

AS-BUILT REPAIR QUANTITY TABLE				
BENT 6 SPAN G FACE				
	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				
CAP	0.0			
COLUMN	0.0			
SURFACE PREP FOR CONCRETE SUBSTRUCTURE	AREA (SQ.FT.)		AREA (SQ.FT.)	
CAP FACES	147.4			
STRUT FACES	69.0			
SILANE SUBSTRUCTURE TREATMENT	AREA (SQ.FT.)		AREA (SQ.FT.)	
CAP FACES	147.4			
STRUT FACES	69.0			

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

NOTES

REPAIR LOCATIONS AND ESTIMATE OF 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.




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

APPLY EPOXY COATING TO HORIZONTAL SUBSTRUCTURE SURFACES AND SILANE SUBSTRUCTURE TREATMENT TO VERTICAL SUBSTRUCTURE SURFACES. ONLY APPLY TO AREAS AS INDICATED ON PLANS.

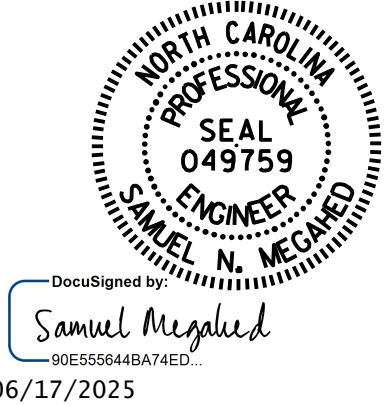
FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR SILANE SUBSTRUCTURE TREATMENT, SEE SPECIAL PROVISIONS.

-  SHOTCRETE REPAIR AREA
-  CONCRETE REPAIR AREA
-  PREVIOUSLY ACCOUNTED FOR AREA

PROJECT NO. 15BPR.119
CATAWBA COUNTY
BRIDGE NO. 170139
SHEET 13 OF 18



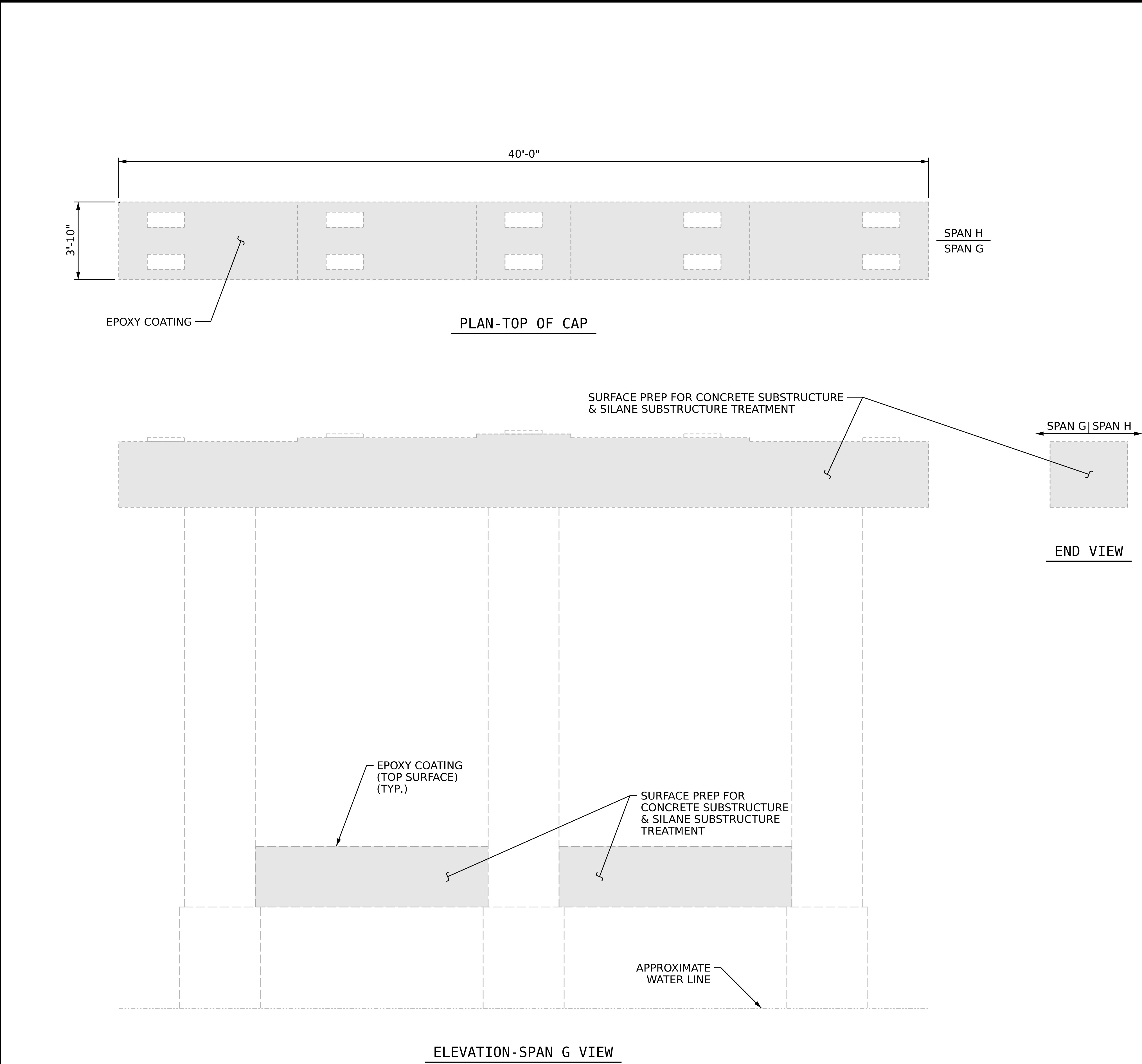
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIRS
BENT 6
SPAN G FACE

DRAWN BY : HRS DATE : 06/24
CHECKED BY : A. SORSENGINH DATE : 06/24
DESIGN ENGINEER OF RECORD: S. MEGAHED DATE : 10/24

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REVISIONS						SHEET NO. S2-35
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 78
2			4			



AS-BUILT REPAIR QUANTITY TABLE				
BENT 7 SPAN G FACE				
	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				
CAP	0.0			
COLUMN	0.0			
EPOXY COATING	AREA (SQ.FT.)		AREA (SQ.FT.)	
TOP OF BENT CAP	139.6			
TOP OF STRUT	85.8			
SURFACE PREP FOR CONCRETE SUBSTRUCTURE	AREA (SQ.FT.)		AREA (SQ.FT.)	
CAP FACES	147.4			
STRUT FACES	69.0			
SILANE SUBSTRUCTURE TREATMENT	AREA (SQ.FT.)		AREA (SQ.FT.)	
CAP FACES	147.4			
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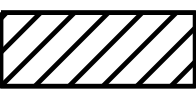
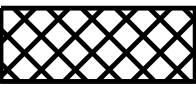
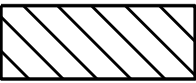
CLEAN AND REMOVE DEBRIS FROM THE TOP OF THE CAP AND APPLY EPOXY PROTECTIVE COATING. EPOXY COATING SHALL BE APPLIED TO THE TOP SURFACE OF THE CAP. THE CONTRACTOR SHALL NOT COAT THE AREA OF THE CAP BENEATH THE MASONRY PLATES. FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

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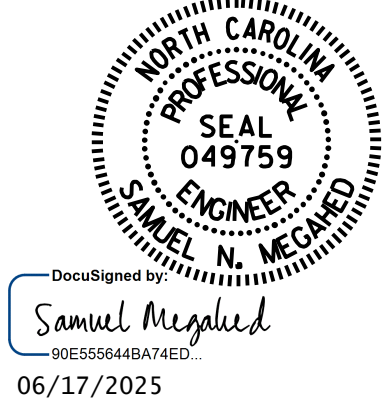
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-  SHOTCRETE REPAIR AREA
-  CONCRETE REPAIR AREA
-  PREVIOUSLY ACCOUNTED FOR AREA

PROJECT NO. 15BPR.119
CATAWBA COUNTY
BRIDGE NO. 170139
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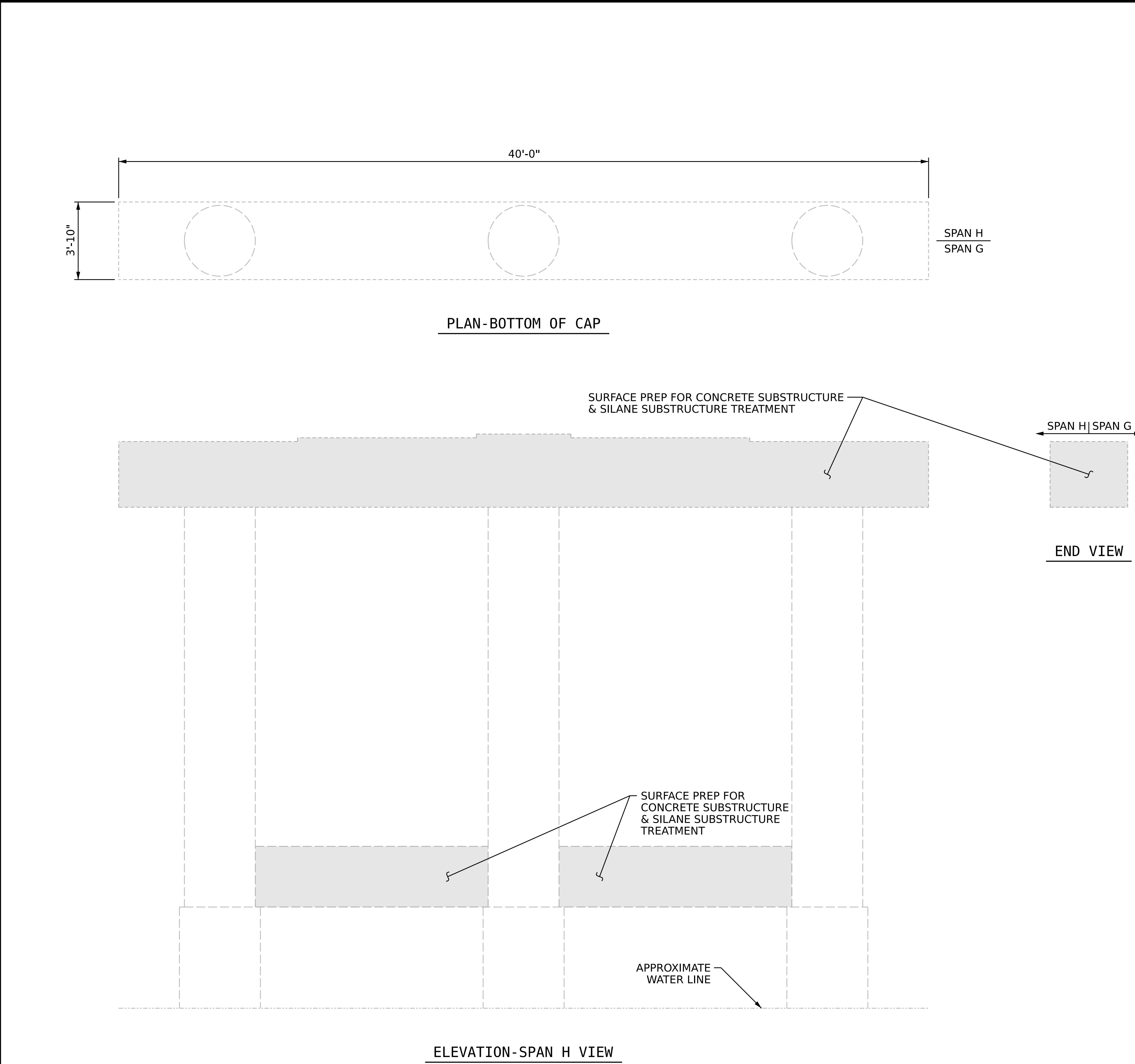
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIRS
BENT 7
SPAN G FACE

DRAWN BY : HRS DATE : 06/24
CHECKED BY : A. SORSENGINH DATE : 06/24
DESIGN ENGINEER OF RECORD: S. MEGAHED DATE : 10/24

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1			3			TOTAL SHEETS 78
2			4			



AS-BUILT REPAIR QUANTITY TABLE				
BENT 7 SPAN H FACE				
	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				
CAP	0.0			
COLUMN	0.0			
SURFACE PREP FOR CONCRETE SUBSTRUCTURE	AREA (SQ.FT.)		AREA (SQ.FT.)	
CAP FACES	147.4			
STRUT FACES	69.0			
SILANE SUBSTRUCTURE TREATMENT	AREA (SQ.FT.)		AREA (SQ.FT.)	
CAP FACES	147.4			
STRUT FACES	69.0			

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

NOTES

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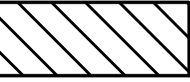
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-  SHOTCRETE REPAIR AREA
-  CONCRETE REPAIR AREA
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PROJECT NO. 15BPR.119
CATAWBA COUNTY
BRIDGE NO. 170139
SHEET 15 OF 18

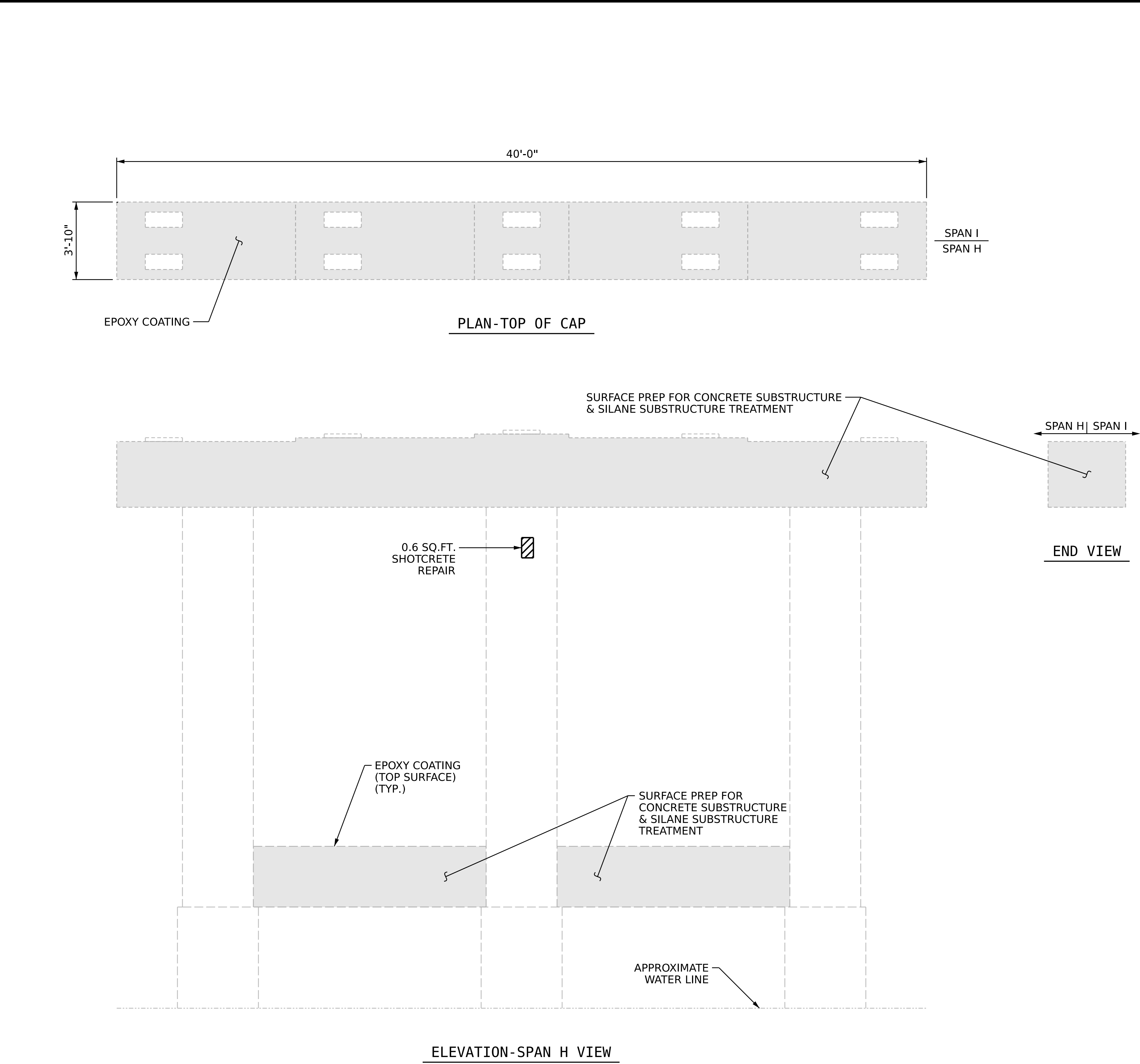


DocuSigned by:
Samuel Megahed
06/17/2025

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S2-37	
SUBSTRUCTURE REPAIRS BENT 7 SPAN H FACE						TOTAL SHEETS 78	
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

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CHECKED BY : A. SORSENGINH DATE : 06/24
DESIGN ENGINEER OF RECORD: S. MEGAHED DATE : 10/24

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AS-BUILT REPAIR QUANTITY TABLE				
BENT 8 SPAN H FACE				
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA (SQ.FT.)	VOLUME (CU.FT.)	AREA (SQ.FT.)	VOLUME (CU.FT.)
CAP	0.0	0.0		
COLUMN	0.6	0.3		
CONCRETE REPAIRS				
CAP	0.0			
COLUMN	0.0			
EPOXY COATING	AREA (SQ.FT.)		AREA (SQ.FT.)	
TOP OF BENT CAP	139.6			
TOP OF STRUT	85.8			
SURFACE PREP FOR CONCRETE SUBSTRUCTURE	AREA (SQ.FT.)		AREA (SQ.FT.)	
CAP FACES	147.4			
STRUT FACES	69.0			
SILANE SUBSTRUCTURE TREATMENT	AREA (SQ.FT.)		AREA (SQ.FT.)	
CAP FACES	147.4			
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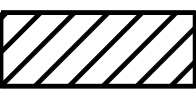
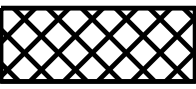
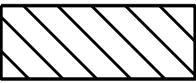
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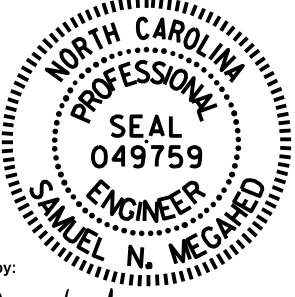
-  SHOTCRETE REPAIR AREA
-  CONCRETE REPAIR AREA
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PROJECT NO. **15BPR.119**
CATAWBA COUNTY
BRIDGE NO. **170139**

SHEET 16 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUBSTRUCTURE REPAIRS
BENT 8
SPAN H FACE**

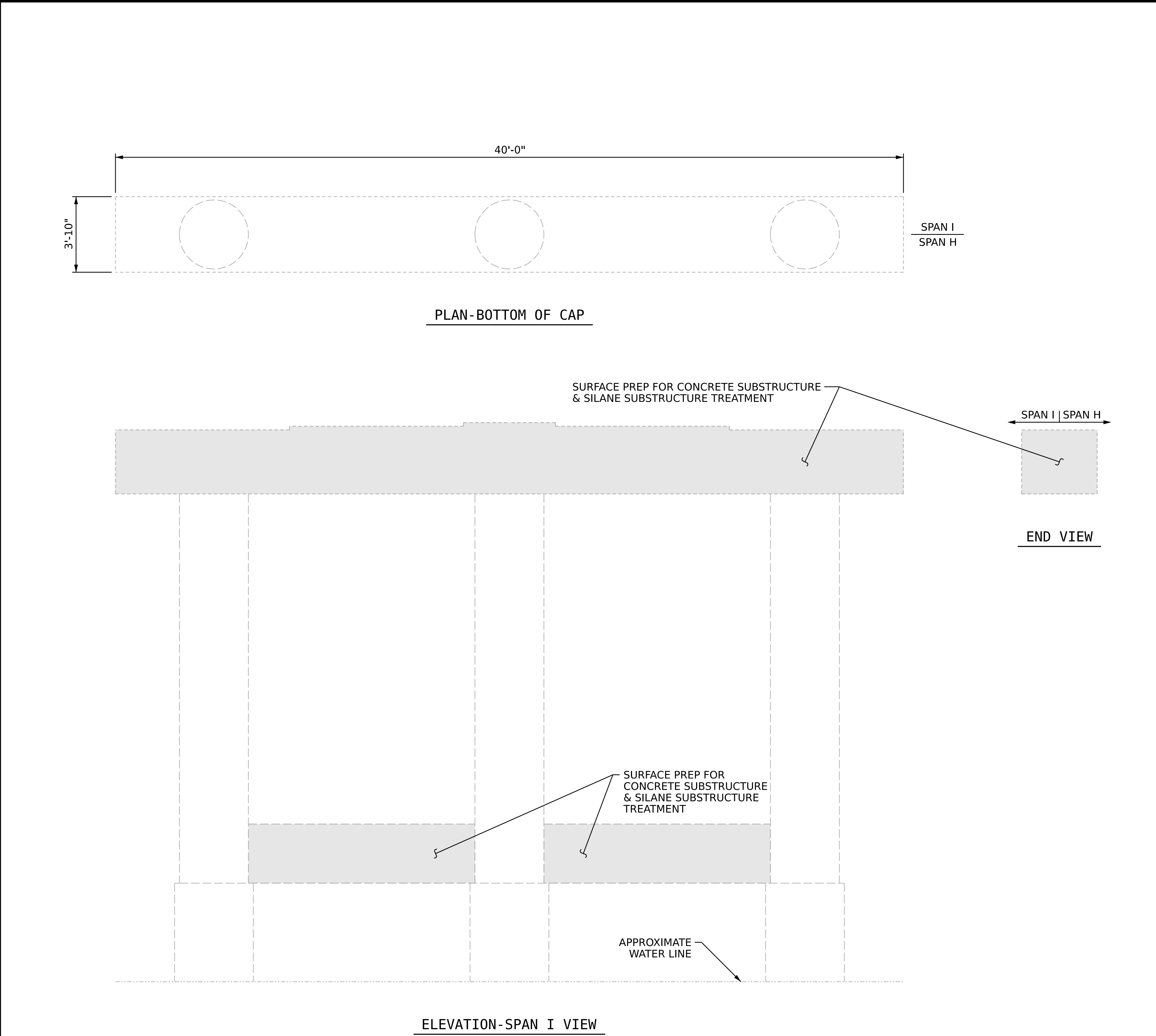


DocuSigned by:
Samuel Megahed
06/17/2025

DRAWN BY : HRS DATE : 06/24
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REVISIONS						SHEET NO. S2-38
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 78
2			4			



AS-BUILT REPAIR QUANTITY TABLE				
BENT 8 SPAN I FACE				
	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				
CAP	0.0			
COLUMN	0.0			
SURFACE PREP FOR CONCRETE SUBSTRUCTURE	AREA (SQ.FT.)		AREA (SQ.FT.)	
CAP FACES	147.4			
STRUT FACES	69.0			
SILANE SUBSTRUCTURE TREATMENT	AREA (SQ.FT.)		AREA (SQ.FT.)	
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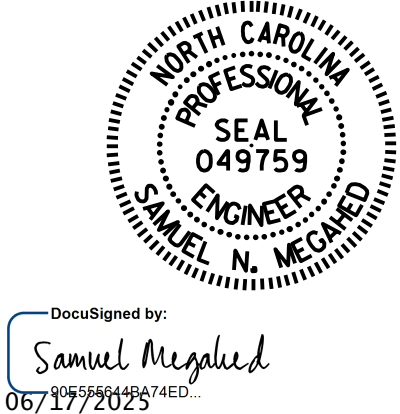
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-  CONCRETE REPAIR AREA
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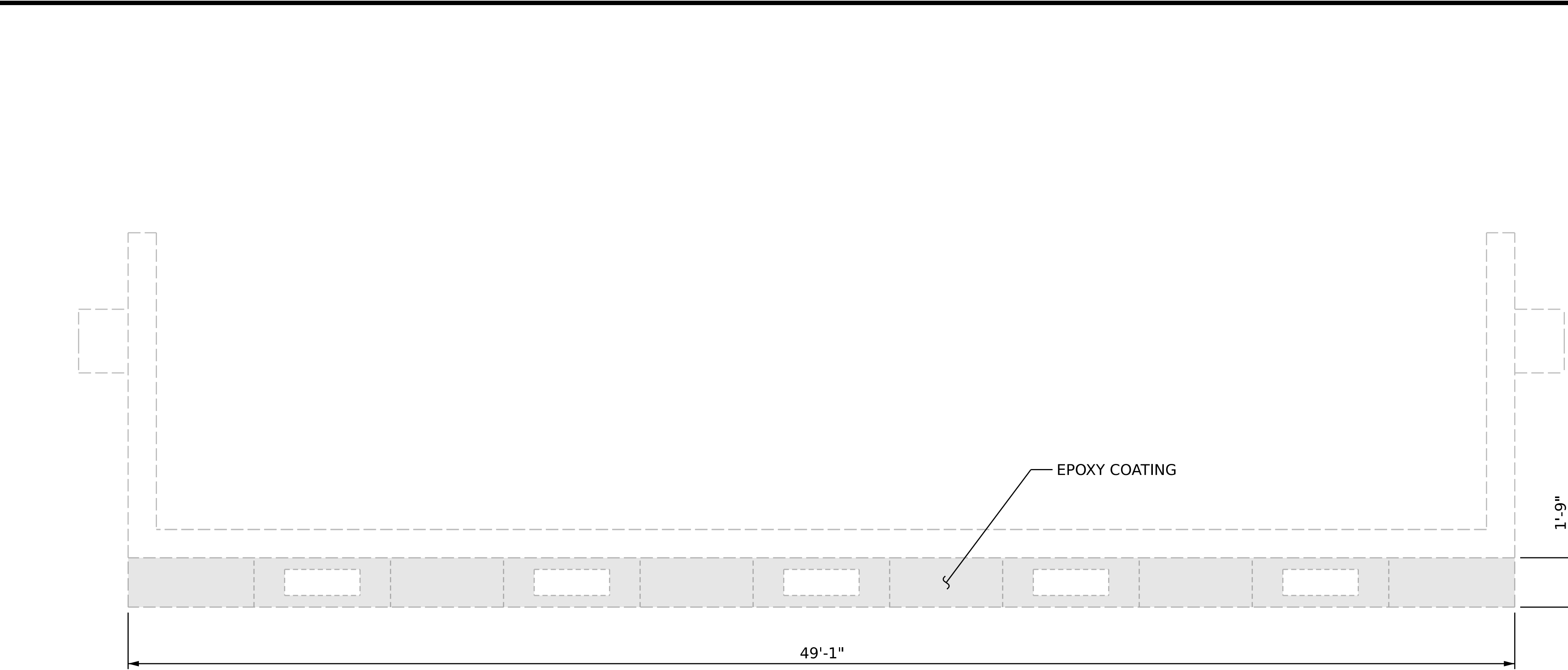
PROJECT NO. 15BPR.119
CATAWBA COUNTY
BRIDGE NO. 170139
SHEET 17 OF 18



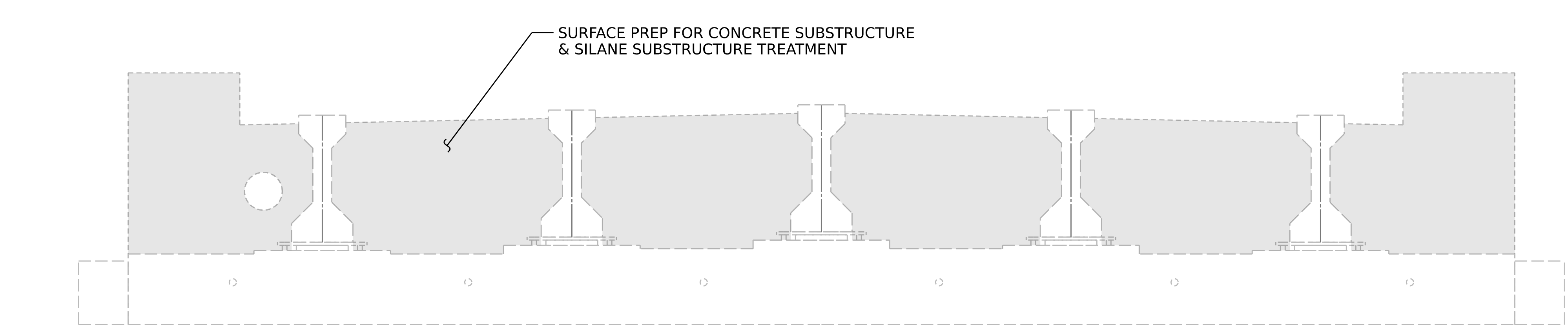
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-39
1			3			TOTAL SHEETS
2			4			78

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PLAN



ELEVATION

AS-BUILT REPAIR QUANTITY TABLE				
END BENT 2				
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA (SQ.FT.)	VOLUME (CU.FT.)	AREA (SQ.FT.)	VOLUME (CU.FT.)
CAP	0.0	0.0		
BACKWALL	0.0	0.0		
CONCRETE REPAIRS	AREA (SQ.FT.)	VOLUME (CU.FT.)	AREA (SQ.FT.)	VOLUME (CU.FT.)
CAP	0.0	0.0		
BACKWALL	0.0	0.0		
EPOXY COATING	AREA (SQ.FT.)		AREA (SQ.FT.)	
CAP	79.0			
SILANE SUBSTRUCTURE TREATMENT	AREA (SQ.FT.)		AREA (SQ.FT.)	
BACKWALL	210.3			
SURFACE PREP FOR CONCRETE SUBSTRUCTURE	AREA (SQ.FT.)		AREA (SQ.FT.)	
BACKWALL	210.3			

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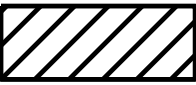


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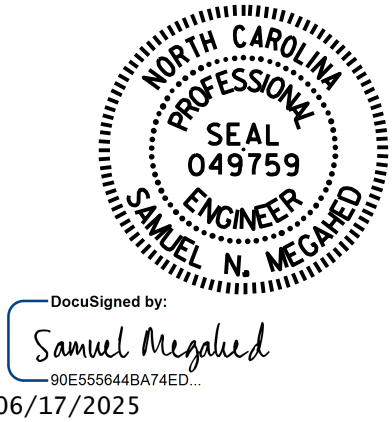
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-  CONCRETE REPAIR AREA
-  PREVIOUSLY ACCOUNTED FOR AREA

PROJECT NO. **15BPR.119**
CATAWBA COUNTY
BRIDGE NO. **170139**

SHEET 18 OF 18



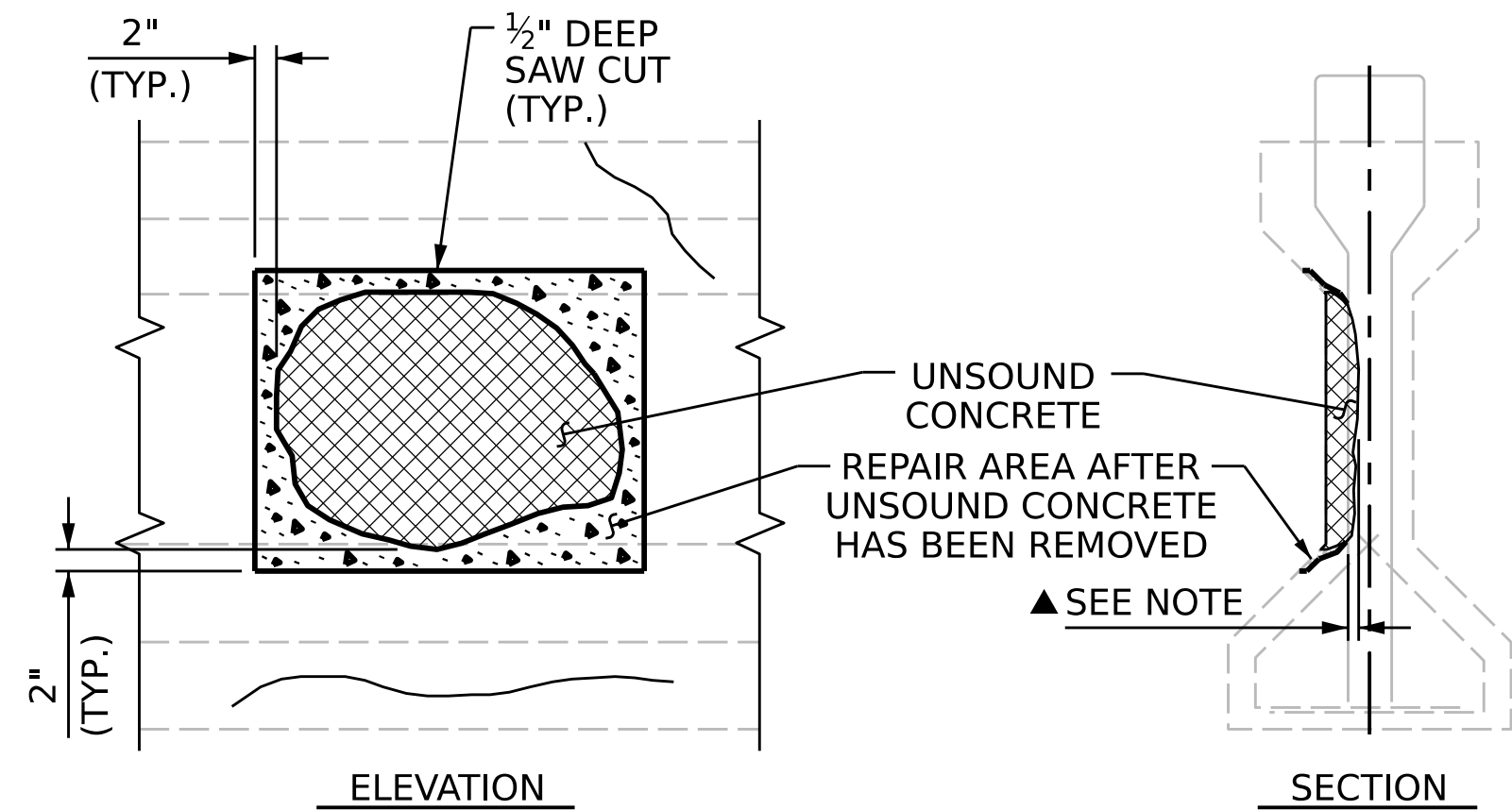
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUBSTRUCTURE REPAIRS
END BENT 2**

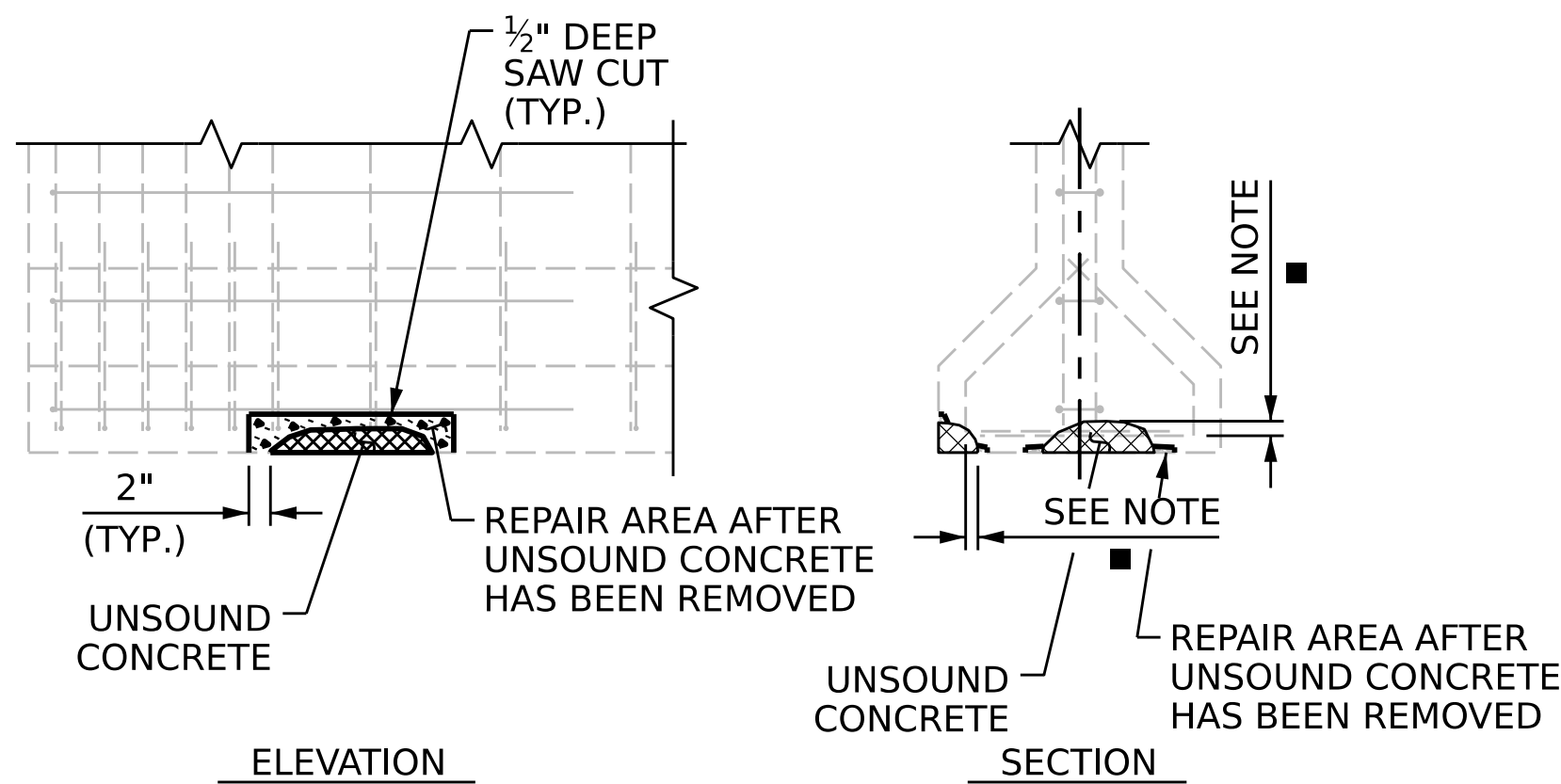
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REVISIONS						SHEET NO. S2-40
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 78
2			4			

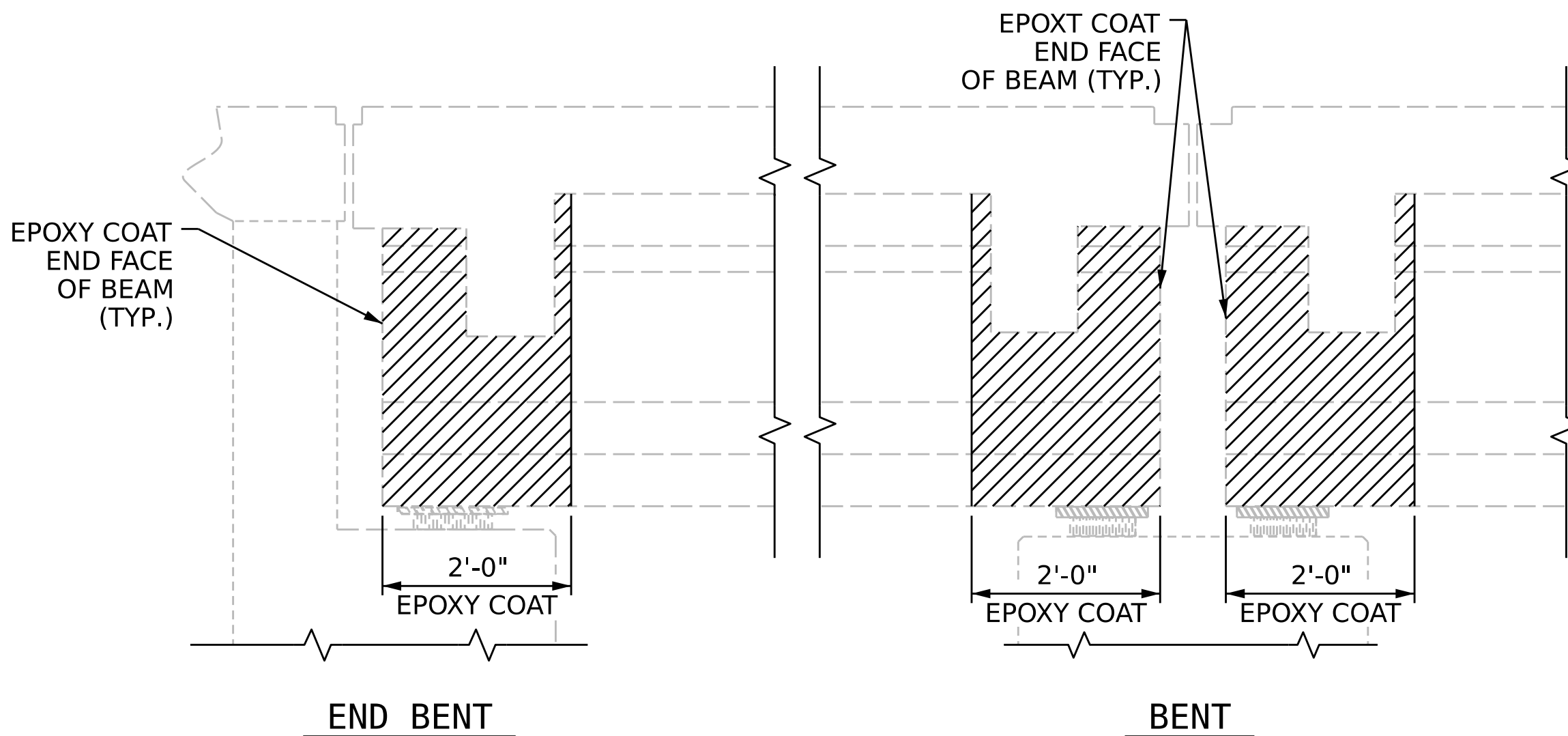
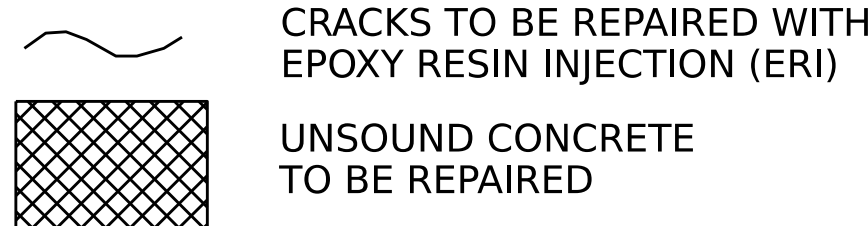


GIRDER WEB REPAIR



GIRDER FLANGE REPAIR

PRESTRESSED GIRDER REPAIR



LIMITS OF EPOXY COATING

NOTES:

PREPACKAGED MATERIAL IS REQUIRED.

CONSULT WITH THE ENGINEER TO DETERMINE PRELOADING REQUIREMENTS WHEN REPAIR IS WITHIN THE CENTER REGION OF THE BEAM (0.25L TO 0.75L).

FOR REPAIRS OVER TRAFFIC AND SHALLOW REPAIRS THAT DO NOT ENGAGE REINFORCEMENT, ANCHOR PATCH MATERIAL USING 3/4" GALVANIZED BOLTS, EPOXY ANCHORED WITH 2" EMBEDMENT. PLACE BOLTS IN A 6" GRID. USE A LATEX OR EPOXY PATCH MATERIAL FOR IMPROVED BOND. USE EXTREME CARE TO NOT DAMAGE STRANDS.

FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

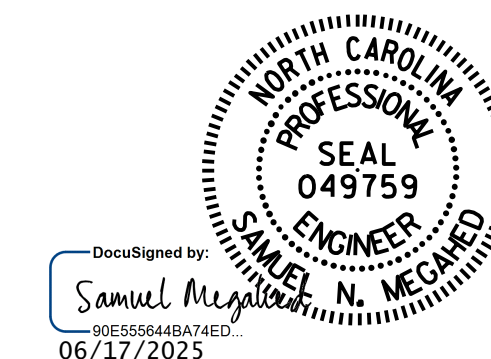
FOR EPOXY RESIN INJECTION (ERI), SEE SPECIAL PROVISIONS.

FOR EPOXY COATING CONCRETE GIRDER ENDS, SEE SPECIAL PROVISIONS.

PRESTRESSED GIRDER REPAIR SEQUENCE:

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

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CATAWBA COUNTY
BRIDGE NO. **170139**

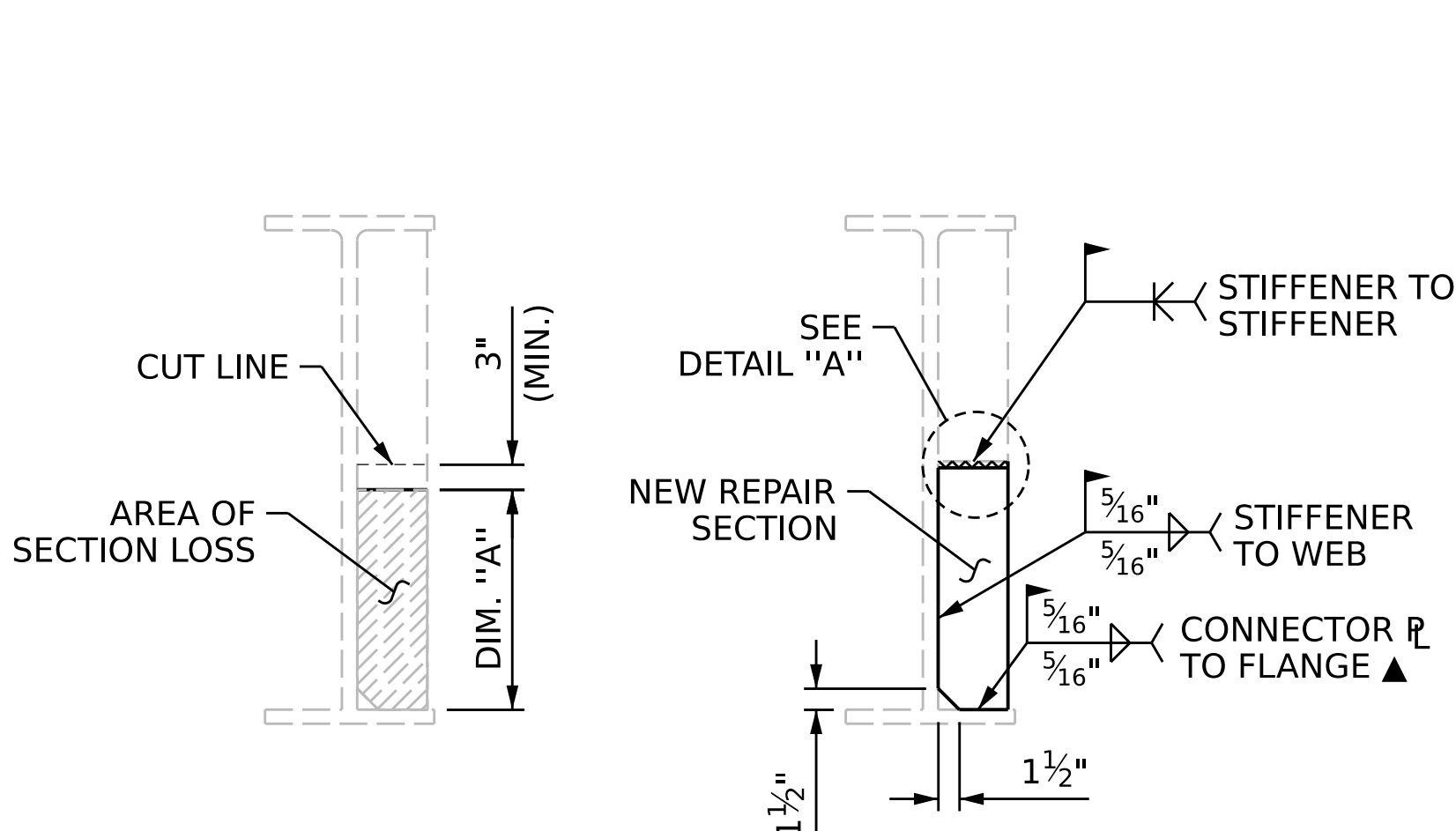


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
**PRESTRESSED CONCRETE
GIRDER REPAIR
DETAILS**

ASSEMBLED BY : HRS
CHECKED BY : A. SORSENGINH
DATE: 12/24
DATE: 12/24
DRAWN BY : NAP 08/18
CHECKED BY :

DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

REVISIONS						SHEET NO. S-70
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 78
2			4			

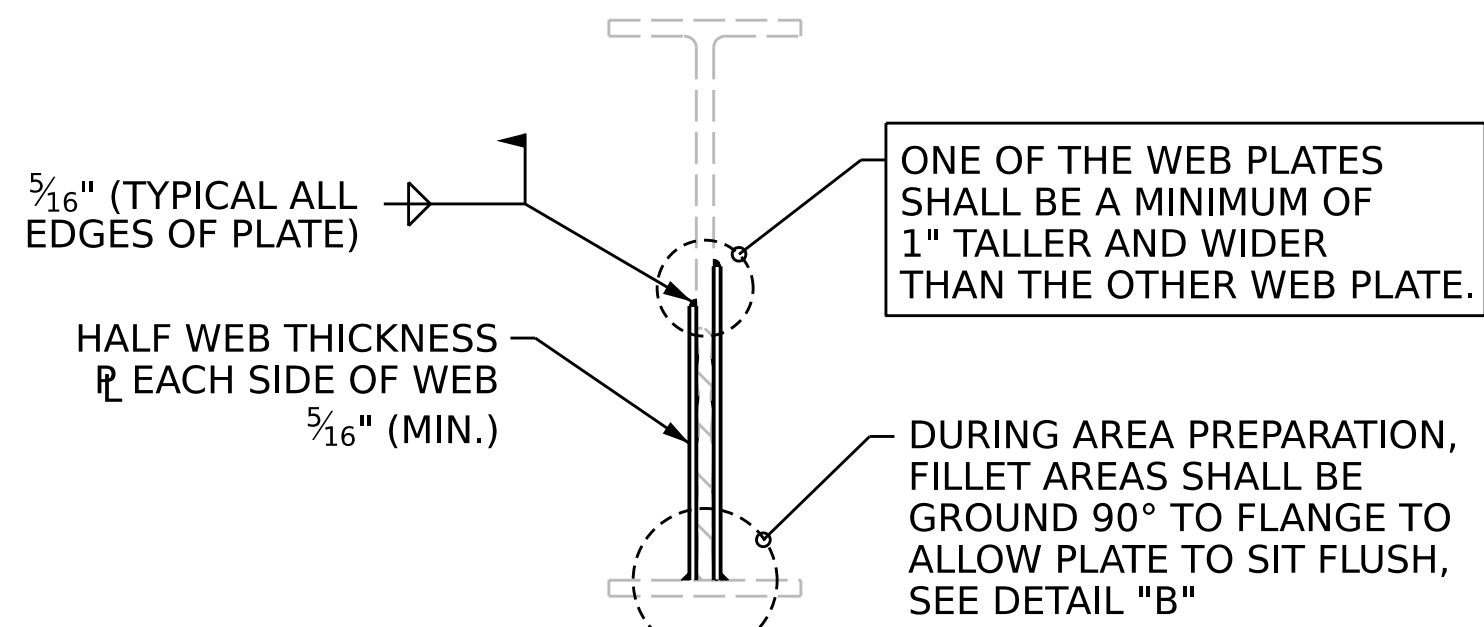


STIFFENER/CONNECTOR SECTION LOSS

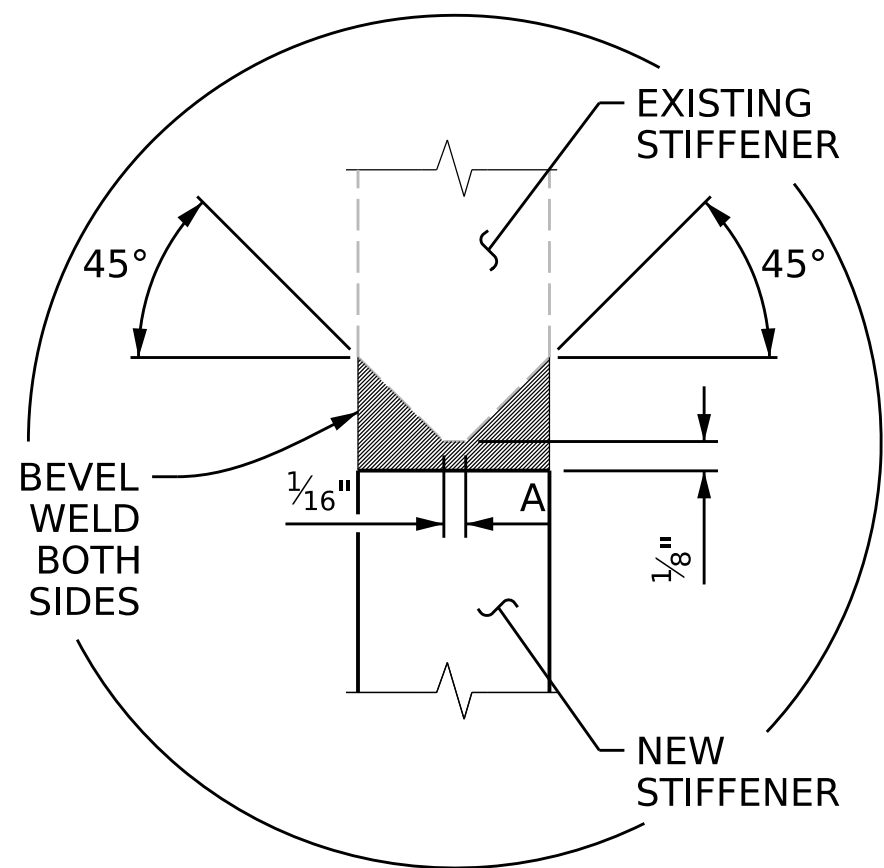
STIFFENER/CONNECTOR SECTION REPAIR

▲ FOR STIFFENERS, MILL TO BEAR AND DO NOT WELD

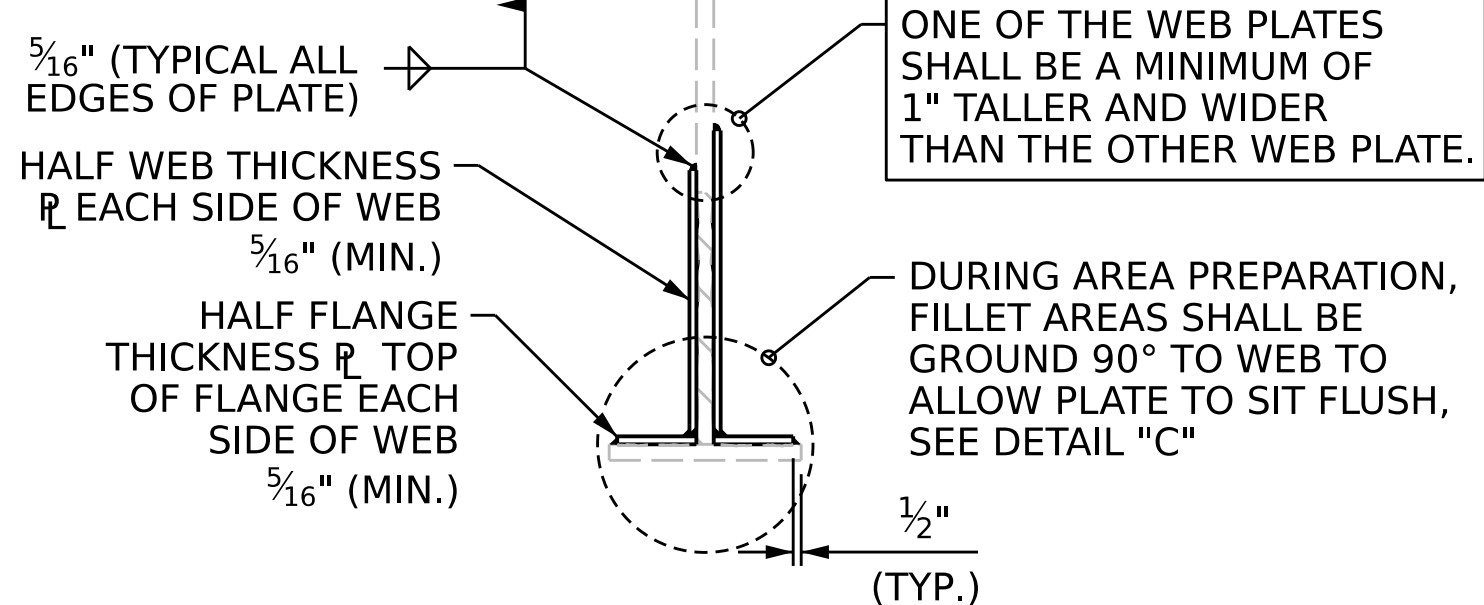
STIFFENER/CONNECTOR PLATE REPAIR



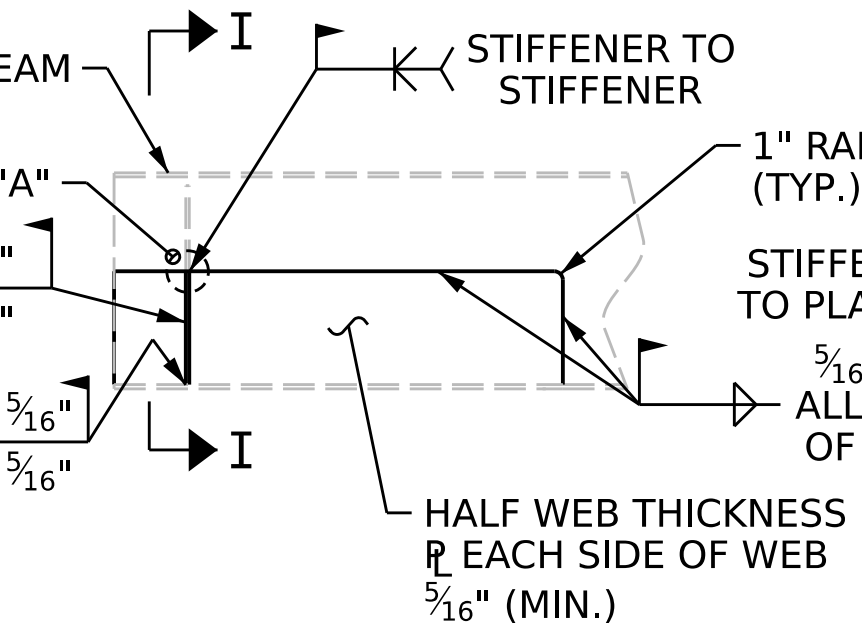
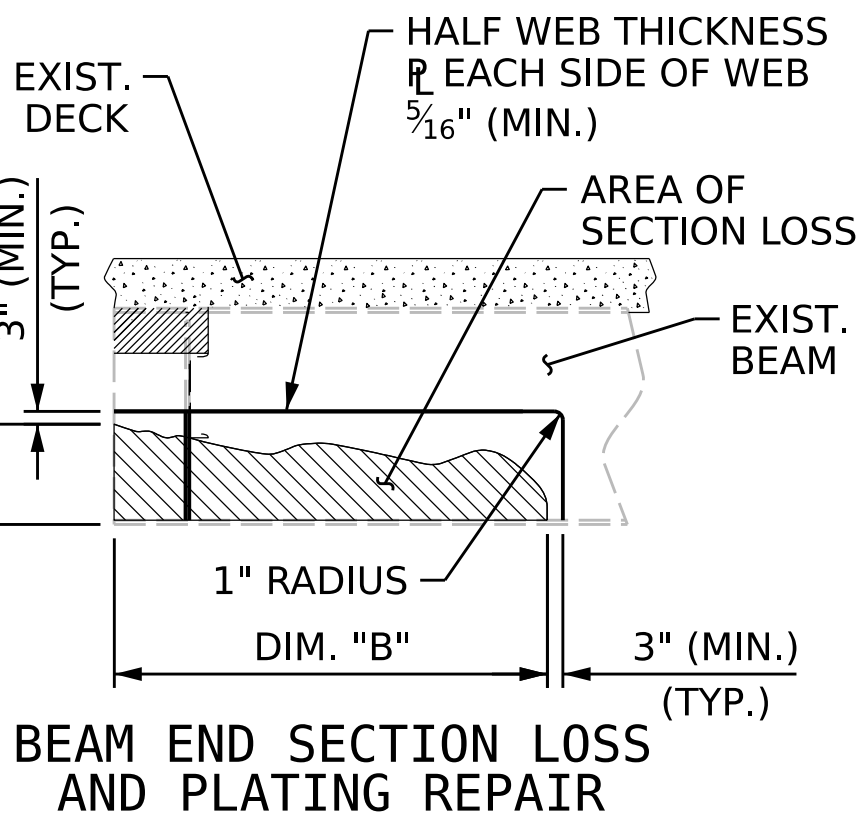
SECTION I-I



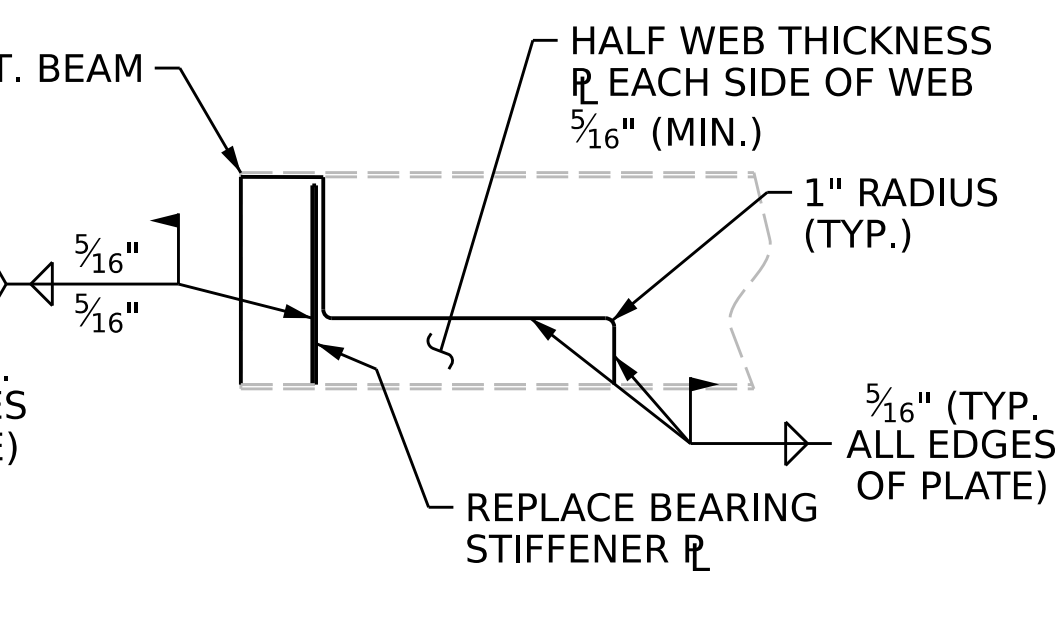
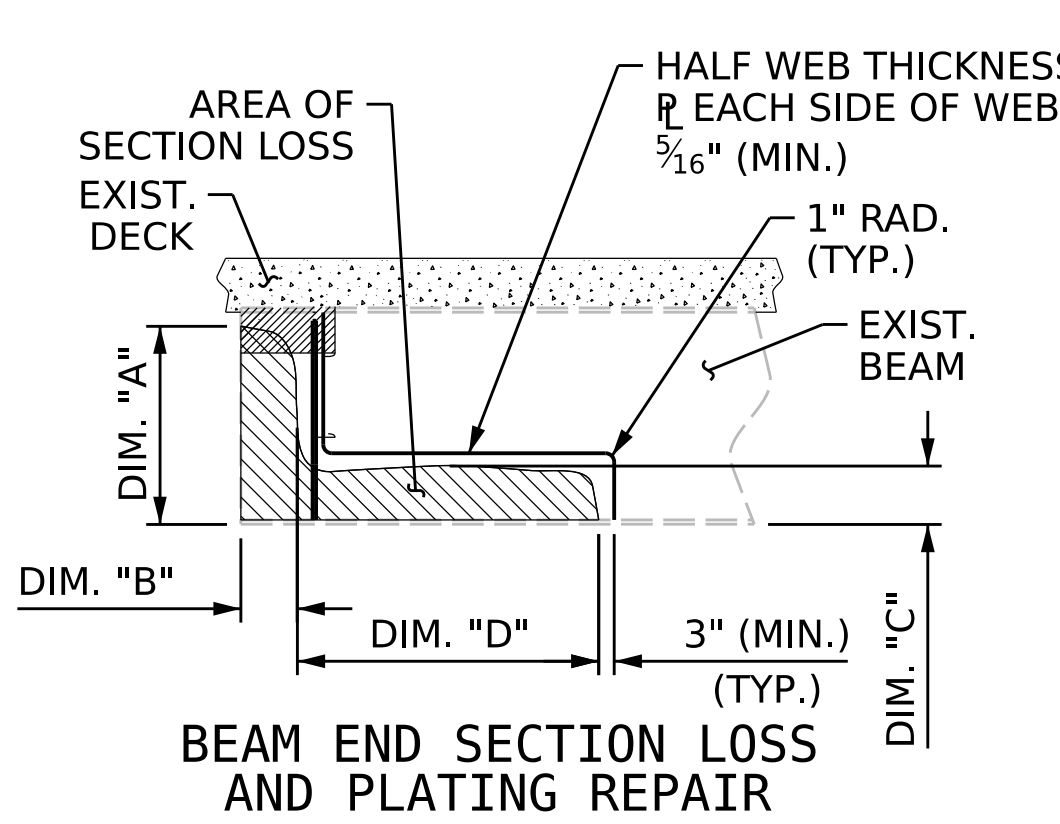
DETAIL "A"



DETAIL "B"

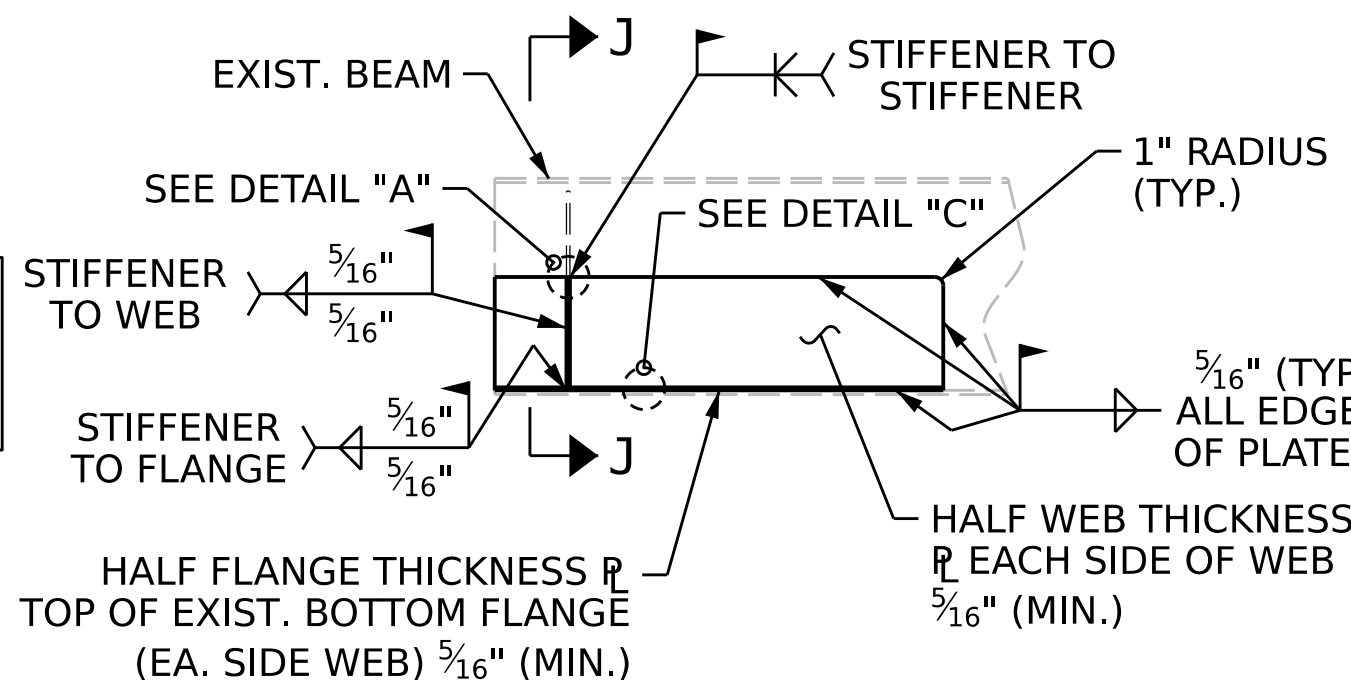


BEAM END PLATING REPAIR

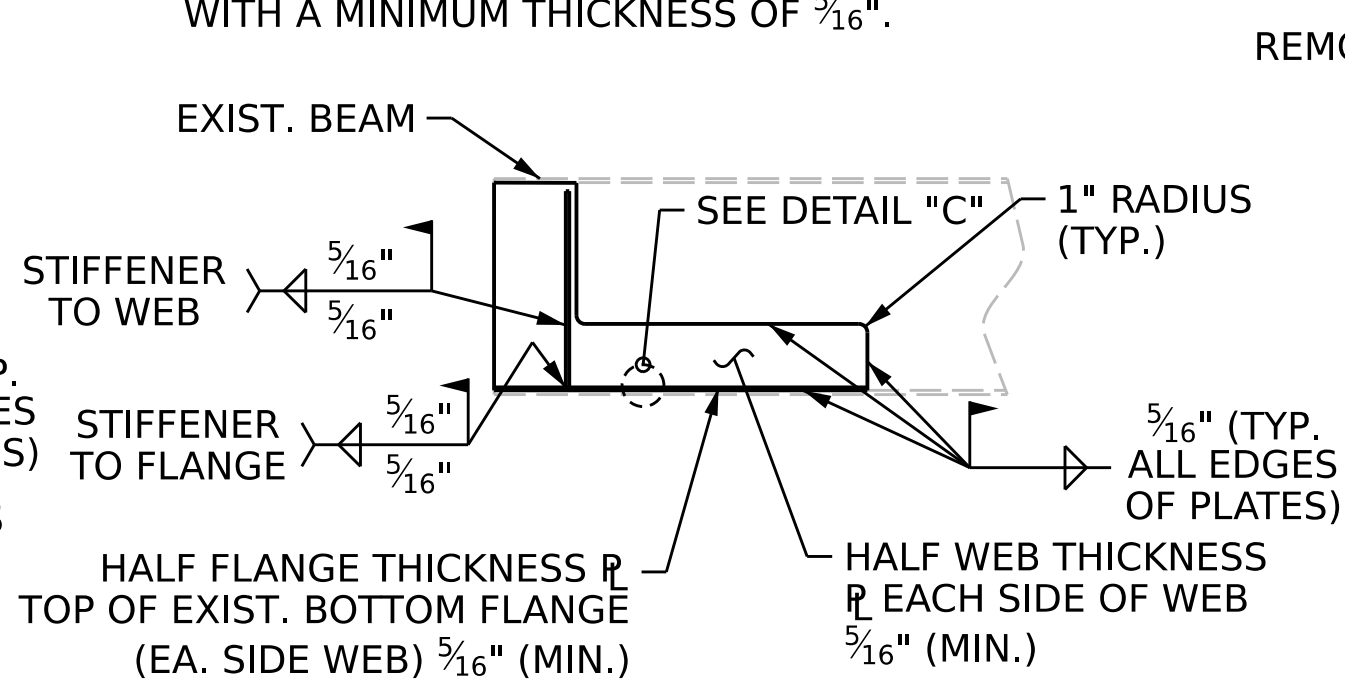


BEAM END PLATING REPAIR

BEAM END PLATING REPAIR

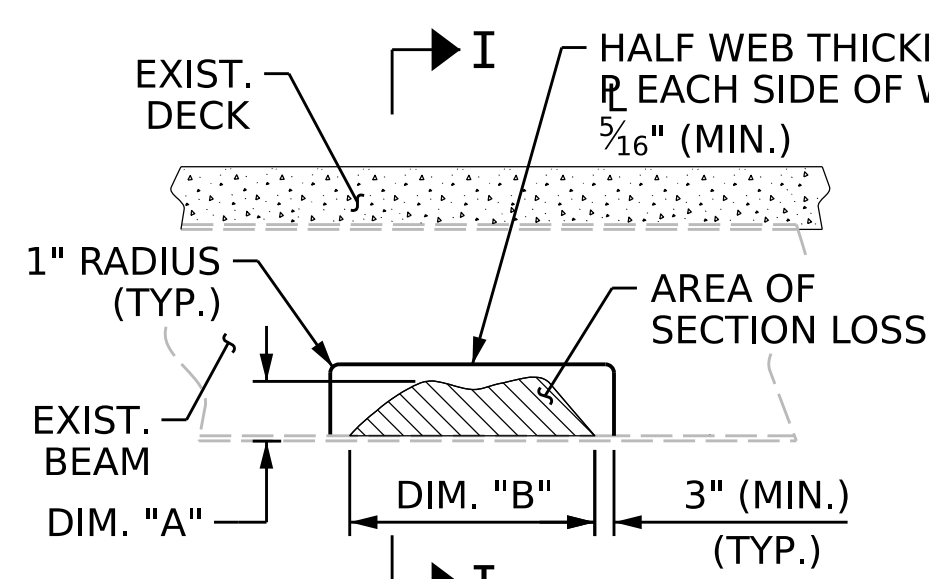


BEAM END BOTTOM FLANGE PLATING REPAIR

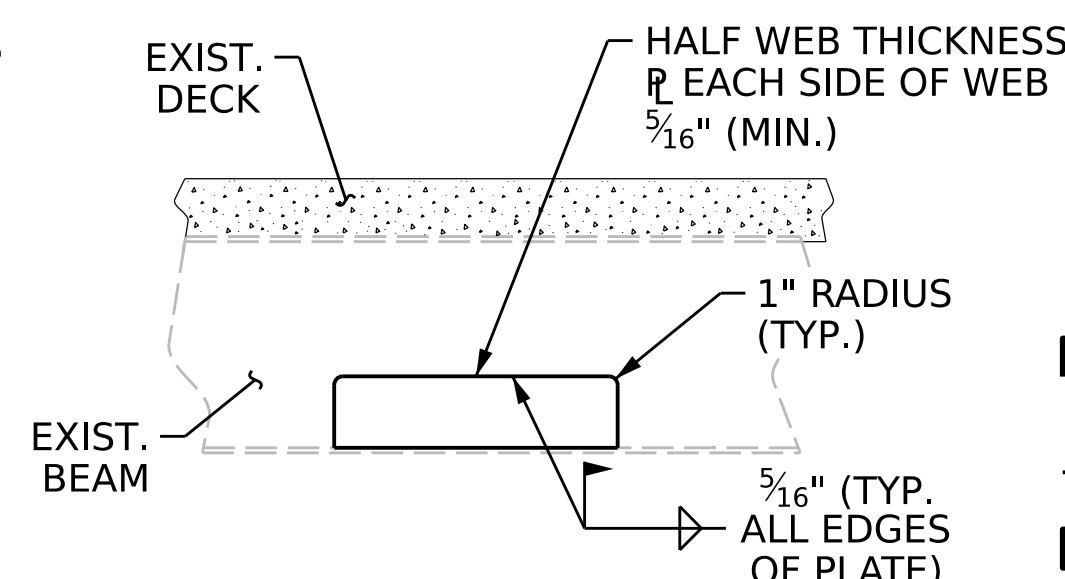


BEAM END BOTTOM FLANGE PLATING REPAIR

BEAM END WITH BOTTOM FLANGE PLATING REPAIR



INTERMEDIATE SECTION LOSS BEAM PLATING REPAIR



INTERMEDIATE SECTION LOSS BEAM PLATING REPAIR

INTERMEDIATE BEAM PLATING REPAIR

BEAM PLATING REPAIR NOTES

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

REPAIR PLATES SHALL MATCH THE STRENGTH OF THE EXISTING STRUCUTRAL STEEL, BUT SHALL BE MINIMUM 36 KSI STEEL.

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 PRIME 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.

UNLESS INDICATED ON PLANS ONE PLATE SHALL BE PLACED, AS INDICATED ON THIS PLAN SHEET, ON EACH SIDE OF THE BEAM WEB. ONE OF THE WEB PLATES SHALL BE A MINIMUM OF 1" TALLER AND WIDER THAN THE OTHER WEB PLATE TO OFFSET THE WEB PLATE WELDING LOCATIONS ON THE EXISTING BEAM WEB.

EACH PLATE SHALL BE APPROXIMATELY ONE-HALF THE ORIGINAL THICKNESS OF THE BEAM WEB, WITH A MINIMUM THICKNESS OF 5/16".

FULLY WELD ALONG ALL EDGES OF THE REPAIR 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 GROOVE WELDS FLUSH, AND THOROUGHLY CLEAN REPAIR AREA TO REMOVE DEBRIS AND OILS.

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

FOR CLEANING AND PAINTING, SEE SPECIAL PROVISIONS.

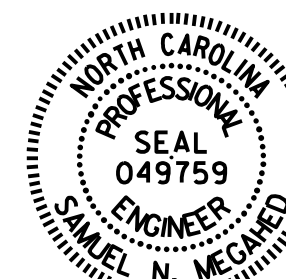
AFTER BEAMS ARE REPAIRED AND PAINTED, ANY CONCRETE REMOVED FROM THE BENT DIAPHRAGMS SHALL BE RECAST. ANY REINFORCING STEEL CUT DURING THE REMOVAL PROCESS SHALL BE SPICED WITH A SIMILAR SIZE BAR WITH AT LEAST A ONE FOOT SPLICE TO THE EXISTING STEEL. NO SEPARATE PAYMENT SHALL BE MADE FOR CONCRETE AND REINFORCING 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. **15BPR.119**
CATAWBA COUNTY
BRIDGE NO. **170091**

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

BEAM PLATING REPAIR DETAILS

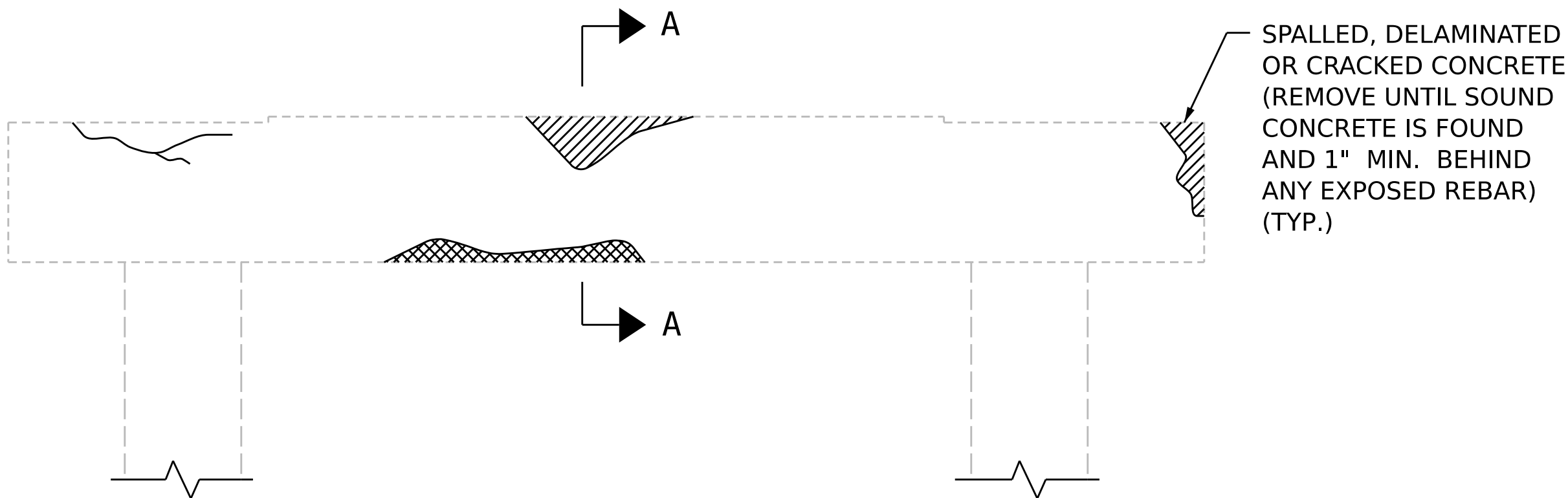


DocuSigned by
Samuel McCard
305599440747253
06/17/2025

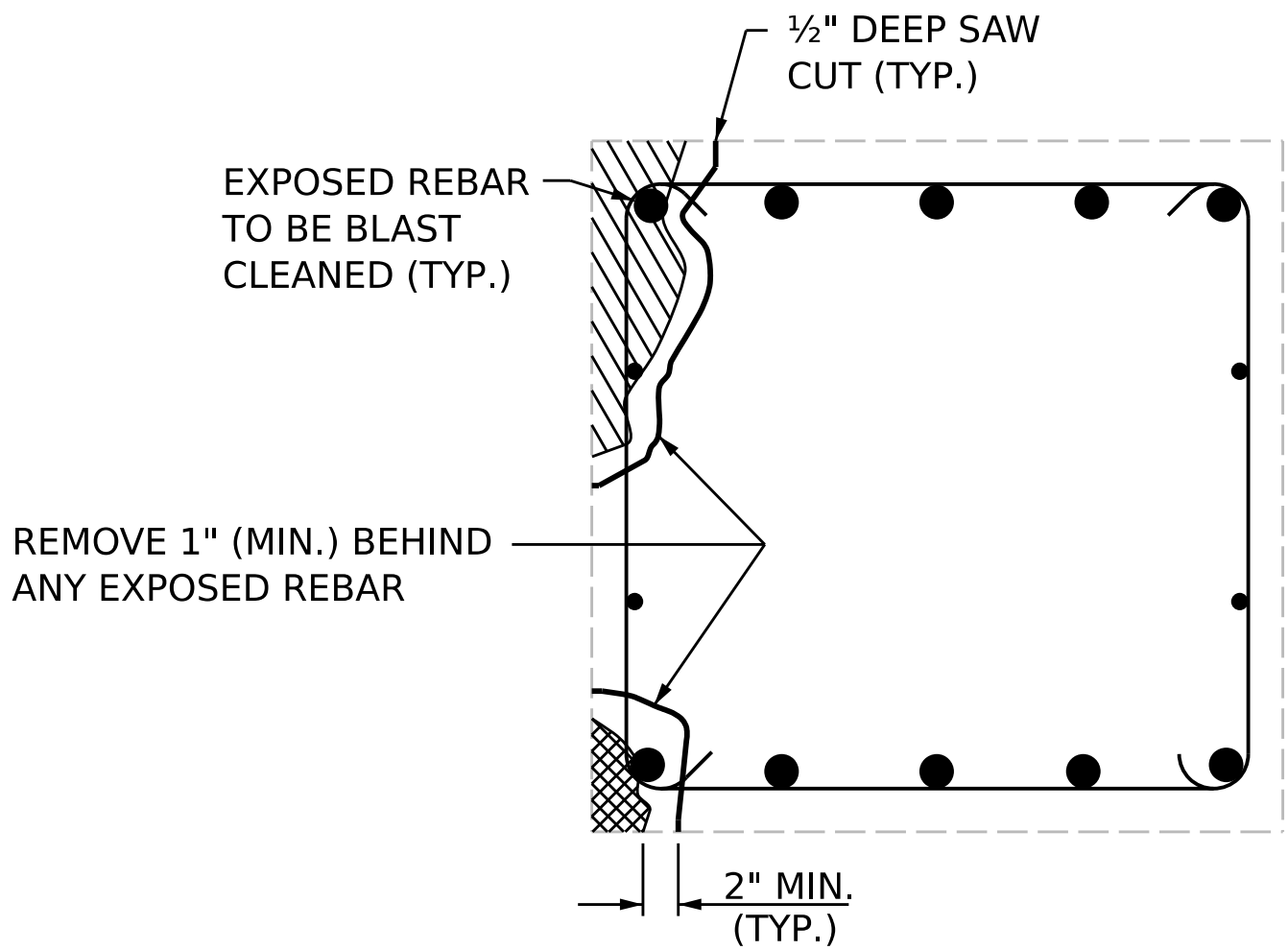
ASSEMBLED BY: HRS	DATE : 12/24
CHECKED BY : A. SORSENGINH	DATE : 12/24
DRAWN BY :	
CHECKED BY :	

DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1	AYG	02/24	3		
2			4		
TOTAL SHEETS				78	



BENT CAP REPAIRS

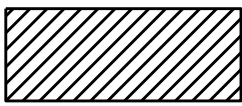
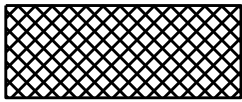


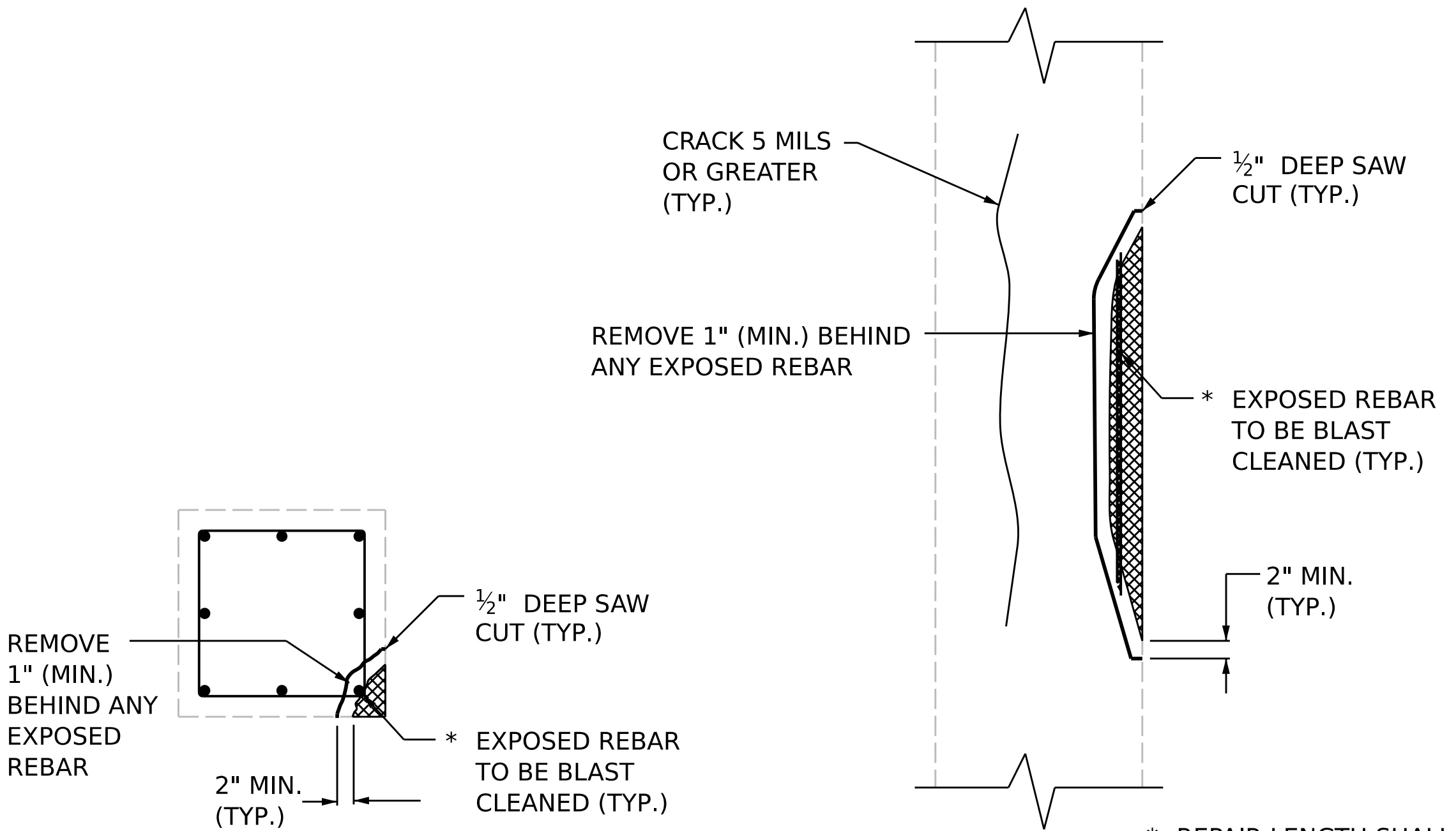
SECTION A-A

CAP REPAIR

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

REPAIR KEY

-  CONCRETE REPAIR AREA (FORM AND POUR)
-  SHOTCRETE REPAIR AREA

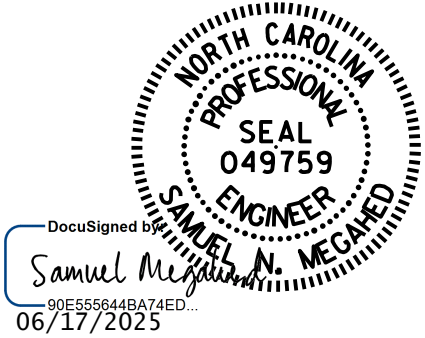


PLAN OF COLUMN

ELEVATION OF COLUMN

COLUMN REPAIR

ASSEMBLED BY : HRS	DATE : 12/24
CHECKED BY : A.SORSENGINH	DATE : 12/24
DRAWN BY : NAP 8/18	
CHECKED BY :	



PROJECT NO. **15BPR.119**
CATAWBA COUNTY
STATION: **170091,170139**

REVISIONS						SHEET NO. S-72
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 78
2			4			

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FINAL UNLESS ALL
SIGNATURES COMPLETED

NOTES

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

THE METHOD USED TO DELINEATE THE AREAS OF UNSOUND CONCRETE TO BE REPAIRED SHALL NOT PERMANENTLY MARK THE CONCRETE, LEAVE ANY RESIDUE AFTER REMOVAL OR REQUIRE HARSH CHEMICALS TO REMOVE.

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

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

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

SIMULTANEOUS REMOVAL OF UNSOUND CONCRETE MAY BE PERMITTED ON MORE THAN ONE FACE OF A CAP AND/OR COLUMN, IF THE AREAS OF REMOVAL ARE NOT ADJACENT TO OR DIRECTLY OPPOSITE ONE ANOTHER. IF REMOVAL EXTENDS MORE THAN 1½" BEHIND THE MAIN REINFORCING BARS, NOTIFY THE ENGINEER PRIOR TO PROCEEDING.

REINFORCING STEEL WHICH IS DETERMINED BY THE ENGINEER TO BE REPLACED, SHALL BE REMOVED TO A POINT WHERE IT IS SOUND. THE REPAIR AREA SHALL EXTEND A SUFFICIENT DISTANCE BEYOND THIS POINT TO DEVELOP A SPLICE LENGTH SPECIFIED IN THE TABLE ON THIS SHEET.

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

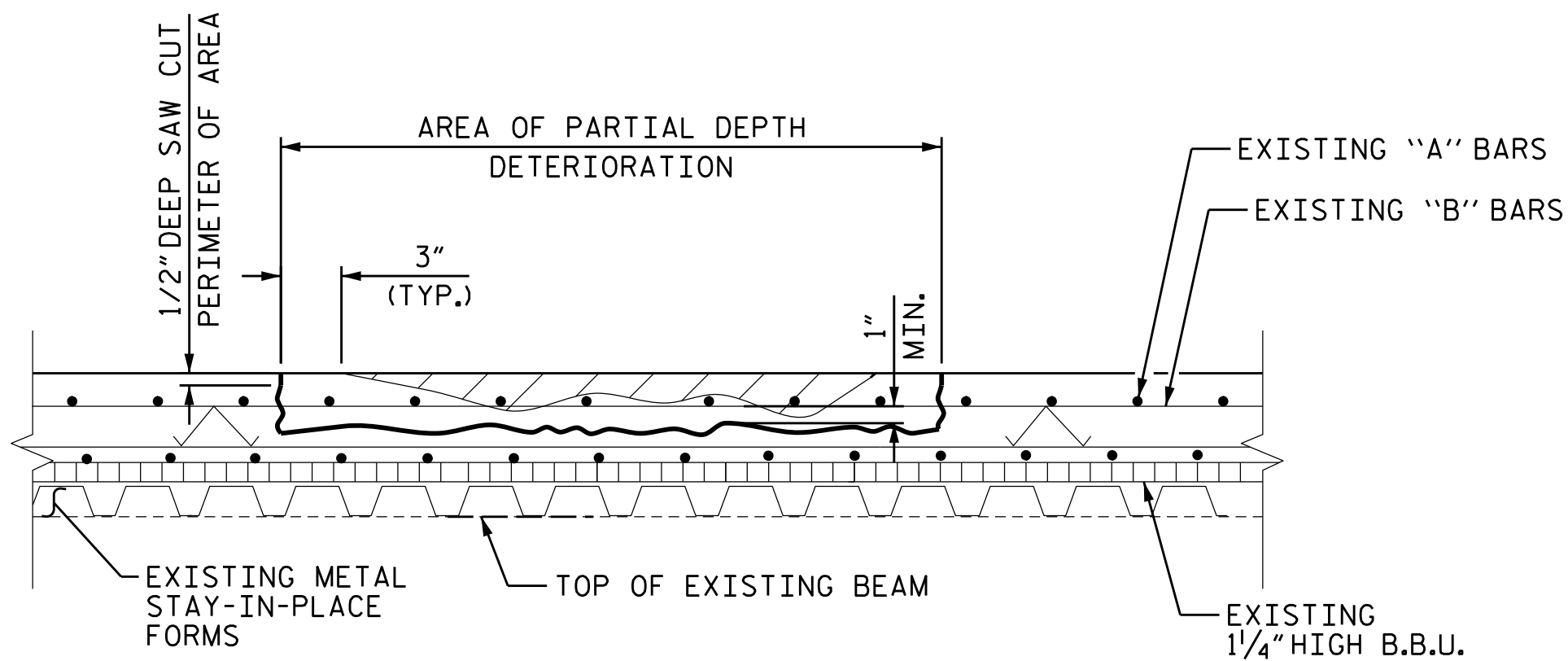
COAT ALL REPAIR SURFACE AREAS ON THE TOP OF CAPS, INCLUDING CHAMFERS, WITH EPOXY PROTECTIVE COATING, OVERLAPPING THE REPAIR AREA BY A MINIMUM OF 3" ON ALL POSSIBLE SIDES.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

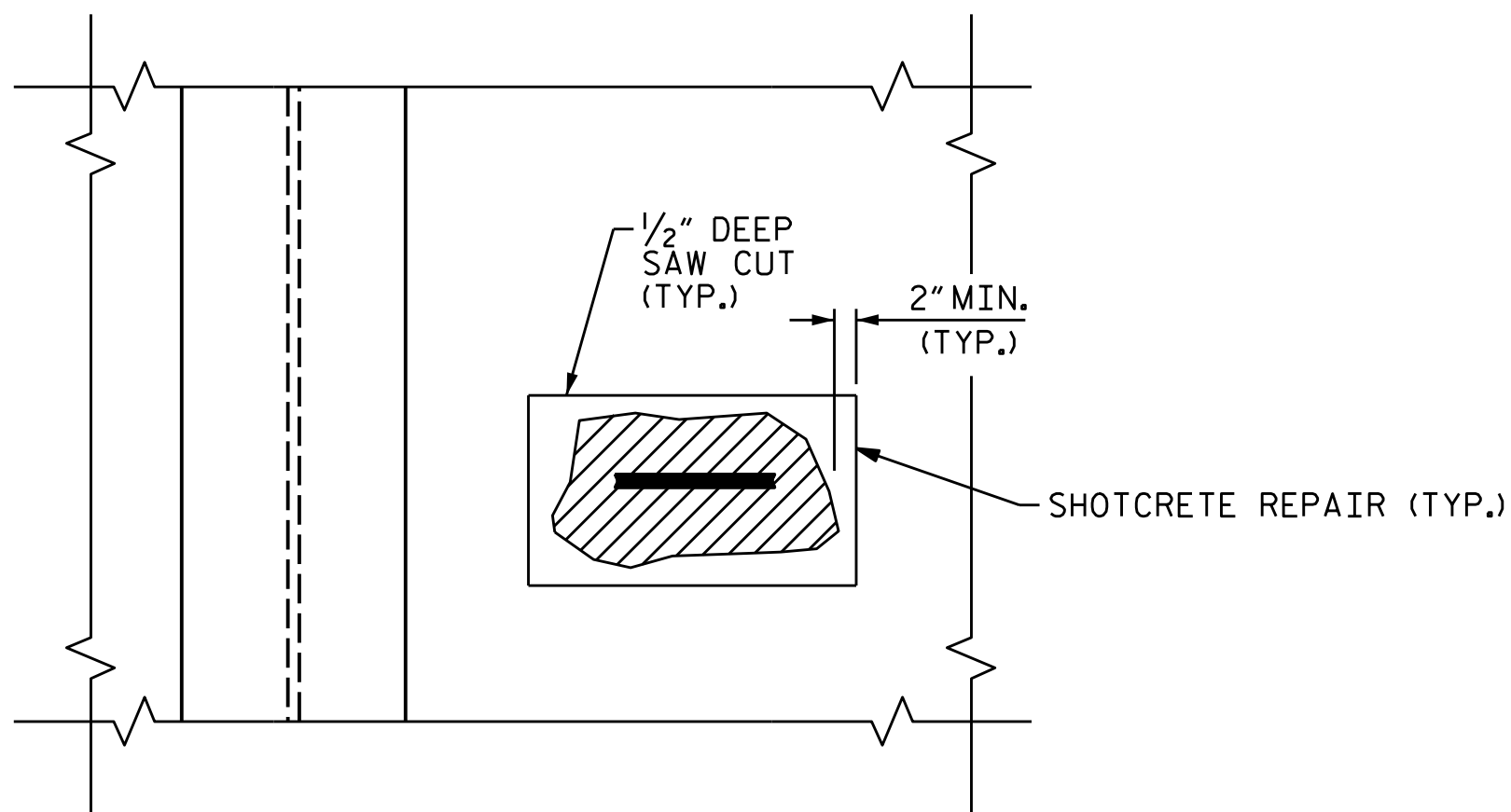
FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

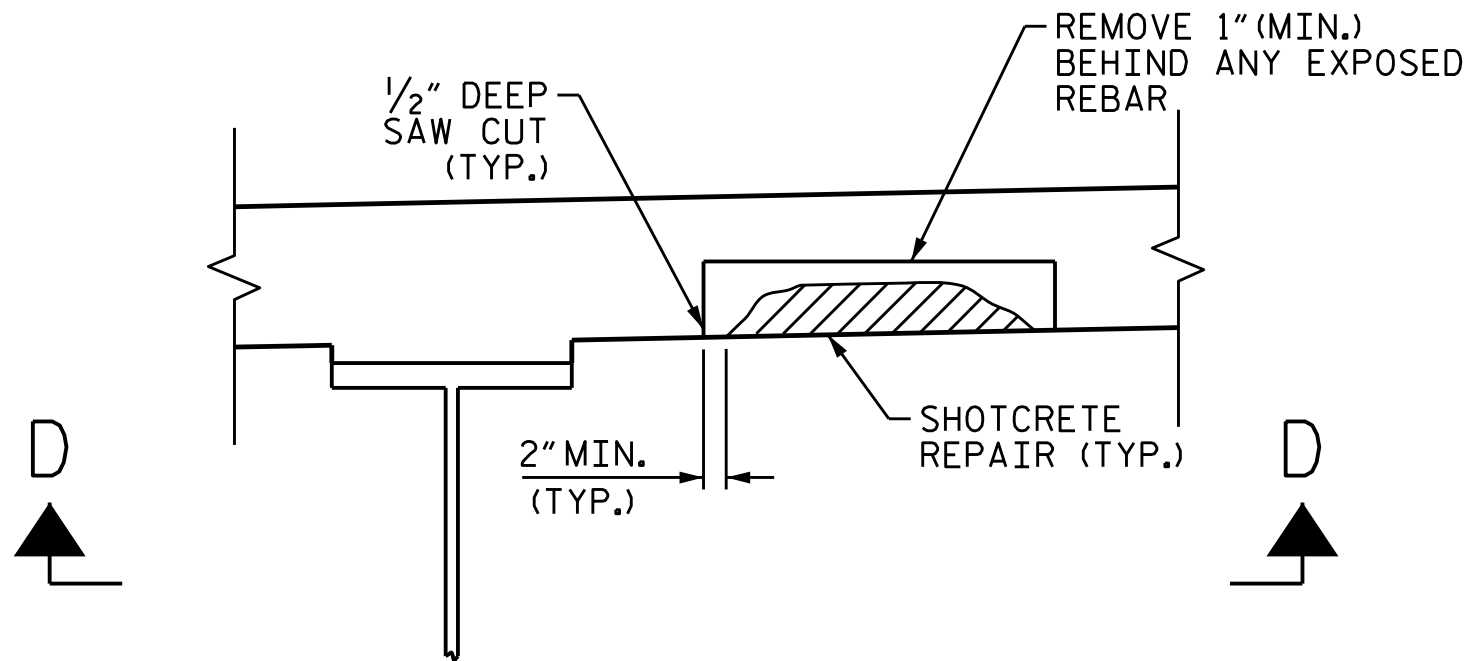
FOR EPOXY RESIN INJECTION (ERI), SEE SPECIAL PROVISIONS.



CLASS II (PARTIAL DEPTH) REPAIR



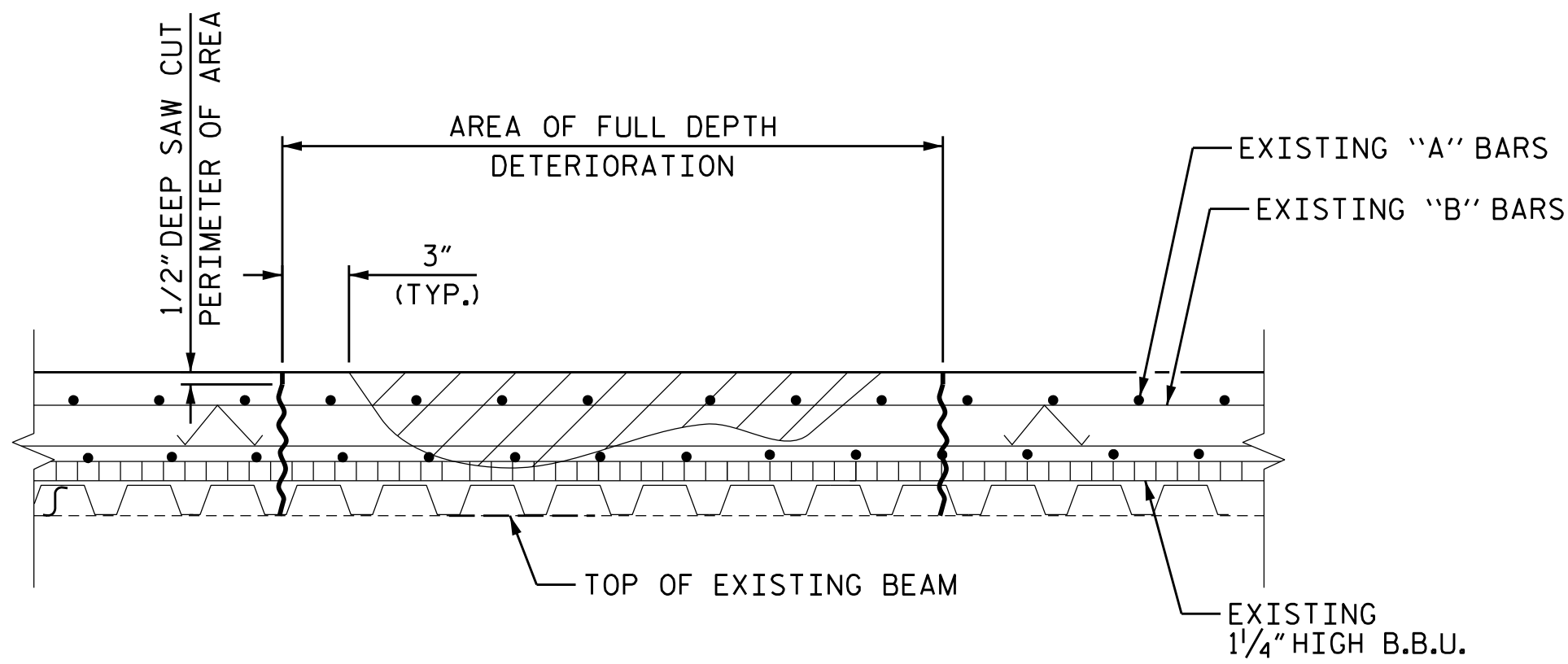
SECTION D-D



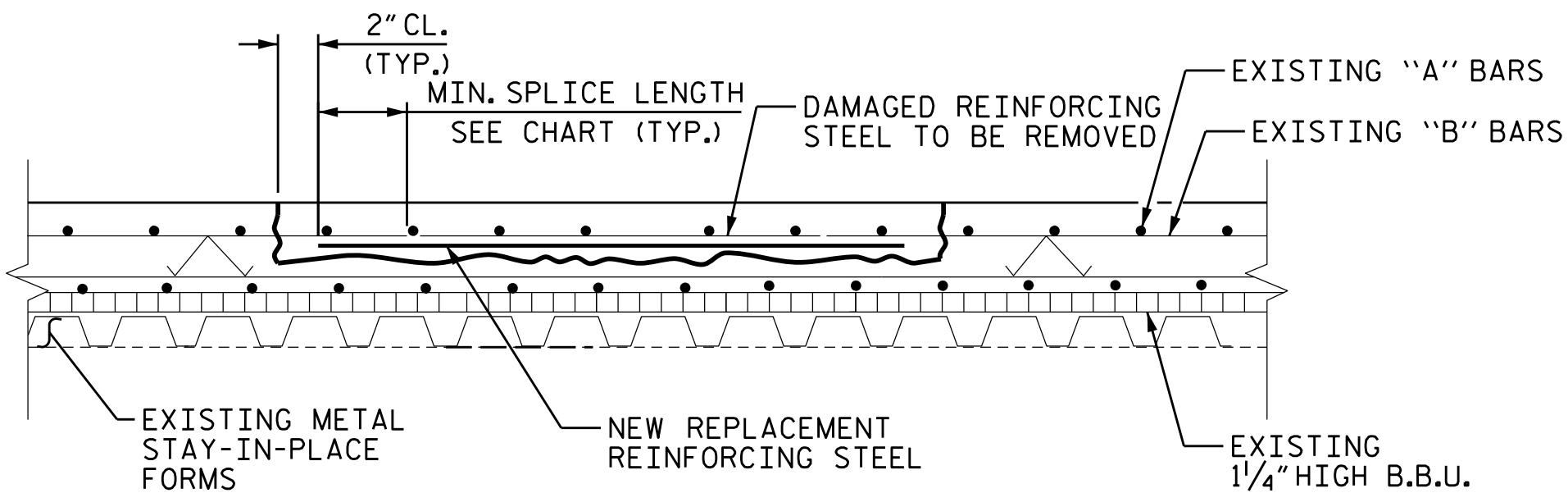
TYPICAL SECTION

UNDERSIDE OF DECK REPAIR

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			



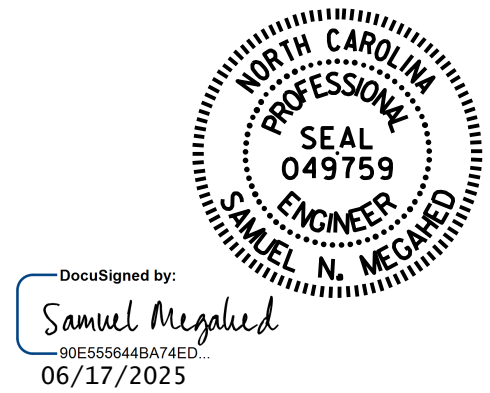
CLASS III (FULL DEPTH) REPAIR



REINFORCING STEEL REPAIR



PROJECT NO. **15BPR.119**
CATAWBA COUNTY
 BRIDGE NO. **170091, 170139**



ASSEMBLED BY : HRS DATE : 4/25
 CHECKED BY : D. CANTRELL DATE : 4/25
 DRAWN BY : NAP 9/18
 CHECKED BY :

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-73
2			4			TOTAL SHEETS 78

STANDARD NOTES

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 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 7⁄8" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7⁄8" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7⁄8" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - 7⁄8"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" 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. FINIS 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.