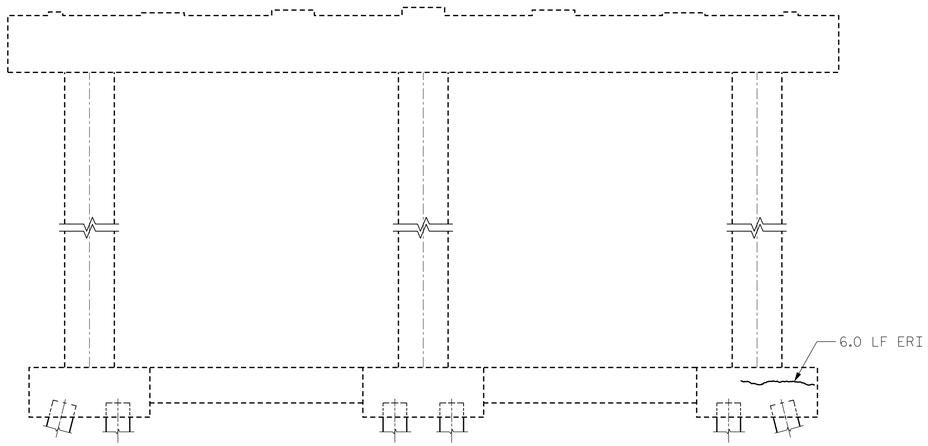
(TOP OF CAP - PILES AND BEAMS NOT SHOWN FOR CLARITY)



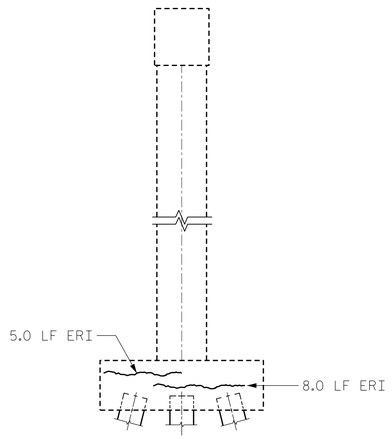
EAST ELEVATION



NORTH ELEVATION



WEST ELEVATION



SOUTH ELEVATION

LEGEND

	CONCRETE REPAIR AREA (CR)
	SHOTCRETE REPAIR AREA (SCR)
	EPOXY RESIN INJECTION (ERI)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	-	-		
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	3.0			
COLUMN/PILE	-			
FOOTING	19.0			
CP INTEGRAL PILE JACKETS	LIN. FT.		LIN. FT.	
PILE	-			

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" SHEETS.

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS ''SCATTERED THROUGHOUT'' IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS AT EACH BENT.

AVERAGE CONCRETE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 1 1/2" TO 2" ON THE PILES. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING EXCAVATION AND DEMOLITION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO THE BENT CAP MAY REQUIRE BRIDGE JACKING. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS AND STANDARD SPECIFICATIONS SECTION 420-18.

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H. DUKE 10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIRS

BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-66
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : FIDEL L. FLORES DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_SBR01_270012.dgn
jduke

LEGEND

(hatched box)	CONCRETE REPAIR AREA (CR)
(cross-hatched box)	SHOTCRETE REPAIR AREA (SCR)
(wavy line)	EPOXY RESIN INJECTION (ERI)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ.FT.	VOLUME CU.FT.	AREA SQ.FT.	VOLUME CU.FT.
CAP/FOOTING	-	-		
COLUMN/PILE	1.40	0.70		
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	-			
FOOTING	41.0			
CP INTEGRAL PILE JACKETS	LIN.FT.		LIN.FT.	
PILE	-			

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" SHEETS.

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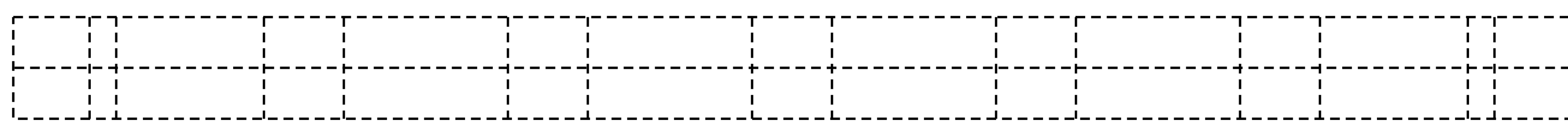
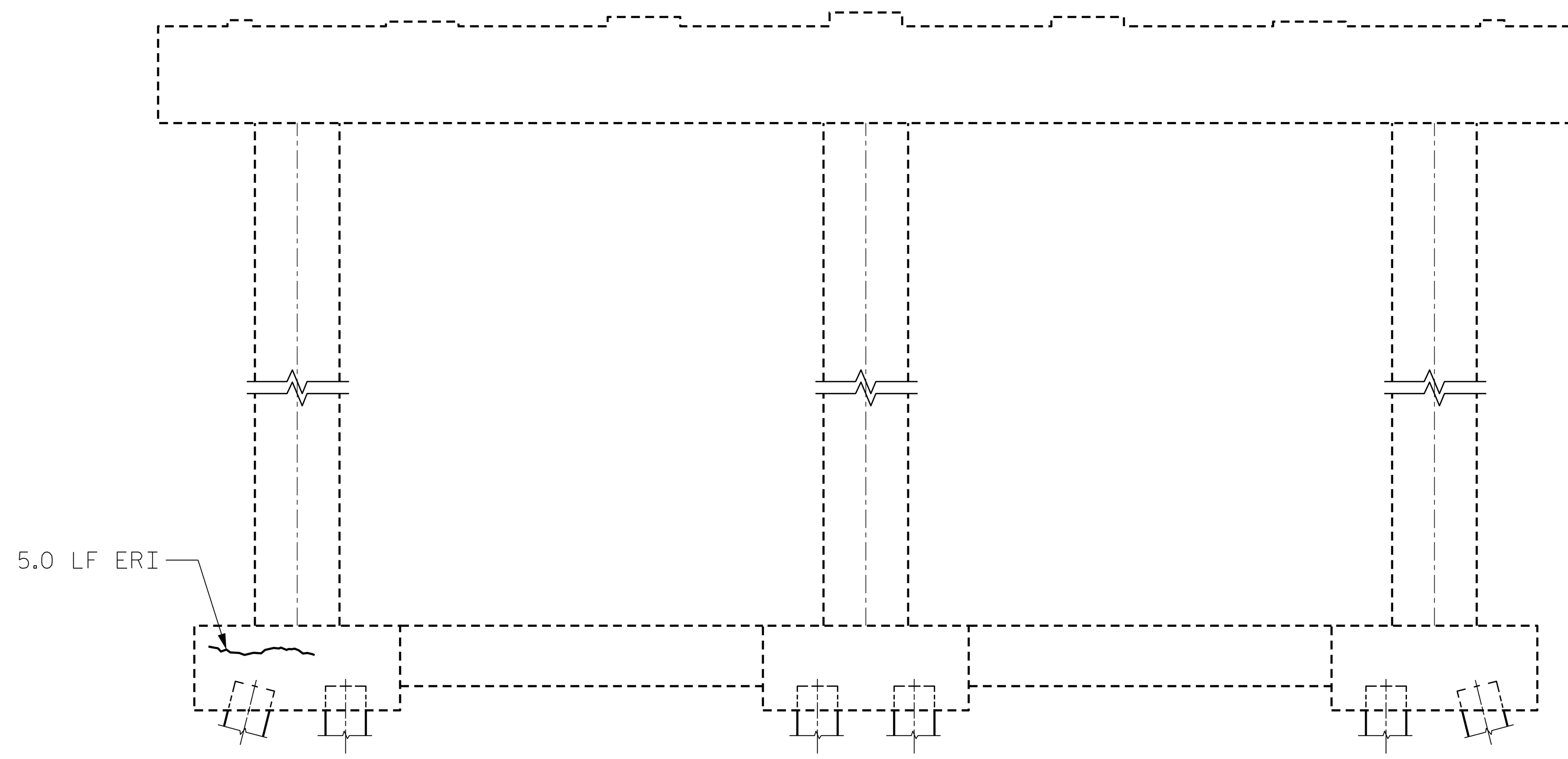
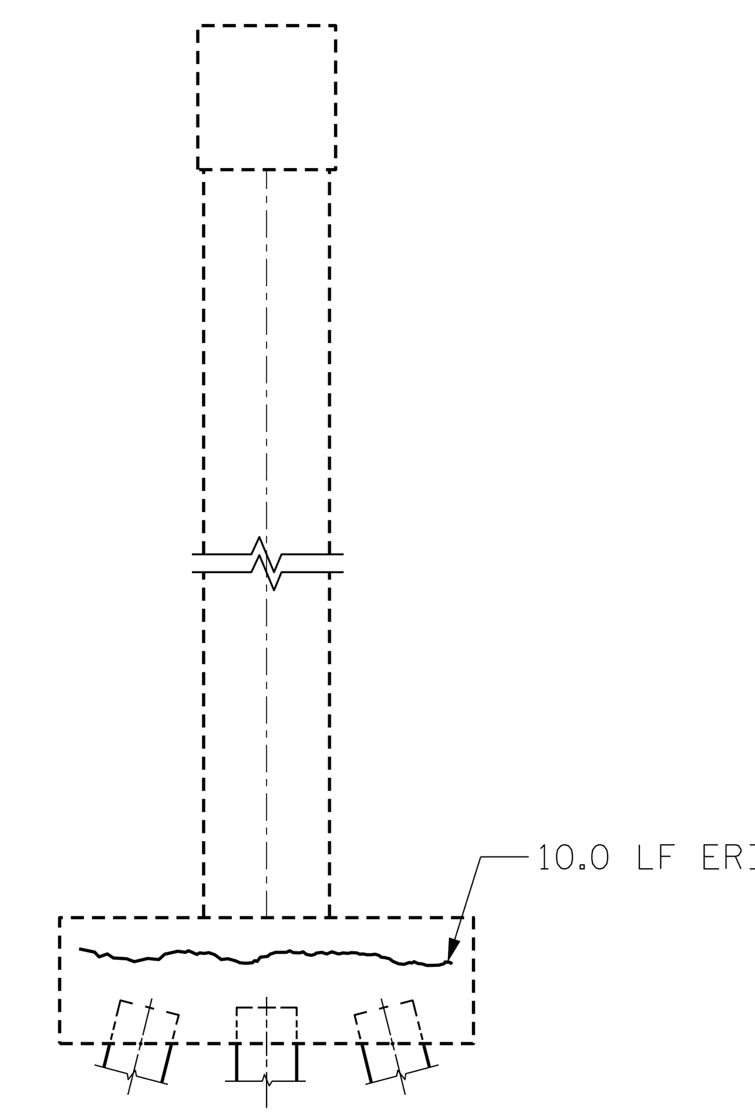


PLAN

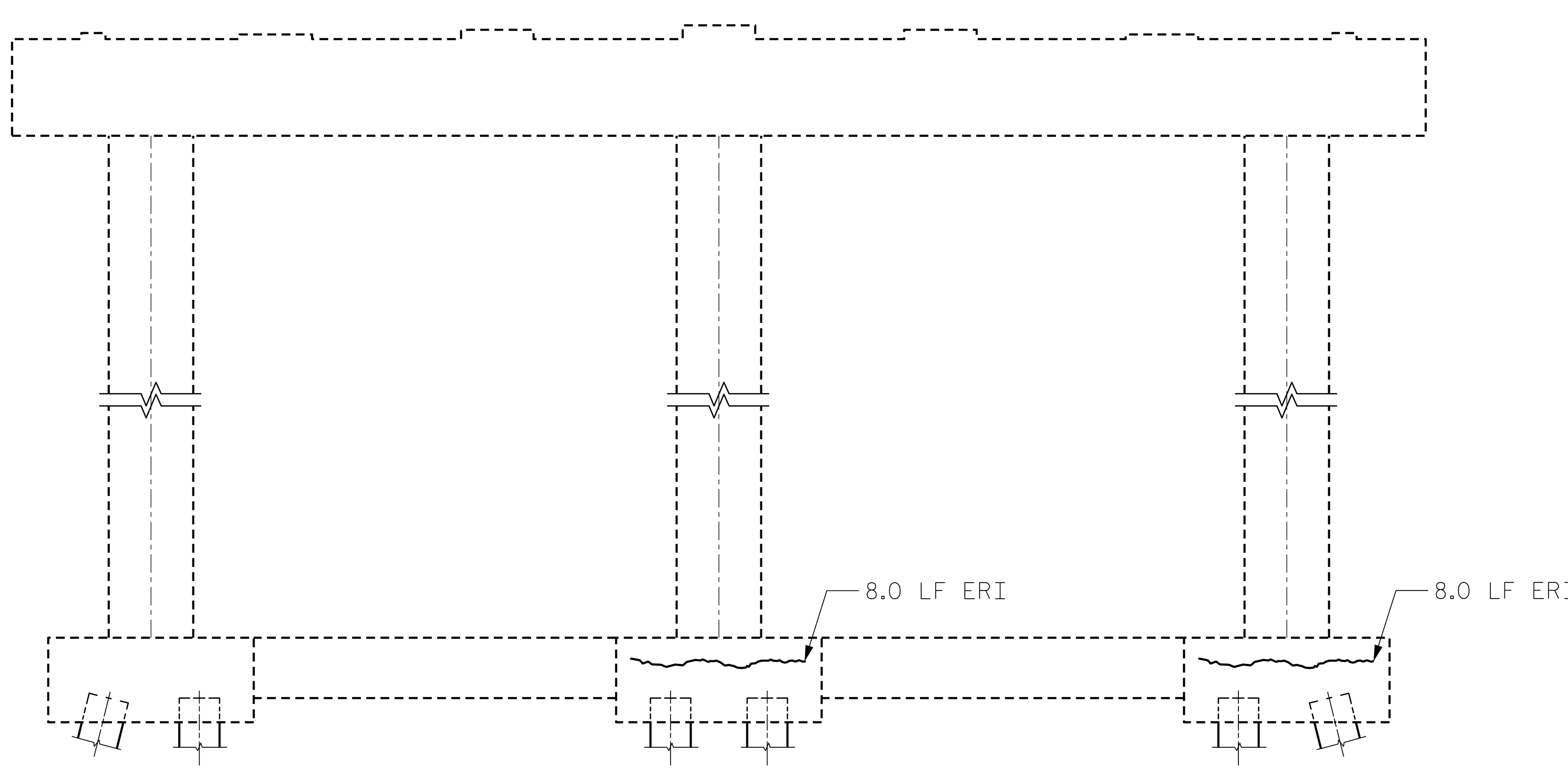
(TOP OF CAP - PILES AND BEAMS NOT SHOWN FOR CLARITY)



EAST ELEVATION



NORTH ELEVATION



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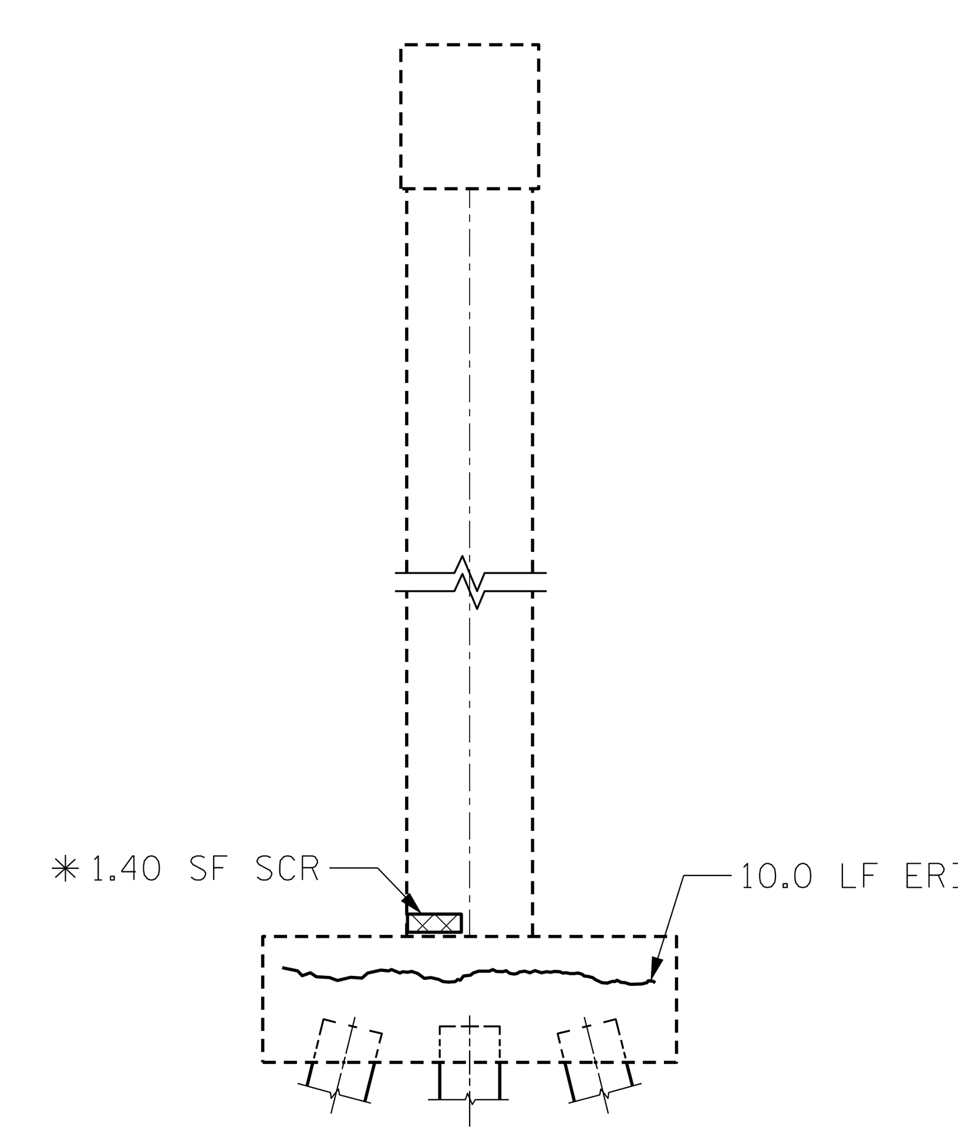


SOUTH ELEVATION

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

SEAL 043777 ENGINEER JACOB H. DUKE 10/19/2021

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIRS

BENT 2

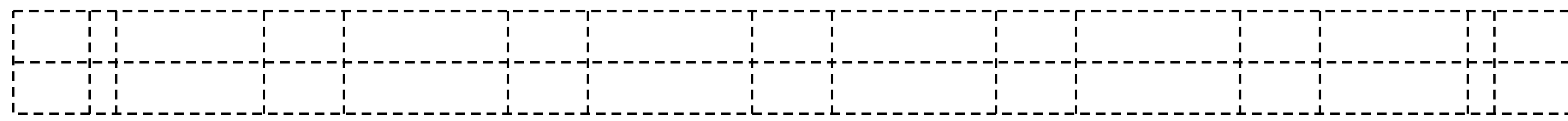
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SHEET NO. S-67
TOTAL SHEETS 137

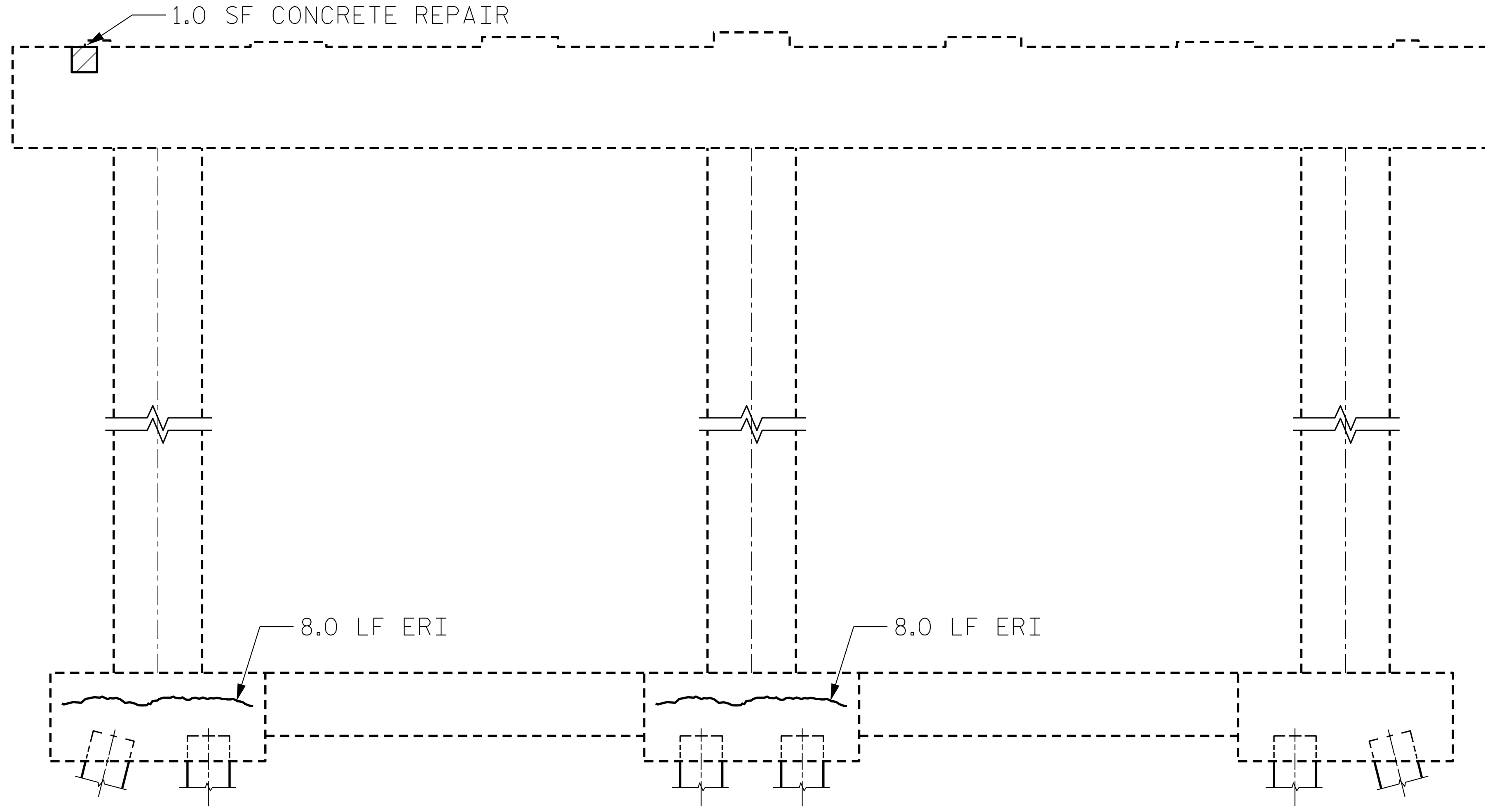
DRAWN BY : FIDEL L. FLORES DATE : 9/30/2020
CHECKED BY : DIEGO A. AGUIRRE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_SBR02_270012.dgn
jduke

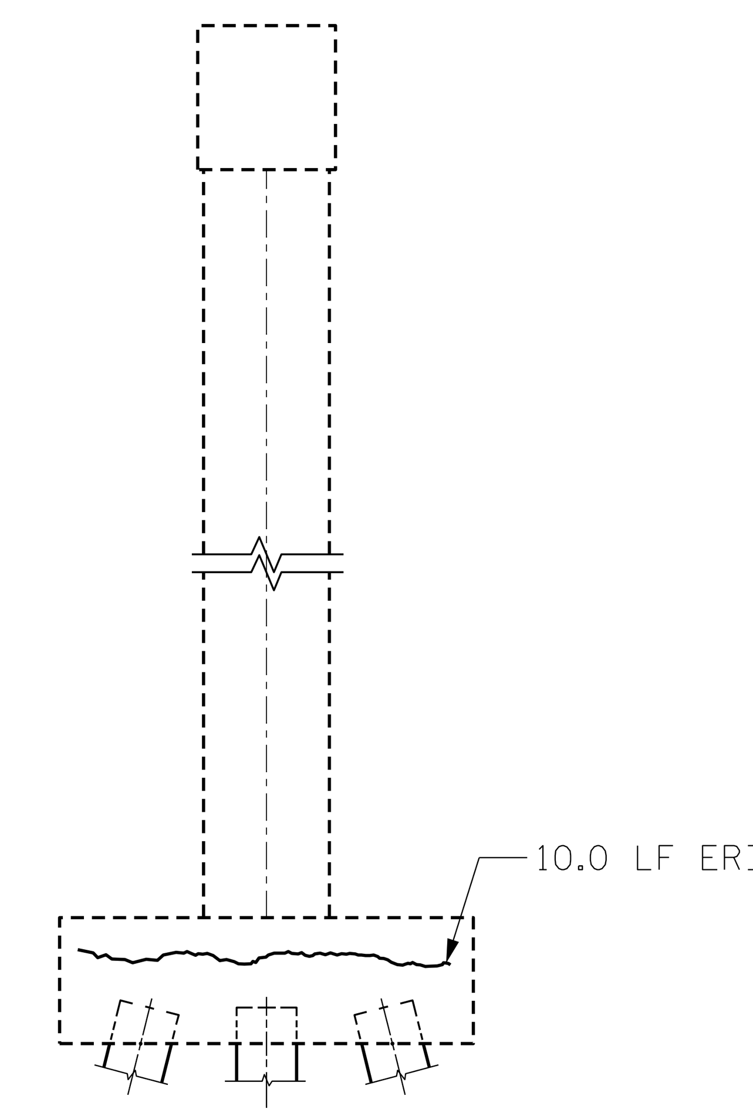


PLAN

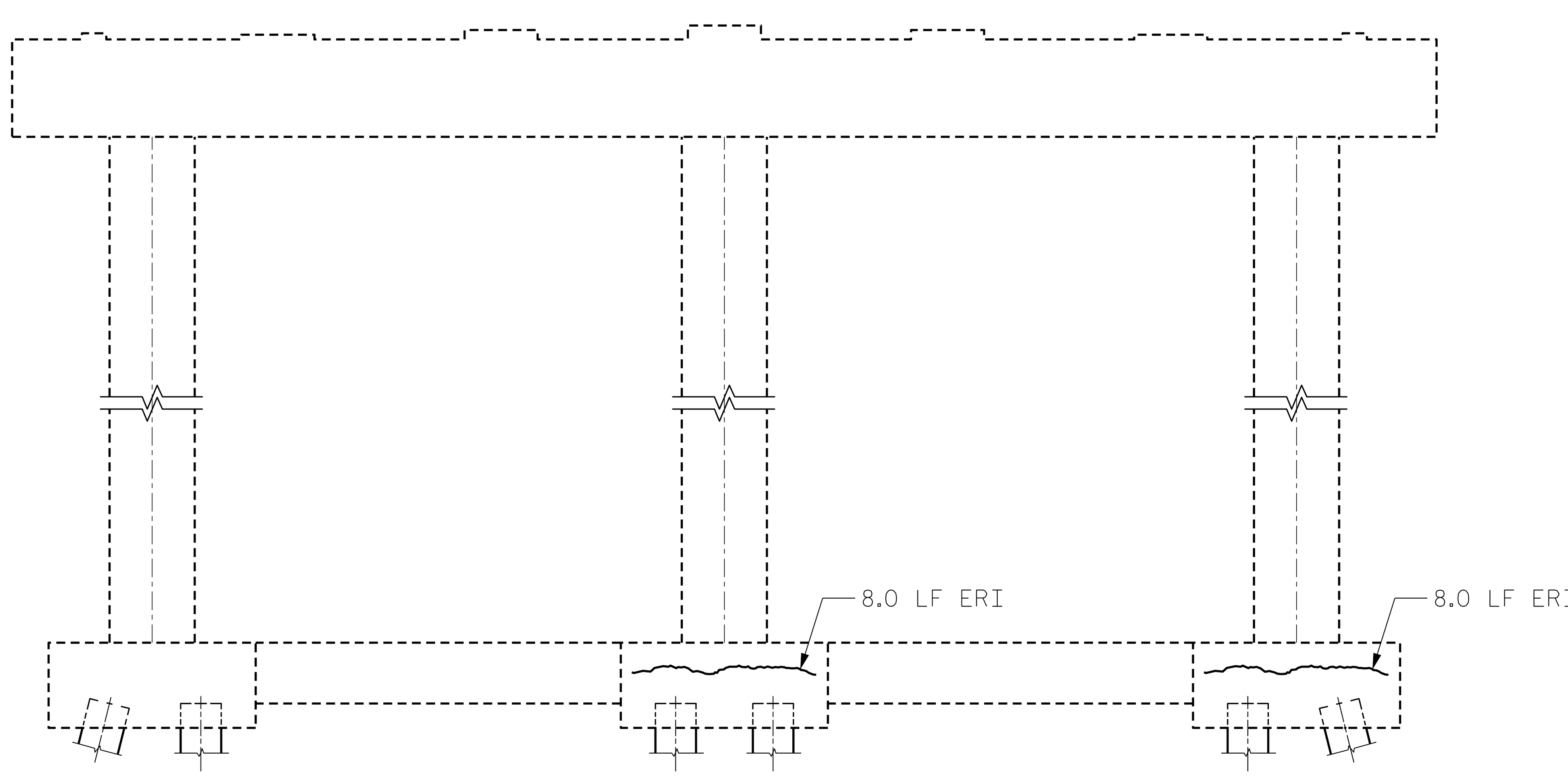
(TOP OF CAP - PILES AND BEAMS NOT SHOWN FOR CLARITY)



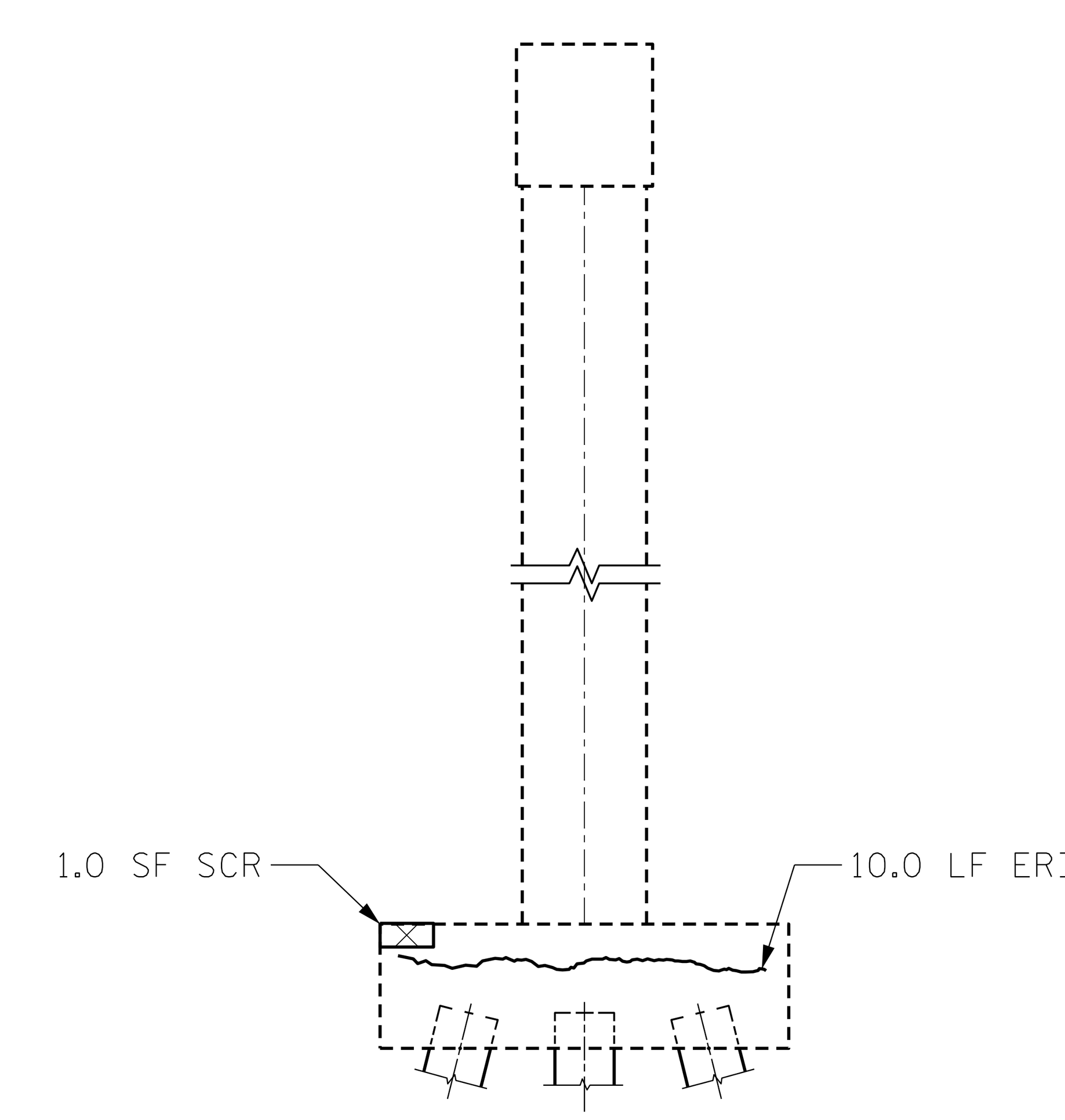
EAST ELEVATION



NORTH ELEVATION



WEST ELEVATION



SOUTH ELEVATION

LEGEND

(hatched box)	CONCRETE REPAIR AREA (CR)
(cross-hatched box)	SHOTCRETE REPAIR AREA (SCR)
(line)	EPOXY RESIN INJECTION (ERI)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	1.0	0.5		
COLUMN/PILE	-	-		
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	-			
COLUMN/PILE	-			
FOOTING	52.0			
CP INTEGRAL PILE JACKETS	LIN. FT.		LIN. FT.	
PILE				

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" SHEETS.

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 TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=1/16" AS DESCRIBED IN THE SPECIAL PROVISIONS AT EACH BENT.

AVERAGE CONCRETE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 1 1/2" TO 2" ON THE PILES. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING EXCAVATION AND DEMOLITION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO THE BENT CAP MAY REQUIRE BRIDGE JACKING. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS AND STANDARD SPECIFICATIONS SECTION 420-18.

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE 10/19/2021

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIRS

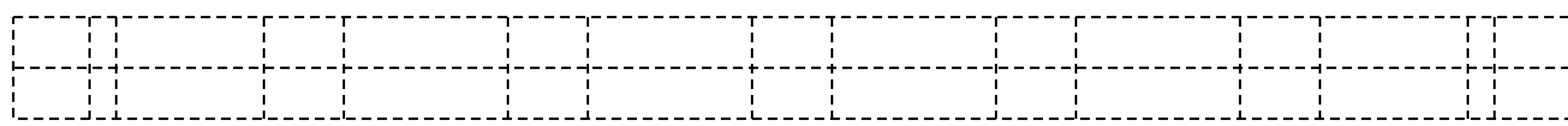
BENT 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-68
1			3			TOTAL SHEETS
2			4			137

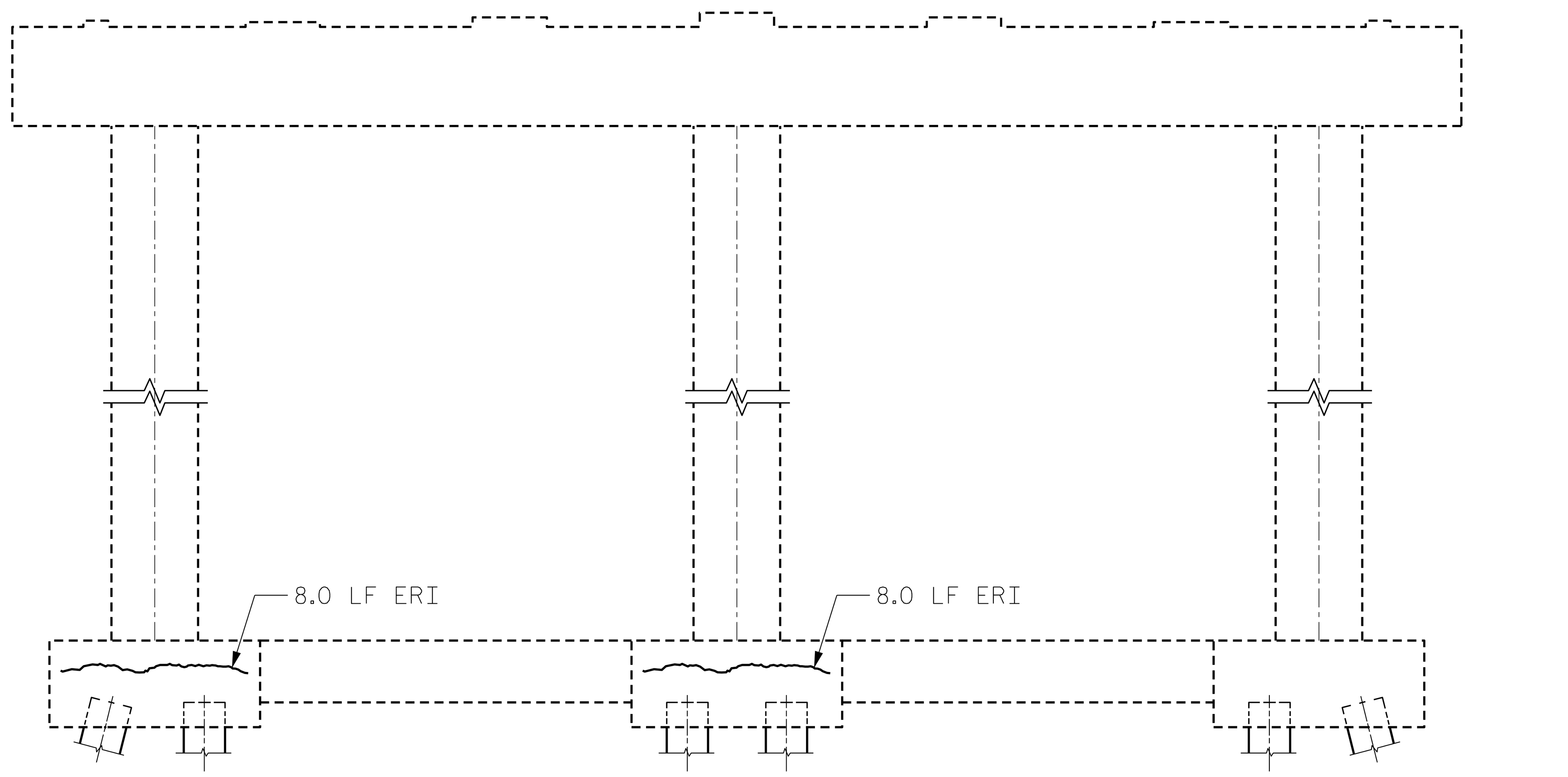
DRAWN BY : FIDEL L. FLORES DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_SBR03_270012.dgn
jduke

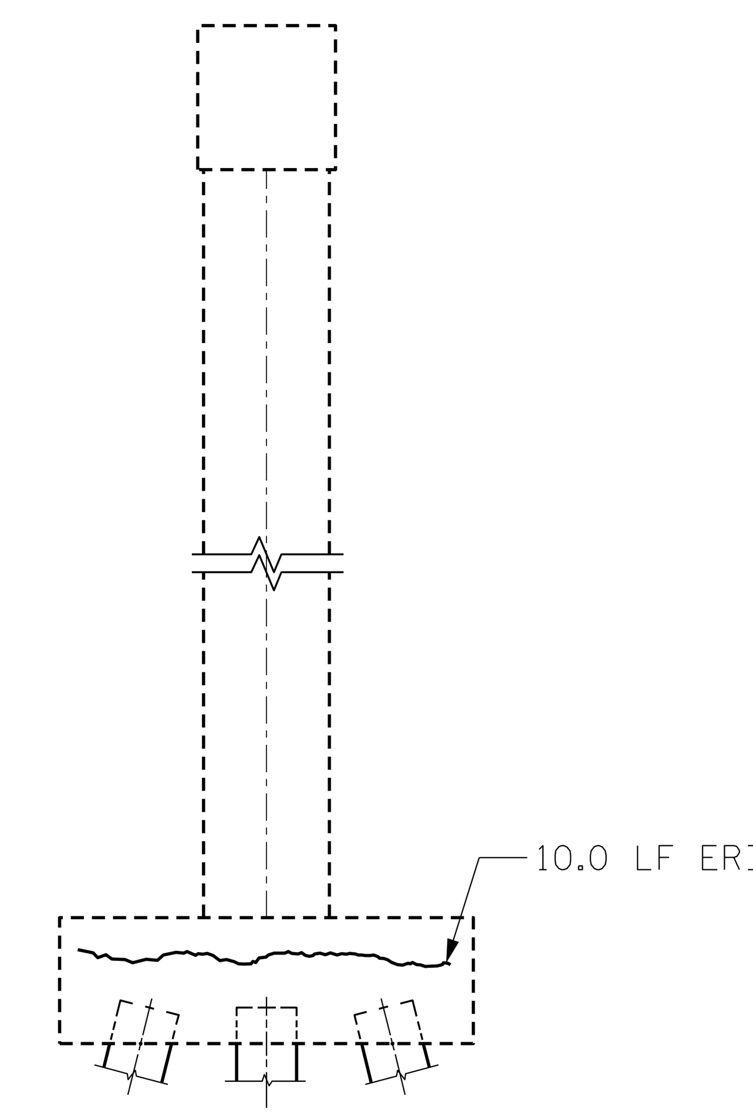


PLAN

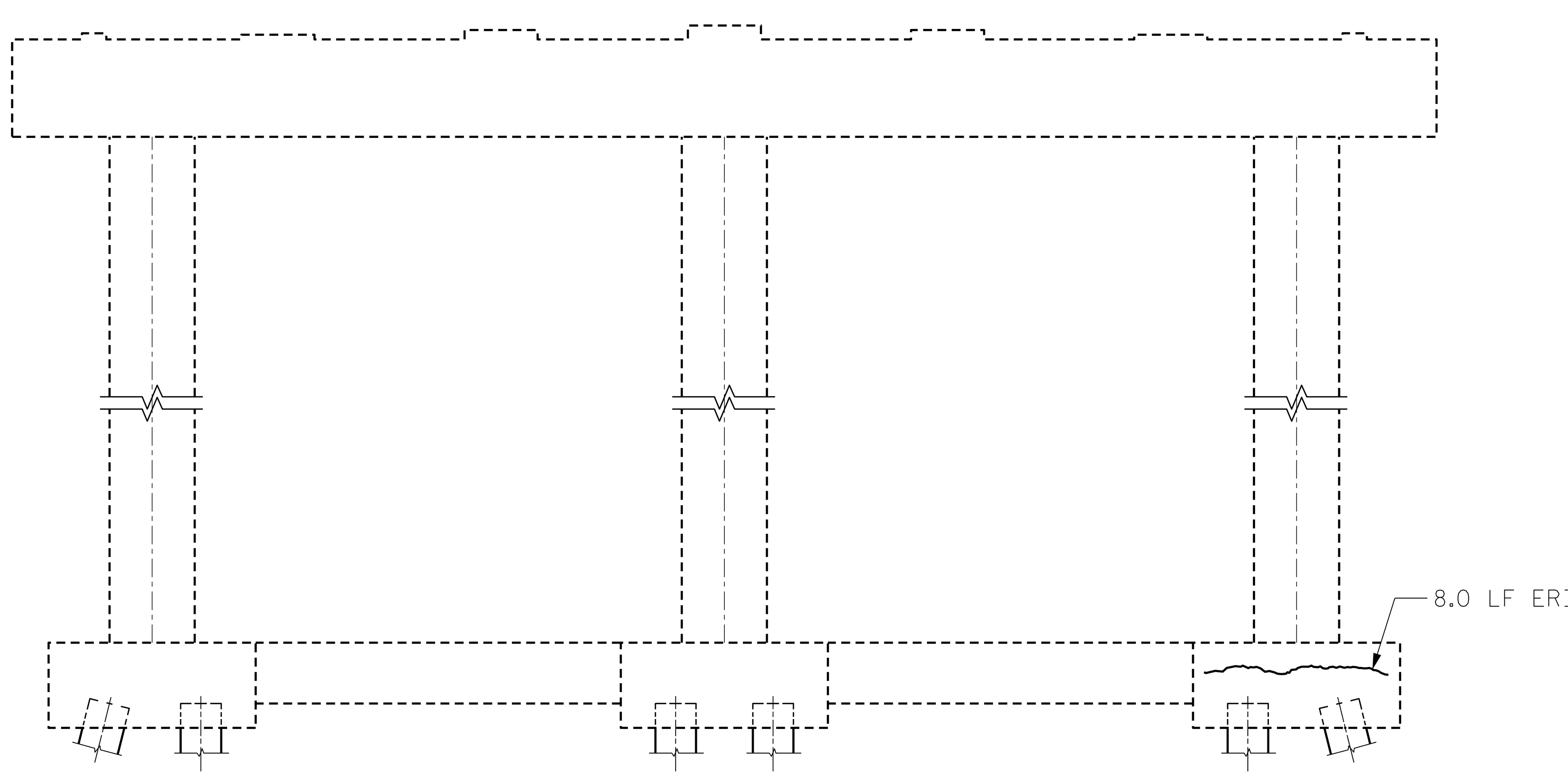
(TOP OF CAP - PILES AND BEAMS NOT SHOWN FOR CLARITY)



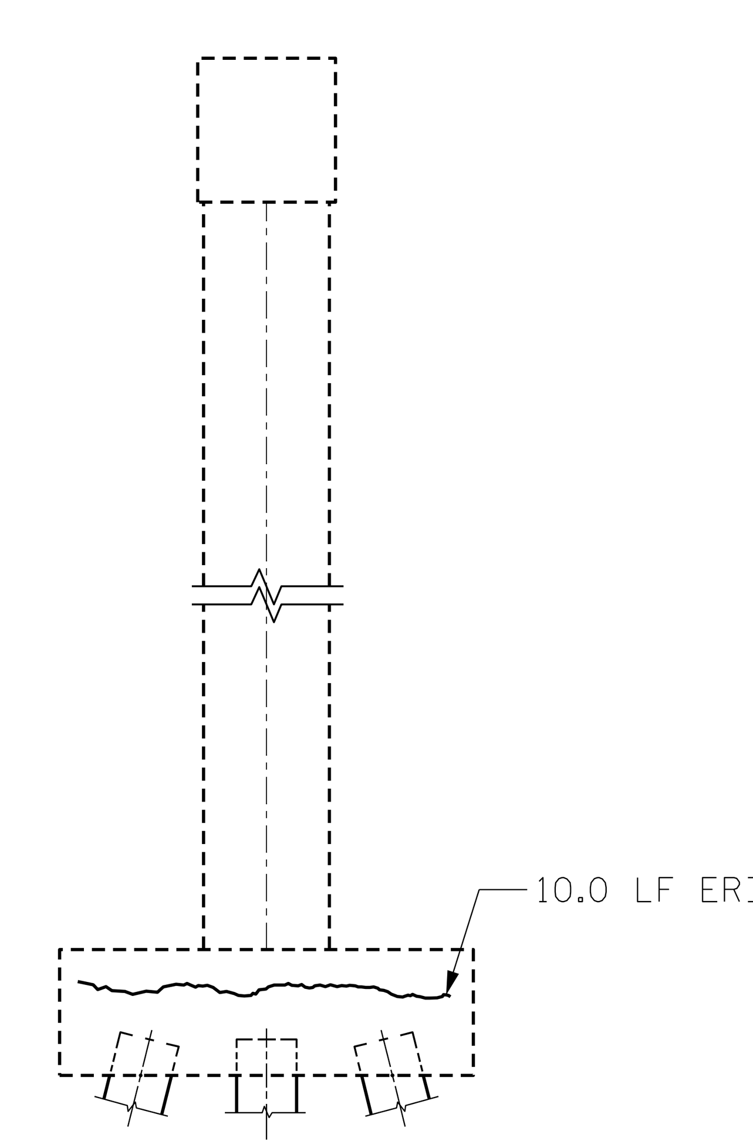
EAST ELEVATION



NORTH ELEVATION



WEST ELEVATION



SOUTH ELEVATION

LEGEND

(hatched)	CONCRETE REPAIR AREA (CR)
(cross-hatched)	SHOTCRETE REPAIR AREA (SCR)
(line)	EPOXY RESIN INJECTION (ERI)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	-	-		
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	-			
FOOTING	44.0			
CP INTEGRAL PILE JACKETS	LIN. FT.		LIN. FT.	
PILE				

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" SHEETS.

NOTES:

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FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO THE BENT CAP MAY REQUIRE BRIDGE JACKING. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS AND STANDARD SPECIFICATIONS SECTION 420-18.

PROJECT NO. 15BPR.46

DARE COUNTY

BRIDGE NO. 270012

SEAL 043777 ENGINEER JACOB H. DUKE 10/19/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIRS

BENT 4

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-69
1			3			TOTAL SHEETS
2			4			137

DRAWN BY : FIDEL L. FLORES DATE : 9/30/2020
CHECKED BY : JACOB H. DUKE DATE : 10/1/2020
DESIGN ENGINEER OF RECORD: JACOB H. DUKE DATE : 10/1/2020

10/19/2021
15BPR.46_SMU_SBR04_270012 .dgn
jduke