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PROJECT: I-5890

CONTRACT: C204242

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BUNCOMBE COUNTY

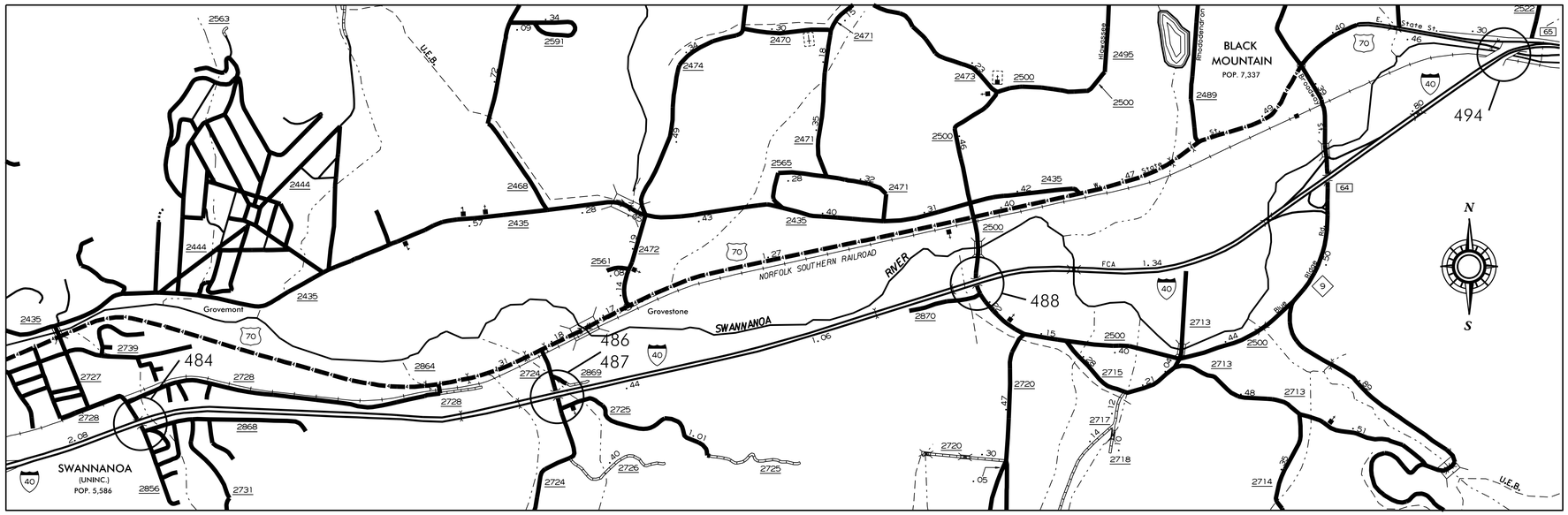
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5890	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
46410.1.1	NHPIM-0040(063)	P.E.
46410.3.1	NHPIM-0040(063)	CONST.

LOCATION: ***BUNCOMBE COUNTY:***

BRIDGE #484 ON INTERSTATE 40 OVER (SR 2856) DENNIS STREET.
BRIDGE #486 ON INTERSTATE 40 EASTBOUND OVER (SR 2724) LYTLE COVE ROAD.
BRIDGE #487 ON INTERSTATE 40 WESTBOUND OVER (SR 2724) LYTLE COVE ROAD.
BRIDGE #488 ON INTERSTATE 40 OVER (SR 2500) BLUE RIDGE ROAD.
BRIDGE #494 ON INTERSTATE 40 OVER NORFOLK SOUTHERN RAILROAD, SWANNANOA RIVER, AND U.S. HWY 70 EASTBOUND.

TYPE OF WORK: ***BRIDGE PRESERVATION – LATEX MODIFIED CONCRETE–EARLY STRENGTH (LMC–ES) OVERLAY, JOINT REPAIR, SUBSTRUCTURE REPAIR, STEEL GIRDER REPAIR, AND PAINTING OF EXISTING BRIDGE STRUCTURES.***



VICINITY MAP – BUNCOMBE CO.

DESIGN DATA

BUNCOMBE COUNTY
#484 ADT 2015 =39,000
#486 ADT 2013 =19,000
#487 ADT 2015 =19,500
#488 ADT 2015 =39,000
#494 ADT 2013 =31,000

PROJECT LENGTH

BUNCOMBE COUNTY
– #484 = 0.022 MILE
– #486 = 0.022 MILE
– #487 = 0.021 MILE
– #488 = 0.025 MILE
– #494 = 0.106 MILE

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

2018 STANDARD SPECIFICATIONS

LETTING DATE :

JANUARY 15, 2019

A. KEITH PASCHAL, P.E.
PROJECT ENGINEER

AMBER M. LEE, P.E.
PROJECT DESIGN ENGINEER

PROJECT: I-5890

CONTRACT: C204242

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BUNCOMBE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5890	1A	

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INDEX OF SHEETS

1	*TITLE SHEET*
1A	*INDEX OF SHEETS*
S–1	*TOTAL BILL OF MATERIAL*
S–2 THRU S–16	*STRUCTURAL PLANS – BRIDGE NO. 484*
S–17 THRU S–32	*STRUCTURAL PLANS – BRIDGE NO. 486*
S–33 THRU S–48	*STRUCTURAL PLANS – BRIDGE NO. 487*
S–49 THRU S–63	*STRUCTURAL PLANS – BRIDGE NO. 488*
S–64 THRU S–87	*STRUCTURAL PLANS – BRIDGE NO. 494*
S–88 THRU S–93	*STANDARD REPAIR DETAILS*
SN	*STANDARD NOTES*

TOTAL BILL OF MATERIAL

BRIDGE NO.	INCIDENTAL MILLING	ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B	ASPHALT BINDER FOR PLANT MIX	GROOVING BRIDGE FLOORS	POLLUTION CONTROL	CLASS II, SURFACE PREPARATION	CLASS III, SURFACE PREPARATION	LATEX MODIFIED CONCRETE OVERLAY-EARLY STRENGTH	PLACING AND FINISHING LATEX MODIFIED CONCRETE OVERLAY-EARLY STRENGTH	CONCRETE REPAIRS	SHOTCRETE REPAIRS	EPOXY RESIN INJECTION	PAINTING CONTAINMENT FOR BRIDGE #__	SPOT PAINTING OF STEEL STRUCTURE REPAIR AREAS	CLEANING & REPAINTING OF BRIDGE #__	CLEANING & PAINTING OF EXISTING WEATHERING STEEL FOR BRIDGE #__
	SQ. YDS.	TONS	TONS	SQ. FT.	LUMP SUM	SQ. YDS.	SQ. YDS.	CU. YDS.	SQ. YDS.	CU. FT.	CU. FT.	LIN. FT.	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM
484	1015	90	6	10693.5	LUMP SUM	2.9	1.5	74.0	1332.0	--	135.5	9.8	LUMP SUM	LUMP SUM	--	--
486	547	50	4	5081.3	LUMP SUM	21.6	1.5	34.8	626.5	3.7	66.5	15.6	LUMP SUM	LUMP SUM	--	--
487	547	50	4	4927.1	LUMP SUM	78.9	1	33.8	607.0	--	21.0	10.5	LUMP SUM	LUMP SUM	--	--
488	1015	90	6	12100.1	LUMP SUM	6.5	1.5	71.4	1483.8	--	234.0	--	LUMP SUM	--	LUMP SUM	--
494	1219	150	7	53880.3	LUMP SUM	9	1	358.6	6454.5	--	154.0	93.1	LUMP SUM	--	--	LUMP SUM
TOTALS	4343	430	27	86682.3	LUMP SUM	118.9	6.5	572.6	10503.8	3.7	611.0	129	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM

BRIDGE NO.	VOLUMETRIC MIXER	EXPANSION JOINT SEALS FOR PRESERVATION	FOAM JOINT SEALS FOR PRESERVATION	CONCRETE FOR DECK REPAIR	ELASTOMERIC CONCRETE FOR PRESERVATION	BEAM REPAIR	BOLTED BEAM REPAIR	BRIDGE JOINT DEMOLITION	CONCRETE WORK FOR JOINT REPLACEMENT	EPOXY COATING	SCARIFYING BRIDGE DECK	SHOTBLASTING BRIDGE DECK	SILANE DECK TREATMENT	HYDRO-DEMOLITION OF BRIDGE DECK	REMOVE AND RESET BEARINGS	TYPE I BRIDGE JACKING FOR BRIDGE NO. --	STEEL KEEPER ANGLE ASSEMBLY
	LUMP SUM	LIN. FT.	LIN. FT.	CU. FT.	CU. FT.	LBS.	LBS.	SQ. FT.	SQ. FT.	SQ. FT.	SQ. YDS.	SQ. YDS.	SQ. YDS.	SQ. YDS.	EA.	EA.	EA.
484	LUMP SUM	--	345.4	4.3	67.7	29.1	108.8	270.8	270.8	1109.8	1332.0	332.3	332.3	1332.0	--	--	--
486	LUMP SUM	--	128.5	40.5	26.8	20.2	51.3	107.1	107.1	407.2	626.5	--	--	626.5	--	--	--
487	LUMP SUM	--	128.9	148	26.8	0	44.4	107.3	107.3	410.0	607.0	--	--	607.0	--	--	--
488	LUMP SUM	--	323.6	9.7	67.4	0	8.1	269.6	269.6	1099.0	1483.8	396.6	396.6	1483.8	--	--	--
494	LUMP SUM	351.8	--	12.9	--	2840.4	--	--	--	1953.4	6454.5	--	--	6454.5	2	2	15
TOTALS	LUMP SUM	351.8	926.4	215.4	188.7	2889.7	212.6	754.8	754.8	4979.4	10503.8	728.9	728.9	10503.8	2	2	15

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 484,486,487,488,494

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee 12/6/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TOTAL BILL OF MATERIAL

DRAWN BY : R.L.PUTEK DATE : 10/2018
CHECKED BY : A.M.LEE DATE : 10/2018

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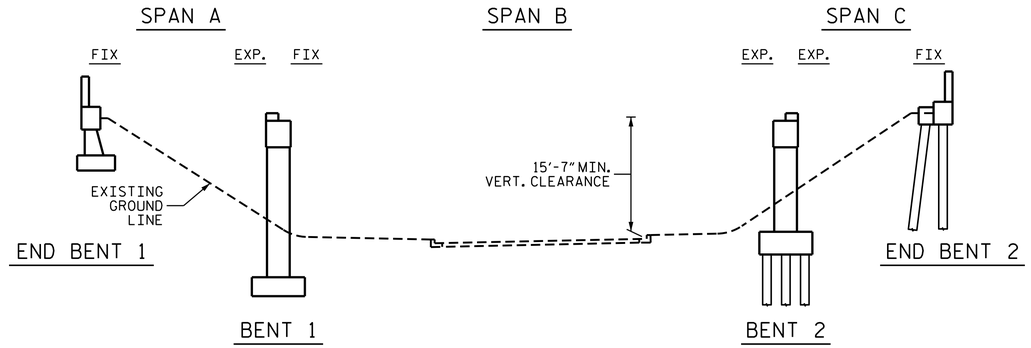
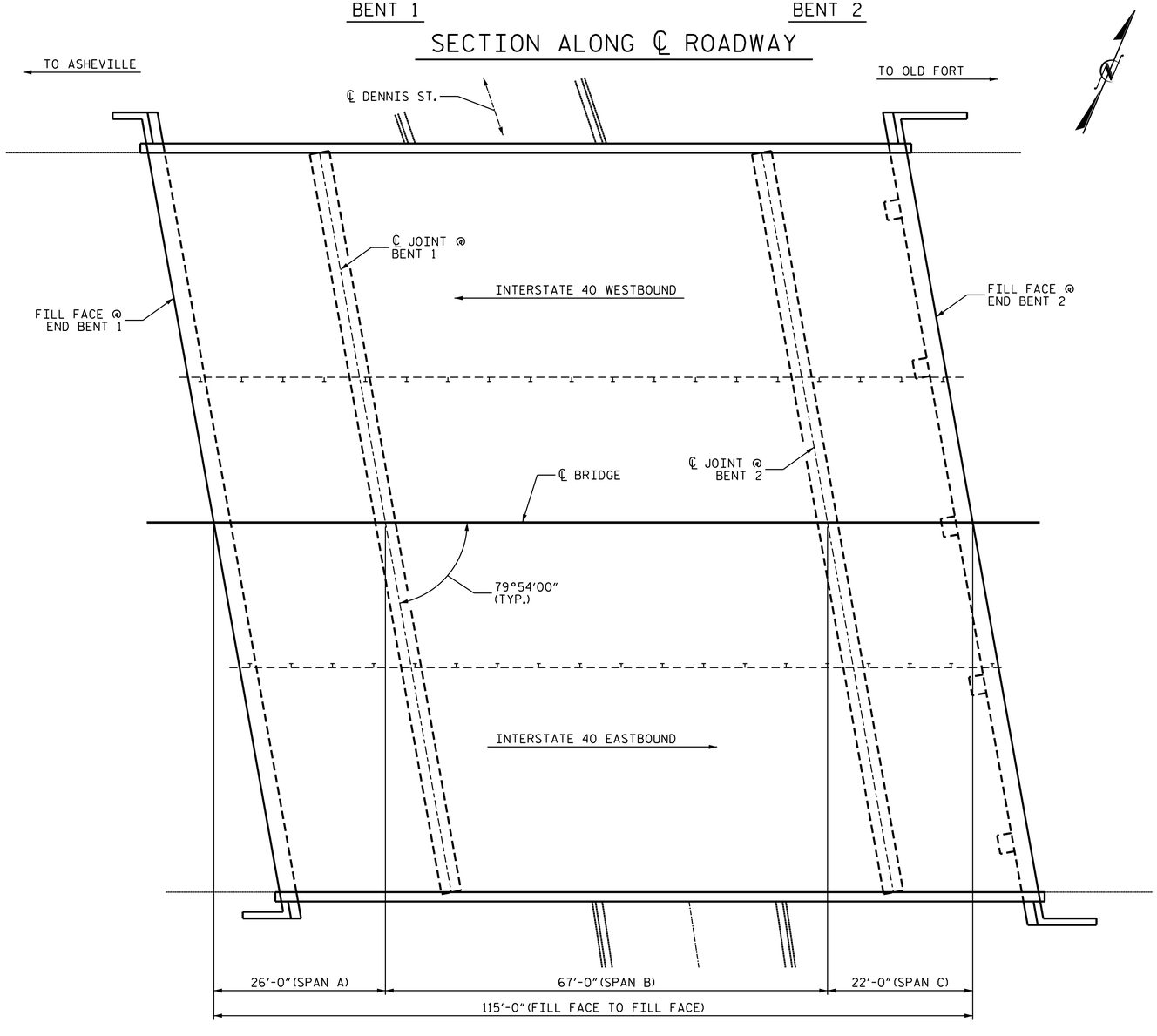


SECTION ALONG ℄ ROADWAY



PLAN

NOTES

GENERAL DRAWING INFORMATION IS TAKEN FROM THE ORIGINAL PLANS AND THE ROUTINE INSPECTION REPORT DATED 11/14/2017.

BRIDGE ORIENTATION CONFORMS TO THE ORIGINAL BRIDGE PLANS.

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

RESIDENT ENGINEER DATE

SCOPE OF WORK

- CLEAN, PLATE REPAIR AND SPOT REPAINT EXISTING STRUCTURAL STEEL.
- EPOXY INJECTION OF CONCRETE CRACKS.
- REMOVE UNSOUND CONCRETE AND PROPERLY PREPARE EXISTING END BENTS AND BENTS FOR SHOTCRETE AND CONCRETE REPAIR.
- PARTIALLY REMOVE TOP OF BRIDGE DECK CONCRETE IN THE CLEAR ROADWAY BY SCARIFICATION AND HYDRO-DEMOLITION METHODS.
- OVERLAY PREPARED TOP OF BRIDGE DECK IN THE CLEAR ROADWAY WITH LATEX MODIFIED CONCRETE-EARLY STRENGTH (LMC-ES).
- GROOVE LMC-ES BRIDGE DECK IN THE CLEAR ROADWAY.
- PARTIALLY REMOVE TOP OF BRIDGE DECK IN THE MEDIAN BY SHOTBLASTING.
- OVERLAY PREPARED TOP OF BRIDGE DECK IN THE MEDIAN WITH SILANE DECK TREATMENT.
- REMOVE EXISTING JOINT MATERIAL AND INSTALL FOAM JOINT SEALS.
- REMOVE DEBRIS FROM TOP OF EXISTING END BENT AND BENT CAPS AND APPLY EPOXY COATING.

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 484

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...
11/21/2018

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: 504B5AAF2F3D484...
11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE
ON INTERSTATE 40
OVER DENNIS STREET

DRAWN BY : R.L.PUTEK DATE : 09/2018
CHECKED BY : A.M.LEE DATE : 09/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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SHEET NO. S-2

TOTAL SHEETS 93

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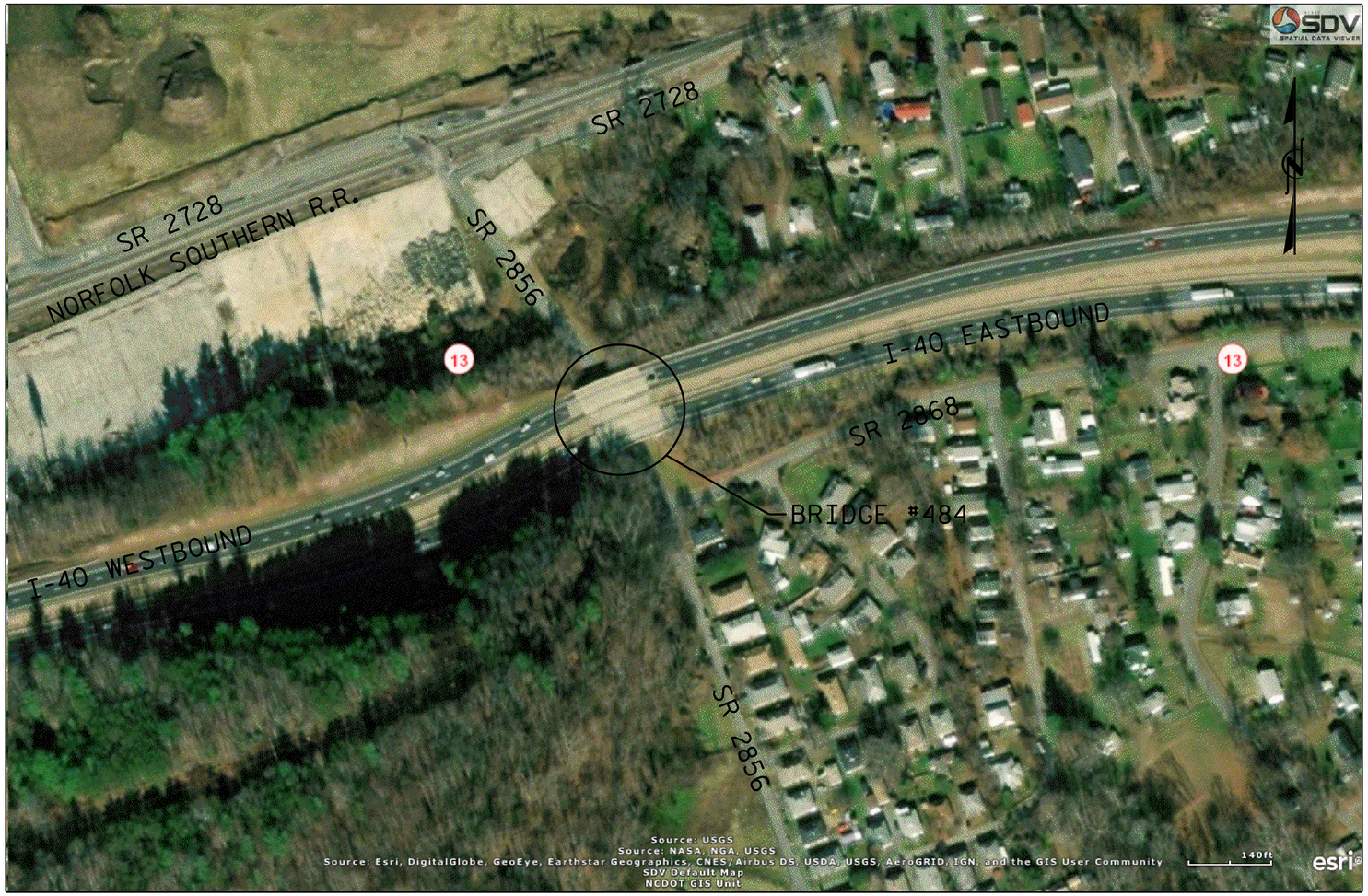

LOCATION SKETCH

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

BRIDGE COORDINATES

LAT: 35.59768149
LONG: -82.39254116

NOTES

EXISTING DIMENSIONS AND BRIDGE CONDITION ARE FROM THE BEST INFORMATION AVAILABLE.

THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.

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

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

WORK ON THE BRIDGES SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL BELOW. THE CONTRACTOR SHALL SUBMIT PLANS FOR CONSTRUCTION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS AND THE PROJECT SPECIAL PROVISIONS.

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

PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL A COMPLETE SEQUENCE OF TASK FOR EACH OPERATION AFFECTING THE BRIDGE SURFACE AND/OR TRAFFIC.
FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

FOR SCARIFYING BRIDGE DECK, HYDRO-DEMOLITION OF BRIDGE DECK, AND CLASS II SURFACE PREPARATION, AND CLASS III SURFACE PREPARATION. SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISION.

THE LMC CONTRACTOR SHALL PROVIDE A METHOD OF HANDLING UNEXPECTED BLOW THROUGH OF THE DECK DURING HYDRO-DEMOLITION.

FOR PLACING AND FINISHING LATEX MODIFIED CONCRETE OVERLAY-EARLY STRENGTH (LMC-ES) AND LATEX MODIFIED CONCRETE-EARLY STRENGTH, SEE LATEX MODIFIED CONCRETE-EARLY STRENGTH SPECIAL PROVISIONS.

LONGITUDINAL CONSTRUCTION JOINTS SHALL BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.

DURING CONSTRUCTION, BERMS OR APPRORIATE MEASURES SHALL BE USED TO ENSURE HYDRO-DEMOLITION WATER DOES NOT MIGRATE INTO ACTIVE TRAVEL LANES.

FOR BRIDGE JOINT DEMOLITION, SEE SPECIAL PROVISIONS.

FOR CONCRETE WORK FOR JOINT REPLACEMENT, SEE SPECIAL PROVISIONS.

FOR CONCRETE FOR DECK REPAIRS, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEAL, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR SPOT PAINTING OF STEEL STRUCTURE REPAIR AREAS AND POLLUTION CONTROL, SEE SPOT PAINTING OF STEEL STRUCTURE REPAIR AREAS SPECIAL PROVISION.

FOR EPOXY COATING AND DEBRIS REMOVAL, SEE SPECIAL PROVISIONS.

FOR BEAM REPAIR, SEE SPECIAL PROVISIONS.

FOR BOLTED BEAM REPAIR, SEE SPECIAL PROVISIONS.

FOR VOLUMETRIC MIXER, SEE SPECIAL PROVISIONS.

FOR SILANE DECK TREATMENT SEE SPECIAL PROVISIONS.

PROJ. NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 484

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee 11/21/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE
ON INTERSTATE 40
OVER DENNIS STREET

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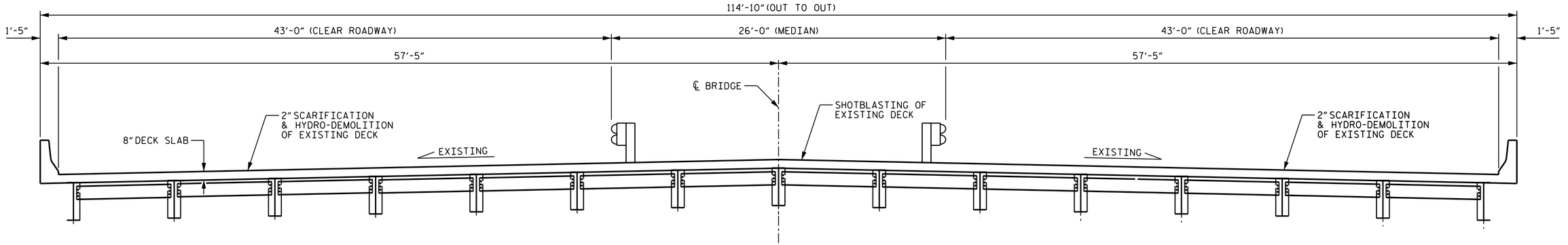

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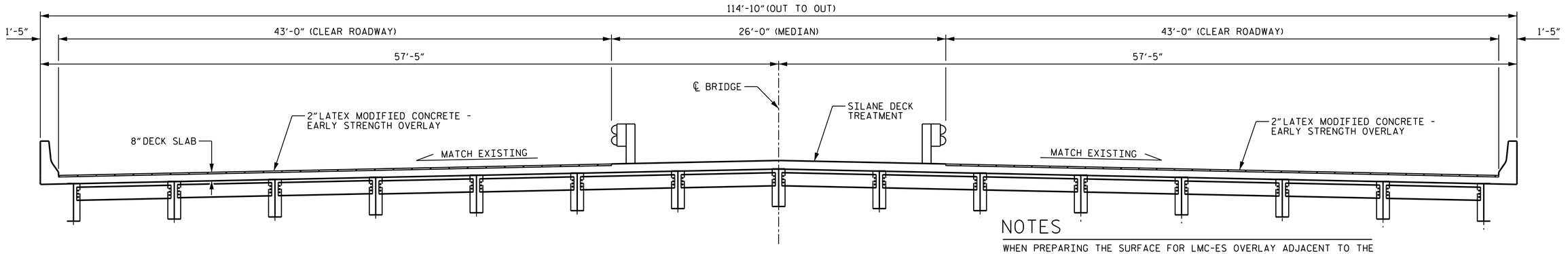
(EXISTING)

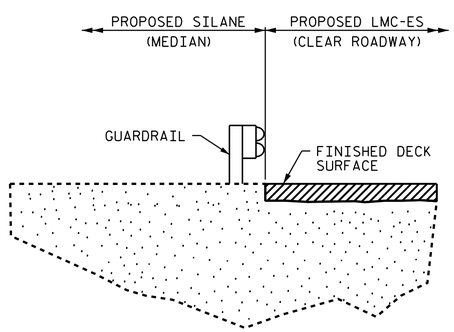


TYPICAL SECTION
(PROPOSED)

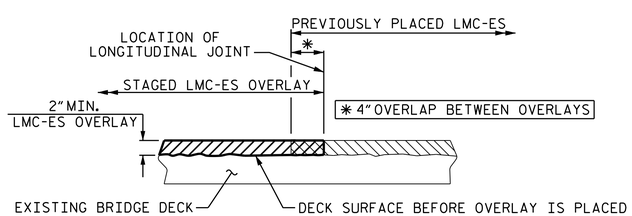
NOTES

WHEN PREPARING THE SURFACE FOR LMC-ES OVERLAY ADJACENT TO THE PREVIOUSLY PLACED LMC-ES STAGE, THE PREVIOUSLY PLACED LMC-ES SHALL BE SAW-CUT TO THE FULL DEPTH OF THE LMC-ES AT THE CENTERLINE OF THE BRIDGE AND ALL LMC-ES-ES IN THE 4" OVERLAP SHALL BE REMOVED WITH HAND TOOLS PRIOR TO PLACEMENT OF LMC-ES IN THE SECOND STAGE.

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

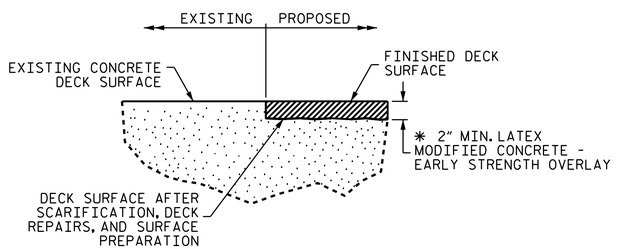


DETAIL FOR SILANE DECK TREATMENT



SECTION THRU DECK

STAGED LMC-ES OVERLAY JOINT
(AS NEEDED)



DETAIL FOR LATEX MODIFIED CONCRETE-EARLY STRENGTH OVERLAY
(FINISHED SURFACE OF THE LATEX MODIFIED CONCRETE - EARLY STRENGTH OVERLAY IS APPROXIMATE)

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE No.: 484

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee
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11/21/2018

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CHECKED BY : E. K. POPE DATE : 10/18

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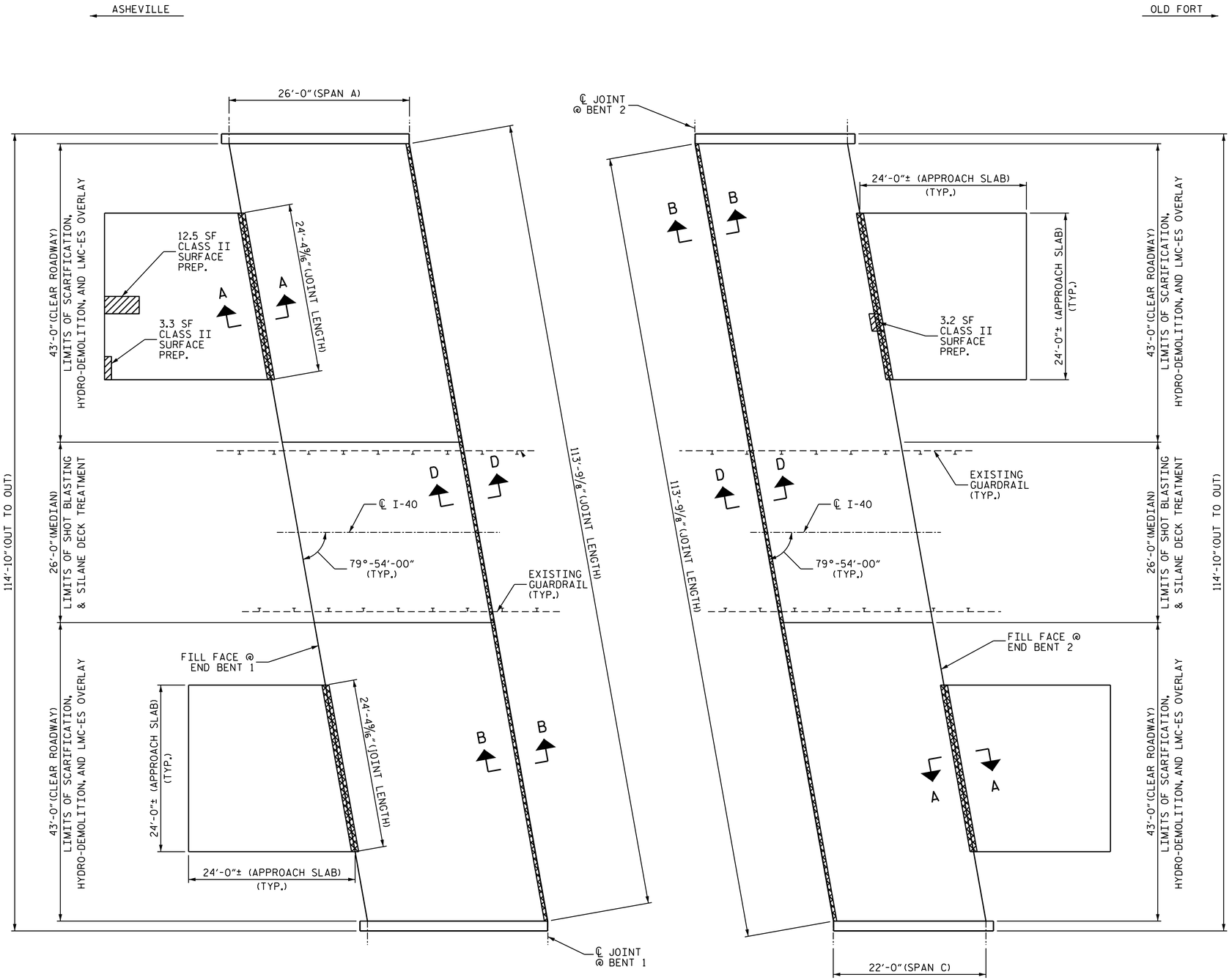

SPAN A

SPAN C

AS-BUILT REPAIR QUANITY TABLE

TOP OF DECK REPAIR SPAN A & APPROACH SLAB

	ESTIMATE	ACTUAL
CLASS II SURFACE PREPARATION	1.8 SQ. YDS.	
✱CLASS III SURFACE PREPARATION	0.5 SQ. YDS.	
CONCRETE FOR DECK REPAIR	2.6 CU. FT.	
LMC-ES MATERIALS	20.2 CU. YDS.	
PLACING & FINISHING LMC-ES OVERLAY	365.0 SQ. YDS.	
SCARIFYING BRIDGE DECK	365.0 SQ. YDS.	
HYDRO-DEMOLITION OF BRIDGE DECK	365.0 SQ. YDS.	
SHOTBLASTING BRIDGE DECK	75.1 SQ. YDS.	
SILANE DECK TREATMENT	75.1 SQ. YDS.	
BRIDGE GROOVING FLOORS	2873.4 SQ. FT.	
BRIDGE JOINT DEMOLITION	88.0 SQ. FT.	
CONCRETE WORK FOR JOINT REPLACEMENT	88.0 SQ. FT.	
ELASTOMERIC CONC. FOR PRESERVATION	22.0 CU. FT.	

AS-BUILT REPAIR QUANITY TABLE

TOP OF DECK REPAIR SPAN C & APPROACH SLAB

	ESTIMATE	ACTUAL
CLASS II SURFACE PREPARATION	0.4 SQ. YDS.	
✱CLASS III SURFACE PREPARATION	0.5 SQ. YDS.	
CONCRETE FOR DECK REPAIR	0.6 CU. FT.	
LMC-ES MATERIALS	18.2 CU. YDS.	
PLACING & FINISHING LMC-ES OVERLAY	326.8 SQ. YDS.	
SCARIFYING BRIDGE DECK	326.8 SQ. YDS.	
HYDRO-DEMOLITION OF BRIDGE DECK	326.8 SQ. YDS.	
SHOTBLASTING BRIDGE DECK	63.6 SQ. YDS.	
SILANE DECK TREATMENT	63.6 SQ. YDS.	
BRIDGE GROOVING FLOORS	2553.4 SQ. FT.	
BRIDGE JOINT DEMOLITION	88.0 SQ. FT.	
CONCRETE WORK FOR JOINT REPLACEMENT	88.0 SQ. FT.	
ELASTOMERIC CONC. FOR PRESERVATION	22.0 CU. FT.	

NOTES

PAYMENT FOR CLASS II SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING SCARIFYING OF THE BRIDGE DECK. SEE SPECIAL PROVISIONS.

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

✱CLASS III SURFACE PREPARATION IS NOT ANTICIPATED. A TOKEN PAY ITEM IS INDICATED FOR PRICING PURPOSES IN THE EVENT OF UNANTICIPATED CLASS III AREAS ARE ENCOUNTERED.

FOR SECTION A-A, B-B AND D-D. SEE "JOINT DETAILS LMC OVERLAY", SHEET S-9.

CLASS II SURFACE PREPARATION

BRIDGE JOINT DEMOLITION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 484

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS SPAN A & C

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: B04B5AA9F2FAD484...
11/28/2018

DRAWN BY : A. S./M. WELDON DATE : 08/18
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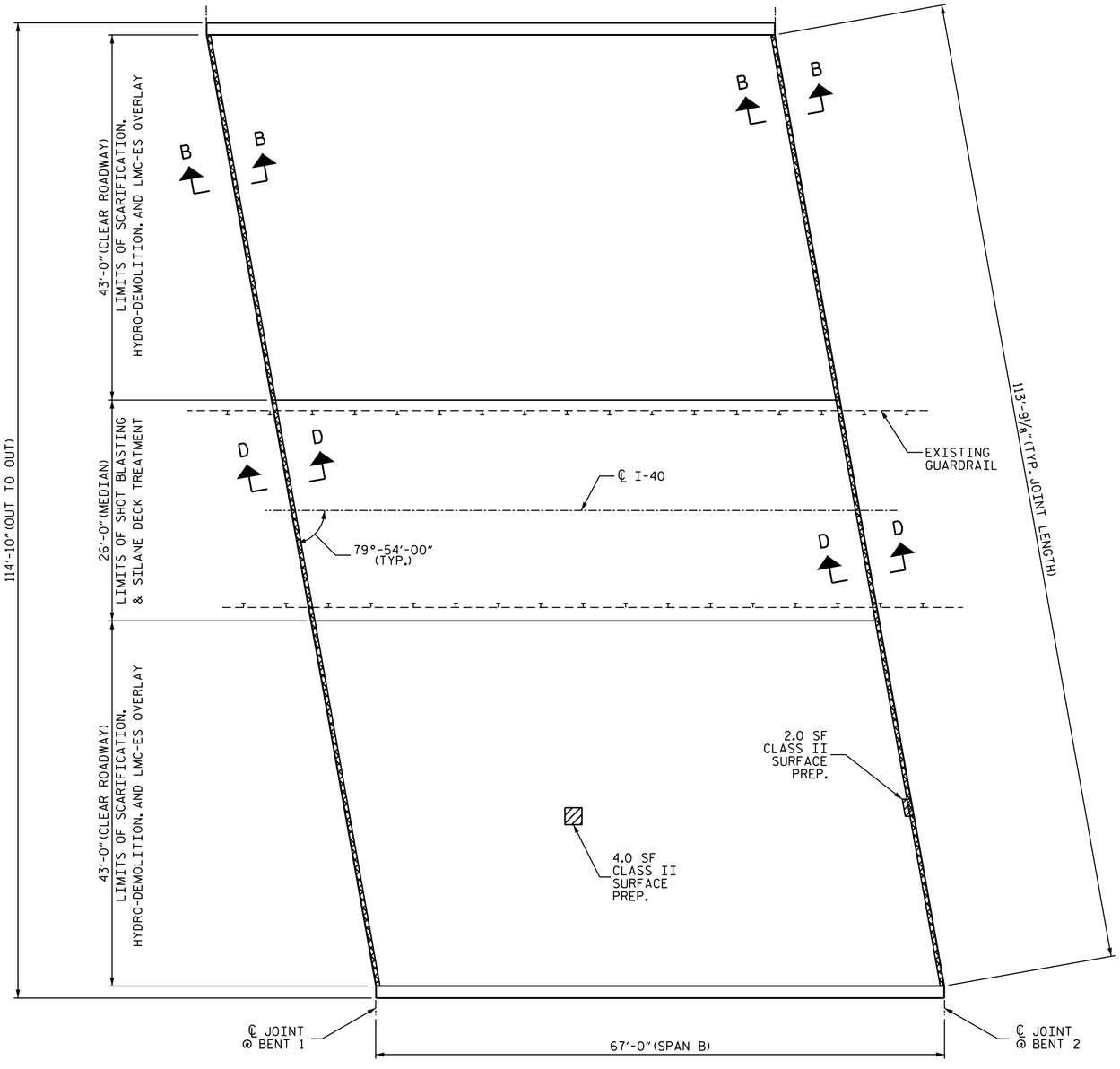

SPAN B

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIR SPAN B

	ESTIMATE	ACTUAL
CLASS II SURFACE PREPARATION	0.7 SQ. YDS.	
✱ CLASS III SURFACE PREPARATION	0.5 SQ. YDS.	
CONCRETE FOR DECK REPAIR	1.1 CU. FT.	
LMC-ES MATERIALS	35.6 CU. YDS.	
PLACING & FINISHING LMC-ES OVERLAY	640.2 SQ. YDS.	
SCARIFYING BRIDGE DECK	640.2 SQ. YDS.	
HYDRO-DEMOLITION OF BRIDGE DECK	640.2 SQ. YDS.	
SHOTBLASTING BRIDGE DECK	193.6 SQ. YDS.	
SILANE DECK TREATMENT	193.6 SQ. YDS.	
GROOVING BRIDGE FLOORS	5266.7 SQ. FT.	
BRIDGE JOINT DEMOLITION	94.8 SQ. FT.	
CONCRETE WORK FOR JOINT REPLACEMENT	94.8 SQ. FT.	
ELASTOMERIC CONC. FOR PRESERVATION	23.7 CU. FT.	

NOTES

PAYMENT FOR CLASS II SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING SCARIFYING OF THE BRIDGE DECK. SEE SPECIAL PROVISIONS.

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

✱ CLASS III SURFACE PREPARTION IS NOT ANTICIPATED. A TOKEN PAY ITEM IS INTICATED FOR PRICING PURPOSES IN THE EVENT OF UNANTICIPATED CLASS III AREAS ARE ENCOUNTERED.

FOR SECTION B-B AND D-D, SEE "JOINT DETAILS LMC OVERLAY", SHEET S-9.

CLASS II SURFACE PREPARATION

BRIDGE JOINT DEMOLITION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 484

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS SPAN B

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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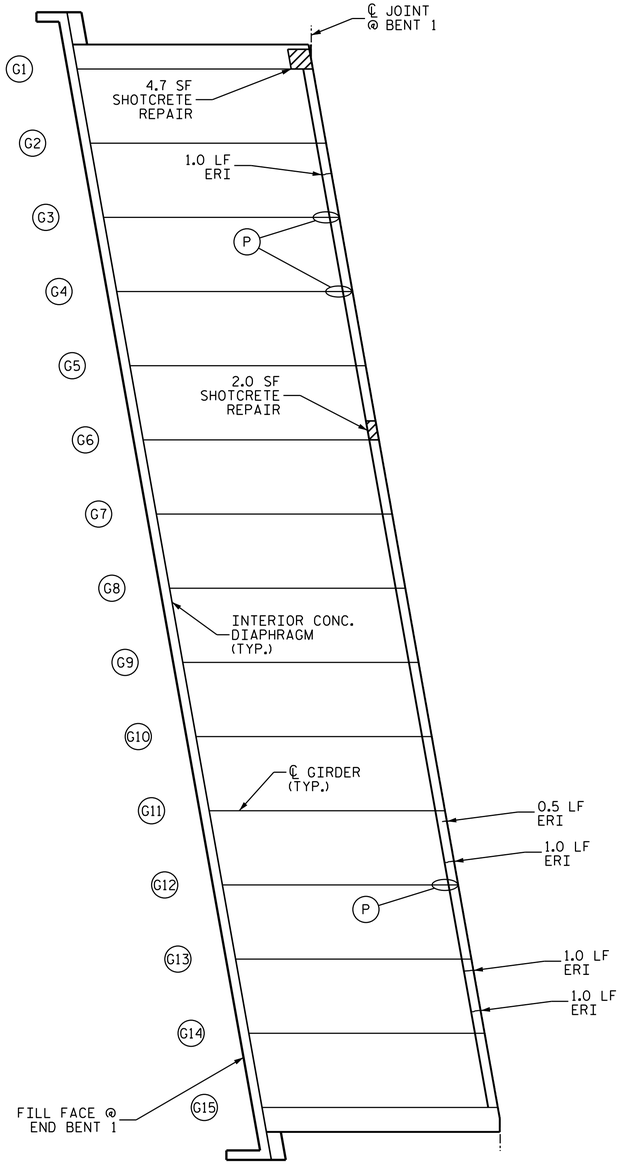
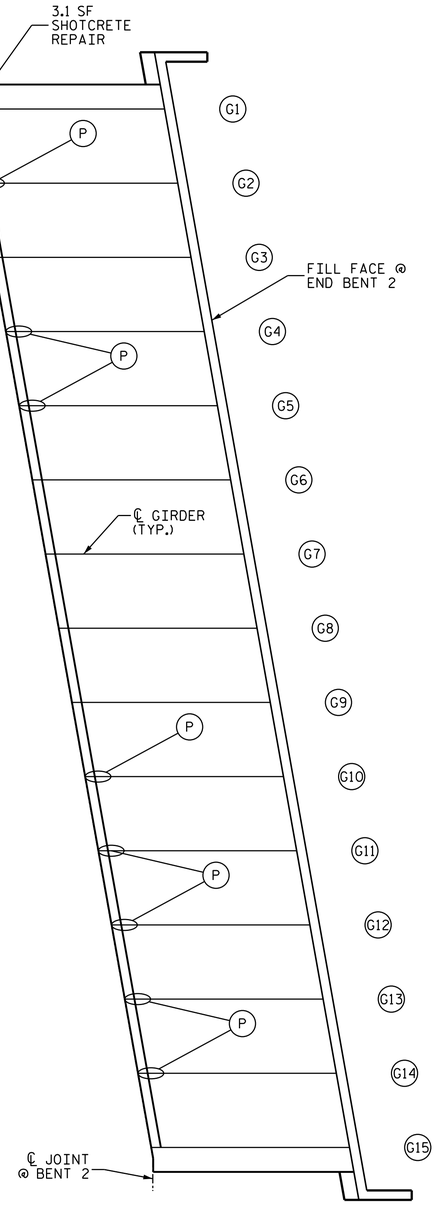


SPAN A
(UNDERSIDE)

OLD FORT



SPAN C
(UNDERSIDE)

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN A

	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR CONCRETE DIAPHRAGM	2.0	1.0		
OVERHANG	4.7	2.4		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR CONCRETE DIAPHRAGM	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
UNDERSIDE OF DECK		0.0		
INTERIOR CONCRETE DIAPHRAGM		4.5		
OVERHANG		0.0		

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN C

	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR CONCRETE DIAPHRAGM	0.0	0.0		
OVERHANG	3.1	1.6		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR CONCRETE DIAPHRAGM	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
UNDERSIDE OF DECK		0.0		
INTERIOR CONCRETE DIAPHRAGM		0.0		
OVERHANG		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAIL" SHEET.

ANTICIPATED STEEL REPAIR LOCATIONS

SPAN	BEAM	LOCATION	DIM "A"	DIM "B"	DIM "E"
A	G3	BENT 1	-	9½"	4"
A	G4	BENT 1	-	9½"	4"
A	G12	BENT 1	-	9½"	3"
C	G2	BENT 2	-	9½"	4"
C	G4	BENT 2	-	9½"	4"
C	G5	BENT 2	-	9½"	4"
C	G10	BENT 2	-	9½"	4"
C	G11	BENT 2	-	9½"	6"
C	G12	BENT 2	-	9½"	4"
C	G12	BENT 2	4"	9½"	-
C	G13	BENT 2	-	9½"	4"
C	G14	BENT 2	-	9½"	4"

FOR BEAM REPAIR DIMENSIONS, SEE "BEAM PLATING REPAIR DETAILS" SHEETS 1 & 2.

(1) BEAM NUMBER
(B) BEAM END REPAIR
(P) PLATING REPAIR
(S) STIFFENER REPAIR
(D) STEEL DIAPHRAGM REPLACEMENT

SHOTCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 484

BEAM REPAIR QUANTITY TABLE

BOLTED STEEL PLATES		STEEL PLATES		STIFFENER		STEEL DIAPHRAGM	
LBS.		LBS.		LBS.		LBS.	
ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
90.3		12.4		3.8		0.0	

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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RALEIGH

UNDERSIDE OF DECK SPAN A & C

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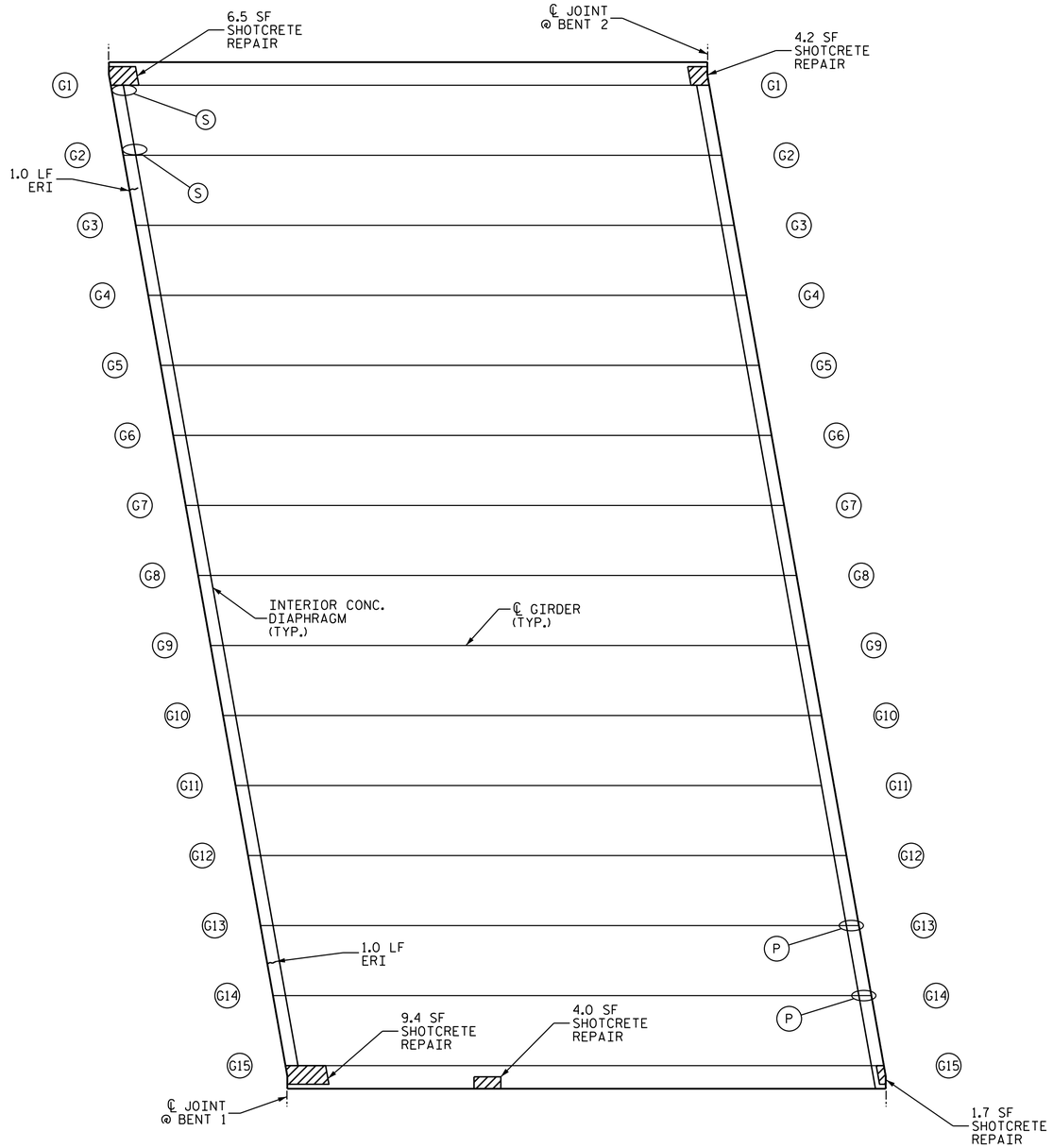

SPAN B

(UNDERSIDE)

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN B

	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR CONCRETE DIAPHRAGM	0.0	0.0		
OVERHANG	25.7	12.9		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR CONCRETE DIAPHRAGM	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
UNDERSIDE OF DECK				
INTERIOR CONCRETE DIAPHRAGM		2.0		
OVERHANG		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAIL" SHEET.

(1) BEAM NUMBER
(B) BEAM END REPAIR
(P) PLATING REPAIR
(S) STIFFENER REPAIR
(D) STEEL DIAPHRAGM REPLACEMENT

SHOTCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 484

ANTICIPATED STEEL REPAIR LOCATIONS

SPAN	BEAM	LOCATION	DIM "A"	DIM "B"	DIM "E"
B	G13	BENT 2	-	9½"	4"
B	G14	BENT 2	-	9½"	3"
S	G1	BENT 1	4"	-	-
S	G2	BENT 1	4"	-	-

FOR BEAM REPAIR DIMENSIONS, SEE "BEAM PLATING REPAIR DETAILS" SHEETS 1 & 2.

BEAM REPAIR QUANTITY TABLE

BOLTED STEEL PLATES		STEEL PLATES		STIFFENER		STEEL DIAPHRAGM	
LBS.		LBS.		LBS.		LBS.	
ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
18.5		0.0		12.9		0.0	

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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STATE OF NORTH CAROLINA
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RALEIGH

UNDERSIDE OF DECK SPAN B

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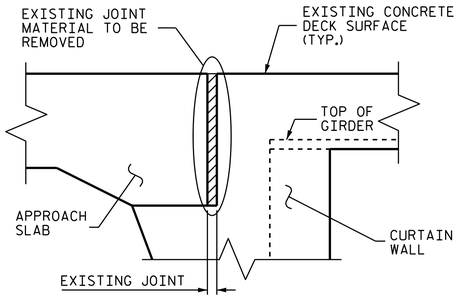
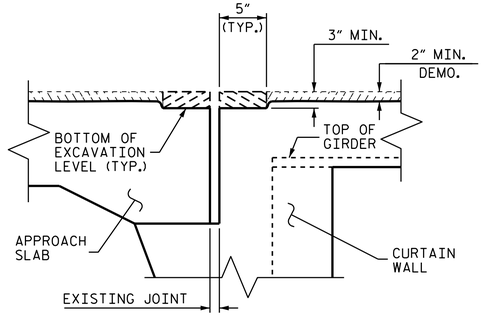
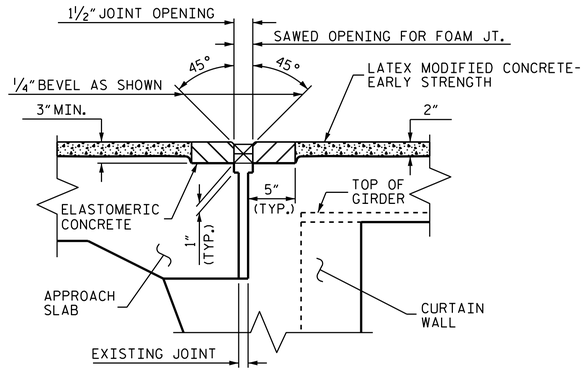


SECTION A-A
(EXISTING JOINT)



SECTION A-A
(MINIMUM EXISTING JOINT DEMOLITION)



SECTION A-A
(PROPOSED FOAM JOINT SEAL)

NOTES

THE FOAM JOINTS SHALL MEET THE MANUFACTURER'S RECOMMENDATION.

THE FOAM JOINTS SHALL MEET THE MANUFACTURER'S RECOMMENDATION FOR THE SIZE OF OPENING ON THE PLANS, AND ACCOMMODATE THE MINIMUM EXPANSION SHOWN ON THE PLANS.

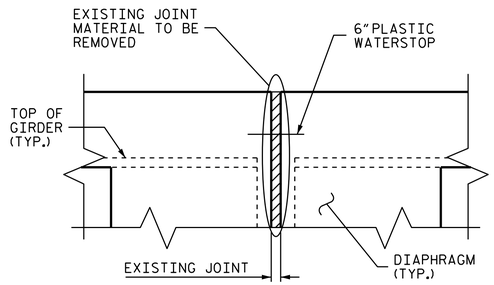
CONTRACTOR SHALL FIELD VERIFY THE EXISTING JOINT OPENING PRIOR TO ORDERING JOINT SEAL MATERIAL. IF ACTUAL JOINT OPENING VARIES FROM OPENING INDICATED IN DETAIL BY MORE THAN ¼", NOTIFY ENGINEER.

THE INSTALLED FOAM JOINTS SHALL BE WATER TIGHT.

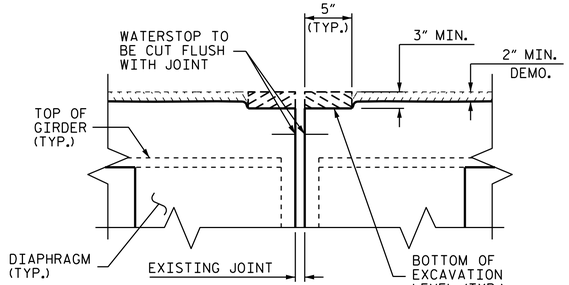
FOR FOAM JOINT SEALS FOR PRESERVATION, SEE SPECIAL PROVISIONS.

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

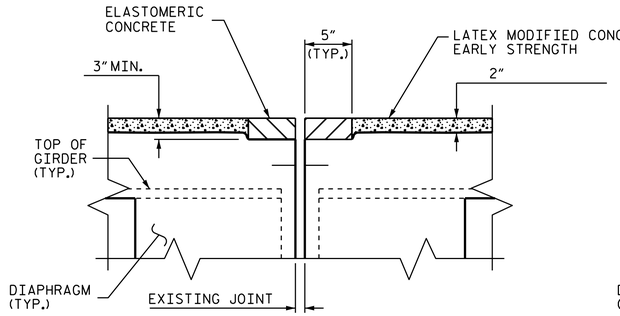
JOINT REPAIR QUANTITY TABLE		
	ESTIMATE	ACTUAL
FOAM JOINT SEALS FOR PRESERVATION	345.4 LIN. FT.	



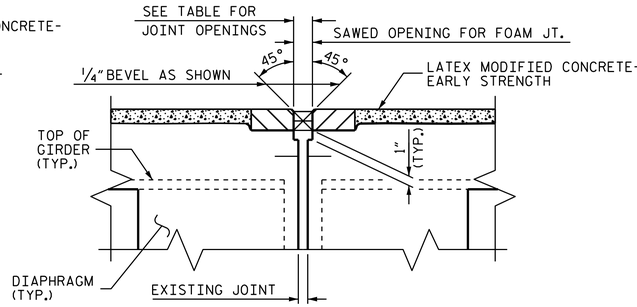
SECTION B-B
(EXISTING JOINT)



SECTION B-B
(MINIMUM EXISTING JOINT DEMOLITION)



SECTION B-B
(PROPOSED JOINT PRE-SAWED)

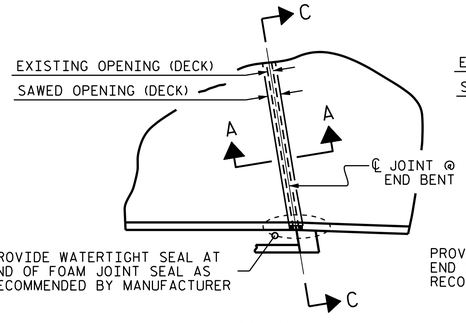


SECTION B-B
(PROPOSED FOAM JOINT SEAL)

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

DEMOLISH BRIDGE JOINT AREA TO THE NECESSARY DEPTH, SUCH THAT ELASTOMERIC CONCRETE SHALL BE FOUNDED ON CONCRETE OR REPAIR CONCRETE SUBSTRATE, NOT LATEX MODIFIED CONCRETE.

SAWED JOINT OPENING TABLE			
	SAWED JT. OPENING (PERPINDICULAR TO JT.)		
LOCATION BRIDGE 484	AT 45°	AT 60°	AT 90°
BENT 1	1 3/16"	1 3/16"	1 1/2"
BENT 2	1 11/16"	1 3/16"	1 3/8"



PLAN
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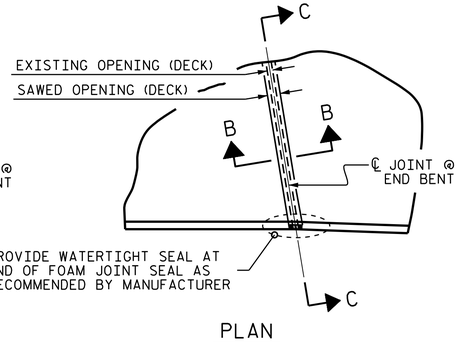

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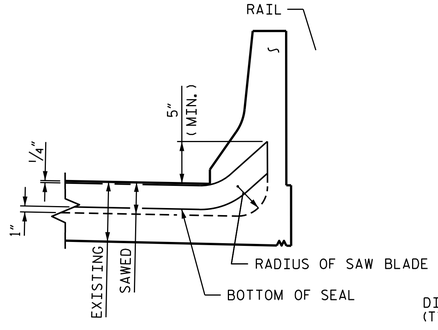
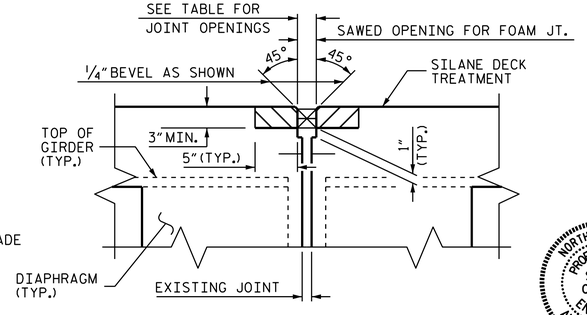


SECTION C-C



SECTION D-D
(PROPOSED FOAM JOINT SEAL)

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 484

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS
LMC OVERLAY

JOINT SEAL DETAILS

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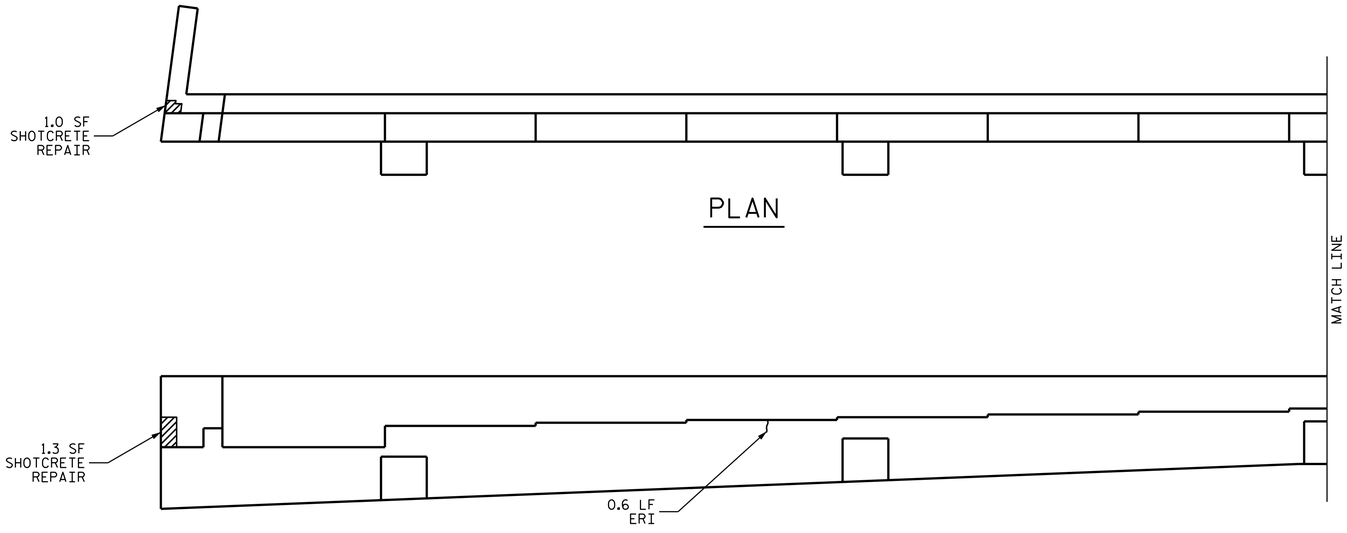

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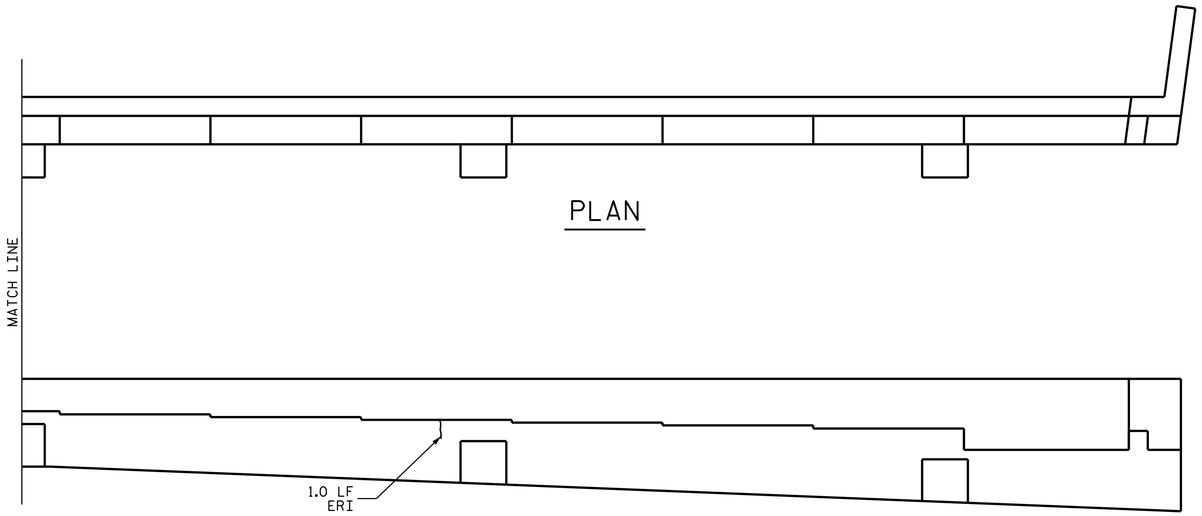
ELEVATION



PLAN

ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

END BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
CURTAIN WALL	0.0	0.0		
WING WALL	2.3	1.2		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
CURTAIN WALL	0.0	0.0		
WING WALL	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		1.6		
CURTAIN WALL		0.0		
WING WALL		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
CAP		183.9		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1"BEHIND REBAR AND MINIMUM 2"CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 484

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 1

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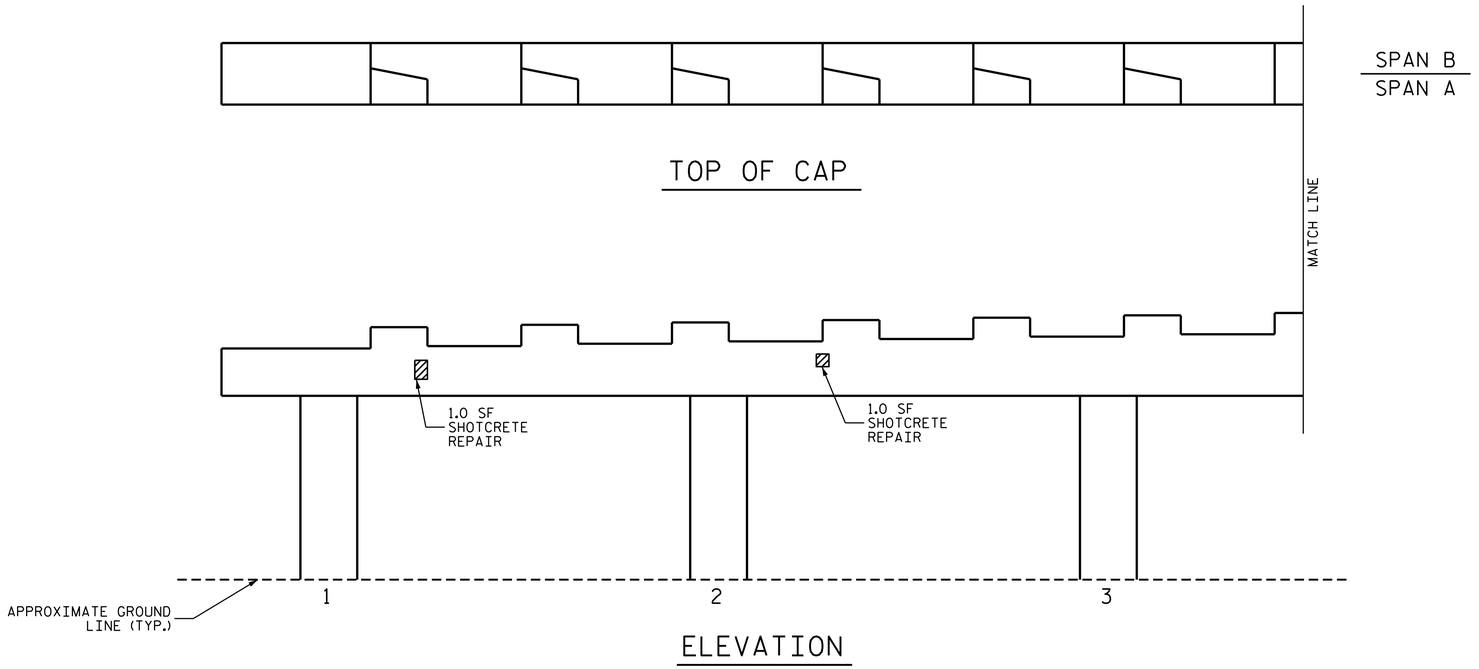


ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 1 SPAN A FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	10.0	5.0		
COLUMN	15.0	7.5		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
TOP OF BENT CAP		371.0		

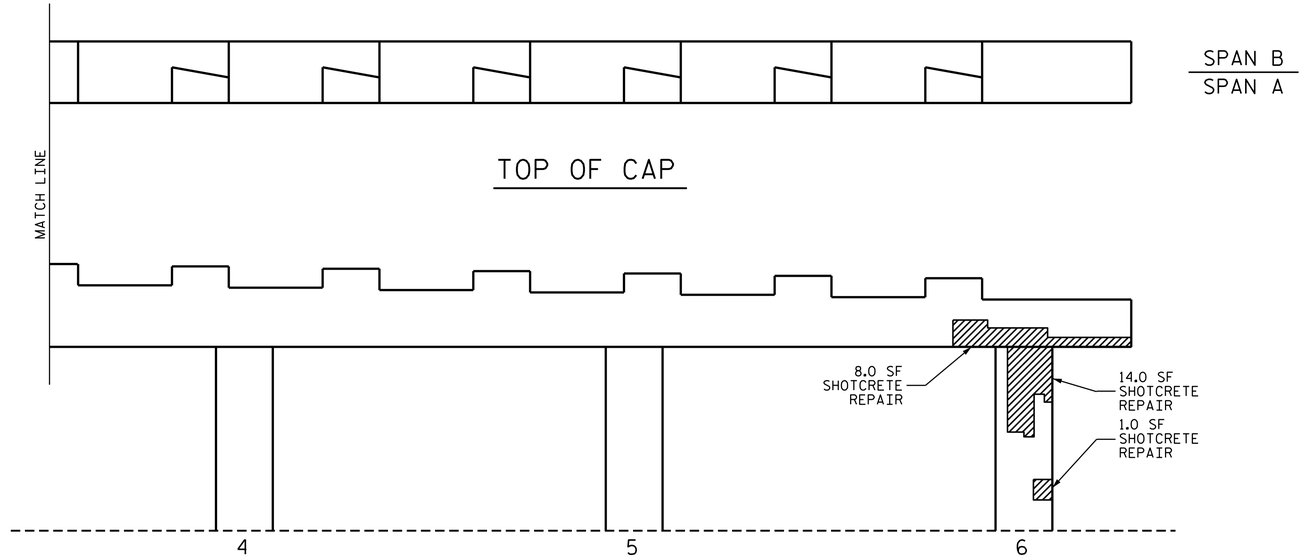
VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1"BEHIND REBAR AND MINIMUM 2"CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES:

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

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



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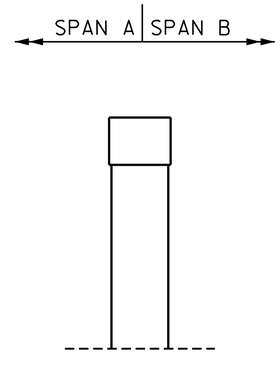

END VIEW

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 484

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 1 SPAN A FACE

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee
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11/21/2018

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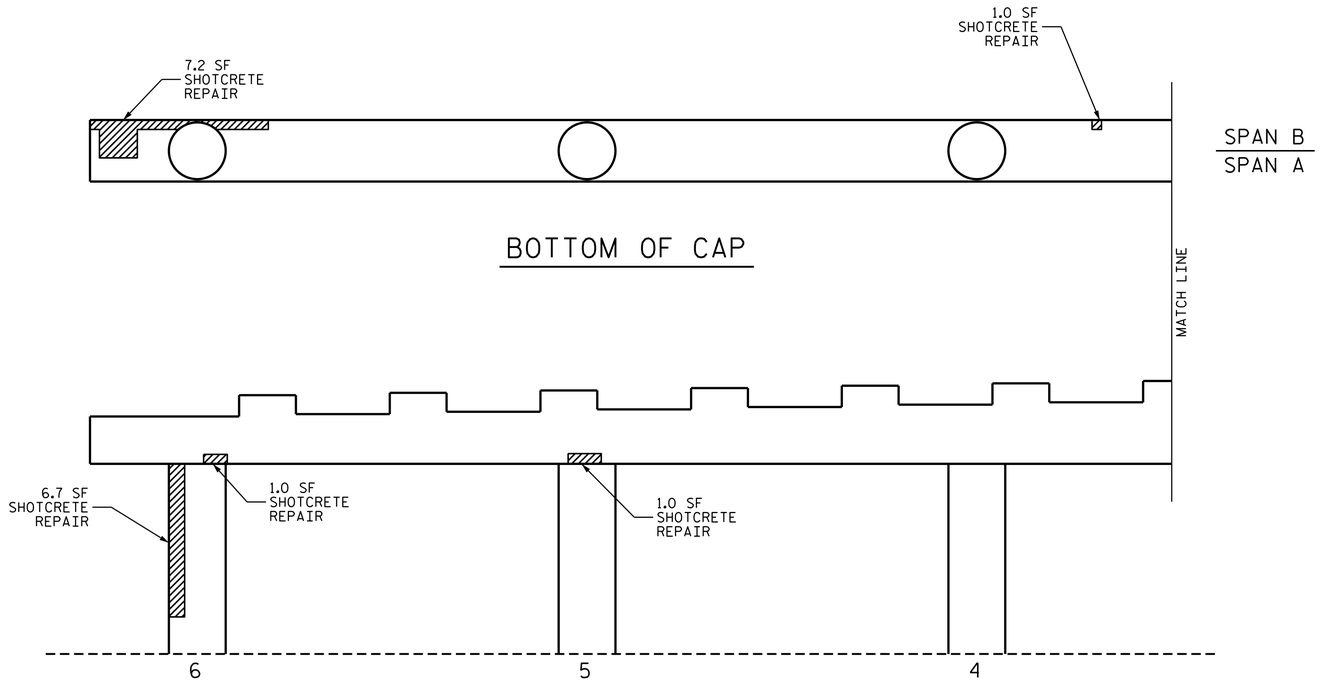

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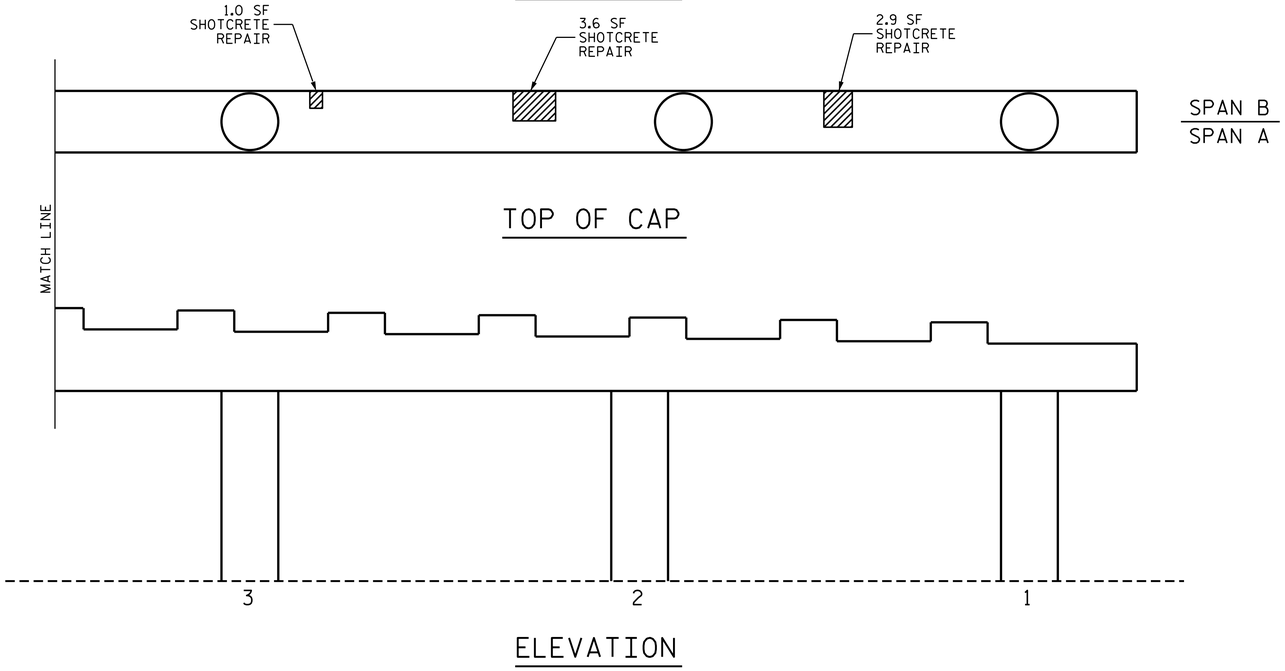

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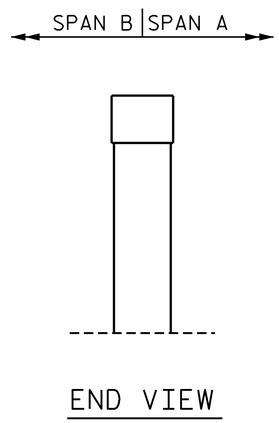

END VIEW

AS-BUILT REPAIR QUANTITY TABLE

BENT 1 SPAN B FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	17.7	8.9		
COLUMN	6.7	3.3		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1"BEHIND REBAR AND MINIMUM 2"CLEARANCE TO SAWCUT. SEE ''TYPICAL CAP AND COLUMN REPAIR DETAILS'' SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 484

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 1
SPAN B FACE

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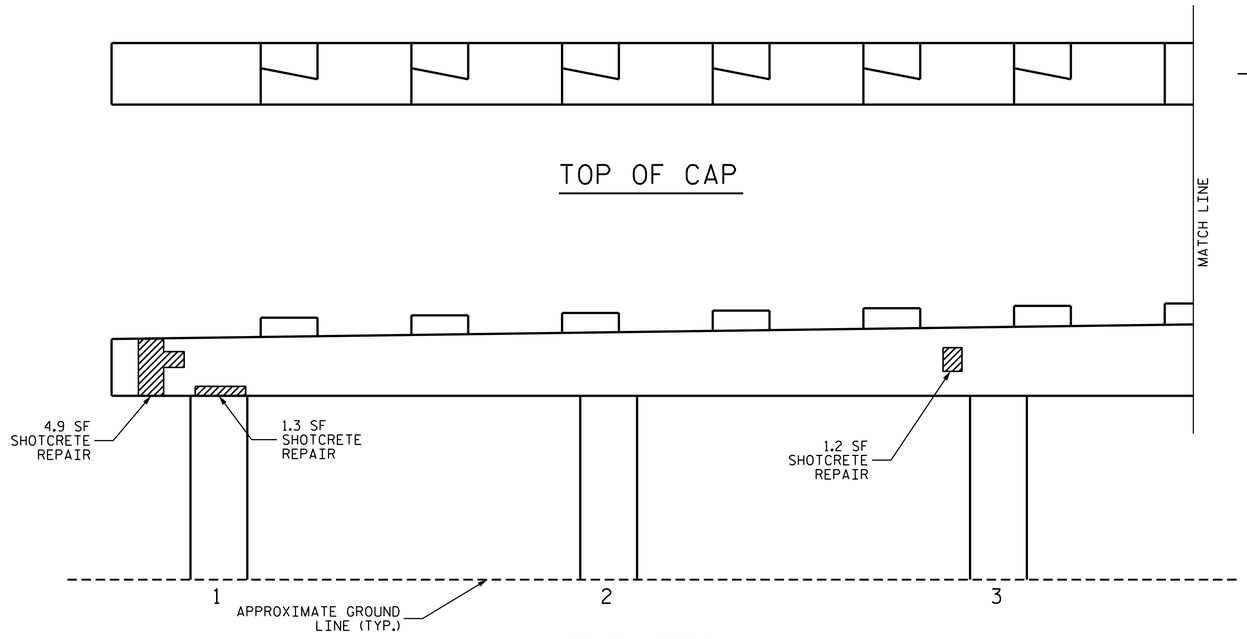

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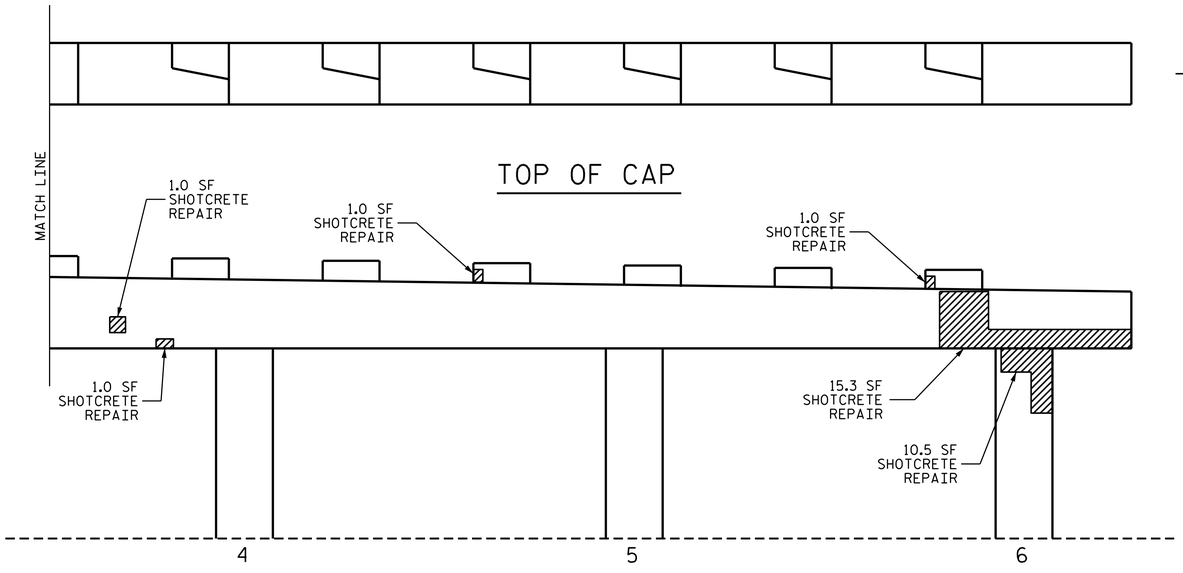

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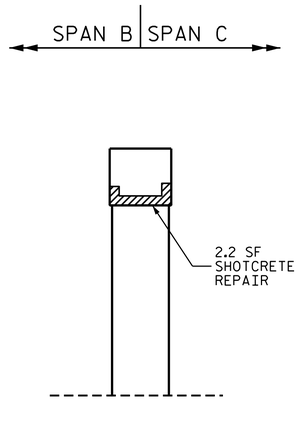

END VIEW

AS-BUILT REPAIR QUANTITY TABLE

BENT 2 SPAN B FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	28.9	14.5		
COLUMN	10.5	5.3		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
CAP		371.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1"BEHIND REBAR AND MINIMUM 2"CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 484

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 2 SPAN B FACE

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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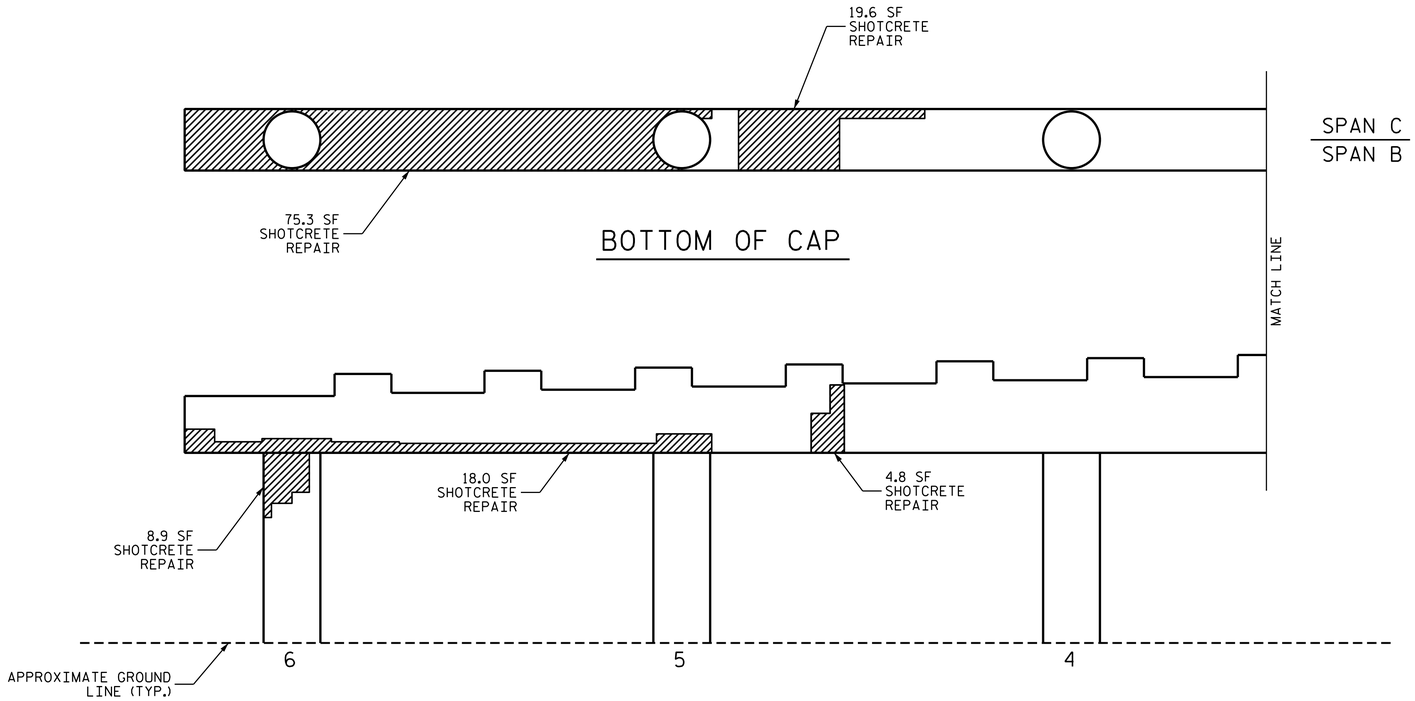

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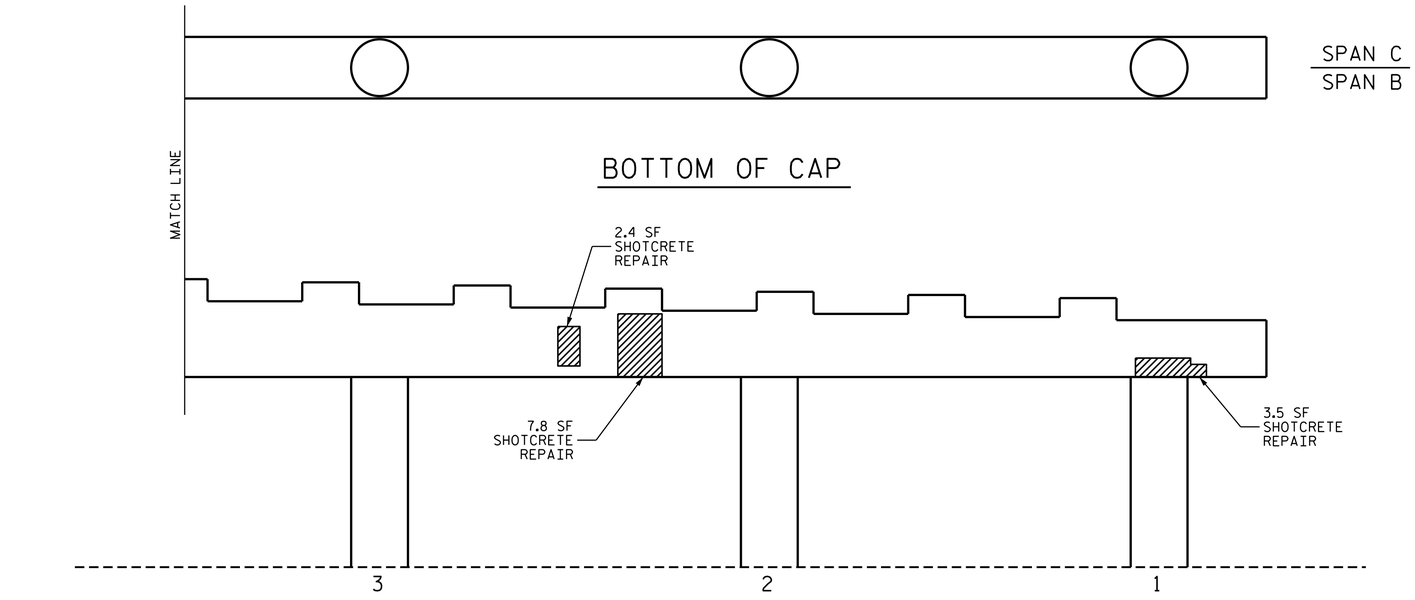

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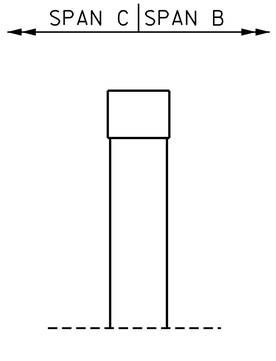

END VIEW

AS-BUILT REPAIR QUANTITY TABLE

BENT 2 SPAN C FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	131.4	65.7		
COLUMN	8.9	4.5		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1"BEHIND REBAR AND MINIMUM 2"CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

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SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 484

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 2
SPAN C FACE

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by:
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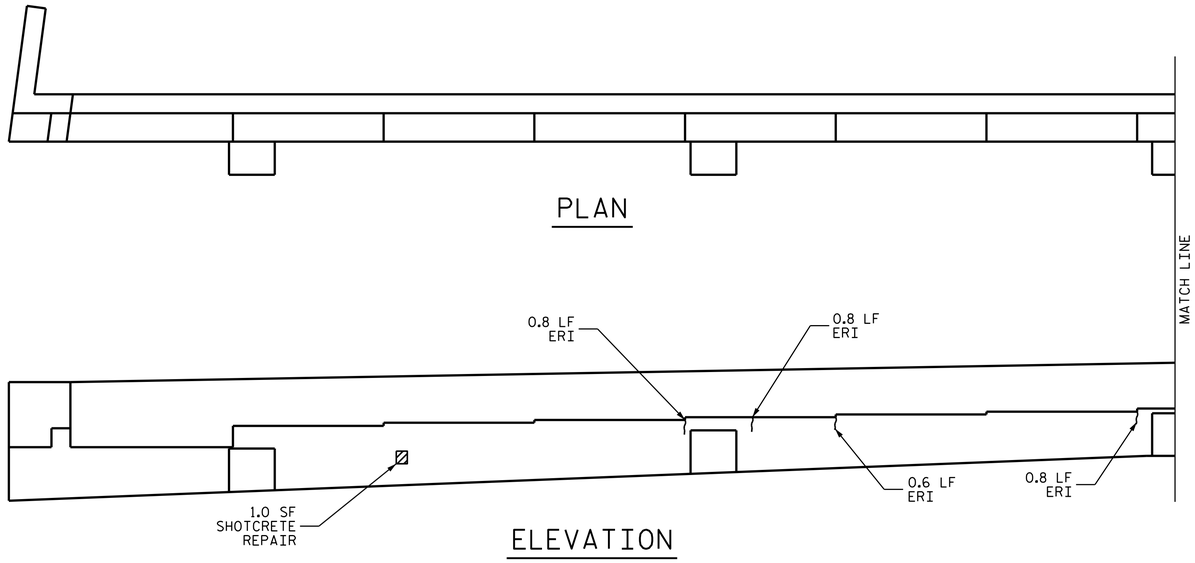

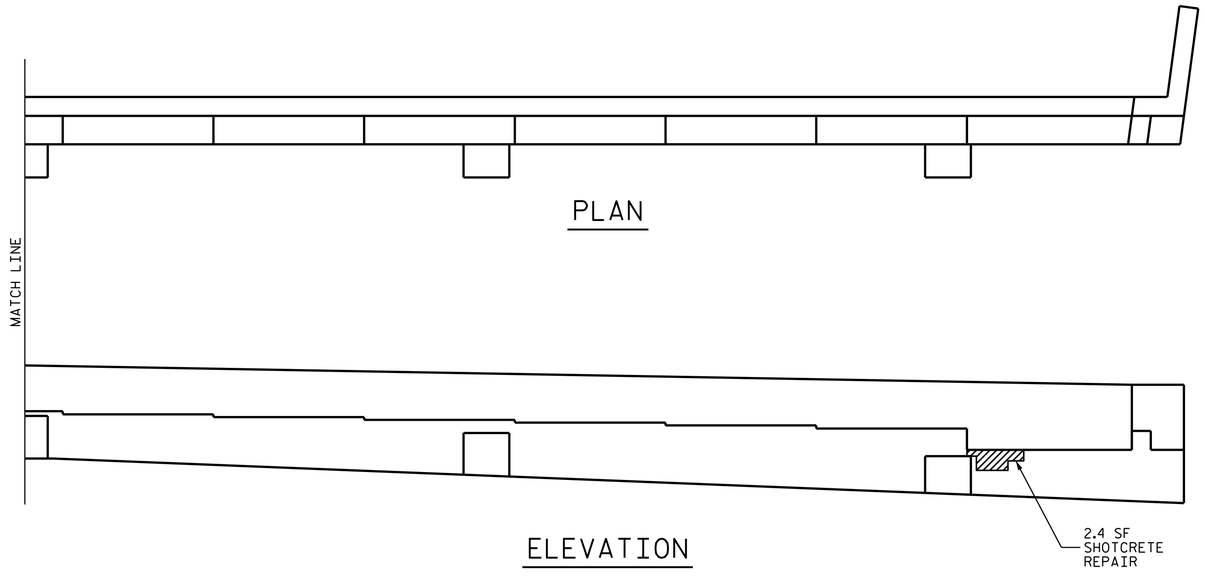

AS-BUILT REPAIR QUANTITY TABLE

END BENT 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	3.4	1.7		
CURTAIN WALL	0.0	0.0		
WING WALL	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
CURTAIN WALL	0.0	0.0		
WING WALL	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		3.0		
CURTAIN WALL		0.0		
WING WALL		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
CAP		183.9		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1"BEHIND REBAR AND MINIMUM 2"CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

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SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 484

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Miller B04B5AAF2FAD484...

11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 2

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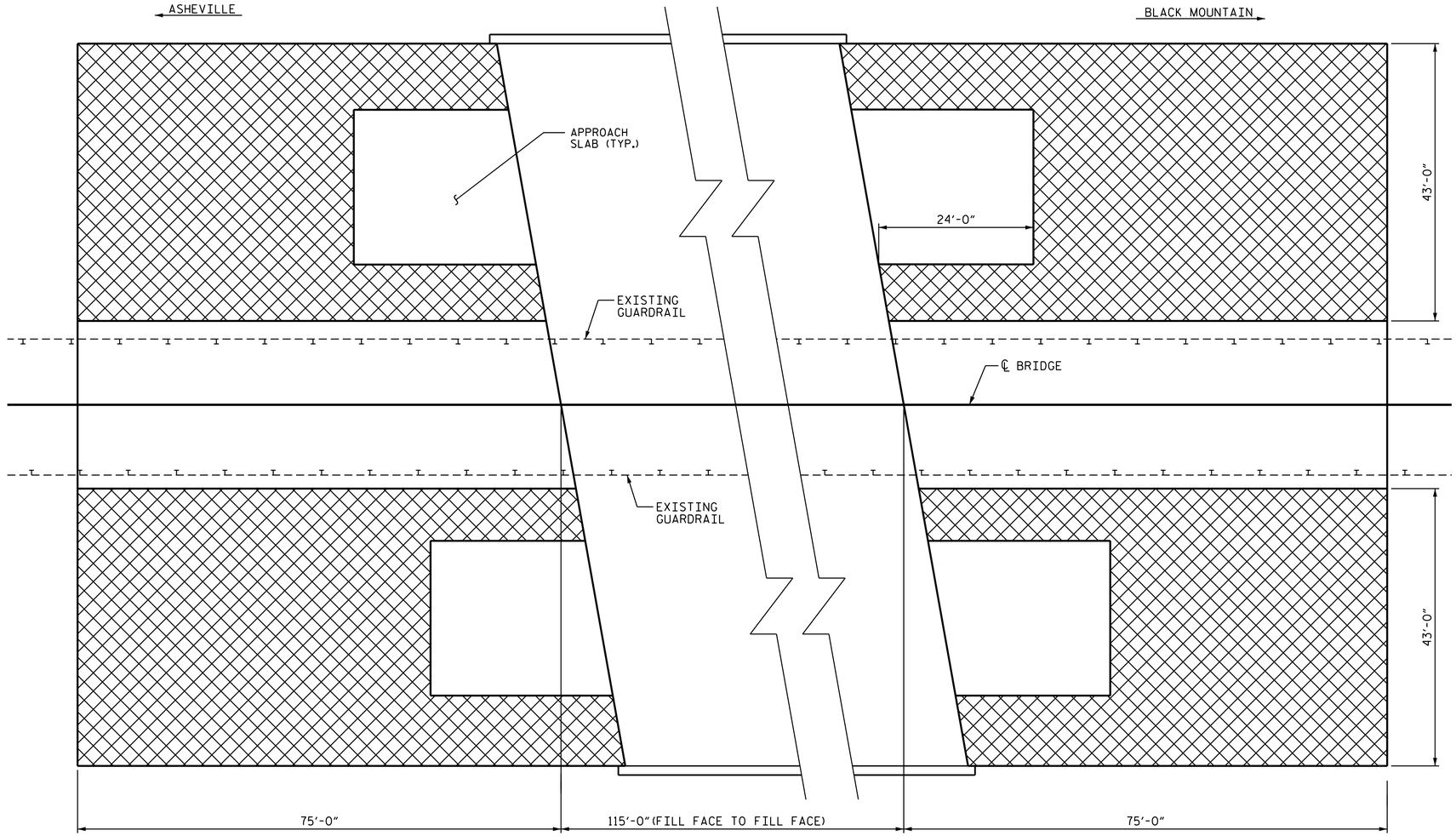


NOTES

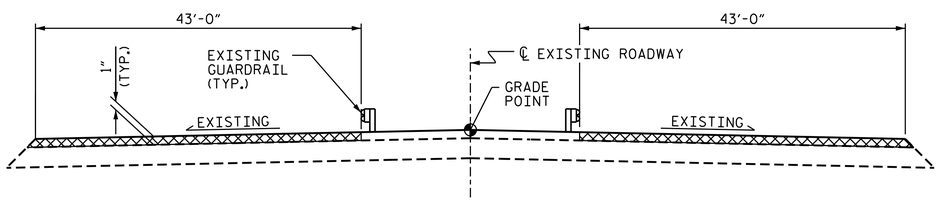
INCIDENTAL MILLING - EXISTING APPROACH ASPHALT PAVEMENT TO BE MILLED AS NECESSARY TO ATTAIN MINIMUM 1½" DEPTH OF NEW ASPHALT PAVEMENT. NEW ASPHALT PAVEMENT SHALL BE OF THICKNESS NECESSARY TO PROVIDE A SMOOTH TRANSITION BETWEEN THE ROADWAY AND THE BRIDGE DECK. THE NEW ASPHALT PAVEMENT THICKNESS MAY EXCEED 1½" DUE TO SETTLEMENT OF THE EXISTING APPROACH.

SUMMARY OF QUANTITIES

	ESTIMATE	ACTUAL
INCIDENTAL MILLING	1015 SQ.YDS.	
ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B	90 TONS	
ASPHALT BINDER FOR PLANT MIX	6 TONS	

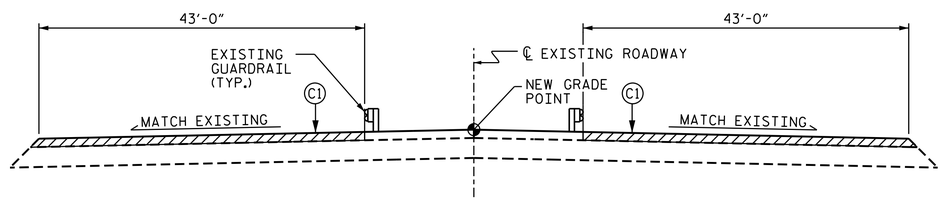
C1	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.

INCIDENTAL MILLING



TYPICAL ROADWAY MILLING SECTION

(MILL TO 1½" DEPTH)



TYPICAL ROADWAY SECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE No. 484

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH MILLING & TYPICAL ROADWAY SECTIONS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee
80485A4F3FAD484...
11/21/2018

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CHECKED BY : A. M. LEE DATE : 10/2018

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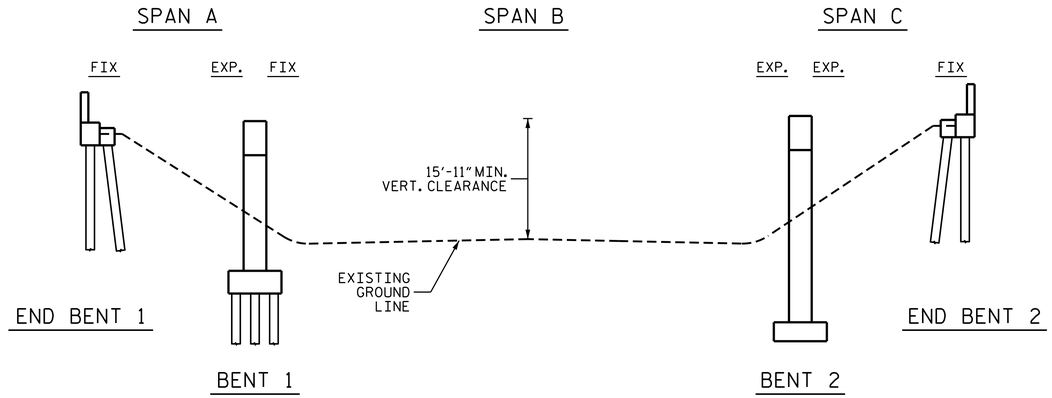
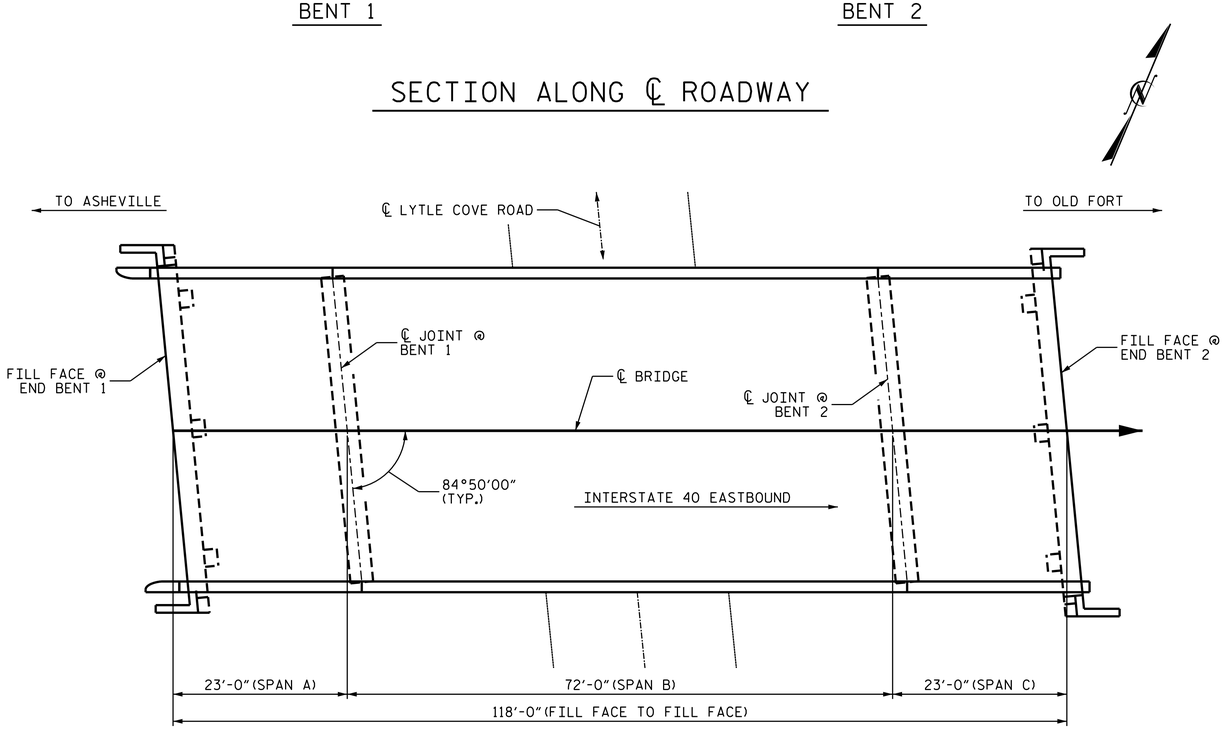


SECTION ALONG ℄ ROADWAY



PLAN

NOTES

GENERAL DRAWING INFORMATION IS TAKEN FROM THE ORIGINAL PLANS AND THE ROUTINE INSPECTION REPORT DATED 11/06/2017.

BRIDGE ORIENTATION CONFORMS TO THE ORIGINAL BRIDGE PLANS.

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

RESIDENT ENGINEER DATE

SCOPE OF WORK

- CLEAN, PLATE REPAIR AND SPOT REPAINT EXISTING STRUCTURAL STEEL.
- EPOXY RESIN INJECTION OF CONCRETE CRACKS.
- REMOVE UNSOUND CONCRETE AND PROPERLY PREPARE SHOTCRETE AND CONCRETE REPAIR AREAS.
- PERFORM SHOTCRETE AND CONCRETE REPAIRS IN PREPARED AREAS.
- PARTIALLY REMOVE BRIDGE DECK CONCRETE BY SCARIFICATION AND HYDRO-DEMOLITION METHODS.
- OVERLAY PREPARED BRIDGE DECK WITH LATEX MODIFIED CONCRETE-EARLY STRENGTH (LMC-ES).
- GROOVE LMC-ES BRIDGE DECK.
- REMOVE EXISTING JOINT MATERIAL AND INSTALL FOAM JOINT SEALS.
- REMOVE DEBRIS FROM TOP OF BENT CAPS, AND APPLY EPOXY COATING.

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 486

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...
11/21/2018

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee 8D4B5AAF2FAD484...
11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON INTERSTATE 40 EASTBOUND OVER LYTLE COVE ROAD

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LOCATION SKETCH

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

BRIDGE COORDINATES

LAT. 35.59970988
LONG. -82.36638954

NOTES

EXISTING DIMENSIONS AND BRIDGE CONDITION ARE FROM THE BEST INFORMATION AVAILABLE.

THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.

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

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

WORK ON THE BRIDGES SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL BELOW. THE CONTRACTOR SHALL SUBMIT PLANS FOR CONSTRUCTION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS AND THE PROJECT SPECIAL PROVISIONS.

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

PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL A COMPLETE SEQUENCE OF TASK FOR EACH OPERATION AFFECTING THE BRIDGE SURFACE AND/OR TRAFFIC.
FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

FOR SCARIFYING BRIDGE DECK, HYDRO-DEMOLITION OF BRIDGE DECK, AND CLASS II SURFACE PREPARATION, AND CLASS III SURFACE PREPARATION. SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISION.

THE LMC CONTRACTOR SHALL PROVIDE A METHOD OF HANDLING UNEXPECTED BLOW THROUGH OF THE DECK DURING HYDRO-DEMOLITION.

FOR PLACING AND FINISHING LATEX MODIFIED CONCRETE OVERLAY-EARLY STRENGTH (LMC-ES) AND LATEX MODIFIED CONCRETE-EARLY STRENGTH, SEE LATEX MODIFIED CONCRETE-EARLY STRENGTH SPECIAL PROVISIONS.

LONGITUDINAL CONSTRUCTION JOINTS SHALL BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.

DURING CONSTRUCTION, BERMS OR APPRORIATE MEASURES SHALL BE USED TO ENSURE HYDRO-DEMOLITION WATER DOES NOT MIGRATE INTO ACTIVE TRAVEL LANES.

FOR BRIDGE JOINT DEMOLITION, SEE SPECIAL PROVISIONS.

FOR CONCRETE WORK FOR JOINT REPLACEMENT, SEE SPECIAL PROVISIONS.

FOR CONCRETE FOR DECK REPAIRS, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEAL, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR SPOT PAINTING OF STEEL STRUCTURE REPAIR AREAS AND POLLUTION CONTROL, SEE SPOT PAINTING OF STEEL REPAIR AREAS SPECIAL PROVISION.

FOR EPOXY COATING AND DEBRIS REMOVAL, SEE SPECIAL PROVISIONS.

FOR BEAM REPAIR, SEE SPECIAL PROVISIONS.

FOR BOLTED BEAM REPAIR, SEE SPECIAL PROVISIONS.

FOR VOLUMETRIC MIXER, SEE SPECIAL PROVISIONS.

PROJ. NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 486

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE
ON INTERSTATE 40
EASTBOUND OVER
LYTLE COVE ROAD

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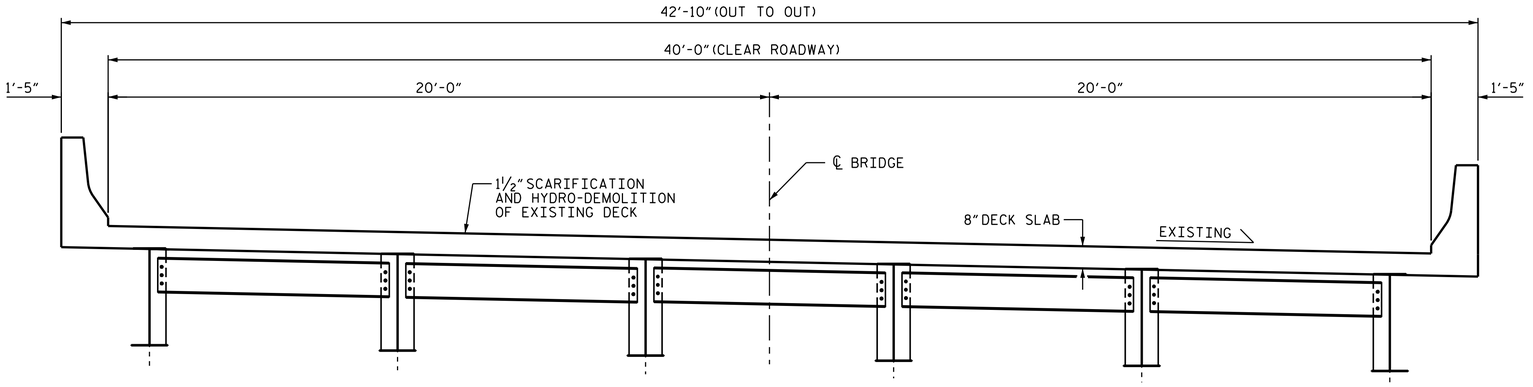
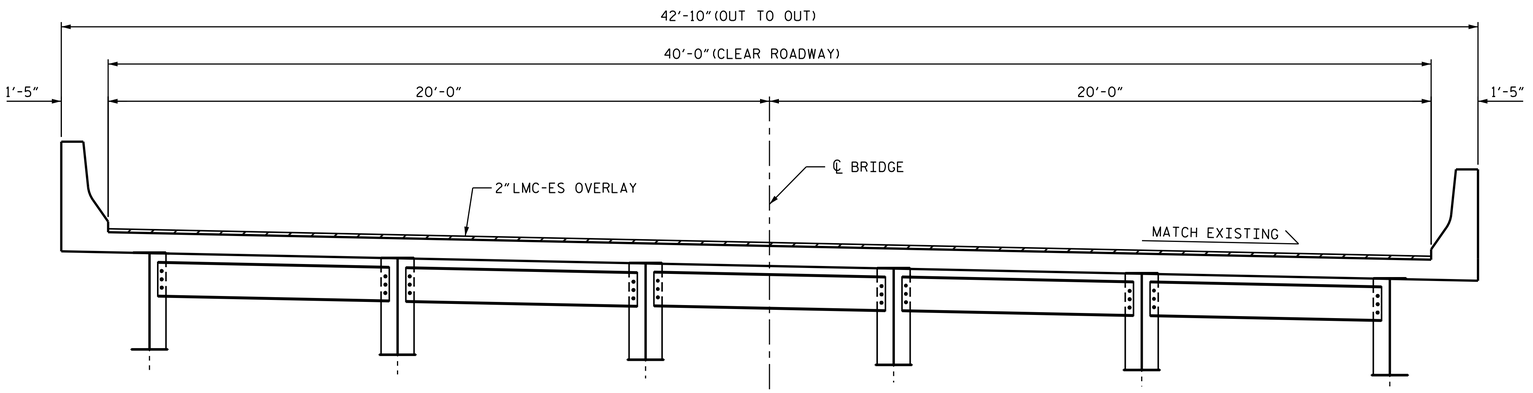


TYPICAL SECTION

(EXISTING)



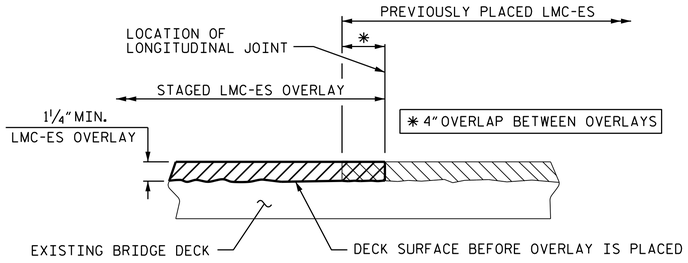
TYPICAL SECTION

(PROPOSED)

NOTES

WHEN PREPARING THE SURFACE FOR LATEX MODIFIED CONCRETE OVERLAY-EARLY STRENGTH (LMC-ES) ADJACENT TO A PREVIOUSLY PLACED LMC-ES STAGE, THE PREVIOUSLY PLACED LMC-ES SHALL BE REMOVED FOR A DISTANCE OF 4-INCHES FROM THE LMC-ES EDGE. THE SURFACE OF THE NEW STAGE AREA, ALONG WITH THE 4 INCH OVERLAY AREA, SHALL BE PREPARED AS PER THE OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS. NEW LMC-ES SHALL BE PLACE IN THE 4-INCH OVERLAP, AS PART OF NEW LMC-ES STAGE PLACEMENT.

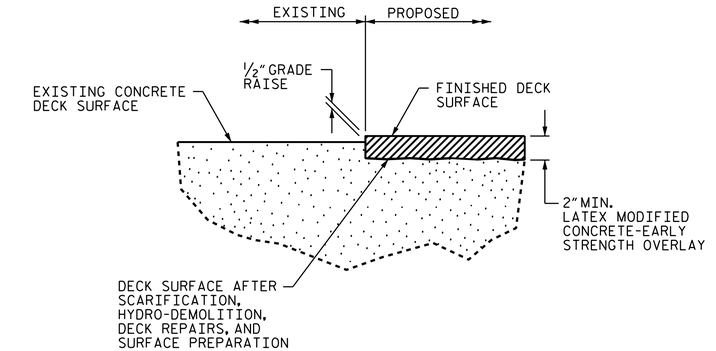
SEE TRAFFIC MANAGEMENT PLANS FOR LANE WIDTHS, SEQUENCING, AND OTHER TRAFFIC CONTROL MEASURES FOR STAGING OF OVERLAY SURFACE PREPARATION AND LMC-ES PLACEMENT.



SECTION THRU DECK

STAGED LMC-ES OVERLAY JOINT

(AS NEEDED)



DETAIL FOR LMC-ES OVERLAY

PROJECT NO. I-5890

BUNCOMBE COUNTY

STATION: 486

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION

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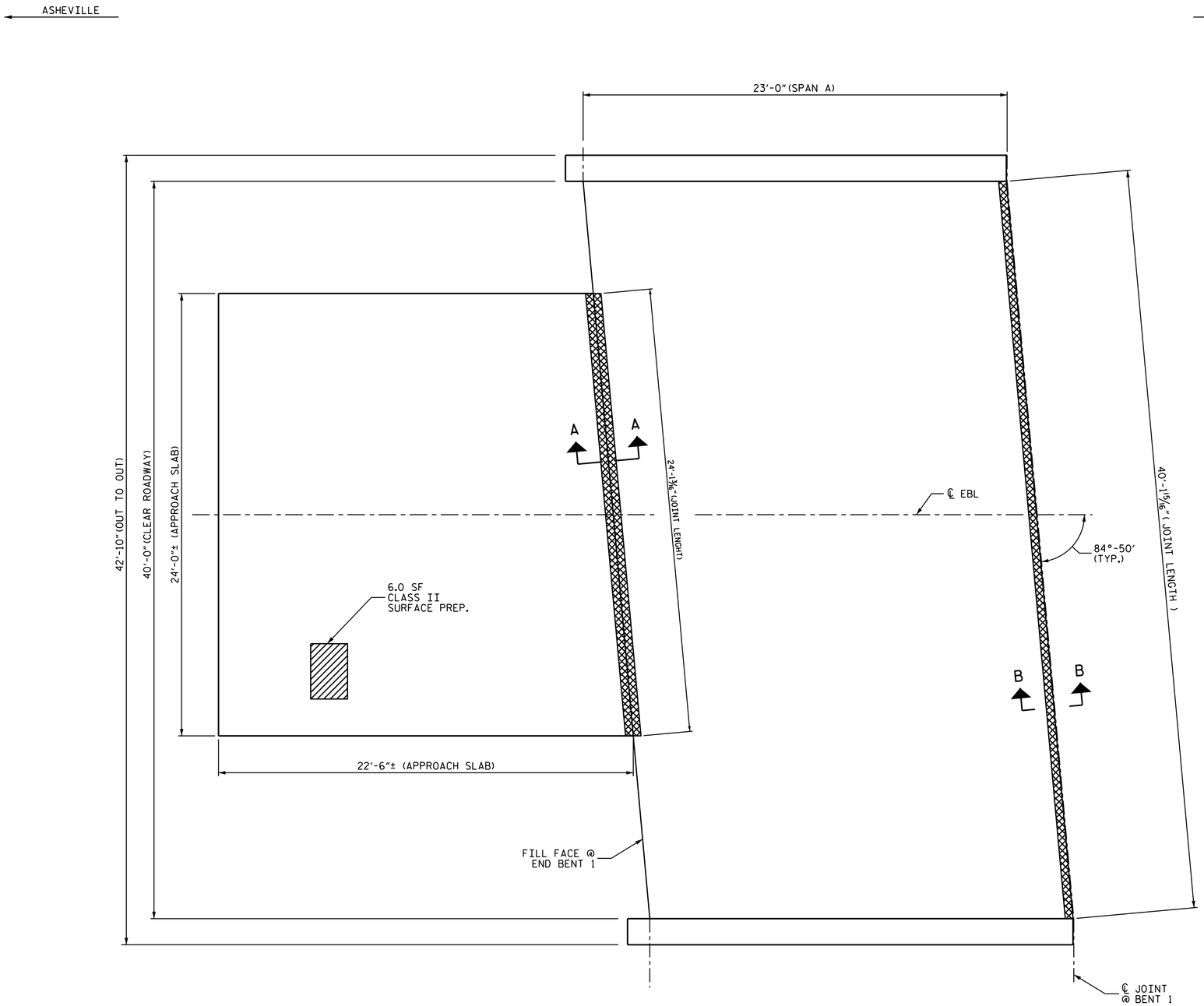

SPAN A

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIR SPAN A AND APPROACH SLAB

	ESTIMATE	ACTUAL
CLASS II SURFACE PREPARATION	0.7 SQ. YDS.	
✳ CLASS III SURFACE PREPARATION	0.5 SQ. YDS.	
BRIDGE JOINT DEMOLITION	36.8 SQ. FT.	
SCARIFYING BRIDGE DECK	155.1 SQ. YDS.	
HYDRO-DEMOLITION OF BRIDGE DECK	155.1 SQ. YDS.	
GROOVING BRIDGE FLOORS	1229.5 SQ. FT.	
CONC. WORK FOR JOINT REPLACEMENT	36.8 SQ. FT.	
ELASTOMERIC CONC. FOR PRESERVATION	9.2 CU. FT.	
CONCRETE FOR DECK REPAIR	1.3 CU. FT.	
LMC-ES OVERLAY	8.6 CU. YDS.	
PLACING & FINISHING LMC-ES OVERLAY	155.1 SQ. YDS.	

NOTES

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE BASED ON THE BEST INFORMATION AVAIABLE. IF ADDITIONAL REPAIRS NOT SHOWN DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS BUILT REPAIR QUANTITY TABLE.

PAYMENT FOR CLASS II & CLASS III SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING HYDRO-DEMOLITION OF THE BRIDGE DECK. SEE SPECIAL PROVISIONS.

FOR SECTION A-A, AND B-B. SEE "JOINT DETAILS LMC OVERLAY", SHEET S-25.

✳ CLASS III SURFACE PREPARATION IS NOT ANTICIPATED. A TOKEN PAY ITEM IS INDICATED FOR PRICING PURPOSES IN THE EVENT OF UNANTICIPATED CLASS III AREAS ARE ENCOUNTERED.

CLASS II SURFACE PREPARATION

BRIDGE JOINT DEMOLITION

SCARIFICATION & HYDRO-DEMOLITION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 486

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS SPAN A AND APPROACH SLAB

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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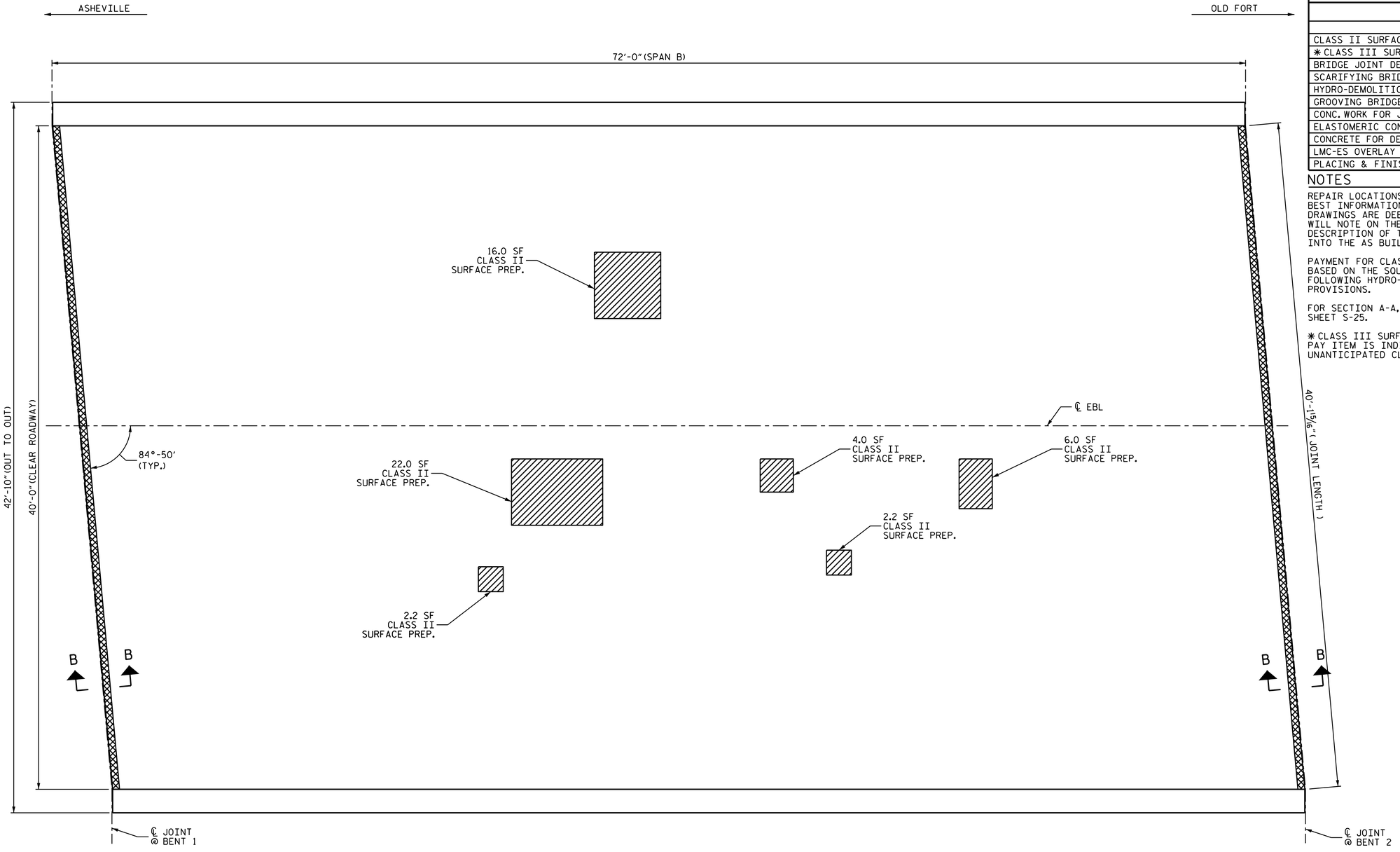

SPAN B

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIR SPAN B

	ESTIMATE	ACTUAL
CLASS II SURFACE PREPARATION	5.8 SQ. YDS.	
✱ CLASS III SURFACE PREPARATION	0.5 SQ. YDS.	
BRIDGE JOINT DEMOLITION	33.5 SQ. FT.	
SCARIFYING BRIDGE DECK	317.2 SQ. YDS.	
HYDRO-DEMOLITION OF BRIDGE DECK	317.2 SQ. YDS.	
GROOVING BRIDGE FLOORS	2629.2 SQ. FT.	
CONC. WORK FOR JOINT REPLACEMENT	33.5 SQ. FT.	
ELASTOMERIC CONC. FOR PRESERVATION	8.4 CU. FT.	
CONCRETE FOR DECK REPAIR	10.9 CU. FT.	
LMC-ES OVERLAY	17.6 CU. YDS.	
PLACING & FINISHING LMC-ES OVERLAY	317.2 SQ. YDS.	

NOTES

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE BASED ON THE BEST INFORMATION AVAIABLE. IF ADDITIONAL REPAIRS NOT SHOWN DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS BUILT REPAIR QUANTITY TABLE.

PAYMENT FOR CLASS II & CLASS III SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING HYDRO-DEMOLITION OF THE BRIDGE DECK. SEE SPECIAL PROVISIONS.

FOR SECTION A-A, AND B-B. SEE "JOINT DETAILS LMC OVERLAY", SHEET S-25.

✱ CLASS III SURFACE PREPARATION IS NOT ANTICIPATED. A TOKEN PAY ITEM IS INDICATED FOR PRICING PURPOSES IN THE EVENT OF UNANTICIPATED CLASS III AREAS ARE ENCOUNTERED.

CLASS II SURFACE PREPARATION

BRIDGE JOINT DEMOLITION

SCARIFICATION & HYDRO-DEMOLITION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 486

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS SPAN B

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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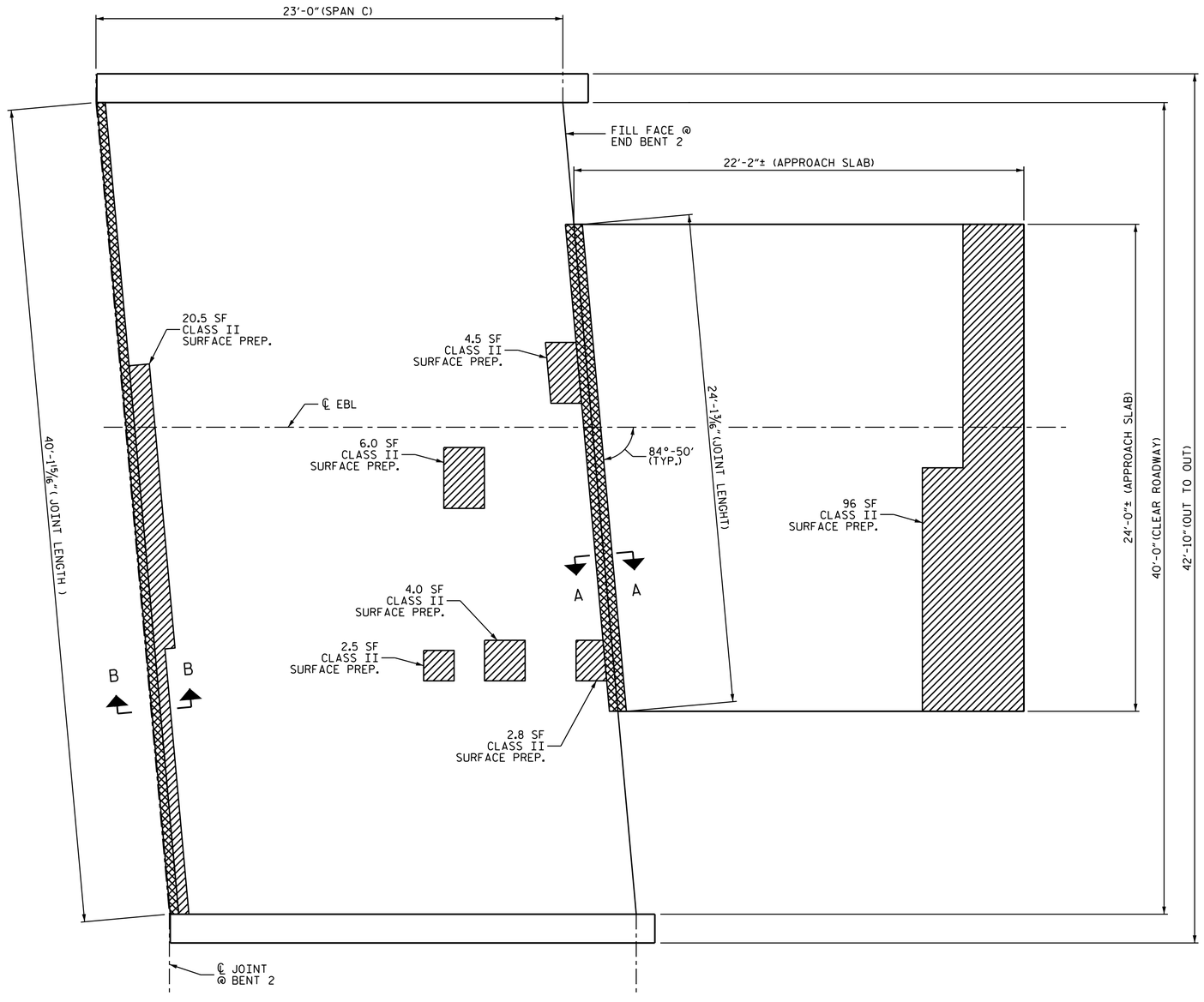
ASHEVILLE

OLD FORT



SPAN C

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIR SPAN C AND APPROACH SLAB

	ESTIMATE	ACTUAL
CLASS II SURFACE PREPARATION	15.1 SQ. YDS.	
✳ CLASS III SURFACE PREPARATION	0.5 SQ. YDS.	
BRIDGE JOINT DEMOLITION	36.8 SQ. FT.	
SCARIFYING BRIDGE DECK	154.2 SQ. YDS.	
HYDRO-DEMOLITION OF BRIDGE DECK	154.2 SQ. YDS.	
GROOVING BRIDGE FLOORS	1222.6 SQ. FT.	
CONC. WORK FOR JOINT REPLACEMENT	36.8 SQ. FT.	
ELASTOMERIC CONC. FOR PRESERVATION	9.2 CU. FT.	
CONCRETE FOR DECK REPAIR	28.3 CU. FT.	
LMC-ES OVERLAY	8.6 CU. YDS.	
PLACING & FINISHING LMC-ES OVERLAY	154.2 SQ. YDS.	

NOTES

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE BASED ON THE BEST INFORMATION AVAIABLE. IF ADDITIONAL REPAIRS NOT SHOWN DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS BUILT REPAIR QUANTITY TABLE.

PAYMENT FOR CLASS II & CLASS III SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING HYDRO-DEMOLITION OF THE BRIDGE DECK. SEE SPECIAL PROVISIONS.

FOR SECTION A-A, AND B-B. SEE "JOINT DETAILS LMC OVERLAY", SHEET S-25.

✳ CLASS III SURFACE PREPARATION IS NOT ANTICIPATED. A TOKEN PAY ITEM IS INDICATED FOR PRICING PURPOSES IN THE EVENT OF UNANTICIPATED CLASS III AREAS ARE ENCOUNTERED.

CLASS II SURFACE PREPARATION

BRIDGE JOINT DEMOLITION

SCARIFICATION & HYDRO-DEMOLITION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 486

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS SPAN C AND APPROACH SLAB

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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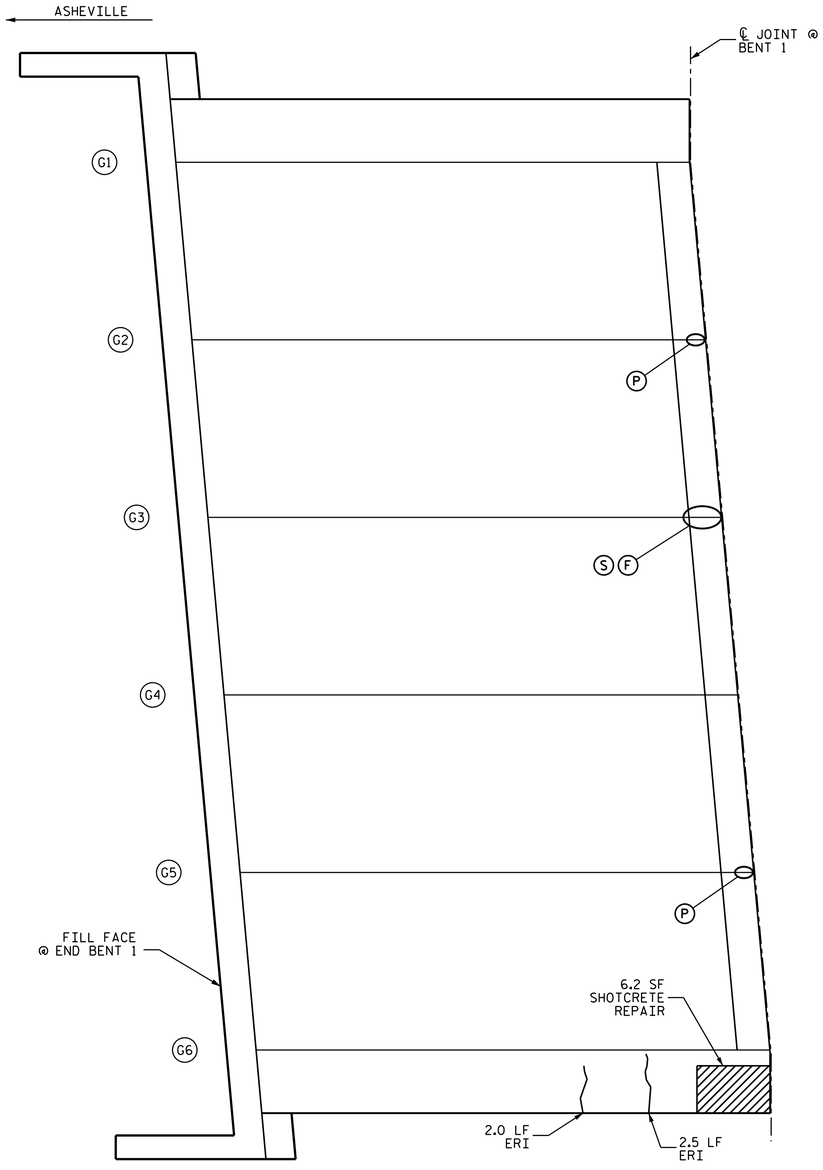
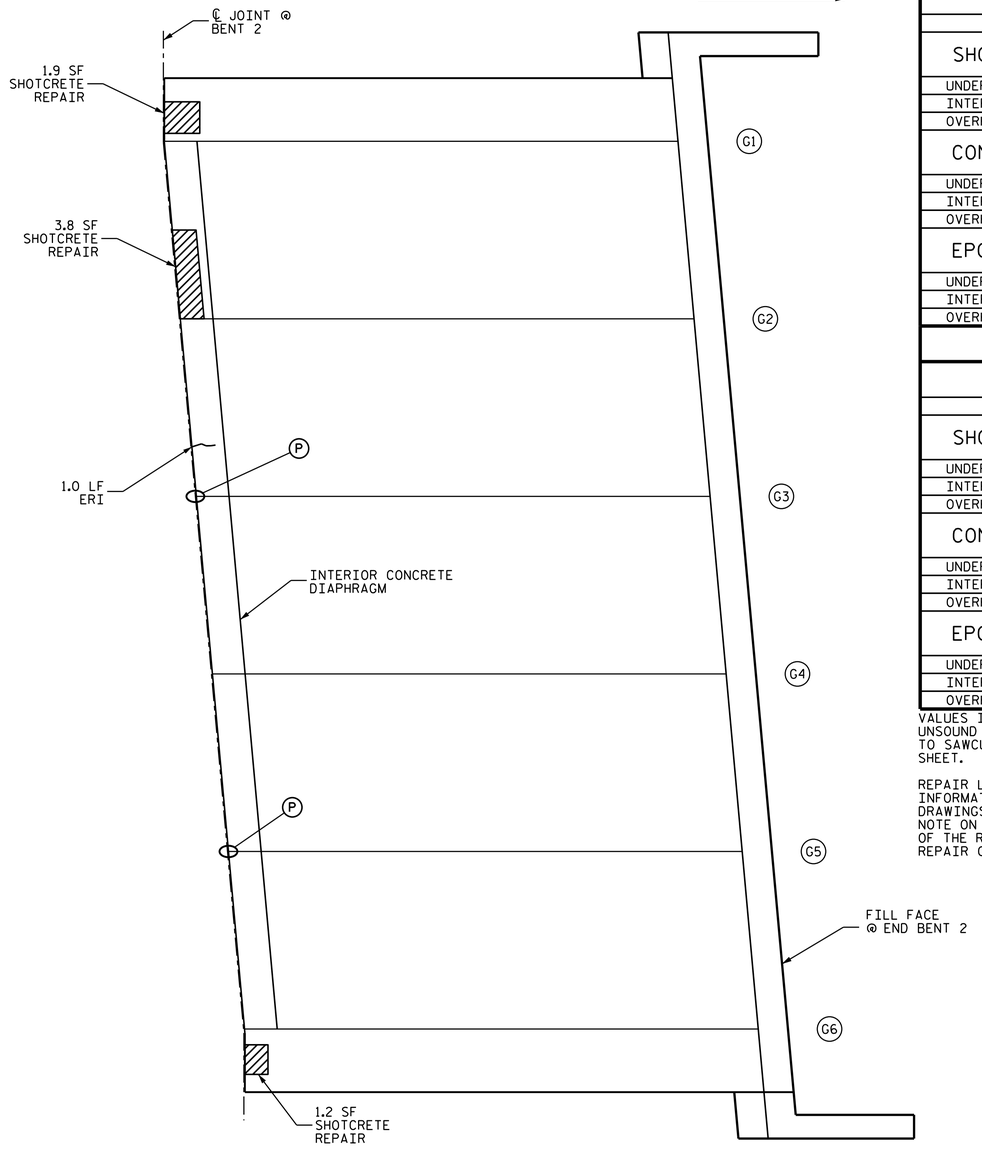


SPAN A
(UNDERSIDE)



SPAN C
(UNDERSIDE)

ANTICIPATED STEEL REPAIR LOCATIONS

SPAN	BEAM	LOCATION	DIM "A"	DIM "B"	DIM "E"	DIM "G"
A	G2	BENT 1	-	9½"	6"	-
A	G3	BENT 1	-	9½"	6"	-
A	G3	BENT 1	-	15"	-	4"
A	G3	BENT 1	2"	17"	-	-
A	G5	BENT 1	-	9½"	4"	-
C	G3	BENT 2	-	9½"	3"	-
C	G5	BENT 2	-	9½"	3"	-

FOR BEAM REPAIR DIMENSIONS, SEE "BEAM PLATING REPAIR DETAILS" SHEETS 1, 2 & 3.

BEAM REPAIR QUANTITY TABLE

BOLTED STEEL PLATES		STEEL PLATES		STIFFENER		STEEL DIAPHRAGM	
LBS.		LBS.		LBS.		LBS.	
ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
43.2		12.5		2.7		0.0	

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN A

	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR DIAPHRAGM	0.0	0.0		
OVERHANG	6.2	3.1		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR DIAPHRAGM	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
UNDERSIDE OF DECK		0.0		
INTERIOR DIAPHRAGM		0.0		
OVERHANG		4.5		

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN C

	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR DIAPHRAGM	3.8	1.9		
OVERHANG	3.1	1.6		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR DIAPHRAGM	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
UNDERSIDE OF DECK		0.0		
INTERIOR DIAPHRAGM		1.0		
OVERHANG		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "OVERHANG, DIAPHRAGM, AND BRIDGE RAIL REPAIR DETAILS" SHEET.

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATED LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITIY TABLE.

- SHOTCRETE REPAIR AREA
- ERI - EPOXY RESIN INJECTION
- (1) BEAM NUMBER
- (B) BEAM END REPAIR
- (P) PLATING REPAIR
- (S) STIFFENER REPAIR
- (D) STEEL DIAPHRAGM REPLACEMENT
- (F) BOTTOM FLANGE REPAIR

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 486

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNDERSIDE OF DECK SPANS A & C

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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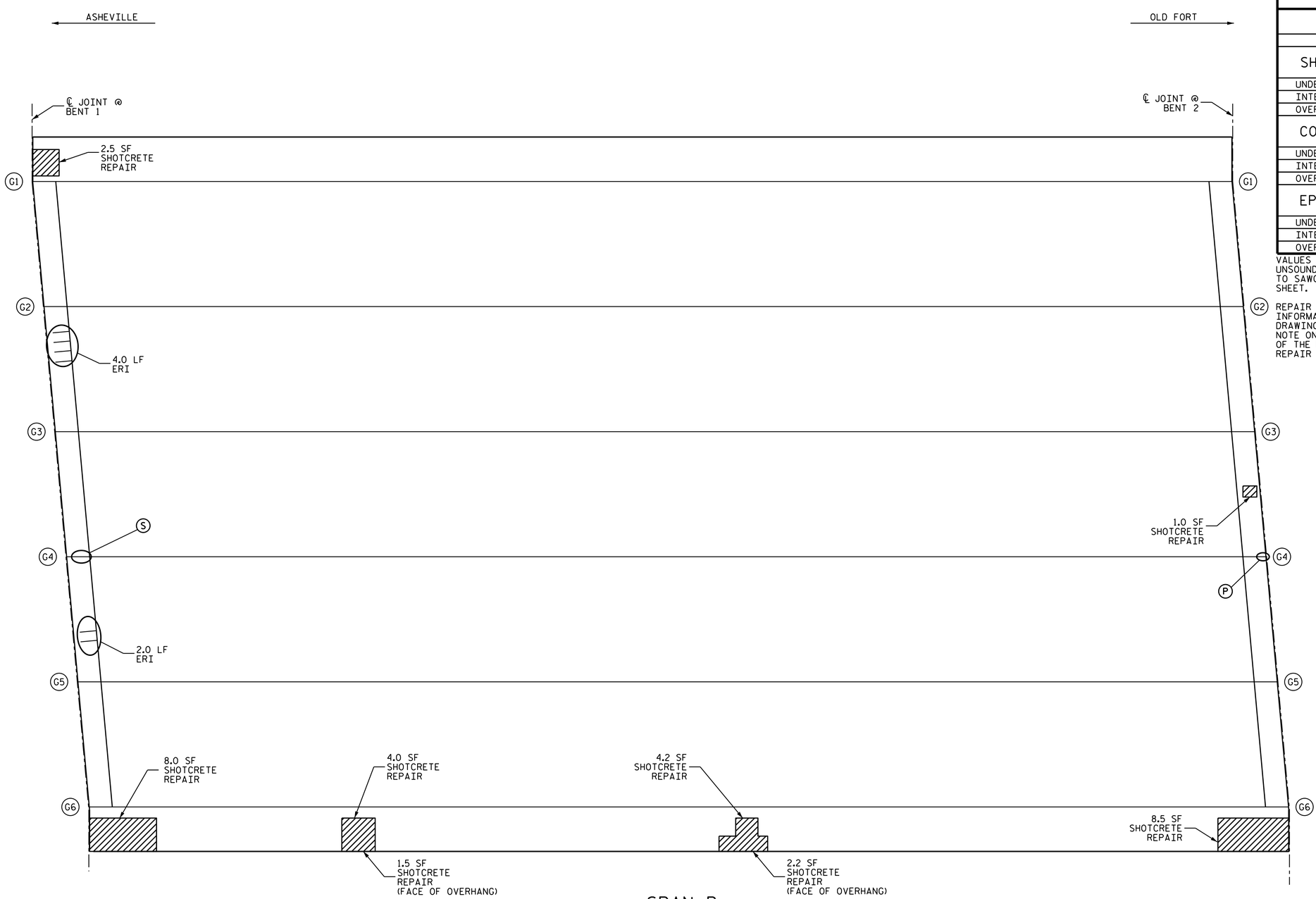

SPAN B
(UNDERSIDE)

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN B

	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR DIAPHRAGM	1.0	0.5		
OVERHANG	30.9	15.5		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR DIAPHRAGM	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
UNDERSIDE OF DECK		0.0		
INTERIOR DIAPHRAGM		6.0		
OVERHANG		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "OVERHANG, DIAPHRAGM, AND BRIDGE RAIL REPAIR DETAILS" SHEET.

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATED LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITIY TABLE.

(I) BEAM NUMBER
(B) BEAM END REPAIR
(P) PLATING REPAIR
(S) STIFFENER REPAIR
(D) STEEL DIAPHRAGM REPLACEMENT

SHOTCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

ANTICIPATED STEEL REPAIR LOCATIONS

SPAN	BEAM	LOCATION	DIM "A"	DIM "B"	DIM "E"
B	G4	BENT 1	6"	-	-
B	G4	BENT 2	9½"	-	4"

FOR BEAM REPAIR DIMENSIONS, SEE "BEAM PLATING REPAIR DETAILS" SHEETS 1 & 2.

BEAM REPAIR QUANTITY TABLE

BOLTED STEEL PLATES		STEEL PLATES		STIFFENER		STEEL DIAPHRAGM	
LBS.		LBS.		LBS.		LBS.	
ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
8.1		0.0		5.0		0.0	

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 486

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNDERSIDE OF DECK SPAN B

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee
11/21/2018

DRAWN BY : M. WELDON DATE : 06/18
CHECKED BY : C. L. BRIGHT DATE : 10/18

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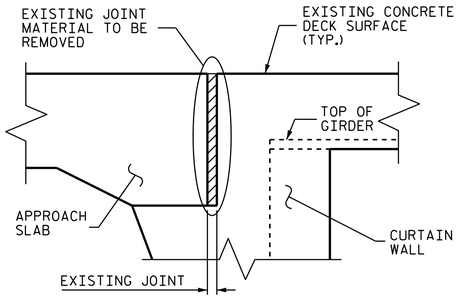
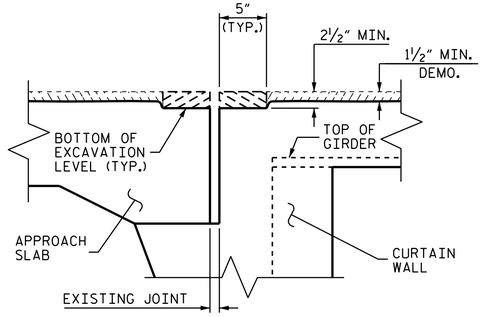
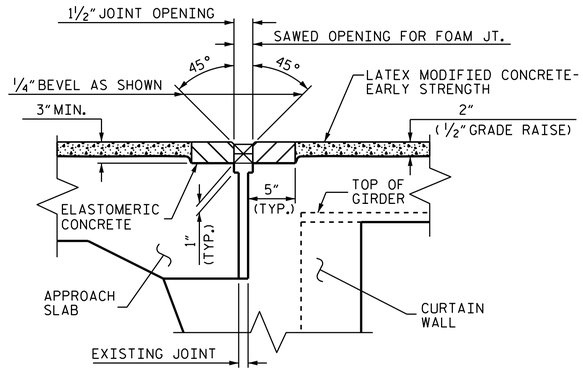


SECTION A-A
(EXISTING JOINT)



SECTION A-A
(MINIMUM EXISTING JOINT DEMOLITION)



SECTION A-A
(PROPOSED FOAM JOINT SEAL)

NOTES

THE FOAM JOINTS SHALL MEET THE MANUFACTURER'S RECOMMENDATION.

THE FOAM JOINTS SHALL MEET THE MANUFACTURER'S RECOMMENDATION FOR THE SIZE OF OPENING ON THE PLANS, AND ACCOMMODATE THE MINIMUM EXPANSION SHOWN ON THE PLANS.

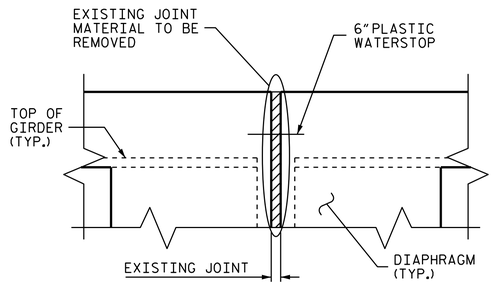
CONTRACTOR SHALL FIELD VERIFY THE EXISTING JOINT OPENING PRIOR TO ORDERING JOINT SEAL MATERIAL. IF ACTUAL JOINT OPENING VARIES FROM OPENING INDICATED IN DETAIL BY MORE THAN ¼", NOTIFY ENGINEER.

THE INSTALLED FOAM JOINTS SHALL BE WATER TIGHT.

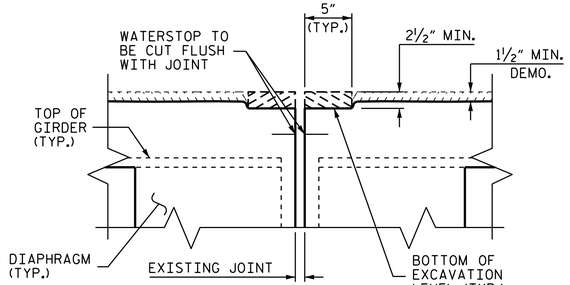
FOR FOAM JOINT SEALS FOR PRESERVATION, SEE SPECIAL PROVISIONS.

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

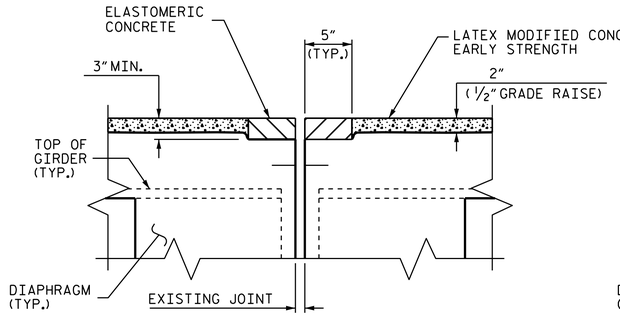
JOINT REPAIR QUANTITY TABLE		
	ESTIMATE	ACTUAL
FOAM JOINT SEALS FOR PRESERVATION	128.5 LIN. FT.	



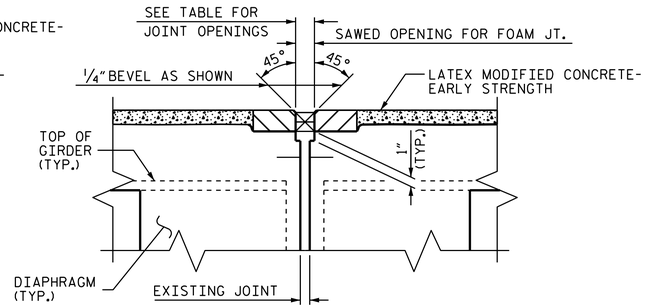
SECTION B-B
(EXISTING JOINT)



SECTION B-B
(MINIMUM EXISTING JOINT DEMOLITION)



SECTION B-B
(PROPOSED JOINT PRE-SAWED)

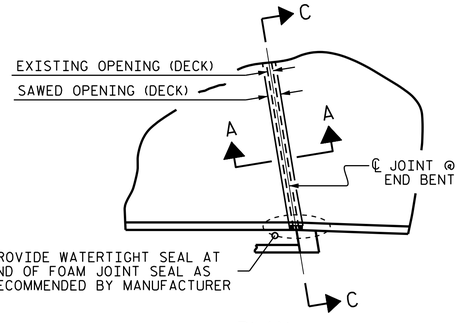


SECTION B-B
(PROPOSED FOAM JOINT SEAL)

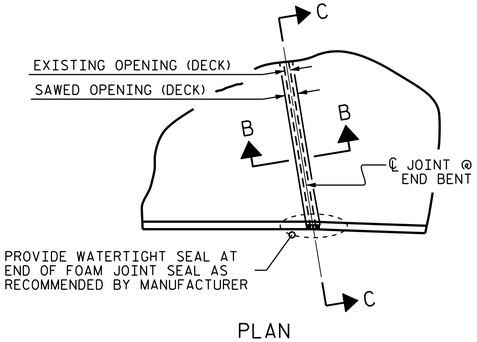
IF THE EMBEDDED PORTION OF THE EXISTING PLASTIC WATERSTOP IS EXPOSED DURING REMOVAL OF UNSOUND CONCRETE, OR IF UNSOUND CONCRETE IS REMOVED WITHIN 2" OF THE WATERSTOP, THE ENTIRE CONCRETE DEPTH TO THE WATERSTOP SHALL BE REMOVED. IF SUCH EXCAVATION EXTENDS MORE THAN 2" BELOW THE BOTTOM OF THE PLANNED ELASTOMERIC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

DEMOLISH BRIDGE JOINT AREA TO THE NECESSARY DEPTH, SUCH THAT ELASTOMERIC CONCRETE SHALL BE FOUNDED ON CONCRETE OR REPAIR CONCRETE SUBSTRATE, NOT LATEX MODIFIED CONCRETE.

SAWED JOINT OPENING TABLE			
	SAWED JT. OPENING (PERPINDICULAR TO JT.)		
LOCATION BRIDGE 486	AT 45°	AT 60°	AT 90°
BENT 1	1 9/16"	1 9/16"	1½"
BENT 2	1 11/16"	1 9/16"	1 5/16"



PLAN
(@ END BENT)



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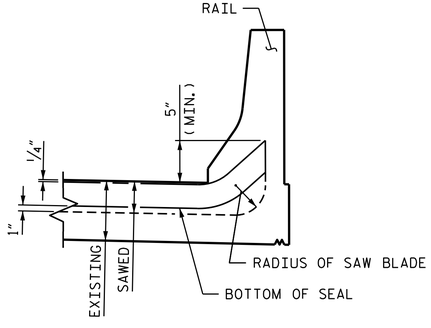

SECTION C-C

JOINT SEAL DETAILS

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 486

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS
LMC OVERLAY

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

DRAWN BY : CL BRIGHT DATE : 10/2018
CHECKED BY : A.M. LEE DATE : 10/2018

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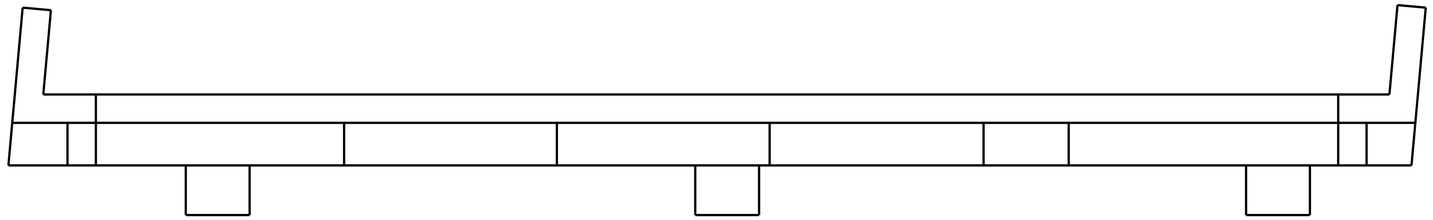

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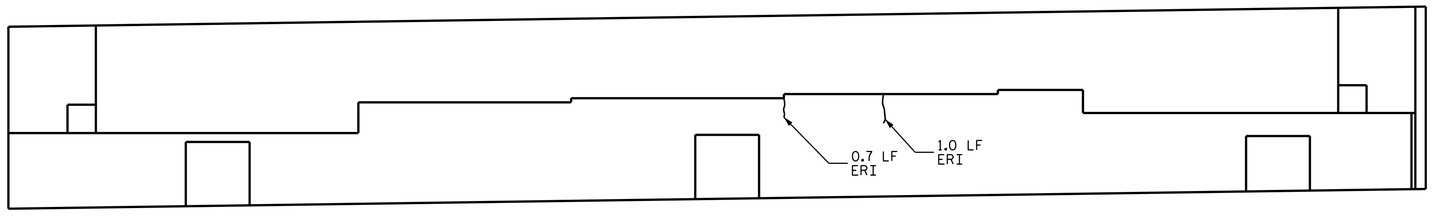

ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

END BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
CURTAIN WALL	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
CURTAIN WALL	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		1.7		
CURTAIN WALL		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
CAP		73.5		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 486

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 1

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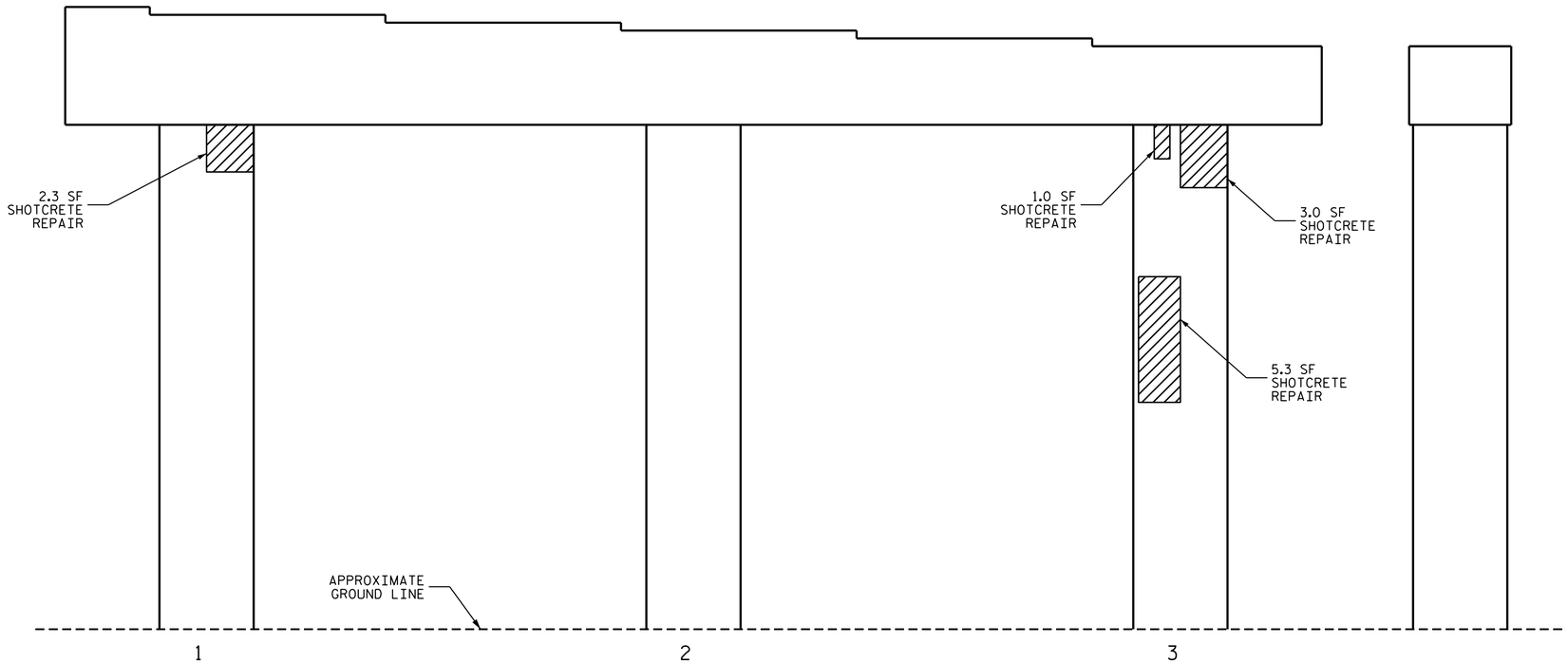
SPAN B
SPAN A

TOP OF CAP

SPAN A | SPAN B



ELEVATION

END VIEW

AS-BUILT REPAIR QUANTITY TABLE

BENT 1 SPAN A FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	11.6	5.8		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
TOP OF BENT CAP		130.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1"BEHIND REBAR AND MINIMUM 2"CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 486

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by:
[signature]
11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 1
SPAN A FACE

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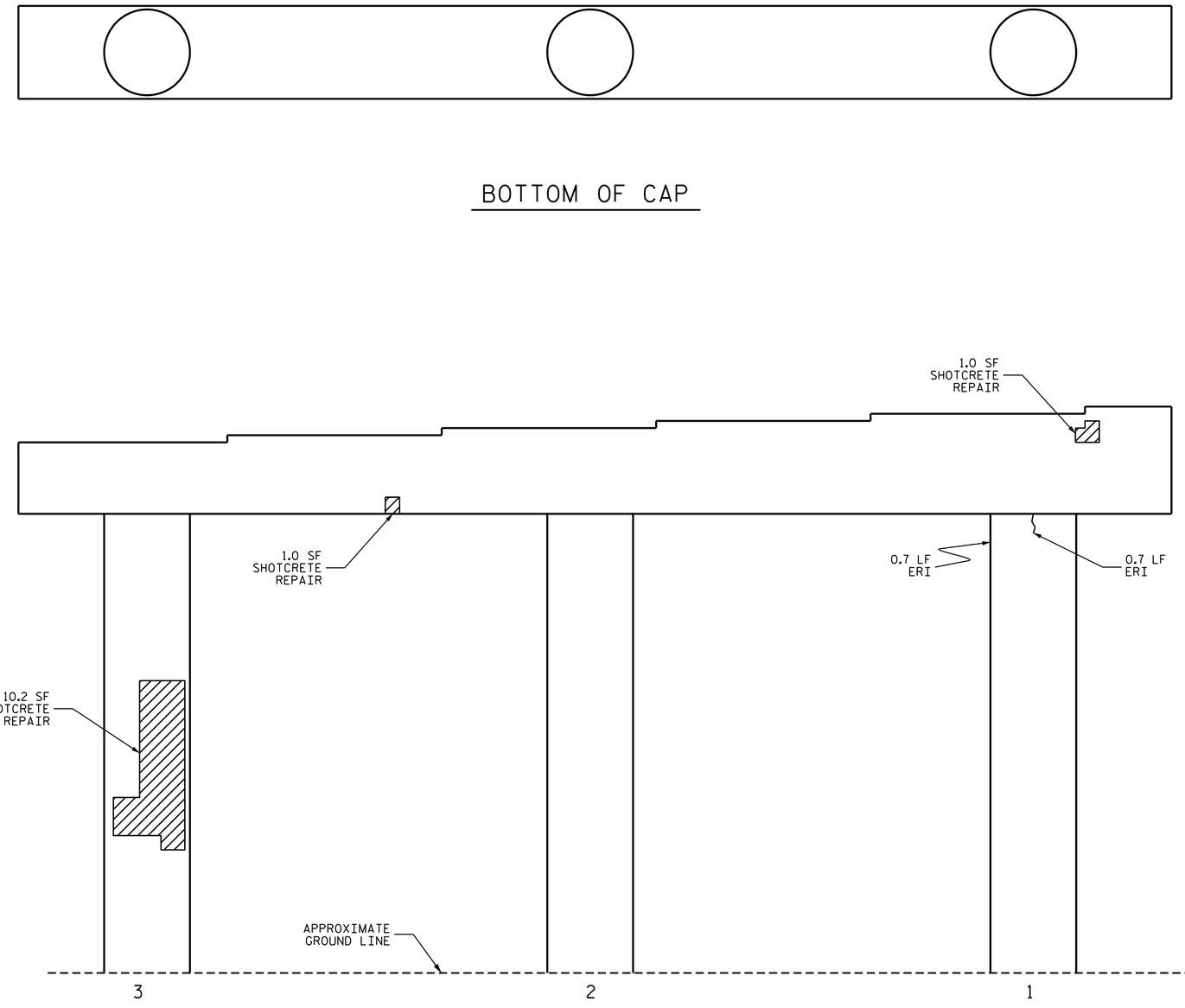

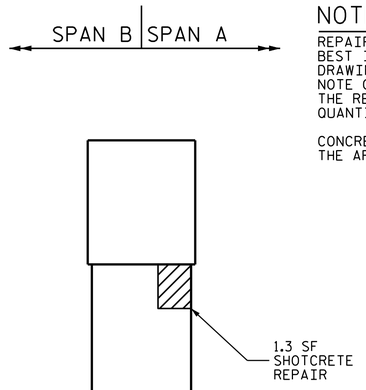

AS-BUILT REPAIR QUANTITY TABLE

BENT 1 SPAN B FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	2.0	1.0		
COLUMN	11.5	5.8		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		1.4		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 486

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 1 SPAN B FACE

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

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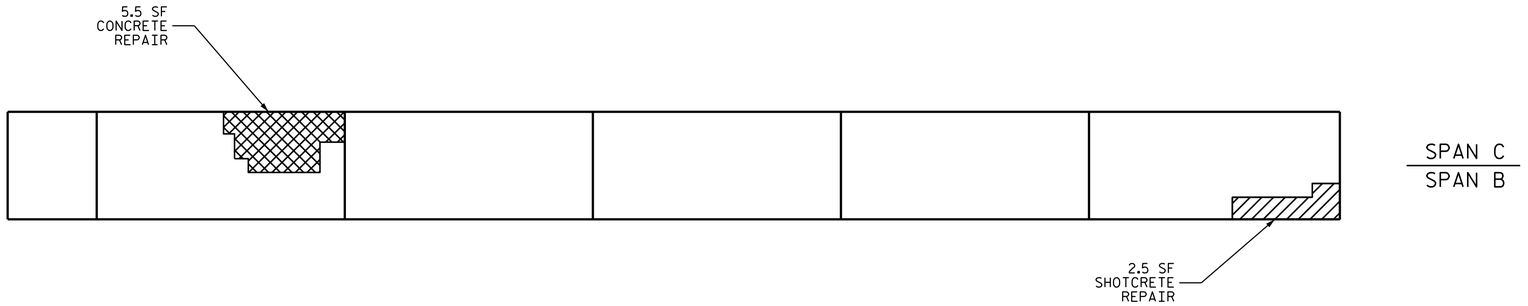
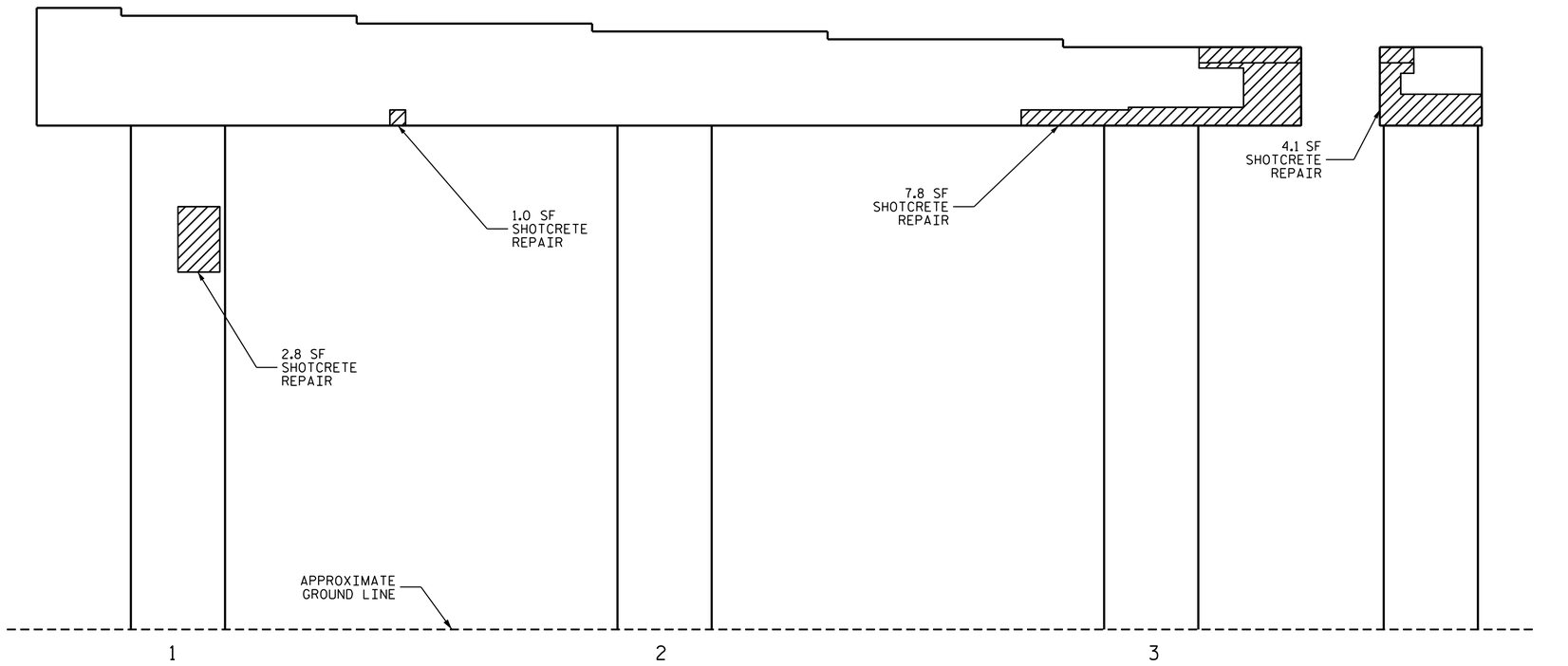


SPAN C
SPAN B

TOP OF CAP

SPAN B | SPAN C



ELEVATION

END VIEW

AS-BUILT REPAIR QUANTITY TABLE

BENT 2 SPAN B FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	15.4	7.7		
COLUMN	2.8	1.4		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	5.5	2.8		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
TOP OF BENT CAP		130.1		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1"BEHIND REBAR AND MINIMUM 2"CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 486

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by:
Amber Lee
B0AB5AAF3FAD484...
11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 2
SPAN B FACE

DRAWN BY : M. WELDON DATE : 06/18
CHECKED BY : C. BRIGHT DATE : 10/18

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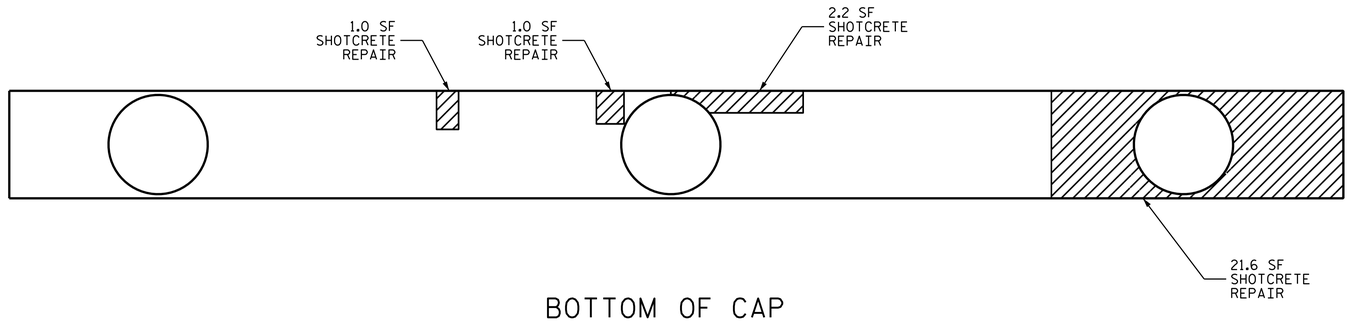
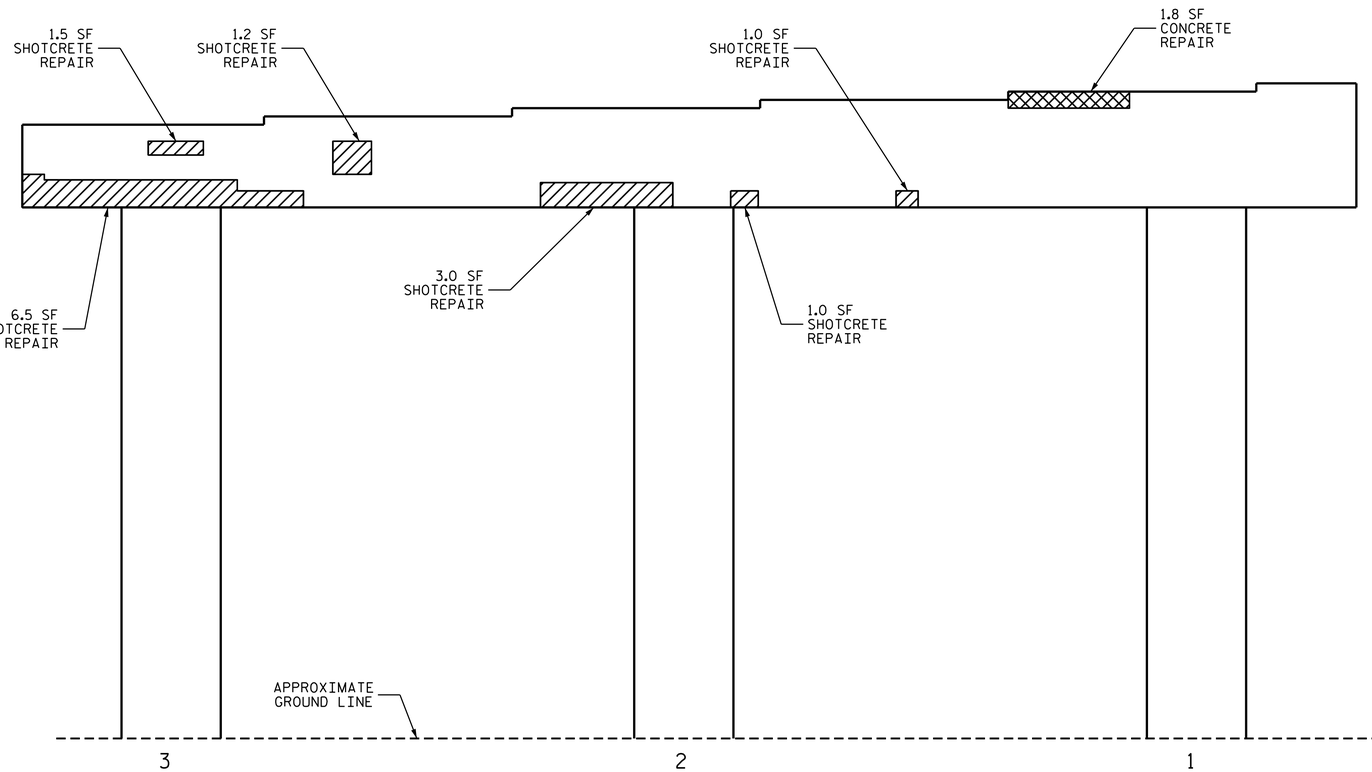


BOTTOM OF CAP

SPAN C
SPAN B

SPAN C | SPAN B



ELEVATION

END VIEW

AS-BUILT REPAIR QUANTITY TABLE

BENT 2 SPAN C FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	40.0	20.0		
COLUMN	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	1.8	0.9		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 486

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber M. Lee
11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 2
SPAN C FACE

DRAWN BY : M. WELDON DATE : 06/18
CHECKED BY : C. BRIGHT DATE : 10/18

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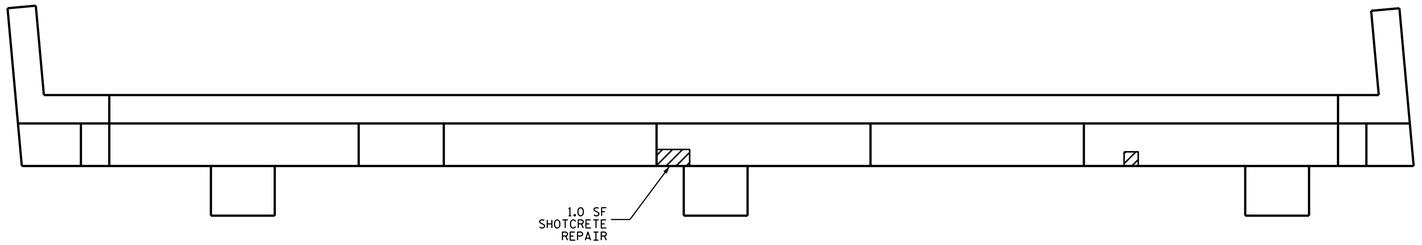

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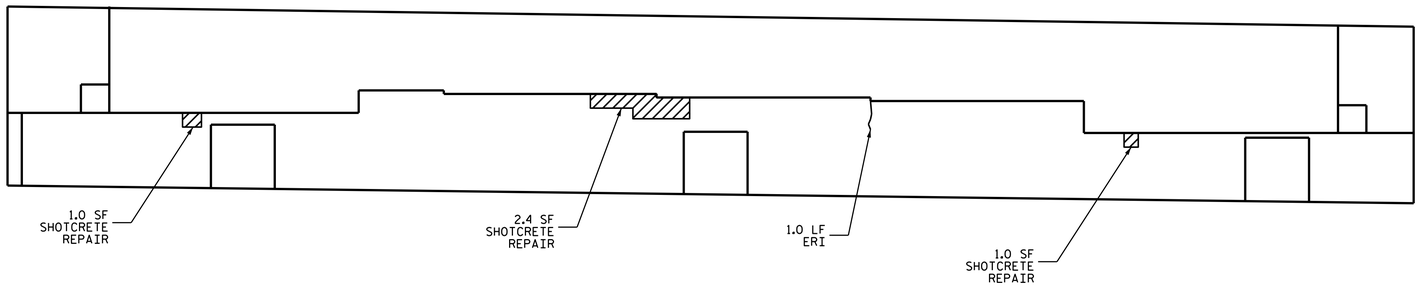

ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

END BENT 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	5.4	2.7		
CURTAIN WALL	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
CURTAIN WALL	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		1.0		
CURTAIN WALL		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
CAP		73.6		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 486

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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Amber Lee
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11/21/2018

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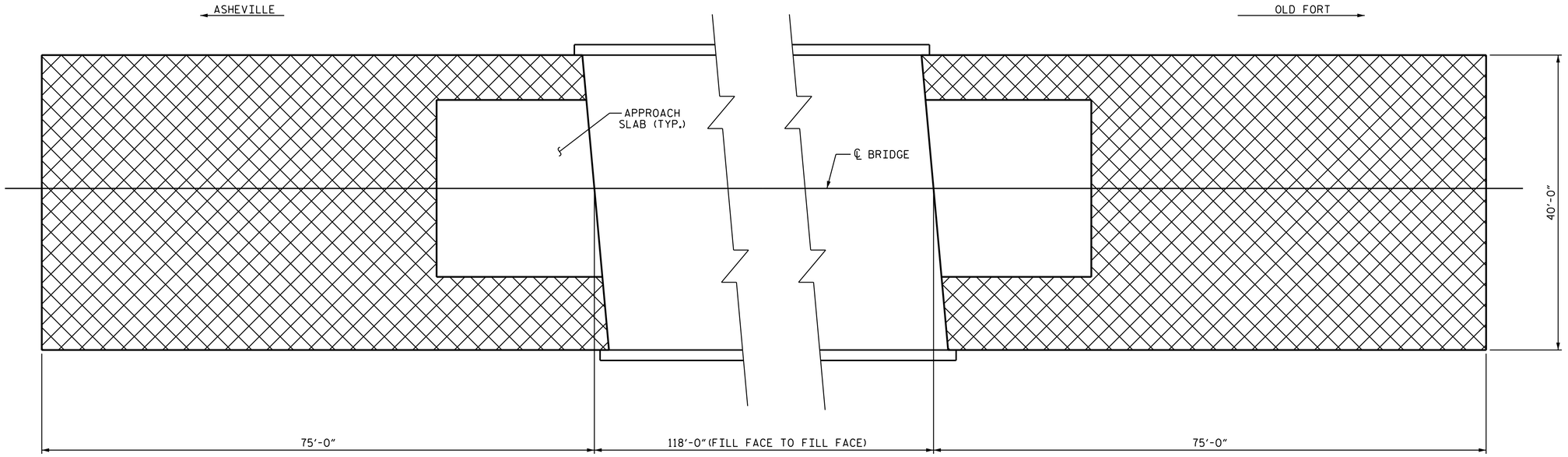
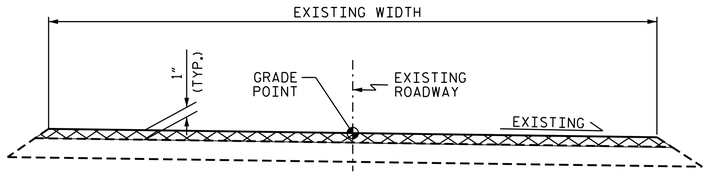
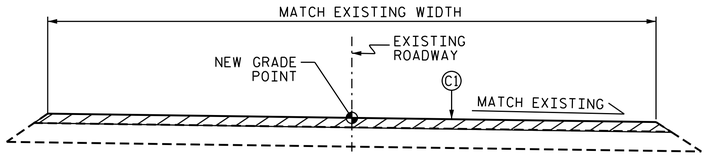




TYPICAL ROADWAY MILLING SECTION

(MILL TO 1 "DEPTH)



TYPICAL ROADWAY SECTION

NOTES

INCIDENTAL MILLING - EXISTING APPROACH ASPHALT PAVEMENT TO BE MILLED AS NECESSARY TO ATTAIN MINIMUM 1½" DEPTH OF NEW ASPHALT PAVEMENT. NEW ASPHALT PAVEMENT SHALL BE OF THICKNESS NECESSARY TO PROVIDE A SMOOTH TRANSITION BETWEEN THE ROADWAY AND THE BRIDGE DECK. THE NEW ASPHALT PAVEMENT THICKNESS MAY EXCEED 1½" DUE TO SETTLEMENT OF THE EXISTING APPROACH.

SUMMARY OF QUANTITIES

	ESTIMATE	ACTUAL
INCIDENTAL MILLING	547 SQ.YDS.	
ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B	50 TONS	
ASPHALT BINDER FOR PLANT MIX	4 TONS	

C1	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1"DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.

INCIDENTAL MILLING

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE.No.: 486

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee B0AB5AAF3FAD484...

11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH MILLING & TYPICAL ROADWAY SECTIONS

DRAWN BY : E.BAYISSA DATE : 10/2018
CHECKED BY : A. M. LEE DATE : 10/2018

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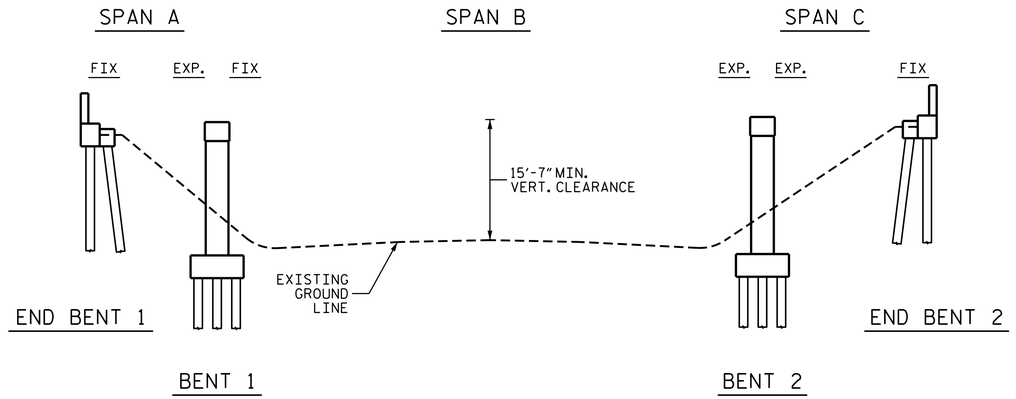
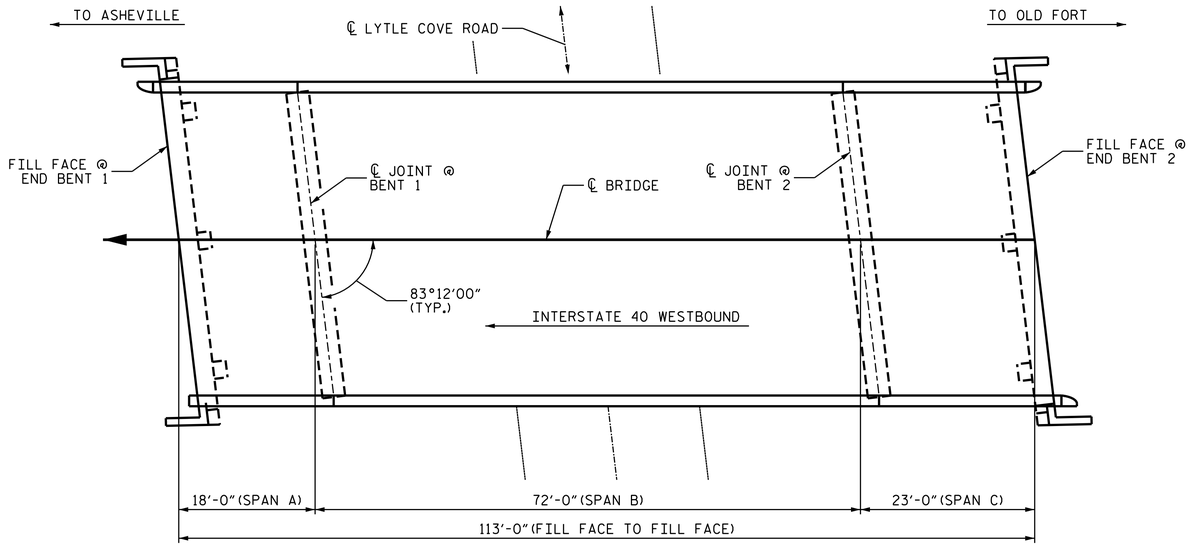


SECTION ALONG ℄ ROADWAY



PLAN

NOTES

GENERAL DRAWING INFORMATION IS TAKEN FROM THE ORIGINAL PLANS AND THE ROUTINE INSPECTION REPORT DATED 11/06/2017.

BRIDGE ORIENTATION CONFORMS TO THE ORIGINAL BRIDGE PLANS.

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

RESIDENT ENGINEER DATE

SCOPE OF WORK

- CLEAN, PLATE REPAIR AND SPOT REPAINT EXISTING STRUCTURAL STEEL.
- EPOXY RESIN INJECTION OF CONCRETE CRACKS.
- REMOVE UNSOUND CONCRETE AND PROPERLY PREPARE SHOTCRETE AND CONCRETE REPAIR AREAS.
- PERFORM SHOTCRETE AND CONCRETE REPAIRS IN PREPARED AREAS.
- PARTIALLY REMOVE BRIDGE DECK CONCRETE BY SCARIFICATION AND HYDRO-DEMOLITION METHODS.
- OVERLAY PREPARED BRIDGE DECK WITH LATEX MODIFIED CONCRETE-EARLY STRENGTH (LMC-ES).
- GROOVE LMC-ES BRIDGE DECK.
- REMOVE EXISTING JOINT MATERIAL AND INSTALL FOAM JOINTS.
- REMOVE DEBRIS FROM TOP OF BENT CAPS AND APPLY EPOXY COATING.

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 487

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6D82FC48F... 11/21/2018

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee B04B5A4F2FAD484... 11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON INTERSTATE 40 WESTBOUND OVER LYTLE COVE ROAD

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LOCATION SKETCH

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

BRIDGE COORDINATES

LAT: 35.59993721
LONG: -82.36651908

NOTES

EXISTING DIMENSIONS AND BRIDGE CONDITION ARE FROM THE BEST INFORMATION AVAILABLE.

THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.

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

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

WORK ON THE BRIDGES SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL BELOW. THE CONTRACTOR SHALL SUBMIT PLANS FOR CONSTRUCTION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS AND THE PROJECT SPECIAL PROVISIONS.

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

PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL A COMPLETE SEQUENCE OF TASK FOR EACH OPERATION AFFECTING THE BRIDGE SURFACE AND/OR TRAFFIC.
FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

FOR SCARIFYING BRIDGE DECK, HYDRO-DEMOLITION OF BRIDGE DECK, AND CLASS II SURFACE PREPARATION, AND CLASS III SURFACE PREPARATION. SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISION.

THE LMC CONTRACTOR SHALL PROVIDE A METHOD OF HANDLING UNEXPECTED BLOW THROUGH OF THE DECK DURING HYDRO-DEMOLITION.

FOR PLACING AND FINISHING LATEX MODIFIED CONCRETE OVERLAY-EARLY STRENGTH (LMC-ES) AND LATEX MODIFIED CONCRETE-EARLY STRENGTH, SEE LATEX MODIFIED CONCRETE-EARLY STRENGTH SPECIAL PROVISIONS.

LONGITUDINAL CONSTRUCTION JOINTS SHALL BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.

DURING CONSTRUCTION, BERMS OR APPRORIATE MEASURES SHALL BE USED TO ENSURE HYDRO-DEMOLITION WATER DOES NOT MIGRATE INTO ACTIVE TRAVEL LANES.

FOR BRIDGE JOINT DEMOLITION, SEE SPECIAL PROVISIONS.

FOR CONCRETE WORK FOR JOINT REPLACEMENT, SEE SPECIAL PROVISIONS.

FOR CONCRETE FOR DECK REPAIRS, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEAL, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR SPOT PAINTING OF STEEL STRUCTURE REPAIR AREAS AND POLLUTION CONTROL, SEE SPOT PAINTING OF STEEL REPAIR AREAS SPECIAL PROVISION.

FOR EPOXY COATING AND DEBRIS REMOVAL, SEE SPECIAL PROVISIONS.

FOR BEAM REPAIR, SEE SPECIAL PROVISIONS.

FOR BOLTED BEAM REPAIR, SEE SPECIAL PROVISIONS.

FOR VOLUMETRIC MIXER, SEE SPECIAL PROVISIONS.

PROJ. NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 487

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE
ON INTERSTATE 40
WESTBOUND OVER
LYTLE COVE ROAD

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

Docusigned by:
11/21/2018

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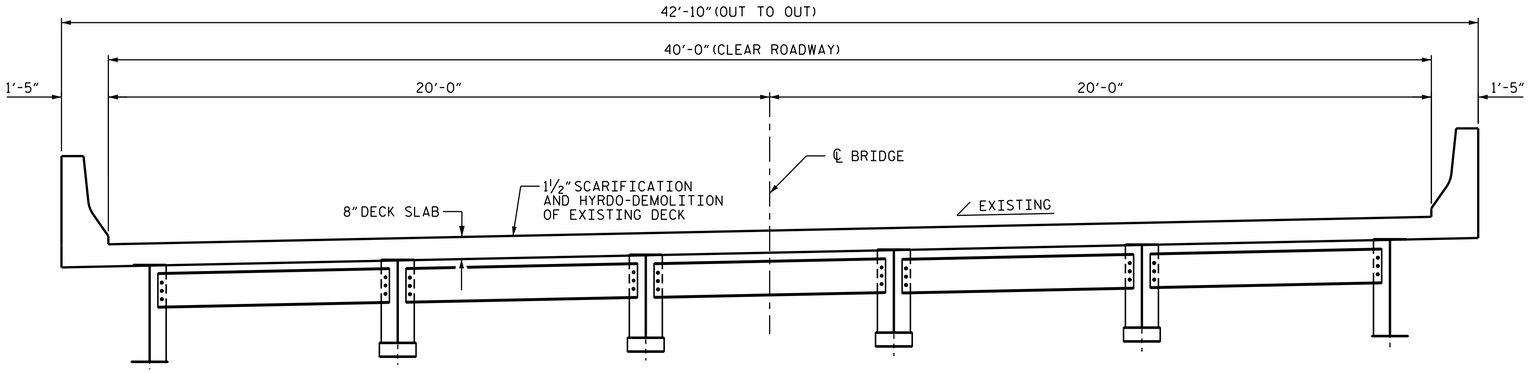

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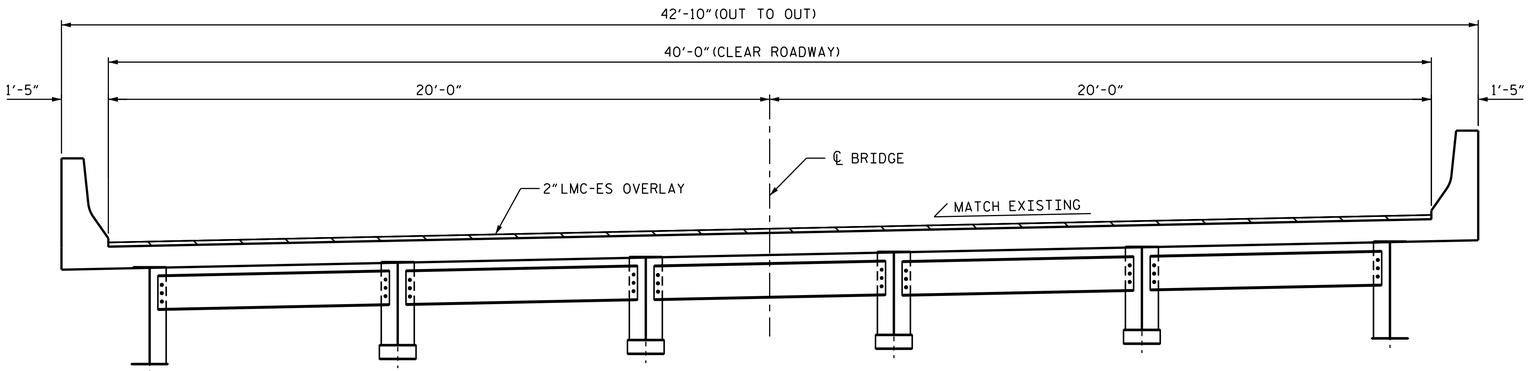


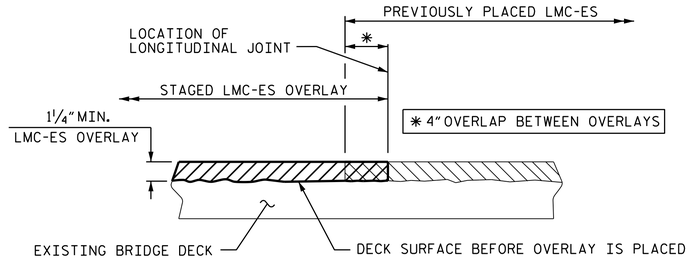
TYPICAL SECTION

(PROPOSED)

NOTES

WHEN PREPARING THE SURFACE FOR LATEX MODIFIED CONCRETE OVERLAY-EARLY STRENGTH (LMC-ES) ADJACENT TO A PREVIOUSLY PLACED LMC-ES STAGE, THE PREVIOUSLY PLACED LMC-ES SHALL BE REMOVED FOR A DISTANCE OF 4-INCHES FROM THE LMC-ES EDGE. THE SURFACE OF THE NEW STAGE AREA, ALONG WITH THE 4 INCH OVERLAY AREA, SHALL BE PREPARED AS PER THE OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS. NEW LMC-ES SHALL BE PLACE IN THE 4-INCH OVERLAP, AS PART OF NEW LMC-ES STAGE PLACEMENT.

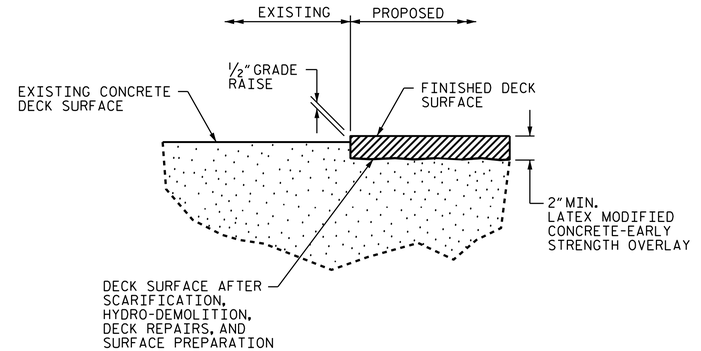
SEE TRAFFIC MANAGEMENT PLANS FOR LANE WIDTHS, SEQUENCING, AND OTHER TRAFFIC CONTROL MEASURES FOR STAGING OF OVERLAY SURFACE PREPARATION AND LMC-ES PLACEMENT.



SECTION THRU DECK

STAGED LMC-ES OVERLAY JOINT

(AS NEEDED)



DETAIL FOR LMC-ES OVERLAY

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE No. 487

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION

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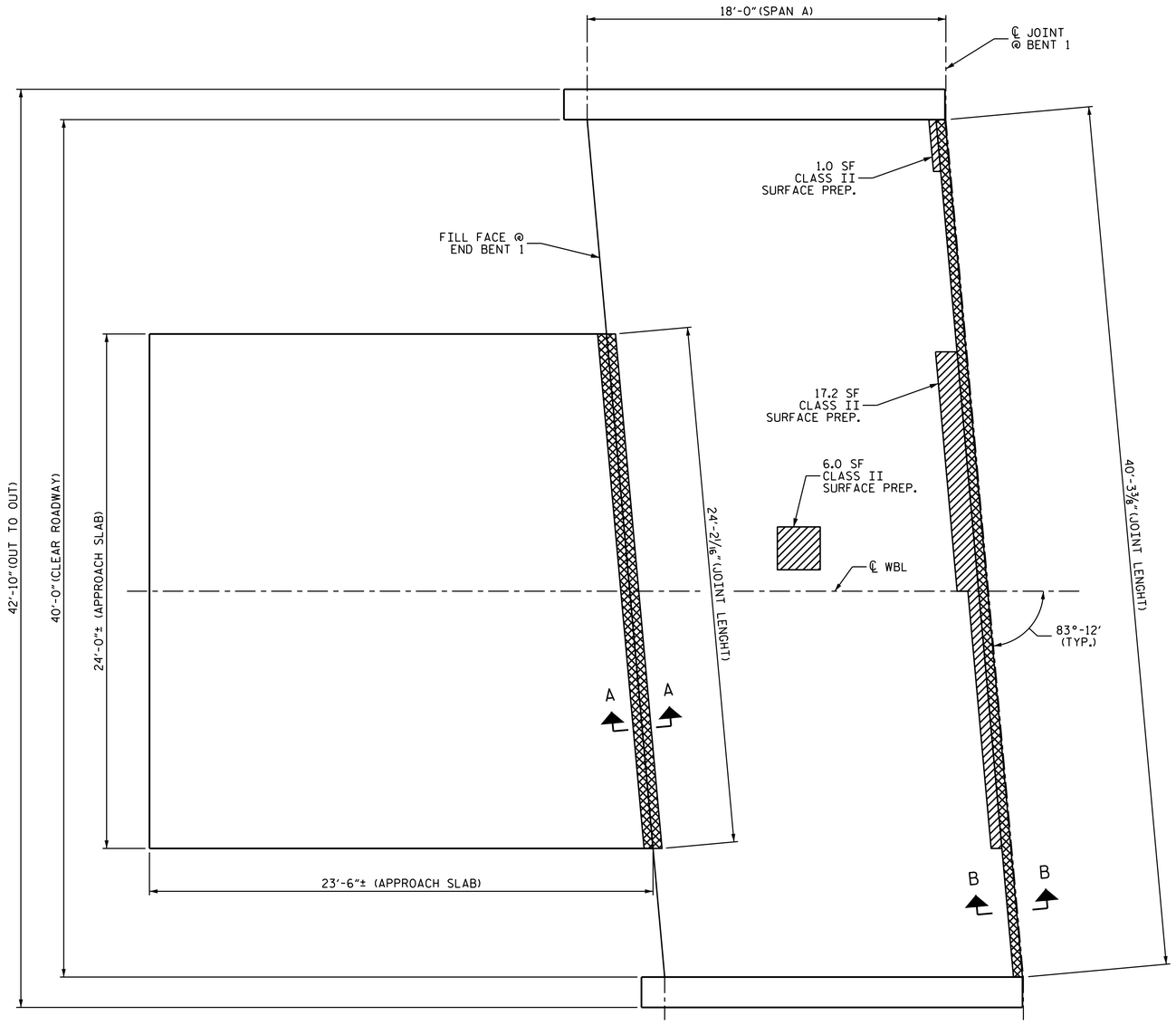

SPAN A

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIR SPAN A AND APPROACH SLAB

	ESTIMATE	ACTUAL
CLASS II SURFACE PREPARATION	2.7 SQ. YDS.	
✳ CLASS III SURFACE PREPARATION	0.5 SQ. YDS.	
BRIDGE JOINT DEMOLITION	36.9 SQ. FT.	
SCARIFYING BRIDGE DECK	134.5 SQ. YDS.	
HYDRO-DEMOLITION OF BRIDGE DECK	134.5 SQ. YDS.	
GROOVING BRIDGE FLOORS	1063.0 SQ. FT.	
CONC. WORK FOR JOINT REPLACEMENT	36.9 SQ. FT.	
ELASTOMERIC CONC. FOR PRESERVATION	9.2 CU. FT.	
CONCRETE FOR DECK REPAIR	5.1 CU. FT.	
LMC-ES OVERLAY	7.5 CU. YDS.	
PLACING & FINISHING LMC-ES OVERLAY	134.5 SQ. YDS.	

NOTES

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE BASED ON THE BEST INFORMATION AVAIABLE. IF ADDITIONAL REPAIRS NOT SHOWN DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS BUILT REPAIR QUANTITY TABLE.

PAYMENT FOR CLASS II & CLASS III SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING HYDRO-DEMOLITION OF THE BRIDGE DECK. SEE SPECIAL PROVISIONS.

FOR SECTION A-A, AND B-B. SEE "JOINT DETAILS LMC OVERLAY", SHEET S-41.

✳ CLASS III SURFACE PREPARATION IS NOT ANTICIPATED. A TOKEN PAY ITEM IS INDICATED FOR PRICING PURPOSES IN THE EVENT OF UNANTICIPATED CLASS III AREAS ARE ENCOUNTERED.

CLASS II SURFACE PREPARATION

BRIDGE JOINT DEMOLITION

SCARIFICATION & HYDRO-DEMOLITION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 487

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS SPAN A AND APPROACH SLAB

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

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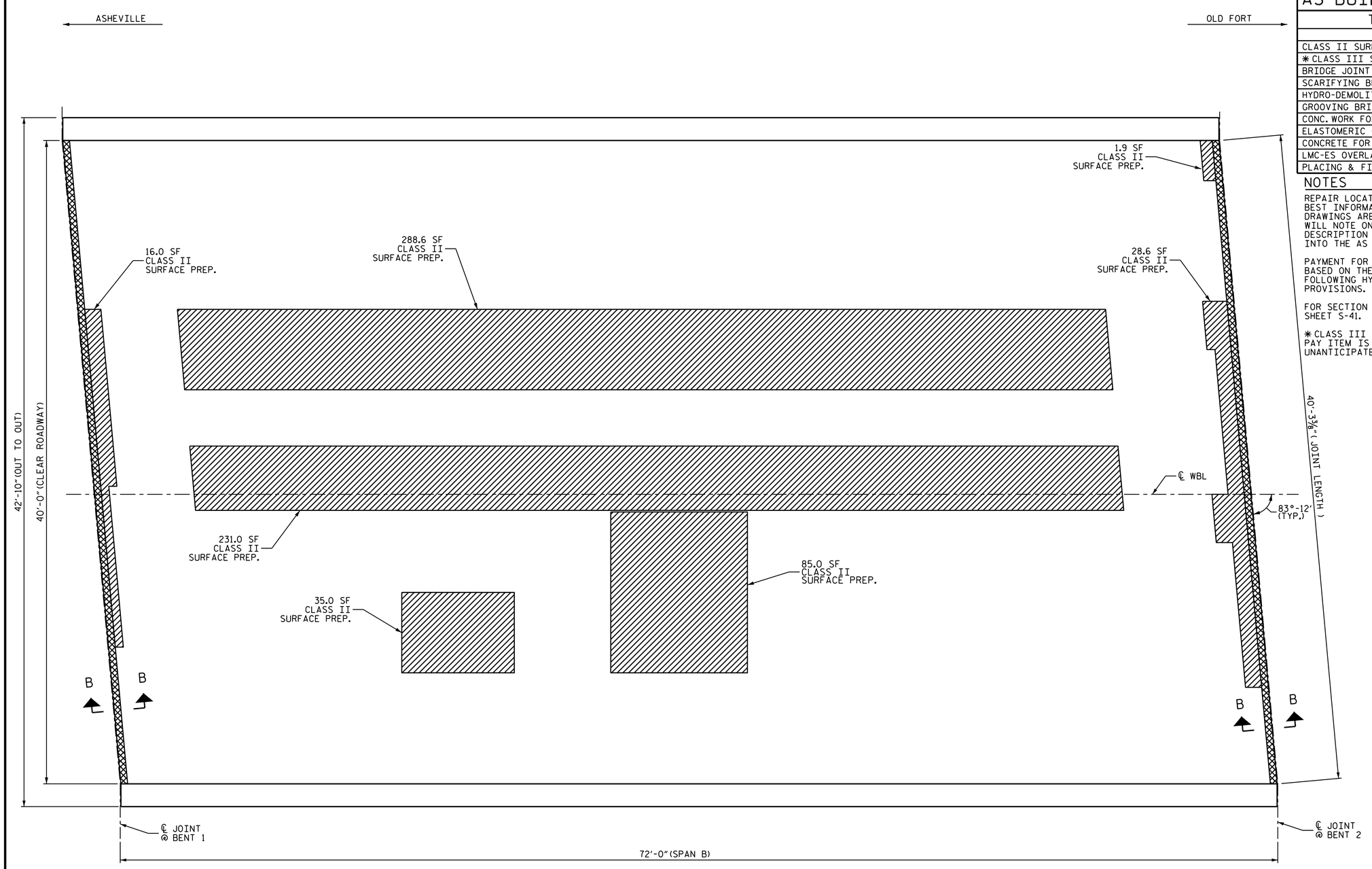

SPAN B

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIR SPAN B

	ESTIMATE	ACTUAL
CLASS II SURFACE PREPARATION	76.2 SQ. YDS.	
✱CLASS III SURFACE PREPARATION	0.5 SQ. YDS.	
BRIDGE JOINT DEMOLITION	33.5 SQ. FT.	
SCARIFYING BRIDGE DECK	315.9 SQ. YDS.	
HYDRO-DEMOLITION OF BRIDGE DECK	315.9 SQ. YDS.	
GROOVING BRIDGE FLOORS	2617.6 SQ. FT.	
CONC. WORK FOR JOINT REPLACEMENT	33.5 SQ. FT.	
ELASTOMERIC CONC. FOR PRESERVATION	8.4 CU. FT.	
CONCRETE FOR DECK REPAIR	142.9 CU. FT.	
LMC-ES OVERLAY	17.6 CU. YDS.	
PLACING & FINISHING LMC-ES OVERLAY	315.9 SQ. YDS.	

NOTES

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PAYMENT FOR CLASS II & CLASS III SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING HYDRO-DEMOLITION OF THE BRIDGE DECK. SEE SPECIAL PROVISIONS.

FOR SECTION A-A, AND B-B. SEE "JOINT DETAILS LMC OVERLAY", SHEET S-41.

✱CLASS III SURFACE PREPARATION IS NOT ANTICIPATED. A TOKEN PAY ITEM IS INDICATED FOR PRICING PURPOSES IN THE EVENT OF UNANTICIPATED CLASS III AREAS ARE ENCOUNTERED.

CLASS II SURFACE PREPARATION

BRIDGE JOINT DEMOLITION

SCARIFICATION & HYDRO-DEMOLITION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 487

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

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STATE OF NORTH CAROLINA
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RALEIGH

PLAN OF SPANS
SPAN B

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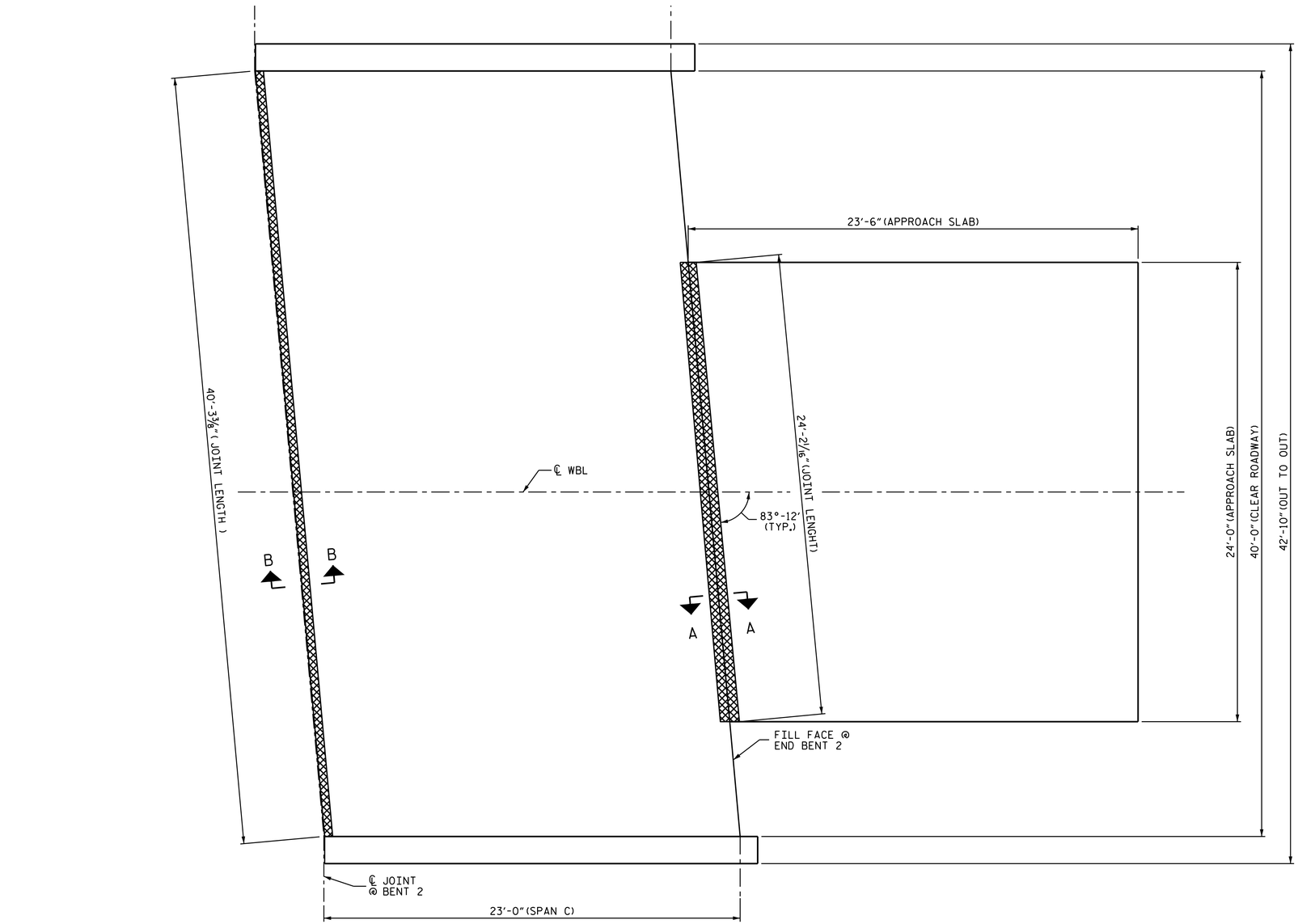

SPAN C

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIR SPAN C AND APPROACH SLAB

	ESTIMATE	ACTUAL
CLASS II SURFACE PREPARATION	0.0 SQ. YDS.	
✳ CLASS III SURFACE PREPARATION	0.0 SQ. YDS.	
BRIDGE JOINT DEMOLITION	36.9 SQ. FT.	
SCARIFYING BRIDGE DECK	156.6 SQ. YDS.	
HYDRO-DEMOLITION OF BRIDGE DECK	156.6 SQ. YDS.	
BRIDGE GROOVING FLOORS	1246.5 SQ. FT.	
CONC. WORK FOR JOINT REPLACEMENT	36.9 SQ. FT.	
ELASTOMERIC CONC. FOR PRESERVATION	9.2 CU. FT.	
CONCRETE FOR DECK REPAIR	0.0 CU. FT.	
LMC-ES OVERLAY	8.7 CU. YDS.	
PLACING & FINISHING LMC-ES OVERLAY	156.6 SQ. YDS.	

NOTES

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE BASED ON THE BEST INFORMATION AVAIABLE. IF ADDITIONAL REPAIRS NOT SHOWN DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS BUILT REPAIR QUANTITY TABLE.

PAYMENT FOR CLASS II & CLASS III SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING HYDRO-DEMOLITION OF THE BRIDGE DECK. SEE SPECIAL PROVISIONS.

FOR SECTION A-A, AND B-B. SEE "JOINT DETAILS LMC OVERLAY", SHEET S-41.

✳ CLASS III SURFACE PREPARATION IS NOT ANTICIPATED. A TOKEN PAY ITEM IS INDICATED FOR PRICING PURPOSES IN THE EVENT OF UNANTICIPATED CLASS III AREAS ARE ENCOUNTERED.

CLASS II SURFACE PREPARATION

BRIDGE JOINT DEMOLITION

SCARIFICATION & HYDRO-DEMOLITION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 487

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS SPAN C AND APPROACH SLAB

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

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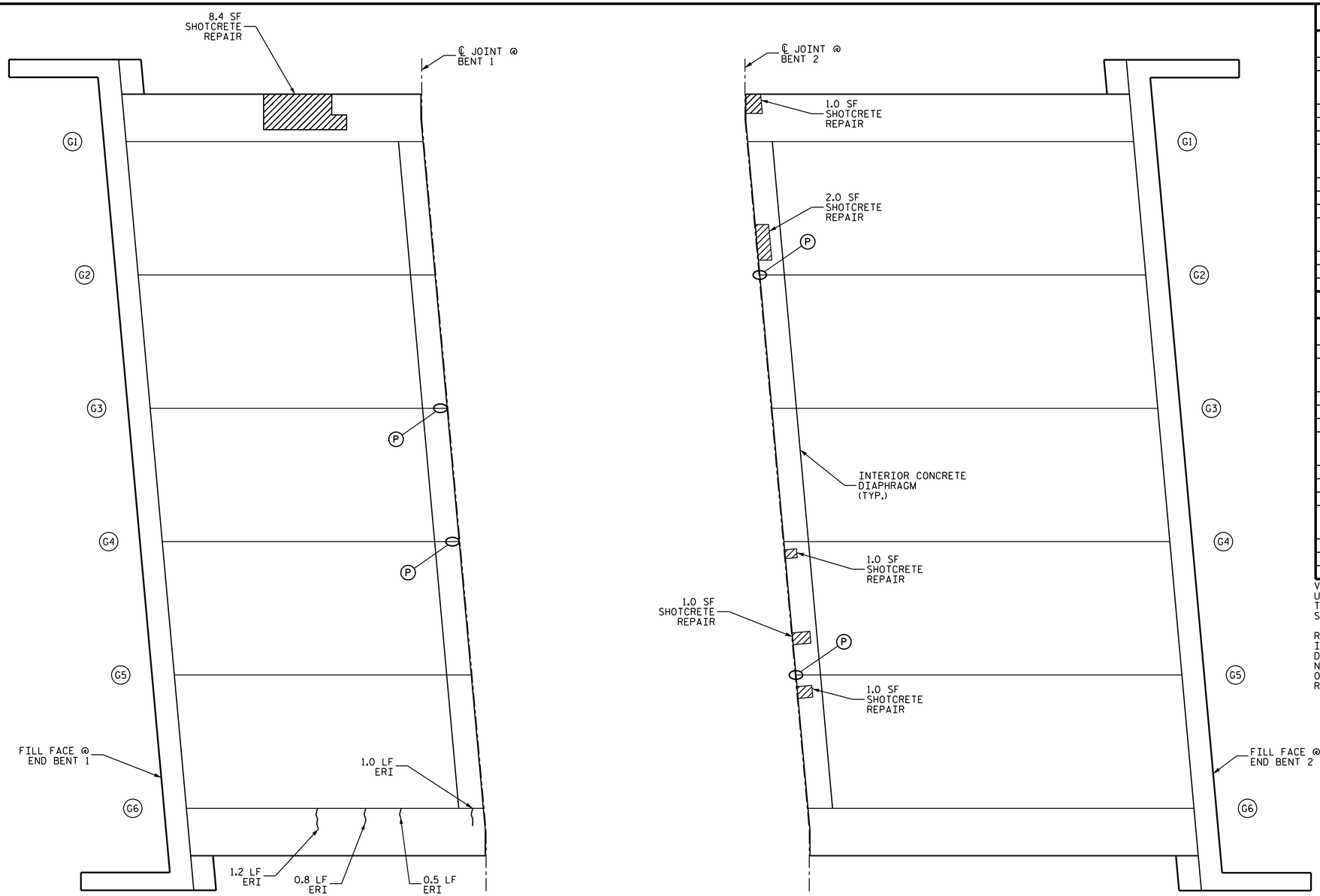

SPAN A
(UNDERSIDE)

SPAN C
(UNDERSIDE)

ANTICIPATED STEEL REPAIR LOCATIONS

SPAN	BEAM	LOCATION	DIM "A"	DIM "B"	DIM "E"
A	G3	BENT 1	-	9½"	3"
A	G4	BENT 1	-	9½"	4"
C	G2	BENT 2	-	9½"	4"
C	G5	BENT 2	-	9½"	4"

FOR BEAM REPAIR DIMENSIONS, SEE "BEAM PLATING REPAIR DETAILS" SHEETS 1 & 2.

BEAM REPAIR QUANTITY TABLE

BOLTED STEEL PLATES		STEEL PLATES		STIFFENER		STEEL DIAPHRAGM	
LBS.		LBS.		LBS.		LBS.	
ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
31.0		0.0		0.0		0.0	

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN A

	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR DIAPHRAGM	0.0	0.0		
OVERHANG	8.4	4.2		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR DIAPHRAGM	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
UNDERSIDE OF DECK		0.0		
INTERIOR DIAPHRAGM		0.0		
OVERHANG		3.5		

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN C

	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR DIAPHRAGM	5.0	2.5		
OVERHANG	1.0	0.5		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR DIAPHRAGM	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
UNDERSIDE OF DECK		0.0		
INTERIOR DIAPHRAGM		0.0		
OVERHANG		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "OVERHANG, DIAPHRAGM, AND BRIDGE RAIL REPAIR DETAILS" SHEET.

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATED LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITIY TABLE.

- SHOTCRETE REPAIR AREA
- ERI - EPOXY RESIN INJECTION
- (1) BEAM NUMBER
- (B) BEAM END REPAIR
- (P) PLATING REPAIR
- (S) STIFFENER REPAIR
- (D) STEEL DIAPHRAGM REPLACEMENT

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 487

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNDERSIDE OF DECK SPAN A & C

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

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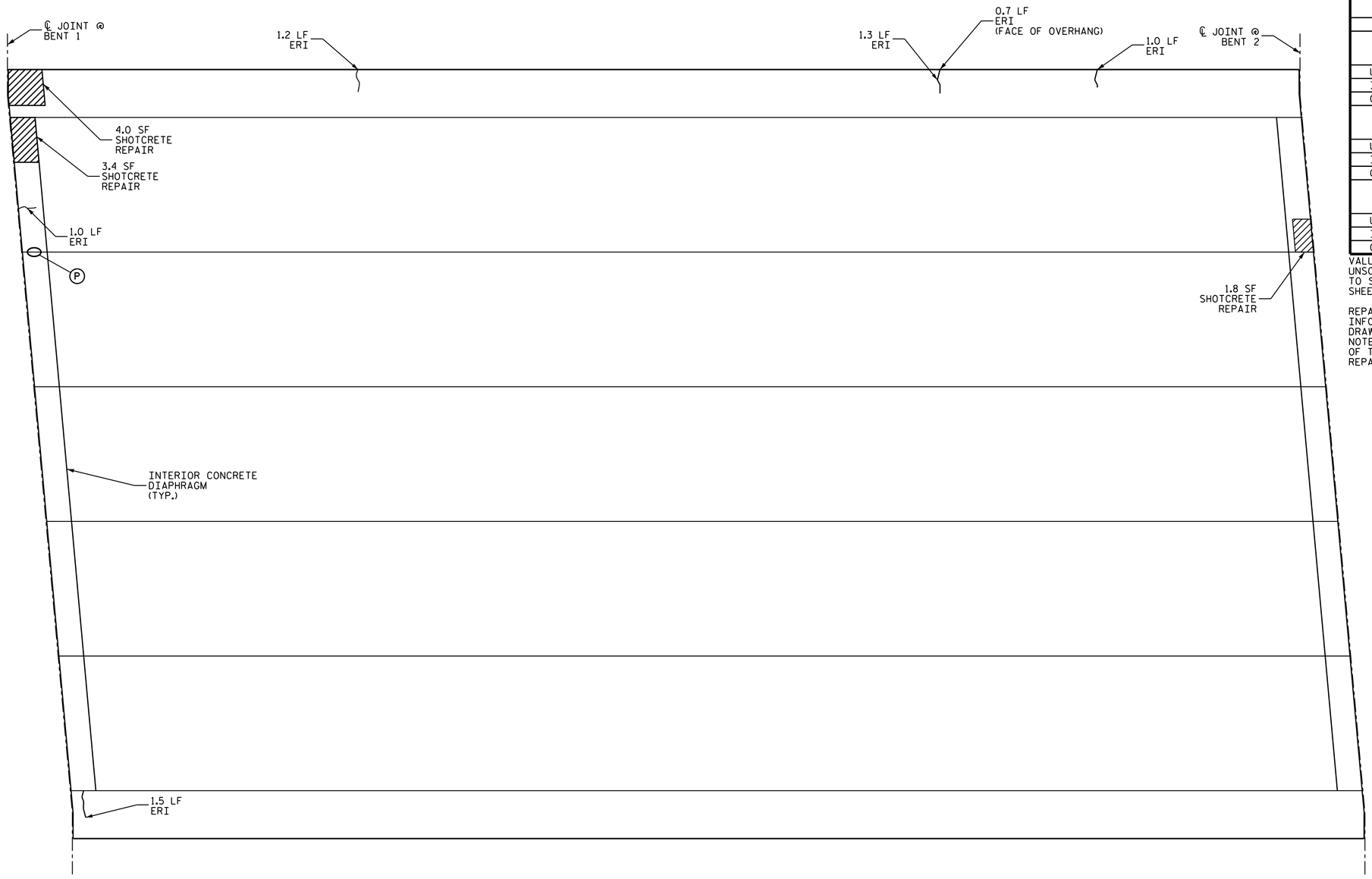

SPAN B
(UNDERSIDE)

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN B

	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR DIAPHRAGM	5.2	2.6		
OVERHANG	4.0	2.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR DIAPHRAGM	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
UNDERSIDE OF DECK		0.0		
INTERIOR DIAPHRAGM		0.0		
OVERHANG		5.7		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "OVERHANG, DIAPHRAGM, AND BRIDGE RAIL REPAIR DETAILS" SHEET.

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATED LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITIY TABLE.

SHOTCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

Ⓘ BEAM NUMBER
Ⓑ BEAM END REPAIR
Ⓟ PLATING REPAIR
Ⓢ STIFFENER REPAIR
Ⓓ STEEL DIAPHRAGM REPLACEMENT

ANTICIPATED STEEL REPAIR LOCATIONS

SPAN	BEAM	LOCATION	DIM "A"	DIM "B"	DIM "E"
B	G2	BENT 1	-	9½"	8"

FOR BEAM REPAIR DIMENSIONS, SEE "BEAM PLATING REPAIR DETAILS" SHEETS 1 & 2.

BEAM REPAIR QUANTITY TABLE

BOLTED STEEL PLATES		STEEL PLATES		STIFFENER		STEEL DIAPHRAGM	
LBS.		LBS.		LBS.		LBS.	
ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
13.4		0.0		0.0		0.0	

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 487

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNDERSIDE OF DECK SPAN B

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NOTES

THE FOAM JOINTS SHALL MEET THE MANUFACTURER'S RECOMMENDATION.

THE FOAM JOINTS SHALL MEET THE MANUFACTURER'S RECOMMENDATION FOR THE SIZE OF OPENING ON THE PLANS, AND ACCOMMODATE THE MINIMUM EXPANSION SHOWN ON THE PLANS.

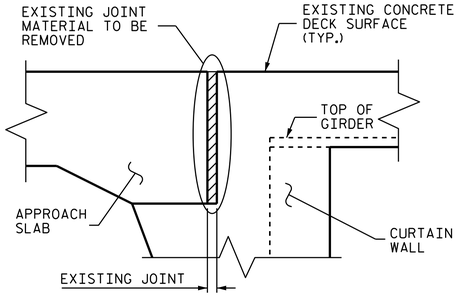
CONTRACTOR SHALL FIELD VERIFY THE EXISTING JOINT OPENING PRIOR TO ORDERING JOINT SEAL MATERIAL. IF ACTUAL JOINT OPENING VARIES FROM OPENING INDICATED IN DETAIL BY MORE THAN 1/4", NOTIFY ENGINEER.

THE INSTALLED FOAM JOINTS SHALL BE WATER TIGHT.

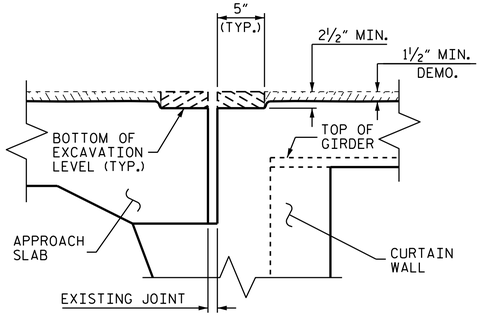
FOR FOAM JOINT SEALS FOR PRESERVATION, SEE SPECIAL PROVISIONS.

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

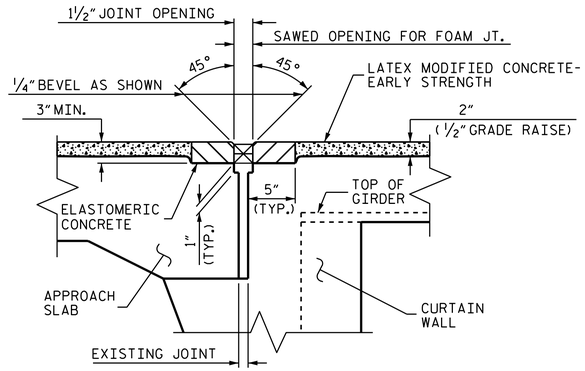
JOINT REPAIR QUANTITY TABLE		
	ESTIMATE	ACTUAL
FOAM JOINT SEALS FOR PRESERVATION	128.9 LIN. FT.	



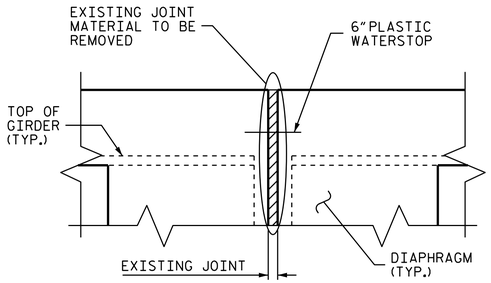
SECTION A-A
(EXISTING JOINT)



SECTION A-A
(MINIMUM EXISTING JOINT DEMOLITION)



SECTION A-A
(PROPOSED FOAM JOINT SEAL)



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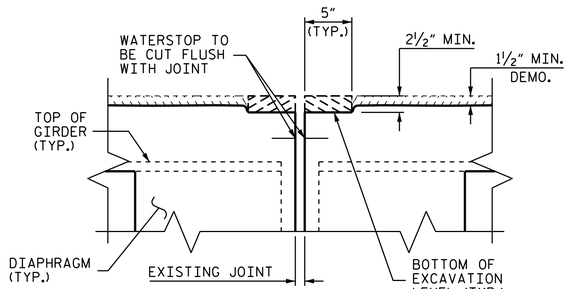
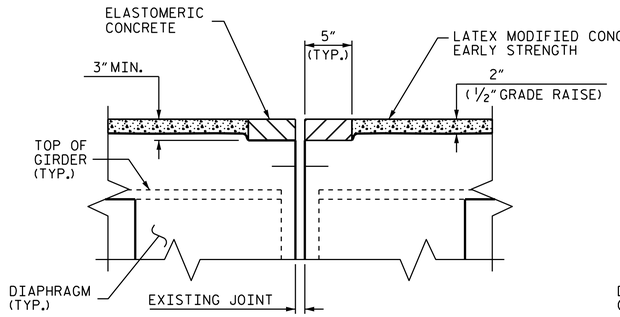
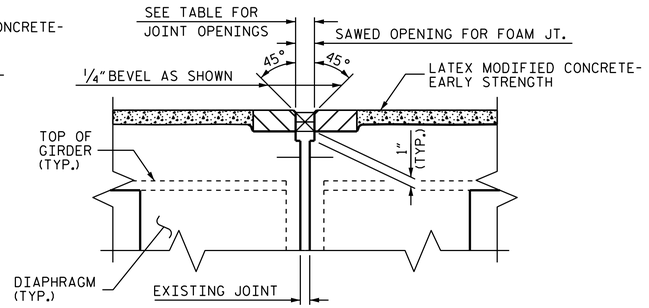
(EXISTING JOINT)



SECTION B-B
(MINIMUM EXISTING JOINT DEMOLITION)



SECTION B-B
(PROPOSED JOINT PRE-SAWED)

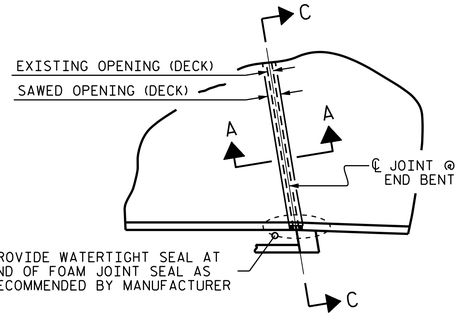


SECTION B-B
(PROPOSED FOAM JOINT SEAL)

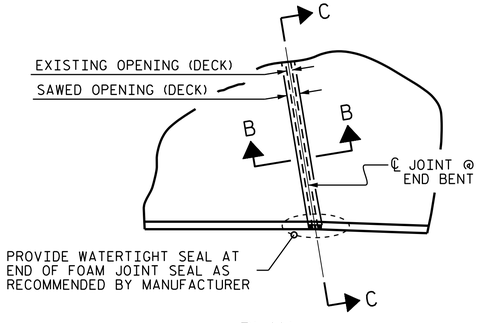
IF THE EMBEDDED PORTION OF THE EXISTING PLASTIC WATERSTOP IS EXPOSED DURING REMOVAL OF UNSOUND CONCRETE, OR IF UNSOUND CONCRETE IS REMOVED WITHIN 2" OF THE WATERSTOP, THE ENTIRE CONCRETE DEPTH TO THE WATERSTOP SHALL BE REMOVED. IF SUCH EXCAVATION EXTENDS MORE THAN 2" BELOW THE BOTTOM OF THE PLANNED ELASTOMERIC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

DEMOLISH BRIDGE JOINT AREA TO THE NECESSARY DEPTH, SUCH THAT ELASTOMERIC CONCRETE SHALL BE FOUNDED ON CONCRETE OR REPAIR CONCRETE SUBSTRATE, NOT LATEX MODIFIED CONCRETE.

SAWED JOINT OPENING TABLE			
	SAWED JT. OPENING (PERPINDICULAR TO JT.)		
LOCATION BRIDGE 487	AT 45°	AT 60°	AT 90°
BENT 1	1 9/16"	1 9/16"	1½"
BENT 2	1 11/16"	1 9/16"	1 7/16"



PLAN
(@ END BENT)



PLAN
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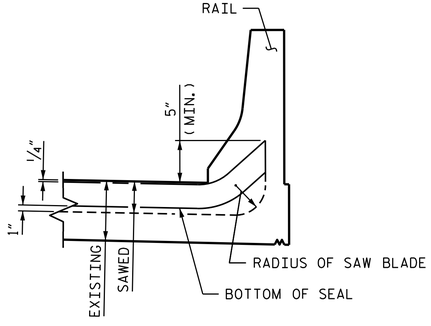

SECTION C-C

JOINT SEAL DETAILS

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 487

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS
LMC OVERLAY

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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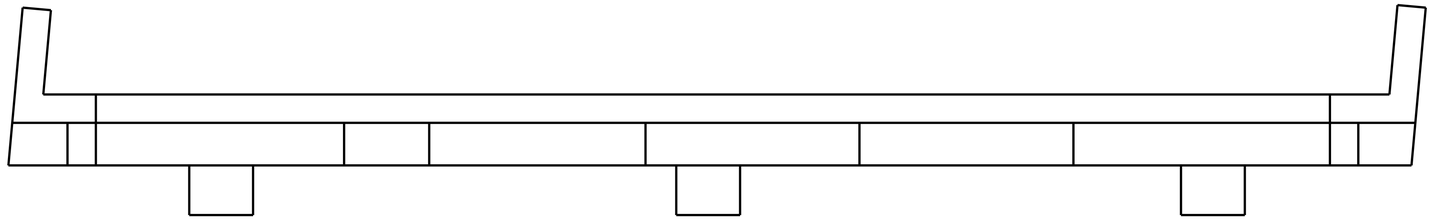
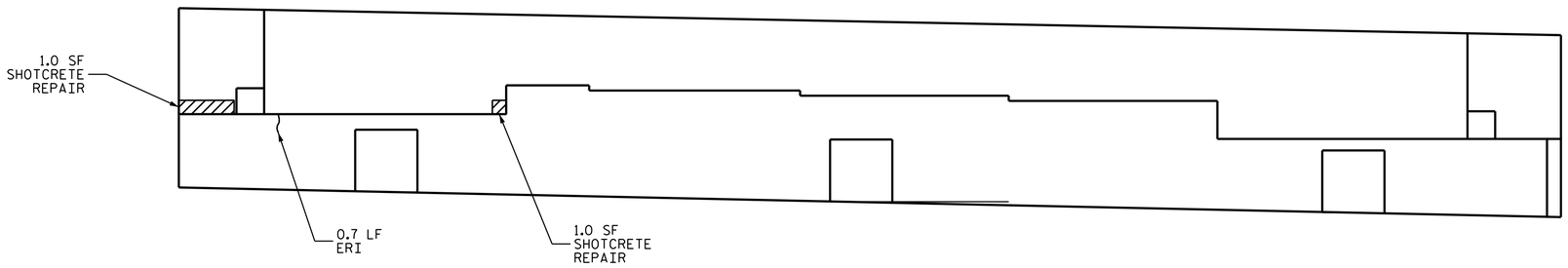


PLAN



ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

END BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
CURTAIN WALL	2.0	1.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
CURTAIN WALL	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.7		
CURTAIN WALL		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
CAP		74.2		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 487

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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RALEIGH

END BENT 1

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2			4			93

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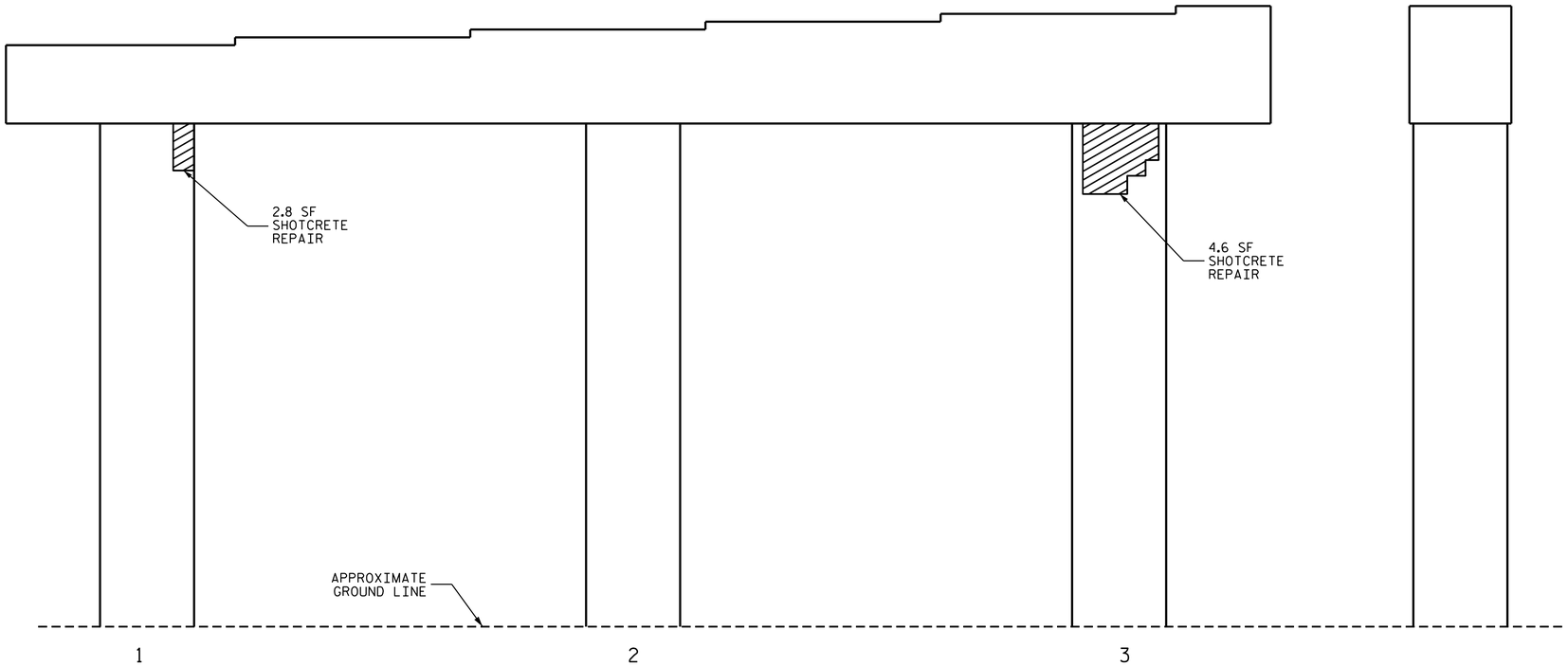
SPAN B
SPAN A

TOP OF CAP

SPAN A | SPAN B



ELEVATION

END VIEW

AS-BUILT REPAIR QUANTITY TABLE

BENT 1 SPAN A FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	7.4	3.7		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
TOP OF BENT CAP		131.1		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 487

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by:
Amber Lee
11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 1
SPAN A FACE

DRAWN BY : M. WELDON DATE : 06/18
CHECKED BY : C. BRIGHT DATE : 10/18

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REVISIONS						SHEET NO.
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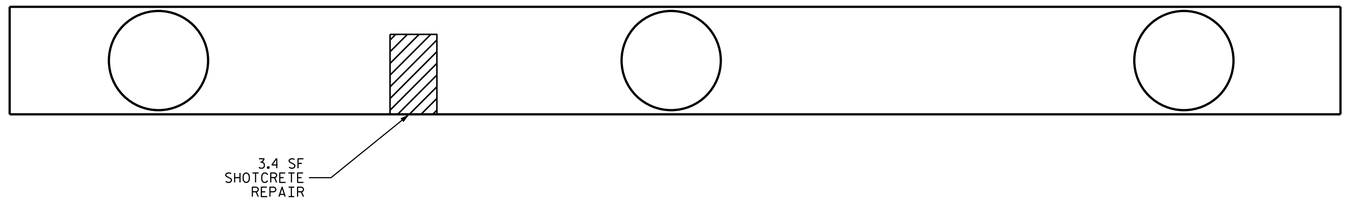
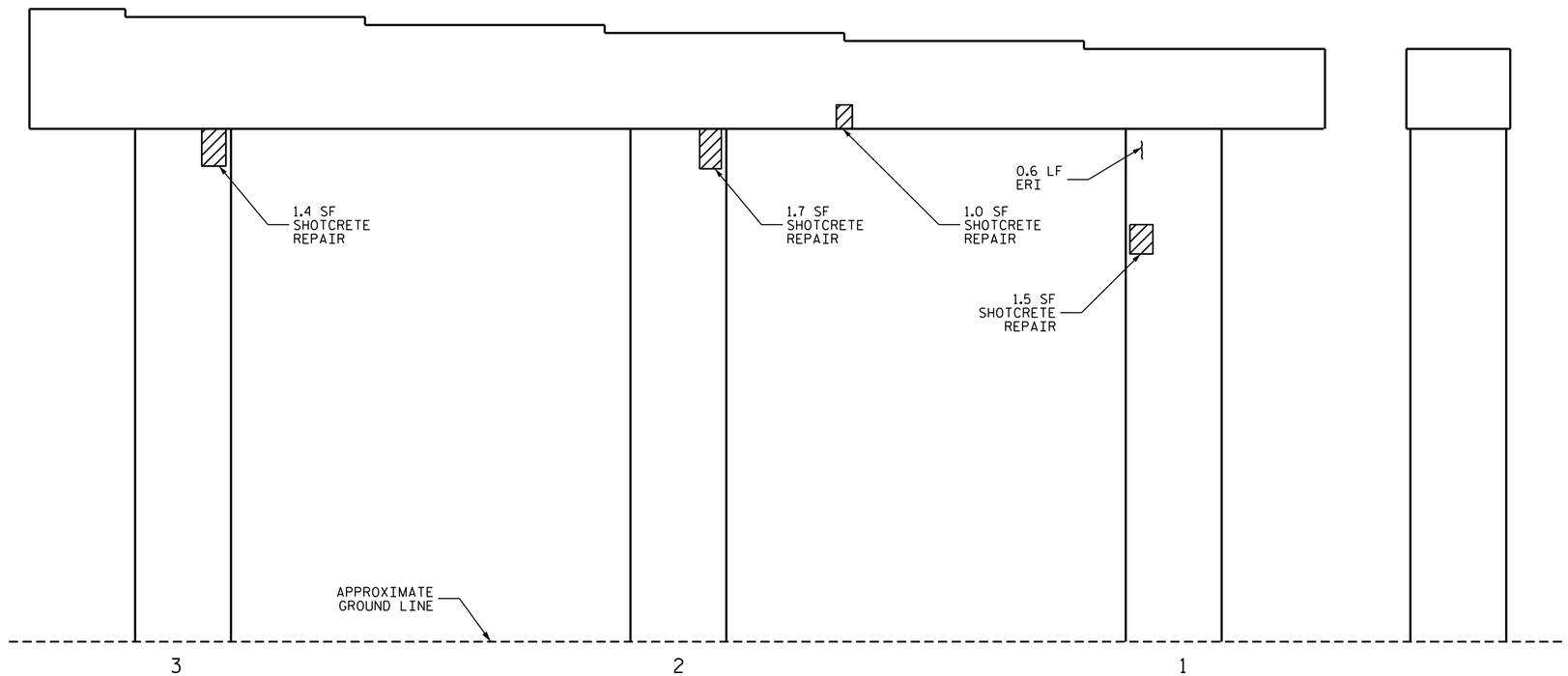


BOTTOM OF CAP

SPAN B
SPAN A

SPAN B | SPAN A



ELEVATION

END VIEW

AS-BUILT REPAIR QUANTITY TABLE

BENT 1 SPAN B FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	4.4	2.2		
COLUMN	4.6	2.3		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.6		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 487

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee 11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 1
SPAN B FACE

DRAWN BY : M. WELDON DATE : 06/18
CHECKED BY : C. BRIGHT DATE : 10/18

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2			4			93

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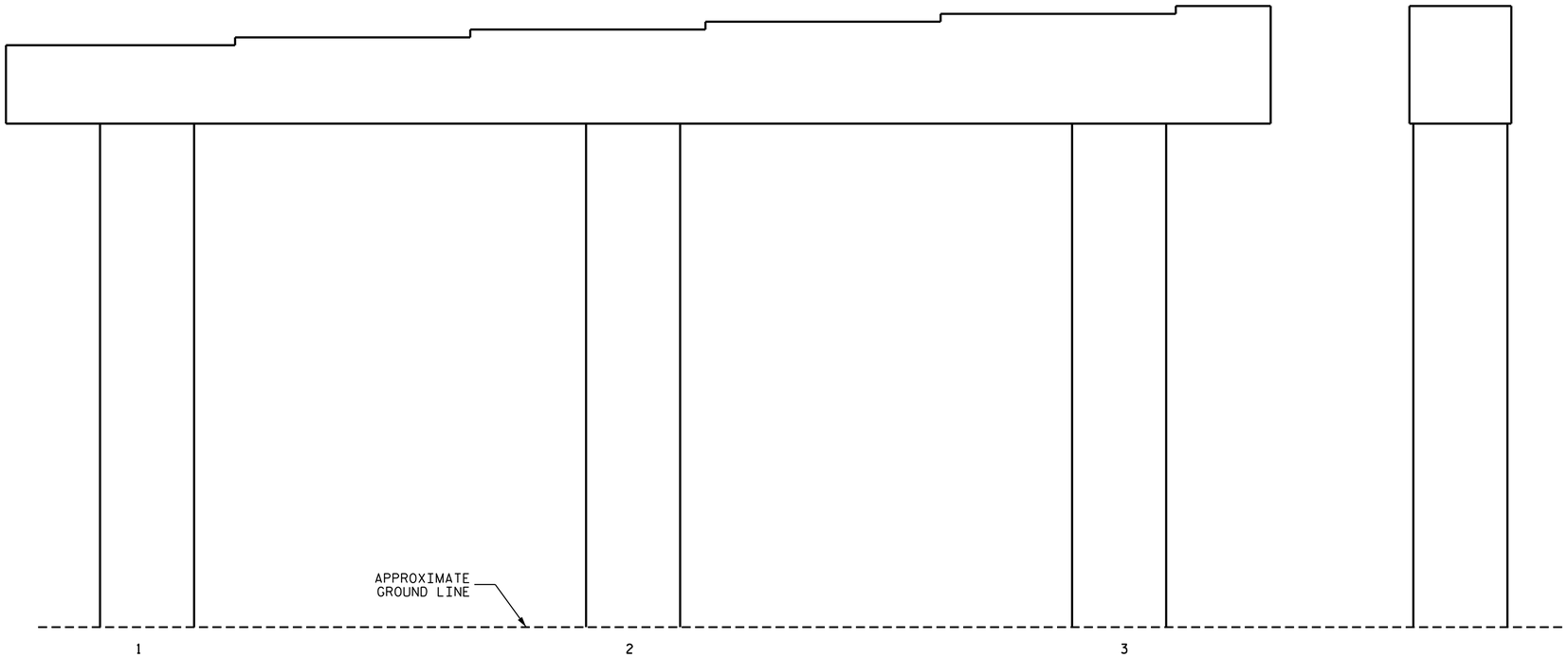
SPAN C
SPAN B

TOP OF CAP

SPAN B | SPAN C



ELEVATION

END VIEW

AS-BUILT REPAIR QUANTITY TABLE

BENT 2 SPAN B FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
TOP OF BENT CAP		131.1		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1"BEHIND REBAR AND MINIMUM 2"CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 487

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by:
[signature]
11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 2
SPAN B FACE

DRAWN BY : M. WELDON DATE : 06/18
CHECKED BY : C. BRIGHT DATE : 10/18

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1			3			TOTAL SHEETS
2			4			93

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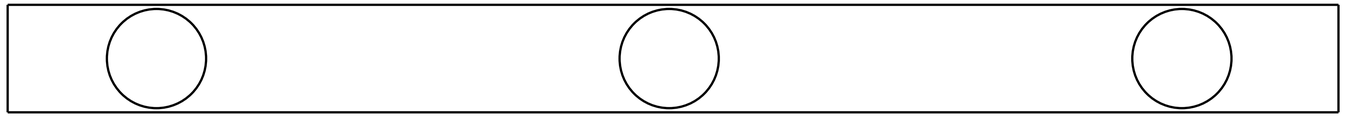
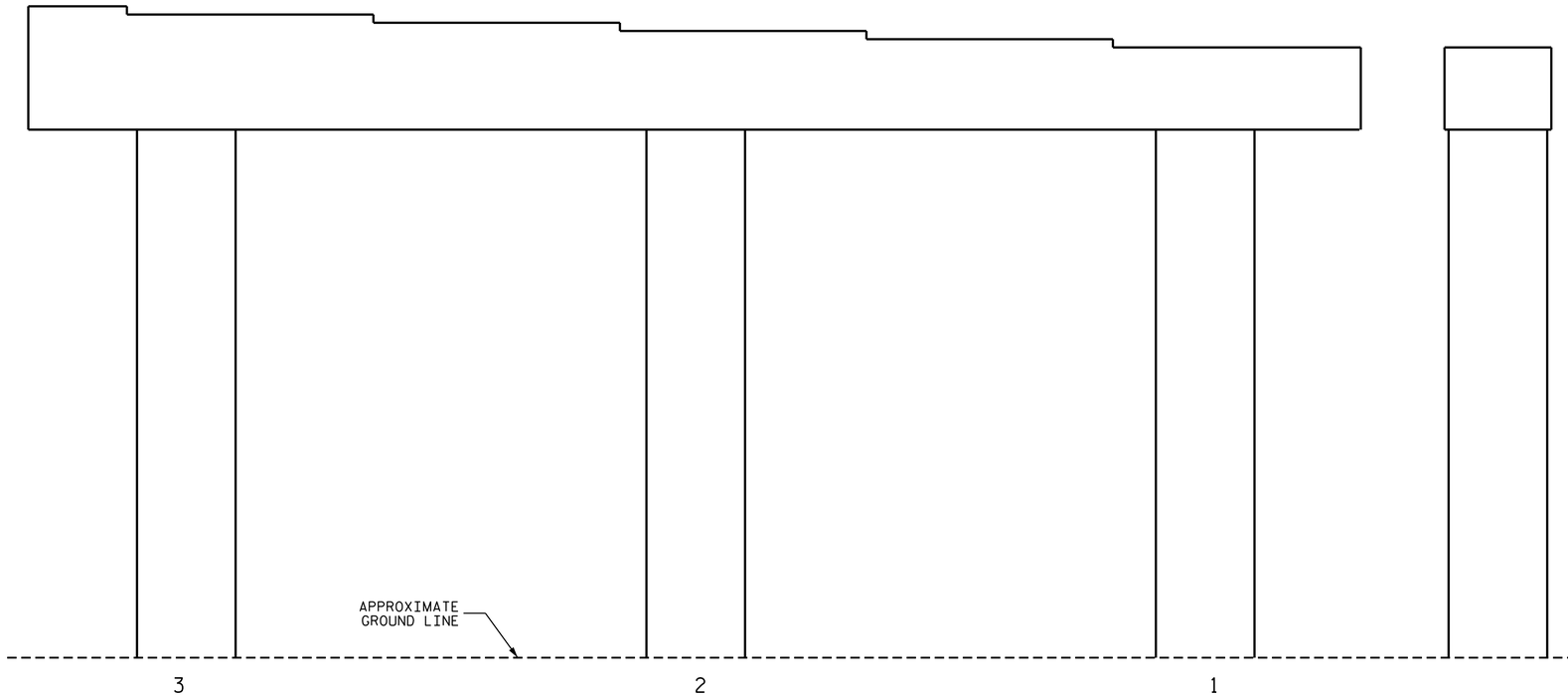


SPAN C
SPAN B

BOTTOM OF CAP

SPAN C | SPAN B



ELEVATION

END VIEW

AS-BUILT REPAIR QUANTITY TABLE

BENT 2 SPAN C FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

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REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 487

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by:
Amber Lee
11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 2
SPAN C FACE

DRAWN BY : M. WELDON DATE : 06/18
CHECKED BY : C. BRIGHT DATE : 10/18

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
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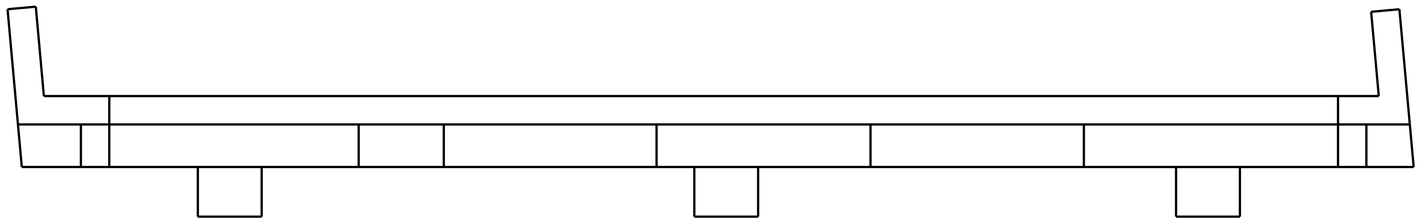
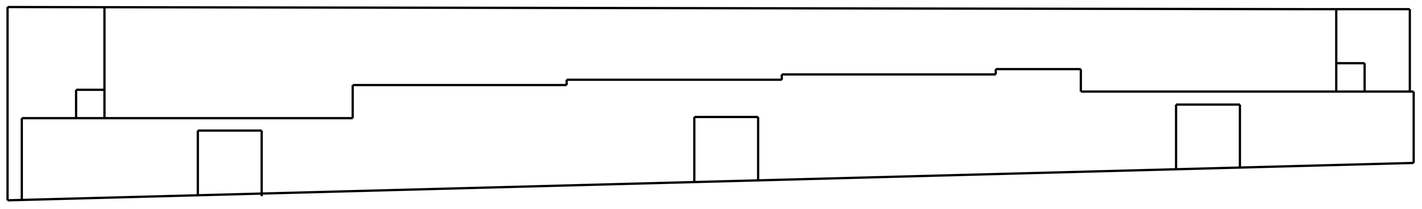


PLAN



ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

END BEND 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
CURTAIN WALL	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
CURTAIN WALL	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
CURTAIN WALL		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
CAP		73.6		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 487

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Miller B04B5AAF2FAD484...

11/21/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 2

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DRAWN BY : M. WELDON DATE : 06/18

CHECKED BY : C. L. BRIGHT DATE : 10/18

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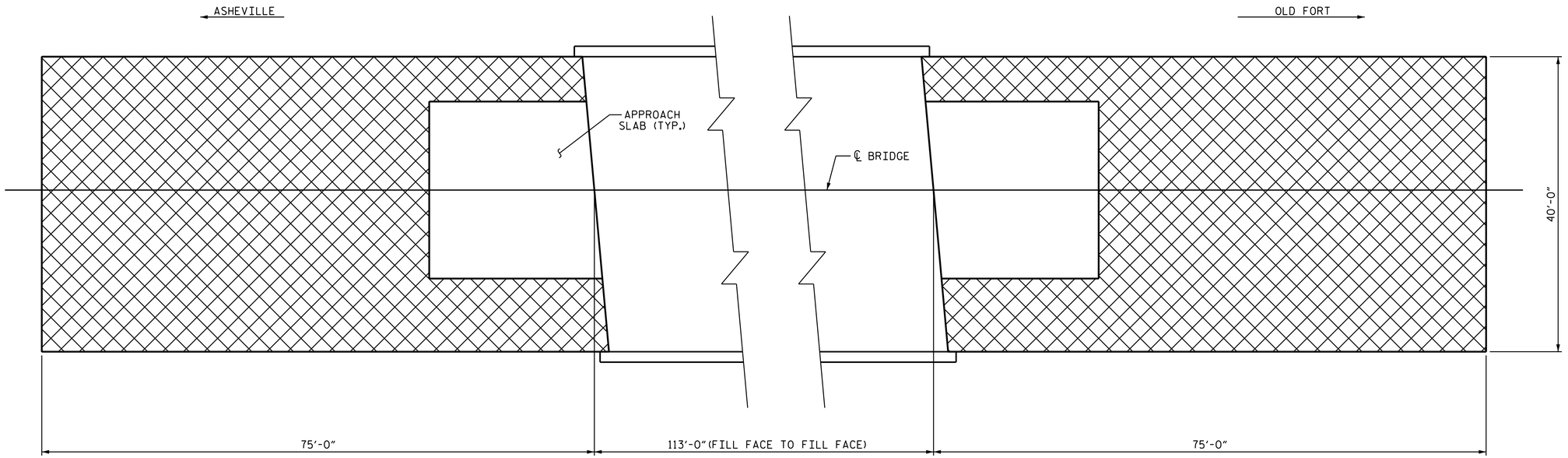
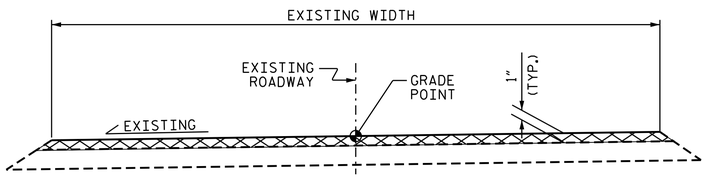
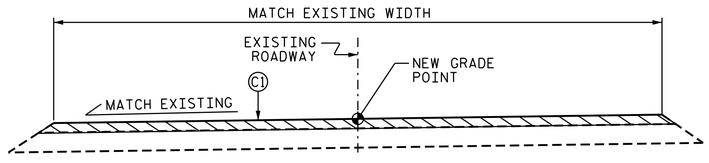




TYPICAL ROADWAY MILLING SECTION

(MILL TO 1 "DEPTH)



TYPICAL ROADWAY SECTION

NOTES

INCIDENTAL MILLING - EXISTING APPROACH ASPHALT PAVEMENT TO BE MILLED AS NECESSARY TO ATTAIN MINIMUM 1½" DEPTH OF NEW ASPHALT PAVEMENT. NEW ASPHALT PAVEMENT SHALL BE OF THICKNESS NECESSARY TO PROVIDE A SMOOTH TRANSITION BETWEEN THE ROADWAY AND THE BRIDGE DECK. THE NEW ASPHALT PAVEMENT THICKNESS MAY EXCEED 1½" DUE TO SETTLEMENT OF THE EXISTING APPROACH.

SUMMARY OF QUANTITIES

	ESTIMATE	ACTUAL
INCIDENTAL MILLING	547 SQ.YDS.	
ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B	50 TONS	
ASPHALT BINDER FOR PLANT MIX	4 TONS	

C1	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.

INCIDENTAL MILLING

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE.No.: 487

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: B04B5AAF2FAD484...

11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH MILLING & TYPICAL ROADWAY SECTIONS

DRAWN BY : E.BAYISSA DATE : 10/2018

CHECKED BY : A. M. LEE DATE : 10/2018

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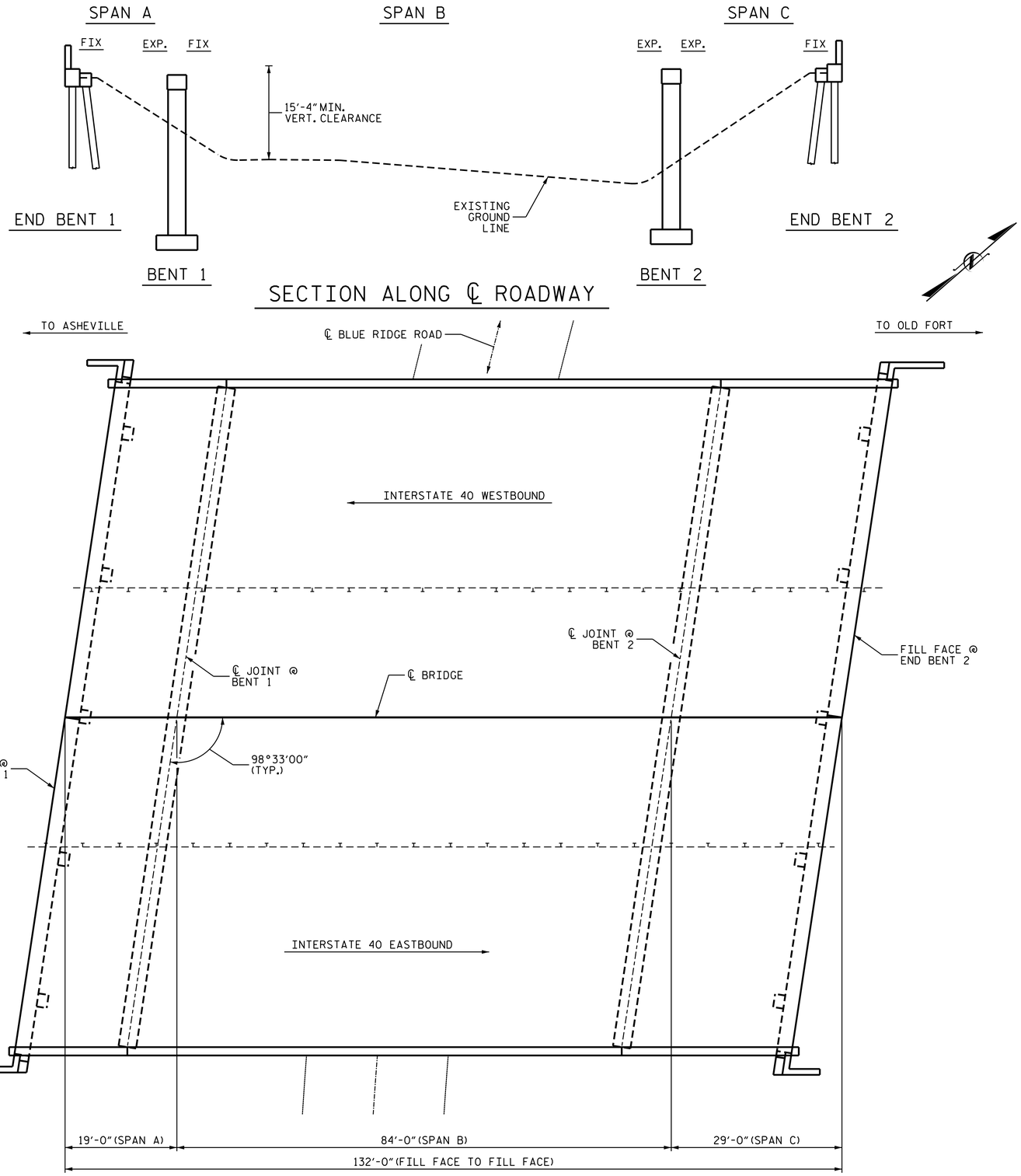

PLAN

NOTES

GENERAL DRAWING INFORMATION IS TAKEN FROM THE ORIGINAL PLANS AND THE ROUTINE INSPECTION REPORT DATED 11/15/2017.

BRIDGE ORIENTATION CONFORMS TO THE ORIGINAL BRIDGE PLANS.

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

RESIDENT ENGINEER DATE

SCOPE OF WORK

- CLEAN, PLATE REPAIR AND SPOT REPAINT EXISTING STRUCTURAL STEEL.
- EPOXY INJECTION OF CONCRETE CRACKS.
- REMOVE UNSOUND CONCRETE AND PROPERLY PREPARE EXISTING END BENTS AND BENTS FOR SHOTCRETE AND CONCRETE REPAIR.
- PARTIALLY REMOVE TOP OF BRIDGE DECK CONCRETE IN THE CLEAR ROADWAY BY SCARIFICATION AND HYDRO-DEMOLITION METHODS.
- OVERLAY PREPARED TOP OF BRIDGE DECK IN THE CLEAR ROADWAY WITH LATEX MODIFIED CONCRETE-EARLY STRENGTH (LMC-ES).
- GROOVE LMC-ES BRIDGE DECK IN THE CLEAR ROADWAY.
- PARTIALLY REMOVE TOP OF BRIDGE DECK IN THE MEDIAN BY SHOTBLASTING.
- OVERLAY PREPARED TOP OF BRIDGE DECK IN THE MEDIAN WITH SILANE DECK TREATMENT.
- REMOVE EXISTING JOINT MATERIAL AND INSTALL FOAM JOINT SEALS.
- REMOVE DEBRIS FROM TOP OF EXISTING END BENT AND BENT CAPS AND APPLY EPOXY COATING.

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 488

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6D52FC48F...

11/21/2018

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: 504B5AAF2F4D484...

11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON
INTERSTATE 40
OVER BLUE RIDGE ROAD

DRAWN BY : R.L.PUTEK DATE : 09/2018

CHECKED BY : A.M.LEE DATE : 09/2018

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REVISIONS						SHEET NO.
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LOCATION SKETCH

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

BRIDGE COORDINATES

LAT: 35.6062213
LONG: -82.34056631

NOTES

EXISTING DIMENSIONS AND BRIDGE CONDITION ARE FROM THE BEST INFORMATION AVAILABLE.

THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.

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

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

WORK ON THE BRIDGES SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL BELOW. THE CONTRACTOR SHALL SUBMIT PLANS FOR CONSTRUCTION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS AND THE PROJECT SPECIAL PROVISIONS.

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

PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL A COMPLETE SEQUENCE OF TASK FOR EACH OPERATION AFFECTING THE BRIDGE SURFACE AND/OR TRAFFIC.
FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

FOR SCARIFYING BRIDGE DECK, HYDRO-DEMOLITION OF BRIDGE DECK, AND CLASS II SURFACE PREPARATION, AND CLASS III SURFACE PREPARATION. SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISION.

THE LMC CONTRACTOR SHALL PROVIDE A METHOD OF HANDLING UNEXPECTED BLOW THROUGH OF THE DECK DURING HYDRO-DEMOLITION.

FOR PLACING AND FINISHING LATEX MODIFIED CONCRETE OVERLAY-EARLY STRENGTH (LMC-ES) AND LATEX MODIFIED CONCRETE-EARLY STRENGTH, SEE LATEX MODIFIED CONCRETE-EARLY STRENGTH SPECIAL PROVISIONS.

LONGITUDINAL CONSTRUCTION JOINTS SHALL BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.

DURING CONSTRUCTION, BERMS OR APPRORIATE MEASURES SHALL BE USED TO ENSURE HYDRO-DEMOLITION WATER DOES NOT MIGRATE INTO ACTIVE TRAVEL LANES.

FOR BRIDGE JOINT DEMOLITION, SEE SPECIAL PROVISIONS.

FOR CONCRETE WORK FOR JOINT REPLACEMENT, SEE SPECIAL PROVISIONS.

FOR CONCRETE FOR DECK REPAIRS, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEAL, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR SPOT PAINTING OF STEEL STRUCTURE REPAIR AREAS AND POLLUTION CONTROL, SEE SPOT PAINTING OF STEEL STRUCTURE REPAIR AREAS SPECIAL PROVISION.

FOR EPOXY COATING AND DEBRIS REMOVAL, SEE SPECIAL PROVISIONS.

FOR BEAM REPAIR, SEE SPECIAL PROVISIONS.

FOR BOLTED BEAM REPAIR, SEE SPECIAL PROVISIONS.

FOR VOLUMETRIC MIXER, SEE SPECIAL PROVISIONS.

FOR SILANE DECK TREATMENT SEE SPECIAL PROVISIONS.

PROJ. NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 488

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

Docusigned by:
Amber Lee
DocuSigned by:

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE
ON INTERSTATE 40
OVER BLUE RIDGE ROAD

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			93

DRAWN BY : R.L.PUTEK DATE : 07/18
CHECKED BY : A.M.LEE DATE : 08/18

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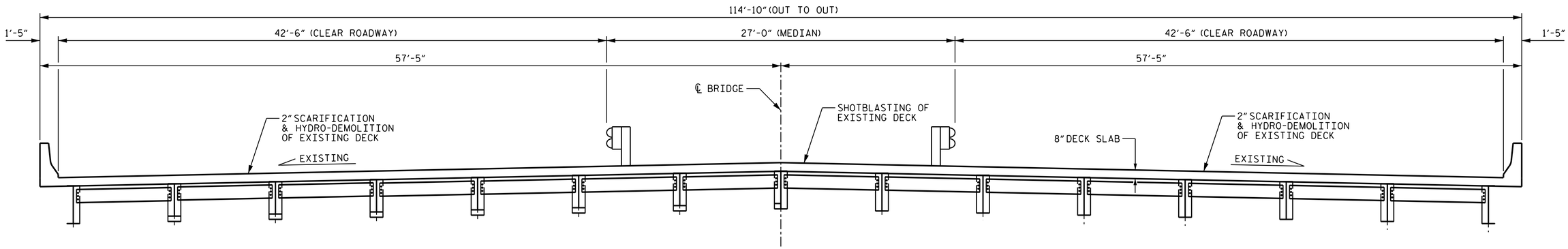

TYPICAL SECTION
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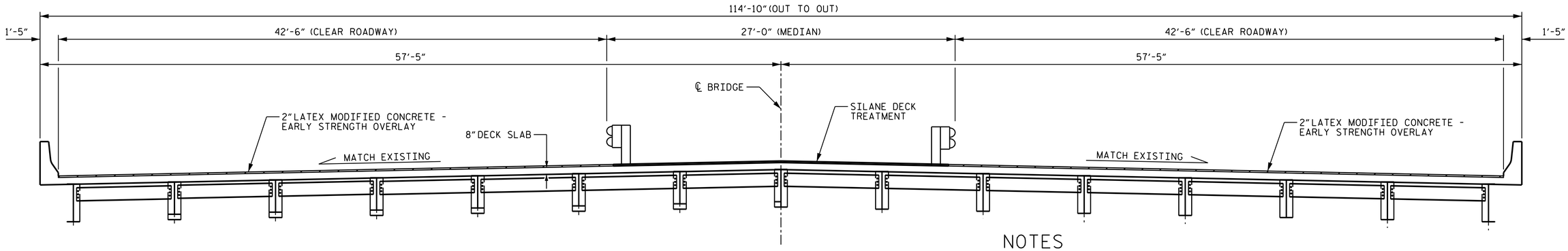
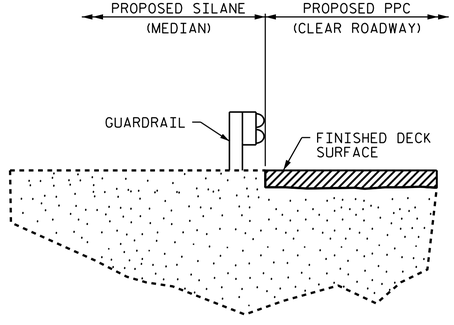


TYPICAL SECTION
(PROPOSED)

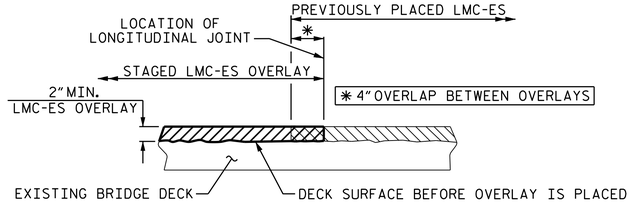
NOTES

WHEN PREPARING THE SURFACE FOR LMC-ES OVERLAY ADJACENT TO THE PREVIOUSLY PLACED LMC-ES STAGE, THE PREVIOUSLY PLACED LMC-ES SHALL BE SAW-CUT TO THE FULL DEPTH OF THE LMC-ES AT THE CENTERLINE OF THE BRIDGE AND ALL LMC-ES-ES IN THE 4" OVERLAP SHALL BE REMOVED WITH HAND TOOLS PRIOR TO PLACEMENT OF LMC-ES IN THE SECOND STAGE.

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

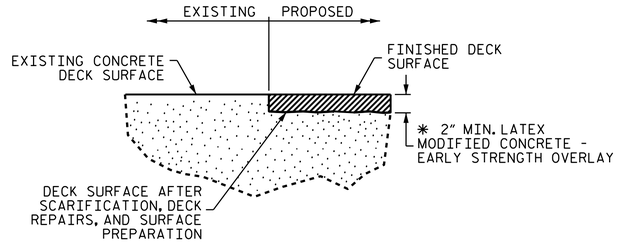


DETAIL FOR SILANE DECK TREATMENT



SECTION THRU DECK

STAGED LMC-ES OVERLAY JOINT
(AS NEEDED)



DETAIL FOR LATEX MODIFIED CONCRETE-EARLY STRENGTH OVERLAY
(FINISHED SURFACE OF THE LATEX MODIFIED CONCRETE - EARLY STRENGTH OVERLAY IS APPROXIMATE)

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE No.: 488

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

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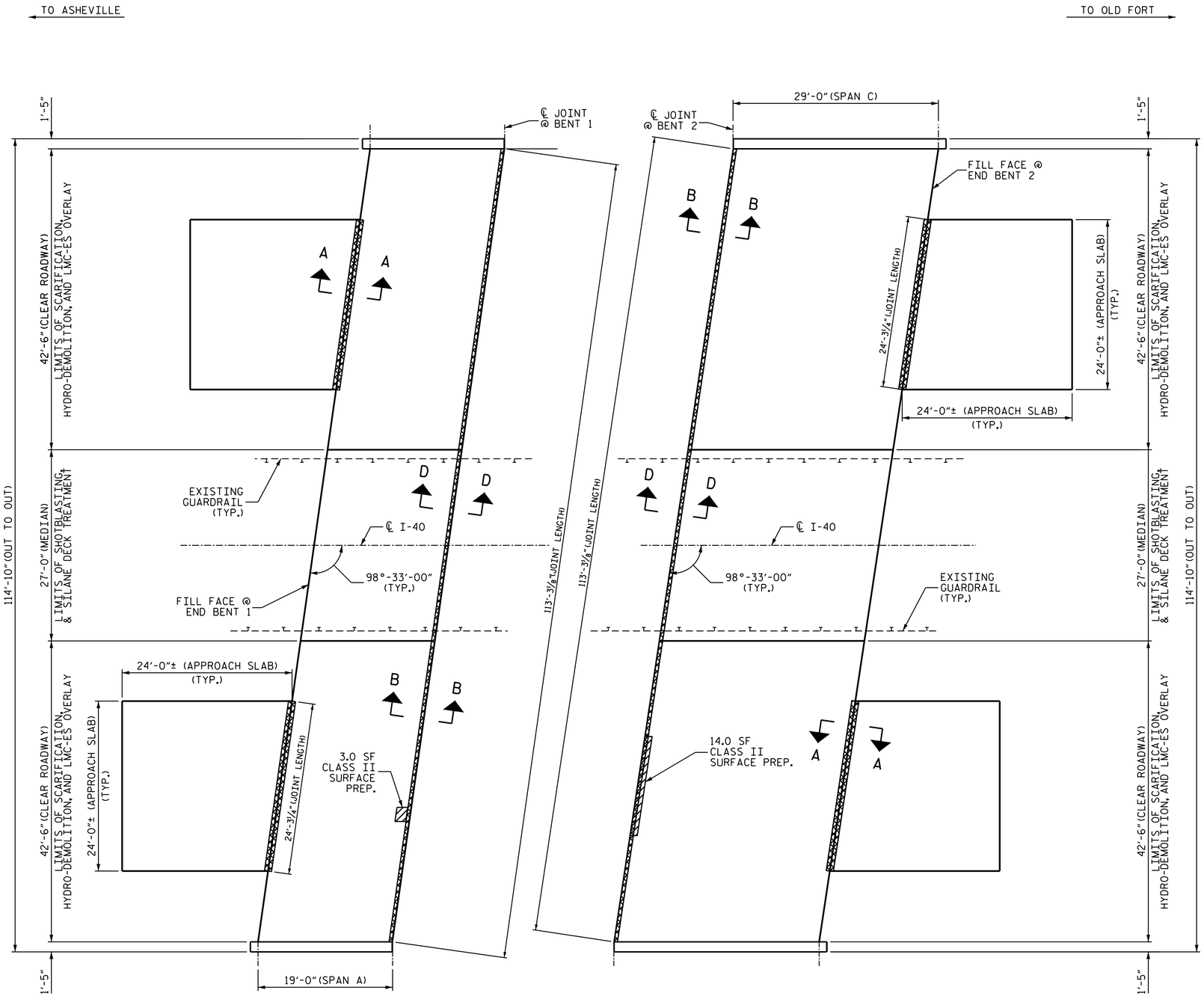

SPAN A

SPAN C

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIR SPAN A & APPROACH SLABS

	ESTIMATE	ACTUAL
CLASS II SURFACE PREPARATION	0.3 SQ. YDS.	
✱ CLASS III SURFACE PREPARATION	0.5 SQ. YDS.	
CONCRETE FOR DECK REPAIR	0.5 CU. FT.	
LMC-ES MATERIALS	16.5 CU. YDS.	
PLACING & FINISHING LMC-ES OVERLAY	298.0 SQ. YDS.	
SCARIFYING BRIDGE DECK	298.0 SQ. YDS.	
HYDRO-DEMOLITION OF BRIDGE DECK	298.0 SQ. YDS.	
SHOTBLASTING BRIDGE DECK	57.0 SQ. YDS.	
SILANE DECK TREATMENT	57.0 SQ. YDS.	
GROOVING BRIDGE FLOORS	2359.3 SQ. FT.	
BRIDGE JOINT DEMOLITION	87.6 SQ. FT.	
CONC. WORK FOR JOINT REPLACEMENT	87.6 SQ. FT.	
ELASTOMERIC CONC. FOR PRESERVATION	21.9 CU. FT.	

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIR SPAN C & APPROACH SLABS

	ESTIMATE	ACTUAL
CLASS II SURFACE PREPARATION	1.6 SQ. YDS.	
✱ CLASS III SURFACE PREPARATION	0.5 SQ. YDS.	
CONCRETE FOR DECK REPAIR	2.3 CU.FT.	
LMC-ES MATERIALS	21.8 CU. YDS.	
PLACING & FINISHING LMC-ES OVERLAY	392.5 SQ. YDS.	
SCARIFYING BRIDGE DECK	392.5 SQ. YDS.	
HYDRO-DEMOLITION OF BRIDGE DECK	392.5 SQ. YDS.	
SHOTBLASTING BRIDGE DECK	87.0 SQ. YDS.	
SILANE DECK TREATMENT	87.0 SQ. YDS.	
GROOVING BRIDGE FLOORS	3144.7 SQ. FT.	
BRIDGE JOINT DEMOLITION	87.6 SQ. FT.	
CONC. WORK FOR JOINT REPLACEMENT	87.6 SQ. FT.	
ELASTOMERIC CONC. FOR PRESERVATION	21.9 CU. FT.	

NOTES

PAYMENT FOR CLASS II SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING SCARIFYING OF THE BRIDGE DECK. SEE SPECIAL PROVISIONS.

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

FOR SECTION A-A, B-B AND D-D. SEE "JOINT DETAILS LMC-ES OVERLAY", SHEET S-56.

CLASS II SURFACE PREPARATION

BRIDGE JOINT DEMOLITION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 488

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/28/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS SPANS A & C AND APPROACH SLABS

DRAWN BY : M. WELDON DATE : 07/18

CHECKED BY : R. PUTEK DATE : 10/18

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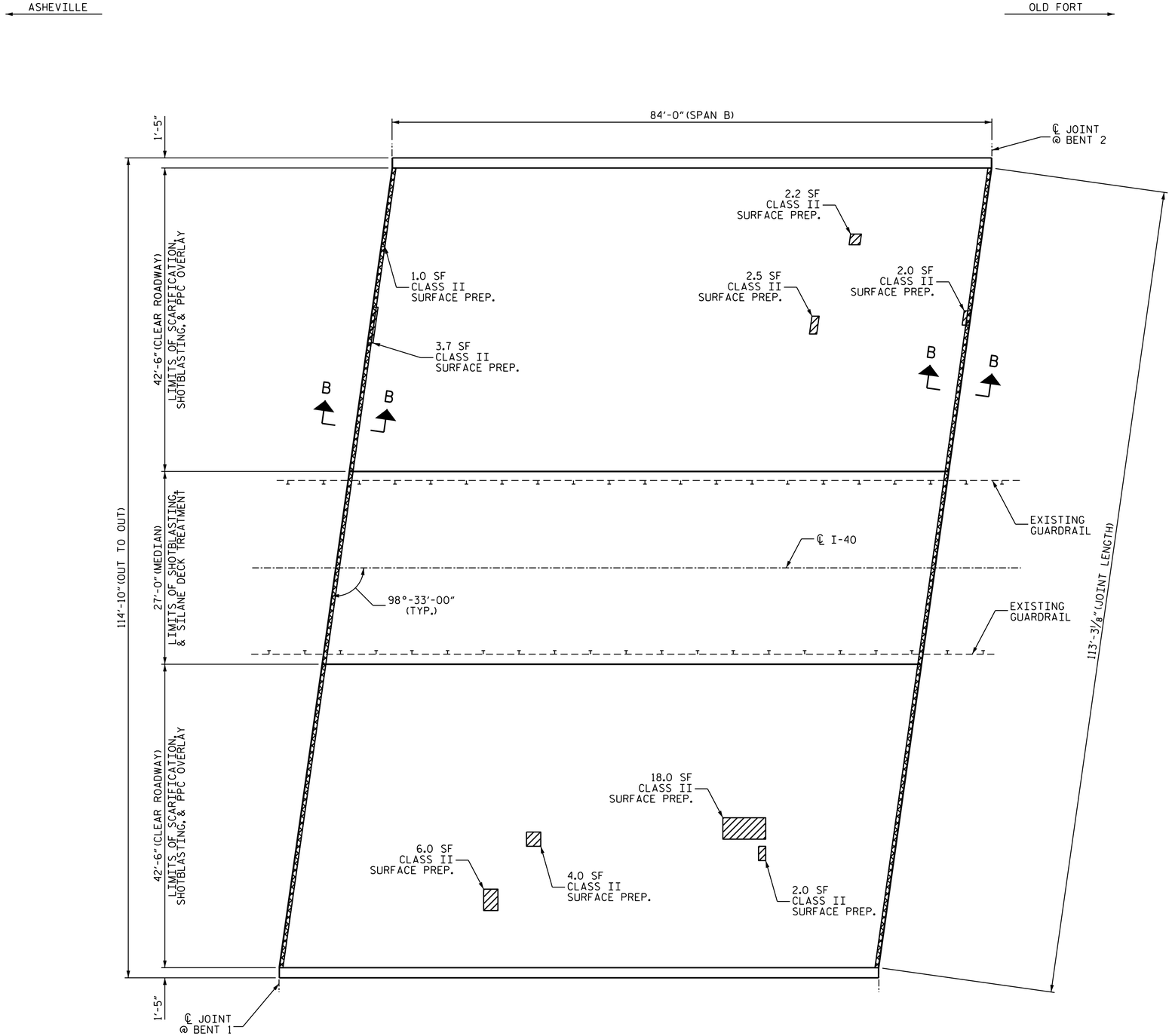

SPAN B

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIR SPAN B

	ESTIMATE	ACTUAL
CLASS II SURFACE PREPARATION	4.6 SQ. YDS.	
✱ CLASS III SURFACE PREPARATION	0.5 SQ. YDS.	
CONCRETE FOR DECK REPAIR	6.9 CU. FT.	
LMC-ES MATERIALS	33.1 CU. YDS.	
PLACING & FINISHING LMC-ES OVERLAY	793.3 SQ. YDS.	
SCARIFYING BRIDGE DECK	793.3 SQ. YDS.	
HYDRO-DEMOLITION OF BRIDGE DECK	793.3 SQ. YDS.	
SHOTBLASTING BRIDGE DECK	252.0 SQ. YDS.	
SILANE DECK TREATMENT	252.0 SQ. YDS.	
GROOVING BRIDGE FLOORS	6596.1 SQ. FT.	
BRIDGE JOINT DEMOLITION	94.4 SQ. FT.	
CONC. WORK FOR JOINT REPLACEMENT	94.4 SQ. FT.	
ELASTOMERIC CONC. FOR PRESERVATION	23.6 CU. FT.	

NOTES

PAYMENT FOR CLASS II SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING SCARIFYING OF THE BRIDGE DECK. SEE SPECIAL PROVISIONS.

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

FOR SECTION A-A, B-B AND D-D. SEE "JOINT DETAILS LMC-ES OVERLAY", SHEET S-56.

CLASS II SURFACE PREPARATION

BRIDGE JOINT DEMOLITION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 488

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPAN SPANS B

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/28/2018

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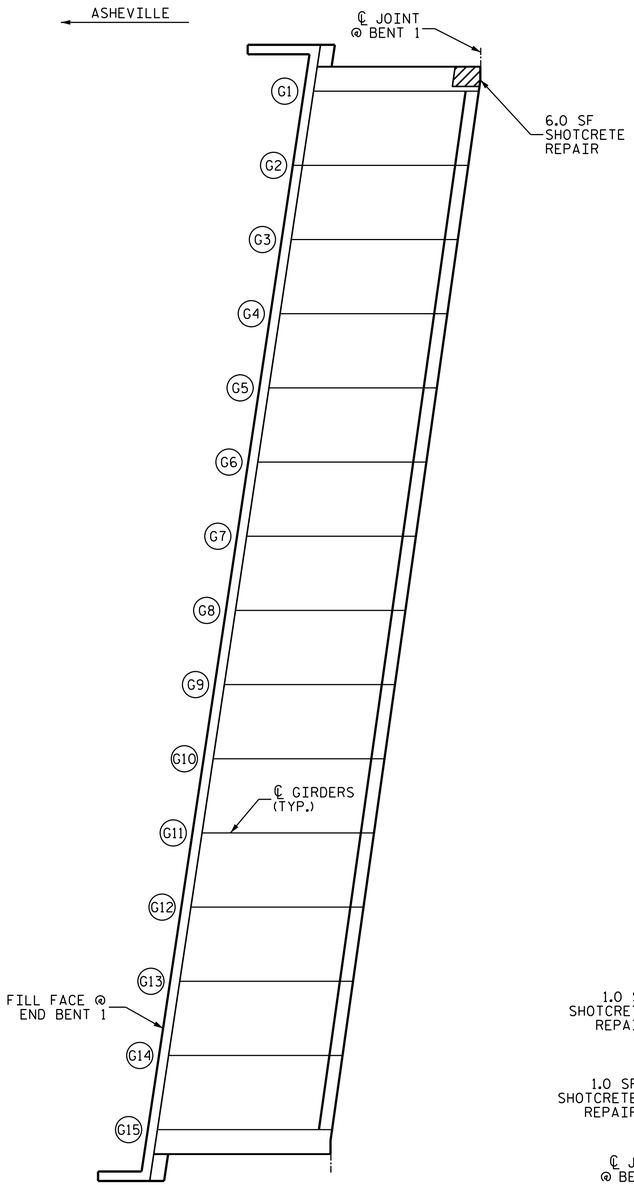
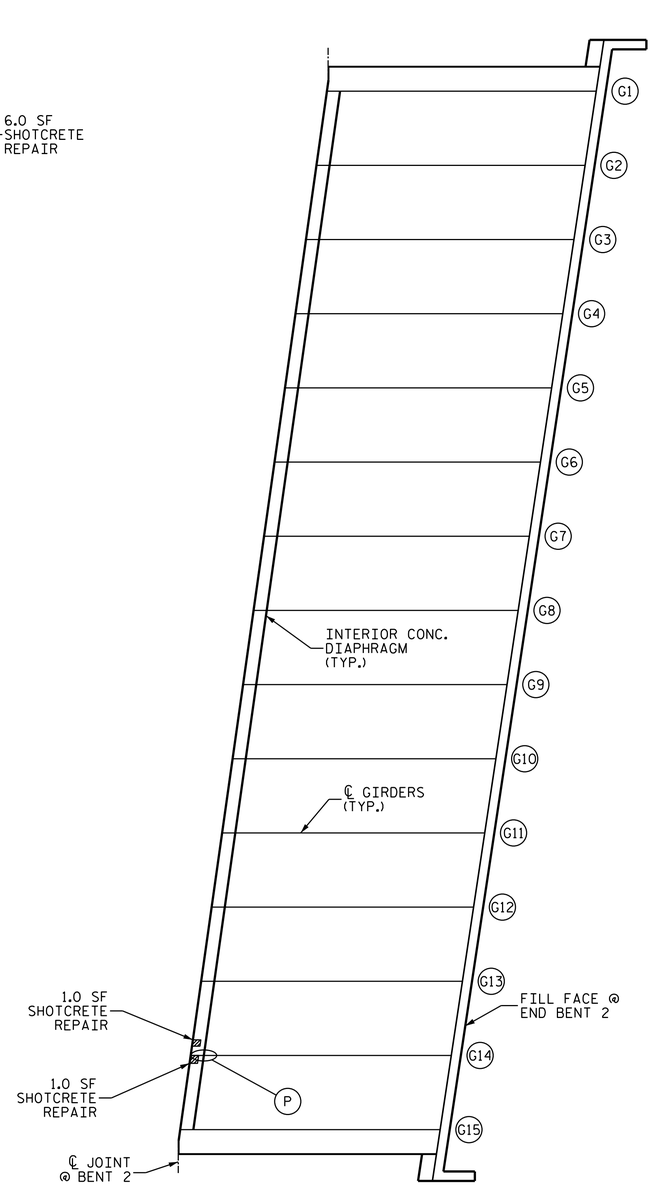


SPAN A
(UNDERSIDE)



SPAN C
(UNDERSIDE)

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN A

	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR CONCRETE DIAPHRAGM	0.0	0.0		
OVERHANG	6.0	3.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR CONCRETE DIAPHRAGM	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
UNDERSIDE OF DECK		0.0		
INTERIOR CONCRETE DIAPHRAGM		0.0		
OVERHANG		0.0		

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN C

	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR CONCRETE DIAPHRAGM	2.0	1.0		
OVERHANG	0.0	0.5		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR CONCRETE DIAPHRAGM	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
UNDERSIDE OF DECK		0.0		
INTERIOR CONCRETE DIAPHRAGM		0.0		
OVERHANG		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR UNDERSIDE OF DECK REPAIRS. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR OVERHANG REPAIRS. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR BEAM PLATING REPAIR. SEE "BEAM PLATING REPAIR DETAILS" SHEETS.

(1) BEAM NUMBER
(B) BEAM END REPAIR
(P) PLATING REPAIR
(S) STIFFENER REPAIR
(D) STEEL DIAPHRAGM REPLACEMENT

SHOTCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

ANTICIPATED STEEL REPAIR LOCATIONS

SPAN	BEAM	LOCATION	DIM "A"	DIM "B"	DIM "E"
C	G14	BENT 1	-	9½"	4"

FOR BEAM REPAIR DIMENSIONS, SEE "BEAM PLATING REPAIR DETAILS" SHEETS 1 & 2.

BEAM REPAIR QUANTITY TABLE

BOLTED STEEL PLATES		STEEL PLATES		STIFFENER		STEEL DIAPHRAGM	
LBS.		LBS.		LBS.		LBS.	
ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
8.1		0.0		0.0		0.0	

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 488

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNDERSIDE OF DECK SPAN A & C

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

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ASHEVILLE

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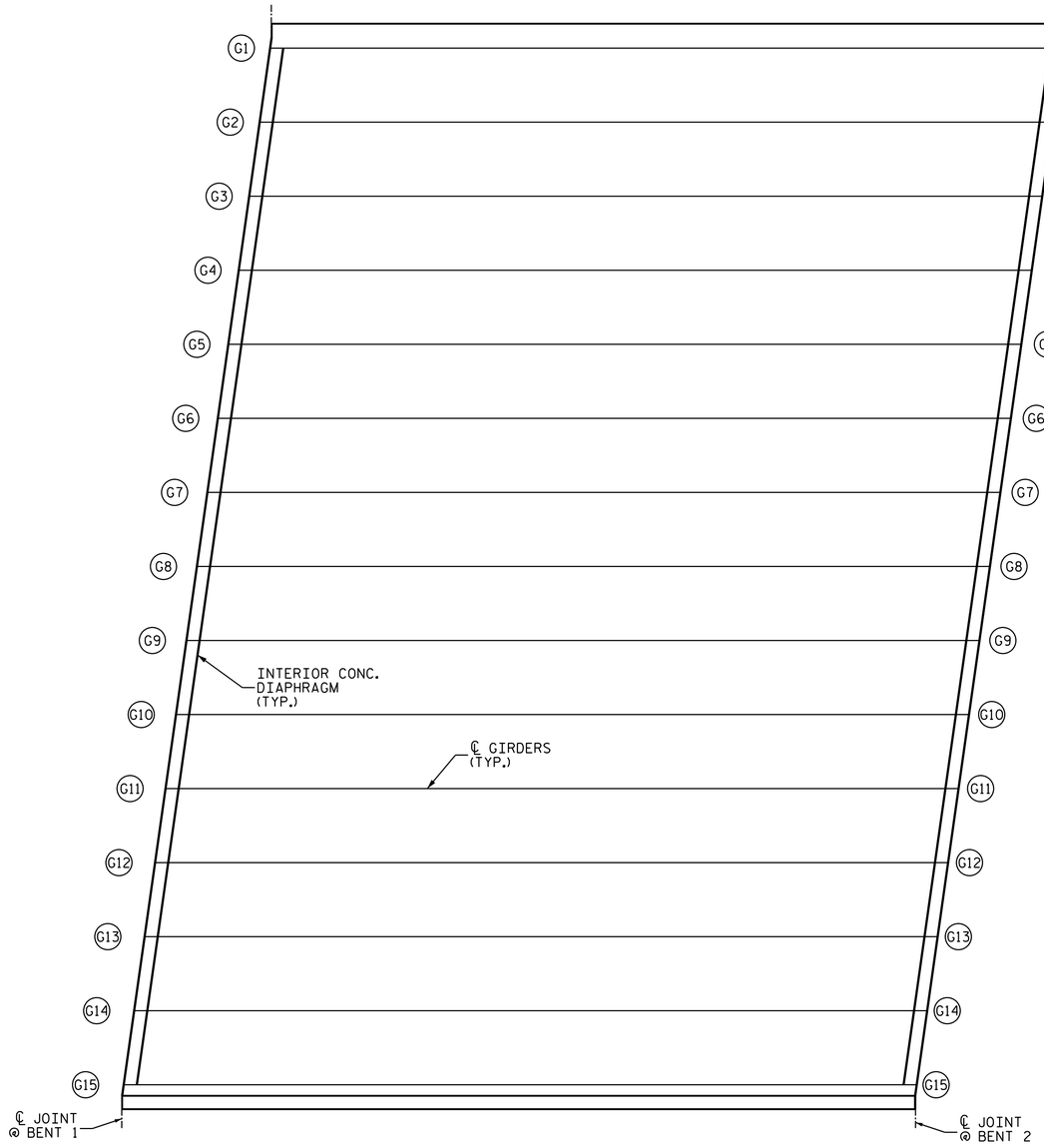

SPAN B

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN B

	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK				
INTERIOR CONCRETE DIAPHRAGM	0.0	0.0		
OVERHANG	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
INTERIOR CONCRETE DIAPHRAGM	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
UNDERSIDE OF DECK		0.0		
INTERIOR CONCRETE DIAPHRAGM		0.0		
OVERHANG		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR UNDERSIDE OF DECK REPAIRS. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR OVERHANG REPAIRS. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR BEAM PLATING REPAIR. SEE "BEAM PLATING REPAIR DETAILS" SHEETS.

(I) BEAM NUMBER
(B) BEAM END REPAIR
(P) PLATING REPAIR
(S) STIFFENER REPAIR
(D) STEEL DIAPHRAGM REPLACEMENT

SHOTCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 488

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNDERSIDE OF DECK SPAN B

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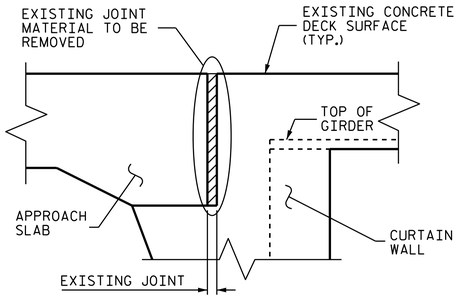
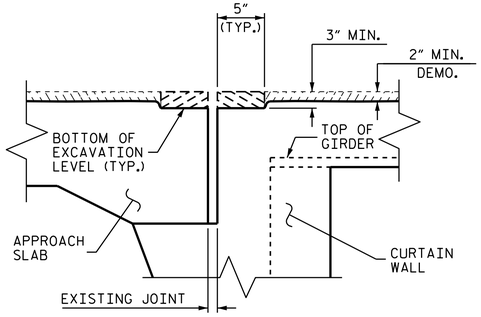
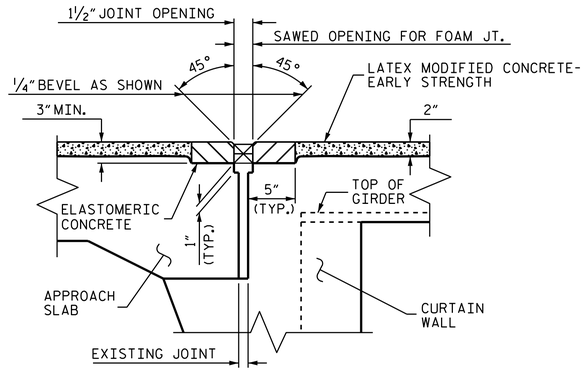


SECTION A-A
(EXISTING JOINT)



SECTION A-A
(MINIMUM EXISTING JOINT DEMOLITION)



SECTION A-A
(PROPOSED FOAM JOINT SEAL)

NOTES

THE FOAM JOINTS SHALL MEET THE MANUFACTURER'S RECOMMENDATION.

THE FOAM JOINTS SHALL MEET THE MANUFACTURER'S RECOMMENDATION FOR THE SIZE OF OPENING ON THE PLANS, AND ACCOMMODATE THE MINIMUM EXPANSION SHOWN ON THE PLANS.

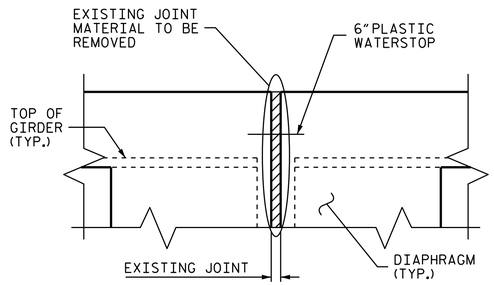
CONTRACTOR SHALL FIELD VERIFY THE EXISTING JOINT OPENING PRIOR TO ORDERING JOINT SEAL MATERIAL. IF ACTUAL JOINT OPENING VARIES FROM OPENING INDICATED IN DETAIL BY MORE THAN ¼", NOTIFY ENGINEER.

THE INSTALLED FOAM JOINTS SHALL BE WATER TIGHT.

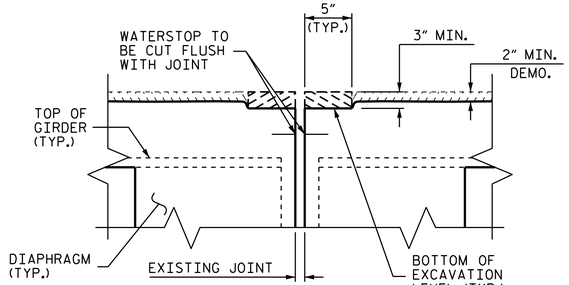
FOR FOAM JOINT SEALS FOR PRESERVATION, SEE SPECIAL PROVISIONS.

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

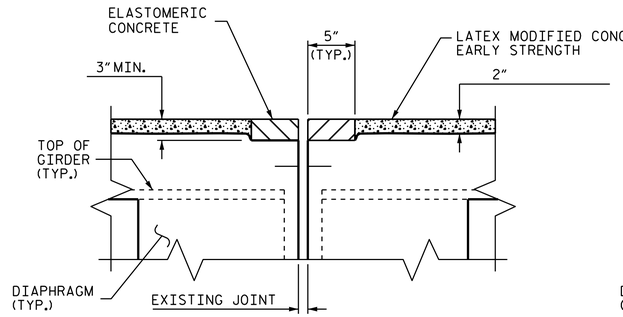
JOINT REPAIR QUANTITY TABLE		
	ESTIMATE	ACTUAL
FOAM JOINT SEALS FOR PRESERVATION	323.6 LIN. FT.	



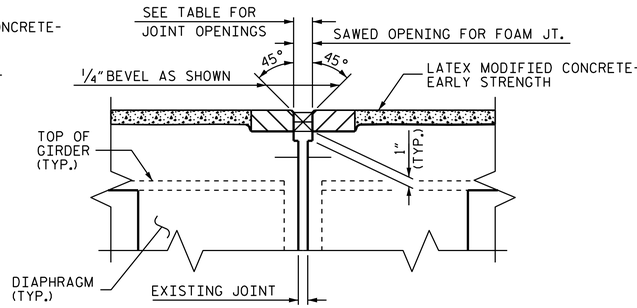
SECTION B-B
(EXISTING JOINT)



SECTION B-B
(MINIMUM EXISTING JOINT DEMOLITION)



SECTION B-B
(PROPOSED JOINT PRE-SAWED)

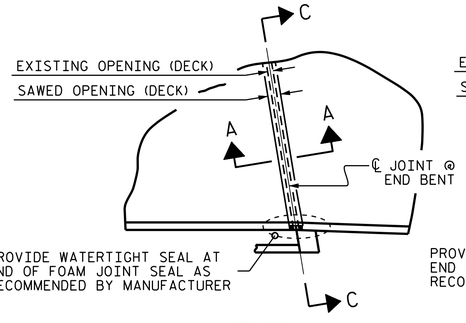


SECTION B-B
(PROPOSED FOAM JOINT SEAL)

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

DEMOLISH BRIDGE JOINT AREA TO THE NECESSARY DEPTH, SUCH THAT ELASTOMERIC CONCRETE SHALL BE FOUNDED ON CONCRETE OR REPAIR CONCRETE SUBSTRATE, NOT LATEX MODIFIED CONCRETE.

SAWED JOINT OPENING TABLE			
	SAWED JT. OPENING (PERPINDICULAR TO JT.)		
LOCATION BRIDGE 488	AT 45°	AT 60°	AT 90°
BENT 1	1 3/16"	1 3/16"	1 1/2"
BENT 2	1 11/16"	1 3/16"	1 5/16"



PLAN
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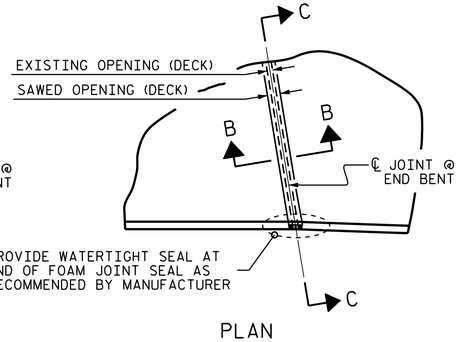

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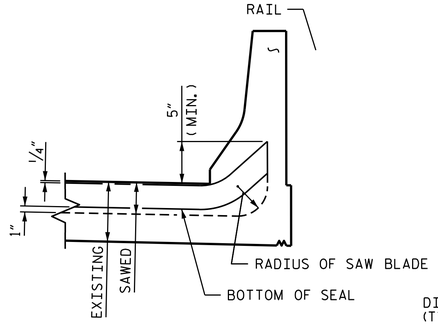

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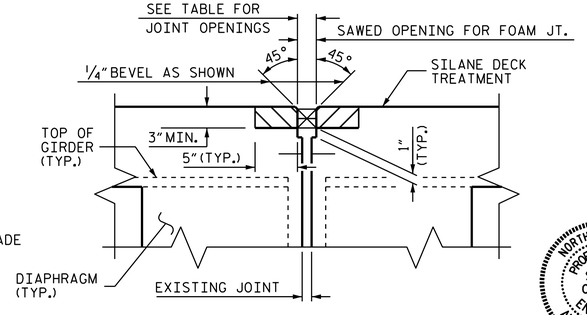

SECTION D-D
(PROPOSED FOAM JOINT SEAL)

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: 11/21/2018

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 484

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS
LMC OVERLAY

JOINT SEAL DETAILS

DRAWN BY : CL BRIGHT DATE : 10/2018
CHECKED BY : A.M. LEE DATE : 10/2018

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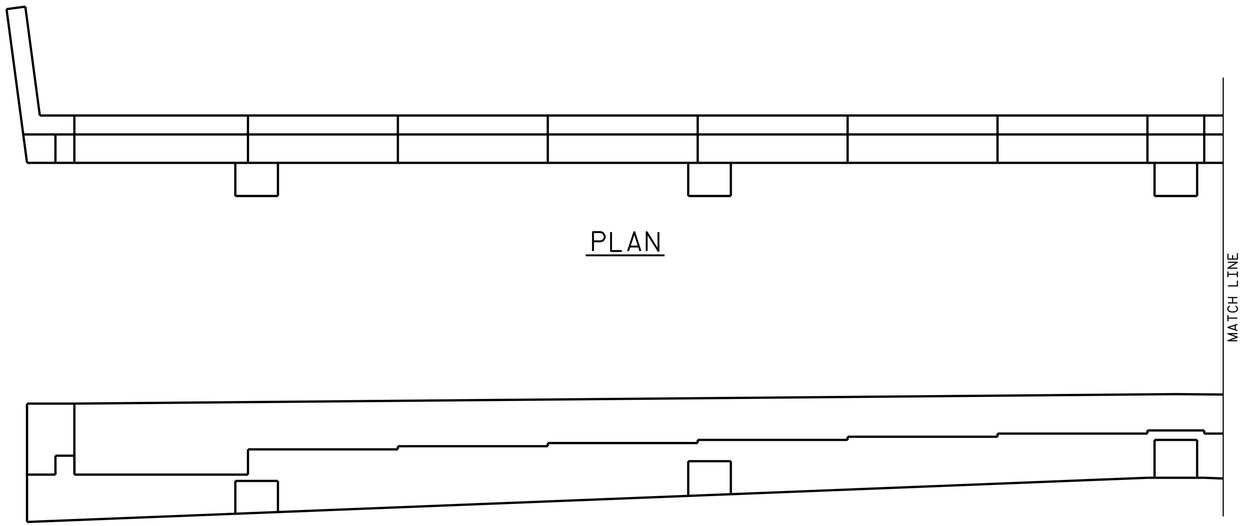
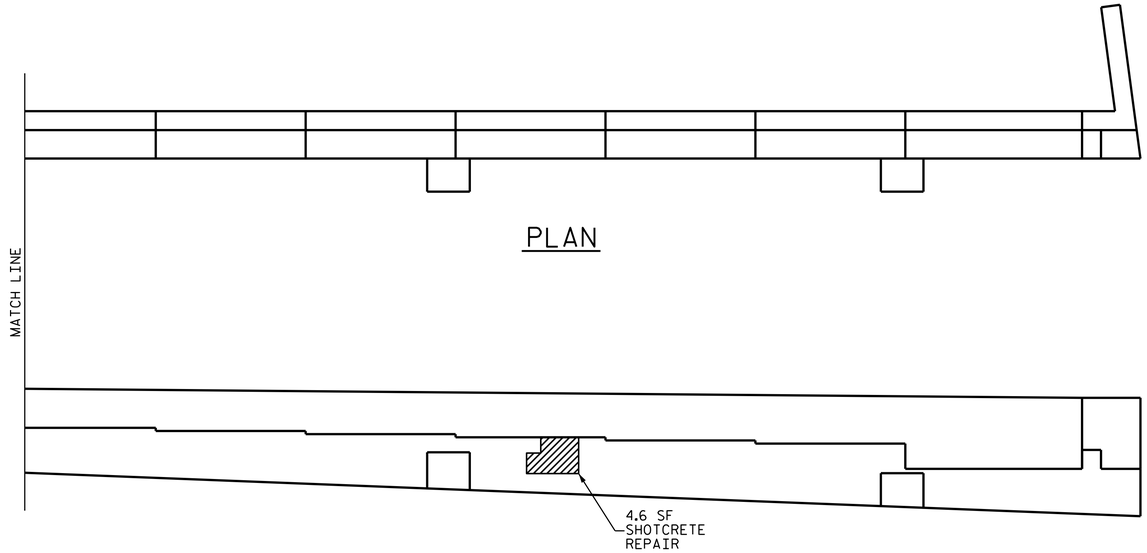


PLAN

ELEVATION



PLAN

ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

END BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	4.6	2.3		
CURTAIN WALL	0.0	0.0		
WING WALL	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
CURTAIN WALL	0.0	0.0		
WING WALL				
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
CURTAIN WALL		0.0		
WING WALL				
EPOXY COATING		SQ. FT.	SQ. FT.	
CAP		175.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1"BEHIND REBAR AND MINIMUM 2"CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 488

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by:
Amber Lee
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11/21/2018

DRAWN BY : M. WELDON DATE : 08/18
CHECKED BY : C. BRIGHT DATE : 10/18

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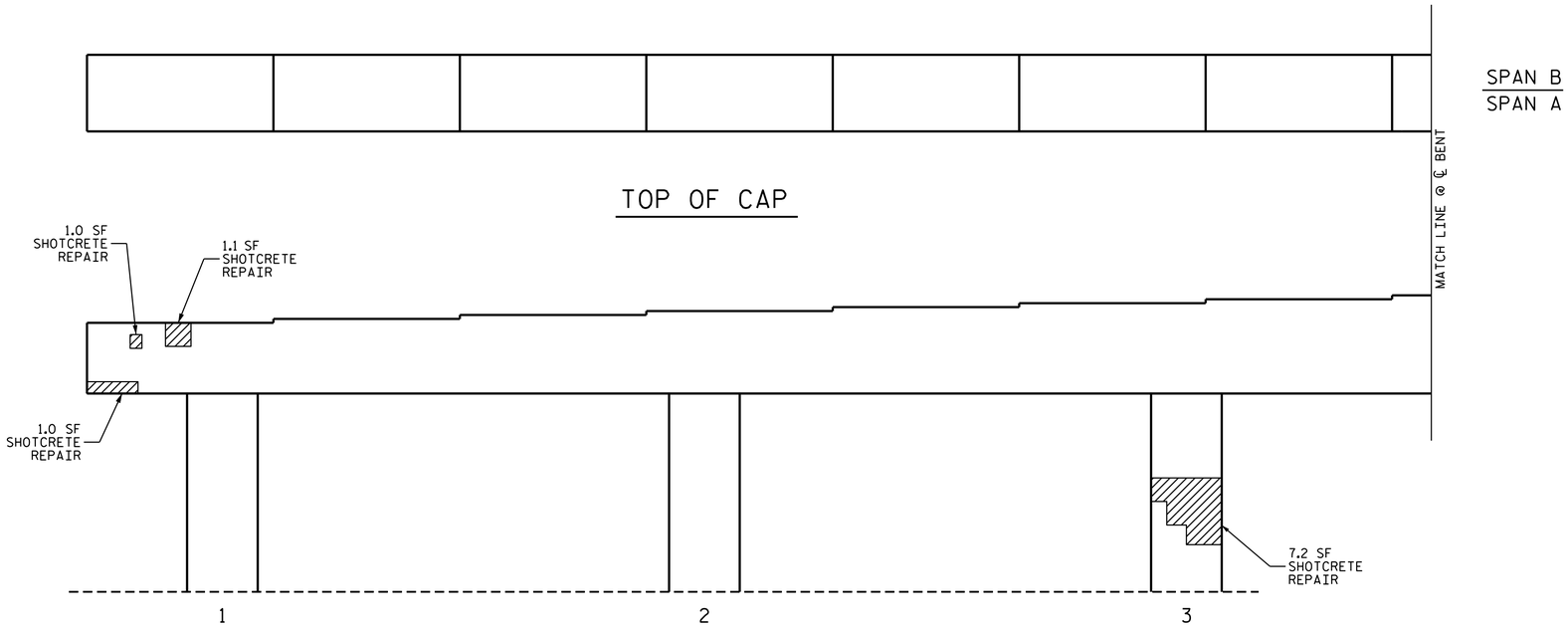

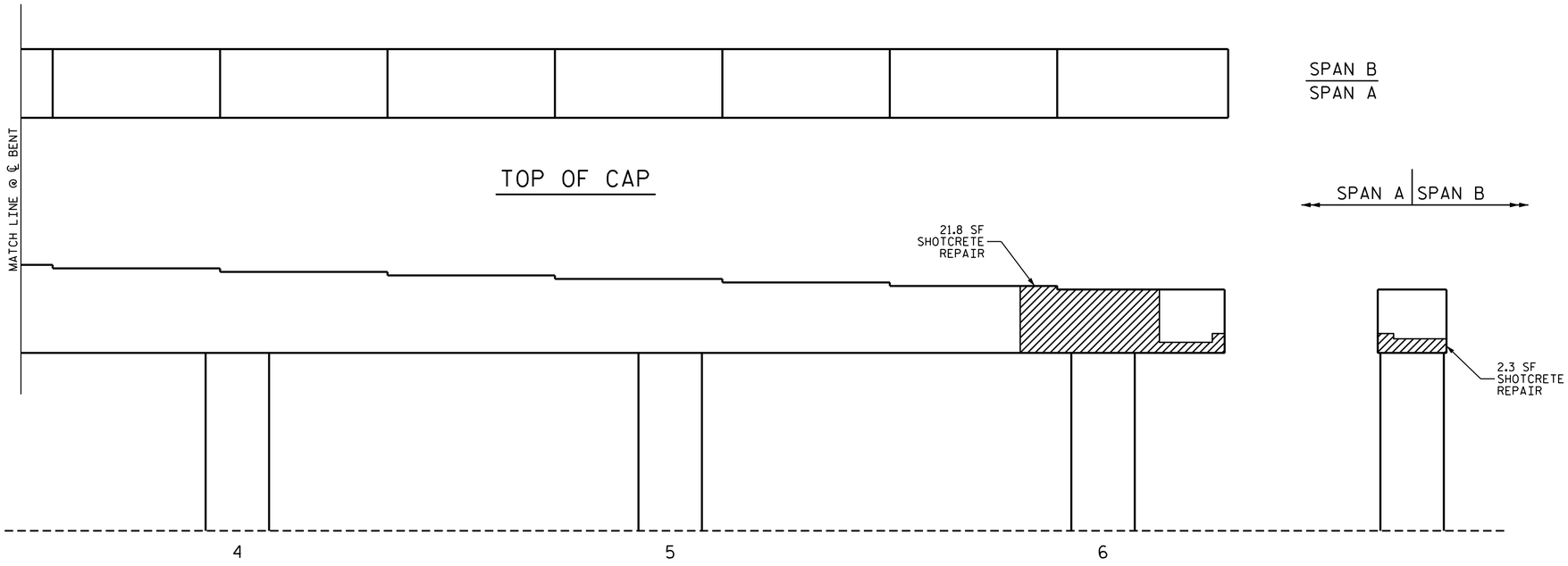

AS-BUILT REPAIR QUANTITY TABLE

BENT 1 SPAN A FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	27.2	13.6		
COLUMN	7.2	3.6		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
TOP OF BENT CAP		371.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 488

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: B0B5A4F3FAD484...
11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 1 SPAN A FACE

DRAWN BY : R. PUTEK/ M. WELDON DATE : 06/18
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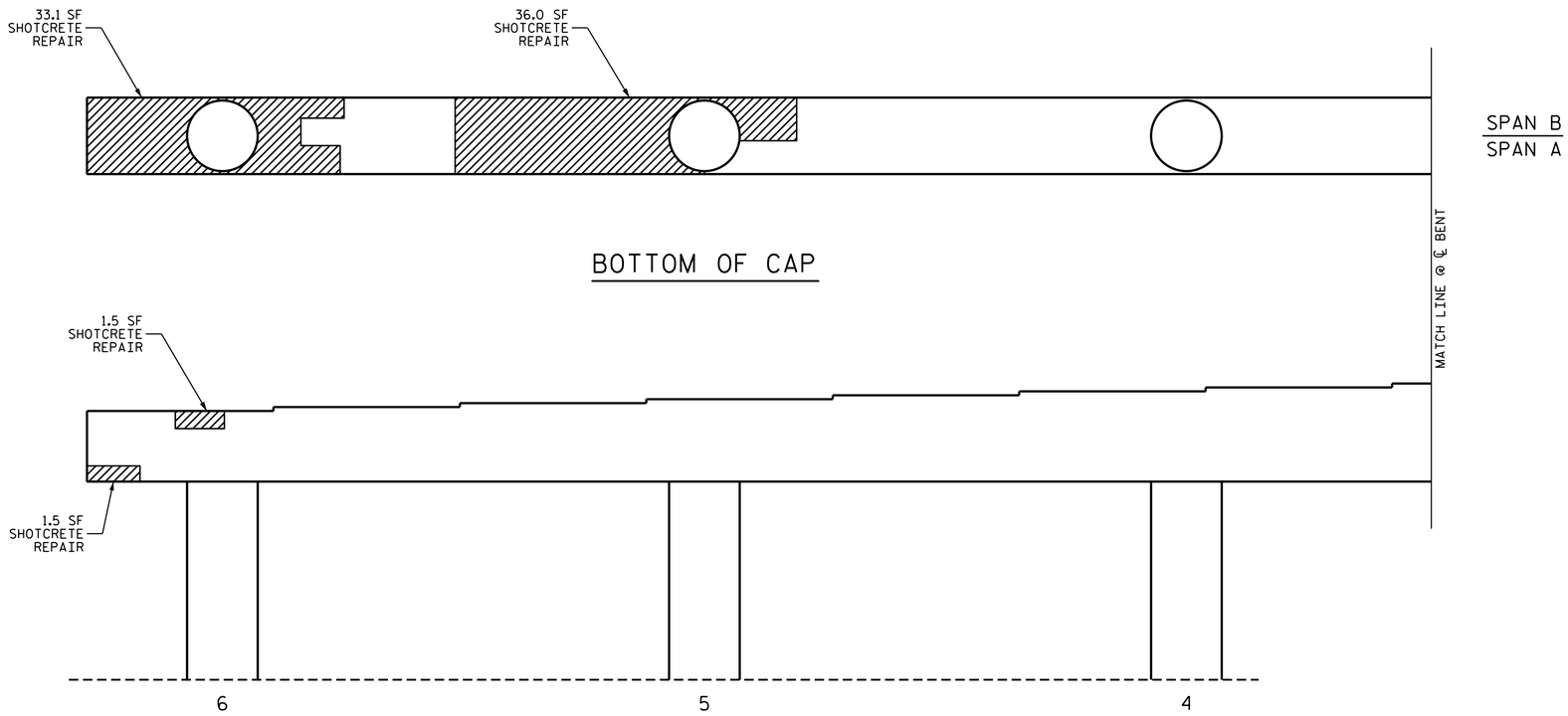

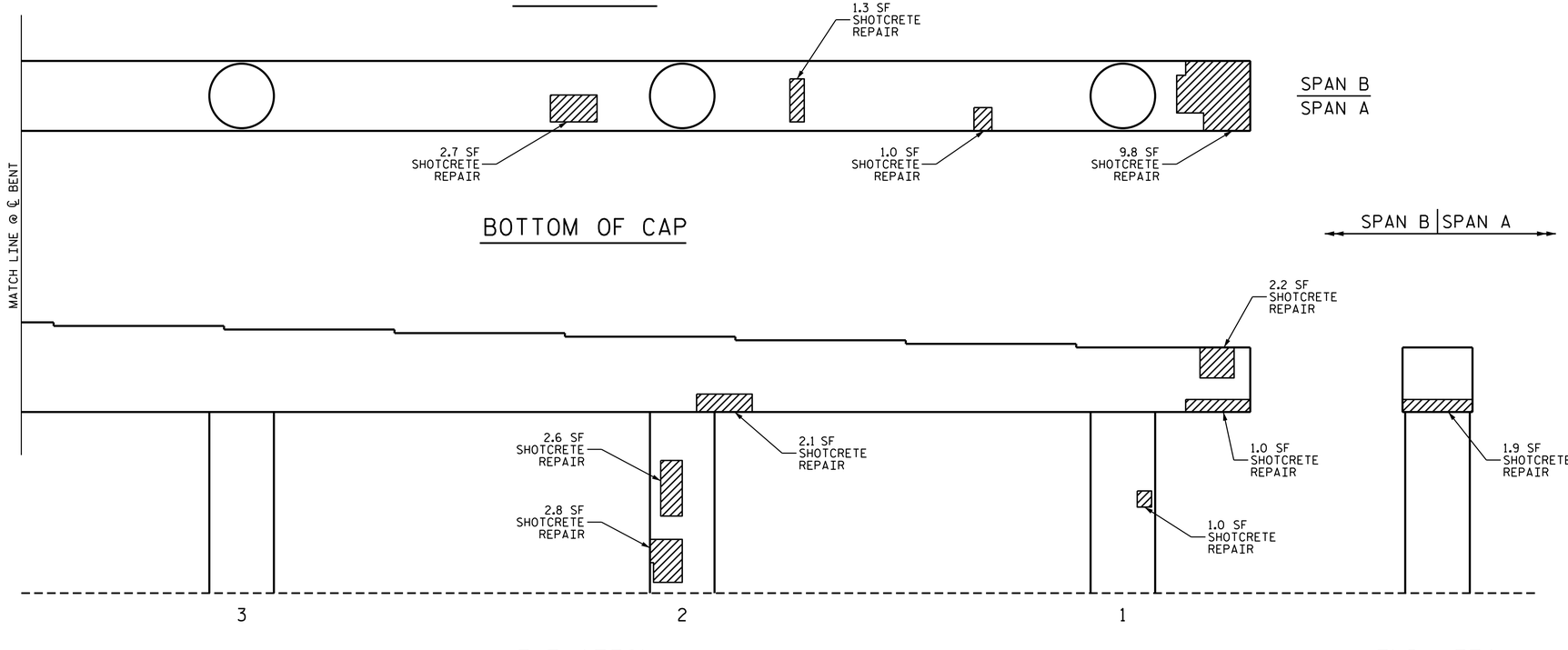

AS-BUILT REPAIR QUANTITY TABLE

BENT 1 SPAN B FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	94.1	47.1		
COLUMN	6.4	3.2		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 488

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 1 SPAN B FACE

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

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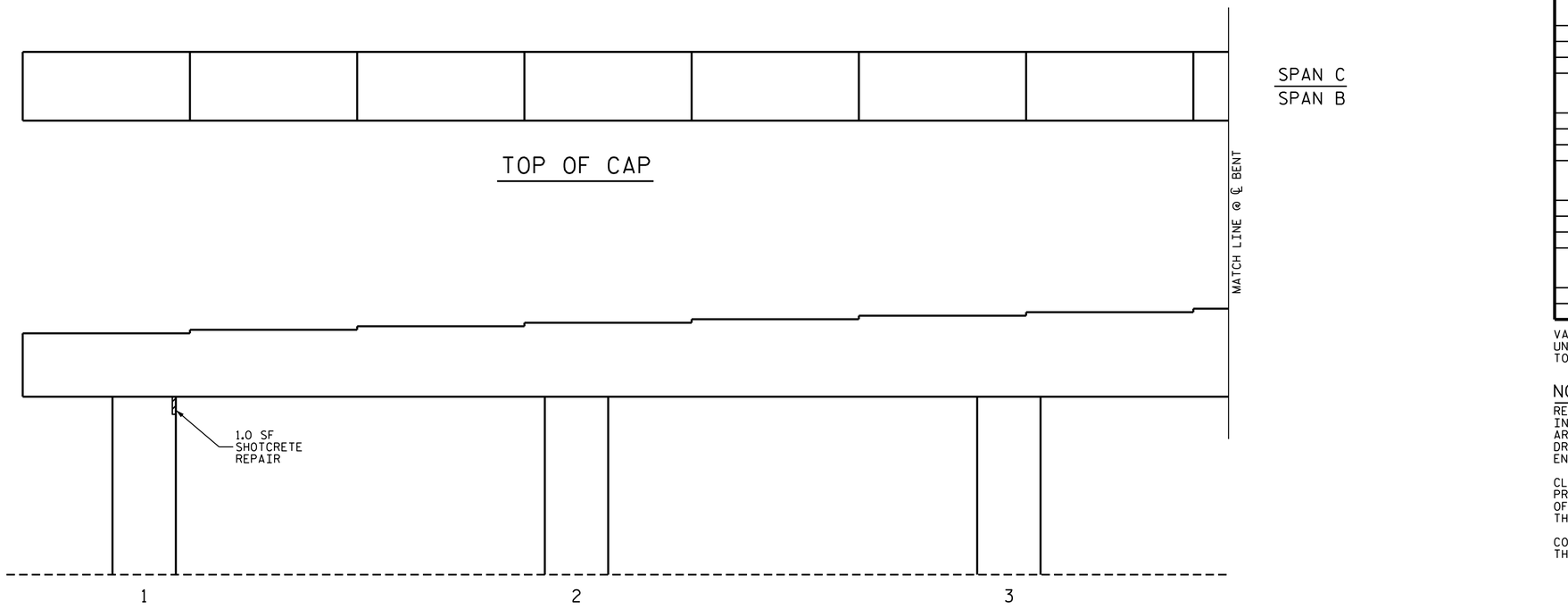

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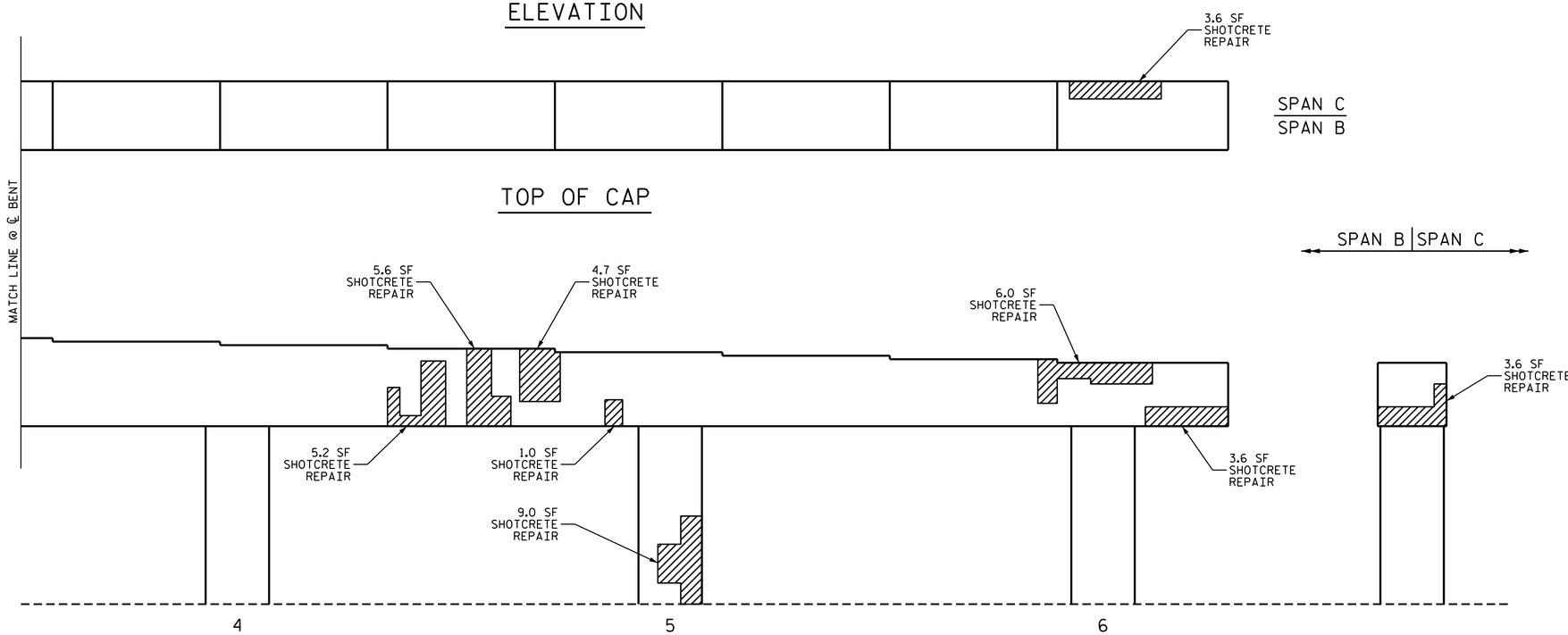

ELEVATION

END VIEW

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

AS-BUILT REPAIR QUANTITY TABLE

BENT 2 SPAN B FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	33.3	16.7		
COLUMN	10.0	5.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
TOP OF BENT CAP		371.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

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

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 488

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee
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11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 2
SPAN B FACE

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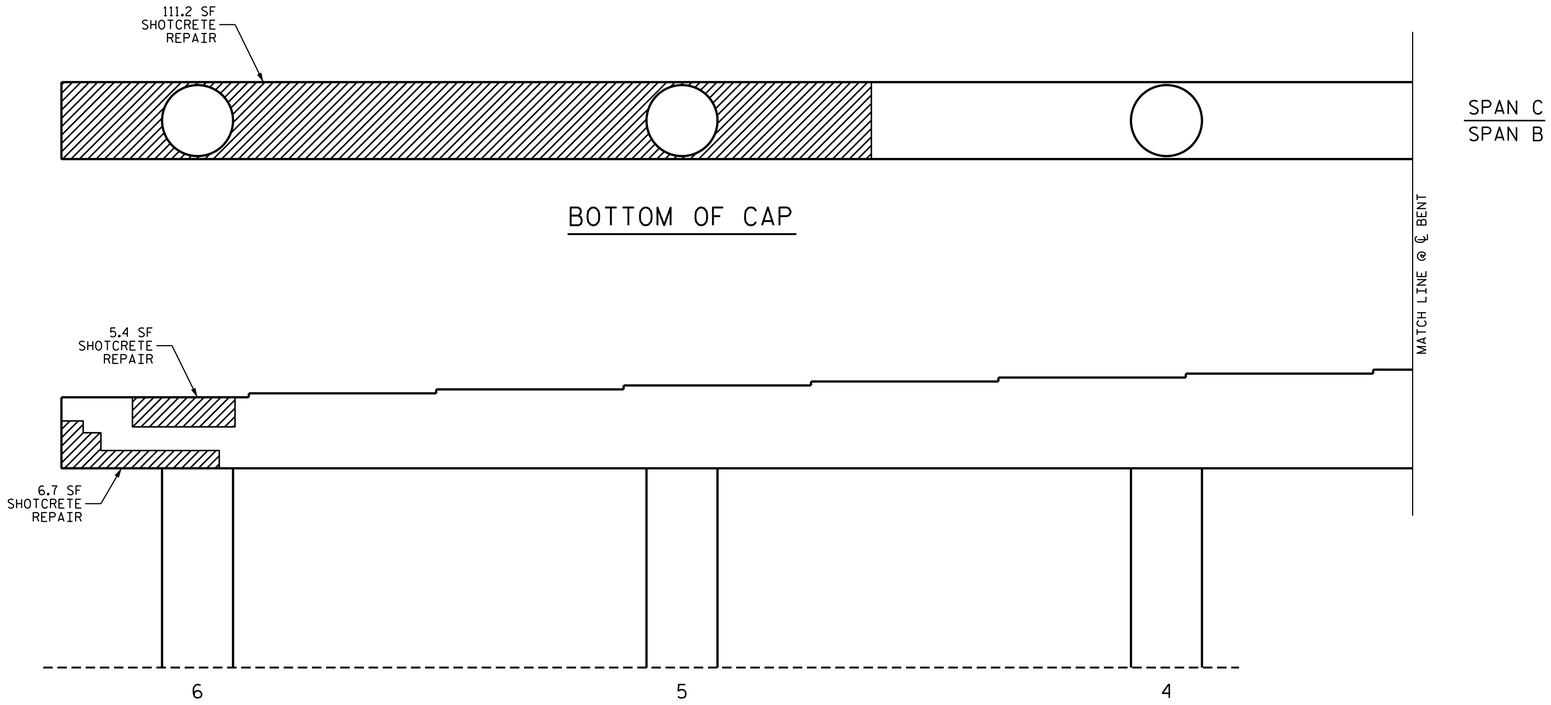

AS-BUILT REPAIR QUANTITY TABLE

BENT 2 SPAN C FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	182.7	91.4		
COLUMN	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 488

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee
11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 2 SPAN C FACE

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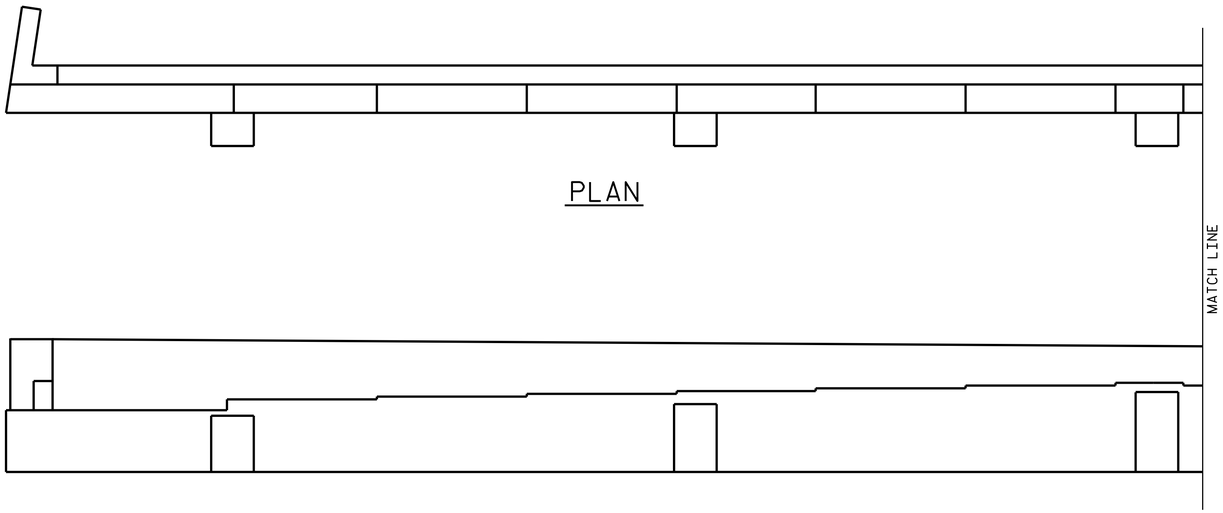
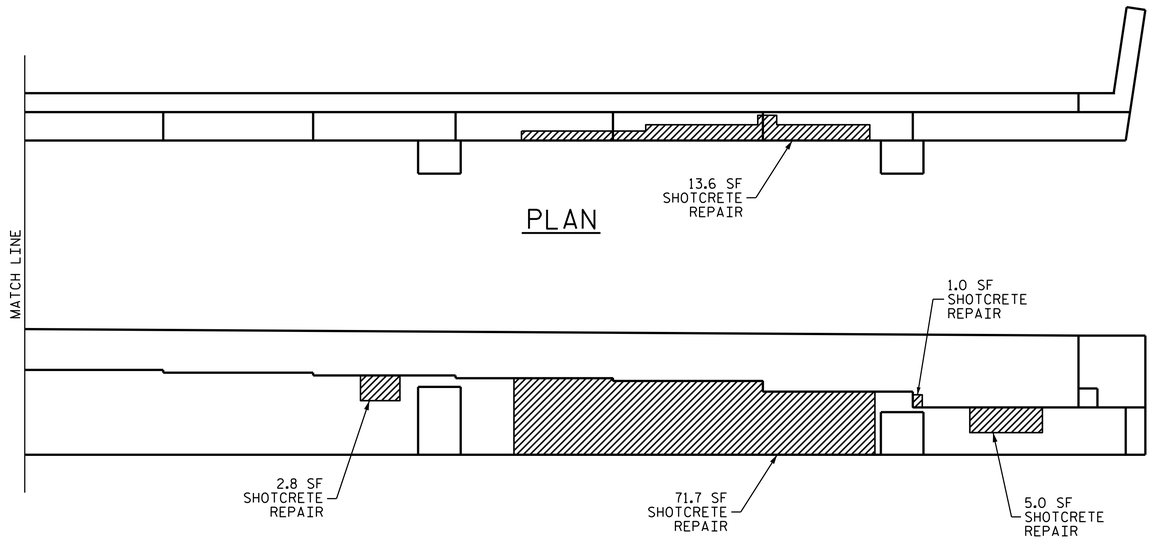


PLAN

ELEVATION



PLAN

ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

END BENT 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	93.1	46.6		
CURTAIN WALL	1.0	0.5		
WING WALL	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
CURTAIN WALL	0.0	0.0		
WING WALL				
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
CURTAIN WALL		0.0		
WING WALL				
EPOXY COATING		SQ. FT.	SQ. FT.	
CAP		182.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1"BEHIND REBAR AND MINIMUM 2"CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

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SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 488

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Miller B04B5AAF2FAD484...
11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 2

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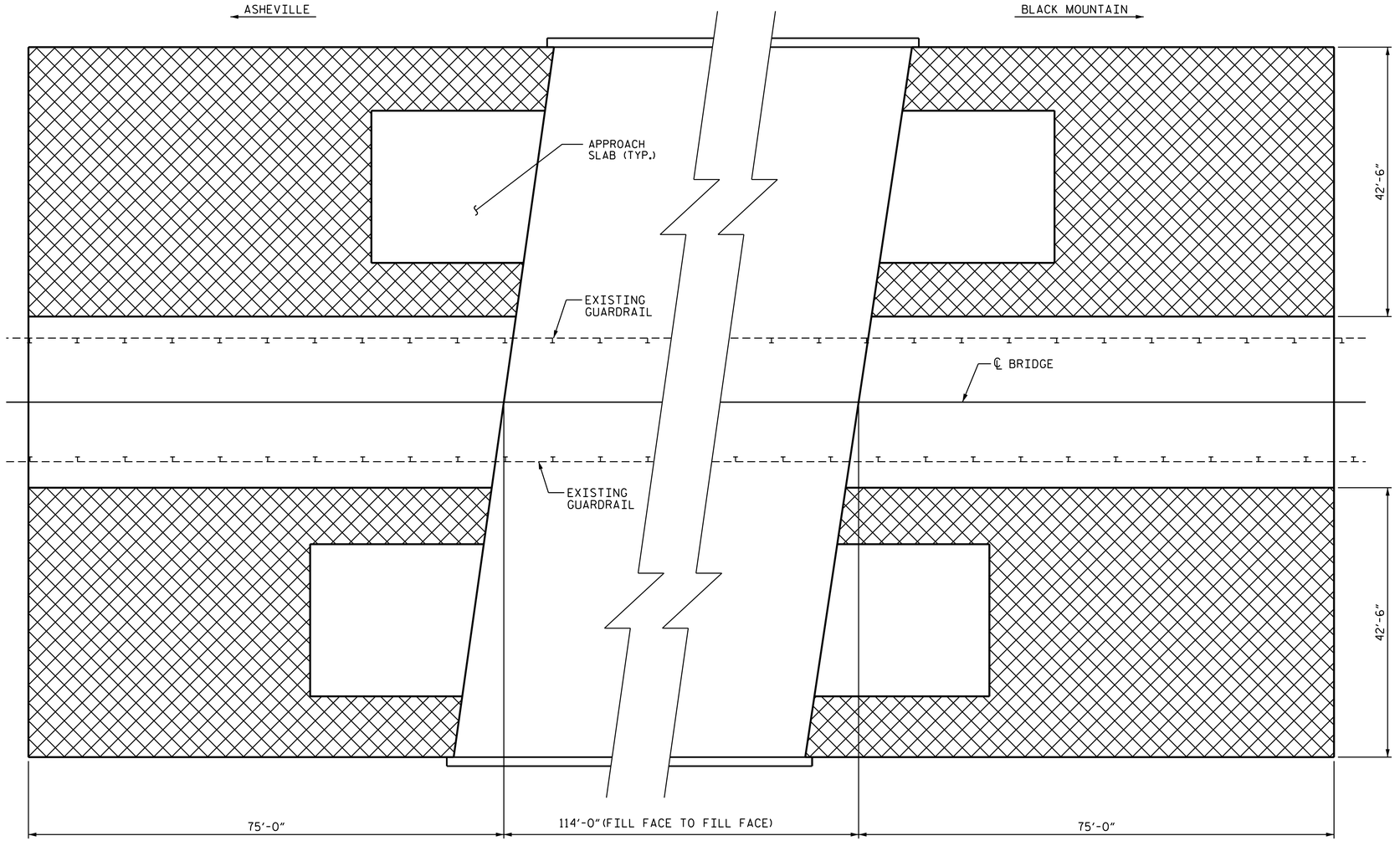


NOTES

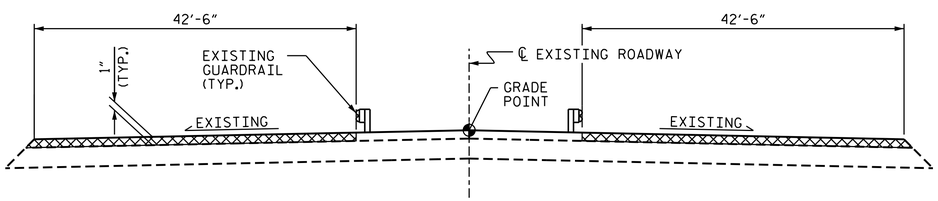
INCIDENTAL MILLING - EXISTING APPROACH ASPHALT PAVEMENT TO BE MILLED AS NECESSARY TO ATTAIN MINIMUM 1½" DEPTH OF NEW ASPHALT PAVEMENT. NEW ASPHALT PAVEMENT SHALL BE OF THICKNESS NECESSARY TO PROVIDE A SMOOTH TRANSITION BETWEEN THE ROADWAY AND THE BRIDGE DECK. THE NEW ASPHALT PAVEMENT THICKNESS MAY EXCEED 1½" DUE TO SETTLEMENT OF THE EXISTING APPROACH.

SUMMARY OF QUANTITIES

	ESTIMATE	ACTUAL
INCIDENTAL MILLING	1015 SQ.YDS.	
ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B	90 TONS	
ASPHALT BINDER FOR PLANT MIX	6 TONS	

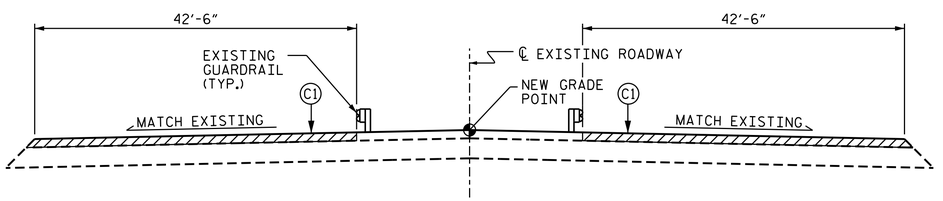
C1	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.

INCIDENTAL MILLING



TYPICAL ROADWAY MILLING SECTION

(MILL TO 1½" DEPTH)



TYPICAL ROADWAY SECTION

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee 11/21/2018

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PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE No.: 488

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH MILLING & TYPICAL ROADWAY SECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-63
1			3			TOTAL SHEETS
2			4			93

DRAWN BY : E.BAYISSA DATE : 10/2018

CHECKED BY : A. M. LEE DATE : 10/2018

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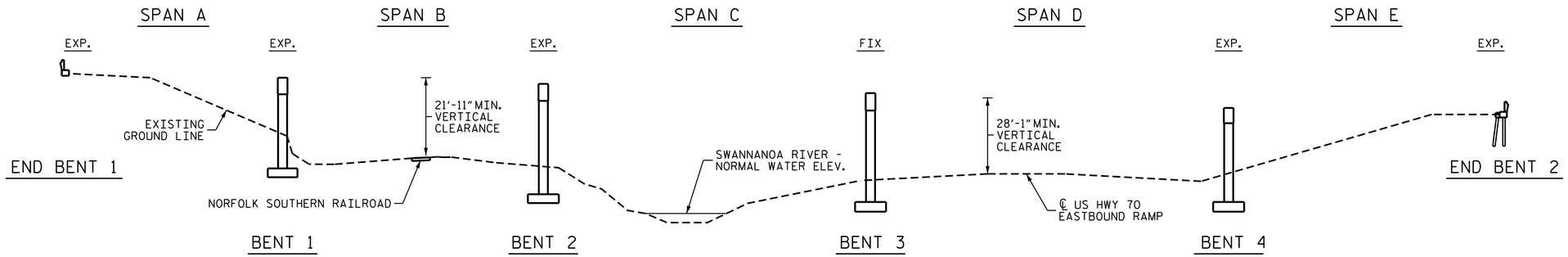
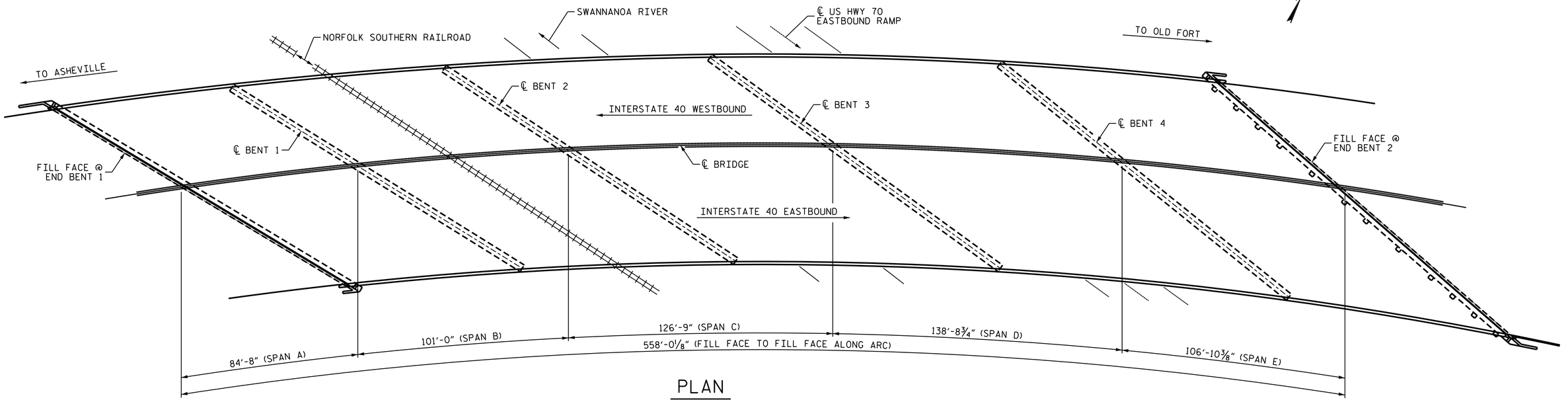
NOTES

GENERAL DRAWING INFORMATION IS TAKEN FROM THE ORIGINAL PLANS AND THE ROUTINE INSPECTION REPORT DATED 11/13/2017.

BRIDGE ORIENTATION CONFORMS TO EXISTING BRIDGE PLANS.



SECTION ALONG ℄ ROADWAY



PLAN

SCOPE OF WORK

- CLEAN, BEAM REPAIR PLATING AND REPAINT EXISTING WEATHERING STEEL.
- EPOXY RESIN INJECTION OF CONCRETE CRACKS.
- REMOVE UNSOUND CONCRETE AND PROPERLY PREPARE SHOTCRETE AND CONCRETE REPAIR AREAS.
- PERFORM SHOTCRETE AND CONCRETE REPAIRS IN PREPARED AREAS.
- PARTIALLY REMOVE BRIDGE DECK CONCRETE BY SCARIFICATION AND HYDRO-DEMOLITION METHODS.
- OVERLAY PREPARED BRIDGE DECK WITH LATEX MODIFIED CONCRETE - EARLY STRENGTH (LMC-ES).
- GROOVE LMC-ES BRIDGE DECK.
- REPAIR EXPANSION JOINT SEALS.
- REMOVE DEBRIS FROM TOP OF END BENT CAPS AND BENT STRUTS, AND APPLY EPOXY COATING.

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

RESIDENT ENGINEER DATE

NORTH CAROLINA PROFESSIONAL SEAL 22005 ENGINEER A. KEITH PASCHAL

DocuSigned by: A. Keith Paschal F8B6AD6DB2FC48F...
11/21/2018

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: B04B5AAF2FAD464...
11/21/2018

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DRAWN BY : R.L.PUTEK DATE : 09/2018
CHECKED BY : A.M.LEE DATE : 09/2018

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PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 494

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON INTERSTATE 40 OVER THE NORFOLK SOUTHERN RAILROAD, SWANNANOA RIVER, AND U.S. HWY 70 EASTBOUND RAMP

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LOCATION SKETCH

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

BRIDGE COORDINATES

LAT: 35.61900637
LONG: -82.30758165

NOTES

EXISTING DIMENSIONS AND BRIDGE CONDITION ARE FROM THE BEST INFORMATION AVAILABLE.

THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.

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

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

WORK ON THE BRIDGES SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL BELOW OR FALL INTO THE WATER. THE CONTRACTOR SHALL SUBMIT PLANS FOR CONSTRUCTION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS AND THE PROJECT SPECIAL PROVISIONS.

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

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

FOR SCARIFYING OF BRIDGE DECK, HYDRO-DEMOLITION OF BRIDGE DECK, CLASS II SURFACE PREPARATION, AND CLASS III SURFACE PREPARATION, SEE LATEX MODIFIED CONCRETE - EARLY STRENGTH OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS.

THE LMC CONTRACTOR SHALL PROVIDE A METHOD OF HANDLING UNEXPECTED BLOW THROUGH OF THE DECK DURING HYDOR-DEMOLITION.

FOR PLACING AND FINISHING LATEX MODIFIED CONCRETE OVERLAY-EARLY STRENGTH (LMC-ES) AND LATEX MODIFIED CONCRETE-EARLY STRENGTH, SEE LATEX MODIFIED CONCRETE-EARLY STRENGTH SPECIAL PROVISIONS.

LONGITUDINAL CONSTRUCTION JOINTS SHALL BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.

DURING CONSTRUCTION, BERMS OR APPRORIATE MEASURES SHALL BE USED TO ENSURE HYDRO-DEMOLITION WATER DOES NOT MIGRATE INTO ACTIVE TRAVEL LANES.

FOR CONCRETE FOR DECK REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY COATING AND DEBRIS REMOVAL, SEE SPECIAL PROVISIONS.

FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

FOR BEAM REPAIR, SEE SPECIAL PROVISIONS.

FOR BOLTED BEAM REPAIR, SEE SPECIAL PROVISIONS.

FOR PAINTING EXISTING WEATHERING STEEL STRUCTURE, SEE SPECIAL PROVISIONS.

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

FOR WORKING ON, OVER, OR ADJACENT TO RAILROAD RIGHT-OF-WAY, SEE SPECIAL PROVISIONS.

FOR KEEPER ANGLE ASSEMBLY, SEE SPECIAL PROVISIONS.

FOR EXPANSION JOINT SEAL REPAIR, SEE SPECIAL PROVISIONS.

PROJ. NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 494

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON INTERSTATE 40 EASTBOUND & WESTBOUND OVER NORFOLK SOUTHERN RAILROAD, SWANNANOA RIVER, AND U.S. HWY 70 EASTBOUND

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee 11/20/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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DRAWN BY : R.L.PUTEK DATE : 07/18
CHECKED BY : A.M.LEE DATE : 08/18

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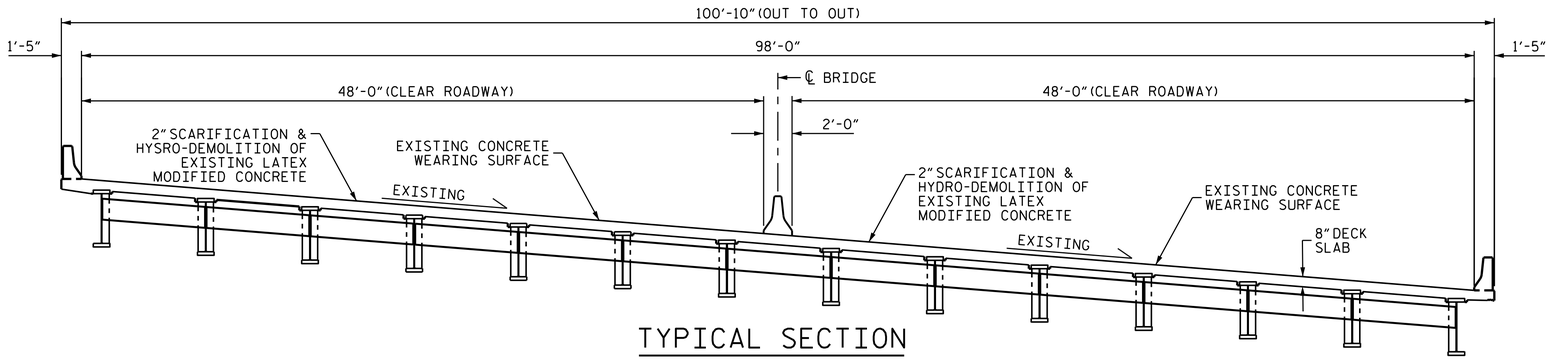
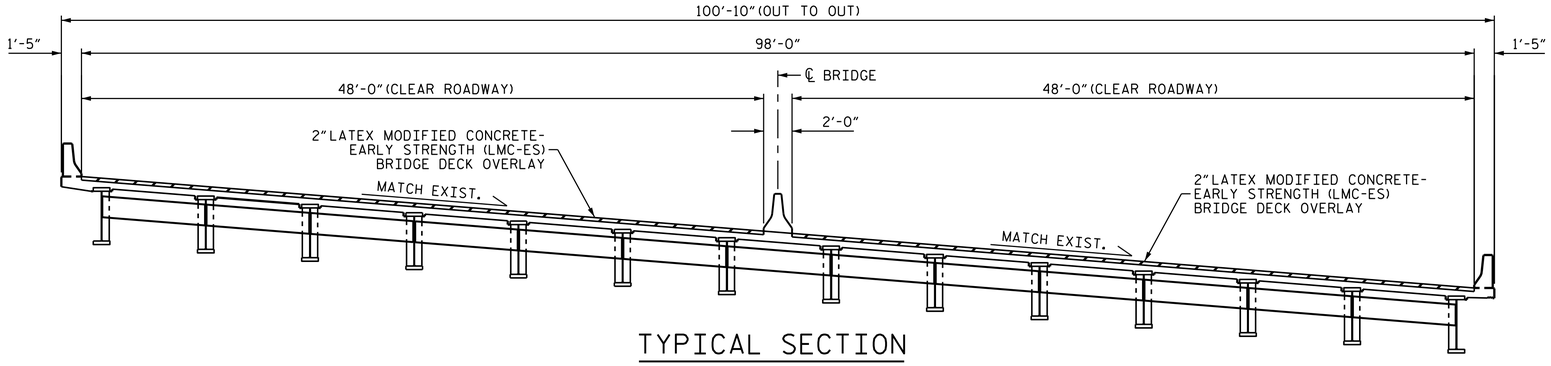


TYPICAL SECTION

(EXISTING WEARING SURFACE)



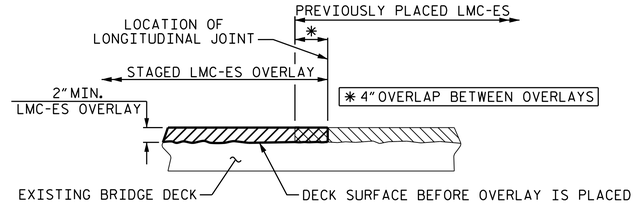
TYPICAL SECTION

(PROPOSED LMC-ES-ES OVERLAY)

NOTES:

WHEN PREPARING THE SURFACE FOR LMC-ES OVERLAY ADJACENT TO THE PREVIOUSLY PLACED LMC-ES STAGE, THE PREVIOUSLY PLACED LMC-ES SHALL BE SAW-CUT TO THE FULL DEPTH OF THE LMC-ES AT THE CENTERLINE OF THE BRIDGE AND ALL LMC-ES-ES IN THE 4" OVERLAP SHALL BE REMOVED WITH HAND TOOLS PRIOR TO PLACEMENT OF LMC-ES IN THE SECOND STAGE.

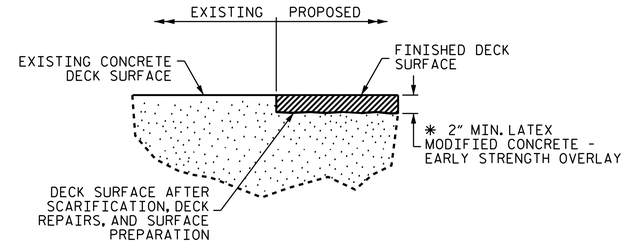
SEE TRAFFIC MANAGEMENT PLANS FOR LANE WIDTHS, SEQUENCING, AND OTHER TRAFFIC CONTROL MEASURES FOR STAGING OF OVERLAY SURFACE PREPARATION AND LMC-ES PLACEMENT.



SECTION THRU DECK

STAGED LMC-ES OVERLAY JOINT

(AS NEEDED)



DETAIL FOR LATEX MODIFIED CONCRETE-EARLY STRENGTH OVERLAY

(FINISHED SURFACE OF THE LATEX MODIFIED CONCRETE - EARLY STRENGTH OVERLAY IS APPROXIMATE)

PROJECT NO. I-5890

BUMCOMBE COUNTY

BRIDGE NO. 494

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee B04B5AAF2F AD484...

11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION

DRAWN BY :	E. CABBELL	DATE :	10/18
CHECKED BY :	R.L.PUTEK	DATE :	10/18

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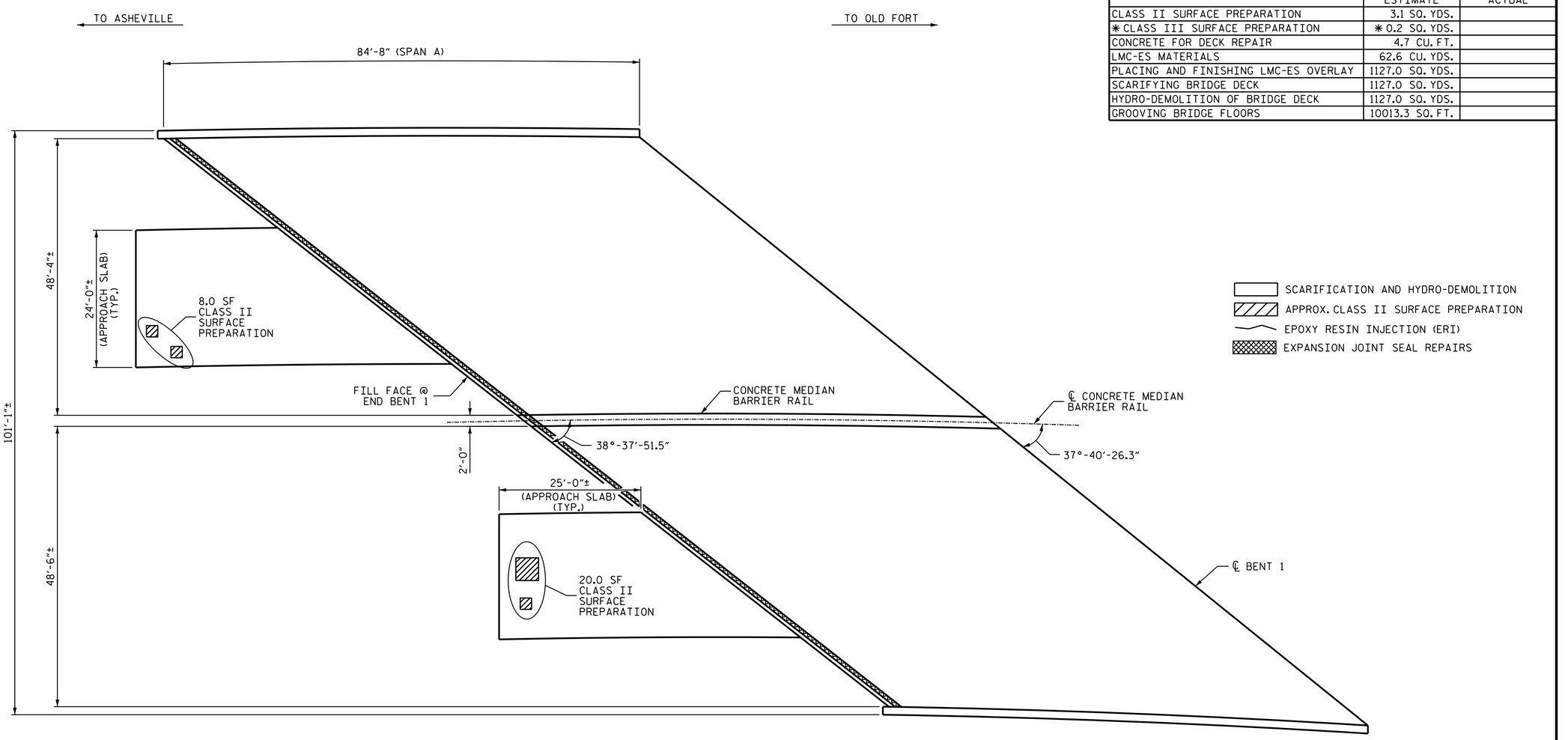
AS-BUILT REPAIR QUANITY TABLE

TOP OF DECK REPAIR SPAN A

	ESTIMATE	ACTUAL
CLASS II SURFACE PREPARATION	3.1 SQ. YDS.	
✳ CLASS III SURFACE PREPARATION	✳ 0.2 SQ. YDS.	
CONCRETE FOR DECK REPAIR	4.7 CU. FT.	
LMC-ES MATERIALS	62.6 CU. YDS.	
PLACING AND FINISHING LMC-ES OVERLAY	1127.0 SQ. YDS.	
SCARIFYING BRIDGE DECK	1127.0 SQ. YDS.	
HYDRO-DEMOLITION OF BRIDGE DECK	1127.0 SQ. YDS.	
GROOVING BRIDGE FLOORS	10013.3 SQ. FT.	



SPAN A

NOTES

✳ CLASS III SURFACE PREPARATION IS NOT ANTICIPATED. A TOKEN PAY ITEM IS INDICATED FOR PRICING PURPOSES IN THE EVENT UNANTICIPATED CLASS III AREAS ARE ENCOUNTERED.

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

PAYMENT FOR CLASS II & CLASS III SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING HYDRO-DEMOLITION OF THE BRIDGE DECK. SEE SPECIAL PROVISIONS.

FOR EXPANSION JOINT SEAL REPAIRS, SEE "EXPANSION JOINT SEAL REPAIR DETAILS," SHEET S-75.

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 494

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS SPAN A AND APPROACH SLABS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by:
Amber Lee
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11/21/2018

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1			3			TOTAL SHEETS
2			4			93

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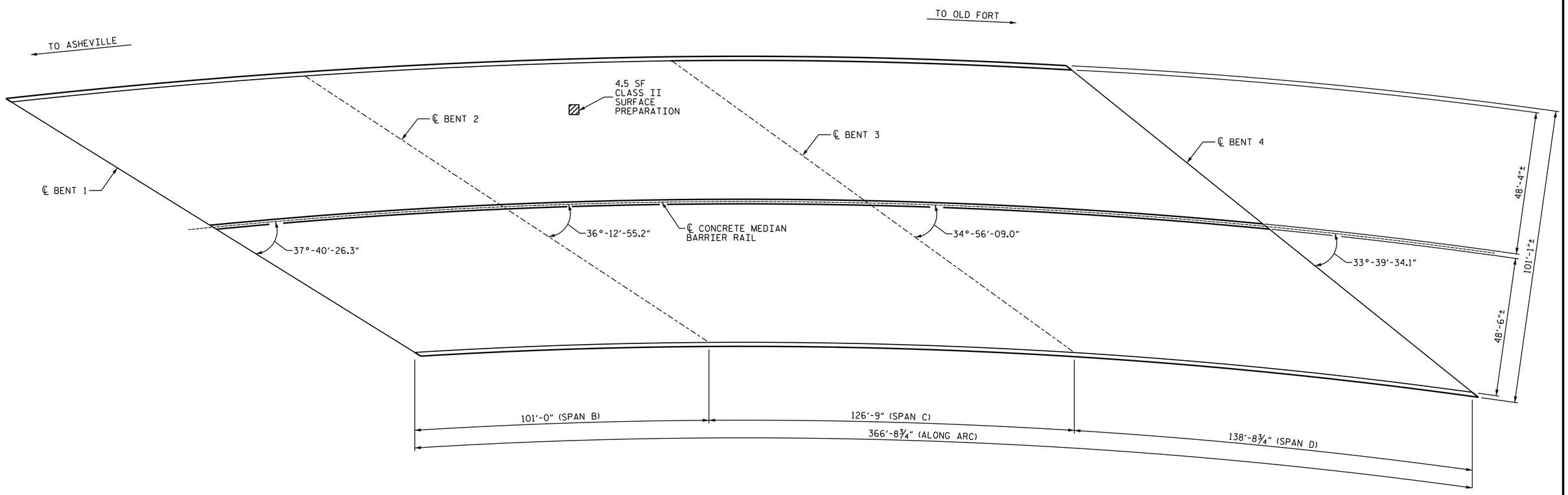

PLAN

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIR SPAN B			TOP OF DECK REPAIR SPAN C			TOP OF DECK REPAIR SPAN D		
	ESTIMATE	ACTUAL		ESTIMATE	ACTUAL		ESTIMATE	ACTUAL
CLASS II SURFACE PREPARATION	0.0 SQ. YDS.		CLASS II SURFACE PREPARATION	0.5 SQ. YDS.		CLASS II SURFACE PREPARATION	0.0 SQ. YDS.	
CLASS III SURFACE PREPARATION	✱0.2 SQ. YDS.		CLASS III SURFACE PREPARATION	✱0.2 SQ. YDS.		CLASS III SURFACE PREPARATION	✱0.2 SQ. YDS.	
CONCRETE FOR DECK REPAIRS	0.0 CU. FT.		CONCRETE FOR DECK REPAIRS	0.8 CU. FT.		CONCRETE FOR DECK REPAIRS	0.0 CU. FT.	
LMC-ES MATERIALS	60.4 CU. YDS.		LMC-ES MATERIALS	75.8 CU. YDS.		LMC-ES MATERIALS	82.9 CU. YDS.	
PLACING AND FINISHING LMC-ES OVERLAY	1086.7 SQ. YDS.		PLACING AND FINISHING LMC-ES OVERLAY	1363.7 SQ. YDS.		PLACING AND FINISHING LMC-ES OVERLAY	1492.6 SQ. YDS.	
SCARIFYING BRIDGE DECK	1086.7 SQ. YDS.		SCARIFYING BRIDGE DECK	1363.7 SQ. YDS.		SCARIFYING BRIDGE DECK	1492.6 SQ. YDS.	
HYDRO-DEMOLITION OF BRIDGE DECK	1086.7 SQ. YDS.		HYDRO-DEMOLITION OF BRIDGE DECK	1363.7 SQ. YDS.		HYDRO-DEMOLITION OF BRIDGE DECK	1492.6 SQ. YDS.	
GROOVING BRIDGE FLOORS	8935.2 SQ. FT.		GROOVING BRIDGE FLOORS	11274.2 SQ. FT.		GROOVING BRIDGE FLOORS	12362.2 SQ. FT.	

SCARIFICATION AND HYDRO-DEMOLITION
APPROX. CLASS II SURFACE PREPARATION
EPOXY RESIN INJECTION (ERI)

NOTES

✱CLASS III SURFACE PREPARATION IS NOT ANTICIPATED. A TOKEN PAY ITEM IS INDICATED FOR PRICING PURPOSES IN THE EVENT UNANTICIPATED CLASS III AREAS ARE ENCOUNTERED.

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

PAYMENT FOR CLASS II & CLASS III SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING HYDRO-DEMOLITION OF THE BRIDGE DECK. SEE SPECIAL PROVISIONS.

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 494

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee B04B5A4F2FAD484...
11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
SPANS B, C, & D

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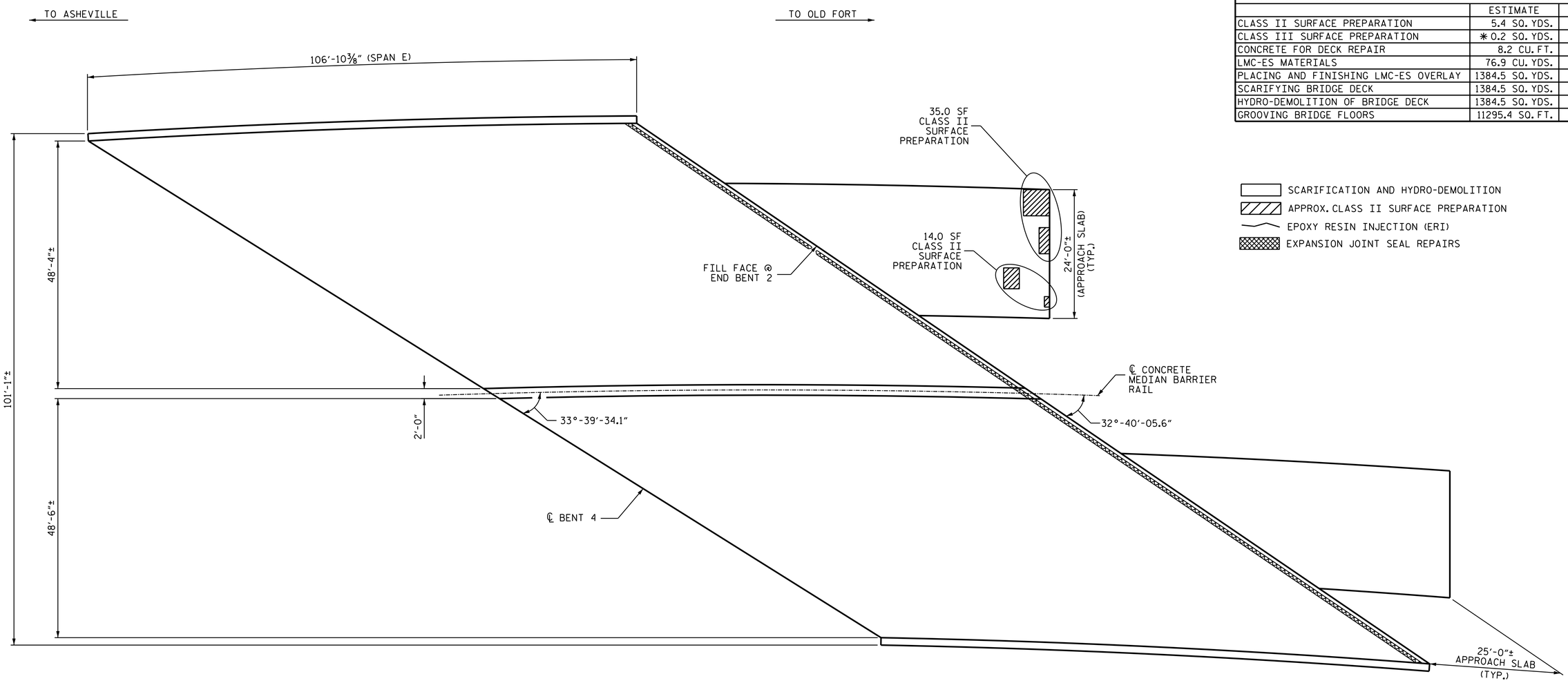
AS-BUILT REPAIR QUANITY TABLE		
TOP OF DECK REPAIR SPAN E & APPROACH SLABS		
	ESTIMATE	ACTUAL
CLASS II SURFACE PREPARATION	5.4 SQ. YDS.	
CLASS III SURFACE PREPARATION	✳ 0.2 SQ. YDS.	
CONCRETE FOR DECK REPAIR	8.2 CU. FT.	
LMC-ES MATERIALS	76.9 CU. YDS.	
PLACING AND FINISHING LMC-ES OVERLAY	1384.5 SQ. YDS.	
SCARIFYING BRIDGE DECK	1384.5 SQ. YDS.	
HYDRO-DEMOLITION OF BRIDGE DECK	1384.5 SQ. YDS.	
GROOVING BRIDGE FLOORS	11295.4 SQ. FT.	



SCARIFICATION AND HYDRO-DEMOLITION

APPROX. CLASS II SURFACE PREPARATION

EPOXY RESIN INJECTION (ERI)

EXPANSION JOINT SEAL REPAIRS

SPAN E

NOTES

✳ CLASS III SURFACE PREPARATION IS NOT ANTICIPATED. A TOKEN PAY ITEM IS INDICATED FOR PRICING PURPOSES IN THE EVENT UNANTICIPATED CLASS III AREAS ARE ENCOUNTERED.

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

PAYMENT FOR CLASS II & CLASS III SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING HYDRO-DEMOLITION OF THE BRIDGE DECK. SEE SPECIAL PROVISIONS.

FOR EXPANSION JOINT SEAL REPAIRS, SEE "EXPANSION JOINT SEAL REPAIR DETAILS" SHEET S-75.

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 494

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS SPAN E AND APPROACH SLABS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Miller B0AB5AAF2FAD484...
11/21/2018

DRAWN BY : R. L. PUTEK DATE : 10/18
CHECKED BY : A.M.LEE DATE : 10/18

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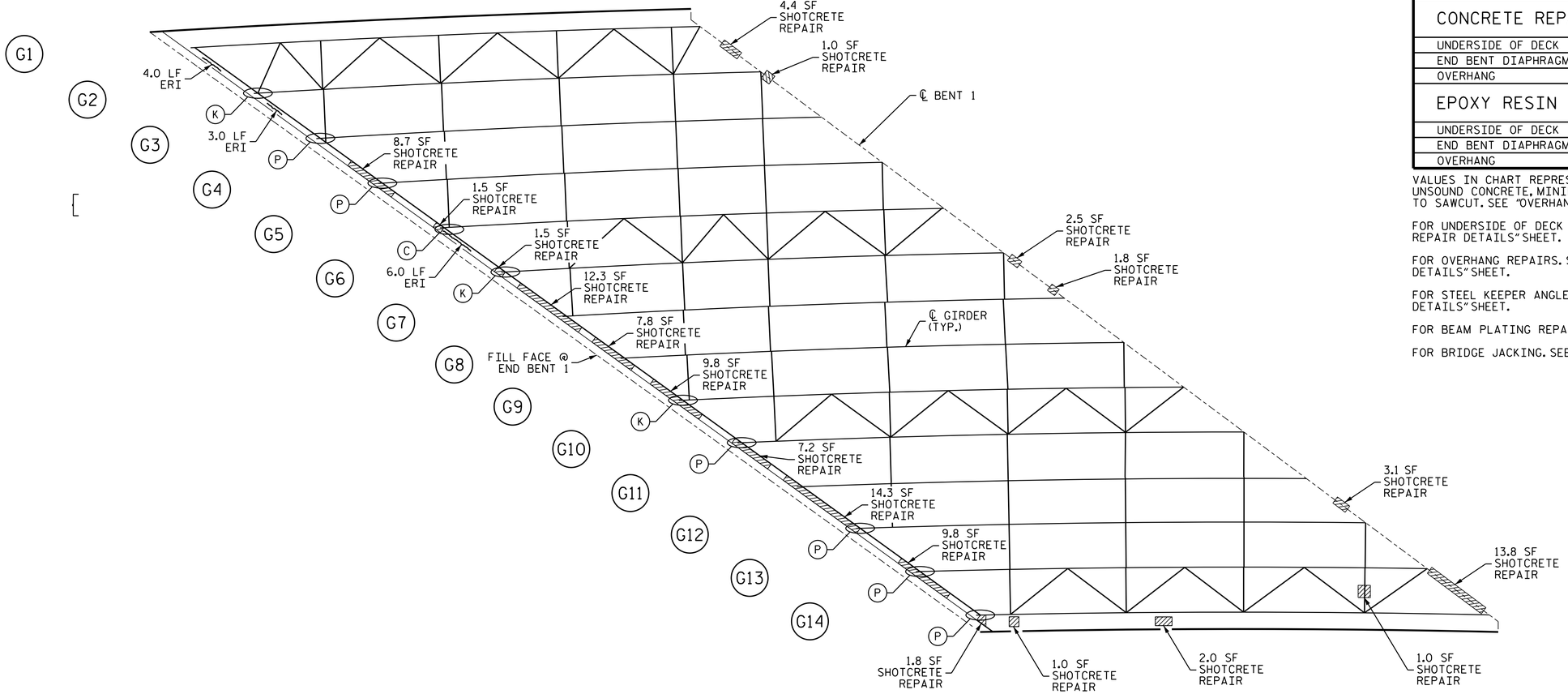

SPAN A

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN A

	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	27.6	9.2		
END BENT DIAPHRAGM	72.9	36.5		
OVERHANG	4.8	1.6		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
END BENT DIAPHRAGM	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
UNDERSIDE OF DECK		0.0		
END BENT DIAPHRAGM		13.0		
OVERHANG		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR UNDERSIDE OF DECK REPAIRS. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR OVERHANG REPAIRS. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR STEEL KEEPER ANGLE ASSEMBLY. SEE "STEEL KEEPER ANGLE ASSEMBLY DETAILS" SHEET.

FOR BEAM PLATING REPAIR. SEE "BEAM PLATING REPAIR DETAILS" SHEETS.

FOR BRIDGE JACKING. SEE "JACKING DETAILS" SHEET.

SHOTCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

(1) BEAM NUMBER
(B) BEAM END REPAIR
(P) PLATING REPAIR
(S) STIFFENER REPAIR
(C) CONNECTOR PLATE REPAIR
(D) STEEL DIAPHRAGM REPLACEMENT
(F) BOTTOM FLANGE REPAIR
(H) HARDWARE REPAIR
(K) STEEL ANGLE KEEPER ASSEMBLY

ANTICIPATED STEEL REPAIR LOCATIONS

SPAN	BEAM	LOCATION	DIM "A"	DIM "B"	DIM "C"	DIM "D"
A	G3	END BENT 1	14"	14"	7"	99"
A	G4	END BENT 1	9"	7"	2"	44"
A	G5	END BENT 1	3"	-		
A	G10	END BENT 1	14"	29"	6"	26"
A	G12	END BENT 1	12"	14"	4"	44"
A	G13	END BENT 1	11"	33"		
A	G14	END BENT 1	6"	68"		

BEAM REPAIR QUANTITY TABLE

STEEL PLATES		BRIDGE JACKING		STIFFENER	
LBS.		EA.		LBS.	
ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
610.0		0		0.0	
STEEL DIAPHRAGM		HARDWARE REPAIR		STEEL ANGLE KEEPER ASSEMBLY	
LBS.		LBS.		EA.	
ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
0.0		0.0		3	

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 494

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNDERSIDE DECK REPAIRS SPAN A

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee 11/21/2018

DRAWN BY : R.L.PUTEK DATE : 10/2018
CHECKED BY : A.M.LEE, P.E. DATE : 10/2018

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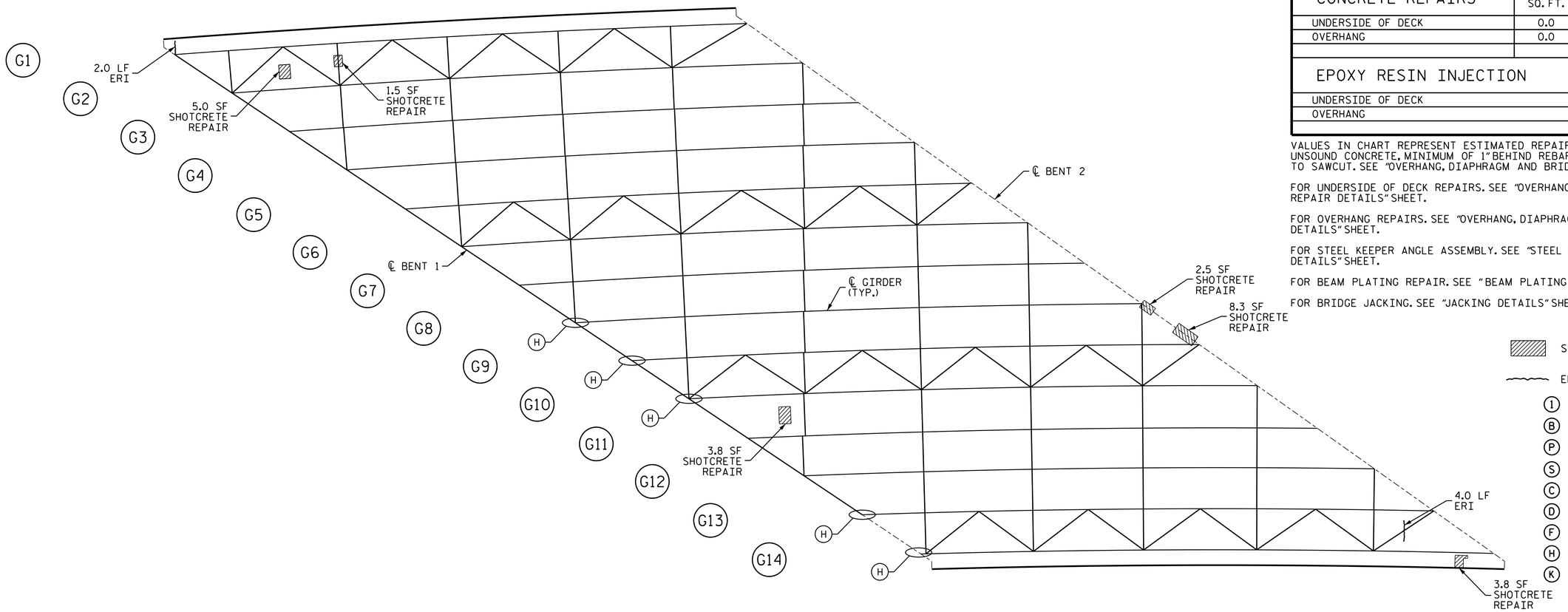

SPAN B

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN B

	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	21.1	7.0		
OVERHANG	3.8	0.5		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
UNDERSIDE OF DECK		4.0		
OVERHANG		2.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR UNDERSIDE OF DECK REPAIRS. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR OVERHANG REPAIRS. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR STEEL KEEPER ANGLE ASSEMBLY. SEE "STEEL KEEPER ANGLE ASSEMBLY DETAILS" SHEET.

FOR BEAM PLATING REPAIR. SEE "BEAM PLATING REPAIR DETAILS" SHEETS.

FOR BRIDGE JACKING. SEE "JACKING DETAILS" SHEET.

SHOTCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

(1) BEAM NUMBER
(B) BEAM END REPAIR
(P) PLATING REPAIR
(S) STIFFENER REPAIR
(C) CONNECTOR PLATE REPAIR
(D) STEEL DIAPHRAGM REPLACEMENT
(F) BOTTOM FLANGE REPAIR
(H) HARDWARE REPAIR
(K) STEEL ANGLE KEEPER ASSEMBLY

ANTICIPATED STEEL REPAIR LOCATIONS

SPAN	BEAM	LOCATION	DIM "A"	DIM "B"	DIM "C"	DIM "D"

BEAM REPAIR QUANTITY TABLE

STEEL PLATES		BRIDGE JACKING		STIFFENER	
LBS.		EA.		LBS.	
ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
0.0		0		0.0	
STEEL DIAPHRAGM		HARDWARE REPAIR		STEEL ANGLE KEEPER ASSEMBLY	
LBS.		LBS.		EA.	
ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
0.0		4.8		0	

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 494

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNDERSIDE DECK REPAIRS SPAN B

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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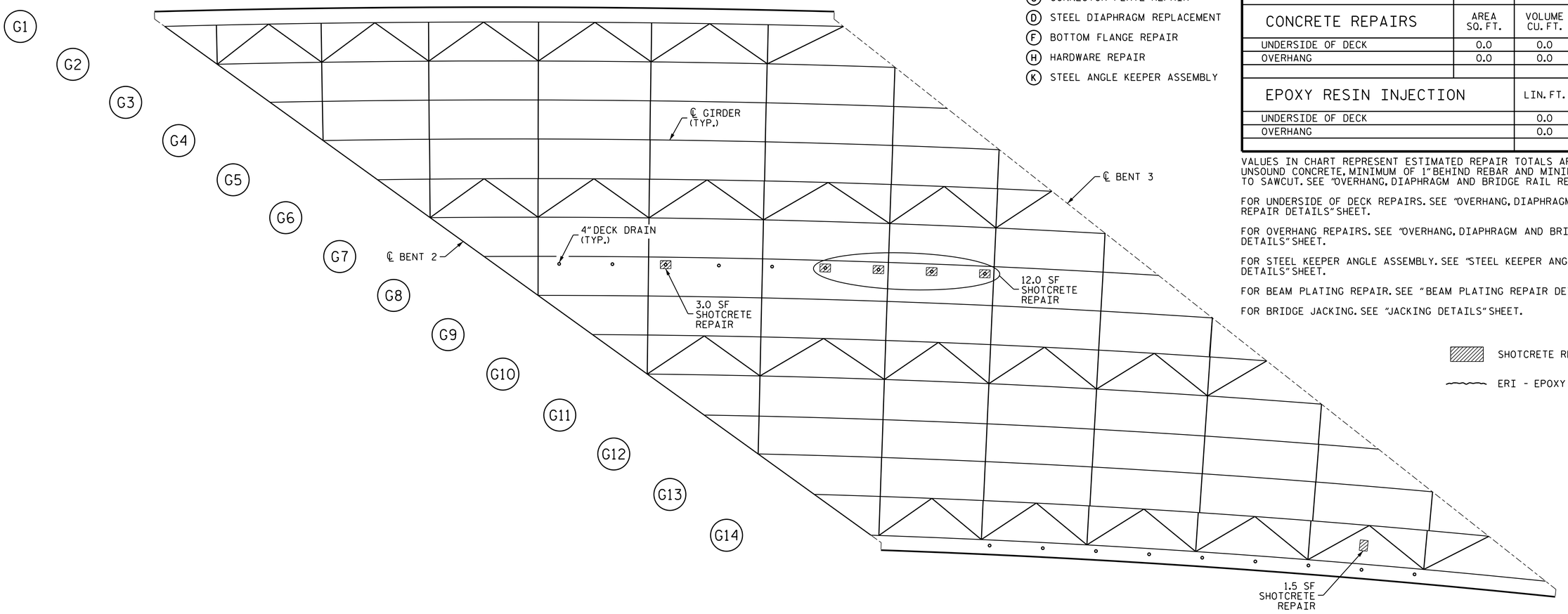

SPAN C

(1) BEAM NUMBER
(B) BEAM END REPAIR
(P) PLATING REPAIR
(S) STIFFENER REPAIR
(C) CONNECTOR PLATE REPAIR
(D) STEEL DIAPHRAGM REPLACEMENT
(F) BOTTOM FLANGE REPAIR
(H) HARDWARE REPAIR
(K) STEEL ANGLE KEEPER ASSEMBLY

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN C

	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	16.5	5.5		
OVERHANG	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
UNDERSIDE OF DECK		0.0		
OVERHANG		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR UNDERSIDE OF DECK REPAIRS. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR OVERHANG REPAIRS. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR STEEL KEEPER ANGLE ASSEMBLY. SEE "STEEL KEEPER ANGLE ASSEMBLY DETAILS" SHEET.

FOR BEAM PLATING REPAIR. SEE "BEAM PLATING REPAIR DETAILS" SHEETS.

FOR BRIDGE JACKING. SEE "JACKING DETAILS" SHEET.

SHOTCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

ANTICIPATED STEEL REPAIR LOCATIONS

SPAN	BEAM	LOCATION	DIM "A"	DIM "B"	DIM "C"	DIM "D"

BEAM REPAIR QUANTITY TABLE

STEEL PLATES		BRIDGE JACKING		STIFFENER	
LBS.		EA.		LBS.	
ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
0.0		0		0.0	
STEEL DIAPHRAGM		HARDWARE REPAIR		STEEL ANGLE KEEPER ASSEMBLY	
LBS.		LBS.		EA.	
	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
0.0		0.0		0	

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 494

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNDERSIDE DECK REPAIRS SPAN C

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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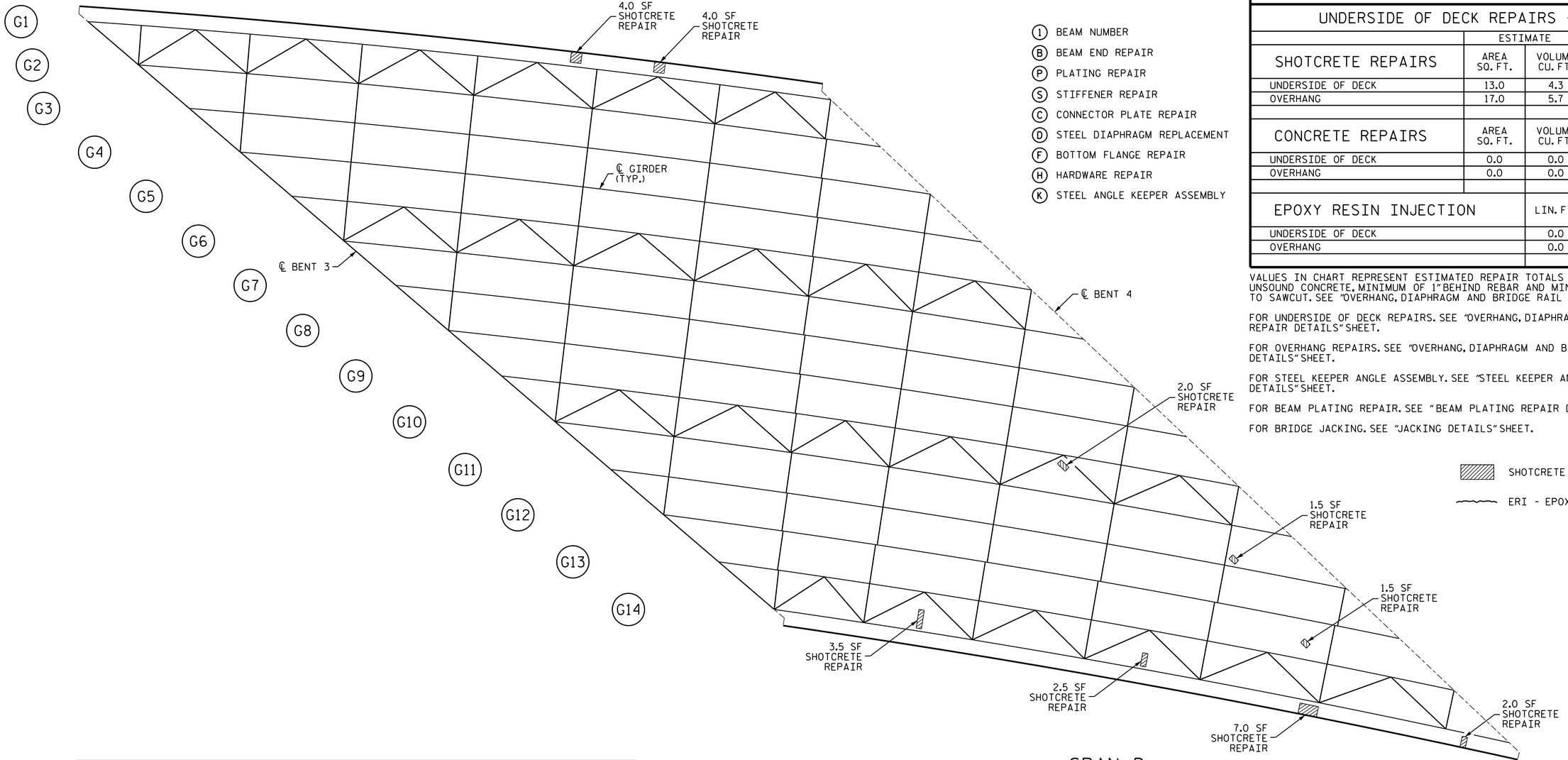

SPAN D

(1) BEAM NUMBER
(B) BEAM END REPAIR
(P) PLATING REPAIR
(S) STIFFENER REPAIR
(C) CONNECTOR PLATE REPAIR
(D) STEEL DIAPHRAGM REPLACEMENT
(F) BOTTOM FLANGE REPAIR
(H) HARDWARE REPAIR
(K) STEEL ANGLE KEEPER ASSEMBLY

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN D

	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	13.0	4.3		
OVERHANG	17.0	5.7		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
UNDERSIDE OF DECK	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
UNDERSIDE OF DECK		0.0		
OVERHANG		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR UNDERSIDE OF DECK REPAIRS. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR OVERHANG REPAIRS. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR STEEL KEEPER ANGLE ASSEMBLY. SEE "STEEL KEEPER ANGLE ASSEMBLY DETAILS" SHEET.

FOR BEAM PLATING REPAIR. SEE "BEAM PLATING REPAIR DETAILS" SHEETS.

FOR BRIDGE JACKING. SEE "JACKING DETAILS" SHEET.

SHOTCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

ANTICIPATED STEEL REPAIR LOCATIONS

SPAN	BEAM	LOCATION	DIM "A"	DIM "B"	DIM "C"	DIM "D"

BEAM REPAIR QUANTITY TABLE

STEEL PLATES		BRIDGE JACKING		STIFFENER	
LBS.		EA.		LBS.	
ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
0.0		0		0.0	
STEEL DIAPHRAGM		HARDWARE REPAIR		STEEL ANGLE KEEPER ASSEMBLY	
LBS.		LBS.		EA.	
ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
0.0		0.0		0	

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 494

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNDERSIDE DECK REPAIRS SPAN D

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

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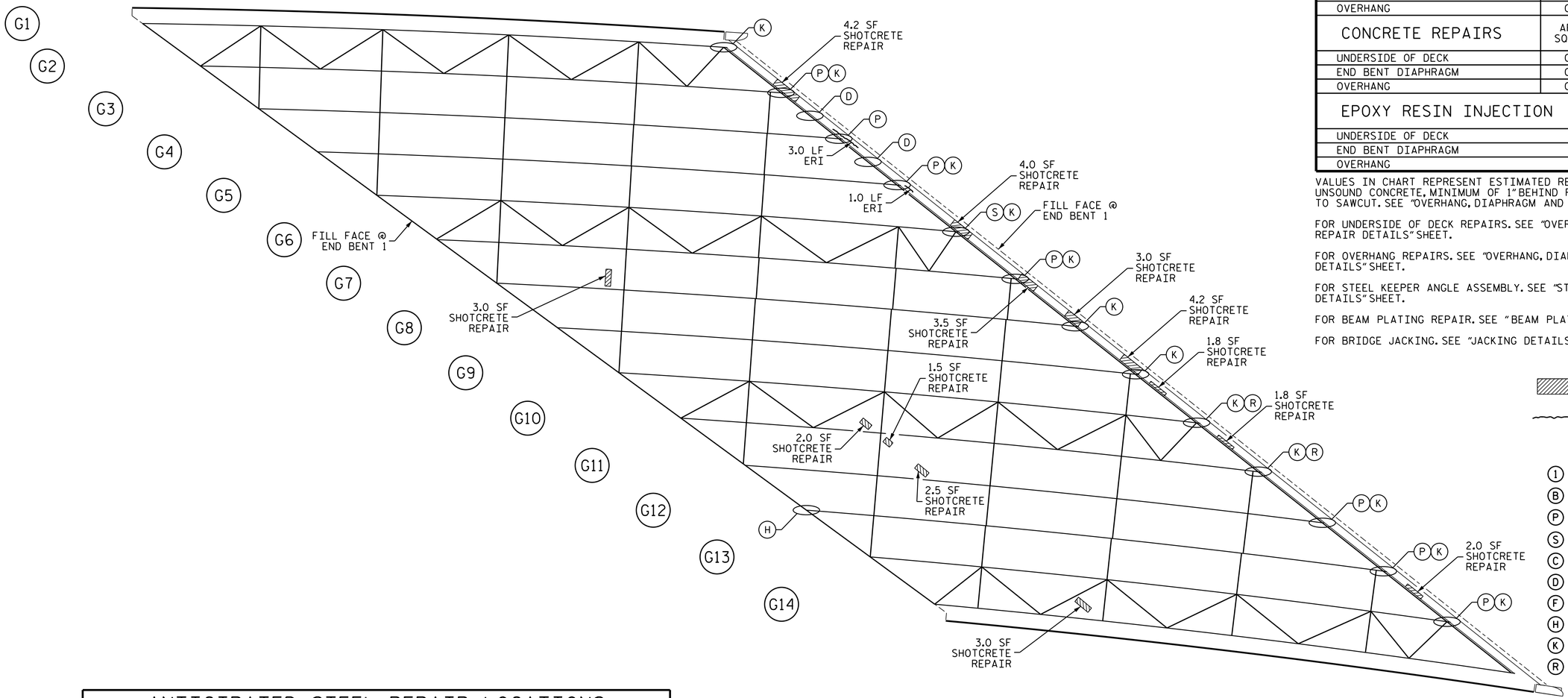

SPAN E

AS-BUILT REPAIR QUANTITY TABLE

UNDERSIDE OF DECK REPAIRS - SPAN E

SHOTCRETE REPAIRS	ESTIMATE AREA SQ. FT.	ESTIMATE VOLUME CU. FT.	ACTUAL AREA SQ. FT.	ACTUAL VOLUME CU. FT.
UNDERSIDE OF DECK	11.0	3.7		
END BENT DIAPHRAGM	21.0	10.5		
OVERHANG	0.0	1.6		
CONCRETE REPAIRS	**AREA SQ. FT.**	**VOLUME CU. FT.**	**AREA SQ. FT.**	**VOLUME CU. FT.**
UNDERSIDE OF DECK	0.0	0.0		
END BENT DIAPHRAGM	0.0	0.0		
OVERHANG	0.0	0.0		
EPOXY RESIN INJECTION		**LIN. FT.**		**LIN. FT.**
UNDERSIDE OF DECK		0.0		
END BENT DIAPHRAGM		4.0		
OVERHANG		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR UNDERSIDE OF DECK REPAIRS. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR OVERHANG REPAIRS. SEE "OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS" SHEET.

FOR STEEL KEEPER ANGLE ASSEMBLY. SEE "STEEL KEEPER ANGLE ASSEMBLY DETAILS" SHEET.

FOR BEAM PLATING REPAIR. SEE "BEAM PLATING REPAIR DETAILS" SHEETS.

FOR BRIDGE JACKING. SEE "JACKING DETAILS" SHEET.

SHOTCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

(1) BEAM NUMBER
(B) BEAM END REPAIR
(P) PLATING REPAIR
(S) STIFFENER REPAIR
(C) CONNECTOR PLATE REPAIR
(D) STEEL DIAPHRAGM REPLACEMENT
(F) BOTTOM FLANGE REPAIR
(H) HARDWARE REPAIR
(K) STEEL ANGLE KEEPER ASSEMBLY
(R) REMOVE AND RESET BEARINGS

ANTICIPATED STEEL REPAIR LOCATIONS

SPAN	BEAM	LOCATION	DIM "A"	DIM "B"	DIM "C"	DIM "D"
E	G2	END BENT 2	7"	8"	4"	17"
E	G3	END BENT 2	19"	12"	13"	64"
E	G4	END BENT 2	20"	11"	8"	64"
E	G5	END BENT 2	9"	-		
E	G5	END BENT 2	9"	-		
E	G6	END BENT 2	14"	29"	6"	37"
E	G11	END BENT 2	11"	36"		
E	G12	END BENT 2	16"	16"	5"	15"
E	G13	END BENT 2	10"	18"	3"	38"

BEAM REPAIR QUANTITY TABLE

STEEL PLATES LBS. ESTIMATE	STEEL PLATES LBS. ACTUAL	BRIDGE JACKING EA. ESTIMATE	BRIDGE JACKING EA. ACTUAL	STIFFENER LBS. ESTIMATE	STIFFENER LBS. ACTUAL
716.0		2		0.0	
STEEL DIAPHRAGM LBS. ESTIMATE	**STEEL DIAPHRAGM LBS. ACTUAL**	**HARDWARE REPAIR LBS. ESTIMATE**	**HARDWARE REPAIR LBS. ACTUAL**	**STEEL ANGLE KEEPER ASSEMBLY EA. ESTIMATE**	**STEEL ANGLE KEEPER ASSEMBLY EA. ACTUAL**
1508.0		1.6		12	

REMOVE & RESET BEARINGS EA. ESTIMATE	REMOVE & RESET BEARINGS EA. ACTUAL
2	

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 494

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

UNDERSIDE DECK REPAIRS SPAN E

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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12/6/2018

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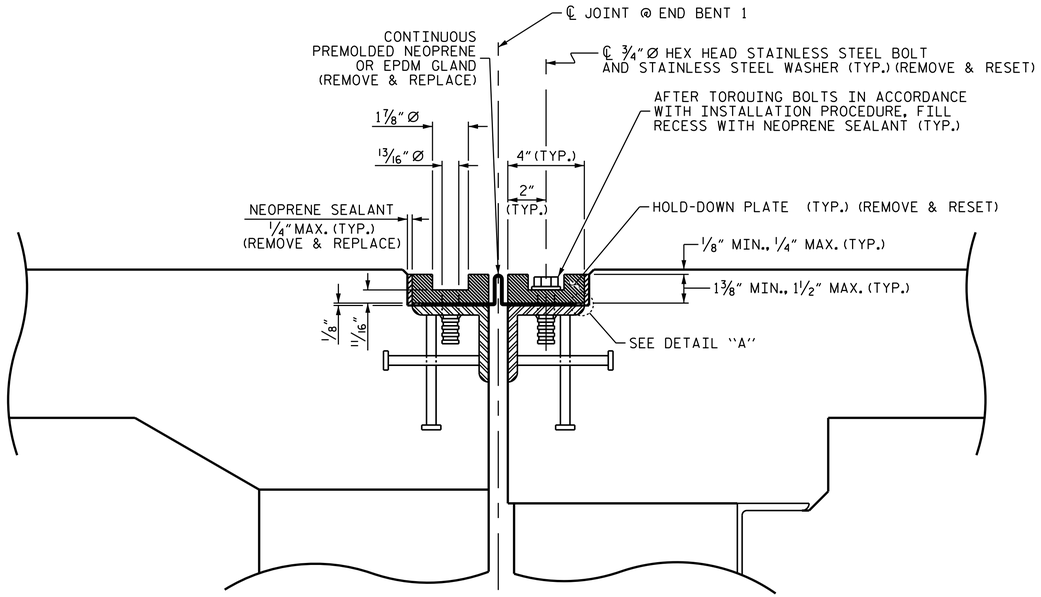


EXPANSION JOINT DETAILS

(SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE)

REPAIR INSTALLATION PROCEDURE

LOOSEN THE EXISTING BOLTS AND HOLD DOWN PLATES TO REMOVE AND REPLACE THE EXISTING GLAND. REMOVE THE EXISTING NEOPRENE SEALANT AND CLEAN THE EXISTING BASE ANGLE OF OIL, GREASE AND OTHER LATENTS.

LAY THE NEW GLAND ON THE BASE ANGLE AND FIELD MARK THE NEW GLAND FOR THE BOLT HOLES. HOLES IN THE NEW GLAND SHALL BE PUNCHED ⅞" IN DIAMETER WITH A HAND PUNCH.

IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE NEW GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEW NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE, BUT DO NOT TIGHTEN. THE ENGINEER WILL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.

AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND NEW GLAND. APPLY NEW NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE NEW GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.

AFTER PROPER TOROUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE. COMPLETELY FILL THESE RECESSES WITH NEW NEOPRENE SEALANT.

GENERAL NOTES

ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°.

THE FINISHED EXPANSION SEAL DEVICE SHALL BE A MINIMUM ⅛" AND A MAXIMUM OF ¼" BELOW THE TOP OF SLAB.

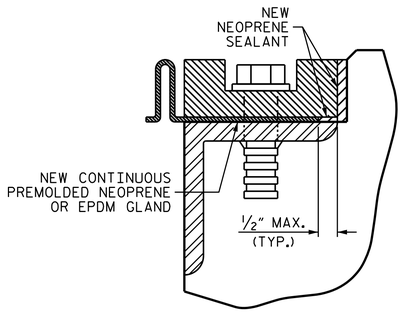
FOR EXPANSION JOINT SEAL REPAIR, SEE SPECIAL PROVISIONS.

NO SEPARATE PAYMENT WILL BE MADE FOR REMOVING AND REINSTALLING MEDIAN AND BARRIER RAIL COVER PLATES. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LINEAR FEET PRICE BID FOR "EXPANSION JOINT SEALS FOR PRESERVATION".

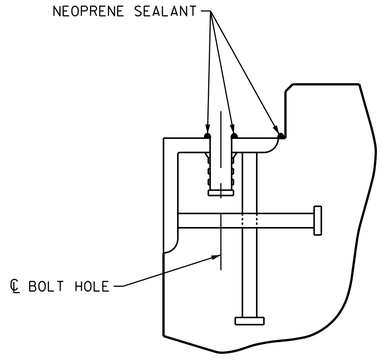
MOVEMENT AND SETTING AT JOINT

LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F *	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	38°31' 51" TS	2½"	2"	1¾"	1¼"
END BENT 2	30°40' 05" TC	2"	1¾"	1½"	1¼"

* 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 DETAIL BY MORE THAN ¼", NOTIFY THE ENGINEER. REVISION TO THE JOINT SEAL SIZE MIGHT BE NECESSARY.



DETAIL "A"



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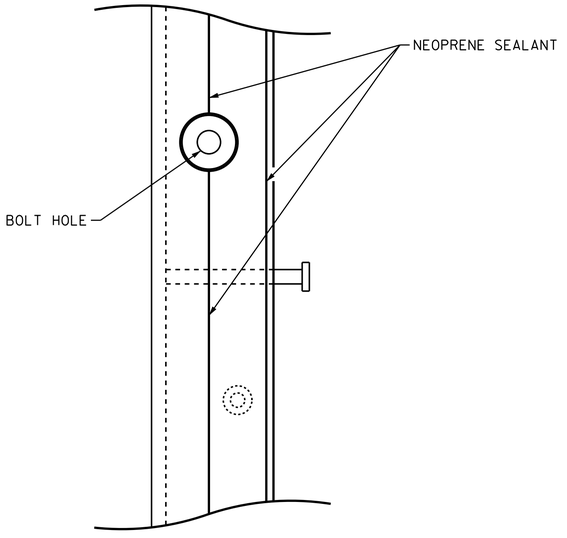

PLAN VIEW

INSTALLATION SKETCH

JOINT REPAIR QUANTITY TABLE

	ESTIMATE	ACTUAL
EXPANSION JOINT SEALS REPAIRS	351.8 LIN. FT.	

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 494

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee B0485AAF2FAD484...

11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EXPANSION JOINT SEAL REPAIR DETAILS

DRAWN BY : R.L.PUTEK DATE : 10/2018

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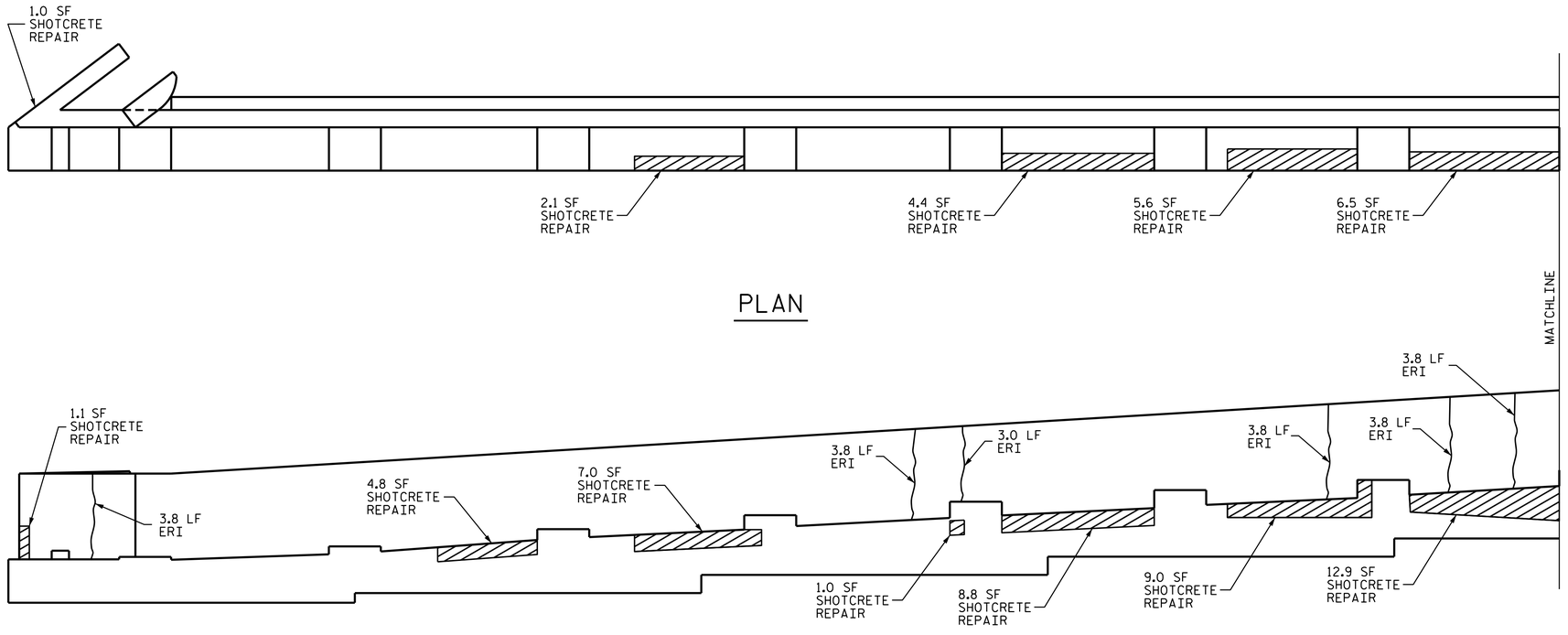

PLAN

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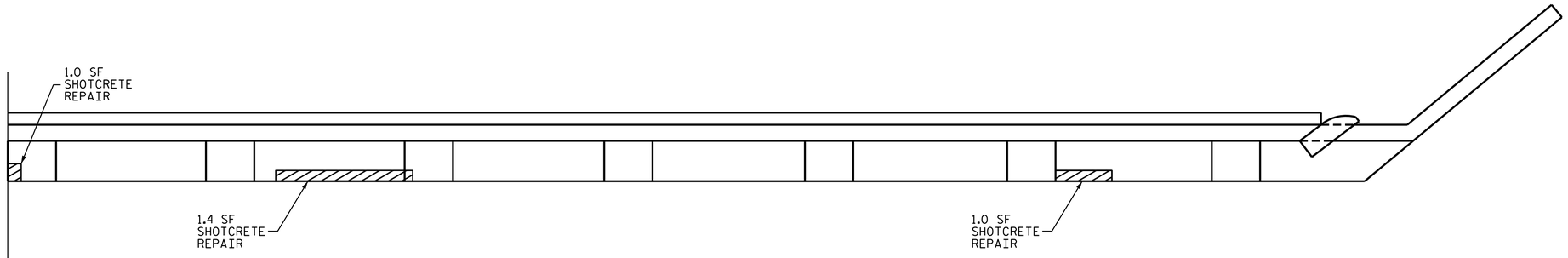

PLAN

ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

END BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	85.7	42.9		
CURTAIN WALL	1.1	0.6		
WING WALL	1.0	0.5		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
CURTAIN WALL	0.0	0.0		
WING WALL				
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.7		
CURTAIN WALL		34.8		
WING WALL		3.8		
EPOXY COATING		SQ. FT.	SQ. FT.	
CAP		438.2		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 494

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

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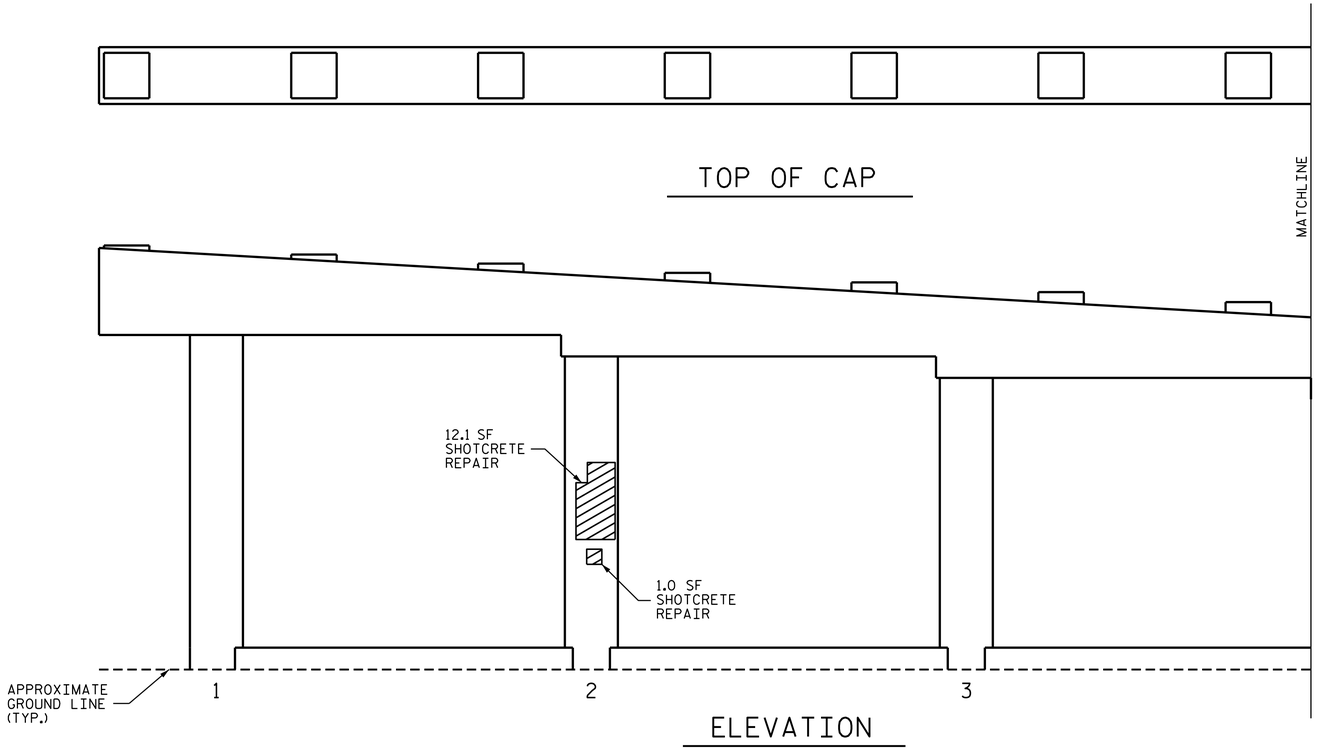


ELEVATION

SPAN B
SPAN A

AS-BUILT REPAIR QUANTITY TABLE

BENT 1 SPAN A FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	13.1	6.6		
STRUT	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
STRUT	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		
STRUT		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
STRUT		320.0		

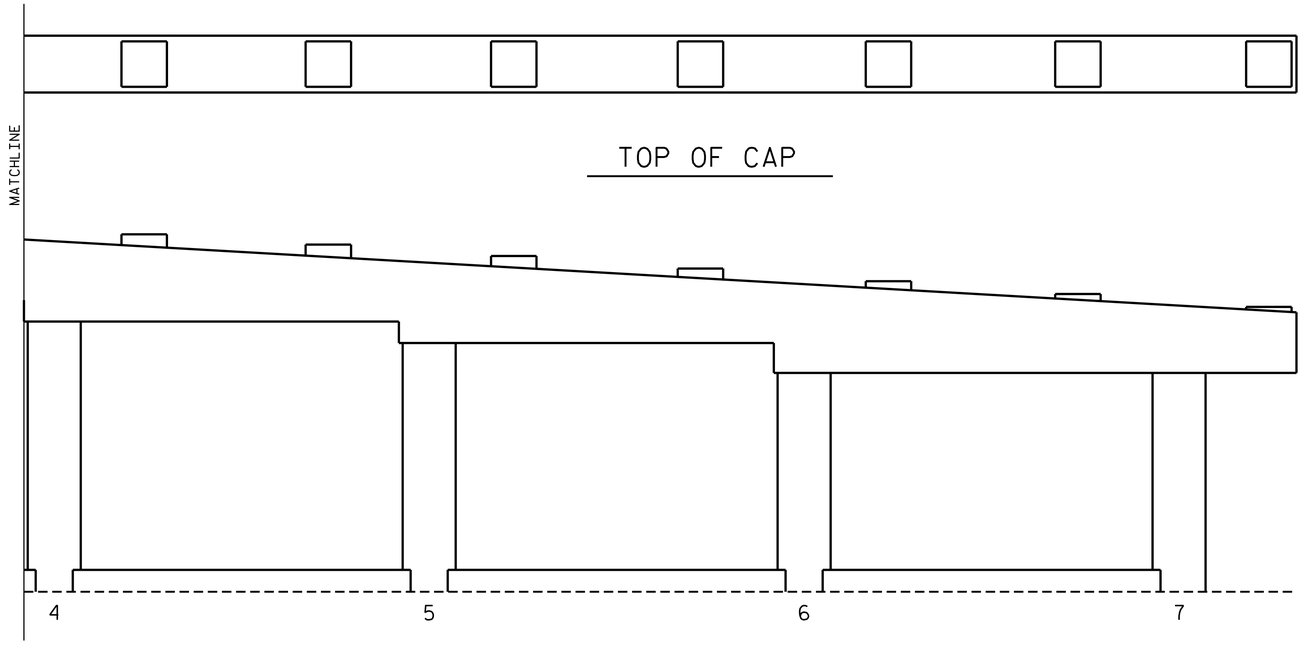
VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

CLEAN AND REMOVE DEBRIS FROM THE TOP OF THE STRUTS AND APPLY EPOXY PROTECTIVE COATING. EPOXY PROTECTIVE COATING SHALL BE APPLIED TO THE TOP SURFACE OF THE STRUTS. FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

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



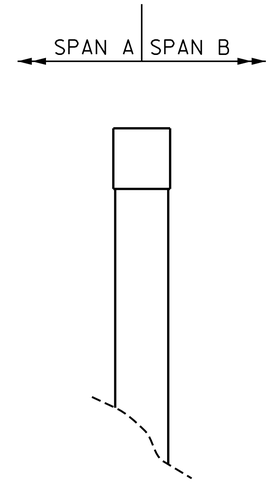
ELEVATION

SPAN B
SPAN A

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION



END VIEW

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 494

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 1
SPAN A FACE

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

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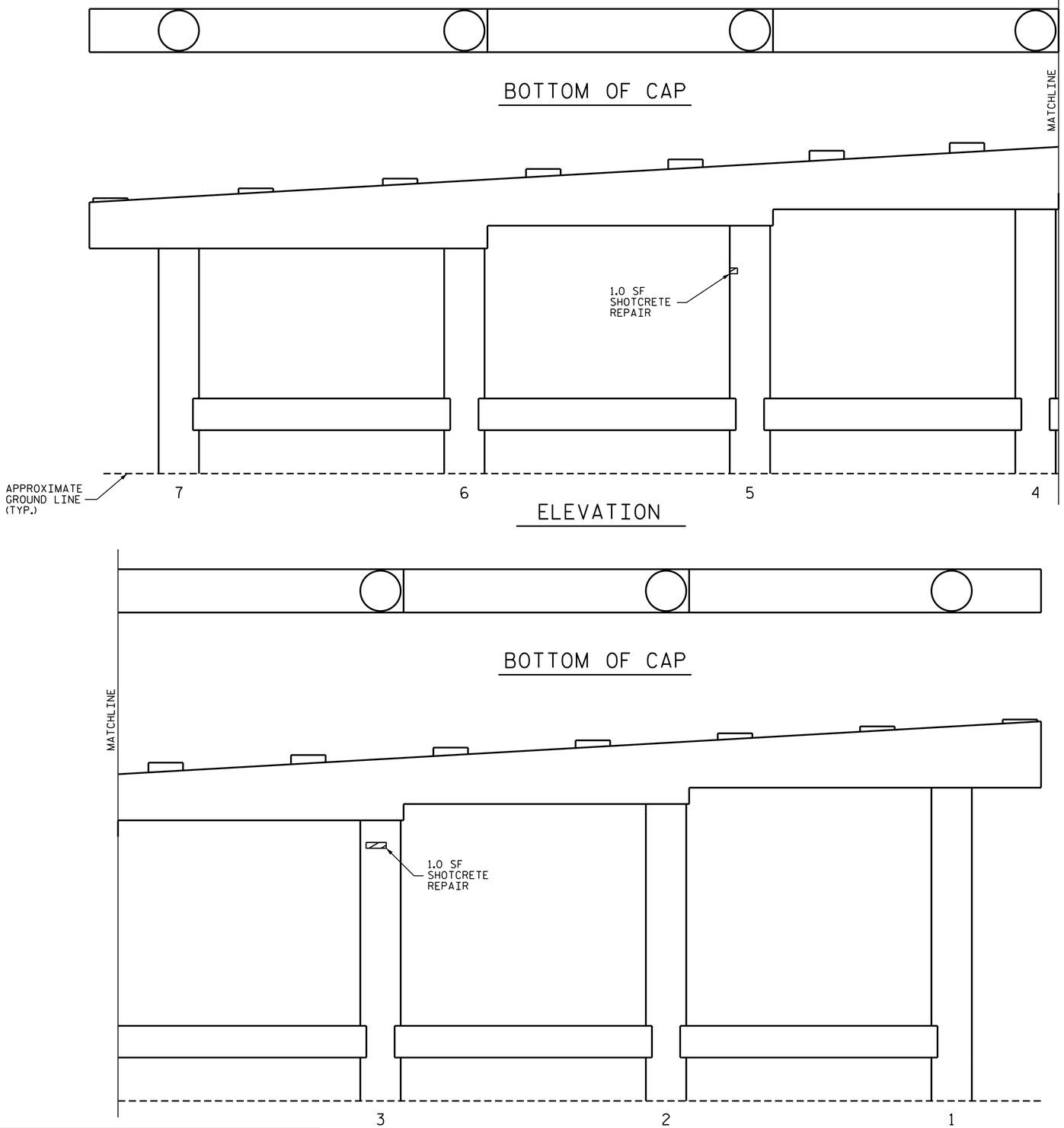

AS-BUILT REPAIR QUANTITY TABLE

BENT 1 SPAN B FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	2.0	1.0		
STRUT	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
STRUT	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		
STRUT		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1"BEHIND REBAR AND MINIMUM 2"CLEARANCE TO SAWCUT. SEE ''TYPICAL CAP AND COLUMN REPAIR DETAILS'' SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 494

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee B0485AAF3F4D484...

11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 1
SPAN B FACE

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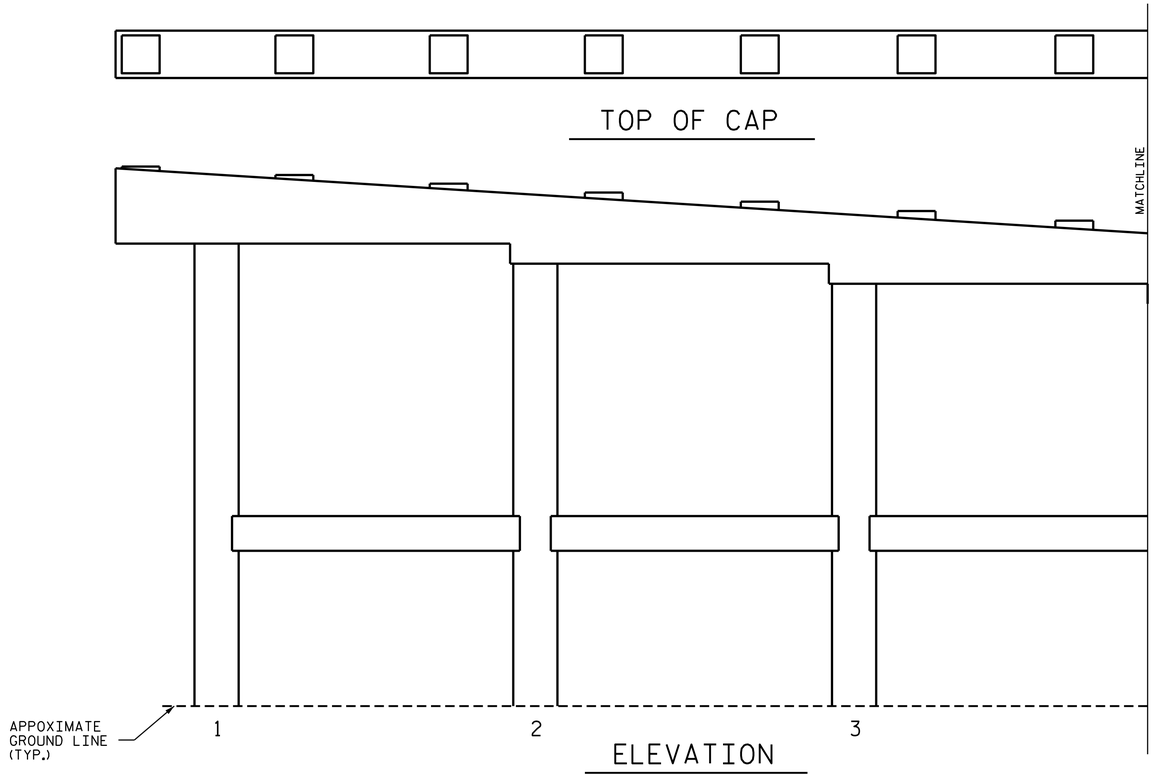


ELEVATION

SPAN C
SPAN B

AS-BUILT REPAIR QUANTITY TABLE

BENT 2 SPAN B FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
STRUT	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
STRUT	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		
STRUT		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
STRUTS		325.0		

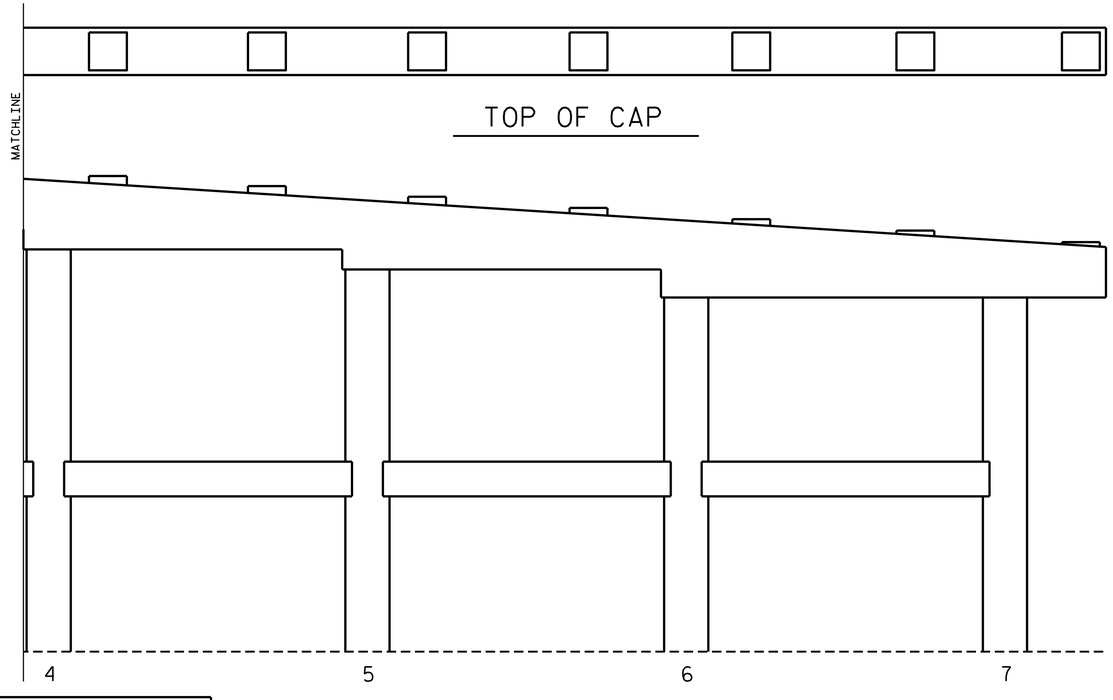
VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

CLEAN AND REMOVE DEBRIS FROM THE TOP OF THE STRUTS AND APPLY EPOXY PROTECTIVE COATING. EPOXY PROTECTIVE COATING SHALL BE APPLIED TO THE TOP SURFACE OF THE STRUTS. FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

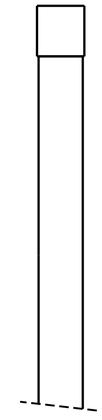
CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.



ELEVATION

SPAN C
SPAN B

SPAN B | SPAN C



END VIEW

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 494

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 2
SPAN B FACE

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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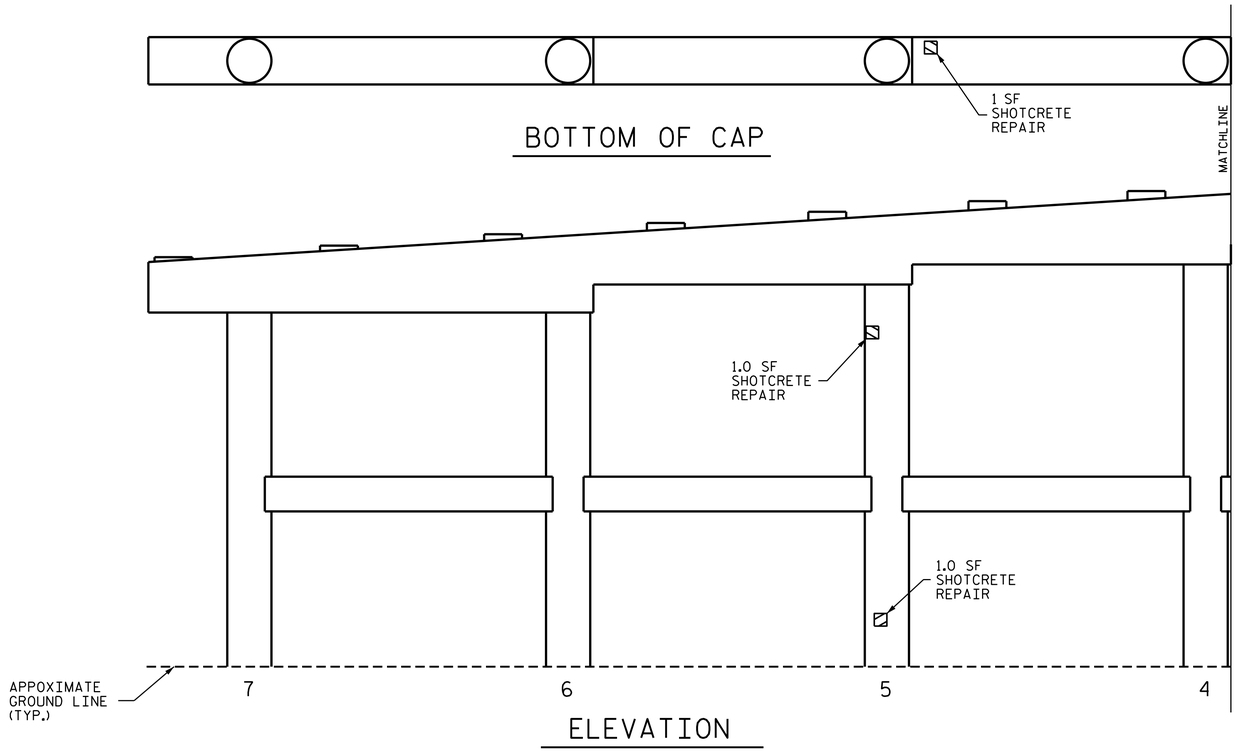

AS-BUILT REPAIR QUANTITY TABLE

BENT 2 SPAN C FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	1.0	0.5		
COLUMN	3.0	1.5		
STRUT	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
STRUT	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		
STRUT		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

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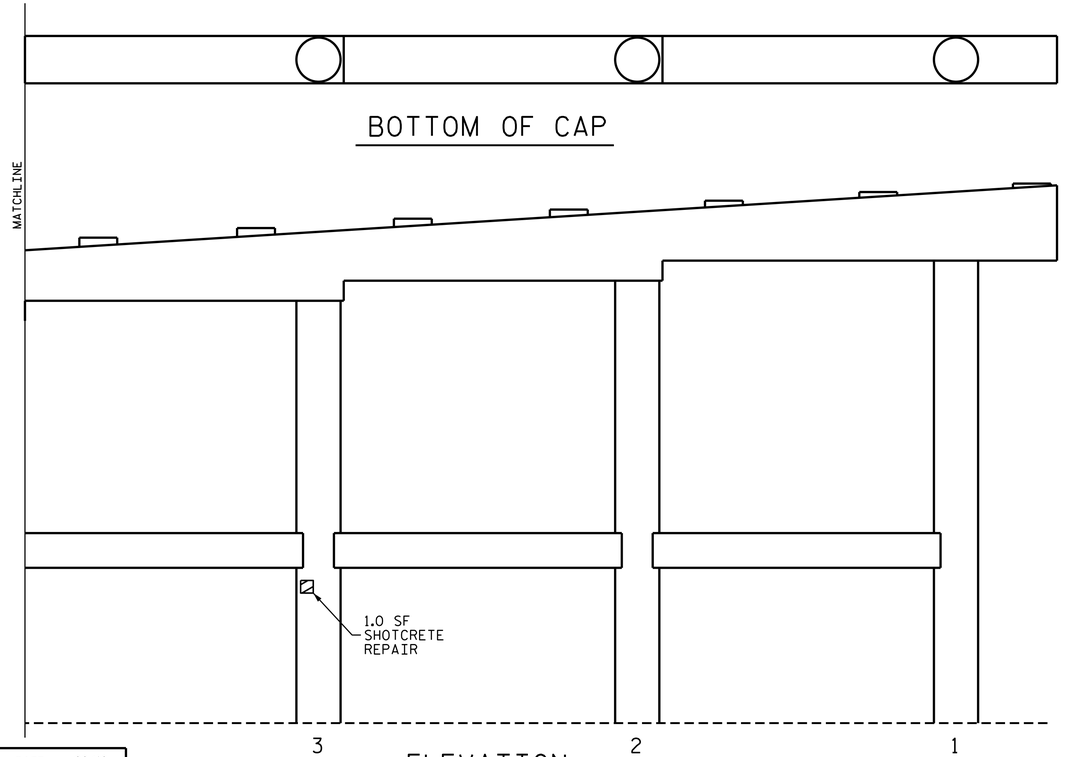
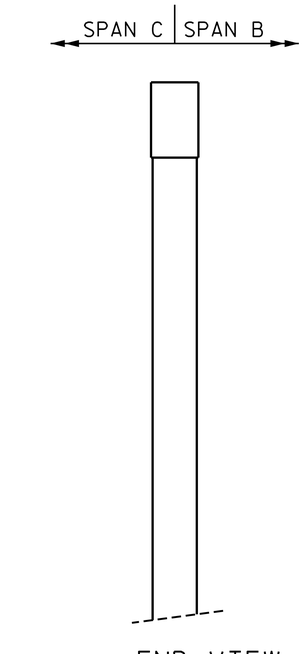
CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.





SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 494

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 2
SPAN C FACE

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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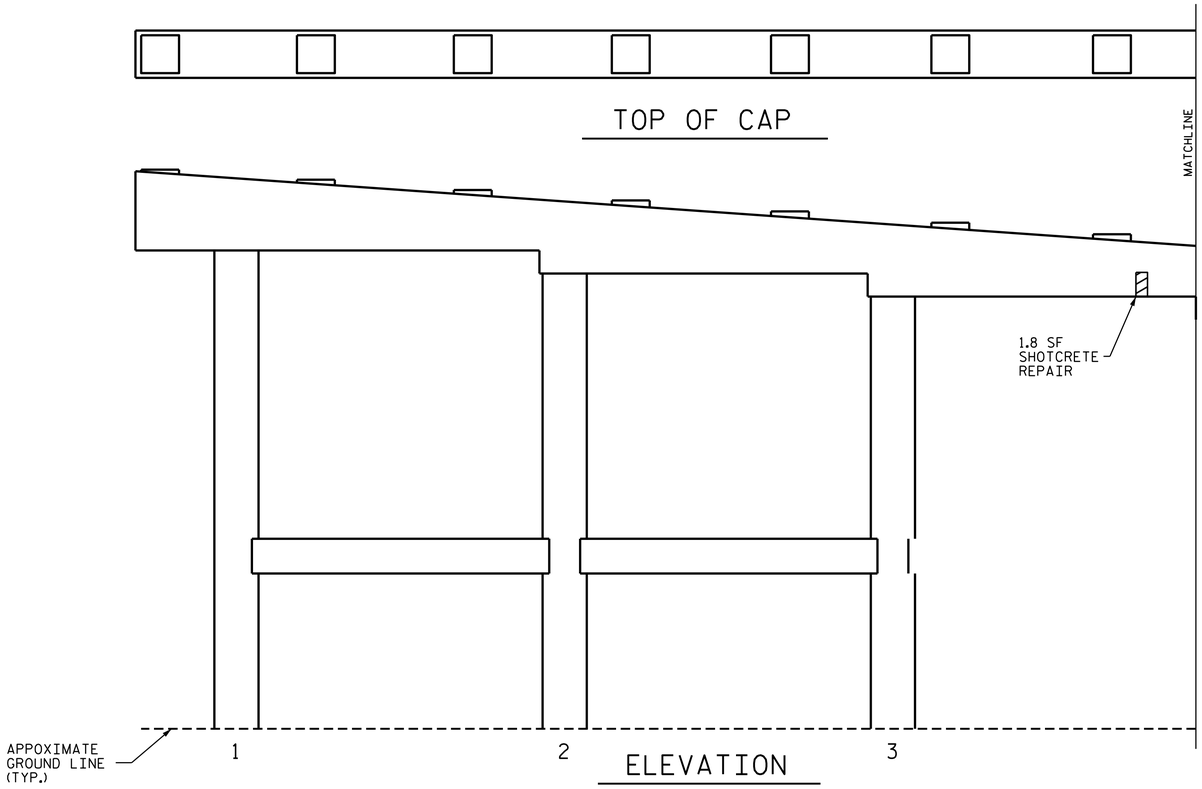

SPAN D
SPAN C

AS-BUILT REPAIR QUANTITY TABLE

BENT 3 SPAN C FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	5.8	2.9		
COLUMN	1.0	0.5		
STRUT	1.0	0.5		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
STRUT	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		
STRUT		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
STRUT		340.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

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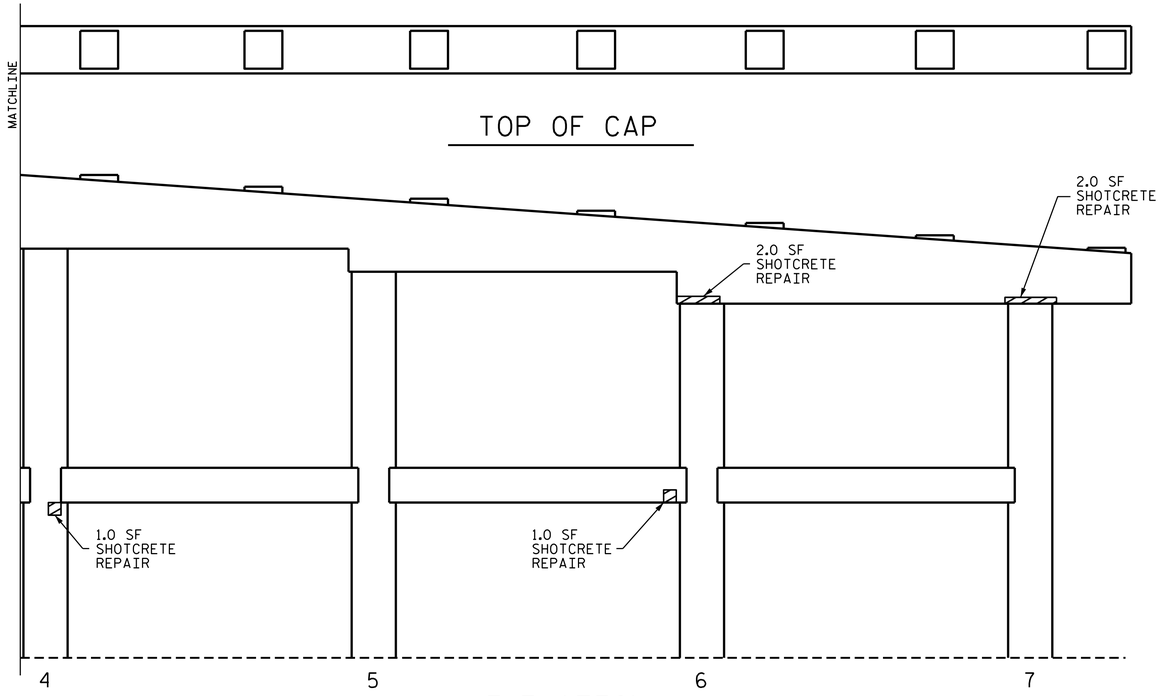
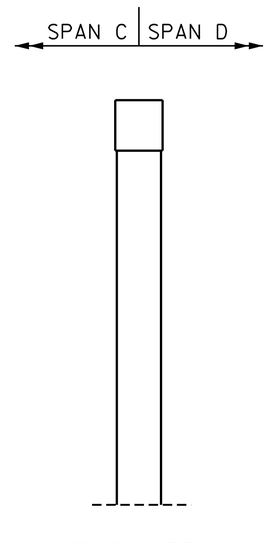
CLEAN AND REMOVE DEBRIS FROM THE TOP OF THE STRUTS AND APPLY EPOXY PROTECTIVE COATING. EPOXY PROTECTIVE COATING SHALL BE APPLIED TO THE TOP SURFACE OF THE STRUTS. FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

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



SPAN D
SPAN C



SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 494

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 3
SPAN C FACE

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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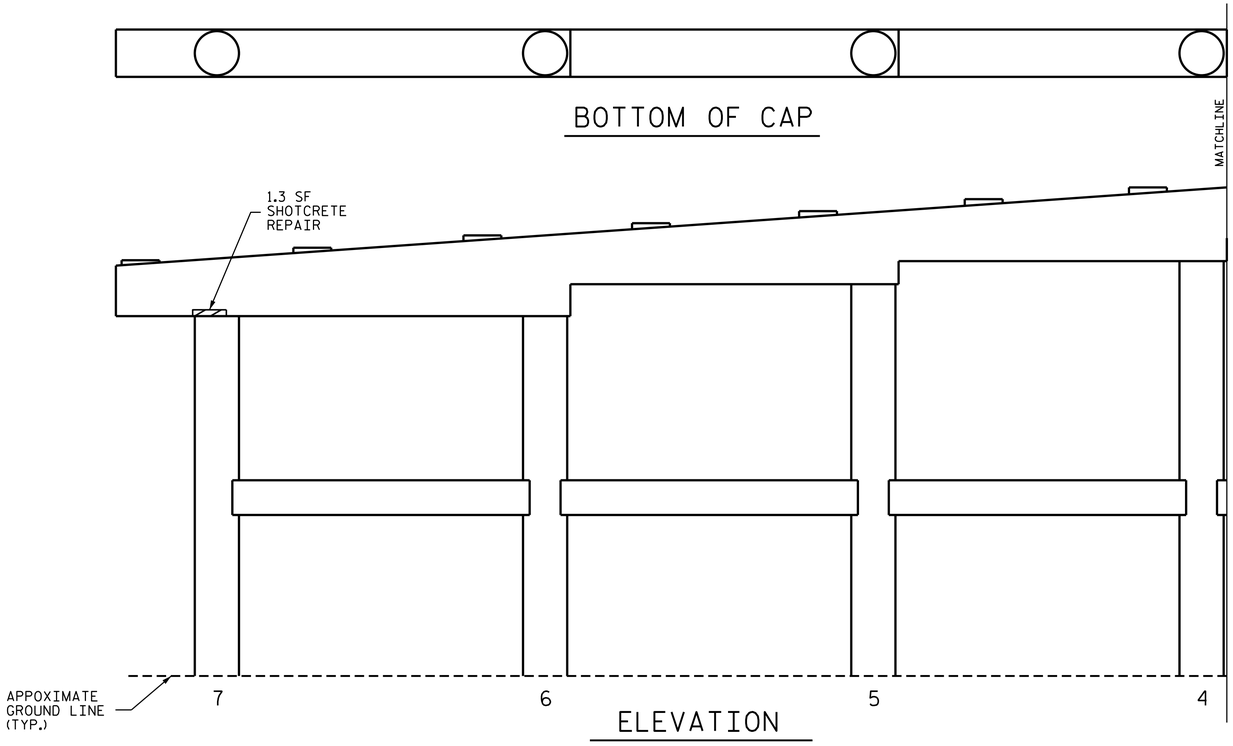

SPAN D
SPAN C

AS-BUILT REPAIR QUANTITY TABLE

BENT 3 SPAN D FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	3.0	1.5		
COLUMN	0.0	0.0		
STRUT	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
STRUT	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		0.0		
COLUMN		0.0		
STRUT		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

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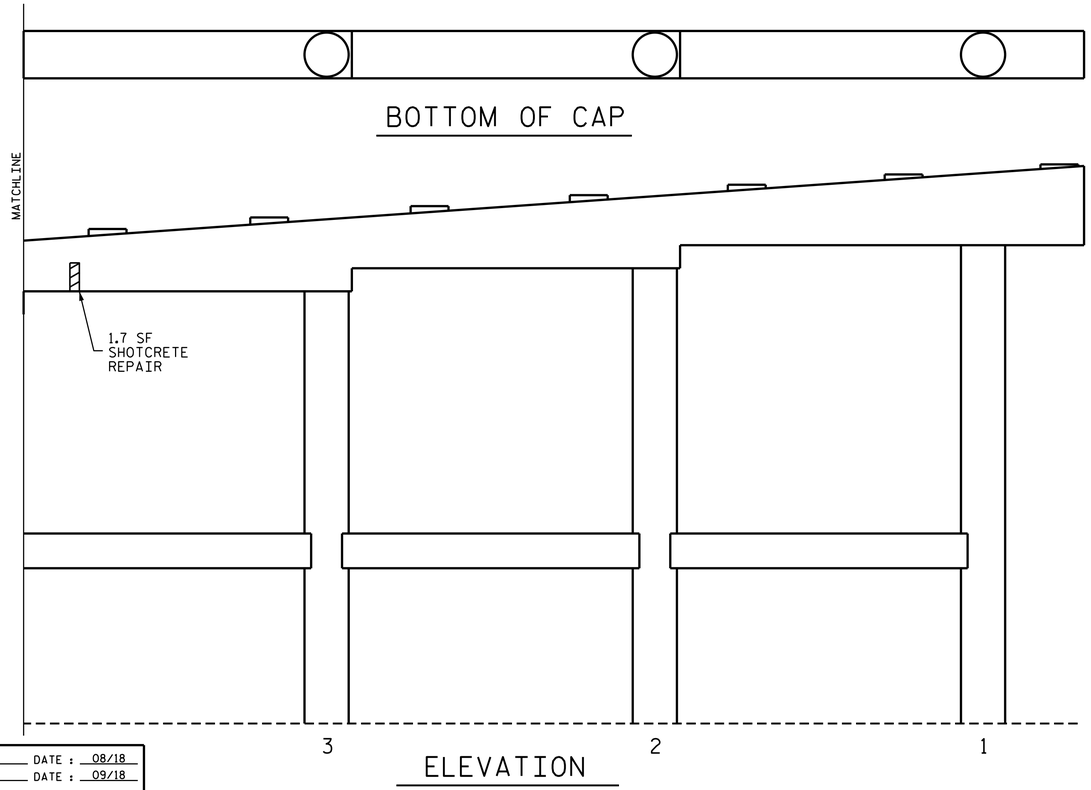
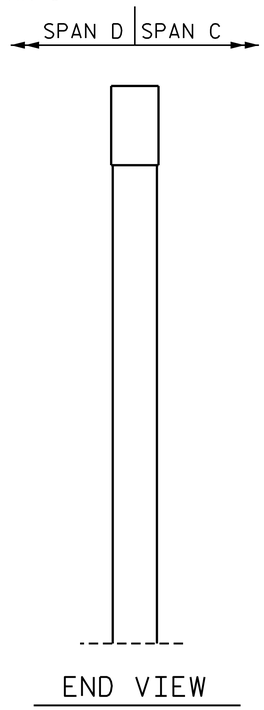
CONCRETE REPAIRS MAYBE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.



SPAN D
SPAN C



SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 494

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 3
SPAN D FACE

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by:
B04B5AAF2FAD484...
11/21/2018

DRAWN BY : C. BRIGHT DATE : 08/18
CHECKED BY : A. COLE DATE : 09/18

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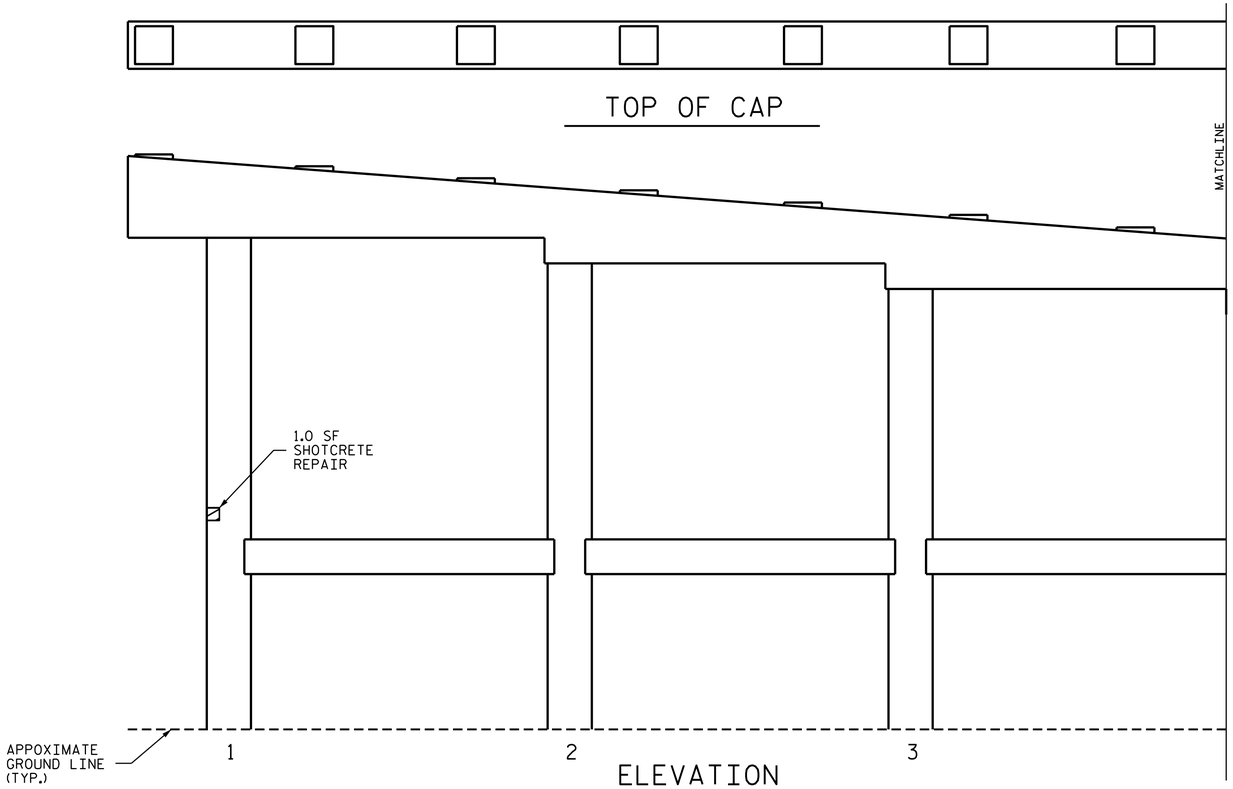

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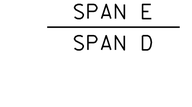

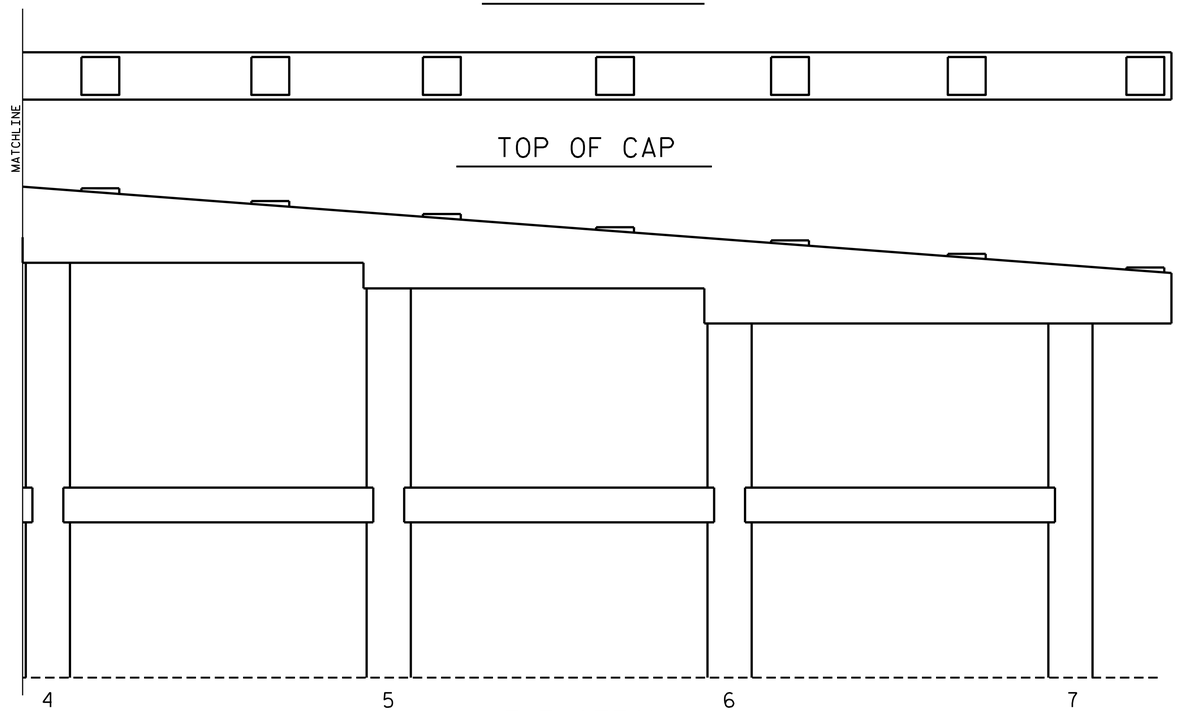

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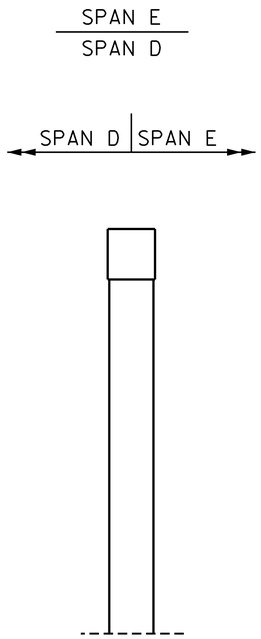

END VIEW

AS-BUILT REPAIR QUANTITY TABLE

BENT 4 SPAN D FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	1.0	0.5		
STRUT	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
STRUT	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		
STRUT		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
STRUT		355.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

CLEAN AND REMOVE DEBRIS FROM THE TOP OF THE STRUTS AND APPLY EPOXY PROTECTIVE COATING. EPOXY PROTECTIVE COATING SHALL BE APPLIED TO THE TOP SURFACE OF THE STRUTS. FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 494

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 4 SPAN D FACE

DRAWN BY : C. BRIGHT DATE : 08/18

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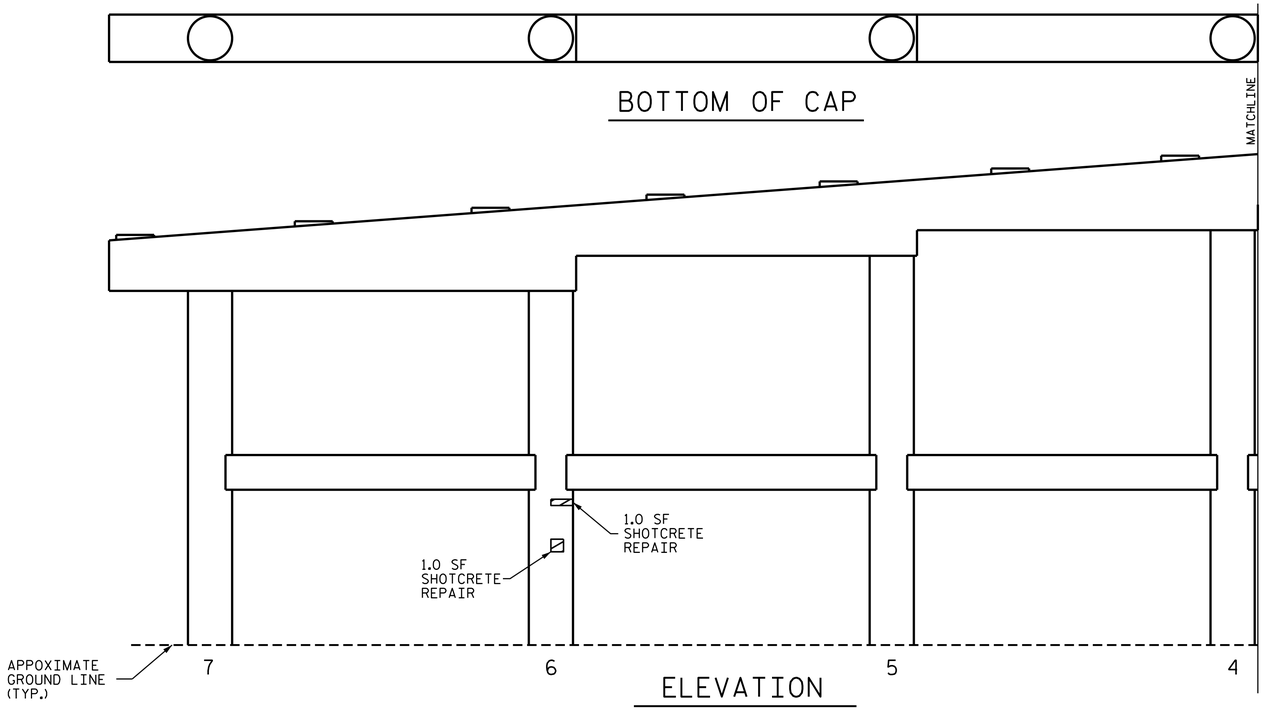
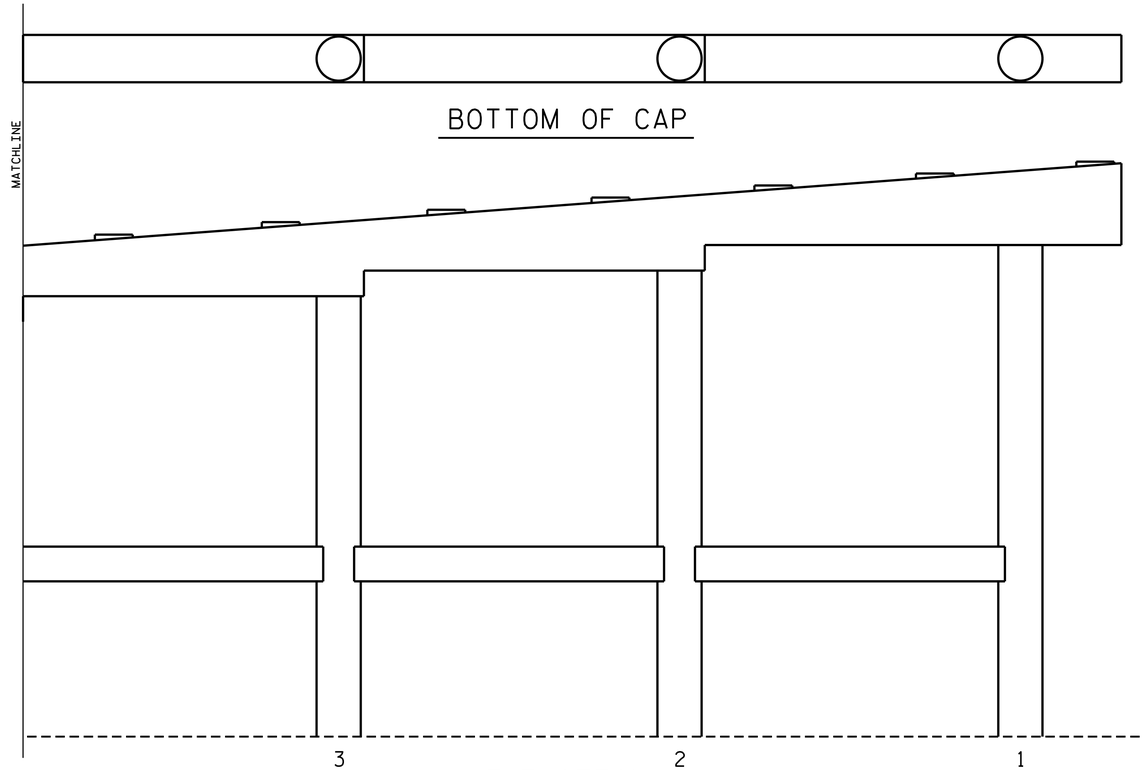


ELEVATION

END VIEW



ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

BENT 4 SPAN E FACE	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	2.0	1.0		
STRUT	0.0	0.0		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	0.0	0.0		
COLUMN	0.0	0.0		
STRUT	0.0	0.0		
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
COLUMN		0.0		
STRUT		0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 494

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 4 SPAN E FACE

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1			3			TOTAL SHEETS
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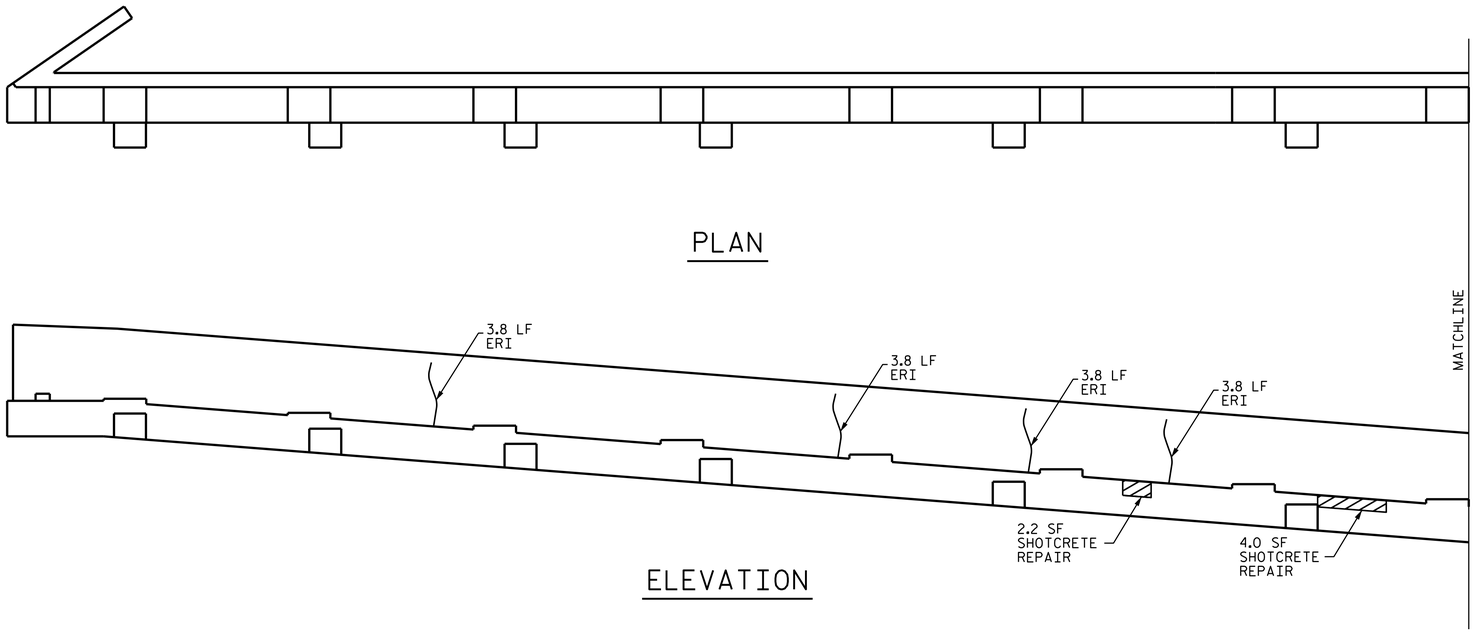

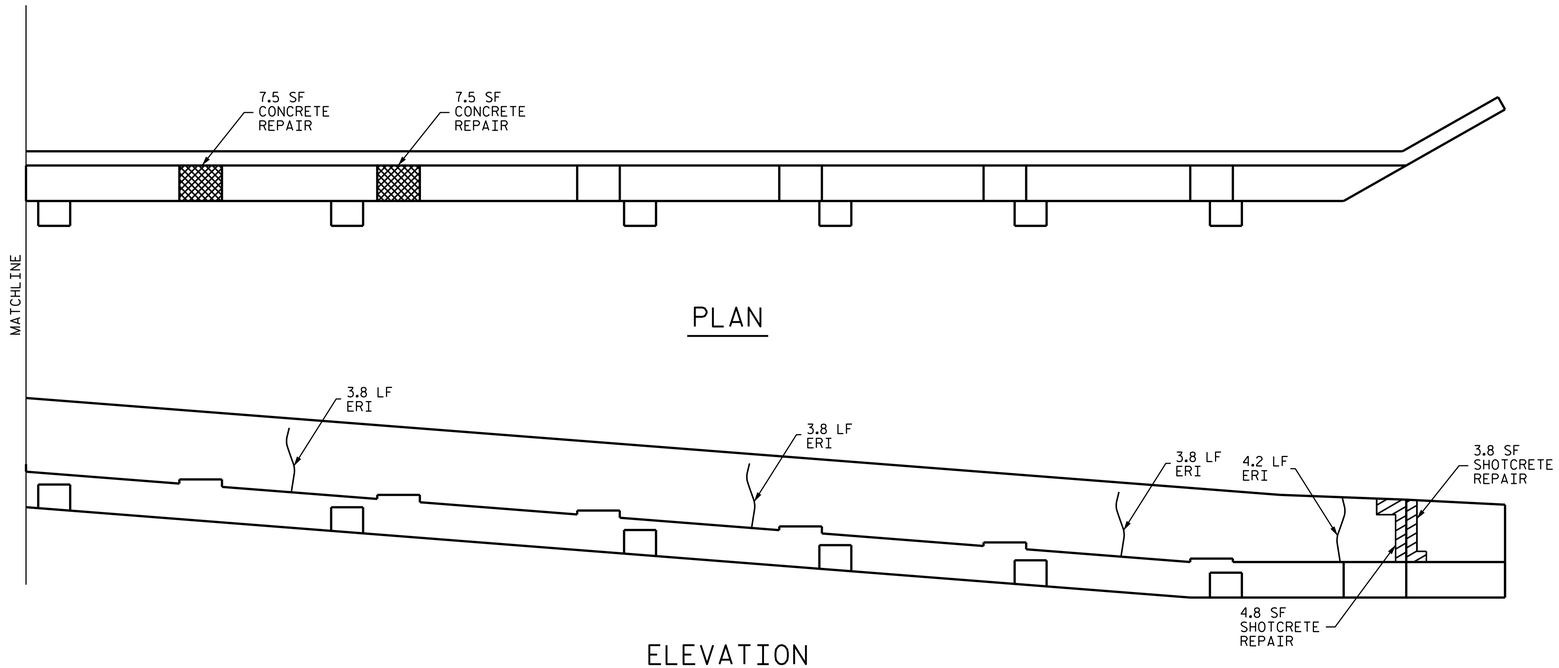

AS-BUILT REPAIR QUANTITY TABLE

END BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	6.2	3.1		
CURTAIN WALL	4.8	2.4		
WING WALL	3.8	1.9		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	15.0	8.8		
CURTAIN WALL	0.0	0.0		
WING WALL				
EPOXY RESIN INJECTION		LIN. FT.	LIN. FT.	
CAP		0.0		
CURTAIN WALL		30.8		
WING WALL		0.0		
EPOXY COATING		SQ. FT.	SQ. FT.	
CAP		175.2		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MINIMUM OF 1"BEHIND REBAR AND MINIMUM 2"CLEARANCE TO SAWCUT. SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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

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

SHOTCRETE REPAIR AREA

CONCRETE REPAIR AREA

ERI - EPOXY RESIN INJECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 494

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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STATE OF NORTH CAROLINA
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RALEIGH

END BENT 2

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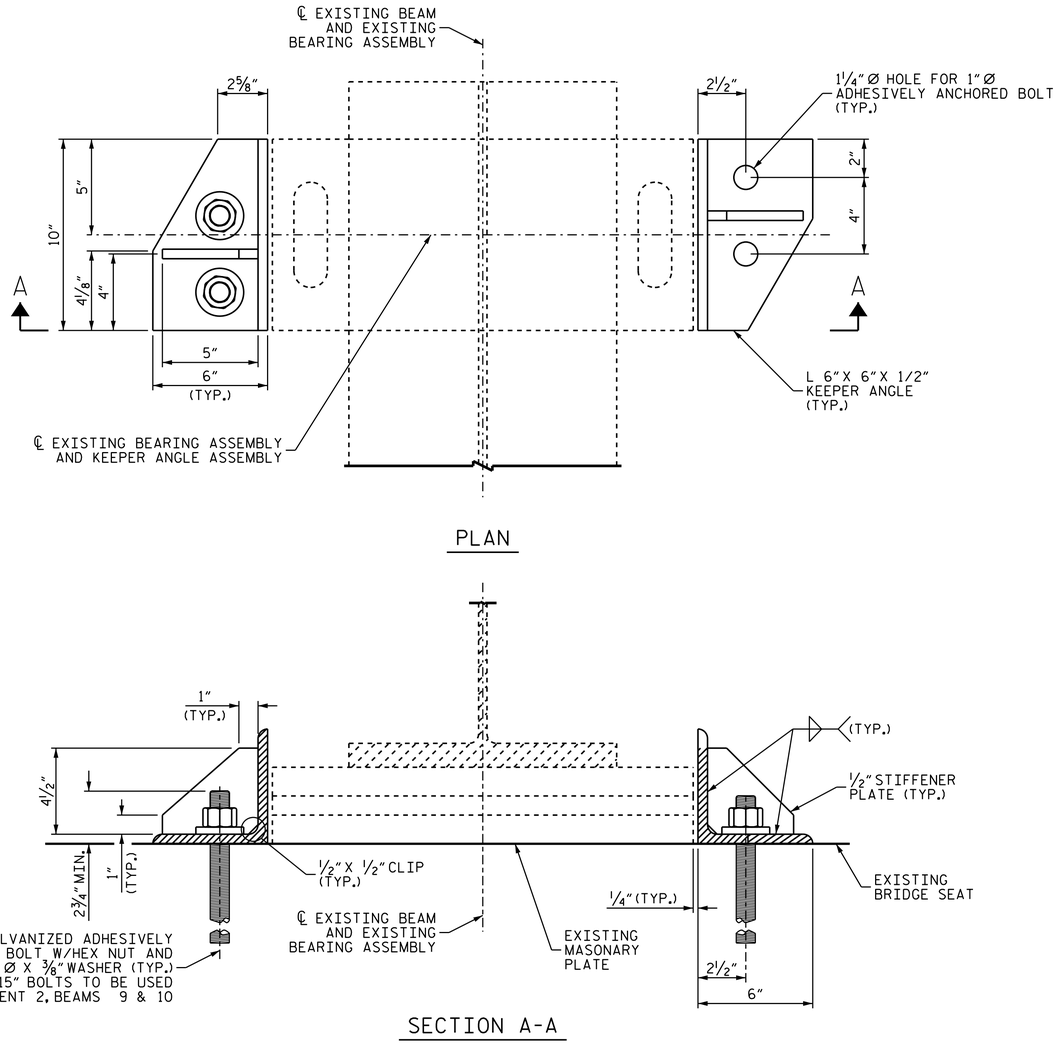


STEEL KEEPER ANGLE ASSEMBLY DETAILS

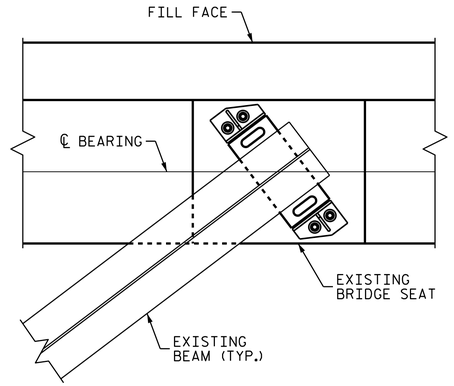
NOTES

STRUCTURAL STEEL SHALL BE AASHTO GRADE 36 OR GREATER.

STRUCTURAL STEEL, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ANCHOR BOLTS MAY BE ADHESIVELY ANCHORED, SEE STANDARD SPECIFICATIONS. NO FIELD TESTING REQUIRED.



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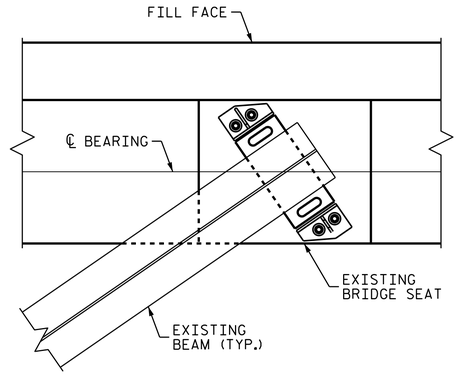

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PLAN

DUE TO VARIABLE SKEWS OF EACH BEAM AT THE END BENTS. ONLY ONE STEEL KEEPER ANGLE ASSEMBLY FOR ONE BEAM FROM EACH END BENT IS SHOWN AS AN EXAMPLE FOR INSTALLATION AND ORIENTATION OF ALL STEEL KEEPER ANGLE ASSEMBLIES.

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 494

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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RALEIGH

STEEL KEEPER ANGLE ASSEMBLY DETAILS

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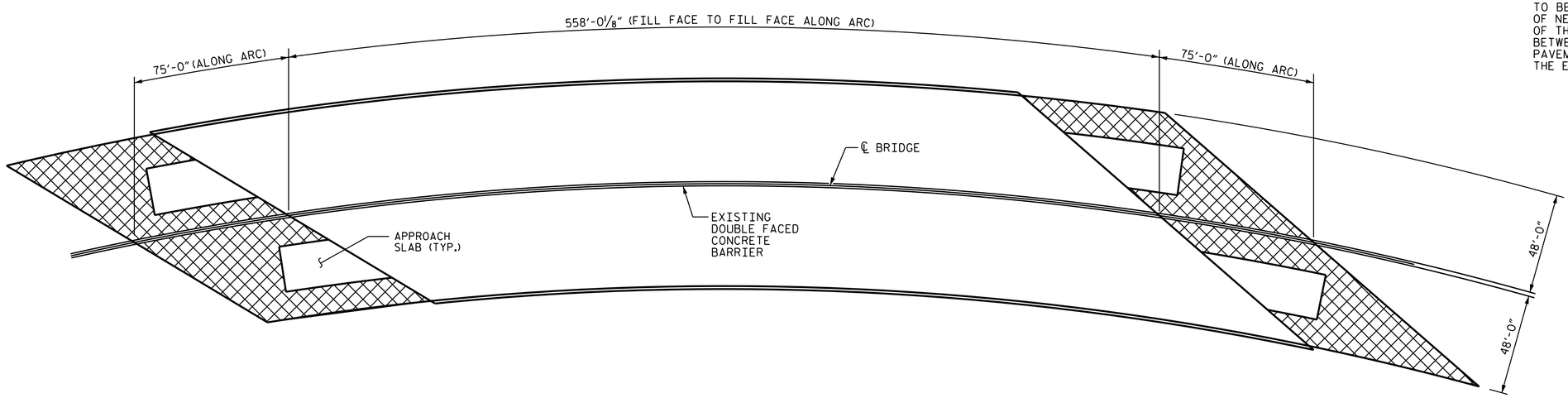


NOTES

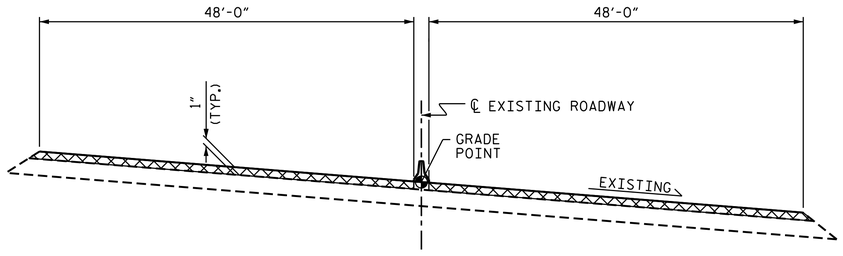
INCIDENTAL MILLING - EXISTING APPROACH ASPHALT PAVEMENT TO BE MILLED AS NECESSARY TO ATTAIN MINIMUM 1½" DEPTH OF NEW ASPHALT PAVEMENT. NEW ASPHALT PAVEMENT SHALL BE OF THICKNESS NECESSARY TO PROVIDE A SMOOTH TRANSITION BETWEEN THE ROADWAY AND THE BRIDGE DECK. THE NEW ASPHALT PAVEMENT THICKNESS MAY EXCEED 1½" DUE TO SETTLEMENT OF THE EXISTING APPROACH.

SUMMARY OF QUANTITIES

	ESTIMATE	ACTUAL
INCIDENTAL MILLING	1219 SO.YDS.	
ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B	105 TONS	
ASPHALT BINDER FOR PLANT MIX	7 TONS	

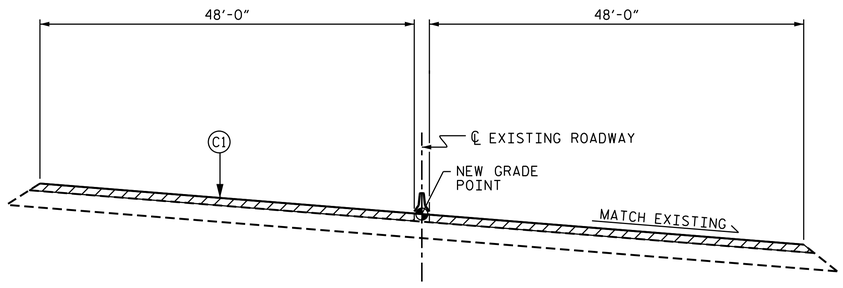
C1	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B AT AN AVERAGE RATE OF 112 LBS. PER SO. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.

INCIDENTAL MILLING



TYPICAL ROADWAY MILLING SECTION

(MILL TO 1½" DEPTH)



TYPICAL ROADWAY SECTION

PROJECT NO. I-5890

BUNCOMBE COUNTY

STATION: 494

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH MILLING & TYPICAL ROADWAY SECTIONS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

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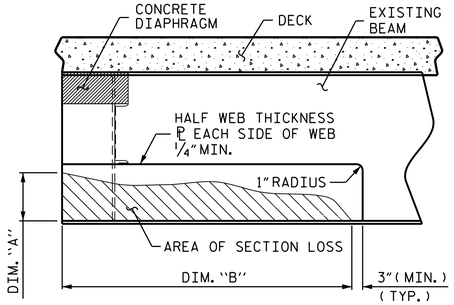

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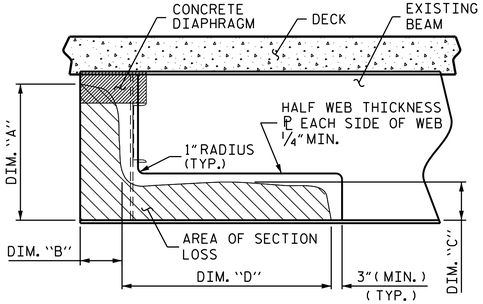

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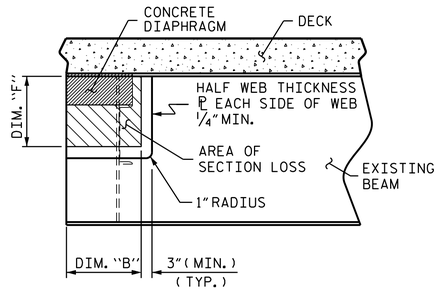

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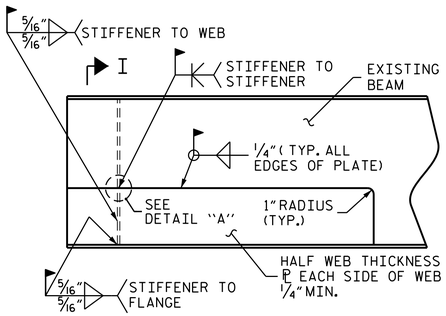

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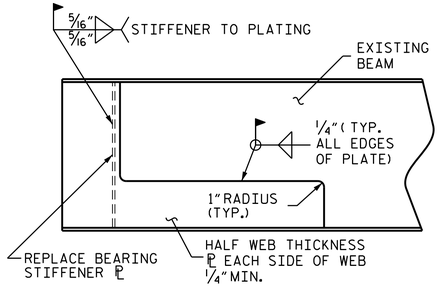

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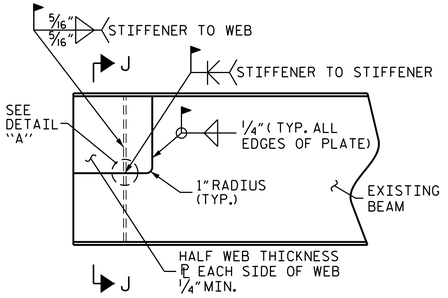

BEAM END PLATING REPAIR

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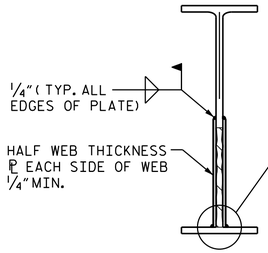

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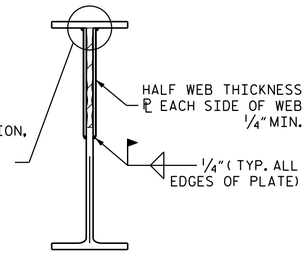

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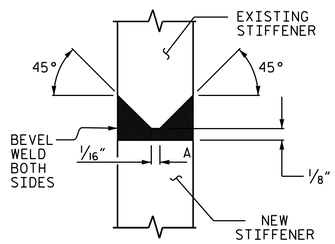
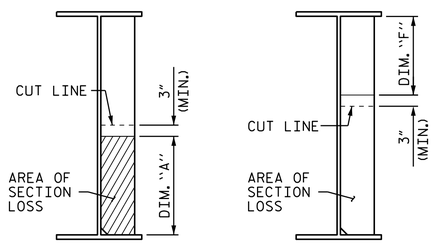
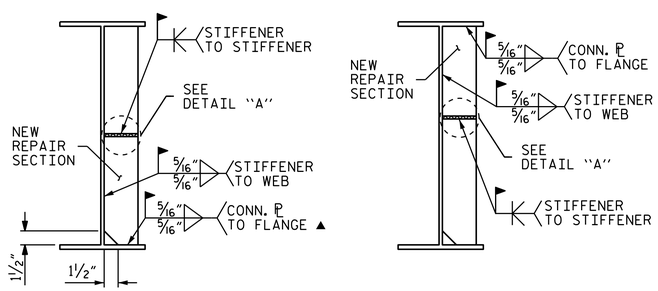


DETAIL "A"



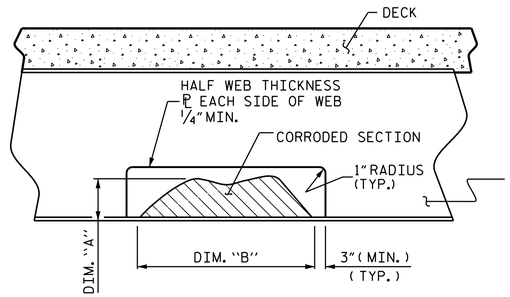
STIFFENER/CONN. ℄ SECTION LOSS



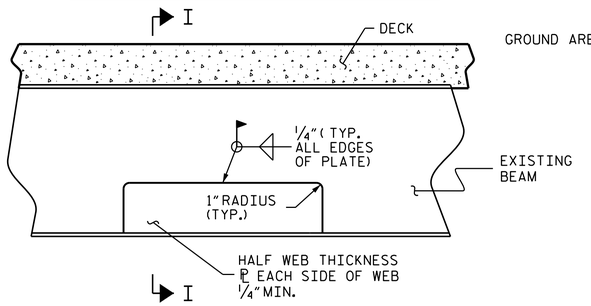
STIFFENER/CONN. ℄ SECTION REPAIR

▲ FOR STIFFENERS, MILL TO BEAR AND DO NOT WELD

STIFFENER/CONNECTOR PLATE REPAIR

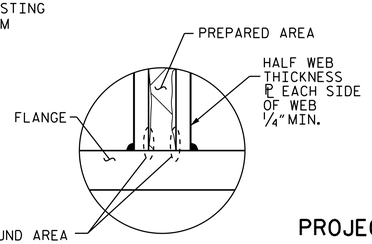


INTERMEDIATE SECTION LOSS BEAM PLATING REPAIR



INTERMEDIATE SECTION LOSS BEAM PLATING REPAIR

INTERMEDIATE BEAM PLATING REPAIR



DETAIL 'B'

BEAM PLATING REPAIR NOTES

ALL CONDITIONS AND DIMENSIONS SHALL BE FIELD VERIFIED PRIOR TO FABRICATION OR INSTALLATION OF ANY COMPONENTS.

REPAIR PLATES SHALL BE NEW, AND SHALL BE THE SAME GRADE OF THE EXISTING STEEL MEMBER OR BETTER.

REPAIR SEQUENCE:

COORDINATE WITH MATERIALS AND TEST UNIT AT LEAST 4 DAYS PRIOR TO ANTICIPATED WORK.

REMOVE LIVE LOAD FROM REPAIR AREA BY EITHER CLOSING BRIDGE TO TRAFFIC OR SHIFTING TRAFFIC AWAY FROM REPAIR AREA.

IF NECESSARY, REMOVE EXISTING STIFFENER TO INSTALL WELDED PLATE REPAIR. REPLACE WITH A NEW STIFFENER PLATE OF SIMILAR SIZE.

IF BEAM DETERIORATION EXTENDS INTO THE CONCRETE DIAPHRAGM THEN CHIP AWAY CONCRETE TO DETERMINE THE EXTENT OF THE DAMAGE.

IF PAINTING THE STEEL, CLEAN AND BLAST STEEL AS REQUIRED, PRIOR TO PERFORMING STEEL REPAIRS. OTHERWISE, MECHANICALLY CLEAN RUST, SCALE, AND EXISTING PAINT TO AT LEAST 3" BEYOND REPAIR AREA.

PRIME ENTIRE REPAIR AREA AND REPAIR PLATES WITH AN ORGANIC ZINC PRIMER PRIOR TO WELDING NEW PLATES. REMOVE PRIMER IN WELD AREA.

ONE PLATE SHALL BE PLACED, AS INDICATED ON EACH SIDE OF THE BEAM WEB.

EACH PLATE SHALL BE APPROXIMATELY ONE-HALF THE ORIGINAL THICKNESS OF THE BEAM WEB.

FULLY WELD ALONG TOP AND SIDES OF THE PLATES AS SHOWN.

ALL WELDING SHALL BE IN ACCORDANCE WITH CURRENT APPLICABLE AWS AND NCDOT STANDARD SPECIFICATIONS.

ALL WELDS SHALL BE INSPECTED AND TESTED BY THE NCDOT MATERIALS AND TEST UNIT IN ACCORDANCE WITH THE CURRENT AWS BRIDGE WELDING CODE AND STANDARD SPECIFICATIONS.

IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, AFTER REPAIR, GRIND ALL WELDS FLUSH, AND THOROUGHLY CLEAN AREA TO REMOVE DEBRIS AND OILS FROM THE REPAIR PROCESS.

CLEANING AND PAINTING OF REPAIRED STRUCTURAL STEEL SHALL BE PERFORMED AS PART OF THE OVERALL CLEANING AND PAINTING CONTRACT.

FOR CLEANING AND PAINTING, SEE PAINTING EXISTING STRUCTURE SPECIAL PROVISIONS.

AFTER BEAMS ARE REPAIRED AND PAINTED, ANY CONCRETE REMOVED FROM THE BENT DIAPHRAGMS SHALL BE RECAST. ANY REINFORCING STEEL CUT DURING THE REMOVAL PROCESS SHALL BE SPLICED WITH A SIMILAR SIZE BAR WITH AT LEAST A ONE FOOT SPLICE TO THE EXISTING STEEL. NO SEPARATE PAYMENT SHALL BE MADE FOR CONCRETE AND REINFORCING STEEL AS THIS IS CONSIDERED INCIDENTAL TO THE PAY ITEM "BEAM REPAIR". FOR BEAM REPAIR, SEE SPECIAL PROVISIONS.

REMOVE ALL TRAFFIC CONTROL DEVICES.

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 484, 486, 487, 488, 494

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BEAM PLATING REPAIR DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee B04B5A4F2FAD484...
11/21/2018

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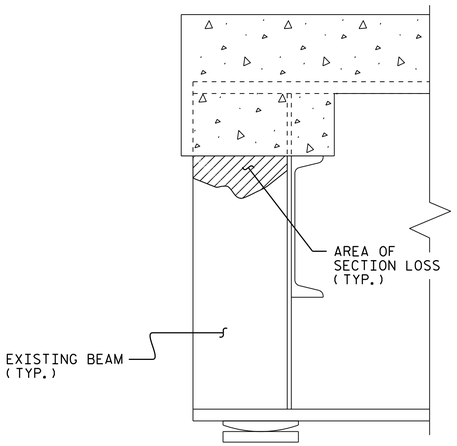
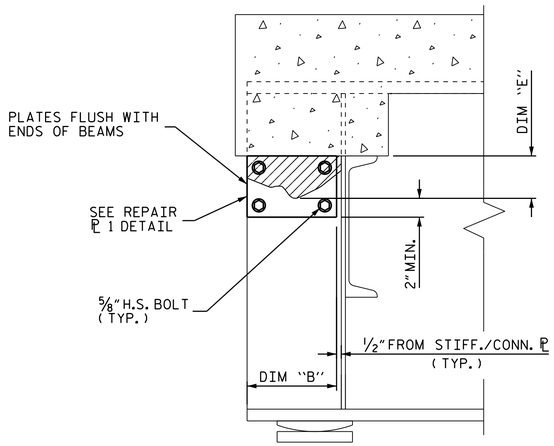
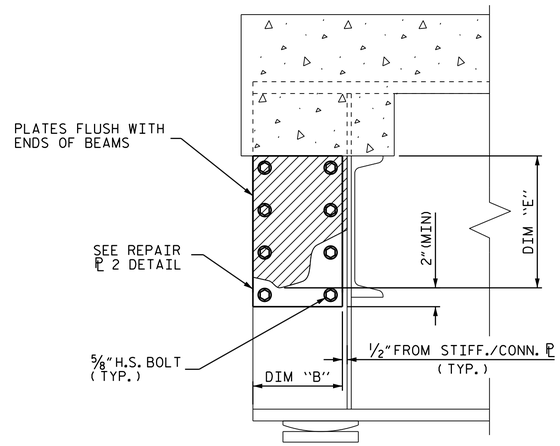


BEAM END SECTION LOSS
(EXISTING)



BEAM END SECTION LOSS PLATING REPAIR
(DIMENSION "E" 3" TO 6 1/2" USE REPAIR ℄ 1)



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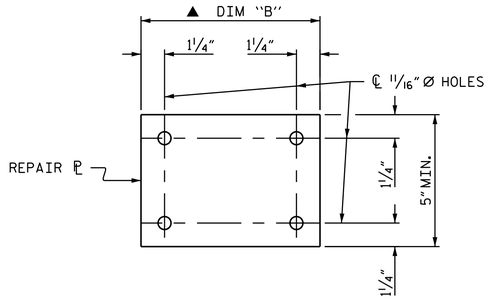
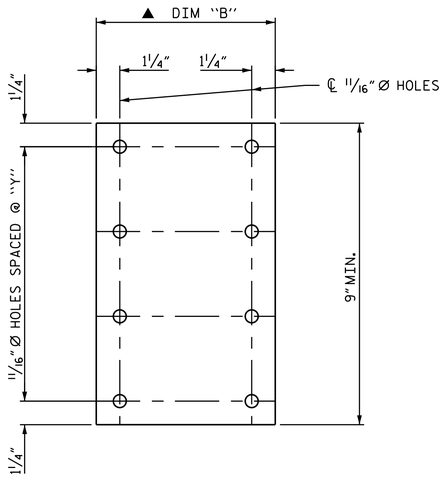
(DIMENSION "E" GREATER THAN 6 1/2" USE REPAIR ℄ 2)



REPAIR ℄ 1 DETAIL
(2-PLATES REQ'D PER REPAIR)



REPAIR ℄ 2 DETAIL
(2-PLATES REQ'D PER REPAIR)

NOTES:

▲ FOR EACH BEAM BEING REPAIRED, CONTRACTOR SHALL FIELD VERIFY DIMENSIONS. PLATE DIMENSIONS SHALL BE ADJUSTED TO FIT IN THE SPACE FROM BEAM END TO 1/2" FROM STIFFENER / CONNECTOR PLATE.

THE ENGINEER SHALL BE NOTIFIED IF DIMENSION "B" EXCEEDS 12". IF SO, AN ADDITIONAL COLUMN OF BOLTS SHALL BE ADDED.

THE PLATES FOR DIM "E" SHALL BE PLACED SNUG TO THE BOTTOM OF THE DIAPHRAGM.

DIMENSION "Y" SHALL BE A MINIMUM OF 3 1/4" AND A MAXIMUM OF 6".

EACH PLATE SHALL BE APPROXIMATELY ONE-HALF THE ORIGINAL THICKNESS OF THE BEAM WEB AND SHALL BE APPROVED BY THE ENGINEER.

PLATES SHALL BE SHOP PRIMED PRIOR TO DELIVERY.

PLATES SHALL BE NEW, AND SHALL BE THE SAME GRADE OF THE EXISTING STEEL MEMBER OR BETTER.

ALL BOLTS SHALL MEET ASTM A325.

ALL NUTS SHALL MEET ASTM A194.

ALL FLAT WASHERS SHALL MEET ASTM F436.

IF STEEL IS WEATHER, ALL BOLTS, NUT, AND WASHERS SHALL BE AASHTO M163 TYPE 3.

THE EPOXY MASTIC USED FOR THIS WORK SHALL BE COMPATIBLE WITH THE PAINT SYSTEM USED FOR THE PAINTING OF EXISTING STEEL AND SHALL BE APPROVED BY THE NCDOT MATERIALS AND TEST UNIT. THE EPOXY MASTIC WILL BE ACCEPTED ON THE BASIS OF THE MANUFACTURER'S WRITTEN CERTIFICATION THAT THE BATCH PRODUCED MEETS THEIR PRODUCT SPECIFICATION.

REPAIR SEQUENCE:

REMOVE LIVE LOAD FROM REPAIR AREA BY EITHER CLOSING BRIDGE TO TRAFFIC OR SHIFTING TRAFFIC AWAY FROM REPAIR AREA.

IF PAINTING THE STEEL, CLEAN AND BLAST STEEL AS REQUIRED, PRIOR TO PERFORMING STEEL REPAIRS. OTHERWISE, MECHANICALLY CLEAN RUST, SCALE, AND EXISTING PAINT TO AT LEAST 3" BEYOND REPAIR AREA.

PRIME ENTIRE REPAIR AREA AND REPAIR PLATES WITH AN ORGANIC ZINC PRIMER PRIOR TO ATTACHING NEW PLATES

ONE PLATE SHALL BE PLACED, ON EACH SIDE OF THE BEAM ENDS.

PRIOR TO PLACEMENT OF THE PLATES, APPLY WET EPOXY MASTIC AROUND THE TOP AND SIDE PERIMETERS ON THE PLATE FACE THAT IS TO BE IN CONTACT WITH THE BEAM. AMOUNT OF EPOXY MASTIC SHALL BE SUFFICIENT TO SEAL THE INTERFACE OF THE PLATE AND THE BEAM AFTER BOLTS ARE TIGHTENED. NO EPOXY MASTIC SHALL BE PLACED ALONG THE BOTTOM PERIMETER ON THE PLATE. WHILE THE MASTIC IS STILL WET, PLATES SHALL BE PUT IN PLACE AND BOLTS PROPERLY TIGHTENED.

TENSION ON THE BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS (DTIS) IN ACCORDANCE WITH ARTICLE 440-8 OF THE NCDOT STANDARD SPECIFICATIONS. DTIS SHALL BE MEET ASTM F959.

AFTER PLACEMENT OF THE PLATES AND TIGHTENING OF THE BOLTS, PLATES, BOLTS, AND SURROUNDING AREA SHALL BE PAINTED OR PAINT SHALL BE REPAIRED AS PER PROJECT REQUIREMENTS AND NCDOT STANDARD SPECIFICATIONS.

PAYMENT WILL BE MADE AT CONTRACT PRICE BID PER POUNDS STRUCTURAL STEEL USED FOR GIRDER REPAIR. SUCH PAYMENTS WILL BE FULL COMPENSATION FOR ALL MATERIALS, EQUIPMENT, TOOLS, LABOR, MISCELLANEOUS STEEL, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.

PROJECT NO. I-5890
BUNCOMBE COUNTY
BRIDGE NO. 484, 486, 487, 488, 494
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BEAM PLATING REPAIR DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee
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11/21/2018

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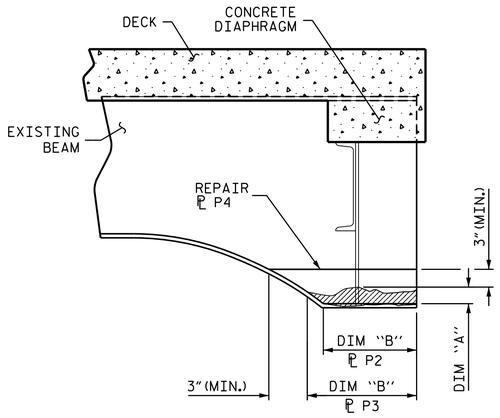
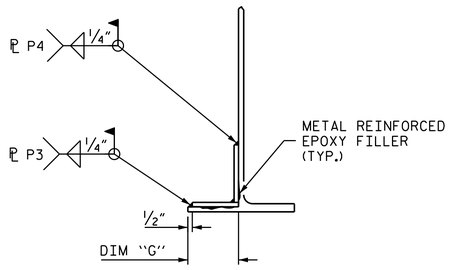
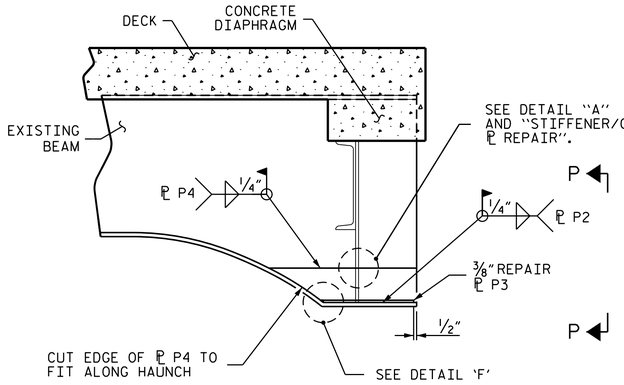


BEAM END SECTION LOSS AND PLATING REPAIR

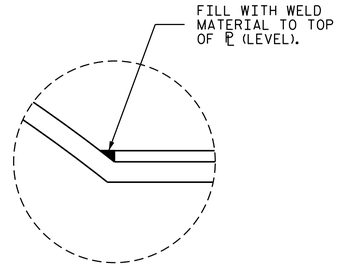


SECTION P-P



BEAM END PLATING REPAIR

BEAM END PLATING REPAIR



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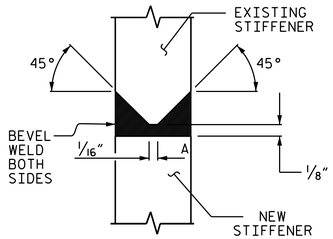

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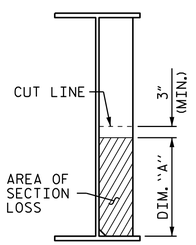
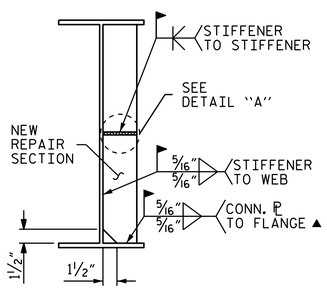


STIFFENER/CONN. ℄ SECTION LOSS



STIFFENER/CONN. ℄ SECTION REPAIR

▲ FOR STIFFENERS, MILL TO BEAR AND DO NOT WELD

STIFFENER/CONNECTOR PLATE REPAIR

BEAM PLATING REPAIR NOTES

ALL CONDITIONS AND DIMENSIONS SHALL BE FIELD VERIFIED PRIOR TO FABRICATION OR INSTALLATION OF ANY COMPONENTS.

REPAIR PLATES SHALL BE NEW, AND SHALL BE THE SAME GRADE OF THE EXISTING STEEL MEMBER OR BETTER.

REPAIR SEQUENCE:

COORDINATE WITH MATERIALS AND TEST UNIT AT LEAST 4 DAYS PRIOR TO ANTICIPATED WORK.

REMOVE LIVE LOAD FROM REPAIR AREA BY EITHER CLOSING BRIDGE TO TRAFFIC OR SHIFTING TRAFFIC AWAY FROM REPAIR AREA.

IF NECESSARY, REMOVE EXISTING STIFFENER TO INSTALL WELDED PLATE REPAIR. REPLACE WITH A NEW STIFFENER PLATE OF SIMILAR SIZE.

IF BEAM DETERIORATION EXTENDS INTO THE CONCRETE DIAPHRAGM THEN CHIP AWAY CONCRETE TO DETERMINE THE EXTENT OF THE DAMAGE.

IF PAINTING THE STEEL, CLEAN AND BLAST STEEL AS REQUIRED, PRIOR TO PERFORMING STEEL REPAIRS. OTHERWISE, MECHANICALLY CLEAN RUST, SCALE, AND EXISTING PAINT TO AT LEAST 3" BEYOND REPAIR AREA.

PRIME ENTIRE REPAIR AREA AND REPAIR PLATES WITH AN ORGANIC ZINC PRIMER PRIOR TO WELDING NEW PLATES. REMOVE PRIMER IN WELD AREA.

ONE PLATE SHALL BE PLACED, AS INDICATED ON EACH SIDE OF THE BEAM WEB.

UNLESS OTHERWISE NOTED EACH PLATE SHALL BE APPROXIMATELY ONE-HALF THE ORIGINAL THICKNESS OF THE BEAM WEB.

FULLY WELD ALONG TOP AND SIDES OF THE PLATES AS SHOWN.

ALL WELDING SHALL BE IN ACCORDANCE WITH CURRENT APPLICABLE AWS AND NCDOT STANDARD SPECIFICATIONS.

ALL WELDS SHALL BE INSPECTED AND TESTED BY THE NCDOT MATERIALS AND TEST UNIT IN ACCORDANCE WITH THE CURRENT AWS BRIDGE WELDING CODE AND STANDARD SPECIFICATIONS.

IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, AFTER REPAIR, GRIND ALL WELDS FLUSH, AND THOROUGHLY CLEAN AREA TO REMOVE DEBRIS AND OILS FROM THE REPAIR PROCESS.

CLEANING AND PAINTING OF REPAIRED STRUCTURAL STEEL SHALL BE PERFORMED AS PART OF THE OVERALL CLEANING AND PAINTING CONTRACT.

FOR CLEANING AND PAINTING, SEE PAINTING EXISTING STRUCTURE SPECIAL PROVISIONS.

AFTER BEAMS ARE REPAIRED AND PAINTED, ANY CONCRETE REMOVED FROM THE BENT DIAPHRAGMS SHALL BE RECAST. ANY REINFORCING STEEL CUT DURING THE REMOVAL PROCESS SHALL BE SPLICED WITH A SIMILAR SIZE BAR WITH AT LEAST A ONE FOOT SPLICE TO THE EXISTING STEEL. NO SEPARATE PAYMENT SHALL BE MADE FOR CONCRETE AND REINFORCING STEEL AS THIS IS CONSIDERED INCIDENTAL TO THE PAY ITEM "BEAM REPAIR". FOR BEAM REPAIR, SEE SPECIAL PROVISIONS.

REMOVE ALL TRAFFIC CONTROL DEVICES.

PROJECT NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 484, 486, 487, 488, 494

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BEAM PLATING REPAIR DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee
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11/21/2018

DRAWN BY : CL BRIGHT DATE : 10/2018
CHECKED BY : T. SHERRILL DATE : 10/2018

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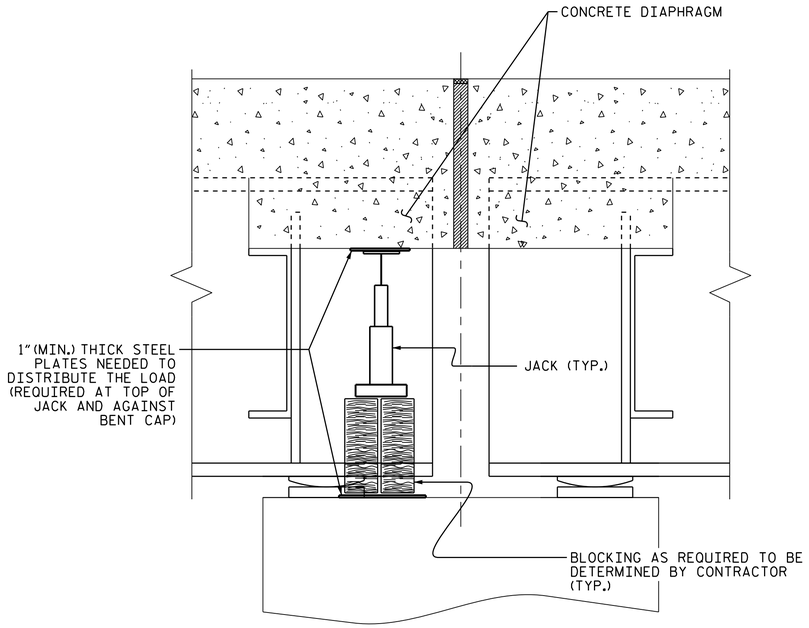

SECTION THRU DIAPHRAGM

THIS DETAIL IS A GENERIC EXAMPLE OF A JACKING SCHEME AND DOES NOT NECESSARILY REPRESENT SPECIFIC CONDITIONS AT A PARTICULAR BRIDGE. ACTUAL BRIDGE GEOMETRIES, DIMENSIONS, AND CONDITIONS MAY DIFFER FROM THIS DETAIL. PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL INVESTIGATE THE BRIDGES ON THE PROJECT AND DEVELOP A JACKING PLAN TO BE SUBMITTED FOR REVIEW AND APPROVAL. SEE BRIDGE JACKING SPECIAL PROVISION.

JACKING NOTES:

THE BEAM SHALL BE LIFTED ENOUGH THAT THE BEAM CLEARS THE BEARINGS AND ALL LOAD IS SUPPORTED BY THE JACKS. AFTER JACKING IS COMPLETE, THE CONTRACTOR SHALL PROVIDE FOR A METHOD TO REMOVE THE JACKS AND SUPPORT THE BEAM FOR DEAD AND LIVE LOAD DURING THE REPAIR OPERATIONS. IF THE JACKS REMAIN IN PLACE DURING THE ENTIRE JACKING AND REPAIR OPERATION, THEY SHALL HAVE MECHANICAL LOCK OFF CAPABILITIES.

IF, DURING THE JACKING PROCESS, OR WHILE THE BEAM IS BEING SUPPORTED, THE BEAM SHIFTS FROM ITS ORIGINAL POSITION, ALL WORK SHALL CEASE AND THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.

PRIOR TO JACKING, THE CONTRACTOR SHALL ENSURE THERE ARE NO OBSTACLES PREVENTING THE BEAM FROM BEING LIFTED.

BEARINGS ADJACENT TO THE BEAM BEING JACKED MAY BE LOOSENED TO DECREASE THE RESISTANCE OF THE DECK SLAB DURING JACKING. ALL BEARINGS LOOSENED SHALL BE TIGHTENED BACK AFTER REPAIR OPERATIONS ARE COMPLETED AND THE JACKS AND BLOCKING HAVE BEEN REMOVED.

THE MAXIMUM DIFFERENTIAL BETWEEN ADJACENT BEAMS THAT ARE BEING JACKED IS $\frac{1}{8}$".

PROJ. NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 494, 486, 487, 488, 494

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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11/21/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JACKING DETAILS

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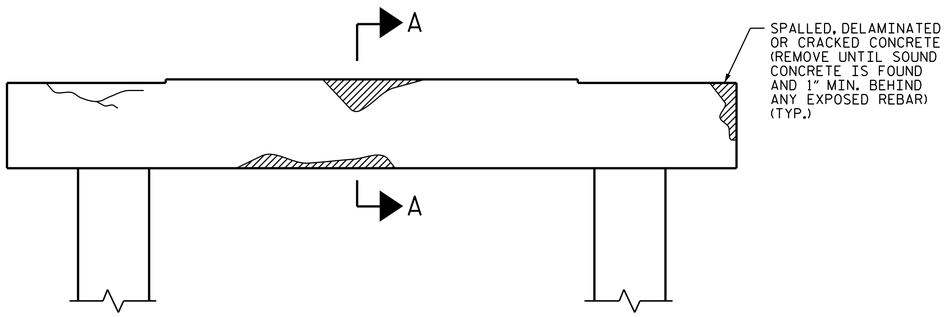
NOTES

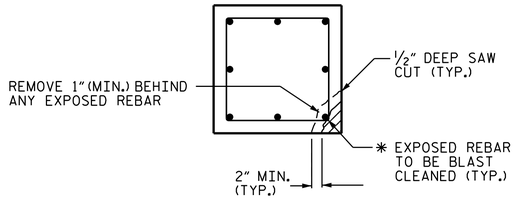
TYPICAL BENT CAP REPAIRS ARE SHOWN. REPAIR DETAILS SIMILAR FOR END BENT CAPS AND STRUTS.

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.

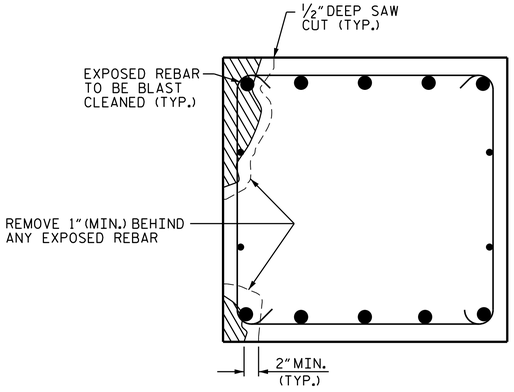
FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.



BENT CAP REPAIRS

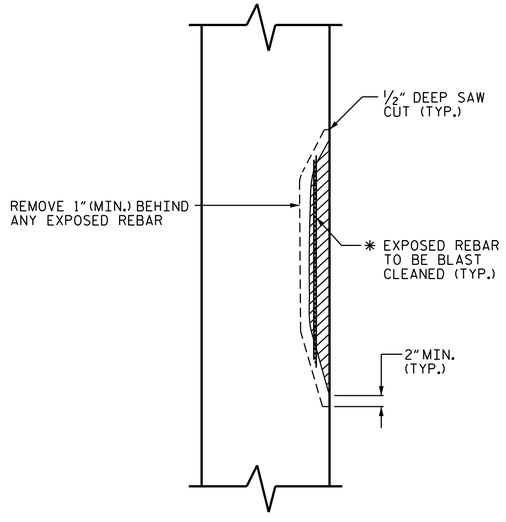


PLAN OF COLUMN



SECTION A-A

CAP REPAIR



* REPAIR LENGTH SHALL NOT EXCEED 10 FEET.

ELEVATION OF COLUMN

COLUMN REPAIR

PROJ. NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 484, 486, 487, 488, 494

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL CAP AND COLUMN REPAIR DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by:
11/21/2018

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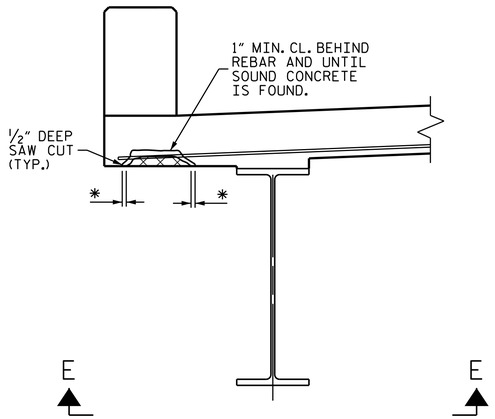
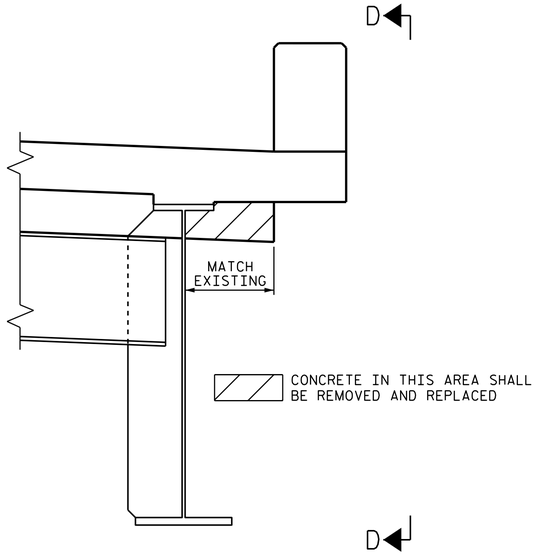
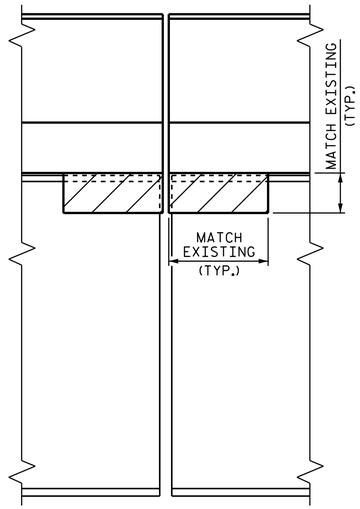
NOTE: OVERHANG DIAPHRAGMS TO BE REMOVED AND REPLACED, ARE SHOWN ON "PLAN OF SPAN" SHEETS. OVERHANG DIAPHRAGMS SHALL BE REMOVED PRIOR TO CLEANING AND PAINTING OF BEAMS AND REPLACED AFTER BEAM REPAIRS AND PAINTING ARE COMPLETE.



TYPICAL SECTION

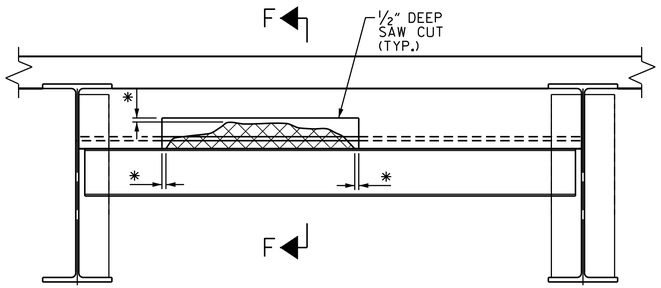


TYPICAL SECTION



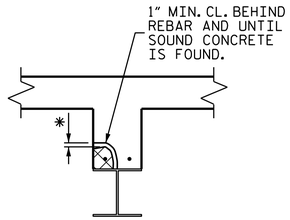
SECTION D-D

OVERHANG DIAPHRAGM REPLACEMENT DETAILS



TYPICAL SECTION

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



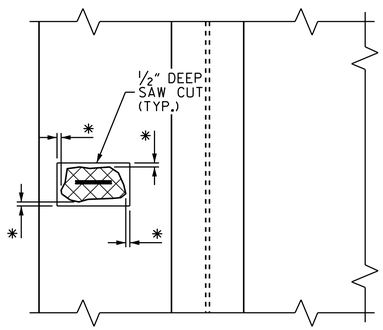
SECTION F-F

DAMAGED AREA

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

INTERIOR DIAPHRAGM REPAIR DETAILS

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



SECTION E-E

OVERHANG DETAILS

PROJ. NO. I-5890

BUNCOMBE COUNTY

BRIDGE NO. 484, 486, 487, 488, 494

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

OVERHANG, DIAPHRAGM AND BRIDGE RAIL REPAIR DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by:
Amber Lee
11/21/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-93
1			3			TOTAL SHEETS
2			4			93

DRAWN BY : R.L.PUTEK DATE : 08/2018
CHECKED BY : A.M. LEE, PE DATE : 08/2018

21-NOV-2018 16:01
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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 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990