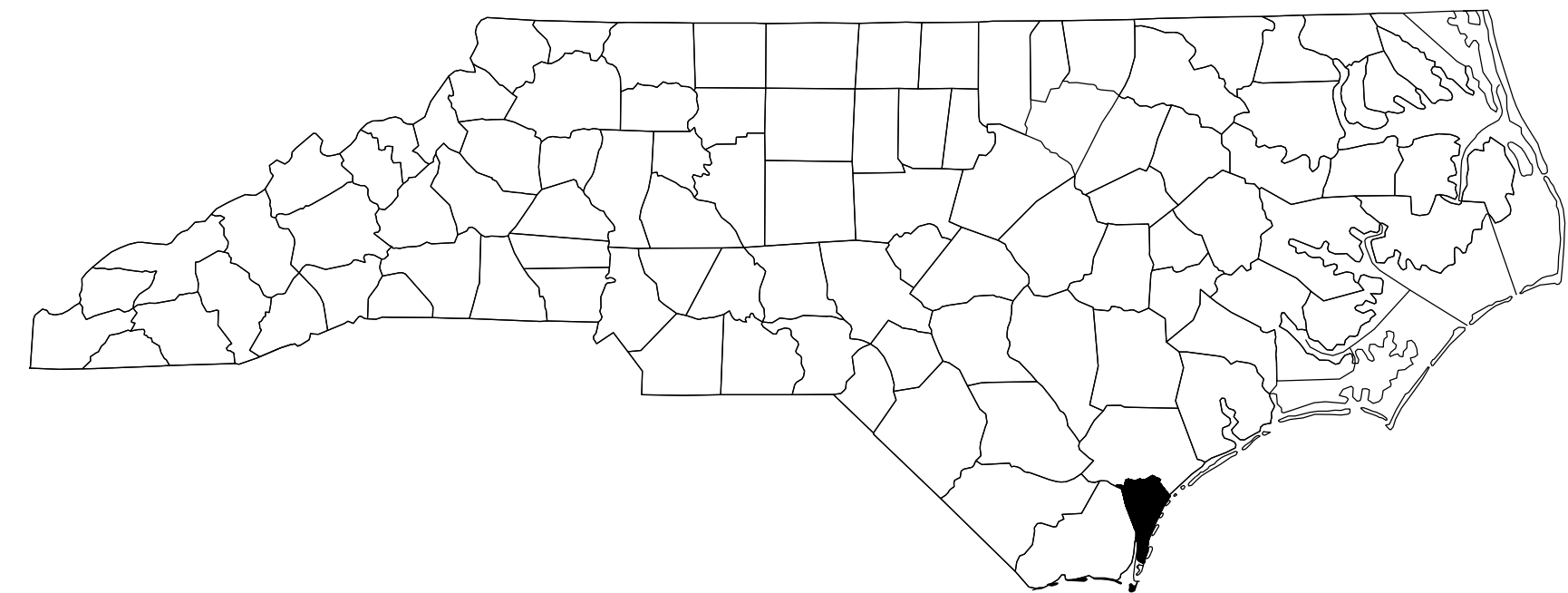


**PROJECT: 15BPR.19**

**CONTRACT: C204331**

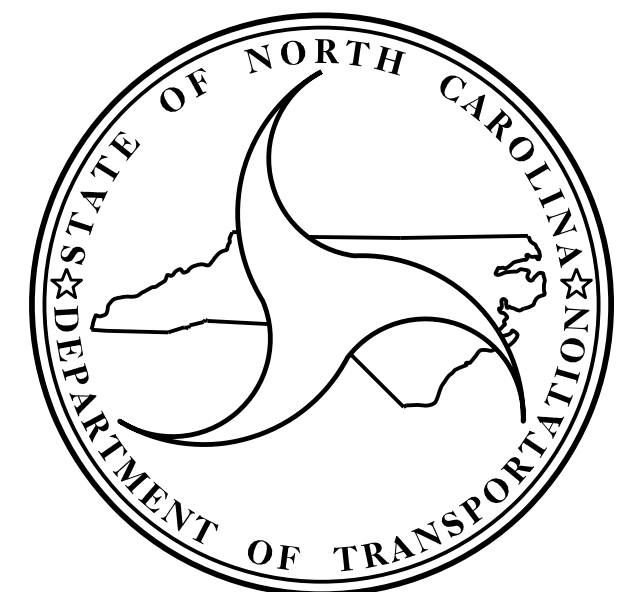
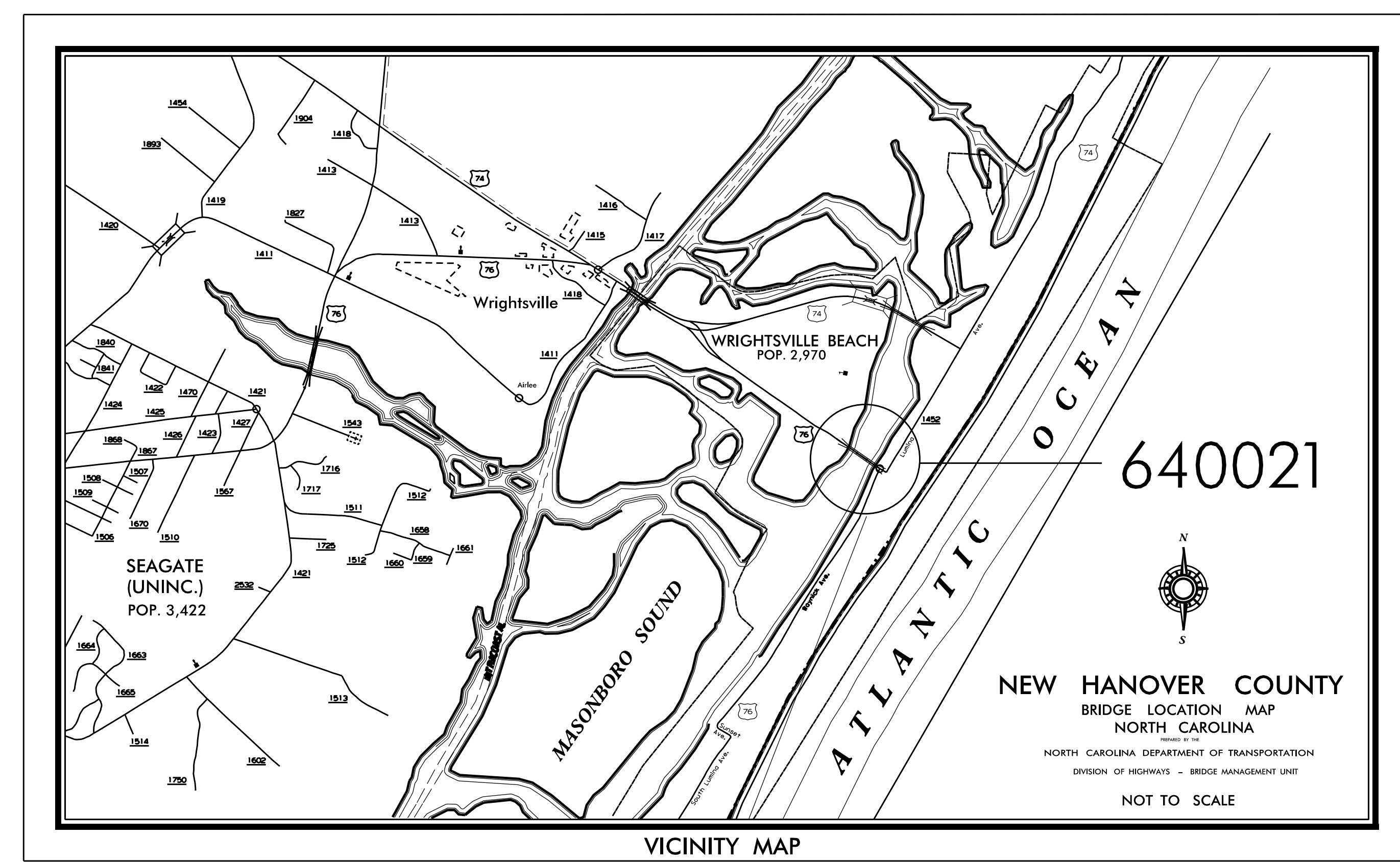


STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**NEW HANOVER COUNTY**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15BPR.19	1	58
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
15BPR.19	-	P.E.	
15BPR.19	-	CONST.	

**LOCATION: BRIDGE #640021 ON US 76 OVER BANKS CHANNEL**  
**TYPE OF WORK: BRIDGE PRESEVATION - EPOXY OVERLAY REPAIR, JOINT REPLACEMENT, AND PEDESTRIAN SAFETY RAIL REPLACEMENT. REPAIR OF EXISTING GIRDERS AND DIAPHRAGMS. EPOXY COAT GIRDER ENDS AND PAINT BEARINGS. REPAIR CAP AND PILES, EPOXY COAT CAP. CATHODIC PROTECTION OF GIRDERS, CAPS AND PILES.**



**DESIGN DATA**  
BRUNSWICK COUNTY  
#21 ADT 2017 = 18000

**PROJECT LENGTH**  
BRUNSWICK COUNTY  
#21 = 0.16 MILES

2018 STANDARD SPECIFICATIONS  
  
LETTING DATE:  
07/20/2021

Prepared for the Office of:  
**DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
STRUCTURES MANAGEMENT UNIT - PRESERVATION & REPAIR GROUP  
1000 Birch Ridge Dr., Raleigh NC, 27610

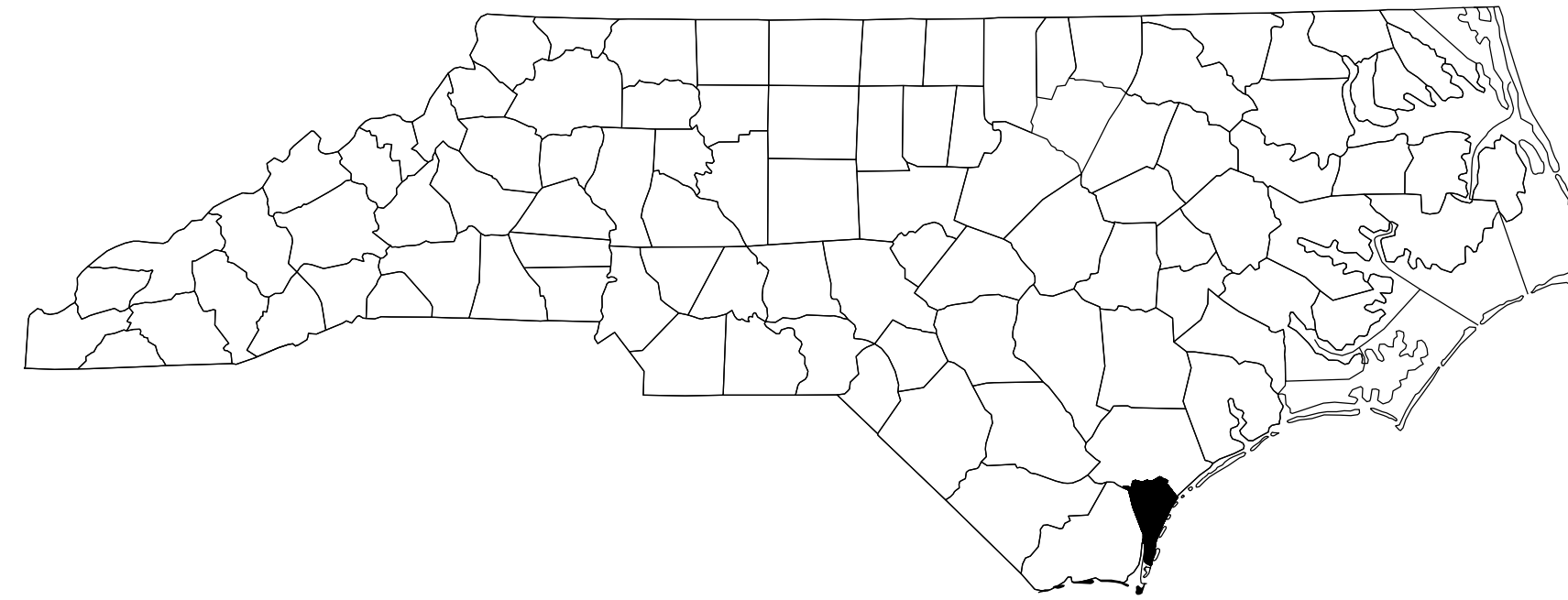
**wsp**  
WSP USA Inc.  
434 PAYETTEVILLE STREET  
SUITE 1500  
RALEIGH, NC 27601  
TEL: 1.919.836.4040  
LICENSE NO. F-0165

Seal of Casey J. Howard, Project Engineer, dated 4/9/2021.  
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

**MICHAEL W. CRAIG, PE**  
PROJECT ENGINEER  
  
**CASEY J. HOWARD, PE**  
PROJECT DESIGN ENGINEER

**PROJECT: 15BPR.19**

**CONTRACT: C204331**



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**NEW HANOVER COUNTY**

**LOCATION:** BRIDGE #640021 ON US 76 OVER BANKS CHANNEL  
**TYPE OF WORK:** BRIDGE PRESEVATION - EPOXY OVERLAY REPAIR, JOINT REPLACEMENT, AND PEDESTRIAN SAFETY RAIL REPLACEMENT. REPAIR OF EXISTING GIRDERS AND DIAPHRAGMS. EPOXY COAT GIRDER ENDS AND PAINT BEARINGS. REPAIR CAP AND PILES, EPOXY COAT CAP. CATHODIC PROTECTION OF GIRDERS, CAPS AND PILES.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15BPR.19	1A	58
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
15BPR.19	-	P.E.	
15BPR.19	-	CONST.	

**INDEX OF SHEETS**

1	TITLE SHEET	S-30	STANDARD PRESTRESSED GIRDER REPAIR DETAILS
1A	INDEX OF SHEETS	S-31	STANDARD BRIDGE JACKING DETAILS
S-1	TOTAL BILL OF MATERIAL	S-32 THRU S-46	SUBSTRUCTURE REPAIRS
S-2	LOCATION SKETCH AND NOTES	S-47 THRU S-48	END BENTS
S-3 THRU S-4	GENERAL DRAWING BRIDGE	S-49	EXPANSION JOINT BENTS
S-5	TYPICAL SECTION	S-50	NON-EXPANSION JOINT BENTS
S-6 THRU S-8	PLAN OF SPANS	S-51	CATHODIC PROTECTION DETAILS
S-9 THRU S-22	GIRDER AND DIAPHRAGM REPAIRS	S-52	SINGLE LINE DIAGRAM
S-23	EPOXY OVERLAY DETAIL	S-53 THRU S-55	PILE JACKET DETAILS
S-24	JOINT REPAIR DETAILS	S-56	STANDARD TYPICAL CAP AND PILE REPAIR DETAILS
S-25	BEAM END EPOXY COATING	SN	STANDARD NOTES
S-26	RESET BEARING DETAILS	TMP-1 THRU TMP-7	TRAFFIC CONTROL PLANS
S-27	CLEANING AND PAINTING OF EXISTING BEARINGS		
S-28 THRU S-29	PRESTRESSED CONCRETE GIRDER WITH THERMAL SPRAY ANODE DETAILS		

<b>TOTAL BILL OF MATERIAL</b>													
	POLLUTION CONTROL	CONCRETE REPAIRS	SHOTCRETE REPAIRS	FOAM JOINT SEALS FOR PRESERVATION	POURABLE SILICONE JOINT SEALANT	GALVANIC CATHODIC PROTECTION INTEGRAL PILE JACKET (MONITORING)	GALVANIC CATHODIC PROTECTION INTEGRAL PILE JACKET (NON-MONITORING)	BULK ANODE	GALVANIZED PEDESTRIAN SAFETY RAIL	PRESTRESSED CONCRETE GIRDER REPAIR	BEAM END EPOXY COATINGS	CATHODIC PROTECTION OF PILE CAP (MONITORING)	CATHODIC PROTECTION OF PILE CAP (NON-MONITORING)
	LS	CF	CF	LF	LF	LF	LF	EA	LF	CF	SF	SF	SF
SUPERSTRUCTURE			27.5	116.0	58.0				869.25	136.5	272.5		
SUBSTRUCTURE		15.0	30.0			40.50	67.25	8				888.0	4,179.0
TOTAL	LS	15.0	57.5	116.0	58.0	40.50	67.25	8	869.25	136.5	272.5	888.0	4,179.0

<b>TOTAL BILL OF MATERIAL - CONT.</b>							
	PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE (NON-MONITORING)	EPOXY OVERLAY SYSTEM I	EPOXY COATING	CLEANING AND PAINTING EXISTING BEARINGS WITH HIGH RATIO CALCIUM SULFONATE	PAINTING CONTAINMENT FOR BRIDGE NO. 640021	BRIDGE JACKING TYPE I FOR BRIDGE No. 640021	REMOVE AND RESET BEARINGS
	SF	SF	SF	EA	LS	EA	EA
SUPERSTRUCTURE	35,966.0	45.0		196		1	1
SUBSTRUCTURE			2,791.0				
TOTAL	35,966.0	45.0	2,791.0	196	LS	1	1

AT THE TIME OF PREPARATION OF THESE PLANS, IT WAS NOT ANTICIPATED THE FOLLOWING LISTED ITEMS THAT WOULD BE REQUIRED. HOWEVER, IT MAY BE DETERMINED IN THE FIELD THAT (SEE CHART BELOW), OR OTHER WORK WILL BE NECESSARY TO PROPERLY COMPLETE THE INTENDED BRIDGE PRESERVATION/ REHABILITATION WORK. THE CONTRACTOR SHALL BE PREPARED TO PERFORM SUCH WORK IN A TIMELY MANNER, AS DETERMINED IN THE FIELD. SUCH WORK SHALL BE CONSIDERED EXTRA WORK AND SHALL BE ADDRESSED AS PER ARTICLE 104-7 OF THE STANDARD SPECIFICATIONS. PROJECT SPECIAL PROVISIONS THAT OUTLINE REQUIREMENTS FOR THESE POTENTIAL ADDITIONAL WORK ITEMS HAVE BEEN PROVIDED IN PROJECT DOCUMENTS, BUT NO QUANTITIES HAVE BEEN LISTED. ACTUAL PAY ITEMS, QUANTITIES, AND COSTS WILL BE ESTABLISHED, AS REQUIRED, IF EXTRA WORK IS ENCOUNTERED.

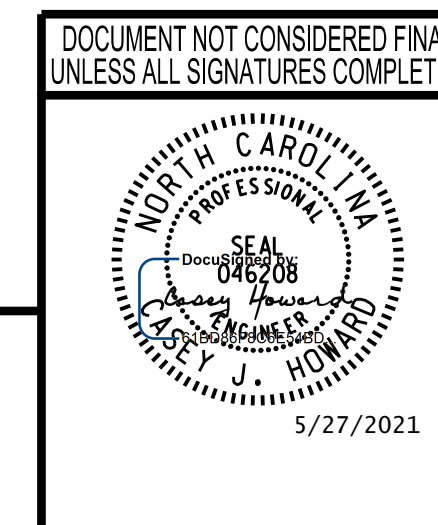
PAY ITEM	
SPLICING OF PRESTRESSING STRANDS	EACH
EPOXY RESIN INJECTION	LINEAR FEET
CONCRETE DECK REPAIR FOR EPOXY OVERLAY	SQUARE FEET
TURBIDITY CURTAIN	SQUARE YARD

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**BILL OF MATERIAL**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			58



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DRAWN BY: M.J. OSTRISHKO DATE: JULY 2018  
 CHECKED BY: C.J. HOWARD DATE: JUL 2018

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### LOCATION SKETCH

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

### BRIDGE COORDINATES

LAT: 34.209153  
LONG: 77.797456

### NOTES

- MARINE TRAFFIC CONSTRUCTION SIGNS SHALL BE PLACED ON BOTH FACES OF EACH BRIDGE AT THE LOCATIONS WHERE WORK IS BEING PERFORMED. PLACEMENT OF THE SIGNS SHALL BE SUCH THAT THEY ARE CLEARLY VISIBLE TO THE APPROACHING MARINE TRAFFIC. BARGES LEFT IN WATER IN LOW-LIGHT CONDITIONS SHALL BE ILLUMINATED SO AS TO BE VISIBLE TO MARINE TRAFFIC.
- THE CONTRACTOR SHALL SUBMIT A POLLUTION CONTROL PLAN TO THE ENGINEER IN ACCORDANCE WITH THE NCDOT STANDARD SPECIFICATIONS, PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITIES.
- THE CONTRACTOR SHALL NOT ALLOW, AT ANY TIME, ANY DISCHARGE OR MATERIALS TO FALL INTO THE WATERWAY.
- THE CONTRACTORS SHALL SUBMIT TO THE ENGINEER AN EROSION CONTROL PLAN AS REQUIRED BY THE NCDOT STANDARD SPECIFICATIONS AND BEST MANAGEMENT PRACTICES.
- NO OFFSITE IMPACTS SHALL BE PERMITTED.
- THE CONTRACTOR IS RESPONSIBLE TO SUBMIT A JACKING PLAN FOR EACH OPERATION TO THE ENGINEER FOR APPROVAL PRIOR TO BRIDGE JACKING.
- REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE REPAIR QUANTITY TABLE.
- EXISTING DIMENSIONS AND BRIDGE CONDITION ARE FROM BEST INFORMATION AVAILABLE. THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL STATE AND FEDERAL SAFETY REQUIREMENTS.
- WORK ON BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL BELOW. THE CONTRACTOR SHALL SUBMIT PLANS FOR CONSTRUCTION IN ACCORDANCE TO THE PROJECT SPECIAL PROVISIONS.
- CONTRACTOR SHALL DETERMINE EXTENT OF WORKING AREA, STAGING PROCESS AND INSTALL COVER PLATE ASSEMBLY AS NECESSARY TO MEET THE REQUIREMENTS OF TRAFFIC MANAGEMENT PLANS.
- ANY DAMAGE TO EXISTING REINFORCING STEEL, DURING CONTRACTOR'S OPERATIONS, SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER AND PERFORMED AT NO ADDITIONAL COST.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR MAINTENANCE OF WATER TRAFFIC, SEE SPECIAL PROVISIONS.
- FOR COORDINATION WITH THE COAST GUARD, SEE SPECIAL PROVISIONS.
- FOR WORK IN, OVER, OR ADJACENT TO NAVIGABLE WATERS, SEE SPECIAL PROVISIONS.
- FOR SECURING VESSELS, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.
- FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.
- FOR EPOXY OVERLAY SYSTEM (FOR ADT>5,000), SEE SPECIAL PROVISIONS.
- FOR CLEANING AND PAINTING EXISTING BEARINGS WITH HRCSA, SEE SPECIAL PROVISIONS.
- FOR FOAM JOINT SEALS FOR PRESERVATION, SEE SPECIAL PROVISIONS.
- FOR POURABLE SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.
- FOR EPOXY COATING AND DEBRIS REMOVAL, SEE SPECIAL PROVISIONS.
- FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.
- FOR REMOVE AND RESET BEARINGS, SEE SPECIAL PROVISIONS.
- FOR PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE, SEE SPECIAL PROVISIONS.
- FOR BEAM END EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.
- FOR GALVANIC CATHODIC PROTECTION INTEGRAL PILE JACKET, SEE SPECIAL PROVISIONS.
- FOR SPLICING OF PRESTRESSING STRAND, SEE SPECIAL PROVISIONS.
- FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.
- FOR GALVANIZED PEDESTRIAN SAFETY RAIL, SEE SPECIAL PROVISIONS.
- FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.
- FOR TURBIDITY CURTAIN, SEE SPECIAL PROVISIONS.

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021

DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
CHECKED BY: C.J. HOWARD DATE: JUL 2018

**wsp**

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434 FAYETTEVILLE STREET  
SUITE 1500  
RALEIGH, NC 27601  
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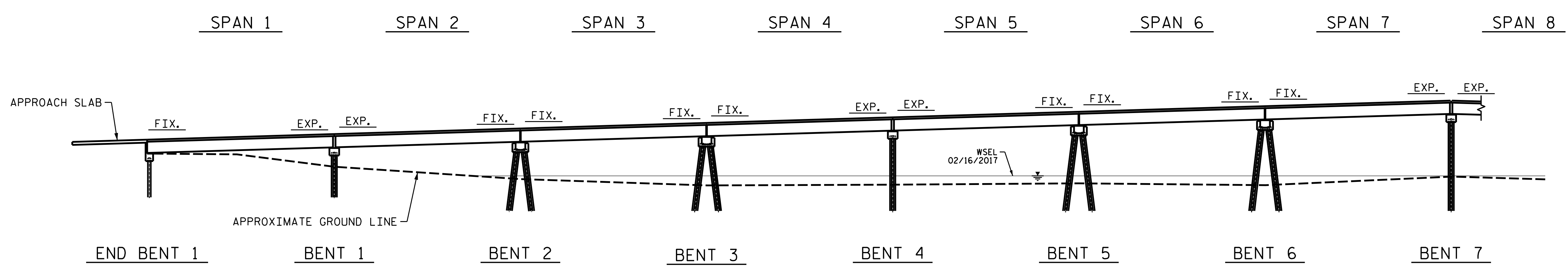
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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

## LOCATION SKETCH AND NOTES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			58

**NOTES**  
 PROFILE INFORMATION IS TAKEN FROM THE ORIGINAL PLANS AND THE ROUTINE INSPECTION REPORT DATED 02/16/2017.  
 BRIDGE ORIENTATION CONFORMS TO THE INSPECTION REPORT.

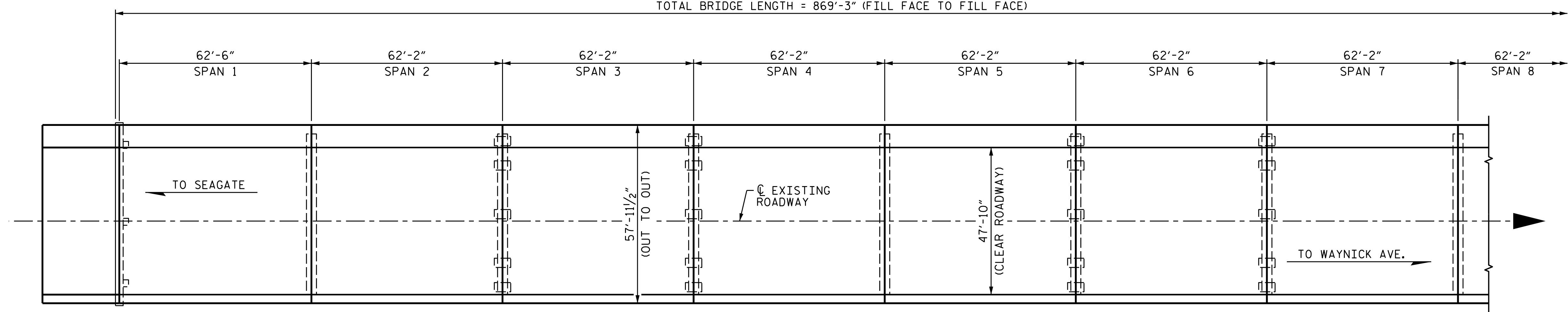


**ELEVATION**  
 SECTION ALONG C OF BRIDGE #21

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

Resident Engineer \_\_\_\_\_ Date \_\_\_\_\_

TOTAL BRIDGE LENGTH = 869'-3" (FILL FACE TO FILL FACE)



**PLAN**  
 FOR CLARITY, PILES ARE NOT SHOWN IN PLAN VIEW.  
 FOR CLARITY, THREE BAR METAL RAILS ARE NOT SHOWN.  
 FOR CLARITY, THE PEDESTRIAN SAFETY RAIL IS NOT SHOWN.

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
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**GENERAL DRAWING**  
 BRIDGE ON US 76  
 OVER BANKS CHANNEL

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REVISIONS				SHEET NO.	
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1			3		
2			4		

TOTAL SHEETS: 58

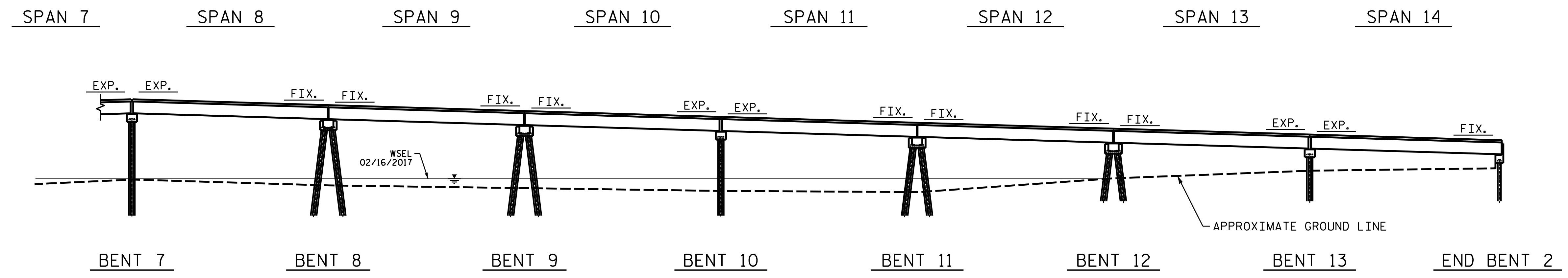
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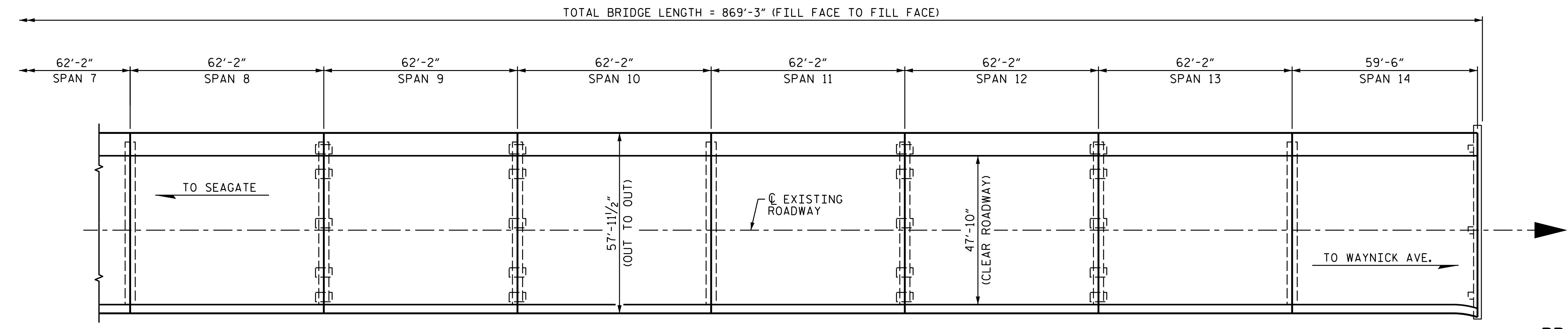
**NOTES**

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BRIDGE ORIENTATION CONFORMS TO THE INSPECTION REPORT.



**ELEVATION**  
SECTION ALONG C OF BRIDGE #21



**PLAN**  
FOR CLARITY, PILES ARE NOT SHOWN IN PLAN VIEW.  
FOR CLARITY, THREE BAR METAL RAILS ARE NOT SHOWN.  
FOR CLARITY, THE PEDESTRIAN SAFETY RAIL IS NOT SHOWN.

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

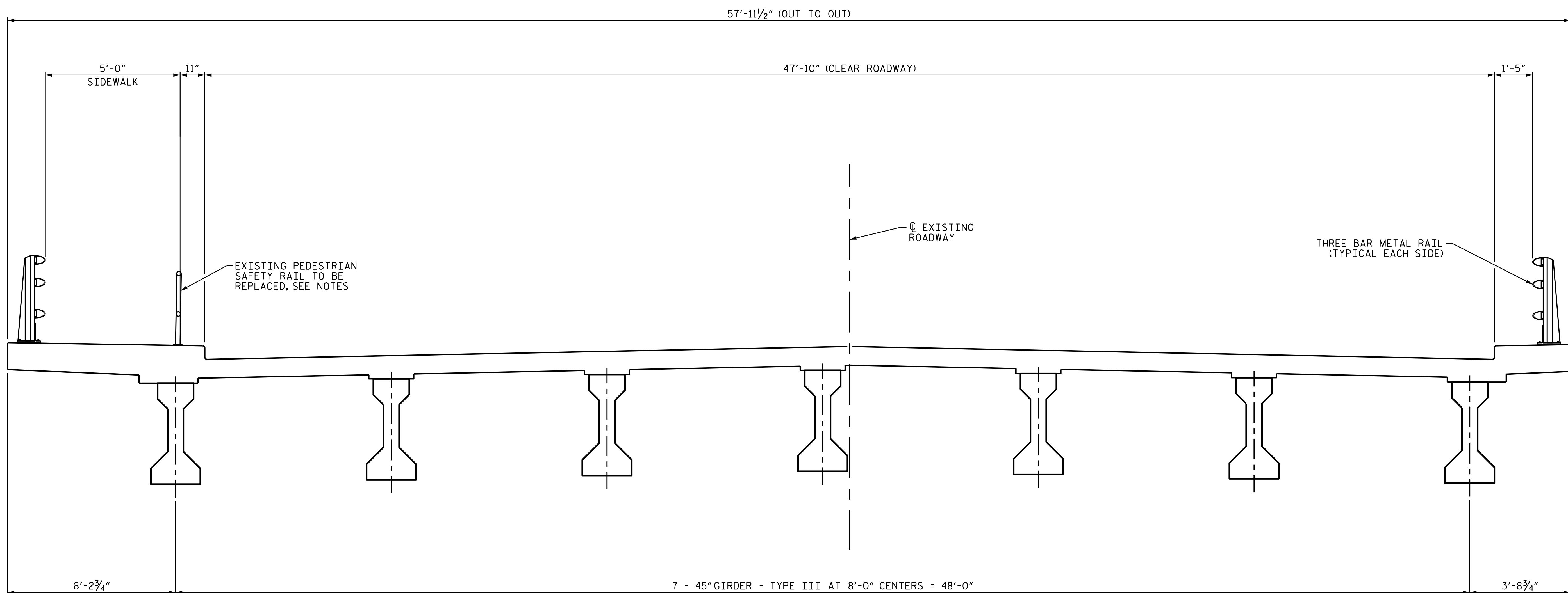
**GENERAL DRAWING**  
BRIDGE ON US 76  
OVER BANKS CHANNEL

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			58
2			4			

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DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
CHECKED BY: C.J. HOWARD DATE: JUL 2018



**TYPICAL SECTION**

LOOKING EAST

**NOTES**

THE CONTRACTOR IS TO FIELD VERIFY THE EXISTING PEDESTRIAN SAFETY RAILING DIMENSIONS AND SUBMIT SHOP DRAWINGS PRIOR TO PURCHASING MATERIALS FOR THE REMOVAL AND REPLACEMENT OF THE EXISTING RAILING WITH A GALVANIZED RAILING MATCHING THE EXISTING PEDESTRIAN SAFETY RAIL.

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

RAILING: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

MINIMUM 3/4" DIAMETER HEADLESS FULL THREADED HIGH STRENGTH ADHESIVE ANCHOR RODS SHALL CONFORM TO ASTM F1554 GRADE 36. SELF-LOCKING HEX NUTS SHALL CONFORM TO ASTM A563, AND WASHERS TO F463, TYPE 1. ANCHOR RODS, NUTS AND WASHERS SHALL BE GALVANIZED TO AASHTO M232. AT THE CONTRACTOR'S OPTION STAINLESS STEEL ANCHOR RODS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE TO THE GALVANIZED IF APPROVED BY THE ENGINEER.

THE CONTRACTOR MAY USE NEW FULL THREADED HIGH STRENGTH ADHESIVELY ANCHORED RODS IN PLACE OF THE EXISTING RAILING'S ANCHORS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF 3/4" DIAMETER BOLT IS 10KIPS. FOR ADHESIVELY ANCHORED BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

THE CONTRACTOR SHALL INCLUDE IN THE SHOP DRAWING SUBMITTAL THE SELECTED MANUFACTURER'S ADHESIVELY ANCHORED SYSTEM AND SUPPORTING MATERIALS, SUCH AS THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII) AND SAFETY DATA SHEET (SDS).

THE GALVANIZED PEDESTRIAN SAFETY RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE, EACH JOINT IN THE RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS SHALL BE ATTACHED TO A MINIMUM OF THREE POST.

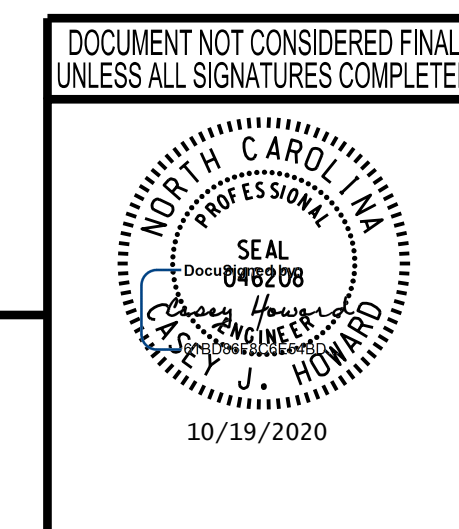
FOR RAIL SPLICE DETAIL REFER TO SHEET S-23.

FOR GALVANIZED PEDESTRIAN SAFETY RAIL, SEE SPECIAL PROVISIONS.

PROJECT NO. 15BPR.19  
 NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
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 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION



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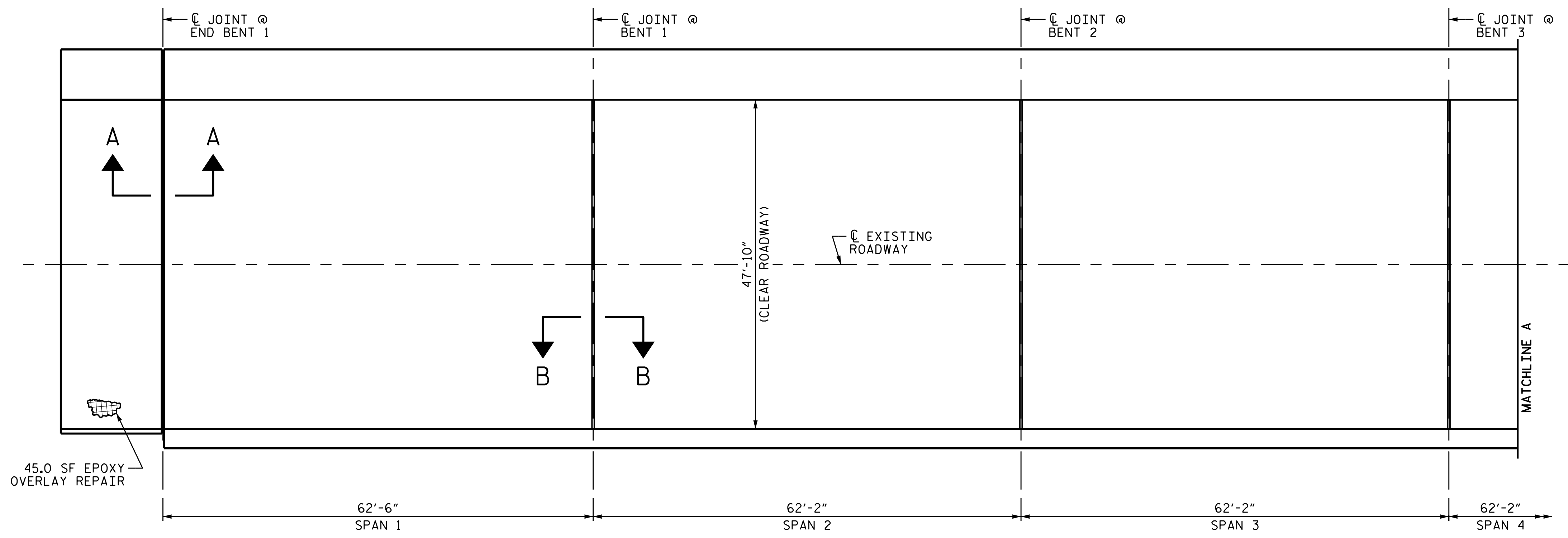
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
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DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
 CHECKED BY: C.J. HOWARD DATE: JUL 2018

### REPAIR QUANTITY TABLE

EPOXY OVERLAY SYSTEM	QUANTITIES	
	ESTIMATE	ACTUAL
	AREA SF	AREA SF
APPROACH SLAB AT END BENT 1	45.0	
JOINT REPAIR	QUANTITIES	
	ESTIMATE	ACTUAL
	LENGTH LN. FT.	LENGTH LN. FT.
FOAM JOINT SEAL	58.0	
POURABLE SILICONE JOINT SEALANT	58.0	



### PLAN OF SPANS

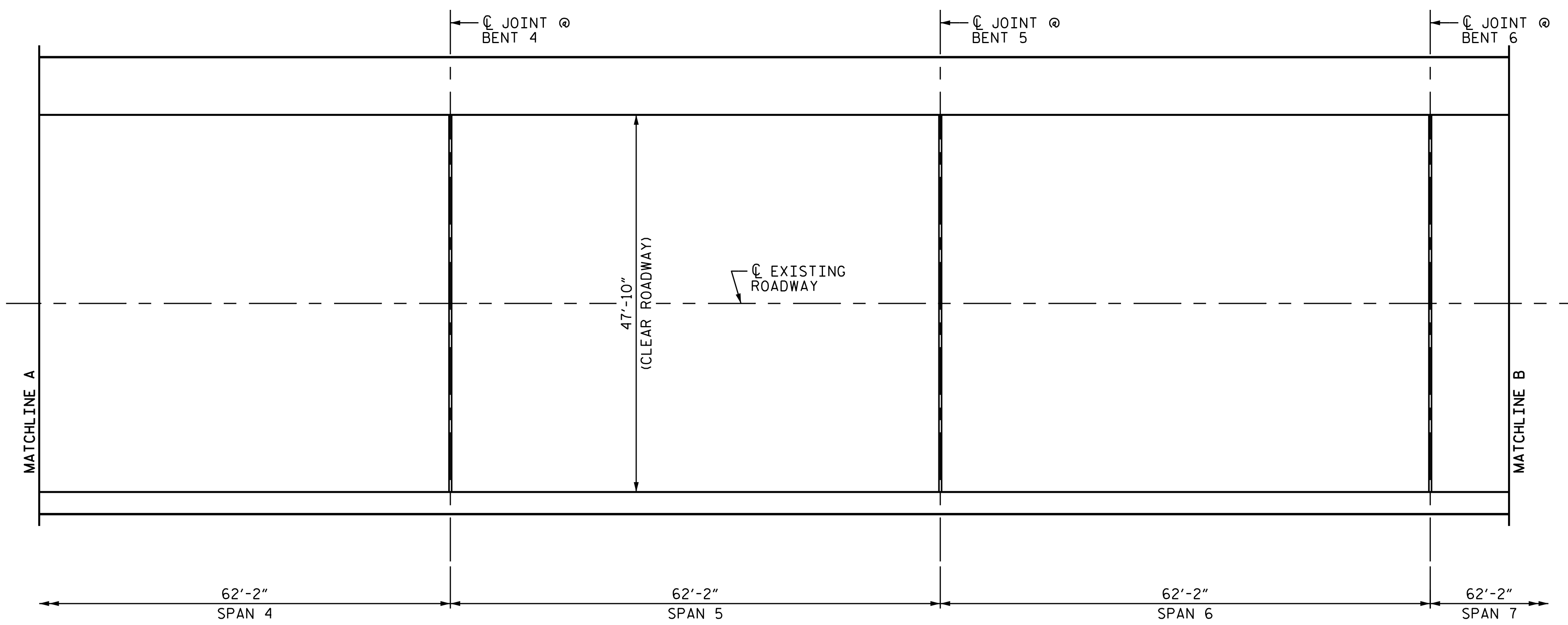
(TOPSIDE)  
FOR CLARITY, THREE BAR METAL RAILS ARE NOT SHOWN.  
FOR CLARITY, THE PEDESTRIAN SAFETY RAIL IS NOT SHOWN.

### NOTES

REFER TO SPECIAL PROVISIONS.  
FOR SECTION A-A, REFER TO SHEET S-24.  
FOR SECTION B-B, REFER TO SHEET S-24.

### LEGEND

FOR EPOXY OVERLAY REPAIR



### PLAN OF SPANS

(TOPSIDE)  
FOR CLARITY, THREE BAR METAL RAILS ARE NOT SHOWN.  
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PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
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SUPERSTRUCTURE  
PLAN OF SPANS  
REPAIRS  
SPAN 1 THRU PARTIAL SPAN 7

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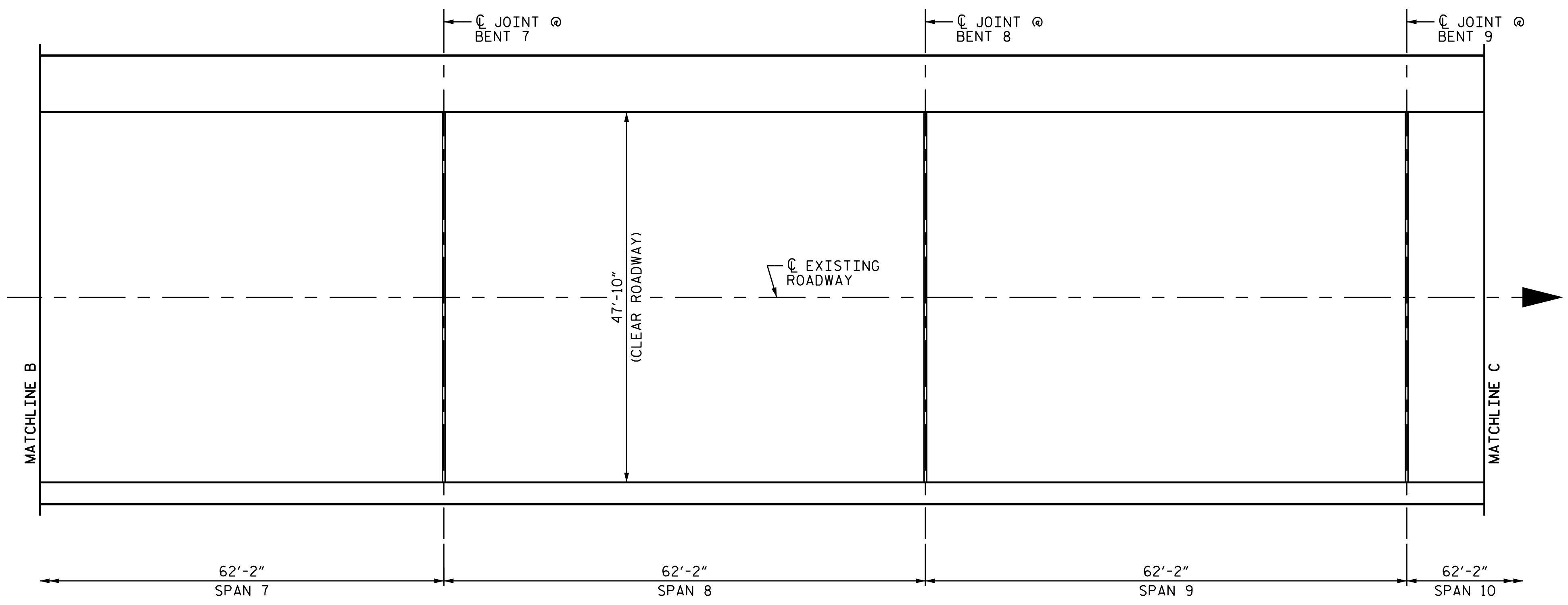
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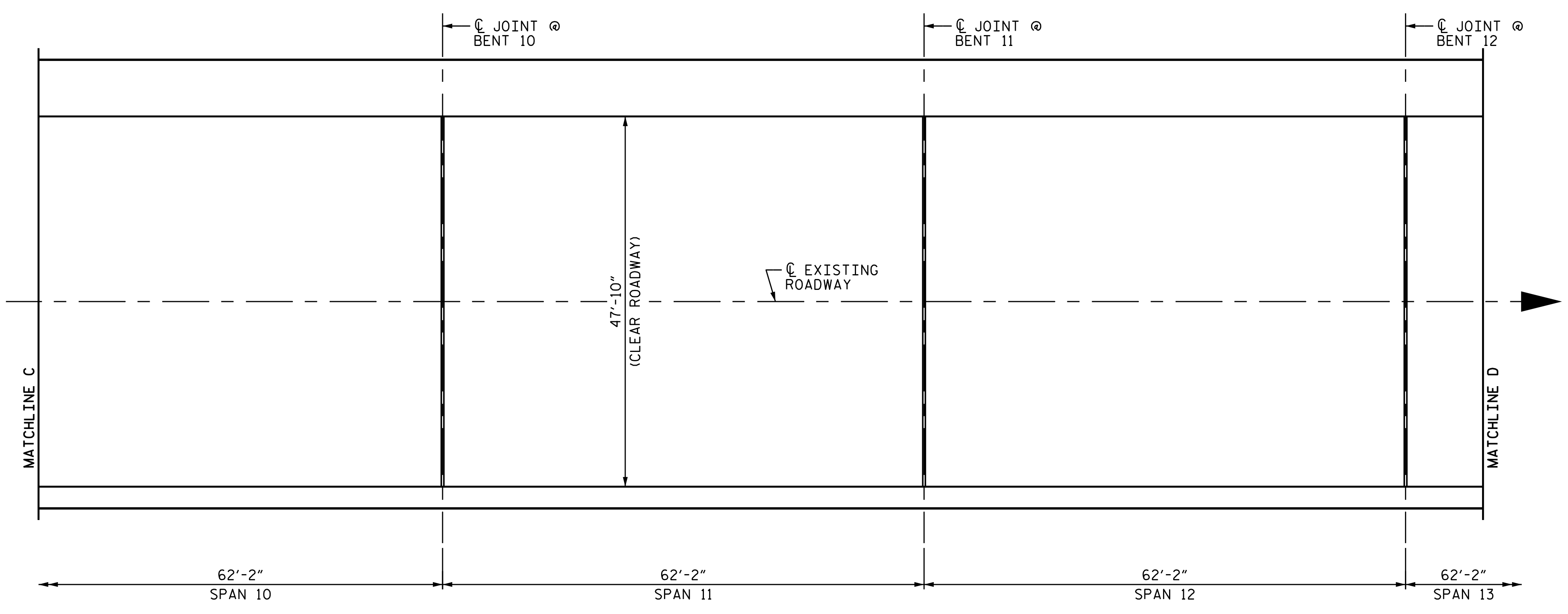
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**PLAN OF SPANS**

(TOPSIDE)  
 FOR CLARITY, THREE BAR METAL RAILS ARE NOT SHOWN.  
 FOR CLARITY, THE PEDESTRIAN SAFETY RAIL IS NOT SHOWN.



**PLAN OF SPANS**

(TOPSIDE)  
 FOR CLARITY, THREE BAR METAL RAILS ARE NOT SHOWN.  
 FOR CLARITY, THE PEDESTRIAN SAFETY RAIL IS NOT SHOWN.

REPAIR QUANTITY TABLE		
EPOXY OVERLAY SYSTEM	QUANTITIES	
	ESTIMATE	ACTUAL
	AREA SF	AREA SF
APPROACH SLAB AT END BENT 1		
JOINT REPAIR	QUANTITIES	
	ESTIMATE	ACTUAL
	LENGTH LN. FT.	LENGTH LN. FT.
FOAM JOINT SEAL		
POURABLE SILICONE JOINT SEALANT		

**NOTES**  
 REFER TO SPECIAL PROVISIONS.

**LEGEND**  
 FOR EPOXY OVERLAY REPAIR

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 PLAN OF SPANS  
 REPAIRS**

PARTIAL SPAN 7 THRU  
 PARTIAL SPAN 13

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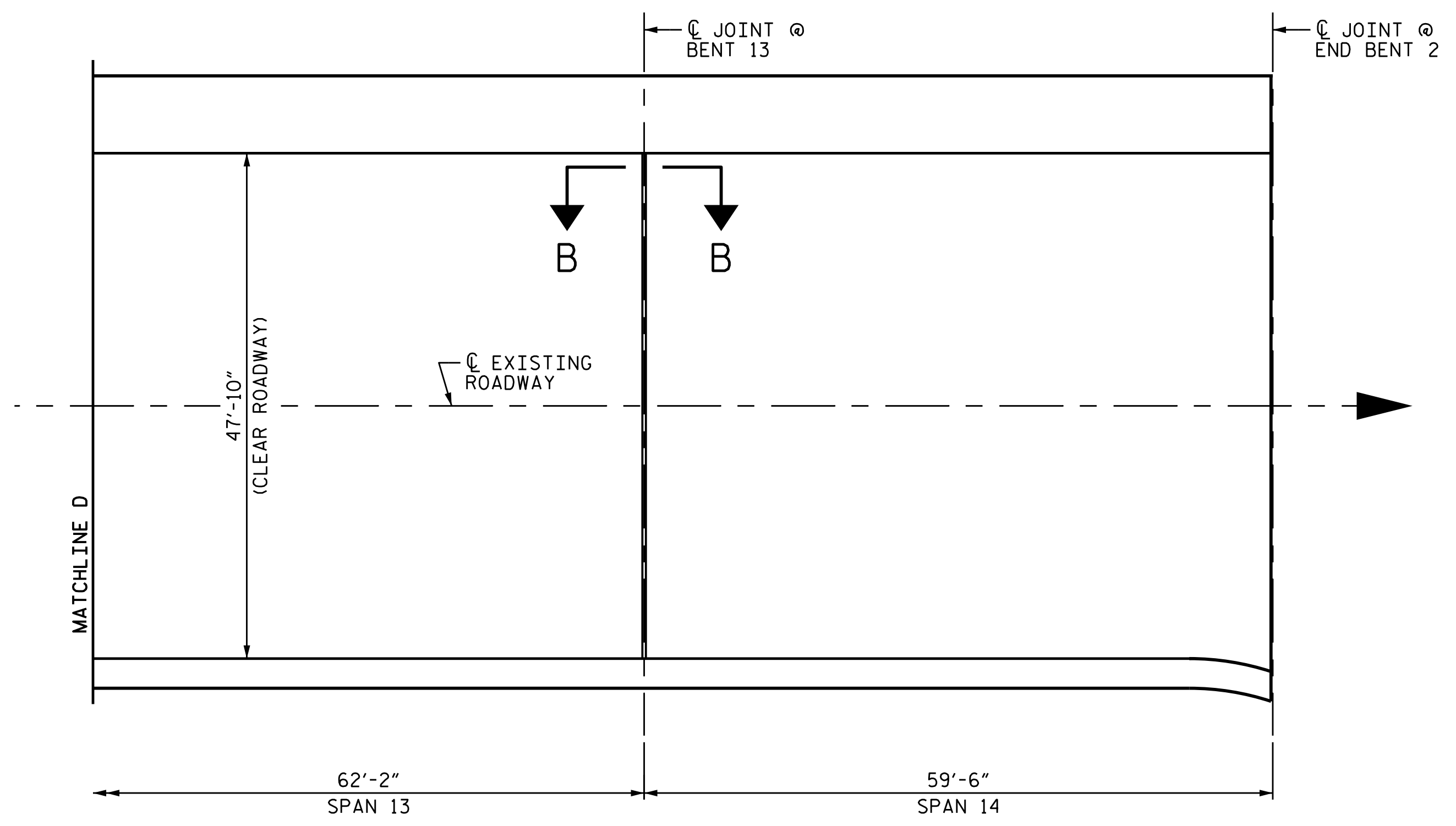
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 SUITE 1500  
 RALEIGH, NC 27601  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			58

DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
 CHECKED BY: C.J. HOWARD DATE: JUL 2018

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**PLAN OF SPANS**


(TOPSIDE)  
 FOR CLARITY, THREE BAR METAL RAILS ARE NOT SHOWN.  
 FOR CLARITY, THE PEDESTRIAN SAFETY RAIL IS NOT SHOWN.

REPAIR QUANTITY TABLE		
EPOXY OVERLAY SYSTEM	QUANTITIES	
	ESTIMATE	ACTUAL
	AREA SF	AREA SF
APPROACH SLAB AT END BENT 1		
JOINT REPAIR	QUANTITIES	
	ESTIMATE	ACTUAL
	LENGTH LN. FT.	LENGTH LN. FT.
FOAM JOINT SEAL	58.0	
POURABLE SILICONE JOINT SEALANT		

**NOTES**

REFER TO SPECIAL PROVISIONS.  
 FOR SECTION B-B, REFER TO SHEET S-24.

**LEGEND**

 FOR EPOXY OVERLAY REPAIR



PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**PLAN OF SPANS  
 REPAIRS**  
 PARTIAL SPAN 13 THRU SPAN 14

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			58

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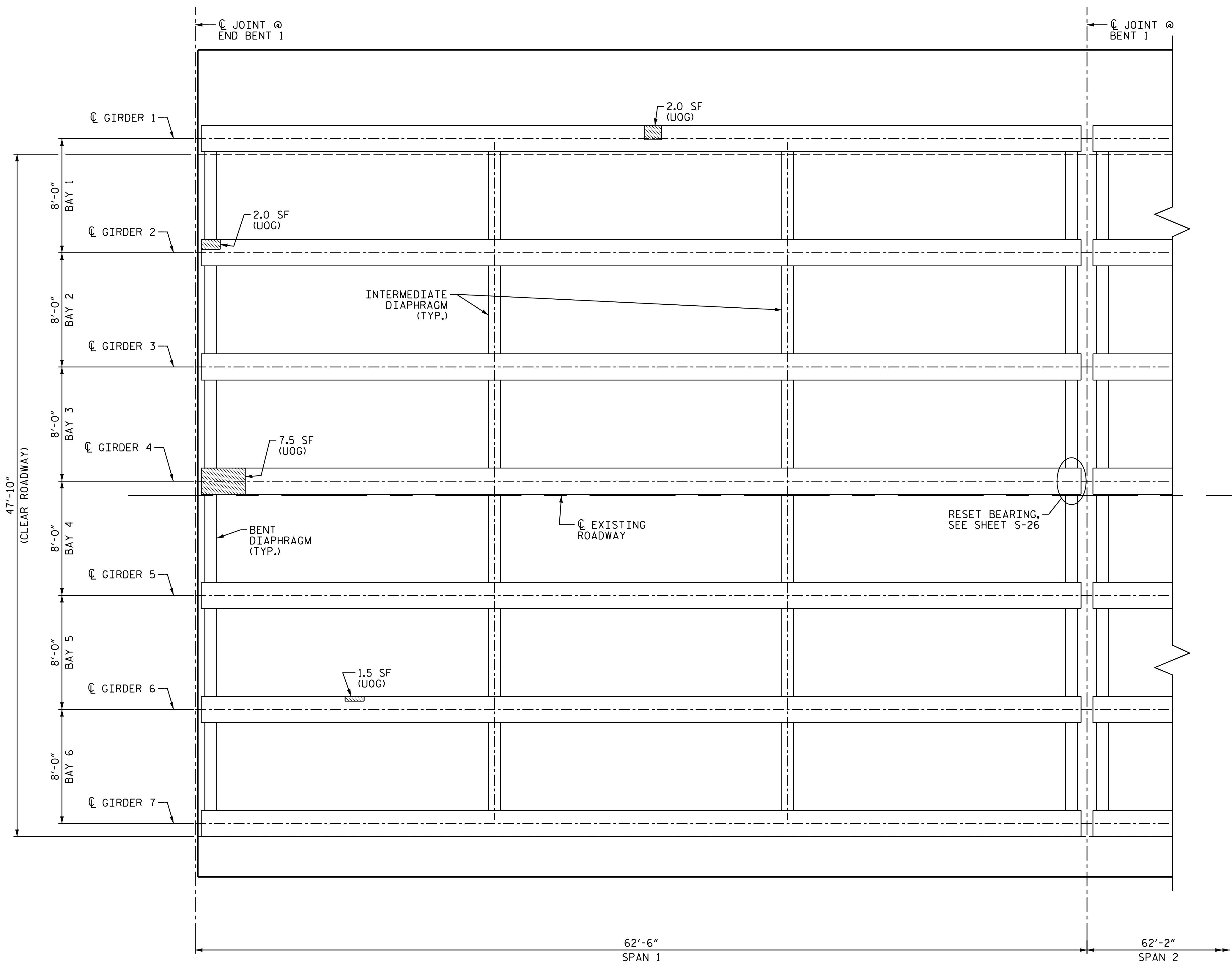
### REPAIR QUANTITY TABLE

UNDERSIDE OF DECK	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK & OVERHANG				
BENT DIAPHRAGMS				
GIRDER REPAIRS				
PRESTRESSED GIRDERS	13.0	4.0		

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.  
 QUANTITIES ASSUME ALL SPALLS AND DELAMINATIONS TO BE 3.5" DEEP.

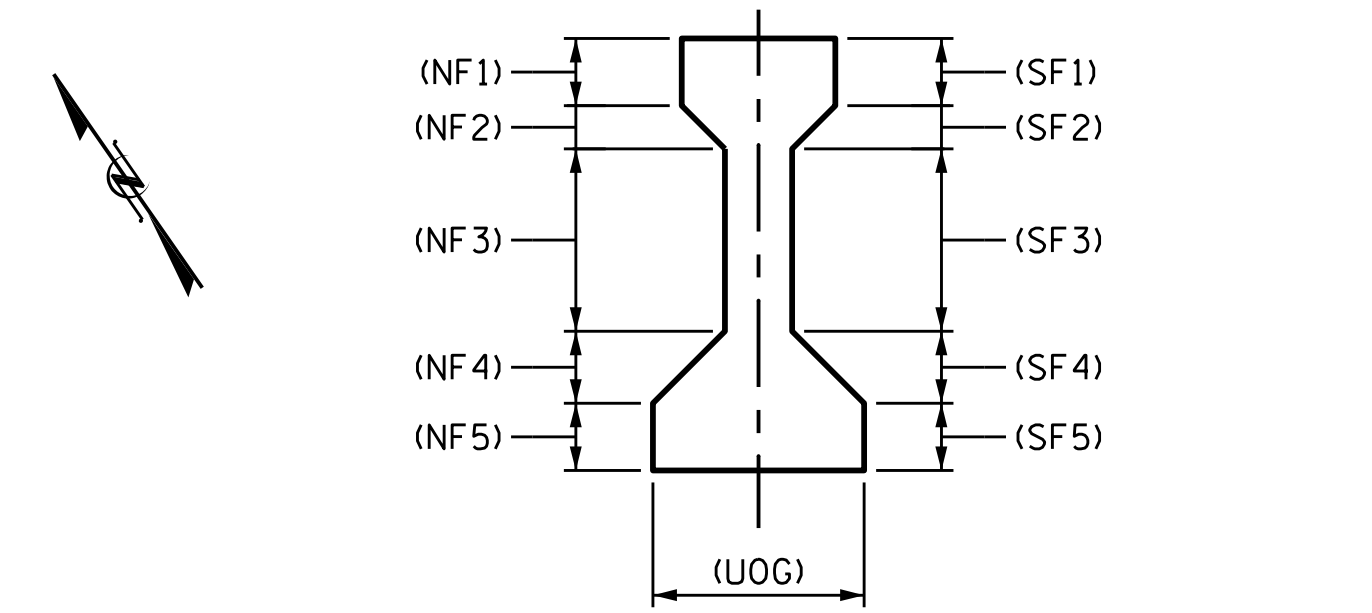
### NOTES

- REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE, IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE INSPECTOR OR ENGINEER THE CONTRACTOR SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE REPAIR QUANTITY TABLE.
- SPANS WILL RECEIVE FULL LENGTH TSA COATING, SEE "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE" SPECIAL PROVISIONS AND SHEETS S-28 THRU S-29.
- FOR PRESTRESSED GIRDER AND BENT DIAPHRAGM REPAIR DETAILS, SEE "TYPICAL GIRDER AND DIAPHRAGM REPAIR DETAILS" SHEET S-30.
- FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.
- FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.



**PLAN OF SPANS**  
(UNDERSIDE)

LEGEND			
SF	SQUARE FEET		DIAPHRAGM REPAIR
(UOD)	UNDERSIDE OF DECK		GIRDER REPAIR
(BOH)	BOTTOM OF OVERHANG		DECK REPAIR
ERI	EPOXY RESIN INJECTION		



**TYPICAL GIRDER SECTION**  
DAMAGE OF GIRDER LOCATIONS

PROJECT NO. 15BPR.19  
 NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 1 OF 14

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**GIRDER & DIAPHRAGM REPAIRS**  
 SPAN 1

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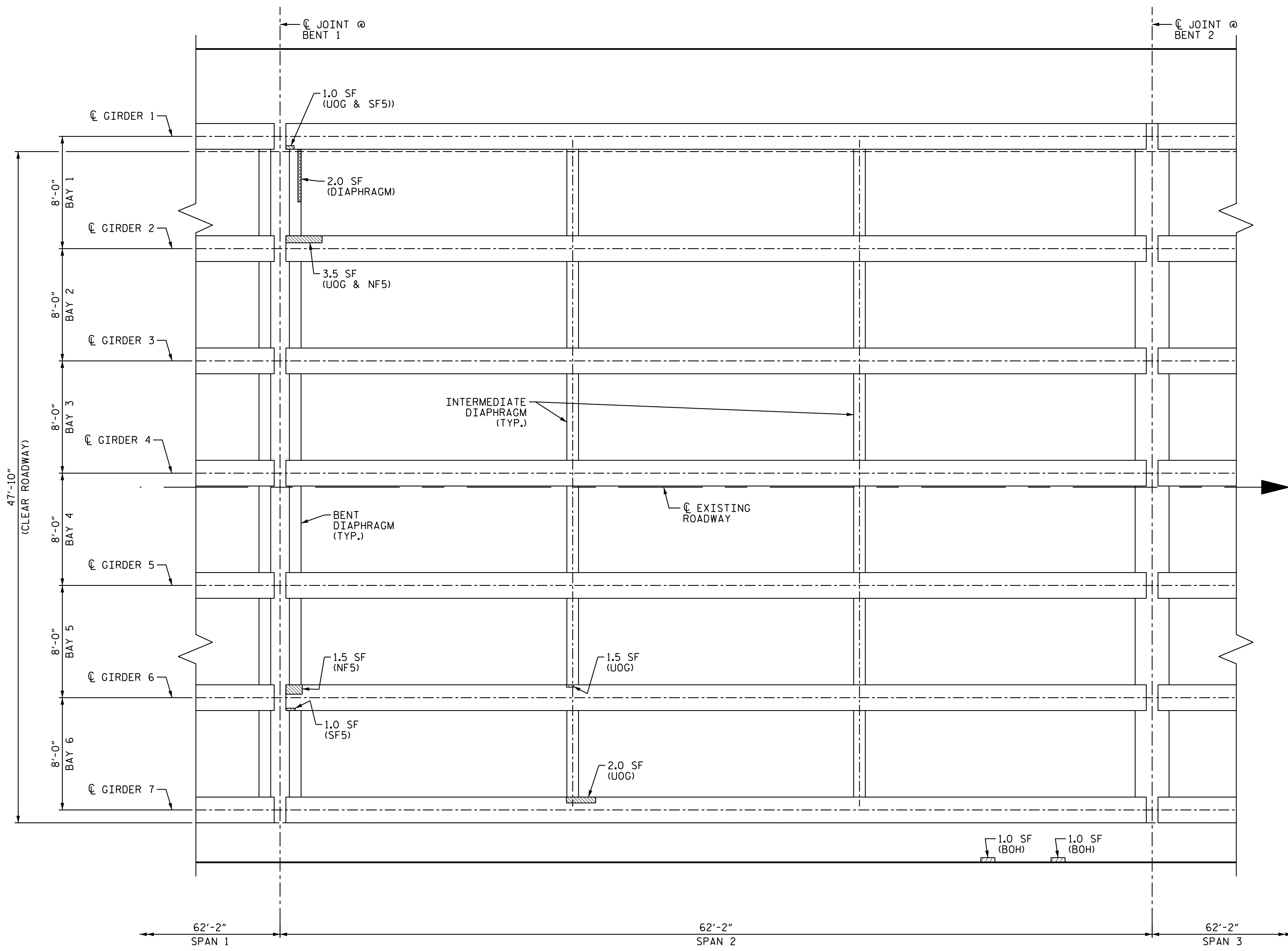
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REVISIONS						SHEET NO. S-9 TOTAL SHEETS 58
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

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**PLAN OF SPANS**  
(UNDERSIDE)

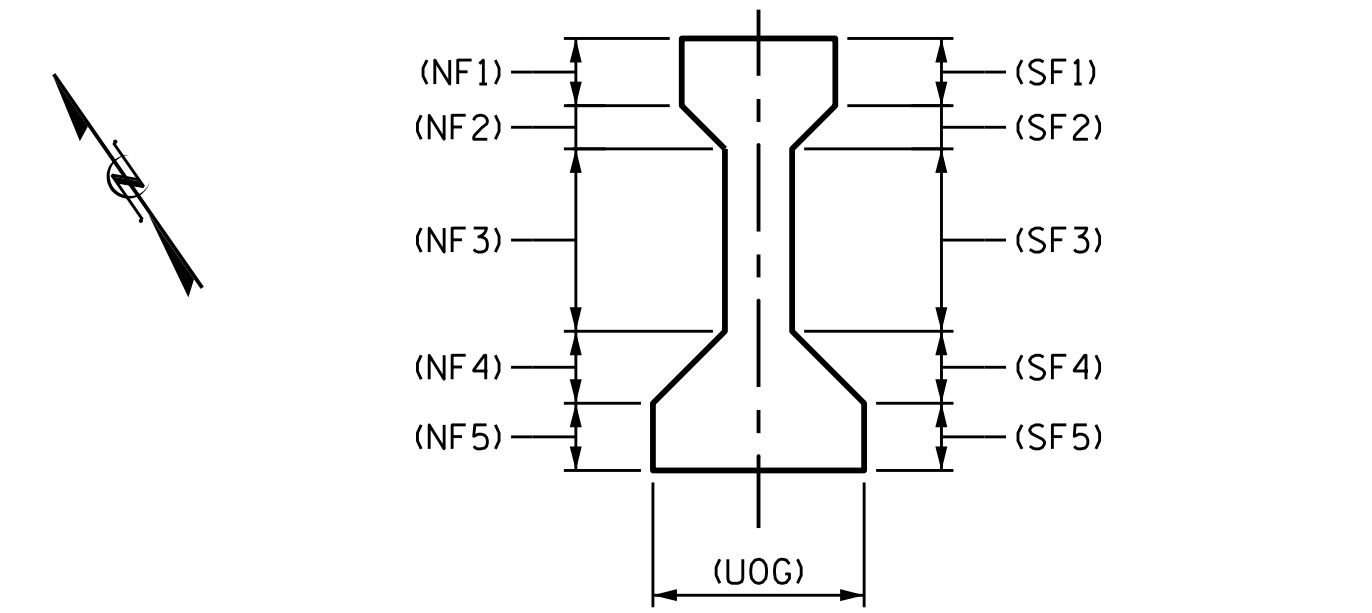
LEGEND			
SF	SQUARE FEET		DIAPHRAGM REPAIR
(UOD)	UNDERSIDE OF DECK		GIRDER REPAIR
(BOH)	BOTTOM OF OVERHANG		DECK REPAIR
ERI	EPOXY RESIN INJECTION		

REPAIR QUANTITY TABLE				
UNDERSIDE OF DECK	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK & OVERHANG	2.0	1.0		
BENT DIAPHRAGMS	2.0	1.0		
GIRDER REPAIRS				
PRESTRESSED GIRDERS	10.5	3.0		

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.  
QUANTITIES ASSUME ALL SPALLS AND DELAMINATIONS TO BE 3.5" DEEP.

**NOTES**

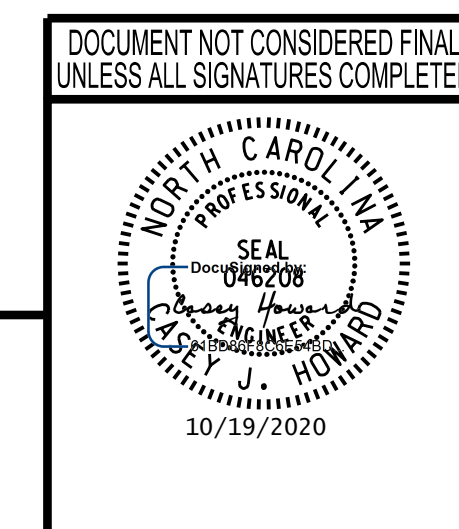
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FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.  
FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.



**TYPICAL GIRDER SECTION**  
DAMAGE OF GIRDER LOCATIONS

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021

SHEET 2 OF 14



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

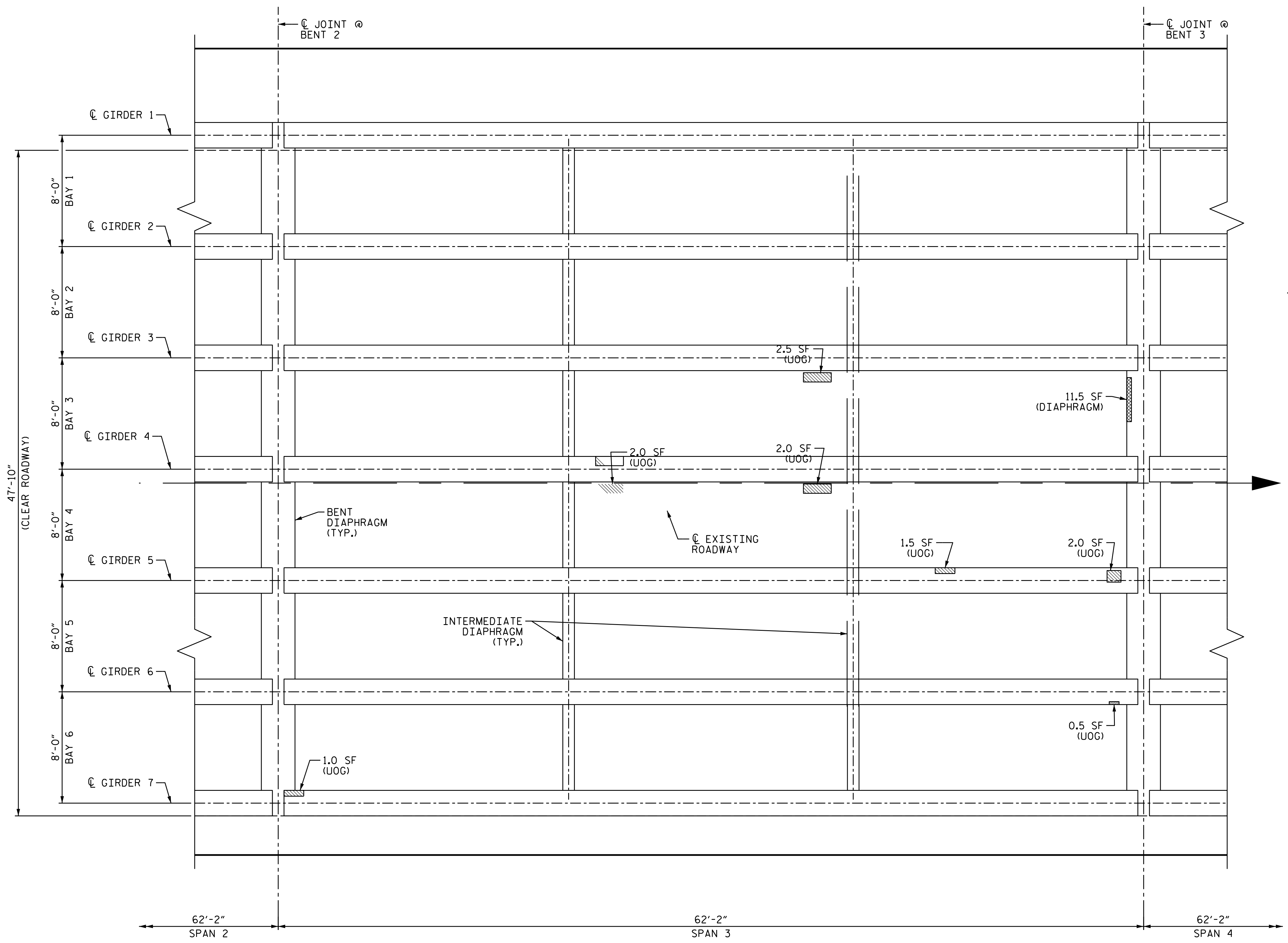
**SUPERSTRUCTURE  
GIRDER & DIAPHRAGM  
REPAIRS  
SPAN 2**

REVISIONS						SHEET NO. S-10 TOTAL SHEETS 58
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

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SUITE 1500  
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**PLAN OF SPANS**  
(UNDERSIDE)

LEGEND			
SF	SQUARE FEET		DIAPHRAGM REPAIR
(UOD)	UNDERSIDE OF DECK		GIRDER REPAIR
(BOH)	BOTTOM OF OVERHANG		DECK REPAIR
ERI	EPOXY RESIN INJECTION		

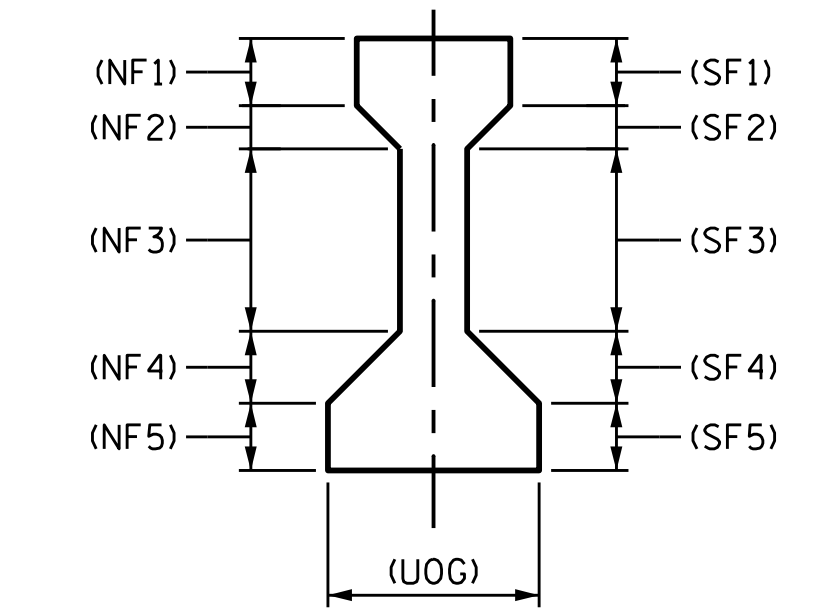
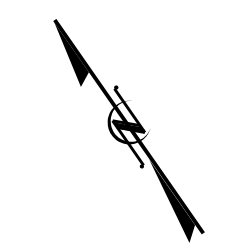
**REPAIR QUANTITY TABLE**

UNDERSIDE OF DECK	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK & OVERHANG				
BENT DIAPHRAGMS	11.5	3.5		
<b>GIRDER REPAIRS</b>				
PRESTRESSED GIRDERS	11.5	3.5		

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.  
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**NOTES**

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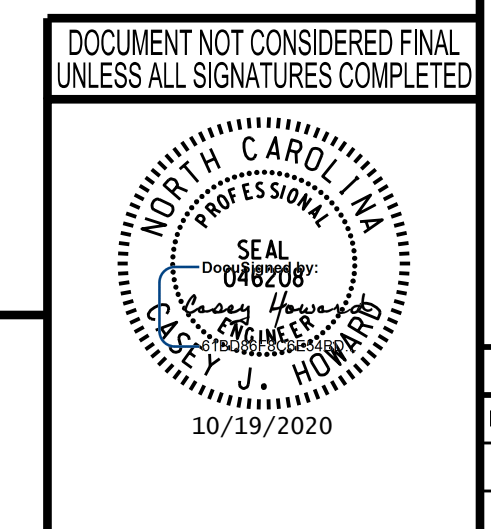


**TYPICAL GIRDER SECTION**  
DAMAGE OF GIRDER LOCATIONS

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021

SHEET 3 OF 14

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**GIRDER & DIAPHRAGM REPAIRS**  
SPAN 3

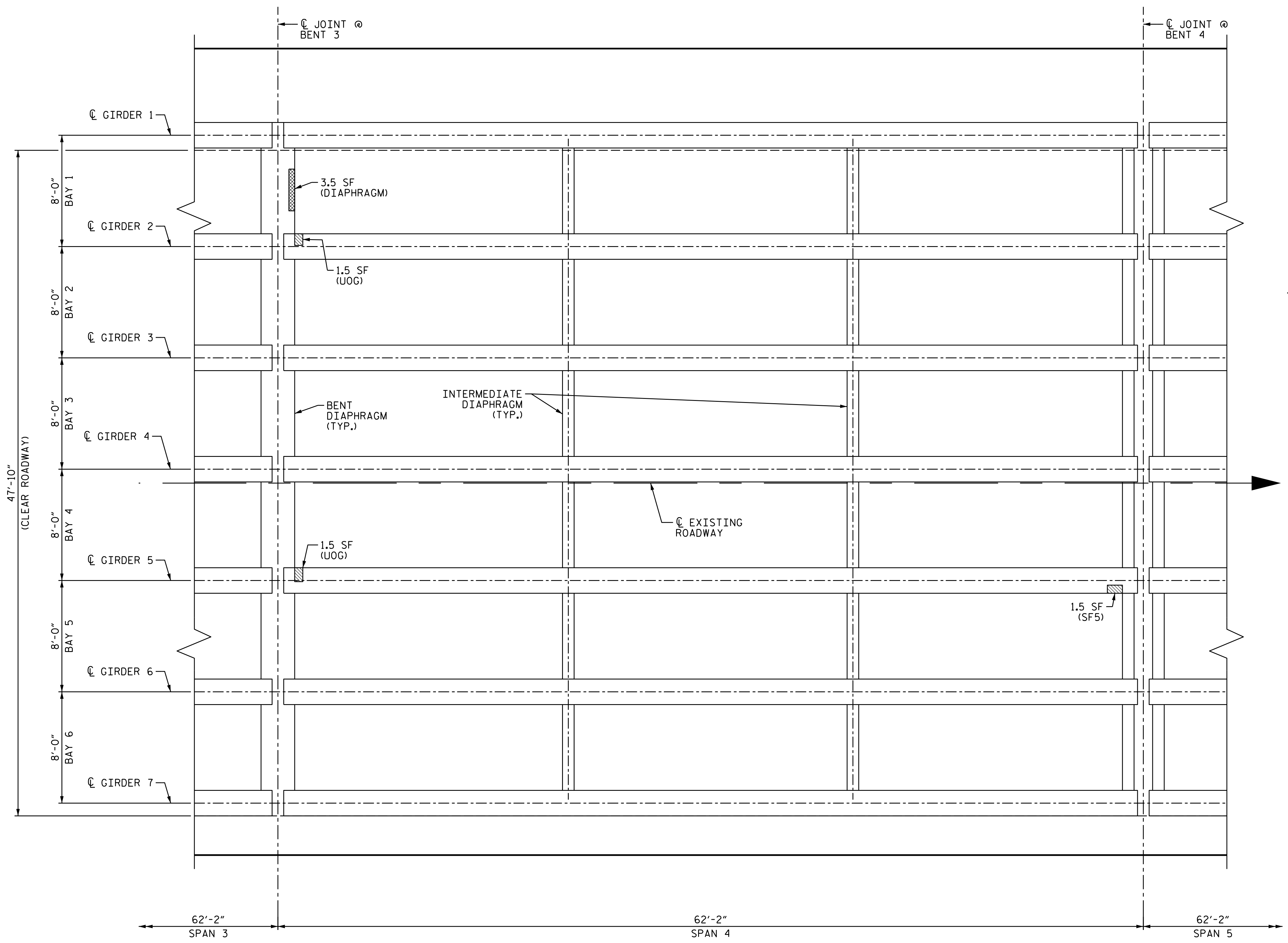


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WSP USA Inc.  
434 FAYETTEVILLE STREET  
SUITE 1500  
RALEIGH, NC 27601  
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REVISIONS						SHEET NO. S-11 TOTAL SHEETS 58
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

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**PLAN OF SPANS**  
(UNDERSIDE)

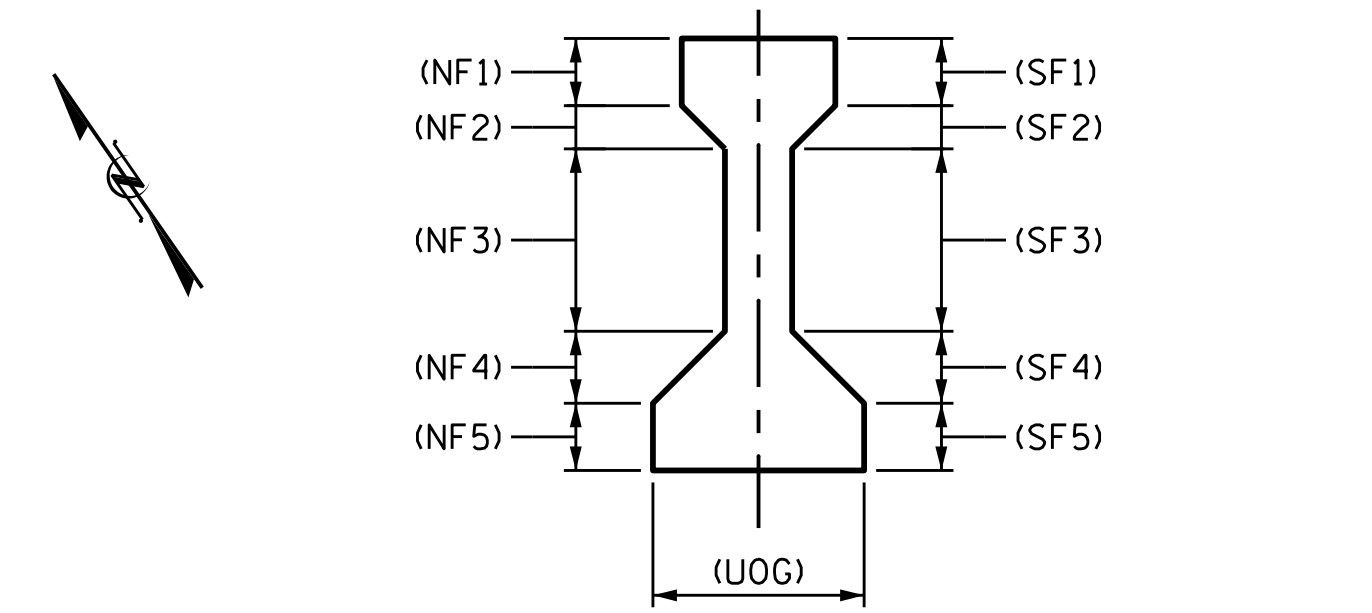
LEGEND			
SF	SQUARE FEET		DIAPHRAGM REPAIR
(UOD)	UNDERSIDE OF DECK		GIRDER REPAIR
(BOH)	BOTTOM OF OVERHANG		DECK REPAIR
ERI	EPOXY RESIN INJECTION		

REPAIR QUANTITY TABLE				
UNDERSIDE OF DECK	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK & OVERHANG				
BENT DIAPHRAGMS	3.5	1.0		
GIRDER REPAIRS				
PRESTRESSED GIRDERS	4.5	1.5		

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.  
QUANTITIES ASSUME ALL SPALLS AND DELAMINATIONS TO BE 3.5" DEEP.

**NOTES**

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- FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.
- FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.



**TYPICAL GIRDER SECTION**  
DAMAGE OF GIRDER LOCATIONS

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021  
SHEET 4 OF 14

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**GIRDER & DIAPHRAGM REPAIRS**  
SPAN 4

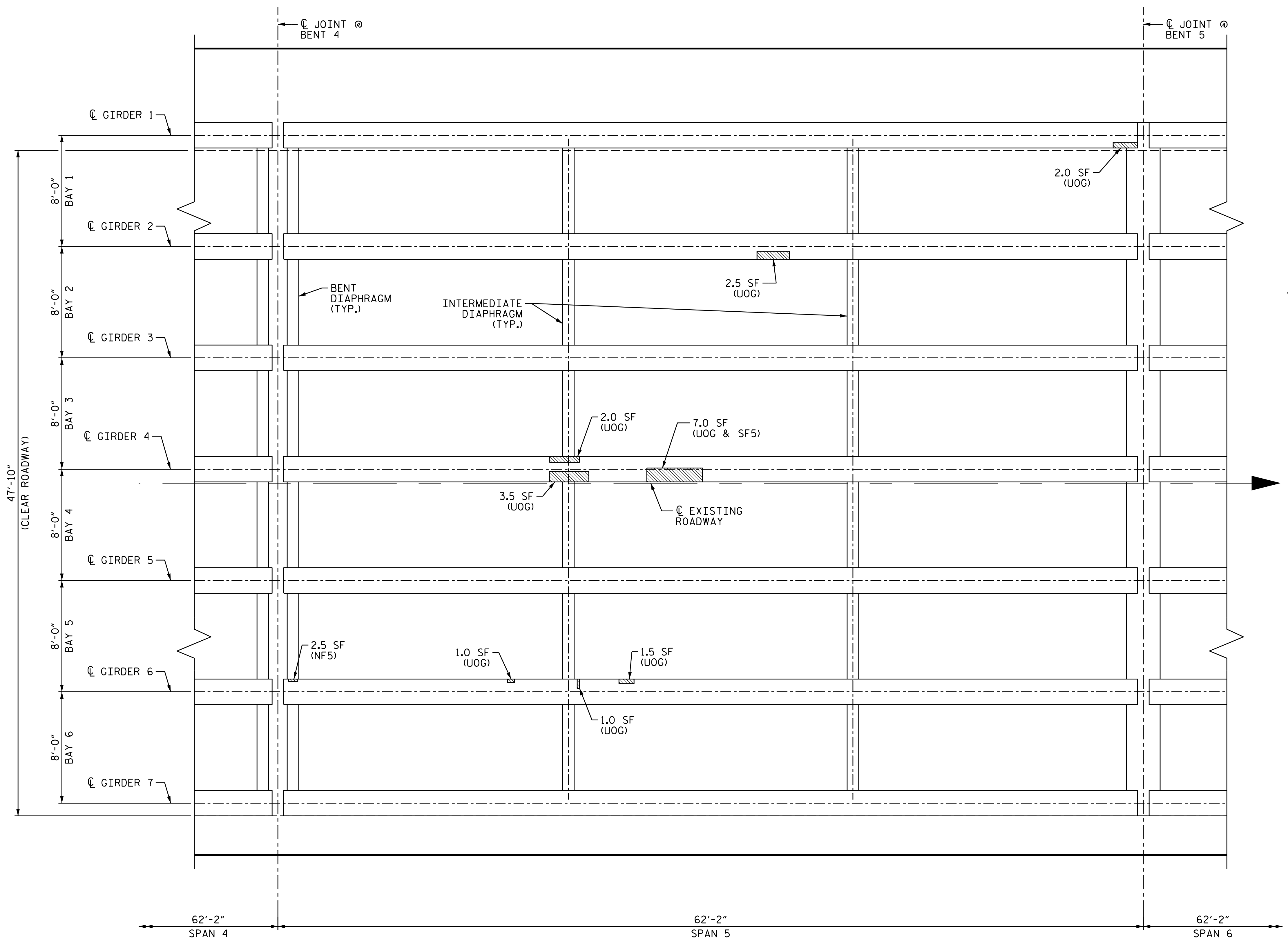
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REVISIONS						SHEET NO. S-12 TOTAL SHEETS 58
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

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**PLAN OF SPANS**  
(UNDERSIDE)

LEGEND			
SF	SQUARE FEET		DIAPHRAGM REPAIR
(UOD)	UNDERSIDE OF DECK		GIRDER REPAIR
(BOH)	BOTTOM OF OVERHANG		DECK REPAIR
ERI	EPOXY RESIN INJECTION		

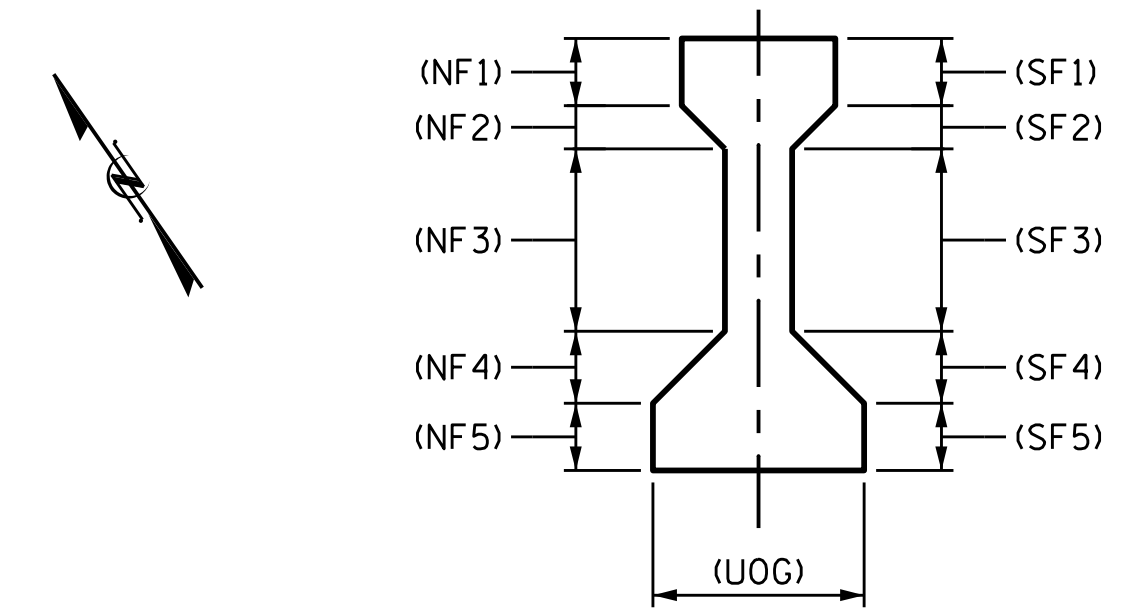
**REPAIR QUANTITY TABLE**

UNDERSIDE OF DECK	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK & OVERHANG				
BENT DIAPHRAGMS				
GIRDER REPAIRS				
PRESTRESSED GIRDERS	23.0	7.0		

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.  
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FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.  
FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.



**TYPICAL GIRDER SECTION**  
DAMAGE OF GIRDER LOCATIONS

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021  
SHEET 5 OF 14

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**GIRDER & DIAPHRAGM REPAIRS**  
SPAN 5

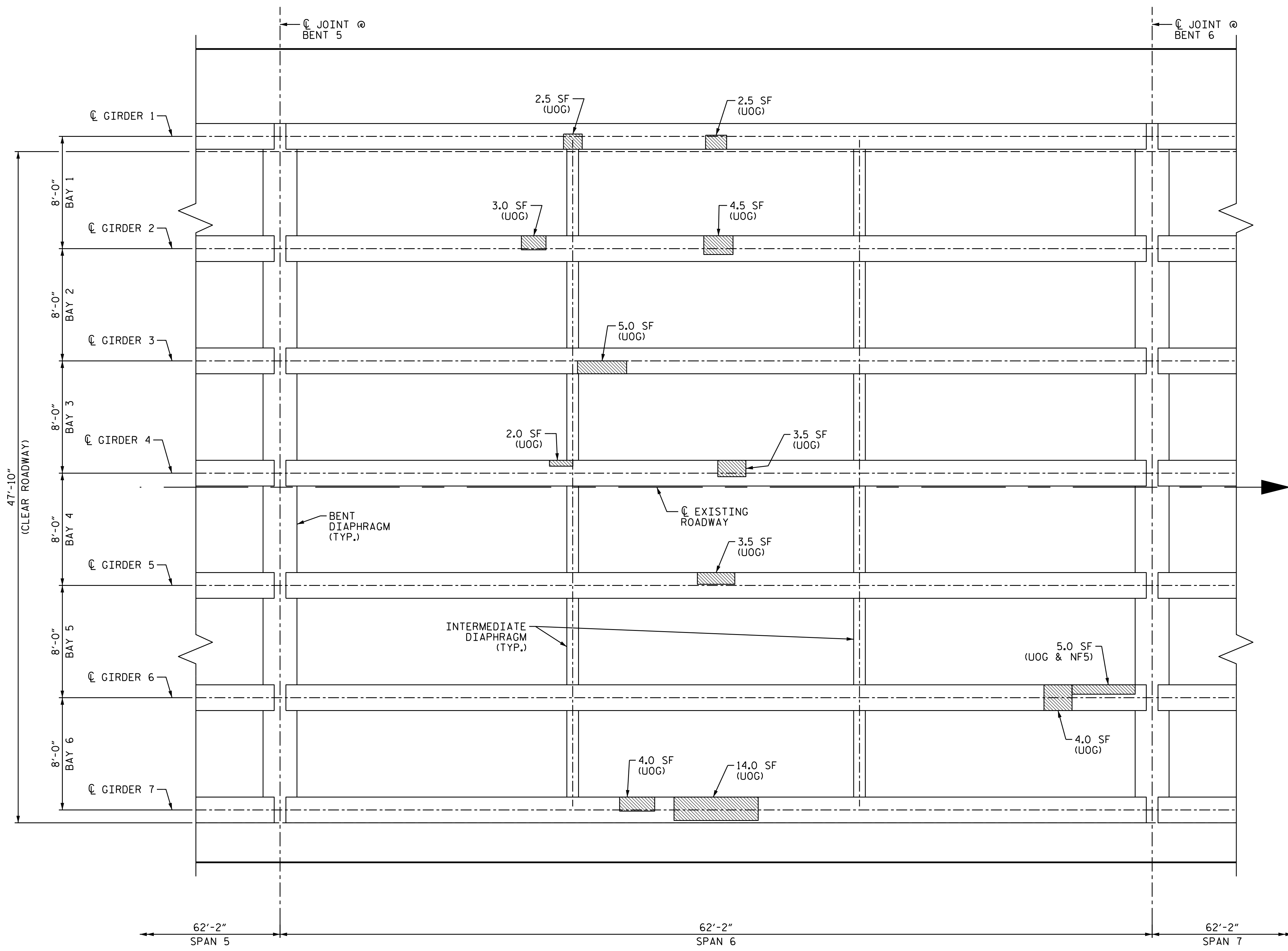
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			58

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**PLAN OF SPANS**  
(UNDERSIDE)

LEGEND			
SF	SQUARE FEET		DIAPHRAGM REPAIR
(UOD)	UNDERSIDE OF DECK		GIRDER REPAIR
(BOH)	BOTTOM OF OVERHANG		DECK REPAIR
ERI	EPOXY RESIN INJECTION		

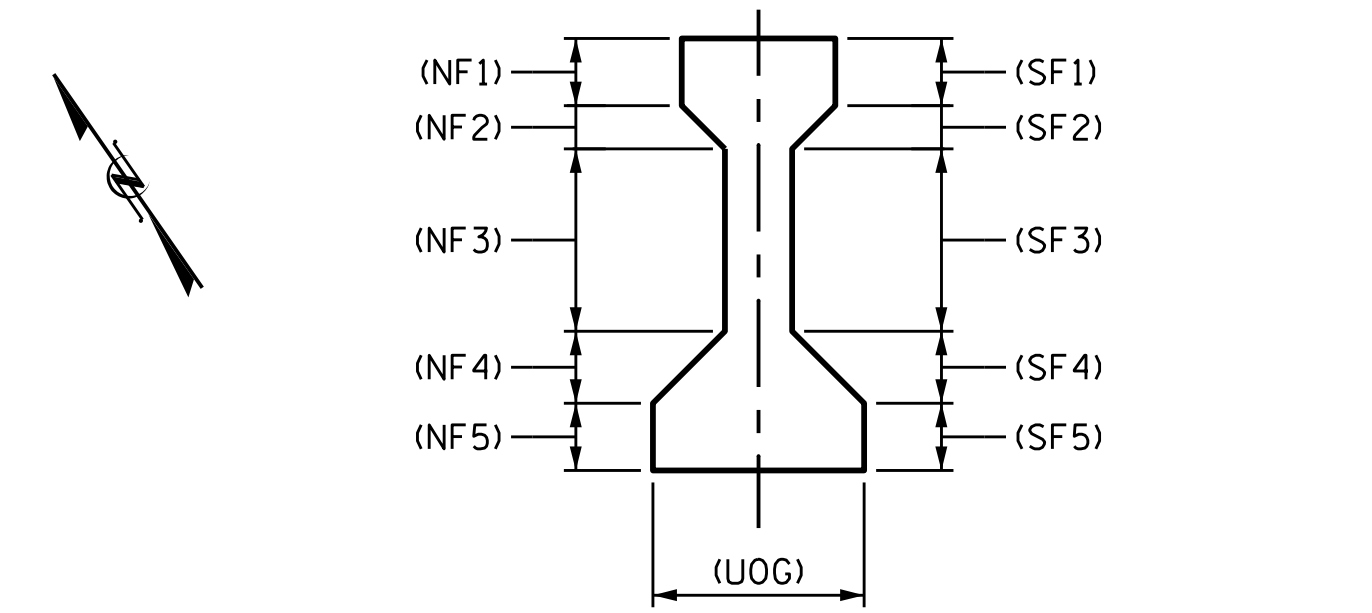
**REPAIR QUANTITY TABLE**

UNDERSIDE OF DECK	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK & OVERHANG				
BENT DIAPHRAGMS				
GIRDER REPAIRS				
PRESTRESSED GIRDERS	53.5	16.0		

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.  
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FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.  
FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.



**TYPICAL GIRDER SECTION**  
DAMAGE OF GIRDER LOCATIONS

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021

SHEET 6 OF 14

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**GIRDER & DIAPHRAGM REPAIRS**  
SPAN 6

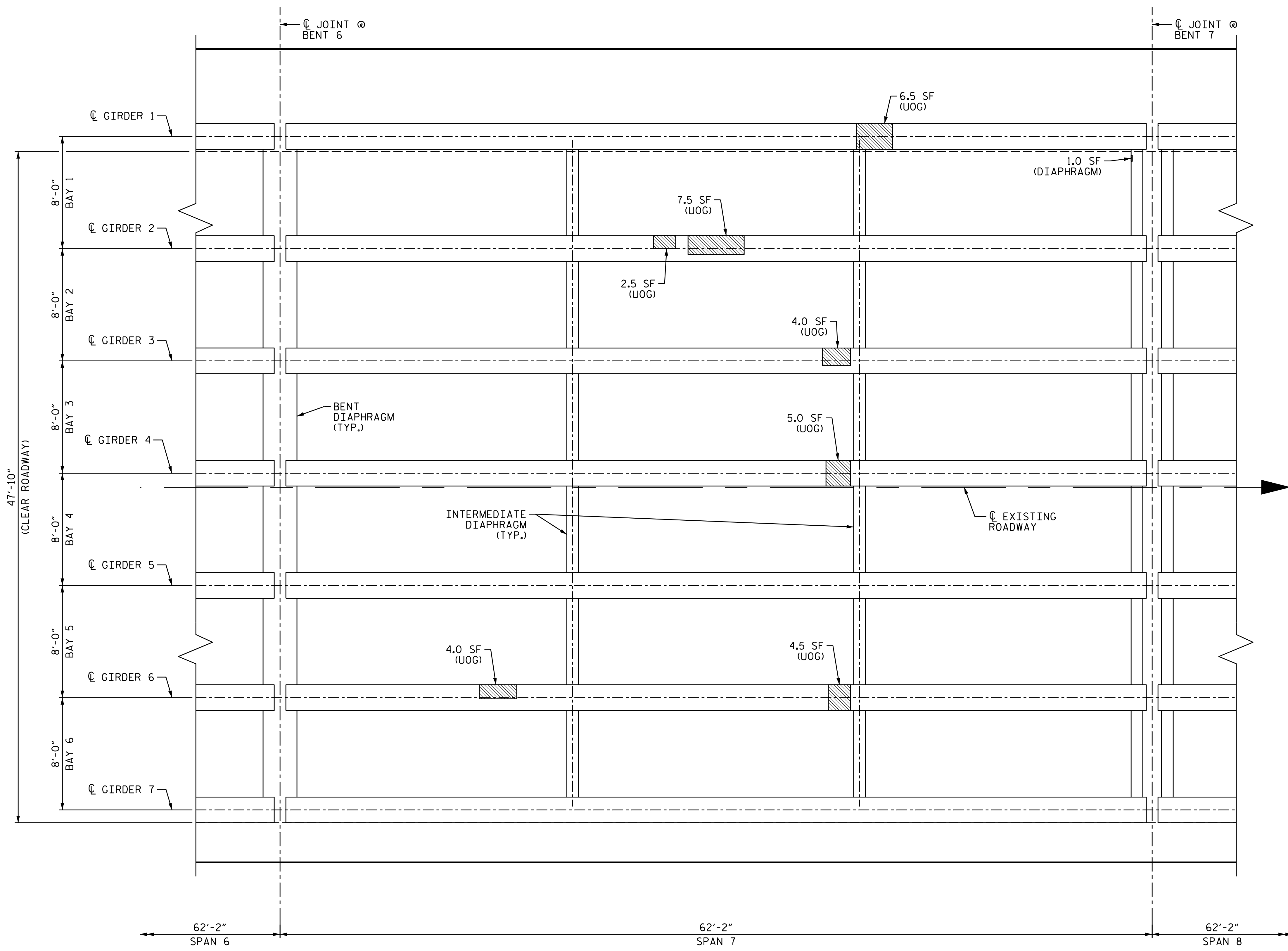
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REVISIONS						SHEET NO. S-14 TOTAL SHEETS 58
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1			3			
2			4			

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**PLAN OF SPANS**  
(UNDERSIDE)

LEGEND			
SF	SQUARE FEET		DIAPHRAGM REPAIR
(UOD)	UNDERSIDE OF DECK		GIRDER REPAIR
(BOH)	BOTTOM OF OVERHANG		DECK REPAIR
ERI	EPOXY RESIN INJECTION		

**REPAIR QUANTITY TABLE**

UNDERSIDE OF DECK	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK & OVERHANG				
BENT DIAPHRAGMS	1.0	0.5		
<b>GIRDER REPAIRS</b>				
PRESTRESSED GIRDERS	34.0	10.0		

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.

QUANTITIES ASSUME ALL SPALLS AND DELAMINATIONS TO BE 3.5" DEEP.

**NOTES**

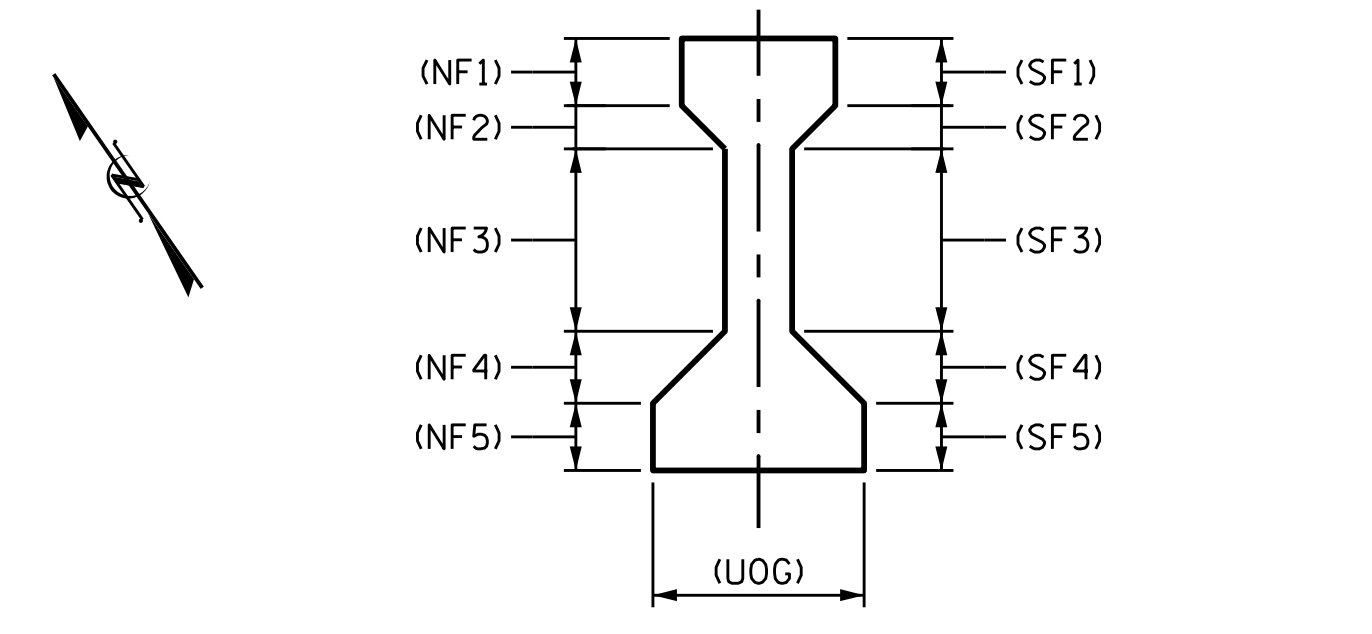
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SPANS WILL RECEIVE FULL LENGTH TSA COATING, SEE "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE" SPECIAL PROVISIONS AND SHEETS S-28 THRU S-29.

FOR PRESTRESSED GIRDER AND BENT DIAPHRAGM REPAIR DETAILS, SEE "TYPICAL GIRDER AND DIAPHRAGM REPAIR DETAILS" SHEET S-30.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.



**TYPICAL GIRDER SECTION**  
DAMAGE OF GIRDER LOCATIONS

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021

SHEET 7 OF 14

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**GIRDER & DIAPHRAGM REPAIRS**  
SPAN 7

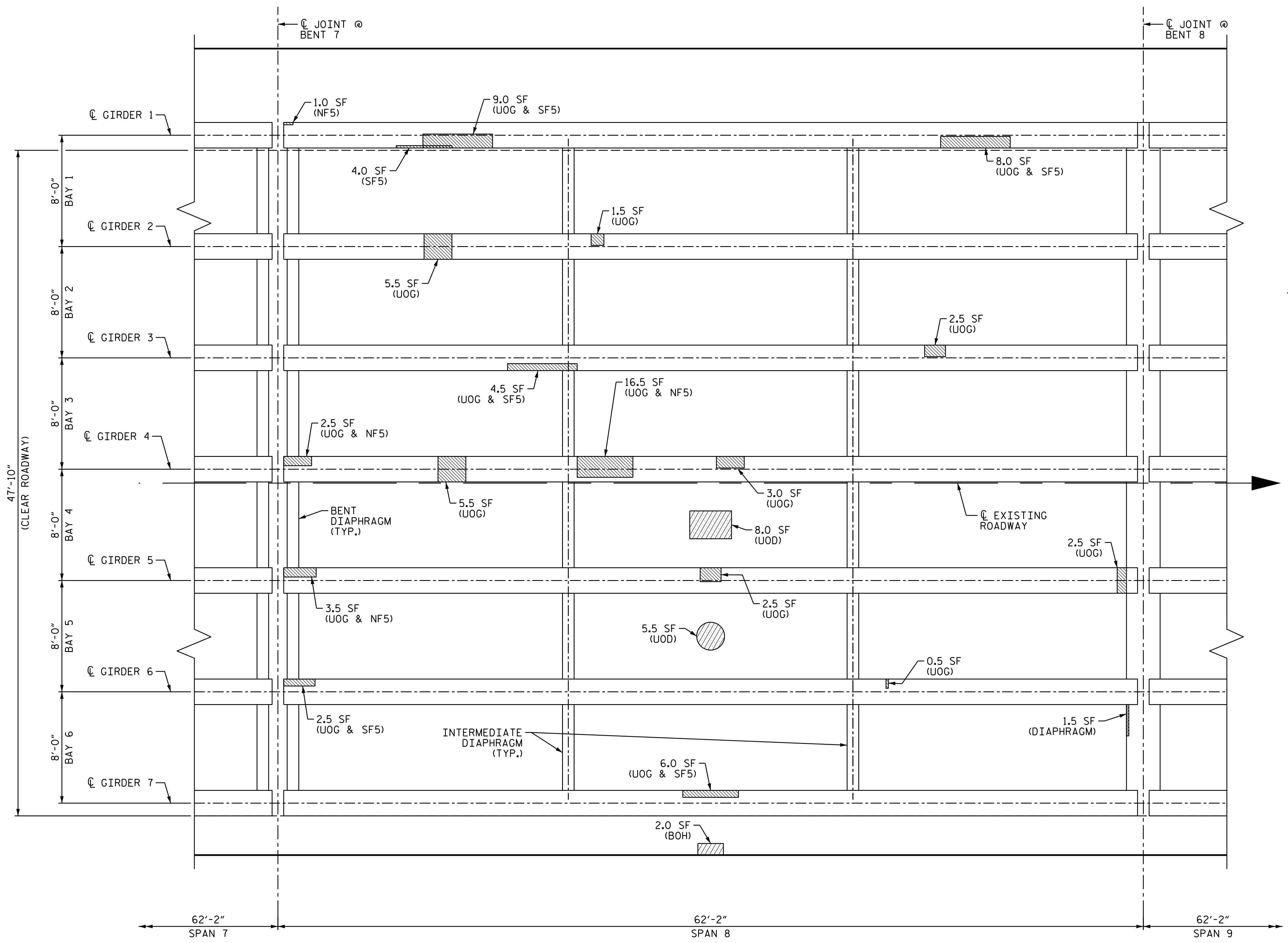
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434 FAYETTEVILLE STREET  
SUITE 1500  
RALEIGH, NC 27601  
TEL: 1.919.836.4040  
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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			58

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**PLAN OF SPANS**  
(UNDERSIDE)

LEGEND			
SF	SQUARE FEET		DIAPHRAGM REPAIR
(UOD)	UNDERSIDE OF DECK		GIRDER REPAIR
(BOH)	BOTTOM OF OVERHANG		DECK REPAIR
ERI	EPOXY RESIN INJECTION		

**REPAIR QUANTITY TABLE**

UNDERSIDE OF DECK	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK & OVERHANG	15.5	4.5		
BENT DIAPHRAGMS	1.5	0.5		
<b>GIRDER REPAIRS</b>				
PRESTRESSED GIRDERS	81.0	24.0		

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.

QUANTITIES ASSUME ALL SPALLS AND DELAMINATIONS TO BE 3.5" DEEP.

**NOTES**

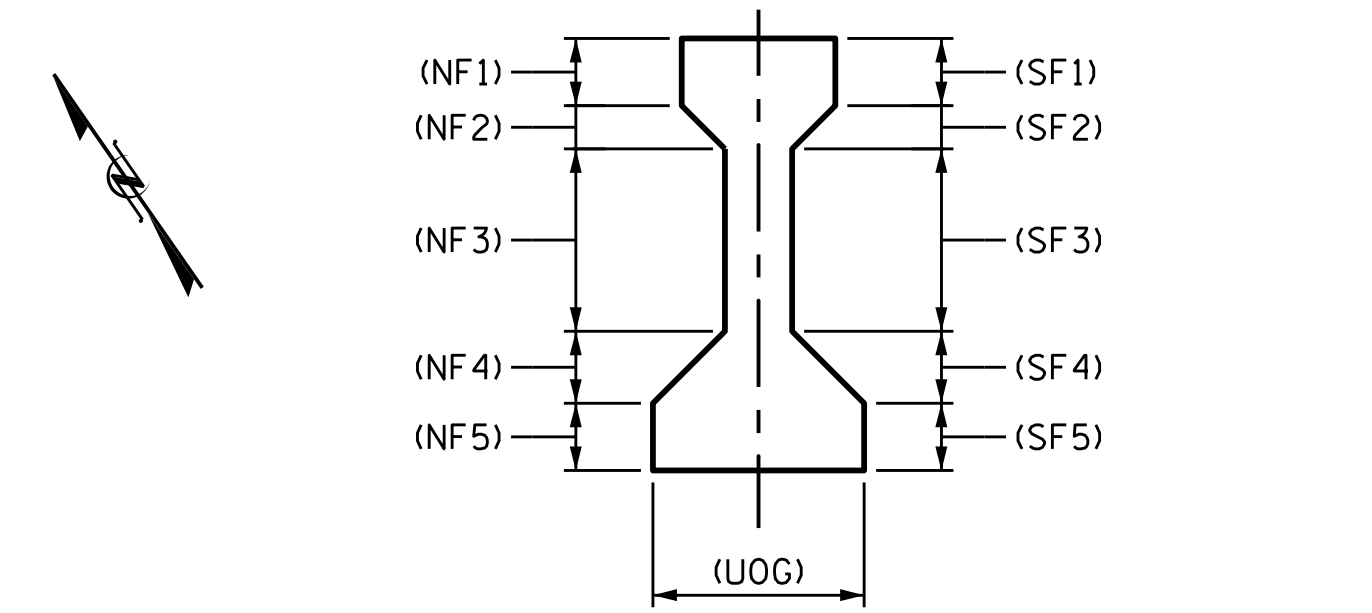
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FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.



**TYPICAL GIRDER SECTION**  
DAMAGE OF GIRDER LOCATIONS

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021

SHEET 8 OF 14

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUPERSTRUCTURE  
GIRDER & DIAPHRAGM  
REPAIRS  
SPAN 8**

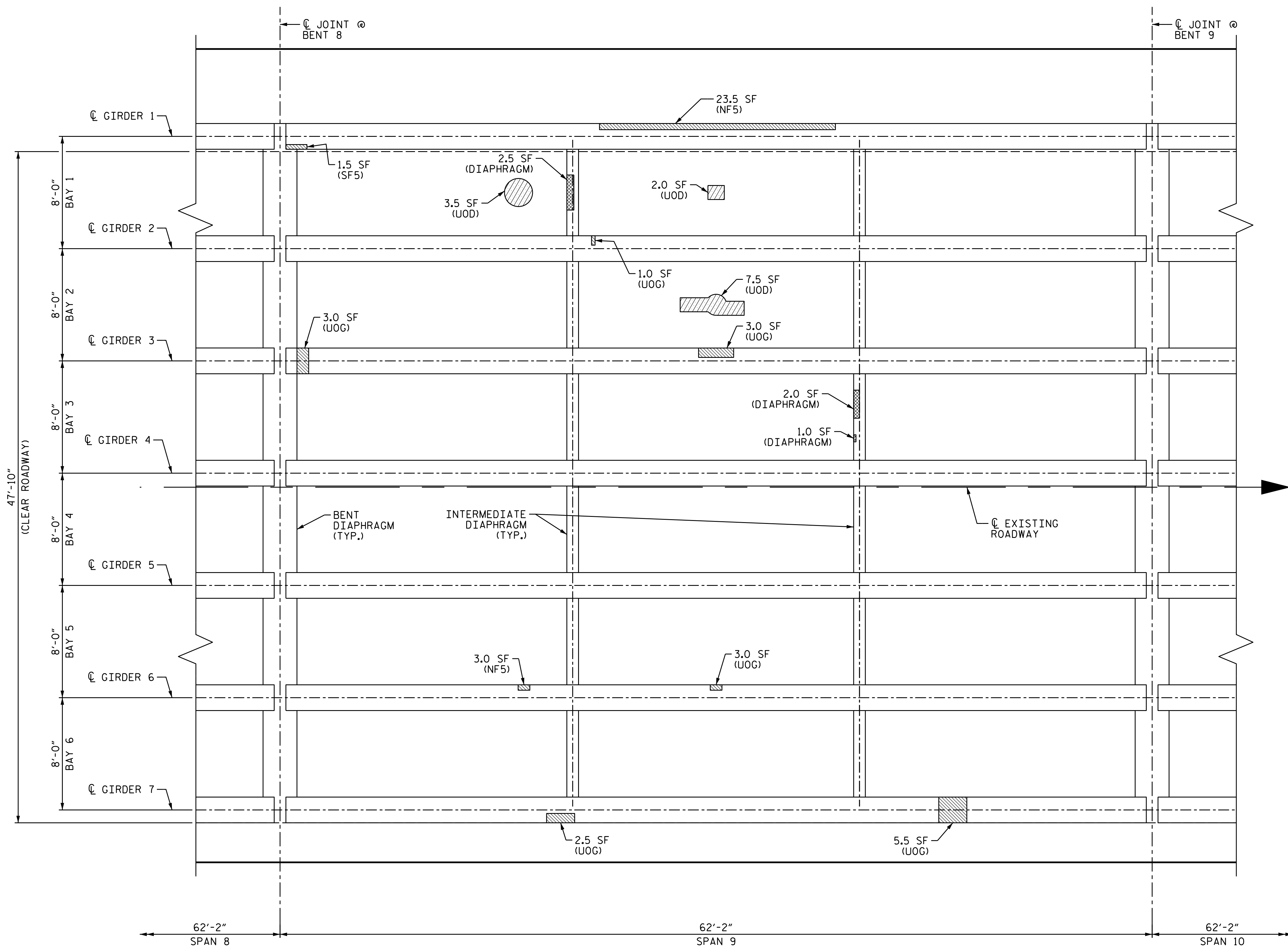
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434 FAYETTEVILLE STREET  
SUITE 1500  
RALEIGH, NC 27601  
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1			3			58
2			4			

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**PLAN OF SPANS**  
(UNDERSIDE)

LEGEND			
SF	SQUARE FEET		DIAPHRAGM REPAIR
(UOD)	UNDERSIDE OF DECK		GIRDER REPAIR
(BOH)	BOTTOM OF OVERHANG		DECK REPAIR
ERI	EPOXY RESIN INJECTION		

**REPAIR QUANTITY TABLE**

UNDERSIDE OF DECK	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK & OVERHANG	13.0	4.0		
BENT DIAPHRAGMS	5.5	2.0		
<b>GIRDER REPAIRS</b>				
PRESTRESSED GIRDERS	46.0	13.5		

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.

QUANTITIES ASSUME ALL SPALLS AND DELAMINATIONS TO BE 3.5" DEEP.

**NOTES**

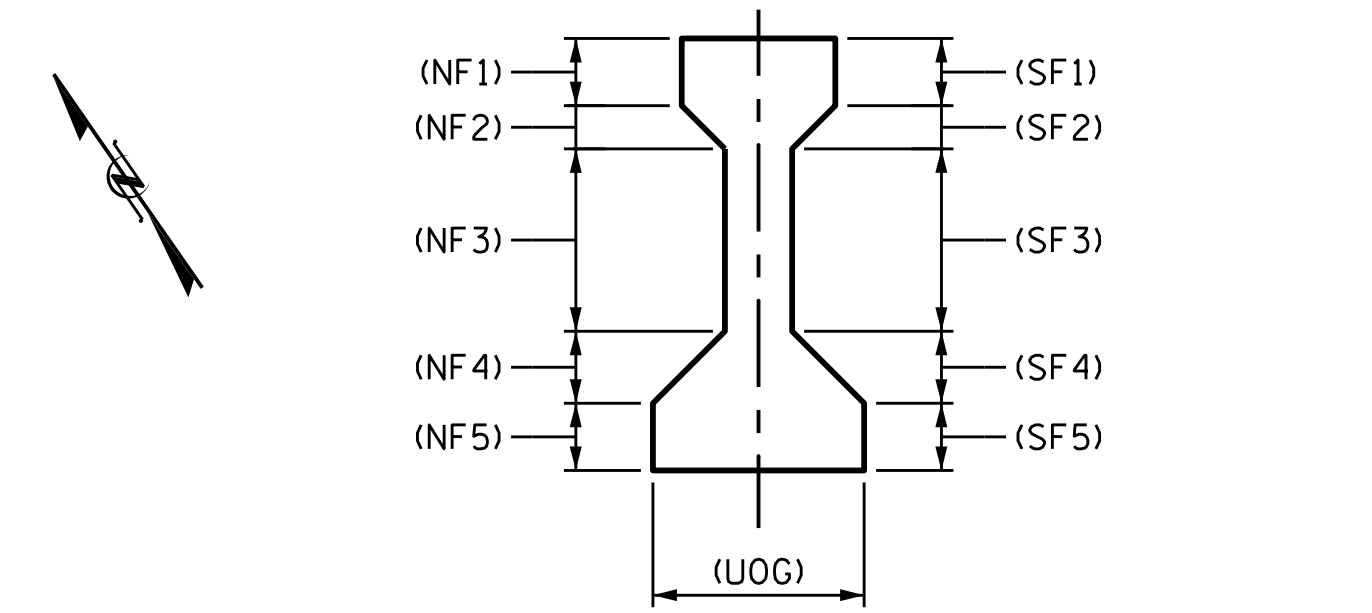
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FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

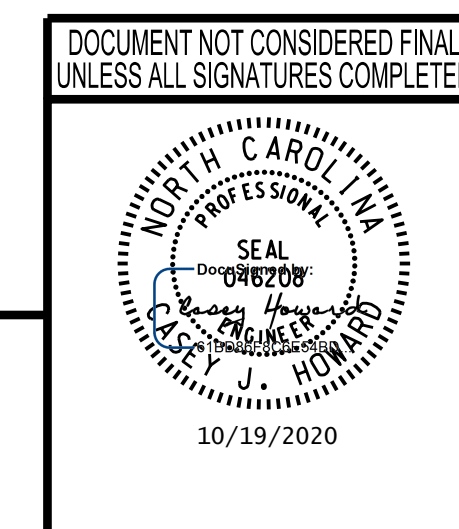


**TYPICAL GIRDER SECTION**  
DAMAGE OF GIRDER LOCATIONS

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021

SHEET 9 OF 14

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**GIRDER & DIAPHRAGM REPAIRS**  
SPAN 9

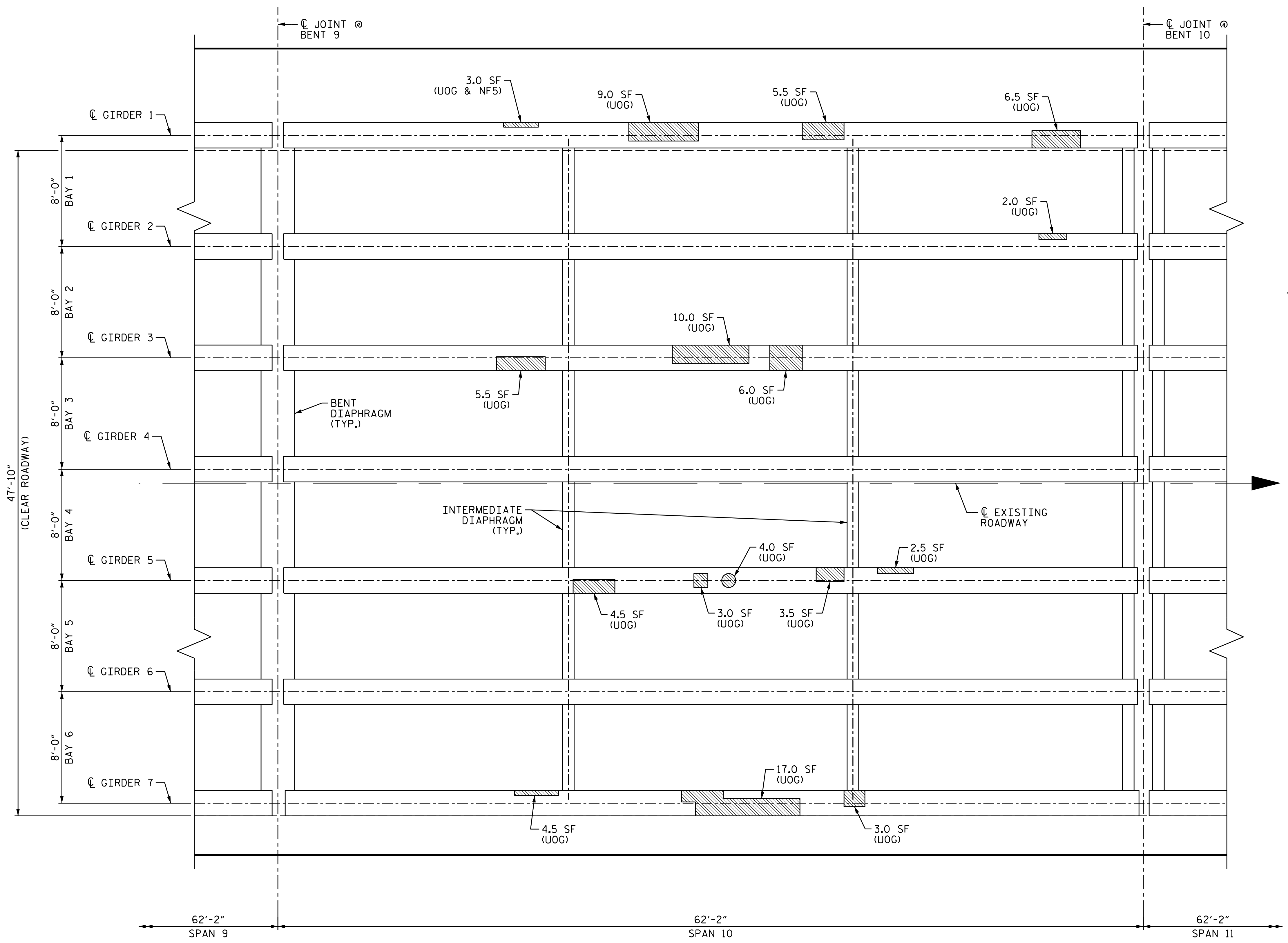


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WSP USA Inc.  
434 FAYETTEVILLE STREET  
SUITE 1500  
RALEIGH, NC 27601  
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2			4			

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**PLAN OF SPANS**  
(UNDERSIDE)

LEGEND			
SF	SQUARE FEET		DIAPHRAGM REPAIR
(UOD)	UNDERSIDE OF DECK		GIRDER REPAIR
(BOH)	BOTTOM OF OVERHANG		DECK REPAIR
ERI	EPOXY RESIN INJECTION		

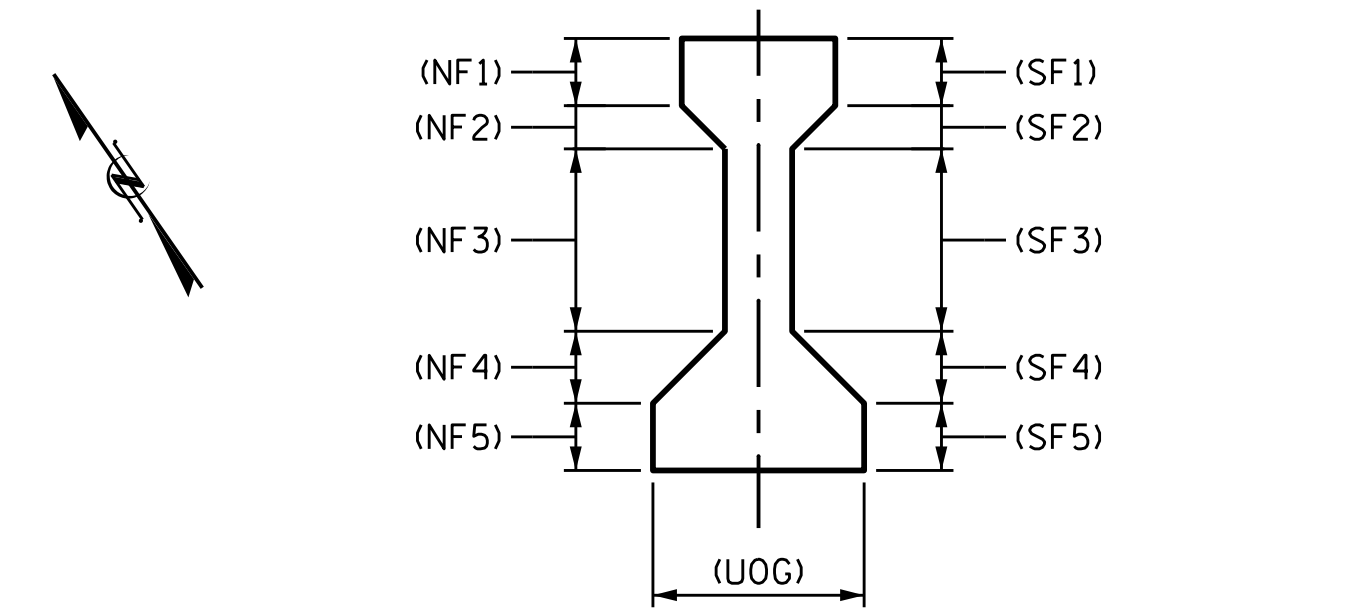
**REPAIR QUANTITY TABLE**

UNDERSIDE OF DECK	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK & OVERHANG				
BENT DIAPHRAGMS				
GIRDER REPAIRS				
PRESTRESSED GIRDERS	89.5	26.5		

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.  
QUANTITIES ASSUME ALL SPALLS AND DELAMINATIONS TO BE 3.5" DEEP.

**NOTES**

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FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.  
FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

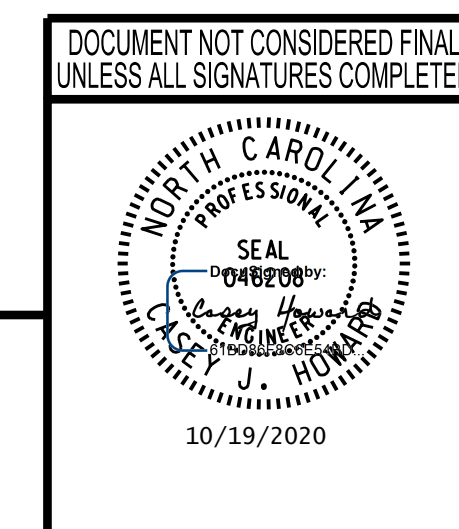


**TYPICAL GIRDER SECTION**  
DAMAGE OF GIRDER LOCATIONS

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021

SHEET 10 OF 14

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
GIRDER & DIAPHRAGM  
REPAIRS  
SPAN 10

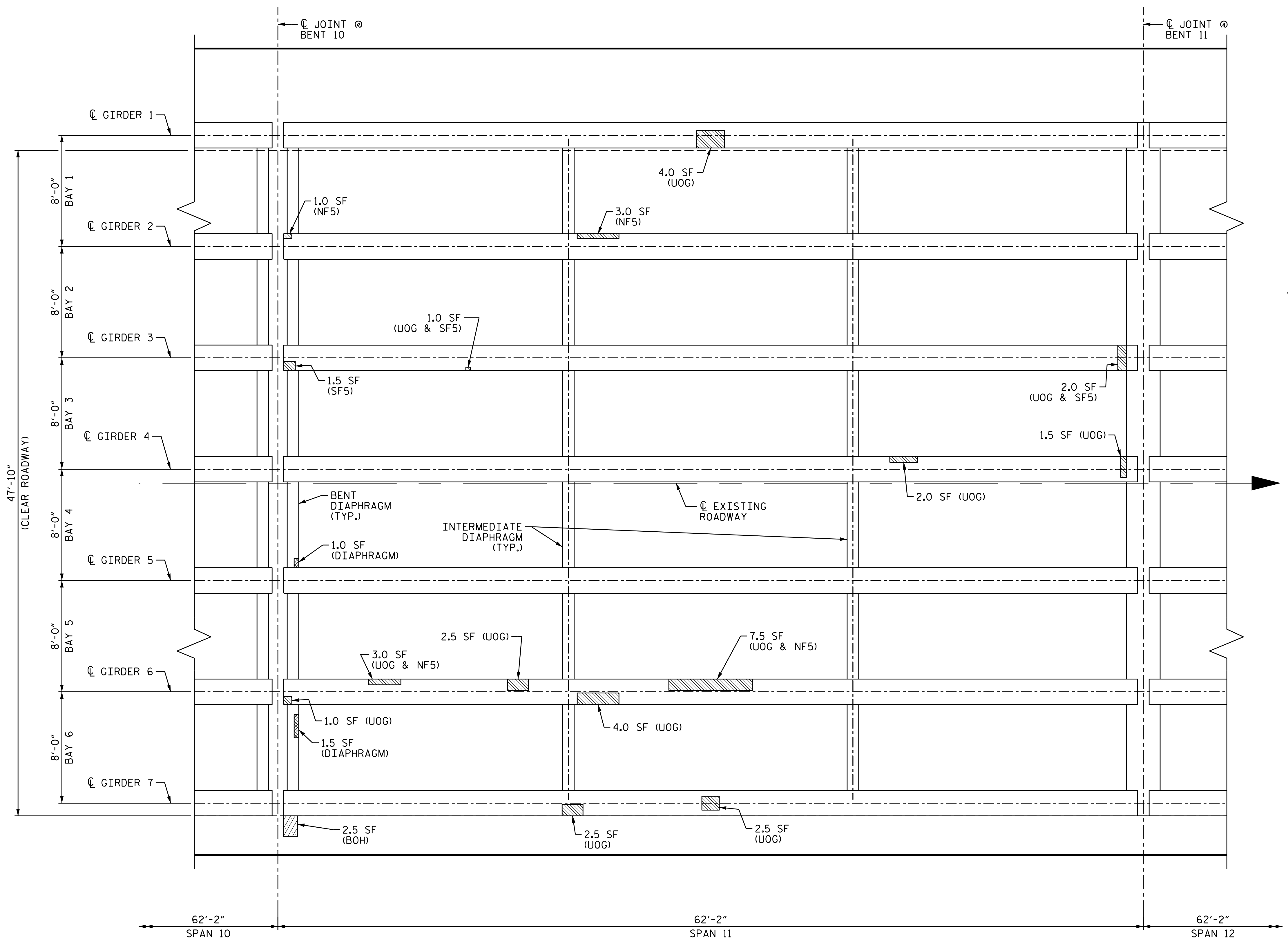


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SUITE 1500  
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REVISIONS						SHEET NO. S-18 TOTAL SHEETS 58
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2			4			

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**PLAN OF SPANS**  
(UNDERSIDE)

LEGEND			
SF	SQUARE FEET		DIAPHRAGM REPAIR
(UOD)	UNDERSIDE OF DECK		GIRDER REPAIR
(BOH)	BOTTOM OF OVERHANG		DECK REPAIR
ERI	EPOXY RESIN INJECTION		

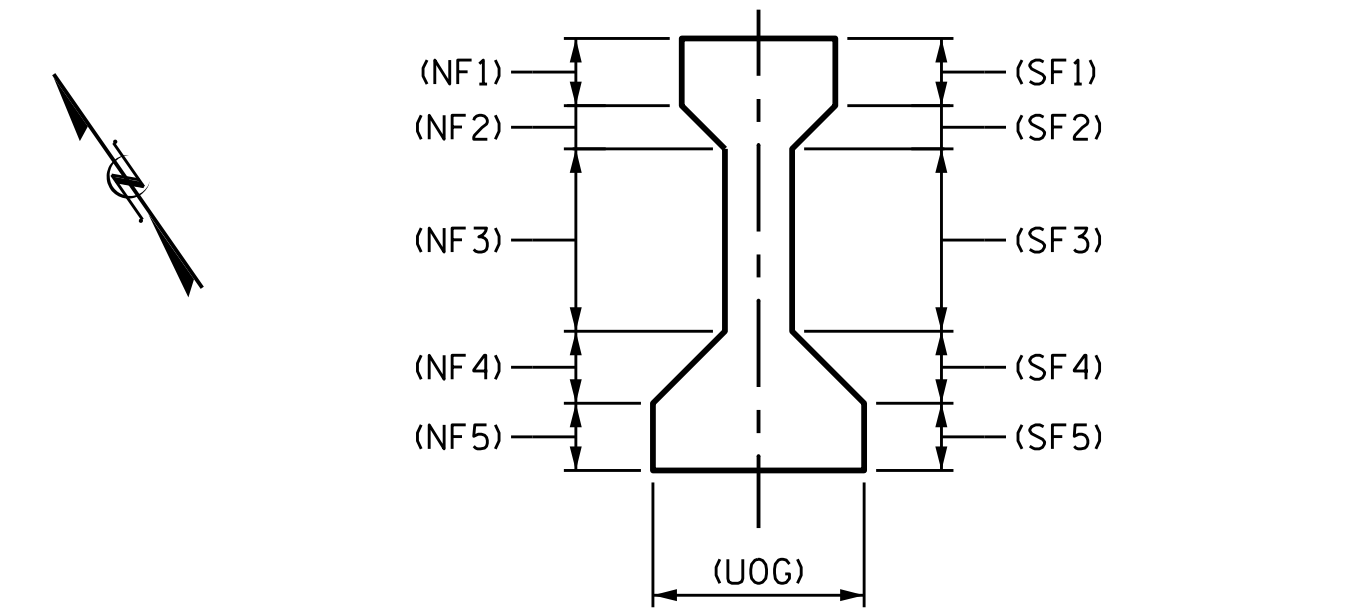
**REPAIR QUANTITY TABLE**

UNDERSIDE OF DECK	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK & OVERHANG	2.5	1.0		
BENT DIAPHRAGMS	2.5	1.0		
<b>GIRDER REPAIRS</b>				
PRESTRESSED GIRDERS	39.0	11.5		

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.  
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**NOTES**

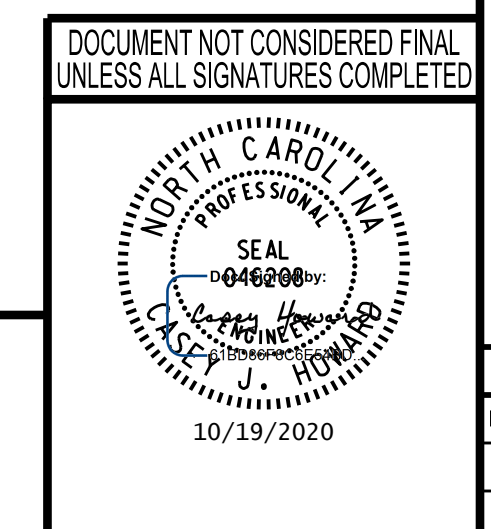
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FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.  
FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.



**TYPICAL GIRDER SECTION**  
DAMAGE OF GIRDER LOCATIONS

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021

SHEET 11 OF 14



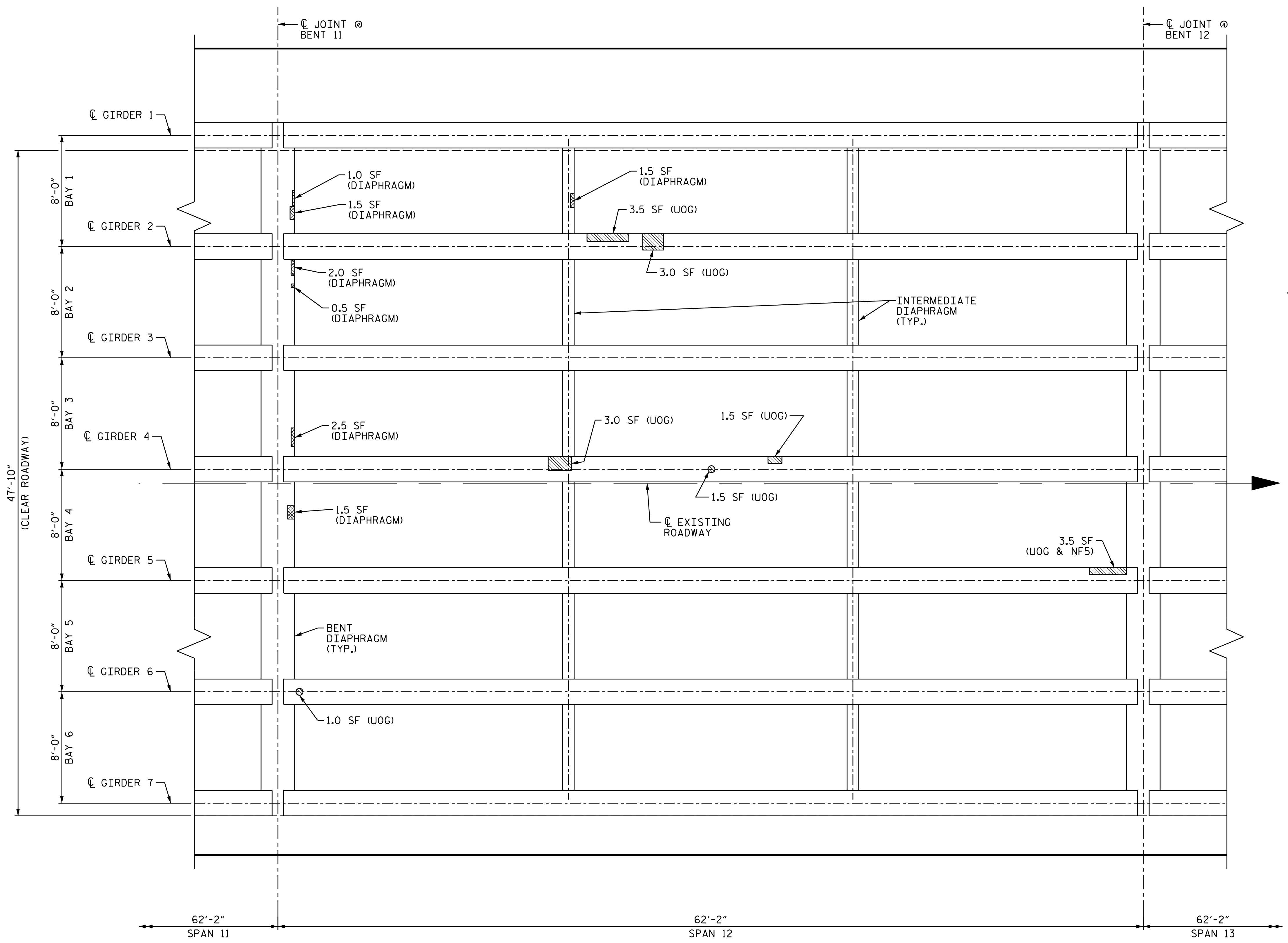
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RALEIGH  
SUPERSTRUCTURE  
**GIRDER & DIAPHRAGM REPAIRS**  
SPAN 11

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

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434 FAYETTEVILLE STREET  
SUITE 1500  
RALEIGH, NC 27601  
TEL: 1.919.836.4040  
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**PLAN OF SPANS**  
(UNDERSIDE)

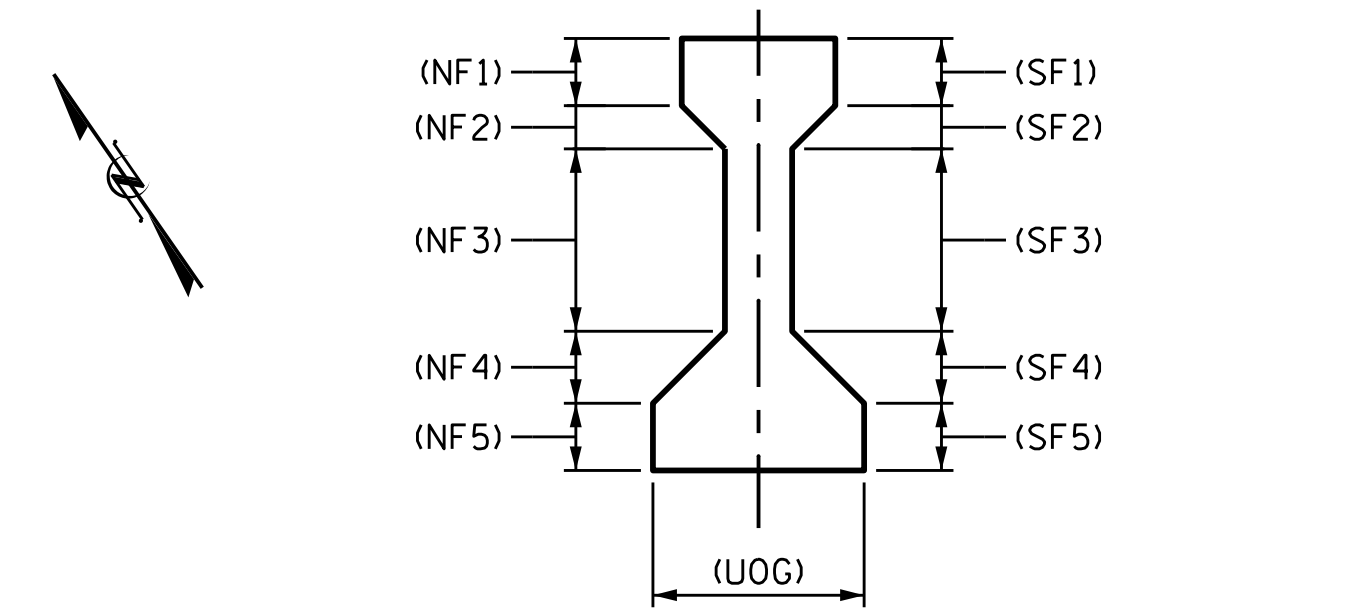
LEGEND			
SF	SQUARE FEET		DIAPHRAGM REPAIR
(UOD)	UNDERSIDE OF DECK		GIRDER REPAIR
(BOH)	BOTTOM OF OVERHANG		DECK REPAIR
ERI	EPOXY RESIN INJECTION		

REPAIR QUANTITY TABLE				
UNDERSIDE OF DECK	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK & OVERHANG				
BENT DIAPHRAGMS	10.5	3.0		
GIRDER REPAIRS				
PRESTRESSED GIRDERS	17.0	5.0		

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.  
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FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.  
FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.



**TYPICAL GIRDER SECTION**  
DAMAGE OF GIRDER LOCATIONS

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021  
SHEET 12 OF 14

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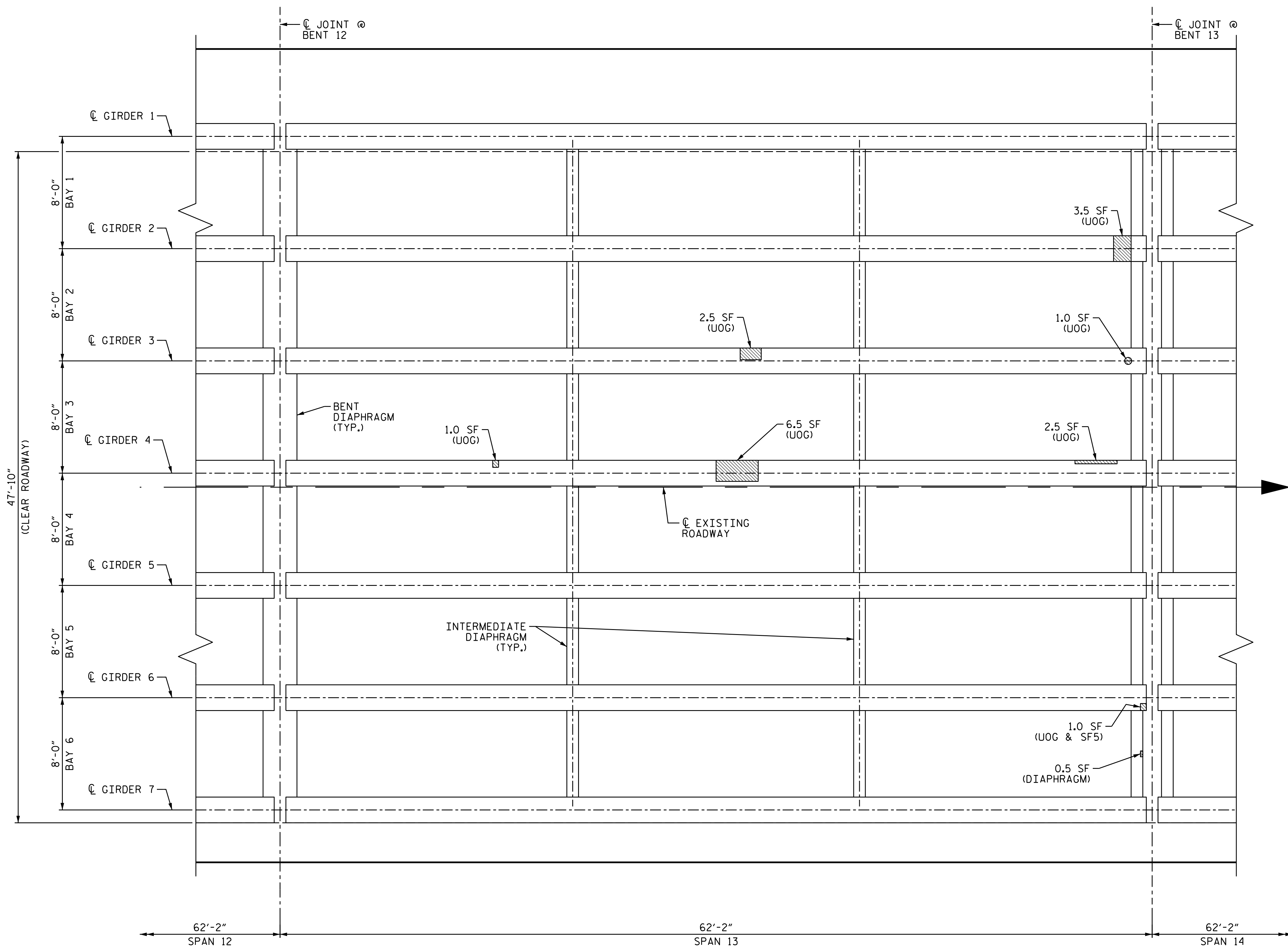
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RALEIGH

SUPERSTRUCTURE  
GIRDER & DIAPHRAGM  
REPAIRS  
SPAN 12

REVISIONS						SHEET NO. S-20 TOTAL SHEETS 58
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

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**PLAN OF SPANS**  
(UNDERSIDE)

LEGEND			
SF	SQUARE FEET		DIAPHRAGM REPAIR
(UOD)	UNDERSIDE OF DECK		GIRDER REPAIR
(BOH)	BOTTOM OF OVERHANG		DECK REPAIR
ERI	EPOXY RESIN INJECTION		

**REPAIR QUANTITY TABLE**

UNDERSIDE OF DECK	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK & OVERHANG				
BENT DIAPHRAGMS	0.5	0.5		
<b>GIRDER REPAIRS</b>				
PRESTRESSED GIRDERS	18.0	5.5		

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.

QUANTITIES ASSUME ALL SPALLS AND DELAMINATIONS TO BE 3.5" DEEP.

**NOTES**

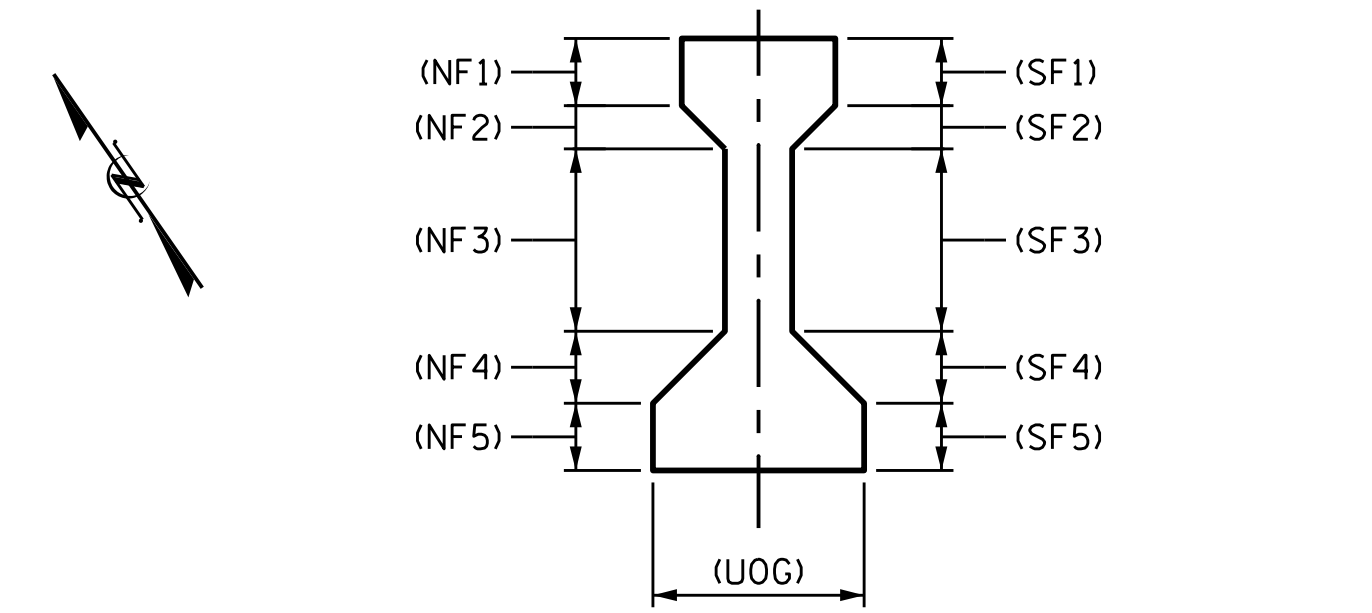
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FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.



**TYPICAL GIRDER SECTION**  
DAMAGE OF GIRDER LOCATIONS

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021

SHEET 13 OF 14

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**GIRDER & DIAPHRAGM REPAIRS**  
SPAN 13

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REVISIONS						SHEET NO. S-21 TOTAL SHEETS 58
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			

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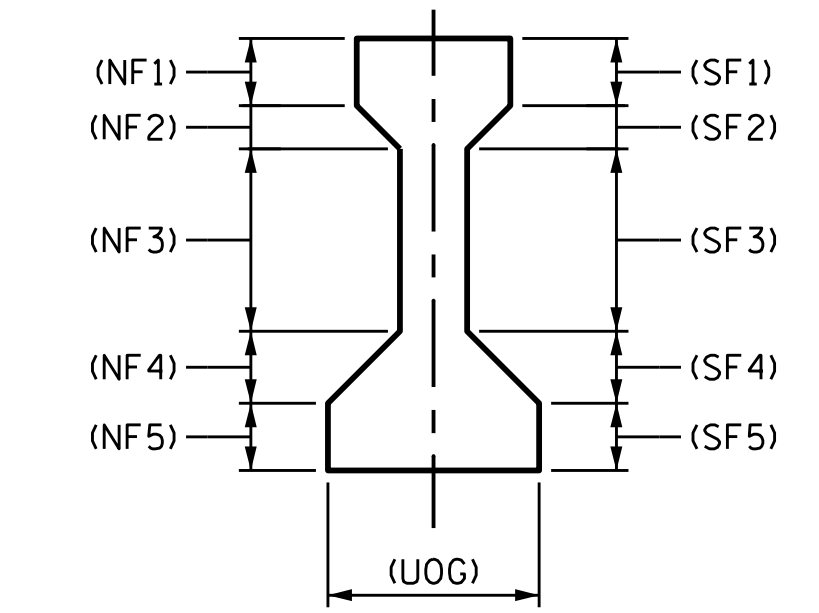
### REPAIR QUANTITY TABLE

UNDERSIDE OF DECK	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
UNDERSIDE OF DECK & OVERHANG				
BENT DIAPHRAGMS	13.5	4.0		
GIRDER REPAIRS				
PRESTRESSED GIRDERS	18.5	5.5		

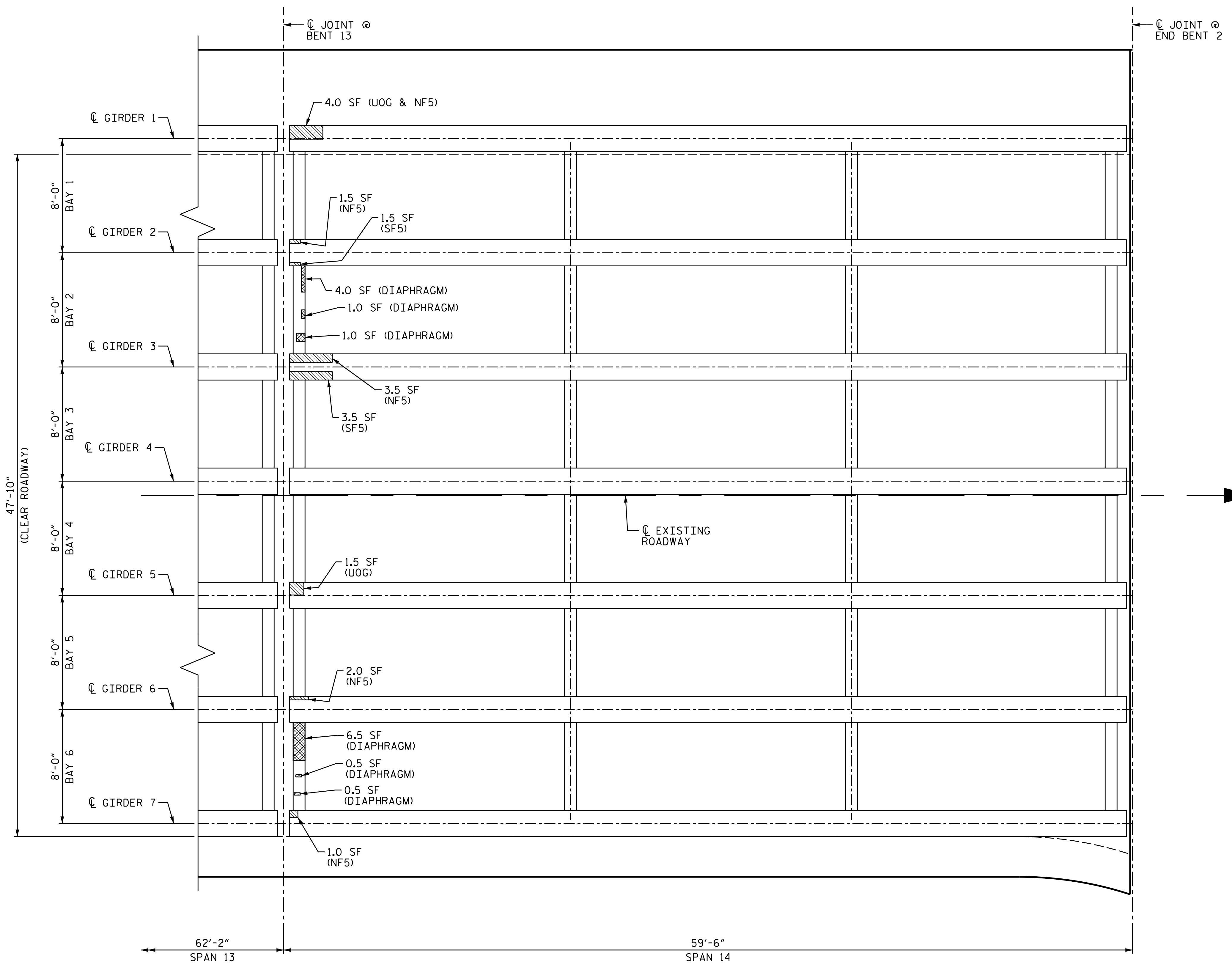
VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 2" CLEAR TO SAWCUT, SEE REPAIR DETAILS.  
 QUANTITIES ASSUME ALL SPALLS AND DELAMINATIONS TO BE 3.5" DEEP.

### NOTES

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE, IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE INSPECTOR OR ENGINEER THE CONTRACTOR SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE REPAIR QUANTITY TABLE.  
 SPANS WILL RECEIVE FULL LENGTH TSA COATING, SEE "PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE" SPECIAL PROVISIONS AND SHEETS S-28 THRU S-29.  
 FOR PRESTRESSED GIRDER AND BENT DIAPHRAGM REPAIR DETAILS, SEE "TYPICAL GIRDER AND DIAPHRAGM REPAIR DETAILS" SHEET S-30.  
 FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.  
 FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.



TYPICAL GIRDER SECTION  
 DAMAGE OF GIRDER LOCATIONS

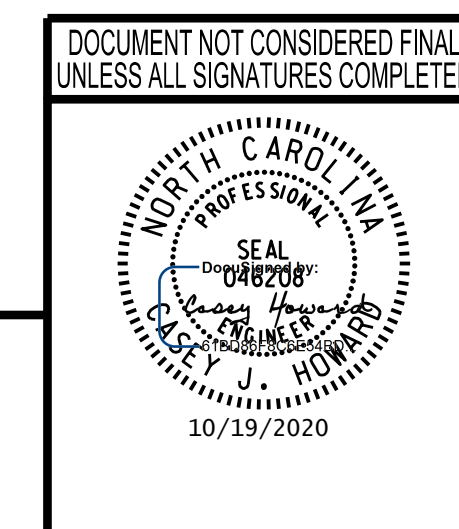


PLAN OF SPANS  
 (UNDERSIDE)

LEGEND			
SF	SQUARE FEET		DIAPHRAGM REPAIR
(UOD)	UNDERSIDE OF DECK		GIRDER REPAIR
(BOH)	BOTTOM OF OVERHANG		DECK REPAIR
ERI	EPOXY RESIN INJECTION		

PROJECT NO. 15BPR.19  
 NEW HANOVER COUNTY  
 BRIDGE NO. 640021  
 SHEET 14 OF 14

STATE OF NORTH CAROLINA  
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 RALEIGH  
 SUPERSTRUCTURE  
 GIRDER & DIAPHRAGM  
 REPAIRS  
 SPAN 14



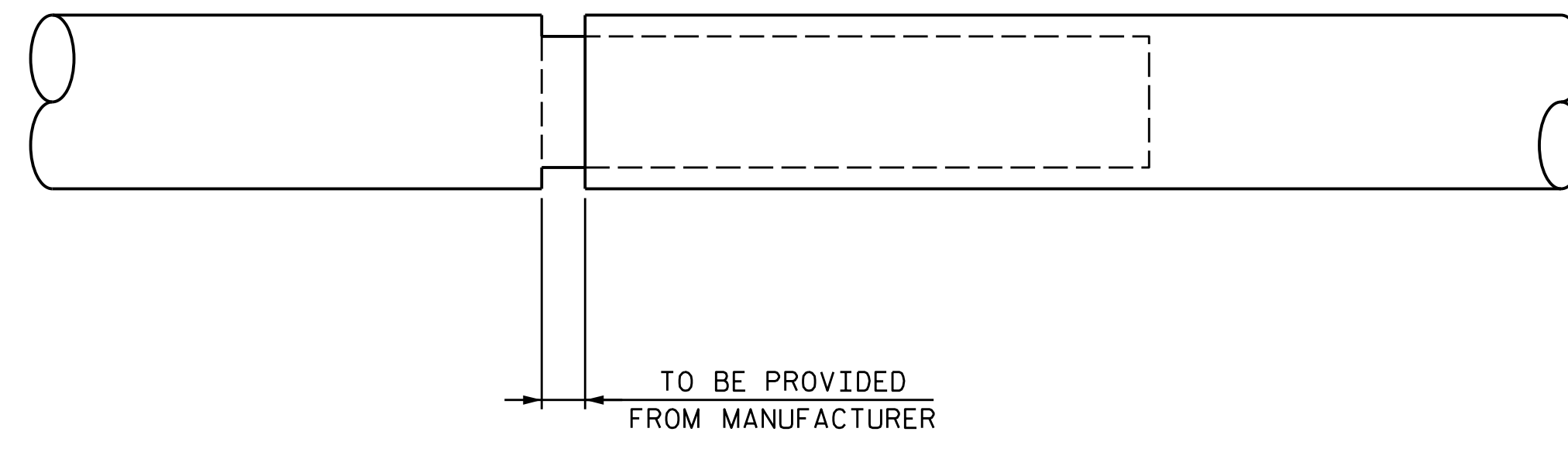
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-22
2			4			TOTAL SHEETS 58

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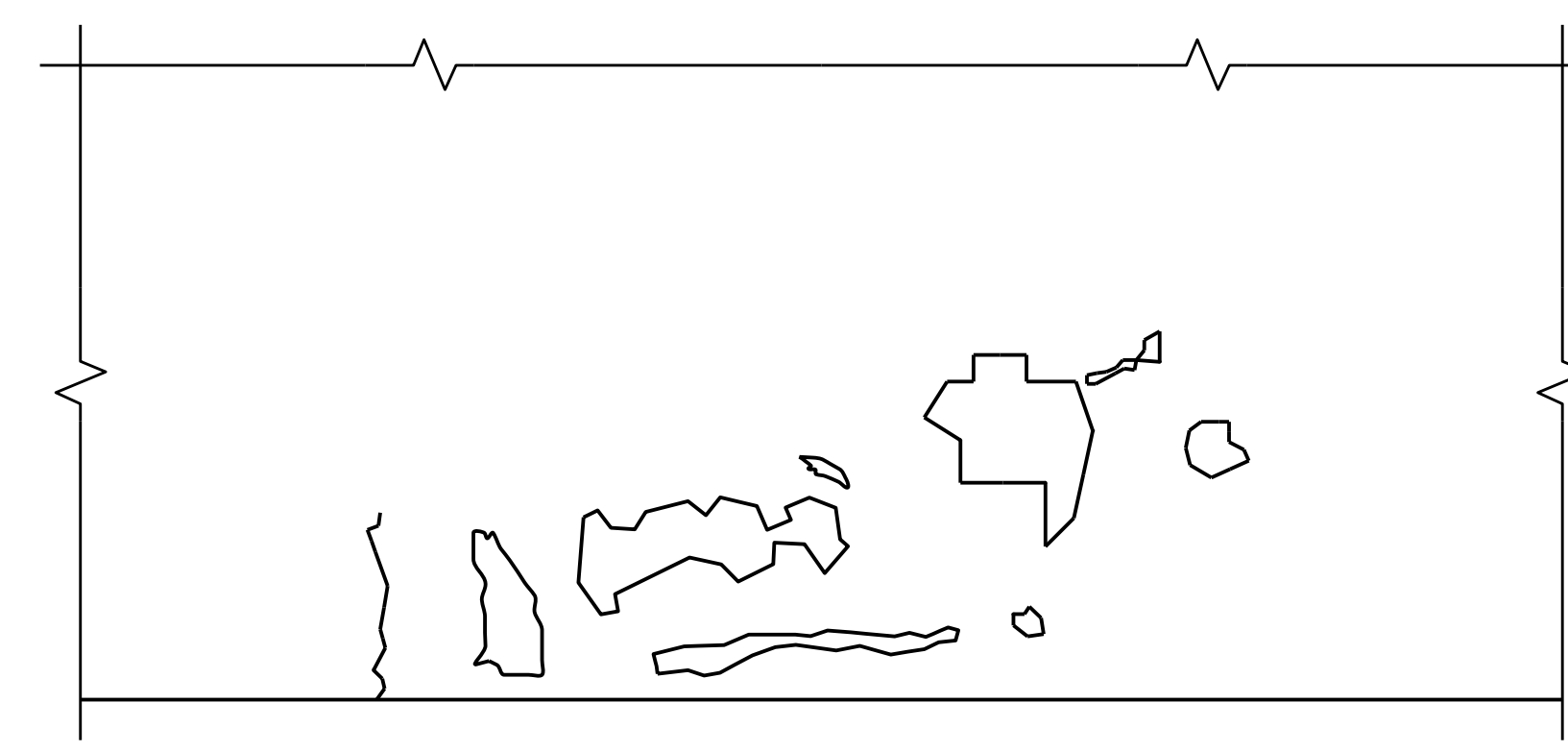


RAIL SPLICE DETAIL

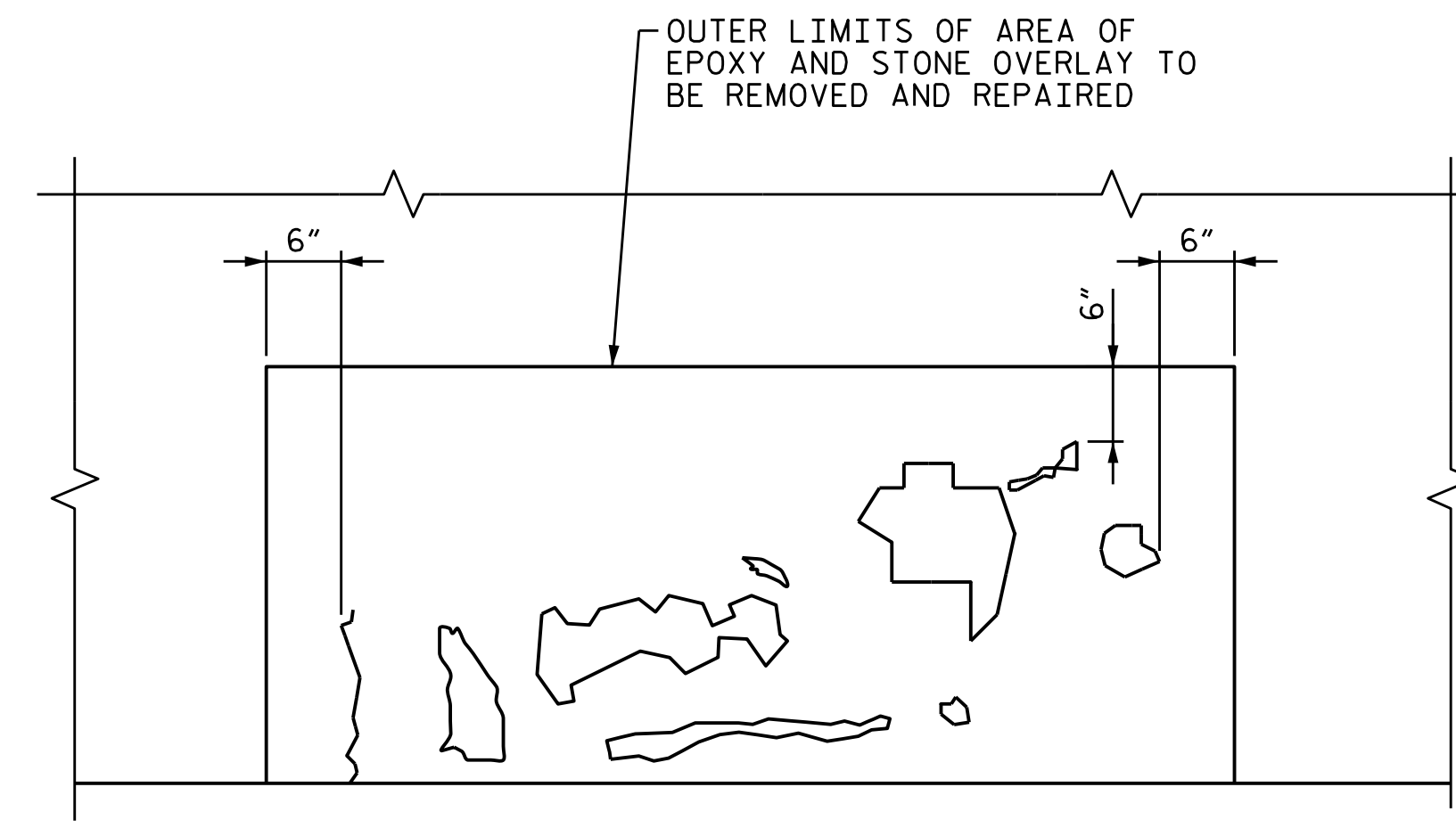
NOTES

ALL SPLICES SHALL MATCH THE RAIL SPLICE DETAIL AS SHOWN AND BE INCORPORATED INTO THE SHOP DRAWINGS THAT WILL BE PROVIDED BY OTHERS.

SPLICE LOCATIONS WILL BE REQUIRED AT BENTS 1, 4, 7 AND 10. IF THERE ARE ADDITIONAL SPLICES REQUIRED THEY SHALL BE REFLECTED ON THE SHOP DRAWINGS AND APPROVED BY THE ENGINEER.



PLAN  
DAMAGED AREAS OF EPOXY AND STONE OVERLAY



PLAN  
LIMITS OF EPOXY AND STONE OVERLAY TO BE REPAIRED

NOTE

FOR EPOXY OVERLAY SYSTEM (FOR ADT>5,000), SEE SPECIAL PROVISIONS.

EPOXY OVERLAY SYSTEM REPAIR

REPAIR OF APPROACH SLAB AT END BENT 1 RIGHT SIDE

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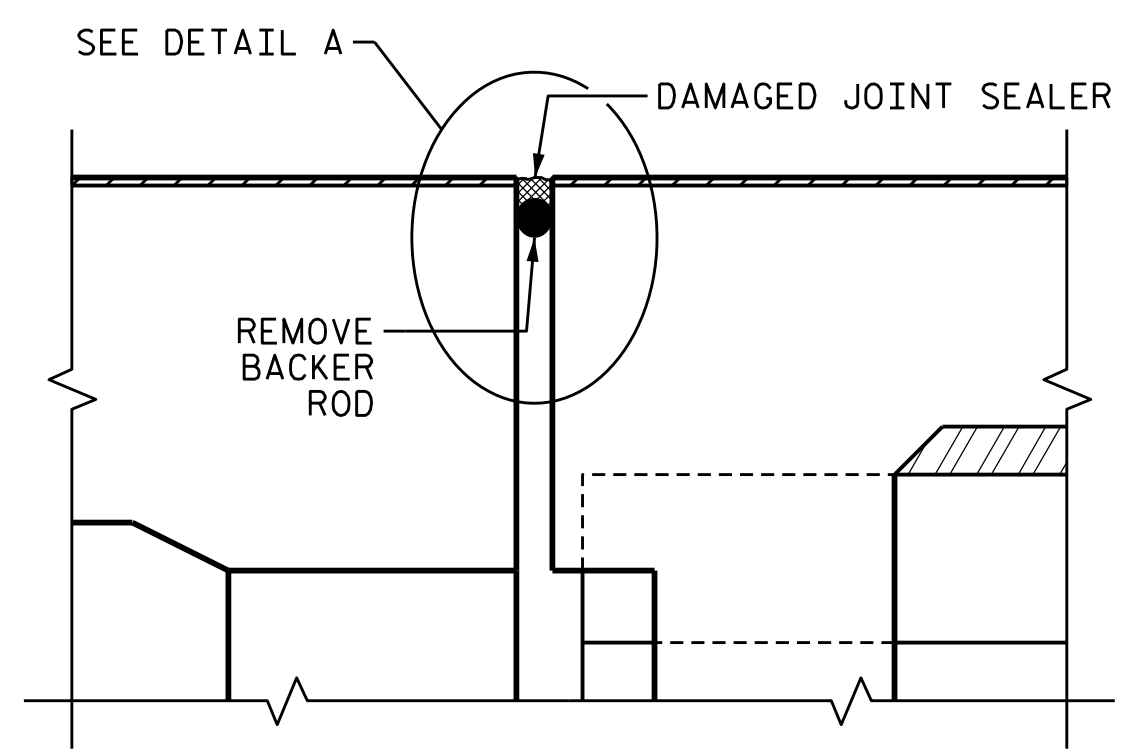
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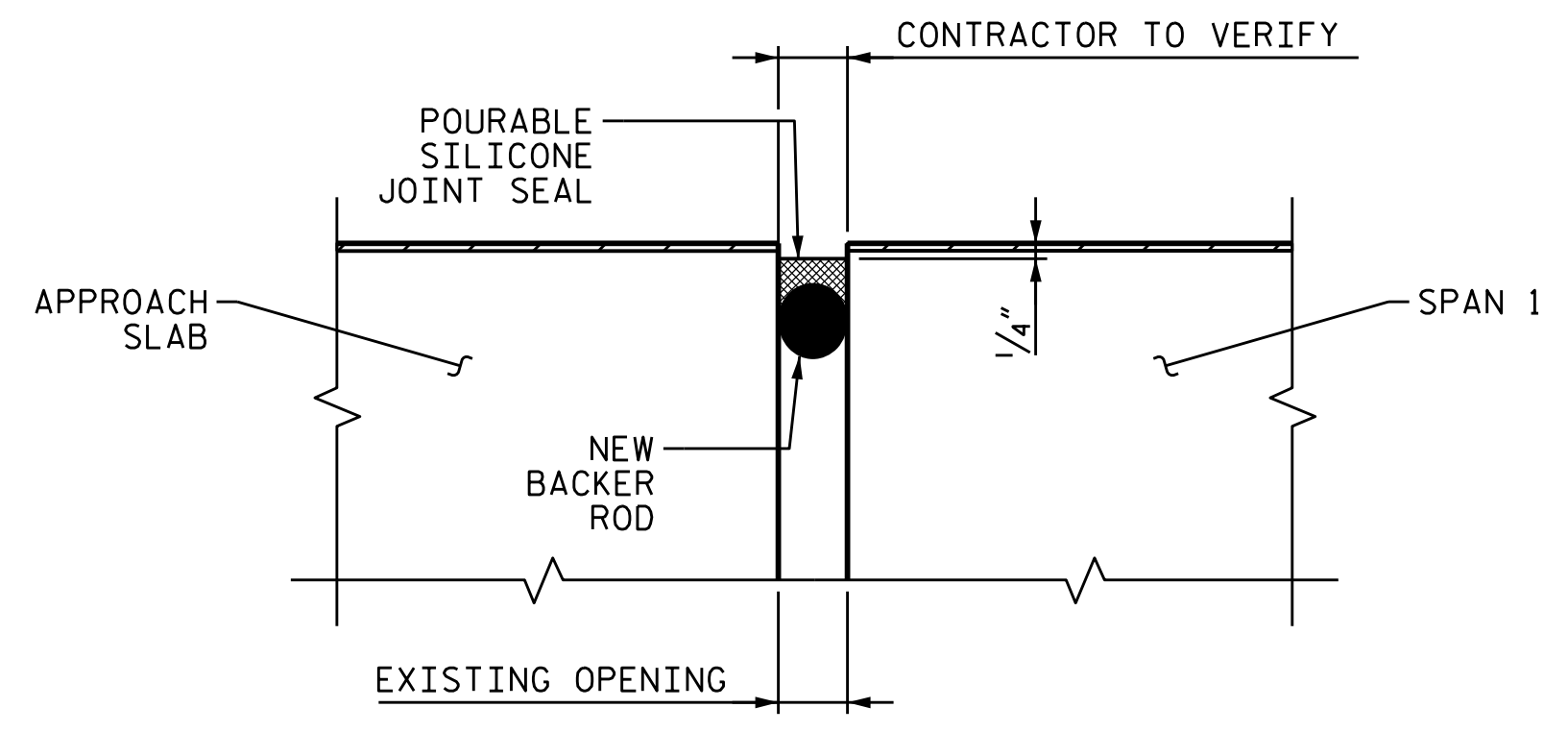
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 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 EPOXY OVERLAY AND  
 RAIL SPLICE  
 DETAILS

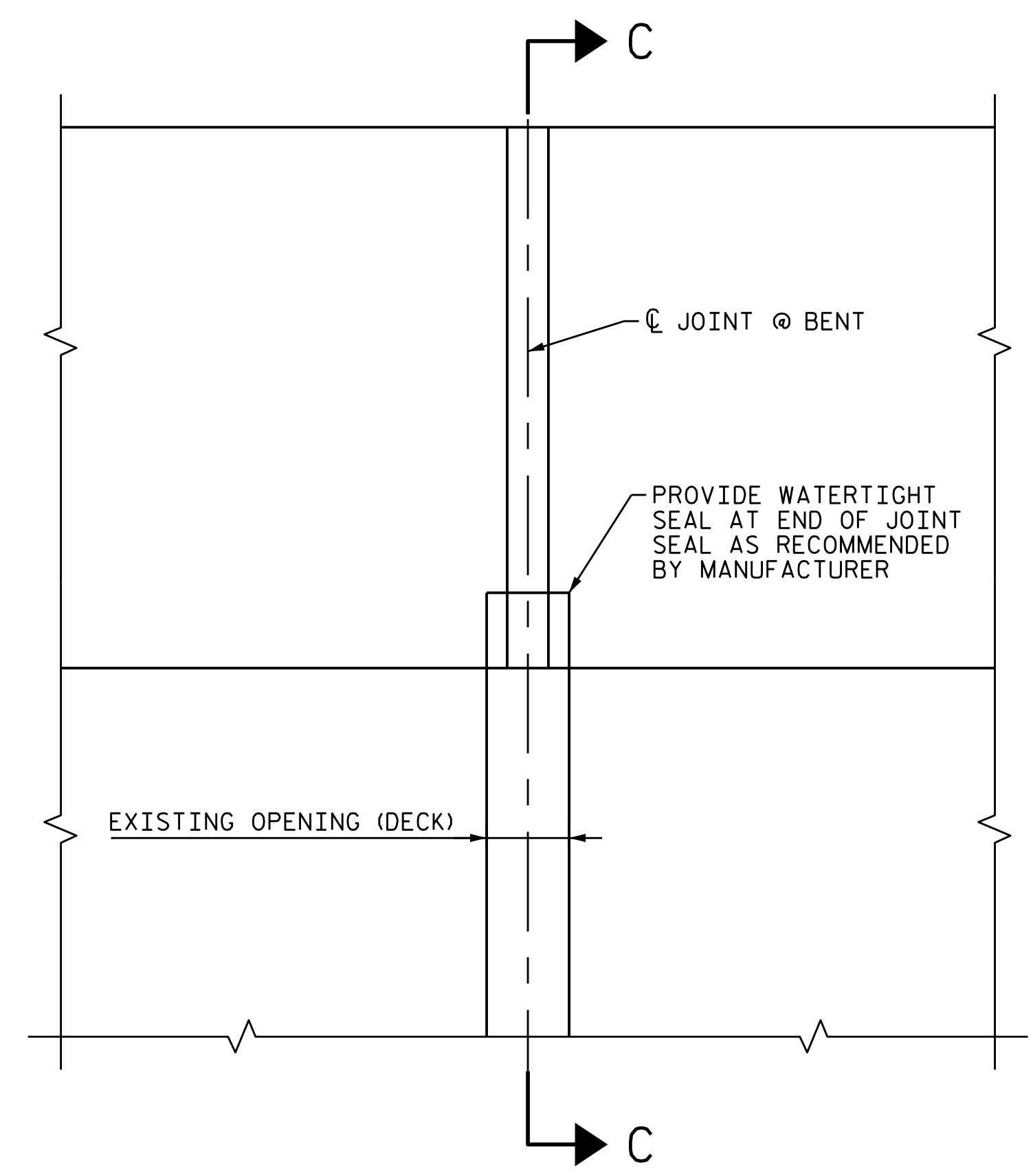
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-23
2			4			TOTAL SHEETS 58



SECTION A-A  
(EXISTING JOINT AT END BENT 1)



DETAIL A



PLAN SECTION B-B

NOTES FOR SECTION A-A

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

THE MANUFACTURER IS TO PROVIDE THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE BACKER ROD FOR THE SIZE OF THE OPENING ON THE PLANS AND ACCOMMODATE THE MINIMUM EXPANSION SHOWN ON THE PLANS.

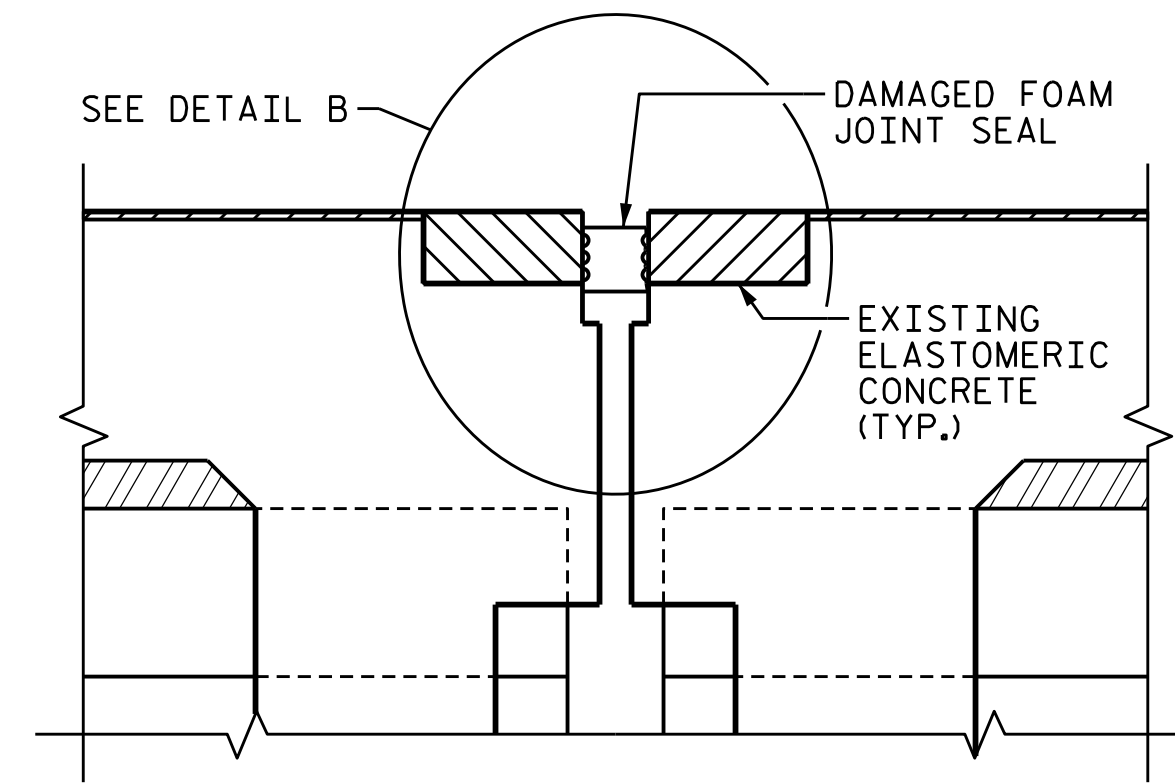
POURABLE SILICONE JOINTS SHALL BE INSTALLED AS PER THE MANUFACTURER'S RECOMMENDATIONS.

THE CONTRACTOR SHALL TAKE CARE DURING JOINT REHAB OPERATIONS NOT TO DROP ANY MATERIAL BELOW BRIDGE, WITHOUT PROTECTIVE DEVICES BELOW TO CATCH THE MATERIAL. ANY MATERIAL THAT FALLS BELOW THE BRIDGE SHALL BE CONTAINED, REMOVED AND DISPOSED BY THE CONTRACTOR AT NO EXTRA COST TO THE DEPARTMENT. IF THE ENGINEER DETERMINES THAT THE PROTECTIVE DEVICES ARE NOT ADEQUATE OR NOT BEING EMPLOYED, THE WORK SHALL BE SUSPENDED UNTIL ADEQUATE PROTECTION IS PROVIDED.

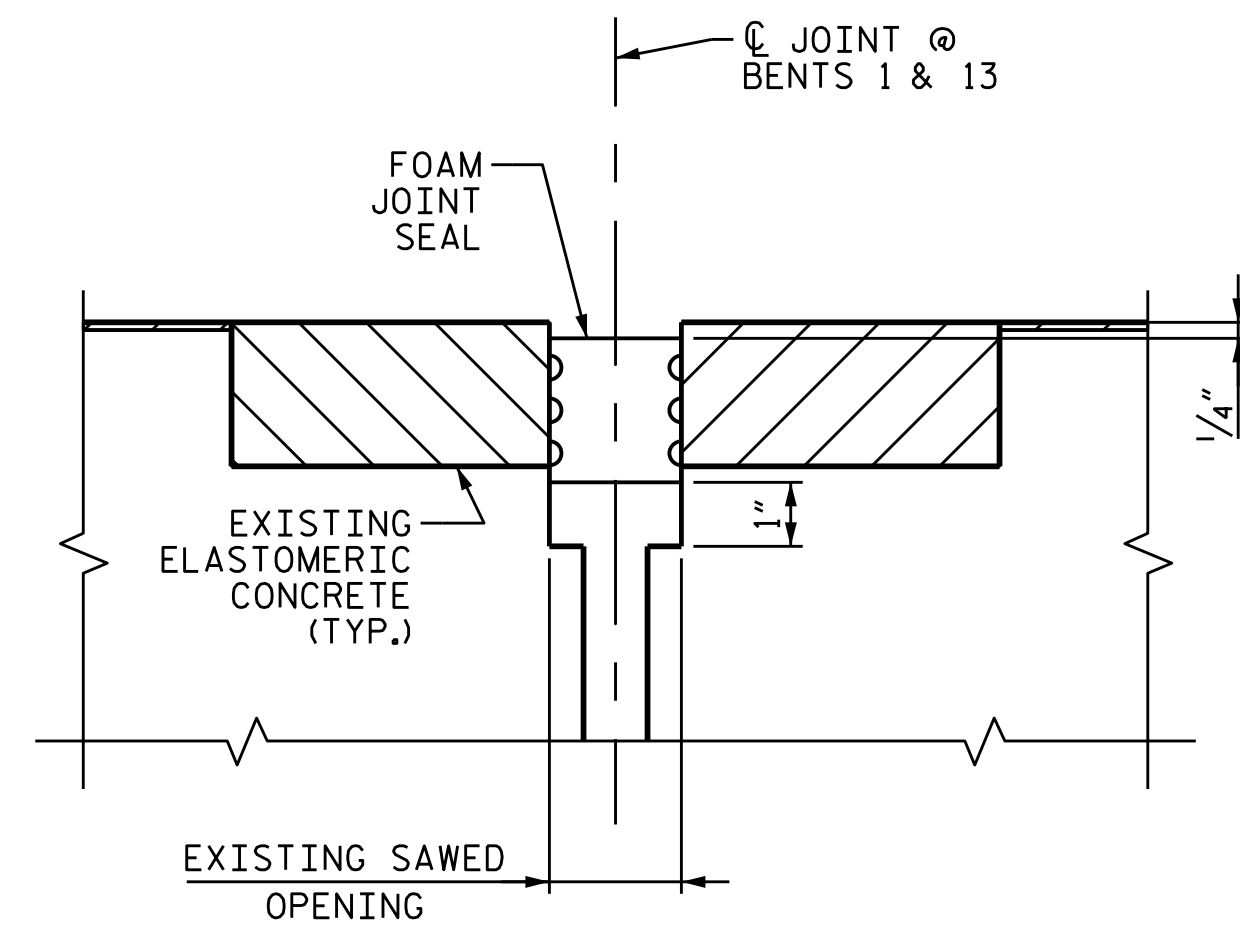
THE CONTRACTOR WILL NOT BE PERMITTED TO FORM THE JOINTS IN LIEU OF SAWING THE JOINTS.

THE INSTALLED POURABLE SILICONE JOINT SHALL BE WATER TIGHT.

FOR POURABLE SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.



SECTION B-B  
(EXISTING JOINT AT BENTS 1 & 13)



DETAIL B

NOTES FOR SECTION B-B

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

THE MANUFACTURER IS TO PROVIDE THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT FOR THE SIZE OF THE OPENING ON THE PLANS AND ACCOMMODATE THE MINIMUM EXPANSION SHOWN ON THE PLANS.

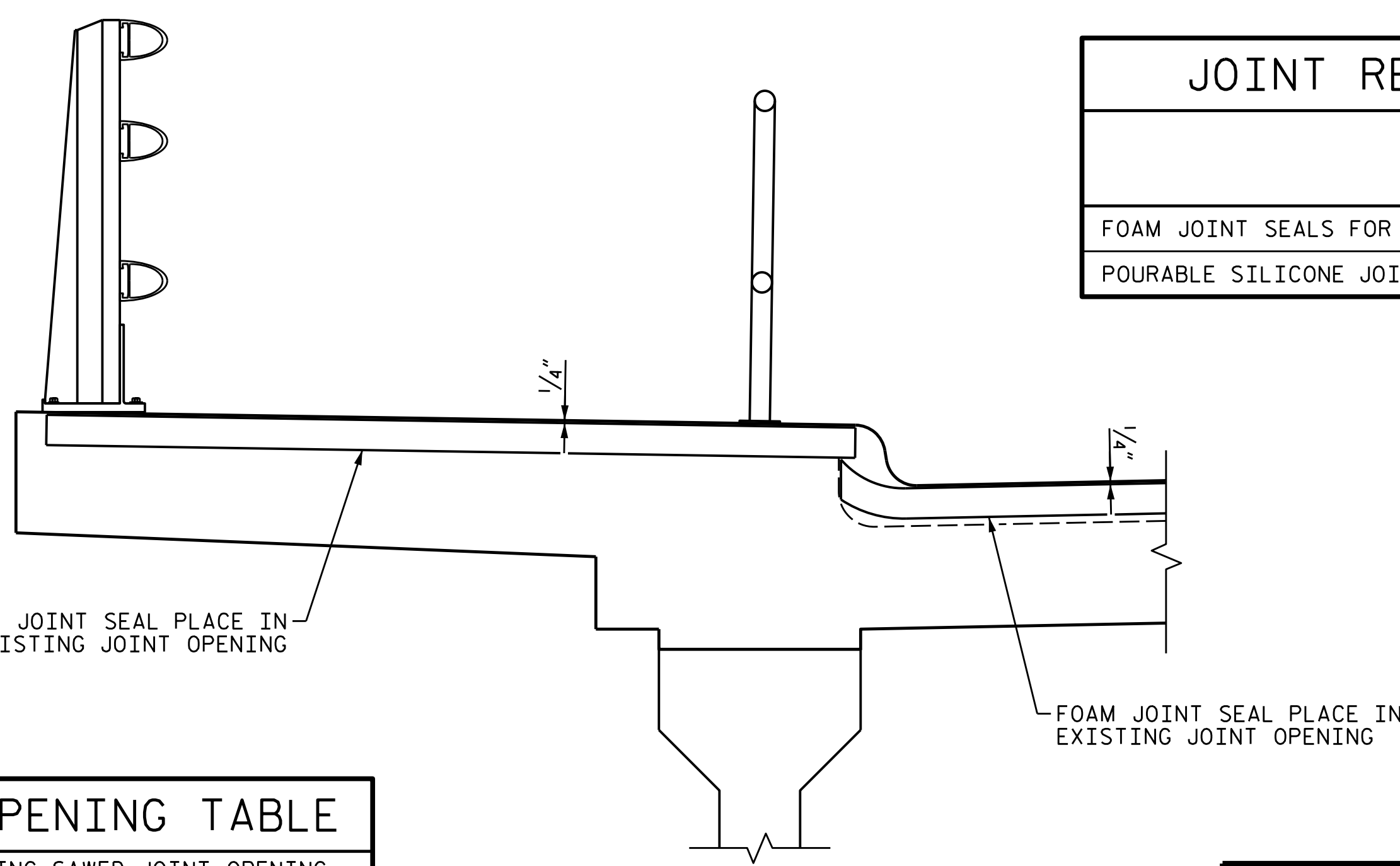
FOAM JOINTS SHALL BE INSTALLED AS PER THE MANUFACTURER'S RECOMMENDATIONS.

THE CONTRACTOR SHALL TAKE CARE DURING JOINT REHAB OPERATIONS NOT TO DROP ANY MATERIAL BELOW BRIDGE, WITHOUT PROTECTIVE DEVICES BELOW TO CATCH THE MATERIAL. ANY MATERIAL THAT FALLS BELOW THE BRIDGE SHALL BE CONTAINED, REMOVED AND DISPOSED BY THE CONTRACTOR AT NO EXTRA COST TO THE DEPARTMENT. IF THE ENGINEER DETERMINES THAT THE PROTECTIVE DEVICES ARE NOT ADEQUATE OR NOT BEING EMPLOYED, THE WORK SHALL BE SUSPENDED UNTIL ADEQUATE PROTECTION IS PROVIDED.

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

THE INSTALLED FOAM JOINT SHALL BE WATER TIGHT.

FOR FOAM JOINT SEALS FOR PRESERVATION, SEE SPECIAL PROVISIONS.



SECTION C-C

JOINT REPAIR QUANTITY TABLE		
	ESTIMATE	ACTUAL
	LENGTH LN. FT.	LENGTH LN. FT.
FOAM JOINT SEALS FOR PRESERVATION	116.0	
POURABLE SILICONE JOINT SEALANT	58.0	

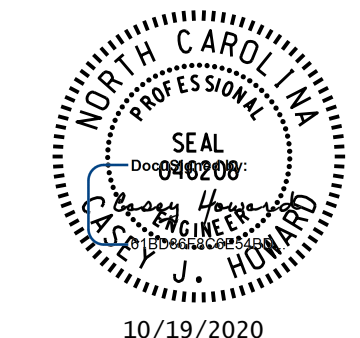
SAWED JOINT OPENING TABLE

	EXISTING SAWED JOINT OPENING (PERPENDICULAR TO JOINT)		
	AT 45°	AT 60°	AT 90°
END BENT 1	2 1/16"	2 1/2"	2 3/4"
BENT 1	2 1/16"	2 1/2"	2 3/4"
BENT 13	2 1/16"	2 1/2"	2 3/4"

PROJECT NO. 15BPR.19  
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BRIDGE NO. 640021

STATE OF NORTH CAROLINA  
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SUPERSTRUCTURE  
JOINT REPAIR  
DETAILS

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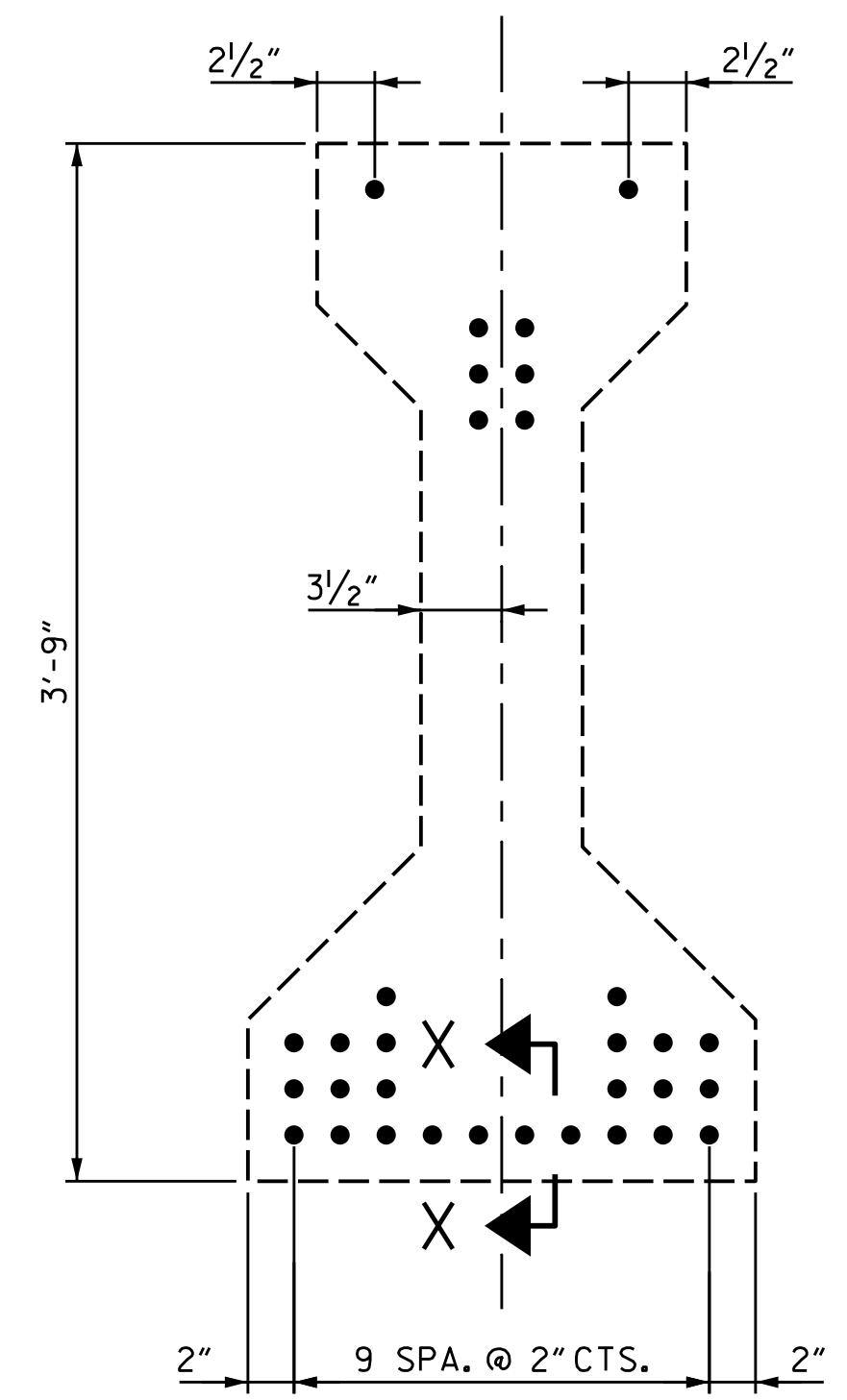


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2			4			

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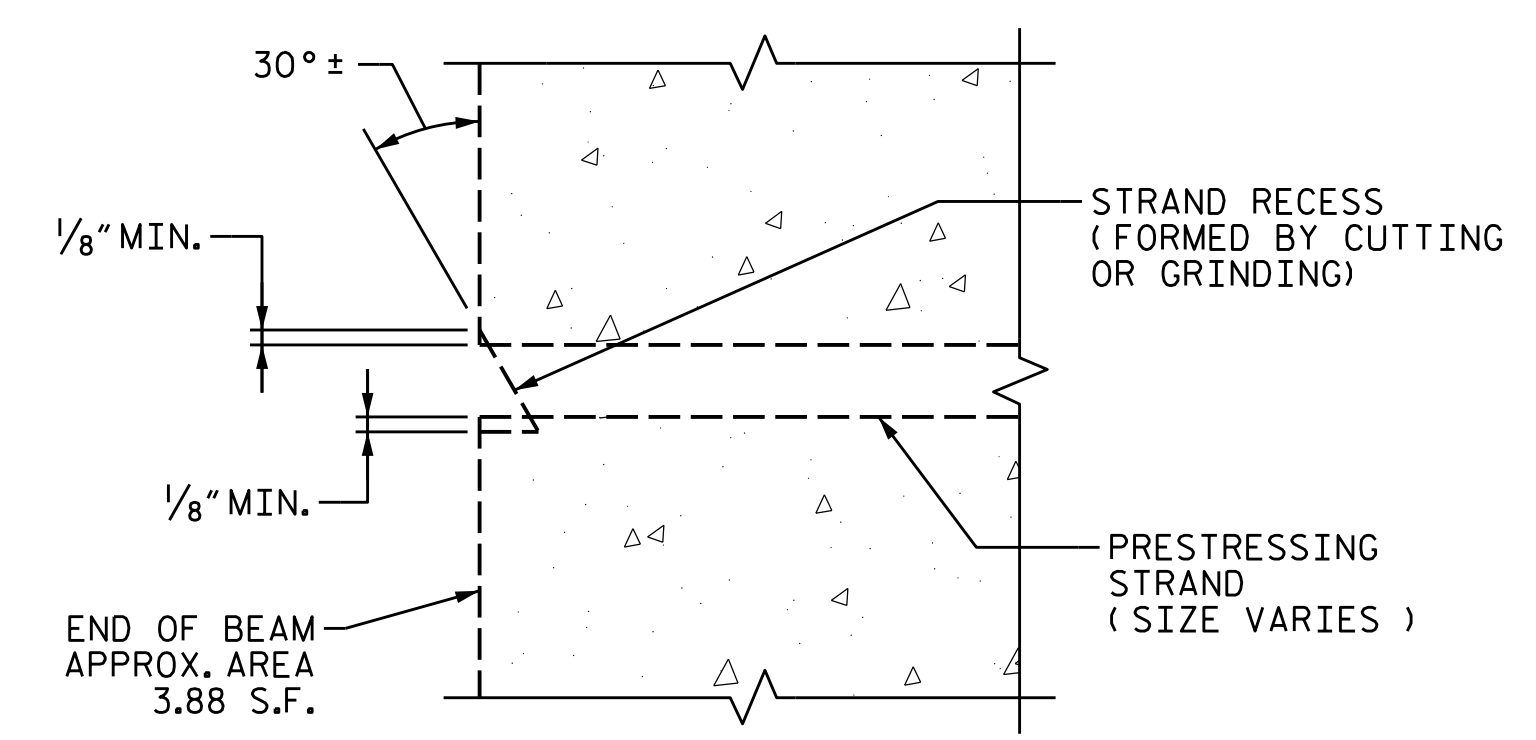


STANDARD PATTERN AT BEAM END

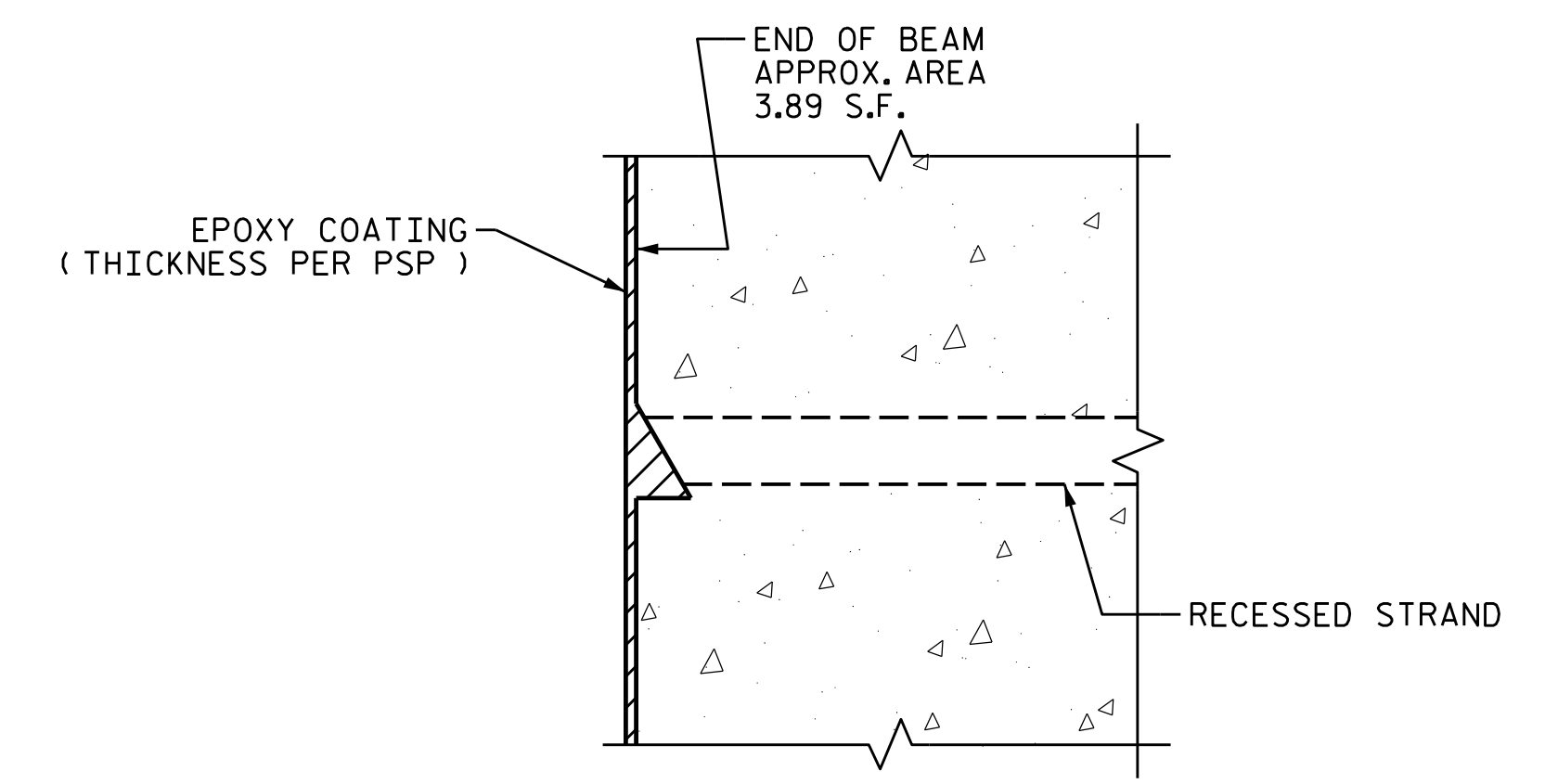
NOTES

- CLEAN AND COAT THE BEAM ENDS IN ACCORDANCE WITH PROJECT SPECIAL PROVISIONS.
- PREPARE BEAM ENDS TO RECEIVE COATING TO A MINIMUM CONCRETE SURFACE PROFILE ( CSP ) OF CSP 3 PER ICRI GUIDELINES 310.2 CLEAN AND ROUGHEN SURFACES TO MAKE ABSORPTIVE BY MECHANICAL MEANS OR ABRASIVE BLASTING.
- UPON COMPLETION OF MECHANICAL/BLASTING SURFACE PREP, WASH THOROUGHLY WITH CLEAN POTABLE WATER AND ALLOW TO DRY. TEST MOISTURE PER PSP PRIOR TO EPOXY APPLICATION.
- APPLY TWO LAYERS OF TYPE 4A EPOXY PER SECTION 1081.
- ALL BLAST MEDIA AND DEBRIS SHALL BE CONTAINED, REMOVED FROM THE SITE AND DISPOSED OF OFF-SITE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- FOR BEAM END EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.
- FOR CONTAINMENT AND POLLUTION CONTROL, SEE SPECIAL PROVISIONS.

BEAM END EPOXY PROTECTIVE COATING QUANTITIES		
	PER BENT SF	TOTAL SF
BENTS 1, 4, 7, 10 & 13 (14 BEAM ENDS PER BENT)	54.5	272.5



TYPICAL STRAND SECTION X-X SHOWING CUT STRAND RECESS LIMITS



TYPICAL STRAND SECTION X-X AFTER EPOXY PROTECTIVE COATING

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**BEAM END COATING DETAILS**

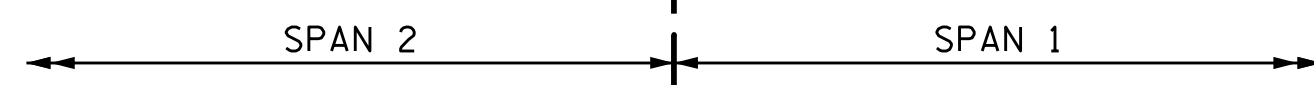
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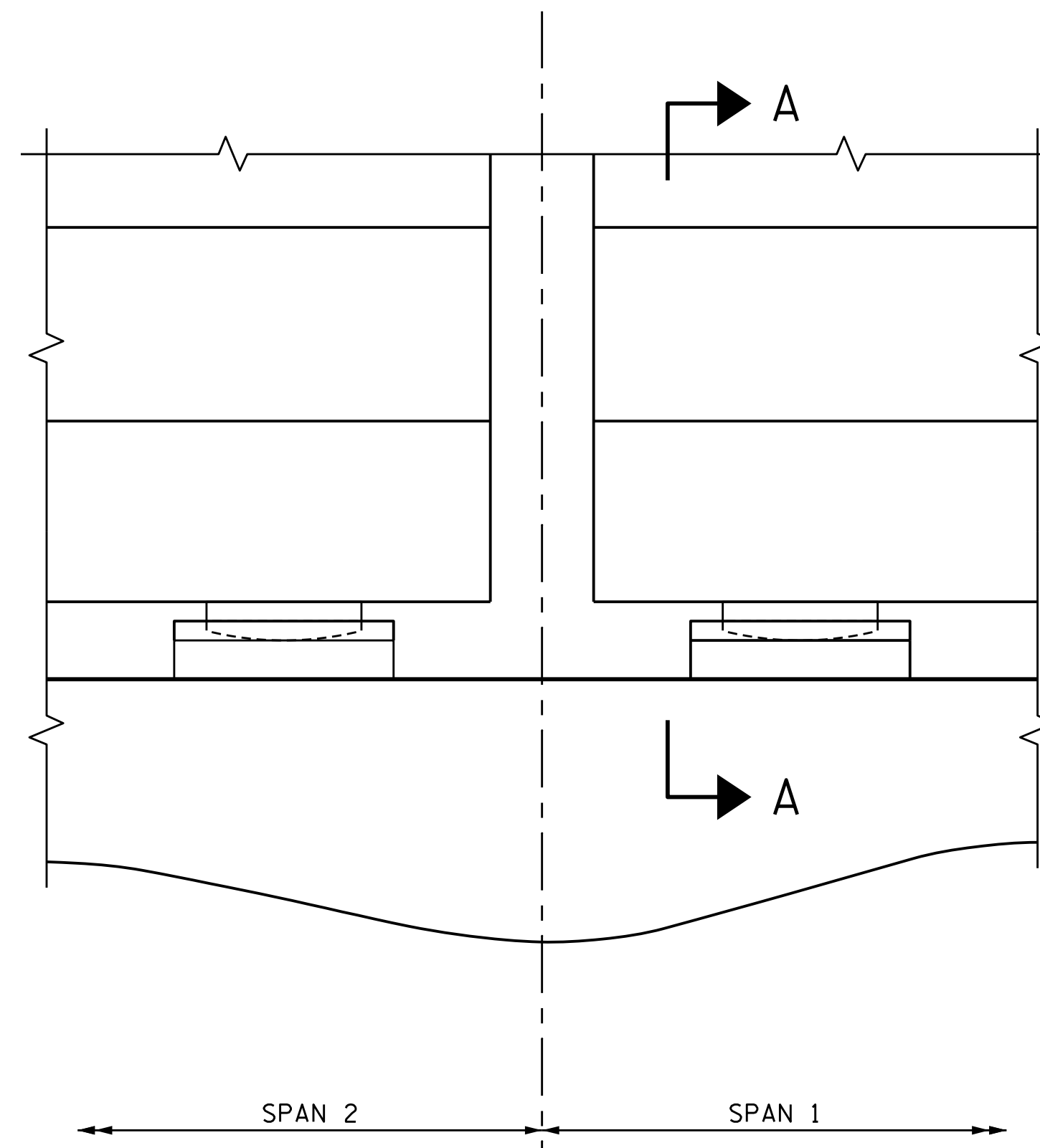
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2			4			58

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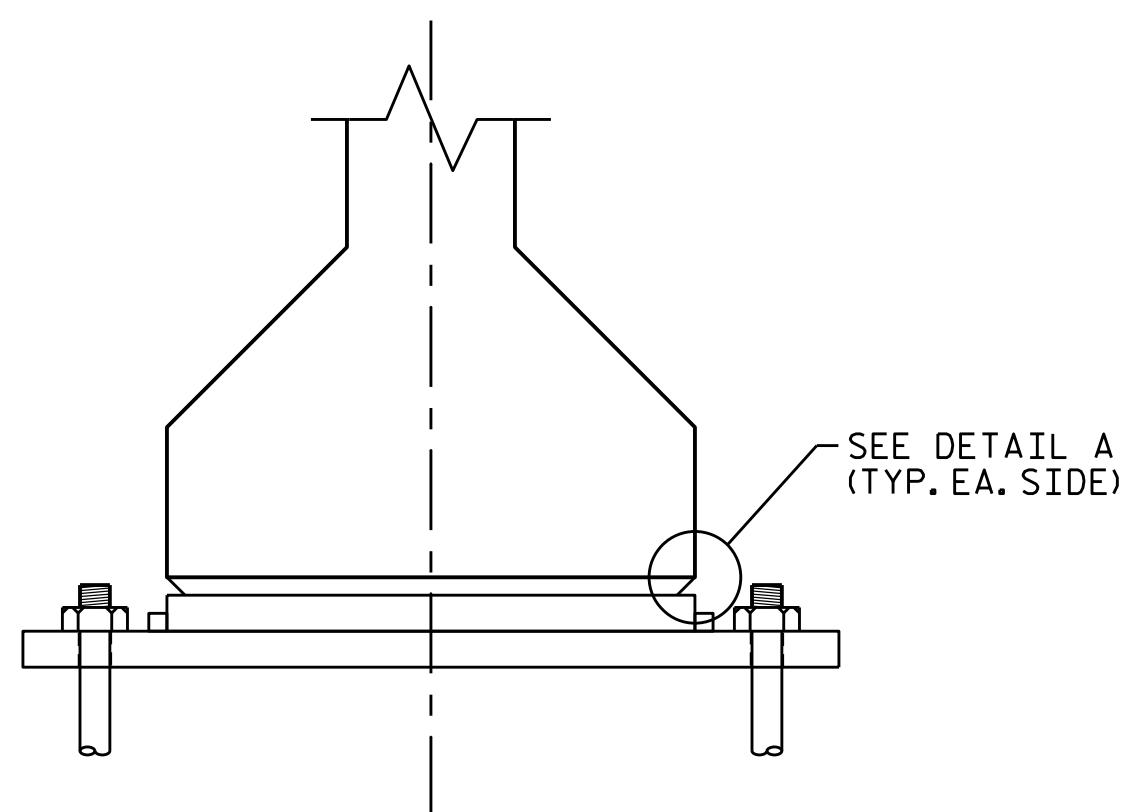
**EXISTING CONDITION**  
SPAN 1 BEAM 4 SOLE PLATE DISPLACEMENT



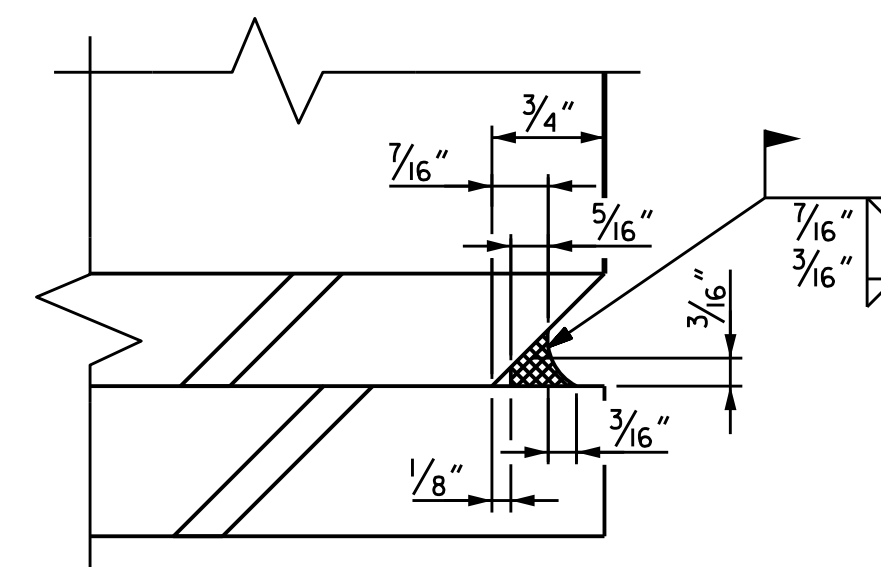
**PROPOSED REPAIR**  
SPAN 1 BEAM 4 SOLE PLATE REPAIRED

**REPAIR SEQUENCE**

- AFTER THE JACKING OF THE GIRDER, PER JACKING PLANS PROVIDED BY OTHERS, GRIND EXISTING WELD TO REMOVE SOLE PLATE FROM EMBEDDED CONNECTOR PLATE.
- PLACE SOLE PLATE IN DESIRED POSITION AND LOCATION.
- CLEAN AND PREP THE AREAS THAT WERE WELDED TO SOLE PLATE SO A CLEAN WELD CAN BE PERFORMED TO REATTACH THE SOLE PLATE TO CONNECTOR PLATE IN THE GIRDER PER DETAIL "A".
- WELD SOLE PLATE TO EMBEDDED PLATE AS INDICATED.
- AFTERWARDS REFER TO THE "CLEANING AND PAINTING EXISTING BEARINGS" SHEET.
- FOR REMOVE AND RESET BEARINGS, SEE SPECIAL PROVISIONS.
- FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.



**SECTION A-A**



**DETAIL "A"**

**SOLE PLATE REPAIR**

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**RESET BEARINGS  
 DETAILS**

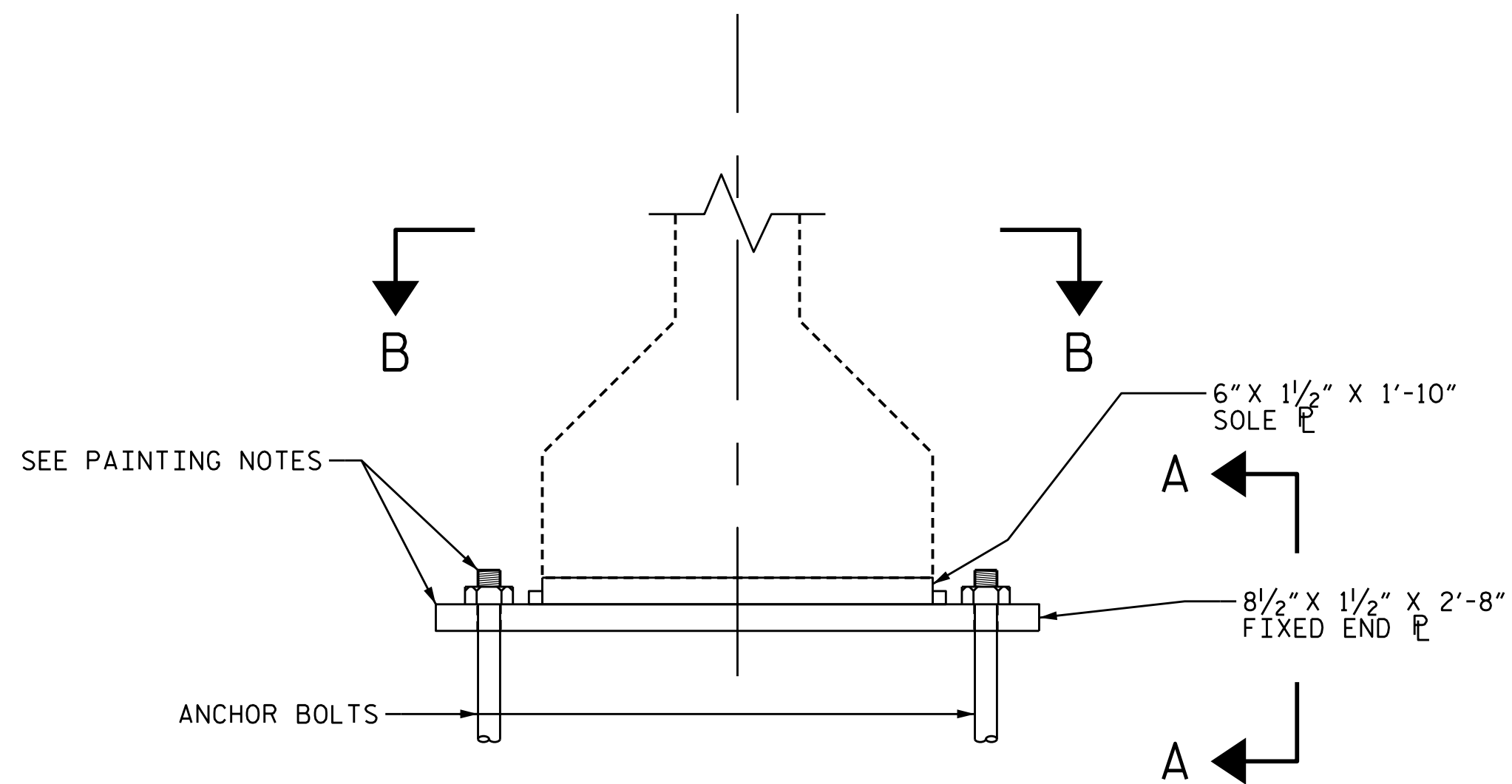
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1			3			TOTAL SHEETS
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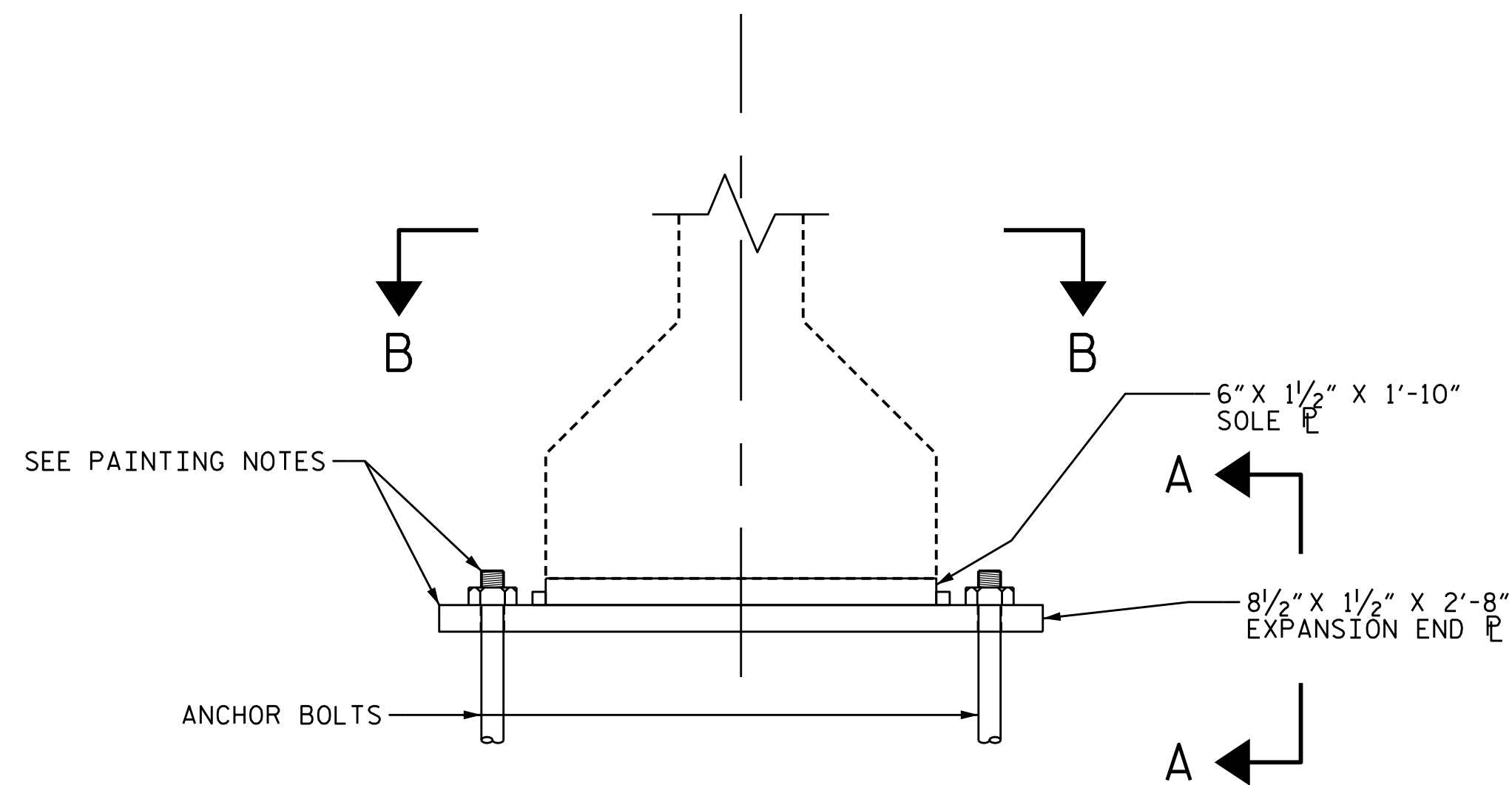
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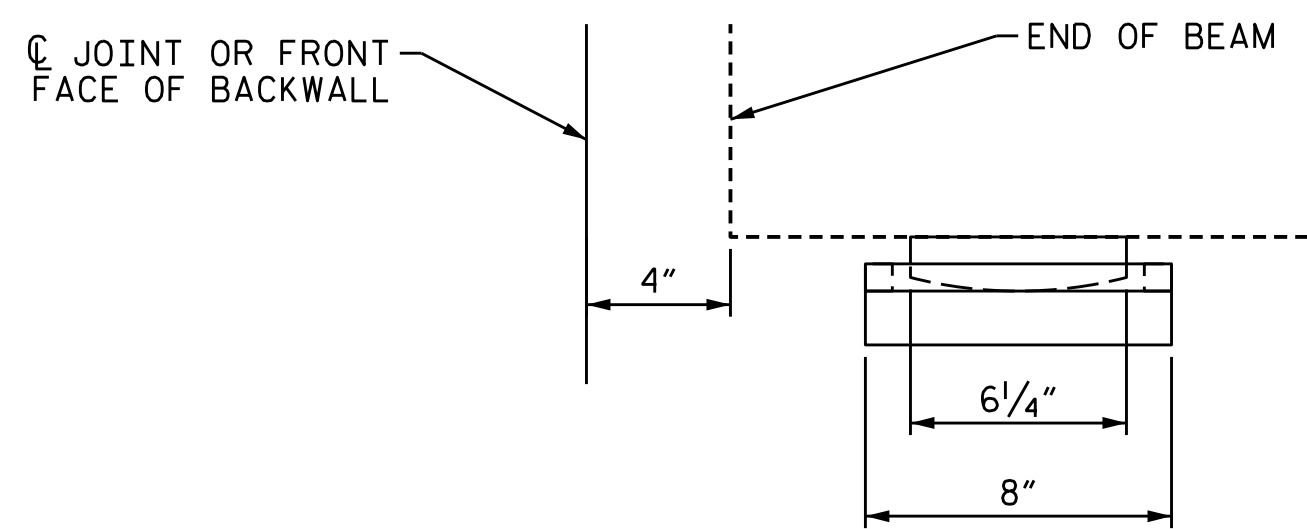
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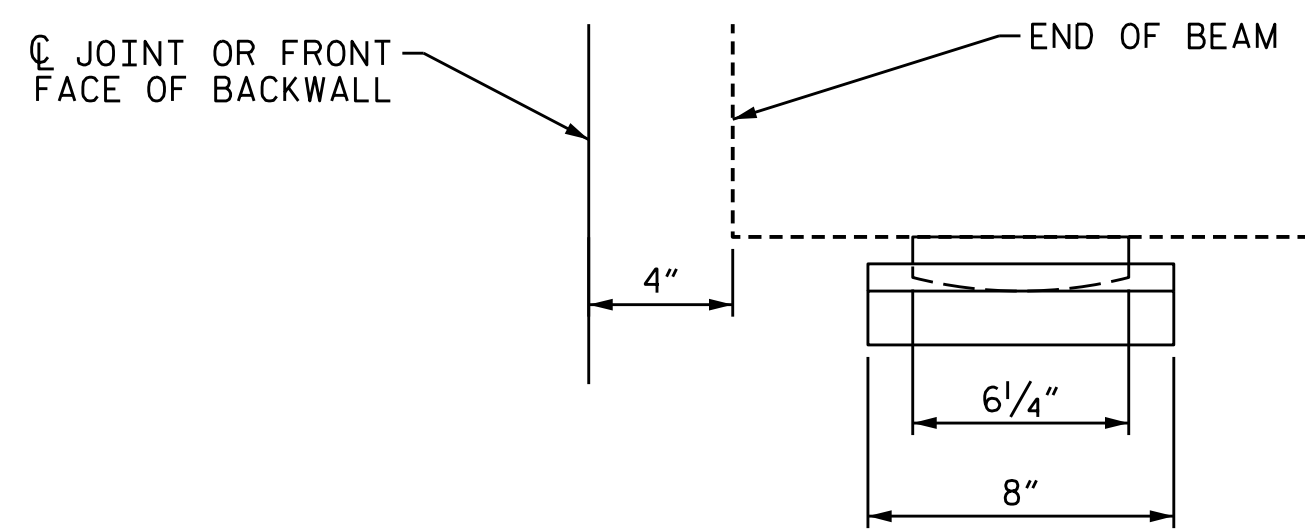
EXISTING BEAM AND FIXED BEARING



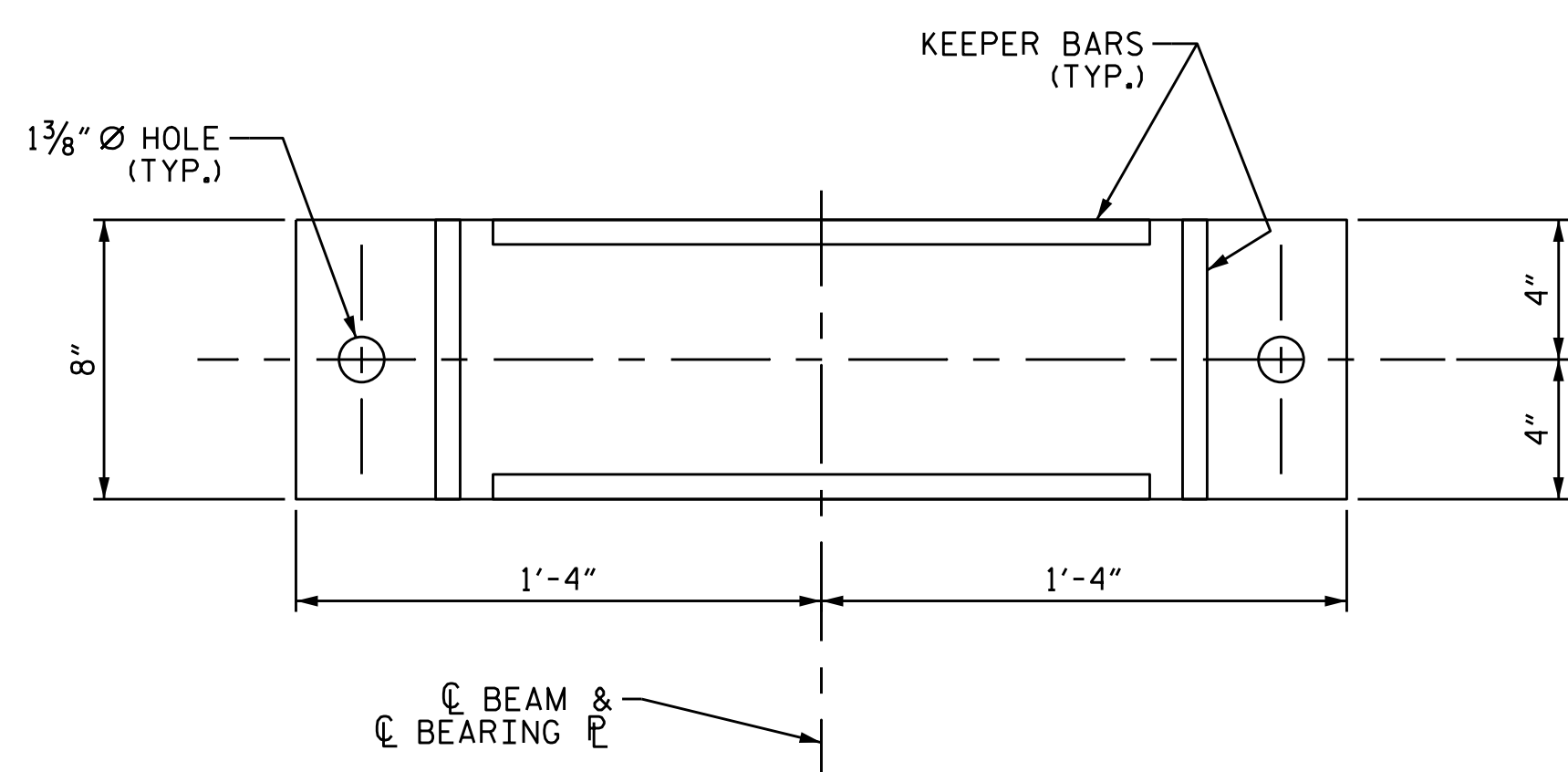
EXISTING BEAM AND EXPANSION BEARING



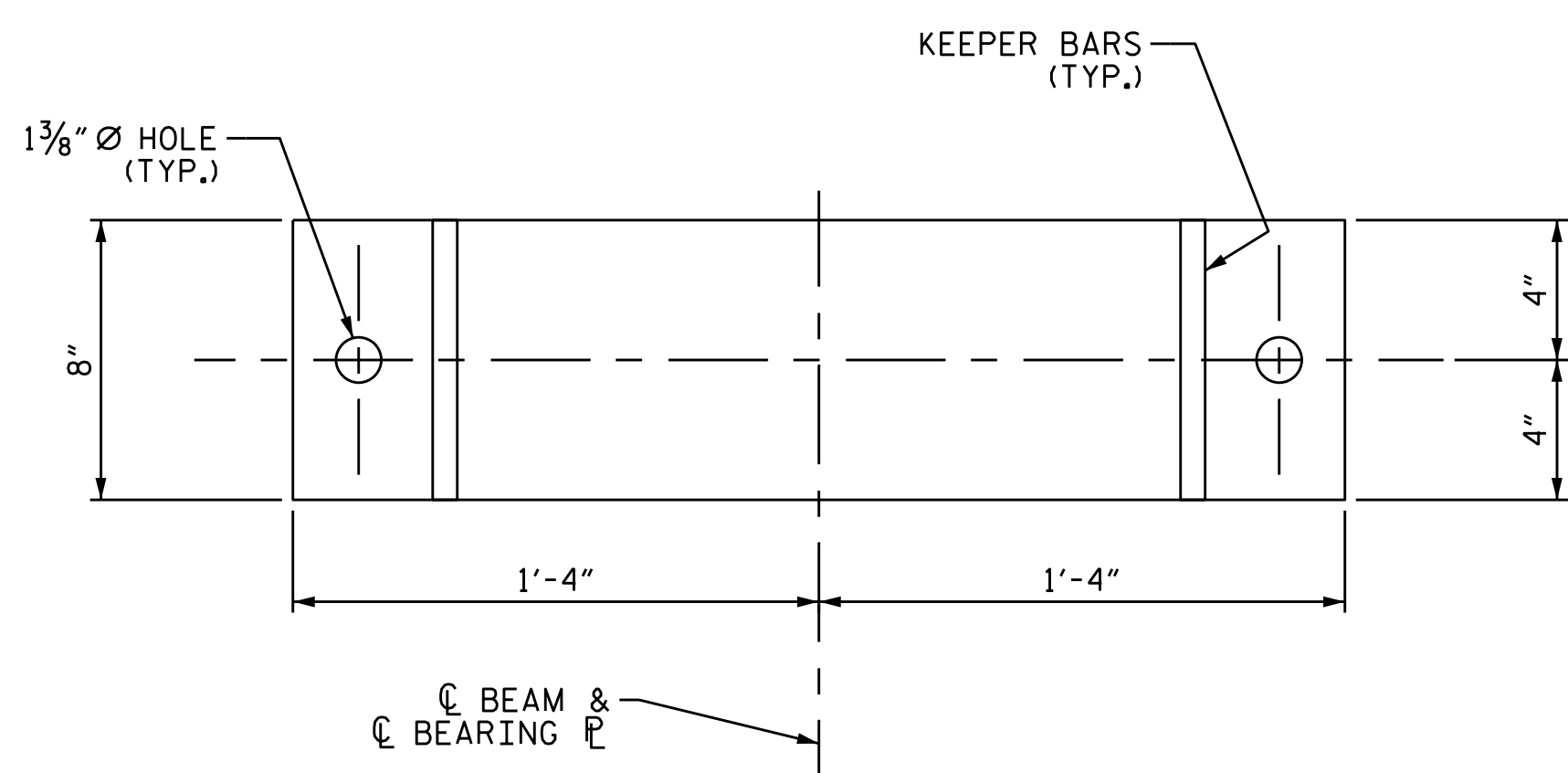
SECTION A-A



SECTION A-A



SECTION B-B



SECTION B-B

**NOTES**

CLEAN AND PAINT ALL EXPOSED AREAS OF PLATES, NUTS, BOLTS, AND WASHERS AT EACH BEARING IN ACCORDANCE WITH PROJECT SPECIAL PROVISIONS.

DURING ALL CLEANING AND PAINTING OPERATIONS, THE CONTRACTOR SHALL ISOLATE WORK AREA WITH APPROPRIATE CONTAINMENT DEVICES (CANVASSES, TARPULINS, SCREENS, ETC.) IN ORDER TO PREVENT ANY GENERATED DEBRIS FROM CAUSING VIOLATIONS OF CURRENT FEDERAL, STATE AND LOCAL AIR AND WATER POLLUTION REGULATIONS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR LEGAL DISPOSAL OF ALL DEBRIS COLLECTED BY THE CONTAINMENT DEVICES.

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

FOR CONTAINMENT AND POLLUTION CONTROL, SEE SPECIAL PROVISIONS.

**REPAIR QUANTITY TABLE**

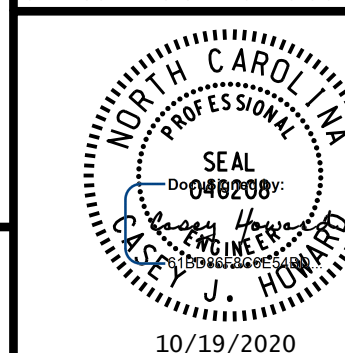
LOCATION	ESTIMATE	ACTUAL
	EACH	EACH
END BENT 1	7	
BENT 1	14	
BENT 2	14	
BENT 3	14	
BENT 4	14	
BENT 5	14	
BENT 6	14	
BENT 7	14	
BENT 8	14	
BENT 9	14	
BENT 10	14	
BENT 11	14	
BENT 12	14	
BENT 13	14	
END BENT 2	7	
TOTAL	196	

PROJECT NO. 15BPR.19  
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**CLEANING AND PAINTING OF EXISTING BEARINGS**

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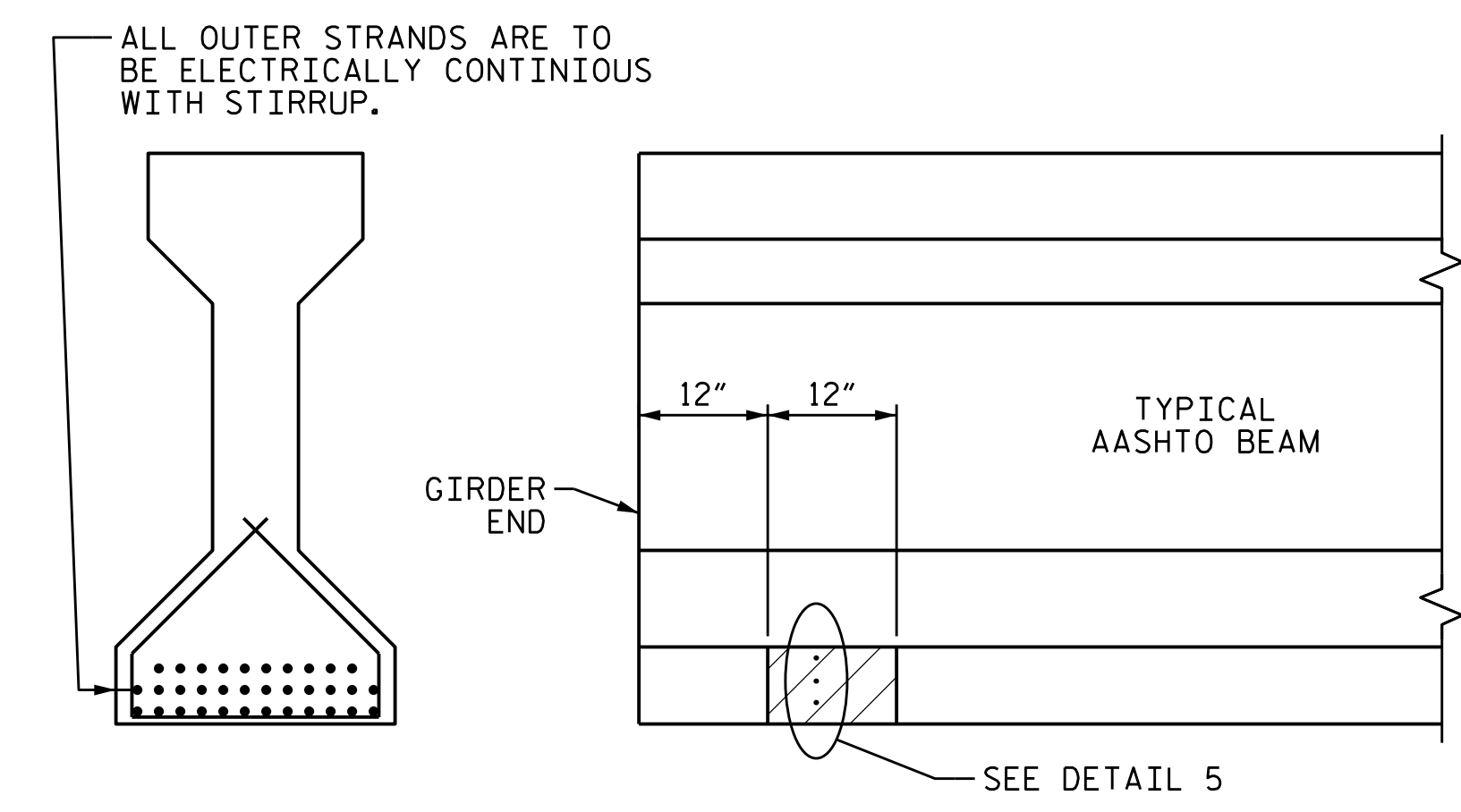
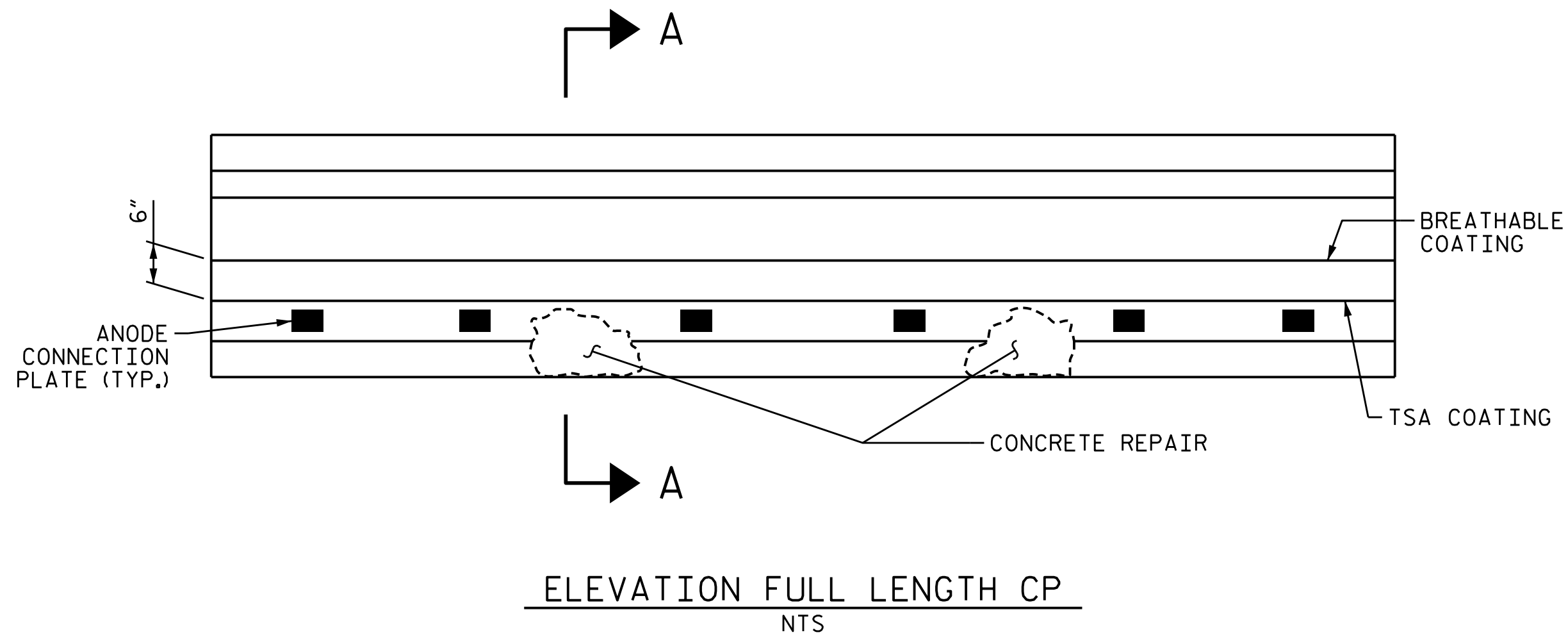
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SHEET NO. **S-27**  
 TOTAL SHEETS **58**

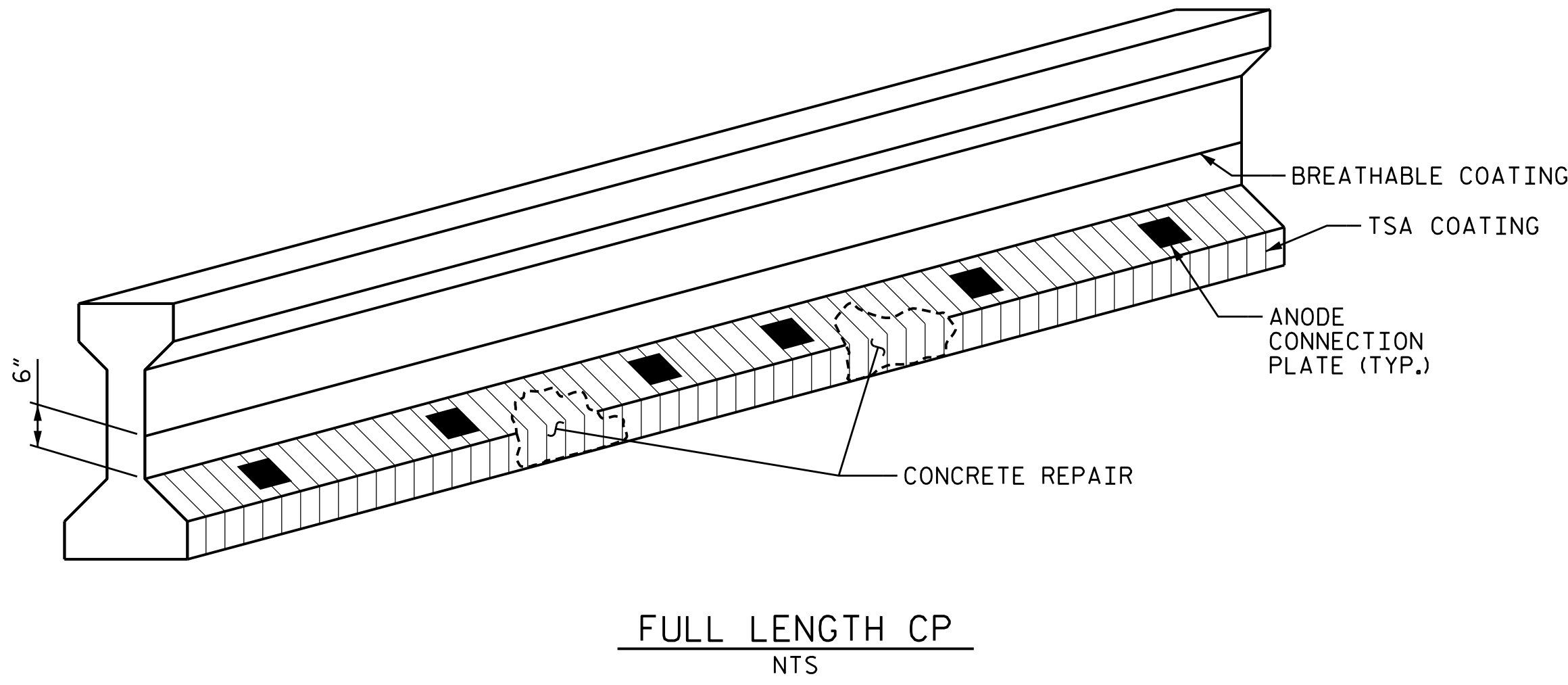
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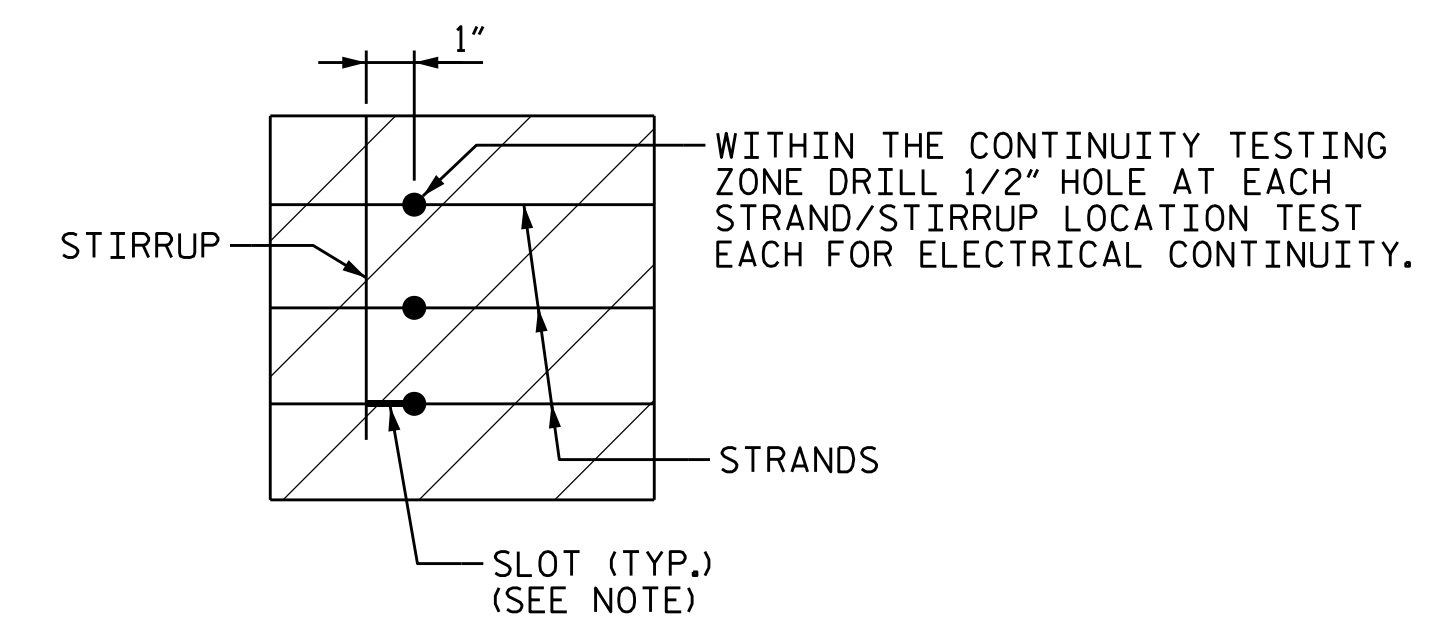
SPAN	PRESTRESSED CONCRETE GIRDERS WITH THERMAL SPRAY ANODE (NON-MONITORING)	
	ESTIMATE (SF)	ACTUAL (SF)
1	2,590.0	
2	2,576.0	
3	2,576.0	
4	2,576.0	
5	2,576.0	
6	2,576.0	
7	2,576.0	
8	2,576.0	
9	2,576.0	
10	2,576.0	
11	2,576.0	
12	2,576.0	
13	2,576.0	
14	2,464.0	



**NOTES**  
SPANS 1 THRU 14 WILL RECEIVE FULL LENGTH TSA COATING.

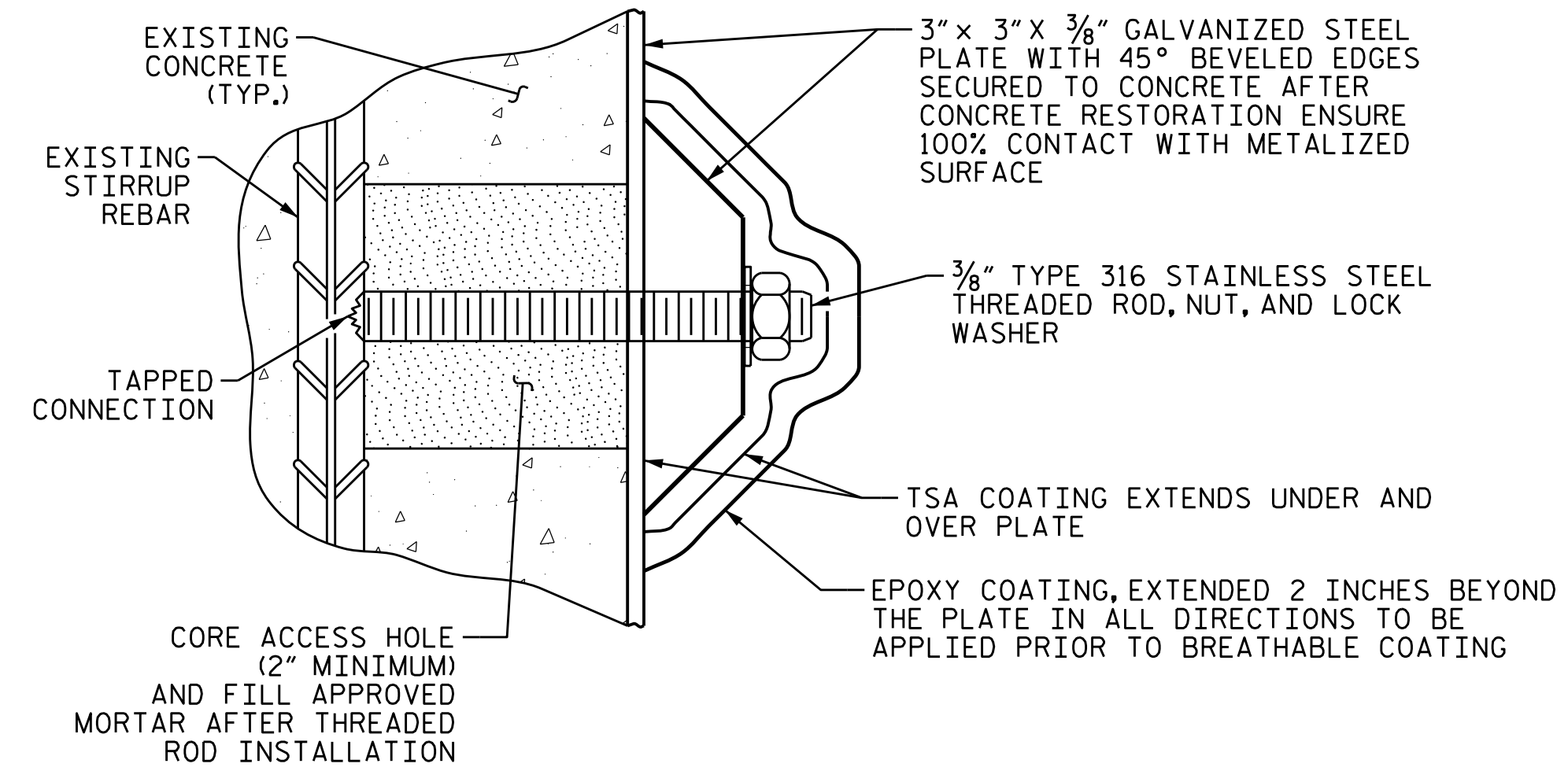


**DETAIL 4 - TYPICAL CONTINUITY TESTING AND CORRECTION ZONE - FULL LENGTH**  
NTS



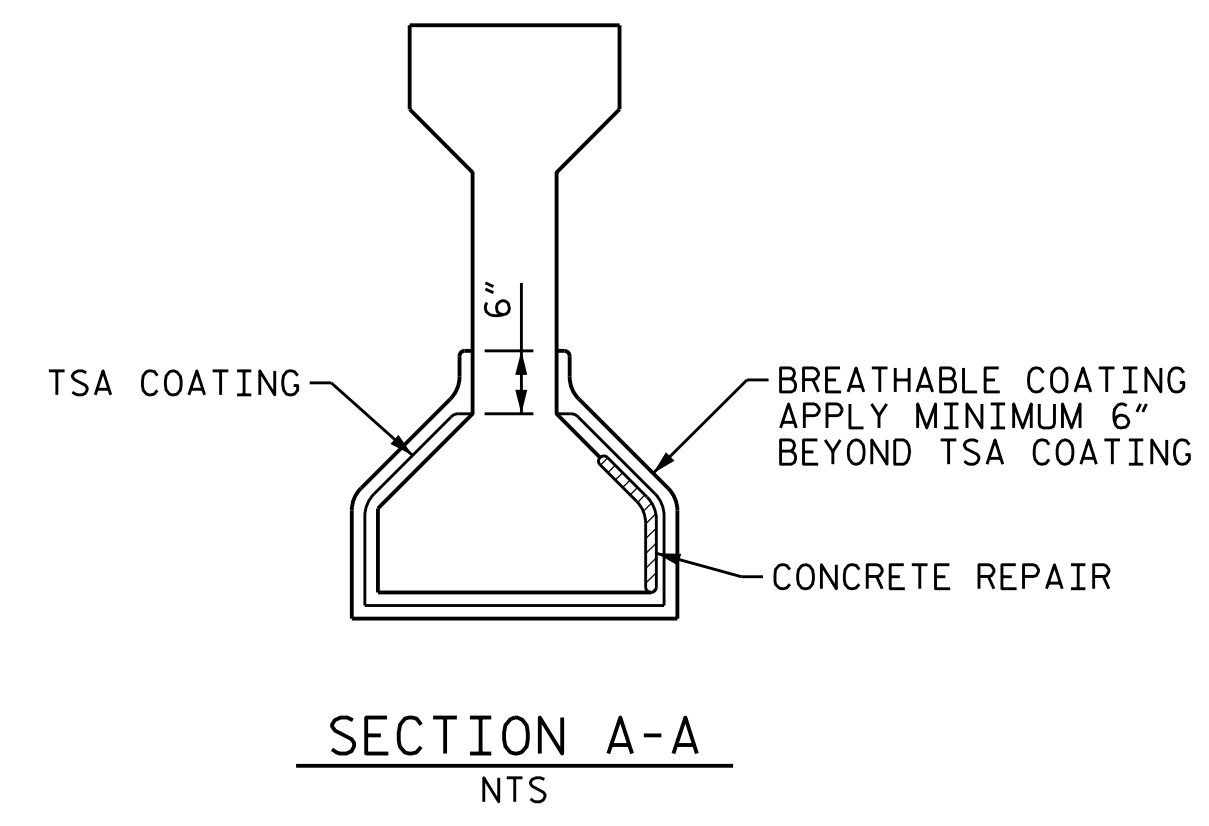
**NOTE:**  
IF ELECTRICAL CONTINUITY DOES NOT EXIST BETWEEN STRAND AND STIRRUP CUT A SLOT TO NEAREST CONTINUOUS STRAND OR STIRRUP AND ESTABLISH CONTINUITY USING CLEAN COATED STAINLESS STEEL WIRE TIES.

**DETAIL 5**  
NTS



**DETAIL 1 - ANODE CONNECTION PLATE DETAIL - CP NON-MONITORING ZONE - FULL LENGTH**  
NTS

**NOTE**  
FOR NON-MONITORING FULL LENGTH, NO CONDUITS OR JUNCTION BOX IS REQUIRED - SEE DETAIL 1.

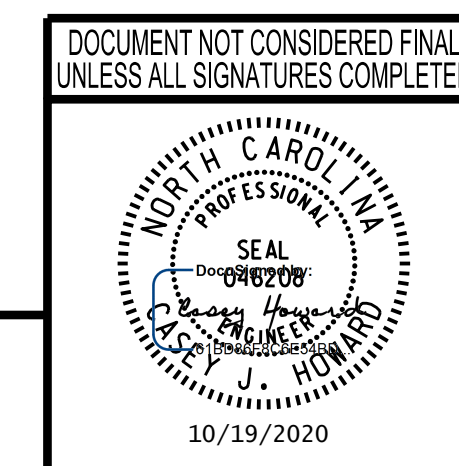


**SECTION A-A**  
NTS

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
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RALEIGH  
SUPERSTRUCTURE  
PRESTRESSED CONCRETE GIRDER WITH THERMAL SPRAY ANODE DETAILS



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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-28
2			4			TOTAL SHEETS 58

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RALEIGH, NC 27601  
TEL: 1.919.836.4040  
LICENSE NO. F-0165

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DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
CHECKED BY: C.J. HOWARD DATE: JUL 2018

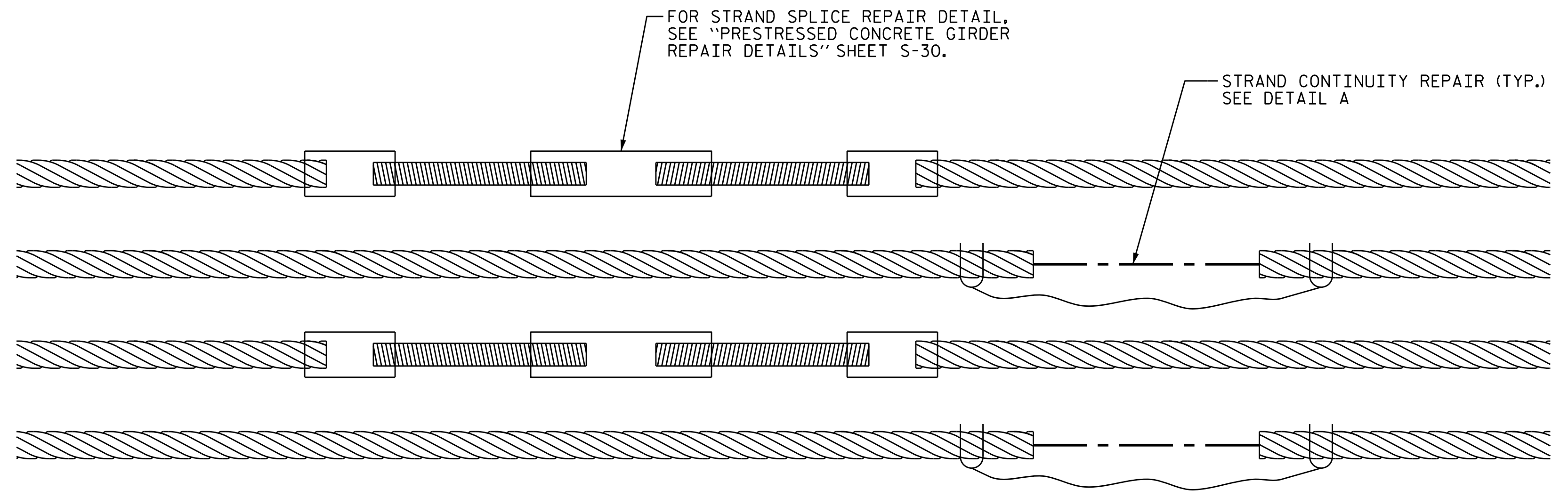
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**NOTES**

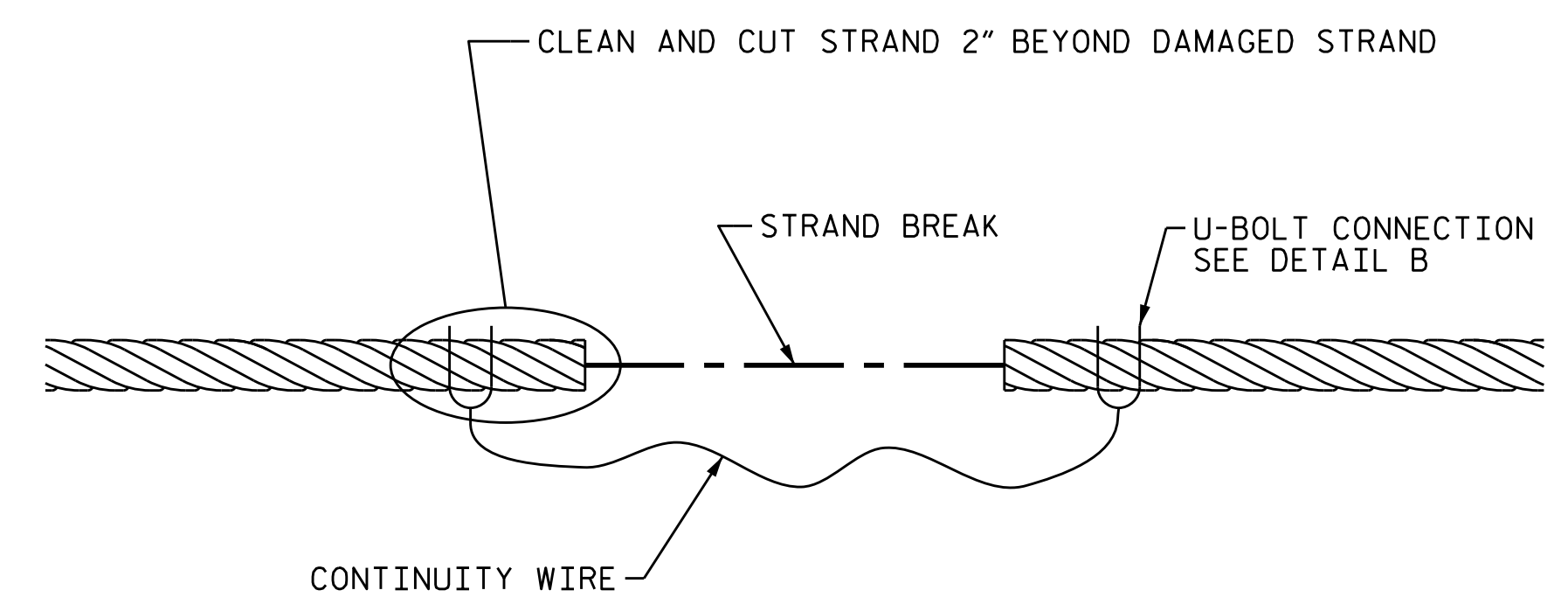
THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION NOT TO DAMAGE THE EXISTING PRESTRESSED STRANDS. IF EXISTING STRAND IS DAMAGED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER FOR ADDITIONAL INSTRUCTIONS ON THE APPLICABLE REPAIR METHOD.

STRAND LOSS GREATER THAN 50% SHALL BE TREATED AS BROKEN.

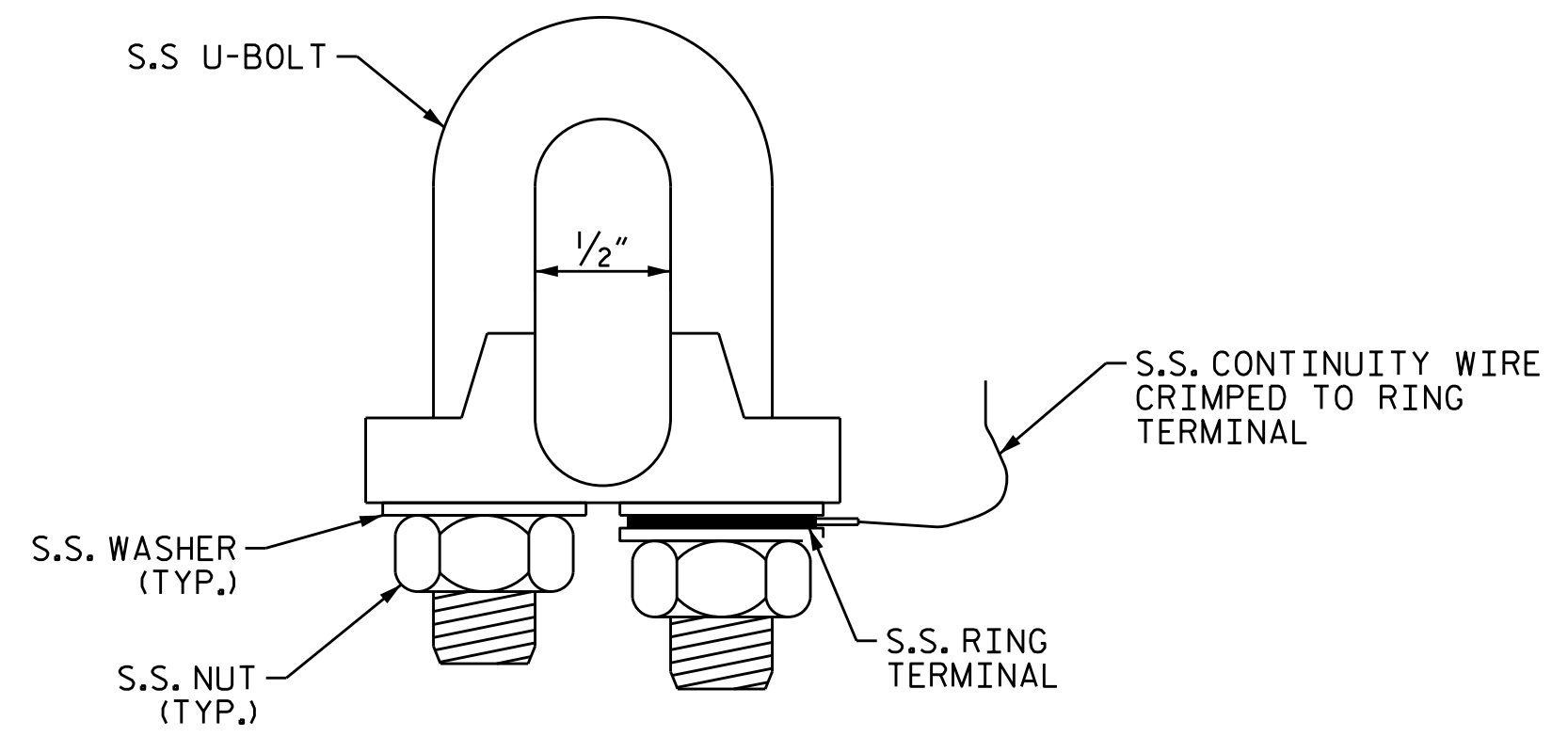
1/2 OF ALL BROKEN STRANDS SHALL BE REPAIRED WITH A STRAND SPLICE. THE REMAINING 1/2 SHALL BE REPAIRED WITH STRAND CONTINUITY REPAIR.



STRAND SPLICE / CONTINUITY REPAIR  
NTS



DETAIL A - STRAND CONTINUITY REPAIR  
NTS

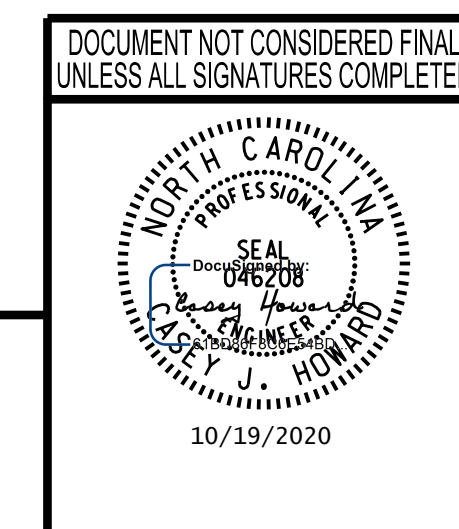


DETAIL B - U-BOLT CONNECTION DETAIL  
NTS

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PRESTRESSED CONCRETE  
 GIRDER WITH THERMAL  
 SPRAY ANODE DETAILS



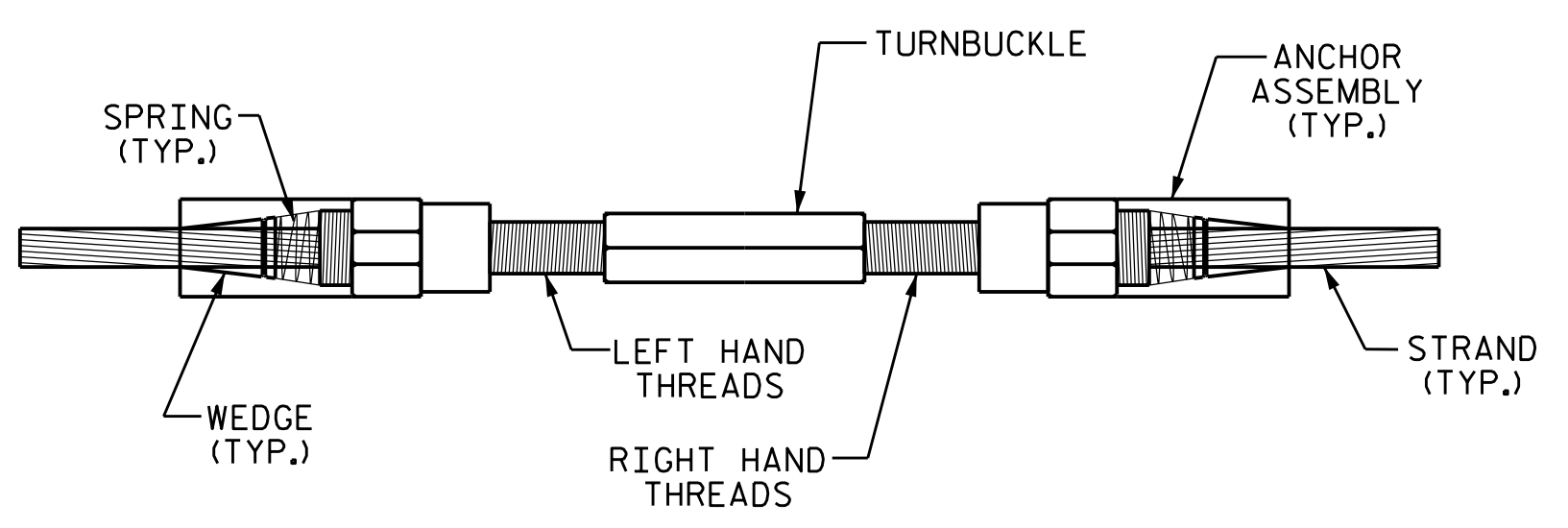
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			58

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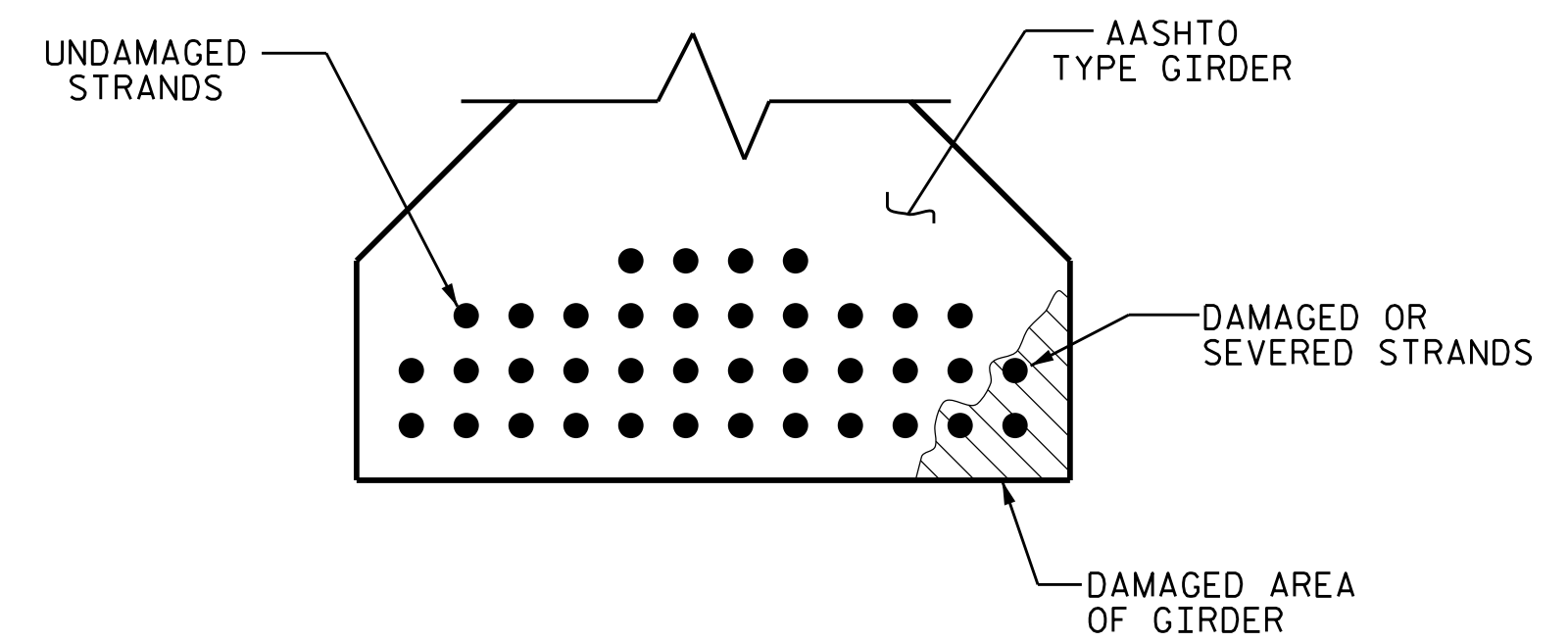
DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
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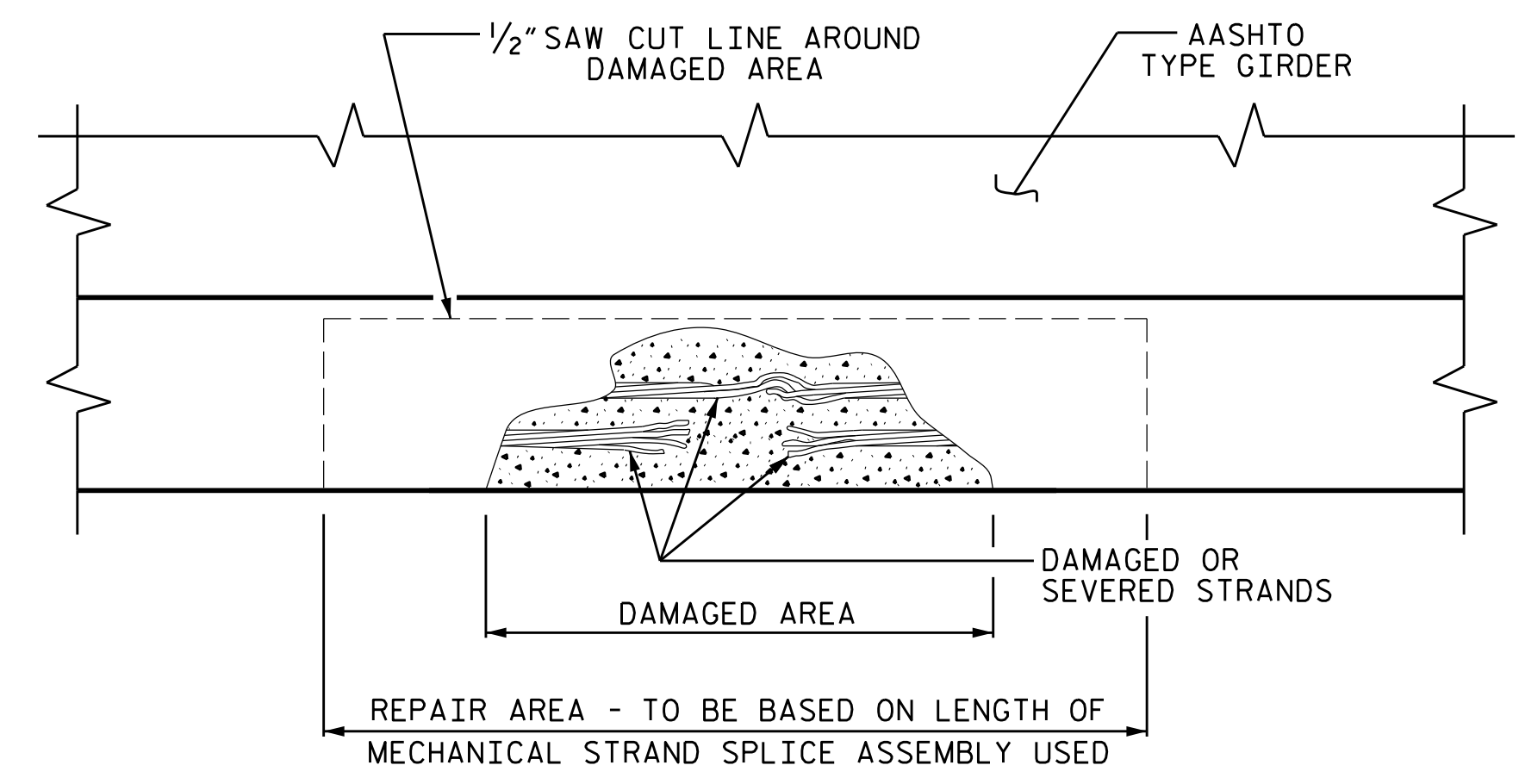
**MECHANICAL STRAND SPLICE ASSEMBLY**  
(ASSEMBLIES MAY VARY DEPENDING ON MANUFACTURER)



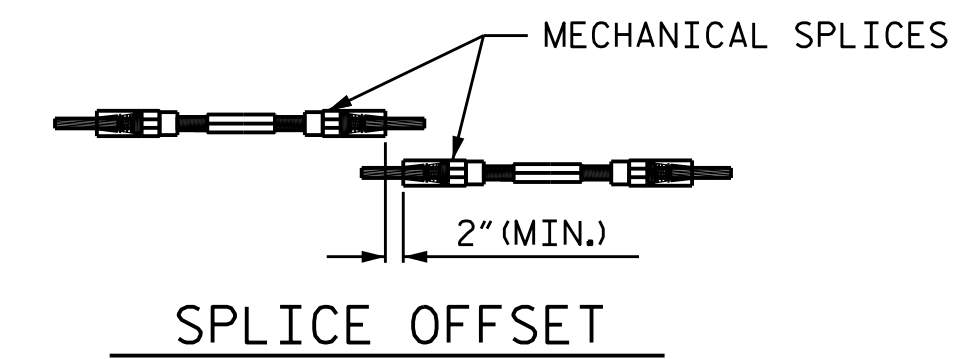
STRAND SPLICE DETAIL



SECTION VIEW OF DAMAGED GIRDER

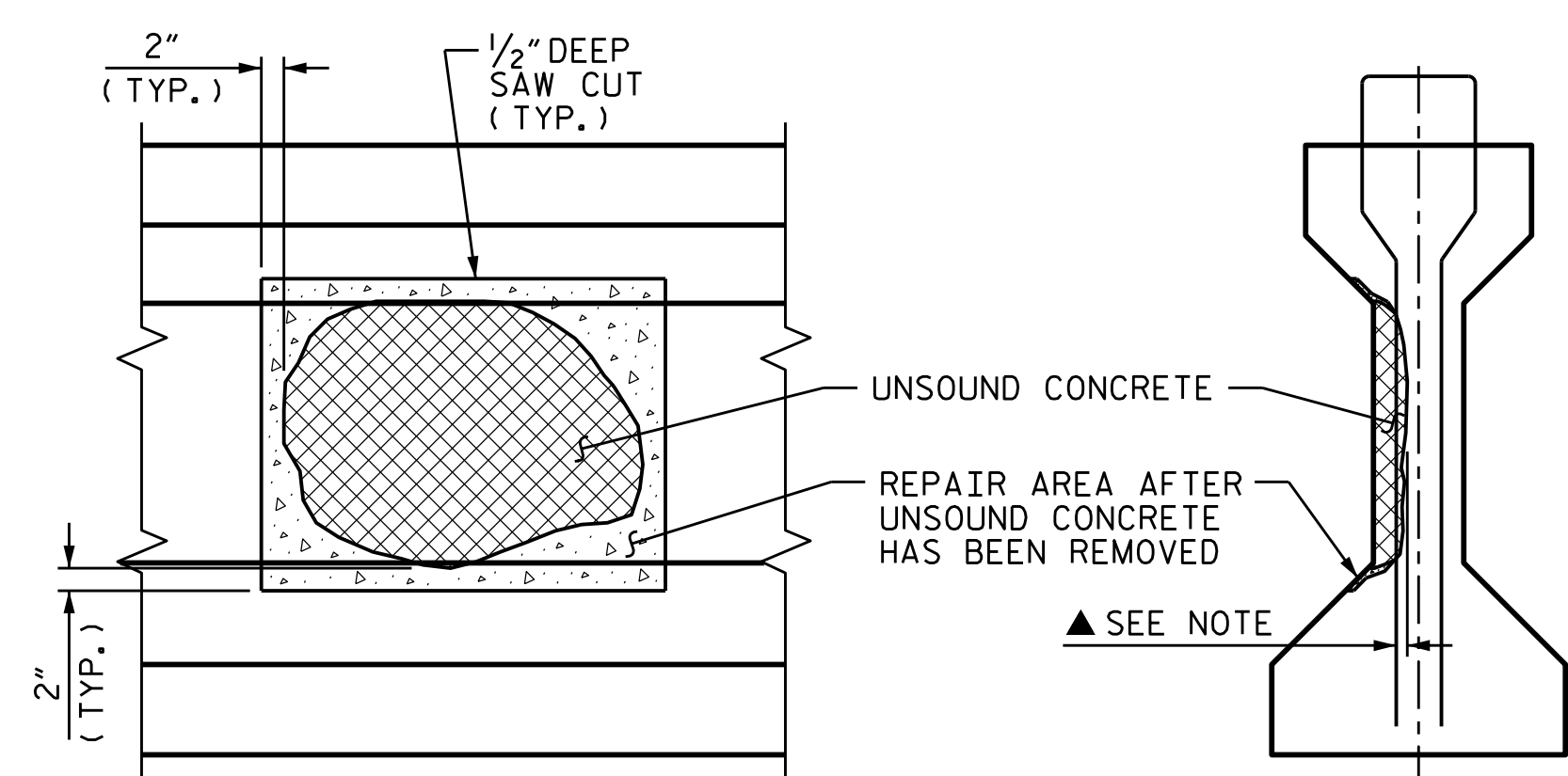


ELEVATION VIEW OF DAMAGED GIRDER

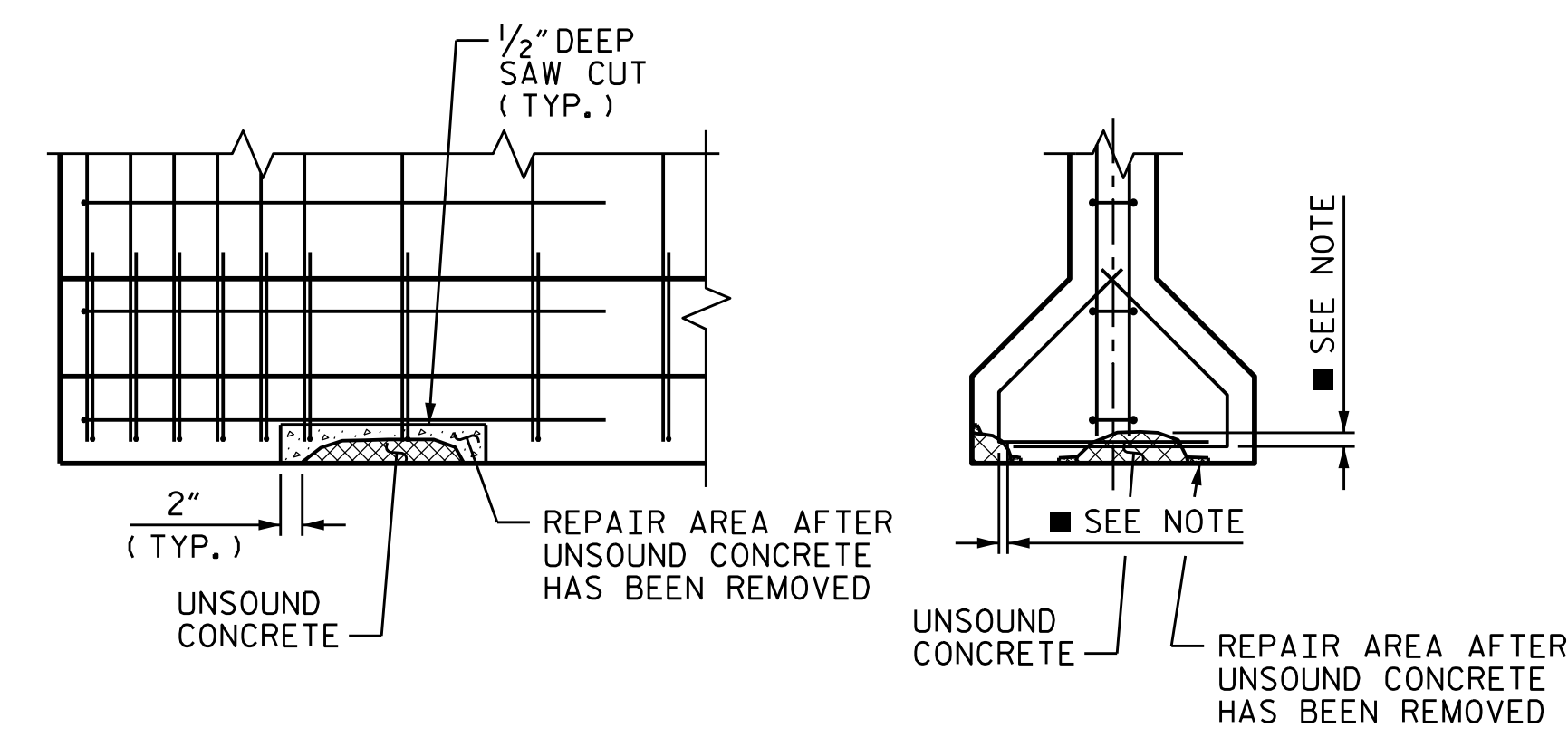


SPLICE OFFSET

**STRAND REPAIR DETAILS**



GIRDER WEB REPAIR



GIRDER FLANGE REPAIR

**PRESTRESSED GIRDER REPAIR**

**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 1/4" 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 PRESTRESSED CONCRETE GIRDER REPAIRS, SEE SPECIAL PROVISIONS.

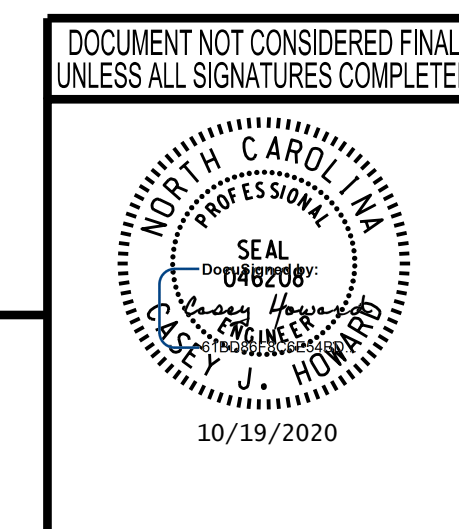
**PRESTRESSED GIRDER STRAND REPAIR SEQUENCE:**

1. REMOVE LIVE LOAD FROM REPAIR AREA BY EITHER CLOSING BRIDGE TO TRAFFIC OR SHIFTING TRAFFIC AWAY FROM REPAIR AREA.
2. MEASURE OUT THE AREA NEEDED TO HAVE ADEQUATE ROOM TO SPLICE THE BROKEN OR DAMAGED STRAND. IF MULTIPLE STRANDS ARE BROKEN ADJACENT TO ONE ANOTHER THEN THE SPLICES SHALL BE STAGGERED. SEE "SPLICE OFFSET". AFTER YOU HAVE DETERMINED THE REPAIR AREA NEEDED, SAW CUT A MINIMUM OF 1/2" AT RIGHT ANGLES AROUND THE DAMAGED AREA. CHIP OUT REST OF CONCRETE TO A SUFFICIENT REPAIR DEPTH.
3. SPLICE STRANDS USING THE MECHANICAL SPLICE STRAND ASSEMBLY AND TENSION TO REQUIRED FORCE PER THE MANUFACTURER'S GUIDELINES.
4. PATCH REPAIR AREA USING NON SHRINK GROUT. PROFILE OF GIRDER MAY NEED TO BE INCREASED AROUND REPAIR AREA TO PROVIDE PROPER COVER.
5. AFTER GROUT HAS CURED PLACE TRAFFIC BACK ON BRIDGE OR REPAIRED AREA OF BRIDGE.

**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 THE REPAIRS TO PRESTRESSED CONCRETE GIRDERS 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.
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.

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021



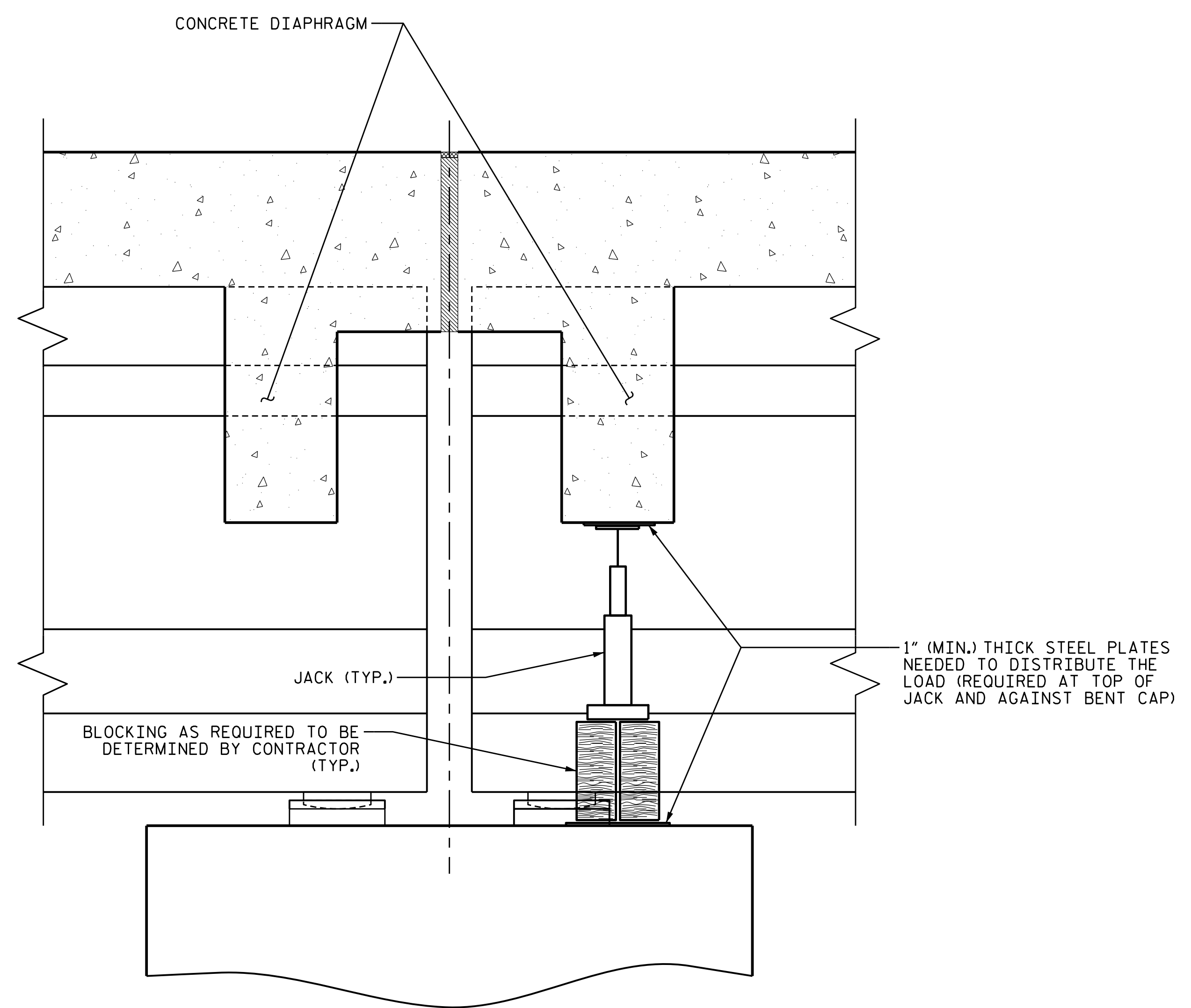
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD PRESTRESSED GIRDER GIRDER REPAIRS DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-30
TOTAL SHEETS					58

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SUITE 1500  
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DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
CHECKED BY: C.J. HOWARD DATE: JUL 2018





**SECTION THRU BENT**  
(DECK SLAB WITH JOINT)

<b>BRIDGE JACKING TABLE</b>				
LOCATION	SPAN	BEAM(S)	BRIDGE JACKING TYPE	DEAD LOAD (DC+DW) (KIPS)
BENT 1	1	4	TYPE I	79.2

**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 SPECIAL PROVISIONS.

FOR WORKING DRAWING SUBMITTALS, SEE SPECIAL PROVISIONS.

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

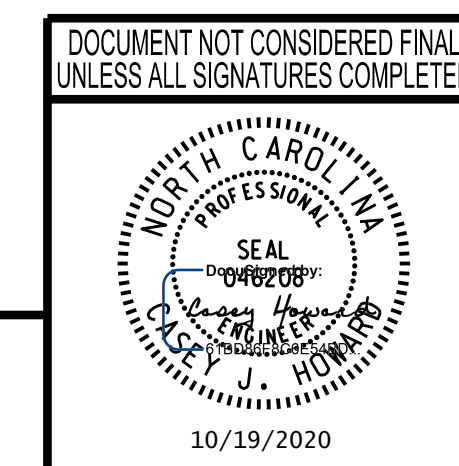
TYPE II BRIDGE JACKING SHALL BE DONE WITH A HYDRAULIC JACKING SYSTEM THAT LIFTS EACH BEAM ALONG ENTIRE SPAN END WITH EQUAL FORCE AND AT AN EQUAL RATE.

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.

JOINT REPAIR TO BE COMPLETED AFTER BRIDGE JACKING.

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE JACKING  
 DETAIL

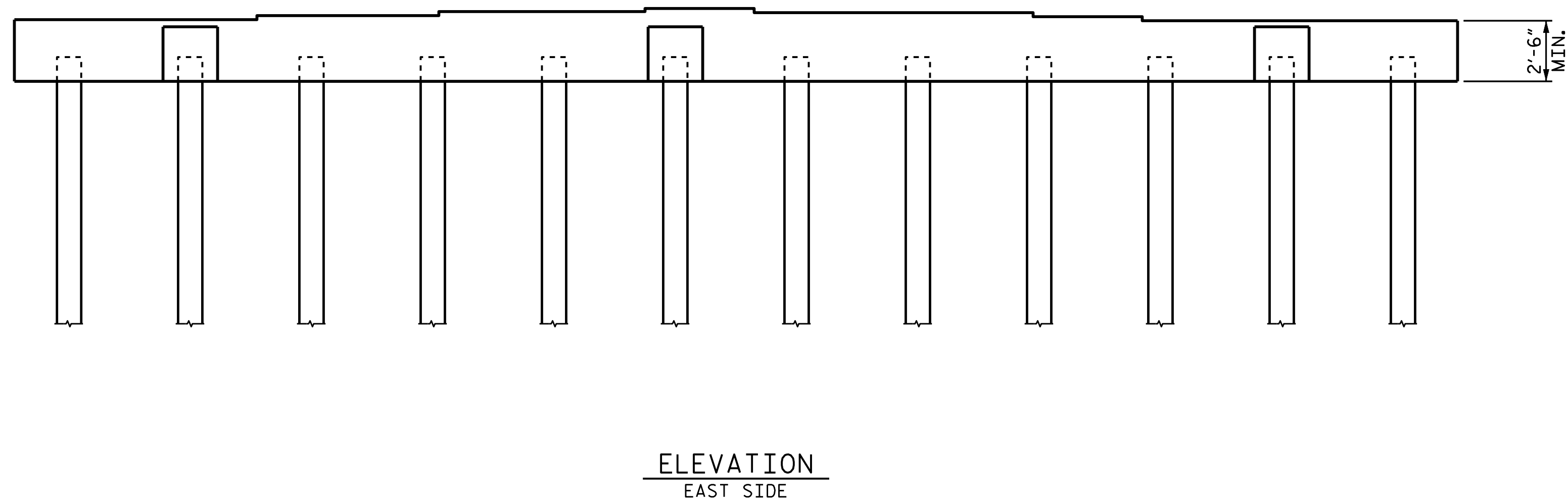
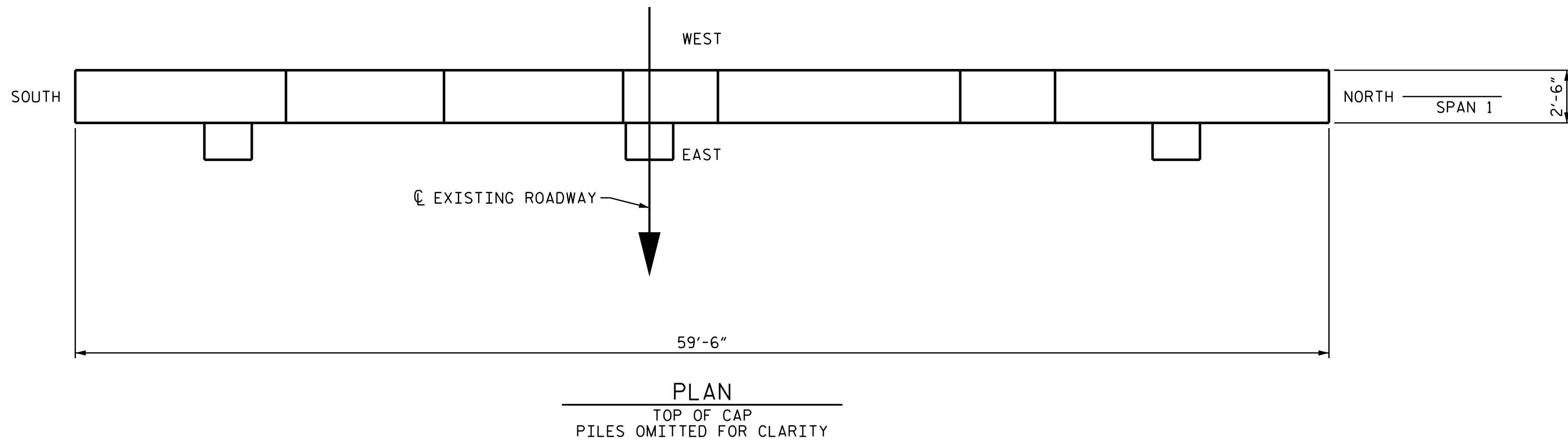


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 434 FAYETTEVILLE STREET  
 SUITE 1500  
 RALEIGH, NC 27601  
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1			3			TOTAL SHEETS
2			4			58

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DRAWN BY: M.J. OSTRISHKO DATE: OCT 2018  
 CHECKED BY: C.J. HOWARD DATE: JUL 2018



NOTES

- SHOTCRETE REPAIR
- CONCRETE REPAIR

REPAIR QUANTITY TABLE

END BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERICAL FACE)				
CAP (HORIZONTAL FACE)				
22" OCT. PREST. CONC. PILES				
CONCRETE REPAIRS				
EPOXY COATING	AREA SF		AREA SF	
TOP OF CAP *	165.0			
PILE JACKET	LENGTH LN. FT.		LENGTH LN. FT.	
PILE NUMBERS :				

\* EPOXY COATING QUANTITY INCLUDES TOP OF PILE CAPS

NOTES

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

CONTRACTOR SHALL SAW CUT TO A MINIMUM OF 1/2" BUT REINFORCING STEEL SHALL NOT BE DAMAGED.

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

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

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR REPAIR DETAILS, SEE "TYPICAL CAP AND PILE REPAIR DETAILS" SHEET S-56.

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.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 1 OF 15

STATE OF NORTH CAROLINA  
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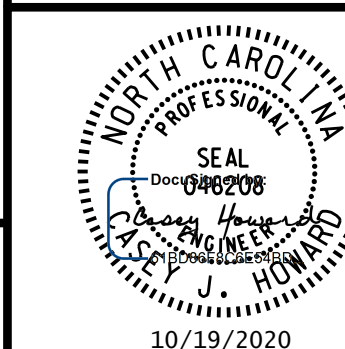
SUBSTRUCTURE  
 END BENT 1  
 REPAIRS

REVISIONS

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

SHEET NO.  
S-32  
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 58

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED



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 SUITE 1500  
 RALEIGH, NC 27601  
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 CHECKED BY: C.J. HOWARD DATE: JUL 2018

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FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CAP AND PILE REPAIR DETAILS, SEE "TYPICAL CAP AND PILE REPAIR DETAILS" SHEET S-56.

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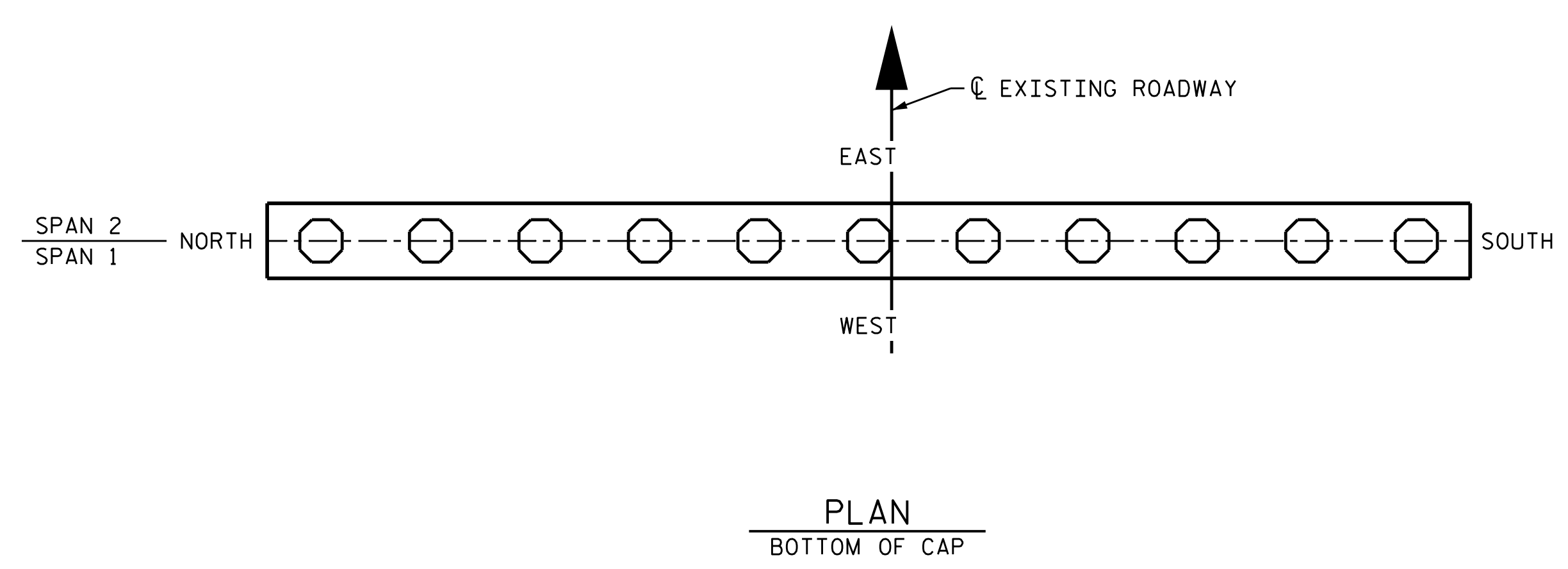
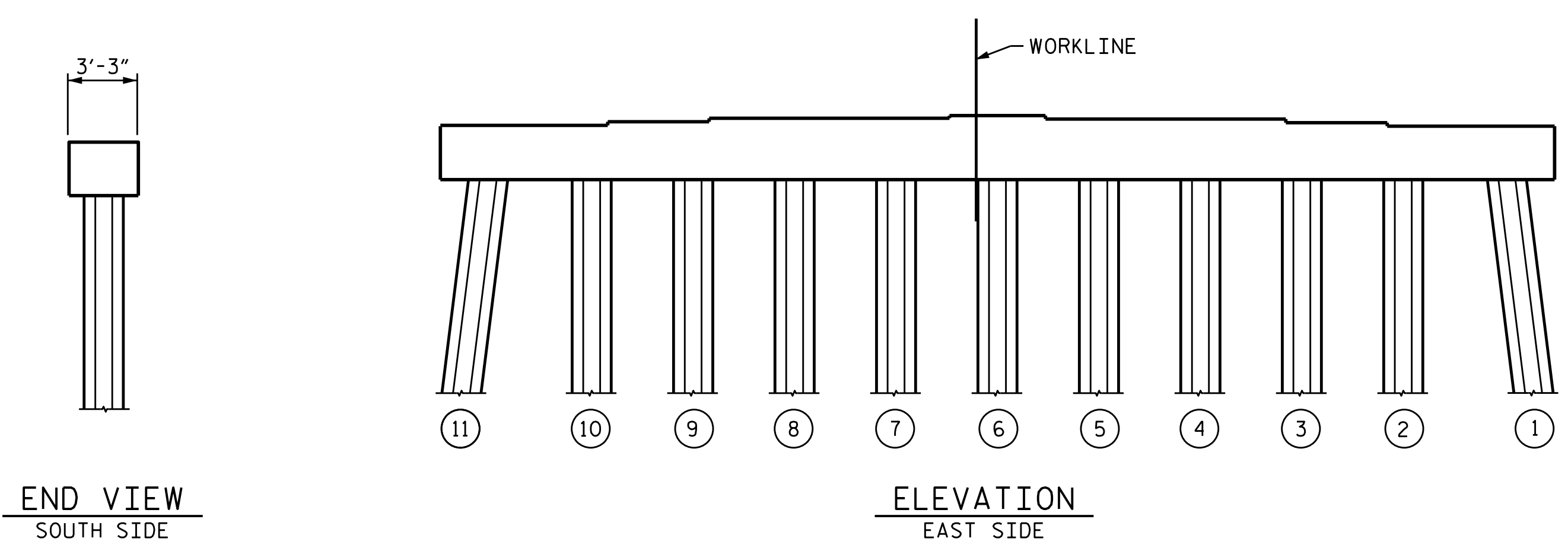
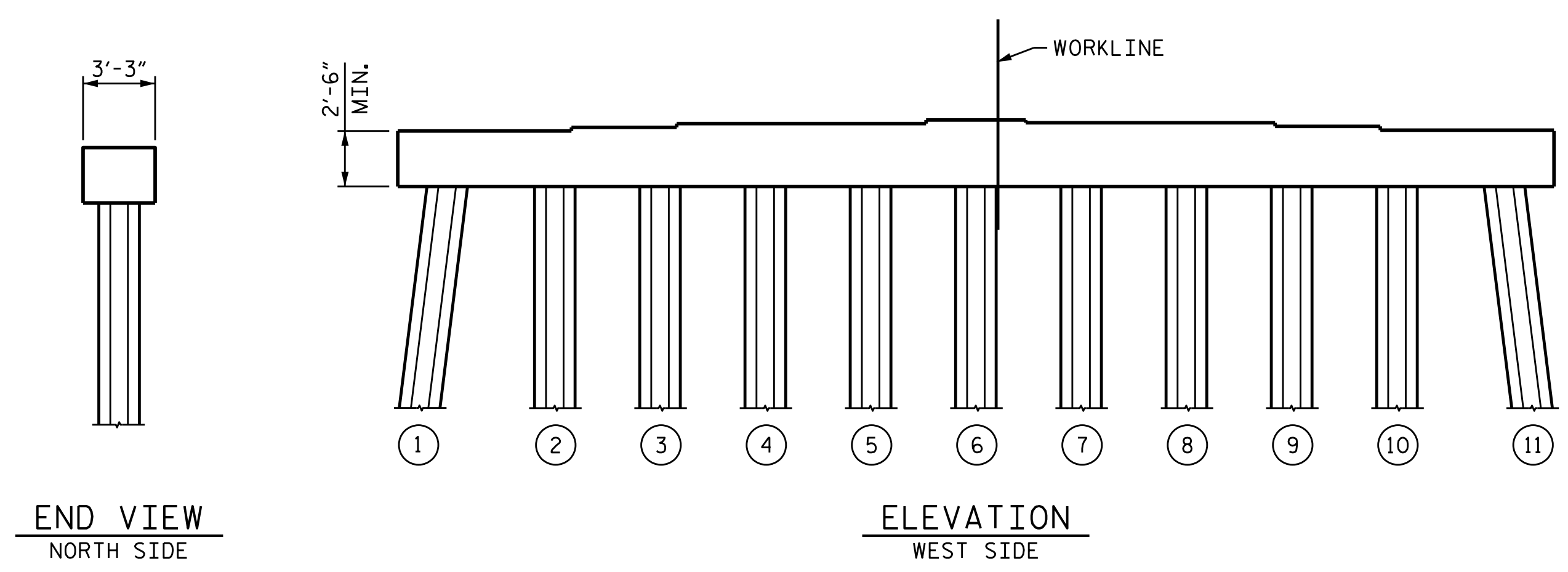
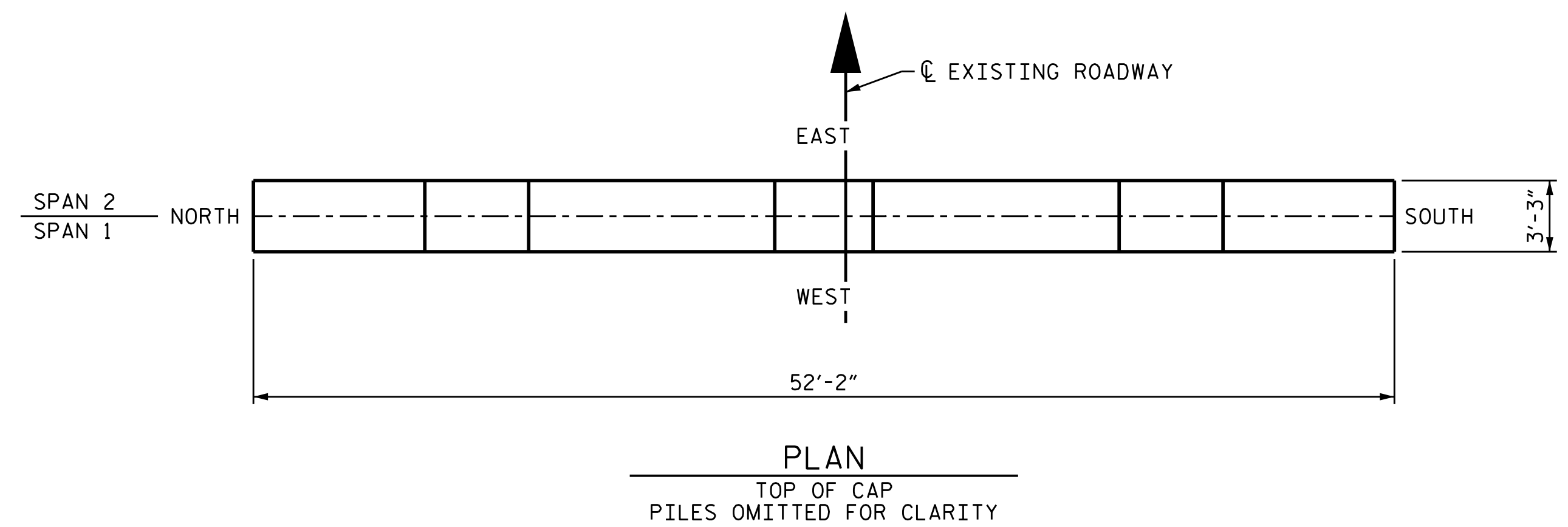
FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

FOR GALVANIC CATHODIC PROTECTION INTEGRAL PILE JACKET, SEE SPECIAL PROVISIONS.

FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

**REPAIR QUANTITY TABLE**

BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)				
CAP (HORIZONTAL FACE)				
22" OCT. PREST. CONC. PILES				
CONCRETE REPAIRS				
EPOXY COATING	AREA SF		AREA SF	
TOP OF CAP	170.0			
PILE JACKET	LENGTH LN. FT.		LENGTH LN. FT.	
PILE NUMBERS :				



**NOTES**

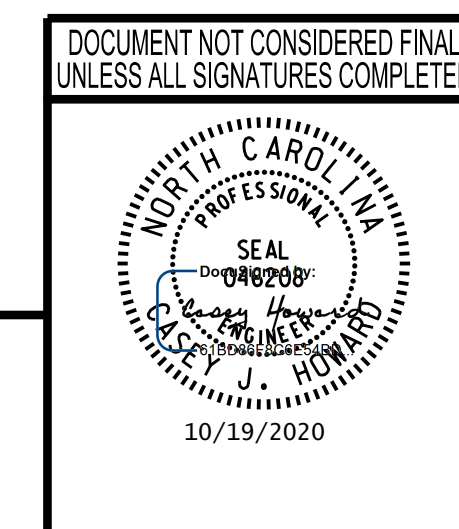
- SHOTCRETE REPAIR
- CONCRETE REPAIR

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 2 OF 15

STATE OF NORTH CAROLINA  
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SUBSTRUCTURE  
**BENT 1**  
 REPAIRS



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 434 FAYETTEVILLE STREET  
 SUITE 1500  
 RALEIGH, NC 27601  
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DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
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CONCRETE REPAIRS MAY BE USED IN LIEU OF SHOTCRETE REPAIRS, WITH THE APPROVAL OF THE ENGINEER.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CAP AND PILE REPAIR DETAILS, SEE "TYPICAL CAP AND PILE REPAIR DETAILS" SHEET S-56.

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.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

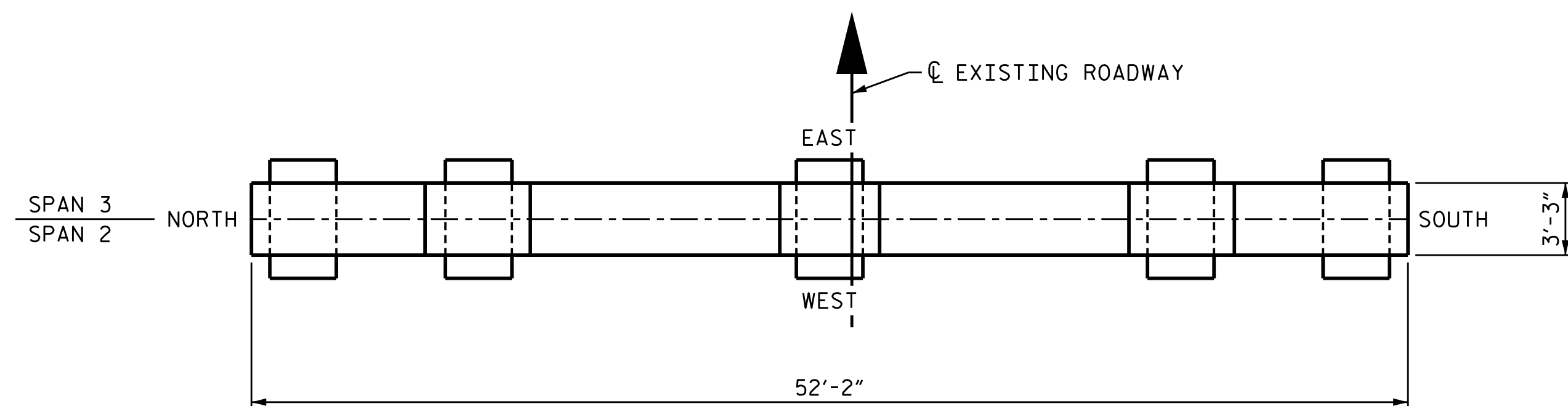
FOR GALVANIC CATHODIC PROTECTION INTEGRAL PILE JACKET, SEE SPECIAL PROVISIONS.

FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

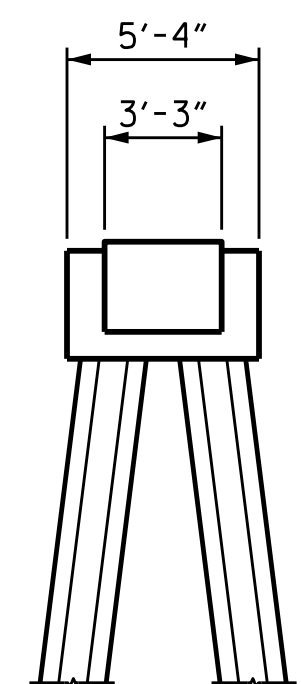
**REPAIR QUANTITY TABLE**

BENT 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	8.0	2.5		
CAP (HORIZONTAL FACE)				
22" OCT. PREST. CONC. PILES				
CONCRETE REPAIRS				
EPOXY COATING	AREA SF		AREA SF	
TOP OF CAP *	201.0			
PILE JACKET	LENGTH LN. FT.		LENGTH LN. FT.	
PILE NUMBERS :	2 & 5	21.67		

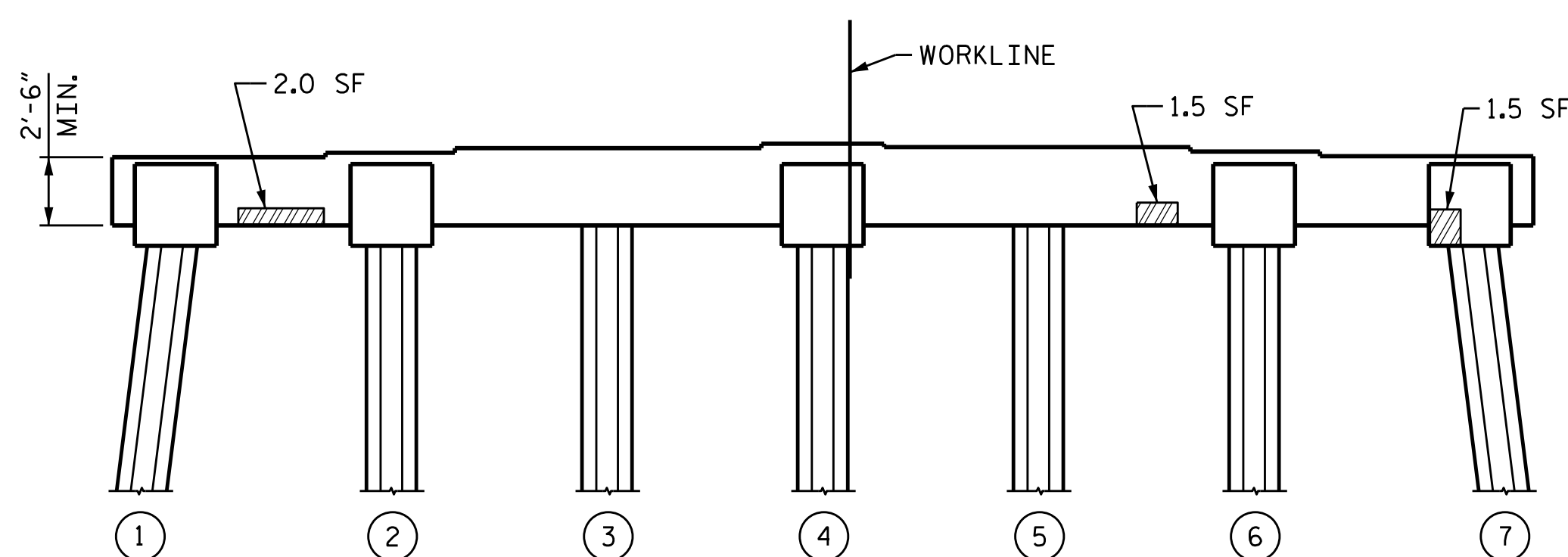
\* EPOXY COATING QUANTITY INCLUDES TOP OF PILE CAPS



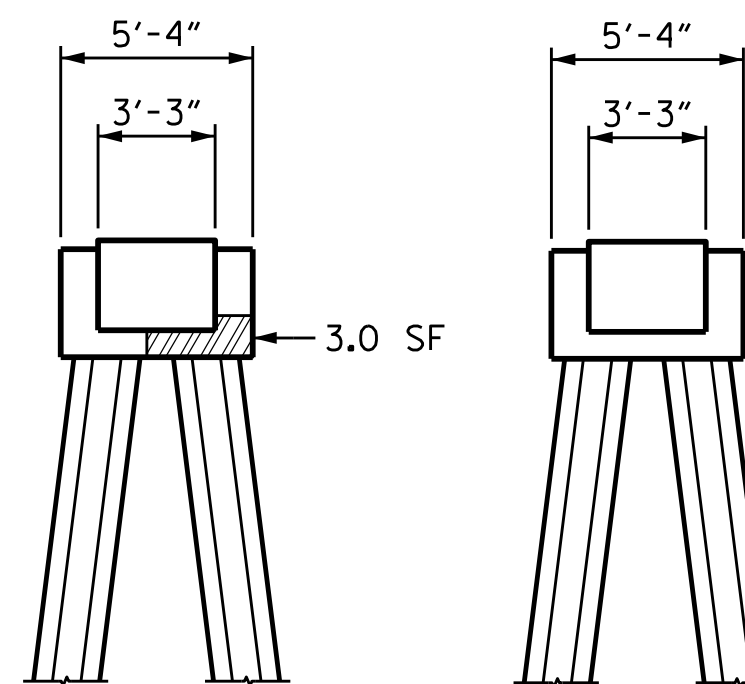
**PLAN**  
TOP OF CAP  
PILES OMITTED FOR CLARITY



**END VIEW**  
NORTH SIDE

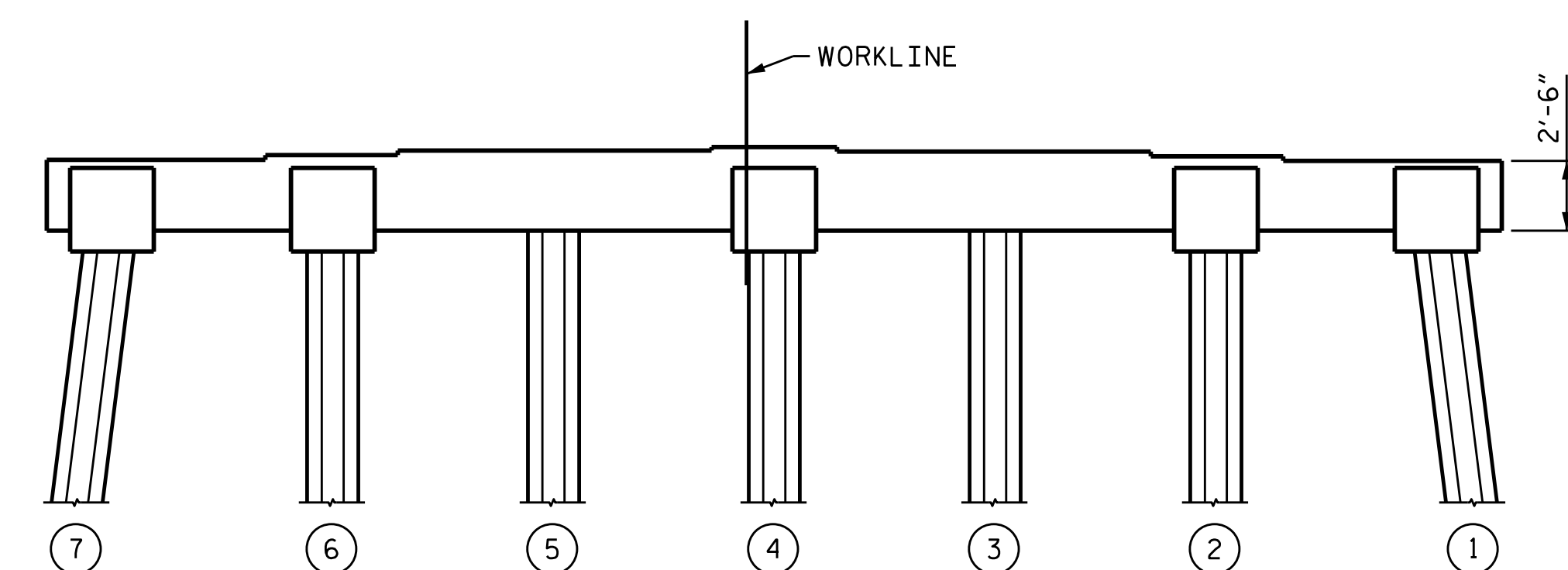


**ELEVATION**  
WEST SIDE

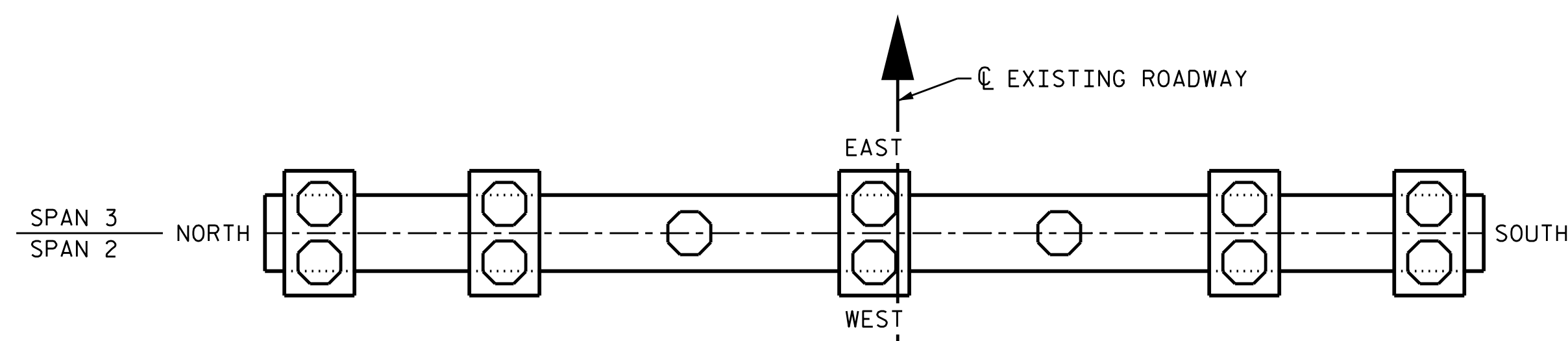


**PILE 7**  
NORTH SIDE

**END VIEW**  
SOUTH SIDE



**ELEVATION**  
EAST SIDE



**PLAN**  
BOTTOM OF CAP

**NOTES**

- SHOTCRETE REPAIR
- CONCRETE REPAIR

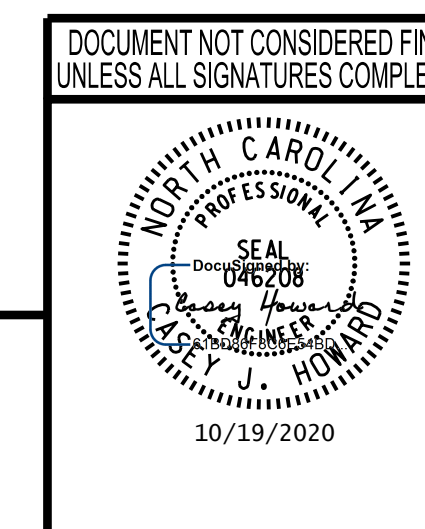
PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 3 OF 15

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
**BENT 2**  
 REPAIRS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			58



**wsp**

WSP USA Inc.  
 434 FAYETTEVILLE STREET  
 SUITE 1500  
 RALEIGH, NC 27601  
 TEL: 1.919.836.4040  
 LICENSE NO. F-0165

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DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
 CHECKED BY: C.J. HOWARD DATE: JUL 2018

### REPAIR QUANTITY TABLE

BENT 3	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERICAL FACE)	8.0	2.5		
CAP (HORIZONTAL FACE)	1.0	0.5		
22" OCT. PREST. CONC. PILES				
CONCRETE REPAIRS				
EPOXY COATING	AREA SF		AREA SF	
TOP OF CAP *	201.0			
PILE JACKET	LENGTH LN. FT.		LENGTH LN. FT.	
PILE NUMBERS :	2, 5, & 8	38.25		

\* EPOXY COATING QUANTITY INCLUDES TOP OF PILE CAPS

### NOTES

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

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FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

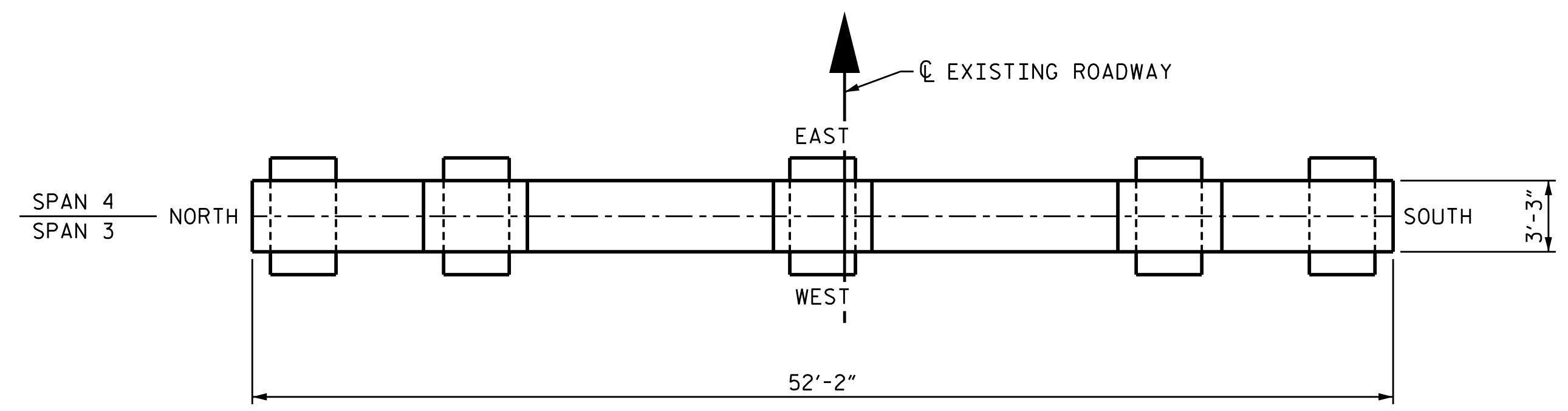
FOR CAP AND PILE REPAIR DETAILS, SEE "TYPICAL CAP AND PILE REPAIR DETAILS" SHEET S-56.

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.

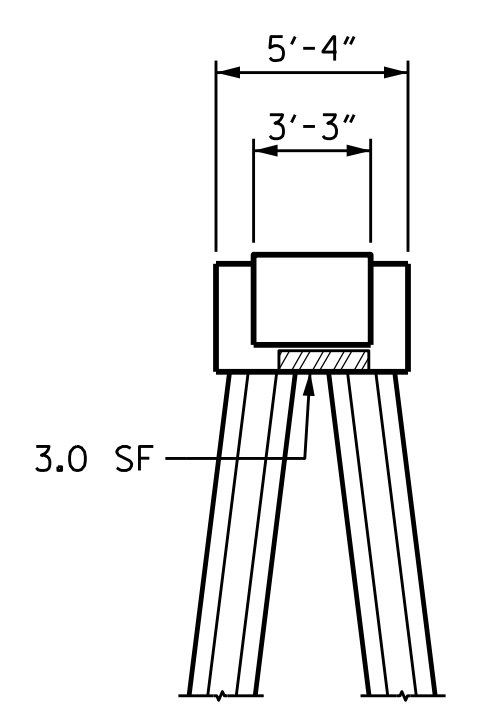
FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

FOR GALVANIC CATHODIC PROTECTION INTEGRAL PILE JACKET, SEE SPECIAL PROVISIONS.

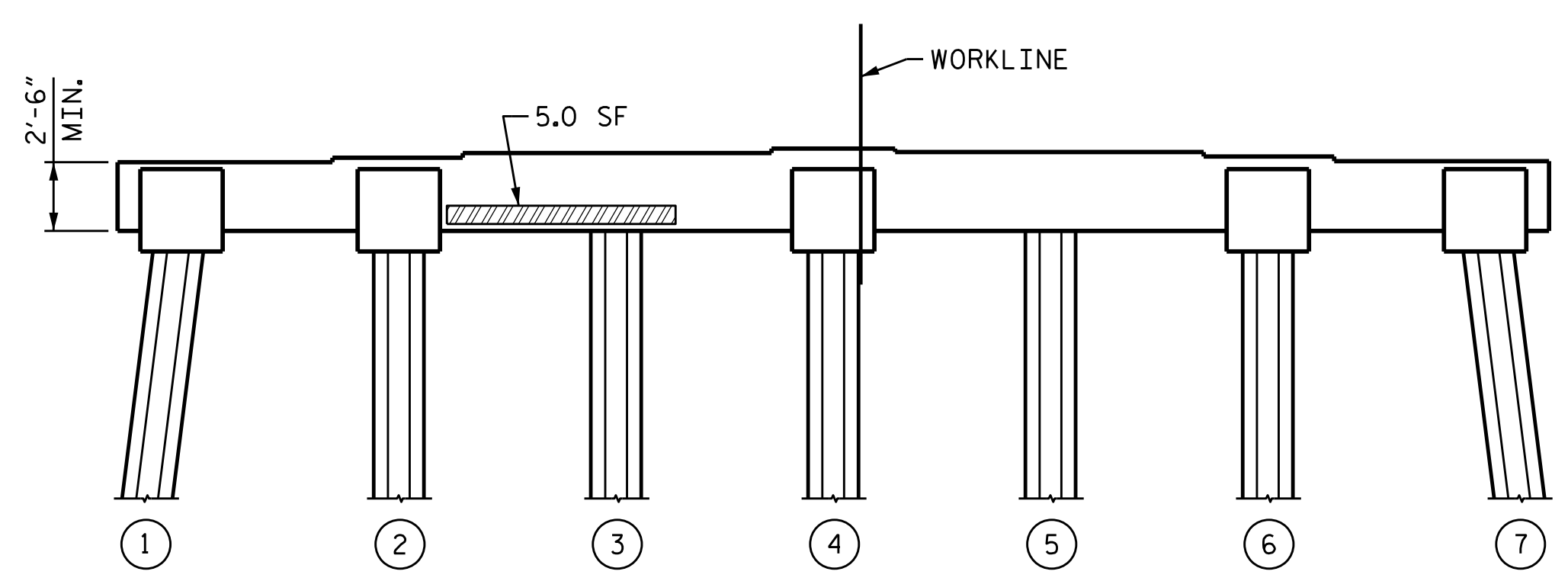
FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.



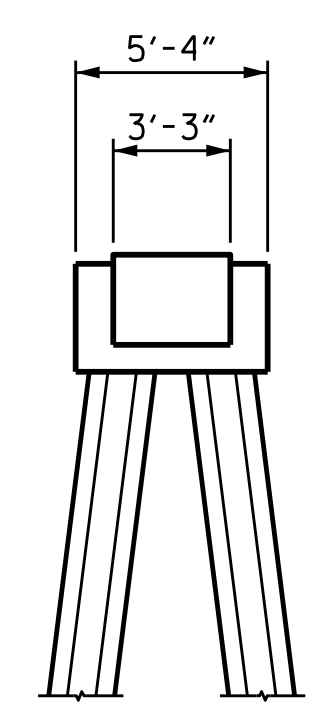
PLAN  
TOP OF CAP  
PILES OMITTED FOR CLARITY



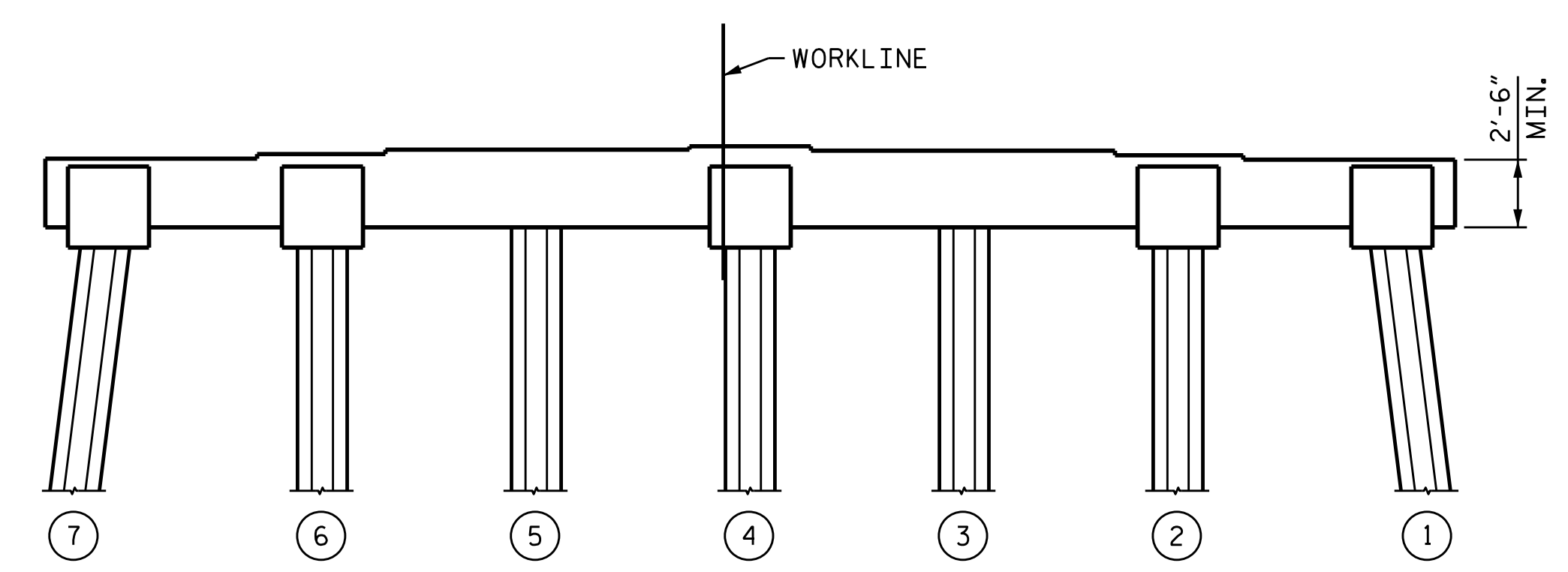
END VIEW  
NORTH SIDE



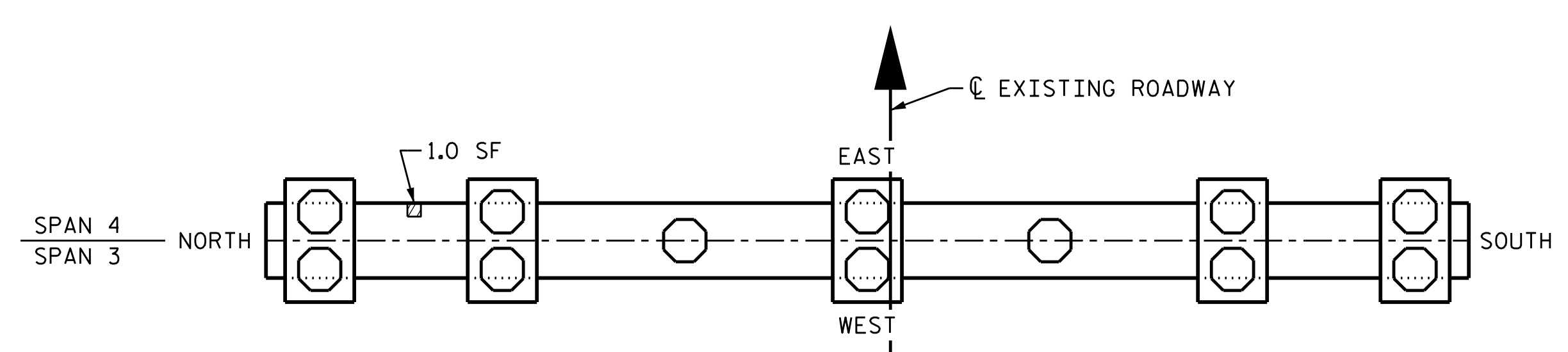
ELEVATION  
WEST SIDE



END VIEW  
SOUTH SIDE



ELEVATION  
EAST SIDE



PLAN  
BOTTOM OF CAP

### NOTES

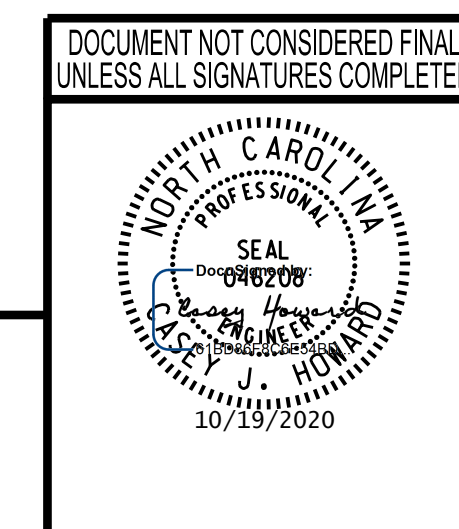
- SHOTCRETE REPAIR
- CONCRETE REPAIR

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
**BENT 3**  
 REPAIRS



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-35
2			4			TOTAL SHEETS 58

**wsp**

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 434 FAYETTEVILLE STREET  
 SUITE 1500  
 RALEIGH, NC 27601  
 TEL: 1.919.836.4040  
 LICENSE NO. F-0165

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DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
 CHECKED BY: C.J. HOWARD DATE: JUL 2018

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**NOTES**

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

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

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

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.

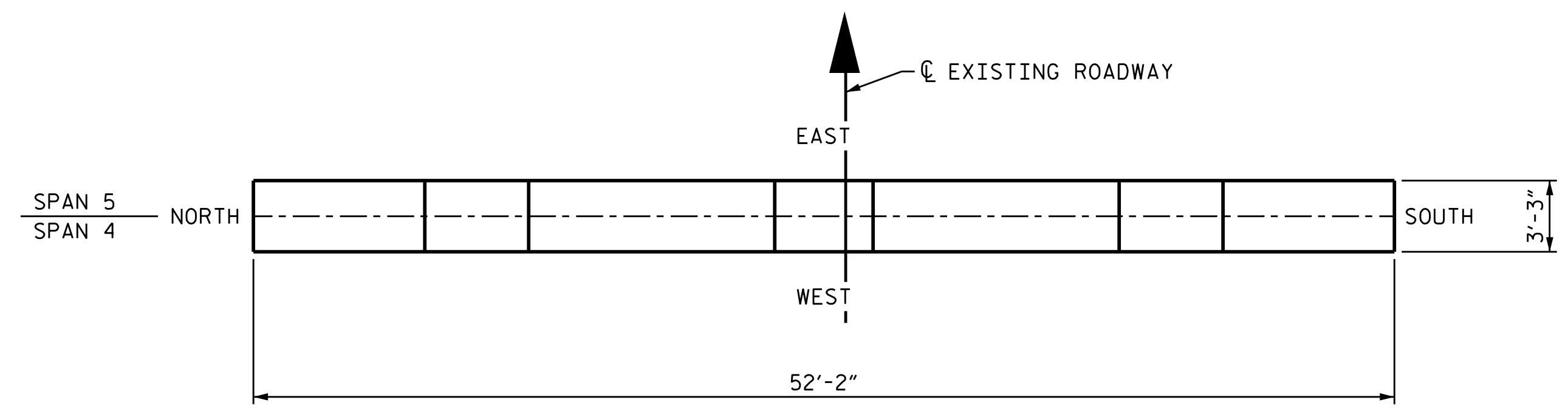
FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

FOR GALVANIC CATHODIC PROTECTION INTEGRAL PILE JACKET, SEE SPECIAL PROVISIONS.

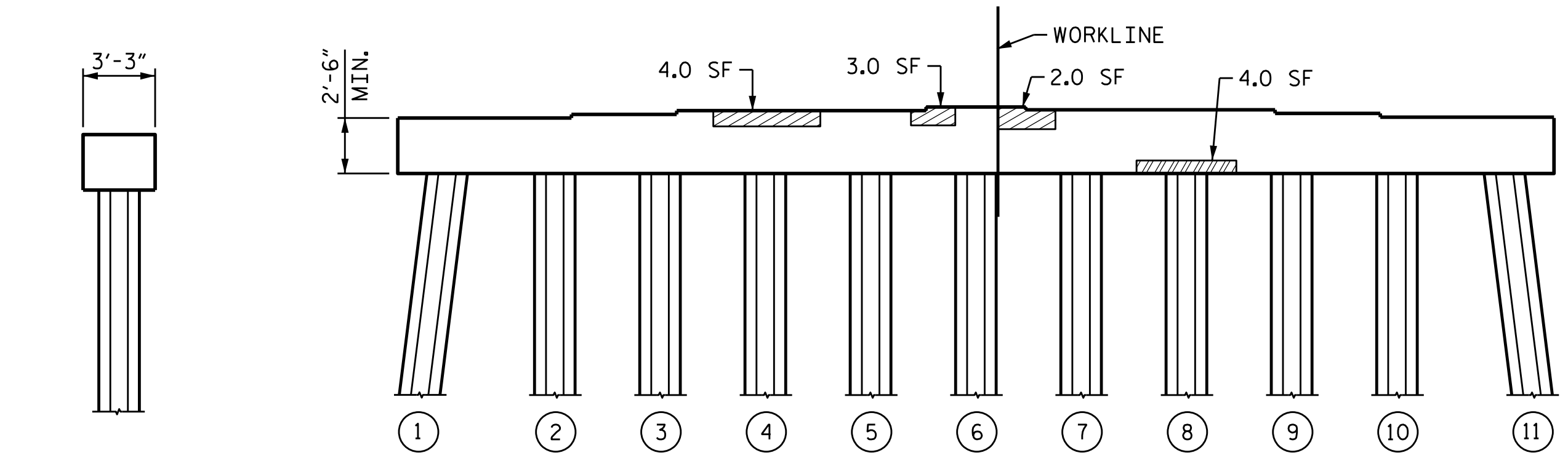
FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

**REPAIR QUANTITY TABLE**

BENT 4	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	6.0	2.0		
CAP (HORIZONTAL FACE)	3.5	1.0		
22" OCT. PREST. CONC. PILES				
CONCRETE REPAIRS	18.5	5.5		
EPOXY COATING	AREA SF		AREA SF	
TOP OF CAP	170.0			
PILE JACKET	LENGTH LN. FT.		LENGTH LN. FT.	
PILE NUMBERS :	9	15.25		

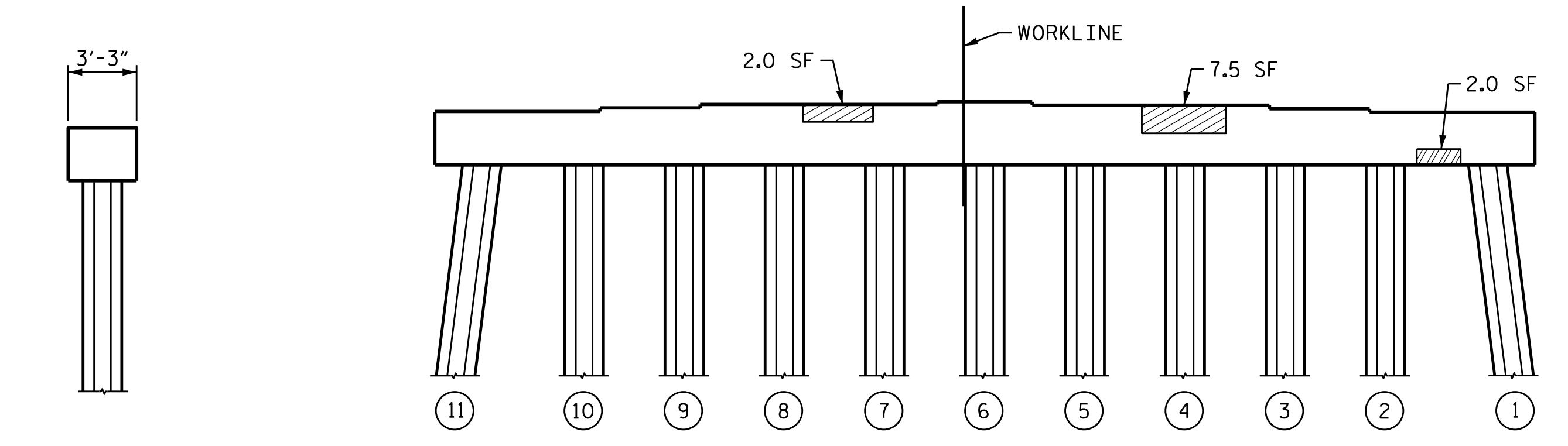


**PLAN**  
TOP OF CAP  
PILES OMITTED FOR CLARITY



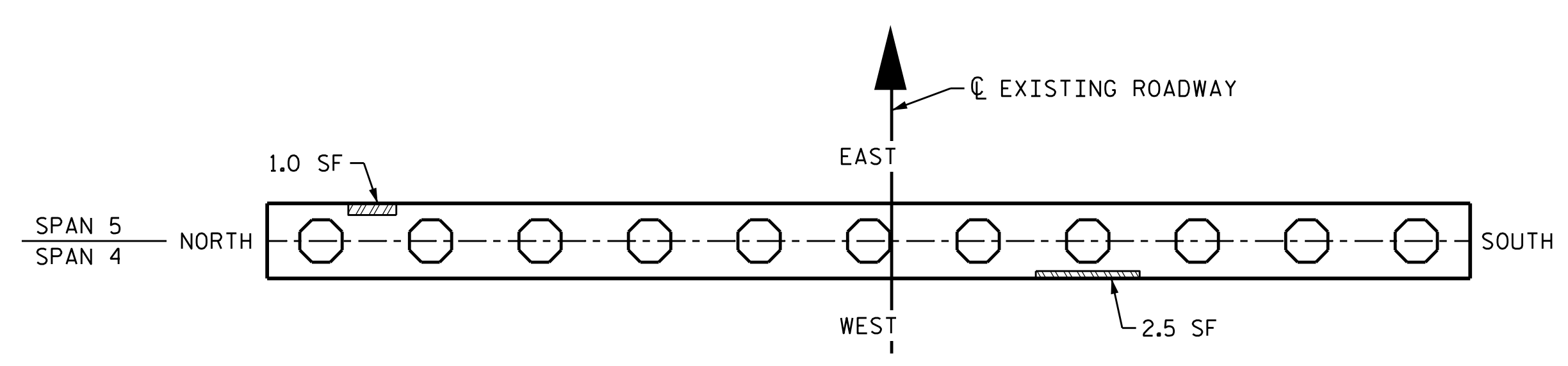
**ELEVATION**  
WEST SIDE

**END VIEW**  
NORTH SIDE



**ELEVATION**  
EAST SIDE

**END VIEW**  
SOUTH SIDE



**PLAN**  
BOTTOM OF CAP

**NOTES**

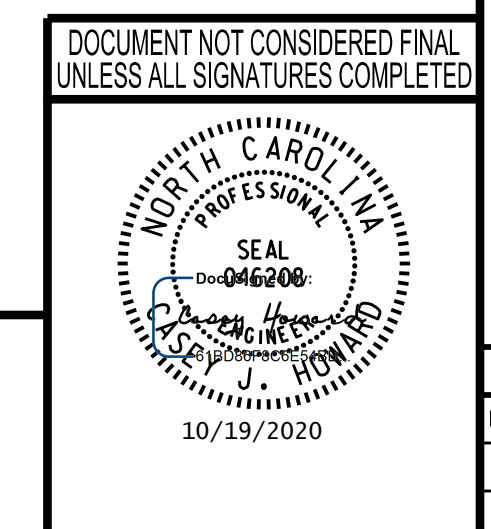
- SHOTCRETE REPAIR
- CONCRETE REPAIR

PROJECT NO. 15BPR.19  
 NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 5 OF 15

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT 4  
 REPAIRS



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 434 FAYETTEVILLE STREET  
 SUITE 1500  
 RALEIGH, NC 27601  
 TEL: 1.919.836.4040  
 LICENSE NO. F-0165

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1			3			S-36
2			4			TOTAL SHEETS 58

DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
 CHECKED BY: C.J. HOWARD DATE: JUL 2018

REPAIR QUANTITY TABLE

BENT 5	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	7.5	2.5		
CAP (HORIZONTAL FACE)				
22" OCT. PREST. CONC. PILES				
CONCRETE REPAIRS				
EPOXY COATING	AREA SF		AREA SF	
TOP OF CAP *	201.0			
PILE JACKET	LENGTH LN. FT.		LENGTH LN. FT.	
PILE NUMBERS :				

\* EPOXY COATING QUANTITY INCLUDES TOP OF PILE CAPS

NOTES

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

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

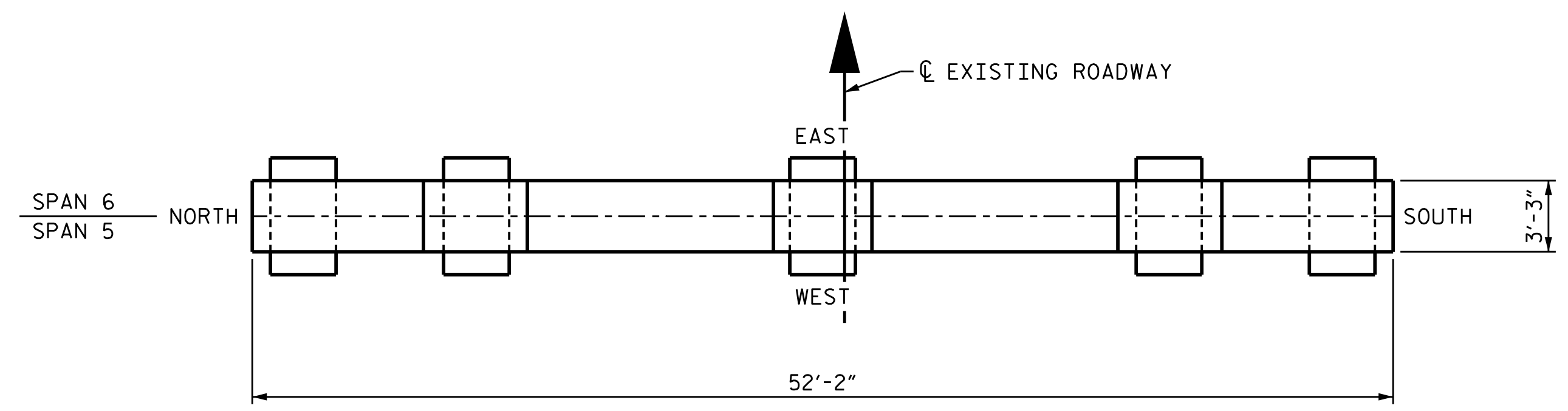
FOR CAP AND PILE REPAIR DETAILS, SEE "TYPICAL CAP AND PILE REPAIR DETAILS" SHEET S-56.

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.

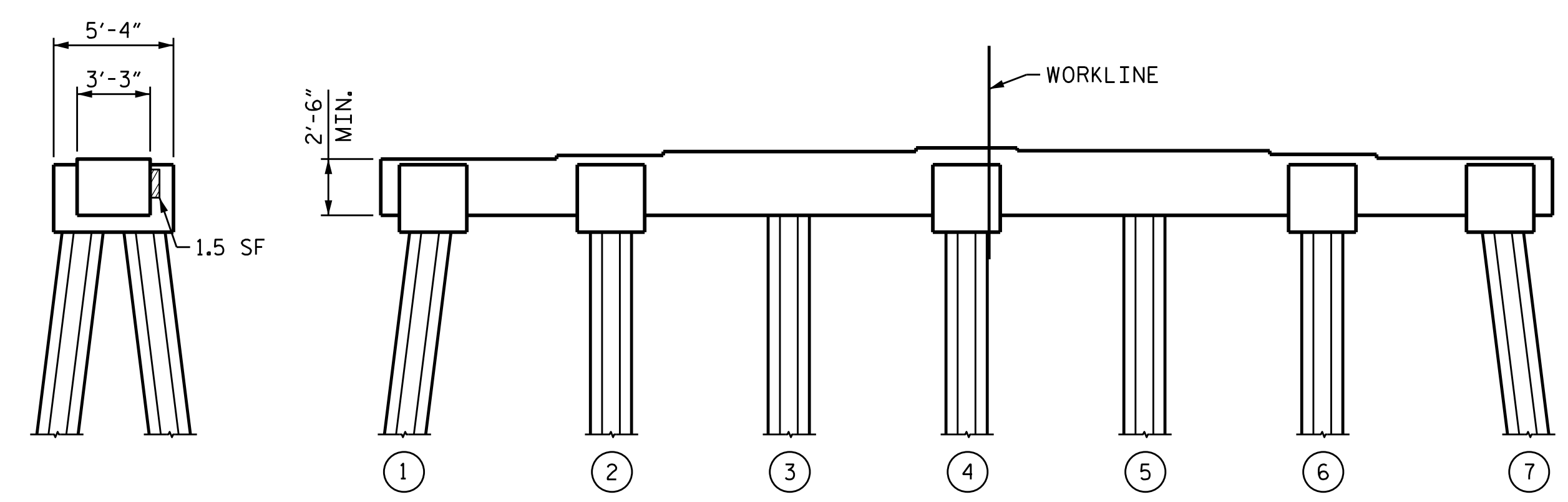
FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

FOR GALVANIC CATHODIC PROTECTION INTEGRAL PILE JACKET, SEE SPECIAL PROVISIONS.

FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

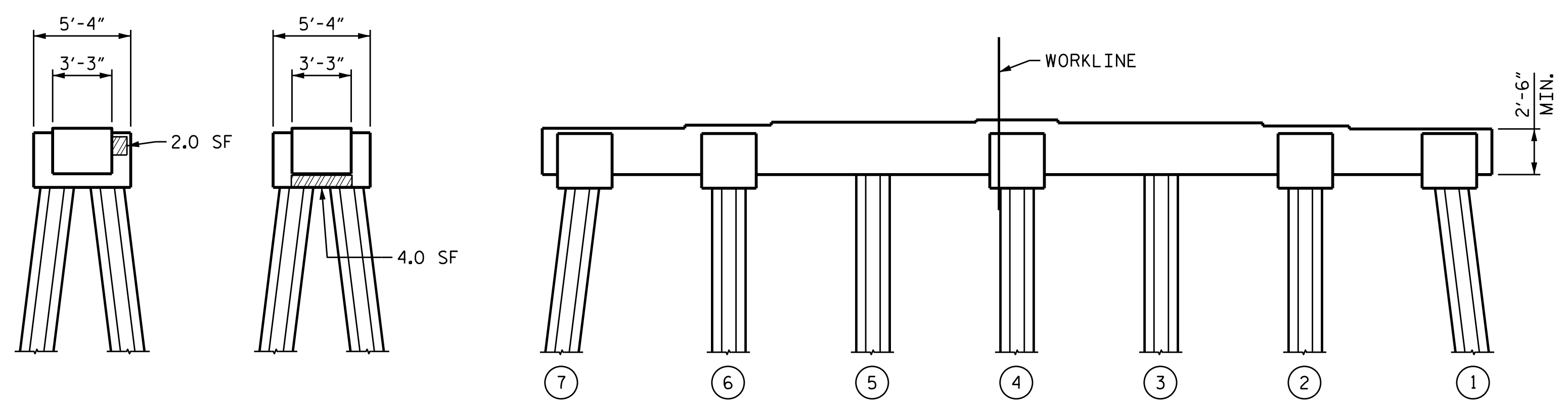


PLAN  
TOP OF CAP  
PILES OMITTED FOR CLARITY



PILE 2  
SOUTH SIDE

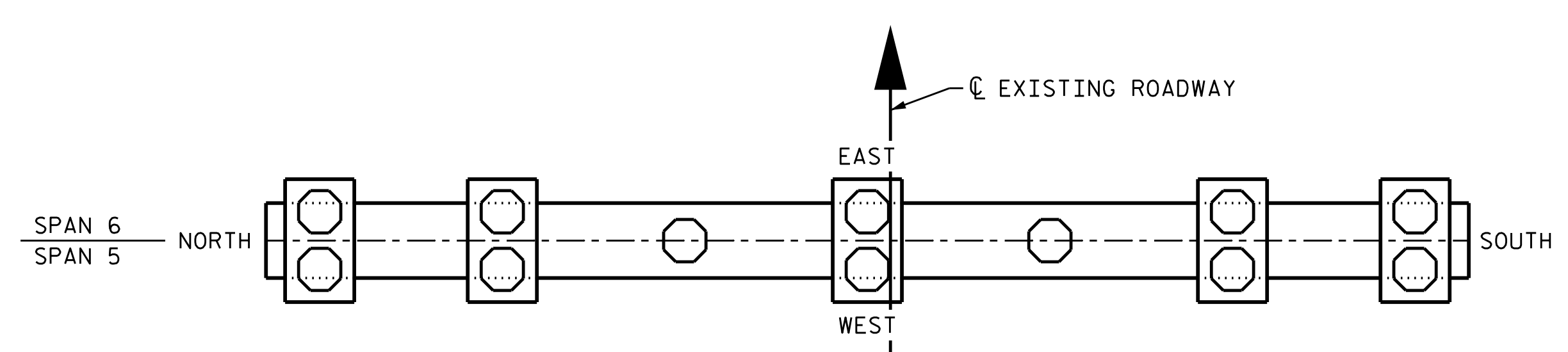
ELEVATION  
WEST SIDE



PILE 6  
SOUTH SIDE

PILE 6  
NORTH SIDE

ELEVATION  
EAST SIDE



PLAN  
BOTTOM OF CAP

NOTES

- SHOTCRETE REPAIR
- CONCRETE REPAIR

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
BRIDGE NO. 640021

SHEET 6 OF 15

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
BENT 5  
REPAIRS

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

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434 FAYETTEVILLE STREET  
SUITE 1500  
RALEIGH, NC 27601  
TEL: 1.919.836.4040  
LICENSE NO. F-0165

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			58

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DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
CHECKED BY: C.J. HOWARD DATE: JUL 2018

### REPAIR QUANTITY TABLE

BENT 6	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	4.5	1.5		
CAP (HORIZONTAL FACE)				
22" OCT. PREST. CONC. PILES				
CONCRETE REPAIRS				
EPOXY COATING	AREA SF		AREA SF	
TOP OF CAP *	201.0			
PILE JACKET	LENGTH LN. FT.		LENGTH LN. FT.	
PILE NUMBERS :				

\* EPOXY COATING QUANTITY INCLUDES TOP OF PILE CAPS

### NOTES

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FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

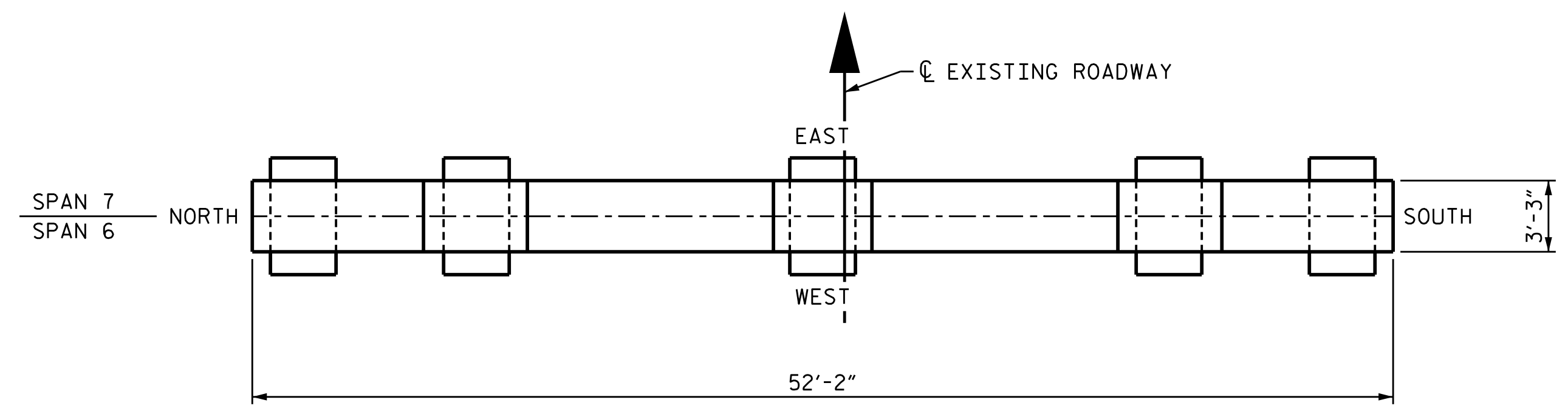
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VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE, MIN. OF 1" BEHIND REBAR AND MIN. 2" CLEAR TO SAWCUT, SEE REPAIR DETAILS.

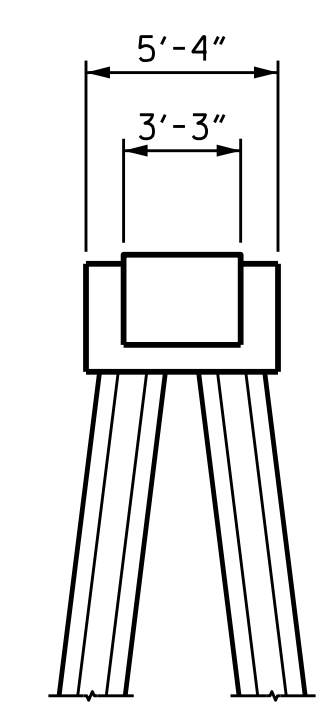
FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

FOR GALVANIC CATHODIC PROTECTION INTEGRAL PILE JACKET, SEE SPECIAL PROVISIONS.

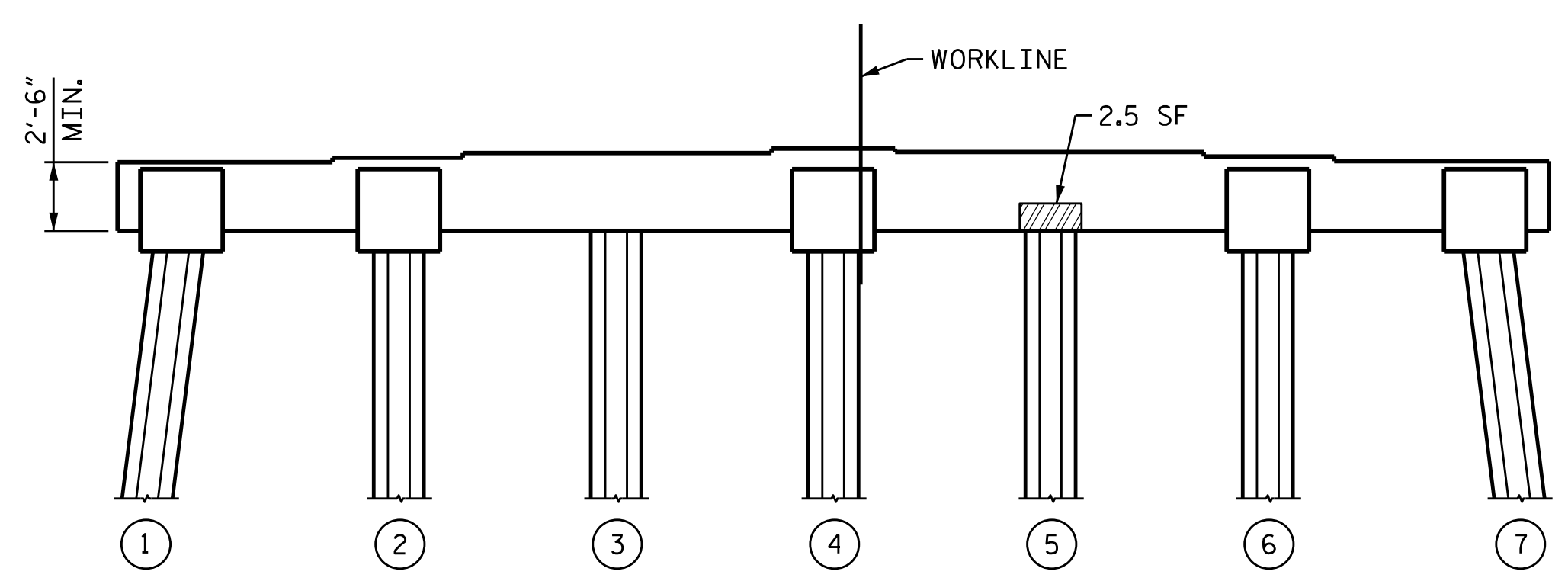
FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.



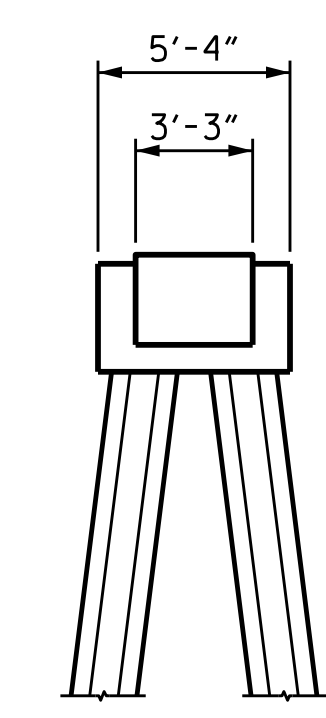
PLAN  
TOP OF CAP  
PILES OMITTED FOR CLARITY



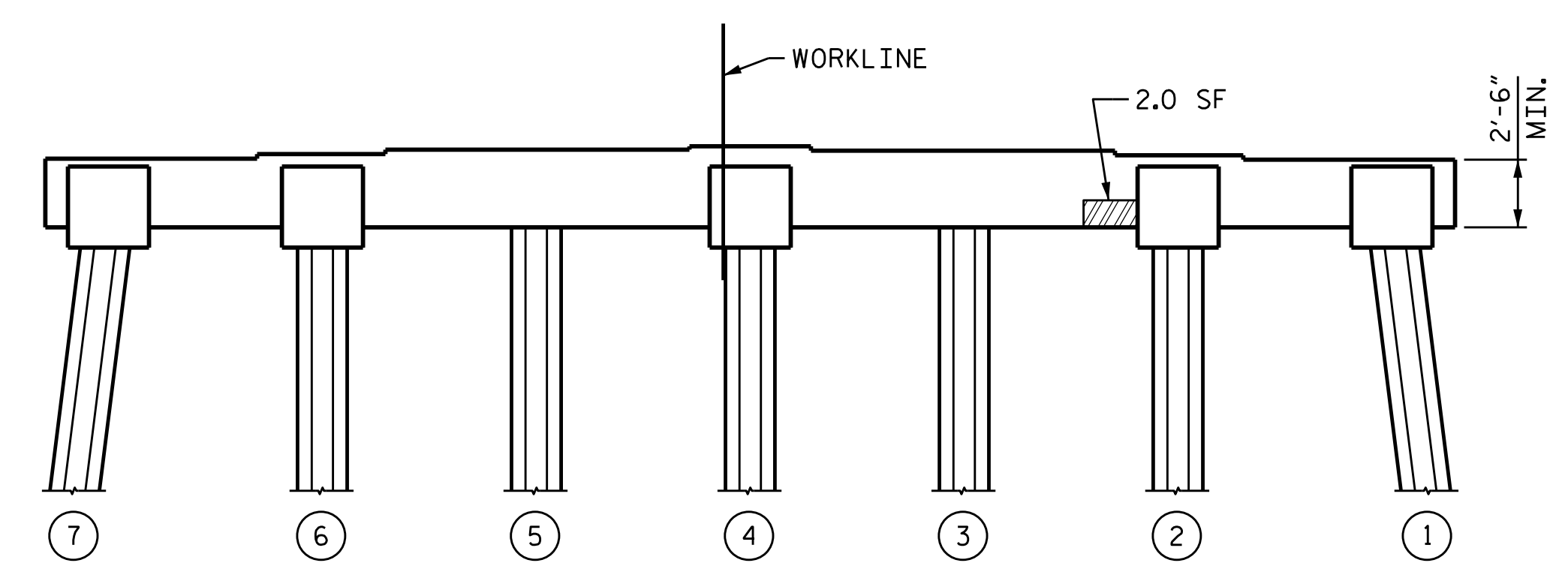
END VIEW  
NORTH SIDE



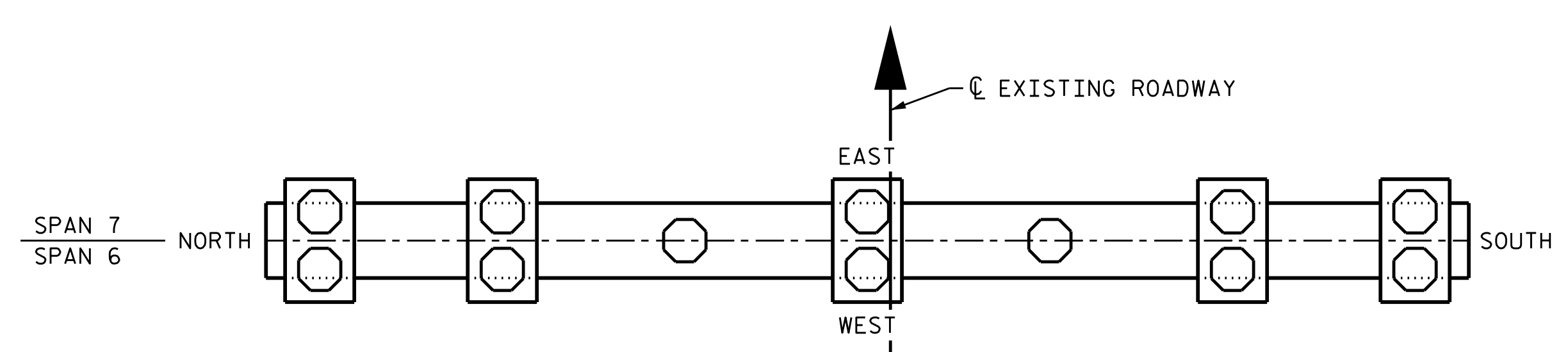
ELEVATION  
WEST SIDE



END VIEW  
SOUTH SIDE



ELEVATION  
EAST SIDE



PLAN  
BOTTOM OF CAP

### NOTES

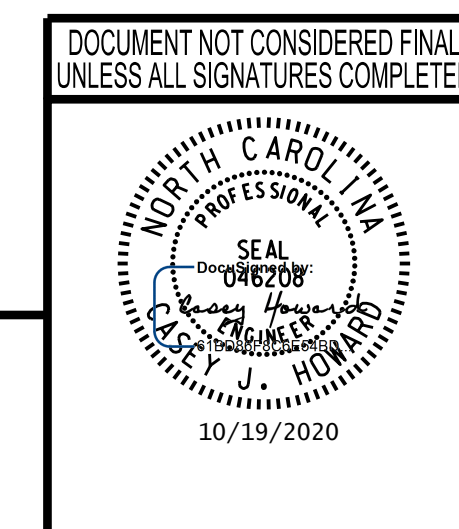
- SHOTCRETE REPAIR
- CONCRETE REPAIR

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 7 OF 15

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT 6  
 REPAIRS



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			58

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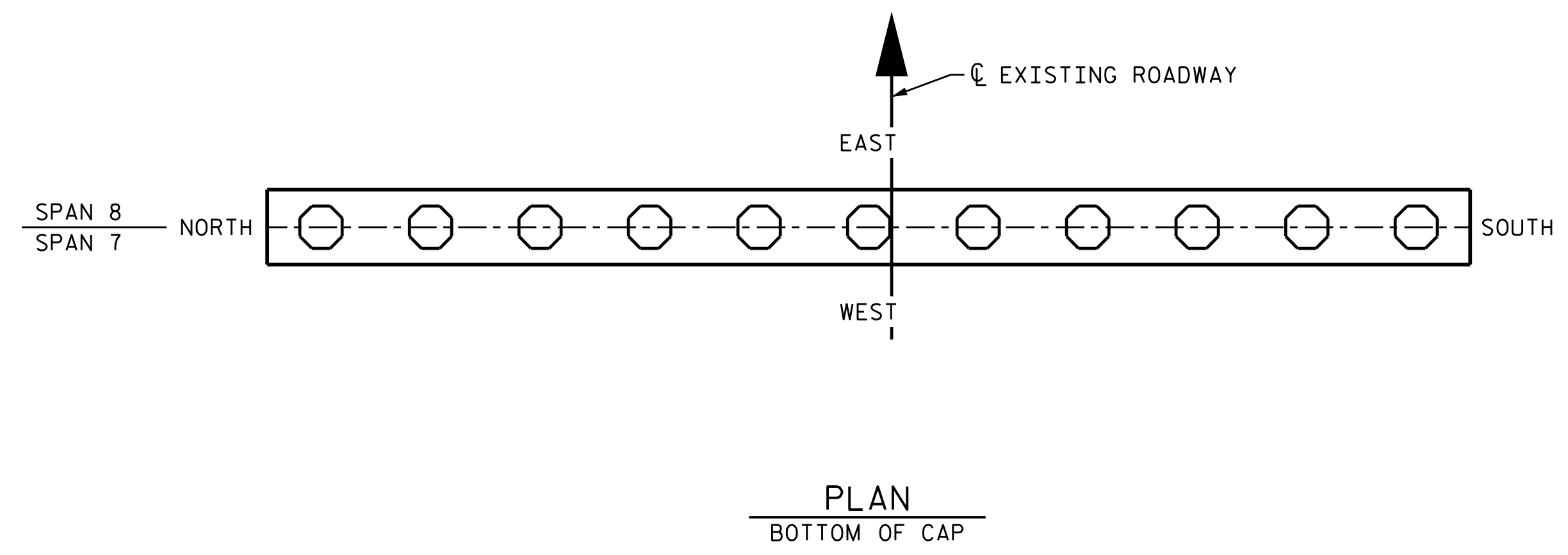
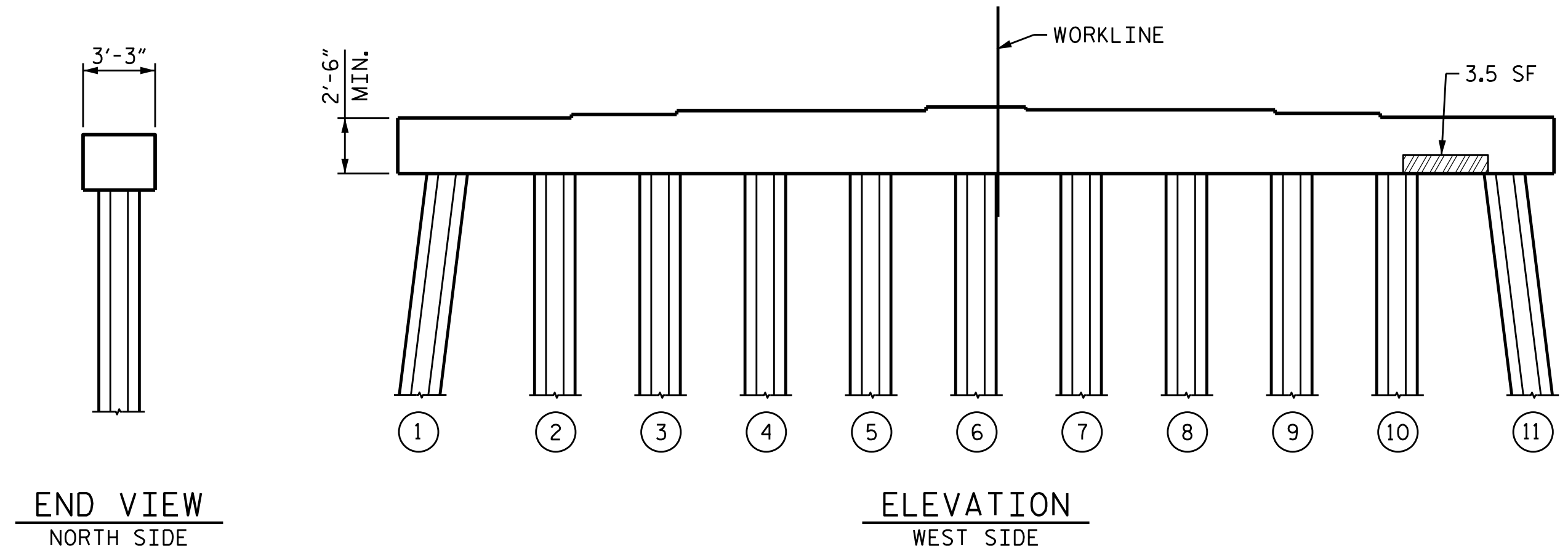
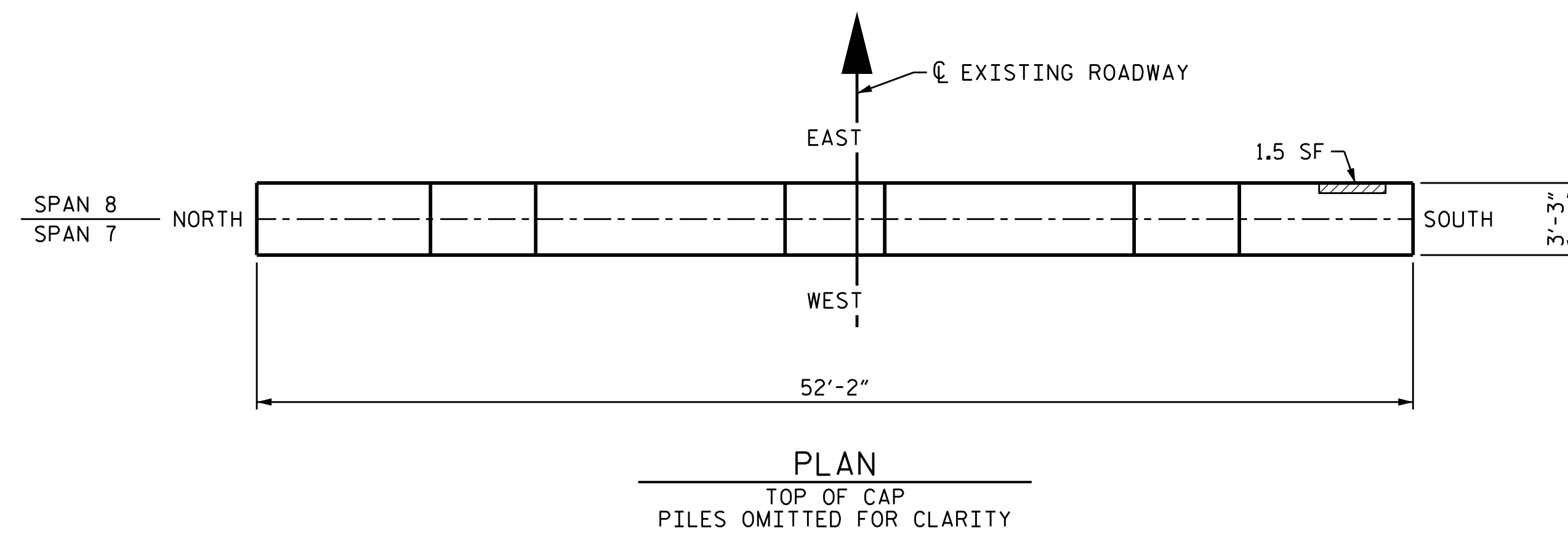
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 SUITE 1500  
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DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
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**NOTES**

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FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CAP AND PILE REPAIR DETAILS, SEE "TYPICAL CAP AND PILE REPAIR DETAILS" SHEET S-56.

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.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

FOR GALVANIC CATHODIC PROTECTION INTEGRAL PILE JACKET, SEE SPECIAL PROVISIONS.

FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

**REPAIR QUANTITY TABLE**

BENT 7	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	6.5	2.0		
CAP (HORIZONTAL FACE)				
22" OCT. PREST. CONC. PILES				
CONCRETE REPAIRS	6.0	2.0		
EPOXY COATING	AREA SF		AREA SF	
TOP OF CAP	170.0			
PILE JACKET	LENGTH LN. FT.		LENGTH LN. FT.	
PILE NUMBERS :				

**NOTES**

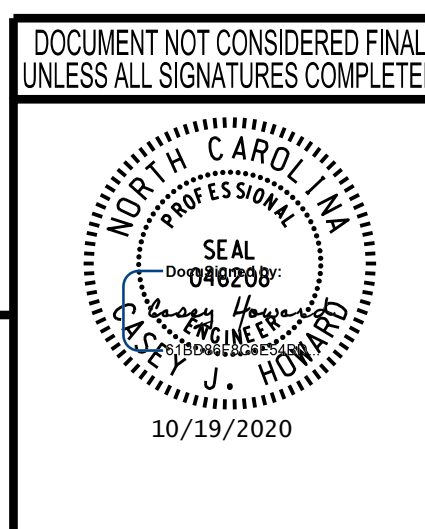
- SHOTCRETE REPAIR
- CONCRETE REPAIR

PROJECT NO. 15BPR.19  
 NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 8 OF 15

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
**BENT 7**  
 REPAIRS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-39
2			4			TOTAL SHEETS 58



**wsp**  
 WSP USA Inc.  
 434 FAYETTEVILLE STREET  
 SUITE 1500  
 RALEIGH, NC 27601  
 TEL: 1.919.836.4040  
 LICENSE NO. F-0165

DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
 CHECKED BY: C.J. HOWARD DATE: JUL 2018

**NOTES**

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

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

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CAP AND PILE REPAIR DETAILS, SEE "TYPICAL CAP AND PILE REPAIR DETAILS" SHEET S-56.

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.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

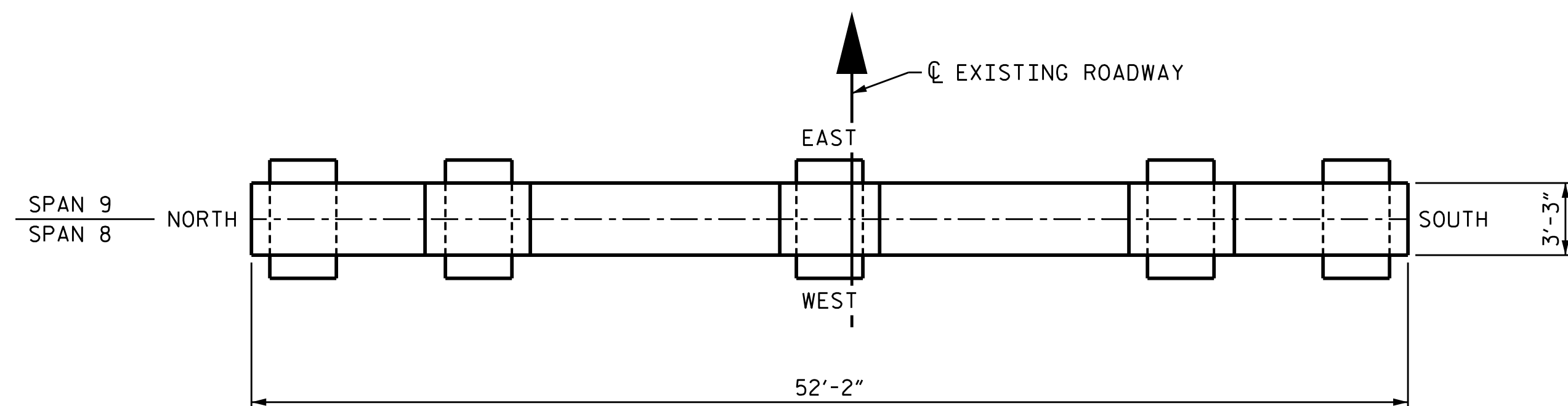
FOR GALVANIC CATHODIC PROTECTION INTEGRAL PILE JACKET, SEE SPECIAL PROVISIONS.

FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

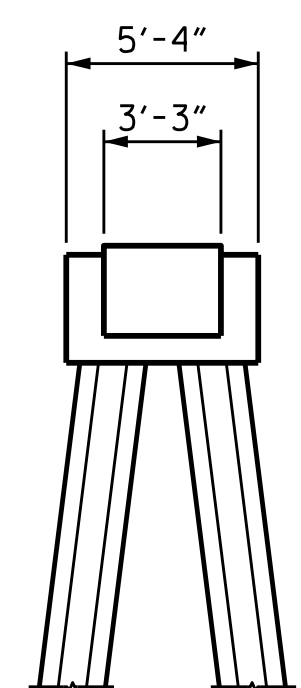
**REPAIR QUANTITY TABLE**

BENT 8	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	8.0	2.5		
CAP (HORIZONTAL FACE)				
22" OCT. PREST. CONC. PILES				
CONCRETE REPAIRS				
EPOXY COATING	AREA SF		AREA SF	
TOP OF CAP *	201.0			
PILE JACKET	LENGTH LN. FT.		LENGTH LN. FT.	
PILE NUMBERS :				

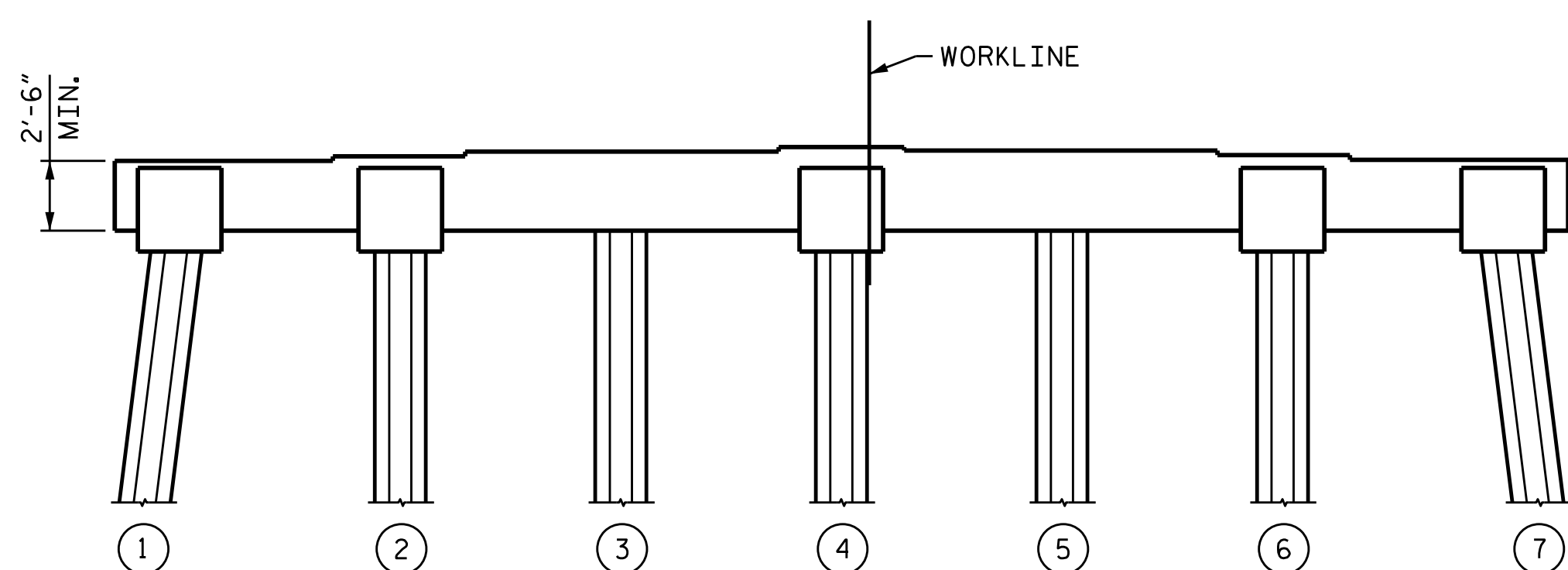
\* EPOXY COATING QUANTITY INCLUDES TOP OF PILE CAPS



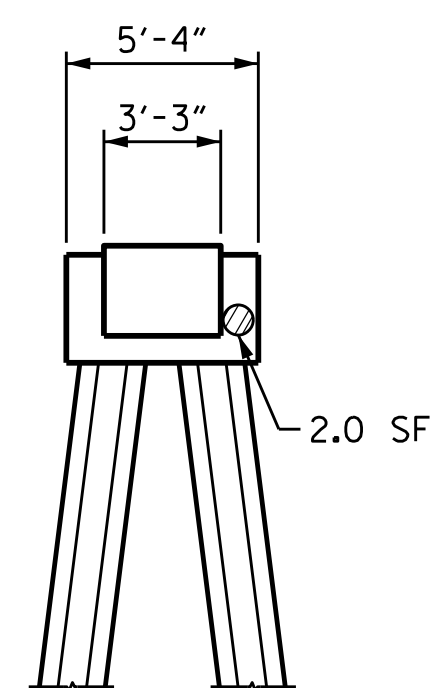
**PLAN**  
TOP OF CAP  
PILES OMITTED FOR CLARITY



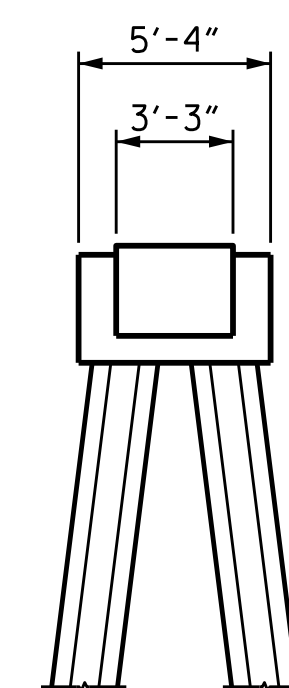
**END VIEW**  
NORTH SIDE



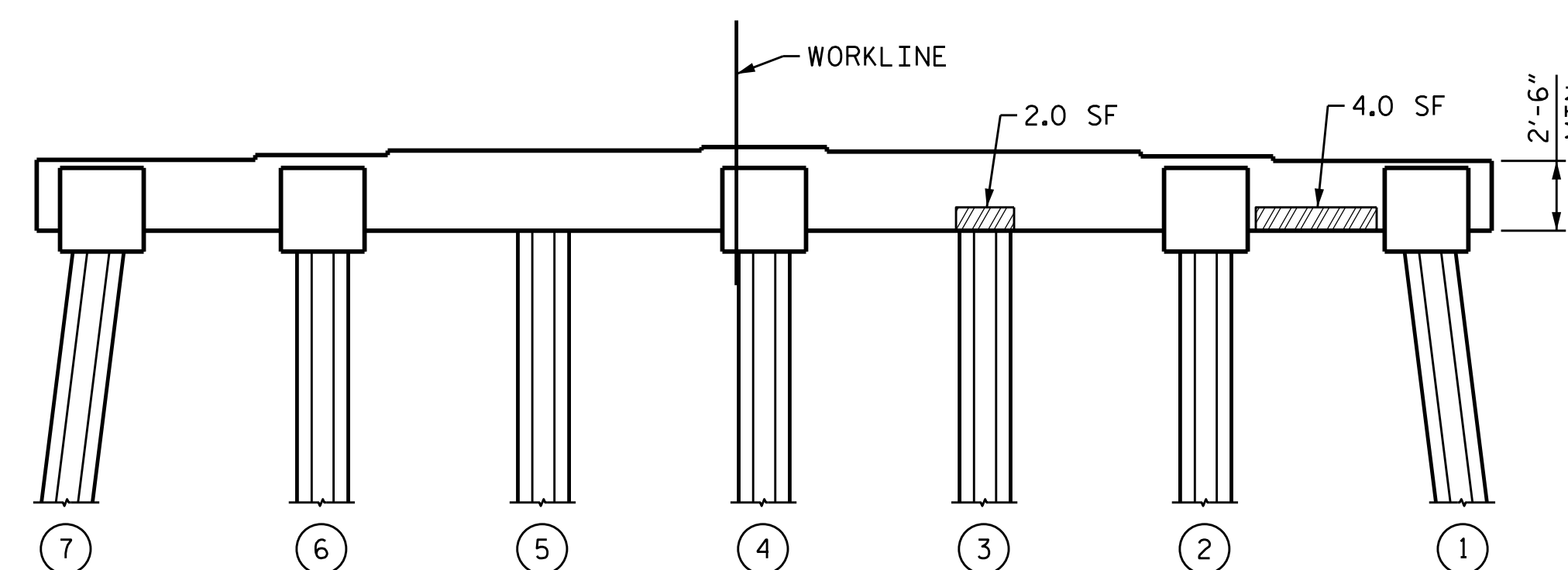
**ELEVATION**  
WEST SIDE



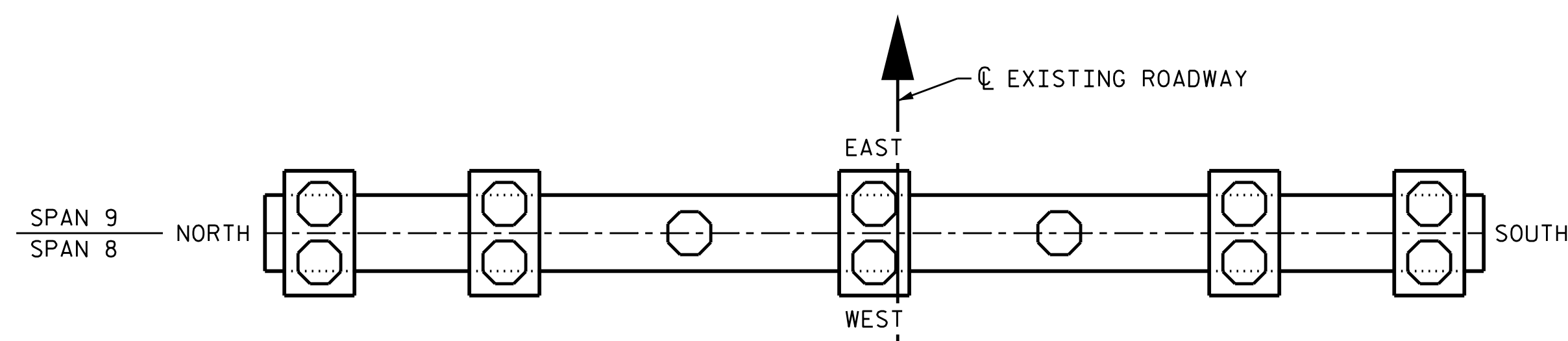
**PILE 2**  
NORTH SIDE



**END VIEW**  
SOUTH SIDE



**ELEVATION**  
EAST SIDE



**PLAN**  
BOTTOM OF CAP

**NOTES**

- SHOTCRETE REPAIR
- CONCRETE REPAIR

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 9 OF 15

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

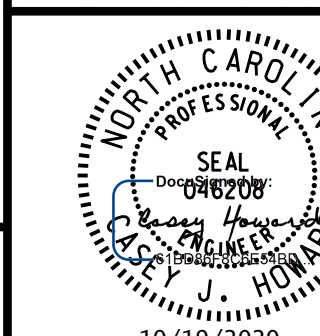
SUBSTRUCTURE  
**BENT 8**  
 REPAIRS

**REVISIONS**

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

SHEET NO.  
**S-40**  
 TOTAL SHEETS  
**58**

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 SUITE 1500  
 RALEIGH, NC 27601  
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 LICENSE NO. F-0165

DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
 CHECKED BY: C.J. HOWARD DATE: JUL 2018

### REPAIR QUANTITY TABLE

BENT 9	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERICAL FACE)	3.5	1.0		
CAP (HORIZONTAL FACE)				
22" OCT. PREST. CONC. PILES				
CONCRETE REPAIRS				
EPOXY COATING	AREA SF		AREA SF	
TOP OF CAP *	201.0			
PILE JACKET	LENGTH LN. FT.		LENGTH LN. FT.	
PILE NUMBERS :	5	18.00		

\* EPOXY COATING QUANTITY INCLUDES TOP OF PILE CAPS

### NOTES

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FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

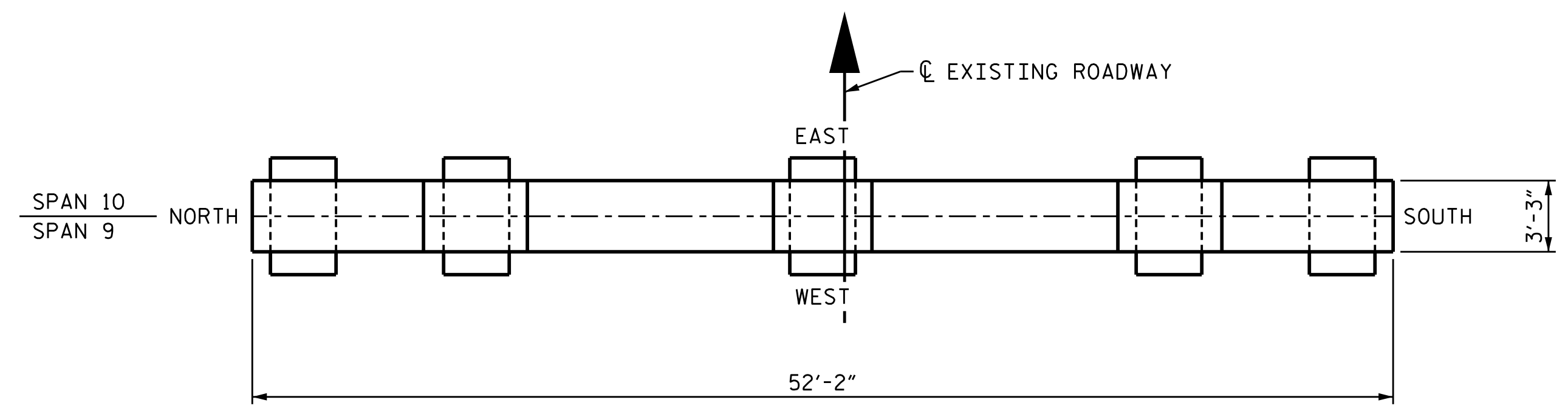
FOR CAP AND PILE REPAIR DETAILS, SEE "TYPICAL CAP AND PILE REPAIR DETAILS" SHEET S-56.

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.

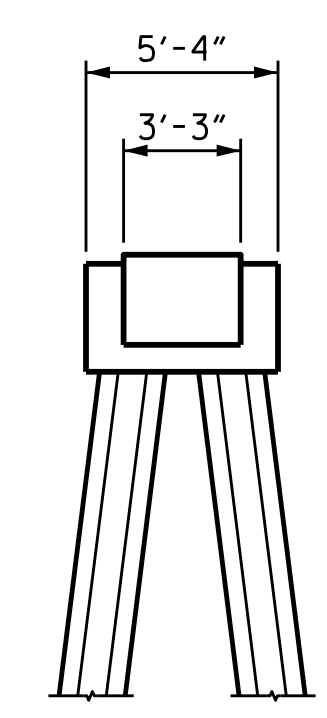
FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

FOR GALVANIC CATHODIC PROTECTION INTEGRAL PILE JACKET, SEE SPECIAL PROVISIONS.

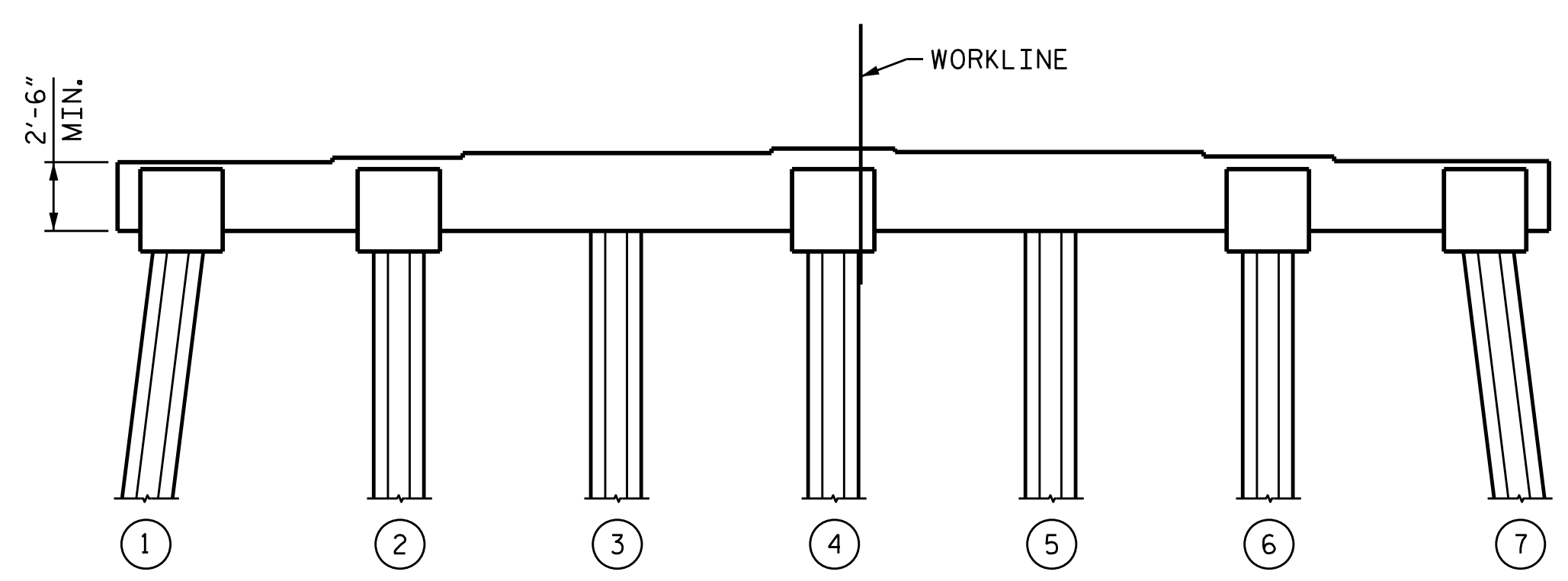
FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.



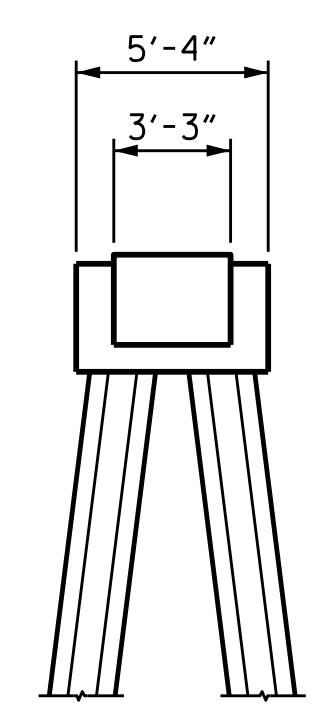
PLAN  
TOP OF CAP  
PILES OMITTED FOR CLARITY



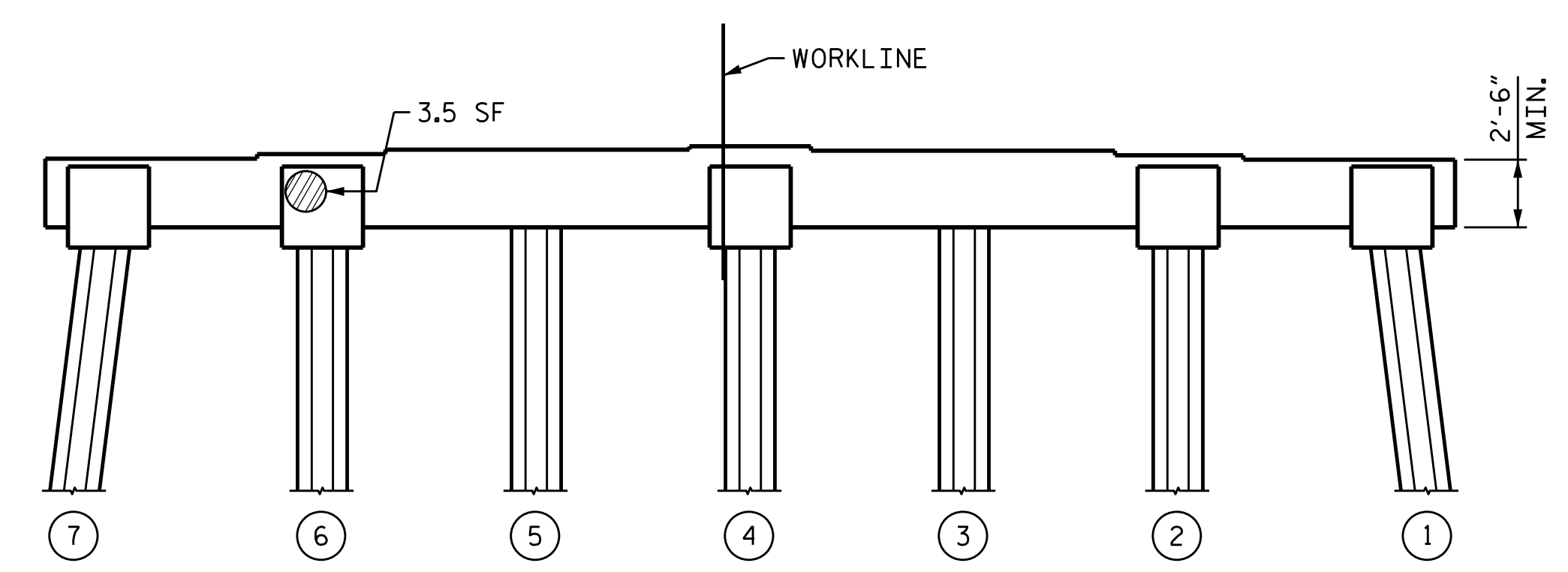
END VIEW  
NORTH SIDE



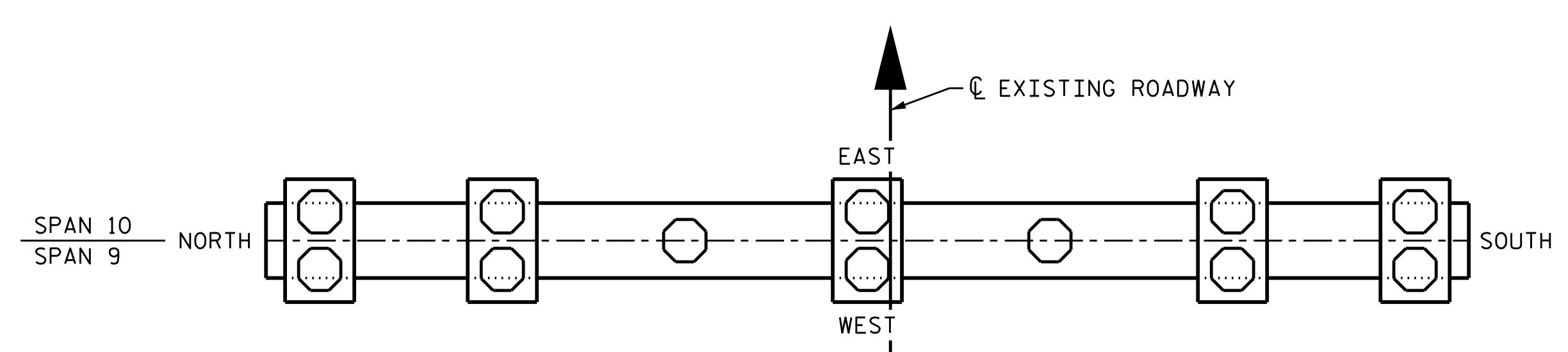
ELEVATION  
WEST SIDE



END VIEW  
SOUTH SIDE



ELEVATION  
EAST SIDE



PLAN  
BOTTOM OF CAP

### NOTES

- SHOTCRETE REPAIR
- CONCRETE REPAIR

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 10 OF 15

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
**BENT 9**  
 REPAIRS

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 434 FAYETTEVILLE STREET  
 SUITE 1500  
 RALEIGH, NC 27601  
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 LICENSE NO. F-0165

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			58

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 CHECKED BY: C.J. HOWARD DATE: JUL 2018

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**NOTES**

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FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

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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.

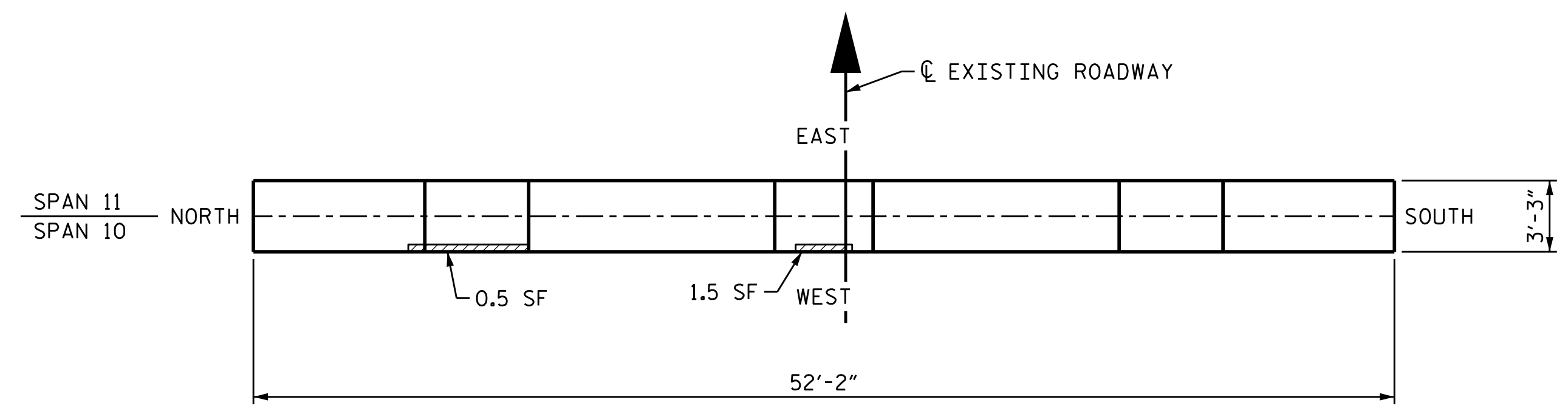
FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

FOR GALVANIC CATHODIC PROTECTION INTEGRAL PILE JACKET, SEE SPECIAL PROVISIONS.

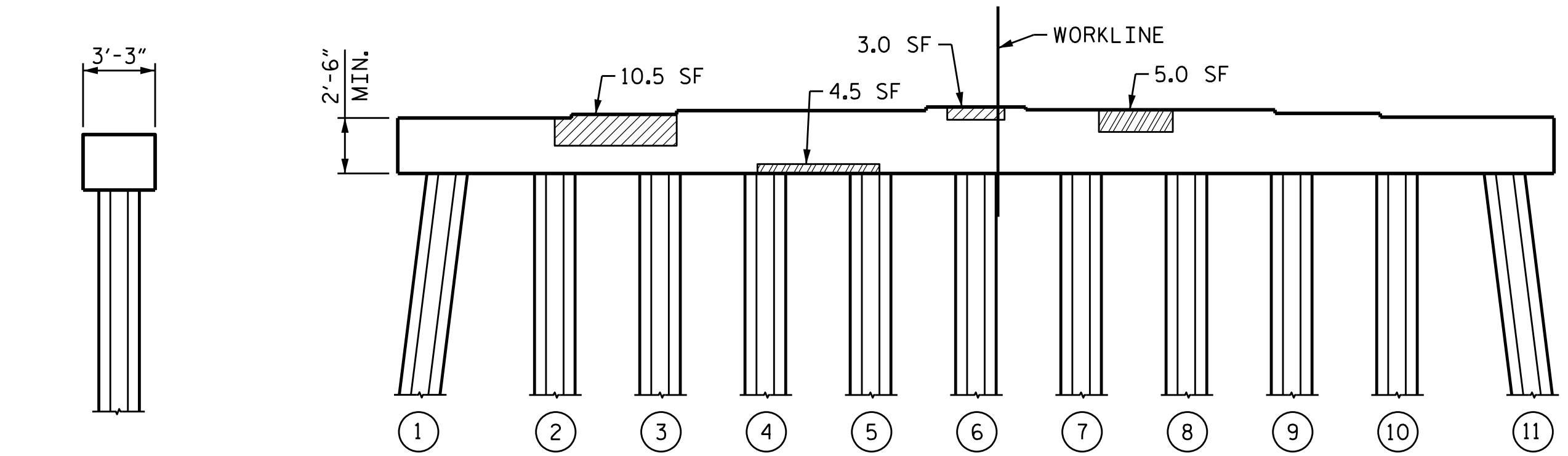
FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

**REPAIR QUANTITY TABLE**

BENT 10	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	9.5	3.0		
CAP (HORIZONTAL FACE)				
22" OCT. PREST. CONC. PILES				
CONCRETE REPAIRS	25.0	7.5		
EPOXY COATING	AREA SF		AREA SF	
TOP OF CAP	170.0			
PILE JACKET	LENGTH LN. FT.		LENGTH LN. FT.	
PILE NUMBERS :	8	16.75		



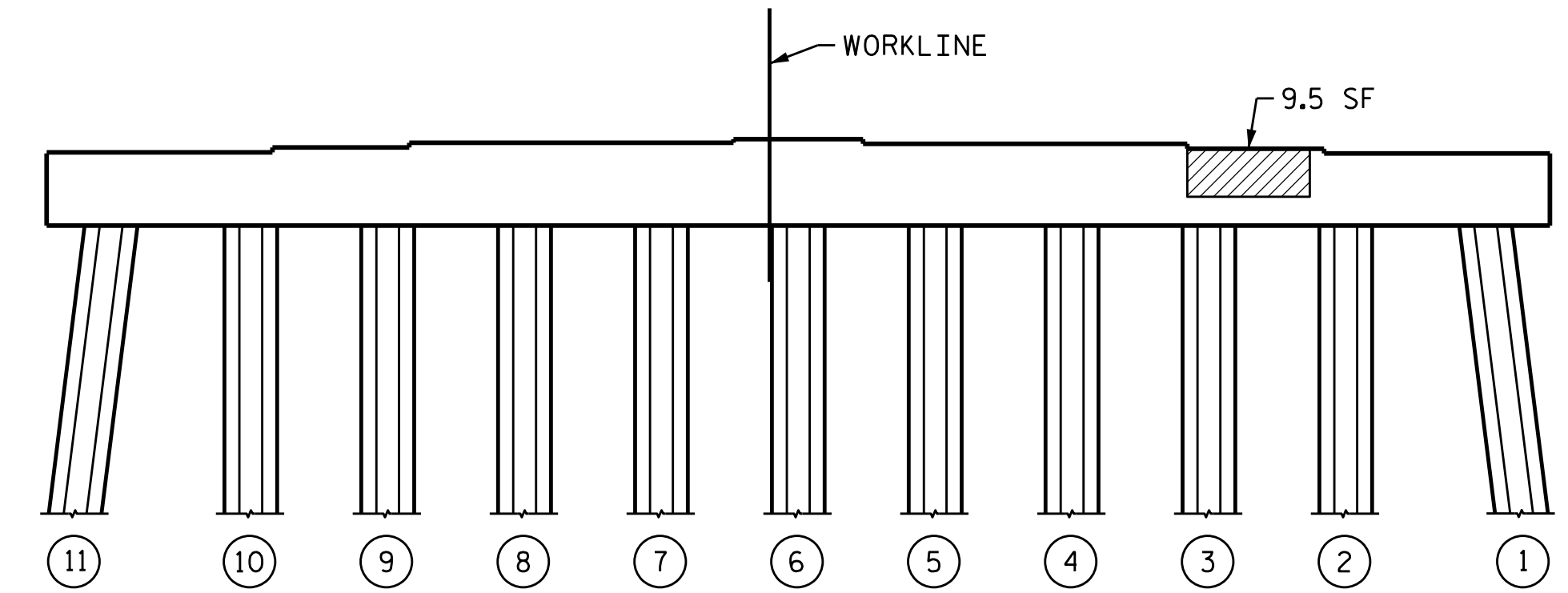
**PLAN**  
TOP OF CAP  
PILES OMITTED FOR CLARITY



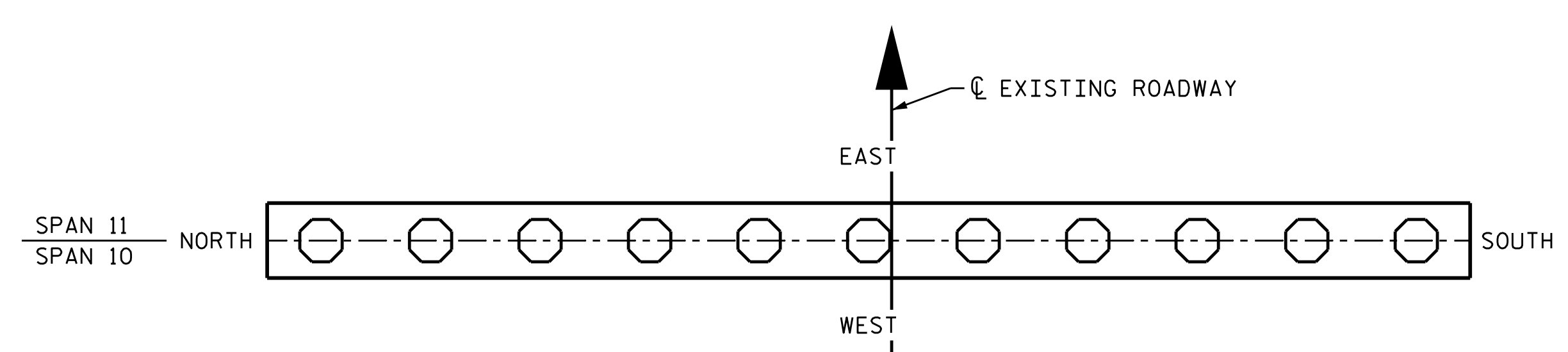
**END VIEW**  
NORTH SIDE

**ELEVATION**  
WEST SIDE

**END VIEW**  
SOUTH SIDE



**ELEVATION**  
EAST SIDE



**PLAN**  
BOTTOM OF CAP

**NOTES**

- SHOTCRETE REPAIR
- CONCRETE REPAIR

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 11 OF 15

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT 10  
 REPAIRS

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 434 FAYETTEVILLE STREET  
 SUITE 1500  
 RALEIGH, NC 27601  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-42 TOTAL SHEETS 58
2			4			

DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
 CHECKED BY: C.J. HOWARD DATE: JUL 2018

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**NOTES**

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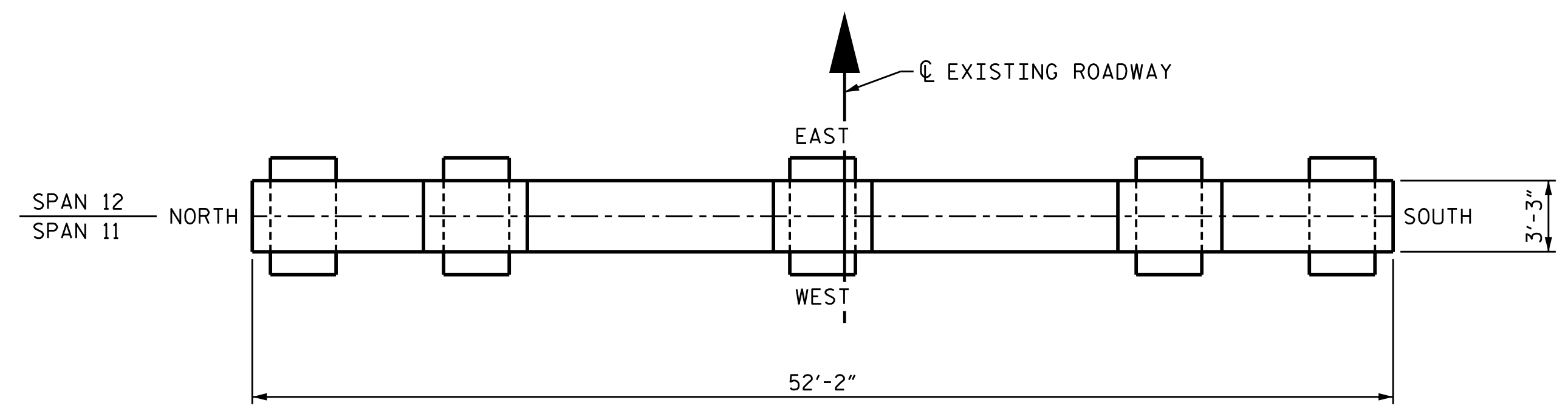
FOR GALVANIC CATHODIC PROTECTION INTEGRAL PILE JACKET, SEE SPECIAL PROVISIONS.

FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

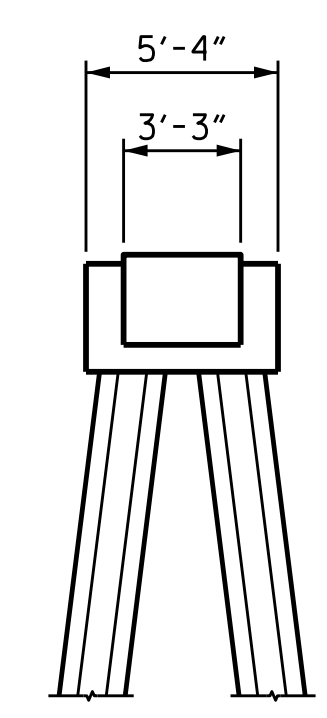
**REPAIR QUANTITY TABLE**

BENT 11	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	19.5	6.0		
CAP (HORIZONTAL FACE)				
22" OCT. PREST. CONC. PILES				
CONCRETE REPAIRS				
EPOXY COATING	AREA SF		AREA SF	
TOP OF CAP *	201.0			
PILE JACKET	LENGTH LN. FT.		LENGTH LN. FT.	
PILE NUMBERS :				

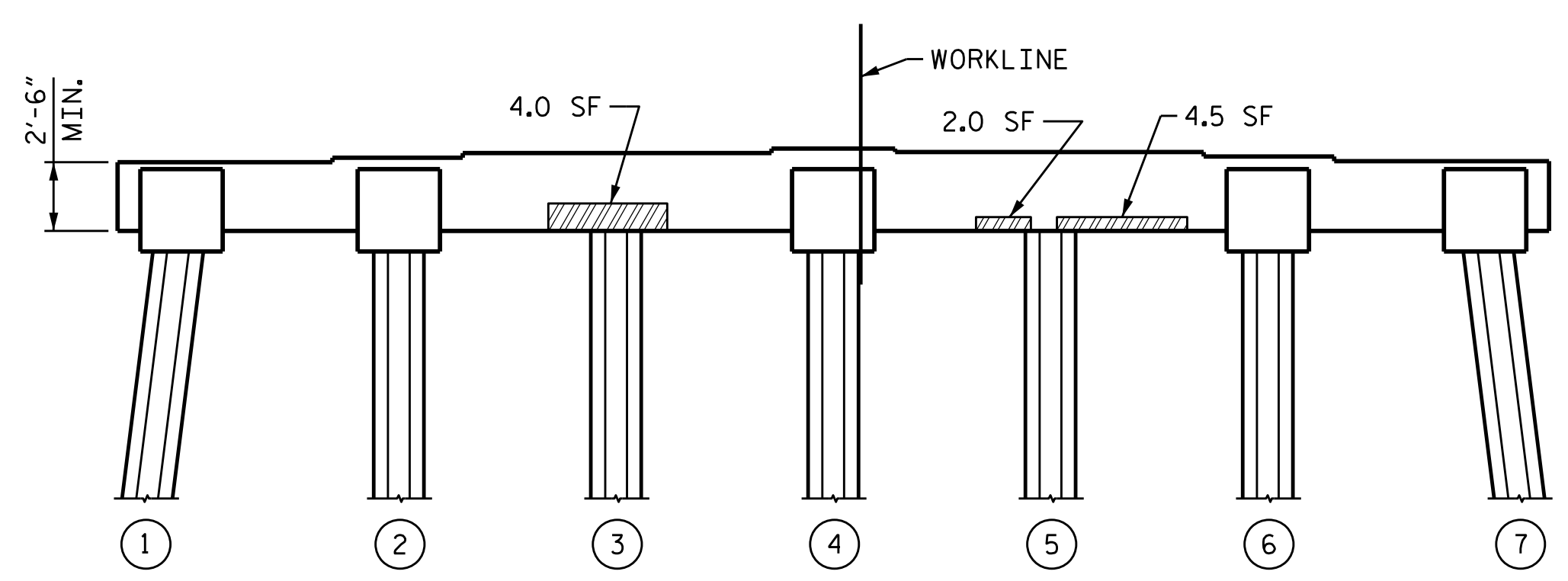
\* EPOXY COATING QUANTITY INCLUDES TOP OF PILE CAPS



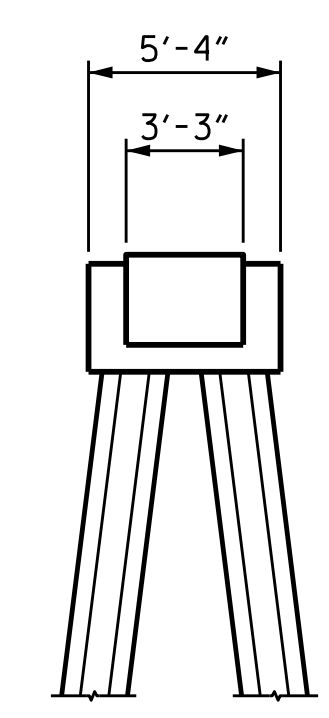
**PLAN**  
TOP OF CAP  
PILES OMITTED FOR CLARITY



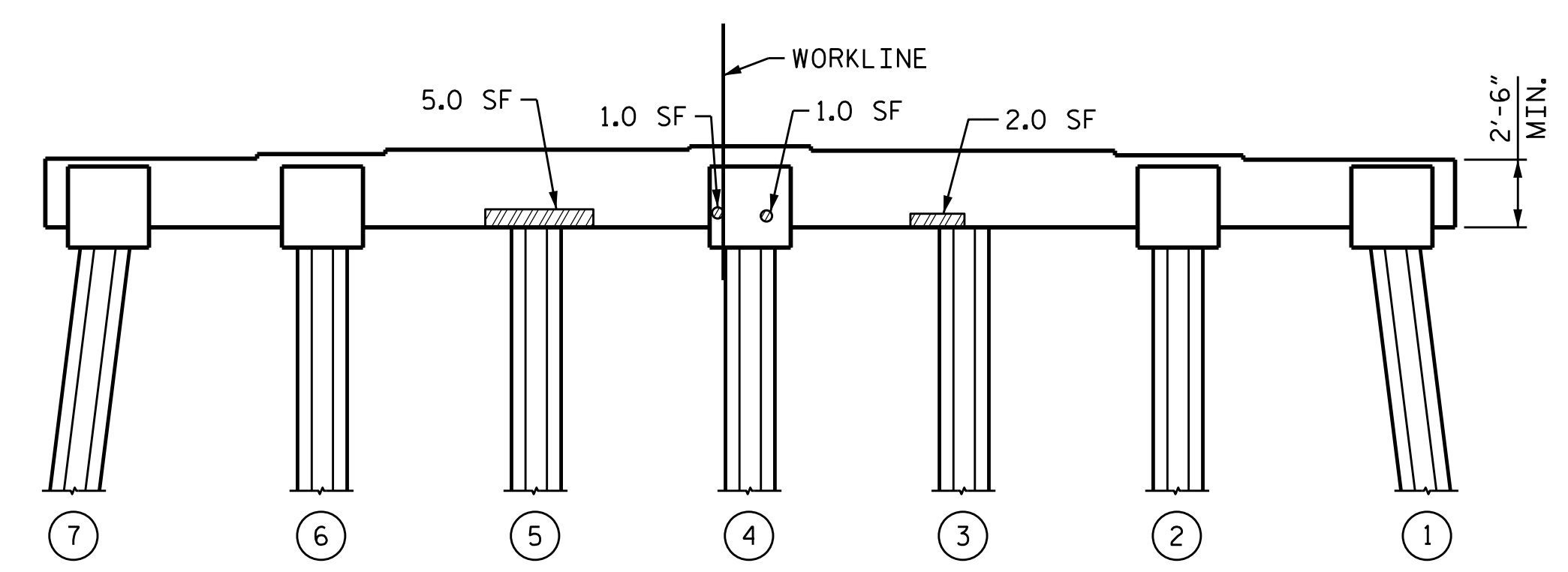
**END VIEW**  
NORTH SIDE



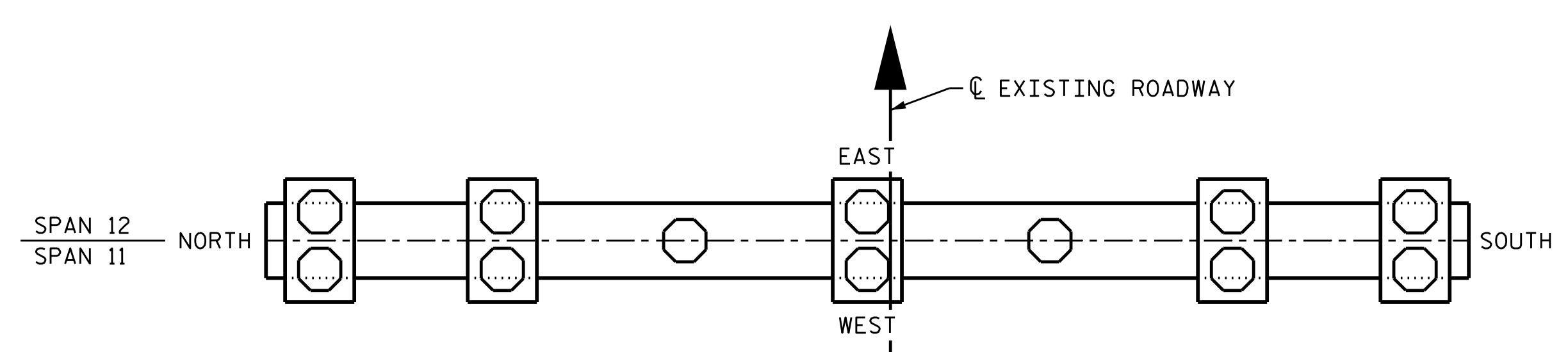
**ELEVATION**  
WEST SIDE



**END VIEW**  
SOUTH SIDE



**ELEVATION**  
EAST SIDE



**PLAN**  
BOTTOM OF CAP

**NOTES**

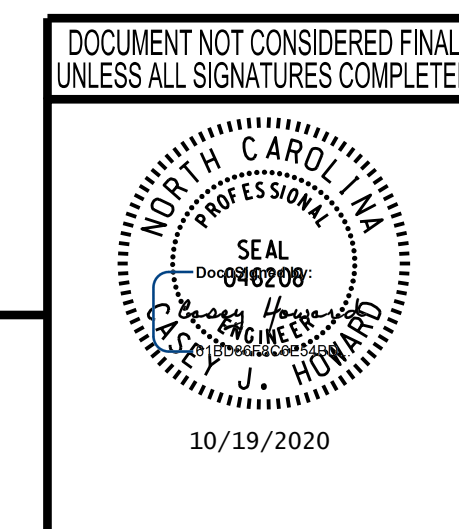
- SHOTCRETE REPAIR
- CONCRETE REPAIR

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 12 OF 15

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
**BENT 11**  
 REPAIRS



**wsp** WSP USA Inc.  
 434 FAYETTEVILLE STREET  
 SUITE 1500  
 RALEIGH, NC 27601  
 TEL: 1.919.836.4040  
 LICENSE NO. F-0165

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			58

DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
 CHECKED BY: C.J. HOWARD DATE: JUL 2018

**NOTES**

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FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

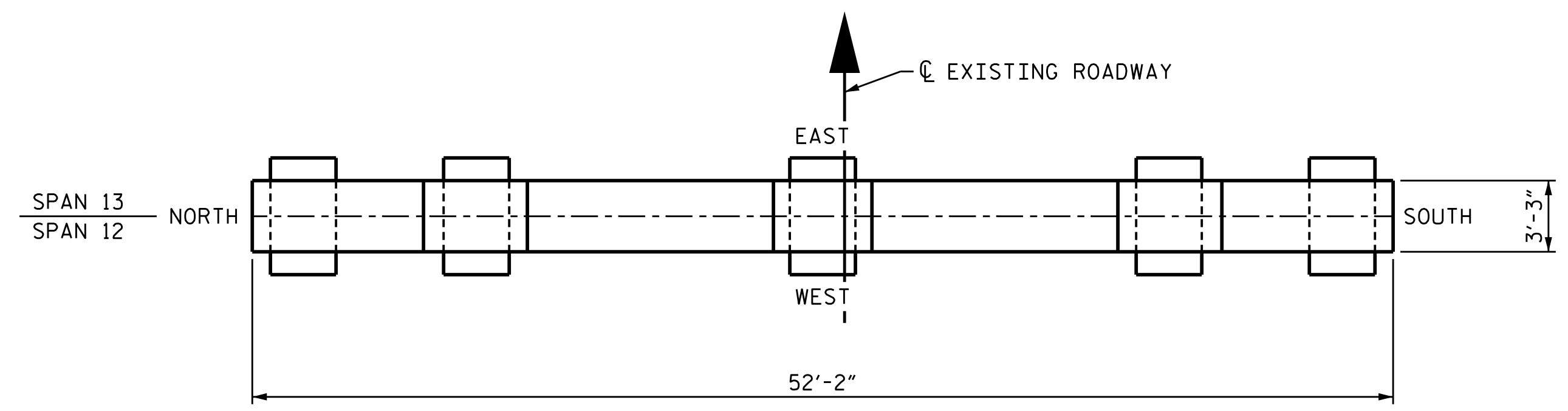
FOR GALVANIC CATHODIC PROTECTION INTEGRAL PILE JACKET, SEE SPECIAL PROVISIONS.

FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

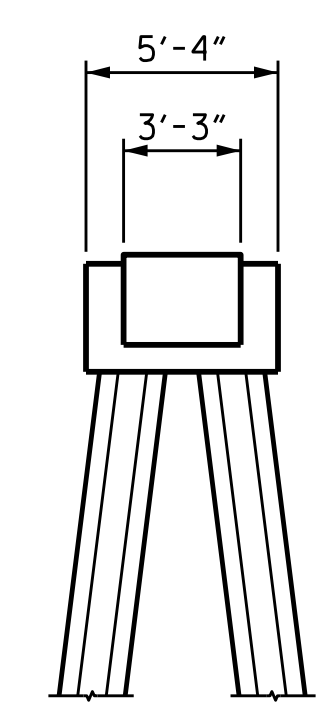
**REPAIR QUANTITY TABLE**

BENT 12	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	5.5	2.0		
CAP (HORIZONTAL FACE)				
22" OCT. PREST. CONC. PILES				
CONCRETE REPAIRS				
EPOXY COATING	AREA SF		AREA SF	
TOP OF CAP *	201.0			
PILE JACKET	LENGTH LN. FT.		LENGTH LN. FT.	
PILE NUMBERS :				

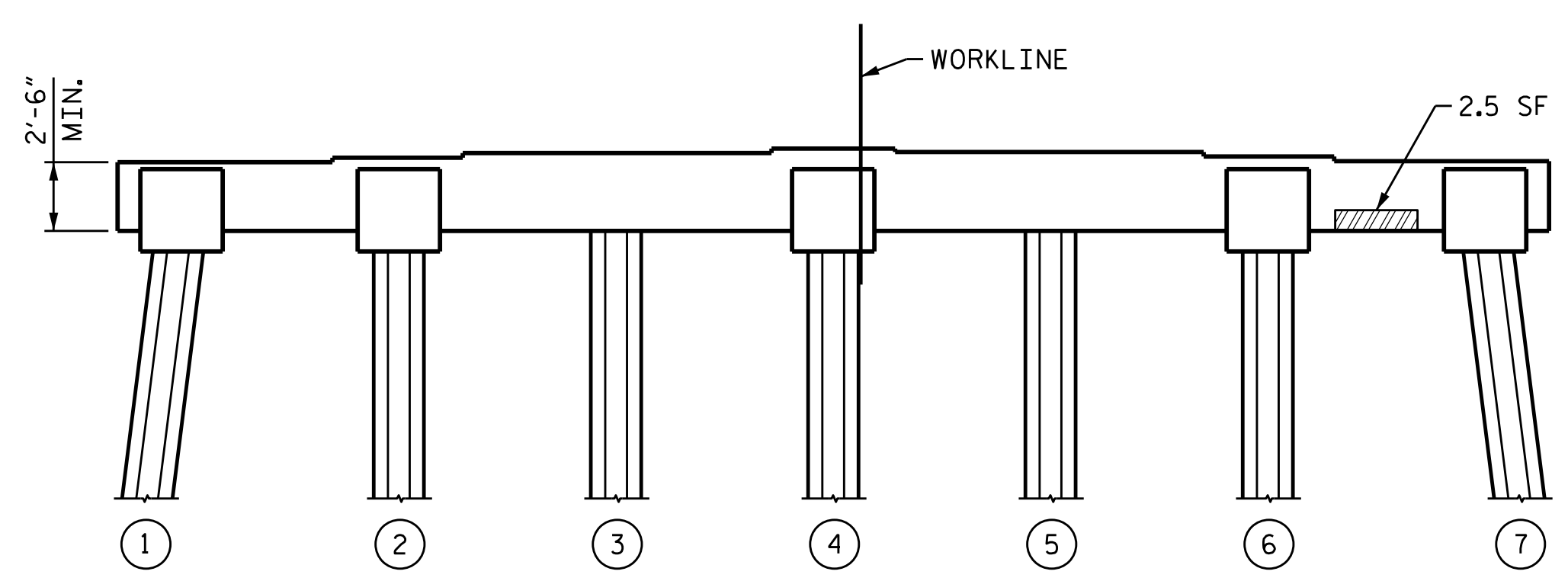
\* EPOXY COATING QUANTITY INCLUDES TOP OF PILE CAPS



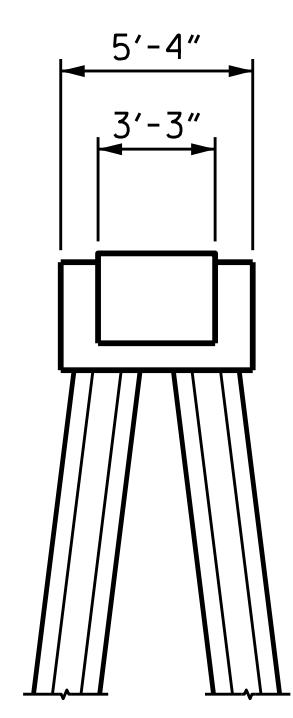
**PLAN**  
TOP OF CAP  
PILES OMITTED FOR CLARITY



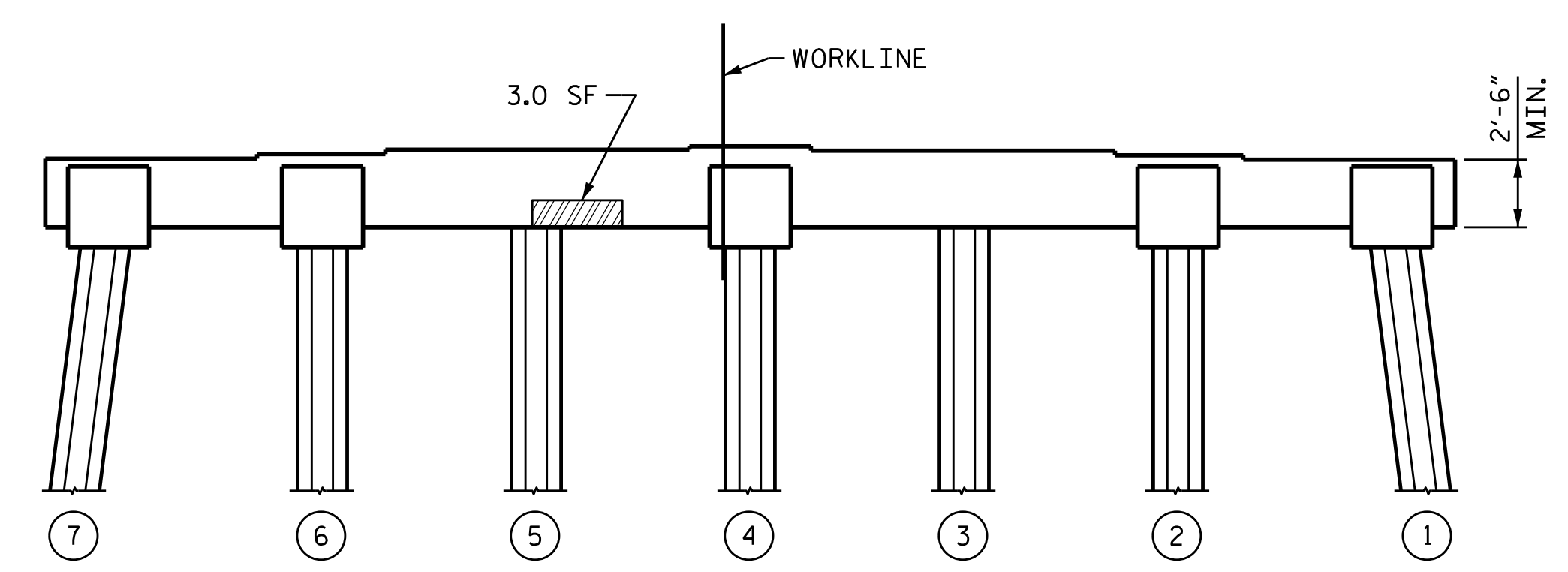
**END VIEW**  
NORTH SIDE



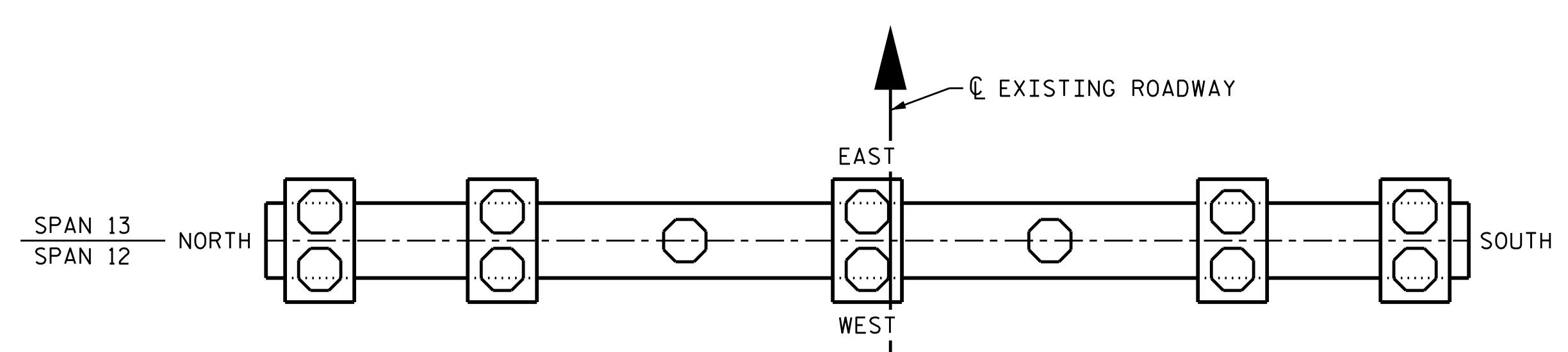
**ELEVATION**  
WEST SIDE



**END VIEW**  
SOUTH SIDE



**ELEVATION**  
EAST SIDE



**PLAN**  
BOTTOM OF CAP

**NOTES**

- SHOTCRETE REPAIR
- CONCRETE REPAIR

PROJECT NO. 15BPR.19  
 NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 13 OF 15

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT 12  
 REPAIRS

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WSP USA Inc.  
 434 FAYETTEVILLE STREET  
 SUITE 1500  
 RALEIGH, NC 27601  
 TEL: 1.919.836.4040  
 LICENSE NO. F-0165

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			58

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DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
 CHECKED BY: C.J. HOWARD DATE: JUL 2018

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**NOTES**

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

CONTRACTOR SHALL SAW CUT TO A MINIMUM OF 1/2" BUT REINFORCING STEEL SHALL NOT BE DAMAGED.

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

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

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR CAP AND PILE REPAIR DETAILS, SEE "TYPICAL CAP AND PILE REPAIR DETAILS" SHEET S-56.

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.

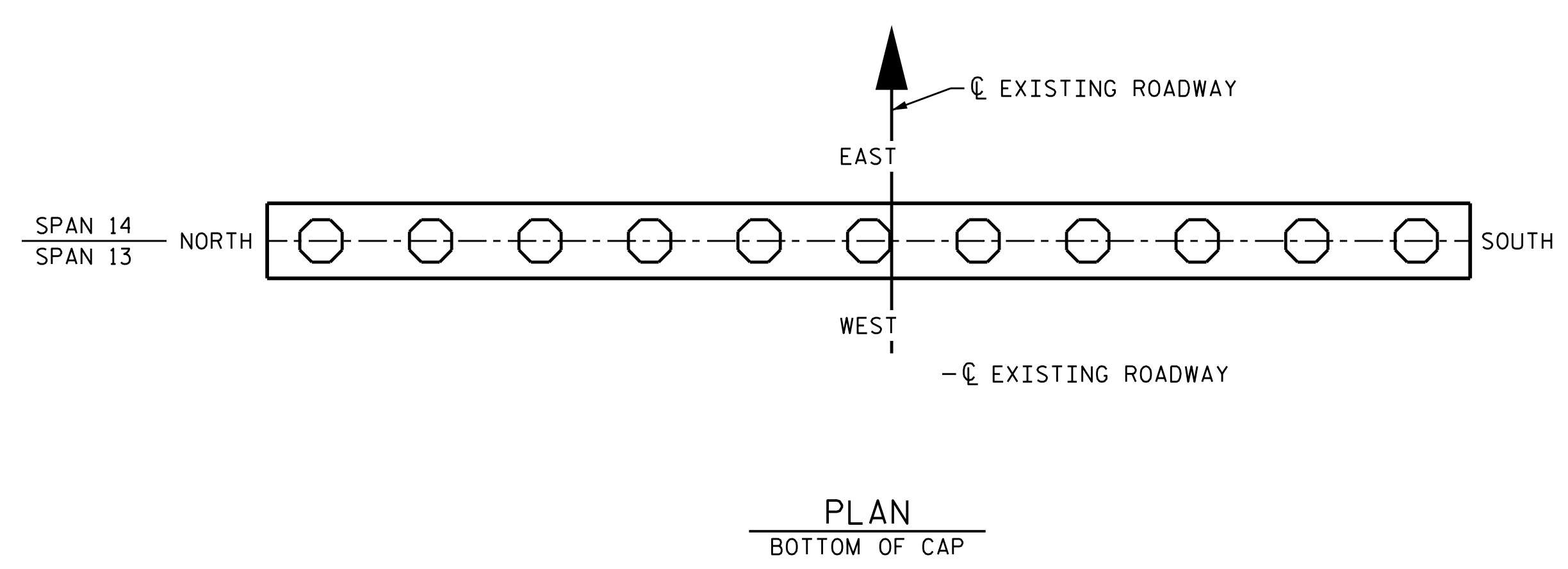
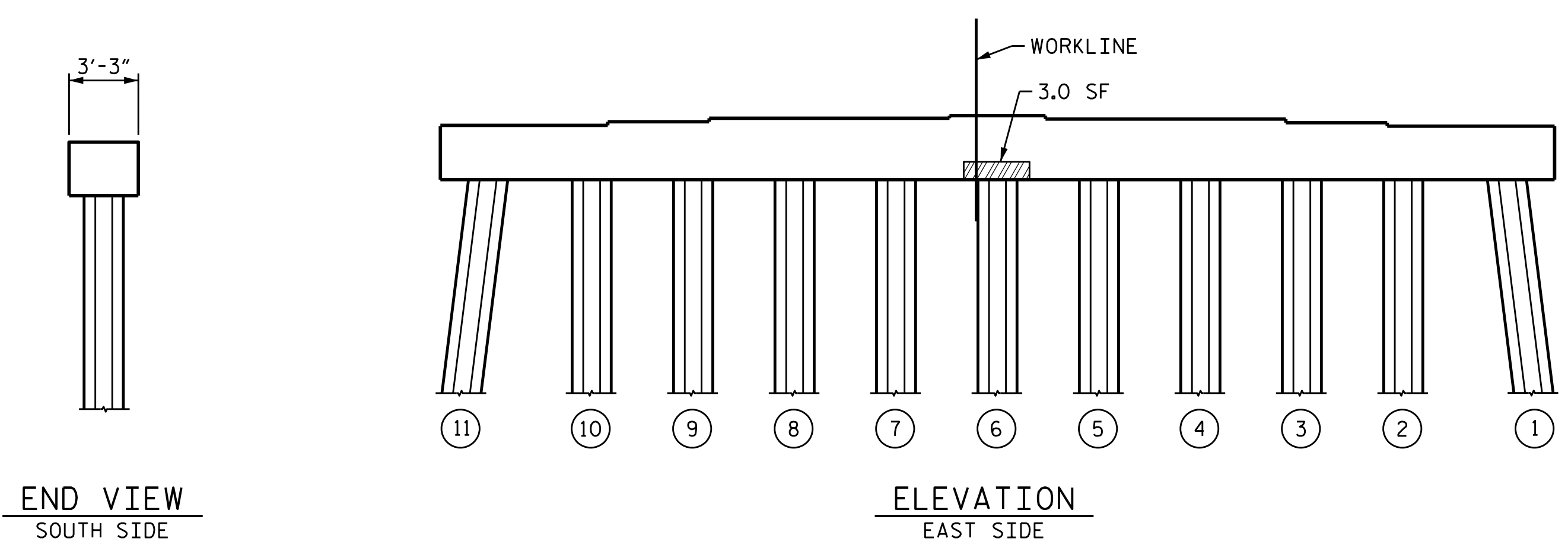
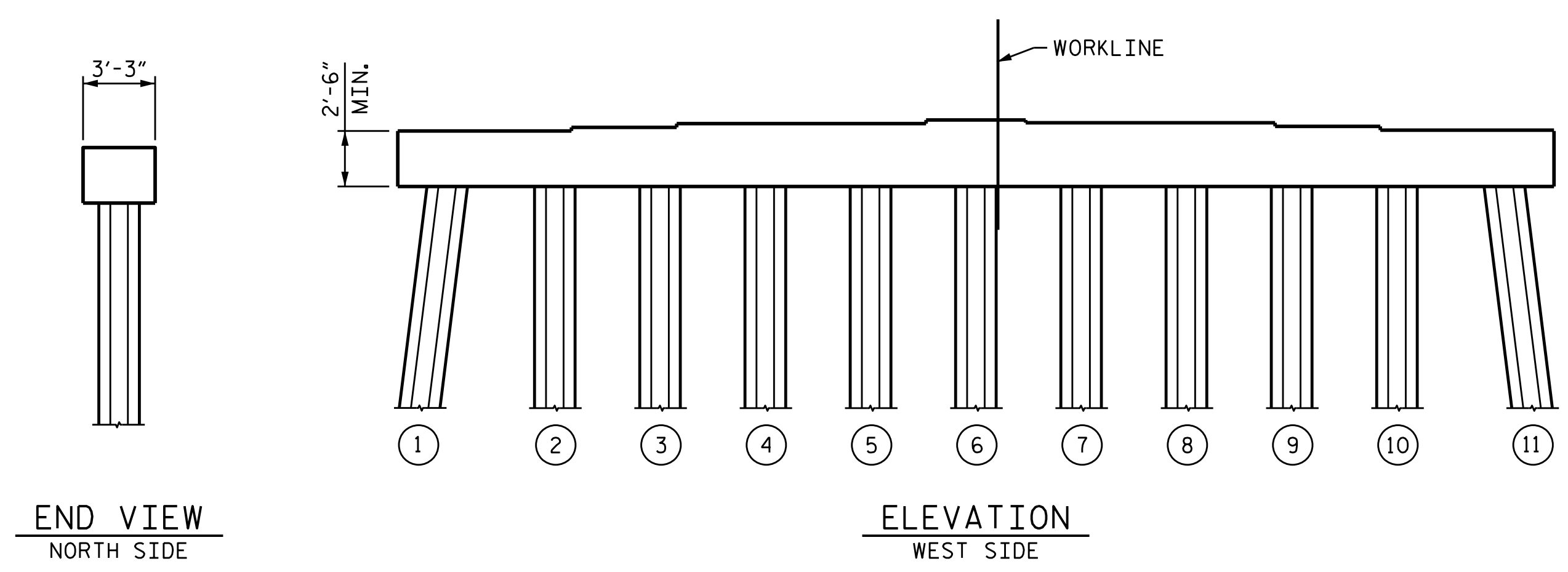
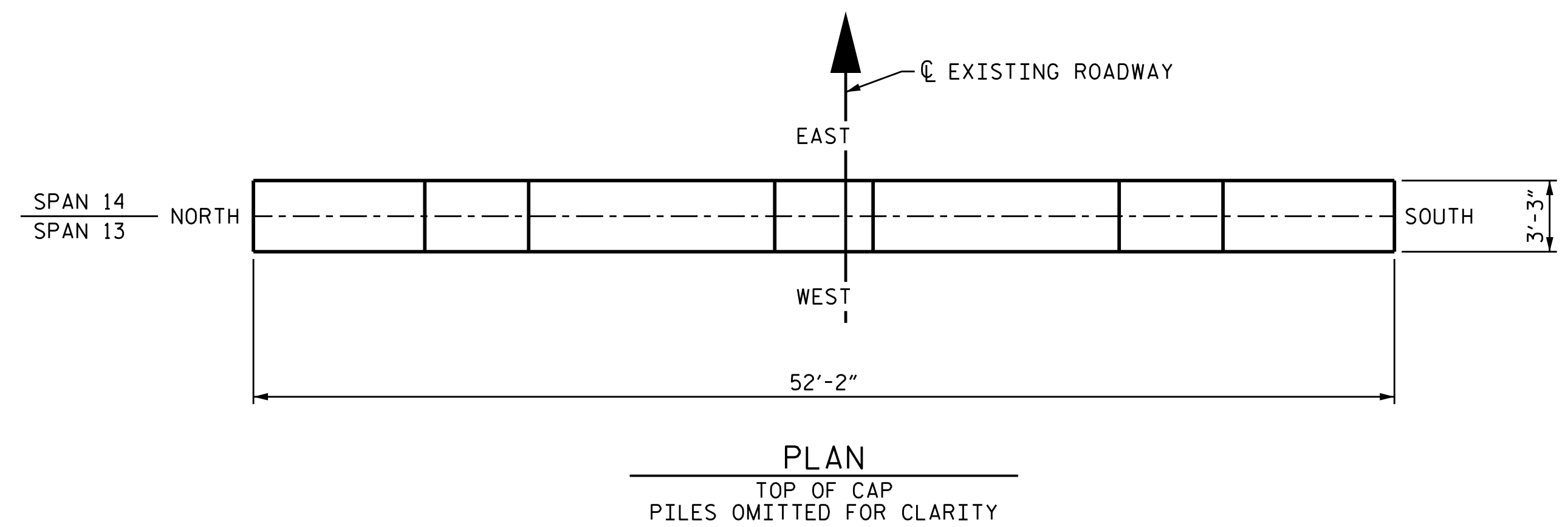
FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

FOR GALVANIC CATHODIC PROTECTION INTEGRAL PILE JACKET, SEE SPECIAL PROVISIONS.

FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

**REPAIR QUANTITY TABLE**

BENT 13	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	3.0	1.0		
CAP (HORIZONTAL FACE)				
22" OCT. PREST. CONC. PILES				
CONCRETE REPAIRS				
EPOXY COATING	AREA SF		AREA SF	
TOP OF CAP	170.0			
PILE JACKET	LENGTH LN. FT.		LENGTH LN. FT.	
PILE NUMBERS :				



**NOTES**

- SHOTCRETE REPAIR
- CONCRETE REPAIR

PROJECT NO. 15BPR.19  
 NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 14 OF 15

STATE OF NORTH CAROLINA  
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 RALEIGH

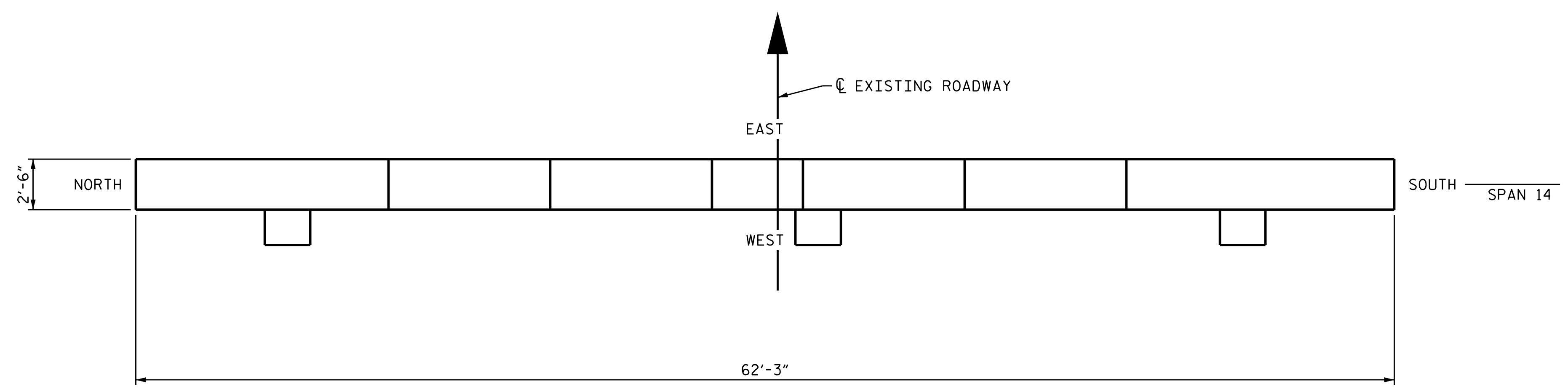
SUBSTRUCTURE  
 BENT 13  
 REPAIRS

DOCUMENT NOT CONSIDERED FINAL  
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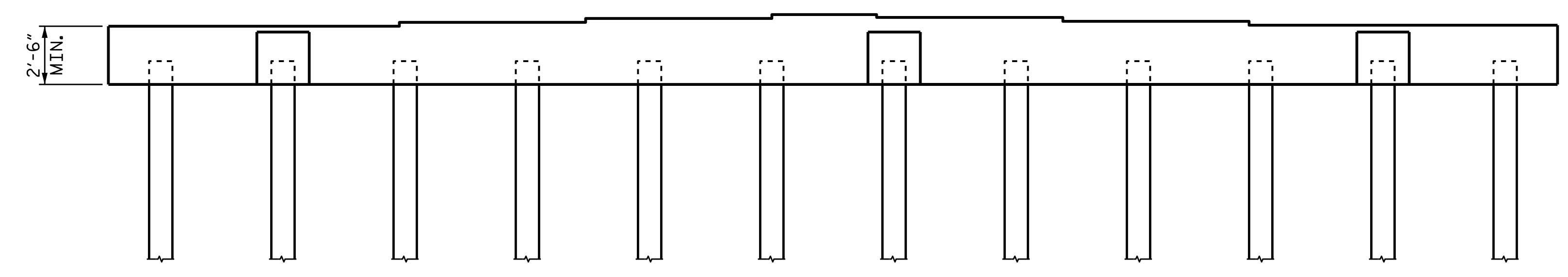
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			58

DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
 CHECKED BY: C.J. HOWARD DATE: JUL 2018



**PLAN**  
TOP OF CAP  
PILES OMITTED FOR CLARITY



**ELEVATION**  
WEST SIDE

**NOTES**

- SHOTCRETE REPAIR
- CONCRETE REPAIR

REPAIR QUANTITY TABLE				
END BENT 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERICAL FACE)				
CAP (HORIZONTAL FACE)				
22" OCT. PREST. CONC. PILES				
CONCRETE REPAIRS				
EPOXY COATING	AREA SF		AREA SF	
TOP OF CAP *	168.0			
PILE JACKET	LENGTH LN. FT.		LENGTH LN. FT.	
PILE NUMBERS :				

\* EPOXY COATING QUANTITY INCLUDES TOP OF PILE CAPS

**NOTES**

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FOR REPAIR DETAILS, SEE "TYPICAL CAP AND PILE REPAIR DETAILS" SHEET S-56.

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.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS.

FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 15 OF 15

STATE OF NORTH CAROLINA  
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SUBRSTRUCTURE  
 END BENT 2  
 REPAIRS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-46
2			4			TOTAL SHEETS 58

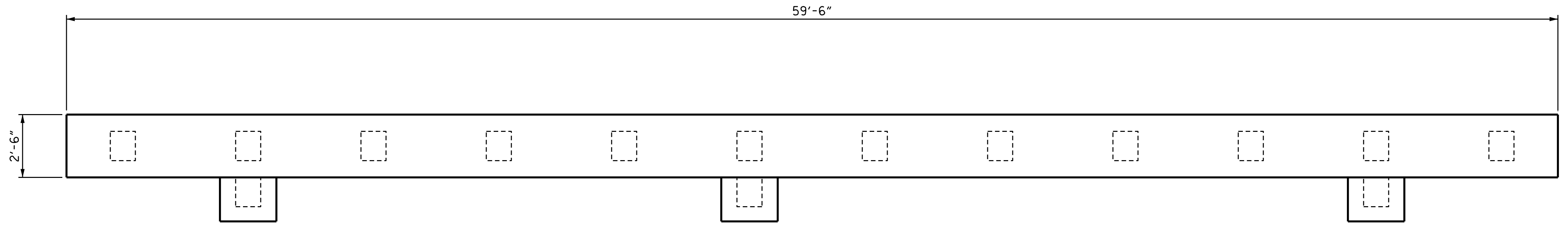
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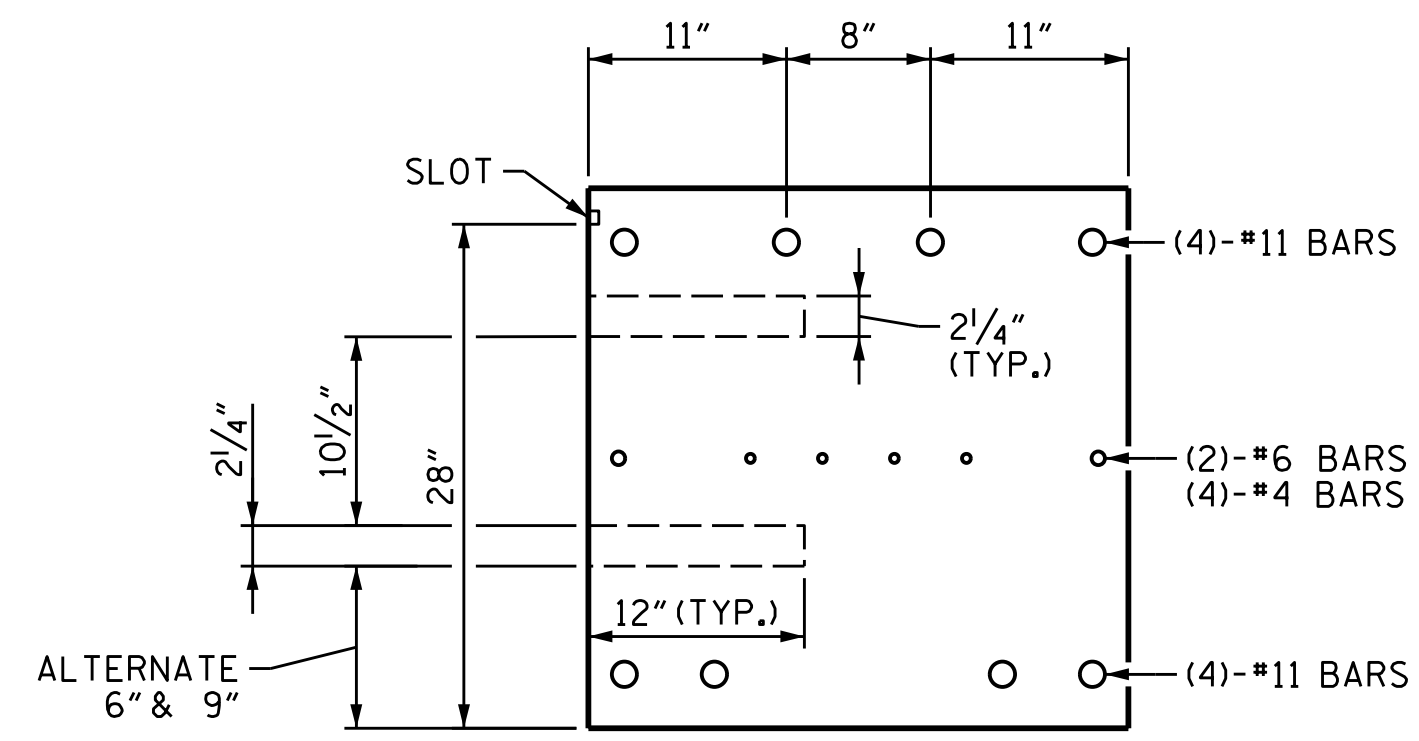
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DRAWN BY: M.J. OSTRISHKO DATE: JUL 2018  
 CHECKED BY: C.J. HOWARD DATE: JUL 2018

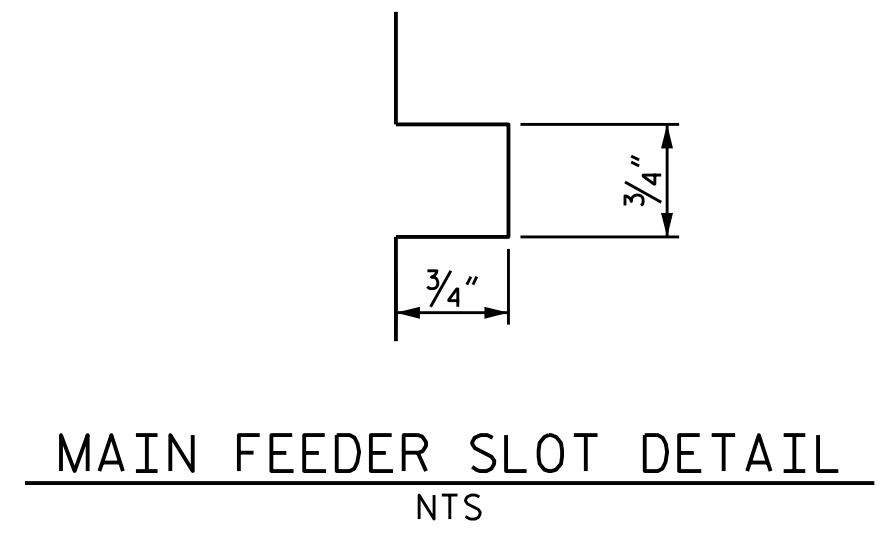




PLAN  
NTS



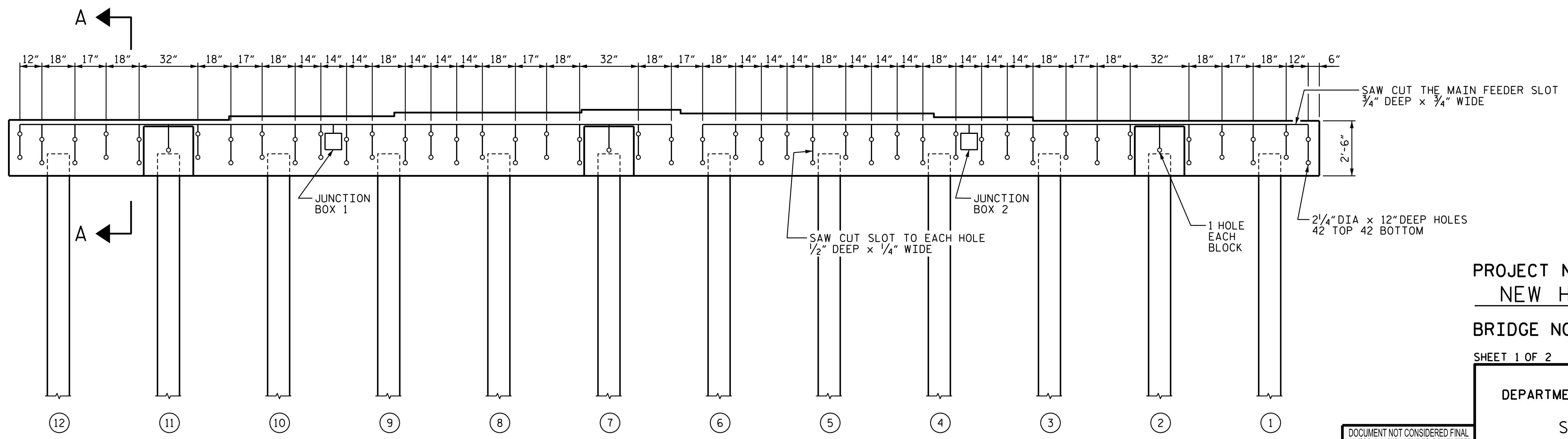
SECTION A-A  
NTS



MAIN FEEDER SLOT DETAIL  
NTS

NOTES

- ONE REFERENCE CELL PER MONITORING CAP.
- REFERENCE ELECTRODE WIRE IS TO BE ROUTED IN THE MAIN FEEDER SLOT TO THE JUNCTION BOX.
- REFERENCE CELL (FOR MONITORING CAPS ONLY) AND STRUCTURE CONNECTION LOCATIONS TO BE SELECTED BY CATHODIC PROTECTION SPECIALIST IN THE FIELD, NOT SHOWN FOR CLARITY.
- ANODE LOCATIONS MAY BE ADJUSTED  $\pm 2"$  TO AVOID EMBEDDED REINFORCEMENT.
- MAKE THREE SYSTEM NEGATIVE CONNECTIONS PER HALF OF PIER CAP (ONE ON EACH END, ONE IN THE MIDDLE). ROUTE WIRES THROUGH MAIN FEEDER SLOT TO THE JUNCTION BOX. BACKFILL THE SLOTS WITH CEMENTITIOUS MORTAR.

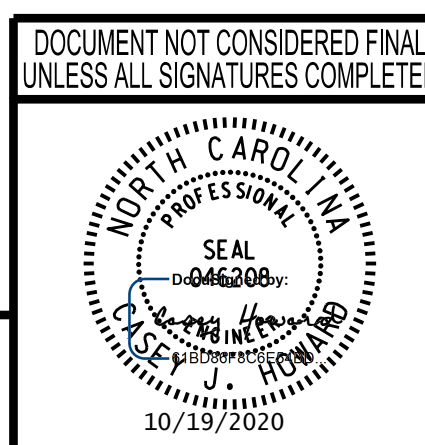


EAST ELEVATION  
NTS

PROJECT NO. 15BPR.19  
 NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 1  
 DETAILS



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-47
2			4			TOTAL SHEETS 58

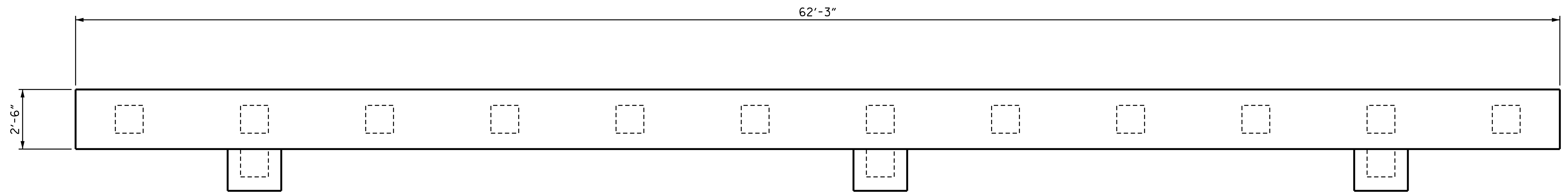
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CHECKED: SM

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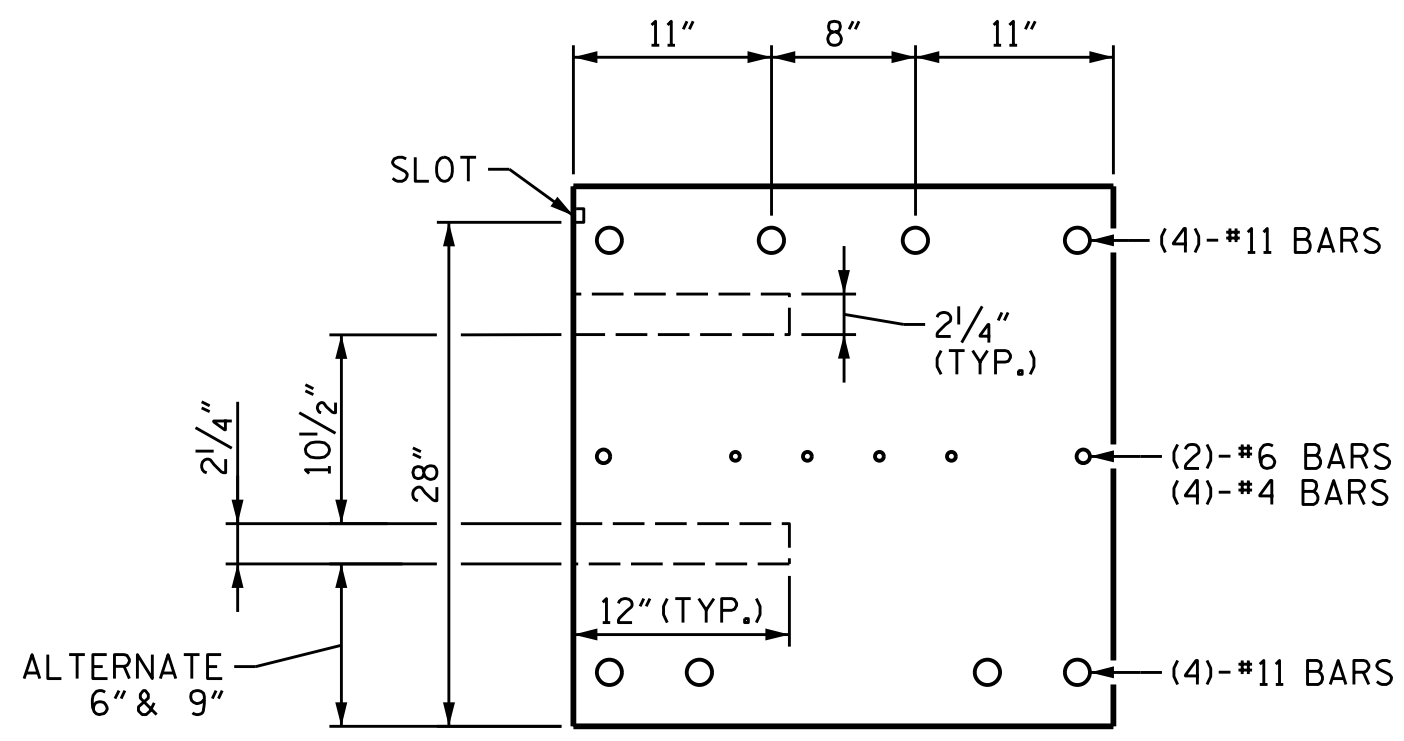
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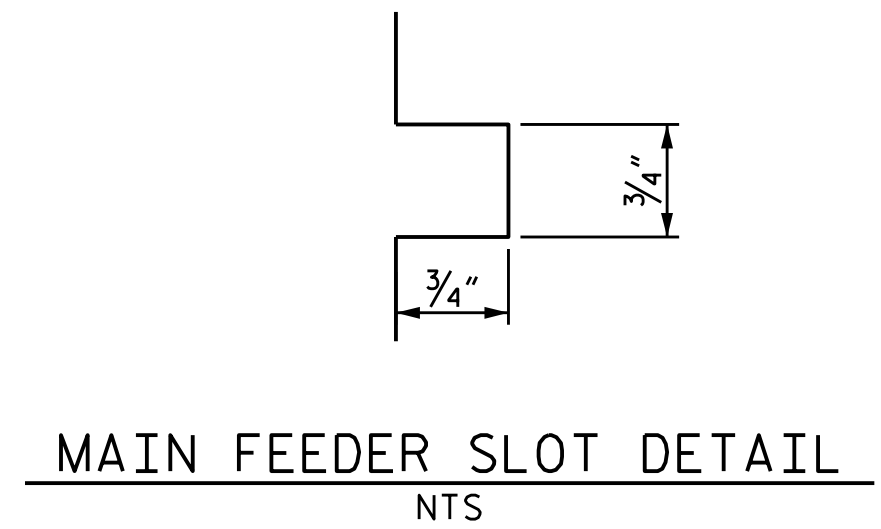
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PLAN  
NTS



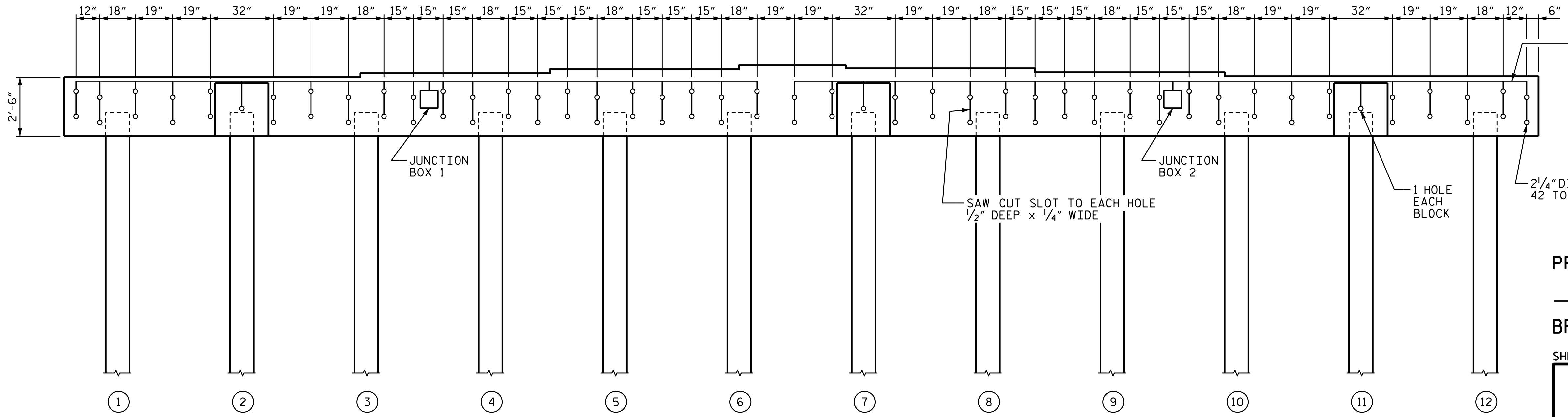
SECTION A-A  
NTS



MAIN FEEDER SLOT DETAIL  
NTS

NOTES

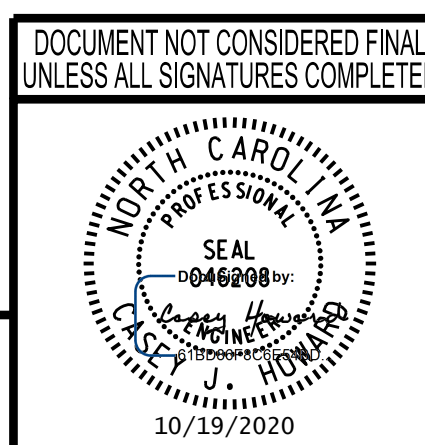
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WEST ELEVATION  
NTS

PROJECT NO. 15BPR.19  
NEW HANOVER COUNTY  
 BRIDGE NO. 640021  
 SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2  
 DETAILS



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			58
2			4			

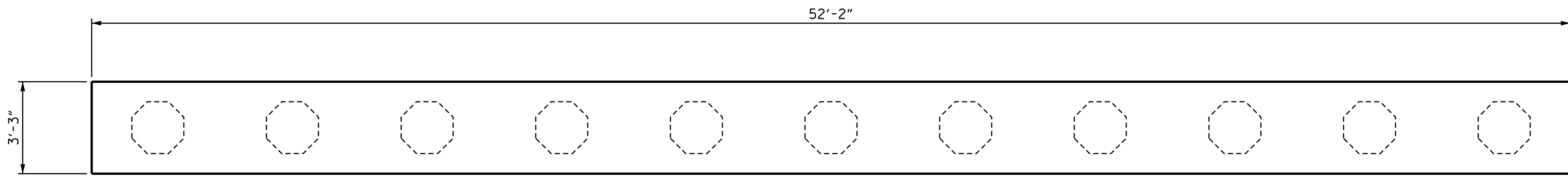
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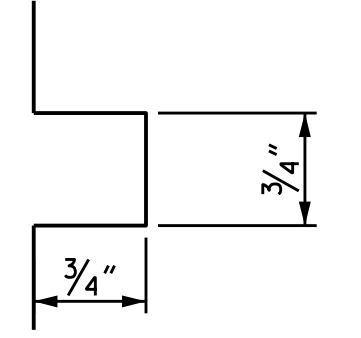
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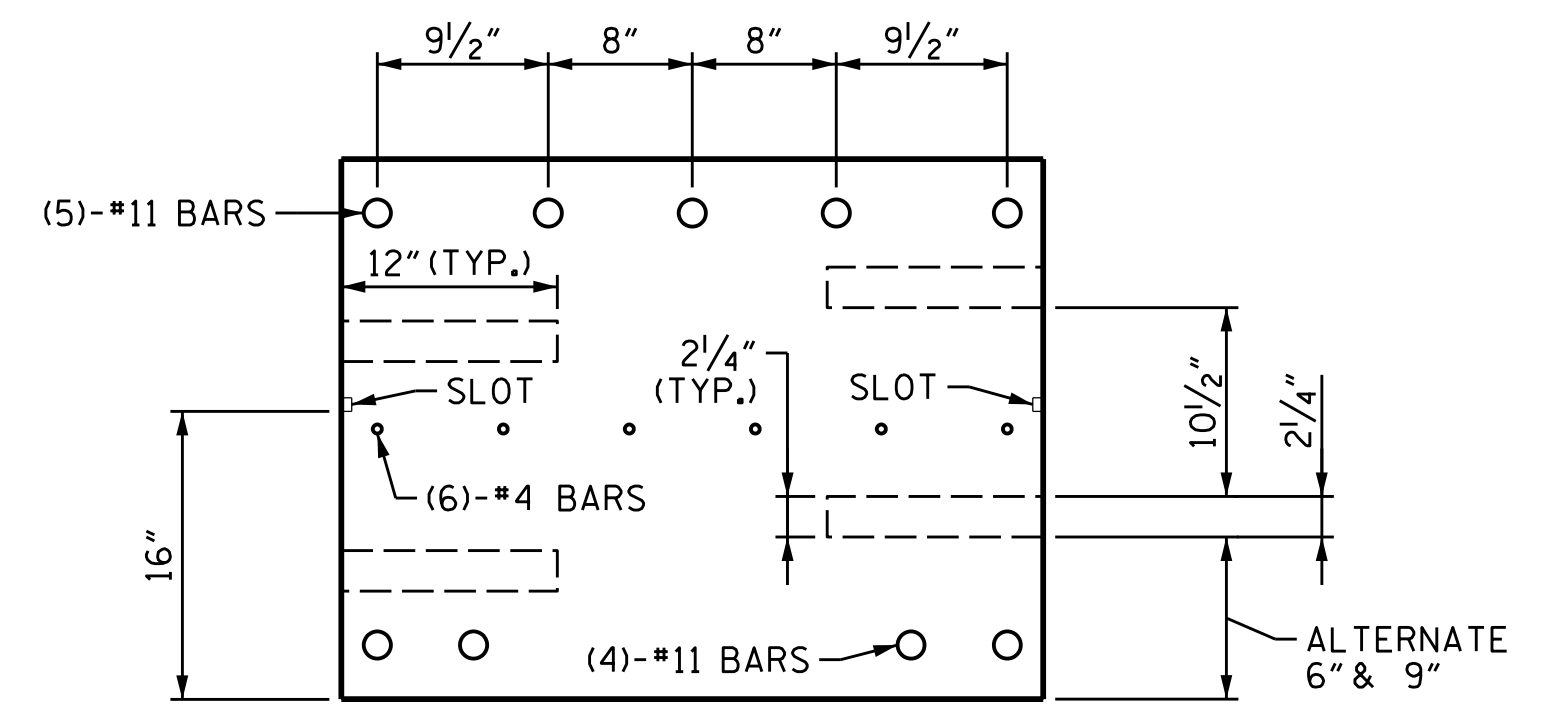
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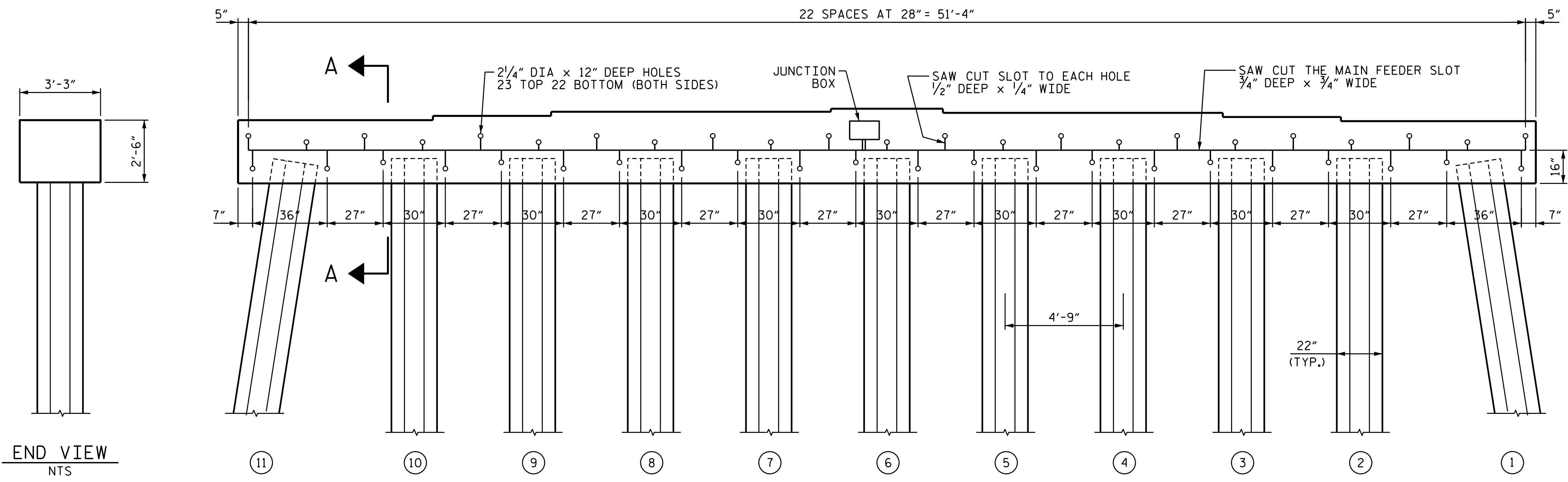
PLAN  
NTS



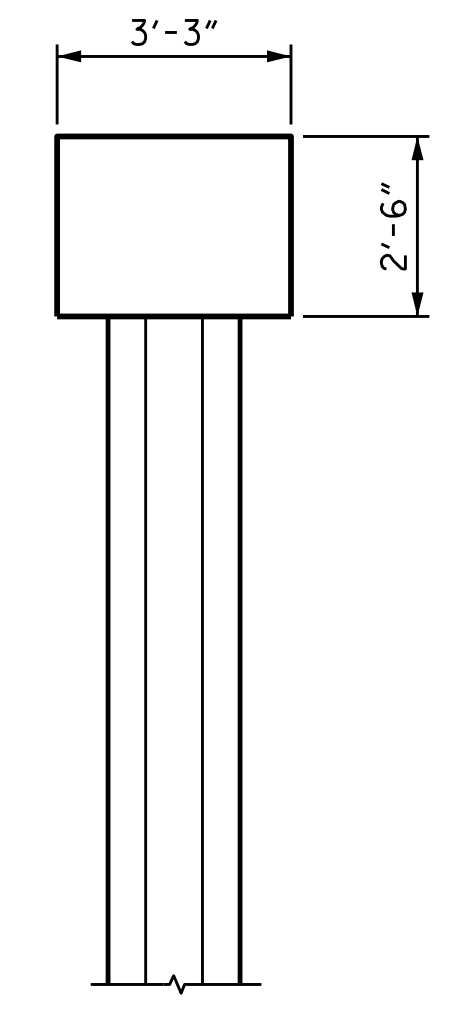
MAIN FEEDER SLOT DETAIL  
NTS



SECTION A-A  
NTS



ELEVATION (BOTH SIDES)  
NTS



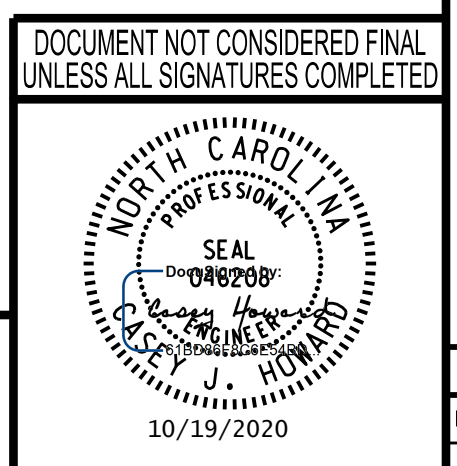
END VIEW  
NTS

- NOTES**
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  - MAKE THREE SYSTEM NEGATIVE CONNECTIONS PER FACE (ONE ON EACH END, ONE IN THE MIDDLE). ROUTE WIRES THROUGH MAIN FEEDER SLOT TO THE JUNCTION BOX. BACKFILL THE SLOTS WITH CEMENTITIOUS MORTAR.

PROJECT NO. 15BPR.19  
 NEW HANOVER COUNTY  
 BRIDGE NO. 640021

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
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 BENTS 1, 4, 7, 10, & 13  
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1			3			TOTAL SHEETS
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