


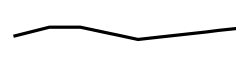
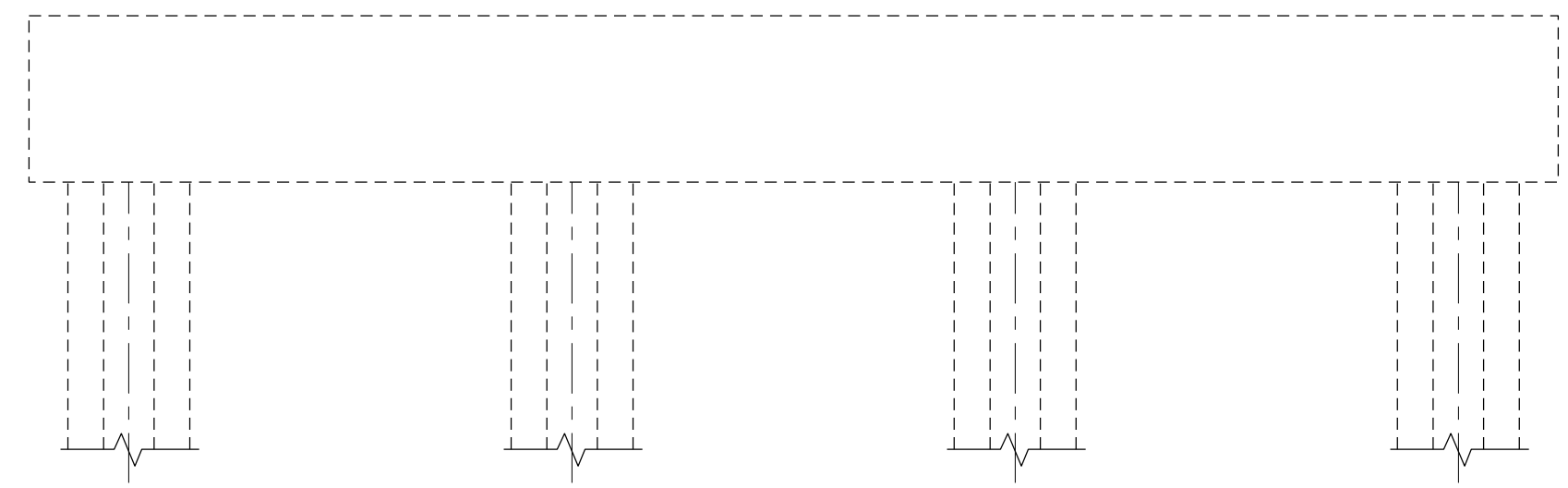


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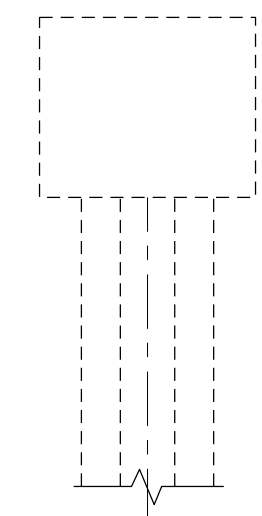
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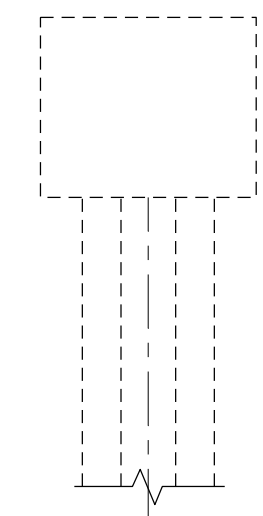
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	CONCRETE REPAIR AREA
	SHOTCRETE REPAIR AREA
	EPOXY COATING AREA
	EPOXY RESIN INJECTION (ERI)



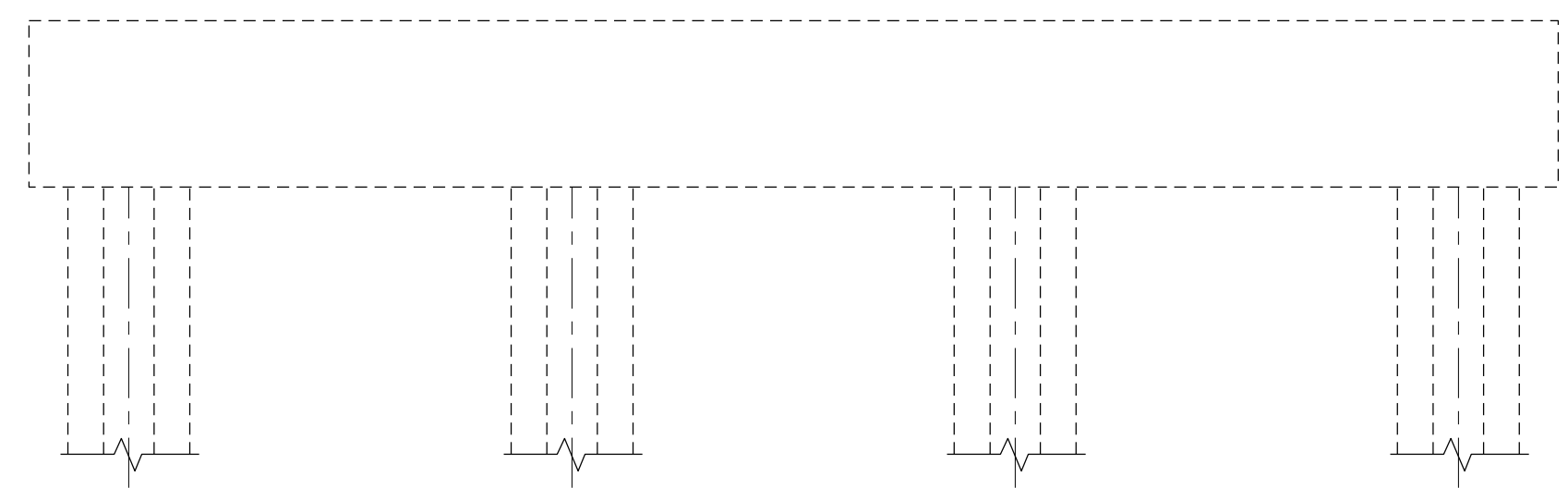
NORTH ELEVATION



WEST ELEVATION



EAST ELEVATION



SOUTH ELEVATION



PLAN  
(TOP OF CAP)  
(PILES AND BEAMS NOT SHOWN FOR CLARITY)

AS-BUILT REPAIR QUANTITY TABLE				
BENT 25B	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	-	-		
PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
* CAP	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
PILE	-			
EPOXY COATING	AREA SQ. FT.		AREA SQ. FT.	
CAP	-			

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

**NOTES:**

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

AVERAGE CONCRETE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 1 1/2" TO 2" ON THE PILES. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

SHOTCRETE REPAIRS TO THE BENT CAP MAY REQUIRE BRIDGE JACKING. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS AND STANDARD SPECIFICATIONS SECTION 420-18.

\* ADDITIONAL QUANTITIES OF CONCRETE REPAIR ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

PROJECT NO. 15BPR.42  
BEAUFORT COUNTY  
 BRIDGE NO. 060025



DocuSigned by:  
 Jacob H. Duke  
 9CDB3ADCC66D6400  
 3/14/2019




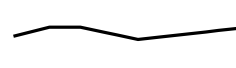
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE REPAIRS**  
 BENT 25B

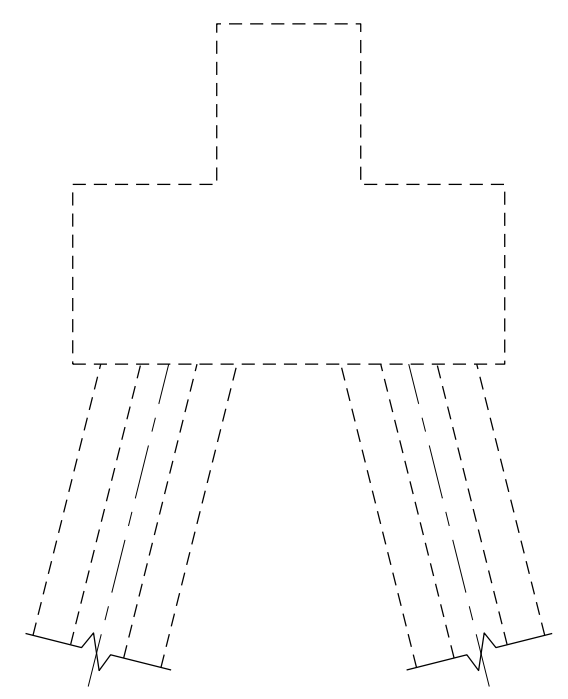
**KCA** 301 FAYETTEVILLE ST., SUITE 1500  
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601  
 (919) 882-7839  
 LICENSE #: C-1506

DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019  
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019  
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

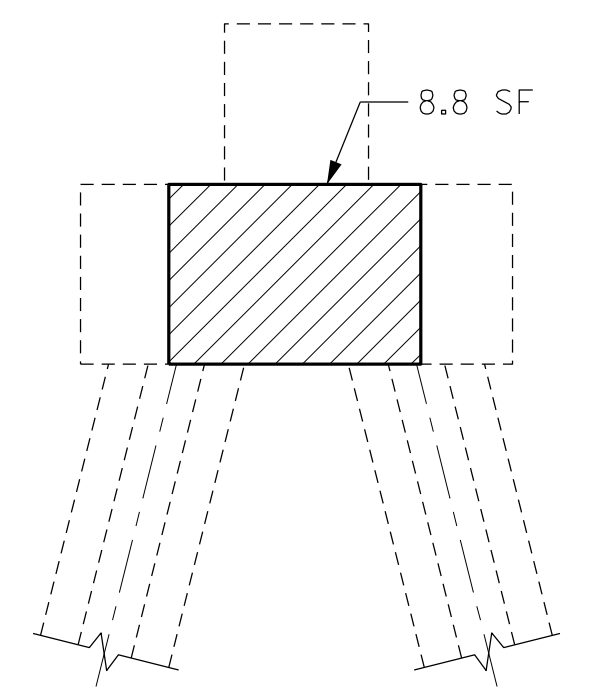
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1			3			TOTAL SHEETS
2			4			57

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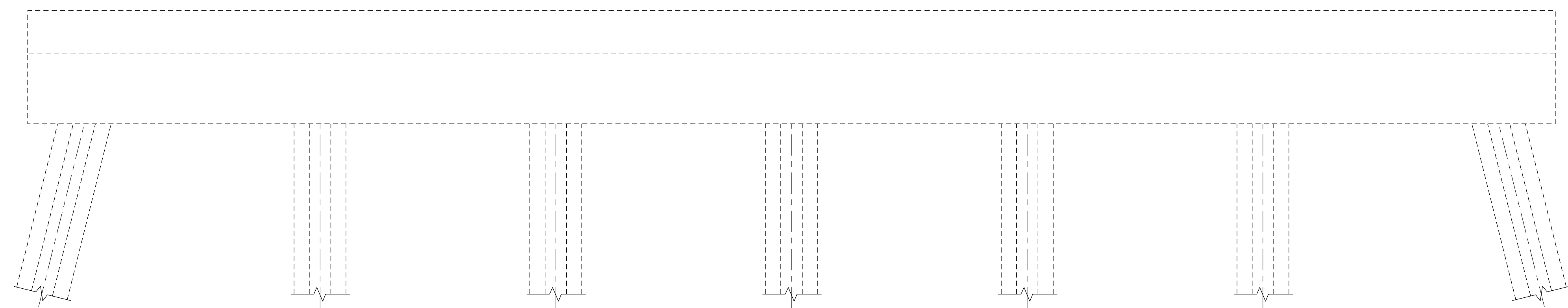
LEGEND	
	CONCRETE REPAIR AREA
	SHOTCRETE REPAIR AREA
	EPOXY COATING AREA
	EPOXY RESIN INJECTION (ERI)



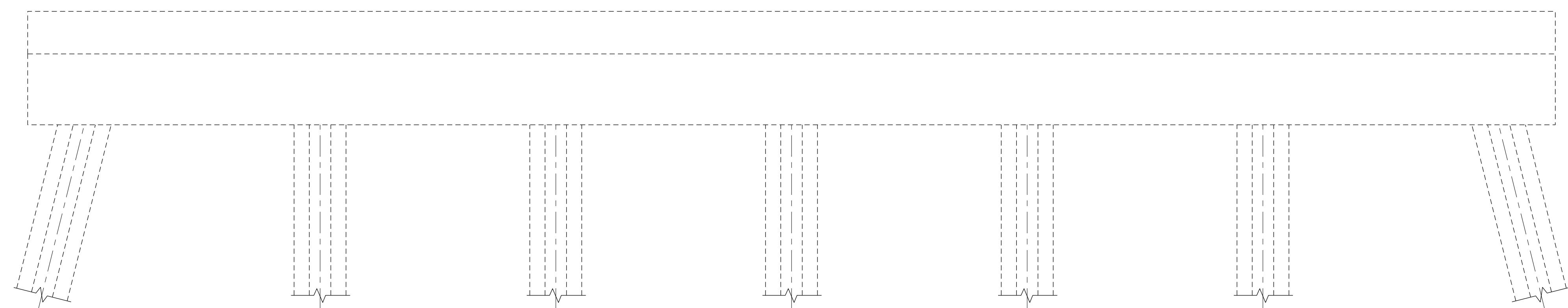
WEST ELEVATION



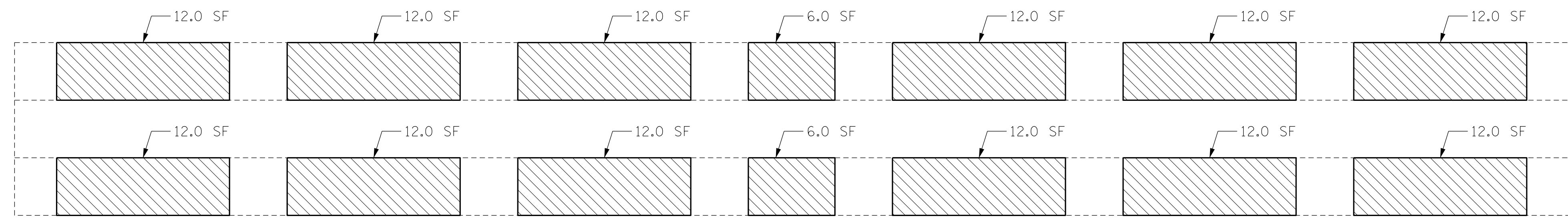
EAST ELEVATION



NORTH ELEVATION



SOUTH ELEVATION



PLAN  
(TOP OF CAP)  
(PILES AND BEAMS NOT SHOWN FOR CLARITY)

AS-BUILT REPAIR QUANTITY TABLE

BENT 26	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	-	-		
PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
* CAP	8.8	4.4		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
PILE	-			
EPOXY COATING	AREA SQ. FT.		AREA SQ. FT.	
CAP	156.0			

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

NOTES:

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

AVERAGE CONCRETE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 1 1/2" TO 2" ON THE PILES. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

SHOTCRETE REPAIRS TO THE BENT CAP MAY REQUIRE BRIDGE JACKING. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS AND STANDARD SPECIFICATIONS SECTION 420-18.

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PROJECT NO. 15BPR.42  
BEAUFORT COUNTY  
 BRIDGE NO. 060025



DocuSigned by:  
 Jacob H. Duke  
 9CD53ADCC66D6400  
 3/14/2019

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE REPAIRS**  
 BENT 26

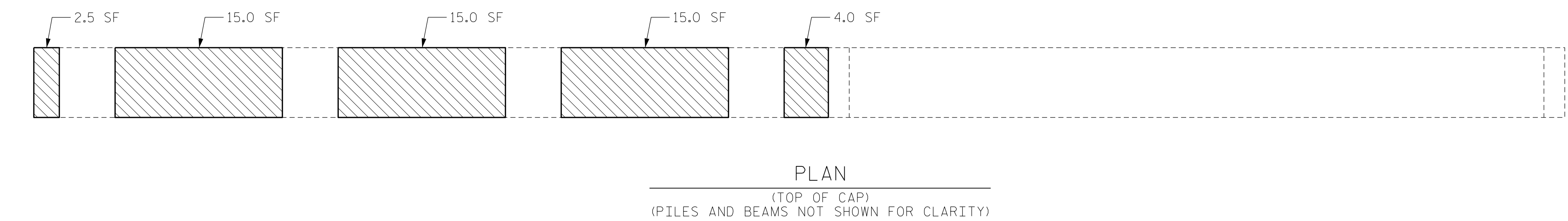
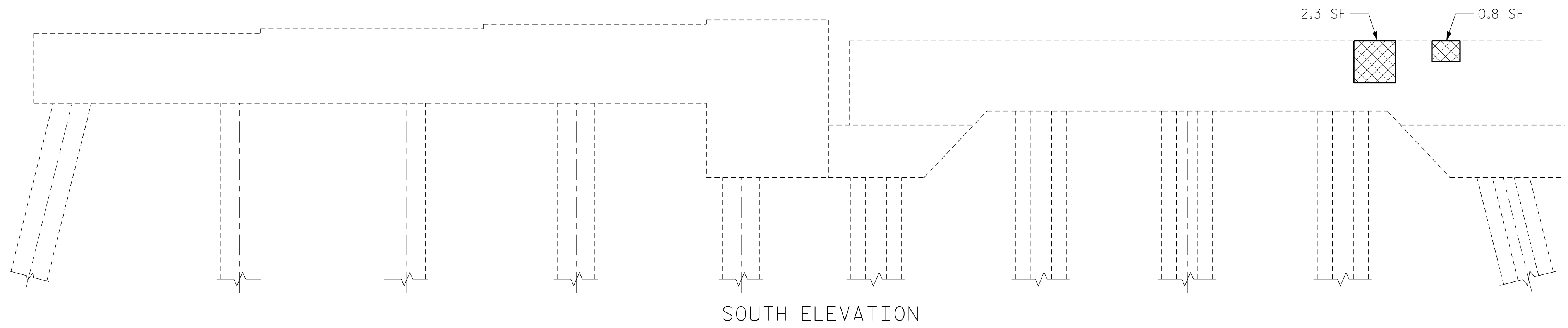
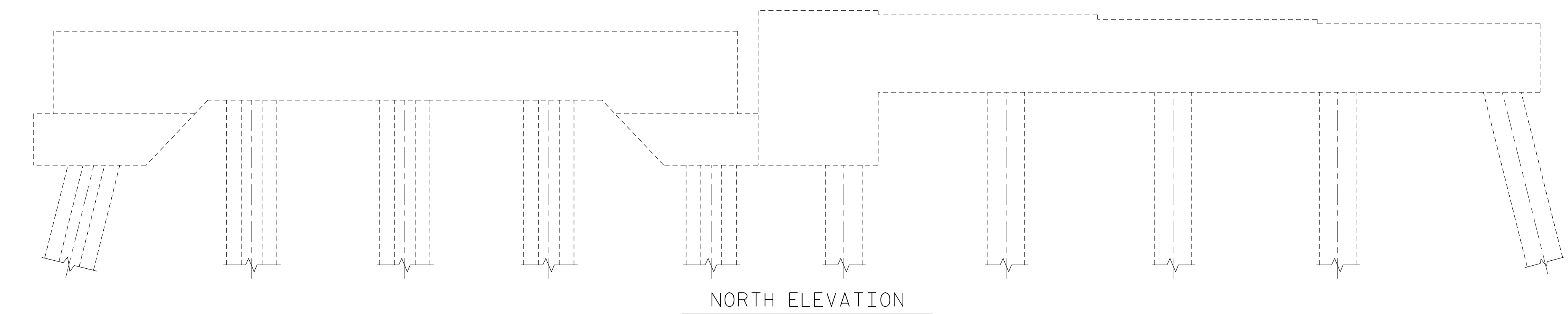
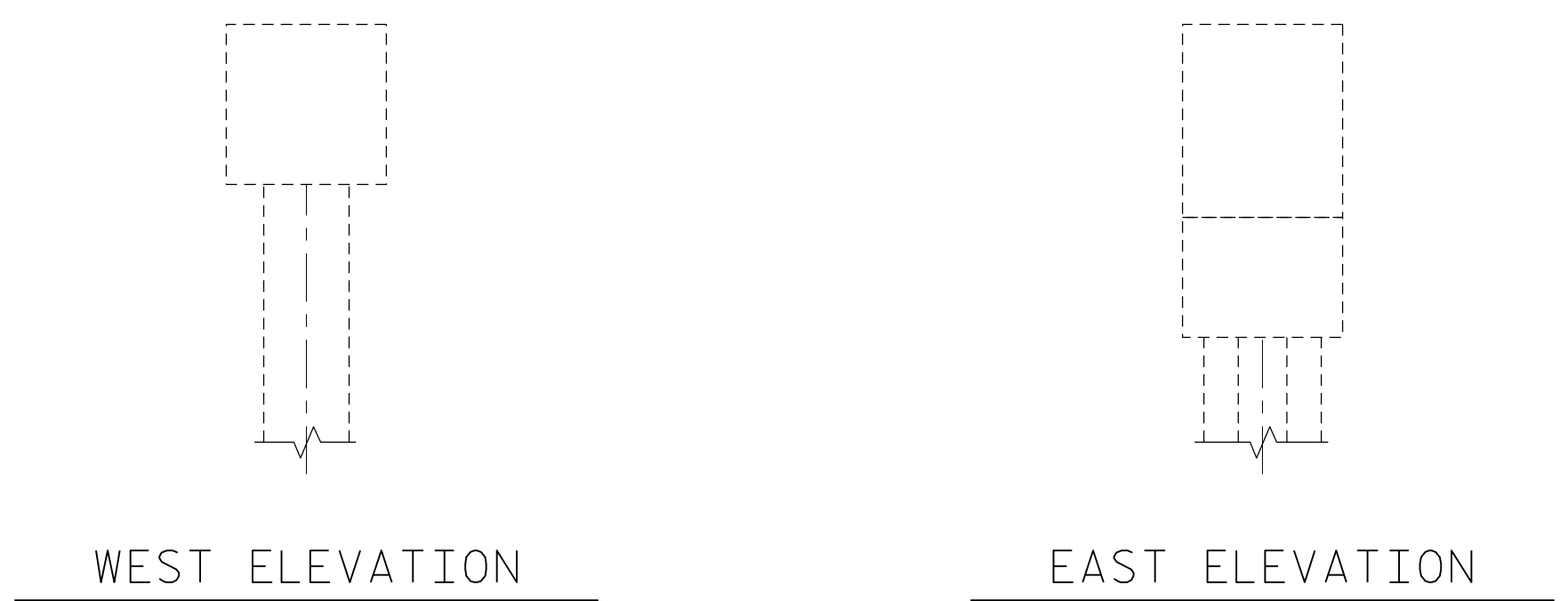
**KCA** 301 FAYETTEVILLE ST., SUITE 1500  
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601  
 (919) 882-7839  
 LICENSE #: C-1506

DRAWN BY :	DIEGO A. AGUIRRE	DATE :	2/5/2019
CHECKED BY :	OMAR M. KHALAFALLA	DATE :	2/5/2019
DESIGN ENGINEER OF RECORD :	JACOB H. DUKE	DATE :	2/5/2019

NO.	REVISIONS			NO.	REVISIONS			SHEET NO.
	BY:	DATE:			BY:	DATE:		
1				3			S-48	
2				4			TOTAL SHEETS 57	

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LEGEND	
	CONCRETE REPAIR AREA
	SHOTCRETE REPAIR AREA
	EPOXY COATING AREA
	EPOXY RESIN INJECTION (ERI)



AS-BUILT REPAIR QUANTITY TABLE				
BENT 27	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	3.1	1.6		
PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
* CAP	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
PILE	-			
EPOXY COATING	AREA SQ. FT.		AREA SQ. FT.	
CAP	51.5			

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

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

SHOTCRETE REPAIRS TO THE BENT CAP MAY REQUIRE BRIDGE JACKING. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS AND STANDARD SPECIFICATIONS SECTION 420-18.

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PROJECT NO. 15BPR.42  
BEAUFORT COUNTY  
 BRIDGE NO. 060025



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE REPAIRS**  
 BENT 27

**KCA** 301 FAYETTEVILLE ST., SUITE 1500  
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601  
 (919) 882-7839  
 LICENSE #: C-1506

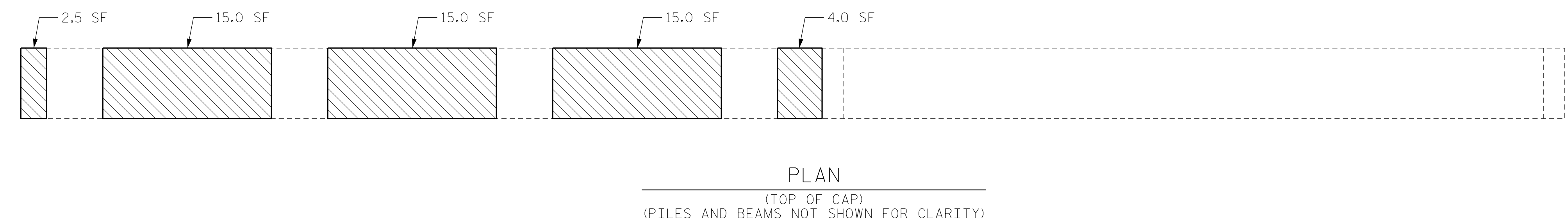
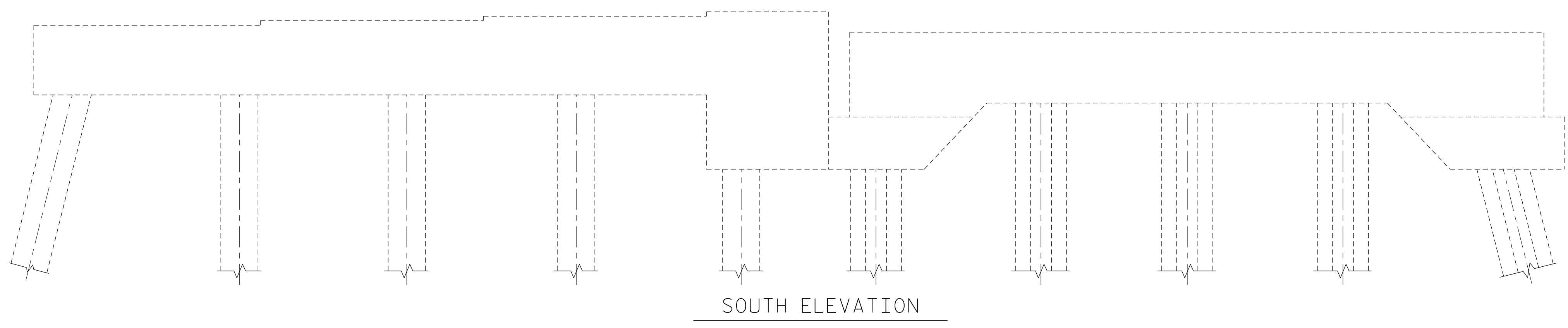
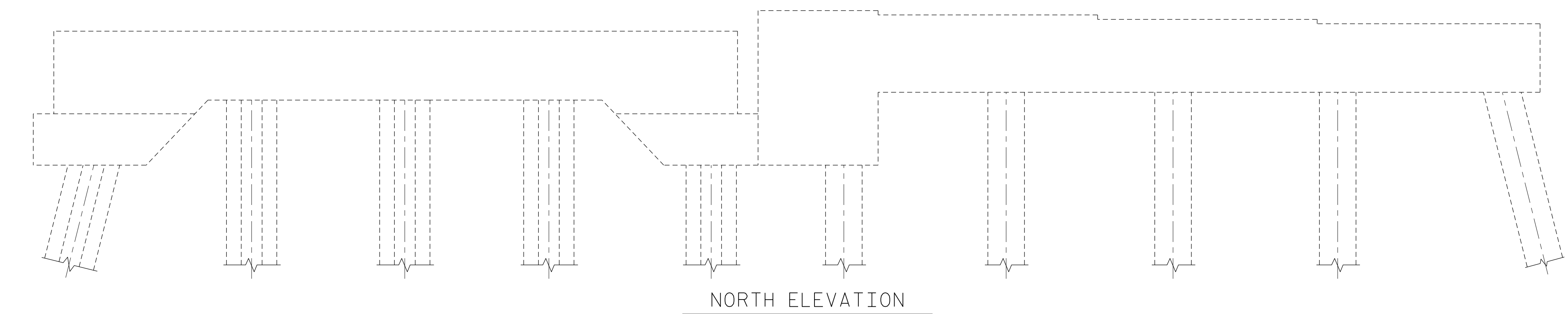
DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019  
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019  
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

DocuSigned by:  
 Jacob H. Duke  
 9CDB3ADCC66D6400  
 3/14/2019

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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-49
2			4			57

LEGEND	
	CONCRETE REPAIR AREA
	SHOTCRETE REPAIR AREA
	EPOXY COATING AREA
	EPOXY RESIN INJECTION (ERI)



### AS-BUILT REPAIR QUANTITY TABLE

BENT 28	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	-	-		
PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
* CAP	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
PILE	-			
EPOXY COATING	AREA SQ. FT.		AREA SQ. FT.	
CAP	51.5			

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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SHOTCRETE REPAIRS TO THE BENT CAP MAY REQUIRE BRIDGE JACKING. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS AND STANDARD SPECIFICATIONS SECTION 420-18.

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PROJECT NO. 15BPR.42  
BEAUFORT COUNTY  
 BRIDGE NO. 060025



DocuSigned by:  
 Jacob H. Duke  
 9CDB3ADC66D6400  
 3/14/2019




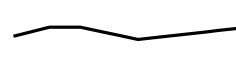
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE REPAIRS**  
 BENT 28

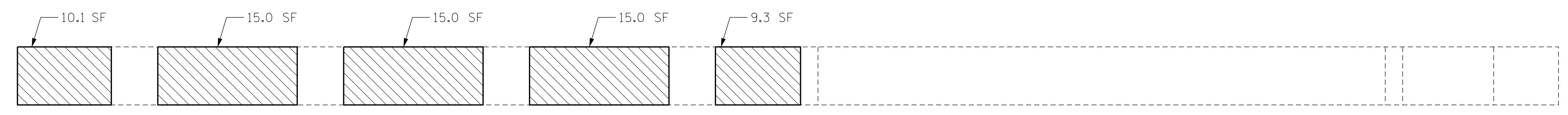
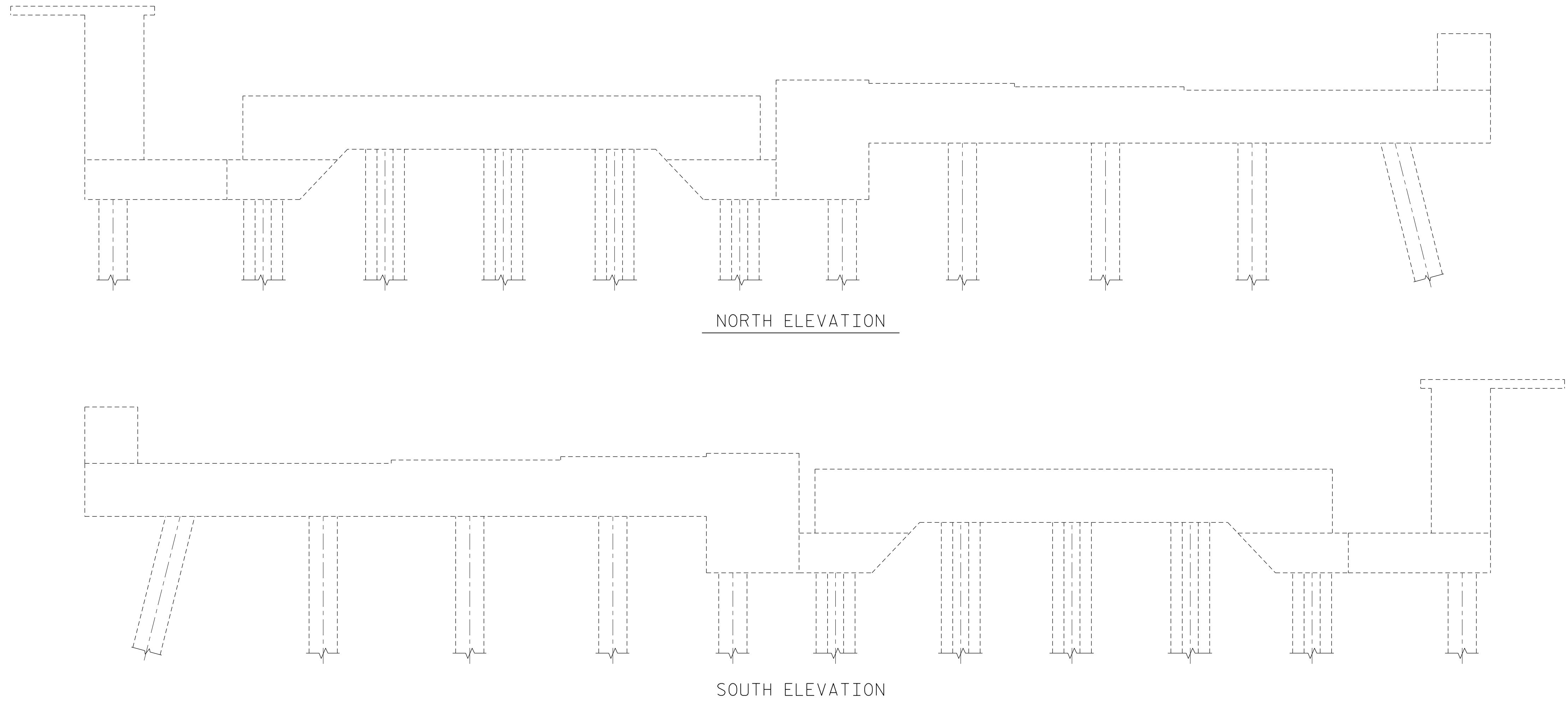
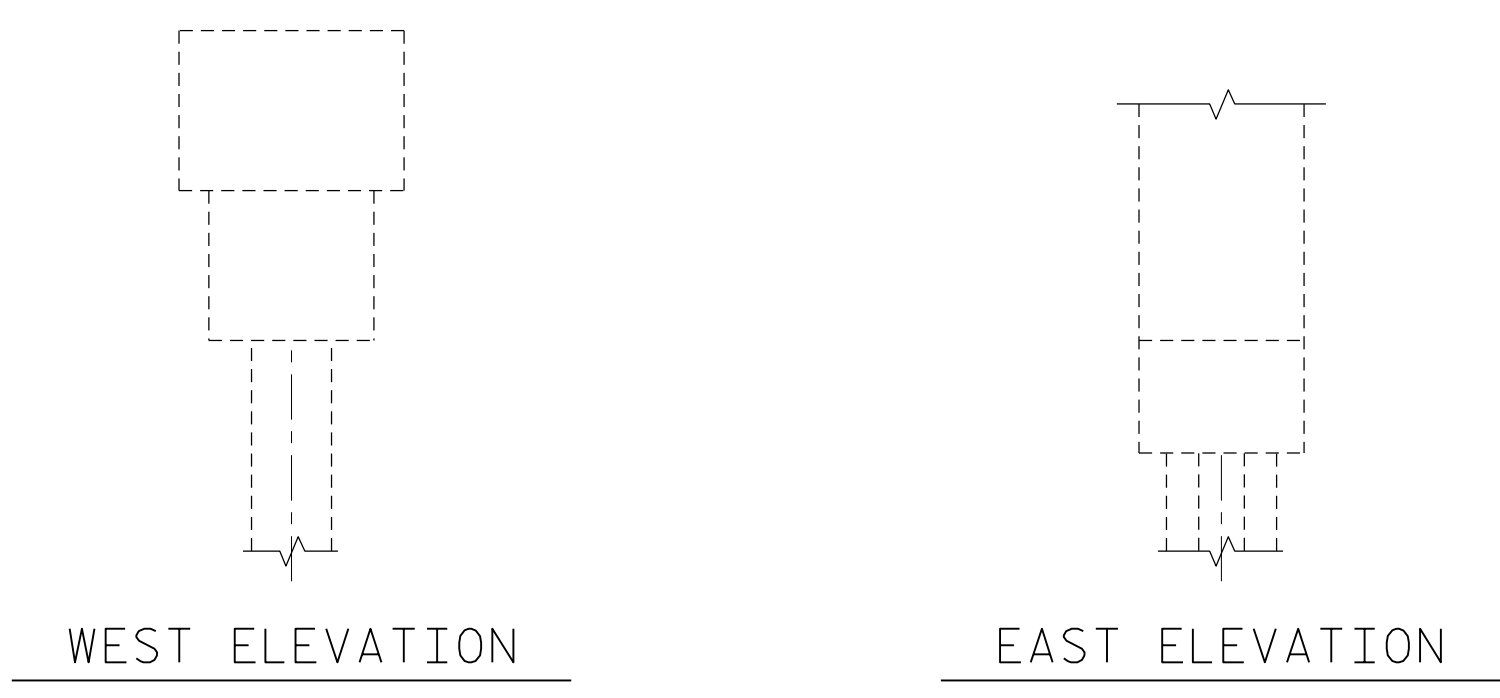
**KCA** 301 FAYETTEVILLE ST., SUITE 1500  
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601  
 (919) 882-7839  
 LICENSE #: C-1506

DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019  
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019  
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			57

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LEGEND	
	CONCRETE REPAIR AREA
	SHOTCRETE REPAIR AREA
	EPOXY COATING AREA
	EPOXY RESIN INJECTION (ERI)



PLAN  
(TOP OF CAP)  
(PILES AND BEAMS NOT SHOWN FOR CLARITY)

AS-BUILT REPAIR QUANTITY TABLE				
BENT 29	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	-	-		
PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
* CAP	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
PILE	-			
EPOXY COATING	AREA SQ. FT.		AREA SQ. FT.	
CAP	64.4			

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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SHOTCRETE REPAIRS TO THE BENT CAP MAY REQUIRE BRIDGE JACKING. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

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PROJECT NO. 15BPR.42  
BEAUFORT COUNTY  
 BRIDGE NO. 060025



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE REPAIRS**  
 BENT 29

**KCA** 301 FAYETTEVILLE ST., SUITE 1500  
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601  
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 LICENSE #: C-1506

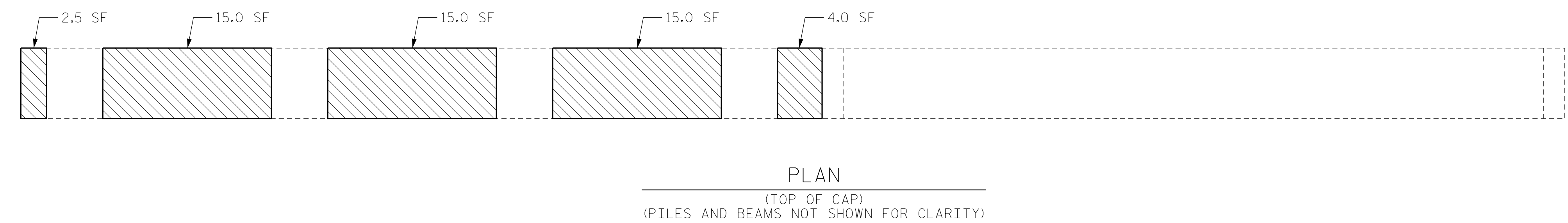
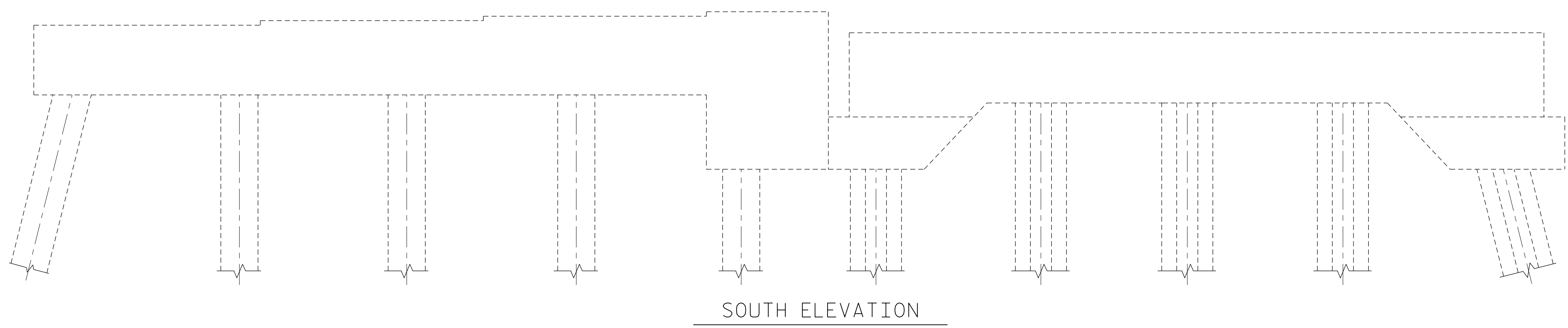
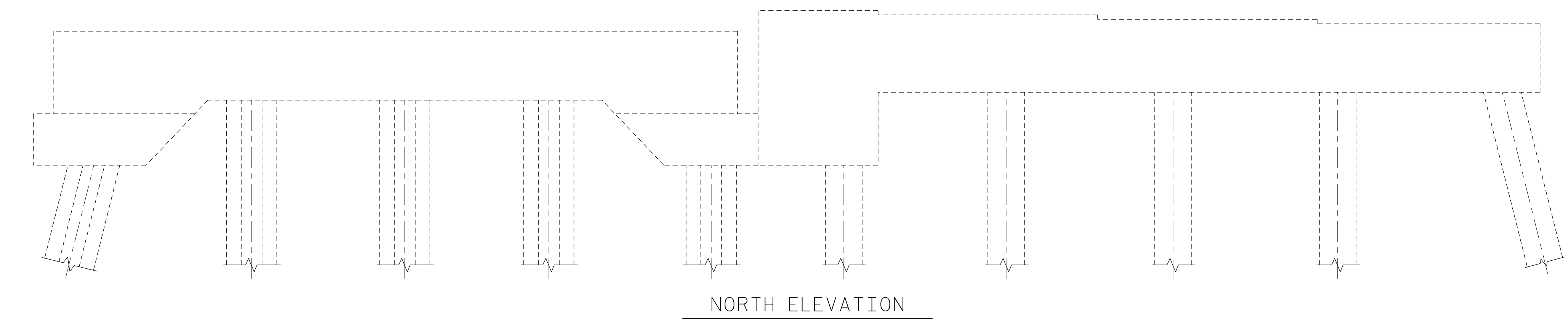
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-51
2			4			TOTAL SHEETS 57

LEGEND	
	CONCRETE REPAIR AREA
	SHOTCRETE REPAIR AREA
	EPOXY COATING AREA
	EPOXY RESIN INJECTION (ERI)



AS-BUILT REPAIR QUANTITY TABLE				
BENT 30	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	-	-		
PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
* CAP	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
PILE	-			
EPOXY COATING	AREA SQ. FT.		AREA SQ. FT.	
CAP	51.5			

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

**NOTES:**  
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FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

SHOTCRETE REPAIRS TO THE BENT CAP MAY REQUIRE BRIDGE JACKING. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS AND STANDARD SPECIFICATIONS SECTION 420-18.

\* ADDITIONAL QUANTITIES OF CONCRETE REPAIR ARE ANTICIPATED. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED.

PROJECT NO. 15BPR.42  
BEAUFORT COUNTY  
 BRIDGE NO. 060025



DocuSigned by:  
 Jacob H. Duke  
 9CDB3ADCC668400  
 3/14/2019

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE REPAIRS**

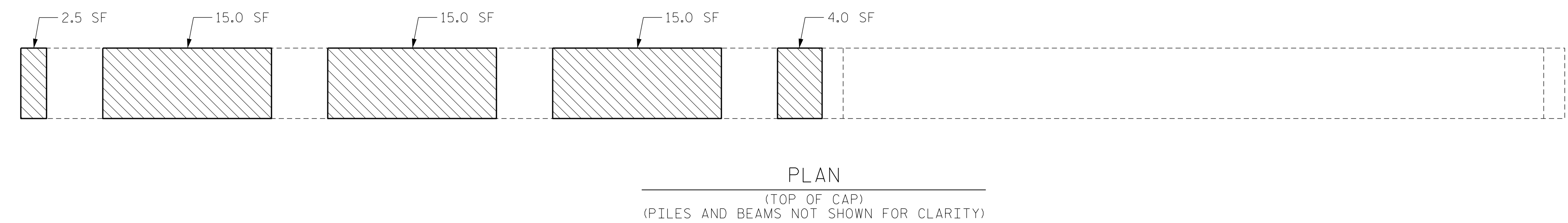
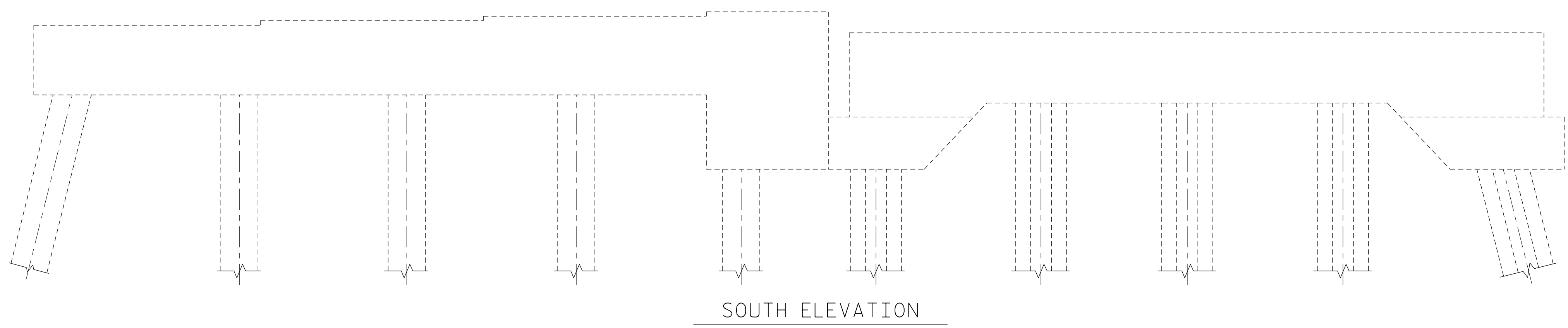
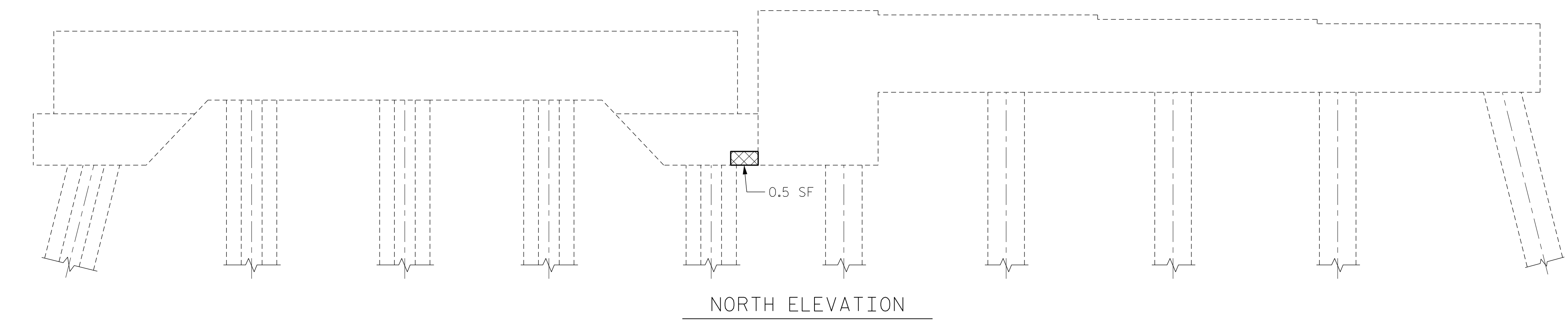
BENT 30

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-52
2			4			TOTAL SHEETS 57

**KCA** 301 FAYETTEVILLE ST., SUITE 1500  
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601  
 (919) 882-7839  
 LICENSE #: C-1506

DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019  
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019  
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

LEGEND	
	CONCRETE REPAIR AREA
	SHOTCRETE REPAIR AREA
	EPOXY COATING AREA
	EPOXY RESIN INJECTION (ERI)



AS-BUILT REPAIR QUANTITY TABLE				
BENT 31	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	0.5	0.3		
PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
* CAP	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
PILE	-			
EPOXY COATING	AREA SQ. FT.		AREA SQ. FT.	
CAP	51.5			

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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PROJECT NO. 15BPR.42  
BEAUFORT COUNTY  
 BRIDGE NO. 060025



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE REPAIRS**  
 BENT 31

**KCA** 301 FAYETTEVILLE ST., SUITE 1500  
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601  
 (919) 882-7839  
 LICENSE #: C-1506

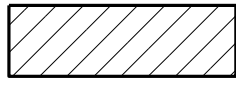
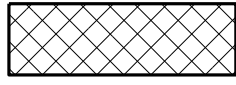
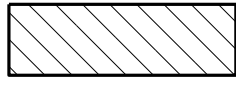
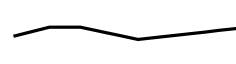
DRAWN BY : DIEGO A. AGUIRRE      DATE : 2/5/2019  
 CHECKED BY : OMAR M. KHALAFALLA      DATE : 2/5/2019  
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE      DATE : 2/5/2019

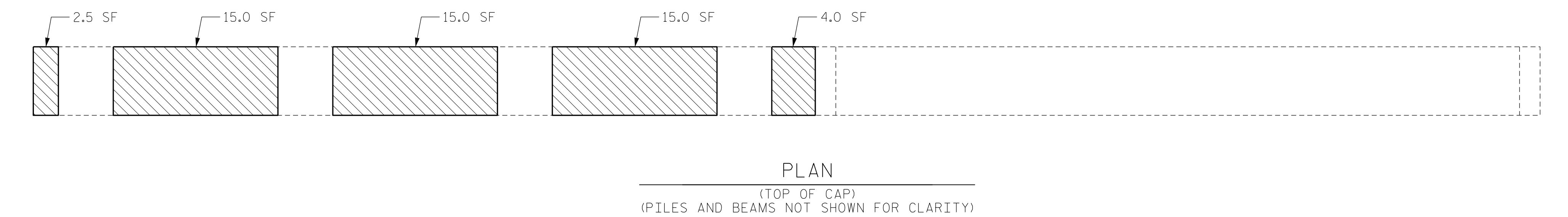
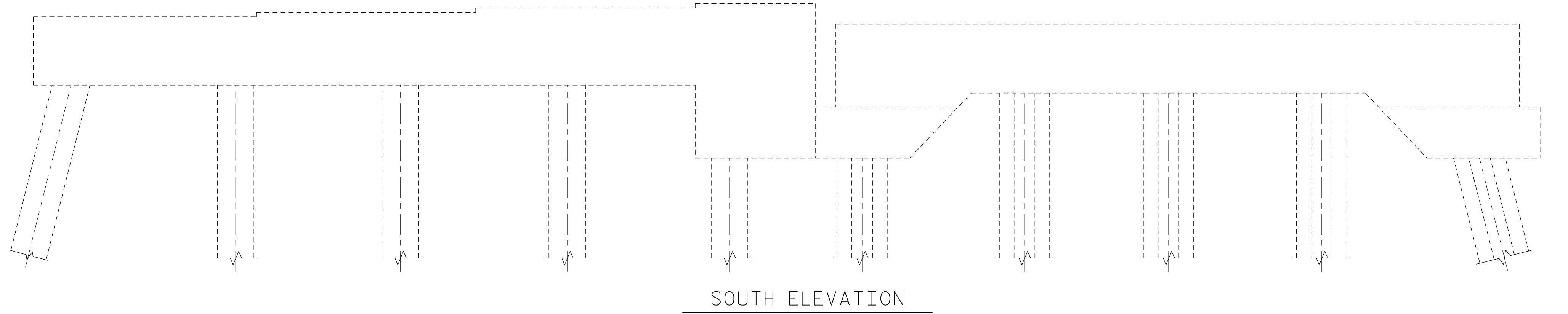
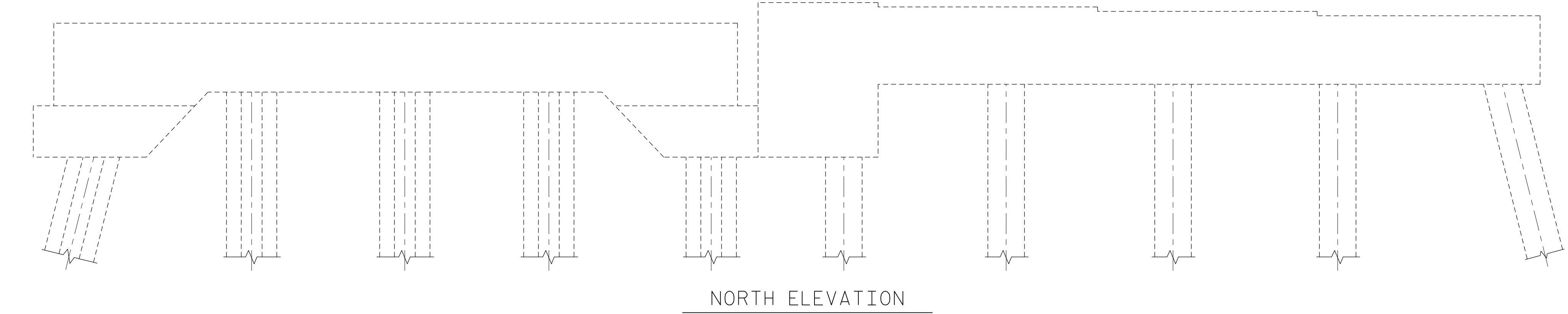
DocuSigned by:  
 Jacob H. Duke  
 9CDB3ADCC668400  
 3/14/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-53
2			4			TOTAL SHEETS 57



LEGEND	
	CONCRETE REPAIR AREA
	SHOTCRETE REPAIR AREA
	EPOXY COATING AREA
	EPOXY RESIN INJECTION (ERI)



AS-BUILT REPAIR QUANTITY TABLE				
BENT 32	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	-	-		
PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
* CAP	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
PILE	-			
EPOXY COATING	AREA SQ. FT.		AREA SQ. FT.	
CAP	51.5			

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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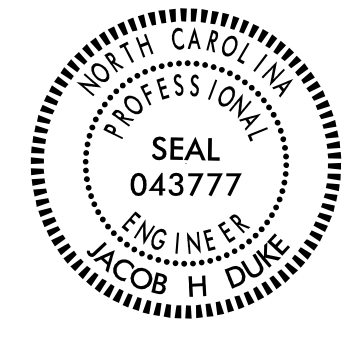
SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

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PROJECT NO. 15BPR.42  
BEAUFORT COUNTY  
 BRIDGE NO. 060025




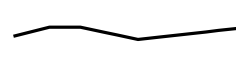


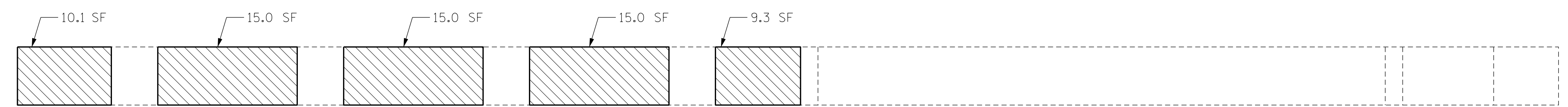
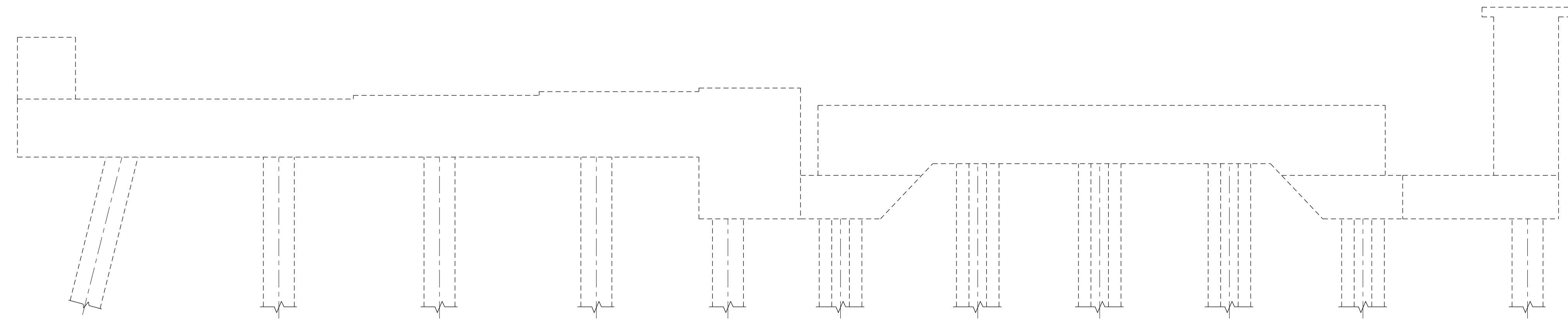
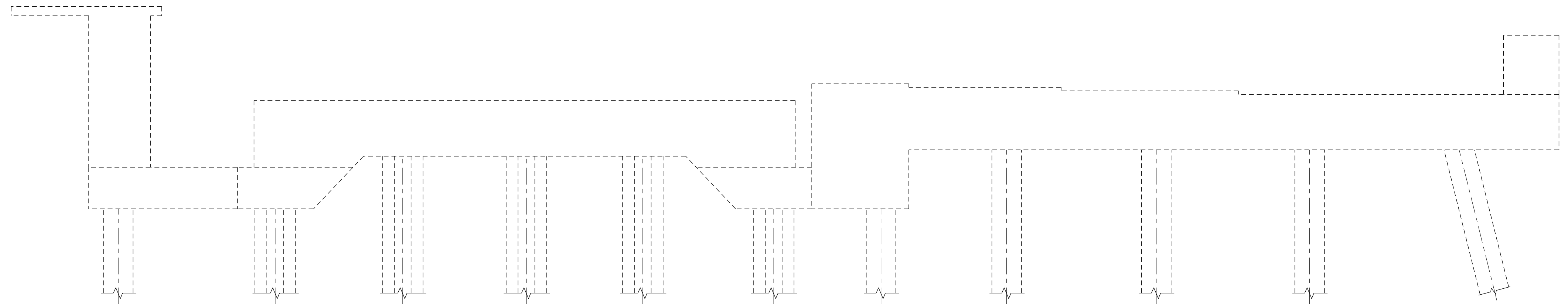
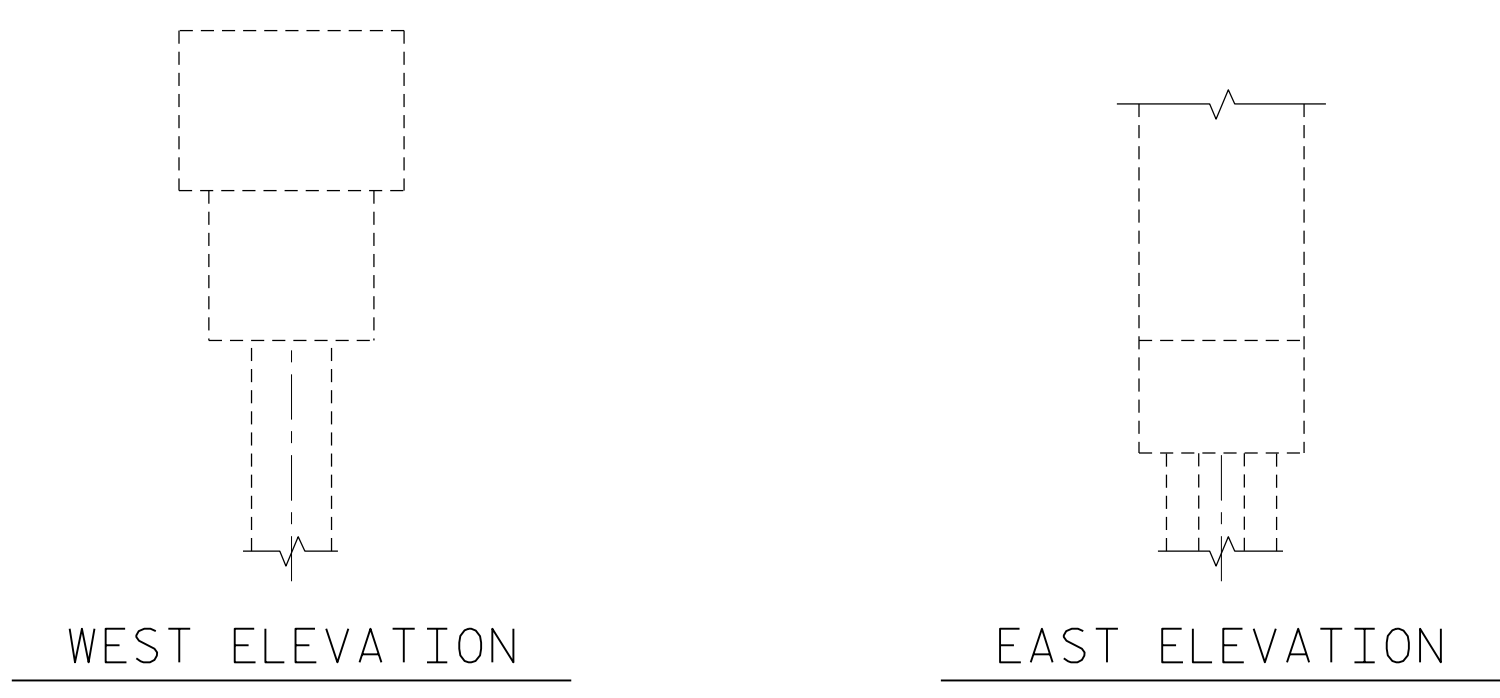
DocuSigned by:  
**Jacob H. Duke**  
9CD53ADC66D6400...  
 3/14/2019

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
<b>SUBSTRUCTURE REPAIRS</b>					
BENT 32					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED					TOTAL SHEETS 57

**KCA** 301 FAYETTEVILLE ST., SUITE 1500  
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601  
 (919) 882-7839  
 LICENSE #: C-1506

DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019  
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019  
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

LEGEND	
	CONCRETE REPAIR AREA
	SHOTCRETE REPAIR AREA
	EPOXY COATING AREA
	EPOXY RESIN INJECTION (ERI)



PLAN  
(TOP OF CAP)  
(PILES AND BEAMS NOT SHOWN FOR CLARITY)

AS-BUILT REPAIR QUANTITY TABLE				
BENT 33	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	-	-		
PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
* CAP	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
PILE	-			
EPOXY COATING	AREA SQ. FT.		AREA SQ. FT.	
CAP	64.4			

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PROJECT NO. 15BPR.42  
BEAUFORT COUNTY  
 BRIDGE NO. 060025



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE REPAIRS**  
 BENT 33




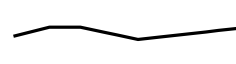
**KCA** 301 FAYETTEVILLE ST., SUITE 1500  
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601  
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 LICENSE #: C-1506

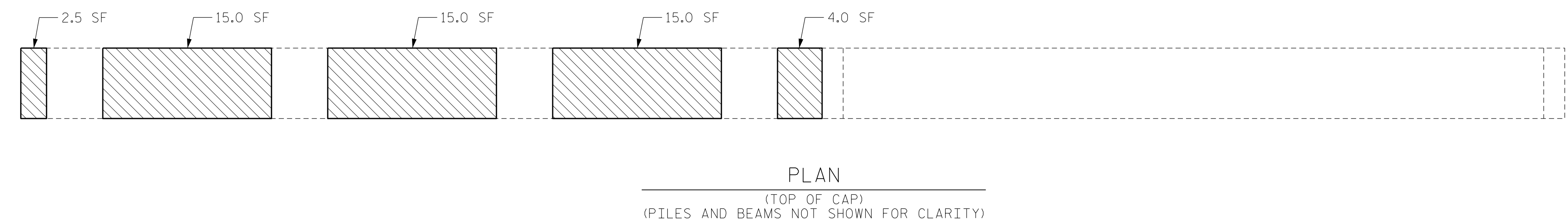
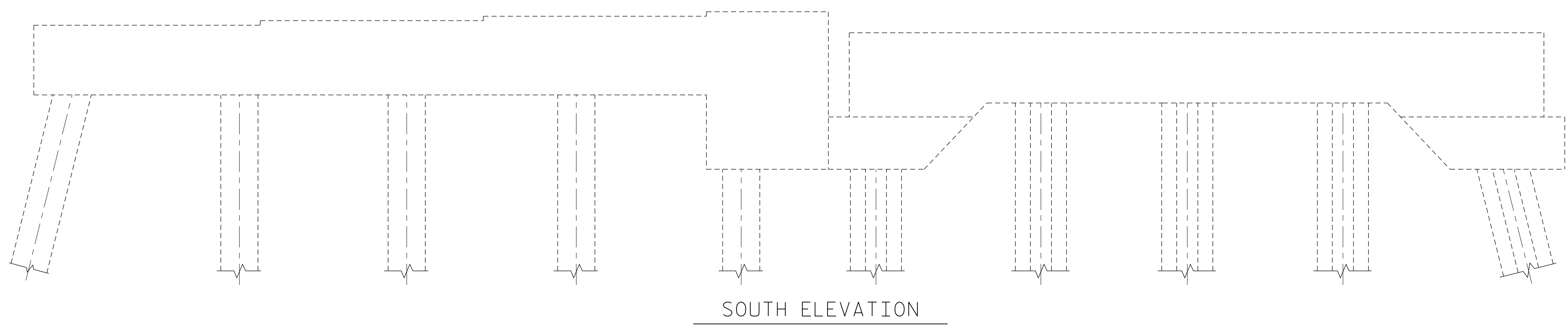
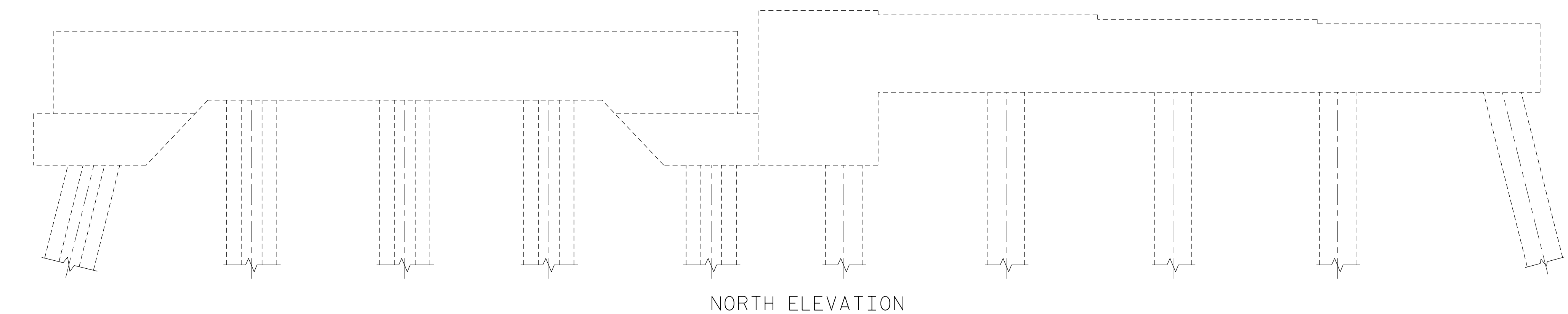
DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019  
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019  
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

DocuSigned by:  
 Jacob H. Duke  
 9CD53ADCC66D6400  
 3/14/2019

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-55
2			4			TOTAL SHEETS 57

LEGEND	
	CONCRETE REPAIR AREA
	SHOTCRETE REPAIR AREA
	EPOXY COATING AREA
	EPOXY RESIN INJECTION (ERI)



AS-BUILT REPAIR QUANTITY TABLE				
BENT 34	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	-	-		
PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
* CAP	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
PILE	-			
EPOXY COATING	AREA SQ. FT.		AREA SQ. FT.	
CAP	51.5			

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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PROJECT NO. 15BPR.42  
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DocuSigned by:  
 Jacob H. Duke  
 9CDB3ADC66D6400  
 3/14/2019

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

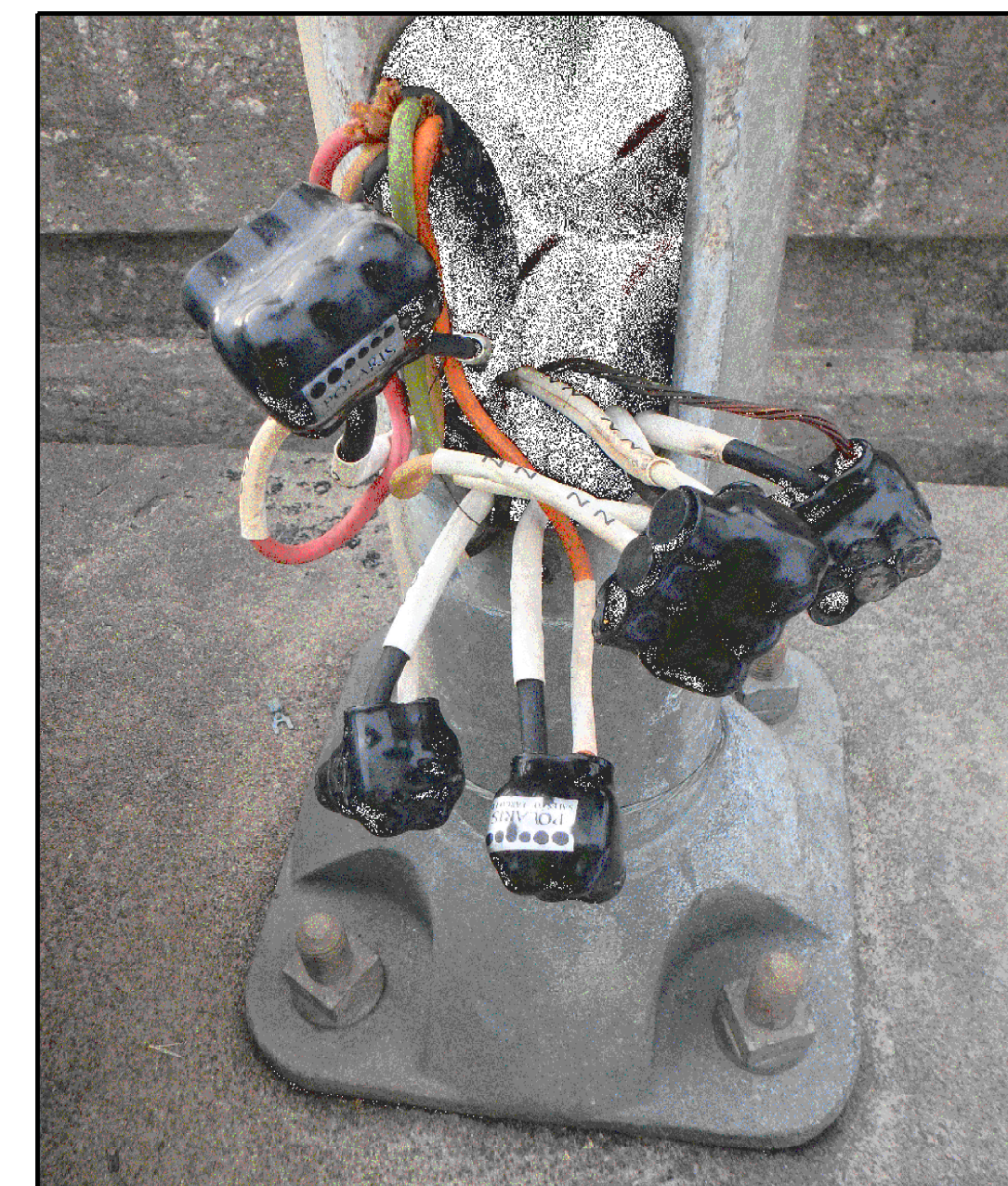
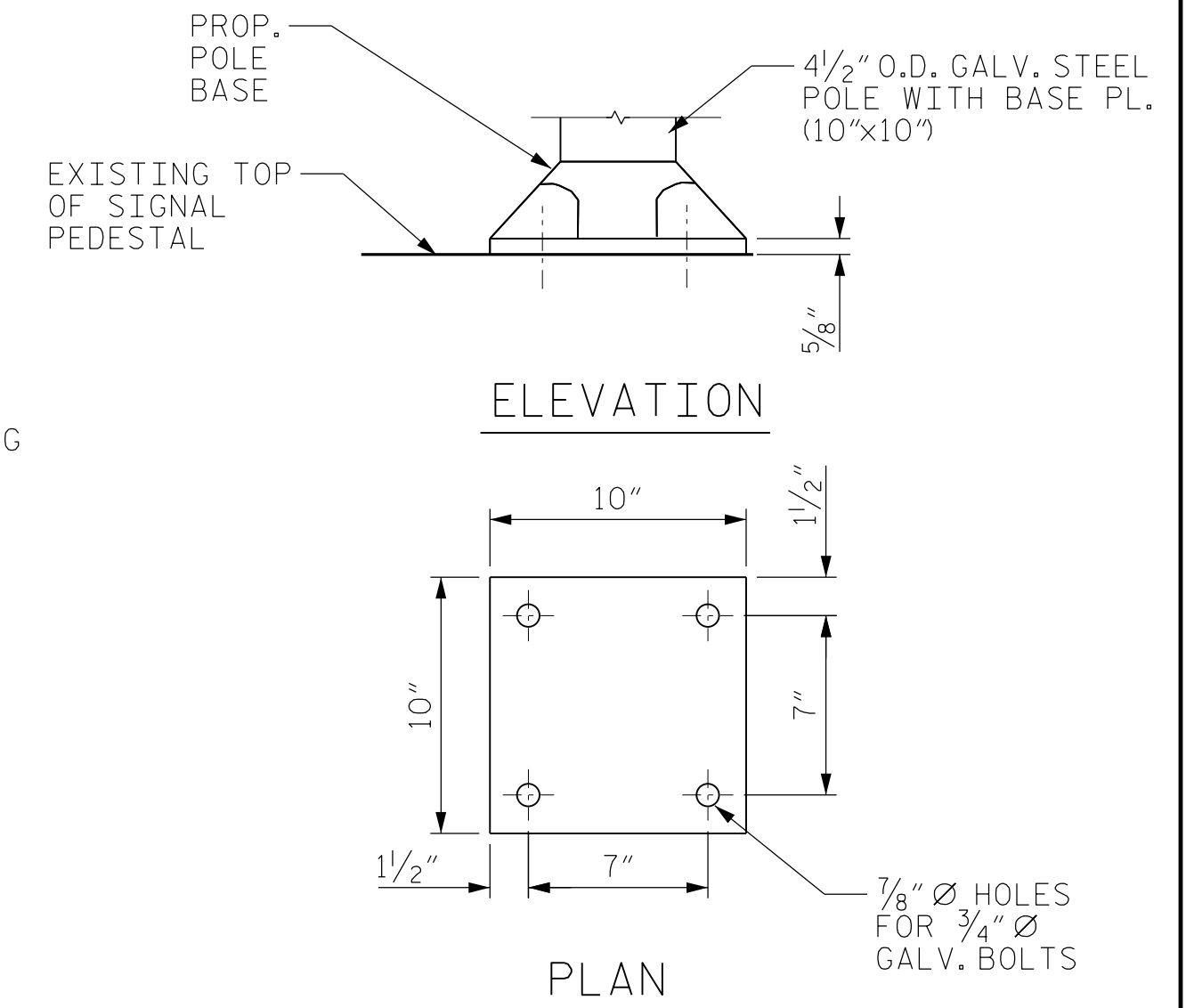
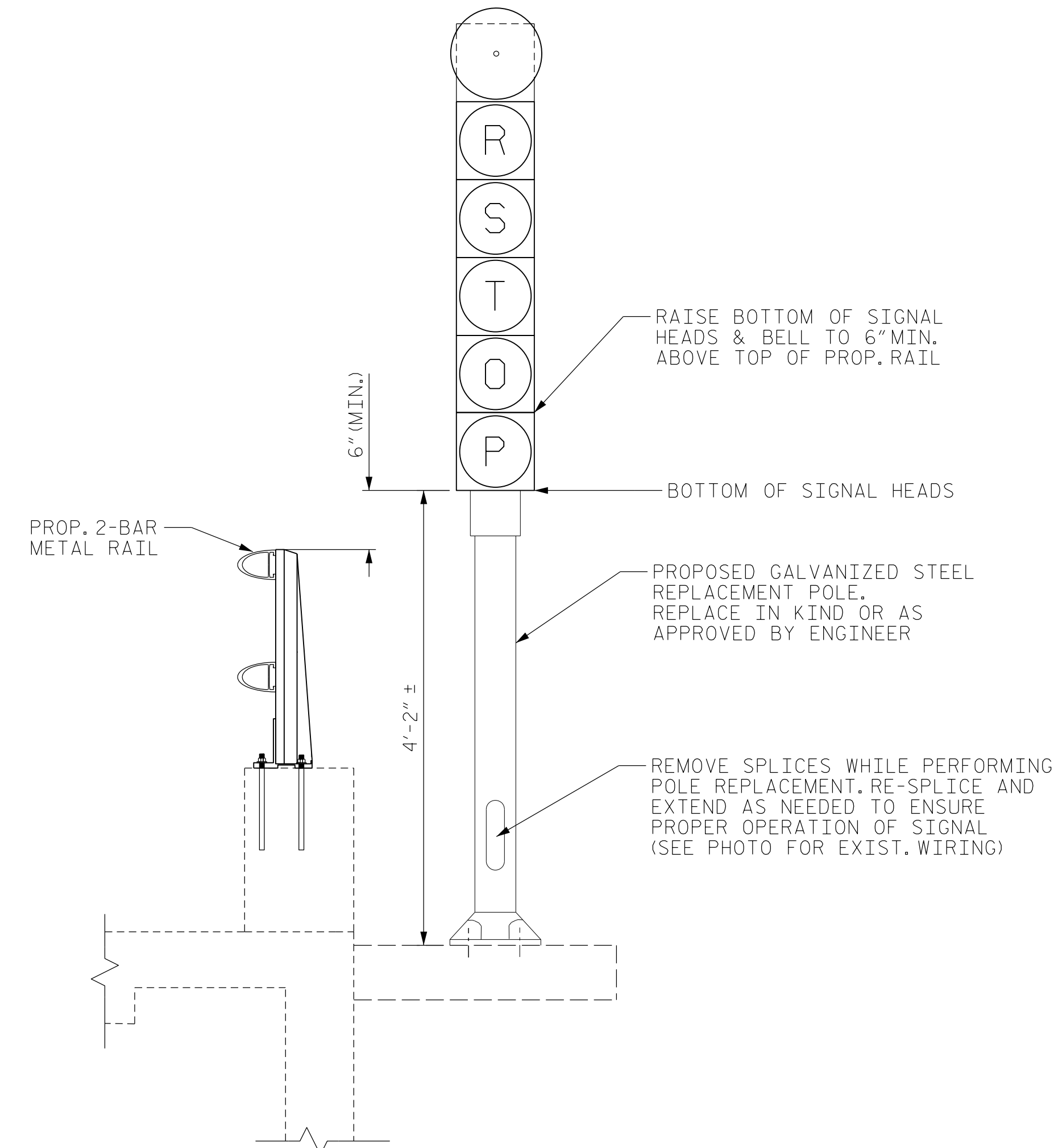
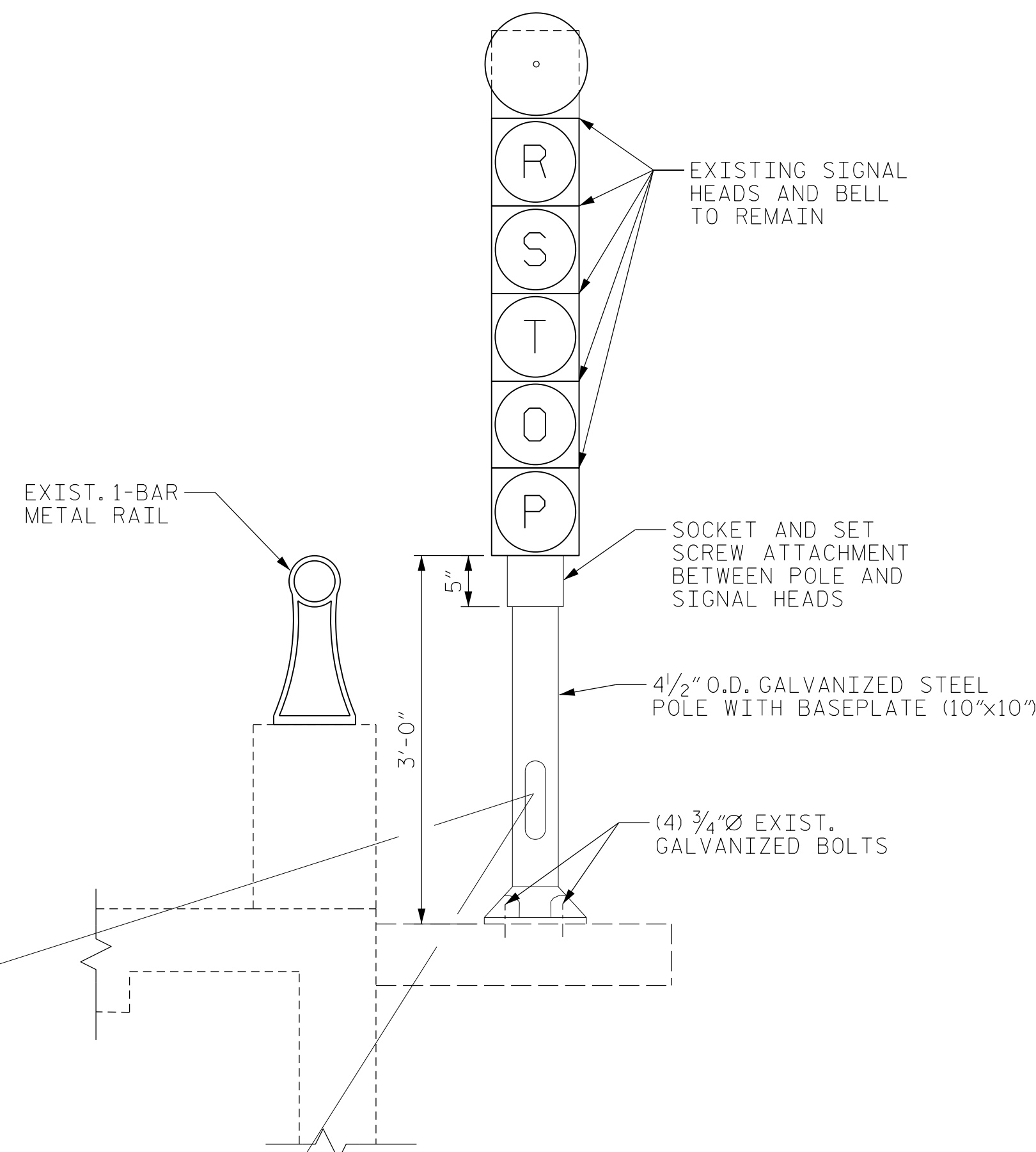
**SUBSTRUCTURE REPAIRS**

BENT 34

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-56
2			4			TOTAL SHEETS 57

**KCA** 301 FAYETTEVILLE ST., SUITE 1500  
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601  
 (919) 882-7839  
 LICENSE #: C-1506

DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019  
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019  
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019



EXISTING

PROPOSED

### SIGNAL POLE PEDESTAL SECTION VIEWS

SOUTH PEDESTAL (EAST FACE) SHOWN, NORTH PEDESTAL (WEST FACE) SIMILAR

**NOTES:**

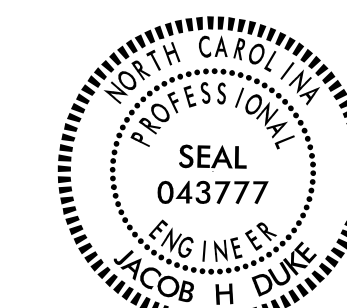
1. SUBMIT PROPOSED REPLACEMENT POLE FOR APPROVAL BY THE ENGINEER.
2. DIRECT QUESTIONS TO THE ENGINEER OR DIVISION 2 ELECTRONICS TECHNICIAN, KEN MILLER (252) 670-2143.
3. THE CONTRACTOR SHALL ENSURE THAT NO BRIDGE OPENINGS WILL OCCUR DURING THE TIME OF THE PROPOSED REPLACEMENT. IF AN UNEXPECTED OPENING OCCURS, THE CONTRACTOR SHALL ENSURE PUBLIC SAFETY BY FLAGGING THE BRIDGE BEFORE, DURING AND AFTER THE BRIDGE OPENING USING FLAGGERS SHOWN IN NCDOT STANDARD DRAWINGS.
4. ELECTRICAL WORK SHALL BE PERFORMED BY A DULY LICENSED ELECTRICIAN.
5. ALL HARDWARE SHALL BE REPLACED IN KIND.
6. THE CONTRACTOR IS RESPONSIBLE TO VERIFY EXISTING DIMENSIONS PRIOR TO ORDERING MATERIAL.
7. THE EXISTING BASEPLATE BOLTS MAY BE REUSED, ALTERNATELY, THE CONTRACTOR CAN REPLACE THE BOLTS PROVIDED THE FOOTPRINT OF THE PLATE AND BOLTS IS LARGER THAN THE EXISTING ASSEMBLY.

PROJECT NO. 15BPR.42  
BEAUFORT COUNTY  
 BRIDGE NO. 060025

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3/14/2019  
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 daguirre



DocuSigned by:  
 Jacob H. Duke  
 9CD53ADC66D6400  
 3/14/2019

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

### SWING SPAN SIGNAL EXTENSION DETAILS

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-57
1			3			TOTAL SHEETS
2			4			57

## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N.C. DEPARTMENT OF TRANSPORTATION.

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

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

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

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

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

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

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

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

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

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

# ENGLISH

JANUARY, 1990

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