

NOTES

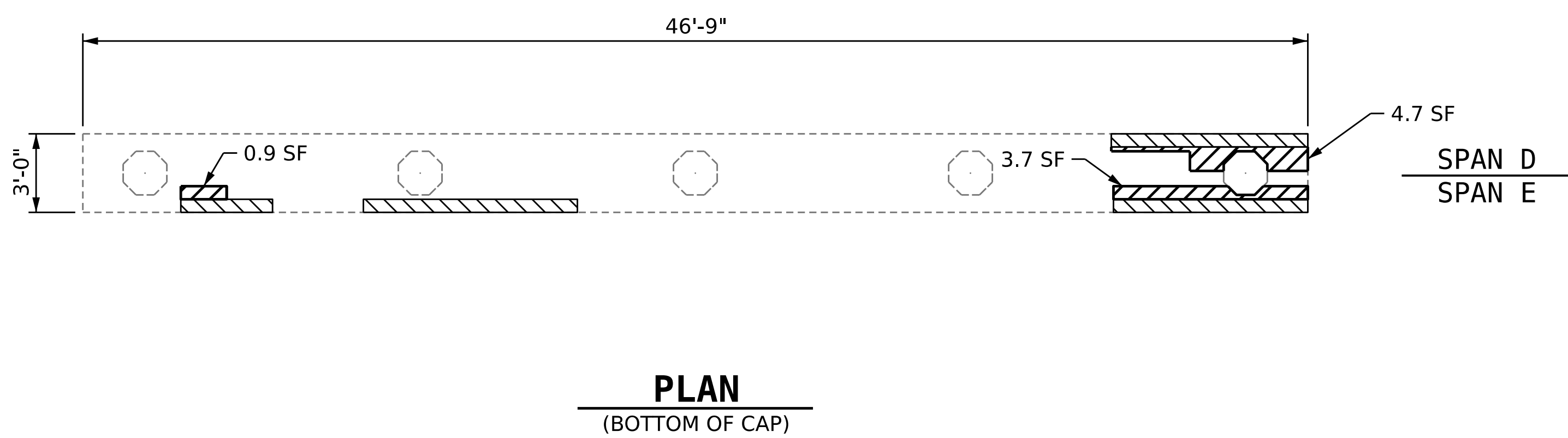
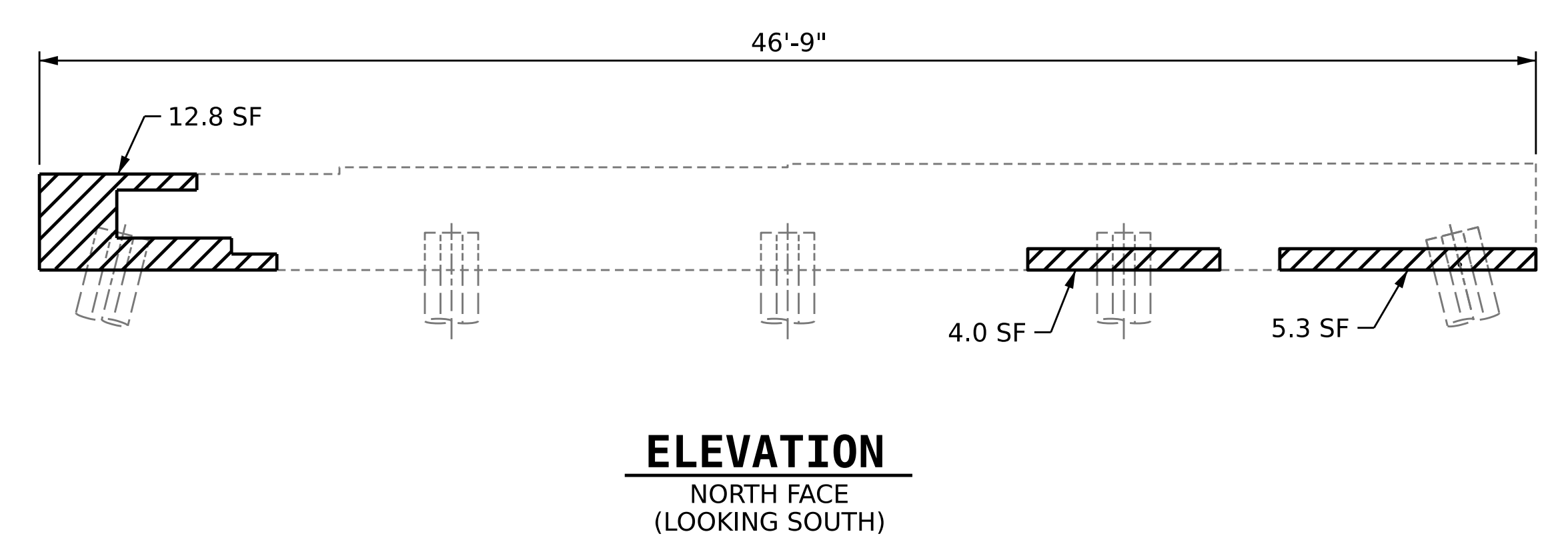
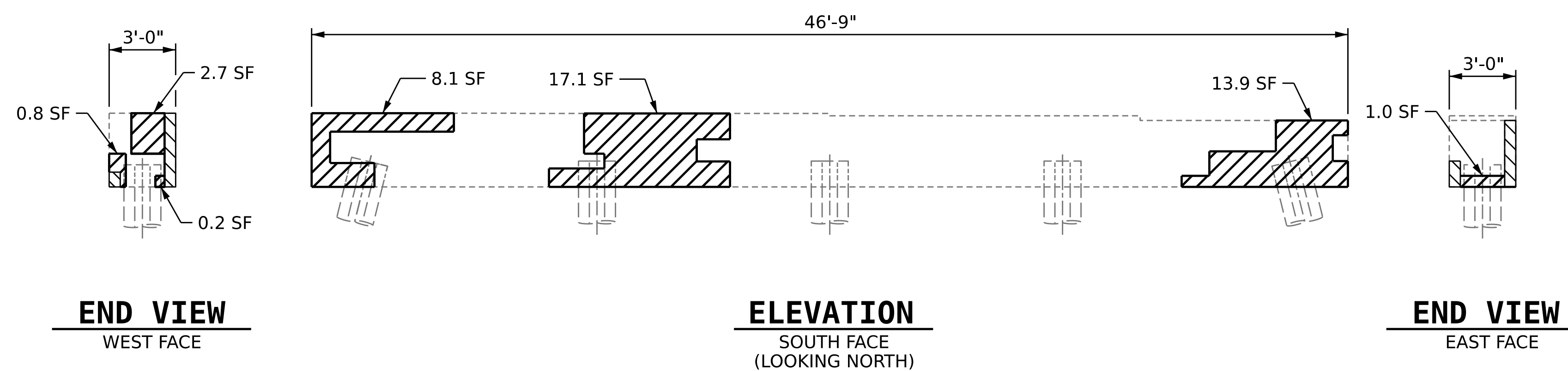
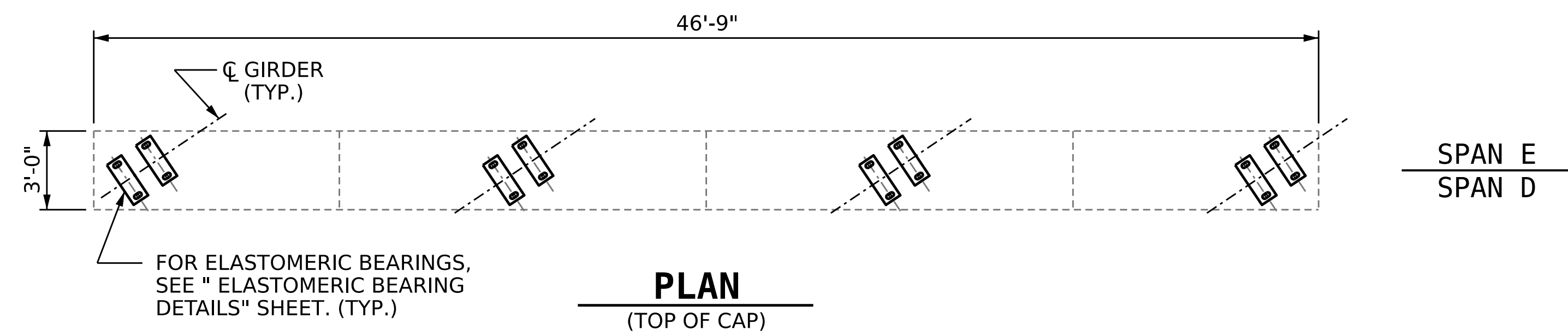
REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES 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 AFTER ELASTOMERIC BEARINGS AND ANCHOR BOLTS ARE INSTALLED. THE CONTRACTOR SHALL NOT COAT THE AREA OF THE CAP BENEATH THE BEARINGS.

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

SUBSTRUCTURE REPAIR QUANTITY TABLE				
REPAIRS - BENT 4	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	75.2	37.6		
COLUMN	0	0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
COLUMN	0	0		
EPOXY RESIN INJECTION		LINEAR FT		LINEAR FT
CAP		0		
COLUMN		0		
EPOXY COATING		AREA SF		AREA SF
CAP		130.5		

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



PROJECT NO. **B-5981**
DUPLIN COUNTY
 BRIDGE NO. **300017**
 SHEET 5 OF 6



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE REPAIR
 BENT 4**

DRAWN BY : S. T. SANDOR DATE : 1/31/23
 CHECKED BY : W. C. SMITH DATE : 5/31/23

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REVISIONS						SHEET NO. S2-20 TOTAL SHEETS 31
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SUBSTRUCTURE REPAIR QUANTITY TABLE

REPAIRS - END BENT 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
CURTAIN WALL	0	0		
WINGWALL	0	0		
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP	0	0		
CURTAIN WALL	0	0		
WINGWALL	0	0		
EPOXY RESIN INJECTION		LINEAR FT		LINEAR FT
CAP		0		
CURTAIN WALL		0		
WINGWALL		0		
EPOXY COATING		AREA SF		AREA SF
CAP		99.0		

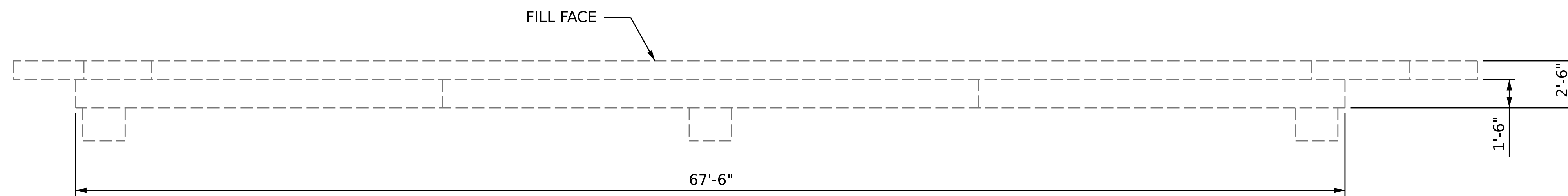
VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 2" CLEAR TO SAWCUT. SEE REPAIR DETAILS.

NOTES

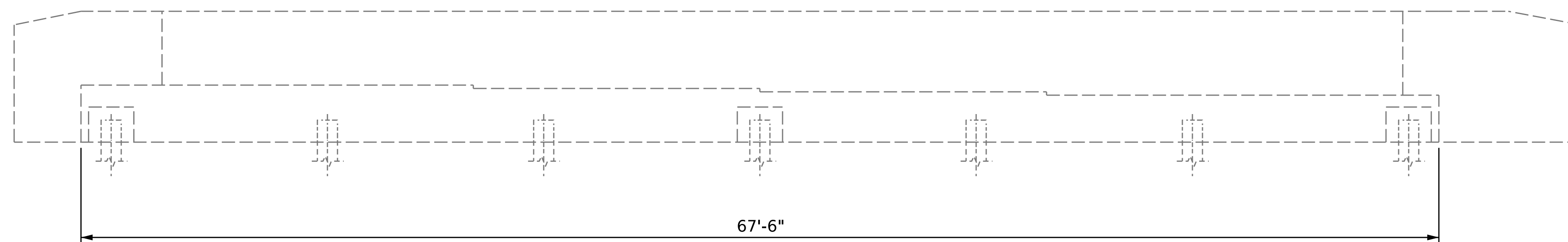
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CLEAN AND REMOVE DEBRIS FROM THE TOP OF THE CAP AND APPLY EPOXY PROTECTIVE COATING. EPOXY COATING SHALL BE APPLIED TO THE TOP SURFACE OF THE CAP. THE CONTRACTOR SHALL NOT COAT THE AREA OF THE CAP BENEATH THE BEARINGS.

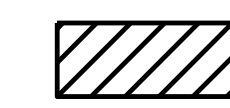

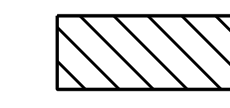

FOR REPAIR DETAILS, SEE "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.



PLAN
(TOP OF CAP)



ELEVATION
(SOUTH FACE
LOOKING NORTH)

-  SHOTCRETE REPAIR AREA
-  CONCRETE REPAIR AREA
-  PREVIOUSLY ACCOUNTED FOR AREA
-  EPOXY RESIN INJECTION

PROJECT NO. **B-5981**
DUPLIN COUNTY
 BRIDGE NO. **300017**

SHEET 6 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE REPAIR
 END BENT 2**



DocuSigned by:
 William C. Smith
 10/24/2023

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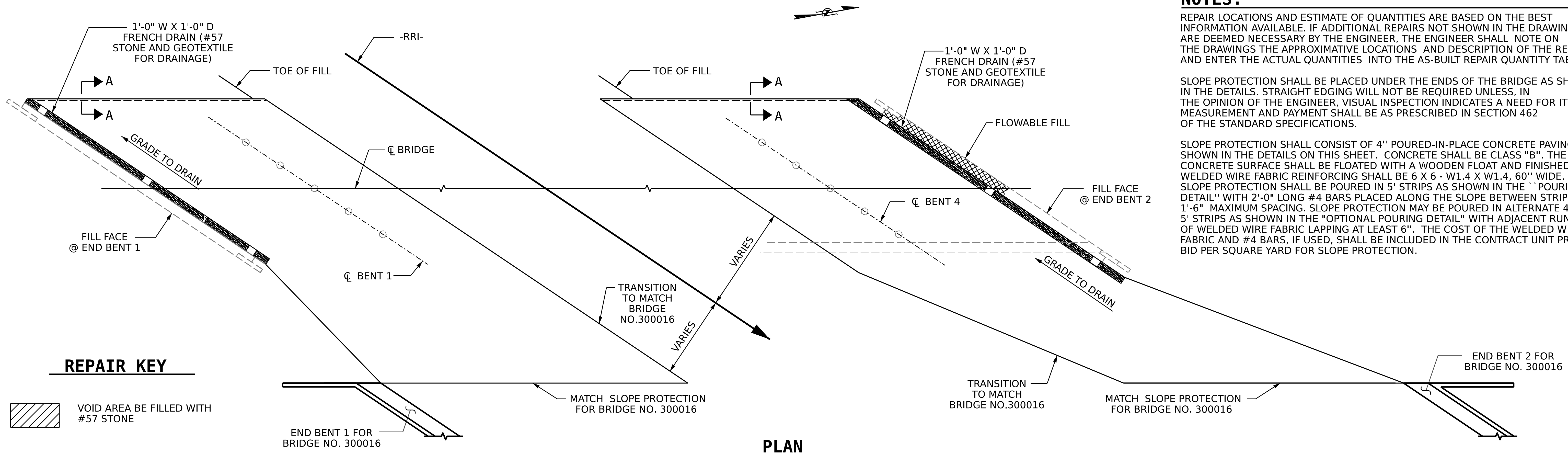
DRAWN BY : S. T. SANDOR DATE : 1/27/23
 CHECKED BY : W. C. SMITH DATE : 5/31/23

NOTES:

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

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4" AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.



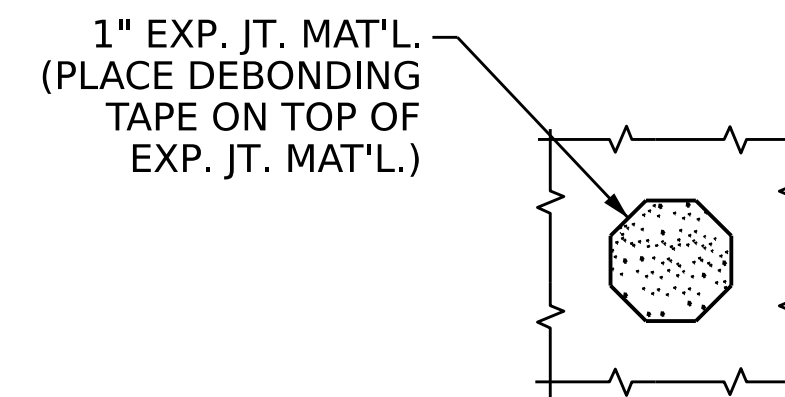
REPAIR KEY

- VOID AREA BE FILLED WITH #57 STONE
- VOID AREA TO BE FILLED USING FLOWABLE FILL

PLAN

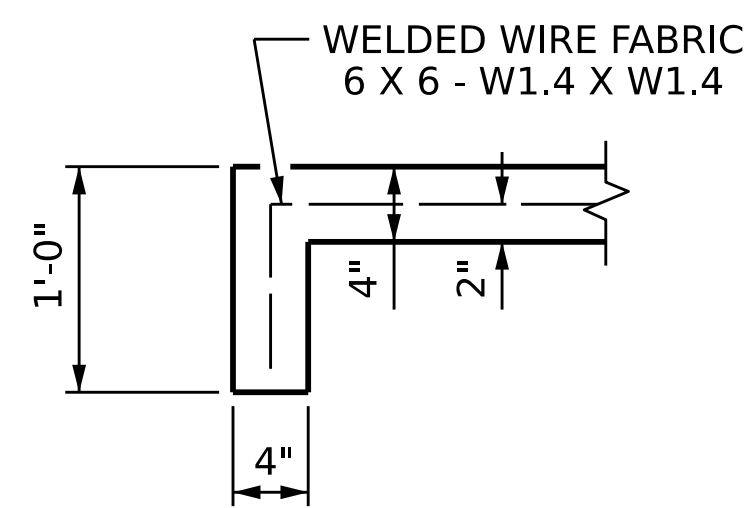
AS-BUILT REPAIR QUANTITY TABLE										
SLOPE PROTECTION FOR BRIDGE NO. 300017	# 57 STONE		GEOTEXTILE FOR DRAINAGE		FLOWABLE FILL		4" INCH SLOPE PROTECTION		* WELDED WIRE FABRIC 60 INCHES WIDE	
	CU. YD.		SQ. YD.		CU. YD.		SQ. YD.		APPROX. L.F.	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
END BENT 1	2.9		26		0.0		650		1,170	
END BENT 2	2.9		26		3.0		703		1,256	

* QUANTITY SHOWN IS BASED ON 5' POURS.

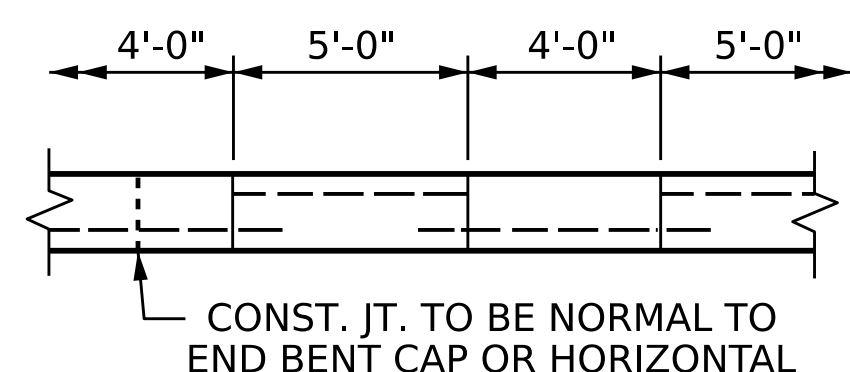


PLAN WHERE CONCRETE SLOPE PROTECTION MUST BE PLACED AROUND A BENT PILE

PROJECT NO. **B-5981**
DUPLIN COUNTY
 BRIDGE NO. **300017**

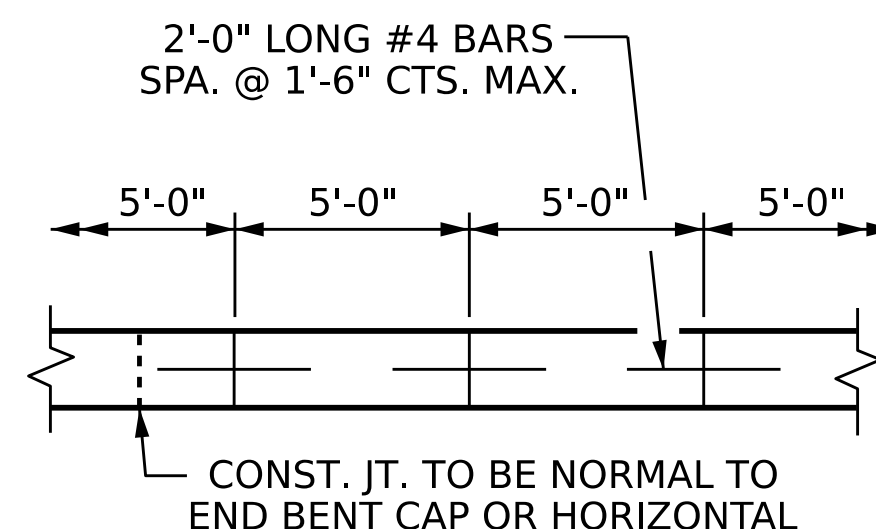


SECTION A-A



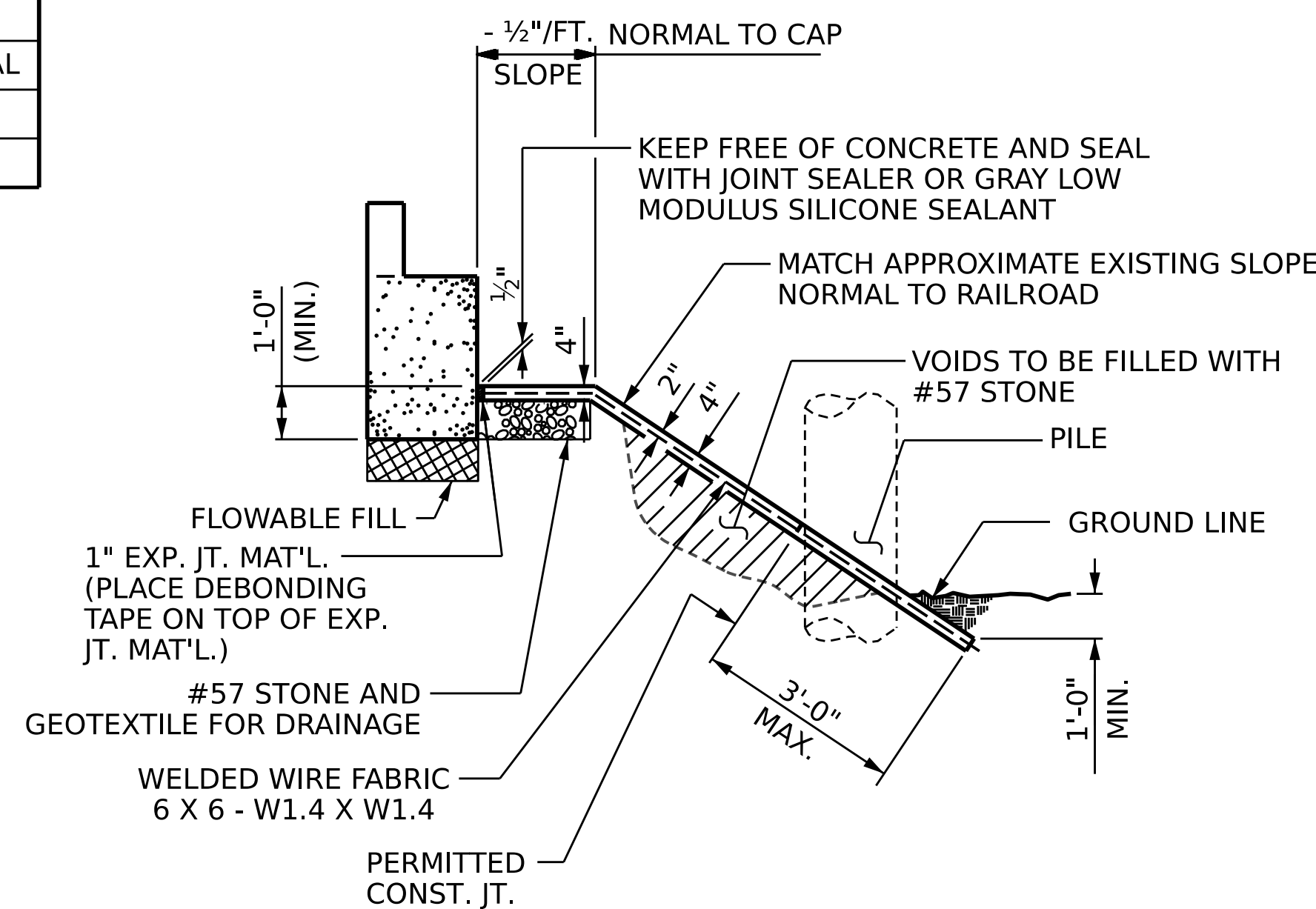
POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



SLOPE PROTECTION TYPICAL SECTION ALONG CL BRIDGE



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 10/24/2023

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
4" SLOPE PROTECTION REPAIR DETAILS

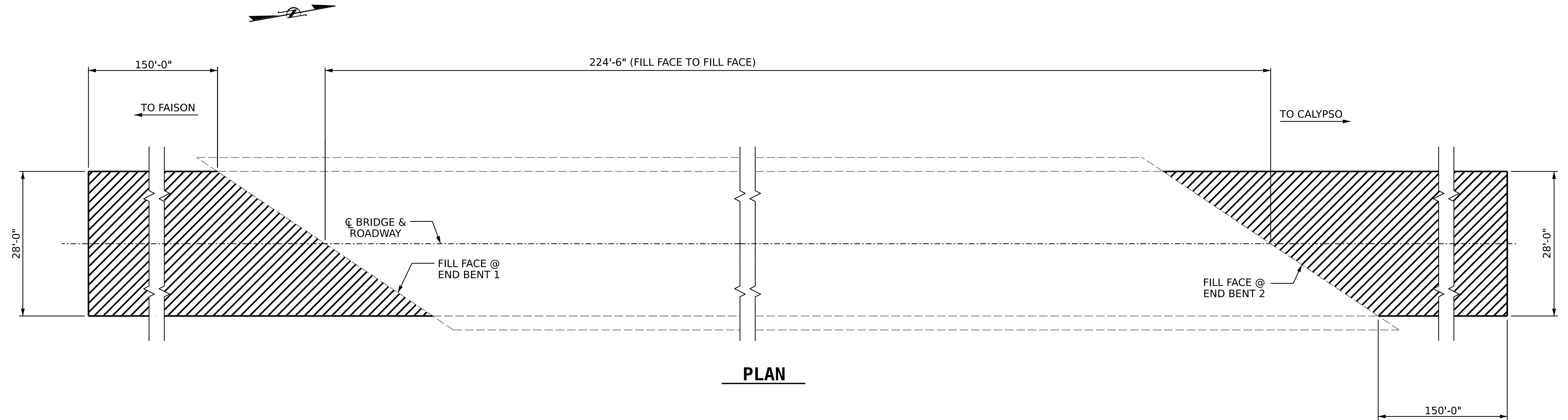
DRAWN BY : S. T. SANDOR DATE : 1/22/23
 CHECKED BY : W. C. SMITH DATE : 5/31/23

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NO.	BY:	DATE:	NO.	BY:	DATE:	S2-22
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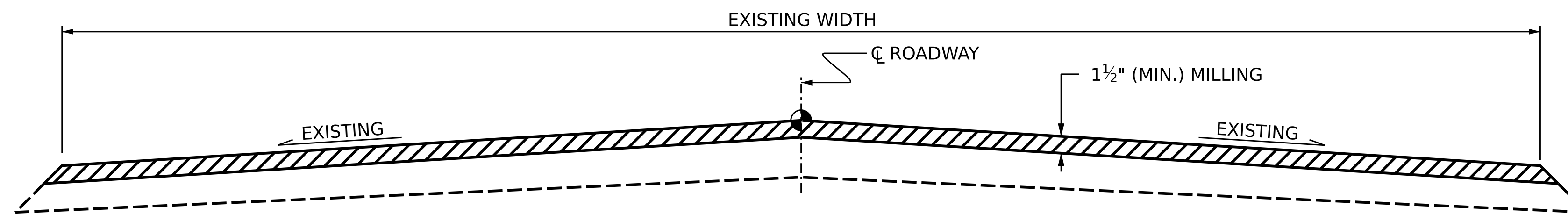
INCIDENTAL MILLING - EXISTING APPROACH ASPHALT PAVING TO BE MILLED AS NECESSARY TO ATTAIN MINIMUM 1½" DEPTH OF NEW ASPHALT PAVING. NEW ASPHALT PAVEMENT SHALL BE OF THICKNESS NECESSARY TO PROVIDE A SMOOTH TRANSITION BETWEEN THE ROADWAY AND THE BRIDGE DECK. THE NEW ASPHALT PAVEMENT THICKNESS MAY EXCEED 1½" DUE TO SETTLEMENT OF THE EXISTING APPROACH.



PLAN

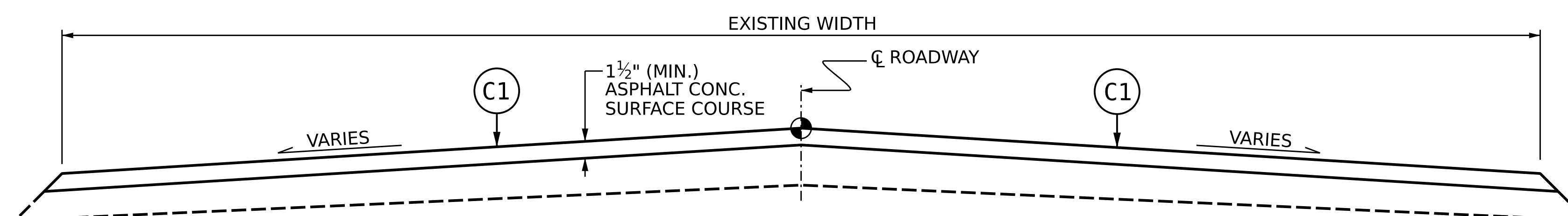
C1 PROPOSED VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" DEPTH.

INCIDENTAL MILLING



TYPICAL ROADWAY MILLING SECTION

SUMMARY OF QUANTITIES		
	ESTIMATE	ACTUAL
INCIDENTAL MILLING	1,063.0 SY	
ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B	90.0 TONS	
ASPHALT BINDER FOR PLANT MIX	10.0 TONS	



TYPICAL PROPOSED ROADWAY SECTION

PROJECT NO. **B-5981**
DUPLIN COUNTY
 BRIDGE NO. **300017**



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 William C. Smith
 8A2A6293F0241D
 10/24/2023

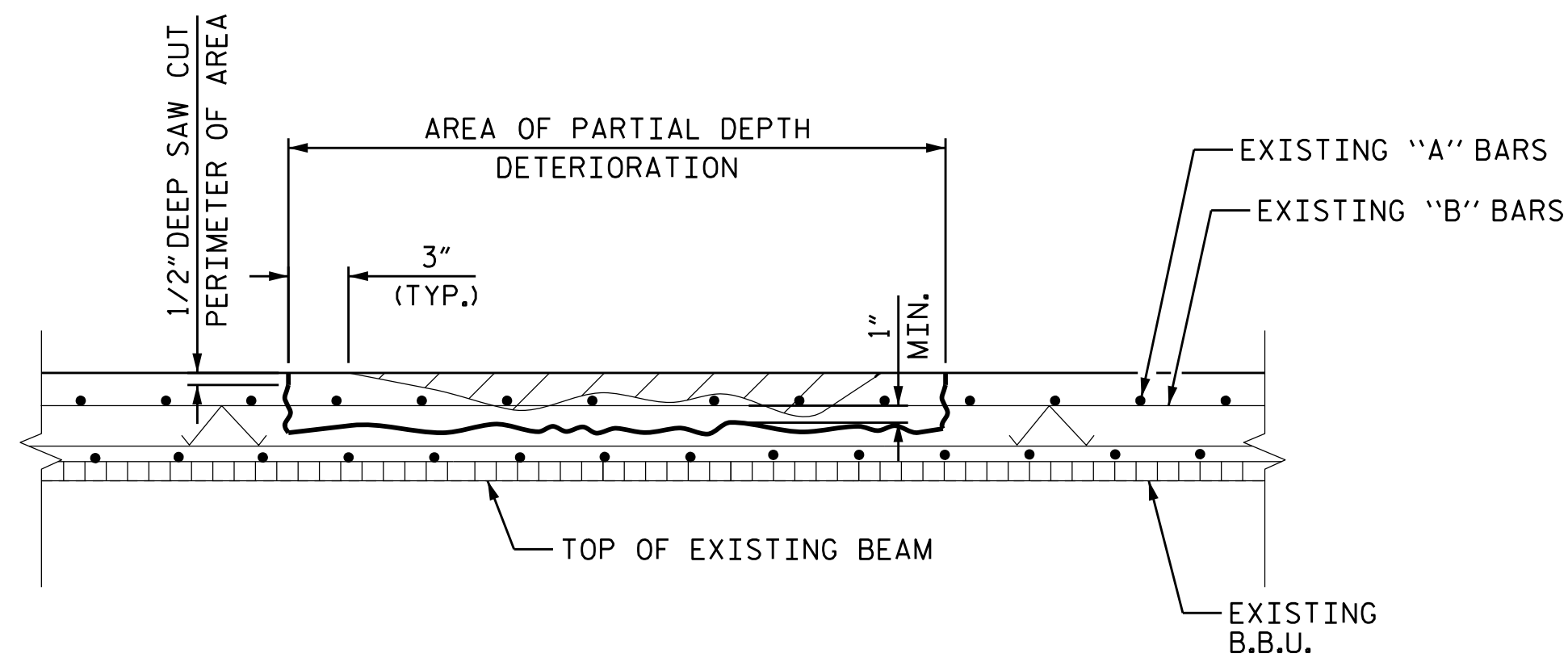
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

APPROACH MILLING & TYPICAL ROADWAY SECTIONS

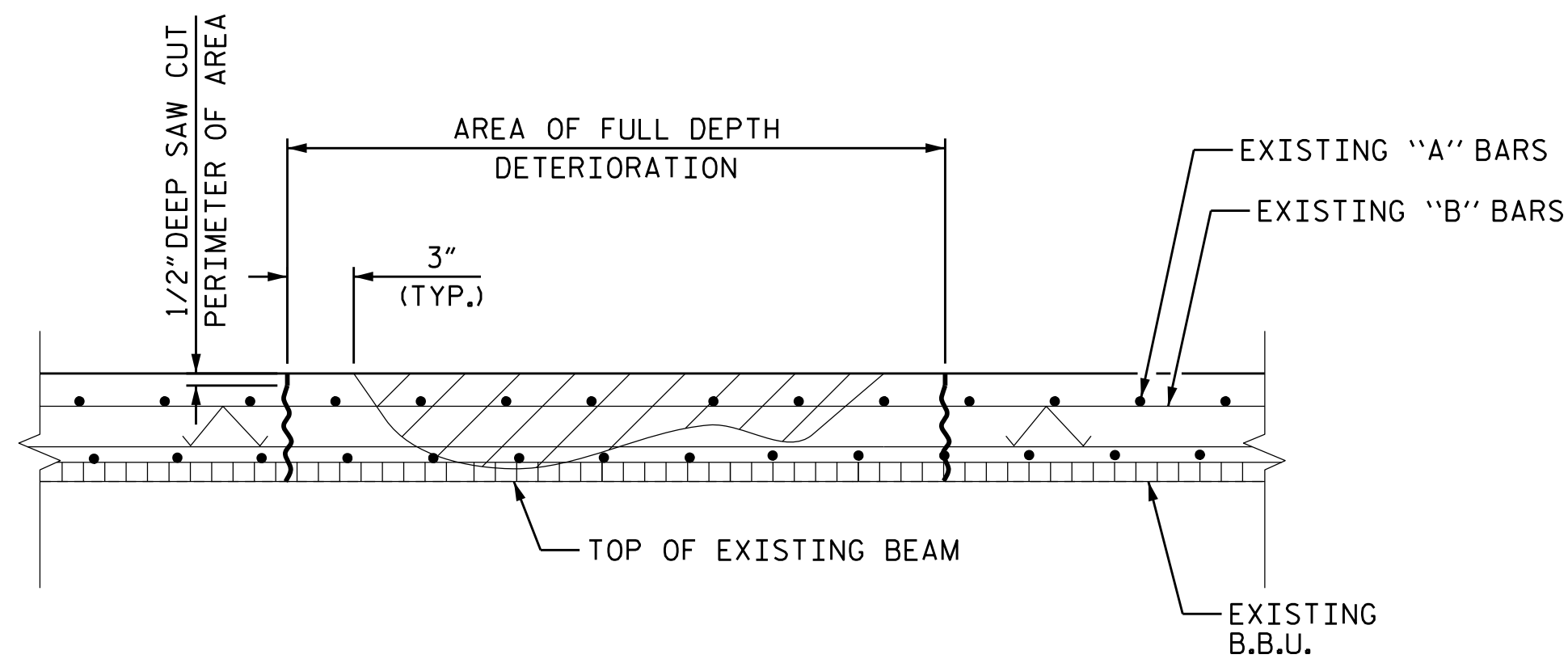
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1			3			TOTAL SHEETS
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DRAWN BY : S. T. SANDOR DATE : 05/2022
 CHECKED BY : W. C. SMITH DATE : 5/31/23



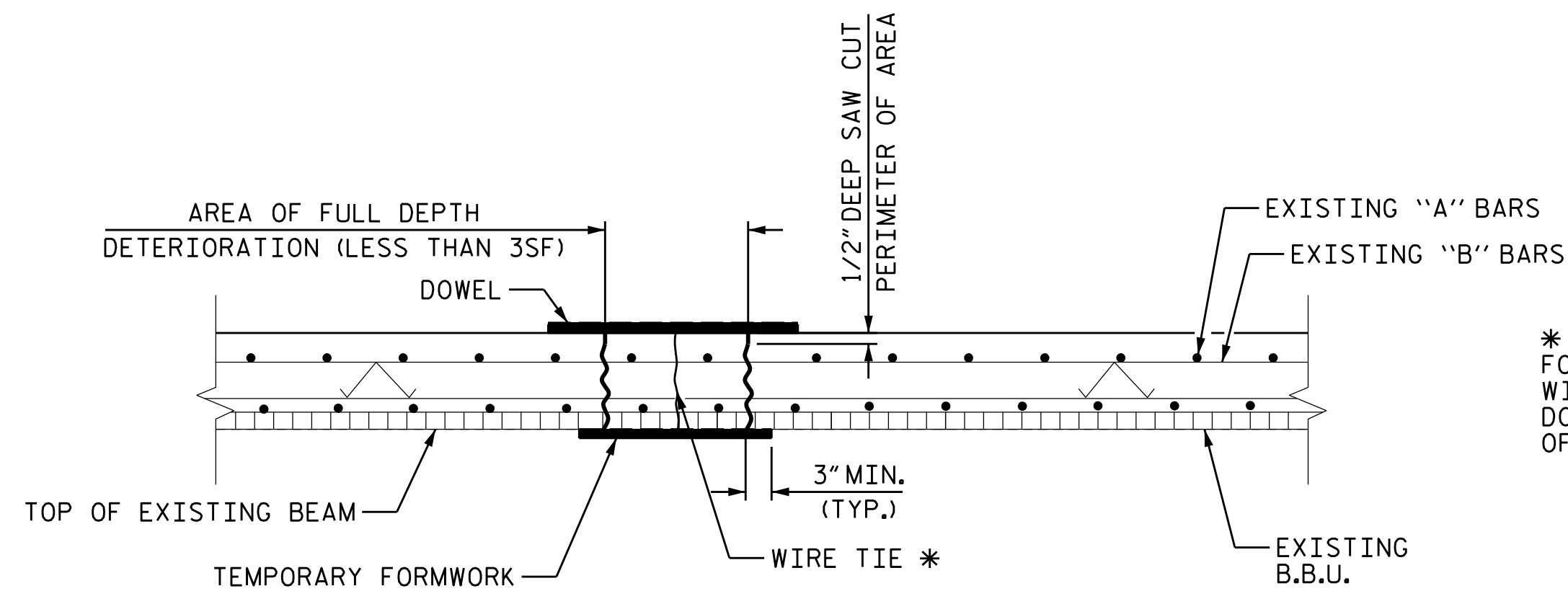
CLASS II (PARTIAL DEPTH) REPAIR



CLASS III (FULL DEPTH) REPAIR

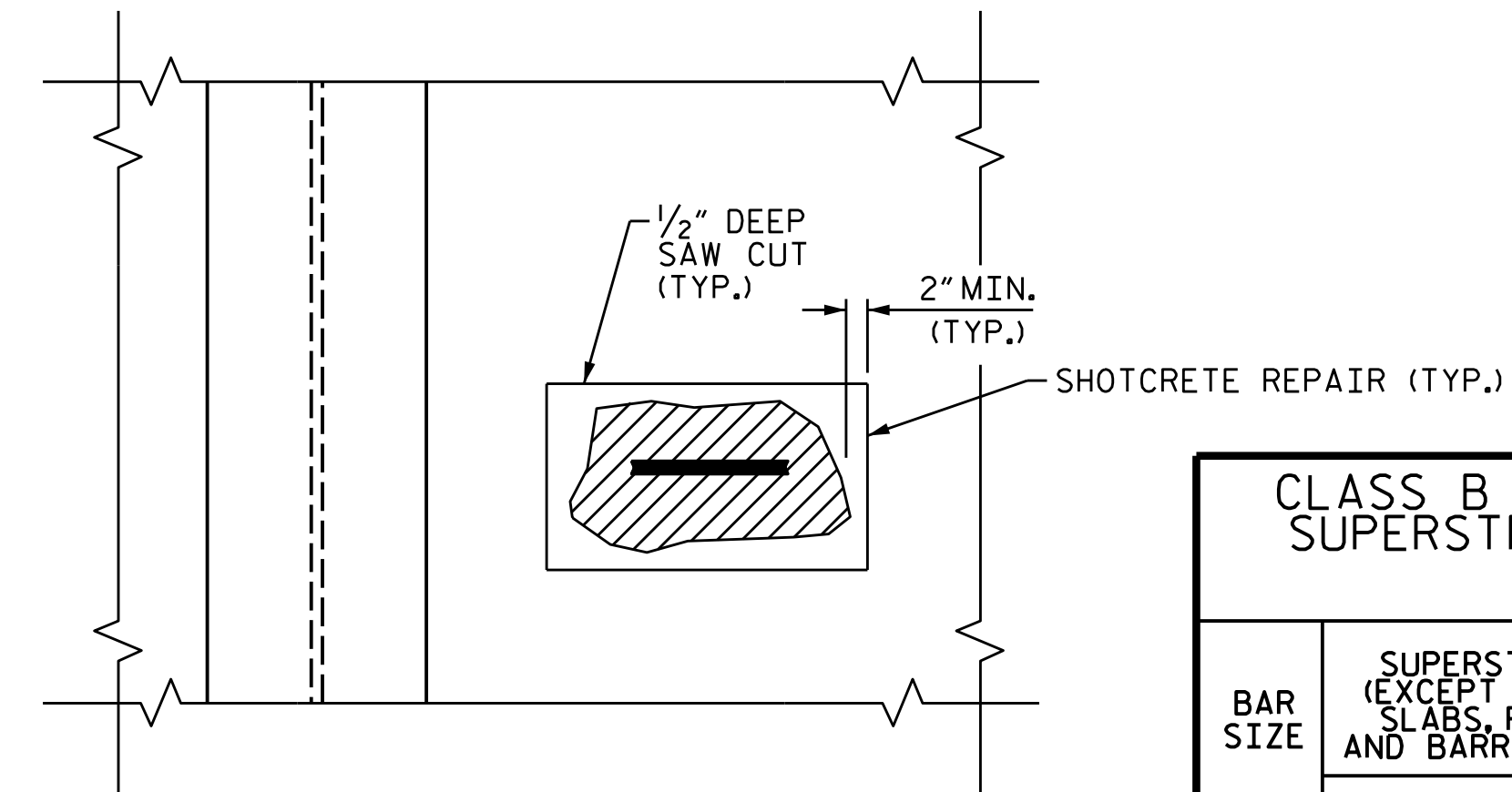
NOTES

- FOR AREAS TO BE REPAIRED, SEE "PLAN OF SPAN" SHEETS.
- ALL DECK REPAIRS SHALL BE COMPLETED PRIOR TO PLACEMENT OF OVERLAY.
- FOR CLASS II AND CLASS III SURFACE PREPARATION, SEE "OVERLAY SURFACE PREPARATIONS" SPECIAL PROVISION.
- FOR CONCRETE FOR DECK REPAIR, SEE SPECIAL PROVISIONS.
- FOR SHOTCRETE REPAIR, SEE SPECIAL PROVISIONS.
- THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO STARTING WORK FOR TEMPORARY FORMWORK. FOR SUBMITTALS OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- UPON REMOVAL OF TEMPORARY FORMWORK, ALL VOIDS AND HONEYCOMBS ON THE UNDERSIDE OF DECK SURFACE SHALL BE FILLED WITH THE SAME MATERIAL AS USED FOR THE PATCH, AND FINISHED TO CONFORM TO THE SURROUNDING CONCRETE SURFACE.
- NO FORMWORK SHALL BE LEFT IN PLACE.

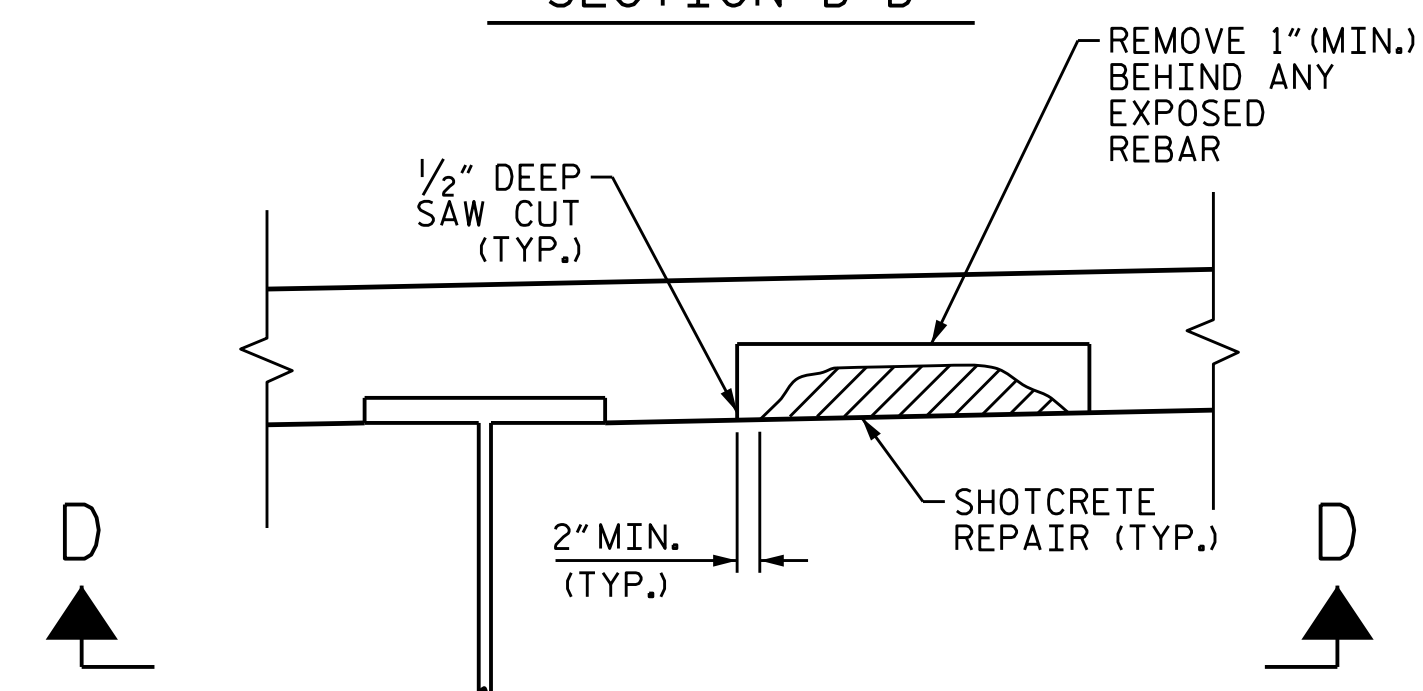


FULL DEPTH REPAIR WITH TEMPORARY FORMWORK
(FOR AREAS OF DETERIORATION EQUAL TO OR LESS THAN 3SF)

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



SECTION D-D

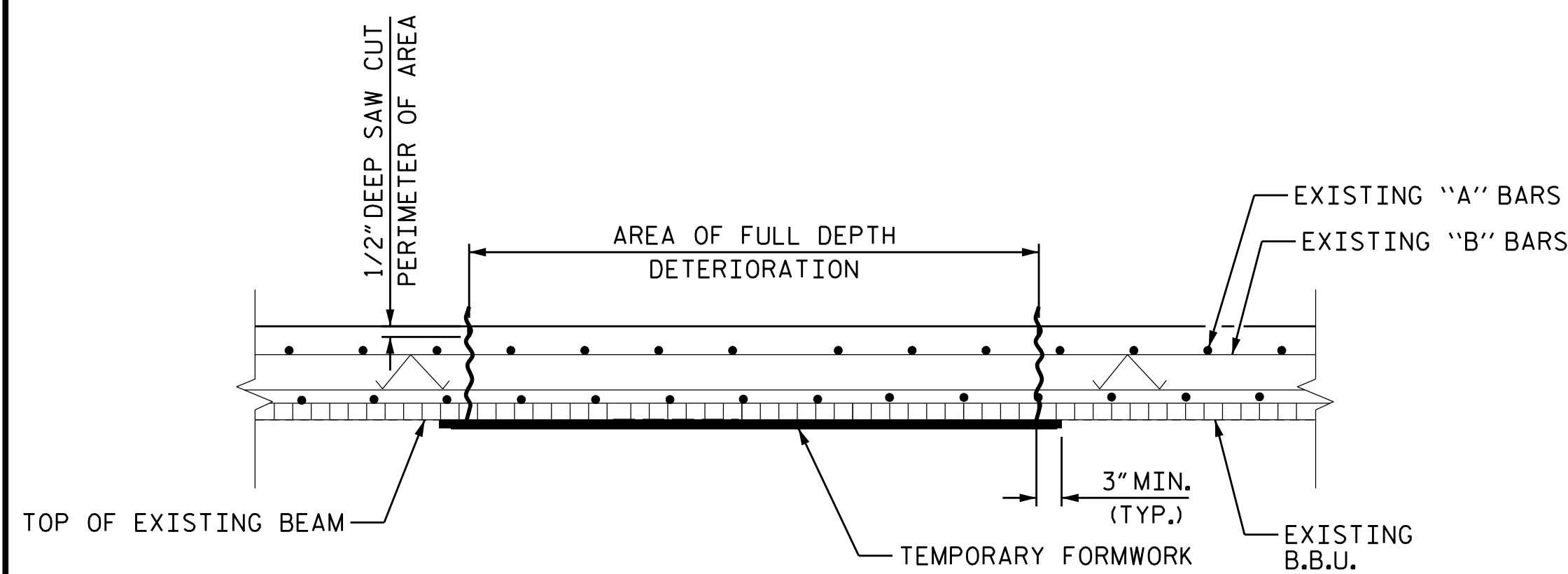


TYPICAL SECTION

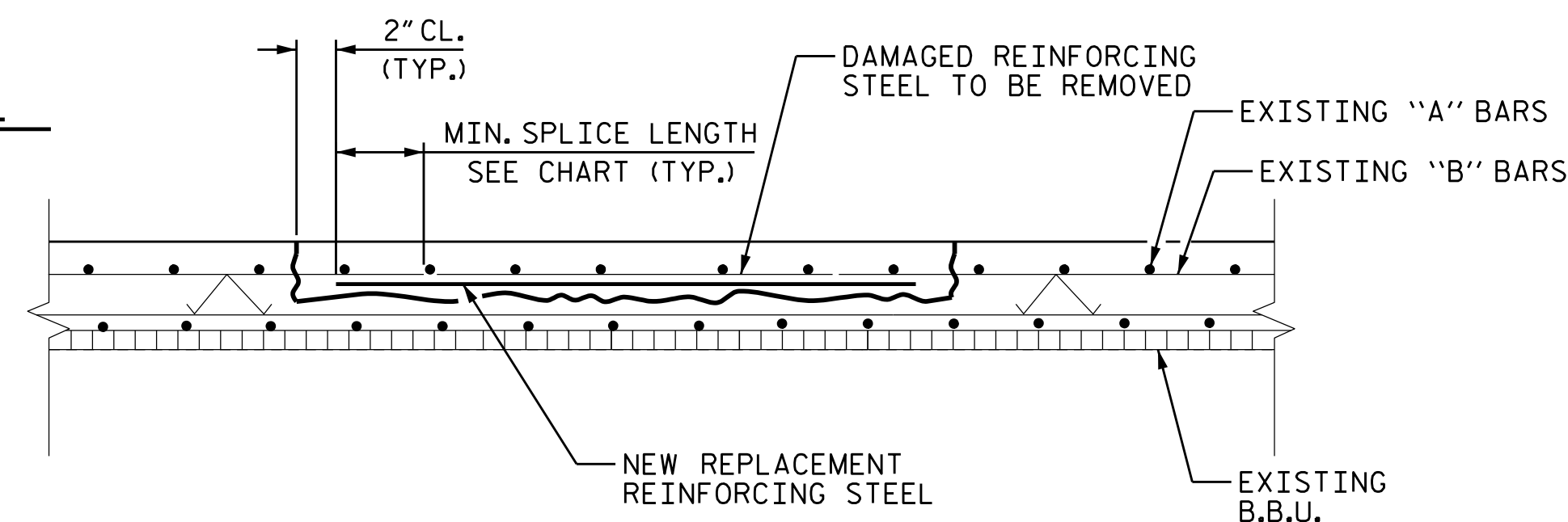
UNDERSIDE OF DECK REPAIR

CLASS B TENSION SPLICE LENGTH FOR SUPERSTRUCTURE REINFORCING STEEL
1.3 x L_d

BAR SIZE	SUPERSTRUCTURE (EXCEPT APPROACH SLABS, PARAPETS AND BARRIER RAILS)		APPROACH SLABS		PARAPETS AND BARRIER RAILS
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	EPOXY COATED
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"	—	—	—
#8	4'-9"	3'-2"	—	—	—

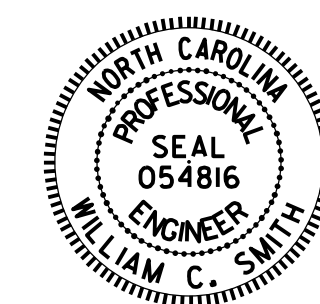


FULL DEPTH REPAIR WITH TEMPORARY FORMWORK
(FOR AREAS OF DETERIORATION GREATER THAN 3SF)



REINFORCING STEEL REPAIR

ASSEMBLED BY : S. T. SANDOR DATE : 06/2022
 CHECKED BY : W. C. SMITH DATE : 5/31/23
 DRAWN BY : NAP 9/18
 CHECKED BY :



DocuSigned by:
 William C. Smith
 8A2A2023F0241D
 10/24/2023

PROJECT NO. **B-5981**
DUPLIN COUNTY
 BRIDGE NO. **300017**

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD

DECK REPAIR DETAILS

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NOTES

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

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

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

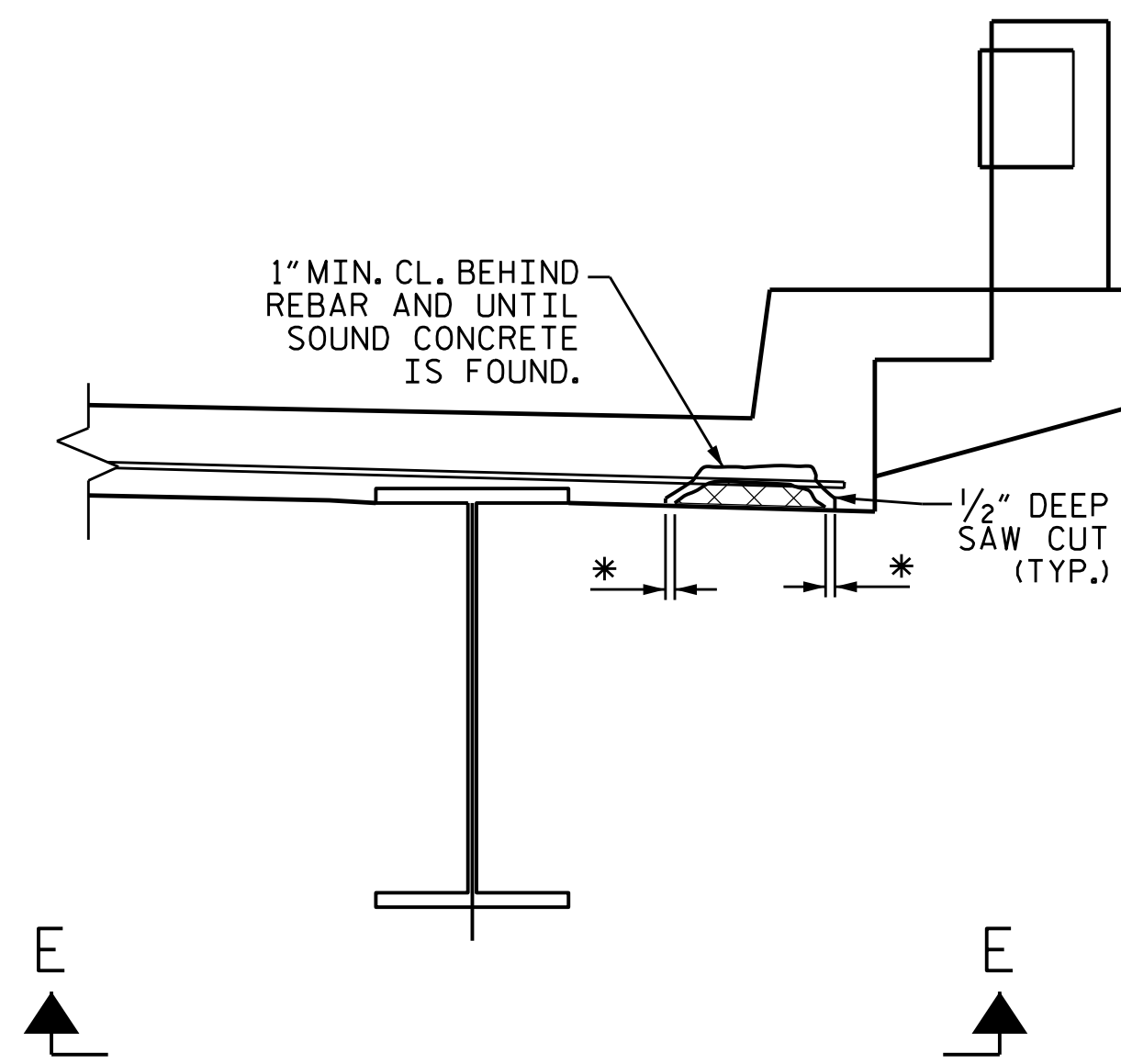
REINFORCING STEEL WHICH IS DETERMINED BY THE ENGINEER TO BE REPLACED, SHALL BE REMOVED TO A POINT WHERE IT IS SOUND. THE PATCH SHALL EXTEND A SUFFICIENT DISTANCE BEYOND THIS POINT TO DEVELOP A SPLICE LENGTH SPECIFIED IN THE TABLE ON THE "DECK REPAIR DETAILS" SHEET.

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

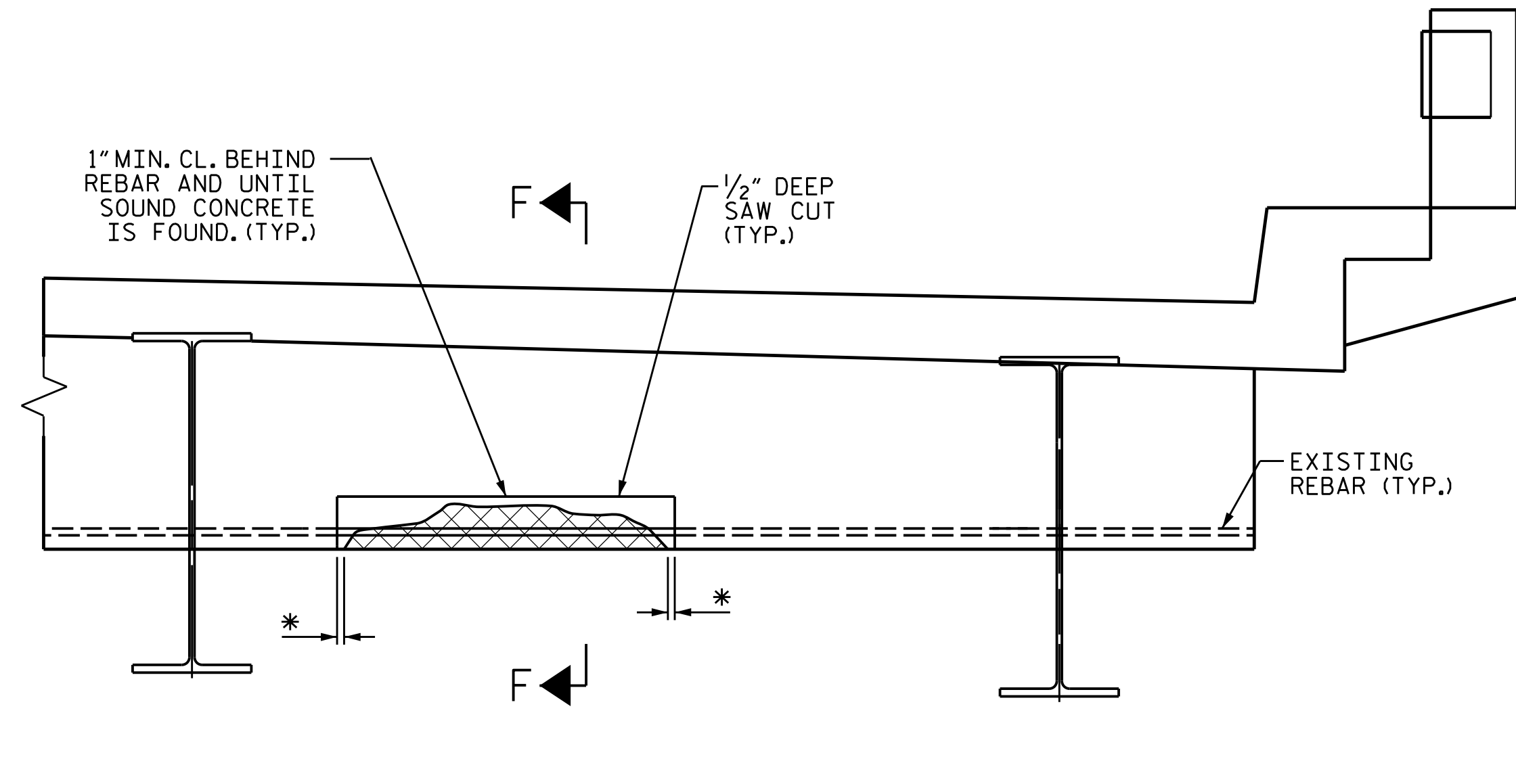
THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO STARTING WORK FOR TEMPORARY FORMWORK. FOR SUBMITTALS OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

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

NO FORMWORK SHALL BE LEFT IN PLACE.

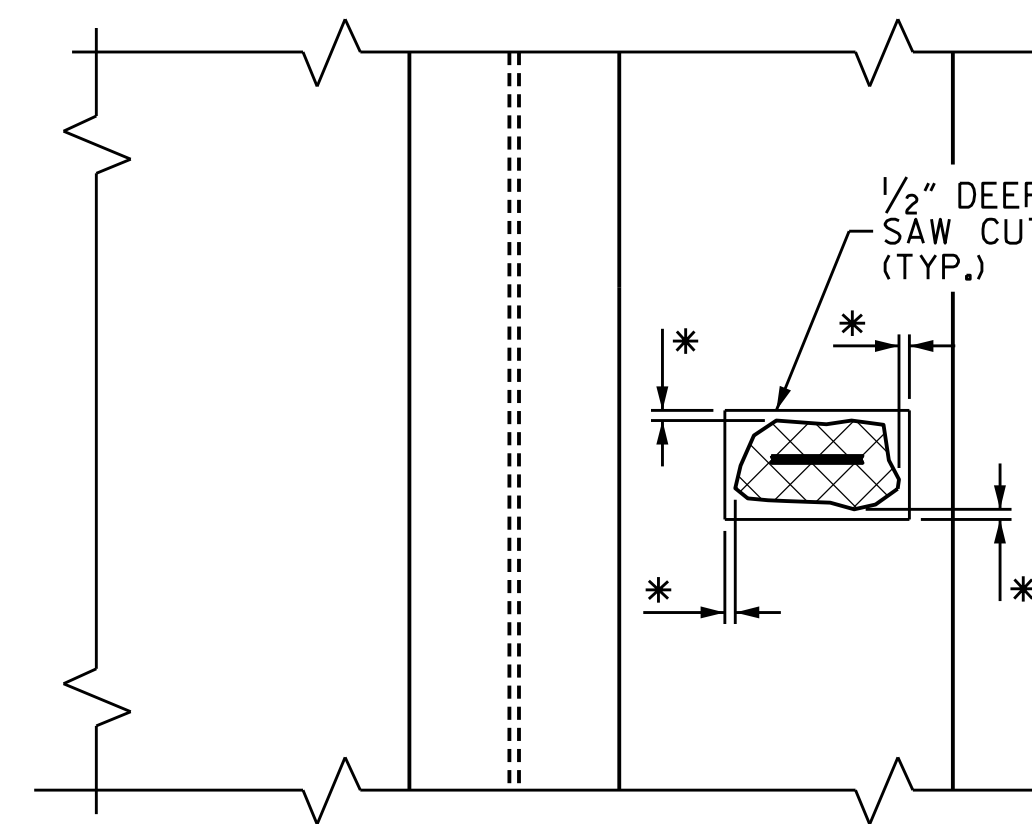


TYPICAL SECTION



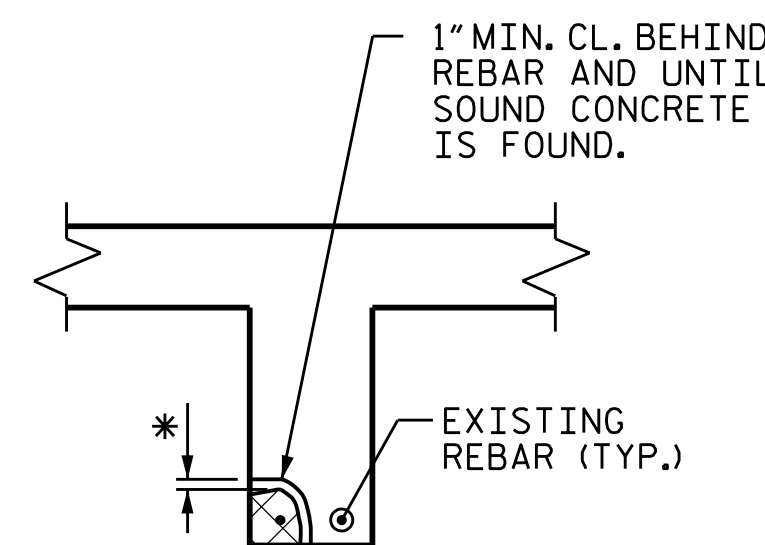
TYPICAL SECTION

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



SECTION E-E

OVERHANG DETAILS



SECTION F-F

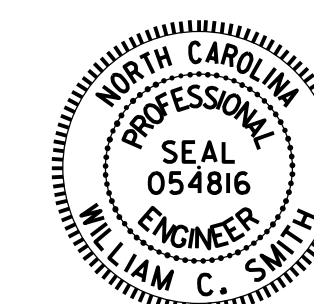
INTERIOR CONCRETE DIAPHRAGM REPAIR DETAILS

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

DAMAGED AREA

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

PROJECT NO. **B-5981**
DUPLIN COUNTY
BRIDGE NO. **300017**



DocuSigned by:
William C. Smith
0A2A2023F0241D

10/24/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

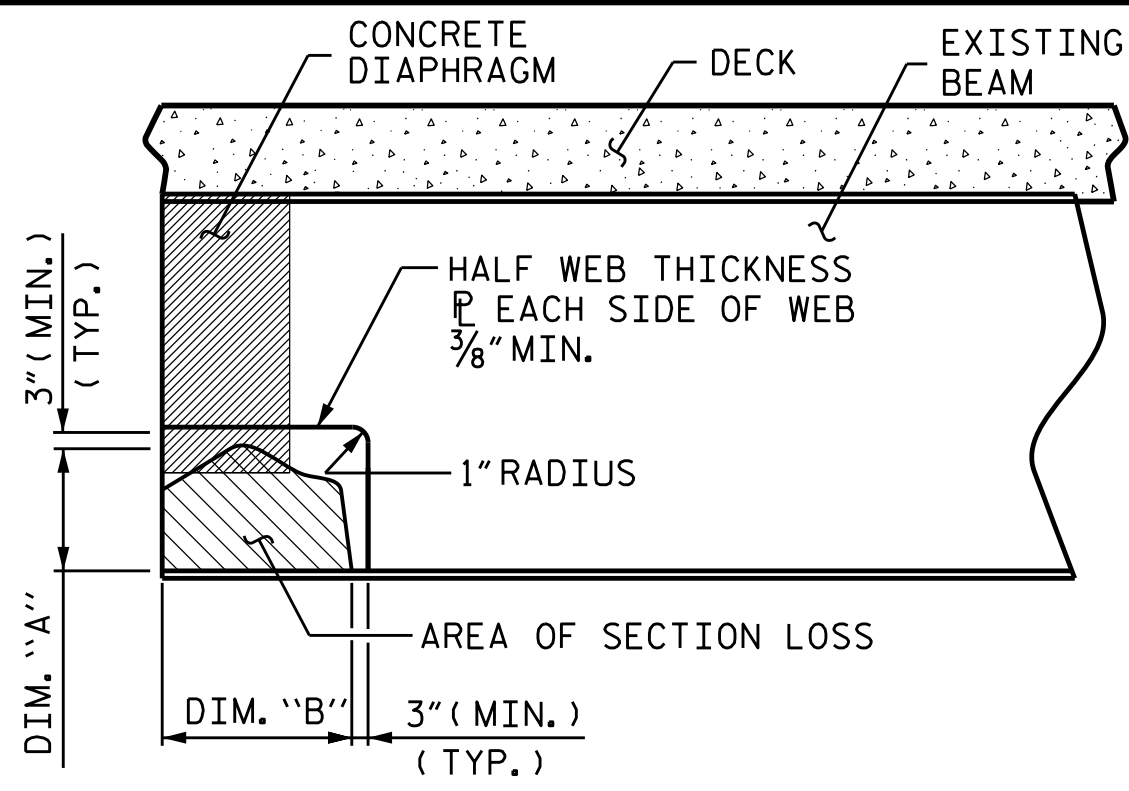
OVERHANG & DIAPHRAGM REPAIR DETAILS

DRAWN BY : S. T. SANDOR DATE : 06/2022
CHECKED BY : W. C. SMITH DATE : 5/31/23

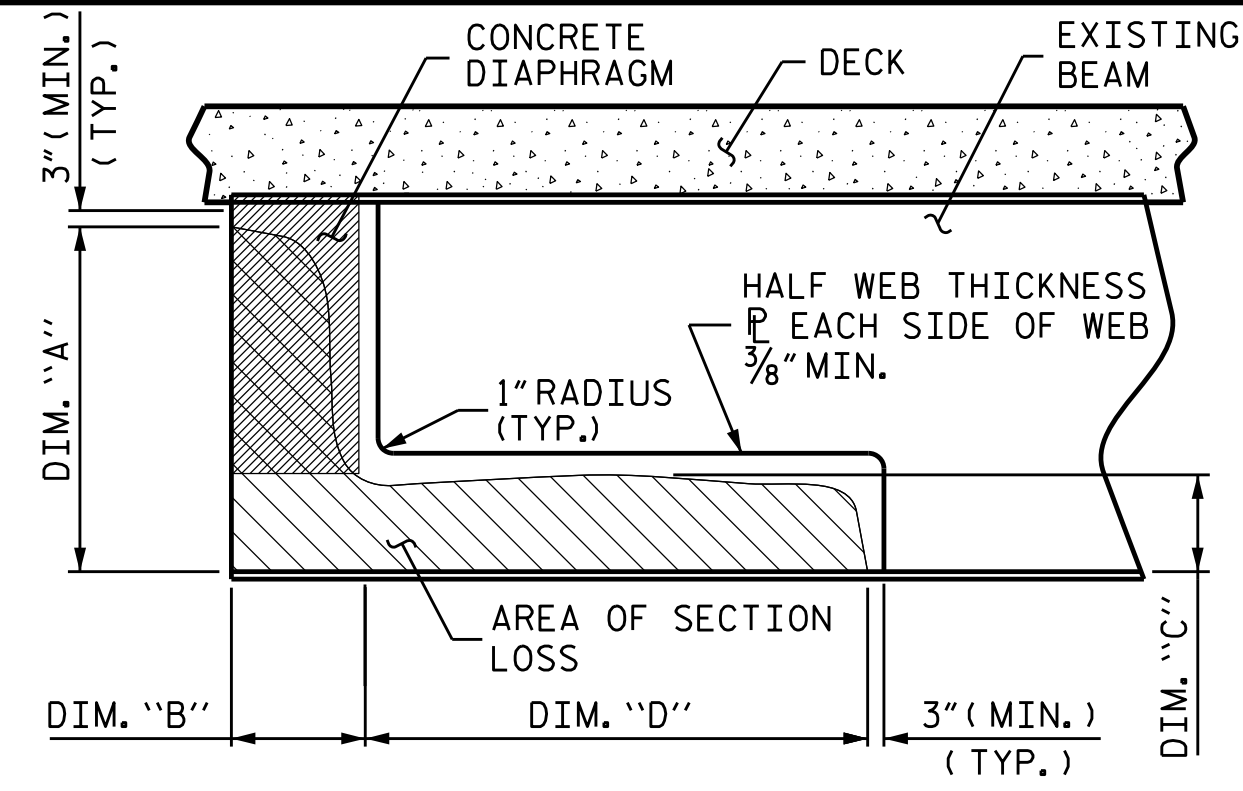
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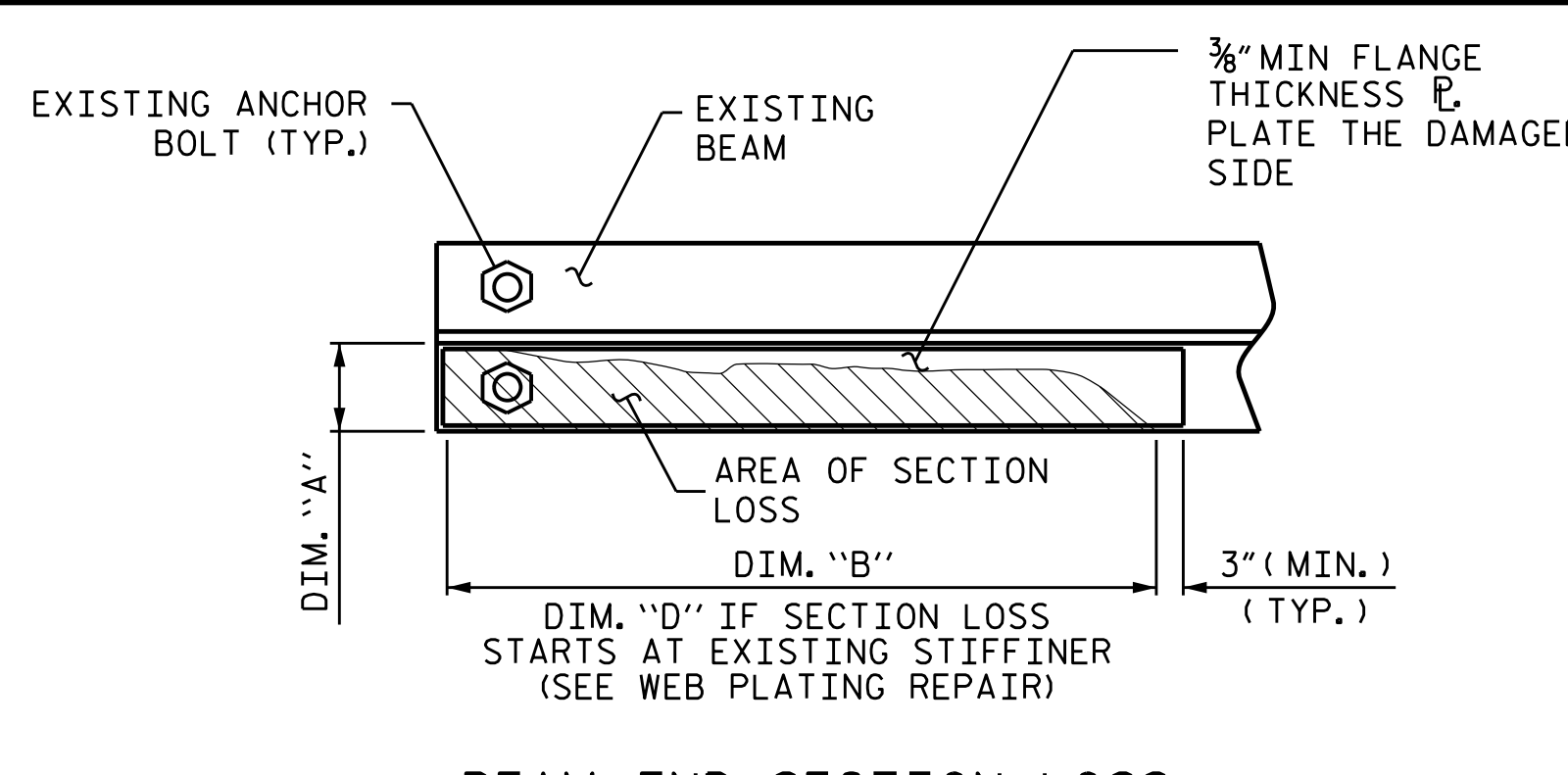
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NO.	BY:	DATE:	NO.	BY:	DATE:	S2-25
1			3			TOTAL SHEETS
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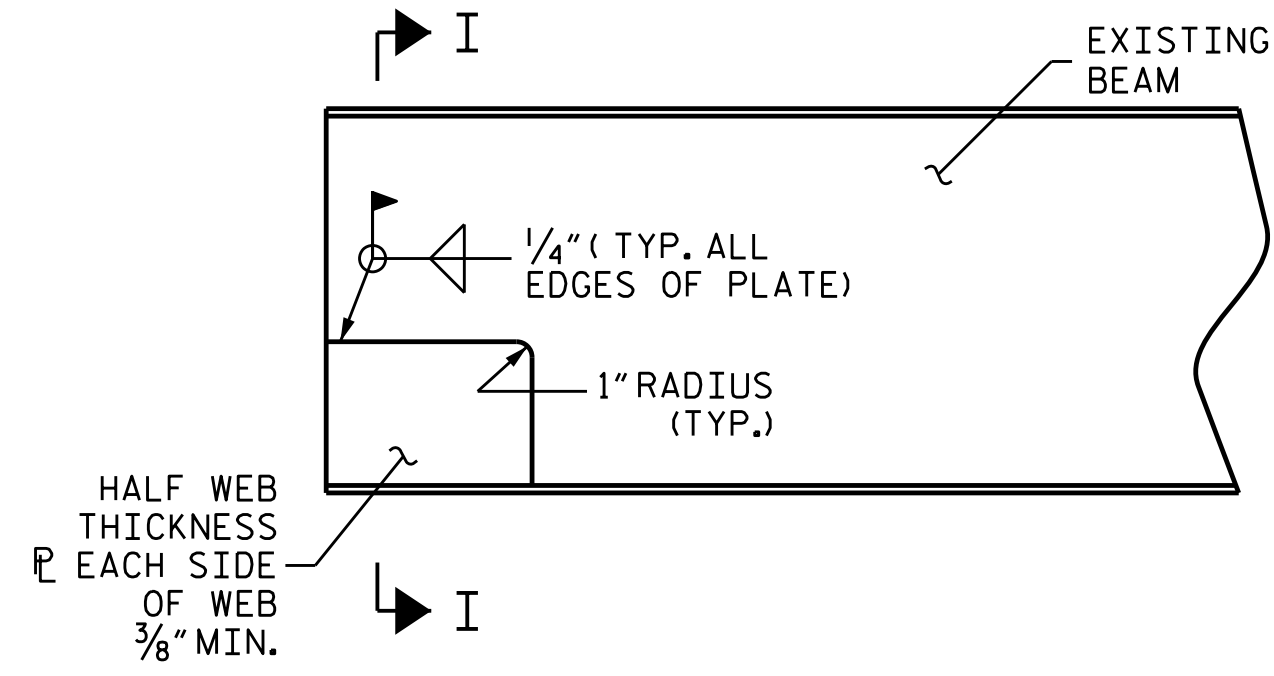
BEAM END SECTION LOSS AND PLATING REPAIR
(*W* REPAIR)



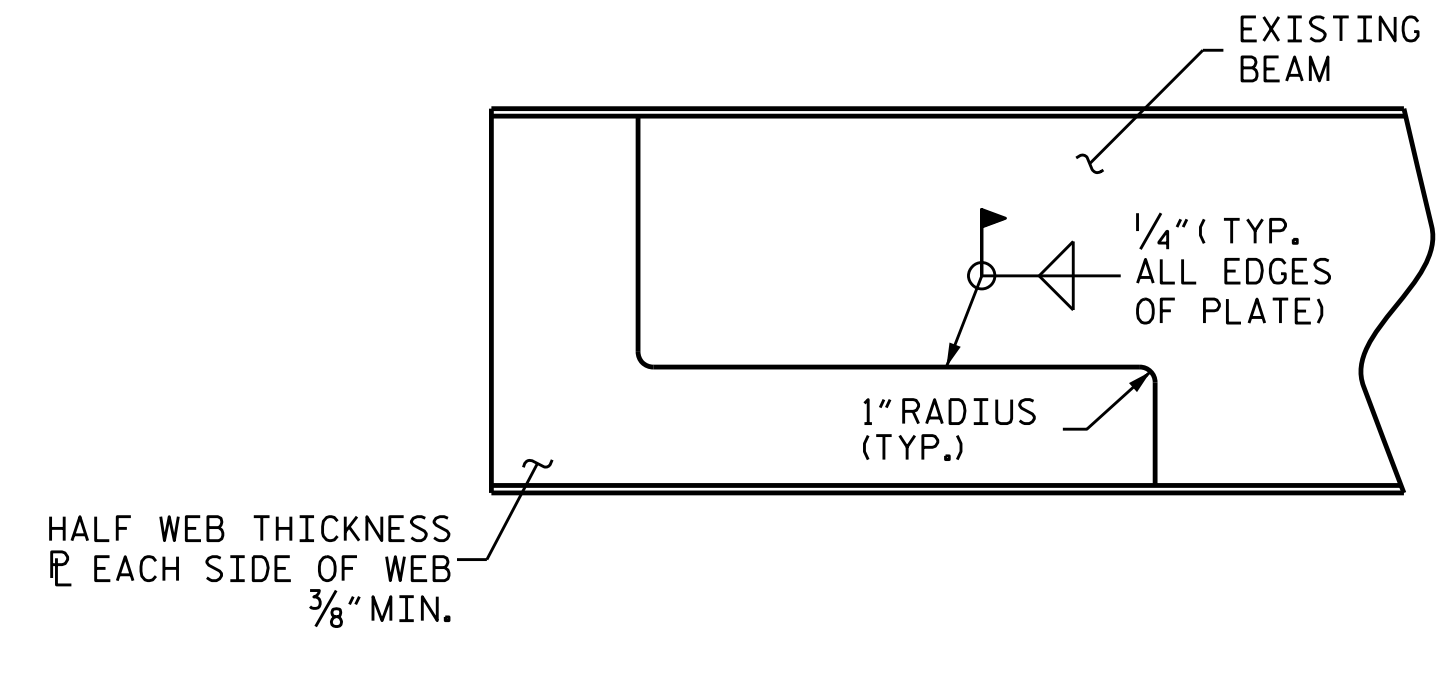
BEAM END SECTION LOSS AND PLATING REPAIR
(*W* REPAIR)



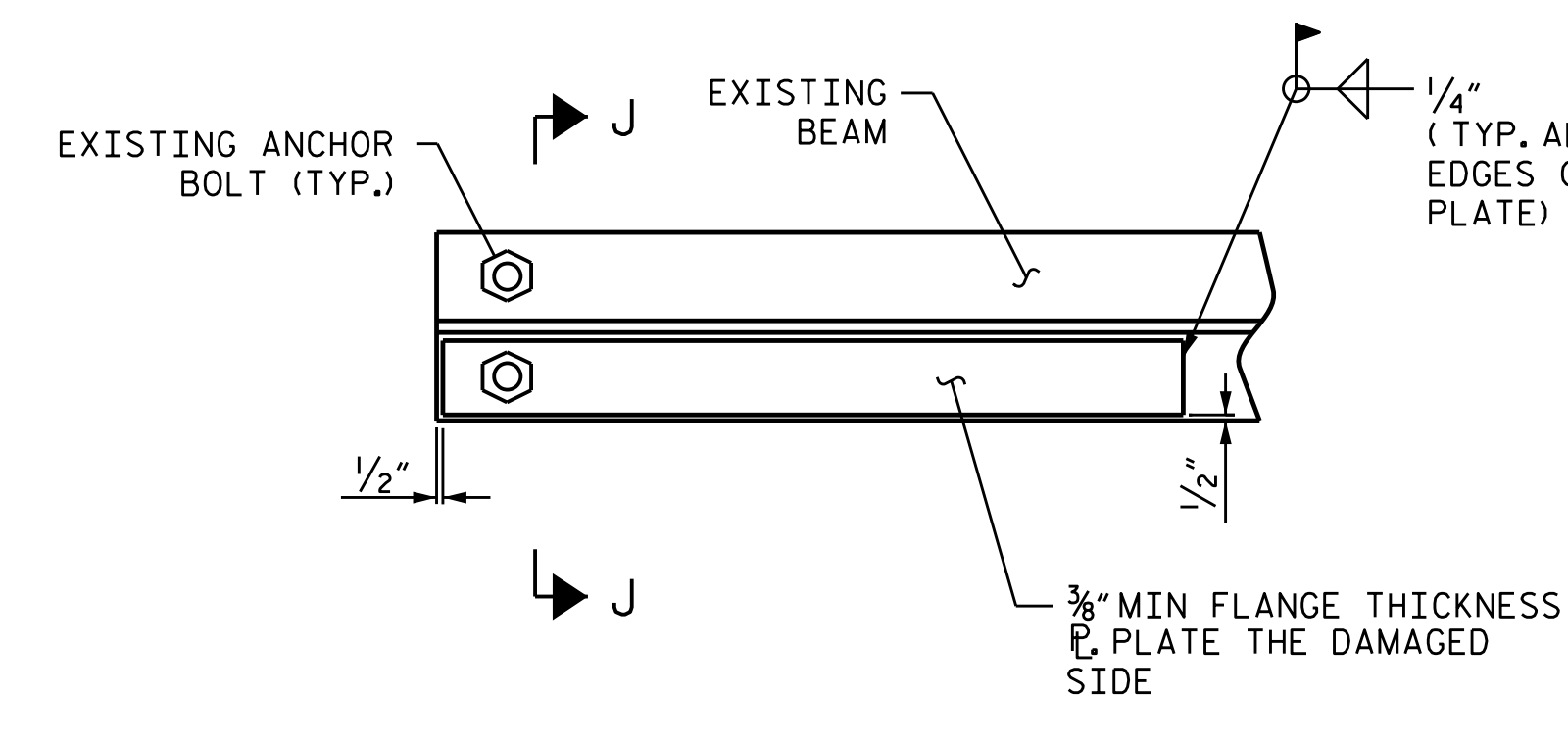
BEAM END SECTION LOSS AND PLATING REPAIR
(*F* REPAIR)



BEAM END PLATING REPAIR
(*W* REPAIR)

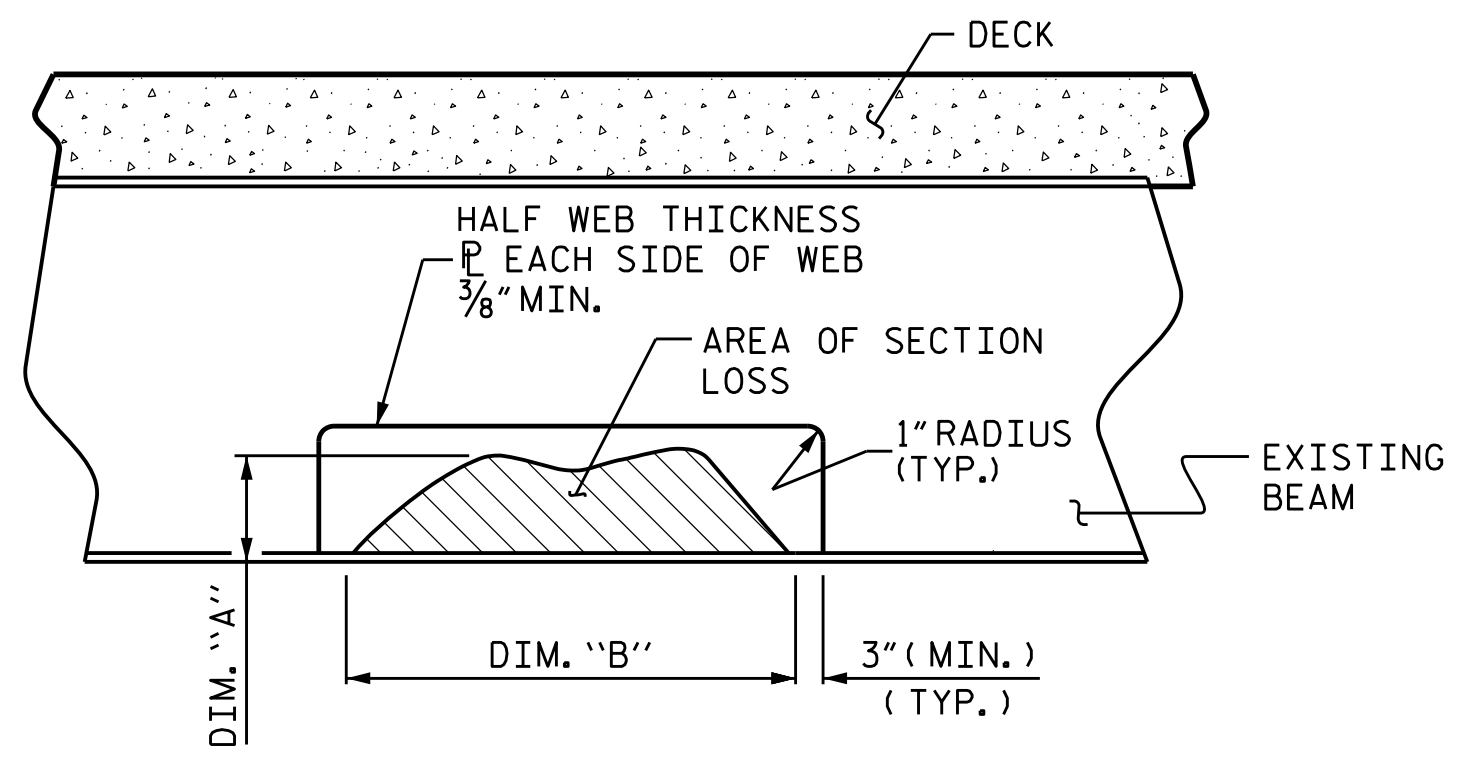


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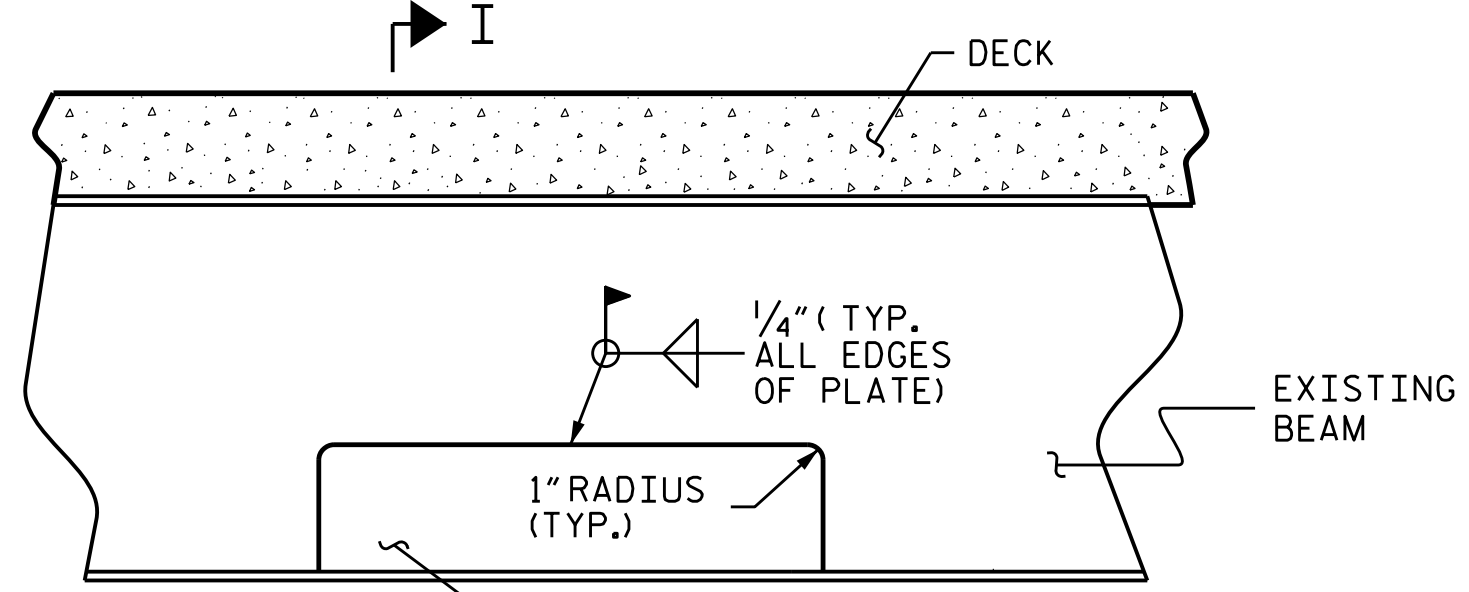


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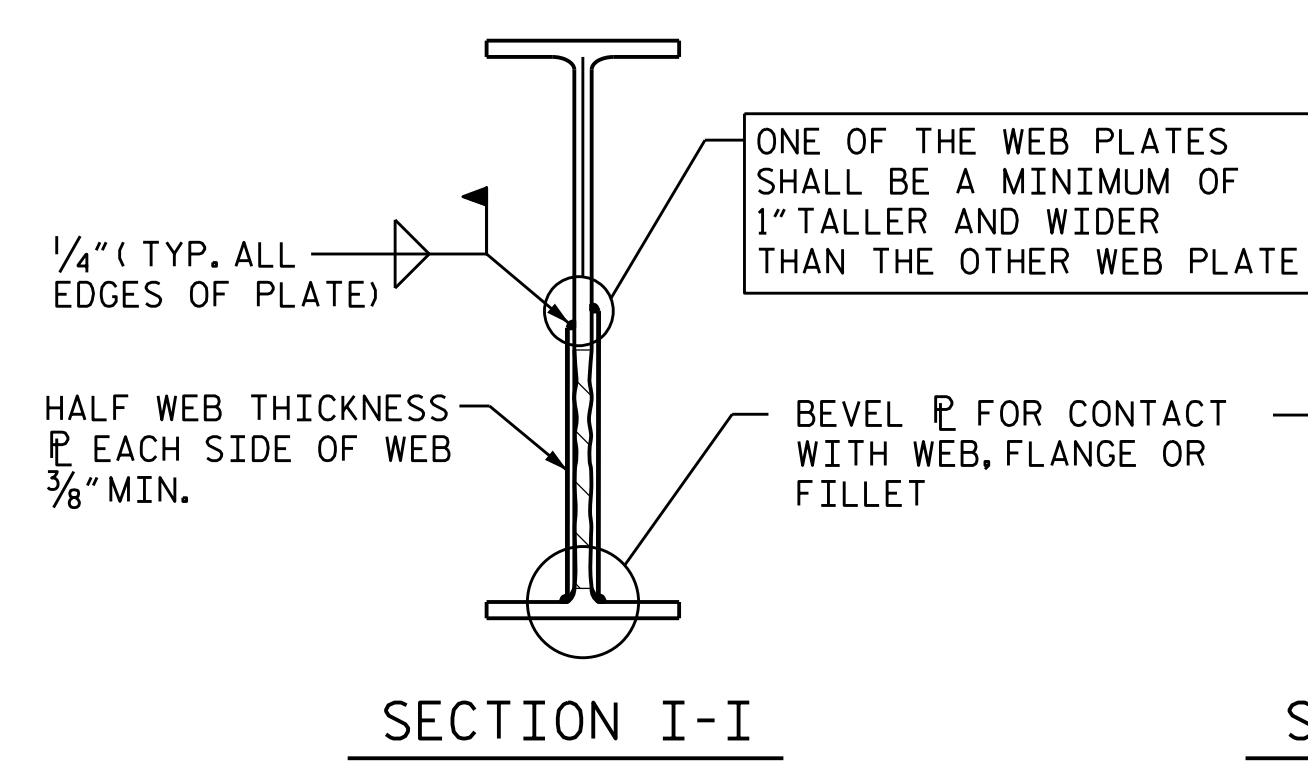


INTERMEDIATE SECTION LOSS BEAM PLATING REPAIR

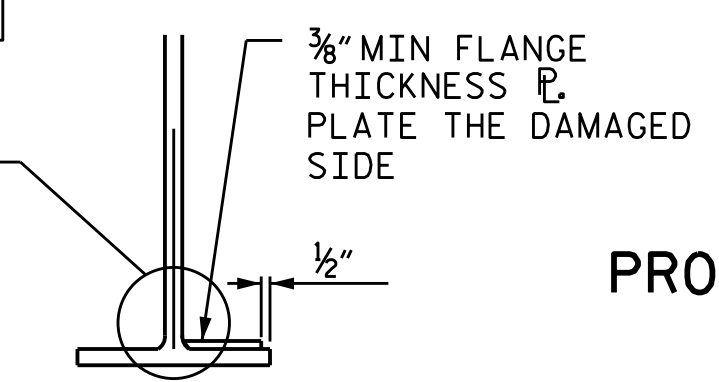


INTERMEDIATE SECTION LOSS BEAM PLATING REPAIR

INTERMEDIATE BEAM PLATING REPAIR



SECTION I-I



SECTION J-J

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. ONE OF THE 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 OF 3/8"

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 OF STEEL, SEE "ZONE PAINTING OF 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 TO DEVELOP A SPLICE LENGTH SPECIFIED IN THE TABLE ON THE "DECK REPAIR DETAILS" SHEET. 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. **B-5981**
DUPLIN COUNTY
BRIDGE NO. **300017**

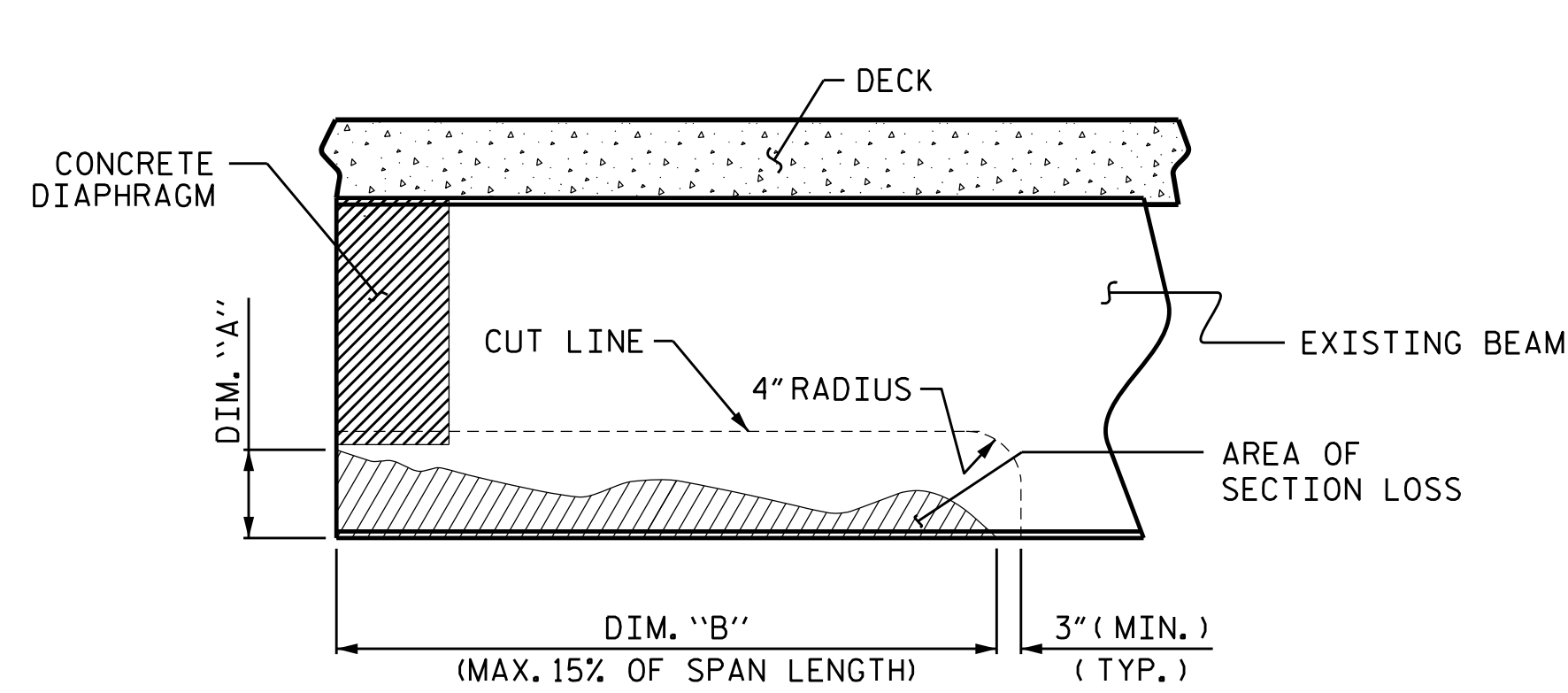


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
WELDED BEAM PLATING REPAIR DETAILS

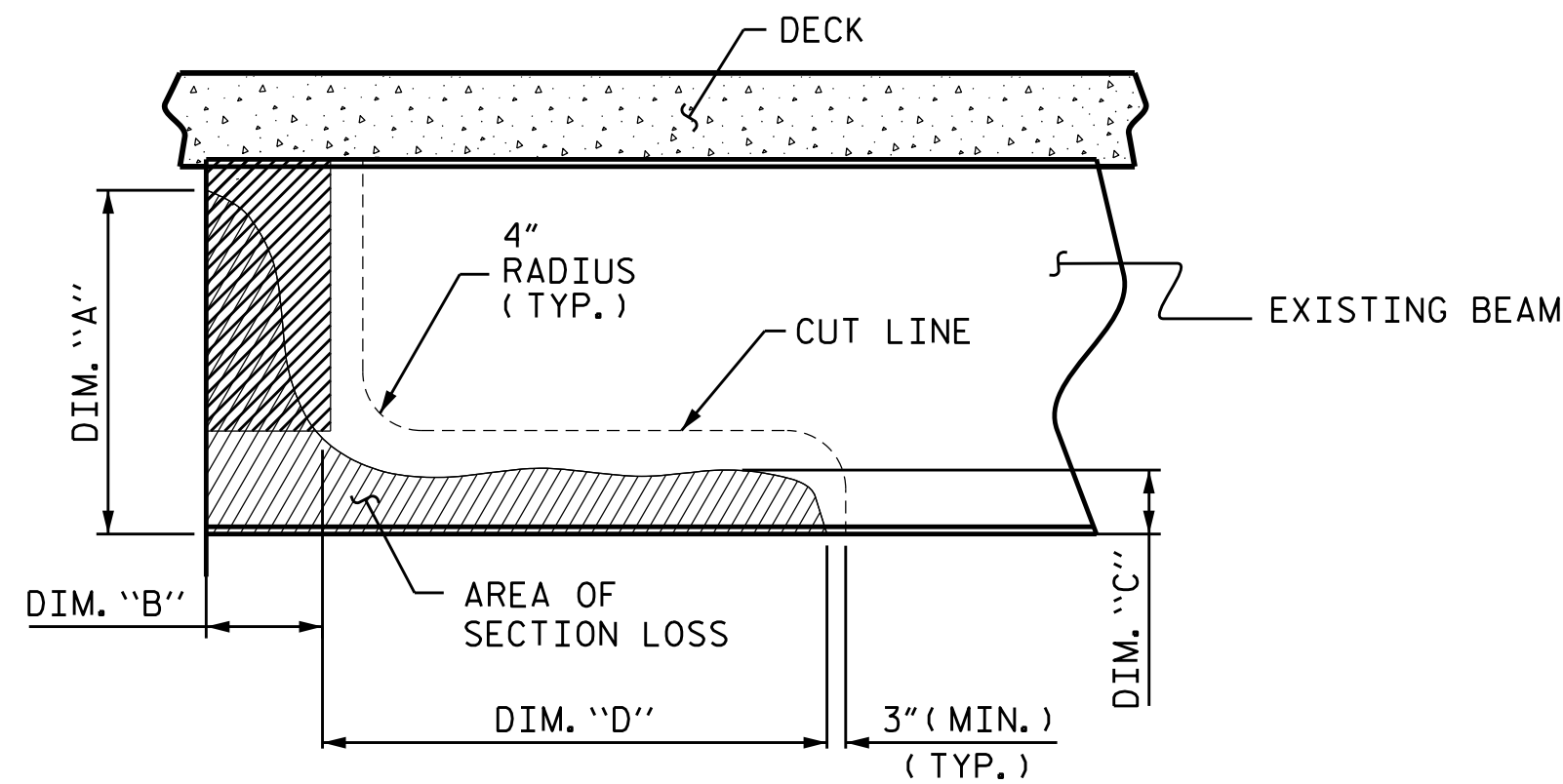
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CHECKED BY: W. C. SMITH DATE: 5/31/23

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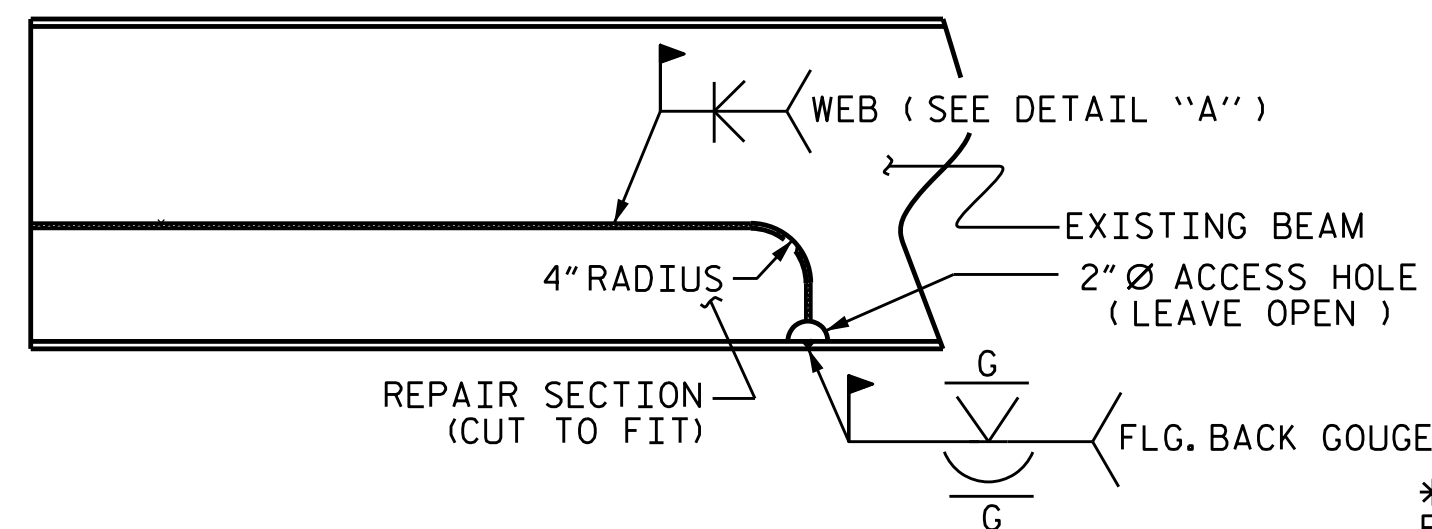
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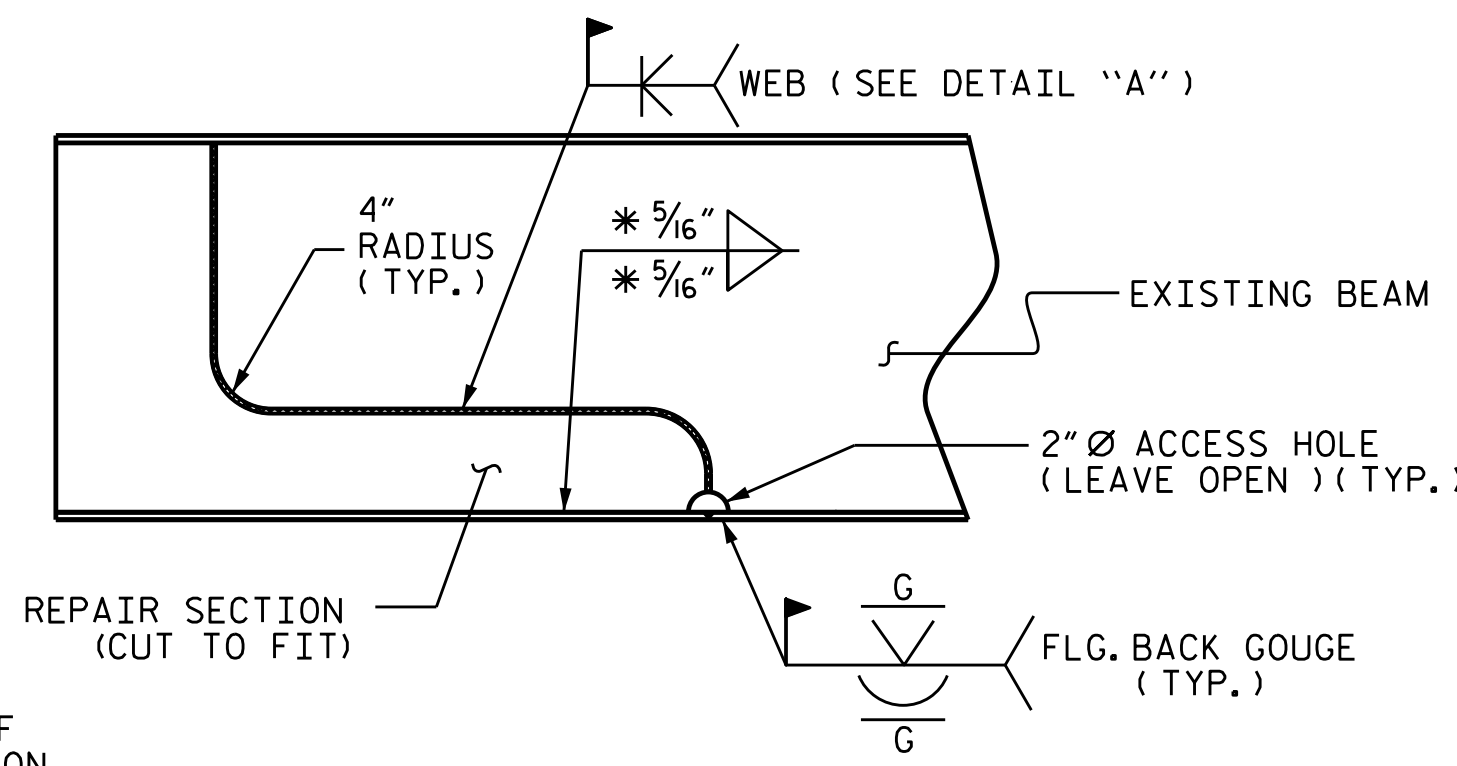
BEAM END SECTION LOSS REMOVAL



BEAM END SECTION LOSS REMOVAL



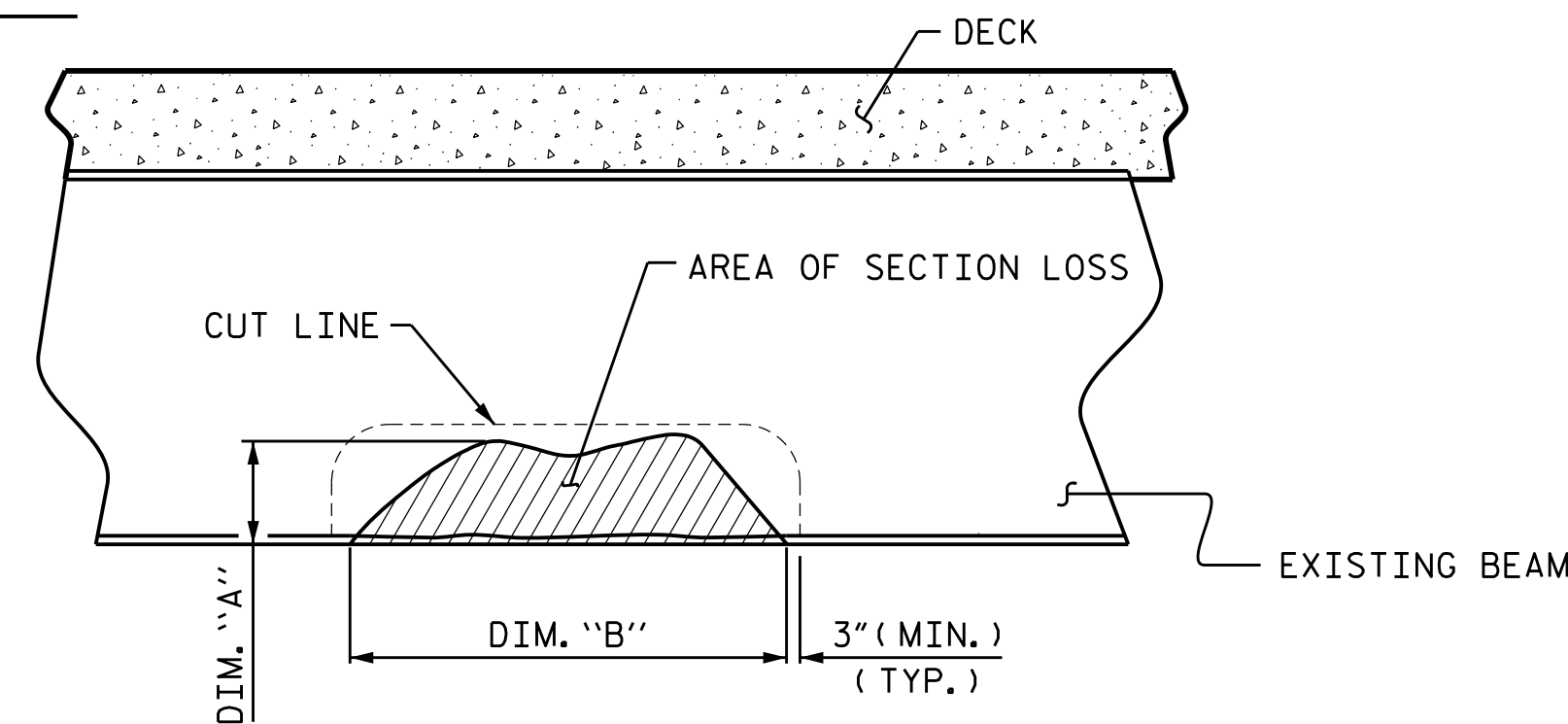
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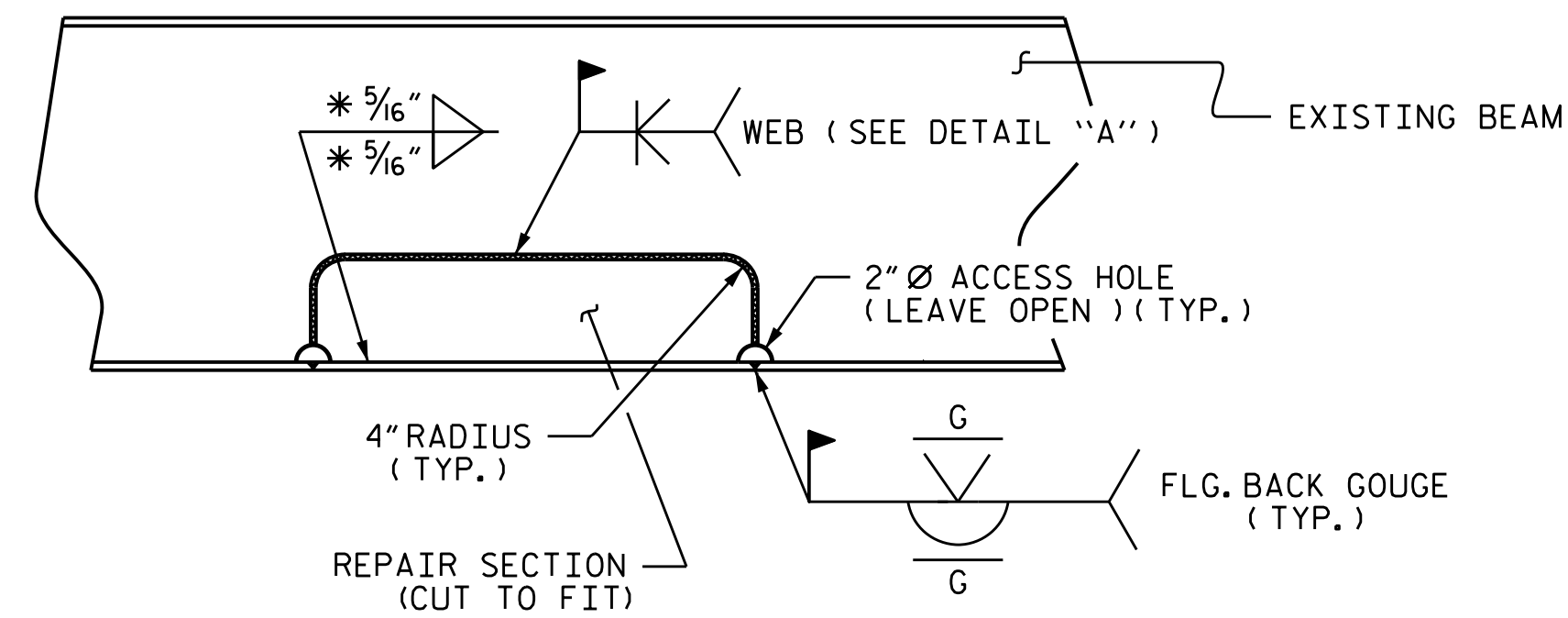
BEAM END SECTION REPAIR

* NOT NEEDED IF REPAIRED SECTION IS CUT FROM A ROLLED BEAM

BEAM END REPAIR

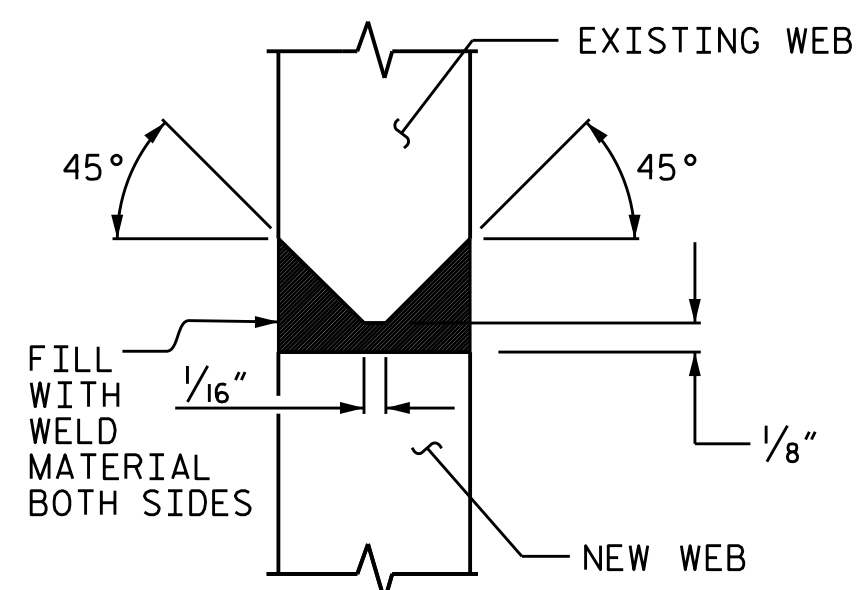


INTERMEDIATE BEAM SECTION LOSS REMOVAL



INTERMEDIATE BEAM SECTION REPAIR

INTERMEDIATE BEAM REPAIR



DETAIL "A"

BEAM REPAIR SEQUENCE

1. REMOVE LIVE LOAD FROM REPAIR AREA BY EITHER CLOSING BRIDGE TO TRAFFIC OR SHIFTING TRAFFIC AWAY FROM REPAIR AREA.
2. REMOVE DEAD LOAD FROM BEAM BY JACKING AND BLOCKING. CONTRACTOR SHALL SUBMIT JACKING PLAN FOR APPROVAL, PRIOR TO BEGINNING WORK. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.
3. STEEL DIAPHRAGM CHANNELS AND/OR STIFFENERS MAY BE TEMPORARILY REMOVED, IF NECESSARY, AND REPLACED AFTER BEAM REPAIR.
4. IF BEAM DETERIORATION EXTENDS INTO THE CONCRETE DIAPHRAGM THEN CHIP AWAY CONCRETE TO DETERMINE THE EXTENT OF THE DAMAGE, CUT OUT BY APPROPRIATE MEANS THE DAMAGED BEAM AREA AND/OR BEARING STIFFENER.
5. MECHANICALLY CLEAN RUST, SCALE, AND EXISTING PAINT TO AT LEAST 3" BEYOND REPAIR AREA.
6. INSTALL NEW CUT-TO-FIT SECTION. REPLACEMENT CUT-TO-FIT BEAM SECTION SHALL BE NEW AND FROM SIMILAR SIZE ROLLED BEAM OR APPROVED EQUIVALENT PLATES. THE GRADE OF STEEL SHALL BE AASHTO M270, GRADE 36 OR BETTER, FULLY WELD ALONG NEW BEAM SECTION AS SHOWN.
7. ALL WELDING SHALL BE IN ACCORDANCE WITH CURRENT APPLICABLE AWS AND NCDOT STANDARD SPECIFICATIONS.
8. 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.
9. IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, AFTER REPAIR, GRIND ALL WELDS FLUSH, THOROUGHLY CLEAN AREA TO REMOVE DEBRIS AND OILS FROM REPAIR PROCESS.
10. CLEANING AND PAINTING OF REPAIRED STRUCTURAL STEEL SHALL BE PERFORMED AS PART OF THE OVERALL CLEANING AND PAINTING CONTRACT.
11. FOR CLEANING AND PAINTING, SEE "ZONE PAINTING EXISTING STRUCTURE" SPECIAL PROVISIONS.
12. AFTER GIRDERS ARE REPAIRED AND PAINTED, ANY CONCRETE REMOVED FROM THE BENT DIAPHRAGMS SHALL BE CAST BACK. ANY REINFORCING STEEL CUT DURING THE REMOVAL PROCESS SHALL BE SPLICED WITH A SIMILAR SIZE BAR TO DEVELOP A SPLICE LENGTH SPECIFIED IN THE TABLE ON THE "DECK REPAIR DETAILS" SHEET. 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.
13. LOWER SPAN TO BEAR; CHECK FOR DISTRESS.
14. REMOVE JACKING EQUIPMENT AND TEMPORARY SUPPORTS.
15. REMOVE ALL TRAFFIC CONTROL DEVICES.

NOTES

AFTER THE STRUCTURAL STEEL HAS BEEN BLASTED AND PRIMED, THE STRUCTURAL STEEL AND BEARING SHALL BE INSPECTED FOR EXCESSIVE SECTION LOSS. AREAS THAT EXHIBIT AN EXCESS OF 35% SECTION LOSS SHALL BE REVIEWED BY THE ENGINEER TO DETERMINE IF AREA OF SECTION LOSS SHOULD BE REPAIRED.

AS DETERMINED BY THE ENGINEER, AREAS WITH EXCESSIVE SECTION LOSS OR AREAS WITH TEMPORARY REPAIRS SHALL BE REMOVED AND THE BEAMS SHALL BE REPAIRED AS INDICATED ON THIS PLAN SHEET. CONTRACTOR AND ENGINEER TO DETERMINE ACTUAL DIMENSIONS OF AREA TO BE REMOVED AND REPLACED. REMOVE CONCRETE BENT DIAPHRAGMS AS NEEDED TO EVALUATE LIMITS OF REPAIR.

AREAS WITH EXCESSIVE SECTION LOSS, IN ADDITION TO THOSE INDICATED ON PLAN SHEETS, MIGHT BE ENCOUNTERED, THE CONTRACTOR SHALL HAVE ADDITIONAL REPAIR MATERIALS ON HAND OR READILY AVAILABLE, SO ADDITIONAL AREAS OF EXCESSIVE SECTION LOSS MAY BE REPAIRED IN A TIMELY MANNER.

PAYMENT FOR THE SECTION REPAIR SHALL BE BASED ON THAT AMOUNT OF REPAIR ACTUALLY PERFORMED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.

PROVIDE RUN-OFF WELD TABS, WHERE APPLICABLE, TO PROVIDE PROPER WELD START AND TERMINATION. SEE NCDOT M&T FIELD WELD MANUAL AND AWS D1.5 SECTION 3.12.

GOUGES AND INDENTIONS FROM IMPACT ON GIRDERS SHALL BE GROUND SMOOTH PRIOR TO BLASTING AND PAINTING OPERATION.

DRAWN BY : S. T. SANDOR DATE : 07/2022
 CHECKED BY : W. C. SMITH DATE : 5/31/23

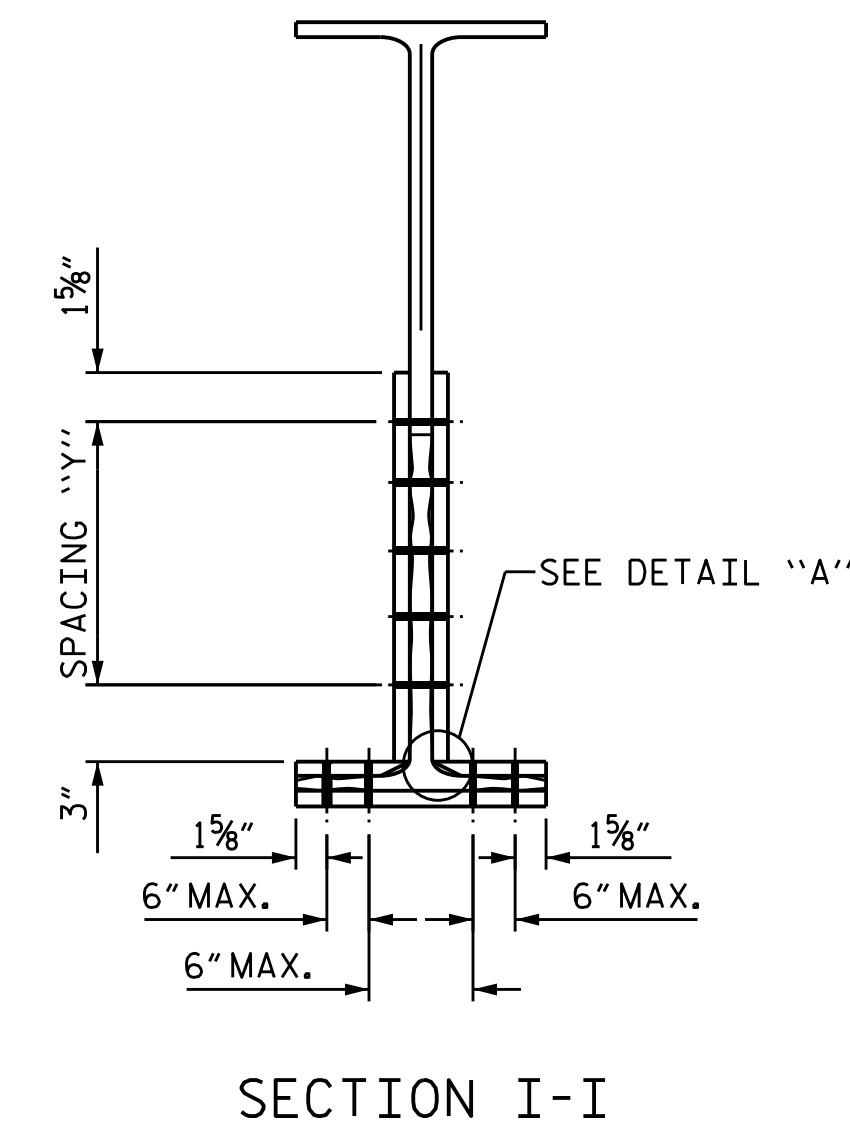
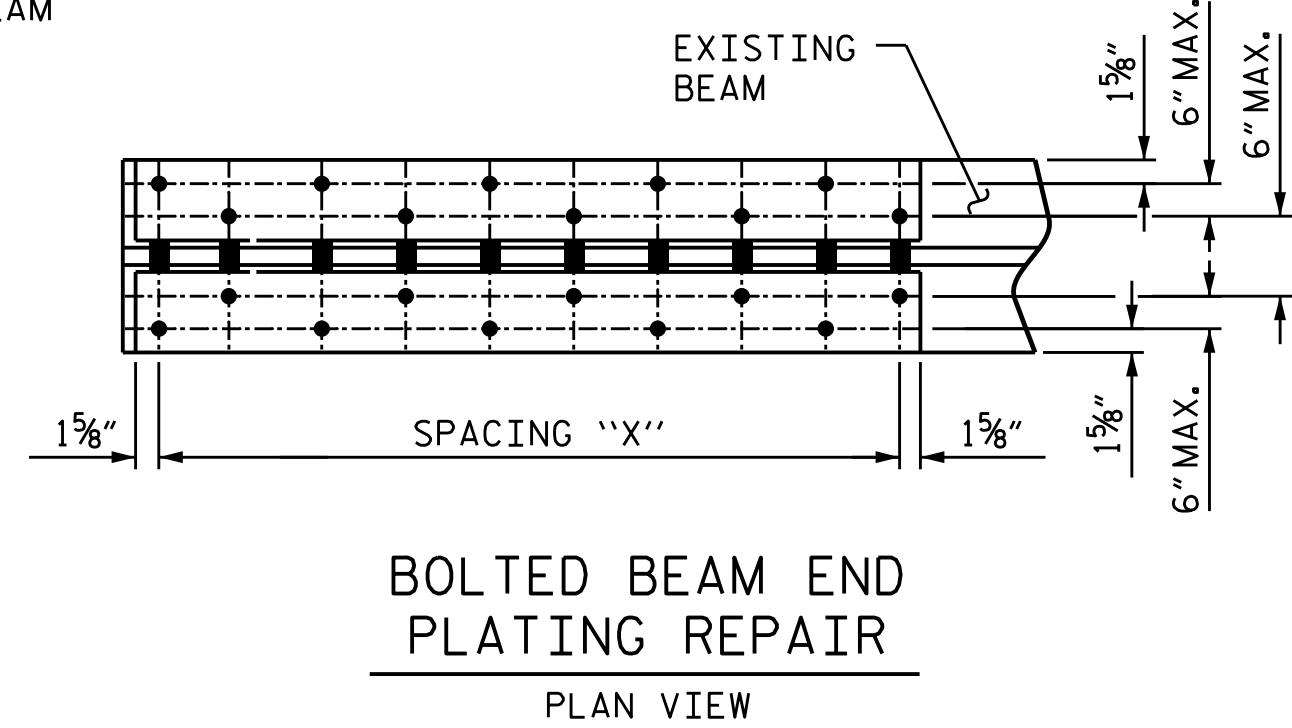
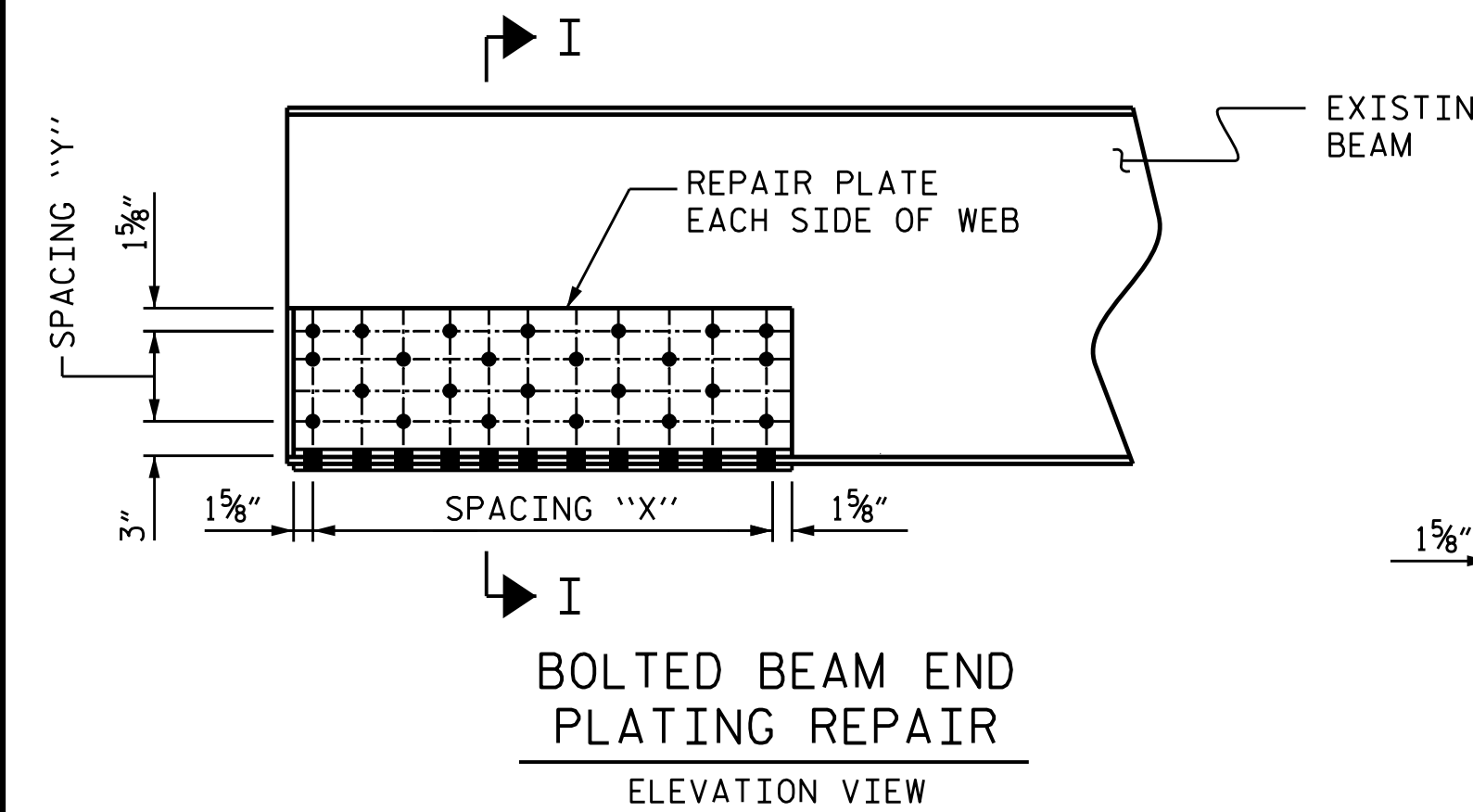
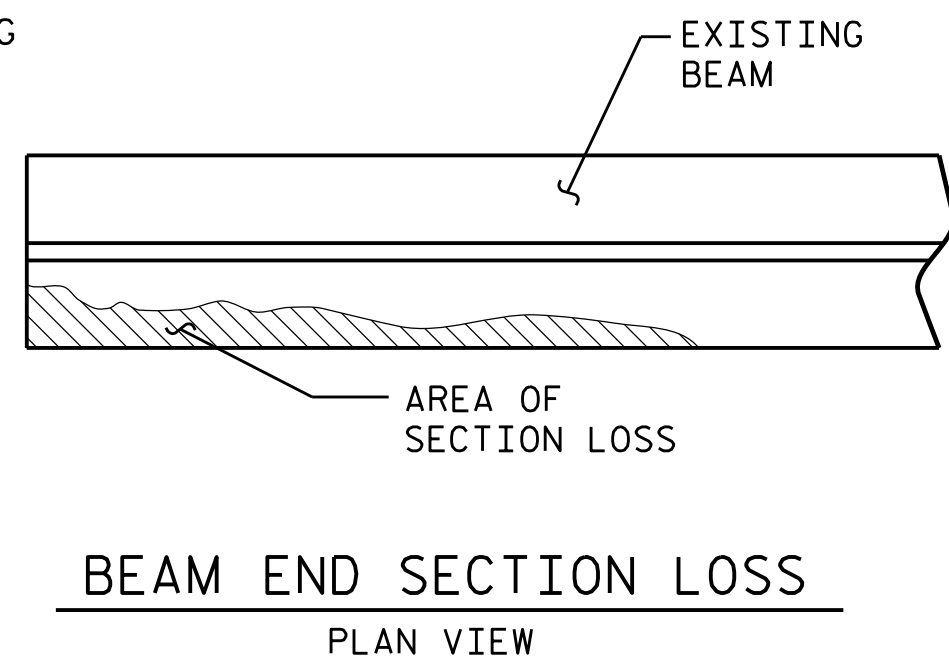
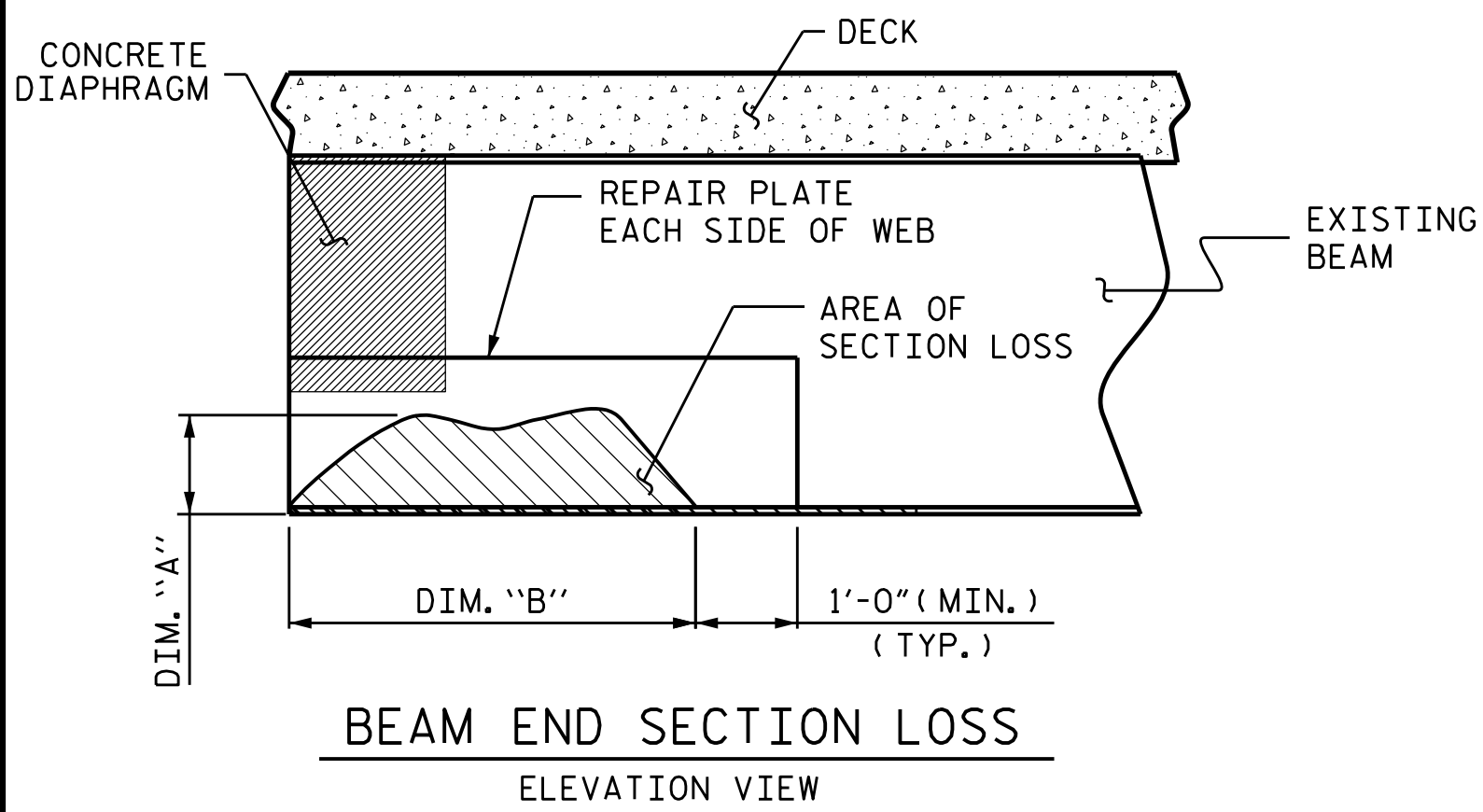
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PROJECT NO. **B-5981**
 DUPLIN COUNTY
 BRIDGE NO. **300017**

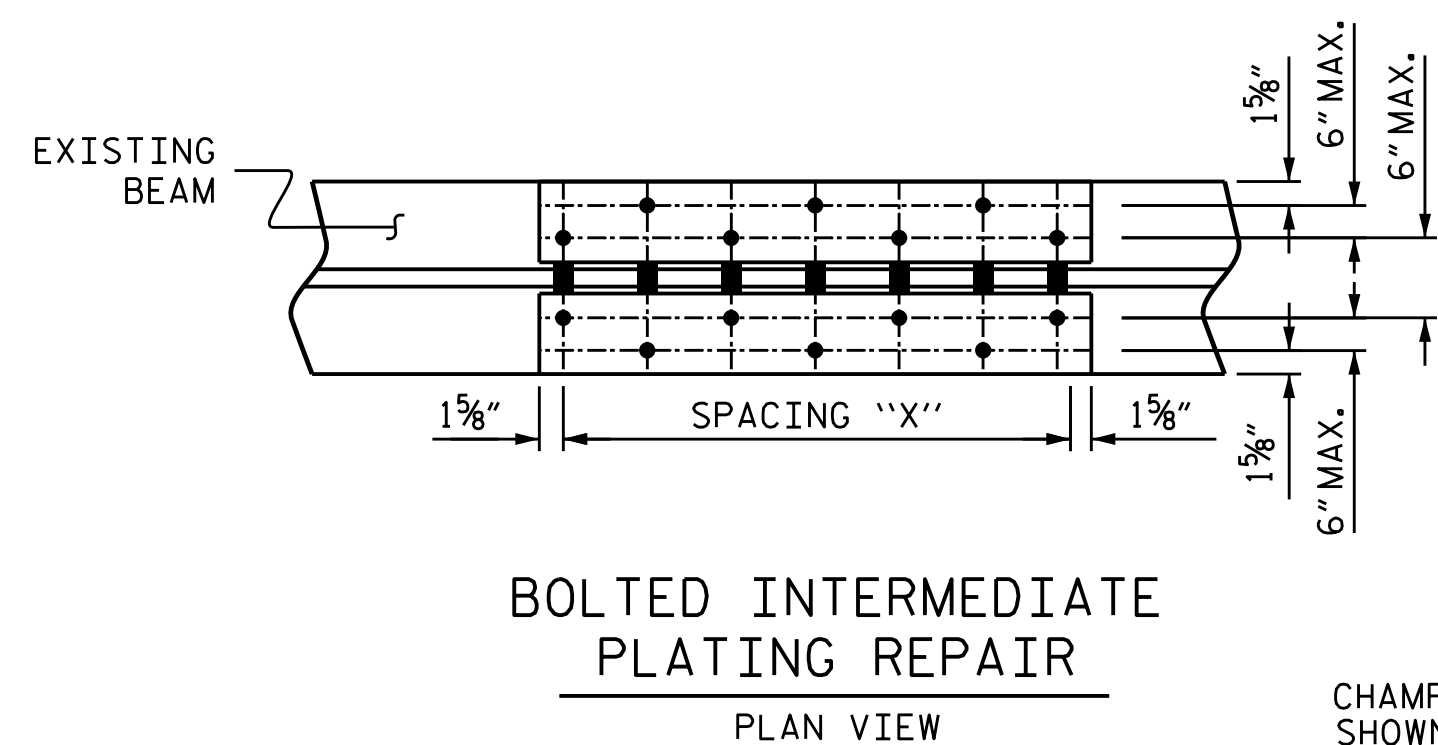
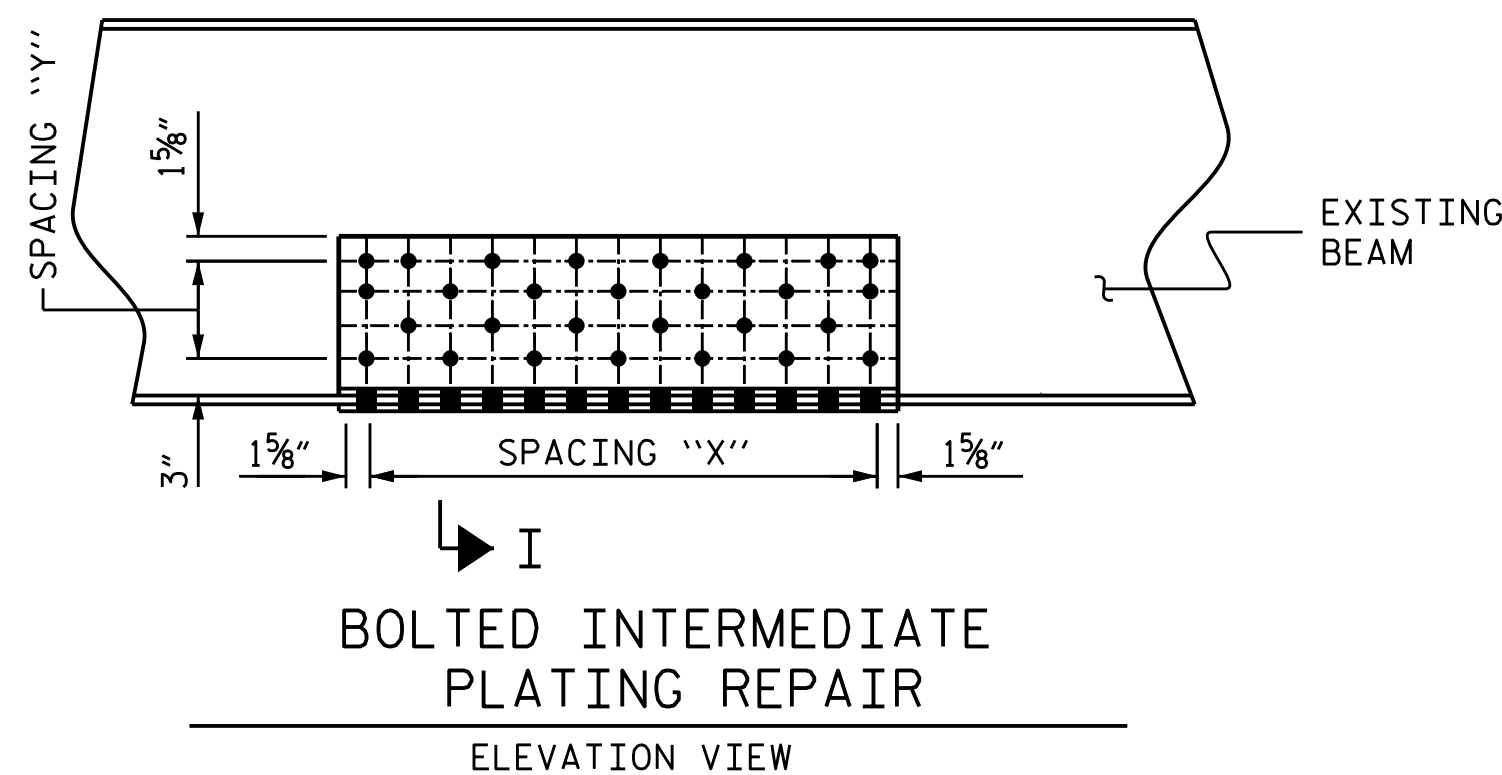
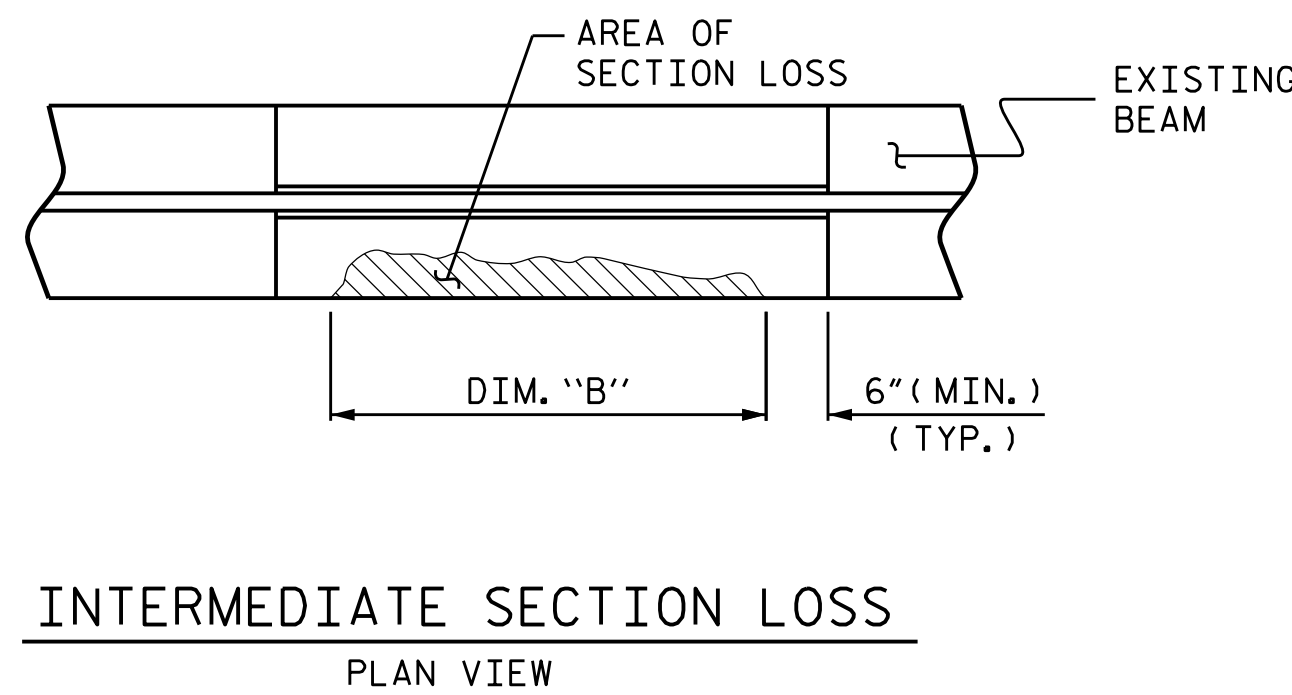
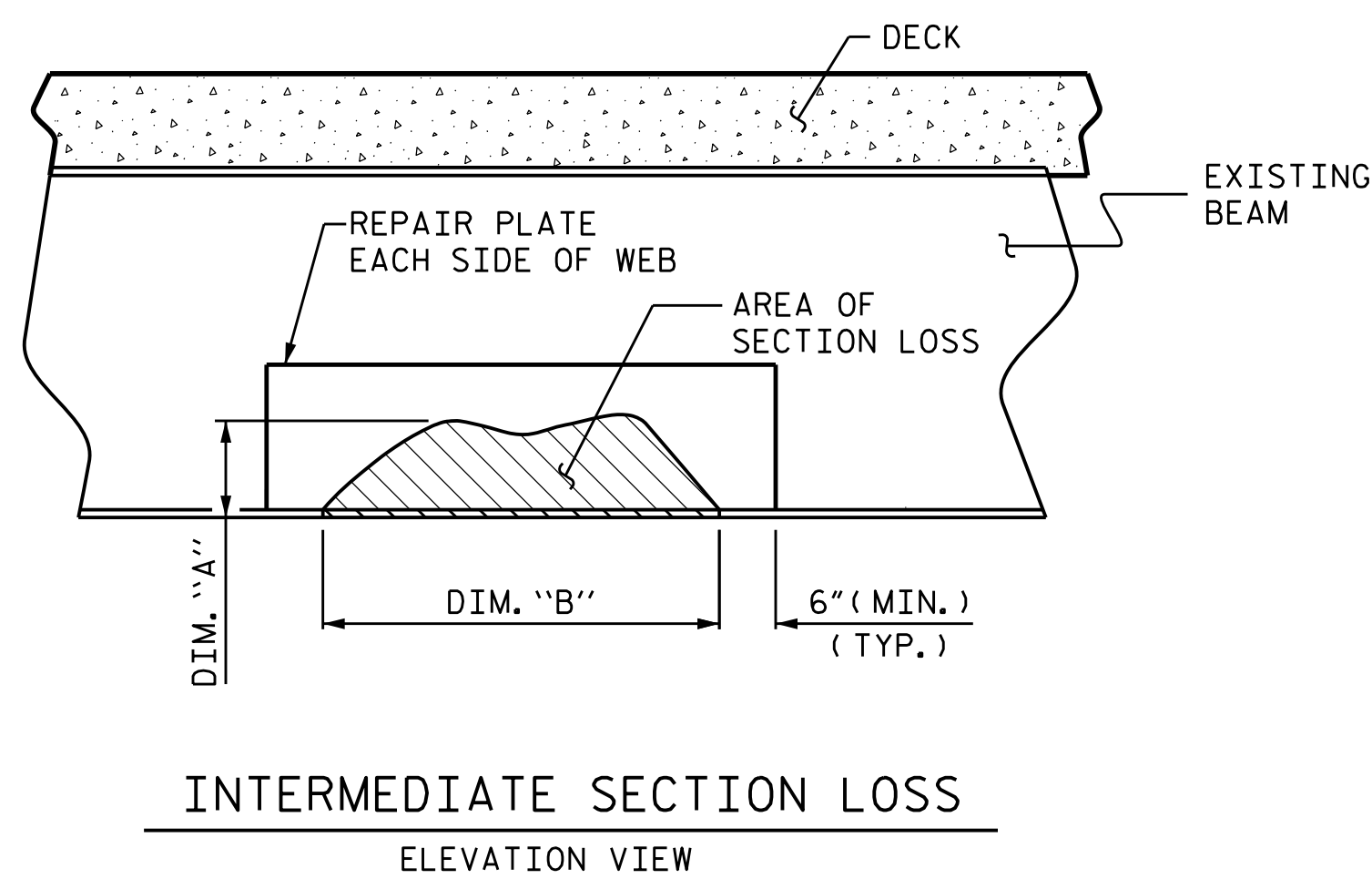


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BEAM END AND INTERMEDIATE BEAM CUT-OUT REPAIR DETAILS					
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DocuSigned by:
 William C. Smith
 10/24/2023



BEAM END PLATING REPAIR



INTERMEDIATE BEAM PLATING REPAIR

BOLTED BEAM PLATING REPAIR NOTES

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

THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO FABRICATING STRUCTURAL STEEL ITEMS. FOR WORKING DRAWING SUBMITTALS, SEE SPECIAL PROVISIONS.

REPAIR PLATES SHALL BE MINIMUM 36 KSI STEEL AND MATCH THE EXISTING STEEL TYPE.

FOR BEAMS WITH AN EXISTING WEB THICKNESS OF 1/2" OR LESS, THE MINIMUM REPAIR PLATE THICKNESS SHALL BE 1/2". FOR BEAMS WITH AN EXISTING WEB THICKNESS GREATER THAN 1/2", THE MINIMUM REPAIR PLATE THICKNESS SHALL BE 3/4".

ALL BOLTS SHALL BE GALVANIZED ASTM A325 3/4" DIAMETER BOLTS. ALL BOLT HOLES SHALL BE 13/16" IN DIAMETER.

ALL NUTS SHALL BE GALVANIZED AND MEET ASTM A194.

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 MEET ASTM F959.

MINIMUM BOLT SPACING IS 2.5". MAXIMUM BOLT SPACING IS 6" FOR "X" SPACING, 12" FOR "Y" SPACING. MINIMUM EDGE DISTANCE IS 1 1/8", UNLESS NOTED OTHERWISE.

THE EPOXY MASTIC USED FOR THIS WORK SHALL BE COMPATIBLE WITH THE PAINT SYSTEM USED 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 MEETS THEIR PRODUCT SPECIFICATION.

ONE FABRICATED SECTION SHALL BE PLACED, AS SHOWN, ON EACH SIDE OF THE BEAM WEB.

BOLT HEADS SHALL BE ON EXTERIOR FACE OF FASCIA BEAMS AND THE BOTTOM OF THE BOTTOM FLANGE.

ADDITIONAL BOLTS MAY BE REQUIRED AT PLATE CORNERS TO MAINTAIN EDGE DISTANCES.

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.

FOR CLEANING AND PAINTING STEEL, SEE "ZONE PAINTING OF EXISTING STRUCTURE" SPECIAL PROVISION.

REPAIR SEQUENCE:

COORDINATE WITH MATERIALS AND TEST UNIT AT LEAST FOUR (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 BOLTED PLATE REPAIR, FOLLOWING SECTION 1072 OF THE STANDARD SPECIFICATIONS. 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.

MECHANICALLY CLEAN RUST, SCALE, AND EXISTING PAINT TO AT LEAST 3" BEYOND REPAIR AREA.

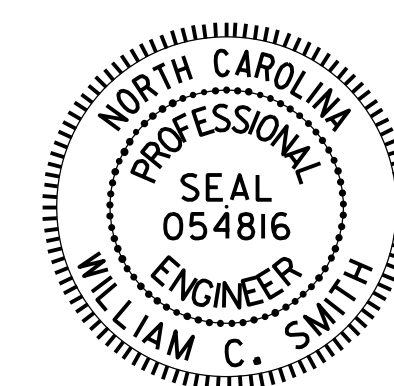
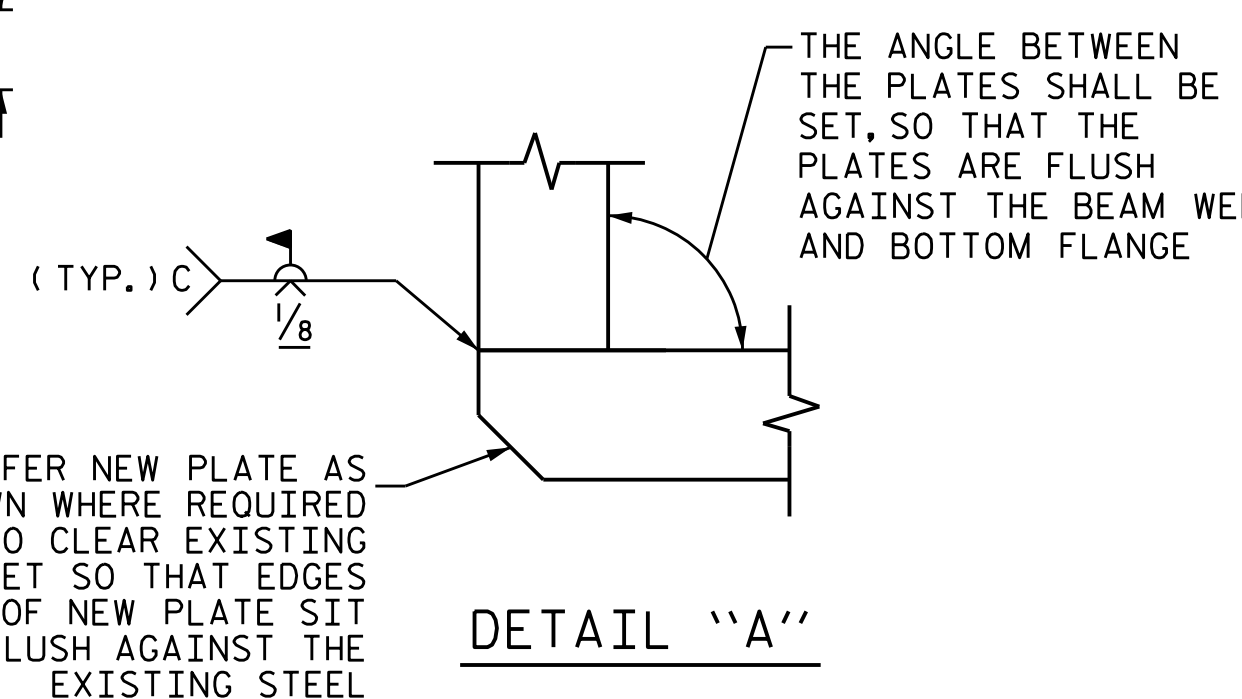
PRIME ENTIRE REPAIR AREA AND REPAIR PLATES WITH AN ORGANIC ZINC PRIMER PRIOR TO BOLTING NEW PLATES.

ALL AREAS OF SECTION LOSS AND PITTING SHALL BE FILLED WITH METAL EPOXY FILLER JUST PRIOR TO INSTALLING NEW REPAIR PLATES.

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

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 TO DEVELOP A SPLICE LENGTH SPECIFIED IN THE TABLE ON THE "DECK REPAIR DETAILS" SHEET. 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.



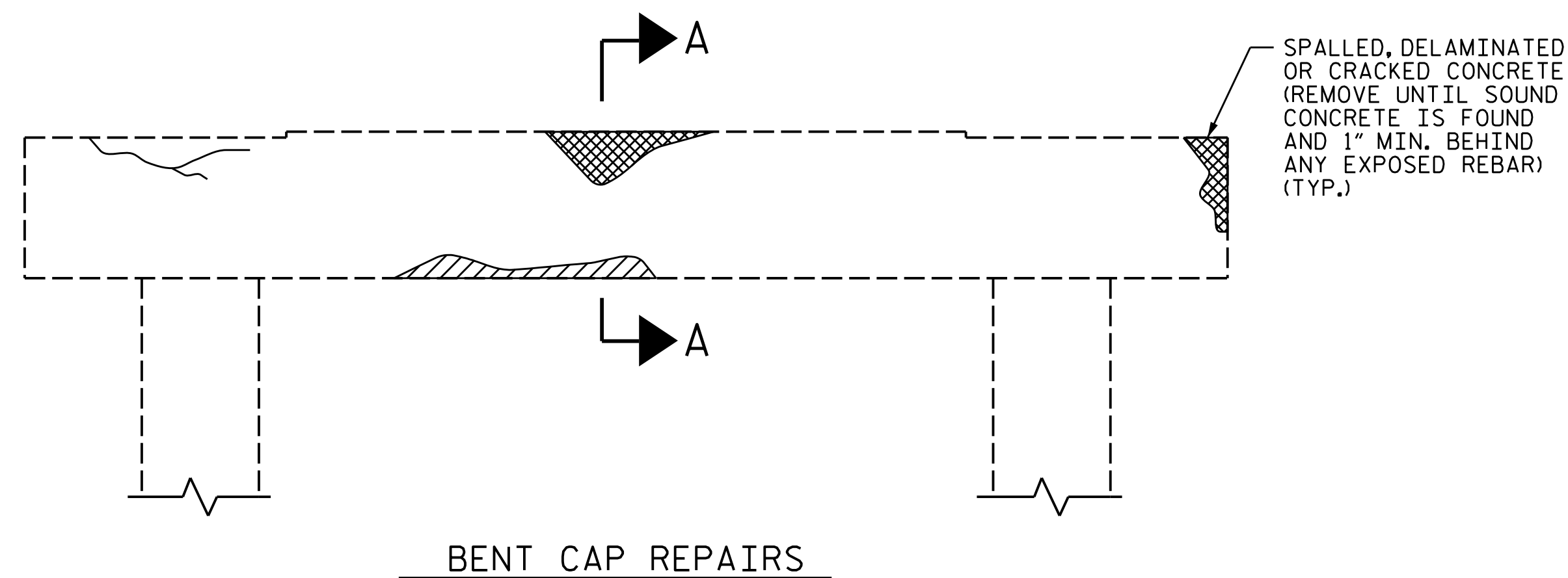
DocuSigned by:
William C. Smith
10/24/2023

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DUPLIN COUNTY
BRIDGE NO. **300017**

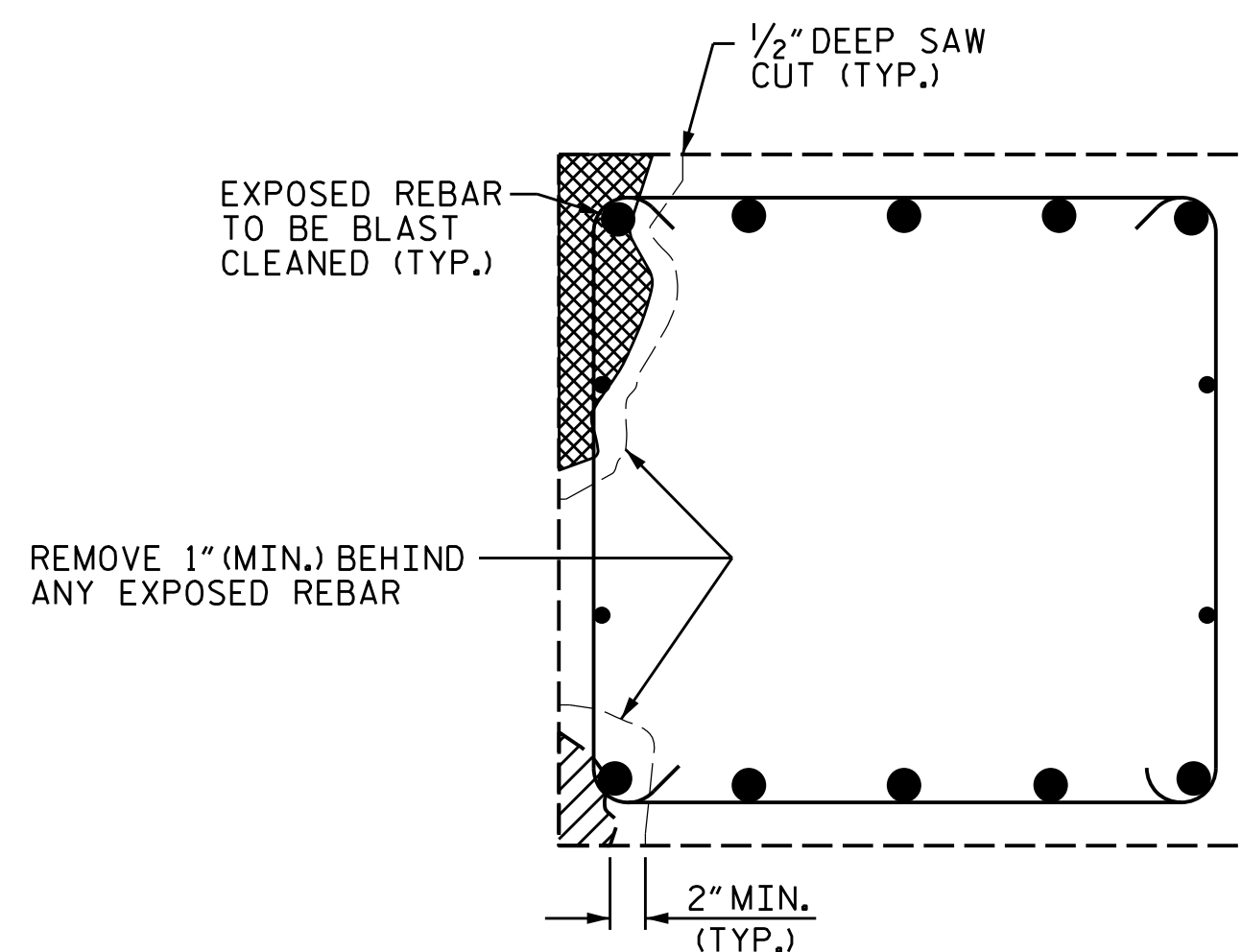
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BOLTED BEAM PLATING REPAIR DETAILS						
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DRAWN BY : S. T. SANDOR DATE : 07/2022
CHECKED BY : W. C. SMITH DATE : 5/31/23

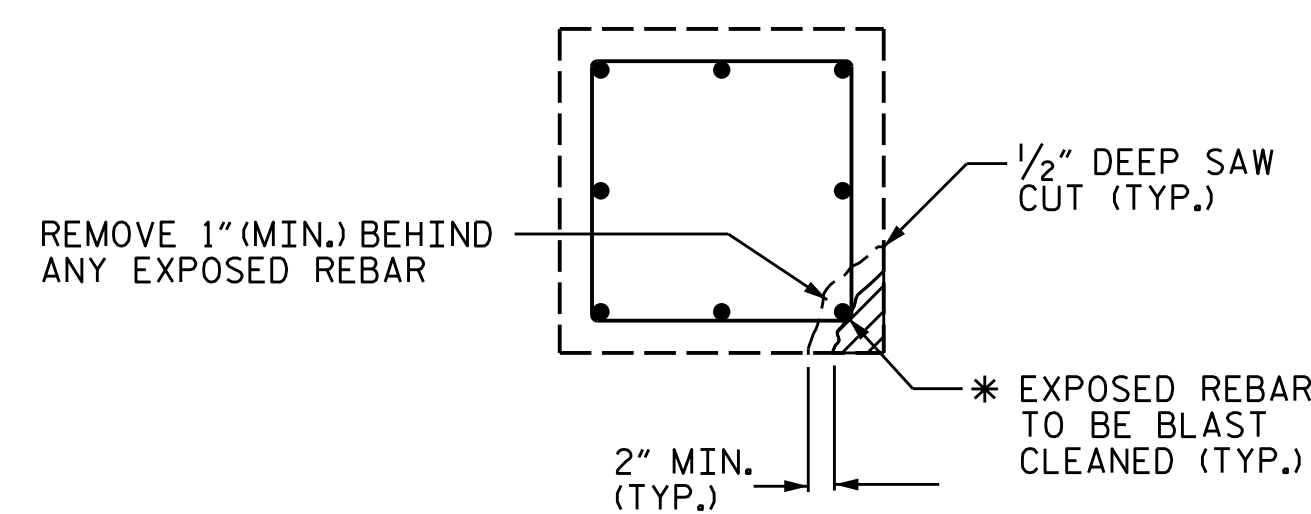
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BENT CAP REPAIRS



SECTION A-A

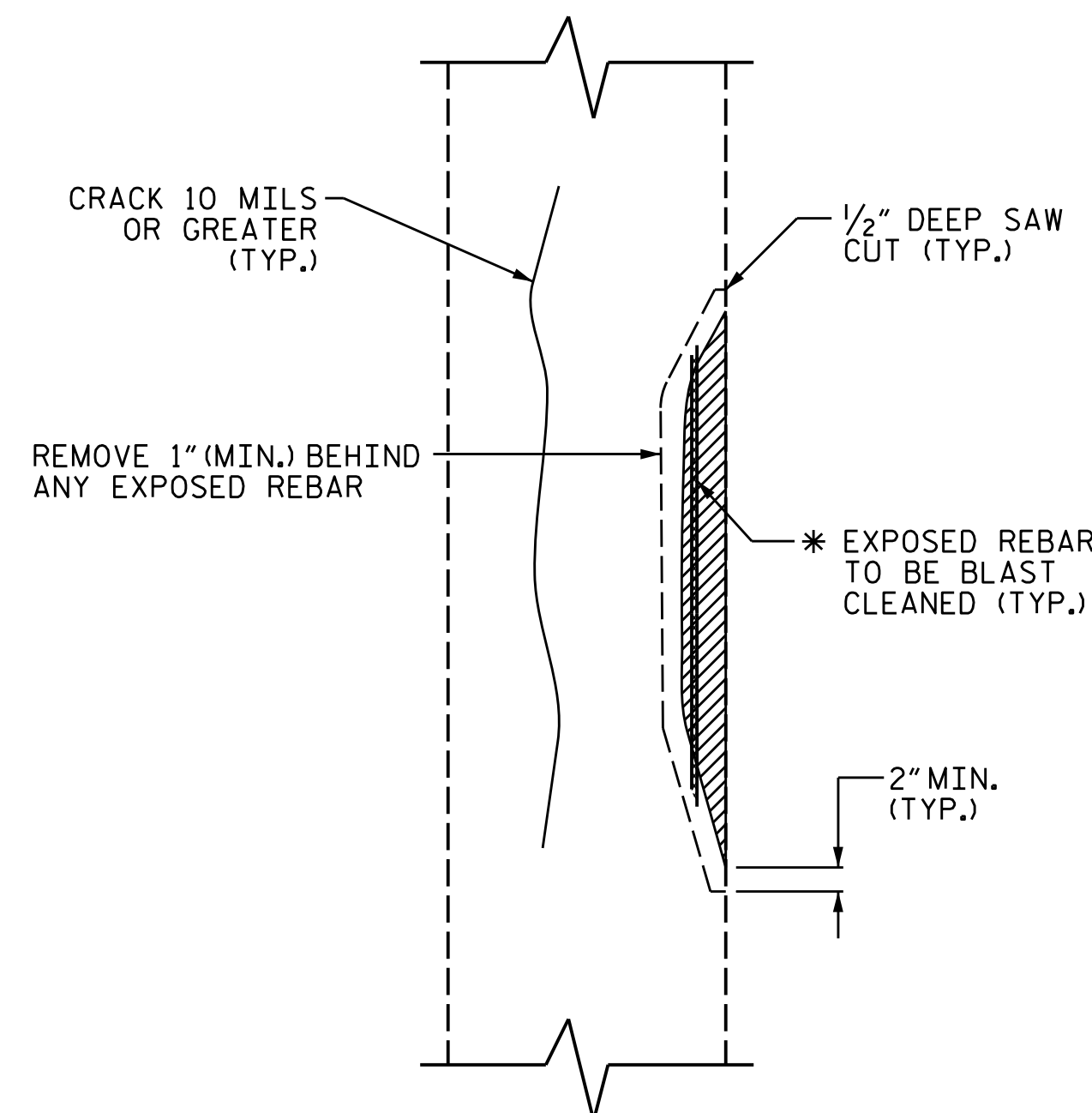


PLAN OF COLUMN

REPAIR KEY

- SHOTCRETE REPAIR AREA
- CONCRETE REPAIR AREA (FORM AND POUR)
- EPOXY RESIN INJECTION (ERI)

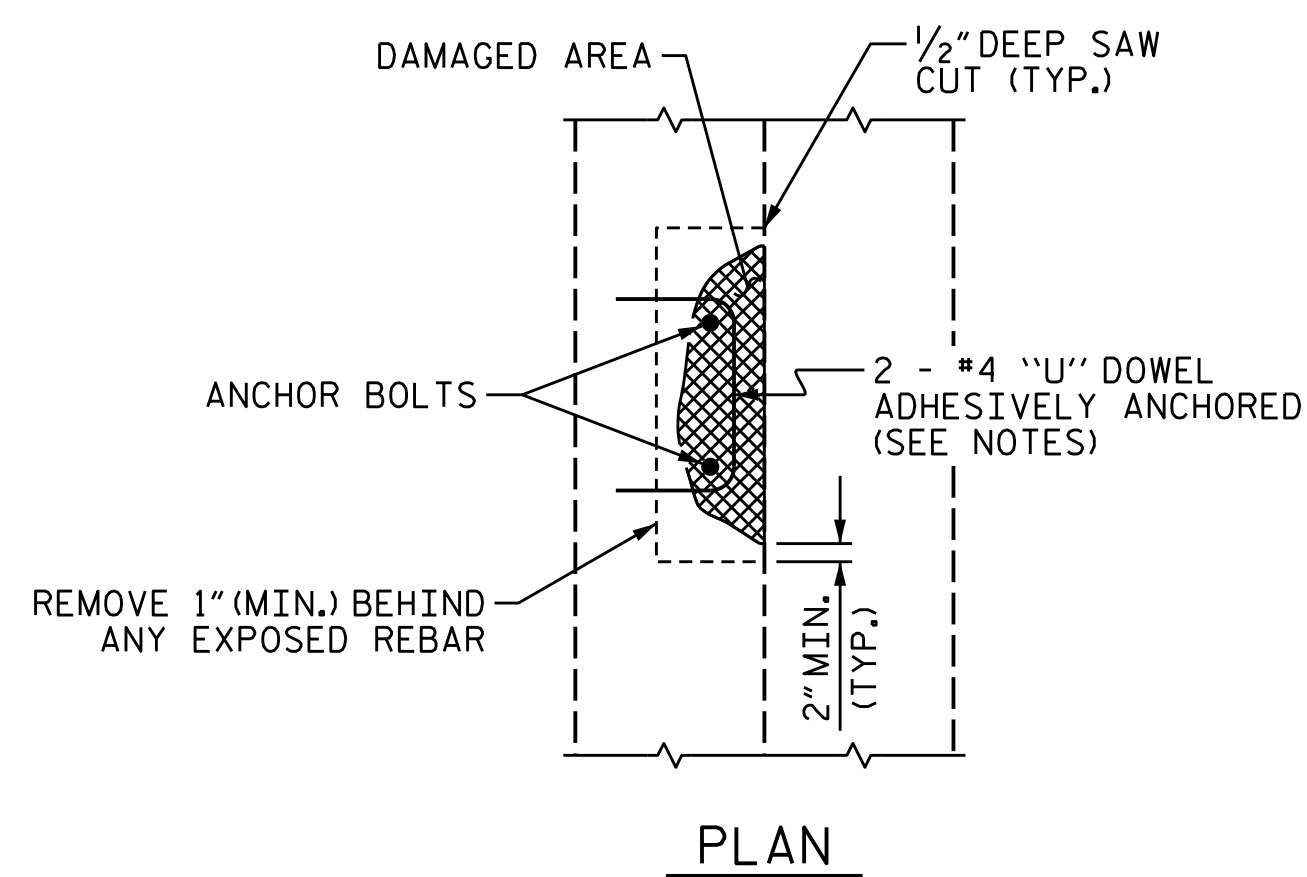
CAP REPAIR



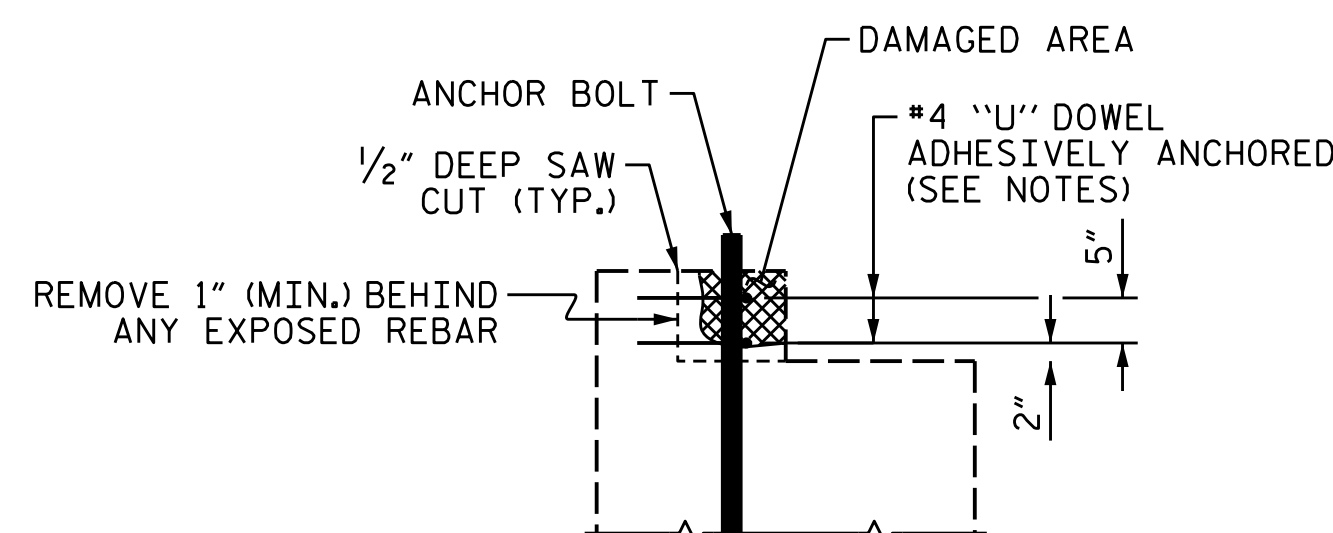
ELEVATION OF COLUMN

COLUMN REPAIR

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



PLAN



ELEVATION

PEDESTAL WALL REPAIR

NOTES

TYPICAL BENT CAP REPAIRS ARE SHOWN. REPAIR DETAILS SIMILAR FOR END BENT CAPS AND STRUTS.
 THE METHOD USED TO DELINEATE THE AREAS OF UNSOUND CONCRETE TO BE REPAIRED SHALL NOT PERMANENTLY MARK THE CONCRETE, LEAVE ANY RESIDUE AFTER REMOVAL OR REQUIRE HARSH CHEMICALS TO REMOVE.

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

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

NO MORE THAN ONE-THIRD OF THE CAP OR COLUMN 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 1 1/2" 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.

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

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

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

CLEAN ALL EXPOSED REINFORCING BARS AND PRESTRESSED STRANDS IN ACCORDANCE WITH APPROPRIATE SPECIAL PROVISIONS. FOR BARS WITH MORE THAN 10% SECTION LOSS, SPLICE AND SECURELY TIE SUPPLEMENTAL REINFORCING BARS AS NEEDED. NOTE AND PROVIDE DETAILED DOCUMENTATION, INCLUDING LOCATION AND SEVERITY, OF ALL DAMAGE TO PRESTRESSED STRANDS THAT EXCEEDS 10% SECTION LOSS. IF FIVE OR MORE STRANDS ARE DAMAGED, NOTIFY THE ENGINEER PRIOR TO PLACEMENT OF REPAIR MATERIAL.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

PROJECT NO. **B-5981**
DUPLIN COUNTY
 BRIDGE NO. **300017**



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD

TYPICAL CAP AND COLUMN REPAIR DETAILS

DocuSigned by:
 William C. Smith
 0A2A6293F0241D
 10/24/2023

ASSEMBLED BY : S. T. SANDOR DATE : 05/2022
 CHECKED BY : W. C. SMITH DATE : 5/31/23
 DRAWN BY : NAP 8/18
 CHECKED BY :

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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S2-29
2			4			TOTAL SHEETS 31

NOTES

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

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

REMOVE UNSOUND CONCRETE TO THE EXTENT NECESSARY, MINIMUM OF 2" CLEARANCE TO SAWCUT.

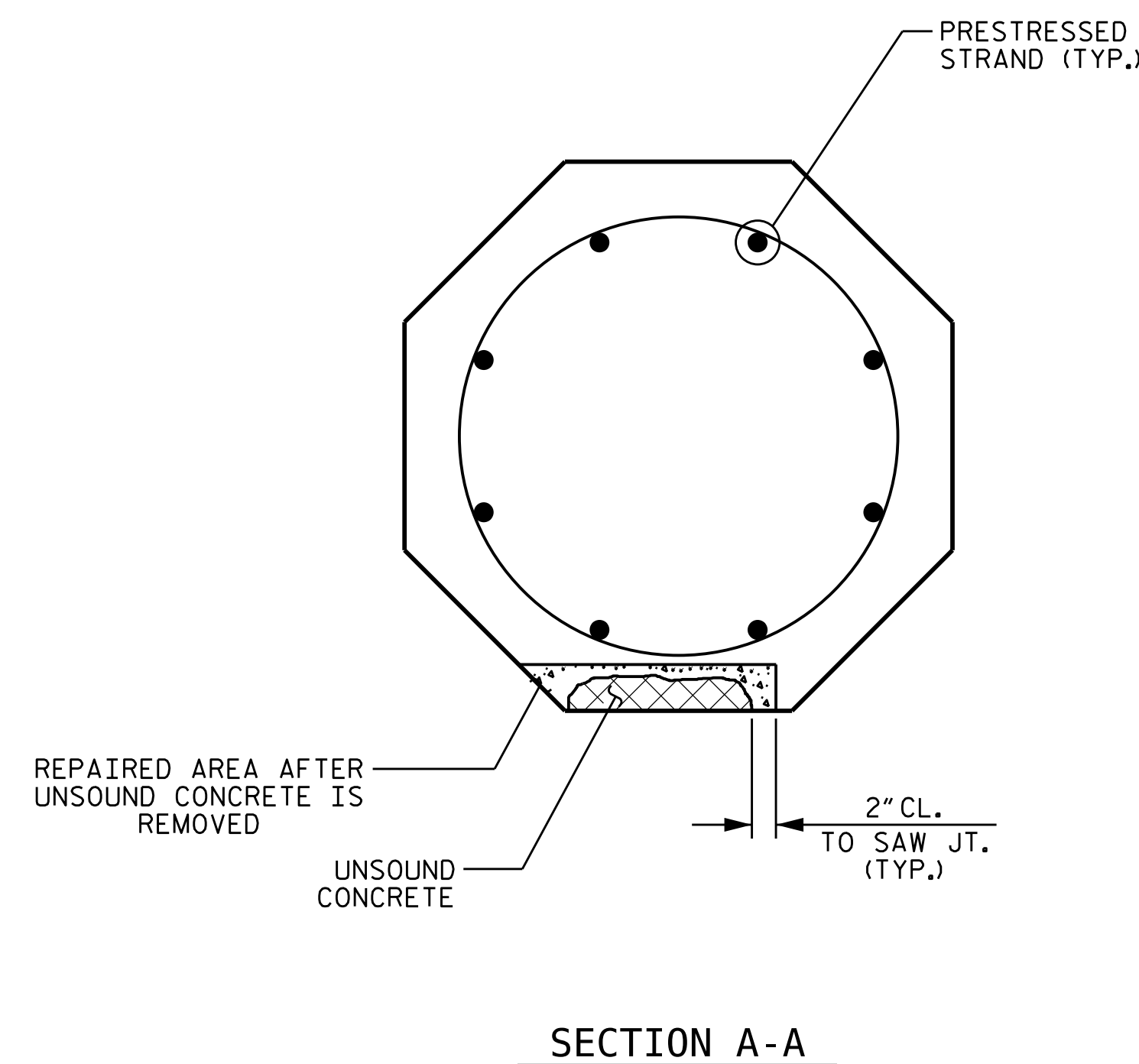
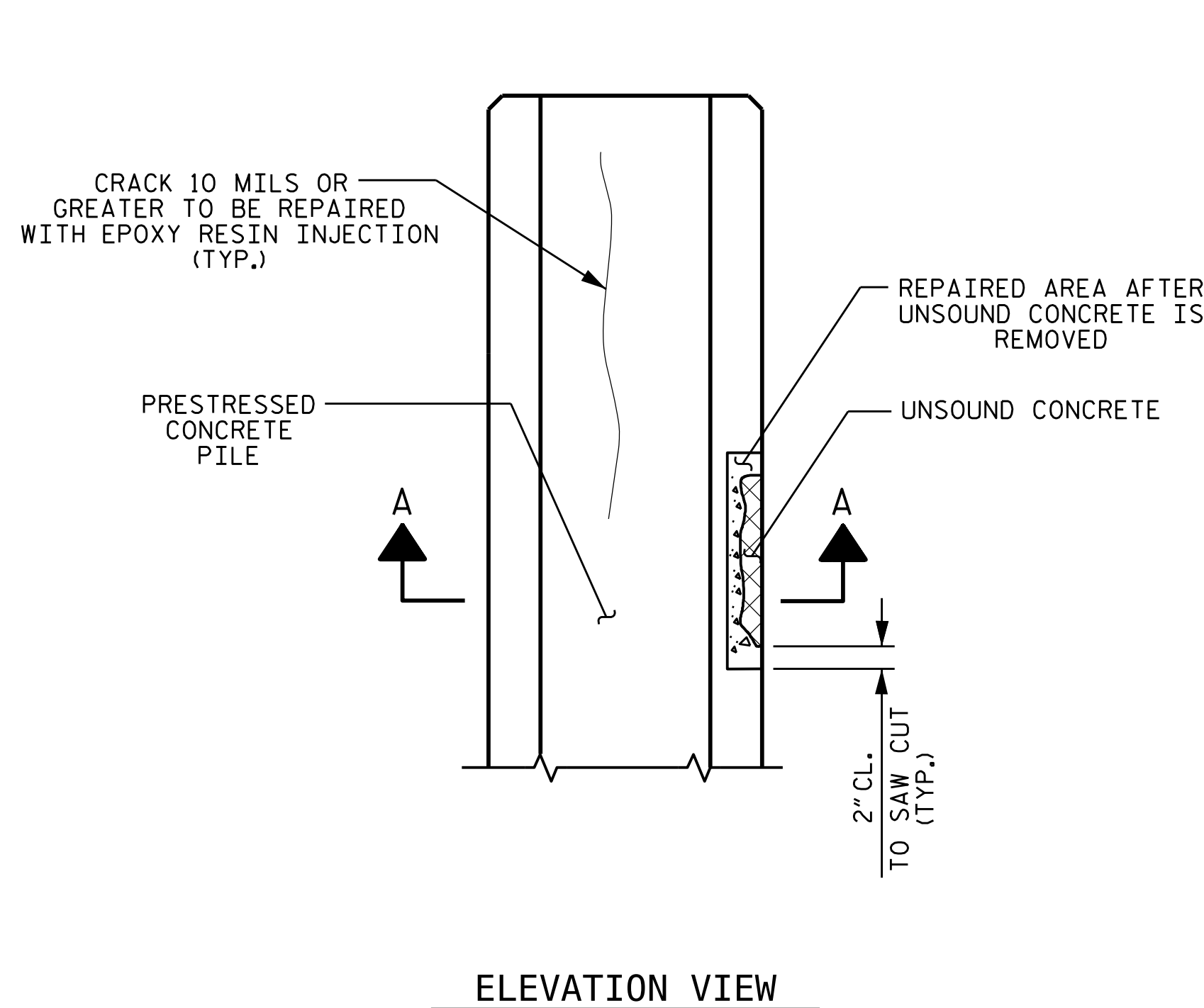
NO MORE THAN ONE-THIRD OF THE CAP OR COLUMN CROSS SECTIONAL AREA SHALL BE REMOVED AT ONE TIME. SHOULD IT BECOME NECESSARY TO REMOVE MORE THAN 30% OF A CAP OR COLUMN CROSS SECTIONAL AREA, NOTIFY THE ENGINEER PRIOR TO PROCEEDING.

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 1 1/2" 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 "TYPICAL CAP AND COLUMN REPAIR DETAILS" SHEET.

PRESTRESSED CONCRETE PILE 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 SHOTCRETE REPAIRS 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 OR MORE STRANDS ARE DAMAGED, NOTIFY THE ENGINEER PRIOR TO PLACEMENT OF REPAIR MATERIAL.
7. REMOVE ALL LOOSE OR WEAKENED MATERIAL THEN CLEAN THE REPAIR AREA OF DIRT, GREASE, OIL, AND FOREIGN MATTER.
8. PREPARE SURFACE AND PLACE SHOTCRETE REPAIRS IN ACCORDANCE WITH SHOTCRETE REPAIRS SPECIAL PROVISION.



PRESTRESSED CONCRETE PILE REPAIR

PROJECT NO. **B5981**
DUPLIN COUNTY
 BRIDGE NO. **300017**



DocuSigned by:
 William C. Smith
 8A2A8283F8241D
 10/24/2023

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**PRESTRESSED
 CONCRETE PILE
 REPAIR DETAILS**

DRAWN BY : S. T. SANDOR DATE : 06/2022
 CHECKED BY : W. C. SMITH DATE : 5/31/23

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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

TOTAL SHEETS: 31

BRIDGE JACKING NOTES:

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.

PRIOR TO BRIDGE JACKING OPERATIONS, THE ENGINEER AND CONTRACTOR SHALL INSPECT THE STRUCTURE FOR ANY NOTABLE DEFECTS TO THE PRIMARY AND SECONDARY STRUCTURAL MEMBERS. ALL NOTABLE DEFECTS SHALL BE DOCUMENTED AND REPORTED TO THE AREA BRIDGE MAINTENANCE ENGINEER PRIOR TO COMMENCEMENT OF ANY BRIDGE JACKING. THE CONTRACTOR SHALL PROVIDE SAFE AND SUFFICIENT ACCESS TO ALL STRUCTURAL MEMBERS FOR THE ENGINEER TO ESTABLISH PROPER DOCUMENTATION.

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

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.

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 1/8".

LOADS PROVIDED IN THE "BRIDGE JACKING TABLE" ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR'S ENGINEER SHALL DETERMINE THE EXPECTED LOADS TO BE LIFTED DURING THE BRIDGE JACKING OPERATIONS.

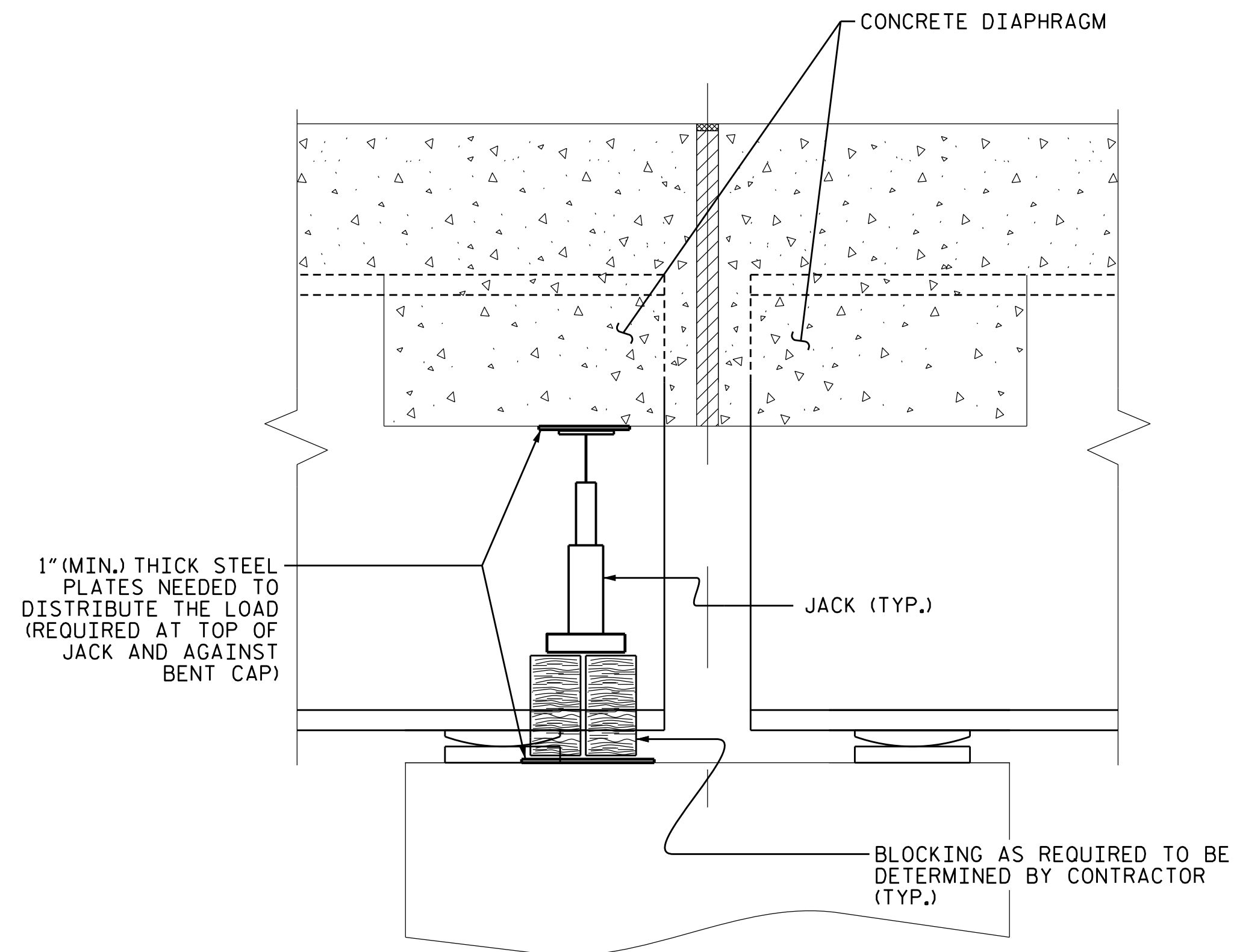
THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS AND CALCULATIONS OF THE JACKING PROCEDURE(S) SEALED BY A PROFESSIONAL ENGINEER IN THE STATE OF NORTH CAROLINA TO THE ENGINEER FOR APPROVAL PRIOR TO BRIDGE JACKING OPERATIONS.

FOR TYPE I OR TYPE II BRIDGE JACKING, SEE "BRIDGE JACKING" SPECIAL PROVISIONS.

ANY STEEL THAT HAS BEEN WELDED TO THE EXISTING STRUCTURE SHALL REMAIN IN PLACE.

TYPE II BRIDGE JACKING SHALL BE DONE WITH A HYDRULIC JACKING SYSTEM THAT LIFTS EACH BEAM ALONG ENTIRE SPAN END WITH EQUAL FORCE AND AT AN EQUAL RATE.

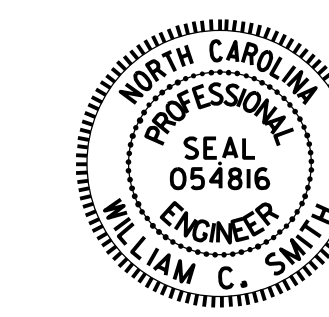
THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE CAUSED TO THE EXISTING STRUCTURE BY BRIDGE JACKING OPERATIONS AT NO ADDITIONAL COST TO THE DEPARTMENT.



SECTION THRU DIAPHRAGM

BRIDGE JACKING TABLE				
LOCATION	SPAN	BEAM(S)	BRIDGE JACKING TYPE	DEAD LOAD (DC + DW) (KIPS)
BENT 1	A-B	1, 2, 3, 4	TYPE I	27.0
BENT 2	B-C	1, 2, 3, 4	TYPE I	27.0
BENT 3	C-D	1, 2, 3, 4	TYPE I	27.0
BENT 4	D-E	1, 2, 3, 4	TYPE I	27.0

PROJ. NO. **B-5981**
DUPLIN COUNTY
 BRIDGE NO. **300017**



DocuSigned by:
 William C. Smith
 8A2A2023F0241D

10/24/2023

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD

**BRIDGE JACKING
 DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-31
1			3			TOTAL SHEETS
2			4			31

ASSEMBLED BY : S. T. SANDOR DATE : 7/14/22
 CHECKED BY : W. C. SMITH DATE : 5/31/23
 DRAWN BY : NAP 08/18
 CHECKED BY :

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST $\frac{3}{16}$ " IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY $\frac{1}{16}$ " 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

STD. NO. SN