5/26/20

PROJECT: HI-0015

CONTRACT NO: C204912

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

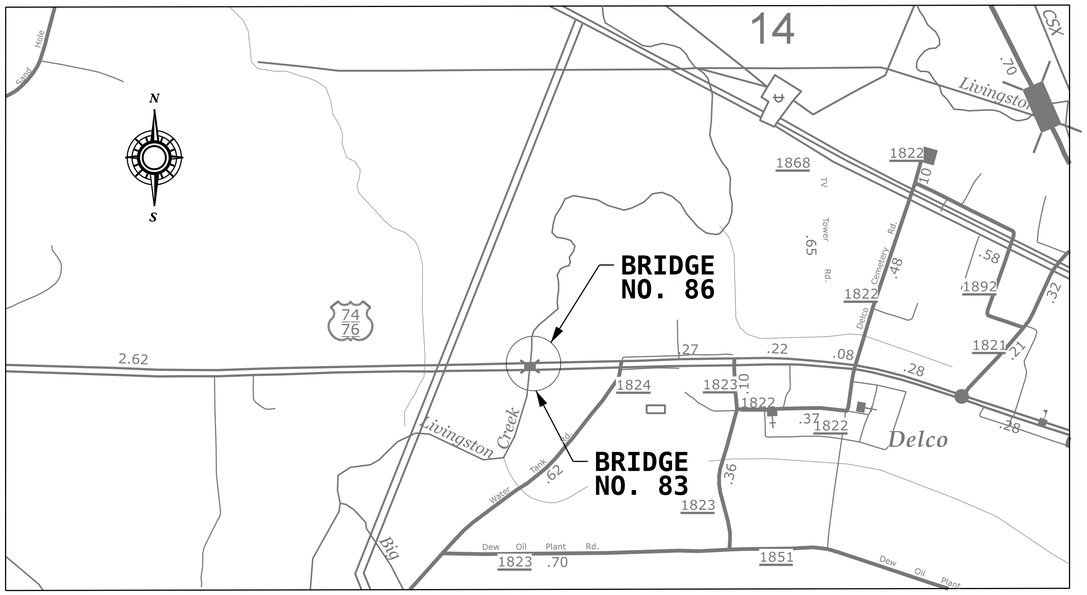
COLUMBUS COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HI-0015	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49986.1.1	0074245	P.E.
49986.3.1	0074245	CONST.

LOCATION: ***BRIDGE #230083 ON US 74/76EB OVER LIVINGSTON CREEK***
BRIDGE #230086 ON US 74/76WB OVER LIVINGSTON CREEK

TYPE OF WORK: ***BRIDGE PRESERVATION – CONCRETE BRIDGE DECK REHABILITATION BY SCARIFICATION, SHOTBLASTING AND PLACEMENT OF POLYMER CONCRETE; DEMOLITION AND RECONSTRUCTION OF BRIDGE DECK JOINTS AND SEALS; CLEANING AND PAINTING OF EXISTING STEEL BEAMS AND BEARINGS, AND SUBSTRUCTURE CONCRETE REPAIRS WITH SHOTCRETE, CONCRETE AND EPOXY RESIN INJECTION.***



VICINITY MAP: COLUMBUS COUNTY

DESIGN DATA

BRIDGE #230083 – ADT 2018 =7,250

BRIDGE #230086 – ADT 2013 =8,000

PROJECT LENGTH

BRIDGE #230083 – 0.023 MILE

BRIDGE #230086 – 0.031 MILE

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

2024 STANDARD SPECIFICATIONS

LET DATE: FEBRUARY 20, 2024

Kristy W. Alford, P.E., CPM
PROJECT ENGINEER

Aster G. Abraha, P.E
PROJECT DESIGN ENGINEER

12/15/2023
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aabraha

5/26/20

PROJECT: HI-0015

CONTRACT NO: C204912

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

COLUMBUS COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HI-0015	1A	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49986.1.1	0074245	P.E.
49986.3.1	0074245	CONST.

LOCATION: ***BRIDGE #230083 ON US 74/76EB OVER LIVINGSTON CREEK***
BRIDGE #230086 ON US 74/76WB OVER LIVINGSTON CREEK

TYPE OF WORK: ***BRIDGE PRESERVATION – CONCRETE BRIDGE DECK REHABILITATION BY SCARIFICATION, SHOTBLASTING AND PLACEMENT OF POLYMER CONCRETE; DEMOLITION AND RECONSTRUCTION OF BRIDGE DECK JOINTS AND SEALS; CLEANING AND PAINTING OF EXISTING STEEL BEAMS AND BEARINGS, AND SUBSTRUCTURE CONCRETE REPAIRS WITH SHOTCRETE, CONCRETE AND EPOXY RESIN INJECTION.***

INDEX OF STRUCTURES SHEETS

12/21/2023
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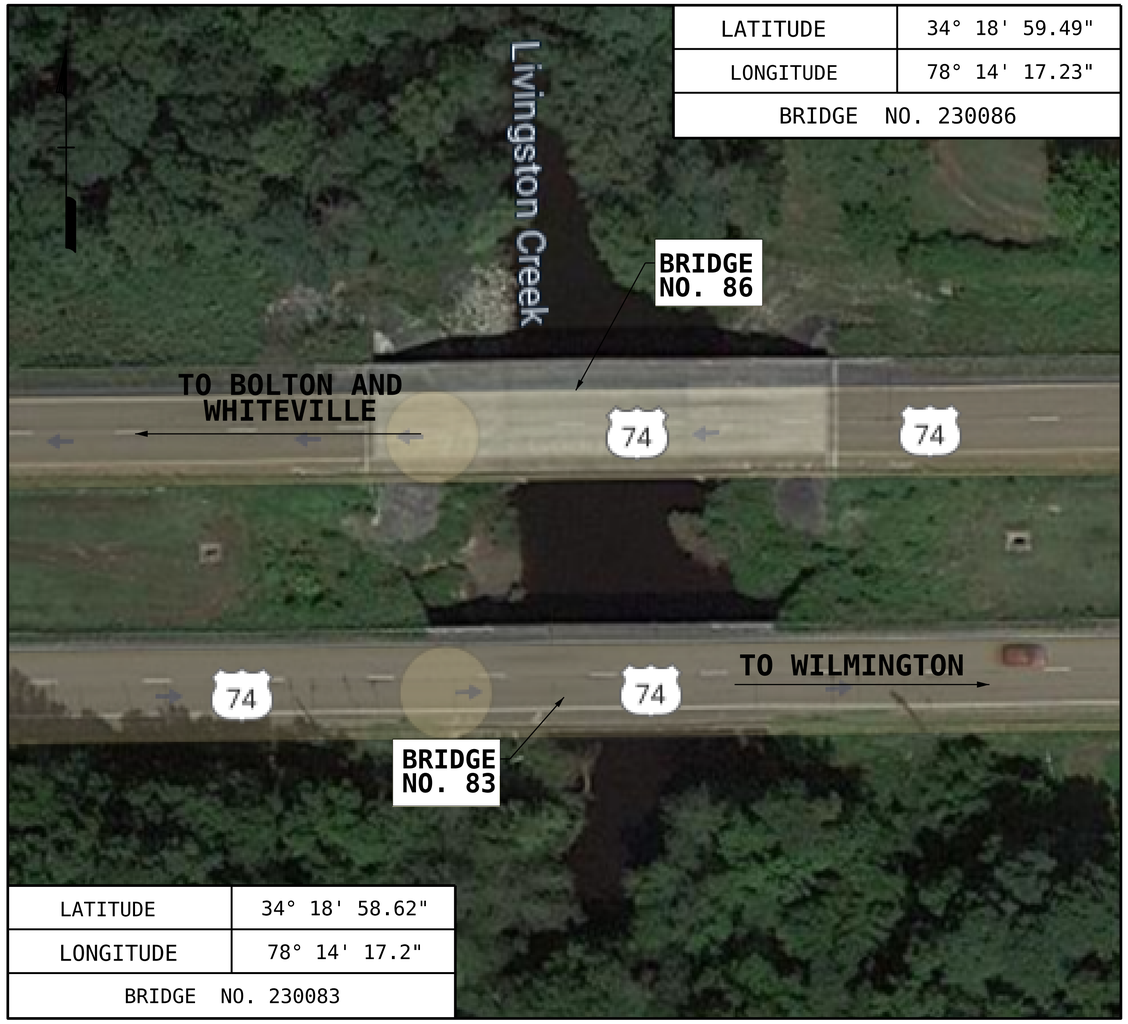

LATITUDE	34° 18' 59.49"
LONGITUDE	78° 14' 17.23"
BRIDGE NO. 230086	

LATITUDE	34° 18' 58.62"
LONGITUDE	78° 14' 17.2"
BRIDGE NO. 230083	

LOCATION SKETCH

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

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230083 & 230086

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Signed by: Aster Abraha

12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LOCATION SKETCH

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : A. ABRAHA DATE : 7/23
CHECKED BY : S. T. SANDOR DATE : 11/23
DESIGN ENGINEER OF RECORD: DATE :

12/15/2023
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aabraha

FA PROJECT NO. 0074245

TOTAL BILL OF MATERIAL

BRIDGE NO.	GROOVING BRIDGE FLOORS	POLLUTION CONTROL	CLASS II SURFACE PREPARATION	SHOTCRETE REPAIRS	EPOXY RESIN INJECTION	FOAM JOINT SEALS FOR PRESERVATION	PAINTING CONTAINMENT FOR BRIDGE # --	CLEANING AND REPAINTING OF BRIDGE # --	VOLUMETRIC MIXER	POLYESTER POLYMER CONCRETE MATERIALS	EPOXY POLYMER CONCRETE MATERIALS (ALTERNATE)	EPOXY COATING	SCARIFYING BRIDGE DECK	SHOTBLASTING BRIDGE DECK	CONCRETE DECK REPAIR FOR POLYMER CONCRETE OVERLAY	PLACING & FINISHING POLYMER CONCRETE OVERLAY	CLEANING & PAINTING EXISTING BEARINGS WITH HIGH RATIO CALCIUM SULFONATE
	SQ. FT.	LUMP SUM	SQ. YD.	CU. FT.	LN. FT.	LN. FT.	LUMP SUM	LUMP SUM	LUMP SUM	CU. YD.	CU. YD.	SQ. FT.	SQ. YD.	SQ. YD.	SQ. YD.	SQ. YD.	EA.
230083				57.2	67												
230086	6117.4	LUMP SUM	8.8	4.9	0.0	80	LUMP SUM	LUMP SUM	LUMP SUM	25.5	25.5	390.8	736.8	736.8	8.8	736.8	24
TOTAL	6117.4	LUMP SUM	8.8	62.1	67	80	LUMP SUM	LUMP SUM	LUMP SUM	25.5	25.5	390.8	736.8	736.8	8.8	736.8	24

GENERAL NOTES:

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 OF 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 THE BRIDGE(S) SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL BELOW, EXCEPT WHERE THE CONTRACTOR PLANS TO USE 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 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.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

ALL PAVEMENT MARKINGS WILL BE IN ACCORDANCE WITH THE TRAFFIC CONTROL PLANS.

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.

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

FOR CONCRETE DECK REPAIR FOR POLYMER CONCRETE OVERLAY, SEE POLYMER CONCRETE BRIDGE DECK OVERLAY SPECIAL PROVISIONS.

FOR POLYMER CONCRETE BRIDGE DECK OVERLAY, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEALS FOR PRESERVATION, SEE SPECIAL PROVISIONS.

FOR CLEANING AND PAINTING EXISTING BEARINGS WITH HRCSA, SEE SPECIAL PROVISIONS.

FOR PAINTING CONTAINMENT AND POLLUTION CONTROL, SEE PAINTING EXISTING STRUCTURE SPECIAL PROVISIONS.

FOR PAINTING EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR VOLUMETRIC MIXER, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

FOR EPOXY COATING AND DEBRIS REMOVAL, SEE SPECIAL PROVISIONS.

AT THE TIME OF PREPARATION OF THESE PLANS, IT WAS NOT ANTICIPATED THAT THE FOLLOWING ITEM(S) LISTED 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:

ITEM	DESCRIPTION	UNIT
1	CONCRETE REPAIRS	CU. FT.
2	CLASS III SURFACE PREPARATION	SQ. YD.

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230083,230086

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha

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12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BILL OF MATERIAL AND GENERAL NOTES

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

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DRAWN BY : A. G. ABRAHA DATE : 7/2023
CHECKED BY : S. T. SANDOR DATE : 11/2023
DESIGN ENGINEER OF RECORD: _____ DATE : _____

12/15/2023
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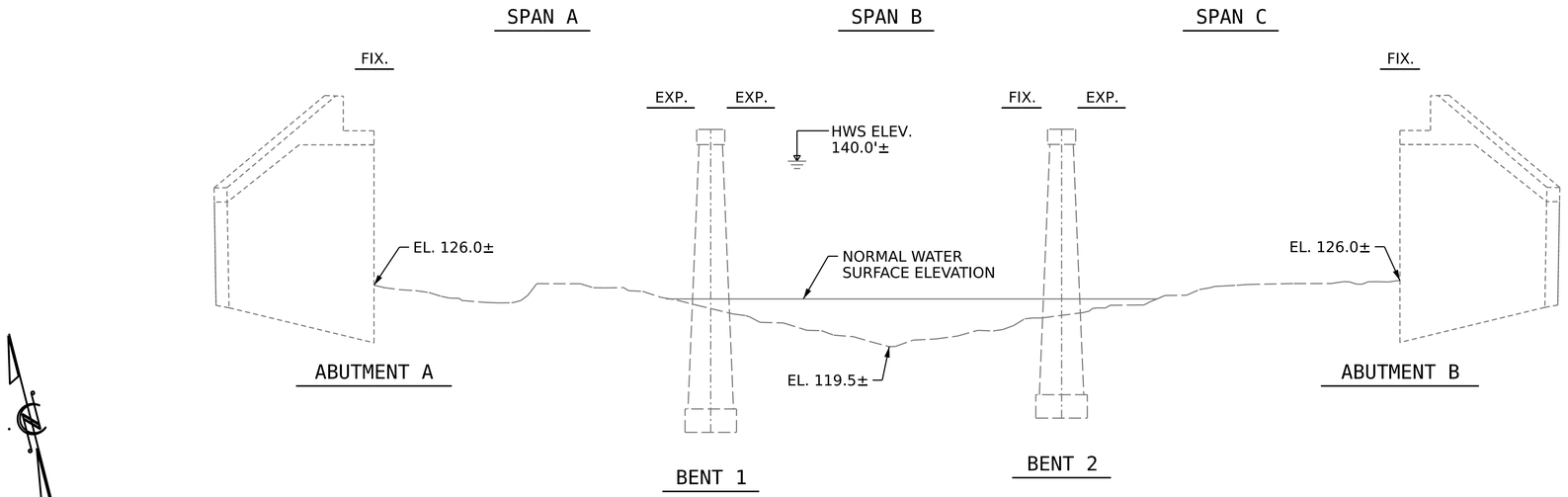
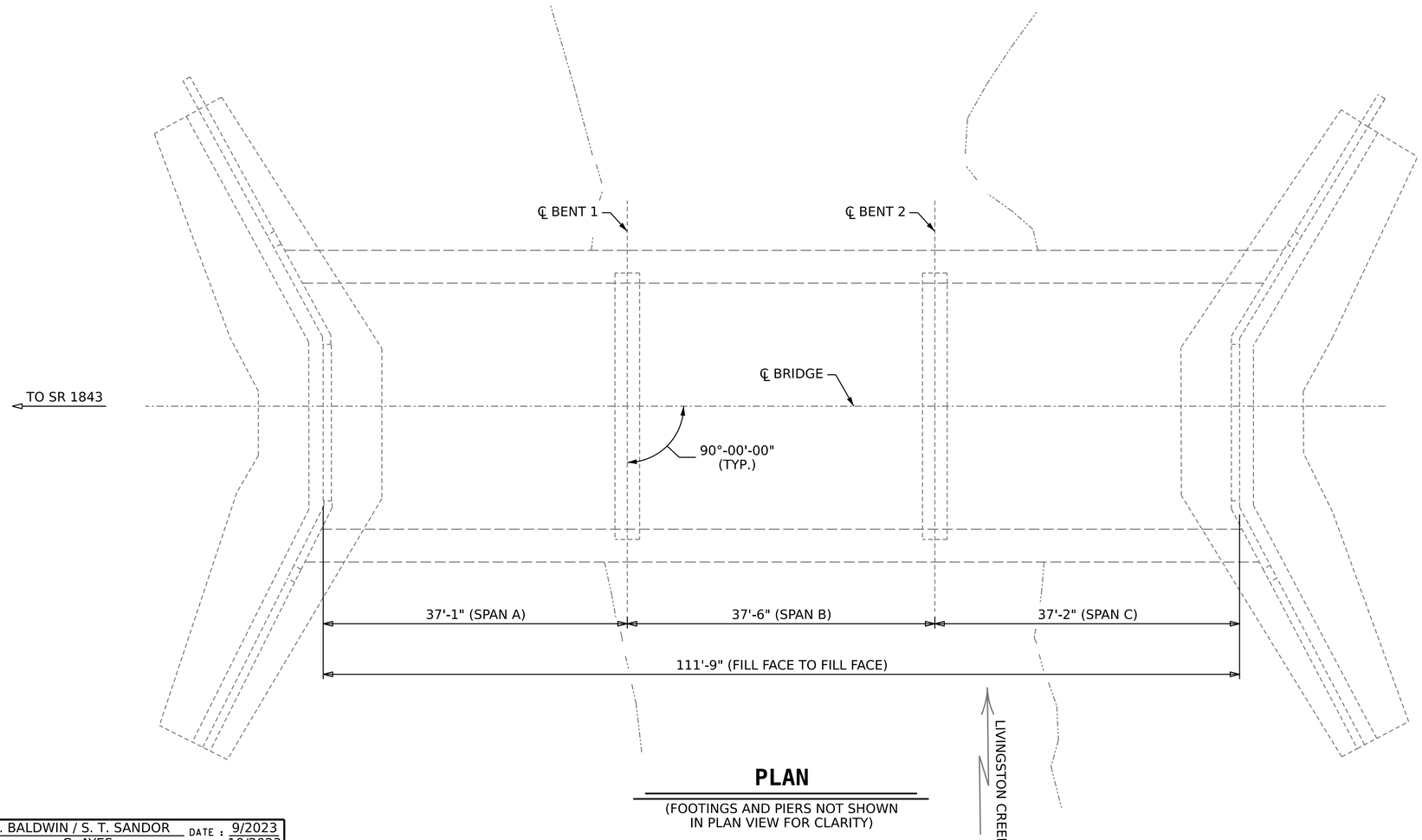


SECTION ALONG ℄ ROADWAY



PLAN

(FOOTINGS AND PIERS NOT SHOWN IN PLAN VIEW FOR CLARITY)

NOTES

- GENERAL DRAWING AND PROFILE INFORMATION IS TAKEN FROM ORIGINAL PLANS AND INSPECTION REPORT DATED 07/12/2022.
- BRIDGE ORIENTATION CONFORMS TO EXISTING BRIDGE PLANS.

SCOPE OF WORK

- MILLING AND RESURFACING OF THE BRIDGE DECK ASPHALT WEARING SURFACE WILL BE PERFORMED UNDER MILLING AND RESURFACING OPERATIONS FOR THE APPROACH PAVEMENT. PAYMENT FOR SUCH WORK IS ACCOUNTED FOR IN ROADWAY PAY ITEMS.
- REMOVE UNSOUND CONCRETE AND PROPERLY PREPARE AREAS FOR CONCRETE AND SHOTCRETE REPAIRS.
- PERFORM CONCRETE AND SHOTCRETE REPAIRS.

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230083

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD
Signed by: Kristy Alford
12/21/2023

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
Signed by: Aster Abraha
12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE 83 ON
US 74 EAST BOUND
OVER LIVINGSTON CREEK,
BETWEEN SR 1843 AND SR 1824

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			13

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DRAWN BY : J. BALDWIN / S. T. SANDOR DATE : 9/2023
CHECKED BY : G. AYES DATE : 10/2023
DESIGN ENGINEER OF RECORD: _____ DATE : _____

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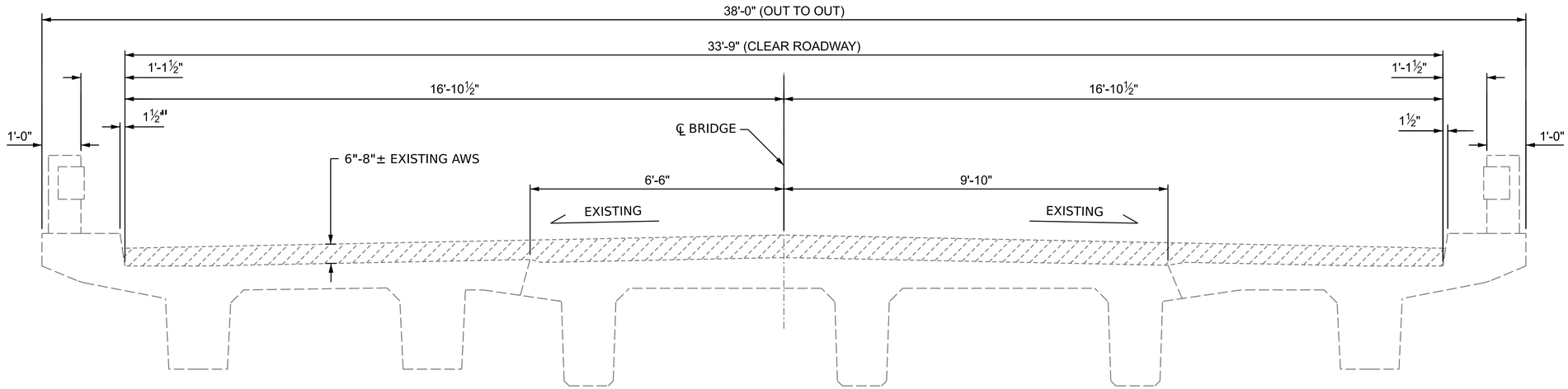

TYPICAL SECTION

(EXISTING)

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230083

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha

12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION

DRAWN BY : J. BALDWIN / S. T. SANDOR DATE : 9/2023
CHECKED BY : G. AYES DATE : 9/2023
DESIGN ENGINEER OF RECORD: _____ DATE : _____

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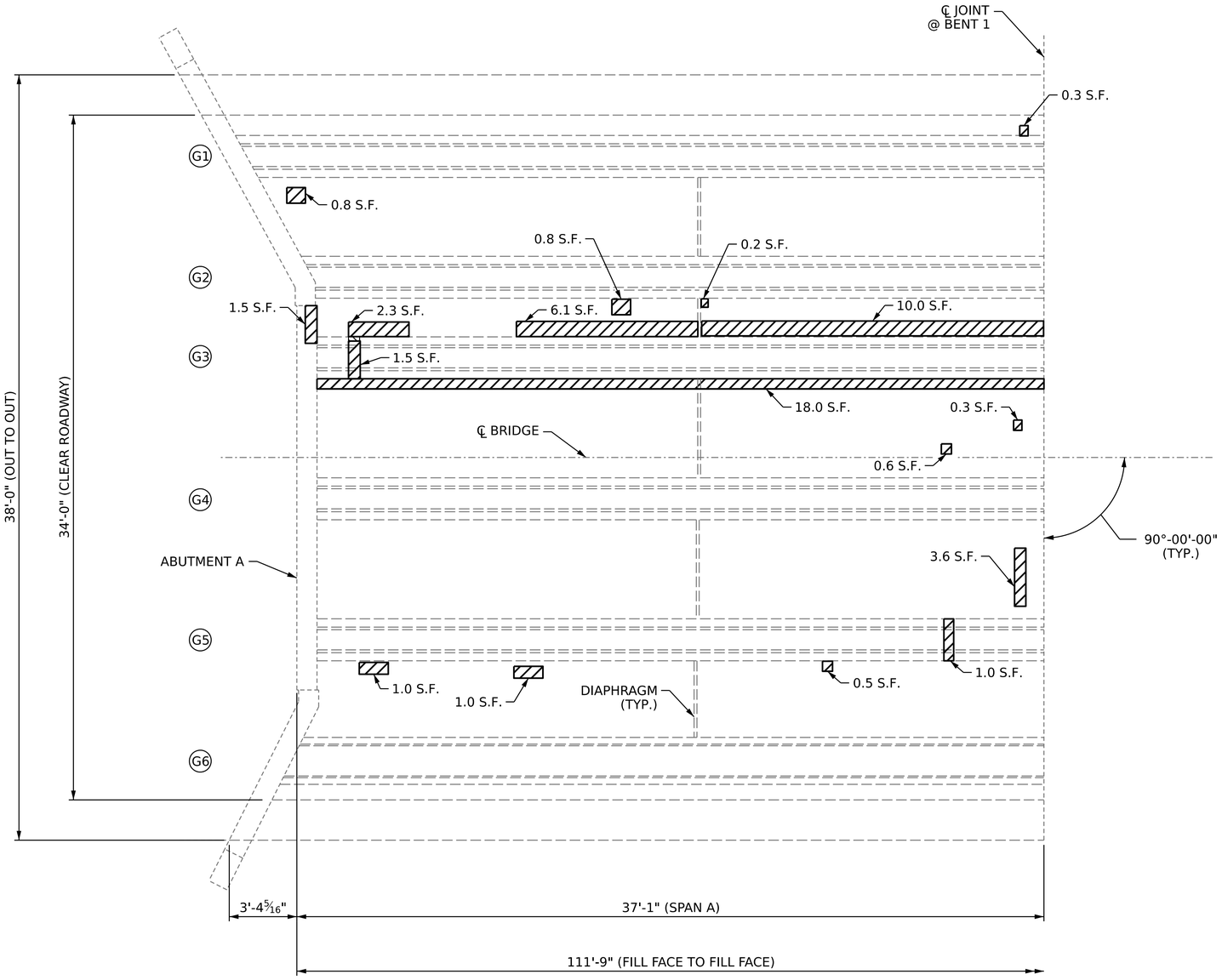

PLAN OF SPAN A

DECK UNDERSIDE REPAIR QUANTITY TABLE

DECK UNDERSIDE REPAIRS SPAN A	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK	45.0	15.0		
CONCRETE DIAPHRAGM	1.7	0.9		
OVERHANG	0	0		
CONCRETE GIRDER	2.8	1.4		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK	0	0		
CONCRETE DIAPHRAGM	0	0		
OVERHANG	0	0		
CONCRETE GIRDER	0	0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT. SEE REPAIR DETAILS.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON 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 AND ENTER THE ACTUAL QUANTITIES INTO THE REPAIR QUANTITY TABLE.

CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR "SHOTCRETE REPAIRS", SEE SPECIAL PROVISIONS.

FOR DECK REPAIRS, SEE "DECK REPAIR DETAILS" SHEET S1-5.

REPAIR KEY

- SHOTCRETE REPAIR AREA
- CONCRETE REPAIR AREA
- EPOXY RESIN INJECTION
- G# GIRDER NUMBER

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230083

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK UNDERSIDE REPAIR SPAN A

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Digitally signed by: Aster Abraha
12/21/2023

DRAWN BY : S. T. SANDOR DATE : 9/2023
CHECKED BY : G. AYES DATE : 9/2023
DESIGN ENGINEER OF RECORD: DATE :

12/21/2023
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1			3			TOTAL SHEETS
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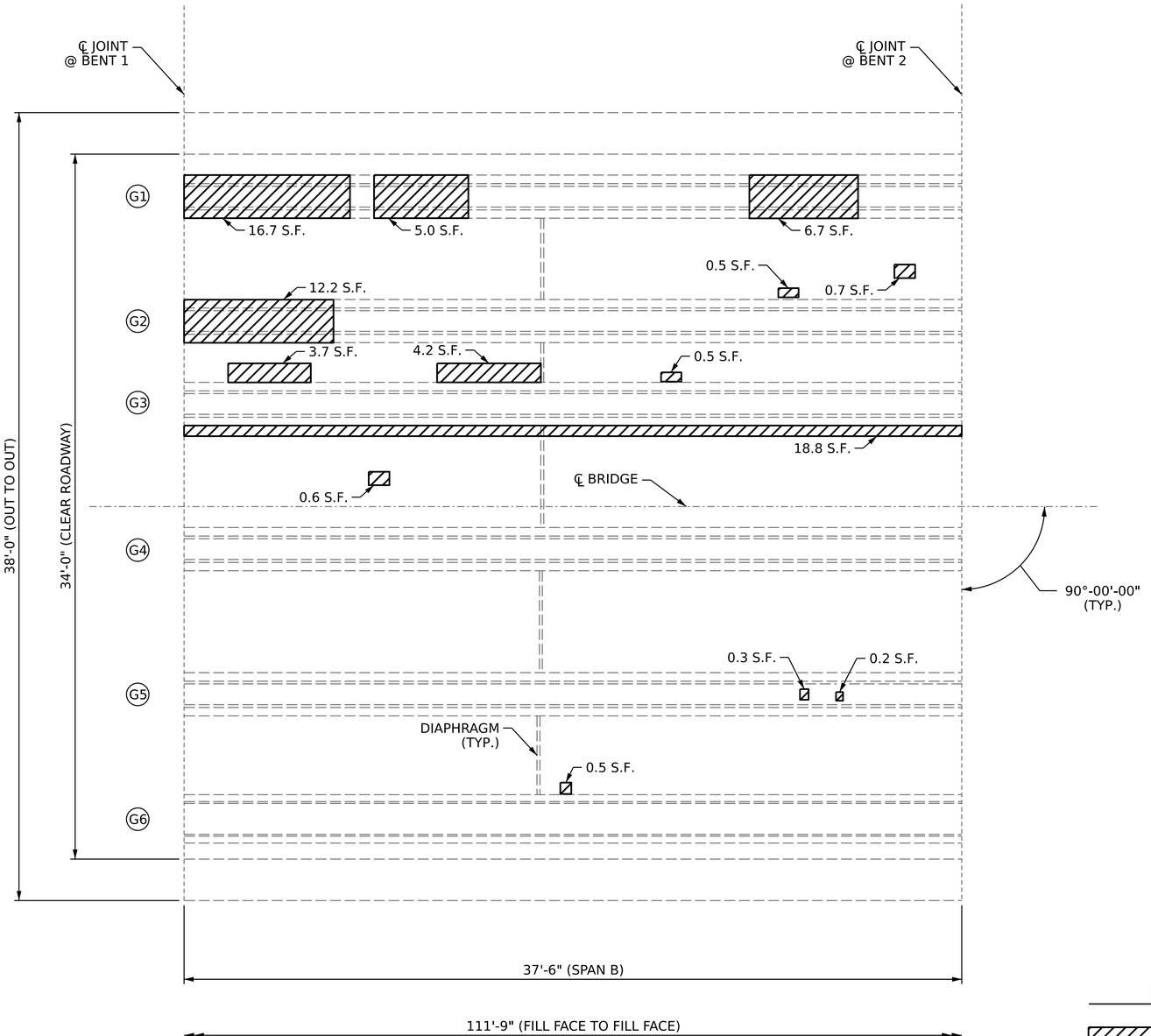

PLAN OF SPAN B

DECK UNDERSIDE REPAIR QUANTITY TABLE

DECK UNDERSIDE REPAIRS SPAN B	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK	29.5	9.9		
CONCRETE DIAPHRAGM	0	0		
OVERHANG	0	0		
CONCRETE GIRDER	41.1	12.9		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK	0	0		
CONCRETE DIAPHRAGM	0	0		
OVERHANG	0	0		
CONCRETE GIRDER	0	0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT. SEE REPAIR DETAILS.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON 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 AND ENTER THE ACTUAL QUANTITIES INTO THE REPAIR QUANTITY TABLE.

CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR "SHOTCRETE REPAIRS", SEE SPECIAL PROVISIONS.

FOR DECK REPAIRS, SEE "DECK REPAIR DETAILS" SHEET S1-5.

REPAIR KEY

- SHOTCRETE REPAIR AREA
- CONCRETE REPAIR AREA
- EPOXY RESIN INJECTION
- G# GIRDER NUMBER

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Signed by: Aster Abraha
12/21/2023

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PROJECT NO. HI-0015
COLUMBUS COUNTY
BRIDGE NO. 230083

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK UNDERSIDE REPAIR SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-4
1			3			TOTAL SHEETS
2			4			13

DRAWN BY : S. T. SANDOR DATE : 9/2023
CHECKED BY : G. AYES DATE : 10/2023
DESIGN ENGINEER OF RECORD: _____ DATE : _____

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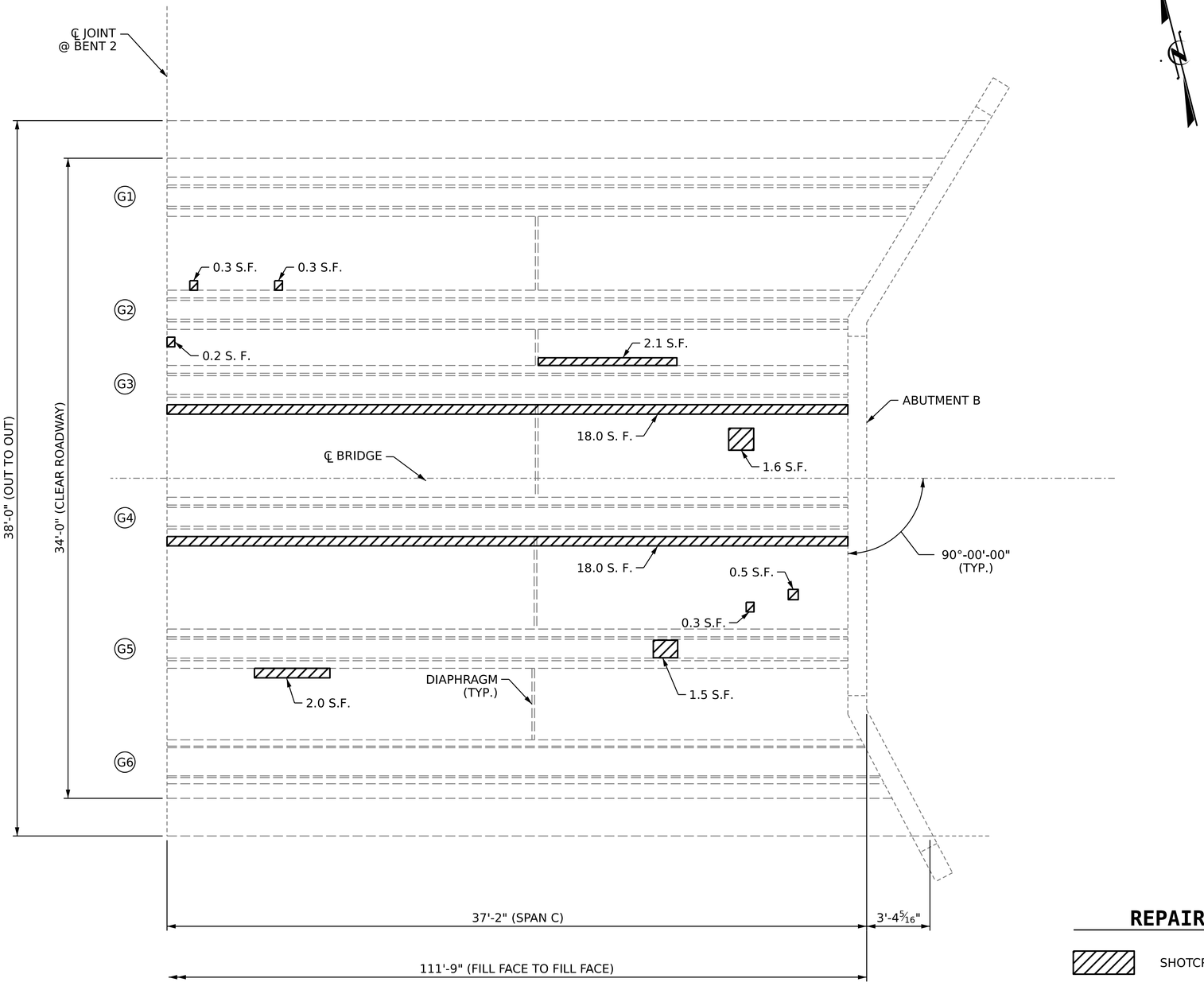

PLAN OF SPAN C

DECK UNDERSIDE REPAIR QUANTITY TABLE

DECK UNDERSIDE REPAIRS SPAN C	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK	43.1	14.4		
CONCRETE DIAPHRAGM	0.2	0.1		
OVERHANG	0	0		
CONCRETE GIRDER	1.5	0.8		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK	0	0		
CONCRETE DIAPHRAGM	0	0		
OVERHANG	0	0		
CONCRETE GIRDER	0	0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT. SEE REPAIR DETAILS.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON 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 AND ENTER THE ACTUAL QUANTITIES INTO THE REPAIR QUANTITY TABLE.

CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR "SHOTCRETE REPAIRS", SEE SPECIAL PROVISIONS.

FOR DECK REPAIRS, SEE "DECK REPAIR DETAILS" SHEET S1-5.

REPAIR KEY

- SHOTCRETE REPAIR AREA
- CONCRETE REPAIR AREA
- EPOXY RESIN INJECTION
- G# GIRDER NUMBER

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Signed by: Aster Abraha
12/21/2023

PROJECT NO. HI-0015
COLUMBUS COUNTY
BRIDGE NO. 230083

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK UNDERSIDE REPAIR SPAN C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-5
1			3			TOTAL SHEETS
2			4			13

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DRAWN BY : S. T. SANDOR DATE : 8/2023
CHECKED BY : G. AYES DATE : 10/2023
DESIGN ENGINEER OF RECORD: DATE :

12/21/2023
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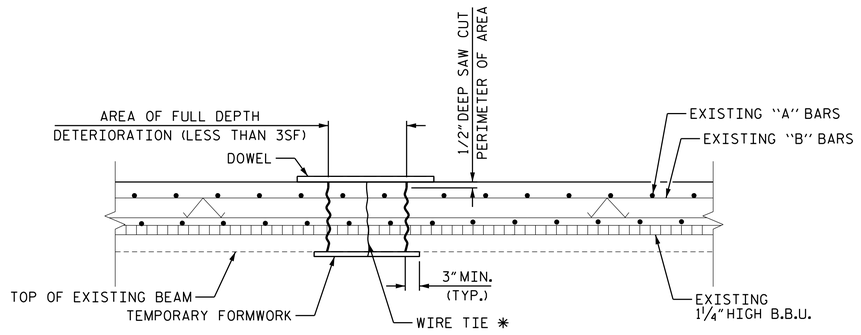
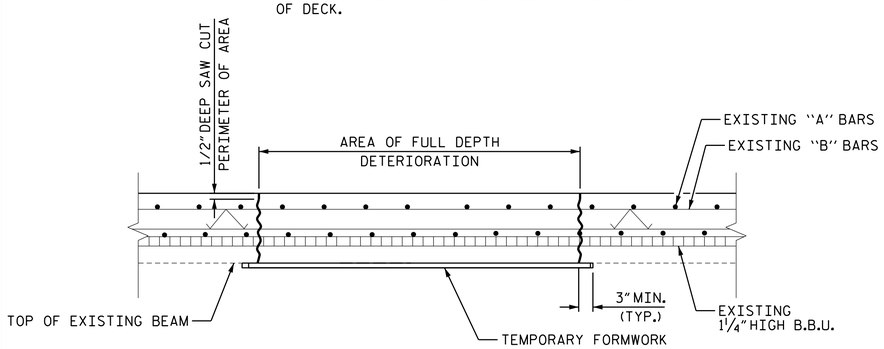
aabraha



FULL DEPTH REPAIR WITH TEMPORARY FORMWORK

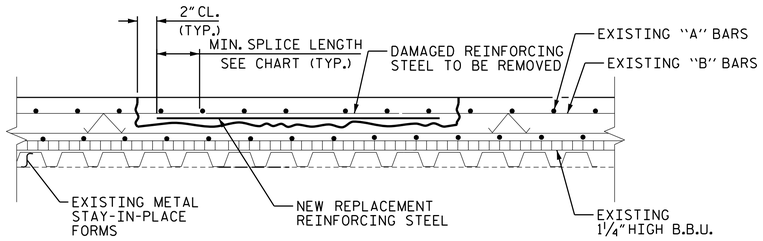
(FOR AREAS OF DETERIORATION EQUAL TO OR LESS THAN 3SF)

* WIRE TIE TO BE KNOTTED BELOW TEMPORARY FORMWORK AND ATTACHED TO DOWEL THAT IS WIDER THAN FORMED FULL DEPTH HOLE. ROTATE DOWEL TO TIGHTEN FORMWORK AGAINST BOTTOM OF DECK.

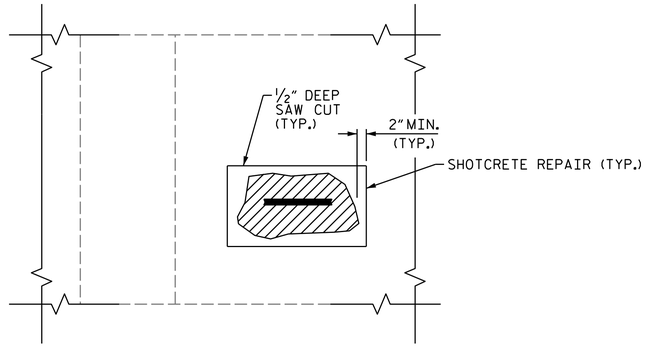


FULL DEPTH REPAIR WITH TEMPORARY FORMWORK

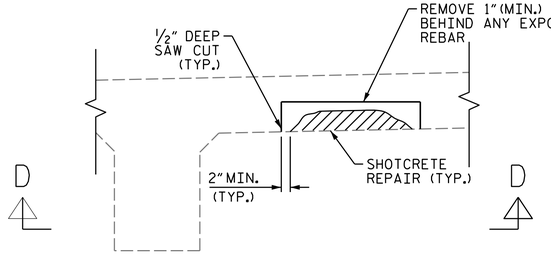
(FOR AREAS OF DETERIORATION GREATER THAN 3SF)



REINFORCING STEEL REPAIR

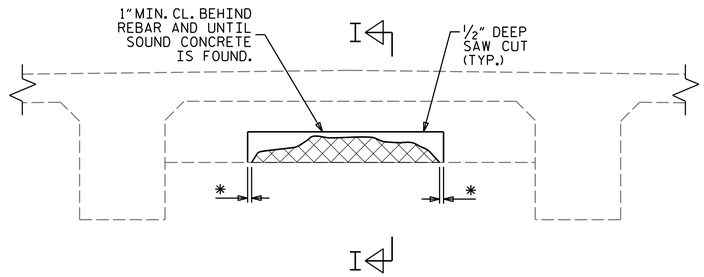


SECTION D-D

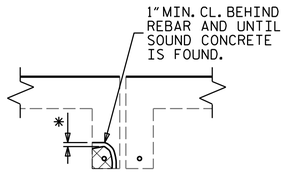


TYPICAL SECTION

UNDERSIDE OF DECK REPAIR



TYPICAL SECTION



SECTION I-I

* REMOVE CONCRETE UNTIL SOUND CONCRETE IS FOUND (2" MIN. DEPTH)

DAMAGED AREA

NOTE:
EXISTING REBAR TO REMAIN IN PLACE. CLEAN AND REPAIR AS NECESSARY.

INTERIOR DIAPHRAGM REPAIR DETAILS

NOTES

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.

THE CONTRACTOR SHALL REMOVE THE DETERIORATED CONCRETE IN ACCORDANCE WITH THE GUIDELINES SET IN THESE NOTES, IN THE SPECIAL PROVISIONS AND THE STANDARD SPECIFICATIONS.

REMOVE UNSOUND CONCRETE TO THE EXTENT NECESSARY, MINIMUM OF 1" BEHIND REBAR AND MINIMUM OF 2" CLEARANCE TO SAWCUT.

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 SHEET S1-25.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR AREAS TO BE REPAIRED, SEE "UNDERSIDE DECK REPAIRS" SHEETS.

THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO STARTING WORK FOR TEMPORARY FORMWORK. FOR SUBMITTALS OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

UPON REMOVAL OF TEMPORARY FORMWORK, ALL VOIDS AND HONEYCOMBS ON THE UNDERSIDE OF DECK SURFACE SHALL BE FILLED WITH THE SAME MATERIAL AS USED FOR THE PATCH, AND FINISHED TO CONFORM TO THE SURROUNDING CONCRETE SURFACE.

NO FORMWORK SHALL BE LEFT IN PLACE.

AREA OF DETERIORATION

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

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

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230083

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha

12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

DECK & DIAPHRAGM REPAIR DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-6
1			3			TOTAL SHEETS
2			4			13

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CHECKED BY : G. AYES DATE : 10/2023

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CHECKED BY :

12/21/2023
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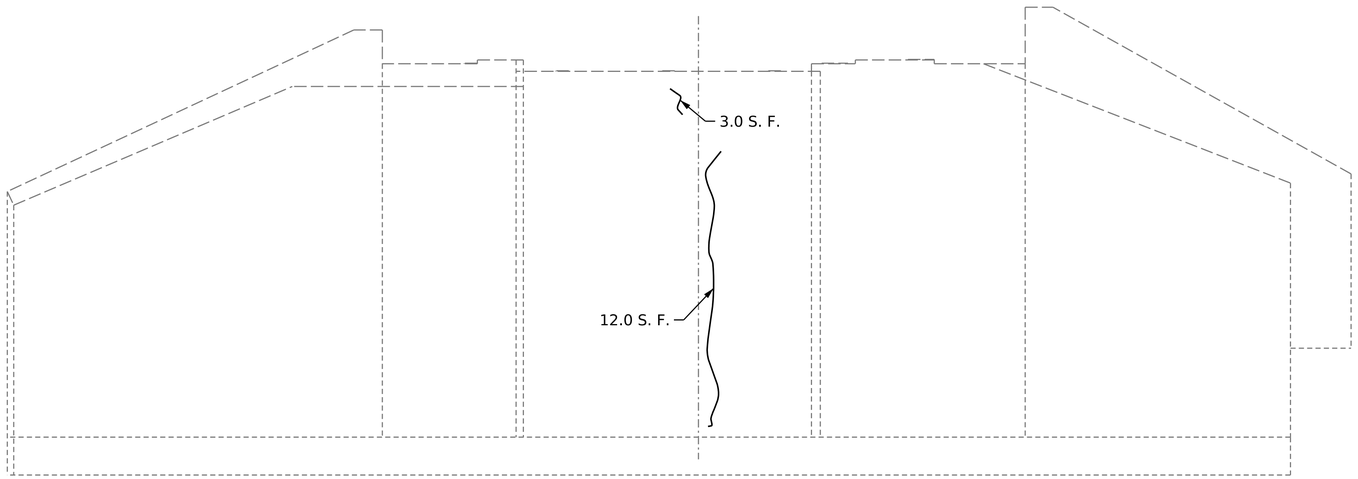
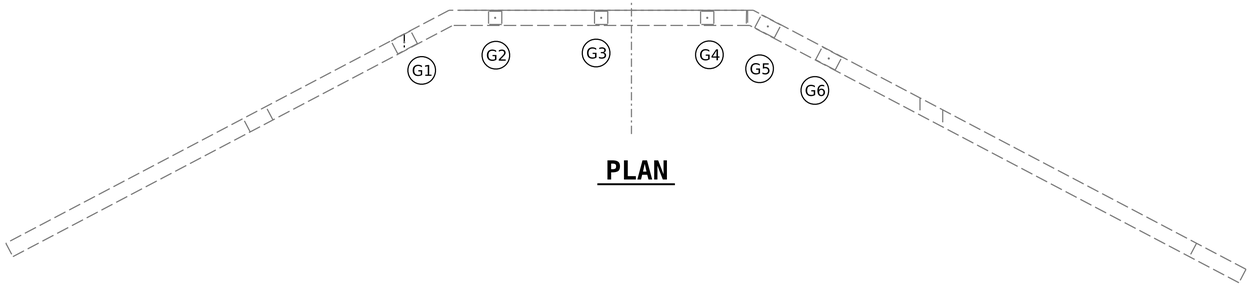
gabraha



ELEVATION



PLAN

REPAIR KEY

- SHOTCRETE REPAIR AREA
- CONCRETE REPAIR AREA
- EPOXY RESIN INJECTION
- G# GIRDER NUMBER

SUBSTRUCTURE REPAIR QUANTITY TABLE

REPAIRS - ABUTMENT A	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
CURTAIN WALL	0	0		
WINGWALL				
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
CURTAIN WALL	0	0		
WINGWALL				
EPOXY RESIN INJECTION		LINEAR FT		LINEAR FT
CAP		0		
CURTAIN WALL		15.0		
WINGWALL				

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT. SEE REPAIR DETAILS.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON 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 AND ENTER THE ACTUAL QUANTITIES INTO THE REPAIR QUANTITY TABLE.

CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR "SHOTCRETE REPAIRS", SEE SPECIAL PROVISIONS.

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230083

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abralca

12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ABUTMENT A

DRAWN BY : S. T. SANDOR DATE : 9/2023
CHECKED BY : G. AYES DATE : 10/2023
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1			3			TOTAL SHEETS
2			4			13

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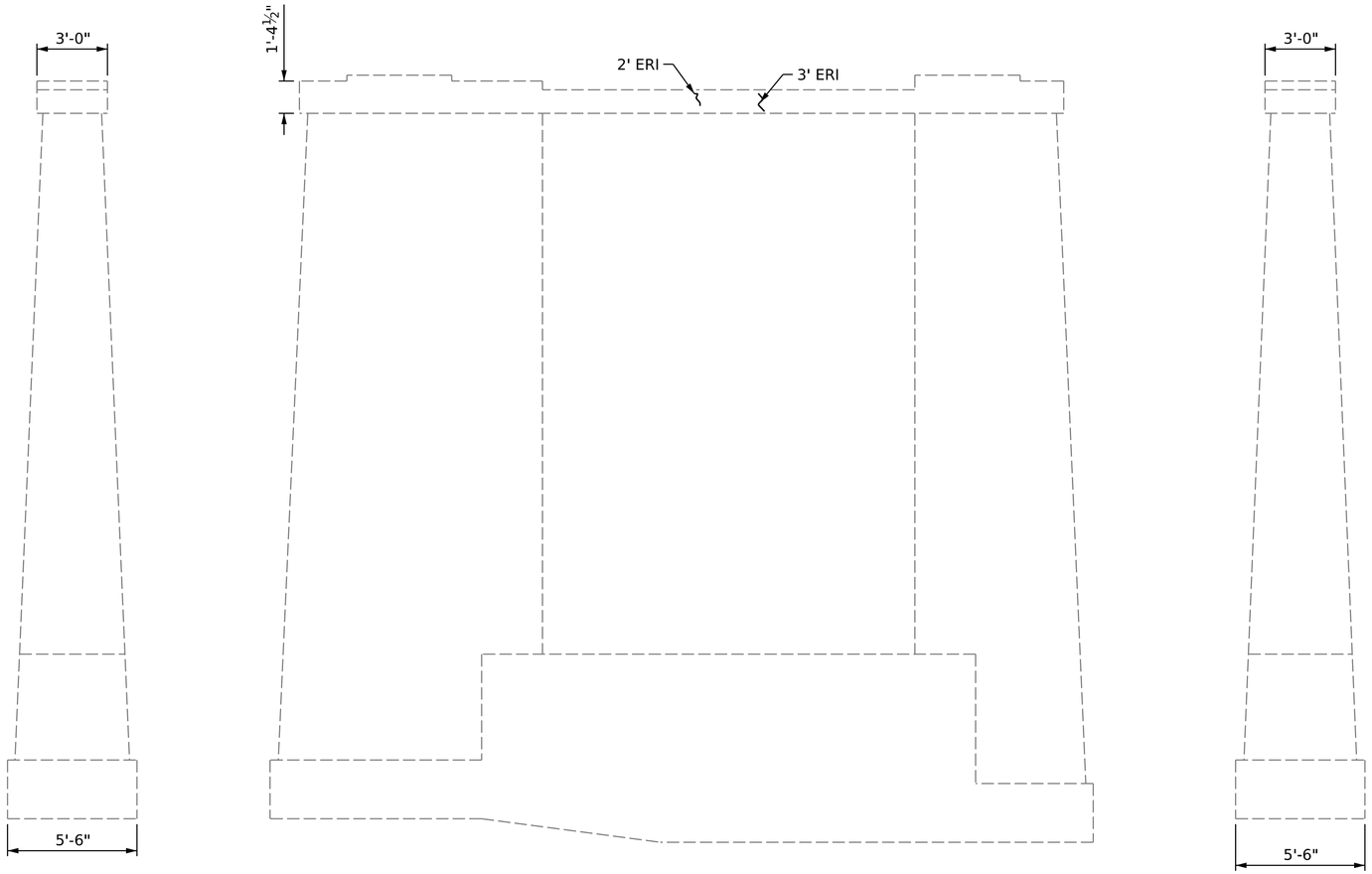
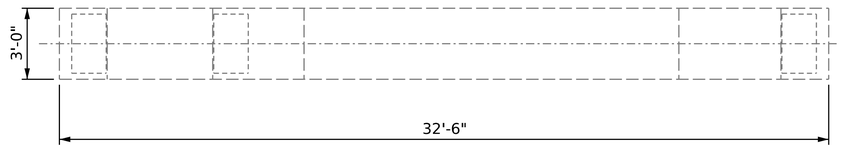


ELEVATION



PLAN

SUBSTRUCTURE REPAIR QUANTITY TABLE

REPAIRS - BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0	0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0	0		
EPOXY RESIN INJECTION		LINEAR FT		LINEAR FT
CAP		5		
COLUMN		0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT.
SEE REPAIR DETAILS.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON 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 AND ENTER THE ACTUAL QUANTITIES INTO THE REPAIR QUANTITY TABLE.

CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR "SHOTCRETE REPAIRS", SEE SPECIAL PROVISIONS.

REPAIR KEY

- SHOTCRETE REPAIR AREA
- CONCRETE REPAIR AREA
- EPOXY RESIN INJECTION

PROJECT NO. HI-0015
COLUMBUS COUNTY
BRIDGE NO. 230083

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
Aster Abraha
12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 1
SPAN A SIDE

DRAWN BY : S. T. SANDOR DATE : 9/2023
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1			3			TOTAL SHEETS
2			4			13

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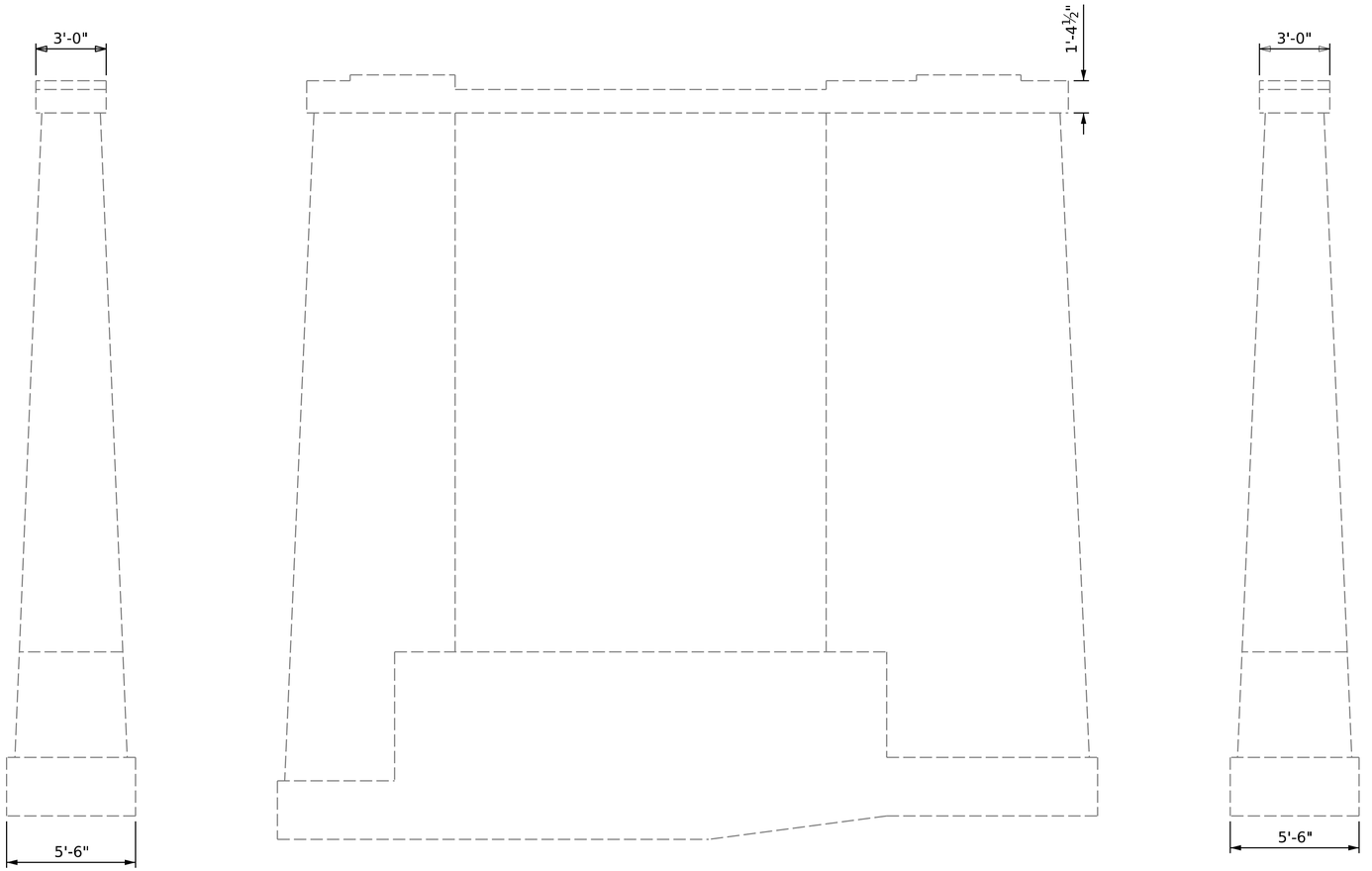
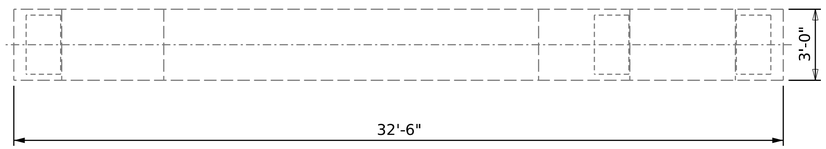
aabraha



ELEVATION



PLAN

SUBSTRUCTURE REPAIR QUANTITY TABLE

REPAIRS - BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0	0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0	0		
EPOXY RESIN INJECTION	.	LINEAR FT		LINEAR FT
CAP		0		
COLUMN		0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT.
SEE REPAIR DETAILS.

NOTES

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CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR "SHOTCRETE REPAIRS", SEE SPECIAL PROVISIONS.

REPAIR KEY

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

EPOXY RESIN INJECTION

PROJECT NO. HI-0015
COLUMBUS COUNTY
BRIDGE NO. 230083

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 1
SPAN B SIDE

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Signed by: Aster Abraha
12/21/2023

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2			4			13

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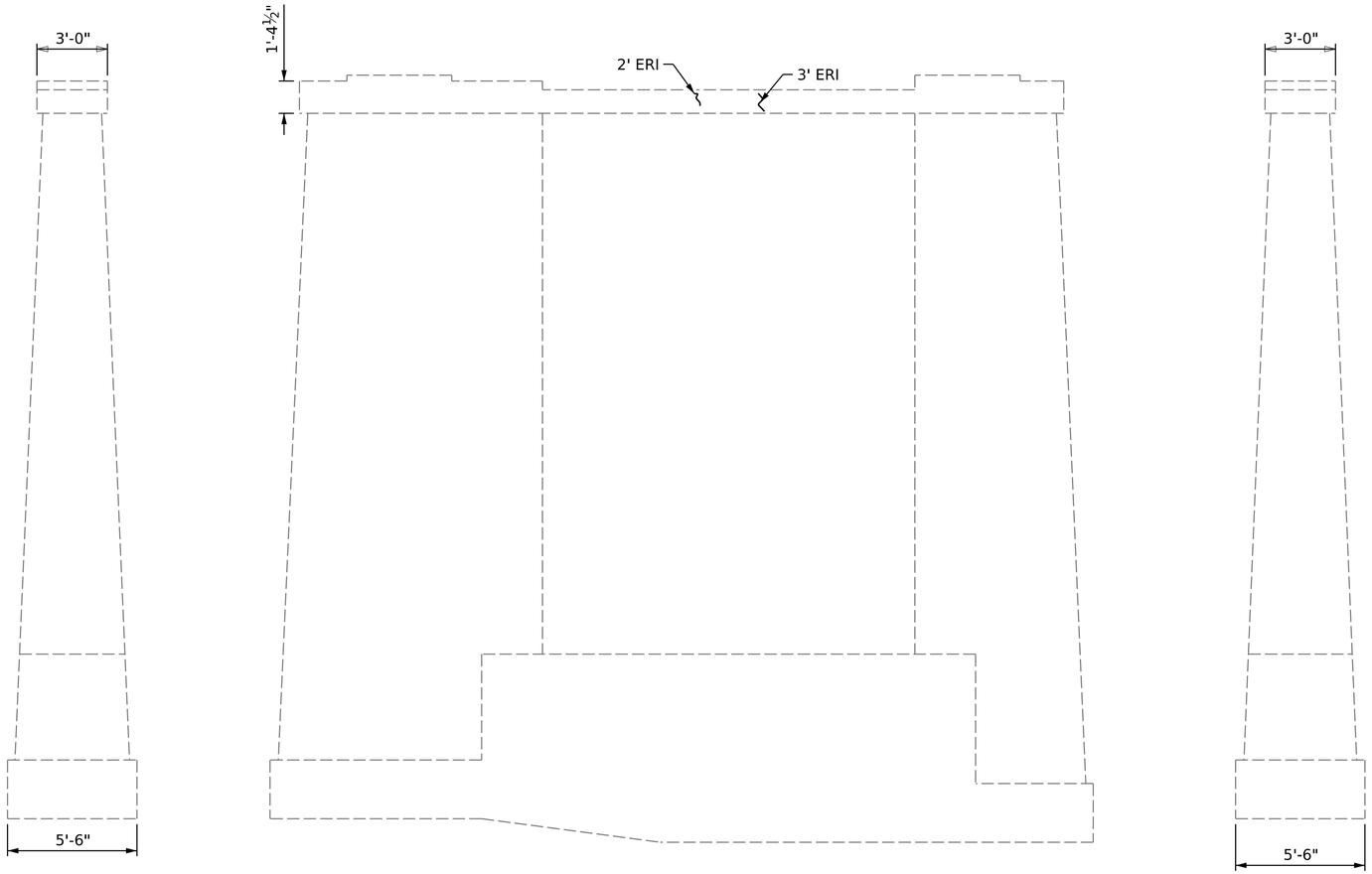
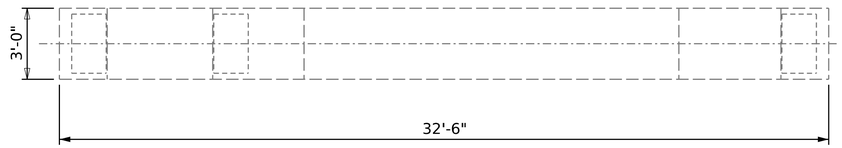


ELEVATION



PLAN

SUBSTRUCTURE REPAIR QUANTITY TABLE

REPAIRS - BENT 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0	0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0	0		
EPOXY RESIN INJECTION	.	LINEAR FT		LINEAR FT
CAP		5		
COLUMN		0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT.
SEE REPAIR DETAILS.

NOTES

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CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR "SHOTCRETE REPAIRS", SEE SPECIAL PROVISIONS.

REPAIR KEY

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

EPOXY RESIN INJECTION

PROJECT NO. HI-0015
COLUMBUS COUNTY
BRIDGE NO. 230083

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
Aster Abraha
12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 2
SPAN B SIDE

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1			3			TOTAL SHEETS
2			4			13

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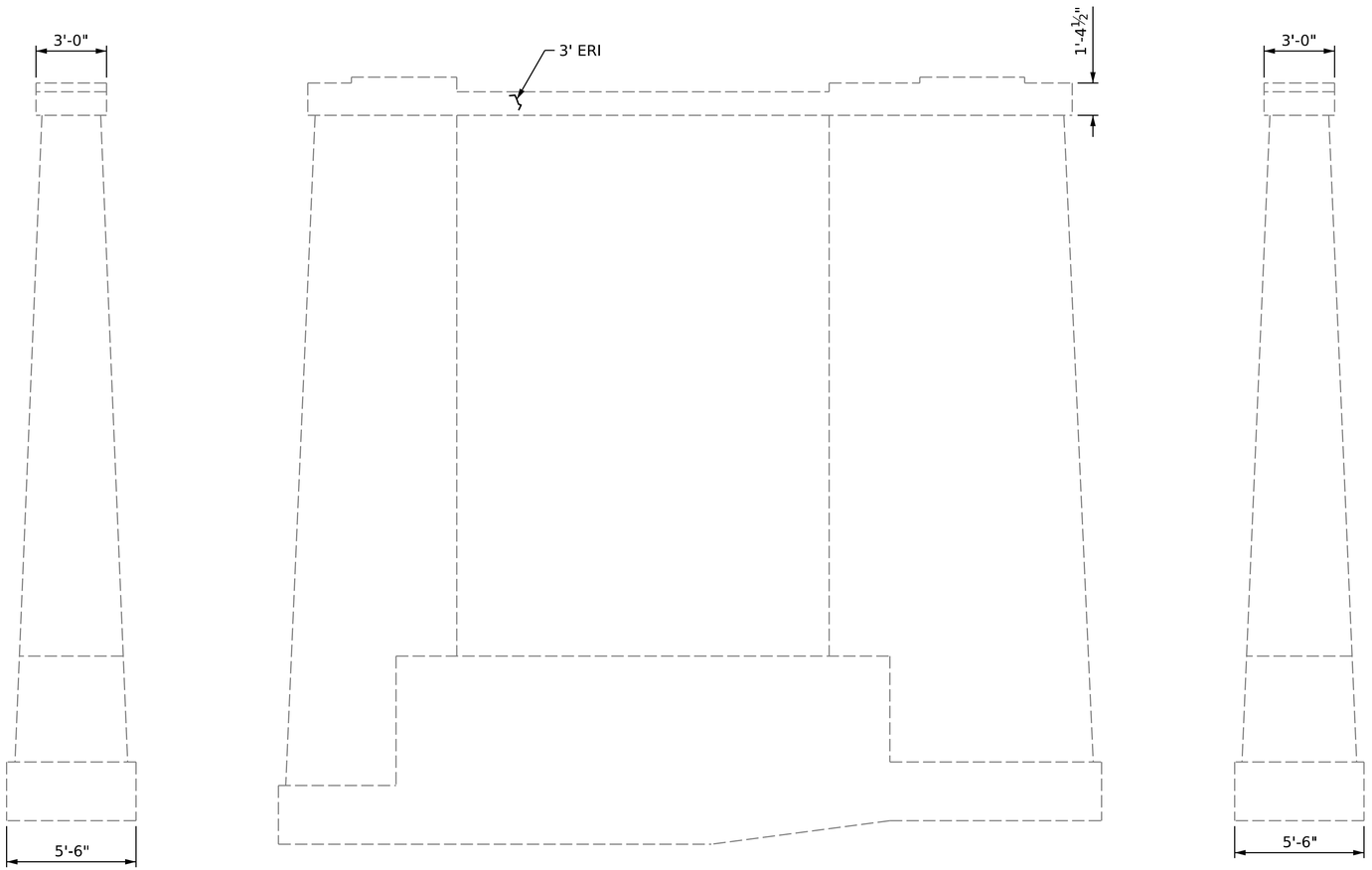
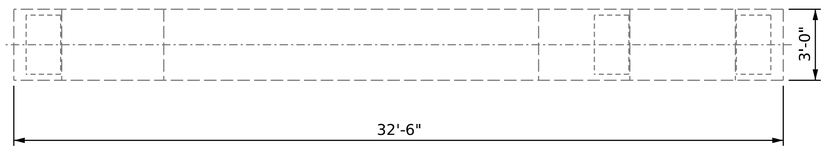
aabraha



ELEVATION



PLAN

SUBSTRUCTURE REPAIR QUANTITY TABLE

REPAIRS - BENT 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0	0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0	0		
EPOXY RESIN INJECTION		LINEAR FT		LINEAR FT
CAP		3.0		
COLUMN		0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT.
SEE REPAIR DETAILS.

NOTES

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CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR "SHOTCRETE REPAIRS", SEE SPECIAL PROVISIONS.

REPAIR KEY

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

EPOXY RESIN INJECTION

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha

12/21/2023

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230083

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 2
SPAN C SIDE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-11
1			3			TOTAL SHEETS
2			4			13

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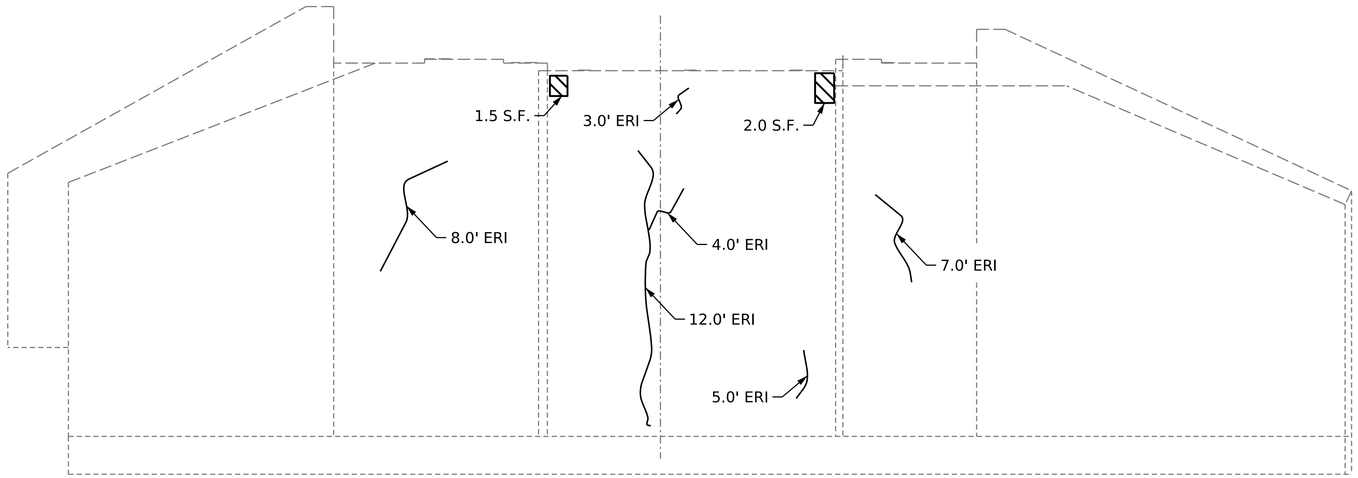

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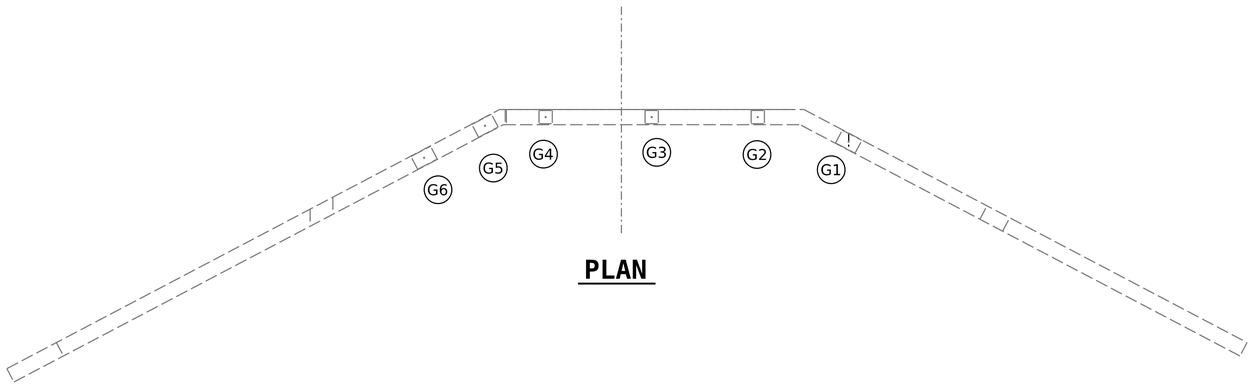

PLAN

REPAIR KEY

- SHOTCRETE REPAIR AREA
- CONCRETE REPAIR AREA
- EPOXY RESIN INJECTION
- (G#) GIRDER NUMBER

SUBSTRUCTURE REPAIR QUANTITY TABLE

REPAIRS - ABUTMENT B	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
CURTAIN WALL	3.5	1.8		
WINGWALL				
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
CURTAIN WALL	0	0		
WINGWALL				
EPOXY RESIN INJECTION		LINEAR FT		LINEAR FT
CAP		0		
CURTAIN WALL		39.0		
WINGWALL				

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT. SEE REPAIR DETAILS.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON 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 AND ENTER THE ACTUAL QUANTITIES INTO THE REPAIR QUANTITY TABLE.

CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR "SHOTCRETE REPAIRS", SEE SPECIAL PROVISIONS.

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230083

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha

12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ABUTMENT B

DRAWN BY : S. T. SANDOR DATE : 9/2023
CHECKED BY : G. AYES DATE : 10/2023
DESIGN ENGINEER OF RECORD: _____ DATE : _____

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1			3			TOTAL SHEETS
2			4			13

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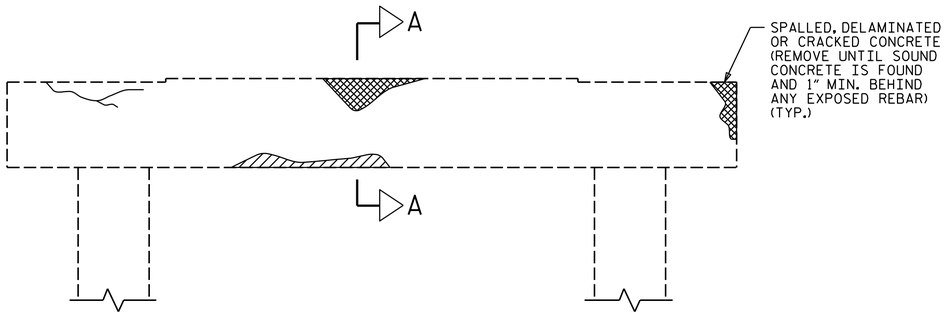
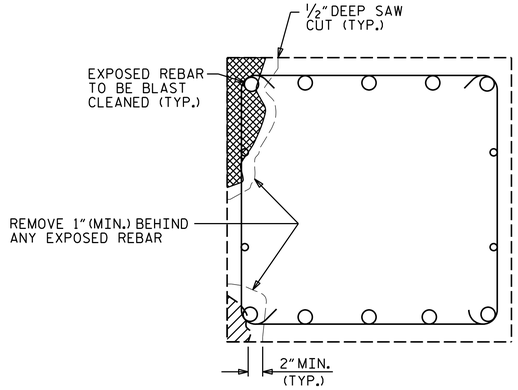
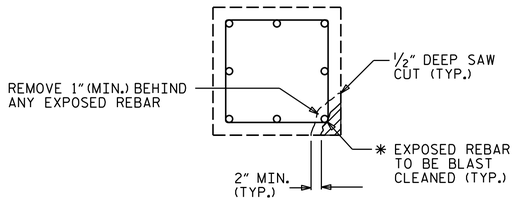


BENT CAP REPAIRS



SECTION A-A



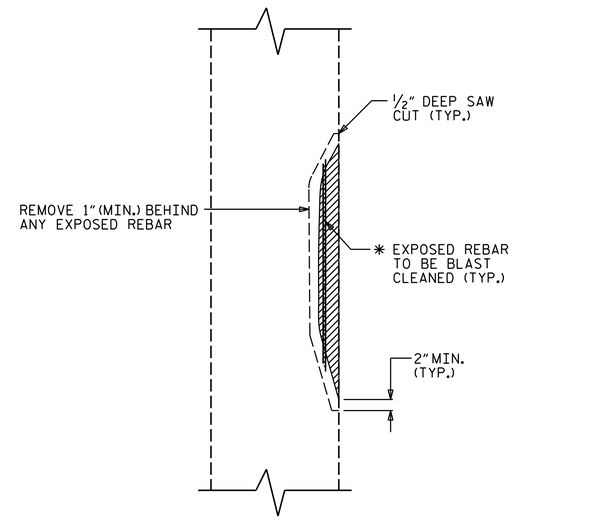
PLAN OF COLUMN

REPAIR KEY

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA (FORM AND POUR)

CAP REPAIR

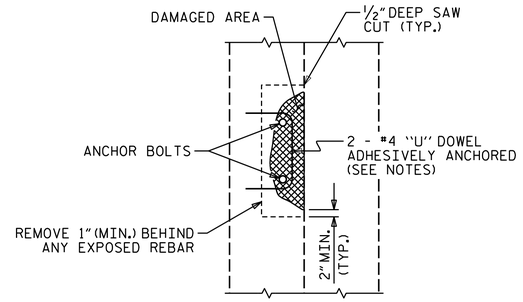


* REPAIR LENGTH SHALL NOT EXCEED 10 FEET.

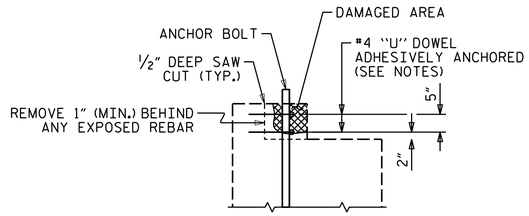
ELEVATION OF COLUMN

COLUMN REPAIR

SPLICE LENGTH TABLE	
BAR SIZE	MIN. SPLICE LENGTH
#4	2'-5"
#5	3'-0"
#6	3'-7"
#7	4'-2"
#8	4'-9"
#9	5'-4"
#10	6'-0"
#11	6'-8"



PLAN



ELEVATION

PEDESTAL WALL REPAIR

NOTES

TYPICAL BENT CAP REPAIRS ARE SHOWN. REPAIR DETAILS SIMILAR FOR END BENT CAPS AND STRUTS.

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.

THE CONTRACTOR SHALL REMOVE THE DETERIORATED CONCRETE IN ACCORDANCE WITH THE GUIDELINES SET IN THESE NOTES, IN THE SPECIAL PROVISIONS AND THE STANDARD SPECIFICATIONS.

REMOVE UNSOUND CONCRETE TO THE EXTENT NECESSARY, MINIMUM OF 1" BEHIND REBAR AND MINIMUM OF 2" CLEARANCE TO SAWCUT.

NO MORE THAN ONE-THIRD OF THE CAP OR COLUMN CIRCUMFERENCE SHALL BE REMOVED AT ONE TIME. SHOULD IT BECOME NECESSARY TO REMOVE MORE THAN 30% OF A CAP OR COLUMN CROSS SECTIONAL AREA, NOTIFY THE ENGINEER PRIOR TO PROCEEDING.

SIMULTANEOUS REMOVAL OF UNSOUND CONCRETE MAY BE PERMITTED ON MORE THAN ONE FACE OF A CAP AND/OR COLUMN, BUT NO MORE THAN ½ OF THE CIRCUMFERENCE SHALL BE REMOVED AT ONE TIME. IF REMOVAL EXTENDS MORE THAN 1½" BEHIND THE MAIN REINFORCING BARS, NOTIFY THE ENGINEER PRIOR TO PROCEEDING. ON COLUMNS AND PILES, NO MORE THAN 10 VERTICAL FEET MAY BE EXPOSED AT ONE TIME BEFORE PLACEMENT OF REPAIR CONCRETE.

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.

THE #4 "U" DOWELS ARE REQUIRED ONLY AROUND THE ANCHOR BOLTS. THE EXISTING REINFORCING STEEL IN THE PEDESTAL WALL SHALL BE CLEANED, STRAIGHTENED AND REMAIN IN PLACE.

FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.

COAT ALL REPAIR SURFACE AREAS ON THE TOP OF CAPS, INCLUDING CHAMFERS, WITH EPOXY PROTECTIVE COATING, OVERLAPPING THE REPAIR AREA BY A MINIMUM OF 3" ON ALL POSSIBLE SIDES.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

CLEAN ALL EXPOSED REINFORCING BARS AND PRESTRESSED STRANDS IN ACCORDANCE WITH APPROPRIATE SPECIAL PROVISIONS. 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.

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230083

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha

DDA090AEDS504FD...

12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
TYPICAL CAP AND COLUMN REPAIR DETAILS

ASSEMBLED BY : S. T. SANDOR	DATE : 10/2023
CHECKED BY : G. AYES	DATE : 11/2023
DRAWN BY : NAP 8/18	
CHECKED BY :	

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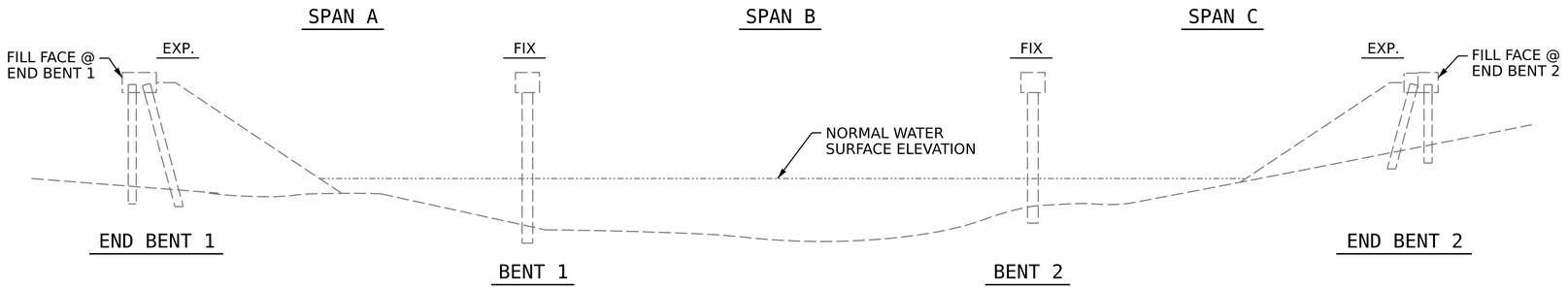
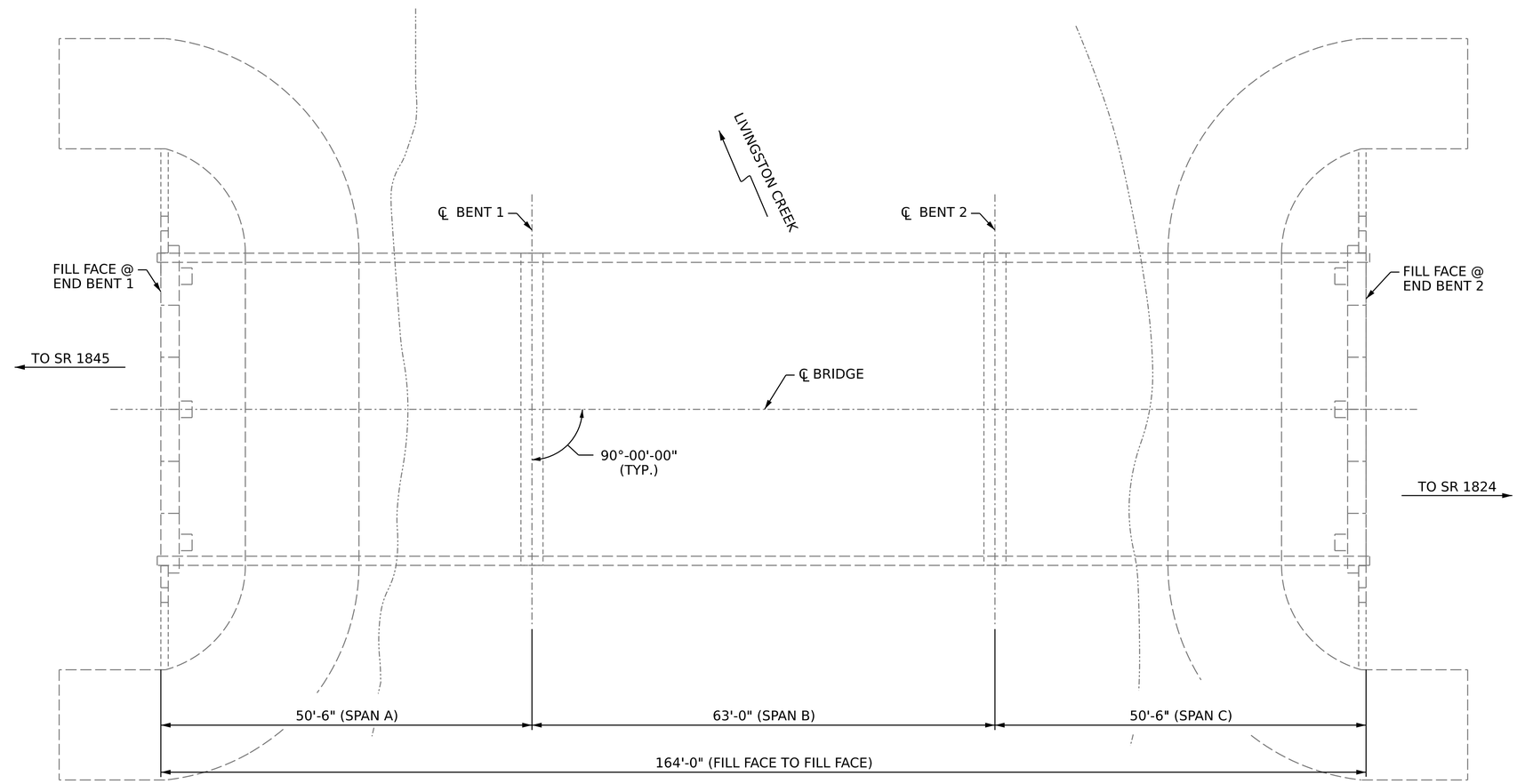


SECTION ALONG ℄ ROADWAY



PLAN

(PILES NOT SHOWN
IN PLAN VIEW FOR CLARITY)

NOTES

- GENERAL DRAWING AND PROFILE INFORMATION IS TAKEN FROM ORIGINAL PLANS AND INSPECTION REPORT DATED 07/12/2022.
- BRIDGE ORIENTATION CONFORMS TO EXISTING BRIDGE PLANS.

SCOPE OF WORK

- PARTIALLY REMOVE TOP OF BRIDGE DECK CONCRETE BY SCARIFICATION AND SHOTBLASTING METHODS.
- DEMOLISH EXISTING BRIDGE DECK JOINTS WITH CLASS II SURFACE PREPARATION.
- PERFORM CONCRETE DECK REPAIRS IN PREPARED AREAS.
- OVERLAY PREPARED BRIDGE DECK WITH POLYMER CONCRETE (PC).
- RECONSTRUCT BRIDGE JOINTS AND INSTALL FOAM JOINT SEAL.
- GROOVE POLYMER CONCRETE BRIDGE DECK.
- CLEAN AND PAINT EXISTING STRUCTURAL STEEL.
- CLEAN AND PAINT EXISTING BEARINGS WITH HRSCA.
- REMOVE UNSOUND CONCRETE AND PROPERLY PREPARE AREAS FOR CONCRETE AND SHOTCRETE REPAIRS.
- PERFORM CONCRETE AND SHOTCRETE REPAIRS.
- EPOXY COAT BENT CAPS.

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230086

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD
Signed by: [signature]
12/21/2023

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
Signed by: Aster Abraha
12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE 86 ON
US 74 WEST BOUND
OVER LIVINGSTON CREEK,
BETWEEN SR 1845 AND SR 1824

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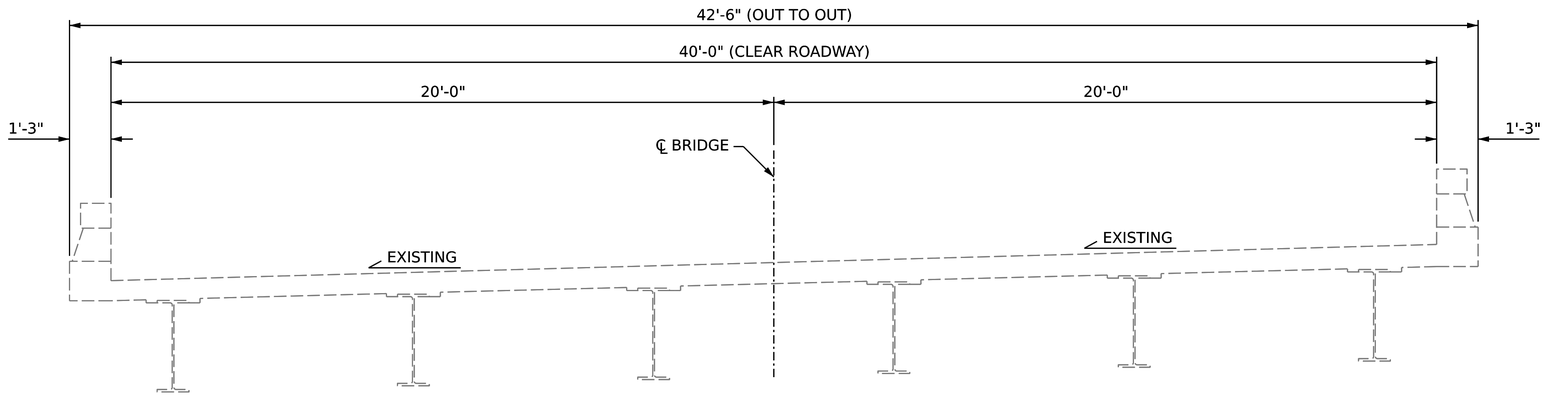
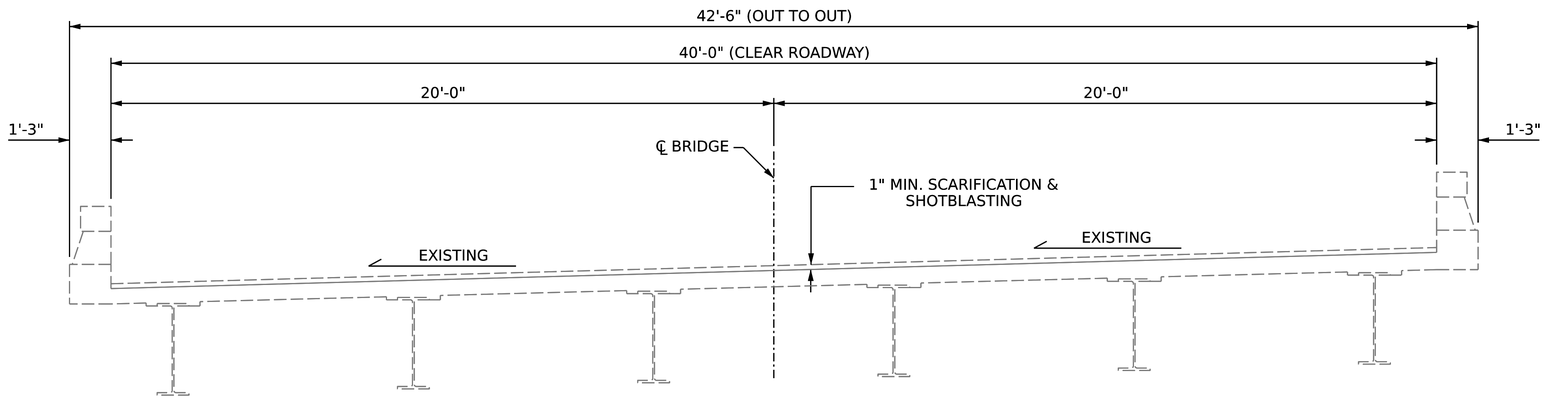
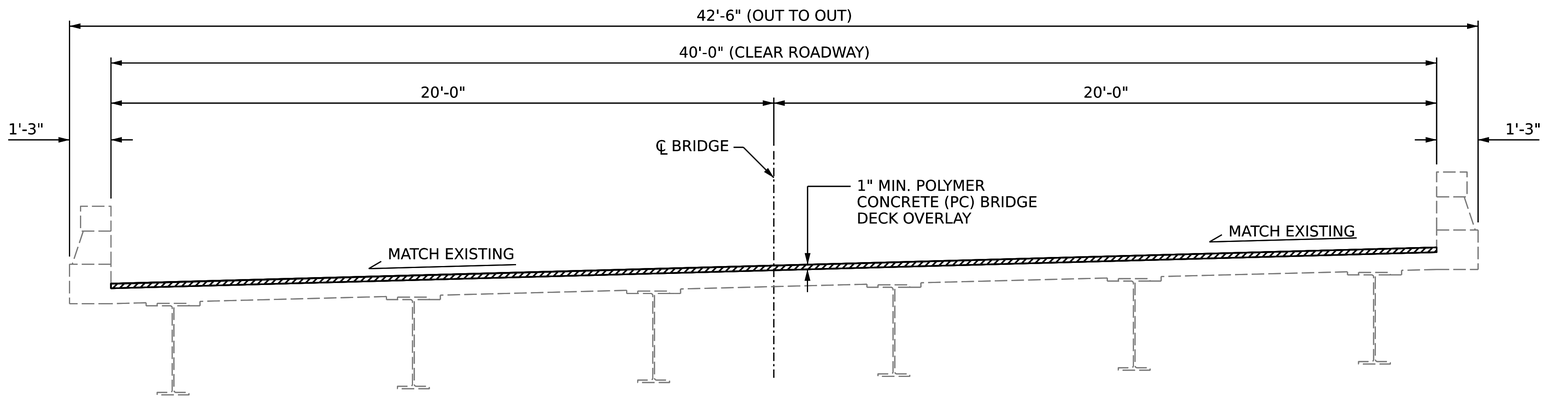


TYPICAL SECTION
(EXISTING)



TYPICAL SECTION
(DECK PREPARATION)

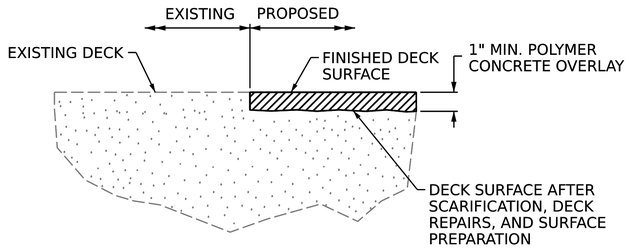


TYPICAL SECTION
(PROPOSED)

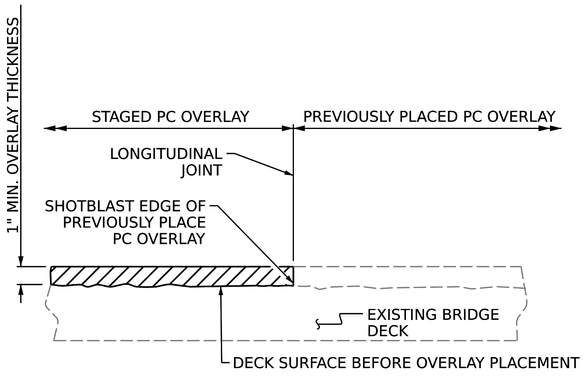
NOTES

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

THE CONTRACTOR SHALL SUBMIT TO REVIEW AND APPROVAL A PLAN FOR SCARIFICATION, SURFACE PREPARATION, PC OVERLAY PLACEMENT AND FINISHING TO ATTAIN THE FINAL SURFACE SLOPE AS INDICATED.



DETAIL FOR
POLYMER CONCRETE (PC) OVERLAY



STAGED PC OVERLAY JOINT

PROJECT NO. HI-0015
COLUMBUS COUNTY
BRIDGE NO. 230086

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRUHA
Signed by: Aster Abrulia
12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION AND SURFACE PREPARATION DETAILS

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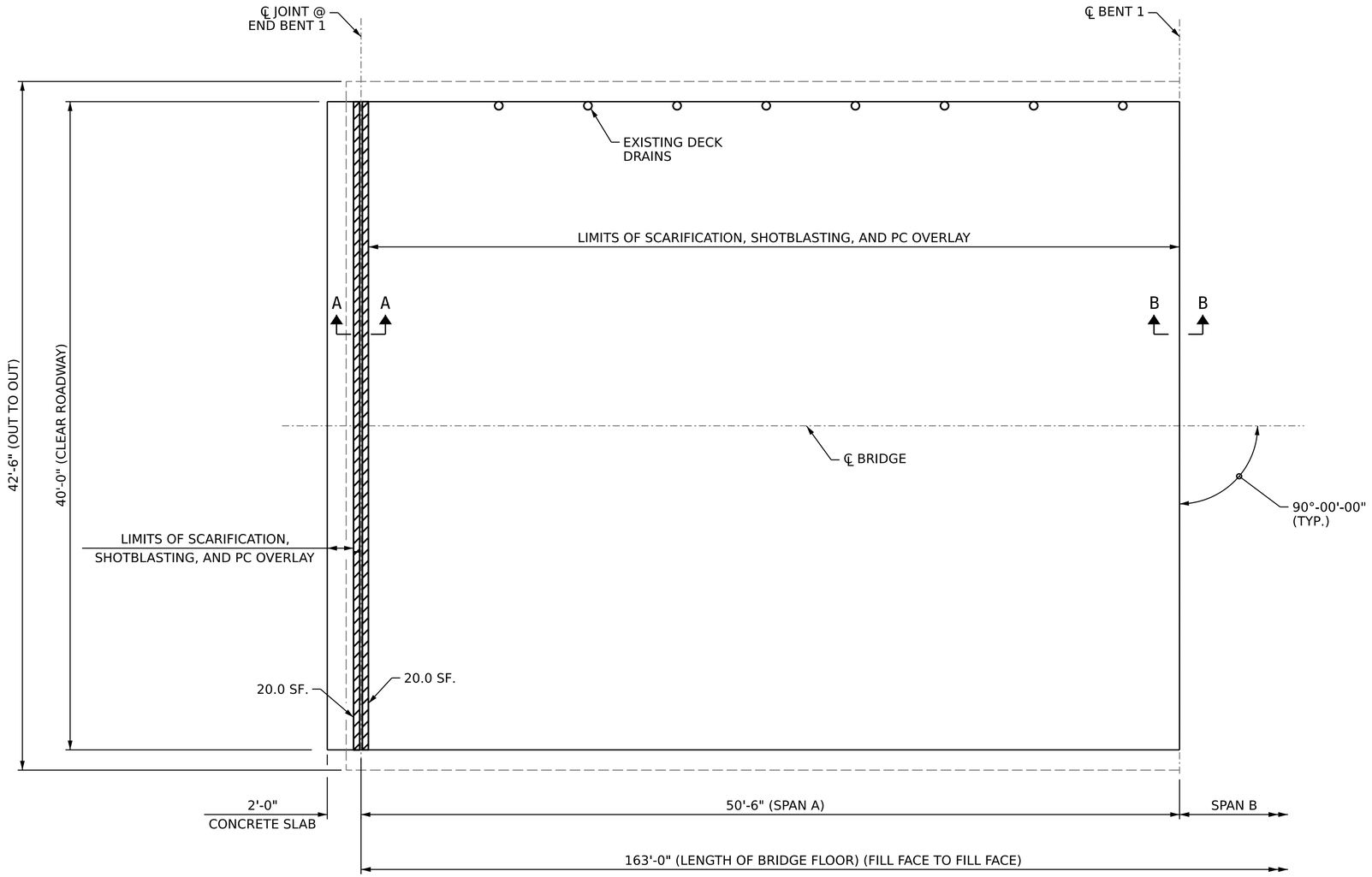

PLAN

SUMMARY OF QUANTITIES FOR SPAN A AND APPROACH SLAB 1

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	228.4 SY	
SHOTBLASTING BRIDGE DECK	228.4 SY	
CLASS II SURFACE PREPARATION	4.4 SY	
CLASS III SURFACE PREPARATION	0.0 SY	
CONCRETE DECK REPAIR FOR PC OVERLAY	4.4 SY	
POLYESTER POLYMER CONCRETE MATERIALS	7.9 CY	
EPOXY POLYMER CONCRETE MATERIALS (ALTERNATE)	7.9 CY	
PLACING & FINISHING PC OVERLAY	228.4 SY	
GROOVING BRIDGE DECK	1,893.2 SF	

QUANTITIES FOR PC OVERLAY ARE BASED ON OVERLAY DEPTH PLUS AN ADDITIONAL 1/4" TO ACCOUNT FOR IRREGULARITIES IN SCARIFICATION PROCESSES.

NOTES:

DECK SURFACE REPAIR QUANTITIES REPRESENT ESTIMATED VALUES OF CLASS II SURFACE PREPARATION AND CONCRETE DECK REPAIR AFTER REMOVAL OF UNSOUND CONCRETE. (MIN. 2" CLEAR TO SAWCUT). SEE CONCRETE DECK REPAIR FOR PC OVERLAY SPECIAL PROVISIONS.

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE BASED ON 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 ENTER THE ACTUAL QUANTITIES INTO THE ACTUAL REPAIR QUANTITY TABLE.

FOR CONCRETE DECK REPAIR FOR PC OVERLAY, SEE SPECIAL PROVISIONS.

FOR SECTION A-A AND B-B, SEE JOINT DETAILS SHEET.

REPAIR LEGEND

SCARIFYING AND SHOTBLASTING OF BRIDGE DECK FOR PC OVERLAY

APPROX. AREA CLASS II SURFACE PREPARATION

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230086

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SURFACE PREPARATION SPAN A

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ISTER G. ABRAHA

Digitally signed by: Ister Abraha
DocuSigned by: 12/21/2023

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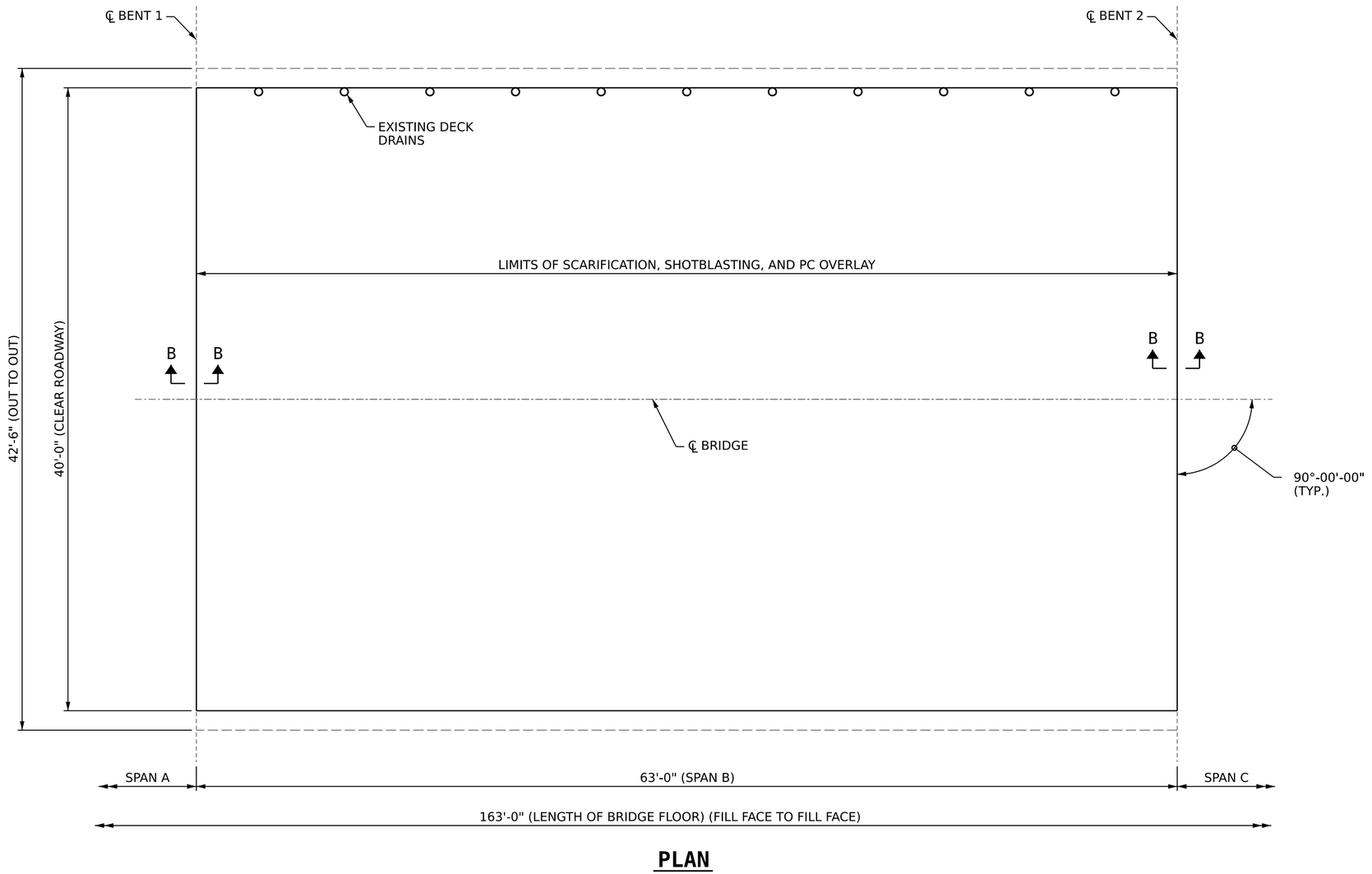

PLAN

SUMMARY OF QUANTITIES FOR SPAN B

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	280.0 SY	
SHOTBLASTING BRIDGE DECK	280.0 SY	
CLASS II SURFACE PREPARATION	0.0 SY	
CLASS III SURFACE PREPARATION	0.0 SY	
CONCRETE DECK REPAIR FOR PC OVERLAY	0.0 SY	
POLYESTER POLYMER CONCRETE MATERIALS	9.7 CY	
EPOXY POLYMER CONCRETE MATERIALS (ALTERNATE)	9.7 CY	
PLACING & FINISHING PC OVERLAY	280.0 SY	
GROOVING BRIDGE DECK	2,331.0 SF	

QUANTITIES FOR PC OVERLAY ARE BASED ON OVERLAY DEPTH PLUS AN ADDITIONAL 1/4" TO ACCOUNT FOR IRREGULARITIES IN SCARIFICATION PROCESSES.

NOTES:

DECK SURFACE REPAIR QUANTITIES REPRESENT ESTIMATED VALUES OF CLASS II SURFACE PREPARATION AND CONCRETE DECK REPAIR AFTER REMOVAL OF UNSOUND CONCRETE. (MIN. 2" CLEAR TO SAWCUT). SEE CONCRETE DECK REPAIR FOR PC OVERLAY SPECIAL PROVISIONS.

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE BASED ON 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 ENTER THE ACTUAL QUANTITIES INTO THE ACTUAL REPAIR QUANTITY TABLE.

FOR CONCRETE DECK REPAIR FOR PC OVERLAY, SEE SPECIAL PROVISIONS.

FOR SECTION A-A AND B-B, SEE JOINT DETAILS SHEET.

REPAIR LEGEND

SCARIFYING AND SHOTBLASTING OF BRIDGE DECK FOR PC OVERLAY

APPROX. AREA CLASS II SURFACE PREPARATION

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230086

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ISTER G. ABRAHA

Ister Abraha

12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SURFACE PREPARATION SPAN B

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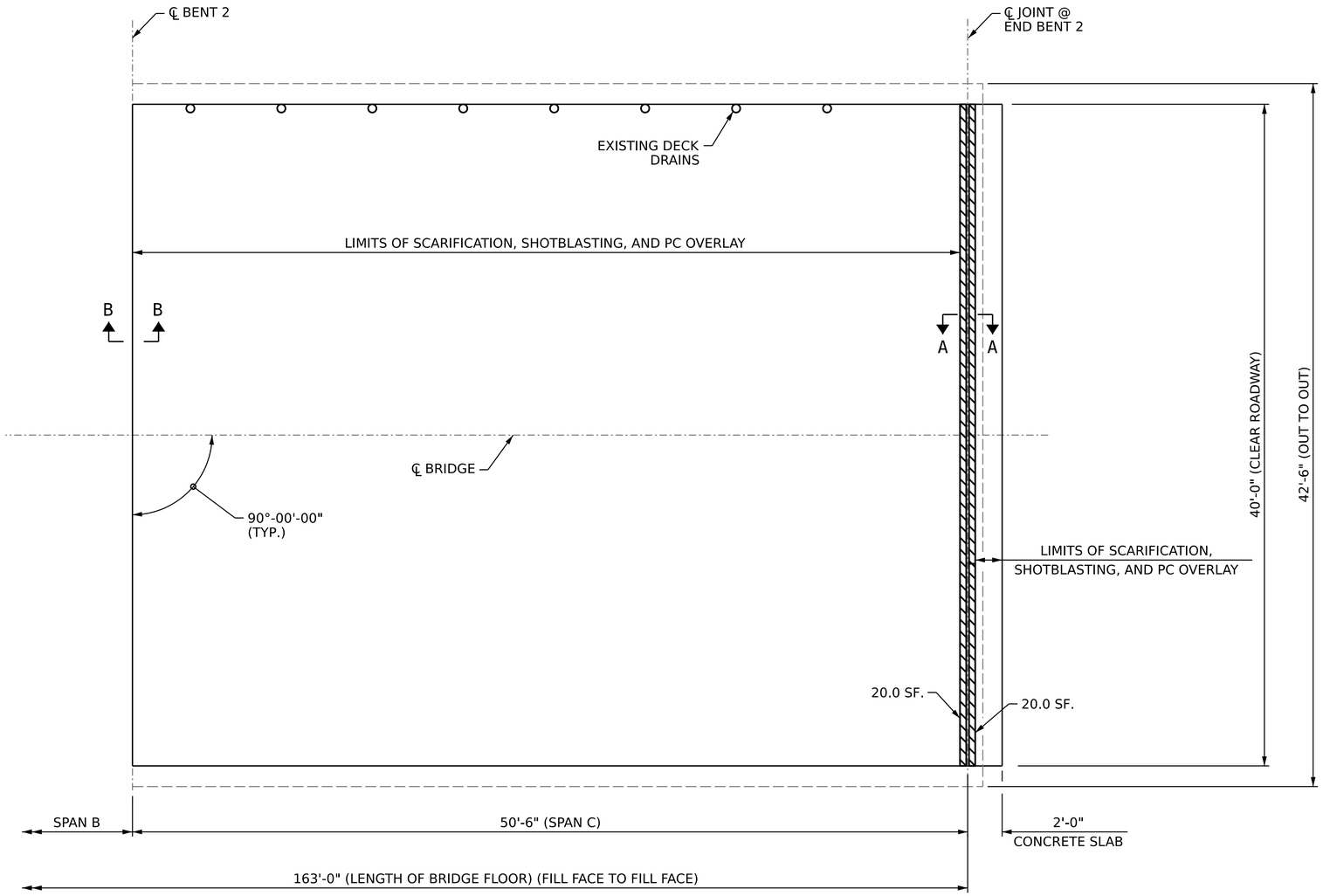

PLAN

SUMMARY OF QUANTITIES FOR SPAN C AND APPROACH SLAB 2

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	228.4 SY	
SHOTBLASTING BRIDGE DECK	228.4 SY	
CLASS II SURFACE PREPARATION	4.4 SY	
CLASS III SURFACE PREPARATION	0.0 SY	
CONCRETE DECK REPAIR FOR PC OVERLAY	4.4 SY	
POLYESTER POLYMER CONCRETE MATERIALS	7.9 CY	
EPOXY POLYMER CONCRETE MATERIALS (ALTERNATE)	7.9 CY	
PLACING & FINISHING PC OVERLAY	228.4 SY	
GROOVING BRIDGE DECK	1,893.2 SF	

QUANTITIES FOR PC OVERLAY ARE BASED ON OVERLAY DEPTH PLUS AN ADDITIONAL 1/4" TO ACCOUNT FOR IRREGULARITIES IN SCARIFICATION PROCESSES.

NOTES:

DECK SURFACE REPAIR QUANTITIES REPRESENT ESTIMATED VALUES OF CLASS II SURFACE PREPARATION AND CONCRETE DECK REPAIR AFTER REMOVAL OF UNSOUND CONCRETE. (MIN. 2" CLEAR TO SAWCUT). SEE CONCRETE DECK REPAIR FOR PC OVERLAY SPECIAL PROVISION.

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE BASED ON 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 ENTER THE ACTUAL QUANTITIES INTO THE ACTUAL REPAIR QUANTITY TABLE.

FOR CONCRETE DECK REPAIR FOR PC OVERLAY, SEE SPECIAL PROVISIONS.

FOR SECTION A-A AND B-B, SEE JOINT DETAILS SHEET.

REPAIR LEGEND

SHOTBLASTING AND SCARIFICATION OF OF BRIDGE DECK FOR PC OVERLAY

APPROX. AREA CLASS II SURFACE PREPARATION

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230086

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ISTER G. ABRAHA

Digitally signed by: Ister Abraha

12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SURFACE PREPARATION SPAN C

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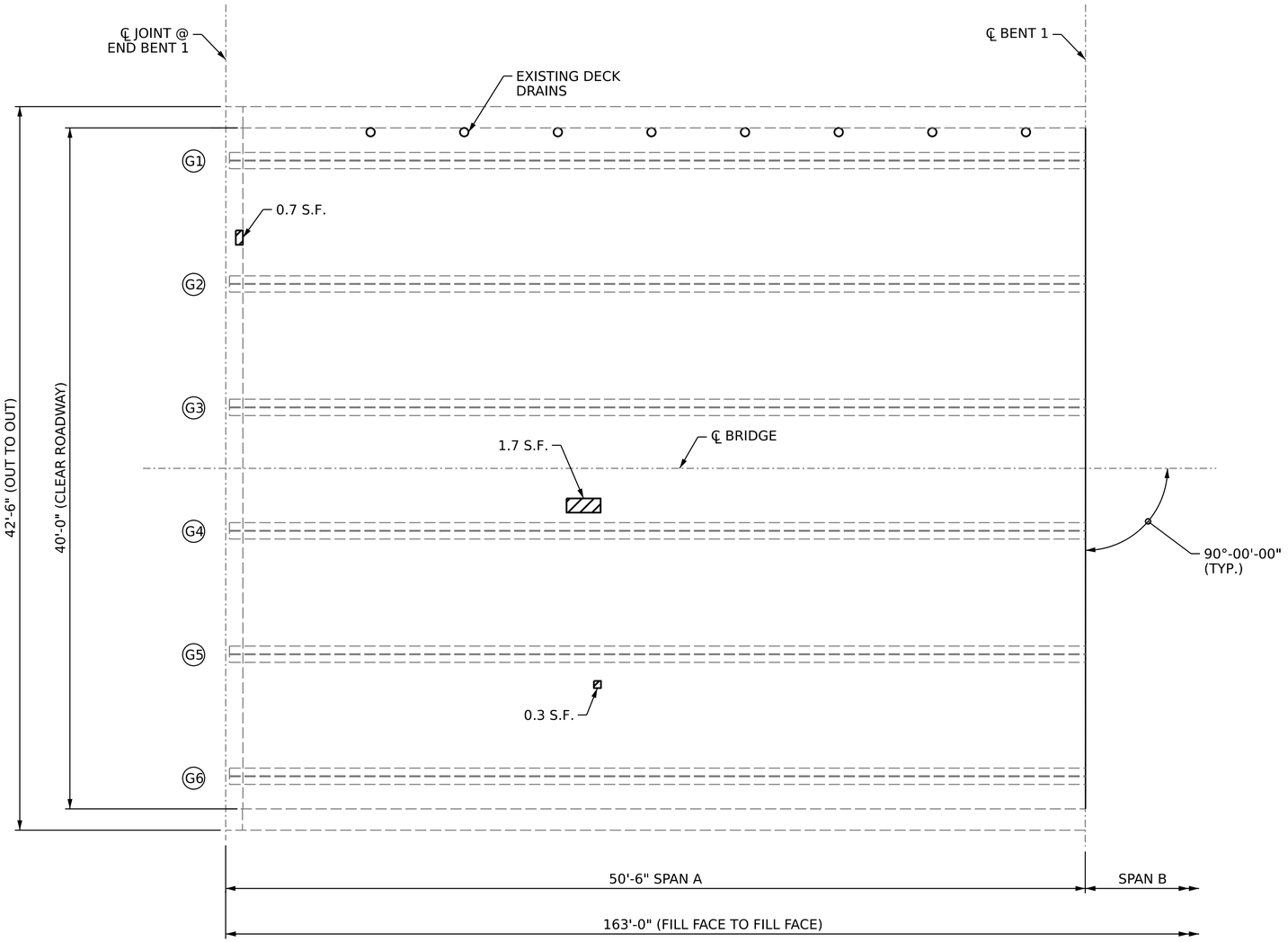

PLAN OF SPAN A

DECK UNDERSIDE REPAIR QUANTITY TABLE

DECK UNDERSIDE REPAIRS SPAN A	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK	2.0	0.7		
CONCRETE DIAPHRAGM	0.7	0.2		
OVERHANG	0	0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK	0	0		
CONCRETE DIAPHRAGM	0	0		
OVERHANG	0	0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT. SEE REPAIR DETAILS.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON 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 AND ENTER THE ACTUAL QUANTITIES INTO THE REPAIR QUANTITY TABLE.

CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR DECK REPAIR DETAILS, SEE SHEET S2-9.

FOR OVERHANG & DIAPHRAGM REPAIR DETAILS, SEE S2-10.

REPAIR KEY

- SHOTCRETE REPAIR AREA
- CONCRETE REPAIR AREA
- EPOXY RESIN INJECTION
- G# GIRDER NUMBER

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
Digitally signed by: Aster Abraha
12/21/2023

PROJECT NO. HI-0015
COLUMBUS COUNTY
BRIDGE NO. 230086
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK UNDERSIDE REPAIR SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-6
1			3			TOTAL SHEETS
2			4			18

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DRAWN BY : S. T. SANDOR DATE : 08/23
CHECKED BY : G. AYES DATE : 10/23
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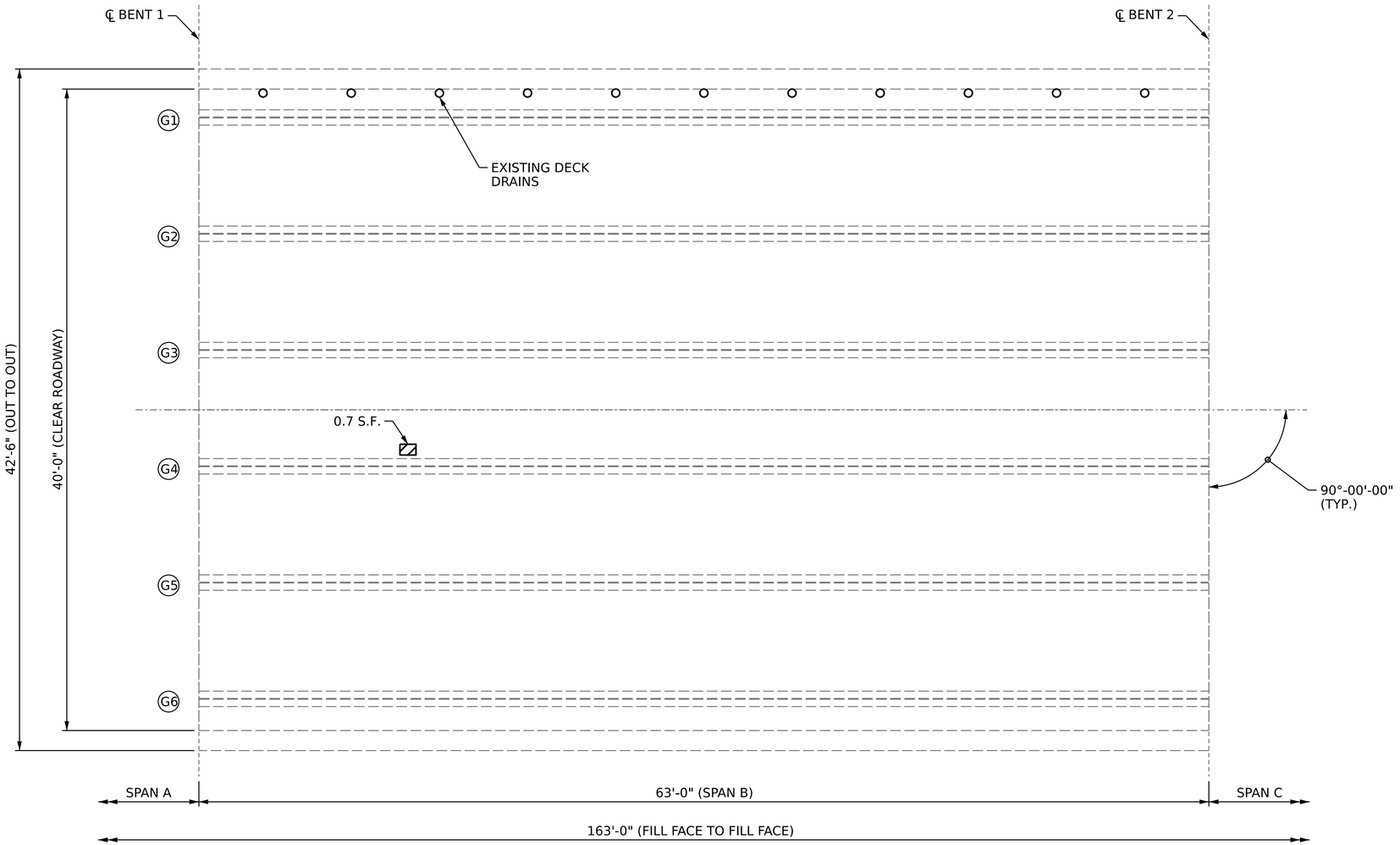

PLAN OF SPAN B

DECK UNDERSIDE REPAIR QUANTITY TABLE

DECK UNDERSIDE REPAIRS SPAN B	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK	0.7	0.2		
CONCRETE DIAPHRAGM	0	0		
OVERHANG	0	0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK	0	0		
CONCRETE DIAPHRAGM	0	0		
OVERHANG	0	0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT. SEE REPAIR DETAILS.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON 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 AND ENTER THE ACTUAL QUANTITIES INTO THE REPAIR QUANTITY TABLE.

CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR DECK REPAIR DETAILS, SEE SHEET S2-9.

FOR OVERHANG & DIAPHRAGM REPAIR DETAILS, SEE S2-10.

REPAIR KEY

- SHOTCRETE REPAIR AREA
- CONCRETE REPAIR AREA
- EPOXY RESIN INJECTION
- G# GIRDER NUMBER

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
Aster Abraha
12/21/2023

PROJECT NO. HI-0015
COLUMBUS COUNTY
BRIDGE NO. 230086

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNDERSIDE REPAIR SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-7
1			3			TOTAL SHEETS
2			4			18

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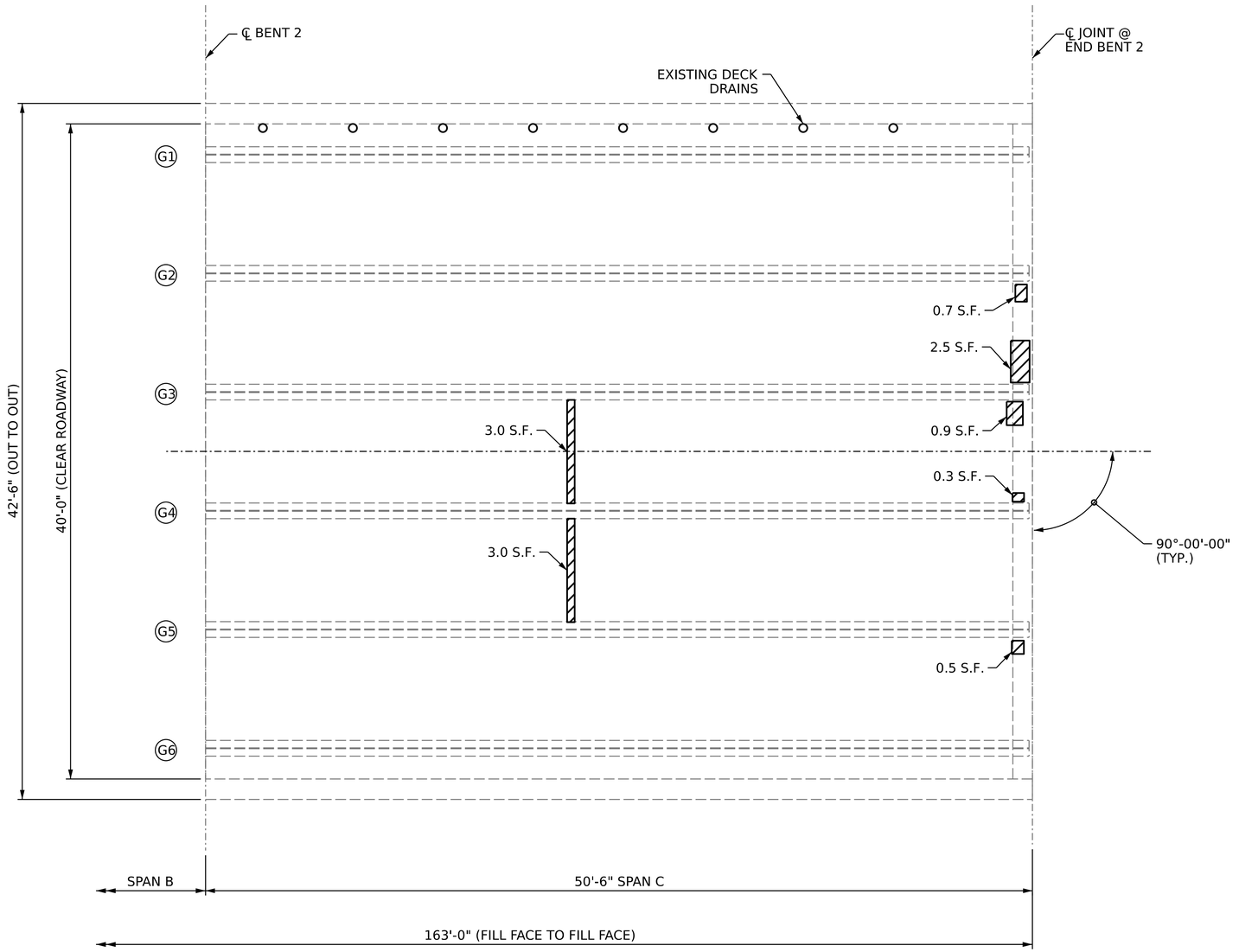
gabraha



PLAN OF SPAN C

DECK UNDERSIDE REPAIR QUANTITY TABLE

DECK UNDERSIDE REPAIRS SPAN C	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK	6.0	2.0		
CONCRETE DIAPHRAGM	4.9	1.6		
OVERHANG	0	0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK	0	0		
CONCRETE DIAPHRAGM	0	0		
OVERHANG	0	0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT. SEE REPAIR DETAILS.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON 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 AND ENTER THE ACTUAL QUANTITIES INTO THE REPAIR QUANTITY TABLE.

CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR DECK REPAIR DETAILS, SEE SHEET S2-9.

FOR OVERHANG & DIAPHRAGM REPAIR DETAILS, SEE S2-10.

REPAIR KEY

- SHOTCRETE REPAIR AREA
- CONCRETE REPAIR AREA
- EPOXY RESIN INJECTION
- (G#) GIRDER NUMBER

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
Signed by: Aster Abraha
12/21/2023

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PROJECT NO. HI-0015
COLUMBUS COUNTY
BRIDGE NO. 230086
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNDERSIDE REPAIR SPAN C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-8
1			3			TOTAL SHEETS
2			4			18

DRAWN BY : S. T. SANDOR DATE : 09/2023
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DESIGN ENGINEER OF RECORD: _____ DATE : _____

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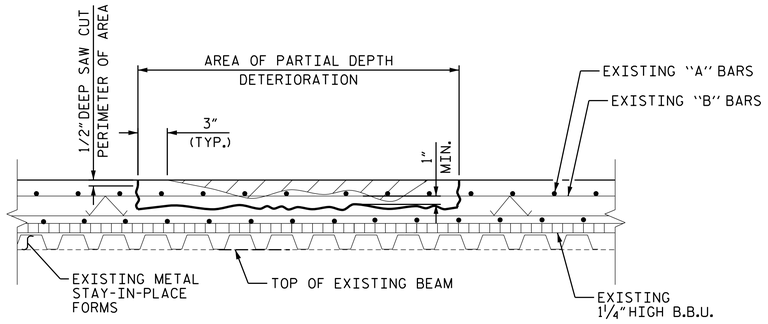
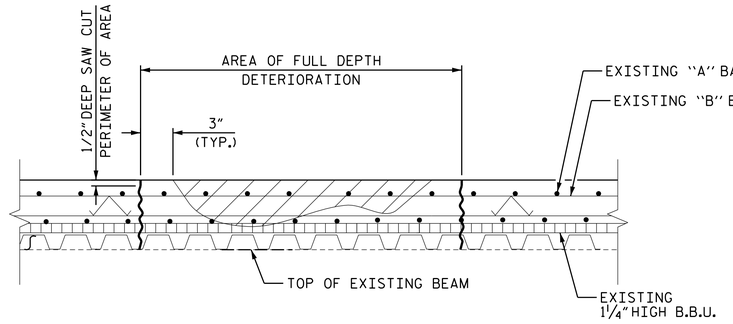


CLASS II (PARTIAL DEPTH) REPAIR



CLASS III (FULL DEPTH) REPAIR

NOTES

FOR AREAS TO BE REPAIRED, SEE "PLAN OF SPAN" SHEETS.

ALL DECK REPAIRS SHALL BE COMPLETED PRIOR TO PLACEMENT OF OVERLAY.

FOR CLASS II AND CLASS III SURFACE PREPARATION, SEE "OVERLAY SURFACE PREPARATIONS" SPECIAL PROVISION.

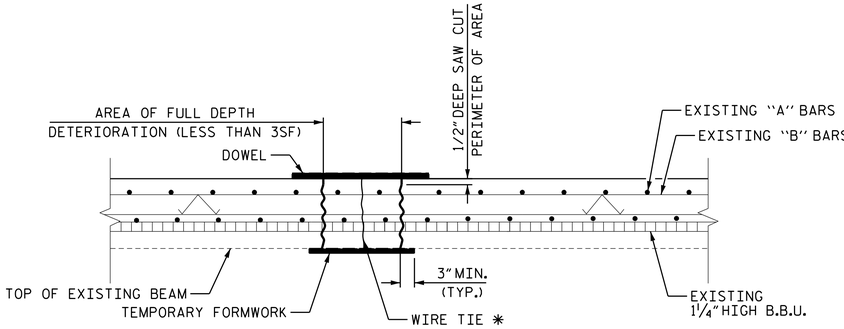
FOR CONCRETE FOR DECK REPAIR, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIR, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO STARTING WORK FOR TEMPORARY FORMWORK. FOR SUBMITTALS OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

UPON REMOVAL OF TEMPORARY FORMWORK, ALL VOIDS AND HONEYCOMBS ON THE UNDERSIDE OF DECK SURFACE SHALL BE FILLED WITH THE SAME MATERIAL AS USED FOR THE PATCH, AND FINISHED TO CONFORM TO THE SURROUNDING CONCRETE SURFACE.

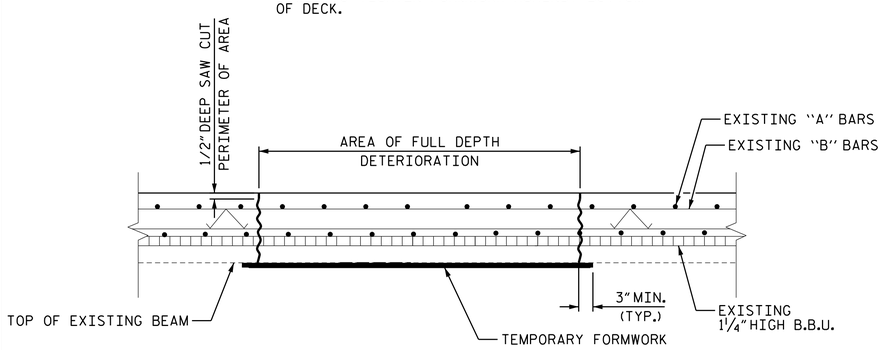
NO FORMWORK SHALL BE LEFT IN PLACE.



FULL DEPTH REPAIR WITH TEMPORARY FORMWORK

(FOR AREAS OF DETERIORATION EQUAL TO OR LESS THAN 3SF)

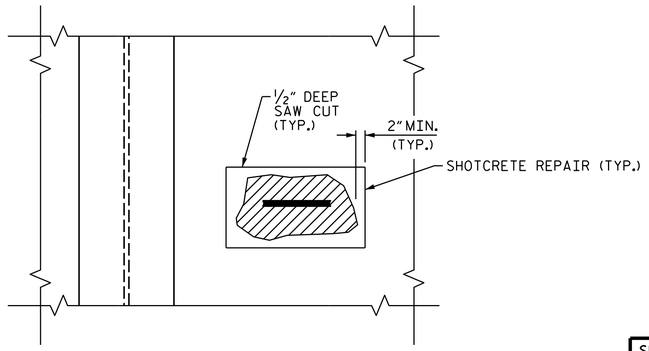
* WIRE TIE TO BE KNOTTED BELOW TEMPORARY FORMWORK AND ATTACHED TO DOWEL THAT IS WIDER THAN FORMED FULL DEPTH HOLE. ROTATE DOWEL TO TIGHTEN FORMWORK AGAINST BOTTOM OF DECK.



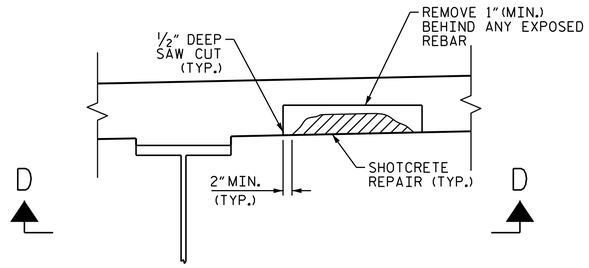
FULL DEPTH REPAIR WITH TEMPORARY FORMWORK

(FOR AREAS OF DETERIORATION GREATER THAN 3SF)

AREA OF DETERIORATION

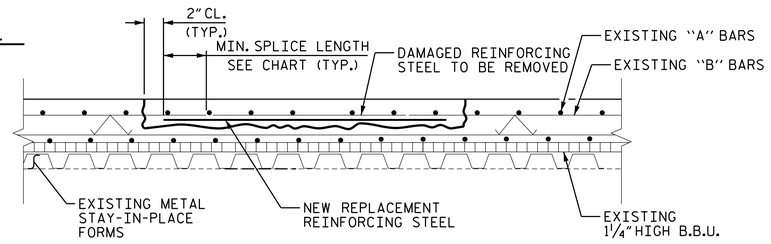


SECTION D-D



TYPICAL SECTION

UNDERSIDE OF DECK REPAIR



REINFORCING STEEL REPAIR

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

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

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230086

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

DECK REPAIR DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
DIGITALLY SIGNED...
12/21/2023

ASSEMBLED BY : S. T. SANDOR	DATE : 10/2023
CHECKED BY : G. AYES	DATE : 10/2023
DRAWN BY : NAP 9/18	
CHECKED BY :	

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-9
1			3			TOTAL SHEETS
2			4			18

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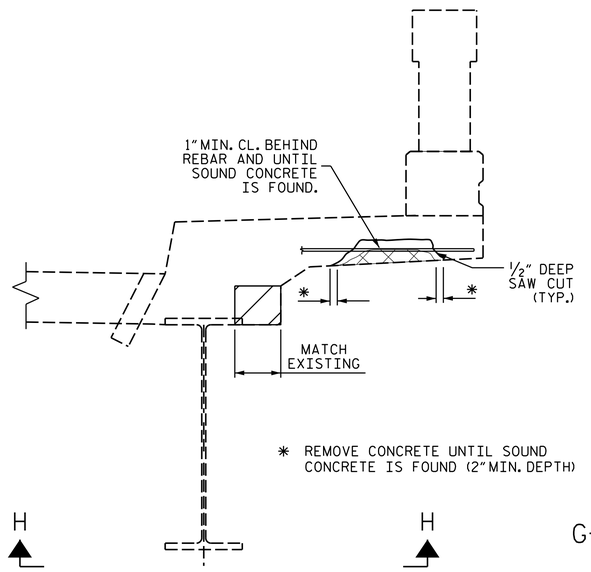
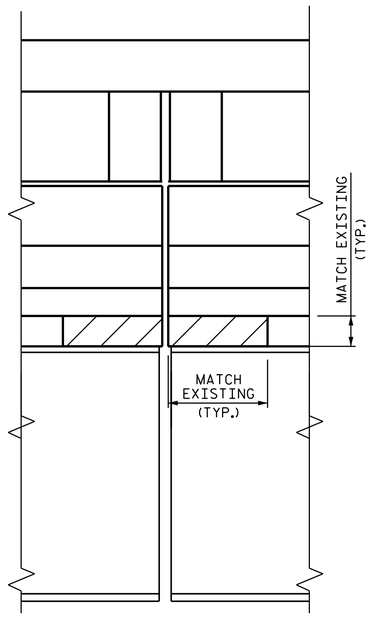
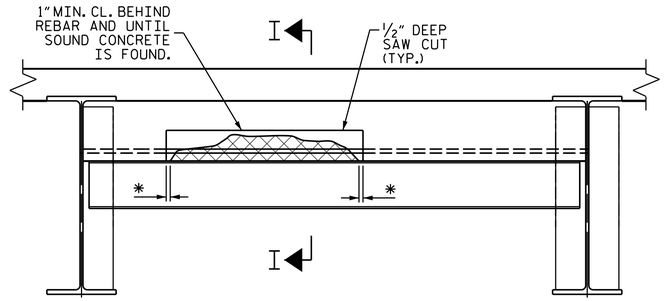


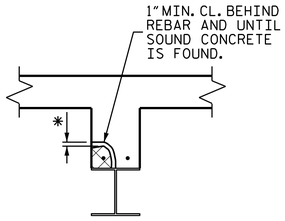
TYPICAL SECTION
(UTILITIES NOT SHOWN FOR CLARITY)



SECTION G-G



TYPICAL SECTION



SECTION I-I

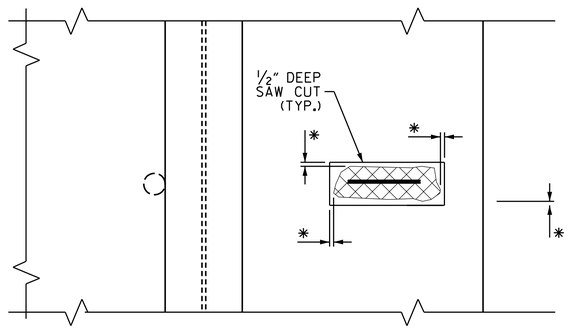
* REMOVE CONCRETE UNTIL SOUND CONCRETE IS FOUND (2" MIN. DEPTH)

DAMAGED AREA

NOTE:
EXISTING REBAR TO REMAIN IN PLACE. CLEAN AND REPAIR AS NECESSARY.

DAMAGED AREA

CONCRETE IN THIS AREA SHALL BE REPAIRED AND FORMED TO MATCH EXISTING.



SECTION H-H

OVERHANG DETAILS

NOTES

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.

THE CONTRACTOR SHALL REMOVE THE DETERIORATED CONCRETE IN ACCORDANCE WITH THE GUIDELINES SET IN THESE NOTES, IN THE SPECIAL PROVISIONS AND THE STANDARD SPECIFICATIONS.

REMOVE UNSOUND CONCRETE TO THE EXTENT NECESSARY, MINIMUM OF 1" BEHIND REBAR AND MINIMUM OF 2" CLEARANCE TO SAWCUT.

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 SHEET S1-25.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR AREAS TO BE REPAIRED, SEE "UNDERSIDE DECK REPAIRS" SHEETS.

THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO STARTING WORK FOR TEMPORARY FORMWORK. FOR SUBMITTALS OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

UPON REMOVAL OF TEMPORARY FORMWORK, ALL VOIDS AND HONEYCOMBS ON THE UNDERSIDE OF DECK SURFACE SHALL BE FILLED WITH THE SAME MATERIAL AS USED FOR THE PATCH, AND FINISHED TO CONFORM TO THE SURROUNDING CONCRETE SURFACE.

NO FORMWORK SHALL BE LEFT IN PLACE.

INTERIOR DIAPHRAGM REPAIR DETAILS

PROJECT NO. H1-0015
COLUMBUS COUNTY
BRIDGE NO. 230086

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
Aster Abraha
12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

OVERHANG & DIAPHRAGM REPAIR DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-10
1			3			TOTAL SHEETS
2			4			18

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CHECKED BY : G. AYES DATE : 10/2023

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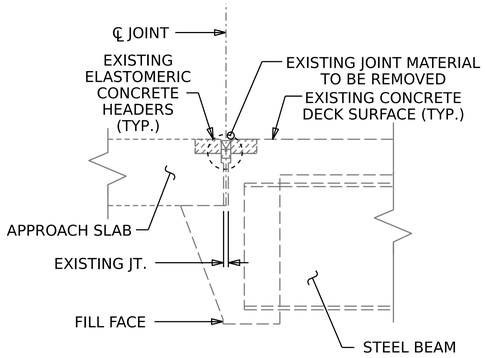
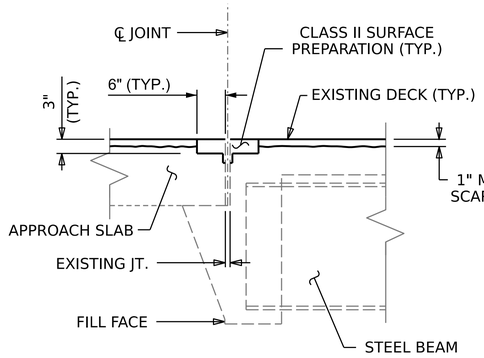
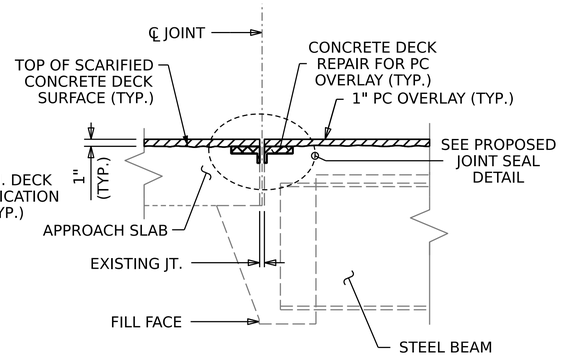


EXISTING JOINT



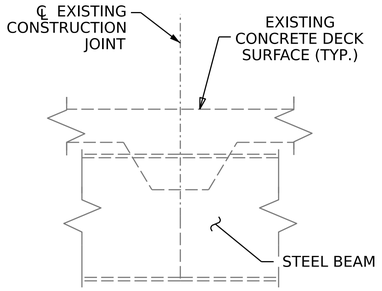
MINIMUM EXISTING JOINT DEMOLITION



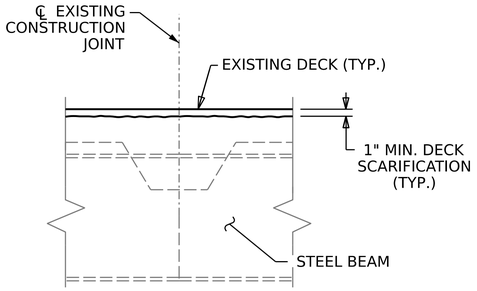
PROPOSED PRE-SAWED JOINT

JOINT INSTALLATION SEQUENCE AT END BENTS

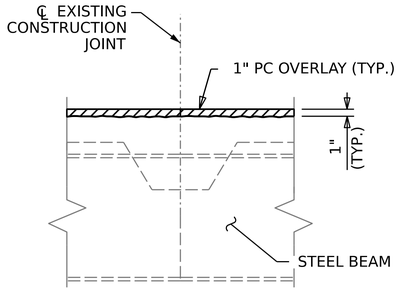
SECTION A-A



EXISTING JOINT



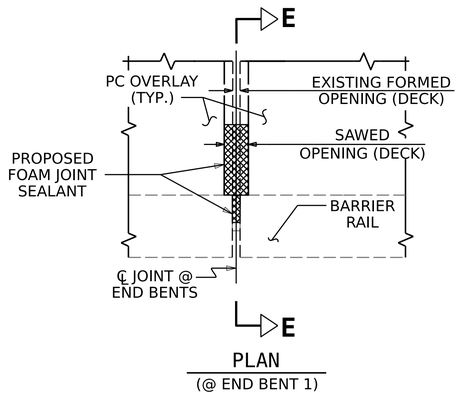
SURFACE PREPARATION



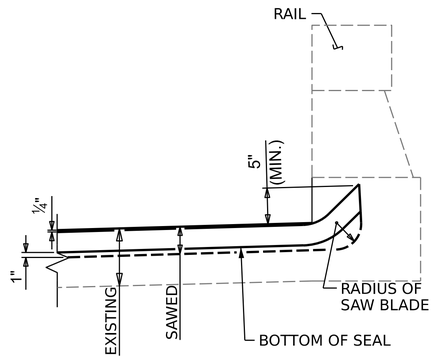
PROPOSED JOINT

JOINT INSTALLATION SEQUENCE AT BENT

SECTION B-B

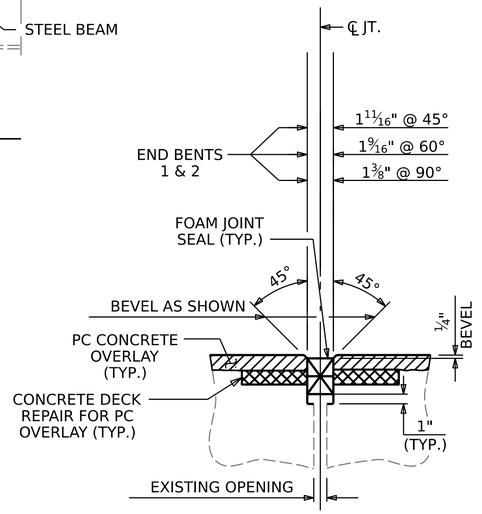


PLAN
(@ END BENT 1)



SECTION E-E

JOINT DETAIL AT BARRIER RAIL



PROPOSED JOINT SEAL DETAIL
(WITH SAWED DIMENSIONS)

NOTES

FINAL JOINT SEALS SHALL NOT BE INSTALLED UNTIL THE OVERLAY OR SEALANT WORK IS COMPLETE.

CONTRACTOR SHALL FIELD VERIFY THE EXISTING FORMED OPENING PRIOR TO OBTAINING JOINT MATERIAL. IF ACTUAL JOINT OPENINGS VARIES FROM THE OPENING INDICATED IN DETAIL MORE THAN ¼", NOTIFY THE ENGINEER. REVISION TO THE JOINT SEAL SIZE MAY 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 ACCOMMODATE THE MINIMUM EXPANSION SHOWN ON THE PLANS.

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

THE CONTRACTOR SHALL TAKE CARE DURING JOINT REHAB OPERATIONS NOT TO DROP ANY MATERIAL BELOW THE BRIDGE WITHOUT PROTECTIVE DEVICES BELOW TO CATCH THE MATERIAL. ANY MATERIAL THAT FALLS BELOW THE BRIDGE SHALL BE CONTAINED, REMOVED AND DISPOSED OF BY THE CONTRACTOR 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.

UNLESS NOTED OTHERWISE RETAIN ALL EXISTING REINFORCING STEEL. CLEAN AND REPAIR AS NEEDED.

ALL EXPOSED ENDS OF CUT BARS SHALL BE COATED WITH EPOXY PRIOR TO THE NEW JOINT MATERIAL INSTALLATION.

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

THE INSTALLED FOAM JOINTS SHALL BE WATERTIGHT.

FOR FOAM JOINT SEALS FOR PRESERVATION, SEE SPECIAL PROVISIONS.

DURING JOINT INSTALLATION PROCEDURE, THE JOINT AND SURROUNDING AREA SHALL BE KEPT CLEAN AND FREE OF DEBRIS.

FINAL SURFACE OF THE JOINT DEMOLITION AREA PRIOR TO PLACEMENT OF CONCRETE REPAIR MATERIAL OR ELASTOMERIC CONCRETE SHOULD BE REASONABLY FLAT AND LEVEL. ENGINEER SHALL DETERMINE THE ACCEPTABILITY OF THE SURFACE PRIOR TO PLACEMENT OF REPAIR CONCRETE OR ELASTOMERIC CONCRETE.

SUMMARY OF QUANTITIES

	ESTIMATE	ACTUAL
FOAM JOINT SEALS FOR PRESERVATION	80.0 LF	

PROJECT NO. HI-0015
COLUMBUS COUNTY
BRIDGE NO. 230086

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
Signed by: Aster Abraha
12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT REPAIR DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-11
1			3			TOTAL SHEETS
2			4			18

DRAWN BY : F. TOLSTON / S. T. SANDOR DATE : 5/2023
CHECKED BY : G. AYES DATE : 10/2023
DESIGN ENGINEER OF RECORD: DATE :

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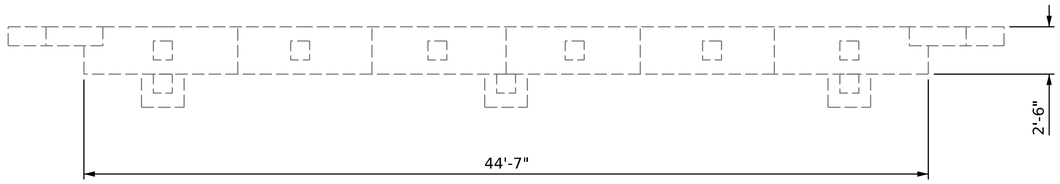
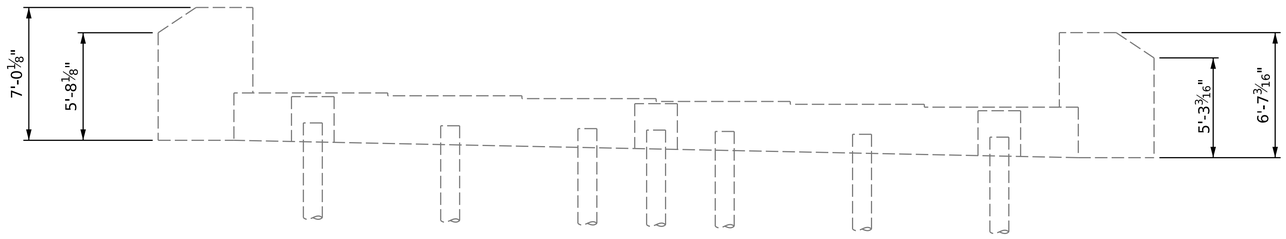


PLAN



ELEVATION

SUBSTRUCTURE REPAIR QUANTITY TABLE

REPAIRS - END BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
CURTAIN WALL	0	0		
WINGWALL				
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
CURTAIN WALL	0	0		
WINGWALL				
EPOXY RESIN INJECTION		LINEAR FT		LINEAR FT
CAP		0		
CURTAIN WALL		0		
WINGWALL				
EPOXY COATING		AREA SF		AREA SF
CAP		69.8		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT. SEE REPAIR DETAILS.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON 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 AND ENTER THE ACTUAL QUANTITIES INTO THE REPAIR QUANTITY TABLE.

CLEAN AND REMOVE DEBRIS FROM THE TOP OF THE CAP AND APPLY EPOXY PROTECTIVE COATING. EPOXY COATING SHALL BE APPLIED TO THE TOP SURFACE OF THE CAP. THE CONTRACTOR SHALL NOT COAT THE AREA OF THE CAP BENEATH THE MASONRY PLATES. FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

REPAIR KEY

- SHOTCRETE REPAIR AREA
- CONCRETE REPAIR AREA
- EPOXY RESIN INJECTION

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230086

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT 1

DRAWN BY : S. T. SANDOR DATE : 08/2023
CHECKED BY : G. AYES DATE : 10/2023
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12/15/2023
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aabraha

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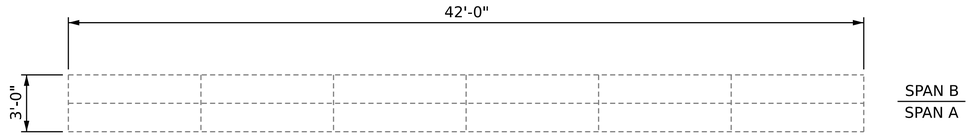
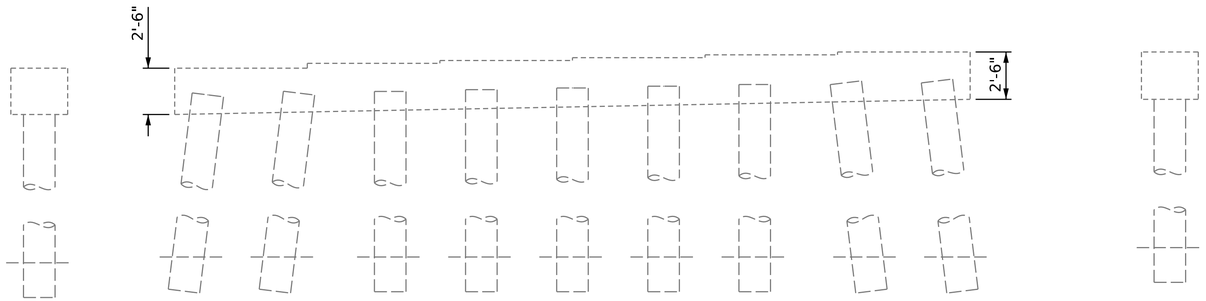
1			3			TOTAL SHEETS
2			4			18



PLAN
TOP OF CAP



END VIEW
NORTH SIDE

END VIEW
SOUTH SIDE

ELEVATION
WEST FACE
(LOOKING EAST)

SUBSTRUCTURE REPAIR QUANTITY TABLE

REPAIRS - BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0	0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0	0		
EPOXY RESIN INJECTION		LINEAR FT		LINEAR FT
CAP		0		
COLUMN		0		
EPOXY COATING		AREA SF		AREA SF
CAP		125.6		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT.
SEE REPAIR DETAILS.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON 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 AND ENTER THE ACTUAL QUANTITIES INTO THE REPAIR QUANTITY TABLE.

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CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

REPAIR KEY

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

EPOXY RESIN INJECTION

PROJECT NO. HI-0015
COLUMBUS COUNTY
BRIDGE NO. 230086

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
Signed by: Aster Abraha
12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 1 SPAN A FACE

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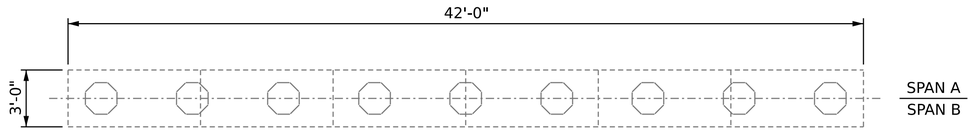
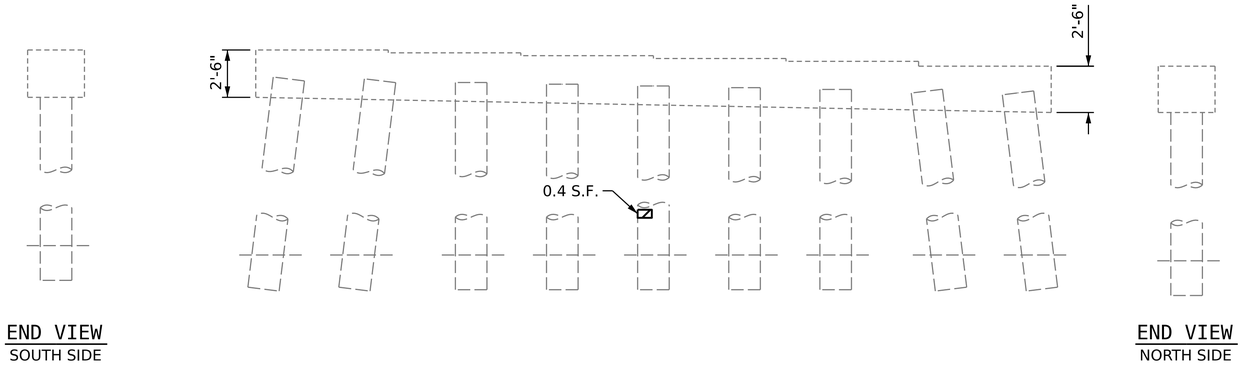
aabraha



PLAN
BOTTOM OF CAP



END VIEW
SOUTH SIDE

END VIEW
NORTH SIDE

ELEVATION
EAST FACE
(LOOKING WEST)

SUBSTRUCTURE REPAIR QUANTITY TABLE

REPAIRS - BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0.4	0.2		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0	0		
.				
EPOXY RESIN INJECTION		LINEAR FT		LINEAR FT
CAP		0		
COLUMN		0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT.
SEE REPAIR DETAILS.

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CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

REPAIR KEY

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

EPOXY RESIN INJECTION

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ESTER G. ABRAHA
Digitally signed by: Ester Abralca
12/21/2023

PROJECT NO. HI-0015
COLUMBUS COUNTY
BRIDGE NO. 230086

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 1 SPAN B FACE

REVISIONS						SHEET NO.
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2			4			18

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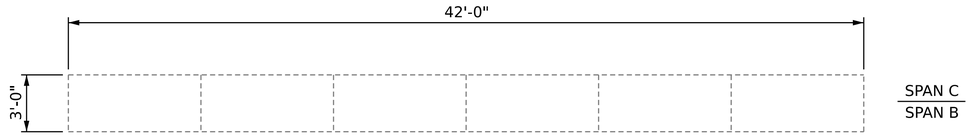
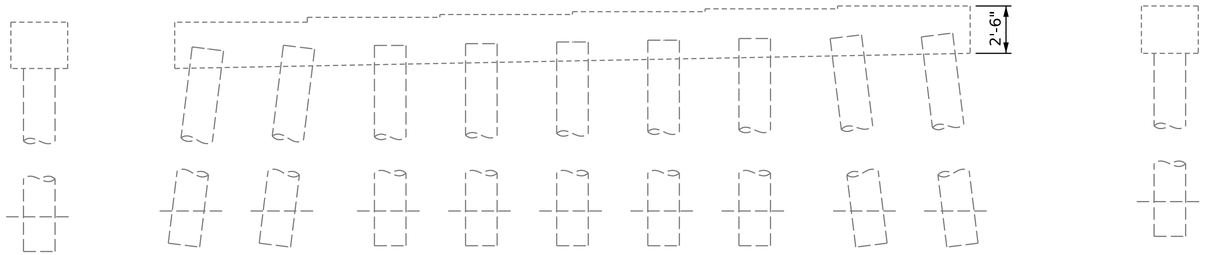


PLAN
TOP OF CAP



END VIEW
NORTH SIDE

END VIEW
SOUTH SIDE

ELEVATION
WEST FACE
(LOOKING EAST)

SUBSTRUCTURE REPAIR QUANTITY TABLE

REPAIRS - BENT 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0	0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0	0		
EPOXY RESIN INJECTION		LINEAR FT		LINEAR FT
CAP		0		
COLUMN		0		
EPOXY COATING		AREA SF		AREA SF
CAP		125.6		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT.
SEE REPAIR DETAILS.

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CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

REPAIR KEY

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

EPOXY RESIN INJECTION

PROJECT NO. **HI-0015**
COLUMBUS COUNTY
BRIDGE NO. **230086**

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
Signed by: Aster Abraha
12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT 2 SPAN B FACE

REVISIONS						SHEET NO.
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2			4			18

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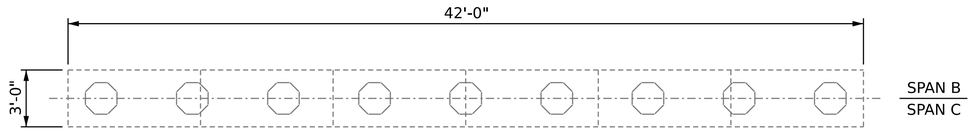
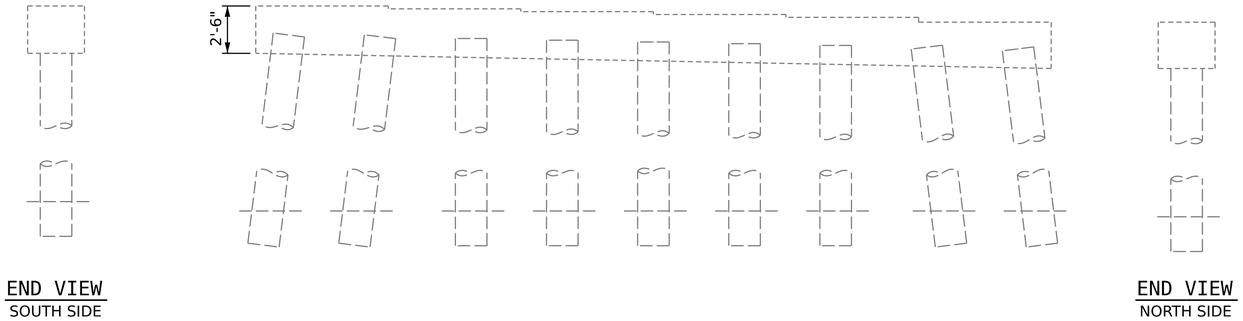


PLAN
BOTTOM OF CAP



END VIEW
SOUTH SIDE

END VIEW
NORTH SIDE

ELEVATION
EAST FACE
(LOOKING WEST)

SUBSTRUCTURE REPAIR QUANTITY TABLE

REPAIRS - BENT 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0	0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0	0		
.				
EPOXY RESIN INJECTION		LINEAR FT		LINEAR FT
CAP		0		
COLUMN		0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT.
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CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR "SHOTCRETE REPAIRS", SEE SPECIAL PROVISIONS.

REPAIR KEY

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

EPOXY RESIN INJECTION

PROJECT NO. **HI-0015**
COLUMBUS COUNTY
BRIDGE NO. **230086**

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ESTER G. ABRAHA
Digitally signed by: Ester Abraha
12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 2
SPAN C FACE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-16
1			3			TOTAL SHEETS
2			4			18

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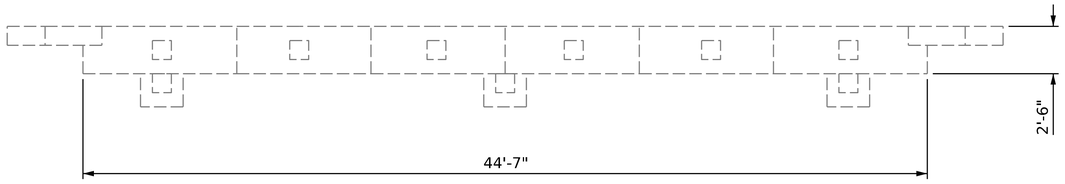
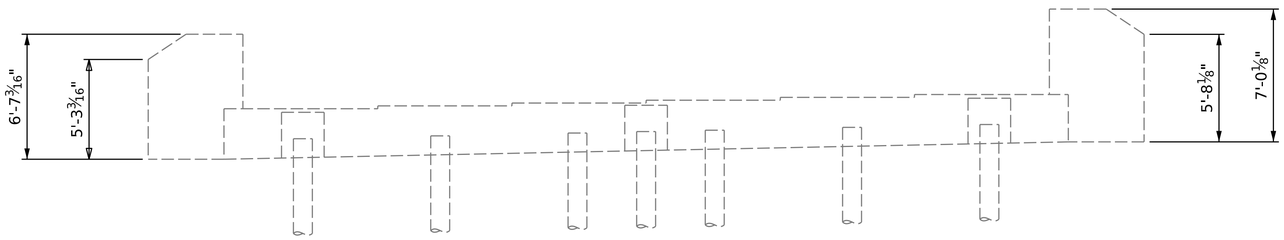


PLAN



ELEVATION

SUBSTRUCTURE REPAIR QUANTITY TABLE

REPAIRS - END BENT 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
CURTAIN WALL	0	0		
WINGWALL				
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
CURTAIN WALL	0	0		
WINGWALL				
EPOXY RESIN INJECTION		LINEAR FT		LINEAR FT
CAP		0		
CURTAIN WALL		0		
WINGWALL				
EPOXY COATING		AREA SF		AREA SF
CAP		69.8		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CLEAR TO SAWCUT. SEE REPAIR DETAILS.

NOTES

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CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

REPAIR KEY

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

EPOXY RESIN INJECTION

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230086

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
12/21/2023

DRAWN BY : S. T. SANDOR DATE : 08/2023
CHECKED BY : G. AYES DATE : 10/2023
DESIGN ENGINEER OF RECORD: _____ DATE : _____

12/15/2023
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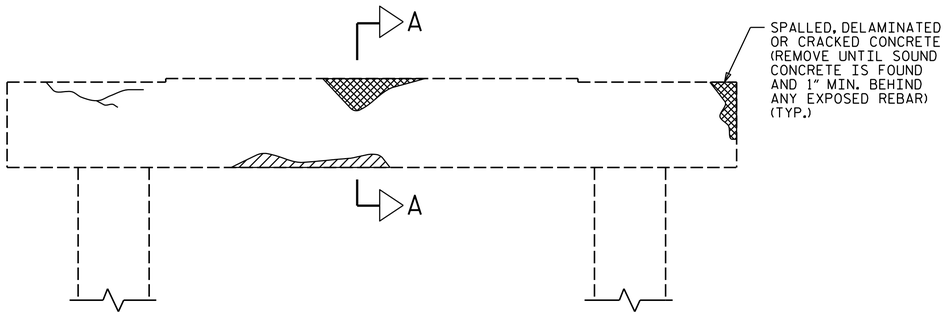
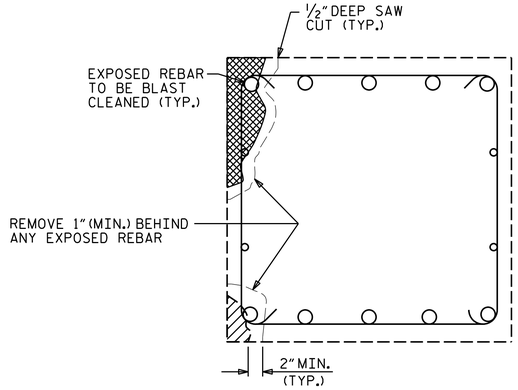
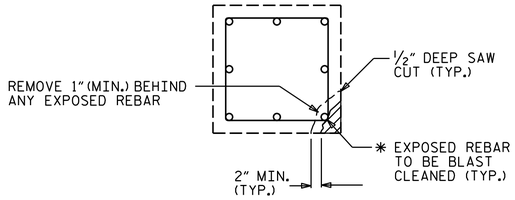


BENT CAP REPAIRS



SECTION A-A

CAP REPAIR

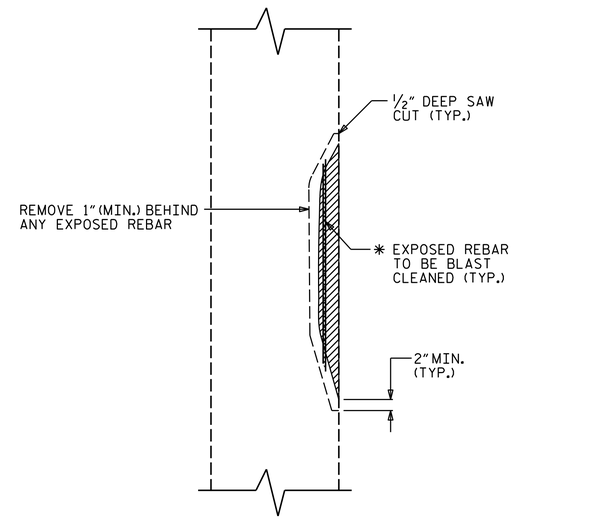


PLAN OF COLUMN

REPAIR KEY

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA (FORM AND POUR)

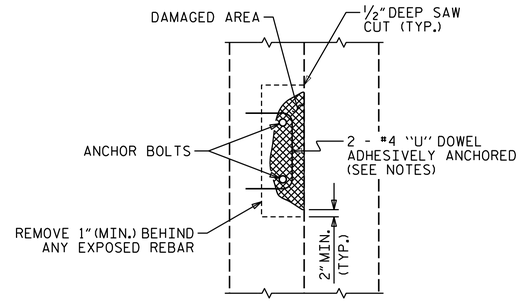


* REPAIR LENGTH SHALL NOT EXCEED 10 FEET.

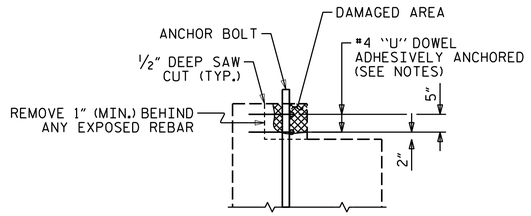
ELEVATION OF COLUMN

COLUMN REPAIR

SPLICE LENGTH TABLE	
BAR SIZE	MIN. SPLICE LENGTH
#4	2'-5"
#5	3'-0"
#6	3'-7"
#7	4'-2"
#8	4'-9"
#9	5'-4"
#10	6'-0"
#11	6'-8"



PLAN



ELEVATION

PEDESTAL WALL REPAIR

NOTES

TYPICAL BENT CAP REPAIRS ARE SHOWN. REPAIR DETAILS SIMILAR FOR END BENT CAPS AND STRUTS.

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.

THE CONTRACTOR SHALL REMOVE THE DETERIORATED CONCRETE IN ACCORDANCE WITH THE GUIDELINES SET IN THESE NOTES, IN THE SPECIAL PROVISIONS AND THE STANDARD SPECIFICATIONS.

REMOVE UNSOUND CONCRETE TO THE EXTENT NECESSARY, MINIMUM OF 1" BEHIND REBAR AND MINIMUM OF 2" CLEARANCE TO SAWCUT.

NO MORE THAN ONE-THIRD OF THE CAP OR COLUMN CIRCUMFERENCE SHALL BE REMOVED AT ONE TIME. SHOULD IT BECOME NECESSARY TO REMOVE MORE THAN 30% OF A CAP OR COLUMN CROSS SECTIONAL AREA, NOTIFY THE ENGINEER PRIOR TO PROCEEDING.

SIMULTANEOUS REMOVAL OF UNSOUND CONCRETE MAY BE PERMITTED ON MORE THAN ONE FACE OF A CAP AND/OR COLUMN, BUT NO MORE THAN ⅓ OF THE CIRCUMFERENCE SHALL BE REMOVED AT ONE TIME. IF REMOVAL EXTENDS MORE THAN 1½" BEHIND THE MAIN REINFORCING BARS, NOTIFY THE ENGINEER PRIOR TO PROCEEDING. ON COLUMNS AND PILES, NO MORE THAN 10 VERTICAL FEET MAY BE EXPOSED AT ONE TIME BEFORE PLACEMENT OF REPAIR CONCRETE.

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.

THE #4 "U" DOWELS ARE REQUIRED ONLY AROUND THE ANCHOR BOLTS. THE EXISTING REINFORCING STEEL IN THE PEDESTAL WALL SHALL BE CLEANED, STRAIGHTENED AND REMAIN IN PLACE.

FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.

COAT ALL REPAIR SURFACE AREAS ON THE TOP OF CAPS, INCLUDING CHAMFERS, WITH EPOXY PROTECTIVE COATING, OVERLAPPING THE REPAIR AREA BY A MINIMUM OF 3" ON ALL POSSIBLE SIDES.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

CLEAN ALL EXPOSED REINFORCING BARS AND PRESTRESSED STRANDS IN ACCORDANCE WITH APPROPRIATE SPECIAL PROVISIONS. 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.

PROJECT NO. HI-0015

COLUMBUS COUNTY

BRIDGE NO. 230086

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha

DDA094AE05104FD...

12/21/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
TYPICAL CAP AND COLUMN REPAIR DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-18
1			3			TOTAL SHEETS
2			4			18

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : S. T. SANDOR	DATE : 10/2023
CHECKED BY : G. AYES	DATE : 10/2023
DRAWN BY : NAP 8/18	
CHECKED BY :	

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STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2024 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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