PROJECT: 15BPR.34

CONTRACT NO: C204302

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

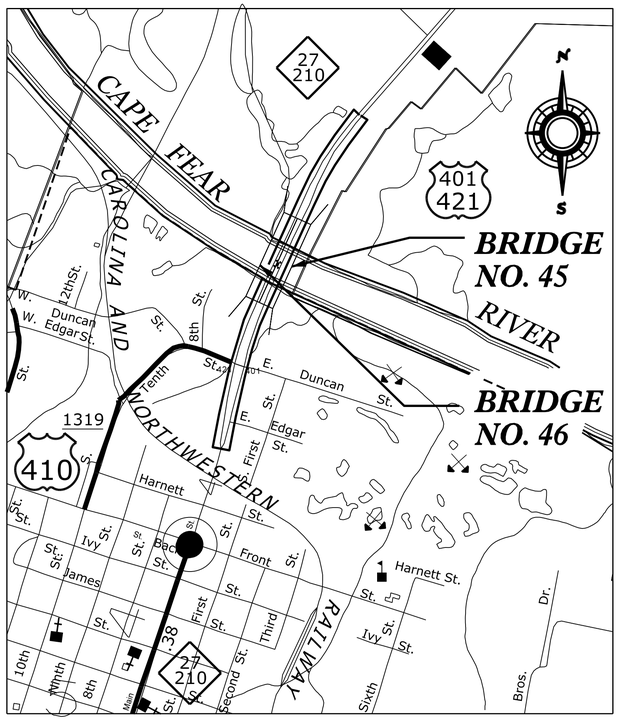
HARNETT COUNTY

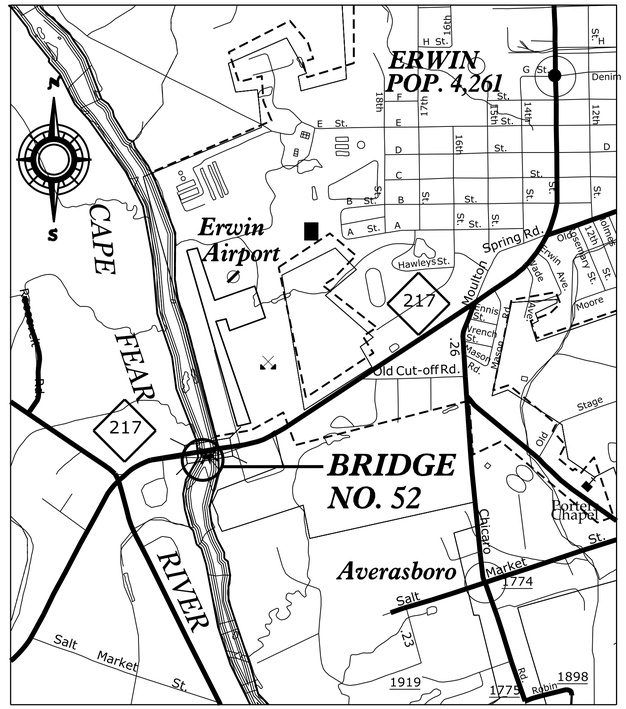
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15BPR.34	1	33

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
15BPR.34		P.E.
15BPR.34		CONST.

LOCATION: *BRIDGE #420045 ON US 401 NBL /US 421/NC 27/NC 210 OVER CAPE FEAR RIVER.*
BRIDGE #420046 ON US 401 SBL /US 421/NC 27/NC 210 OVER CAPE FEAR RIVER.
BRIDGE #420052 ON NC 217 OVER CAPE FEAR RIVER.

TYPE OF WORK: *CONCRETE BRIDGE DECK REHABILITATION BY SCARIFICATION, SHOTBLASTING AND PLACEMENT OF POLYMER CONCRETE; RECONSTRUCTION OF BRIDGE DECK JOINTS AND SEALS; SHOTBLASTING AND SILANE DECK TREATMENT; SUBSTRUCTURE CONCRETE REPAIRS WITH SHOTCRETE, EPOXY RESIN INJECTION AND EPOXY COATING OF TOP OF SUBSTRUCTURE CAPS; PAINTING EXISTING WEATHERING STEEL.*





VICINITY MAP

DESIGN DATA

BRIDGE #420045 ADT 2015 = 15,500
BRIDGE #420046 ADT 2015 = 15,500
BRIDGE #420052 ADT 2013 = 6,000

PROJECT LENGTH

BRIDGE #420045 = 0.114 MILES
BRIDGE #420046 = 0.119 MILES
BRIDGE #420052 = 0.129 MILES

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

2018 STANDARD SPECIFICATIONS

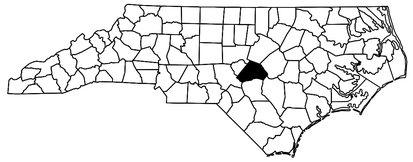
LETTING DATE :
FEBRUARY 15, 2022

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

Aster G Abraha, P.E.
PROJECT DESIGN ENGINEER

PROJECT: 15BPR.34

CONTRACT NO: C204302



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HARNETT COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15BPR.34	1A	33

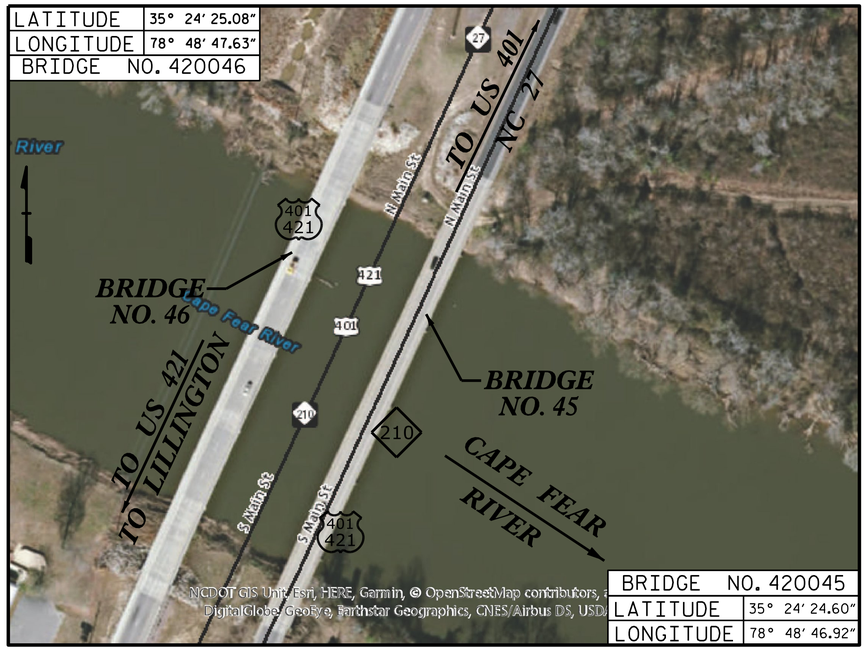
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
15BPR.34		P.E.
15BPR.34		CONST.

LOCATION: ***BRIDGE #420045 ON US 401 NBL /US 421/NC 27/NC 210 OVER CAPE FEAR RIVER.***
BRIDGE #420046 ON US 401 SBL /US 421/NC 27/NC 210 OVER CAPE FEAR RIVER.
BRIDGE #420052 ON NC 217 OVER CAPE FEAR RIVER.

INDEX OF STRUCTURES SHEETS

TYPE OF WORK:
BRIDGE PRESERVATION – CONCRETE BRIDGE DECK REHABILITATION BY SCARIFICATION; SHOTBLASTING AND PLACEMENT OF POLYMER CONCRETE; RECONSTRUCTION OF BRIDGE DECK JOINTS AND SEALS; SHOTBLASTING AND SILANE DECK TREATMENT; SUBSTRUCTURE REPAIRS WITH SHOTCRETE, EPOXY RESIN INJECTION AND EPOXY COATING OF TOP OF SUBSTRUCTURE CAPS, PAINTING EXISTING WEATHERING STEEL.

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



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.

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.

NOTES:

REPAIR LOCATION AND ESTIMATES OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN IN THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE IN THE DRAWING THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED IN TO REPAIR QUANTITIES TABLE.

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

EXISTING JOINTS AND DECK DRAINS SHALL BE SEALED PRIOR TO BEGINNING SURFACE PREPARATION OF 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.

WORK ON THE BRIDGE(S) SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL BELOW, EXCEPT WHERE THE CONTRACTOR'S PLAN 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.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

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

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 FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR STRIP SEALS FOR PRESERVATION, SEE SPECIAL PROVISIONS.

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

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

FOR EPOXY COATING OF TOP OF THE CAP, SEE SPECIAL PROVISIONS.

FOR SCARIFYING BRIDGE DECK, SHOTBLASTING BRIDGE DECK AND CLASS II SURFACE PREPARATION, SEE OVERLAY SURFACE PREPARATION FOR POLYMER CONCRETE SPECIAL PROVISION.

FOR SILANE TREATMENT OF DECK, SEE SPECIAL PROVISIONS.

FOR CONCRETE WORK FOR JOINT REPLACEMENT, SEE SPECIAL PROVISIONS.

FOR VOLUMETRIC MIXER, SEE SPECIAL PROVISIONS.

FOR CLEANING AND PAINTING EXISTING WEATHERING STEEL, POLLUTION CONTROL AND PAINTING CONTAINMENT, SEE "PAINTING EXISTING WEATHERING STEEL STRUCTURE", SPECIAL PROVISION.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

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

FOR POLYMER CONCRETE DECK OVERLAY, 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 NO.	DESCRIPTION	UNIT
1.	CLASS II SURFACE PREPARATION	SQ. YD.
2.	CONCRETE DECK REPAIR FOR PC OVERLAY	SQ. YD.
3.	CONCRETE DECK REPAIR FOR SILANE DECK TREATMENT	SQ. FT.
4.	CLASS III SURFACE PREPARATION	SQ. YD.

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO.: 420045, 420046 & 420052

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD
F2455B930BF40E...
Dec 10, 2021

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
DDA094AED6104FD...
Dec 9, 2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LOCATION SKETCHES

FOR BRIDGE 45 & 46 ON US 401/ US421/ US 210/ NC 27 AND BRIDGE 52 ON NC 217 OVER CAPE FEAR RIVER

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : S. T. SANDOR/A. Y. GODFREY DATE : 08/2021
CHECKED BY : A. G. ABRAHA DATE : 08/2021

09-DEC-2021 17:01
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aabraha

TOTAL BILL OF MATERIAL

BRIDGE NO.	GROOVING BRIDGE FLOORS	EPOXY COATED REINFORCING STEEL	POLLUTION CONTROL	SHOTCRETE REPAIRS	EPOXY RESIN INJECTION	STRIP SEALS FOR PRESERVATION	PAINTING CONTAINMENT FOR BRIDGE #--	CLEANING AND PAINTING EXISTING WEATHERING STEEL FOR BRIDGE #--	VOLUMETRIC MIXER	POLYESTER POLYMER CONCRETE MATERIALS	EPOXY POLYMER CONCRETE MATERIALS (ALTERNATE)	CONCRETE WORK FOR JOINT REPLACEMENT	EPOXY COATING	SCARIFYING BRIDGE DECK	SHOTBLASTING BRIDGE DECK	PLACING & FINISHING POLYMER CONCRETE OVERLAY	SILANE DECK TREATMENT
	SQ. FT.	LB	LUMP SUM	CU. FT.	LN. FT.	LN. FT.	LUMP SUM	LUMP SUM	LUMP SUM	CU. YD.	CU. YD.	SQ. FT.	SQ. FT.	SQ. YD.	SQ. YD.	SQ. YD.	SQ. YD.
420045	19,317.0	988.0	LUMP SUM	-	148.5	71.2	LUMP SUM	LUMP SUM	LUMP SUM	65.1	65.1	340.0	894.6	2,345.3	2,345.3	2,345.3	-
420046	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,962	-	2,962
420052	-	-	-	68.6	204.0	-	-	-	-	-	-	-	944.0	-	-	-	-
TOTAL	19,317.0	988.0	LUMP SUM	68.6	352.5	71.2	LUMP SUM	LUMP SUM	LUMP SUM	65.1	65.1	340.0	1,838.6	2,345.3	5,307.3	2,345.3	2,962

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO.: 420045
420046 &
420052

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
DDA094AED6104FD...
Dec 9, 2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BILL OF MATERIAL

FOR BRIDGES 45 & 46 ON US 401/US 421/NC 27/NC 210 AND BRIDGE 52 ON NC 217 OVER CAPE FEAR RIVER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DRAWN BY : S. T. SANDOR/A. Y. GODFREY DATE : 08/2021
CHECKED BY : A. G. ABRAHA DATE : 08/2021

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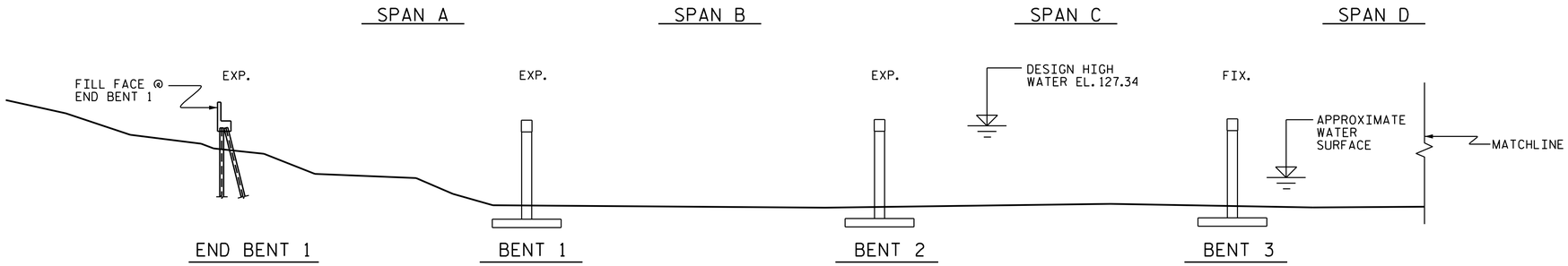
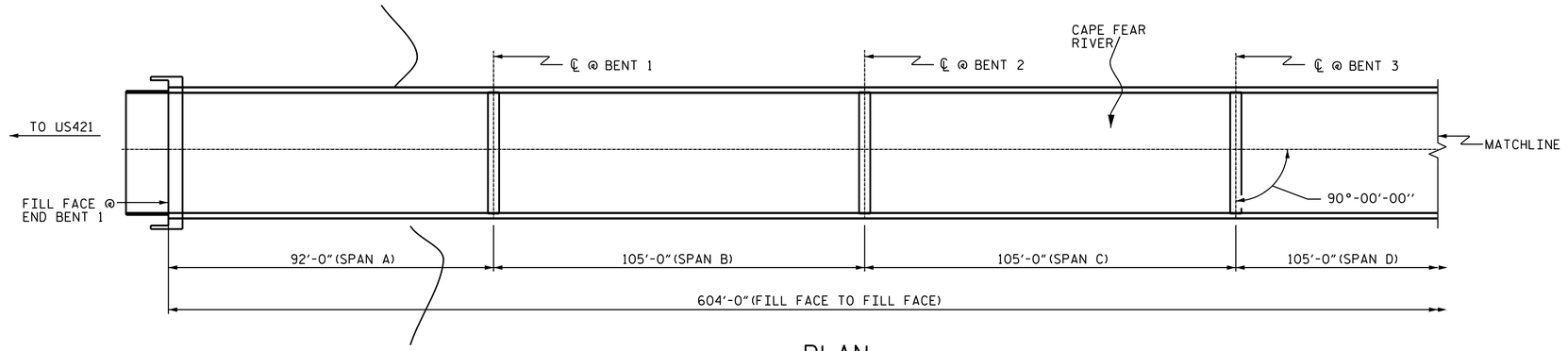
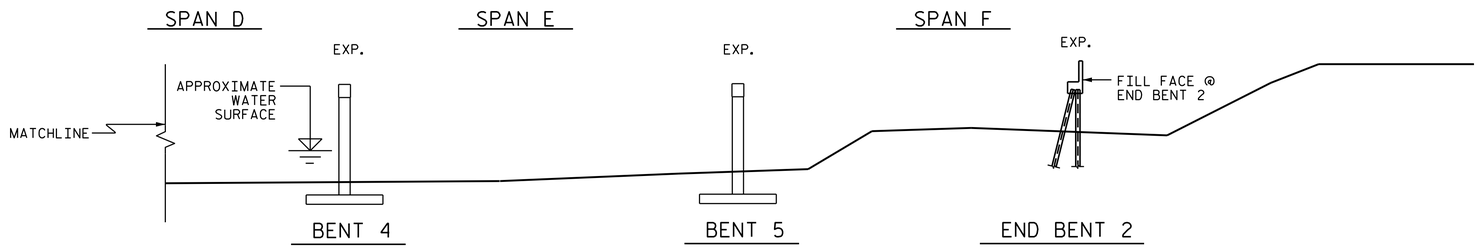


SECTION ALONG ℄ ROADWAY

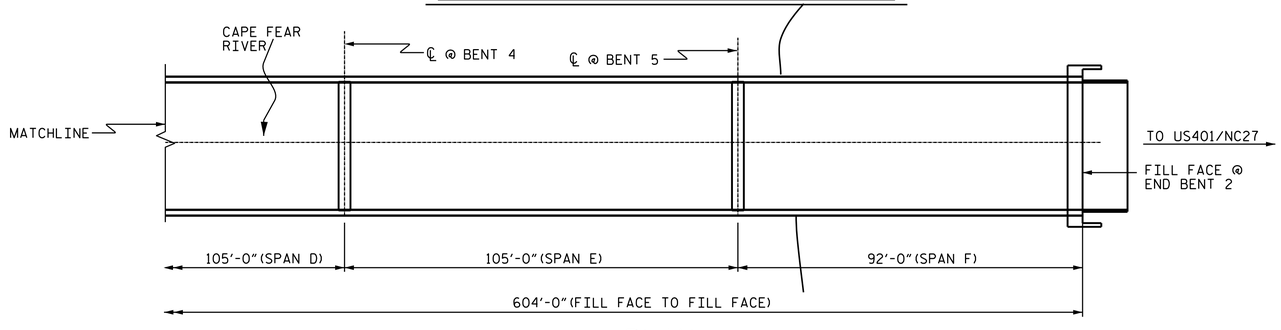


PLAN

(COLUMNS & FOOTINGS NOT SHOWN IN PLAN VIEW FOR CLARITY)



SECTION ALONG ℄ ROADWAY



PLAN

(COLUMNS & FOOTINGS NOT SHOWN IN PLAN VIEW FOR CLARITY)

I hereby certify that this structure was rehabilitated according to these plans or as noted therein.

Resident Engineer Date

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420045

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY L. ALFORD
F24563B90BF40E...
Dec 10, 2021

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
DocuSigned by: DDA094AED5104FD...
Dec 9, 2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE 45 ON US 401 NORTHBOUND OVER THE CAPE FEAR RIVER

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-1
1			3			TOTAL SHEETS
2			4			33

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DRAWN BY : S. T. SANDOR DATE : 10/2018
CHECKED BY : A. G. ABRAHA DATE : 11/2018

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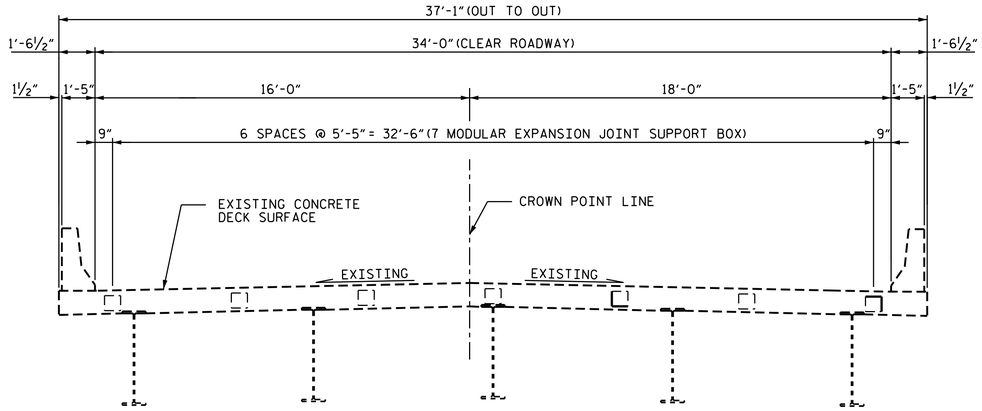
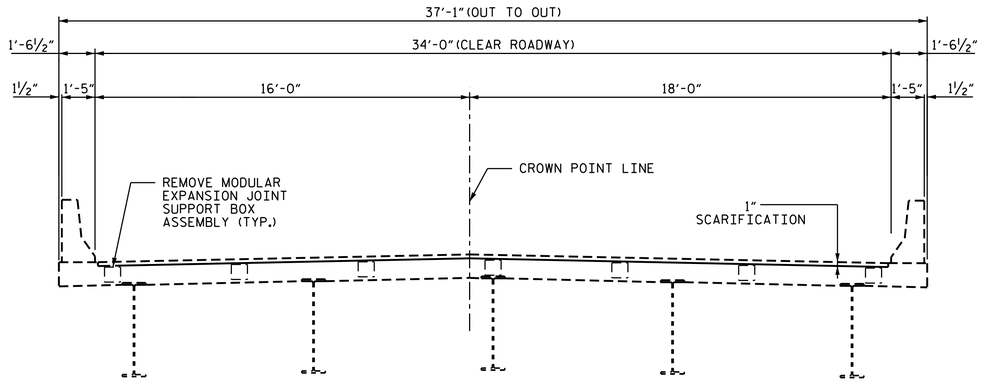
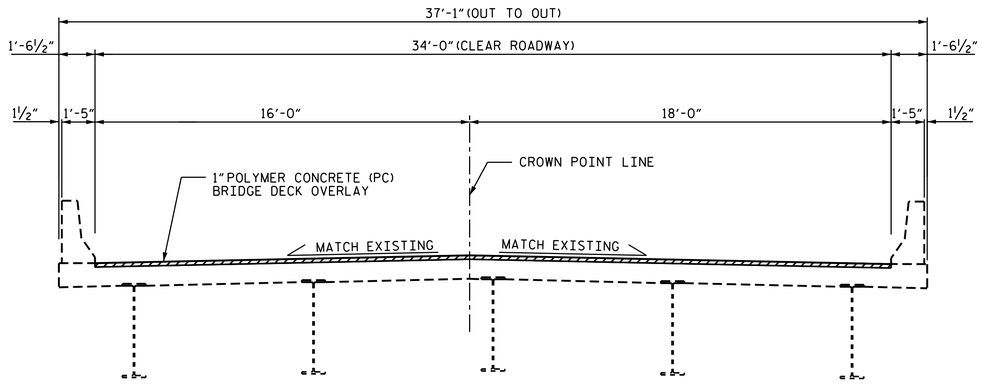


TYPICAL SECTION
(EXISTING)



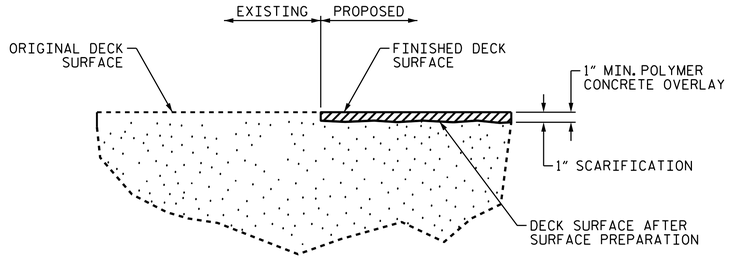
TYPICAL SECTION
(DECK PREPARATION)



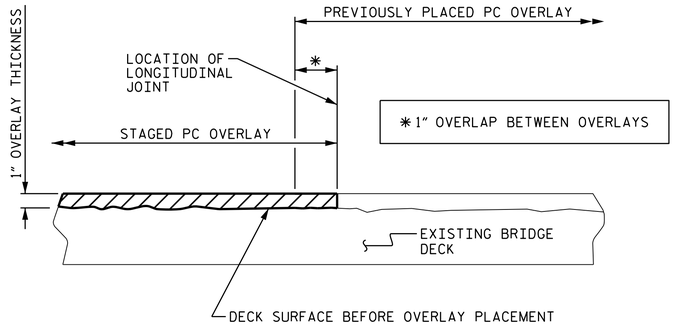
TYPICAL SECTION
(PROPOSED)

NOTES

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



POLYMER CONCRETE OVERLAY DETAIL



STAGED POLYMER CONCRETE OVERLAY JOINT
(AS NEEDED)

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420045

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABARAHA

Aster Abraha

DocuSigned by: DDA094AED5104FD...

Dec 9, 2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION & POLYMER CONCRETE OVERLAY DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-2
1			3			TOTAL SHEETS
2			4			33

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CHECKED BY : A. G. ABARAHA DATE : 08/2021

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NOTES:

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

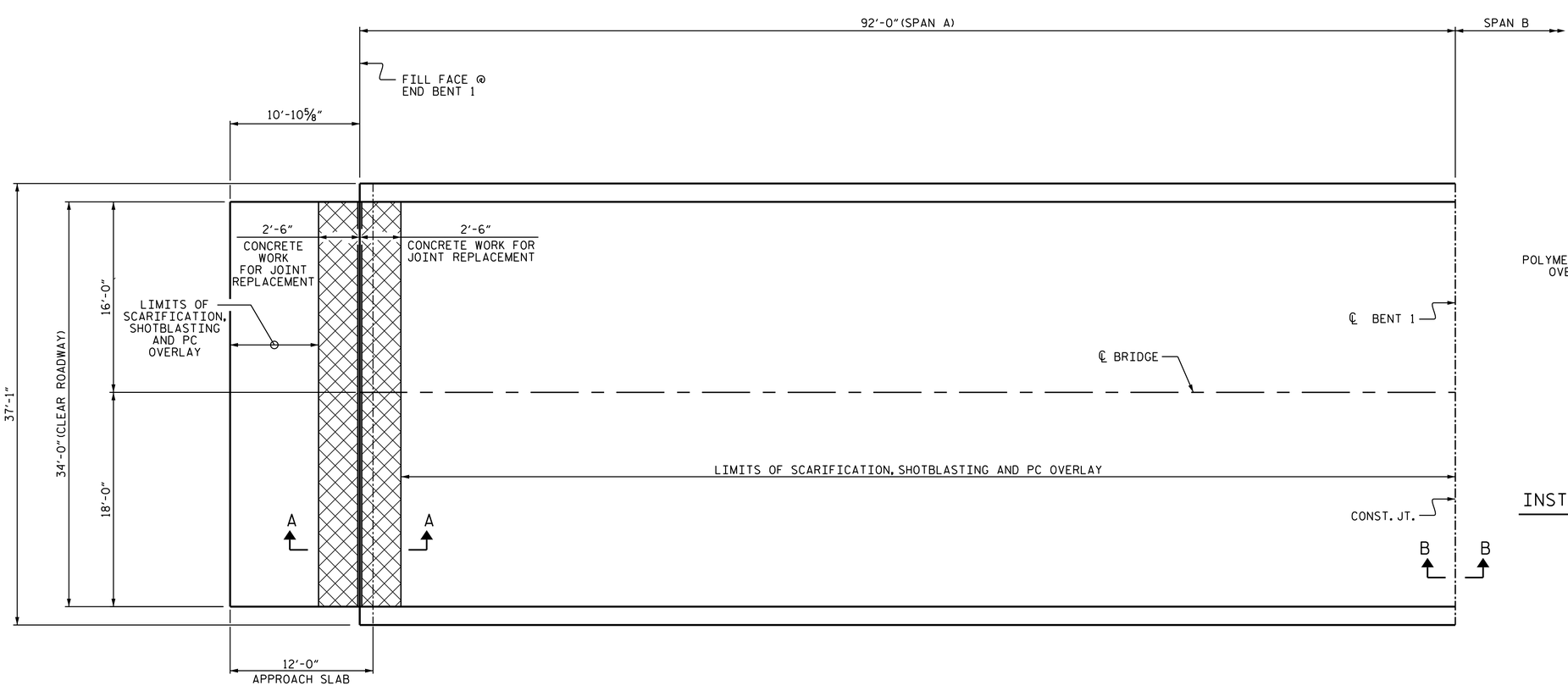
FOR POLYMER CONCRETE BRIDGE DECK OVERLAY, SEE SPECIAL PROVISIONS.

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

FOR CONCRETE WORK FOR JOINT REPLACEMENT, SEE SPECIAL PROVISIONS.

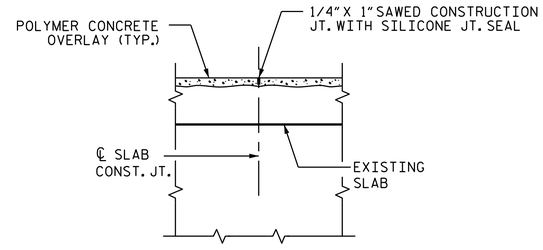
SUMMARY OF QUANTITIES FOR SPAN A AND APPROACH SLAB

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	369.8 SY	
POLYESTER POLYMER CONCRETE MATERIALS	10.3 CY	
EPOXY POLYMER CONCRETE MATERIALS (ALTERNATE)	10.3 CY	
SHOTBLASTING BRIDGE DECK	369.8 SY	
PLACING & FINISHING PC OVERLAY	369.8 SY	
CLASS II SURFACE PREPARATION	0.0 SY	
GROOVING BRIDGE DECK	3,148.5 SF	
CONCRETE WORK FOR JOINT REPLACEMENT	170.0 SF	



- SCARIFYING AND SHOTBLASTING OF BRIDGE DECK FOR PC OVERLAY

- CONCRETE WORK FOR JOINT REPLACEMENT AND SCARIFYING AND SHOTBLASTING OF BRIDGE DECK FOR PC OVERLAY



INSTALLATION AT CONSTRUCTION JOINT

SECTION B-B

PLAN OF SPAN A AND APPROACH SLAB

(SEE SHEET NO. S1-9 FOR SECTION A-A)

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420045

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Digitally signed by Aster Abraha DocuSigned by: 0CDA094AED0104FD... Dec 9, 2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SURFACE PREPARATION SPAN A AND APPROACH SLAB

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-3
1			3			TOTAL SHEETS
2			4			33

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : M. K. BEARD/ S. T. SANDOR DATE : 03/2018
CHECKED BY : S. WANCE / A. G. ABRAHA DATE : 04/2018

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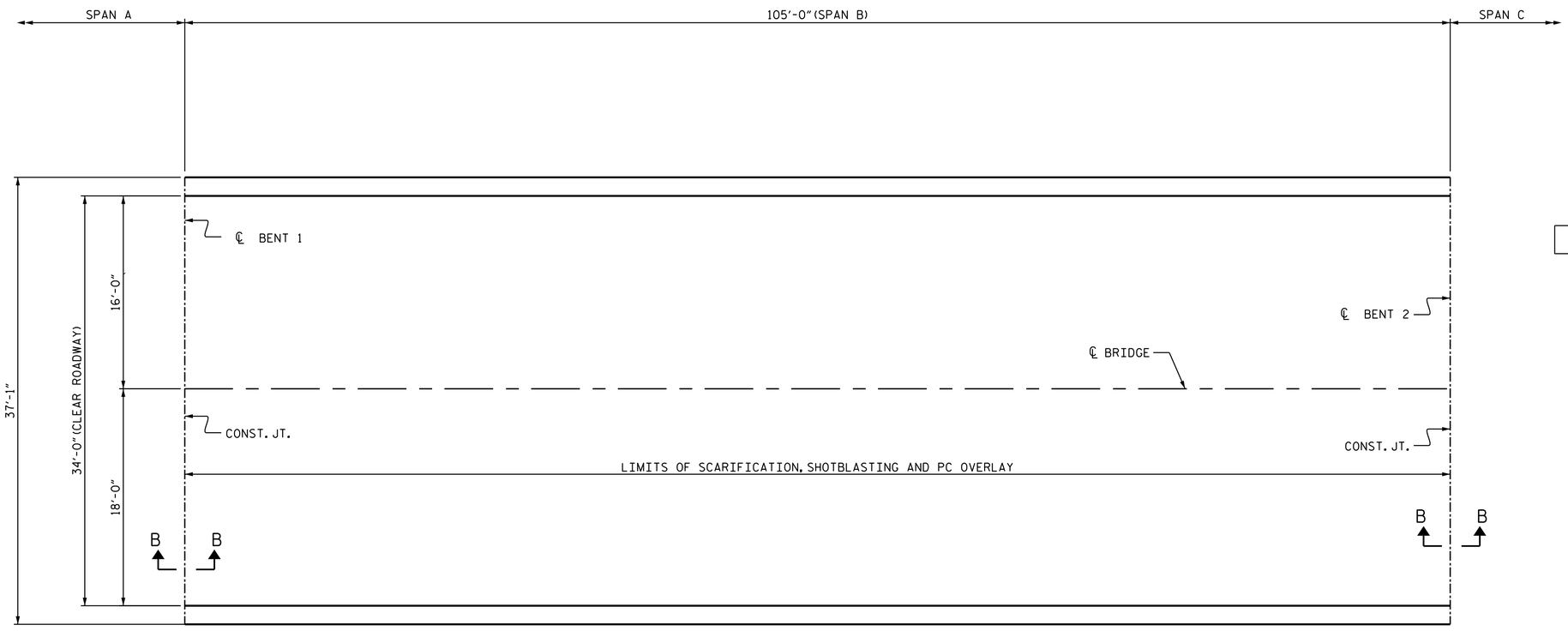
aabraha

NOTES:

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

SUMMARY OF QUANTITIES FOR SPAN B

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	396.7 SY	
POLYESTER POLYMER CONCRETE MATERIALS	11.0 CY	
EPOXY POLYMER CONCRETE MATERIALS (ALTERNATE)	11.0 CY	
SHOTBLASTING BRIDGE DECK	396.7 SY	
PLACING & FINISHING PC OVERLAY	396.7 SY	
CLASS II SURFACE PREPARATION	0.0 SY	
GROOVING BRIDGE DECK	3,255.0 SF	



PLAN OF SPAN B

(SEE SHEET NO. S1-3 FOR SECTION B-B)

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420045

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Digitally signed by Aster Abraha DDA094AED5104FD...

Dec 9, 2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SURFACE PREPARATION SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-4
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : M. K. BEARD/ S. T. SANDOR DATE : 03/2018

CHECKED BY : S. WANCE / A. G. ABRAHA DATE : 04/2018

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aabraha

NOTES:

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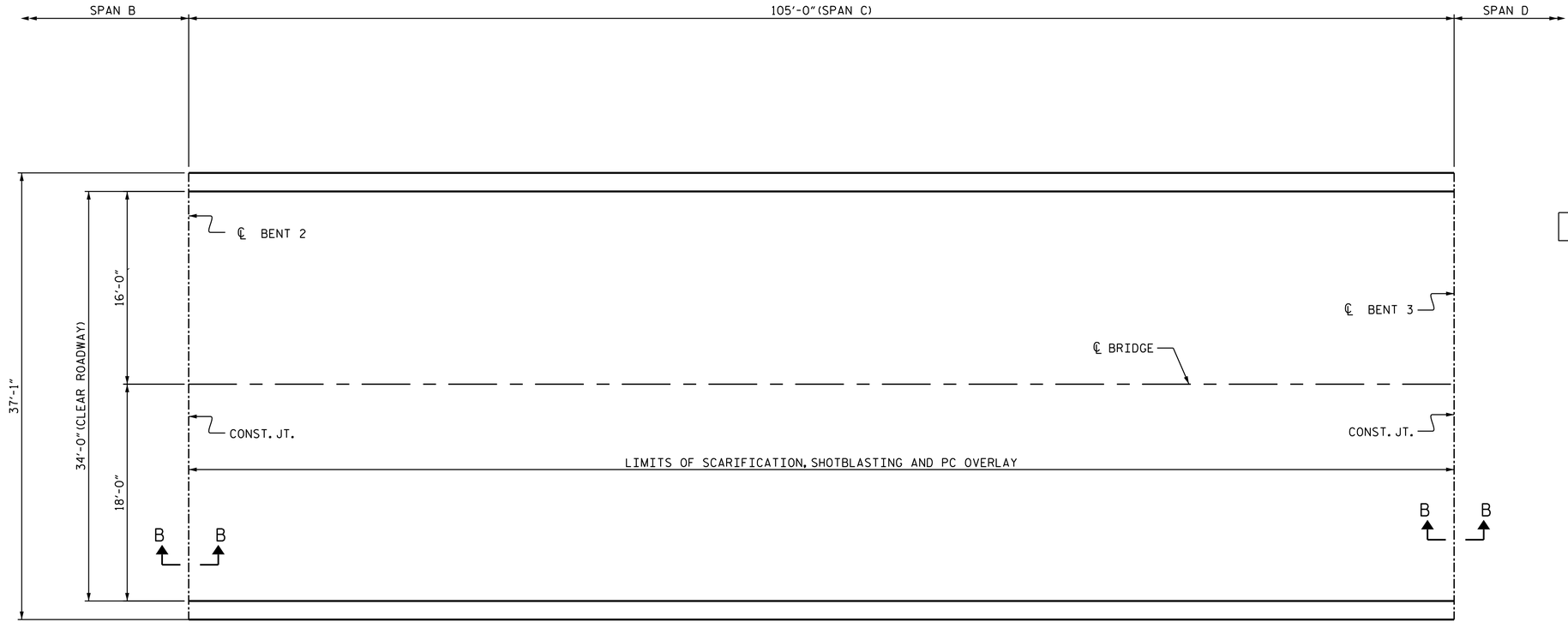
SUMMARY OF QUANTITIES FOR SPAN C

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	396.7 SY	
POLYESTER POLYMER CONCRETE MATERIALS	11.0 CY	
EPOXY POLYMER CONCRETE MATERIALS (ALTERNATE)	11.0 CY	
SHOTBLASTING BRIDGE DECK	396.7 SY	
PLACING & FINISHING PC OVERLAY	396.7 SY	
CLASS II SURFACE PREPARATION	0.0 SY	
GROOVING BRIDGE DECK	3,255.0 SF	



- SCARIFYING AND SHOTBLASTING OF BRIDGE DECK FOR PC OVERLAY

PLAN OF SPAN C

(SEE SHEET NO. S1-3 FOR SECTION B-B)

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420045

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SURFACE PREPARATION SPAN C

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
Dec 9, 2021

REVISIONS						SHEET NO.
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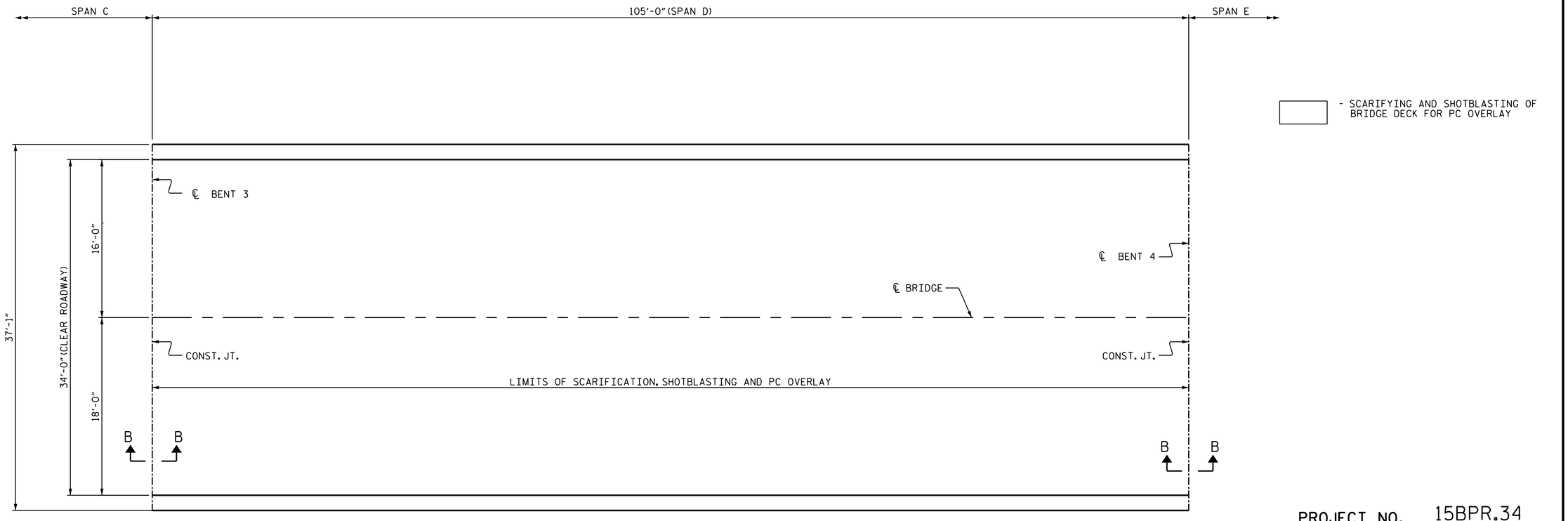
SUMMARY OF QUANTITIES FOR SPAN D

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	396.7 SY	
POLYESTER POLYMER CONCRETE MATERIALS	11.0 CY	
EPOXY POLYMER CONCRETE MATERIALS (ALTERNATE)	11.0 CY	
SHOTBLASTING BRIDGE DECK	396.7 SY	
PLACING & FINISHING PC OVERLAY	396.7 SY	
CLASS II SURFACE PREPARATION	0.0 SY	
GROOVING BRIDGE DECK	3,255.0 SF	



PLAN OF SPAN D

(SEE SHEET NO. S1-3 FOR SECTION B-B)

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420045

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha

DocuSigned by: DDA094AED6104FD...

Dec 9, 2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SURFACE PREPARATION SPAN D

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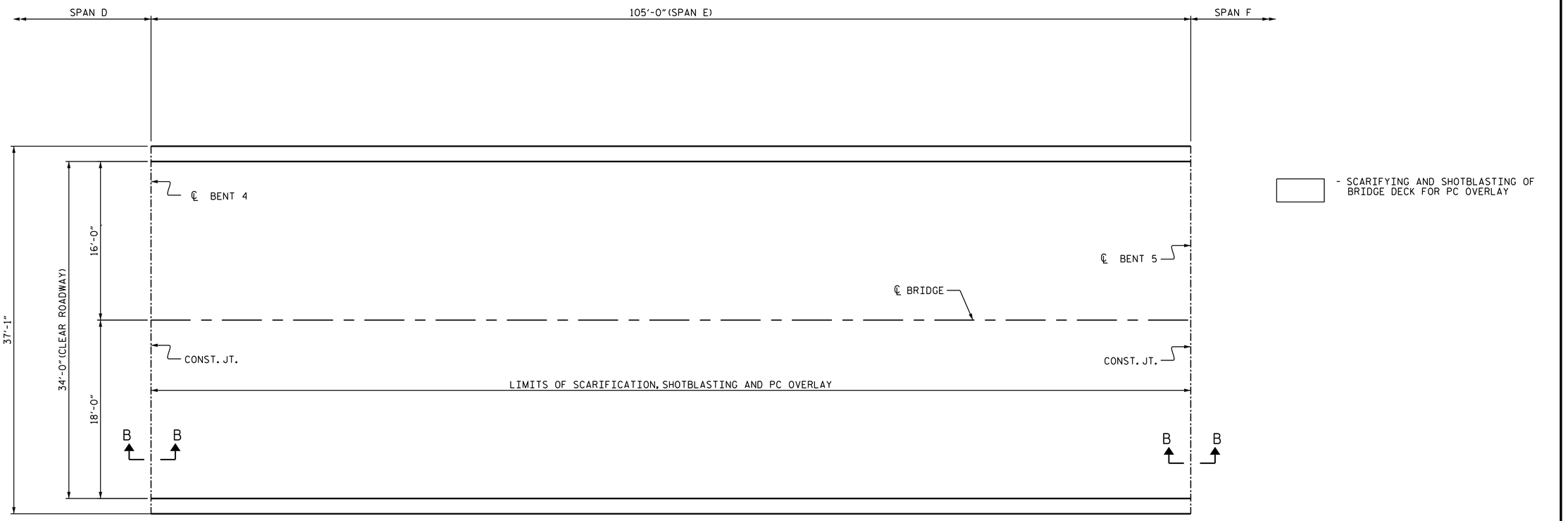
SUMMARY OF QUANTITIES FOR SPAN E

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	396.7 SY	
POLYESTER POLYMER CONCRETE MATERIALS	11.0 CY	
EPOXY POLYMER CONCRETE MATERIALS (ALTERNATE)	11.0 CY	
SHOTBLASTING BRIDGE DECK	396.7 SY	
PLACING & FINISHING PC OVERLAY	396.7 SY	
CLASS II SURFACE PREPARATION	0.0 SY	
GROOVING BRIDGE DECK	3,255.0 SF	



PLAN OF SPAN E

(SEE SHEET NO. S1-3 FOR SECTION B-B)

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420045

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

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SURFACE PREPARATION SPAN E

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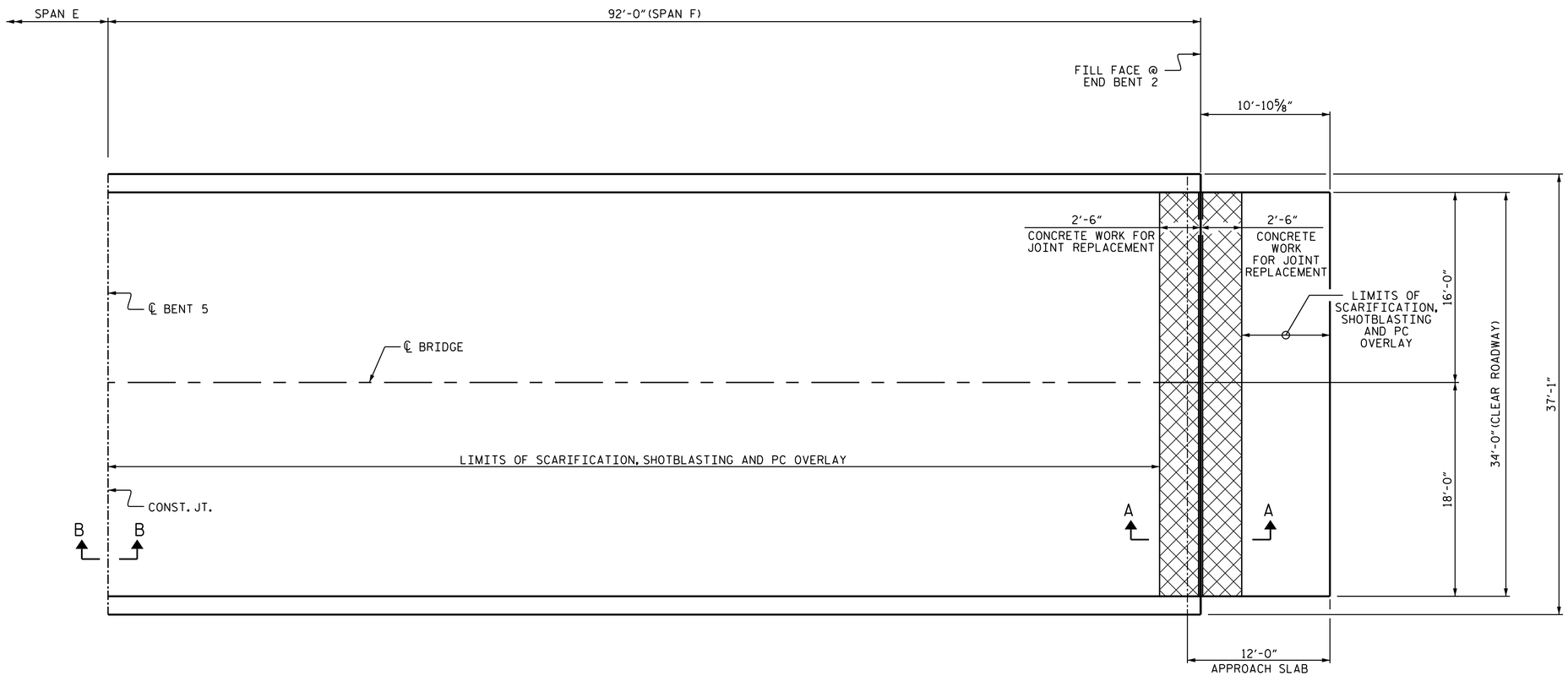
SUMMARY OF QUANTITIES FOR SPAN F AND APPROACH SLAB

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	369.8 SY	
POLYESTER POLYMER CONCRETE MATERIALS	10.3 CY	
EPOXY POLYMER CONCRETE MATERIALS (ALTERNATE)	10.3 CY	
SHOTBLASTING BRIDGE DECK	369.8 SY	
PLACING & FINISHING PC OVERLAY	369.8 SY	
CLASS II SURFACE PREPARATION	0.0 SY	
GROOVING BRIDGE DECK	3,148.5 SF	
CONCRETE WORK FOR JOINT REPLACEMENT	170.0 SF	



PLAN OF SPAN F AND APPROACH SLAB

(SEE SHEET NO. S1-9 FOR SECTION A-A)
(SEE SHEET NO. S1-3 FOR SECTION B-B)

PROJECT NO. 15BPR.34
HARNETT COUNTY
BRIDGE NO. 420045

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
Aster Abraha
Dec 9, 2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SURFACE PREPARATION SPAN F AND APPROACH SLAB

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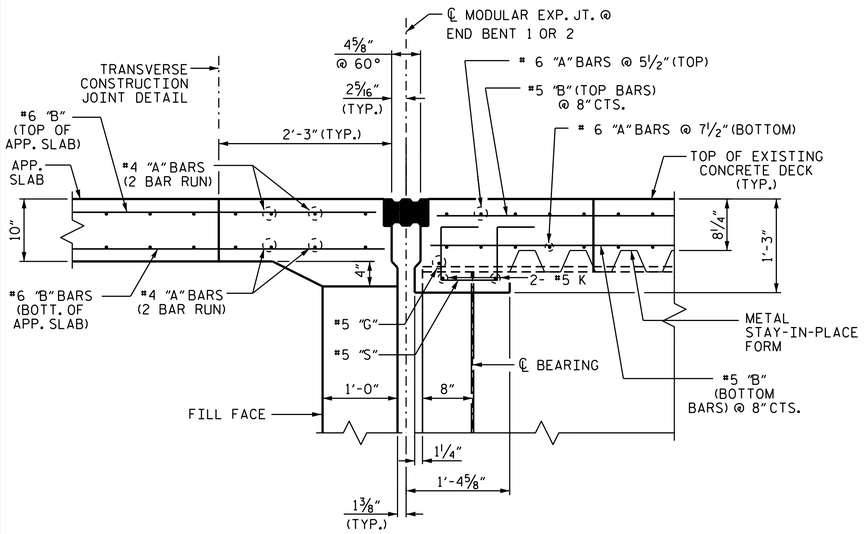
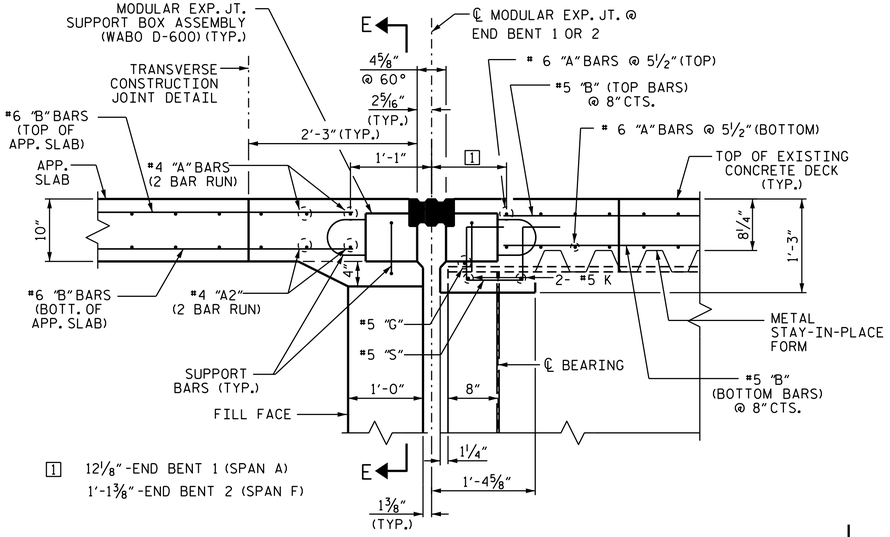


EXISTING MODULAR EXPANSION JOINT DETAIL @ END BENT

(BETWEEN MODULAR JOINT BOXES)



1 12⅛" -END BENT 1 (SPAN A)
1'-1⅜" -END BENT 2 (SPAN F)

EXISTING MODULAR EXPANSION JOINT DETAIL @ END BENT

(EXISTING JOINT AT MODULAR JOINT BOXES)

NOTES

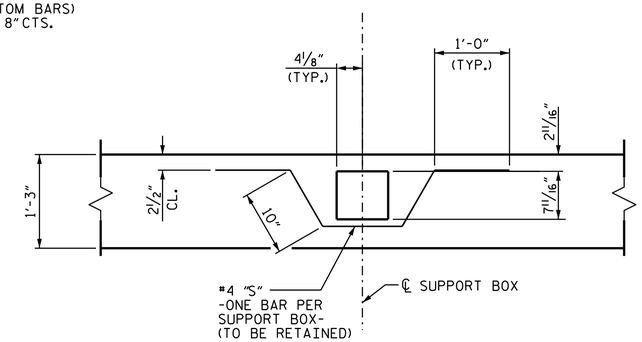
EXISTING MODULAR EXPANSION JOINT DETAILS ARE SHOWN FOR INFORMATION ONLY. ACTUAL FIELD CONDITIONS MAY VARY. THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT IF ACTUAL CONDITIONS VARY FROM WHAT IS SHOWN IN THESE PLANS.

THE CONTRACTOR SHALL HAVE A REPRESENTATIVE FROM THE JOINT MANUFACTURER PRESENT DURING INSTALLATION OF PROPOSED STRIP SEAL EXPANSION JOINT.

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

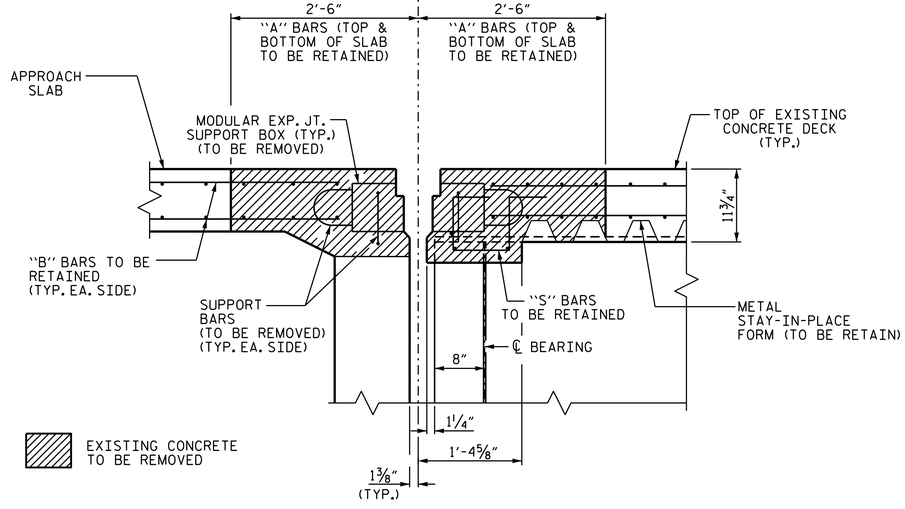
THE CONTRACTOR SHALL PREPARE THE BOTTOM SURFACE OF BLOCKOUT TO BE PARALLEL WITH THE PLANE OF THE ROADWAY AND PROVIDE A UNIFORM SURFACE.

SECTION A-A



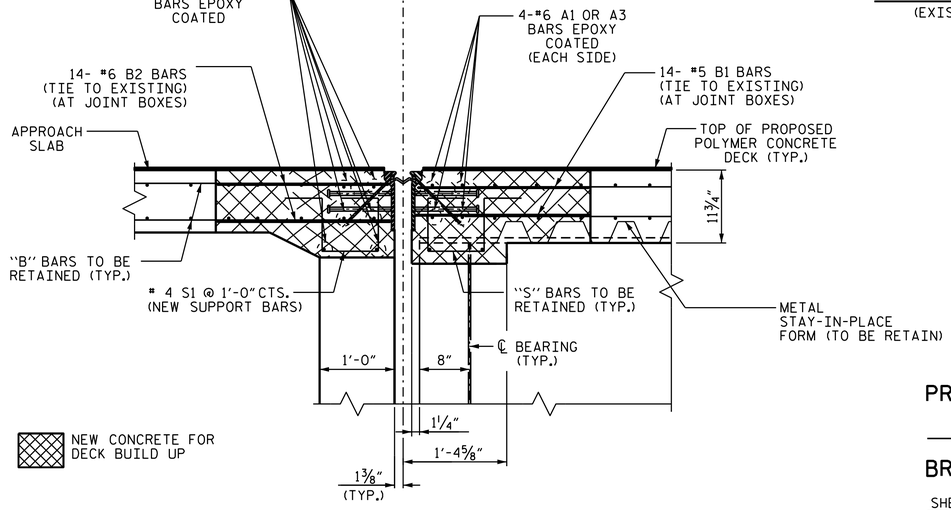
SECTION E-E

(EXISTING JOINT)



MODULAR EXPANSION JOINT DEMOLITION

(JOINT AT MODULAR JOINT BOXES & BETWEEN MODULAR JOINT BOXES)



PROPOSED MODULAR EXPANSION JOINT REPAIR

SECTION A-A

PROJECT NO. 15BPR.34
HARNETT COUNTY
BRIDGE NO. 420045

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SECTION A-A

MODULAR JOINT REPLACEMENT FOR APPROACH SLAB 1 AND END BENT 1

(APP. SLAB 2 AND END BENT 2 SIMILAR)

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
Digitally signed by: Aster Abraha
Dec 9, 2021

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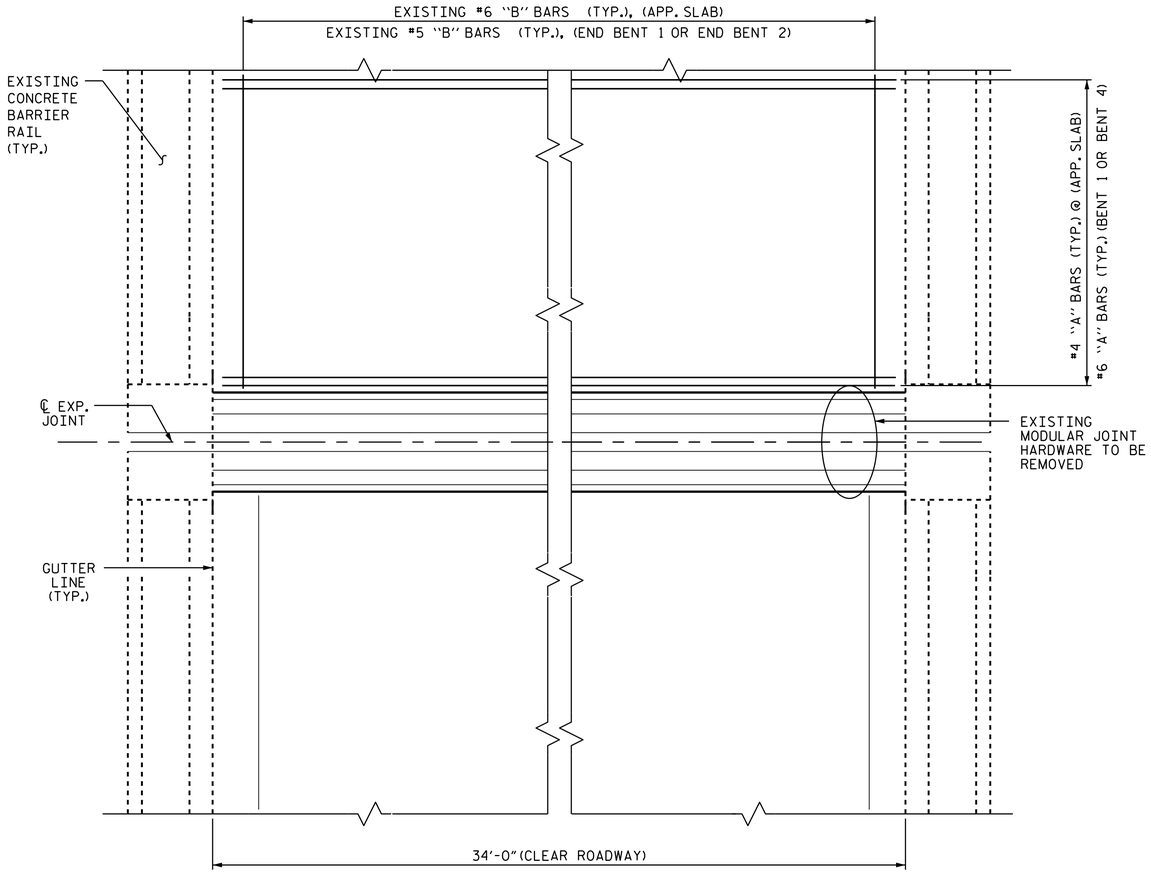
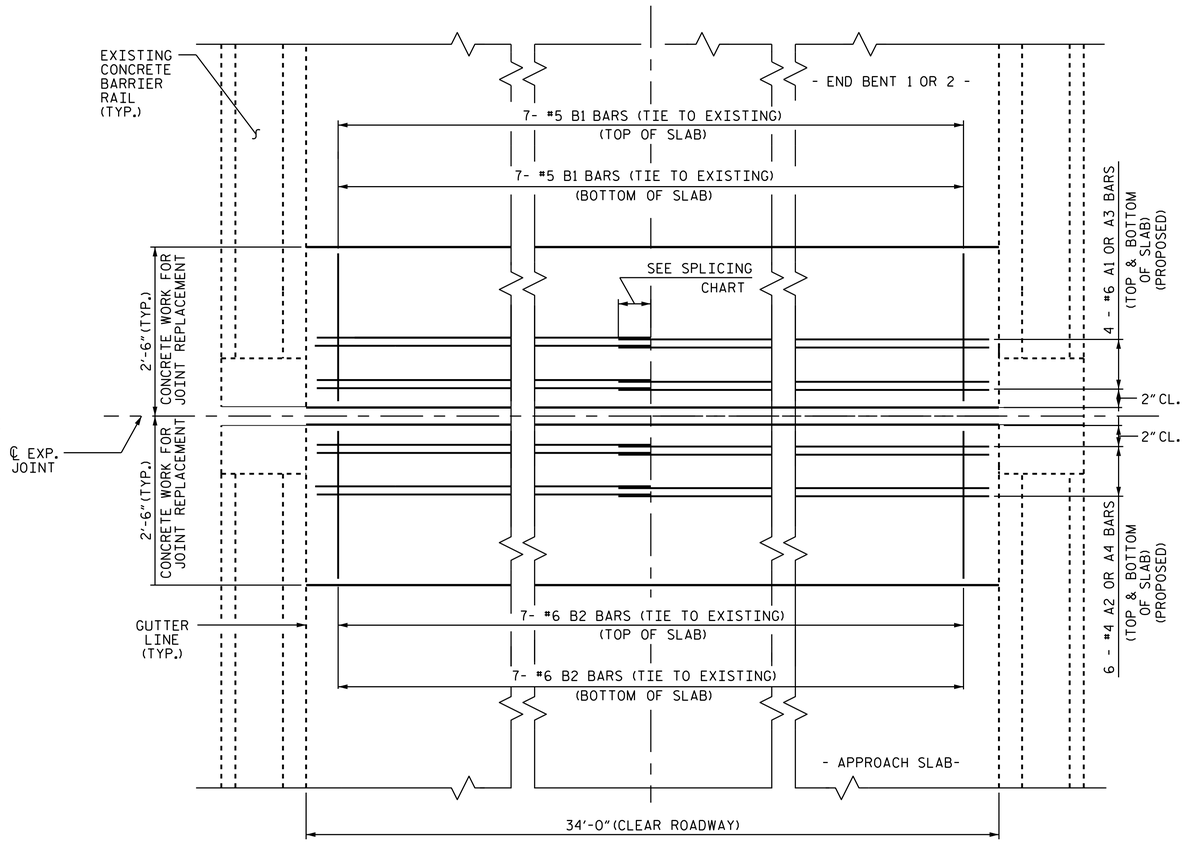


TYPICAL PLAN OF EXISTING MODULAR JOINT



TYPICAL PROPOSED JOINT

NOTES

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

THE ENGINEER WILL REVIEW EXISTING DECK CONDITIONS. THE CONTRACTOR SHALL REMOVE UNSOUND CONCRETE IN THE DECK, OR AS DIRECTED BY THE ENGINEER.

DECK CONCRETE SHALL BE REPLACED WITH CLASS AA HIGH EARLY STRENGTH PORTLAND CEMENT CONCRETE ACCORDING TO SECTION 1000-5 OF THE STANDARD SPECIFICATIONS.

REMOVE BRIDGE DECK CONCRETE TO THE EXTENT NECESSARY TO REMOVE EXISTING JOINT. INTRODUCE A PARTIAL DEPTH SAWCUT NOT EXCEEDING 1" IN DEPTH. FOLLOWED BY CONCRETE REMOVAL WITHOUT DAMAGE TO EXISTING REINFORCING STEEL AND EXISTING GIRDERS.

RETAIN BRIDGE DECK REINFORCING STEEL. STRAIGHTEN, REPAIR, OR REPLACE REINFORCING STEEL, AS NECESSARY.

THE CONTRACTOR SHALL CONSTRUCT THE OPENING FOR THE STRIP SEAL EXPANSION JOINT BASED UPON THE MANUFACTURER'S RECOMMENDATIONS. FOR ALL TEMPERATURE RANGES, THE JOINT WIDTH MAY NOT BE LESS THAN 1" OR GREATER THAN 3½". THE CONTRACTOR SHALL INSTALL JOINT SEAL ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

REMOVE EXISTING MODULAR EXPANSION JOINT IN ENTIRETY AND ALL OTHER JOINT HARDWARE.

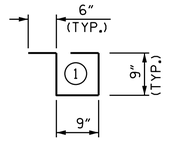
PROPOSED A1 AND B1 BARS SHALL BE SPACED SO AS TO MATCH SPACING OF EXISTING "A" AND "B" BARS.

THE REPAIR CONCRETE SHALL ATTAIN A STRENGTH OF 4,500 PSI PRIOR TO THE INTRODUCTION OF TRAFFIC.

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

BAR SIZE BAR	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"

— BAR TYPES —



BILL OF MATERIAL

FOR APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A2	6	#4	STR	16'-10"	68.0
✳ A4	6	#4	STR	18'-10"	75.0
✳ B2	14	#6	STR	2'-2"	46.0
✳ S1	24	#4	1	3'-3"	52.0
✳ EPOXY COATED REINFORCING STEEL = 241.0 LBS					
CONCRETE FOR JOINT REPAIR = 3.2 C.Y.					

FOR END BENT (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	4	#6	STR	16'-10"	101.0
✳ A3	4	#6	STR	19'-10"	120.0
✳ B1	14	#5	STR	2'-2"	32.0
✳ EPOXY COATED REINFORCING STEEL = 253.0 LBS					
CONCRETE FOR JOINT REPAIR = 3.2 C.Y.					

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
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Dec 9, 2021

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PROJECT NO. 15BPR.34
HARNETT COUNTY
BRIDGE NO. 420045
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SECTION A-A
MODULAR JOINT REPLACEMENT FOR APPROACH SLAB 1 AND END BENT 1

(APP. SLAB 2 AND END BENT 2 SIMILAR)

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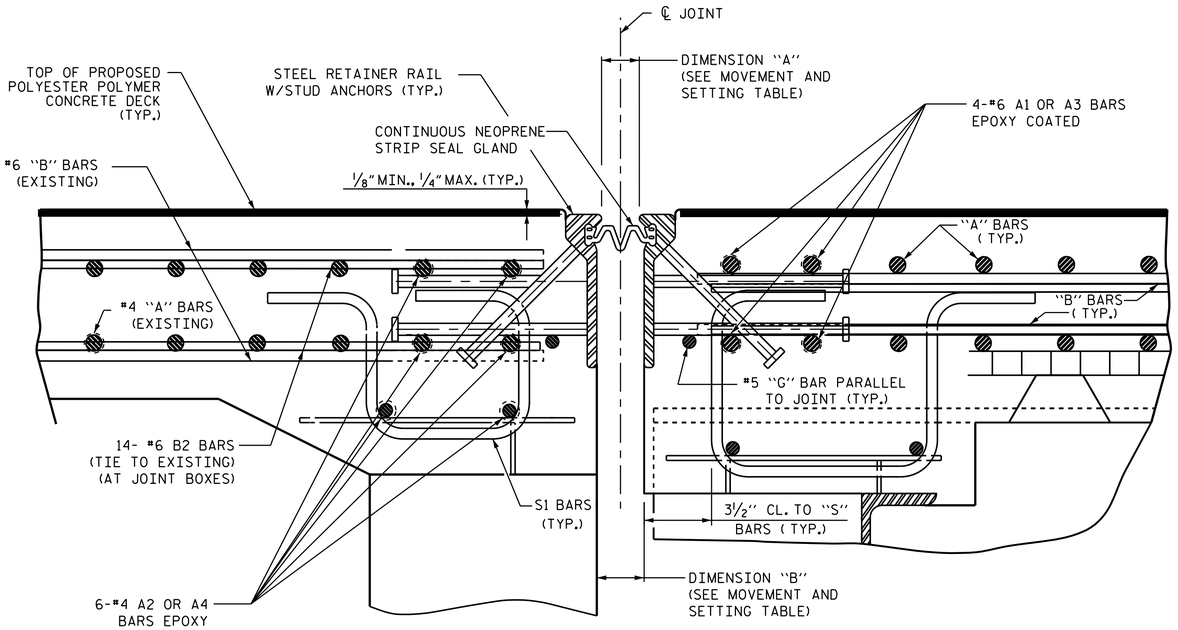
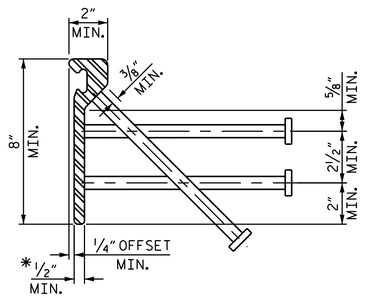


STRIP SEAL EXPANSION JOINT DETAILS

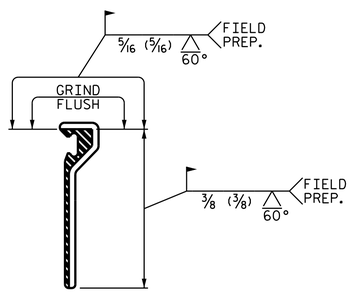
SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

MOVEMENT AND SETTING TABLE								
LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	DIMENSION "A"			DIMENSION "B"		
			PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	90°-00'-00"	2 3/8"	2 1/2"	2 3/16"	1 1/2"	3"	2 11/16"	2"
END BENT 2	90°-00'-00"	2 3/8"	2 1/2"	2 3/16"	1 1/2"	3"	2 11/16"	2"

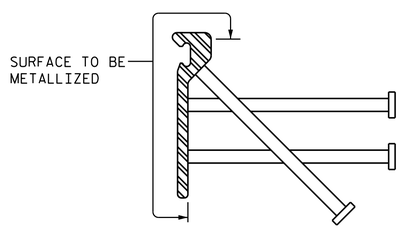


TYPICAL SECTION STEEL RETAINER RAIL

*DIMENSION "B" BASED ON STEEL RETAINER RAIL TOP OFFSET TO FACE OF RAIL OF 1/4" MINIMUM. IF ACTUAL OFFSET IS GREATER ADJUST DIMENSION "B" AS REQUIRED.



STEEL RETAINER RAIL (FIELD SPLICE DETAIL)



METALLIZING DETAIL

JOINT INSTALLATION PROCEDURE:

1. INSTALL THE STRIP SEAL EXPANSION JOINT AS RECOMMENDED BY THE STRIP SEAL EXPANSION JOINT MANUFACTURER.
2. A MANUFACTURER'S REPRESENTATIVE IS TO BE PRESENT DURING INSTALLATION OF THE JOINT.
3. PLACE STEEL RETAINER RAILS IN JOINT OPENING. PROPERLY ALIGN THE RAILS BOTH HORIZONTALLY AND VERTICALLY.
4. SHIFT SLIGHTLY, AS NECESSARY, CONFLICTING REINFORCING STEEL.
5. DECK SLAB CONCRETE PLACEMENT OPERATIONS SHALL COMMENCE PER THE POURING SEQUENCE AFTER FINAL JOINT ALIGNMENT IS SET.
6. CARE MUST BE TAKEN DURING THE CONCRETE POUR TO PROTECT THE STEEL RETAINER RAILS FROM BEING FOULED BY CONCRETE SPILLOVER.
7. ON APPROACH SLAB SIDE OF JOINT, RE-LEVEL AND RE-ALIGN STEEL RETAINER RAIL AS REQUIRED.
8. PLACE APPROACH SLAB CONCRETE.
9. ONCE THE CONCRETE HAS HARDENED SUFFICIENTLY ON BOTH SIDES OF JOINT, STEEL RETAINER RAILS SHALL BE CLEANED THOROUGHLY AND SEAL CHANNELS SHALL BE INSPECTED TO ASCERTAIN THE ABSENCE OF CONCRETE AND DEBRIS.
10. COAT THE STRIP SEAL LUGS WITH LUBRICANT-ADHESIVE AND INSTALL THE NEOPRENE STRIP SEAL GLAND AS RECOMMENDED BY THE STRIP SEAL EXPANSION JOINT MANUFACTURER.

GENERAL NOTES

FOR STRIP SEALS, SEE SPECIAL PROVISIONS.

STEEL RETAINER RAILS SHALL CONFORM TO AASHTO M270 GRADE 36 OR GRADE 50W STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSEDEND AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.

ONLY STEEL RETAINER RAILS OF ONE-PIECE CONSTRUCTION ARE PERMITTED. STEEL RETAINER RAILS CONSISTING OF TWO OR MORE COMPONENTS WELDED TOGETHER TO OBTAIN THEIR FINAL CROSS-SECTIONAL SHAPE ARE NOT PERMITTED.

NEOPRENE STRIP SEAL GLAND SHALL BE CONTINUOUS THROUGHOUT THE JOINT AND SHALL BE COMPATIBLE WITH THE STEEL RETAINER RAILS.

STUD ANCHORS SHALL BE SHOP WELDED AND SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

SURFACES COMING IN CONTACT WITH STRIP SEAL GLAND SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.

UPON COMPLETION OF SHOP FABRICATION, THE STEEL RETAINER RAILS SHALL BE METALLIZED AS SHOWN IN THE "METALLIZING DETAIL". SEE SPECIAL PROVISIONS FOR THERMAL SPRAYED COATINGS (METALLIZATION).

INSTALLED STEEL RETAINER RAILS SHALL FOLLOW THE ROADWAY SLOPE.

FIELD SPLICES OF THE RETAINER RAILS SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL.

NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.

THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

THE CONTRACTOR SHALL FIELD VERIFY THE EXISTING JOINT OPENING PRIOR TO ORDERING JOINT SEAL MATERIAL. IF THE ACTUAL JOINT OPENING VARIES FROM THE OPENING INDICATED IN THE DETAILS BY MORE THAN 1/4", NOTIFY THE ENGINEER.

THE MANFACTURER TO PROVIDE THE NOMINAL JOINT SEAL WIDTH FOR THE SIZE OPENING ON THE PLANS AND ACCOMODATE THE TOTAL MOVEMENT SHOWN ON THE PLANS.

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420045

SHEET 3 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

STRIP SEAL EXPANSION JOINT DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-11
1			3			TOTAL SHEETS
2			4			33

ASSEMBLED BY :	S. T. SANDOR	DATE : 11/2018
CHECKED BY :	A. G. ABRAHA	DATE : 11/2018
DRAWN BY :	MAA	6/17
CHECKED BY :	BNB	6/17

09-DEC-2021 17:02
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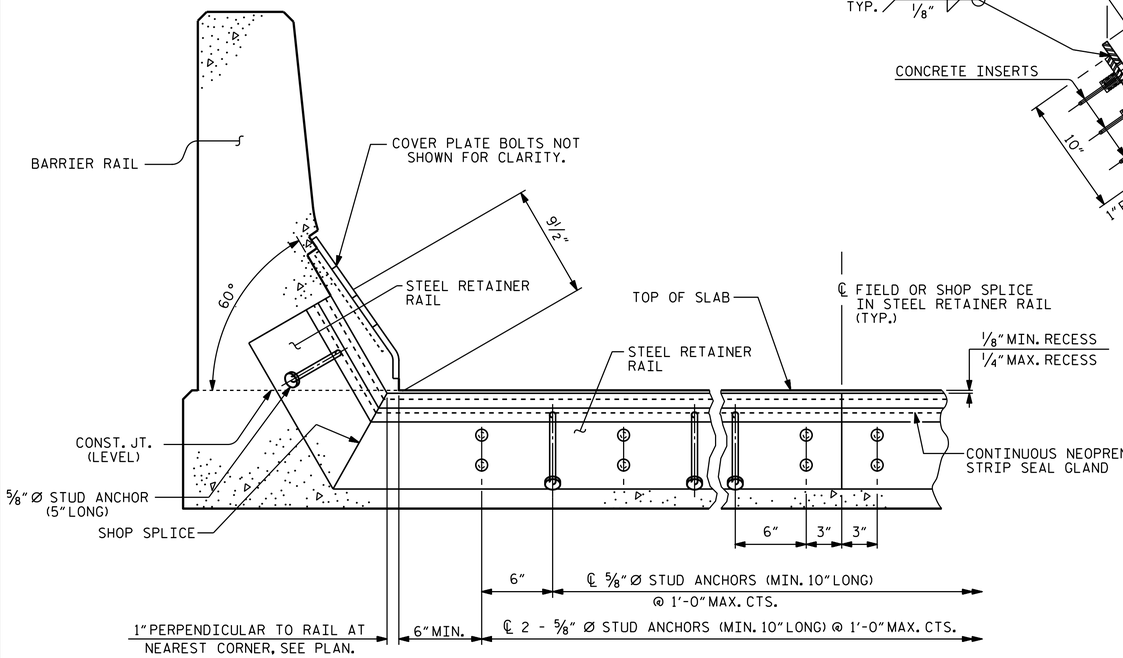
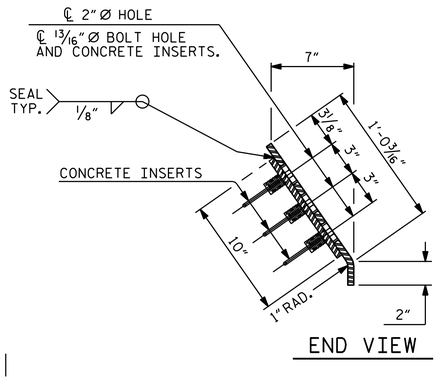
aabraha

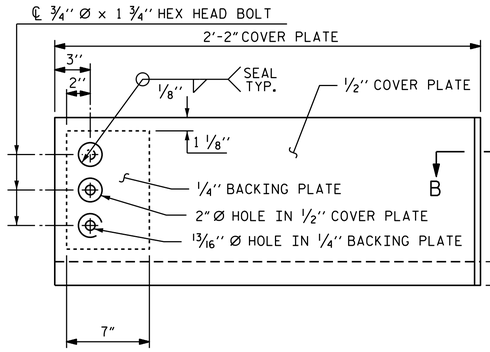
STD. NO. SSEJ1



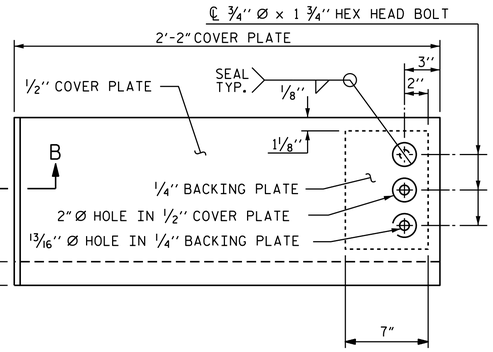
SECTION THRU RAIL NORMAL TO JOINT



END VIEW

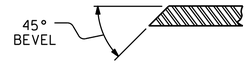


TYPE I - ELEVATION VIEW

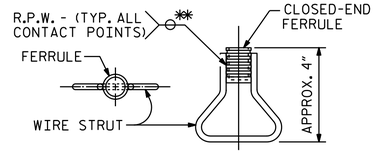


TYPE II - ELEVATION VIEW

COVER PLATE DETAILS



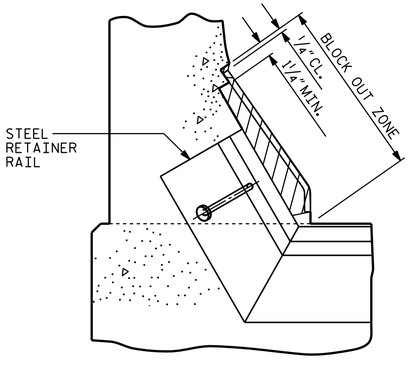
SECTION B - B



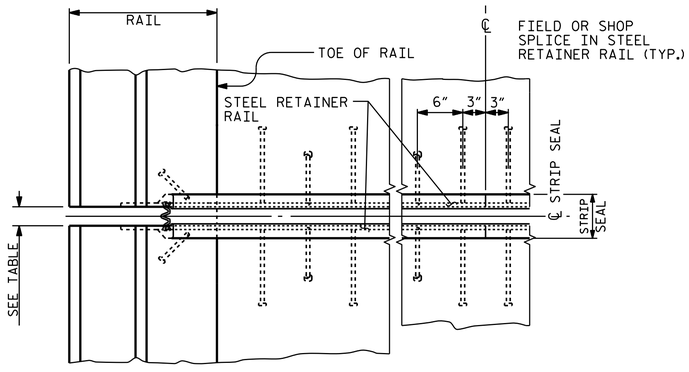
PLAN ELEVATION

CONCRETE INSERT

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



BLOCK OUT DETAIL



PLAN OF STRIP SEAL EXPANSION JOINT

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420045

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

STRIP SEAL EXPANSION JOINT DETAILS FOR BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
DocuSigned by: DDA094AED5104FD...
Dec 9, 2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SHEET NO. S1-12

TOTAL SHEETS 33

ASSEMBLED BY :	S.T. SANDOR	DATE : 10/18
CHECKED BY :	ASTER ABRAHA, P.E.	DATE : 10/18
DRAWN BY :	MAA	6/17
CHECKED BY :	BNB	6/17

09-DEC-2021 17:02
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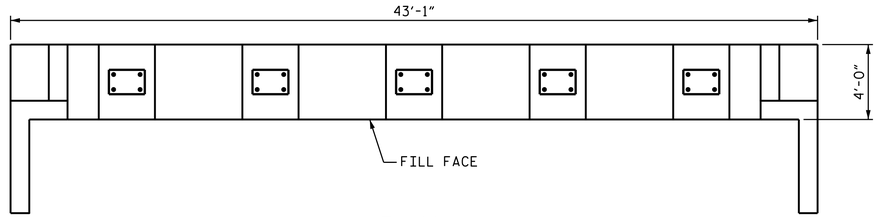
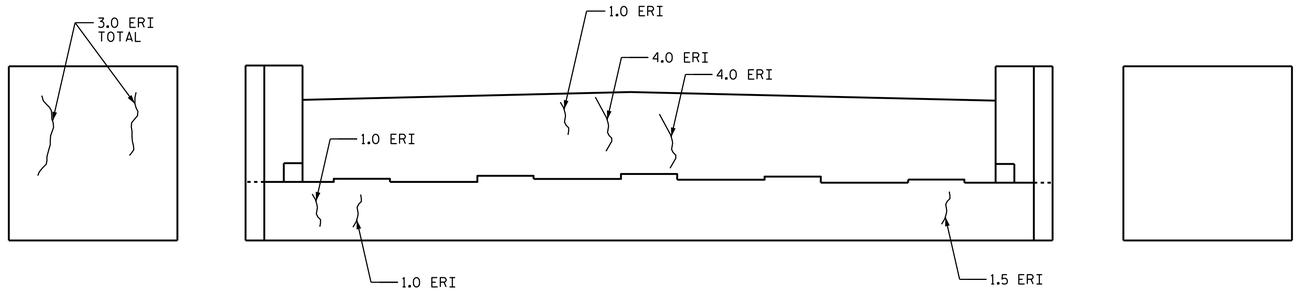
aabraha



PLAN
END BENT 1

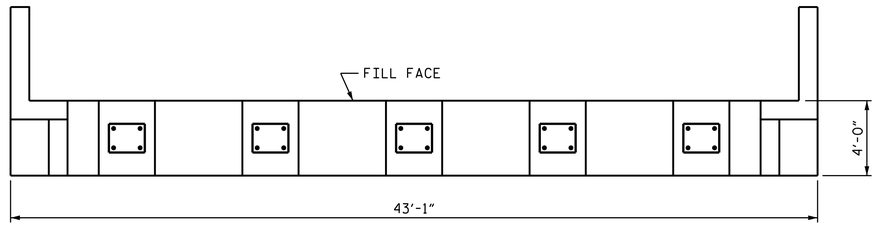


ELEVATION
END BENT 1 - WING WALL
(SOUTHWEST)

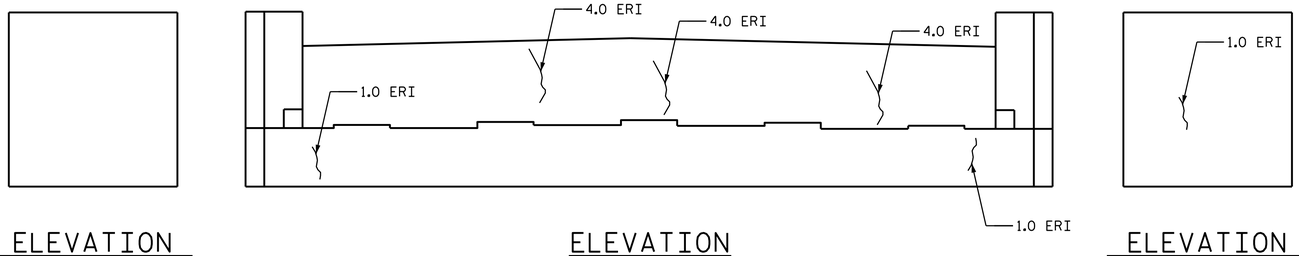
ELEVATION
END BENT 1
(NORTH FACE)

ELEVATION
END BENT 1 - WING WALL
(SOUTHEAST)

END BENT 1



PLAN
END BENT 2



ELEVATION
END BENT 2 - WING WALL
(NORTHWEST)

ELEVATION
END BENT 2
(SOUTH FACE)

ELEVATION
END BENT 2 - WING WALL
(NORTHEAST)

END BENT 2

REPAIR QUANTITY TABLE

REPAIRS END BENT 1 & 2	QUANTITIES			
	ESTIMATE		ACTUAL	
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LN. FT		LN. FT
CAP		26.5		
WING WALL		4.0		
EPOXY COATING	AREA SF		AREA SF	
TOP OF CAP	351.0			

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

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE INSPECTOR OR ENGINEER THE CONTRACTOR SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE REPAIR QUANTITY TABLE.

CONTRACTOR SHALL SAW CUT TO A NOMINAL DEPTH OF ½" BUT REINFORCING STEEL SHALL NOT BE DAMAGED.

CONTRACTOR SHALL REMOVE SURFACE CONCRETE TO VERIFY THAT SAWCUT DEPTH WILL NOT DAMAGE EXISTING REINFORCING STEEL.

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

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

FOR REPAIR DETAILS, SEE TYPICAL CAP AND COLUMN REPAIR DETAILS SHEET.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

ERI - EPOXY RESIN INJECTION

▨ - CONCRETE REPAIRS

▩ - SHOTCRETE REPAIRS

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420045

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIR END BENT 1 & END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-13
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : M.K. BEARD / S. T. SANDOR DATE : 11/2018

CHECKED BY : A. G. ABRAHA DATE : 12/2018

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aabraha

NOTES:

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE INSPECTOR OR ENGINEER, THE CONTRACTOR SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE REPAIR QUANTITY TABLE.

FOR CAP AND COLUMN REPAIR DETAILS, SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

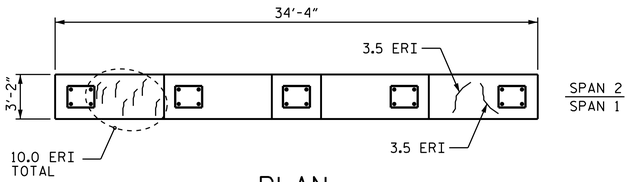
CONCRETE REPAIRS MAY BE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

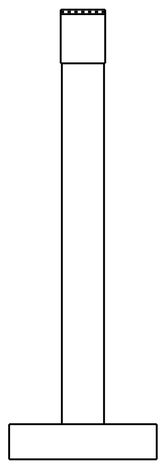
REPAIR QUANTITY TABLE

REPAIRS BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LN. FT		LN. FT
CAP		27.0		
COLUMN		0.0		
EPOXY COATING	AREA SF			AREA SF
TOP OF CAP	108.7			

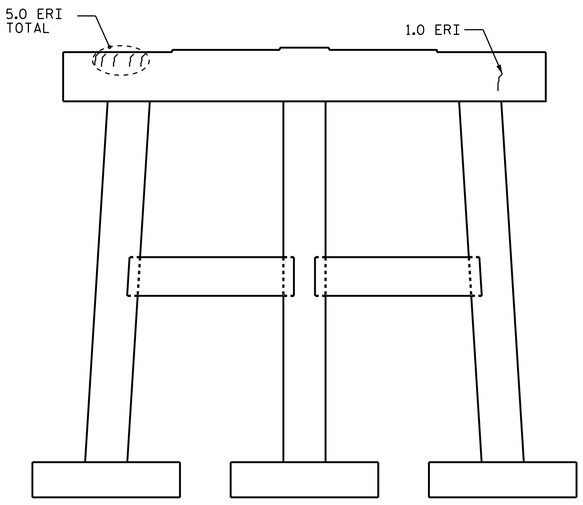
VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CL TO SAWCUT. SEE REPAIR DETAILS.



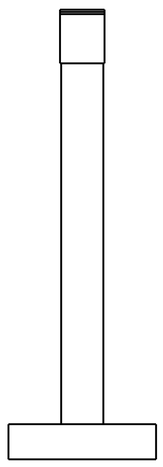
PLAN
TOP OF CAP



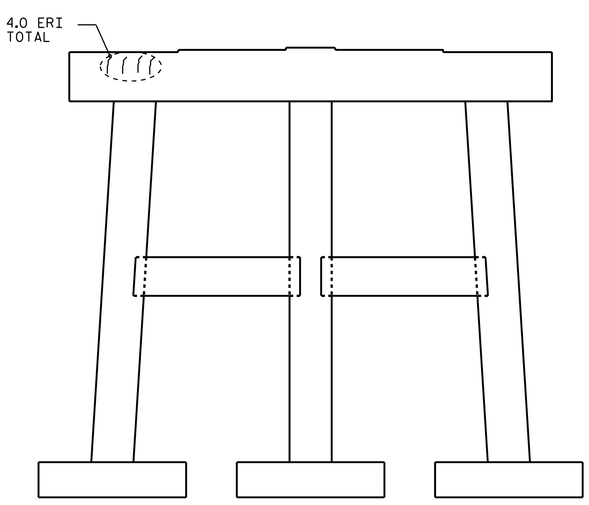
END VIEW
LOOKING EAST



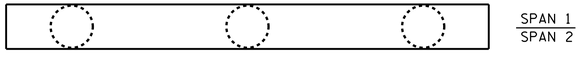
ELEVATION
LOOKING NORTH



END VIEW
LOOKING WEST



ELEVATION
LOOKING SOUTH



PLAN
BOTTOM OF CAP

SHOTCRETE REPAIRS

CONCRETE REPAIRS

ERI EPOXY RESIN INJECTION

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

DocuSigned by: Aster Abraha DD4094AED6104FD...

Dec 9, 2021

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420045

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIR BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-14
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : M.K BEARD / S. T. SANDOR DATE : 11/2018
CHECKED BY : A. G. ABRAHA DATE : 12/2018

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NOTES:

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE INSPECTOR OR ENGINEER, THE CONTRACTOR SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE REPAIR QUANTITY TABLE.

FOR CAP AND COLUMN REPAIR DETAILS, SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

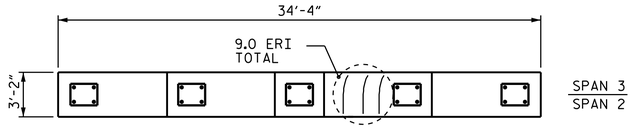
CONCRETE REPAIRS MAY BE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

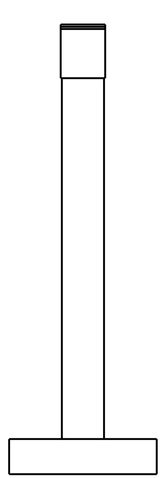
REPAIR QUANTITY TABLE

REPAIRS BENT 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LN. FT		LN. FT
CAP		15.0		
COLUMN		0.0		
EPOXY COATING	AREA SF			AREA SF
TOP OF CAP	108.7			

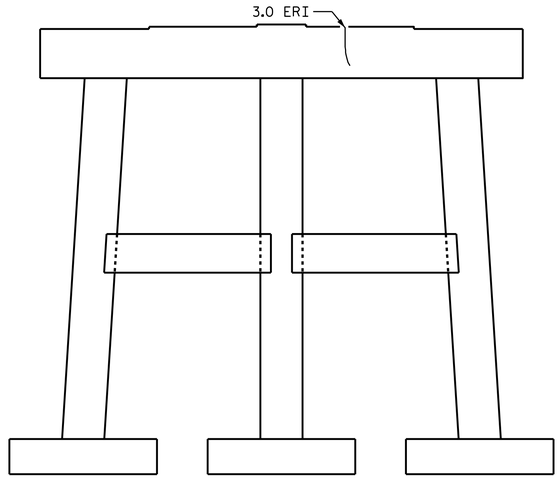
VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CL TO SAWCUT. SEE REPAIR DETAILS.



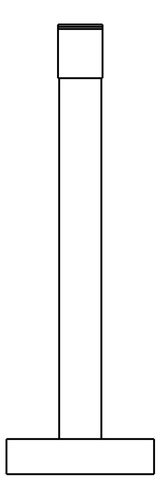
PLAN
TOP OF CAP



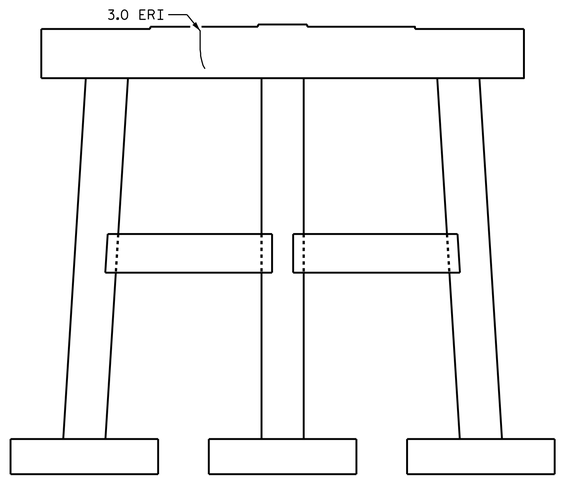
END VIEW
LOOKING EAST



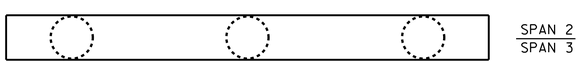
ELEVATION
LOOKING NORTH



END VIEW
LOOKING WEST



ELEVATION
LOOKING SOUTH



PLAN
BOTTOM OF CAP

SHOTCRETE REPAIRS

CONCRETE REPAIRS

ERI EPOXY RESIN INJECTION

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

DocuSigned by: Aster Abraha DD8094AED6104FD...
Dec 9, 2021

PROJECT NO. 15BPR.34
HARNETT COUNTY
BRIDGE NO. 420045

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIR BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-15
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : M.K BEARD / S. T. SANDOR DATE : 11/2018
CHECKED BY : A. G. ABRAHA DATE : 12/2018

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aabraha

NOTES:

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FOR CAP AND COLUMN REPAIR DETAILS, SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

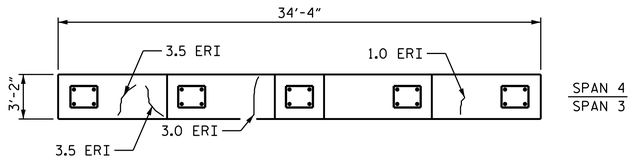
CONCRETE REPAIRS MAY BE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

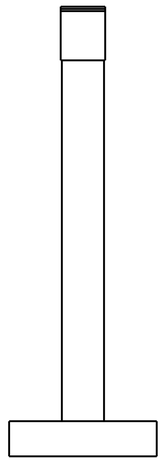
REPAIR QUANTITY TABLE

REPAIRS BENT 3	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LN. FT		LN. FT
CAP		16.0		
COLUMN		0.0		
EPOXY COATING	AREA SF			AREA SF
TOP OF CAP	108.7			

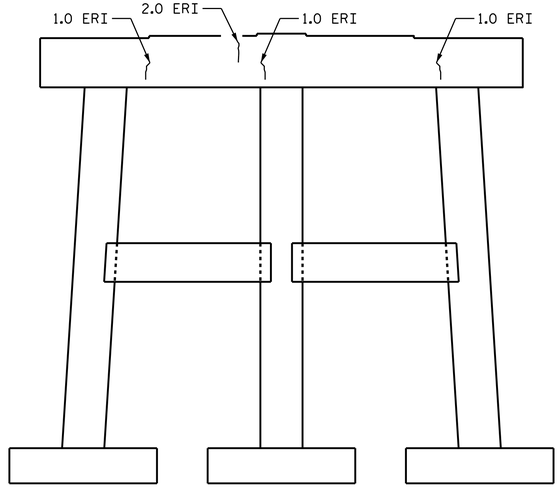
VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CL TO SAWCUT. SEE REPAIR DETAILS.



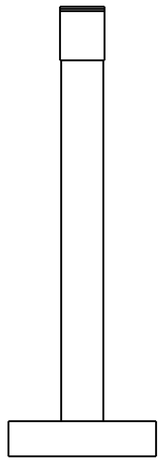
PLAN
TOP OF CAP



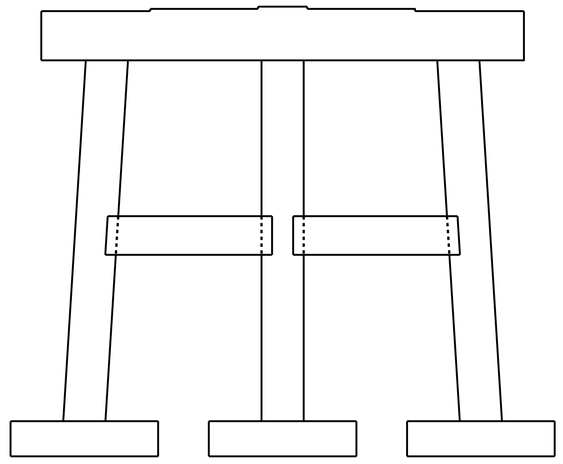
END VIEW
LOOKING EAST



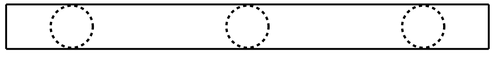
ELEVATION
LOOKING NORTH



END VIEW
LOOKING WEST



ELEVATION
LOOKING SOUTH



PLAN
BOTTOM OF CAP

SHOTCRETE REPAIRS

CONCRETE REPAIRS

ERI EPOXY RESIN INJECTION

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
DocuSigned by:
DDA094AED6104FD...
Dec 9, 2021

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420045

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIR BENT 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-16
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : M.K BEARD / S. T. SANDOR DATE : 11/2018
CHECKED BY : A. G. ABRAHA DATE : 12/2018

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NOTES:

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE INSPECTOR OR ENGINEER, THE CONTRACTOR SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE REPAIR QUANTITY TABLE.

FOR CAP AND COLUMN REPAIR DETAILS, SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

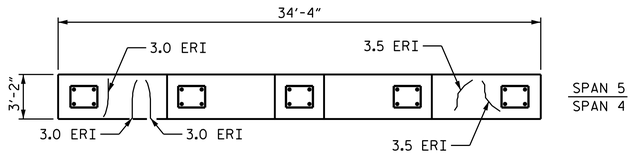
CONCRETE REPAIRS MAY BE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

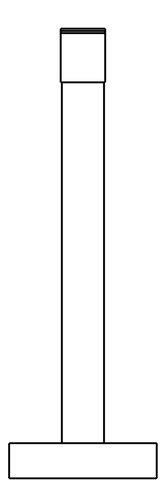
REPAIR QUANTITY TABLE

REPAIRS BENT 4	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LN. FT		LN. FT
CAP		24.0		
COLUMN		0.0		
EPOXY COATING	AREA SF			AREA SF
TOP OF CAP	108.7			

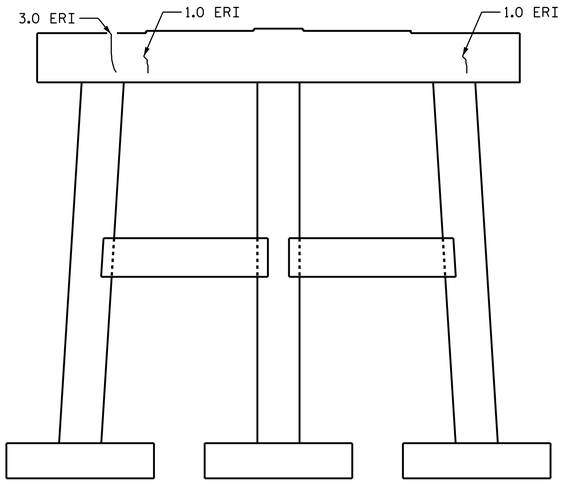
VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CL TO SAWCUT. SEE REPAIR DETAILS.



PLAN
TOP OF CAP

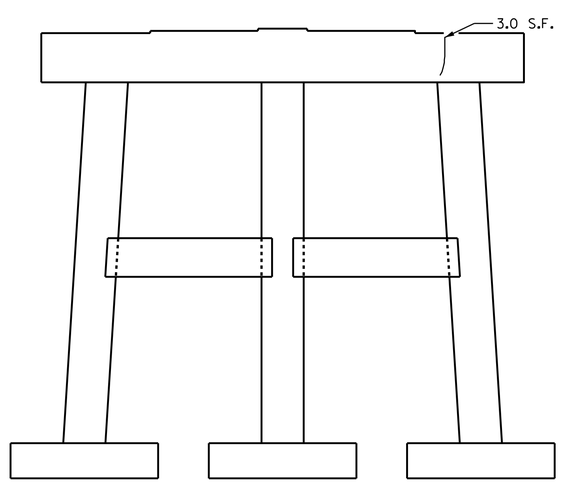


END VIEW
LOOKING EAST

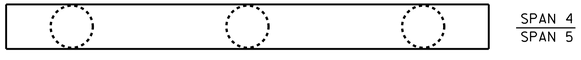


ELEVATION
LOOKING NORTH

END VIEW
LOOKING WEST



ELEVATION
LOOKING SOUTH



PLAN
BOTTOM OF CAP

SHOTCRETE REPAIRS

CONCRETE REPAIRS

ERI EPOXY RESIN INJECTION

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
DocuSigned by:
DDA094AED6104FD...
Dec 9, 2021

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420045

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIR BENT 4

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-17
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : M.K BEARD / S. T. SANDOR DATE : 11/2018
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aabraha

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FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

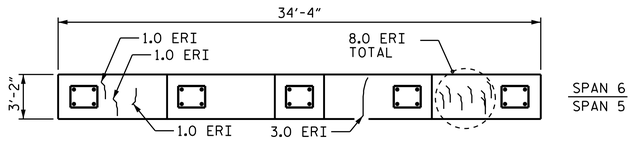
CONCRETE REPAIRS MAY BE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

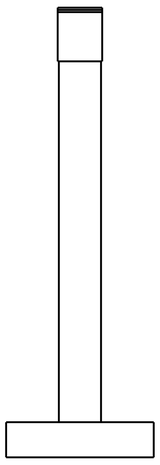
REPAIR QUANTITY TABLE

REPAIRS BENT 5	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL, CORNER)	0.0	0.0		LN. FT
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LN. FT		LN. FT
CAP		36.0		
COLUMN		0.0		
EPOXY COATING	AREA SF			AREA SF
TOP OF CAP	108.7			

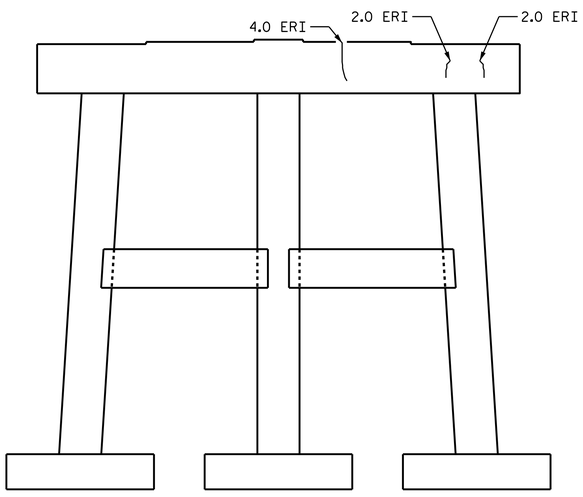
VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 1" CL TO SAWCUT. SEE REPAIR DETAILS.



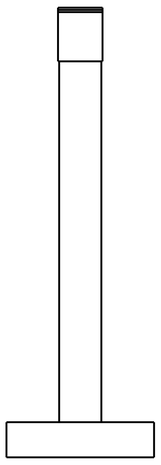
PLAN
TOP OF CAP



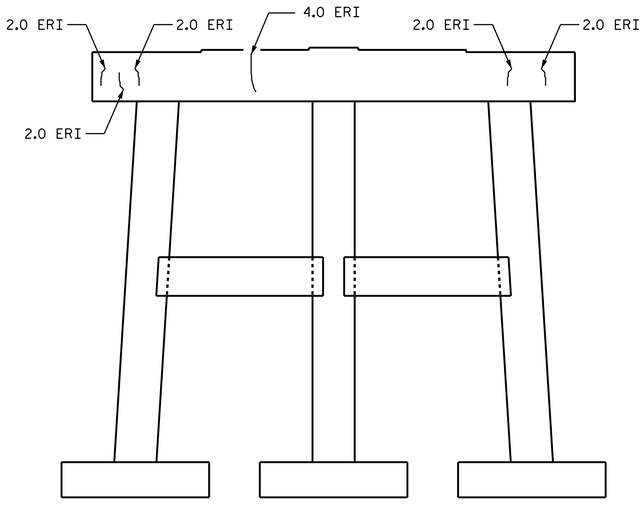
END VIEW
LOOKING EAST



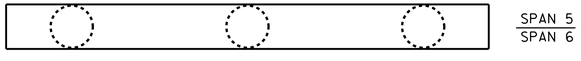
ELEVATION
LOOKING NORTH



END VIEW
LOOKING WEST



ELEVATION
LOOKING SOUTH



PLAN
BOTTOM OF CAP

SHOTCRETE REPAIRS

CONCRETE REPAIRS

ERI EPOXY RESIN INJECTION

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
DocuSigned by:
DDA094AED6104FD...
Dec 9, 2021

PROJECT NO. 15BPR.34
HARNETT COUNTY
BRIDGE NO. 420045

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIR BENT 5

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-18
1			3			TOTAL SHEETS
2			4			33

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CHECKED BY : A. G. ABRAHA DATE : 12/2018

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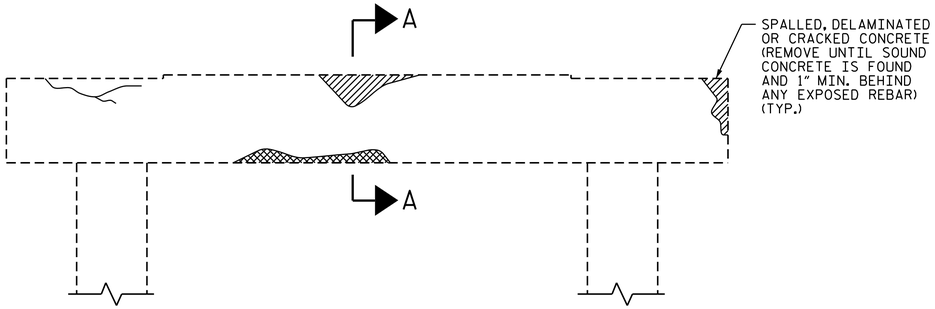
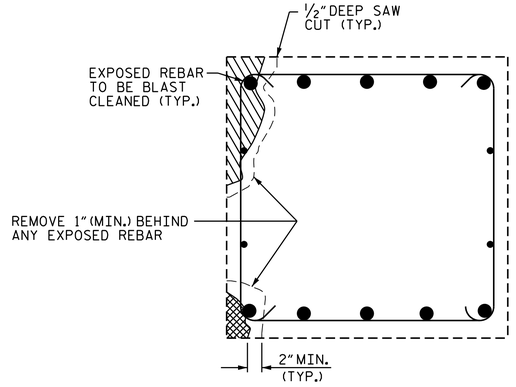
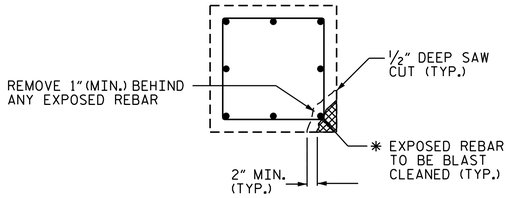


BENT CAP REPAIRS



SECTION A-A

CAP REPAIR



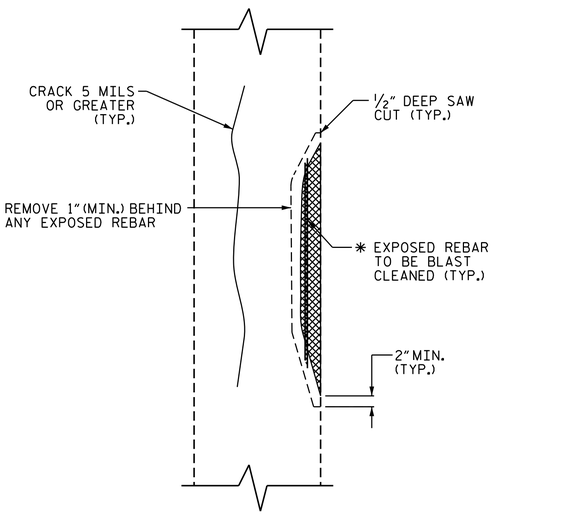
PLAN OF COLUMN

REPAIR KEY

CONCRETE REPAIR AREA (FORM AND POUR)

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

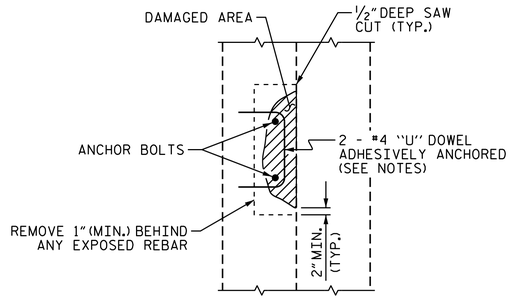


* REPAIR LENGTH SHALL NOT EXCEED 10 FEET.

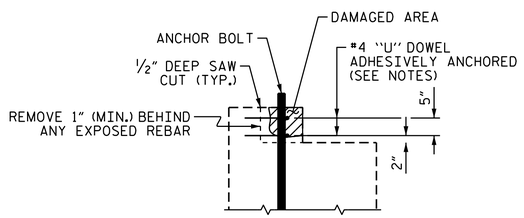
ELEVATION OF COLUMN

COLUMN REPAIR

SPLICE LENGTH TABLE	
BAR SIZE	MIN. SPLICE LENGTH
#4	2'-4"
#5	2'-9"
#6	4'-0"
#7	5'-3"
#8	6'-9"
#9	8'-6"
#10	10'-11"
#11	13'-4"



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 CROSS SECTIONAL AREA 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, IF THE AREAS OF REMOVAL ARE NOT ADJACENT TO OR DIRECTLY OPPOSITE ONE ANOTHER. IF REMOVAL EXTENDS MORE THAN 1½" BEHIND THE MAIN REINFORCING BARS, NOTIFY THE ENGINEER PRIOR TO PROCEEDING.

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.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION (ERI), SEE SPECIAL PROVISIONS.

PROJ. NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420045

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

DocuSigned by: Aster Abraha DD4094AED6104FD...

Dec 9, 2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
TYPICAL CAP AND COLUMN REPAIR DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-19
1			3			TOTAL SHEETS
2			4			33

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ASSEMBLED BY : S. T. SANDOR	DATE : 11/2018
CHECKED BY : W. C. SMITH	DATE : 03/2019
DRAWN BY : NAP 8/18	
CHECKED BY :	

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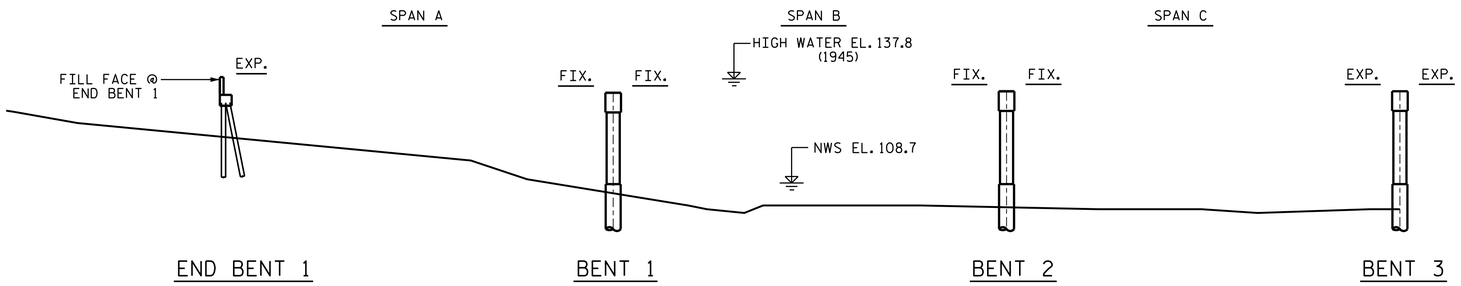
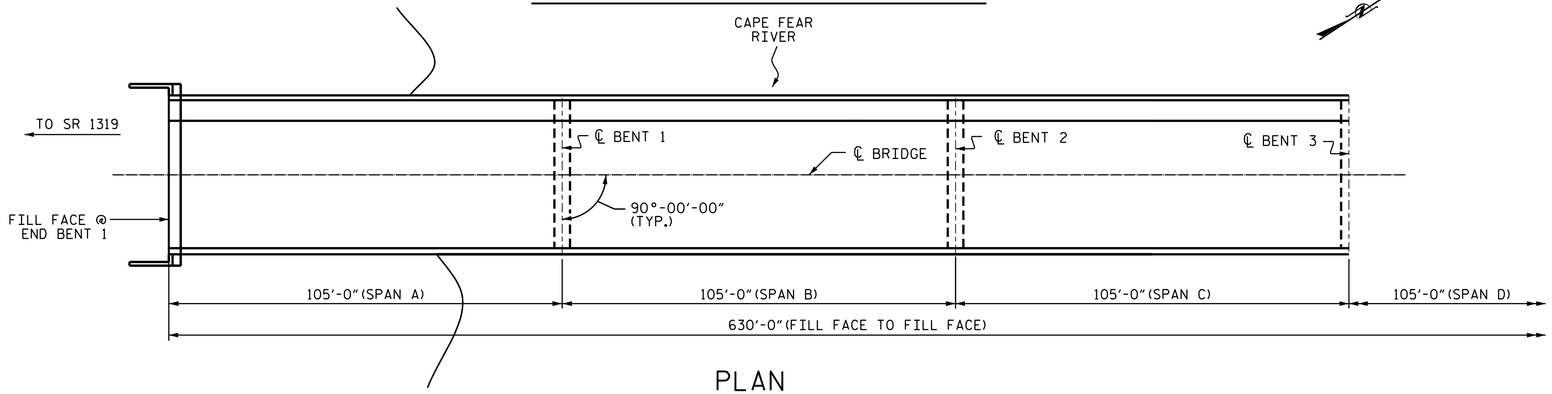
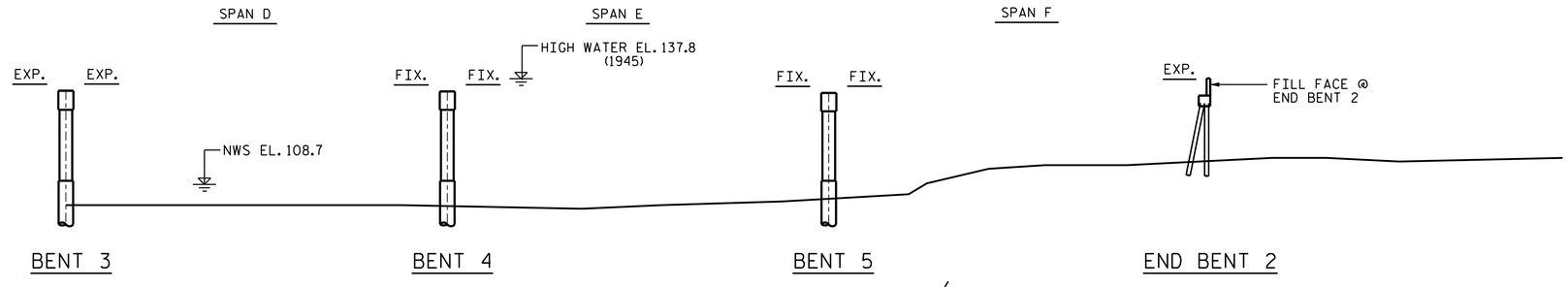


SECTION ALONG ℄ ROADWAY

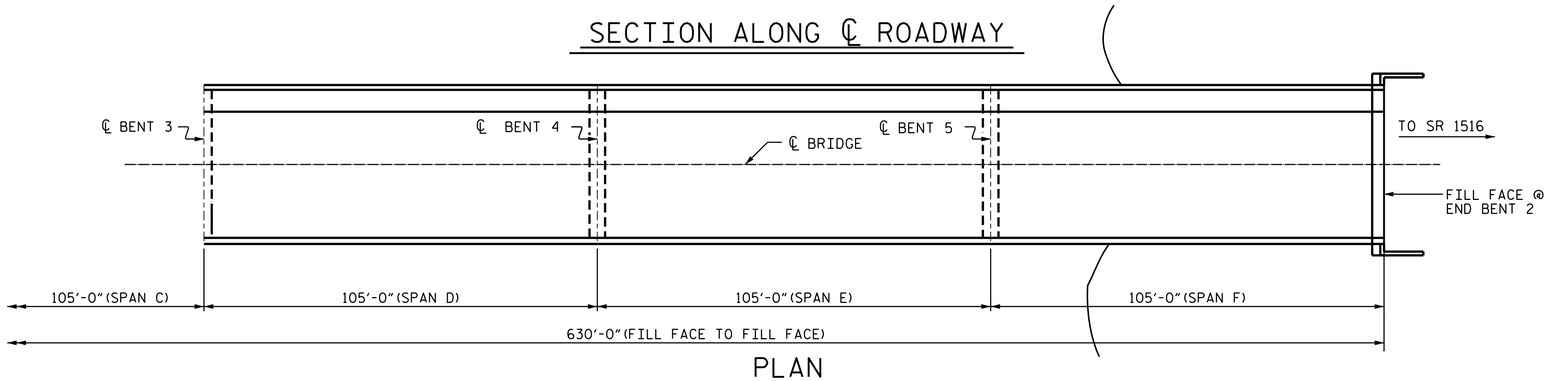


PLAN

(COLUMN & PILES NOT SHOWN IN
PLAN VIEW FOR CLARITY)



SECTION ALONG ℄ ROADWAY



PLAN

(COLUMN & PILES NOT SHOWN IN
PLAN VIEW FOR CLARITY)

SCOPE OF WORK

- BRIDGE DECK SURFACE PREPARATION.
- PLACEMENT OF SILANE DECK TREATMENT.

NOTES

GENERAL DRAWING INFORMATION IS TAKEN FROM THE ORIGINAL PLANS AND THE ROUTINE INSPECTION REPORT DATED 8/05/2019.

BRIDGE ORIENTATION CONFORMS TO THE ORIGINAL BRIDGE PLANS.

I hereby certify that this structure was rehabilitated according to these plans or as noted therein.

Resident Engineer Date

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTI W. ALFORD
F2453B80BF40E...
Dec 10, 2021

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
DDA094AED6104FD...
Dec 9, 2021

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420046

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE 46 ON
US 401 SOUTHBOUND OVER
THE CAPE FEAR RIVER

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-1
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : A. Y. GODFREY DATE : 02/2019
CHECKED BY : S. T. SANDOR DATE : 02/2019

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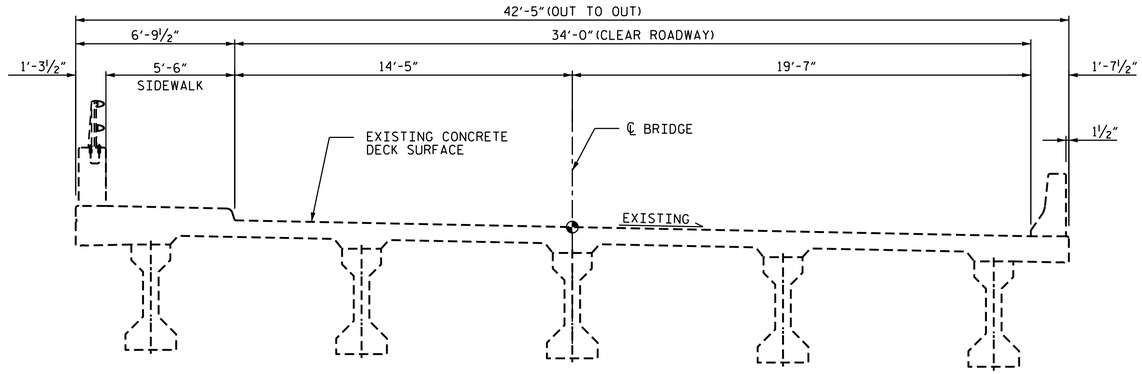
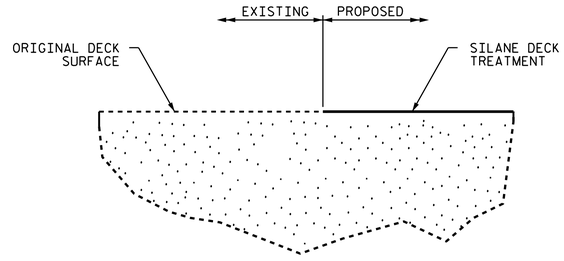
NOTES

SEE TRANSPORTATION PLANS FOR LANE WIDTH, SEQUENCING AND OTHER TRAFFIC CONTROL MEASURES FOR STAGING OF SURFACE PREPARATION AND SILANE DECK TREATMENT PLACEMENT.

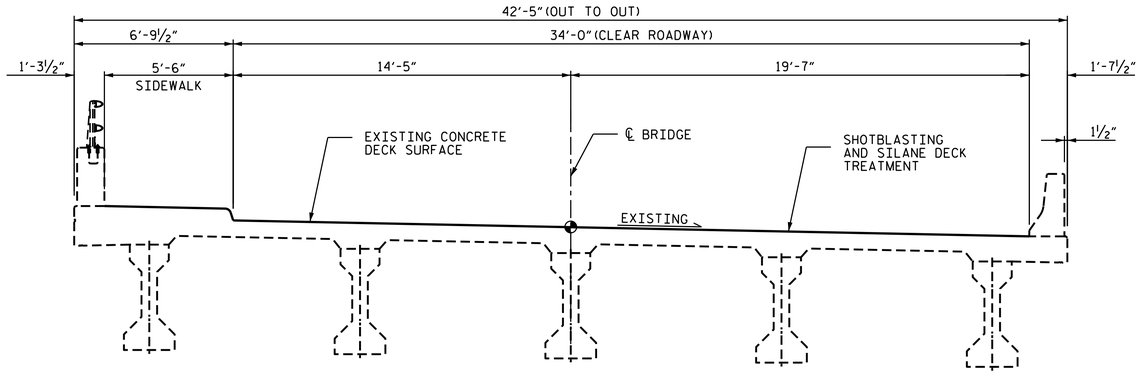


TYPICAL SECTION

(EXISTING)



DETAIL FOR SILANE DECK TREATMENT



TYPICAL SECTION

(PROPOSED)

PROJECT NO. 15BPR.34

HARNETT COUNTY

STATION: 420046

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION AND SILANE DECK TREATMENT DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Aster Abraha
DDA094AED5104FD...
Dec 9, 2021

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-2
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : A. Y. GODFREY DATE : 01/2019
CHECKED BY : S. T. SANDOR DATE : 02/2019

09-DEC-2021 17:03
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NOTES

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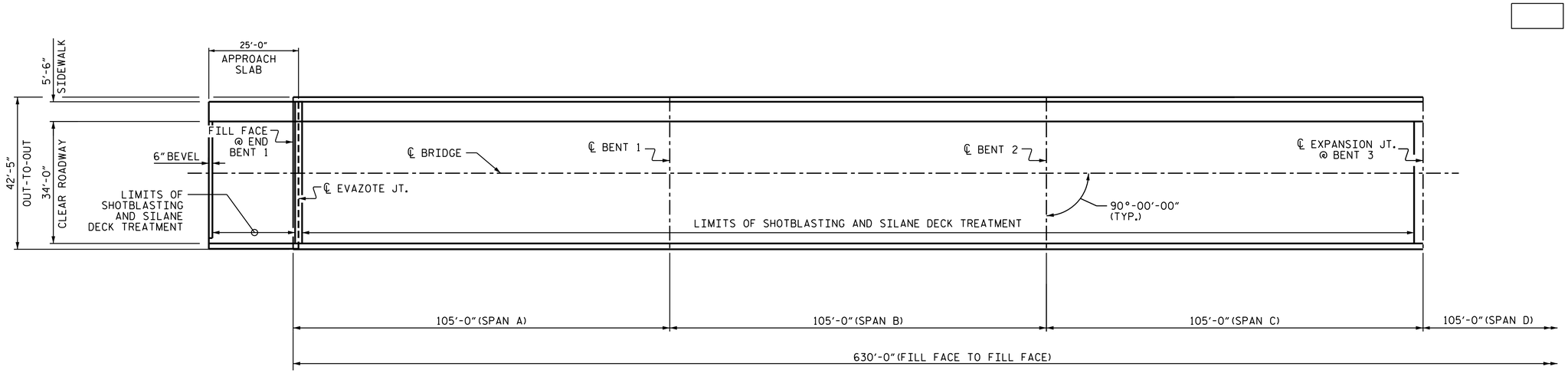
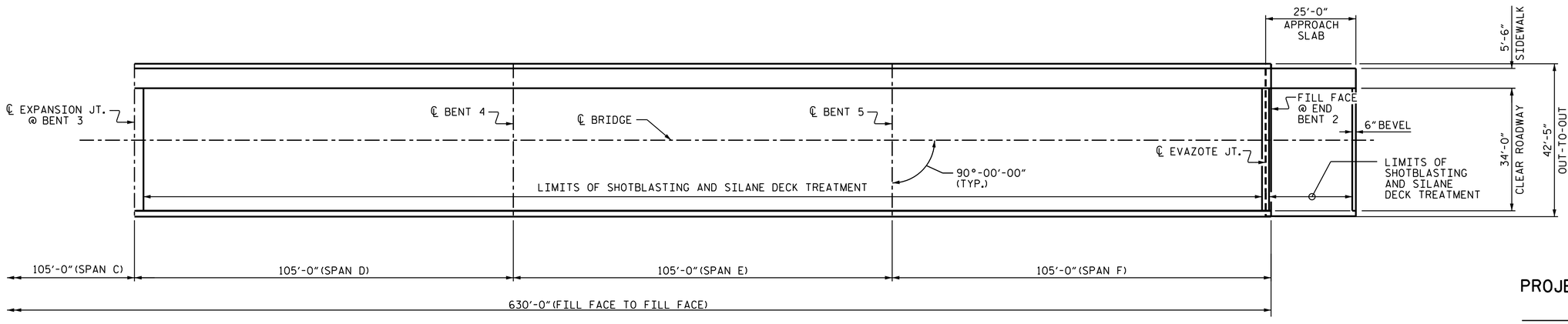
SEE SPECIAL PROVISIONS FOR SILANE DECK TREATMENT.

SUMMARY OF QUANTITIES FOR DECK AND APPROACH SLABS

	ESTIMATE	ACTUAL
CONCRETE DECK REPAIR FOR SILANE DECK TREATMENT	0.0 SY	
SHOTBLASTING BRIDGE DECK	2,962 SY	
SILANE DECK TREATMENT	2,962 SY	



PLAN OF SPANS - DECK REPAIRS



PLAN OF SPANS - DECK REPAIRS

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420046

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Digitally signed by Aster Abraha DDA094AED6104FD...

Dec 9, 2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SILANE DECK TREATMENT

DRAWN BY : A. Y. GODFREY DATE : 02/2019

CHECKED BY : S. T. SANDOR DATE : 02/2019

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

SHEET NO. S2-3

TOTAL SHEETS 33

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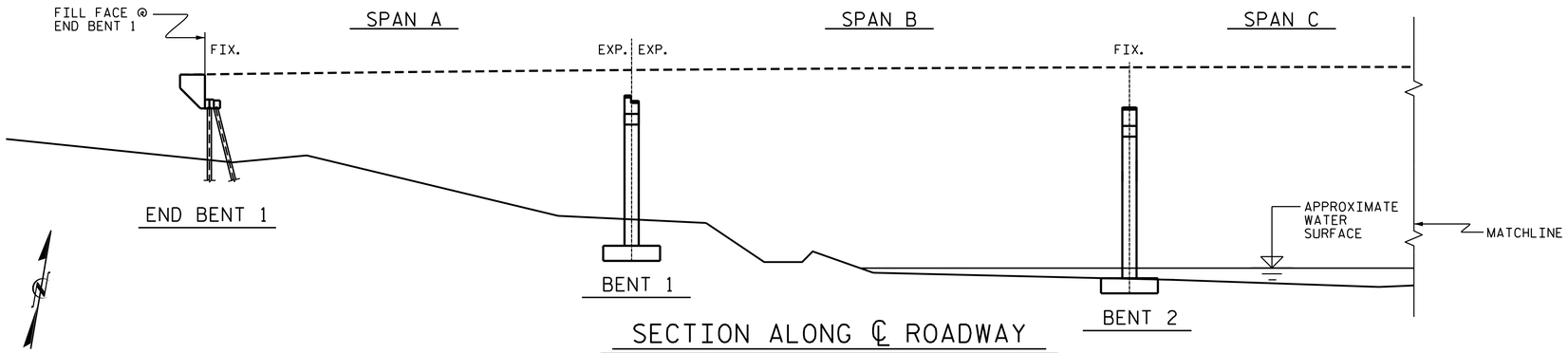
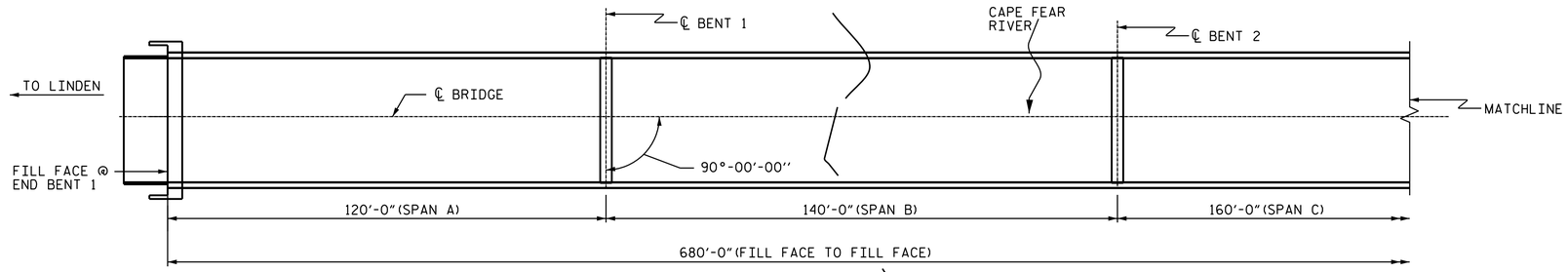
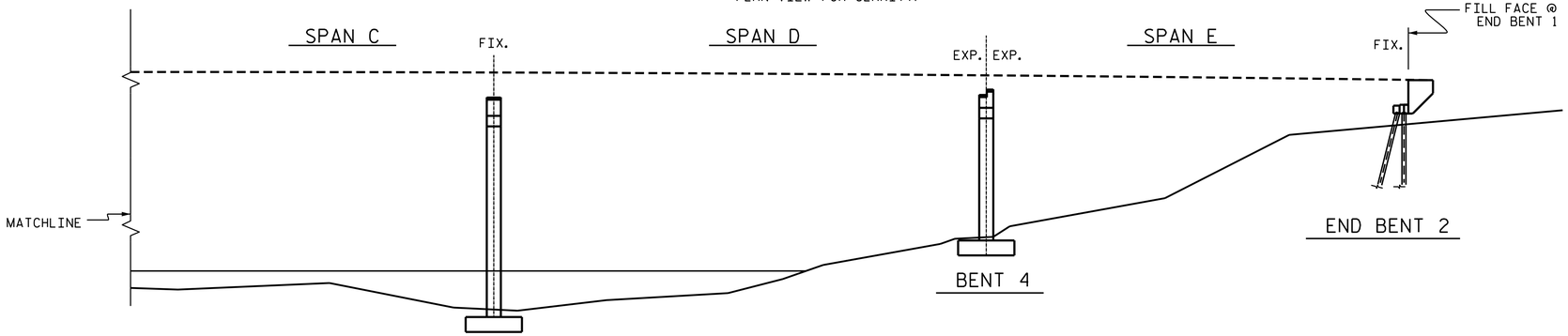


SECTION ALONG ℄ ROADWAY



PLAN

(COLUMNS & FOOTINGS NOT SHOWN IN PLAN VIEW FOR CLARITY)



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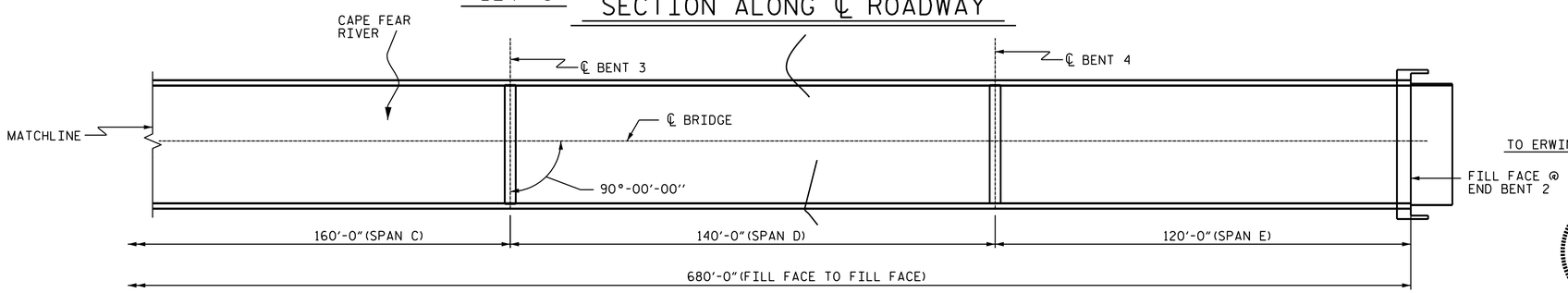

PLAN

(COLUMNS & FOOTINGS NOT SHOWN IN PLAN VIEW FOR CLARITY)

SCOPE OF WORK

- SUBSTRUCTURE REPAIRS USING EPOXY RESIN INJECTION AND SHOTCRETE.
- EPOXY COATING OF TOP OF CAPS.

NOTES

- PROFILE INFORMATION IS TAKEN FROM ORIGINAL PLANS AND THE ROUTINE INSPECTION, DATED 02/24/2021.
- BRIDGE ORIENTATION CONFORMS TO EXISTING BRIDGE PLANS.

I hereby certify that this structure was rehabilitated according to these plans or as noted therein.

Resident Engineer Date

PROJECT NO. 15BPR.34

HARNETT COUNTY

STATION: 420052

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD
Dec 10, 2021

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
Dec 9, 2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE 52 ON NC 217 OVER THE CAPE FEAR RIVER

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-1
1			3			TOTAL SHEETS
2			4			33

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DRAWN BY : S. T. SANDOR DATE : 11/2018
CHECKED BY : A. G. ABRAHA DATE : 11/2018

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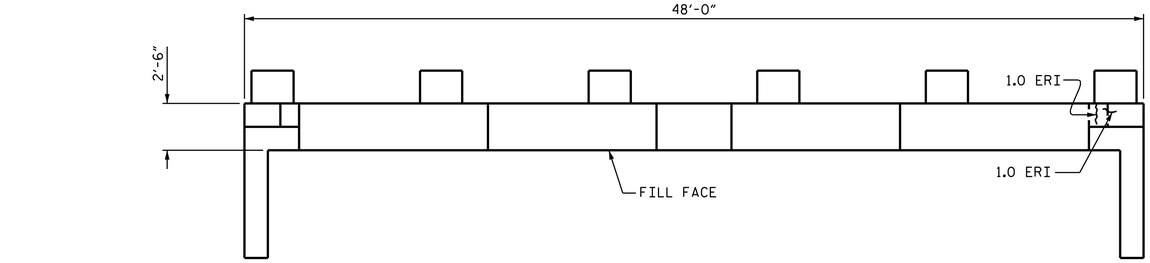
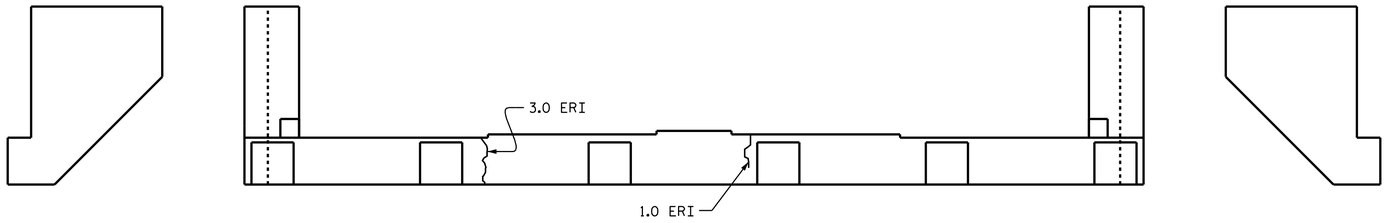


PLAN
END BENT 1

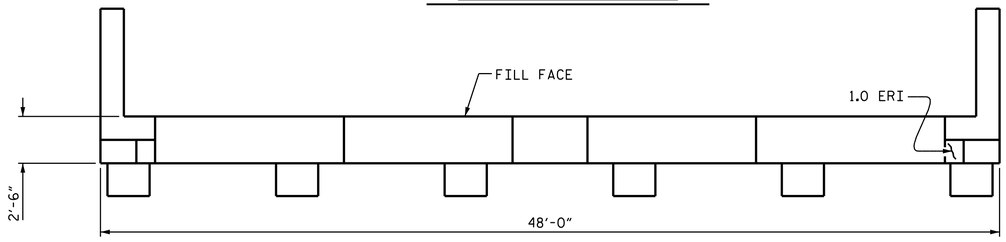


ELEVATION
END BENT 1 - WING WALL
(NORTHEAST)

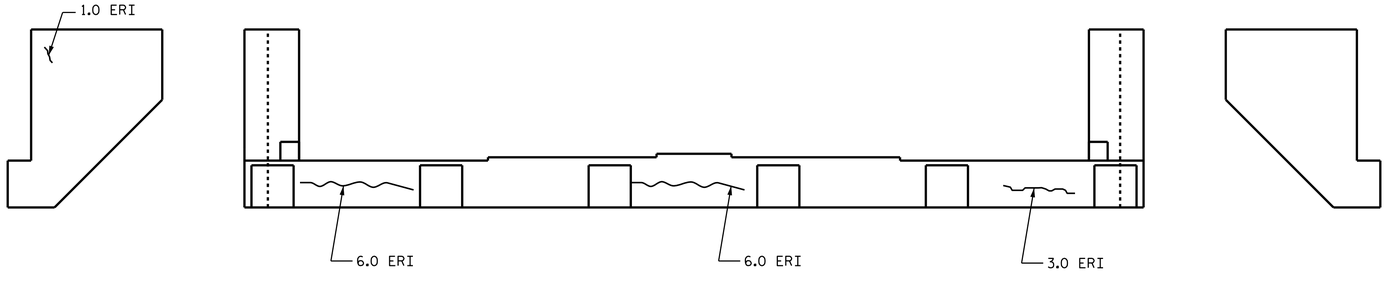
ELEVATION
END BENT 1
(WEST FACE)

ELEVATION
END BENT 1 - WING WALL
(SOUTHEAST)

END BENT 1



PLAN
END BENT 2



ELEVATION
END BENT 2 - WING WALL
(NORTHEAST)

ELEVATION
END BENT 2
(EAST FACE)

ELEVATION
END BENT 2 - WING WALL
(SOUTHEAST)

END BENT 2

ERI - EPOXY RESIN INJECTION

- CONCRETE REPAIRS

- SHOTCRETE REPAIRS

REPAIR QUANTITY TABLE

REPAIRS END BENT 1 & 2	QUANTITIES			
	ESTIMATE		ACTUAL	
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LN. FT		LN. FT
CAP		22.0		
CURTAIN WALL		1.0		
EPOXY COATING		AREA SF		AREA SF
TOP OF CAP		288.0		

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

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE INSPECTOR OR ENGINEER THE CONTRACTOR SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE REPAIR QUANTITY TABLE.

CONTRACTOR SHALL SAW CUT TO A NOMINAL DEPTH OF ½" BUT REINFORCING STEEL SHALL NOT BE DAMAGED.

CONTRACTOR SHALL REMOVE SURFACE CONCRETE TO VERIFY THAT SAWCUT DEPTH WILL NOT DAMAGE EXISTING REINFORCING STEEL.

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

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

FOR REPAIR DETAILS, SEE TYPICAL CAP AND COLUMN REPAIR DETAILS SHEET.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

EPOXY COATING TOP OF CAP QUANTITIES INCLUDES TOP OF PILE CAPS.

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420052

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Digitally signed by Aster Abraha DDA094AED6104FD...

Dec 9, 2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIR END BENT 1 & END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-2
1			3			TOTAL SHEETS
2			4			33

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DRAWN BY : M.K. BEARD / S. T. SANDOR DATE : 11/2018

CHECKED BY : A. G. ABRAHA DATE : 11/2018

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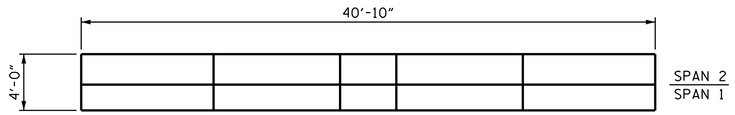


PLAN
TOP OF CAP

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE INSPECTOR OR ENGINEER THE CONTRACTOR SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE REPAIR QUANTITY TABLE.

CONTRACTOR SHALL REMOVE SURFACE CONCRETE TO VERIFY THAT SAWCUT DEPTH WILL NOT DAMAGE EXISTING REINFORCING STEEL.

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

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

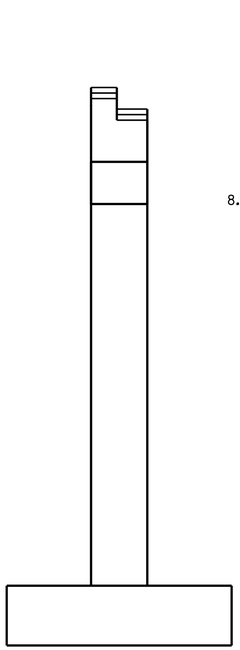
FOR REPAIR DETAILS, SEE TYPICAL CAP AND COLUMN REPAIR DETAILS SHEET.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

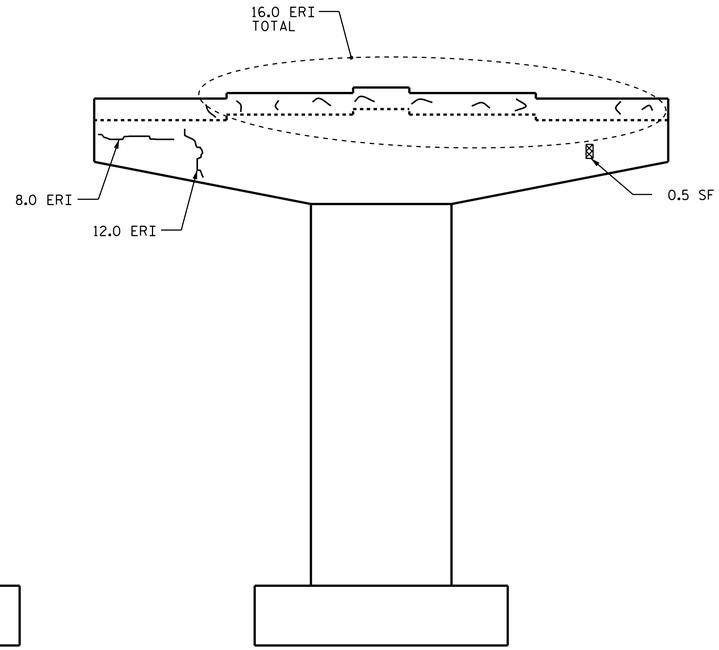
REPAIR QUANTITY TABLE

BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.5	0.3		
CAP (HORIZONTAL FACE, CORNER)	20.0	10.0		
COLUMN	4.6	2.3		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL FACE, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LN. FT		LN. FT
CAP		55.0		
COLUMN		0.0		
EPOXY COATING		AREA SF		AREA SF
TOP OF CAP		164.0		

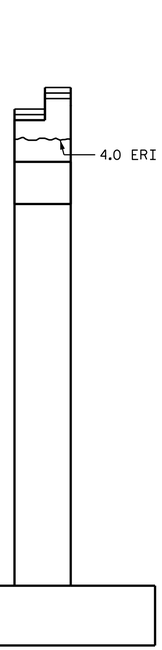
VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 2" CL TO SAWCUT. SEE REPAIR DETAILS.



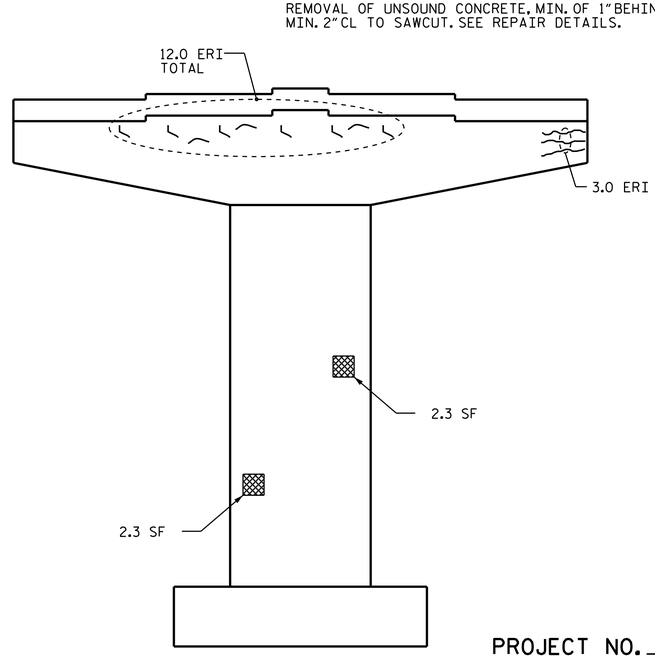
END VIEW
LOOKING EAST



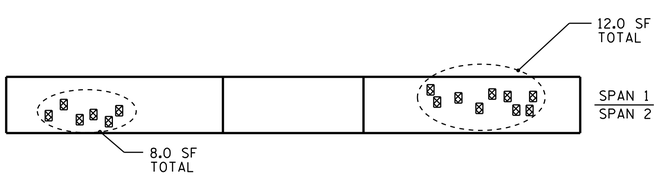
ELEVATION
LOOKING EAST



END VIEW
LOOKING SOUTH



ELEVATION
LOOKING WEST



PLAN
BOTTOM OF CAP

SHOTCRETE REPAIRS

CONCRETE REPAIRS

ERI EPOXY RESIN INJECTION

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
Aster Abraha
Dec 9, 2021

PROJECT NO. 15BPR.34
HARNETT COUNTY
BRIDGE NO. 420052

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIR BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-3
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : M.K BEARD / S. T. SANDOR DATE : 11/2018
CHECKED BY : A. G. ABRAHA DATE : 12/2018

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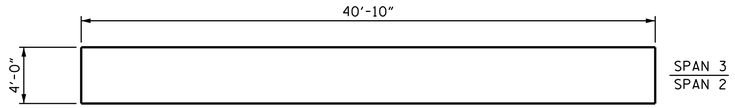


PLAN
TOP OF CAP

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE INSPECTOR OR ENGINEER THE CONTRACTOR SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE REPAIR QUANTITY TABLE.

CONTRACTOR SHALL REMOVE SURFACE CONCRETE TO VERIFY THAT SAWCUT DEPTH WILL NOT DAMAGE EXISTING REINFORCING STEEL.

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

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

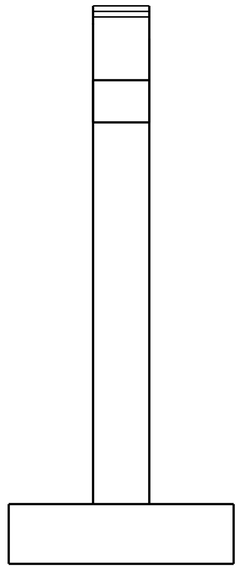
FOR REPAIR DETAILS, SEE TYPICAL CAP AND COLUMN REPAIR DETAILS SHEET.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

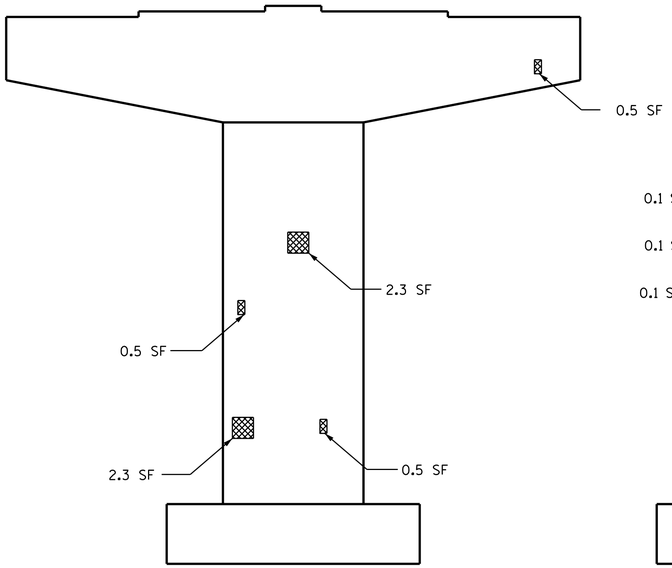
REPAIR QUANTITY TABLE

BENT 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.5	0.3		
CAP (HORIZONTAL FACE, CORNER)	0.0	0.0		
COLUMN	13.4	6.7		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL FACE, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LN. FT		LN. FT
CAP		0.0		
COLUMN		0.0		
EPOXY COATING		AREA SF		AREA SF
TOP OF CAP		164.0		

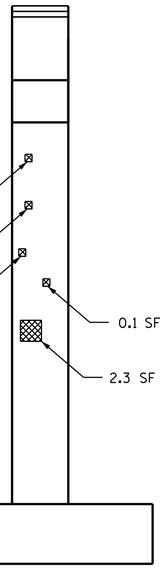
VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 2" CL TO SAWCUT. SEE REPAIR DETAILS.



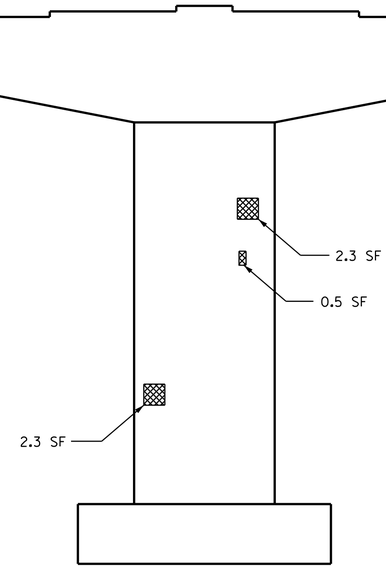
END VIEW
LOOKING NORTH



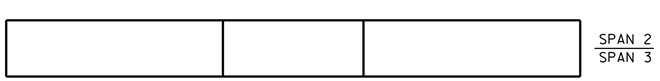
ELEVATION
LOOKING EAST



END VIEW
LOOKING SOUTH



ELEVATION
LOOKING WEST



PLAN
BOTTOM OF CAP

SHOTCRETE REPAIRS

CONCRETE REPAIRS

ERI EPOXY RESIN INJECTION

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
DocuSigned by: Aster Abraha DD4094AED6104FD...
Dec 9, 2021

PROJECT NO. 15BPR.34
HARNETT COUNTY
BRIDGE NO. 420052

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIR BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-4
1			3			TOTAL SHEETS
2			4			33

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CHECKED BY : A. G. ABRAHA DATE : 12/2018

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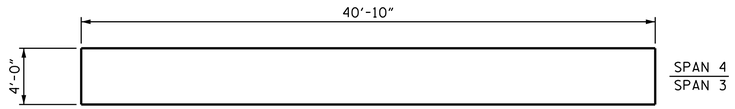


PLAN
TOP OF CAP

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE INSPECTOR OR ENGINEER THE CONTRACTOR SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE REPAIR QUANTITY TABLE.

CONTRACTOR SHALL REMOVE SURFACE CONCRETE TO VERIFY THAT SAWCUT DEPTH WILL NOT DAMAGE EXISTING REINFORCING STEEL.

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

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

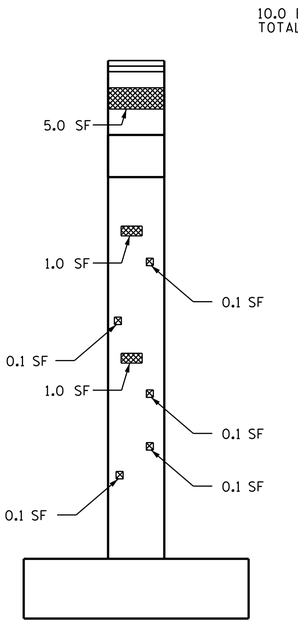
FOR REPAIR DETAILS, SEE TYPICAL CAP AND COLUMN REPAIR DETAILS SHEET.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

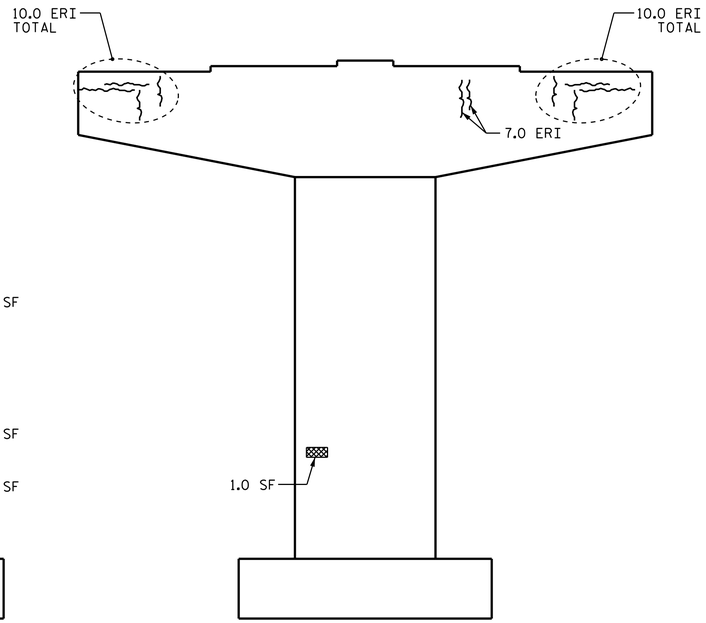
REPAIR QUANTITY TABLE

BENT 3	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL FACE, CORNER)	50.0	25.0		
COLUMN	6.0	3.0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL FACE, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LN. FT		LN. FT
CAP		53.0		
COLUMN		0.0		
EPOXY COATING		AREA SF		AREA SF
TOP OF CAP		164.0		

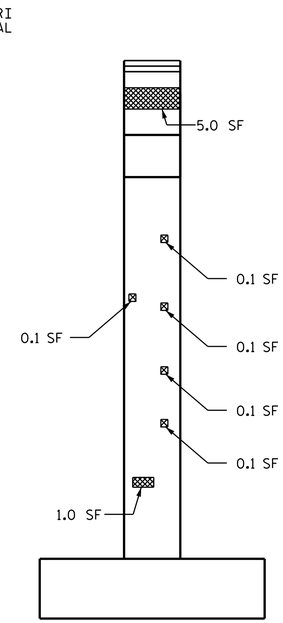
VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 2" CL TO SAWCUT. SEE REPAIR DETAILS.



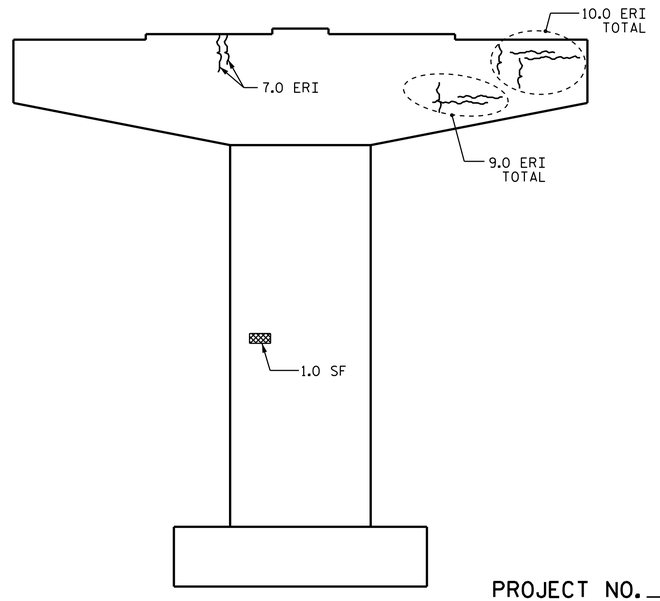
END VIEW
LOOKING NORTH
(SOUTH FACE)



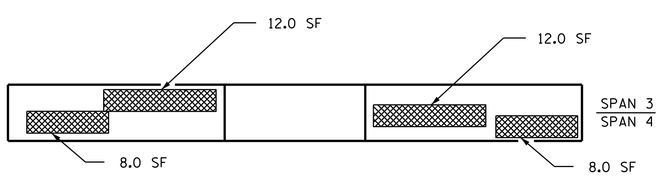
ELEVATION
LOOKING EAST
(WEST FACE)



END VIEW
LOOKING SOUTH
(NORTH FACE)



ELEVATION
LOOKING WEST
(EAST FACE)



PLAN
BOTTOM OF CAP

SHOTCRETE REPAIRS

CONCRETE REPAIRS

ERI EPOXY RESIN INJECTION

PROJECT NO. 15BPR.34
HARNETT COUNTY
BRIDGE NO. 420052

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIR BENT 3

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

Digitally signed by: Aster Abraha
DocuSigned by: DDA0944AE0D104FD...
Dec 9, 2021

DRAWN BY : M.K BEARD / S. T. SANDOR DATE : 11/2018
CHECKED BY : A. G. ABRAHA DATE : 12/2018

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-5
1			3			TOTAL SHEETS
2			4			33

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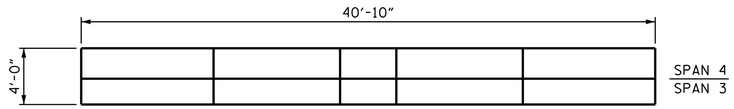


PLAN
TOP OF CAP

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE INSPECTOR OR ENGINEER THE CONTRACTOR SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE REPAIR QUANTITY TABLE.

CONTRACTOR SHALL SAW CUT TO A NOMINAL DEPTH OF ½" BUT REINFORCING STEEL SHALL NOT BE DAMAGED.

CONTRACTOR SHALL REMOVE SURFACE CONCRETE TO VERIFY THAT SAWCUT DEPTH WILL NOT DAMAGE EXISTING REINFORCING STEEL.

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

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

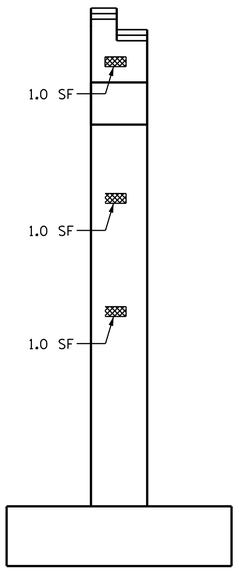
FOR REPAIR DETAILS, SEE TYPICAL CAP AND COLUMN REPAIR DETAILS SHEET.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

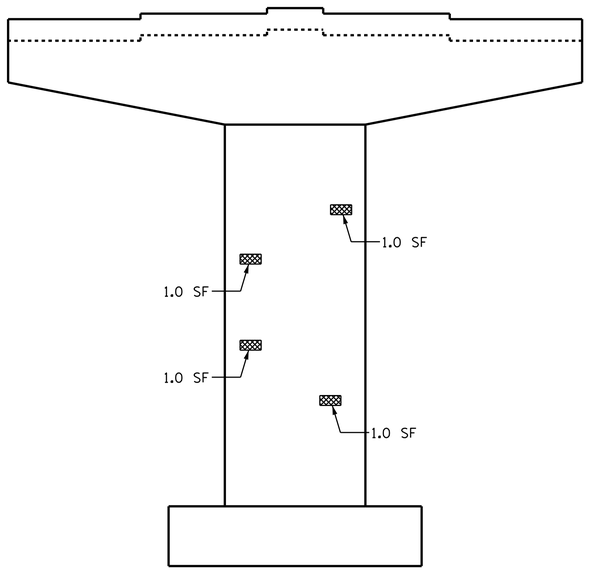
REPAIR QUANTITY TABLE

BENT 4	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL FACE, CORNER)	42.0	21.0		
COLUMN	10.0	5.0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	0.0	0.0		
CAP (HORIZONTAL FACE, CORNER)	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LN. FT		LN. FT
CAP		48.0		
COLUMN		25.0		
EPOXY COATING		AREA SF		AREA SF
		164.0		

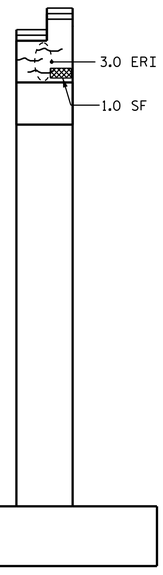
VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 2" CL TO SAWCUT. SEE REPAIR DETAILS.



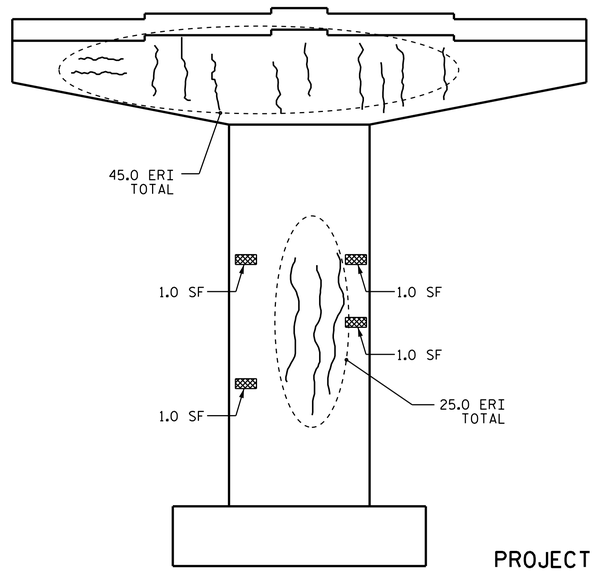
END VIEW
LOOKING SOUTH
(NORTH FACE)



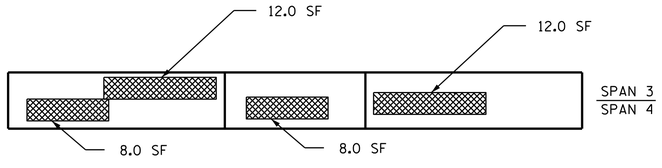
ELEVATION
LOOKING WEST
(WEST FACE)



END VIEW
LOOKING NORTH
(EAST FACE)



ELEVATION
LOOKING EAST
(SOUTH FACE)



PLAN
BOTTOM OF CAP

SHOTCRETE REPAIRS

CONCRETE REPAIRS

ERI EPOXY RESIN INJECTION

PROJECT NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420052

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIR BENT 4

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

SHEET NO. S3-6
TOTAL SHEETS 33

DRAWN BY : M.K BEARD / S. T. SANDOR DATE : 11/2018
CHECKED BY : A. G. ABRAHA DATE : 12/2018

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NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA
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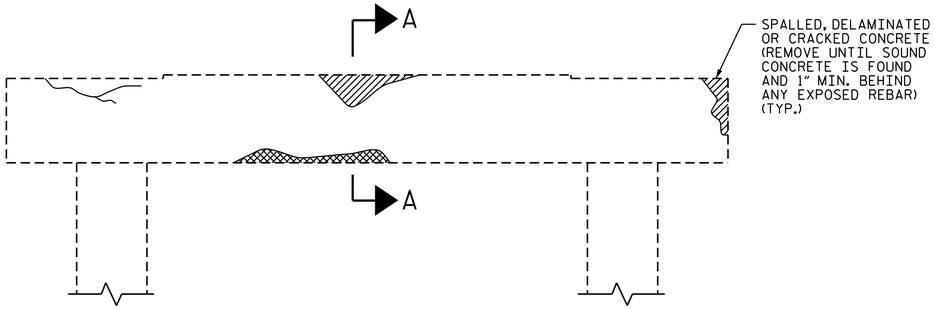
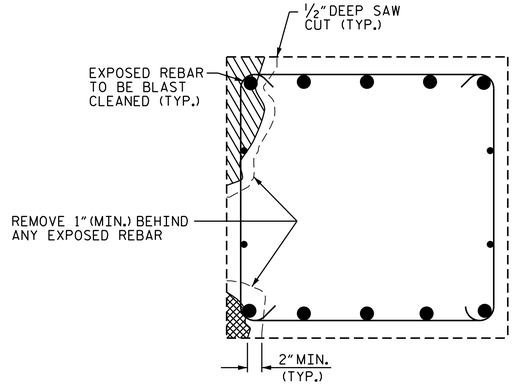
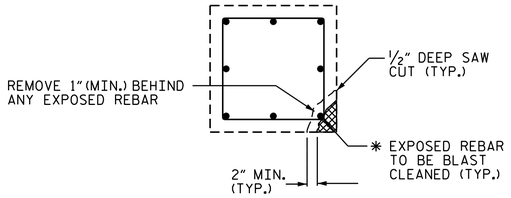


BENT CAP REPAIRS



SECTION A-A

CAP REPAIR



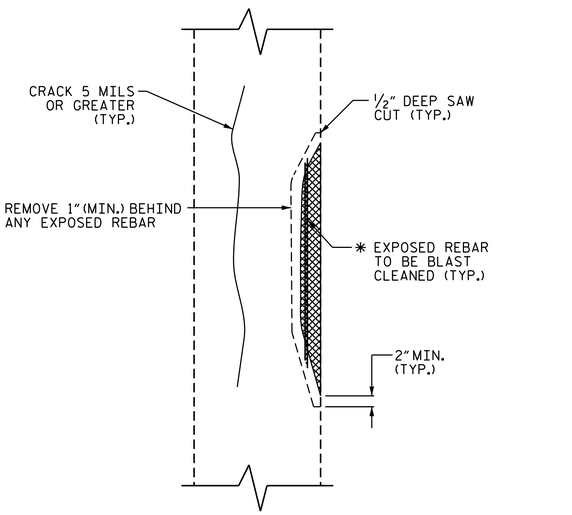
PLAN OF COLUMN

REPAIR KEY

CONCRETE REPAIR AREA (FORM AND POUR)

SHOTCRETE REPAIR AREA

EPOXY RESIN INJECTION (ERI)

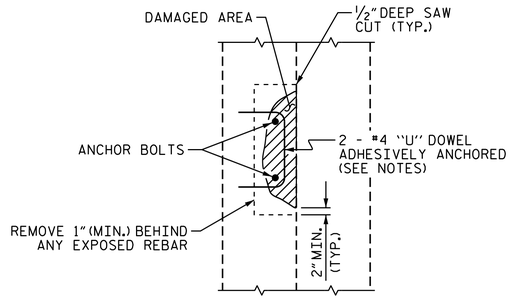


* REPAIR LENGTH SHALL NOT EXCEED 10 FEET.

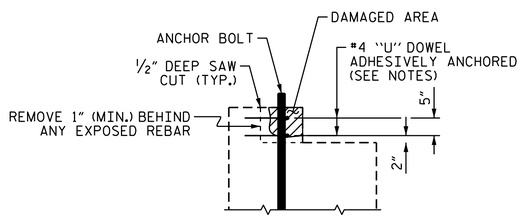
ELEVATION OF COLUMN

COLUMN REPAIR

SPLICE LENGTH TABLE	
BAR SIZE	MIN. SPLICE LENGTH
#4	2'-4"
#5	2'-9"
#6	4'-0"
#7	5'-3"
#8	6'-9"
#9	8'-6"
#10	10'-11"
#11	13'-4"



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 CROSS SECTIONAL AREA 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, IF THE AREAS OF REMOVAL ARE NOT ADJACENT TO OR DIRECTLY OPPOSITE ONE ANOTHER. IF REMOVAL EXTENDS MORE THAN 1½" BEHIND THE MAIN REINFORCING BARS, NOTIFY THE ENGINEER PRIOR TO PROCEEDING.

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.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION (ERI), SEE SPECIAL PROVISIONS.

PROJ. NO. 15BPR.34

HARNETT COUNTY

BRIDGE NO. 420052

NORTH CAROLINA PROFESSIONAL SEAL 030024 ENGINEER ASTER G. ABRAHA

DocuSigned by: Aster Abraha DD4094AED6104FD...

Dec 9, 2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
TYPICAL CAP AND COLUMN REPAIR DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-7
1			3			TOTAL SHEETS
2			4			33

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ASSEMBLED BY : S. T. SANDOR	DATE : 11/2018
CHECKED BY: W. C. SMITH	DATE : 03/2019
DRAWN BY : NAP 8/18	
CHECKED BY :	

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STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "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 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 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 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 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990