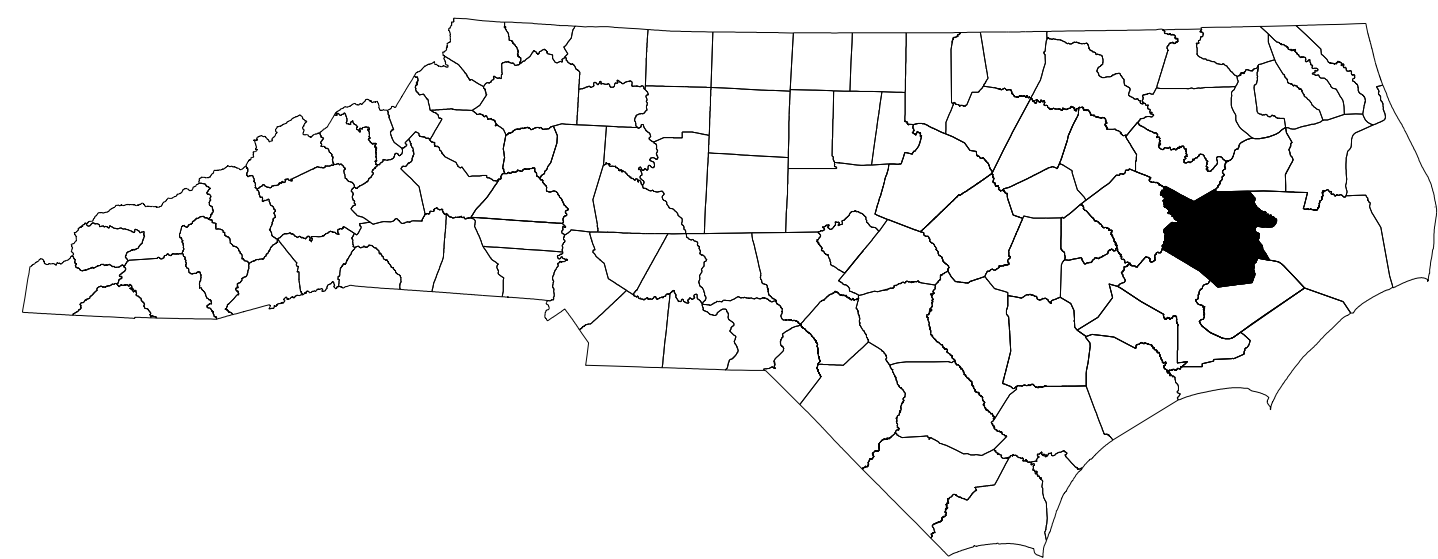


**This electronic collection of documents is provided
for the convenience of the user
and is Not a Certified Document –**

**The documents contained herein were originally issued
and sealed by the individuals whose names and license
numbers appear on each page, on the dates appearing
with their signature on that page.**

**This file or an individual page
shall not be considered a certified document.**

PROJECT NUMBER: 15BPR.42
CONTRACT: C204219



STATE OF NORTH CAROLINA

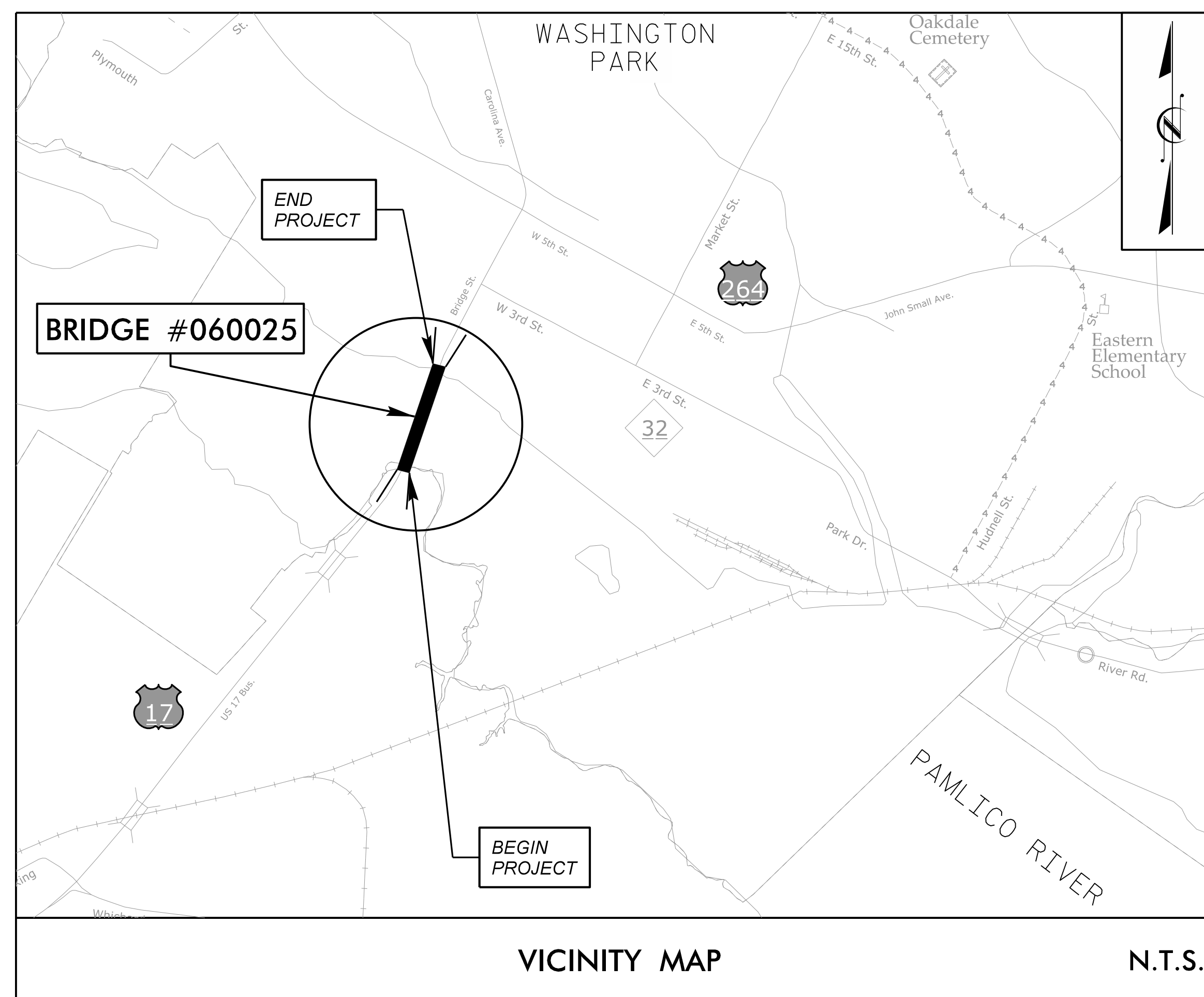
DIVISION OF HIGHWAYS

BEAUFORT COUNTY

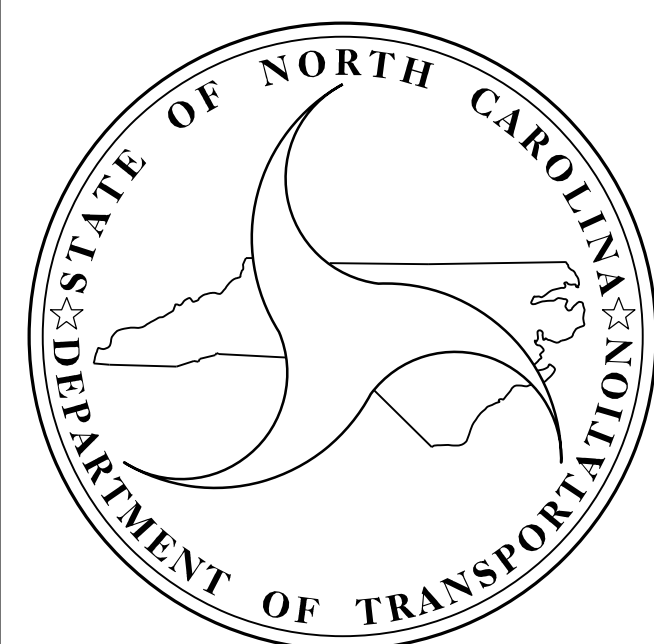
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15BPR.42	1	57
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
15BPR.42	-	P.E.	
15BPR.42	-	CONST.	

LOCATION: **BEAUFORT COUNTY**
BRIDGE # 060025 ON US17 BUS. OVER PAMLICO RIVER

TYPE OF WORK: **BRIDGE PRESERVATION - DECK ASPHALT WEARING SURFACE MILLING AND RESURFACING, JOINT REPAIR, APPROACH ROADWAY MILLING AND RESURFACING, RAIL RETROFIT, SUPERSTRUCTURE CONCRETE REPAIRS, SUBSTRUCTURE CONCRETE REPAIRS, SIGNAL MODIFICATION.**



STRUCTURES



DESIGN DATA

BEAUFORT COUNTY
#25 ADT 2013 = 13,000

PROJECT LENGTH

BEAUFORT COUNTY
#25 = 0.23 MILE

2018 STANDARD SPECIFICATIONS

LETTING DATE :
MAY 21, 2019

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

KCA
KISINGER CAMPO & ASSOCIATES

301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601
(919) 882-7839
LICENSE #: C-1506

JACOB H. DUKE
PROJECT ENGINEER

DIEGO A. AGUIRRE
PROJECT DESIGN ENGINEER

DocuSigned by:
Jacob H. Duke
3/7/2019 10:04:00 AM

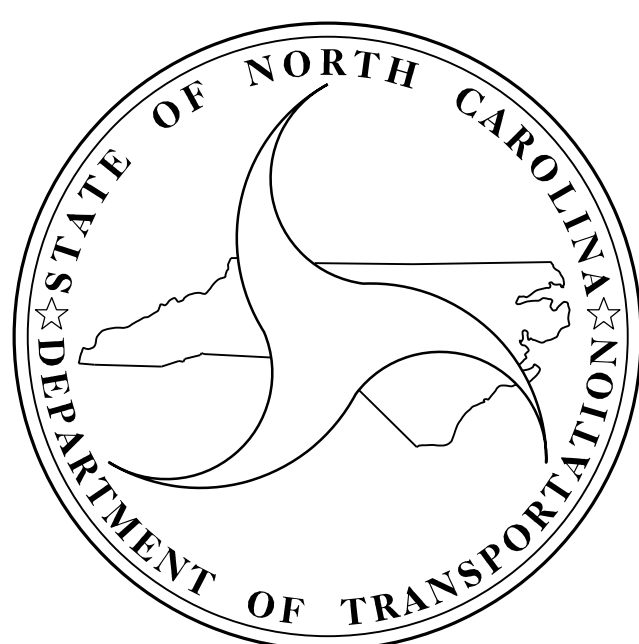
TIP PROJECT: 15BPR.42

CONTRACT: C204219

INDEX OF SHEETS - STRUCTURES

1	TITLE SHEET	40	SUBSTRUCTURE REPAIRS - BENT 20
1A	INDEX OF SHEETS	41	SUBSTRUCTURE REPAIRS - BENT 21
1	BILL OF MATERIALS	42	SUBSTRUCTURE REPAIRS - BENT 22
2	GENERAL DRAWING (1 OF 3)	43	SUBSTRUCTURE REPAIRS - BENT 23
3	GENERAL DRAWING (2 OF 3)	44	SUBSTRUCTURE REPAIRS - BENT 24
4	GENERAL DRAWING (3 OF 3)	45	SUBSTRUCTURE REPAIRS - BENT 25
5	TYPICAL SECTION - MILLING AND RESURFACING	46	SUBSTRUCTURE REPAIRS - BENT 25A
6	DECK SURFACE REPAIR - APPROACH SPANS	47	SUBSTRUCTURE REPAIRS - BENT 25B
7	DECK SURFACE REPAIR - SWING SPAN	48	SUBSTRUCTURE REPAIRS - BENT 26
8	JOINT DETAILS	49	SUBSTRUCTURE REPAIRS - BENT 27
9	APPROACH ROADWAY - MILLING AND RESURFACING	50	SUBSTRUCTURE REPAIRS - BENT 28
10	RAIL RETROFIT IN APPROACH SPANS - MODIFIED STANDARD 2 BAR METAL RAIL (1 OF 4)	51	SUBSTRUCTURE REPAIRS - BENT 29
11	RAIL RETROFIT IN APPROACH SPANS - MODIFIED STANDARD 2 BAR METAL RAIL (2 OF 4)	52	SUBSTRUCTURE REPAIRS - BENT 30
12	RAIL RETROFIT IN APPROACH SPANS - MODIFIED STANDARD 2 BAR METAL RAIL (3 OF 4)	53	SUBSTRUCTURE REPAIRS - BENT 31
13	RAIL RETROFIT IN APPROACH SPANS - MODIFIED STANDARD 2 BAR METAL RAIL (4 OF 4)	54	SUBSTRUCTURE REPAIRS - BENT 32
14	RAIL RETROFIT IN SWING SPANS - MODIFIED STANDARD 3 BAR METAL RAIL (1 OF 3)	55	SUBSTRUCTURE REPAIRS - BENT 33
15	RAIL RETROFIT IN SWING SPANS - MODIFIED STANDARD 3 BAR METAL RAIL (2 OF 3)	56	SUBSTRUCTURE REPAIRS - BENT 34
16	RAIL RETROFIT IN SWING SPANS - MODIFIED STANDARD 3 BAR METAL RAIL (3 OF 3)	57	SWING SPAN SIGNAL - EXTENSION DETAILS
17	CONCRETE RESTORATION DETAILS (1 OF 2)		
18	CONCRETE RESTORATION DETAILS (2 OF 2)		
19	SUPERSTRUCTURE REPAIRS		
20	SUBSTRUCTURE REPAIRS - END BENTS 1 & 2		
21	SUBSTRUCTURE REPAIRS - BENT 1		
22	SUBSTRUCTURE REPAIRS - BENT 2		
23	SUBSTRUCTURE REPAIRS - BENT 3		
24	SUBSTRUCTURE REPAIRS - BENT 4		
25	SUBSTRUCTURE REPAIRS - BENT 5		
26	SUBSTRUCTURE REPAIRS - BENT 6		
27	SUBSTRUCTURE REPAIRS - BENT 7		
28	SUBSTRUCTURE REPAIRS - BENT 8		
29	SUBSTRUCTURE REPAIRS - BENT 9		
30	SUBSTRUCTURE REPAIRS - BENT 10		
31	SUBSTRUCTURE REPAIRS - BENT 11		
32	SUBSTRUCTURE REPAIRS - BENT 12		
33	SUBSTRUCTURE REPAIRS - BENT 13		
34	SUBSTRUCTURE REPAIRS - BENT 14		
35	SUBSTRUCTURE REPAIRS - BENT 15		
36	SUBSTRUCTURE REPAIRS - BENT 16		
37	SUBSTRUCTURE REPAIRS - BENT 17		
38	SUBSTRUCTURE REPAIRS - BENT 18		
39	SUBSTRUCTURE REPAIRS - BENT 19		

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15BPR.42	1A	57
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
15BPR.42	-	P.E.	
15BPR.42	-	CONST.	



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

SUMMARY OF QUANTITIES

TOTAL BILL OF MATERIALS

	INCIDENTAL MILLING	ASPHALT CONCRETE SURFACE COURSE TYPE, S9.5B	ASPHALT BINDER FOR PLANT MIX	CONCRETE REPAIRS	SHOTCRETE REPAIRS	EPOXY RESIN INJECTION	TRAFFIC SIGNAL EXTENSION	RAIL RETROFIT (2-BAR METAL RAIL)	RAIL RETROFIT (3-BAR METAL RAIL)	SILICONE JOINT SEALANT	ASPHALT JOINT REPAIR/REPLACEMENT (20" WIDE, W/PLATE)	EPOXY COATING AND DEBRIS REMOVAL	CONCRETE FILLED GRID DECK REPAIR FOR EPOXY OVERLAY	EPOXY OVERLAY SYSTEM I
	SO. YD.	TON	TON	CU. FT.	CU. FT.	LIN. FT.	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	SO. FT.	SO. FT.	SO. FT.
TOTAL	6811	375	22.6	111	18	122	LUMP SUM	2079	360	365	1716	2862	88	2184

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

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

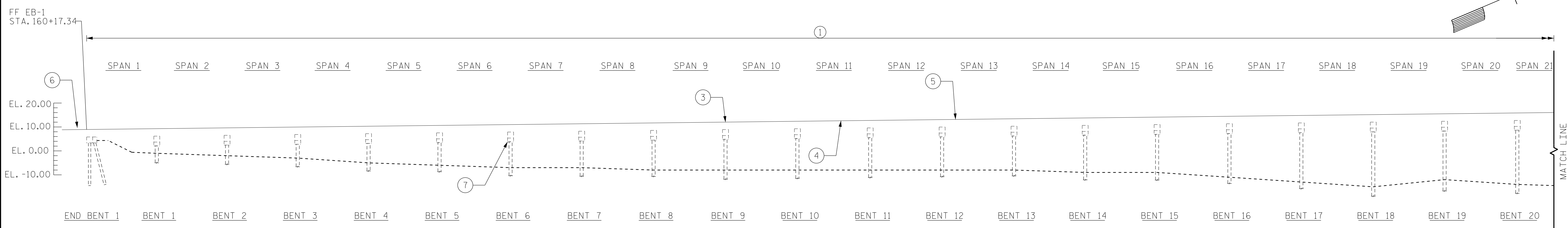
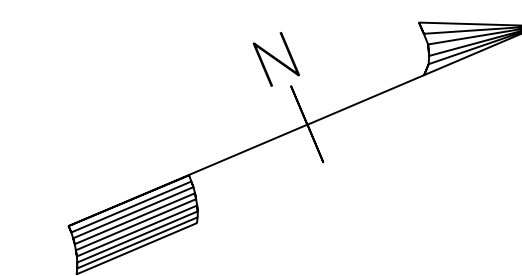
DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

4/2/2019
 15BPR.42.SMU.BOM.060025.dgn
 jduke



DocuSigned by:
Jacob H. Duke
 4/2/2019

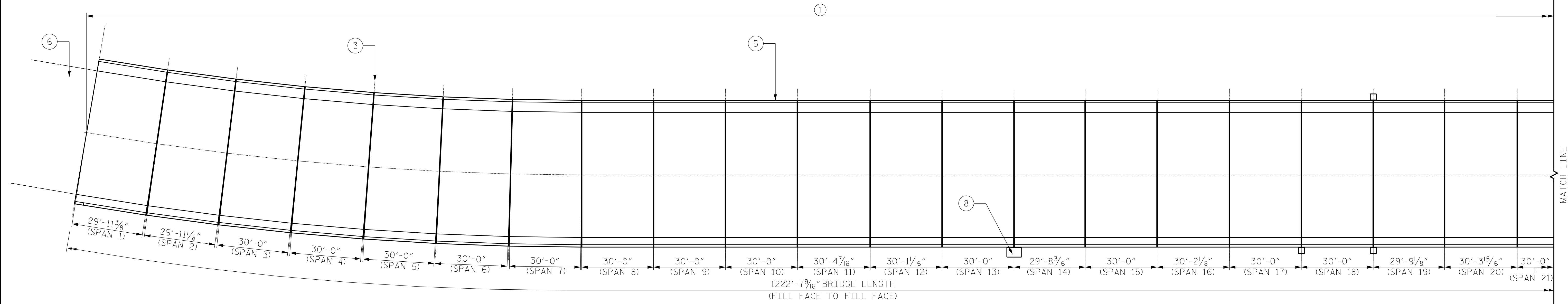
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BILL OF MATERIALS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED					TOTAL SHEETS 57



PARTIAL SECTION ALONG C ROADWAY

← TO CHOCOWINITY

→ TO WASHINGTON



PARTIAL PLAN

SUBSTRUCTURE UNITS NOT SHOWN FOR CLARITY

SCOPE LEGEND:

- ① DECK SURFACE REPAIR - MILLING AND RESURFACING (GUTTERLINE-GUTTERLINE)
- ② DECK SURFACE REPAIR - CONCRETE FILLED GRID DECK REPAIR & EPOXY OVERLAY
- ③ ASPHALT JOINT REPAIR/REPLACEMENT (TYP.)
- ④ SUPERSTRUCTURE CONCRETE REPAIRS (TYP.)
- ⑤ RAIL RETROFIT (TYP.)
- ⑥ APPROACH ROADWAY MILLING AND RESURFACING
- ⑦ SUBSTRUCTURE CONCRETE REPAIRS (TYP.)
- ⑧ SWING SPAN SIGNAL EXTENSION

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

RESIDENT ENGINEER _____ DATE _____

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

SHEET 1 OF 3

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

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

NOTES:

1. CURVE AND HYDRAULIC DESIGN DATA BASED ON EXISTING WIDENING PLANS DATED 08/1964.
2. STATIONING BASED ON EXISTING WIDENING PLANS DATED 08/1964.
3. SPAN AND BENT NUMBERS BASED ON CURRENT BRIDGE INSECTION REPORT.
4. ELEVATIONS ARE NGVD'29 UNLESS OTHERWISE NOTED.



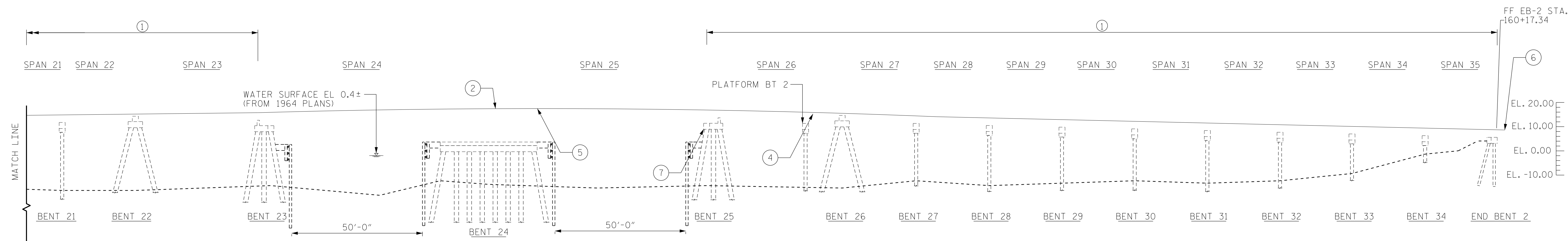
DocuSigned by:
 Jacob H. Duke
 9CDB3ADC66D6400
 3/14/2019

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON US 17 BUS.
 OVER PAMLICO RIVER

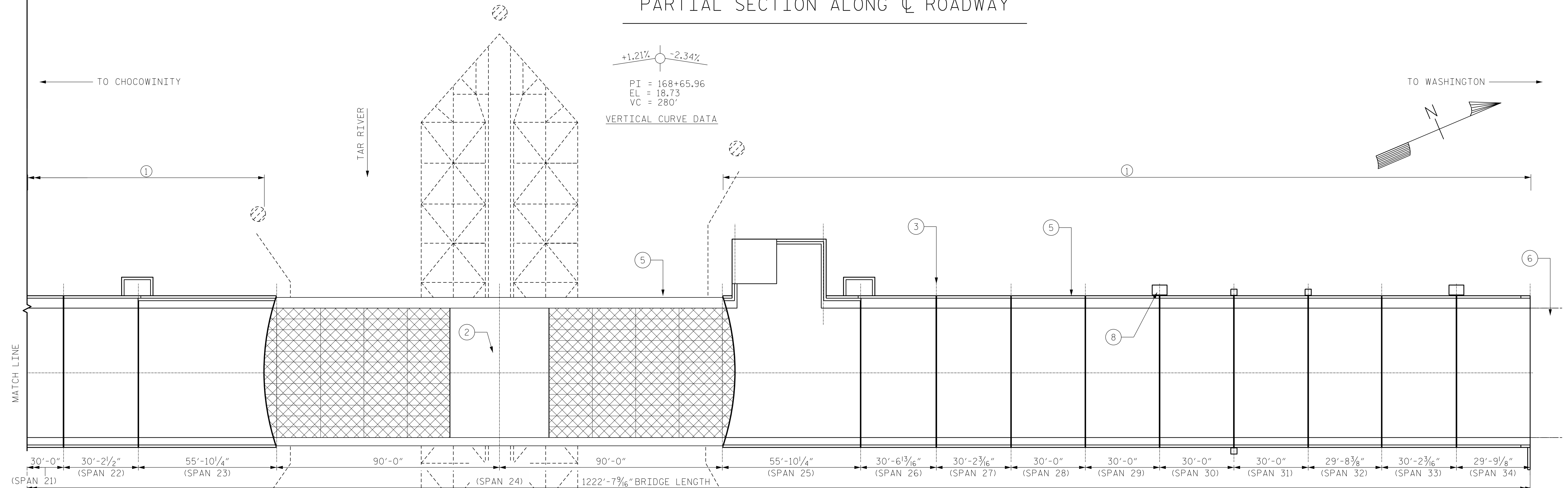
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			57

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PARTIAL SECTION ALONG \odot ROADWAY

+1.21% -2.34%
 PI = 168+65.96
 EL = 18.73
 VC = 280'
 VERTICAL CURVE DATA



PARTIAL PLAN

SUBSTRUCTURE UNITS NOT SHOWN FOR CLARITY

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

SHEET 2 OF 3

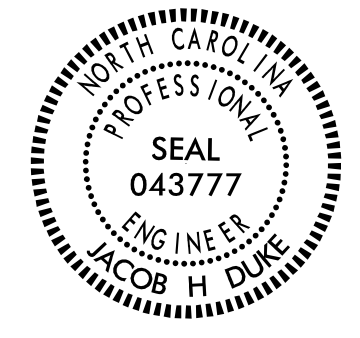
- NOTES:
- CURVE AND HYDRAULIC DESIGN DATA BASED ON EXISTING WIDENING PLANS DATED 08/1964.
 - STATIONING BASED ON EXISTING WIDENING PLANS DATED 08/1964.
 - SPAN AND BENT NUMBERS BASED ON CURRENT BRIDGE INSECTION REPORT.
 - ELEVATIONS ARE NGVD'29 UNLESS OTHERWISE NOTED.

SCOPE LEGEND:

- DECK SURFACE REPAIR - MILLING AND RESURFACING (GUTTERLINE-GUTTERLINE)
- DECK SURFACE REPAIR - CONCRETE FILLED GRID DECK REPAIR & EPOXY OVERLAY
- ASPHALT JOINT REPAIR/REPLACEMENT (TYP.)
- SUPERSTRUCTURE CONCRETE REPAIRS (TYP.)
- RAIL RETROFIT (TYP.)
- APPROACH ROADWAY MILLING AND RESURFACING
- SUBSTRUCTURE CONCRETE REPAIRS (TYP.)
- SWING SPAN SIGNAL EXTENSION

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

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



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

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GENERAL DRAWING FOR BRIDGE ON US 17 BUS. OVER PAMLICO RIVER					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-3
					TOTAL SHEETS 57



LOCATION SKETCH

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

BRIDGE COORDINATES	
LATITUDE	LONGITUDE
35°32' 34.73"	77°3' 42.19"

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

3/14/2019
 15BPR.42_SMU.C003.060025.dgn
 daguirre

GENERAL NOTES

- IT IS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL STATE AND FEDERAL SAFETY REQUIREMENTS.
- DO NOT SCALE DRAWINGS FOR DIMENSIONS NOT GIVEN.
- ALL DIMENSIONS ARE IN FEET AND INCHES.
- EXISTING DIMENSIONS AND BRIDGE CONDITION ARE FROM THE BEST INFORMATION AVAILABLE. THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS PRIOR TO COMMENCING REPAIRS OR ORDERING ANY MATERIAL. NOTIFY ENGINEER OF ANY DISCREPANCIES.
- LIMITS OF REPAIRS PROVIDED IN THESE PLANS ARE BASED ON PREVIOUS NBIS ELEMENT INSPECTIONS AND LIMITED FIELD WORK. THE EXTENT OF THE REPAIRS IS EXPECTED TO VARY DURING CONSTRUCTION.
- DUE TO TIME SINCE INSPECTION, DEFICIENCIES MAY HAVE DETERIORATED OR INCREASED IN NUMBER. NOTIFY THE ENGINEER OF SIGNIFICANT CHANGES.
- PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL, A COMPLETE SEQUENCE OF TASKS FOR EACH OPERATION AFFECTING THE BRIDGE SURFACE AND/OR VEHICLE/MARINE TRAFFIC.
- WORK ON BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL SUBMIT PLANS FOR CONSTRUCTION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS. A CONTAINMENT PLAN IS REQUIRED FOR CONCRETE REPAIRS.
- EXISTING JOINTS AND DECK DRAINS SHALL BE SEALED PRIOR TO BEGINNING REPAIR OF BRIDGE DECK.
- LONGITUDINAL CONSTRUCTION JOINTS OF OVERLAYS SHALL BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.
- CONSTRUCTION JOINTS ARE PERMITTED ONLY AT LOCATIONS SPECIFIED IN THE PLANS. ADDITIONAL CONSTRUCTION JOINTS OR ALTERATIONS TO THOSE SHOWN REQUIRE THE ENGINEER'S APPROVAL.
- ALL SURVEYING AND STAKING NECESSARY TO COMPLETE THE PROPOSED WORK IS INCIDENTAL TO ALL OTHER PAY ITEMS FOR THIS PROJECT.
- FOR TRAFFIC CONTROL REQUIREMENTS, FINAL PAVEMENT MARKINGS AND MARKERS, SEE TRANSPORTATION MANAGEMENT PLAN FOR PROJECT B-5302.
- AT THE TIME OF PREPARATION OF THESE PLANS, IT WAS NOT ANTICIPATED THAT "BRIDGE JACKING" WOULD BE REQUIRED. HOWEVER, IT MAY BE DETERMINED IN THE FIELD THAT "BRIDGE JACKING", 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.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR SECURING OF VESSELS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR MAINTENANCE OF WATER TRAFFIC, SEE SPECIAL PROVISIONS.
- FOR COORDINATION WITH THE US COAST GUARD, SEE SPECIAL PROVISIONS.
- FOR WORK IN, OVER OR ADJACENT TO NAVIGABLE WATERS, SEE SPECIAL PROVISIONS.
- FOR CONCRETE FILLED GRID DECK REPAIR FOR EPOXY OVERLAY, SEE SPECIAL PROVISIONS.
- FOR EPOXY OVERLAY SYSTEM, SEE SPECIAL PROVISIONS.
- FOR ASPHALT JOINT REPAIR/REPLACEMENT, SEE SPECIAL PROVISIONS.
- FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.
- FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.
- FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.
- FOR CONCRETE REPAIRS, SEE PLAN DETAILS AND SPECIAL PROVISIONS.
- FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.
- FOR RAIL RETROFIT, SEE SPECIAL PROVISIONS.
- FOR SIGNAL EXTENSION, SEE SPECIAL PROVISIONS.

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

SHEET 3 OF 3

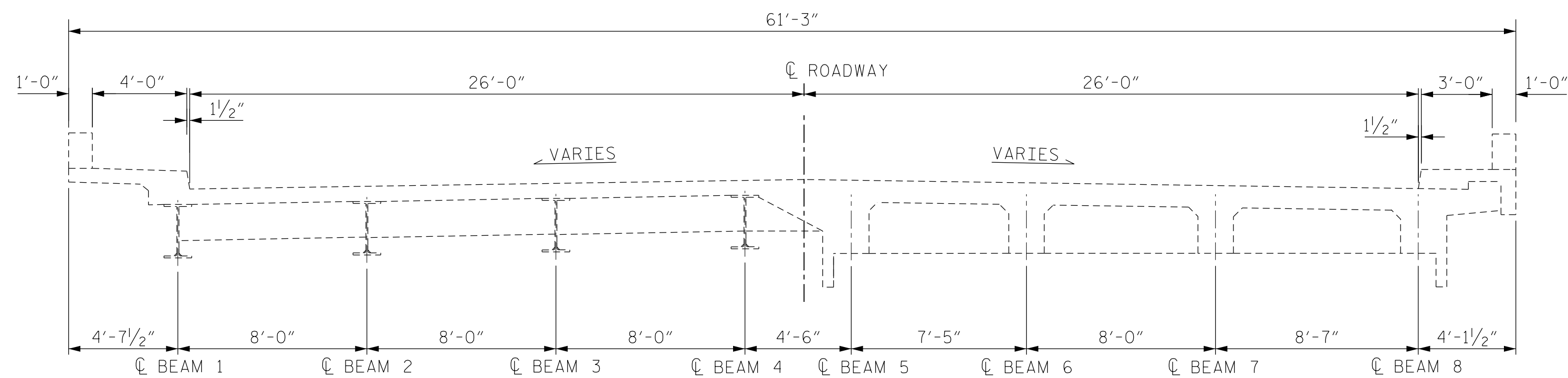


DocuSigned by:
 Jacob H. Duke
 9CD53ADC66D6400
 3/14/2019

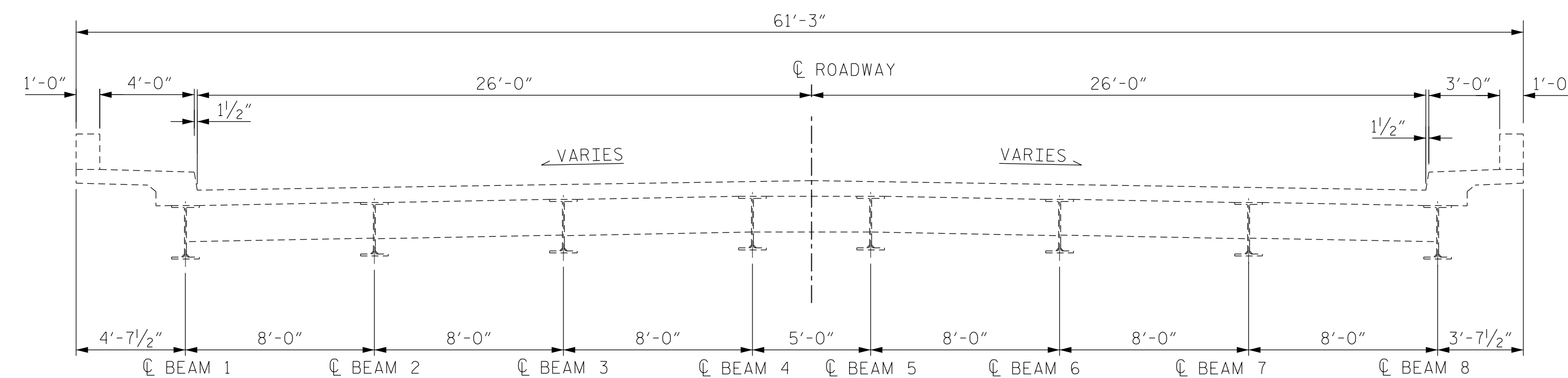
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE ON US 17 BUS.
 OVER PAMLICO RIVER

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

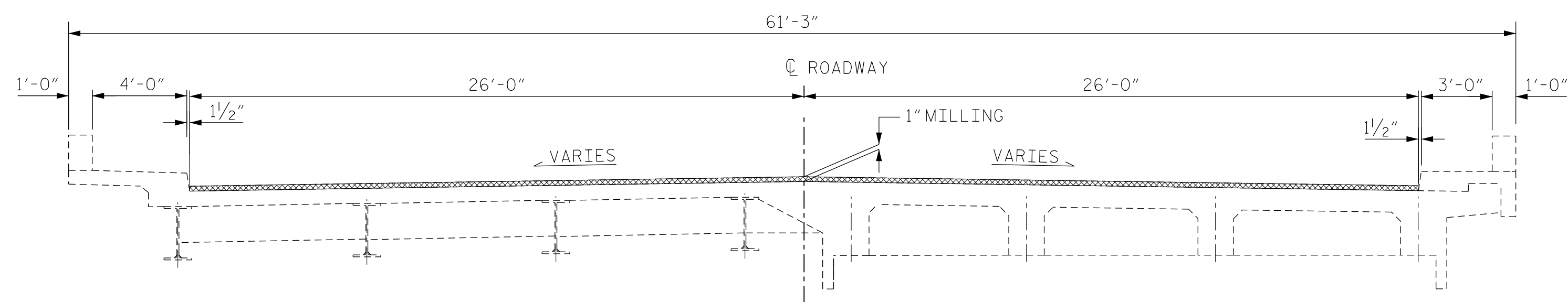
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED



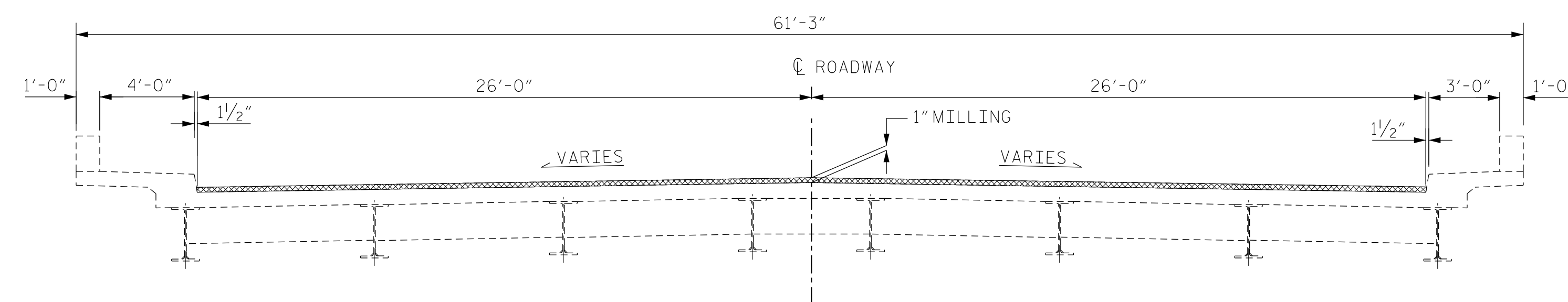
TYPICAL SECTION
SPANS 1-21 AND 27-34
(PROPOSED RAIL NOT SHOWN FOR CLARITY)



TYPICAL SECTION
SPANS 22, 23, 25, AND 26
(PROPOSED RAIL NOT SHOWN FOR CLARITY)

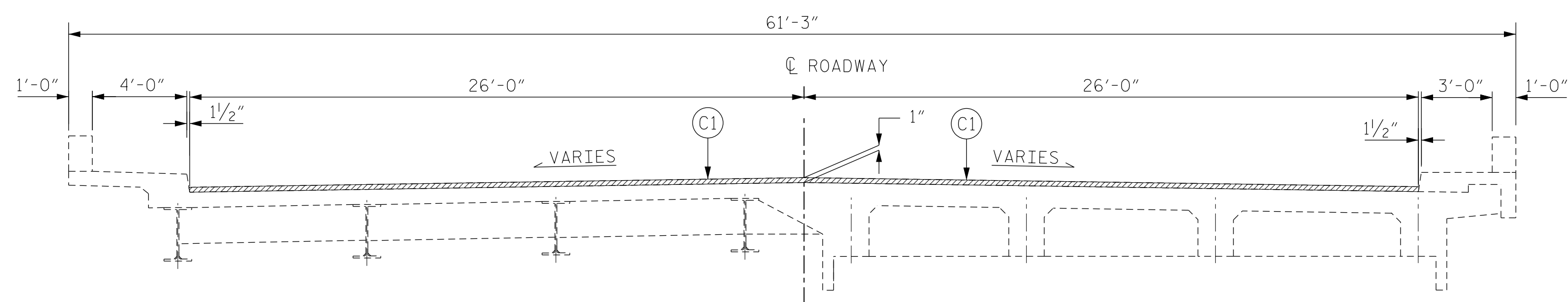


EXISTING SECTION
SPANS 1-21 AND 27-34
(PROPOSED RAIL NOT SHOWN FOR CLARITY)

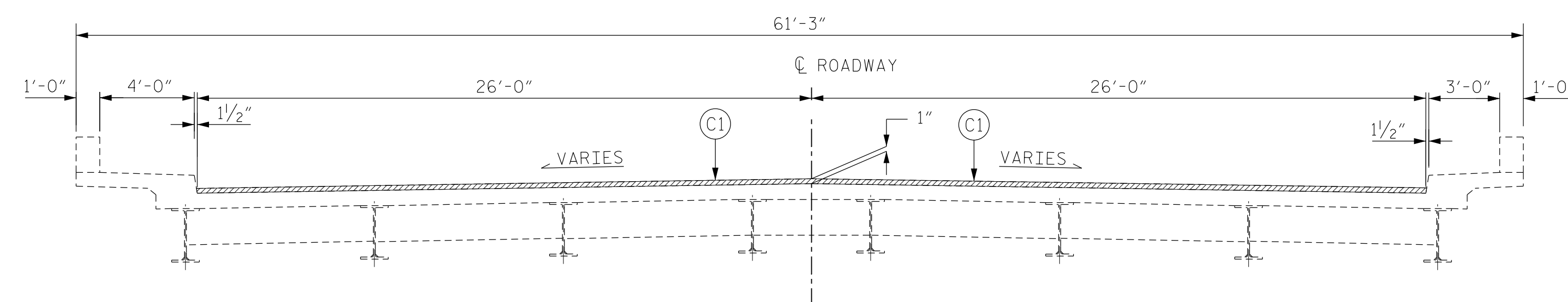


EXISTING SECTION
SPANS 22, 23, 25, AND 26
(PROPOSED RAIL NOT SHOWN FOR CLARITY)

TYPICAL ROADWAY MILLING SECTION



PROPOSED SECTION
SPANS 1-21 AND 27-34
(PROPOSED RAIL NOT SHOWN FOR CLARITY)



PROPOSED SECTION
SPANS 22, 23, 25, AND 26
(PROPOSED RAIL NOT SHOWN FOR CLARITY)

TYPICAL ROADWAY SECTION

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

NOTES

- INCIDENTAL MILLING - EXISTING APPROACH ASPHALT PAVEMENT TO BE MILLED AS NECESSARY TO ATTAIN MINIMUM 1" DEPTH OF NEW ASPHALT PAVEMENT. NEW ASPHALT PAVEMENT SHALL BE OF THICKNESS NECESSARY TO PROVIDE A SMOOTH TRANSITION BETWEEN THE ROADWAY AND THE BRIDGE DECK. THE NEW ASPHALT PAVEMENT THICKNESS MAY EXCEED 1" DUE TO SETTLEMENT OF THE EXISTING APPROACH.
- FOR NEW ASPHALT PLACEMENT, SEE STANDARD SPECIFICATIONS.
- WORK THIS SHEET WITH "SURFACE DECK REPAIR - APPROACH SPAN" SHEET.
- LONGITUDINAL CONSTRUCTION JOINTS OF OVERLAYS SHALL BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.
- FOR PROPOSED RAIL RETROFIT DETAILS, SEE "RAIL RETROFIT" SHEETS.

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

- INCIDENTAL MILLING
- ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B



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

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

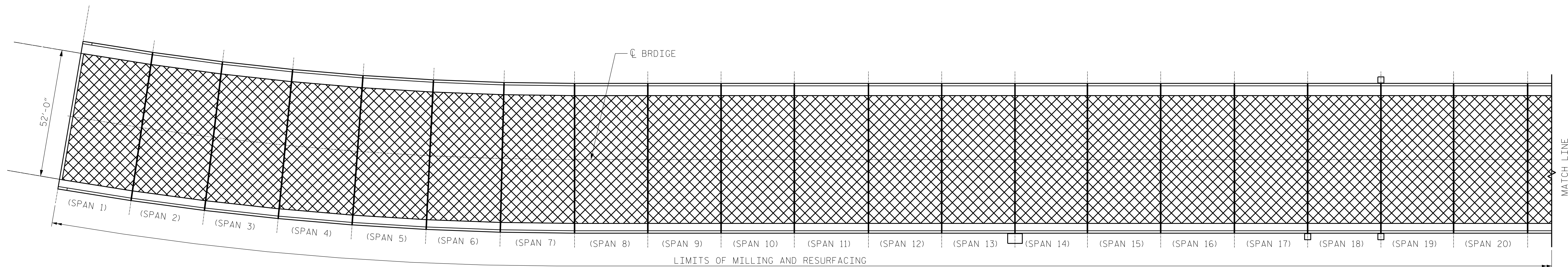
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION
MILLING & RESURFACING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			57

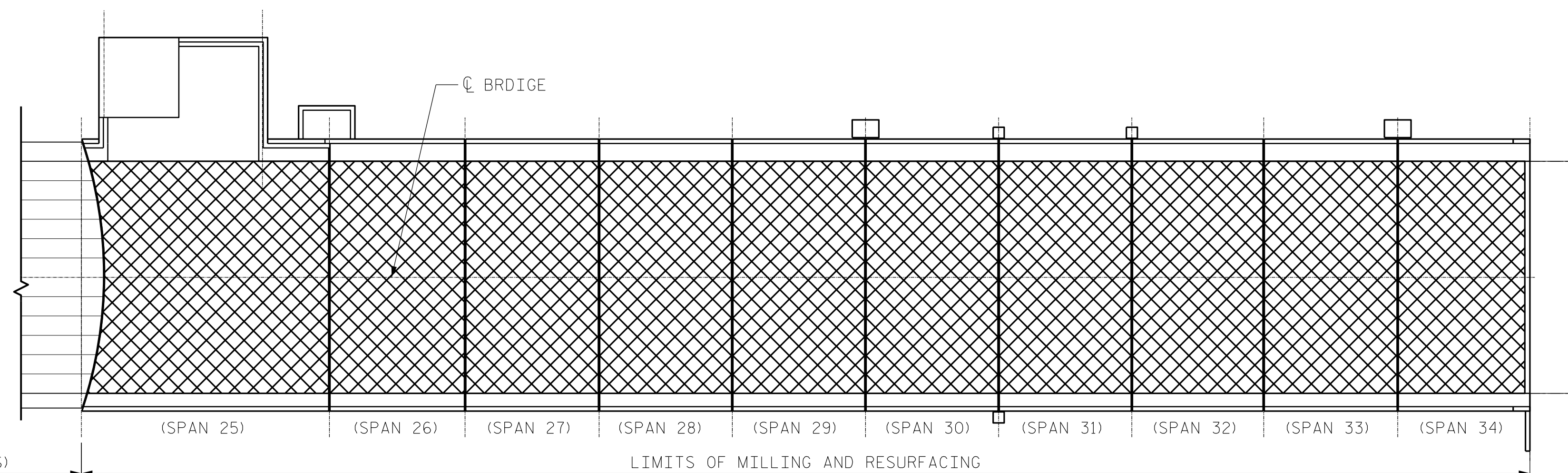
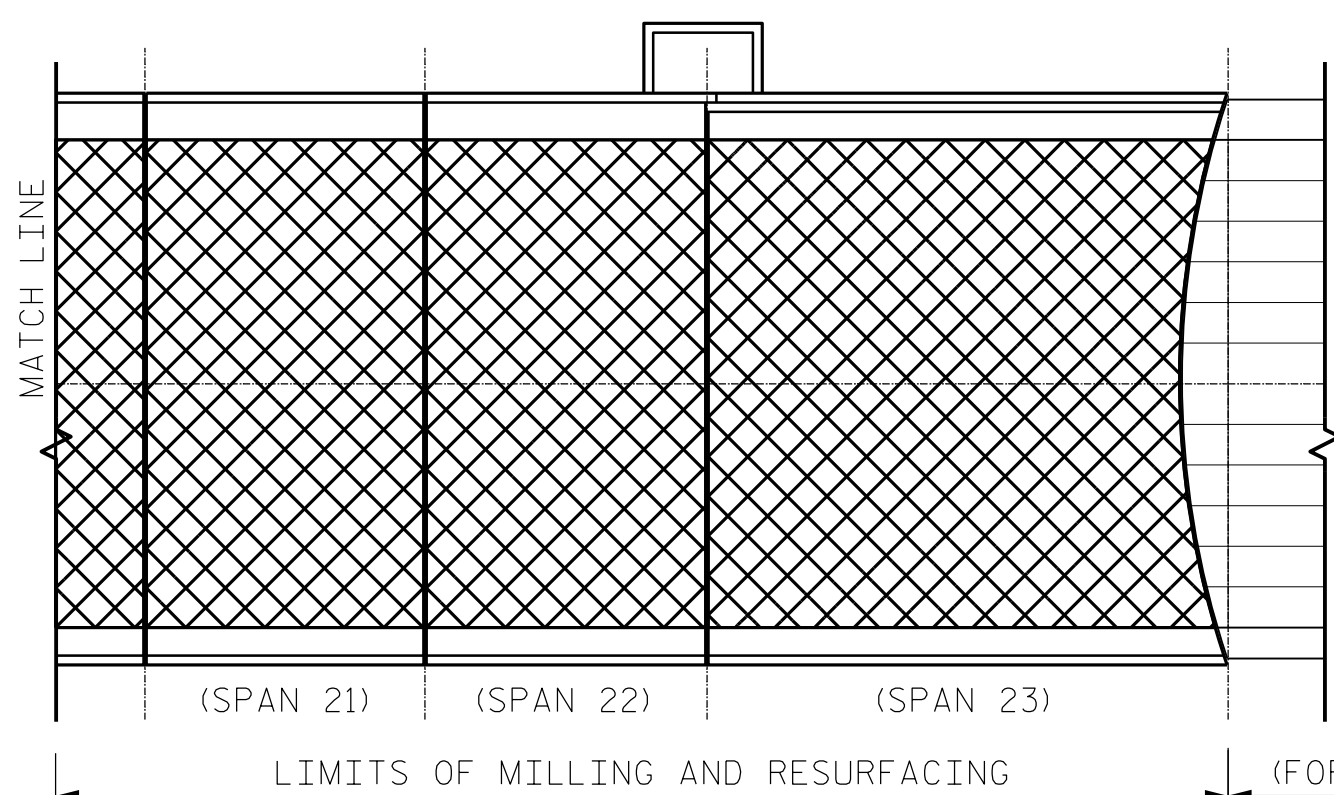
KCA 301 FAYETTEVILLE ST., SUITE 1500
KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601
(919) 882-7839
LICENSE #: C-1506

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



PLAN
(SPANS 1-20)

 INCIDENTAL MILLING



PLAN
(SPANS 21-34)

NOTES

1. WORK THIS SHEET WITH "JOINT DETAILS" SHEET
2. WORK THIS SHEET WITH "TYPICAL SECTION - MILLING AND RESURFACING SHEET"
3. QUANTITIES SHOWN IN THE AS-BUILT TABLE IS THE TOTAL QUANTITIES FOR SPANS 1 THROUGH 23 AND 25 THROUGH 34.
4. WORK THIS SHEET WITH "DECK SURFACE REPAIR - SWING SPAN" SHEET.
5. ESTIMATED QUANTITIES IN THE AS-BUILT TABLE ARE TOTAL QUANTITIES FOR ALL SPANS.

AS-BUILT QUANTITY TABLE
SPANS 1 THRU 23 AND 25 THRU 34

	ESTIMATE	ACTUAL
INCIDENTAL MILLING	6326 S.Y.	
ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B	348.3 TON	
ASPHALT BINDER FOR PLAN MIXER	21.0 TON	

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

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

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

3/14/2019
 15BPR.42_SMU.DSR01.060025.dgn
 daguirre



DocuSigned by:
Jacob H. Duke
 9CDB3ADCC6ED6400
 3/14/2019

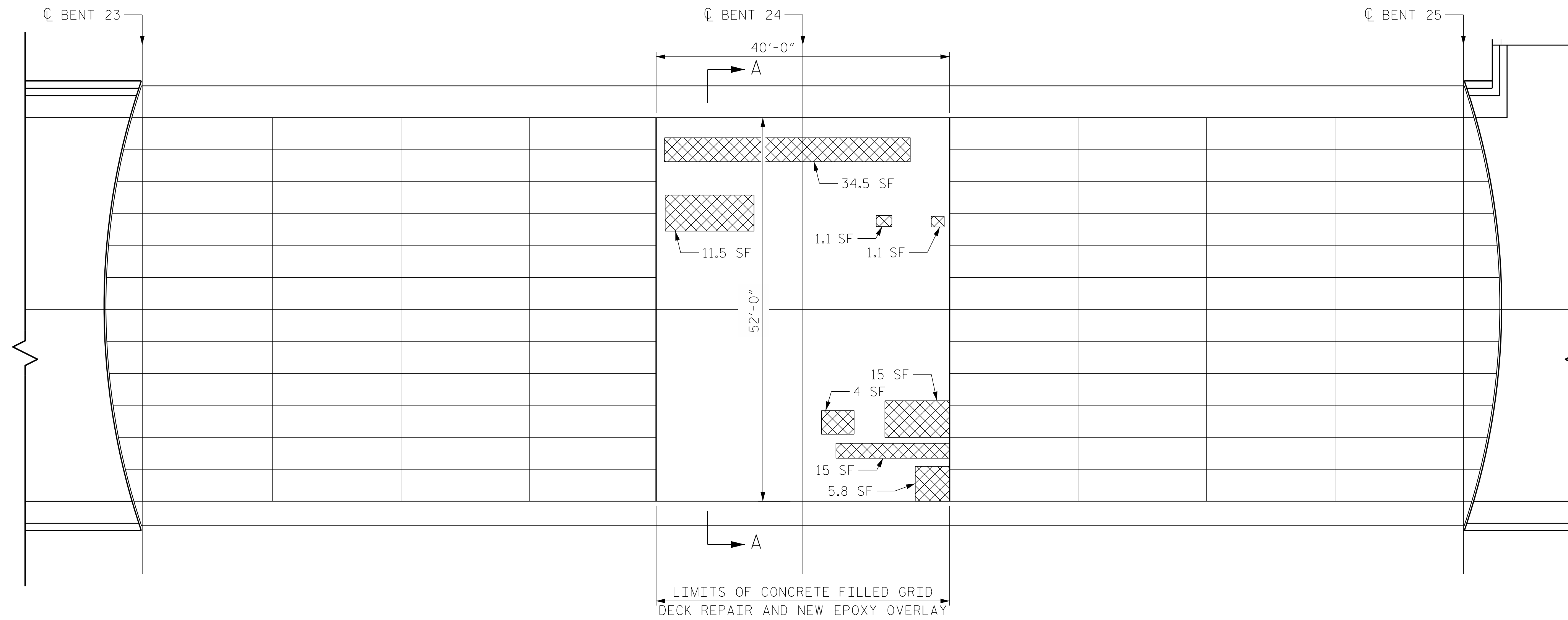
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
DECK SURFACE REPAIR
 APPROACH SPANS

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

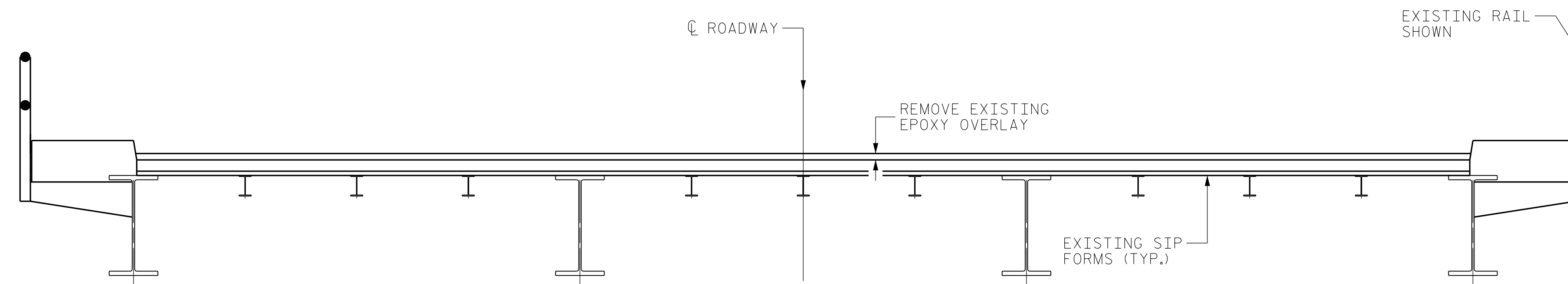
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-6
2			4			TOTAL SHEETS 57

CONCRETE FILLED GRID DECK REPAIR AND NEW EPOXY OVERLAY

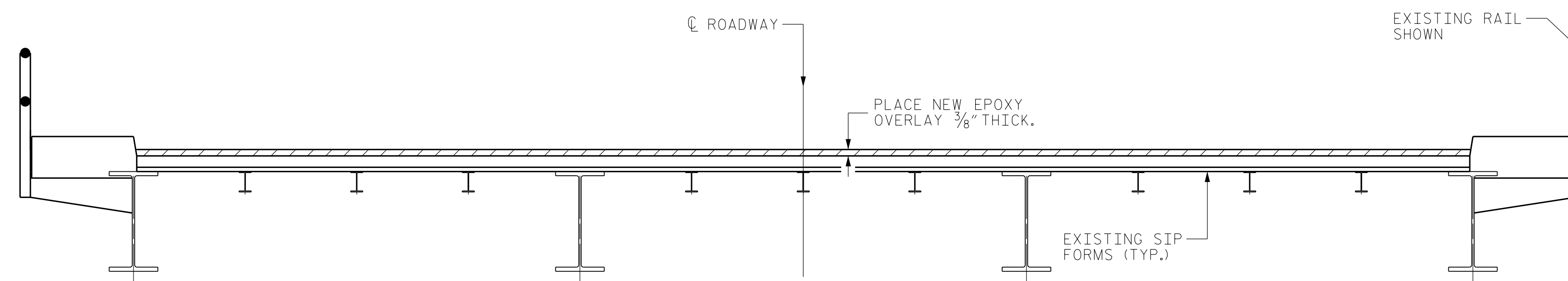
1. REMOVE THE EXISTING EPOXY OVERLAY FROM THE BRIDGE DECK TO A DEPTH NO LESS THAN 3/8".
2. PRIOR TO SURFACE PREPARATION, REMOVE ALL LOOSE, DISINTEGRATED, UNSOUND OR CONTAMINATED CONCRETE FROM THE BRIDGE DECK.
3. PERFORM CLASS II SURFACE PREPARATION (PARTIAL DEPTH).
4. REPAIR SPALLED AREAS AND CURE IN ACCORDANCE WITH THE MANUFACTURE'S RECOMMENDATIONS OF THE REPAIR MATERIAL.
5. FOR FURTHER DETAILS OF CONCRETE FILLED GRID DECK REPAIR, SEE SPECIAL PROVISIONS.
6. UPON COMPLETION OF THE DECK REPAIRS, CLEAN THE ENTIRE DECK SURFACE BY STEEL SHOTBLASTING.
7. PERFORM BOND TESTING OF THE EPOXY OVERLAY MATERIAL.
8. APPLY NEW EPOXY OVERLAY WITH A MINIMUM THICKNESS OF 3/8".
9. FOR FURTHER DETAILS OF THE EPOXY OVERLAY SYSTEM, SEE SPECIAL PROVISIONS.
10. CLASS II, SURFACE PREPARATION IS INCIDENTAL TO THE PAY ITEM FOR "CONCRETE FILLED GRID DECK REPAIR FOR EPOXY OVERLAY"
11. SHOTBLASTING BRIDGE DECK IS INCIDENTAL TO THE PAY ITEM FOR "EPOXY OVERLAY SYSTEM"



PLAN



SECTION A-A
EXISTING SECTION



SECTION A-A
PROPOSED SECTION

AS-BUILT QUANTITY TABLE (SPAN 24)		
	ESTIMATE	ACTUAL
CONCRETE FILLED GRID DECK REPAIR FOR EPOXY OVERLAY	88 SF	
CLASS II, SURFACE PREPARATION (INCIDENTAL)	10 SY	
EPOXY OVERLAY SYSTEM	2184 SF	
SHOTBLASTING BRIDGE DECK (INCIDENTAL)	232 SY	

 CONCRETE FILLED GRID DECK REPAIR FOR EPOXY OVERLAY

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



DocuSigned by:
 Jacob H. Duke
 0025A0C0606400
 4/2/2019

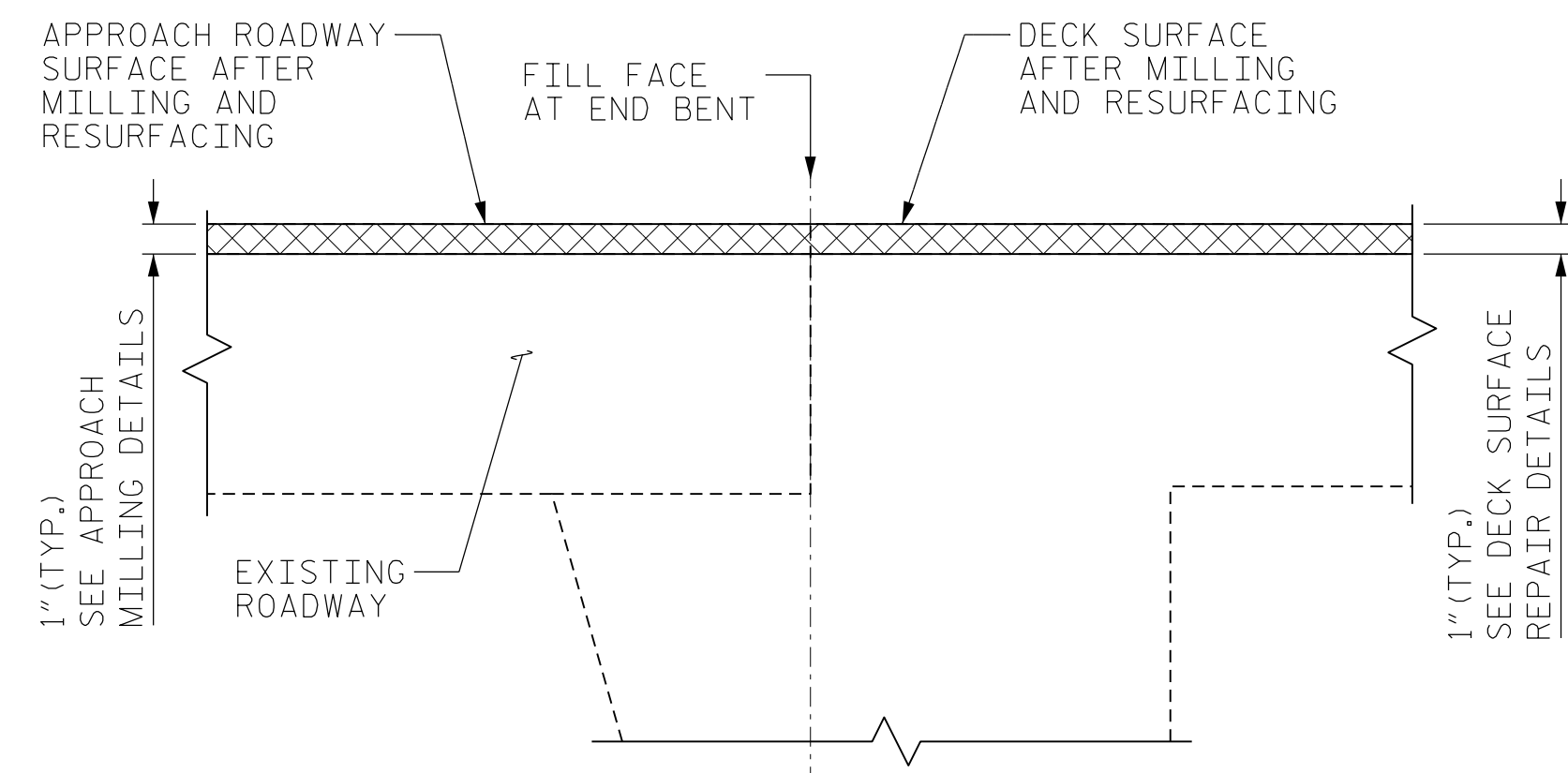
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
DECK SURFACE REPAIR
 SWING SPAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-7
2			4			TOTAL SHEETS 57

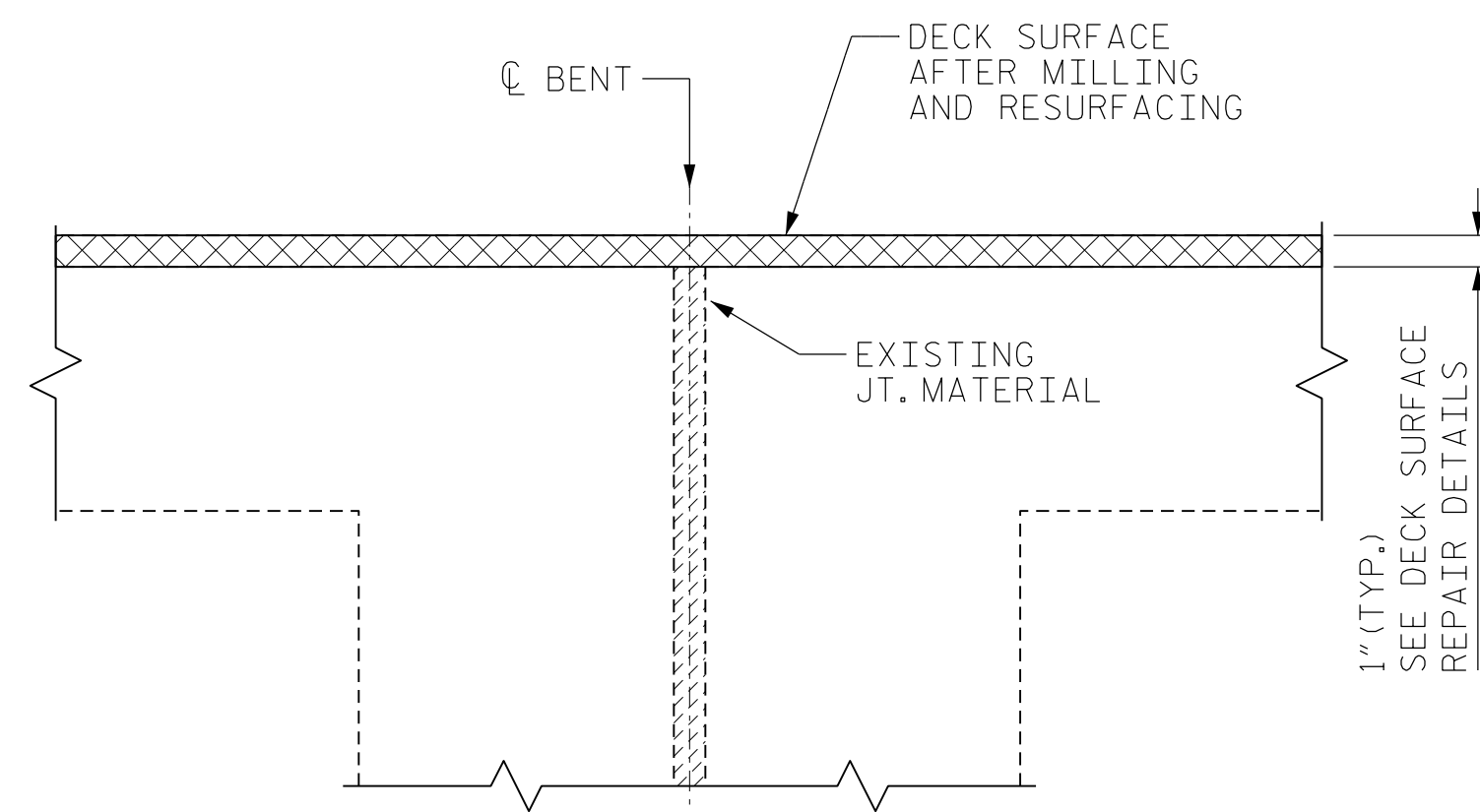
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

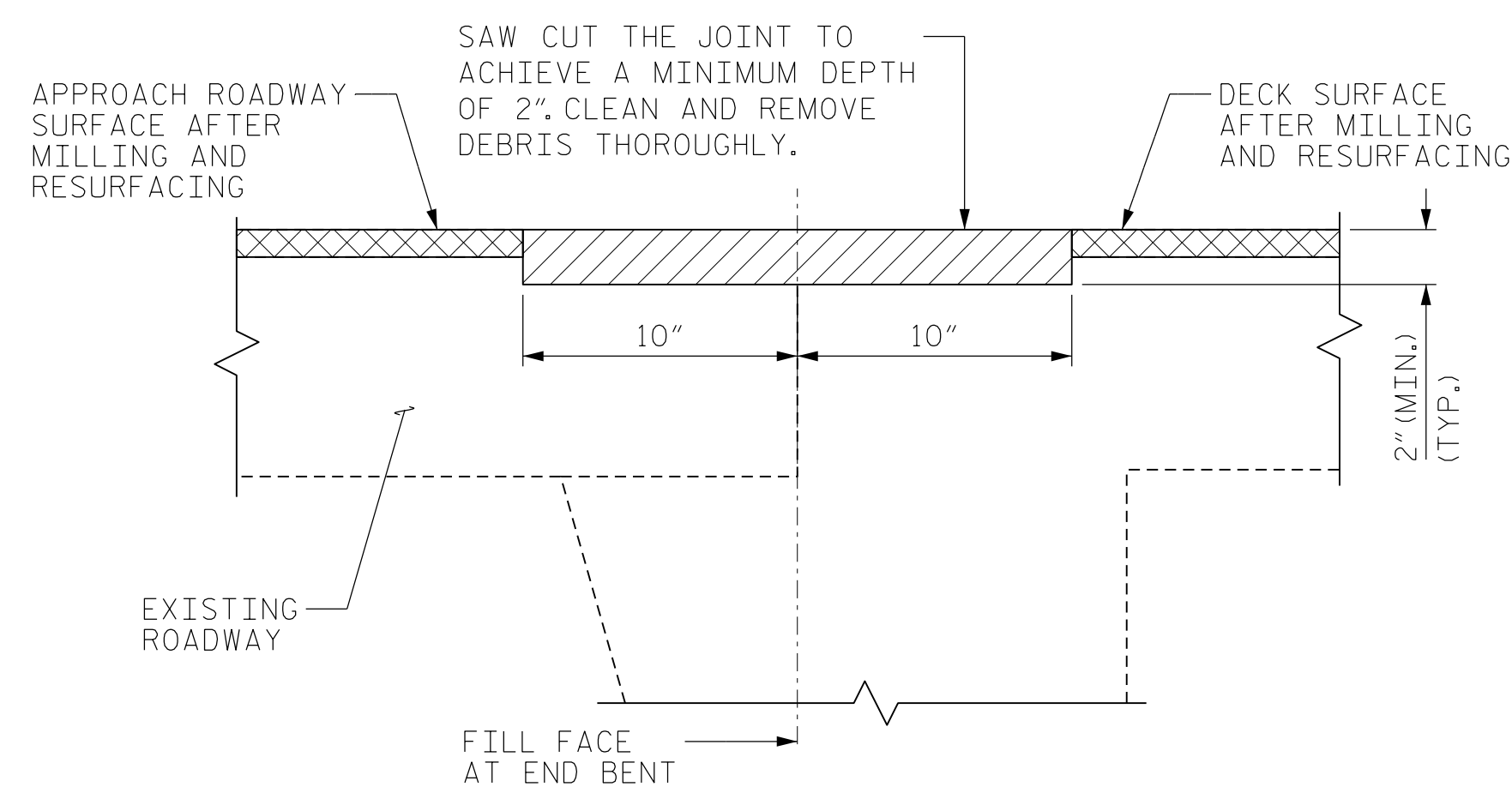
DRAWN BY : OMAR M. KHALAFALLA DATE : 2/5/2019
 CHECKED BY : DIEGO A. AGUIRRE DATE : 2/5/2019
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019



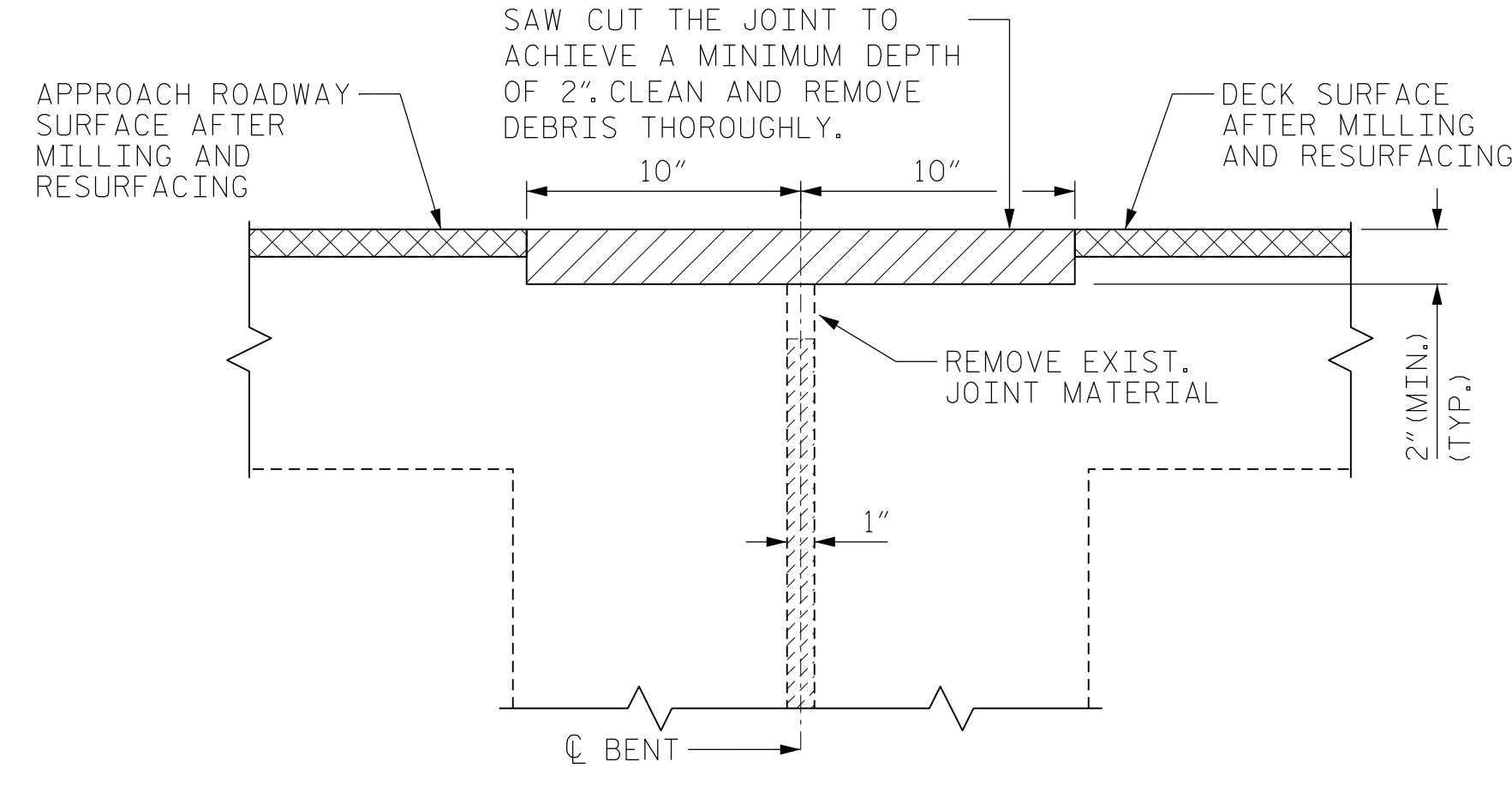
EXISTING
(AFTER MILLING AND RESURFACING)



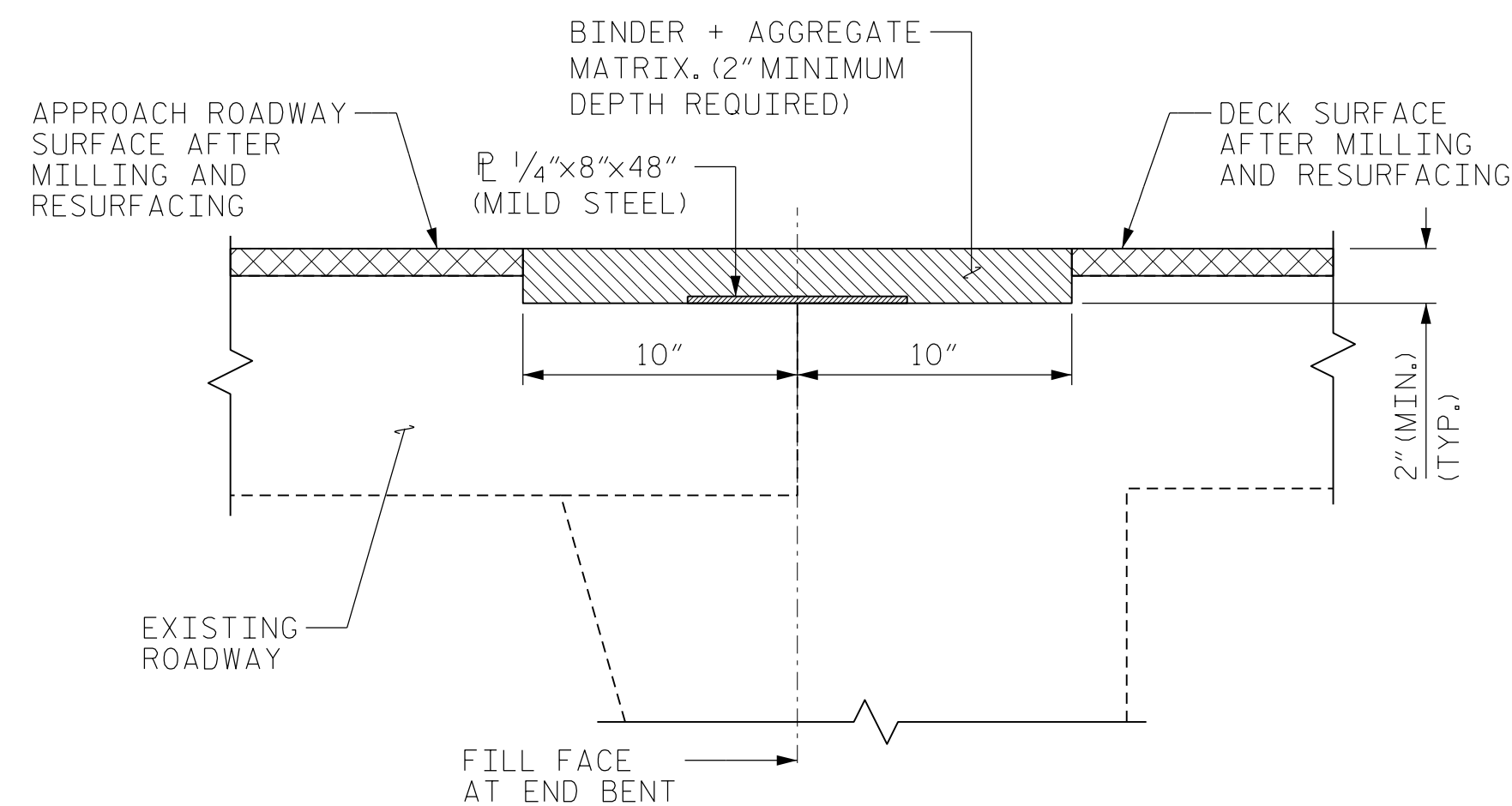
EXISTING
(AFTER MILLING AND RESURFACING)



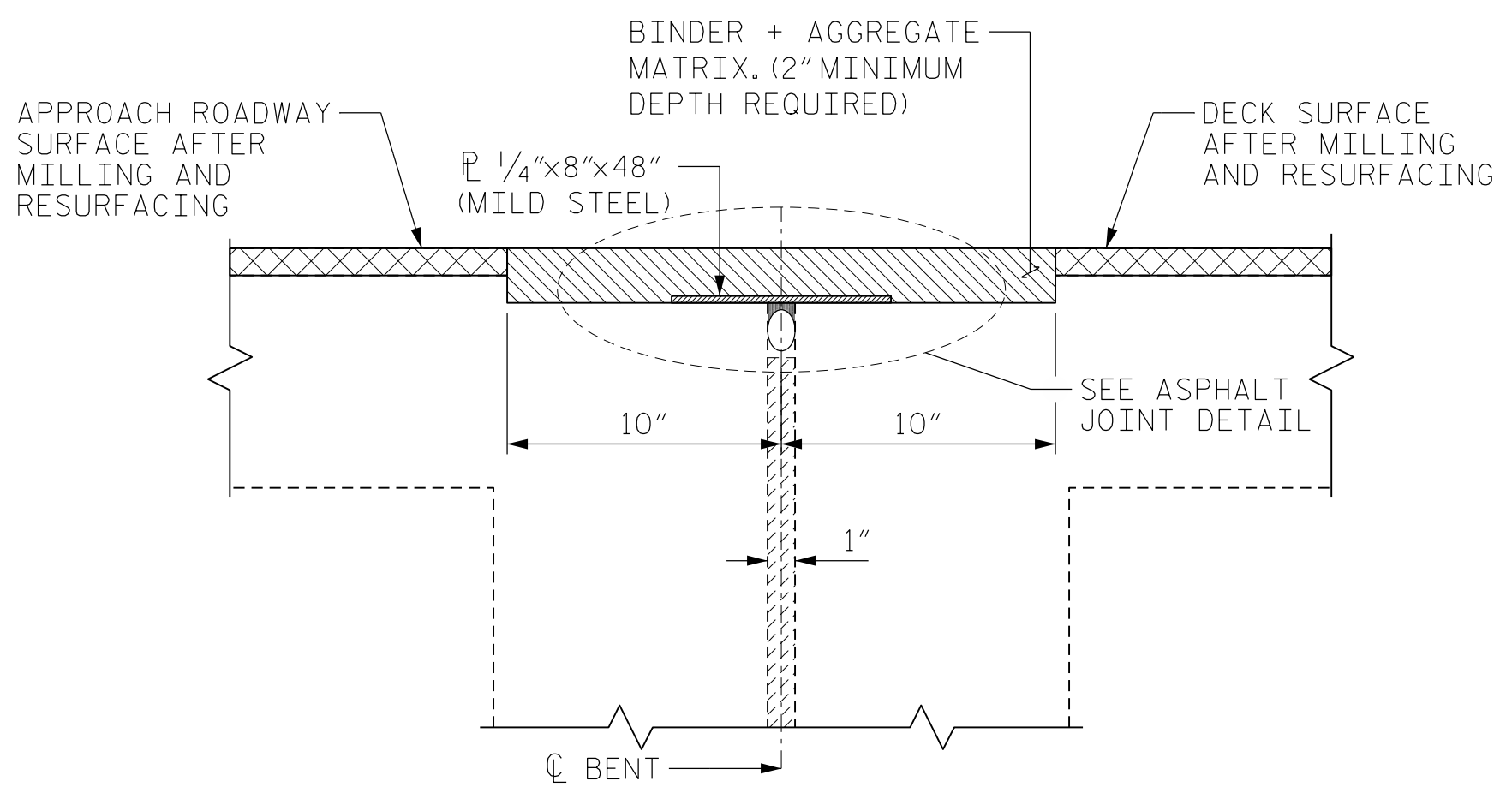
JOINT EXCAVATION
(JOINT MUST BE INSTALLED AT A MINIMUM DEPTH OF 2")



JOINT EXCAVATION
(JOINT MUST BE INSTALLED AT A MINIMUM DEPTH OF 2")



PROPOSED ASPHALT JOINT
(JOINT MINIMUM WIDTH MUST BE AT LEAST 20")



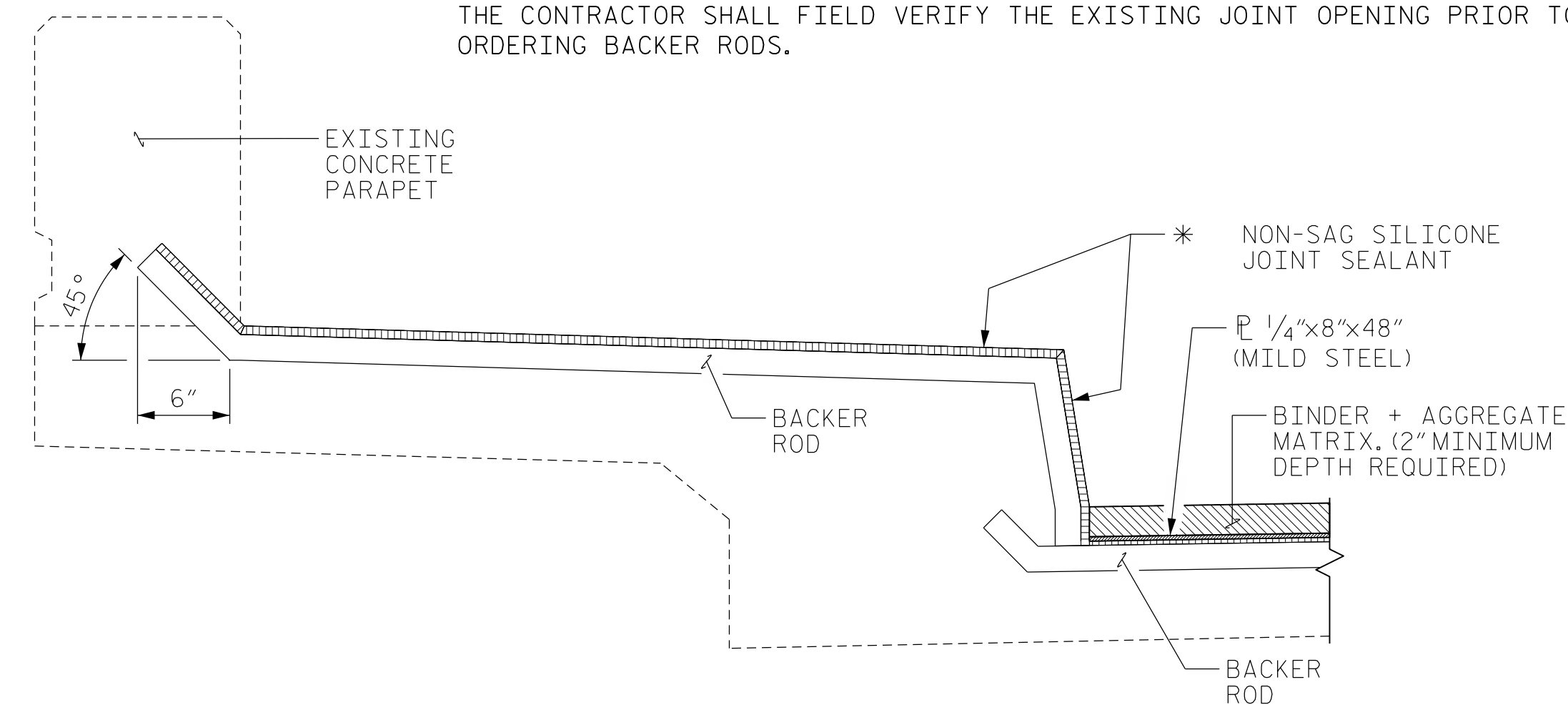
PROPOSED ASPHALT JOINT
(JOINT MINIMUM WIDTH MUST BE AT LEAST 20")

TYPICAL JOINT AT END BENTS

TYPICAL JOINT AT INTERMEDIATE BENTS

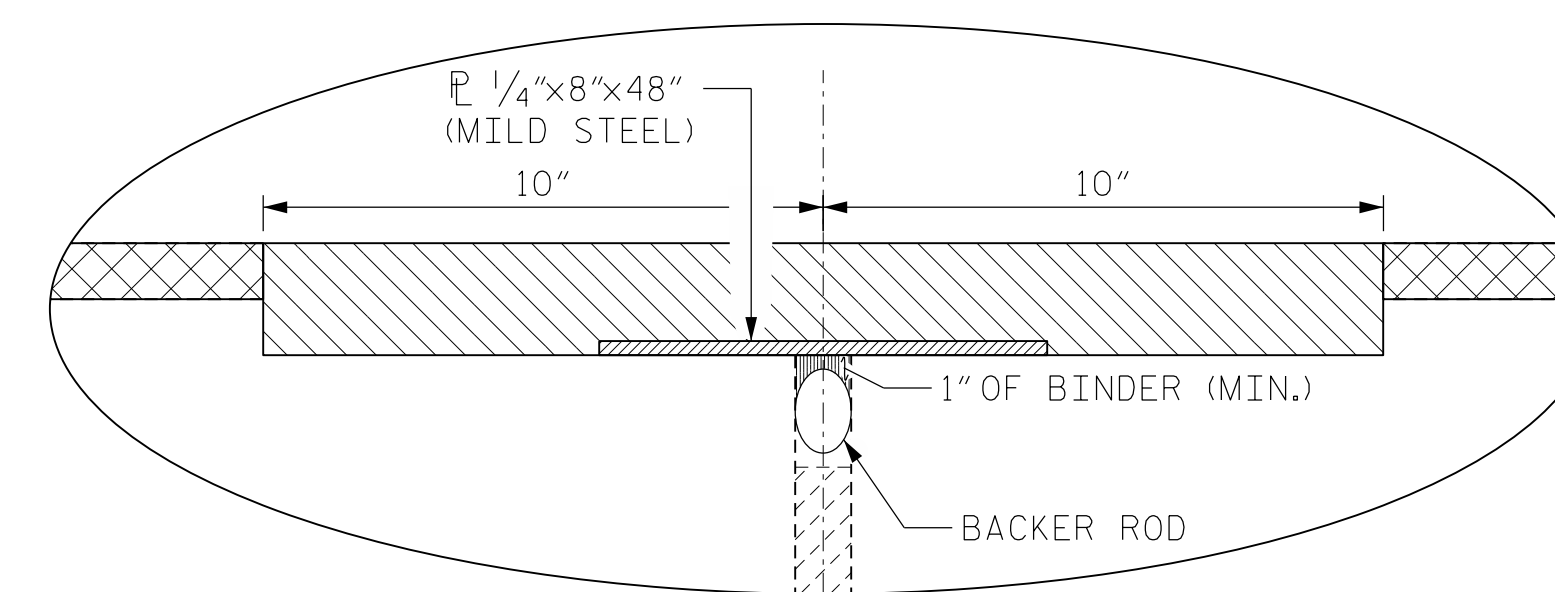
NOTES:

- PRIOR TO ASPHALT JOINT REPAIR/REPLACEMENT, PERFORM DECK SURFACE REPAIR IN ACCORDANCE WITH SHEETS S-5 AND S-6.
- FOR ASPHALT JOINT REPAIR/REPLACEMENT, SEE SPECIAL PROVISIONS.
- FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.
- SILICONE JOINT SEALANT AND BACKER ROD SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.
- THE CONTRACTOR SHALL FIELD VERIFY THE EXISTING JOINT OPENING PRIOR TO ORDERING BACKER RODS.



TYPICAL JOINT AT SIDEWALKS

- * NON-SAG SILICONE JOINT SEALANT TO BE PLACED AND ALLOWED TO SET, PRIOR TO PLACEMENT OF SELF-LEVELING SILICONE JOINT SEALANT.



ASPHALT JOINT DETAIL

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

JOINT DETAILS

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

3/14/2019
 15BPR.42_SMU.JT_060025.dgn
 daguirre

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			57

AS-BUILT QUANTITY TABLE

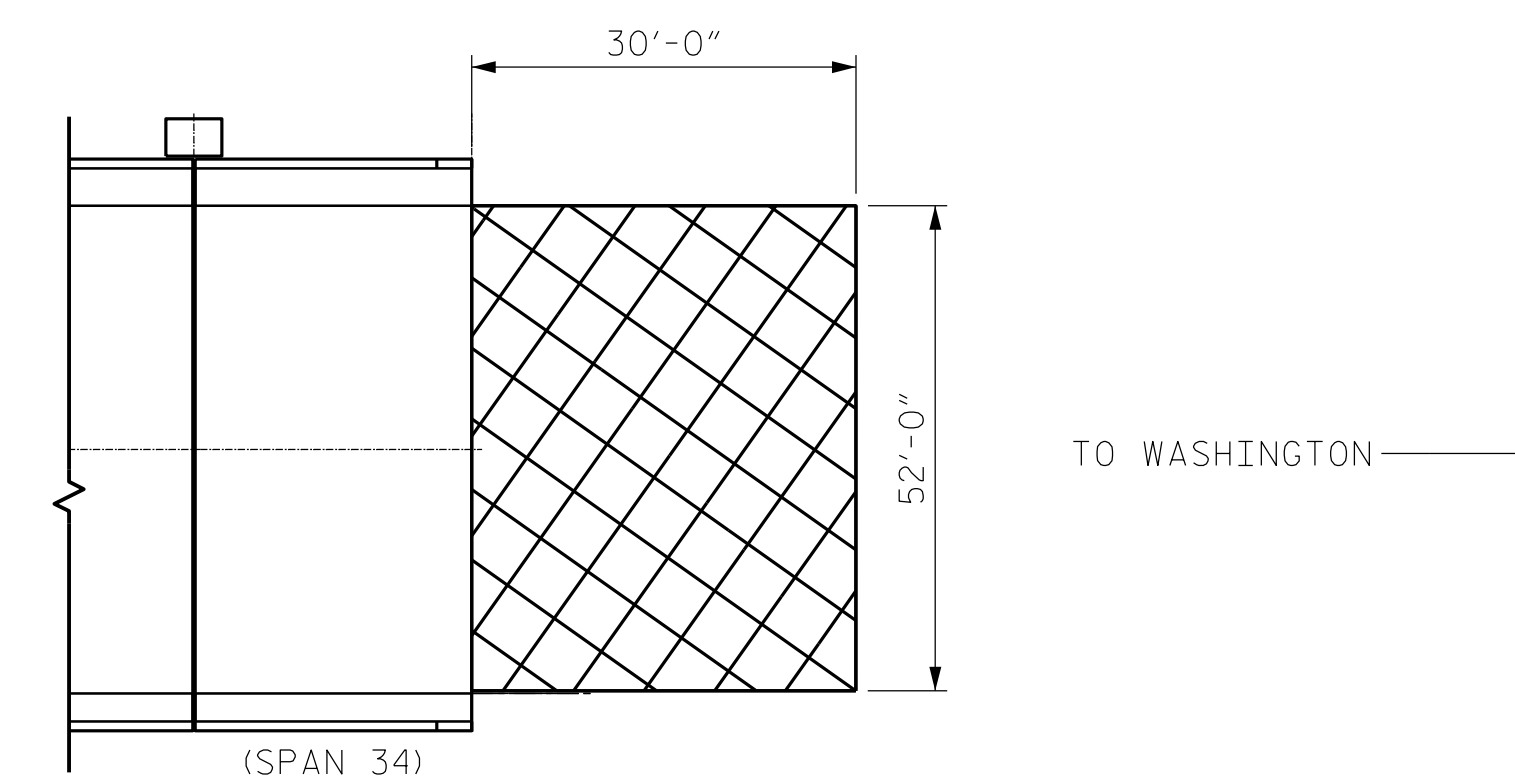
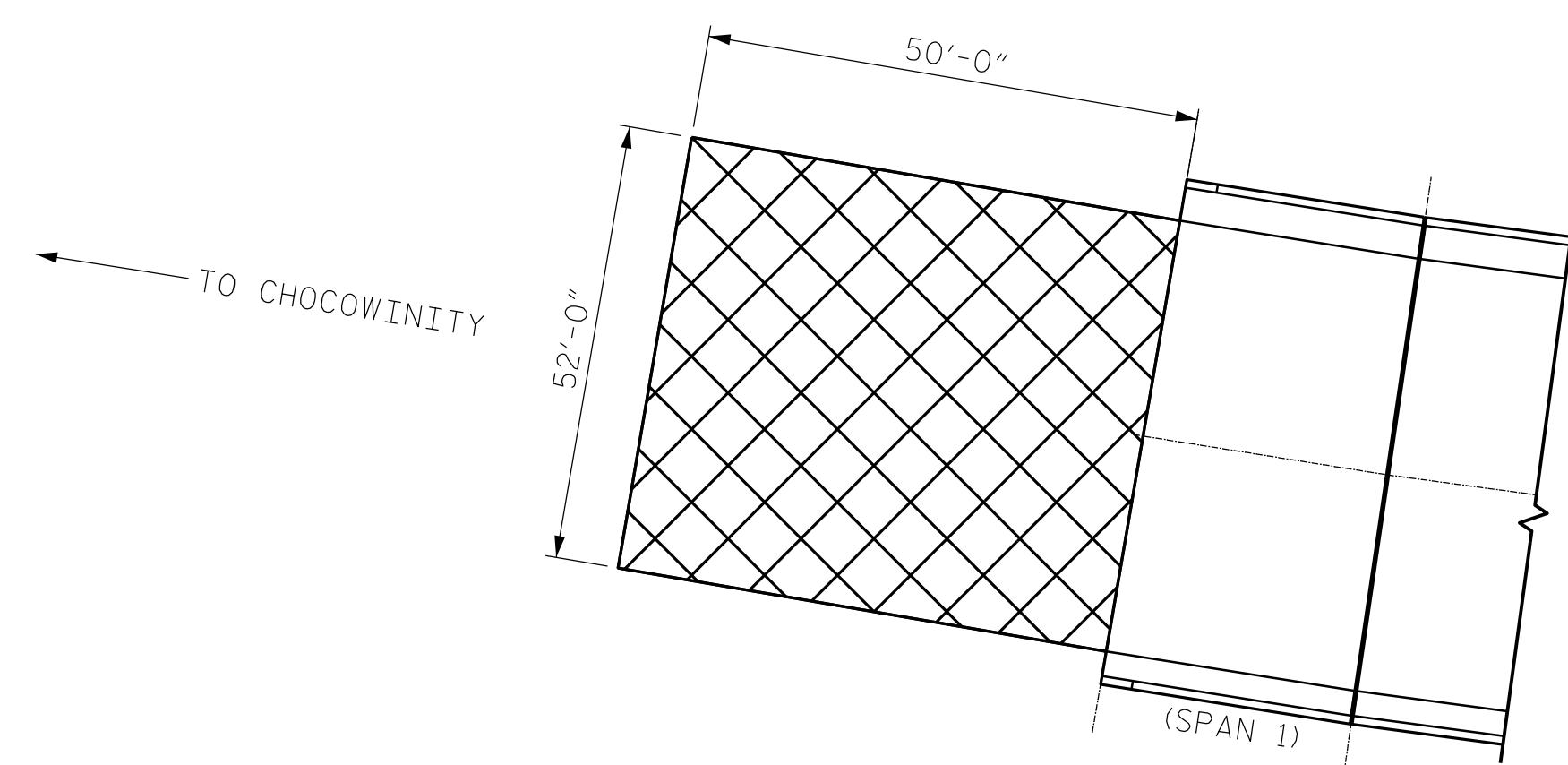
	ESTIMATE	ACTUAL
INCIDENTAL MILLING	485 S.Y.	
ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B	26.7 TON	
ASPHALT BINDER FOR PLAN MIXER	1.6 TON	

NOTES

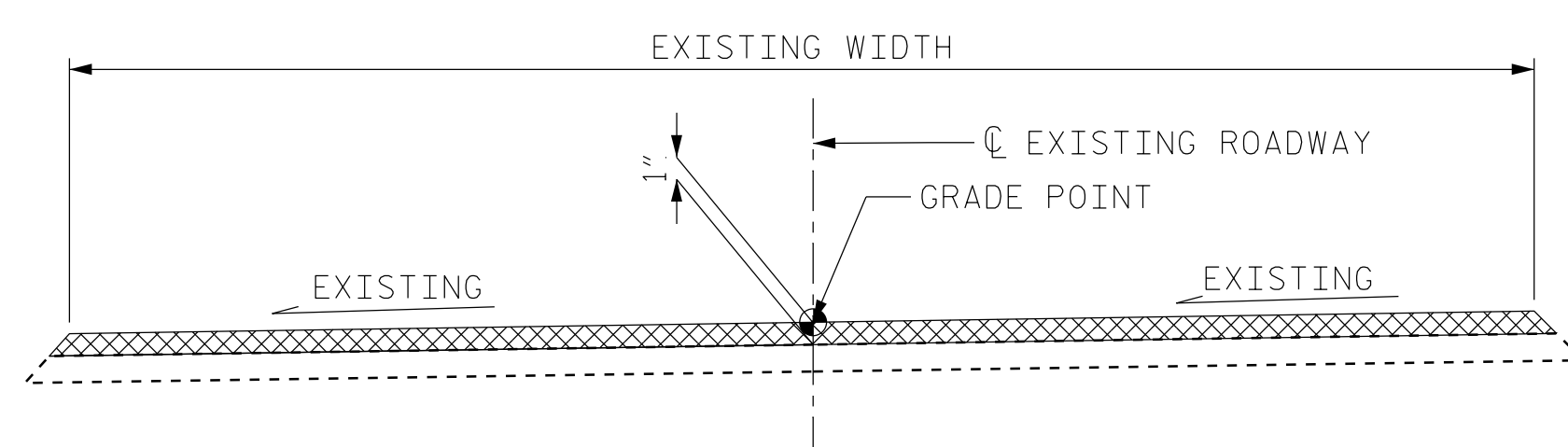
- INCIDENTAL MILLING - EXISTING APPROACH ASPHALT PAVEMENT TO BE MILLED AS NECESSARY TO ATTAIN MINIMUM 1" DEPTH OF NEW ASPHALT PAVEMENT. NEW ASPHALT PAVEMENT SHALL BE OF THICKNESS NECESSARY TO PROVIDE A SMOOTH TRANSITION BETWEEN THE ROADWAY AND THE BRIDGE DECK. THE NEW ASPHALT PAVEMENT THICKNESS MAY EXCEED 1" DUE TO SETTLEMENT OF THE EXISTING APPROACH.
- FOR NEW ASPHALT PLACEMENT, SEE STANDARD SPECIFICATIONS.

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

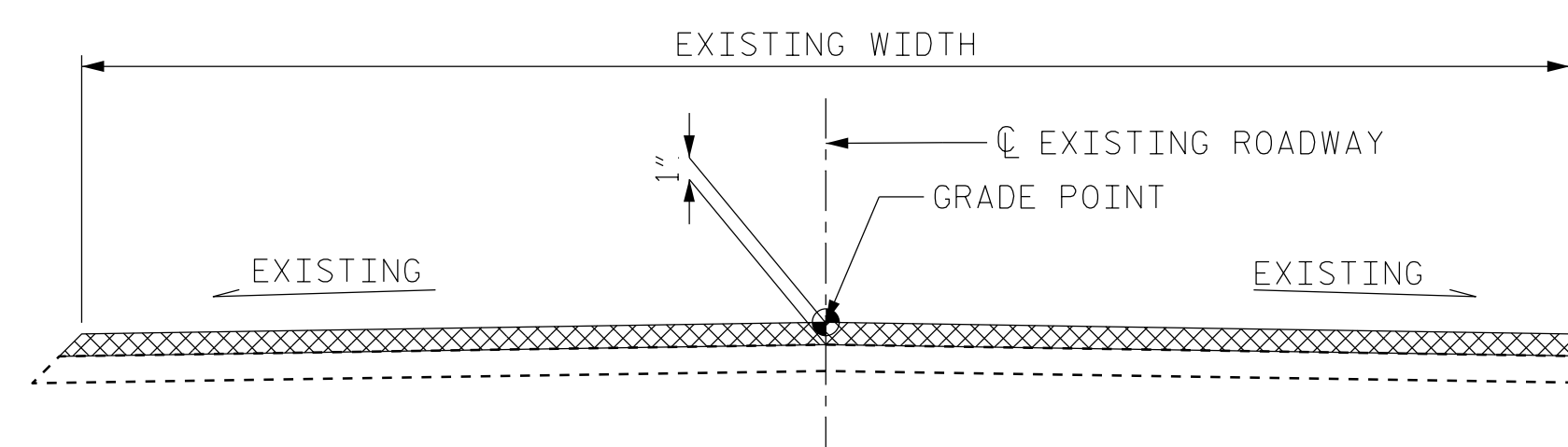
-  INCIDENTAL MILLING
-  ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B



PLAN

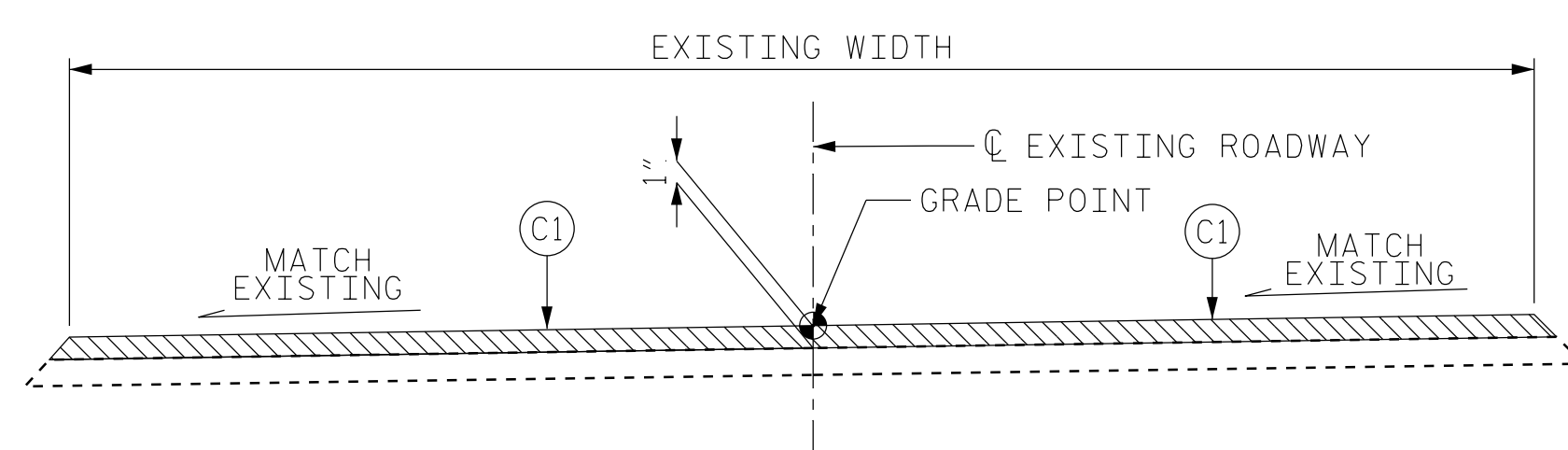


EXISTING SECTION
BEGIN BRIDGE

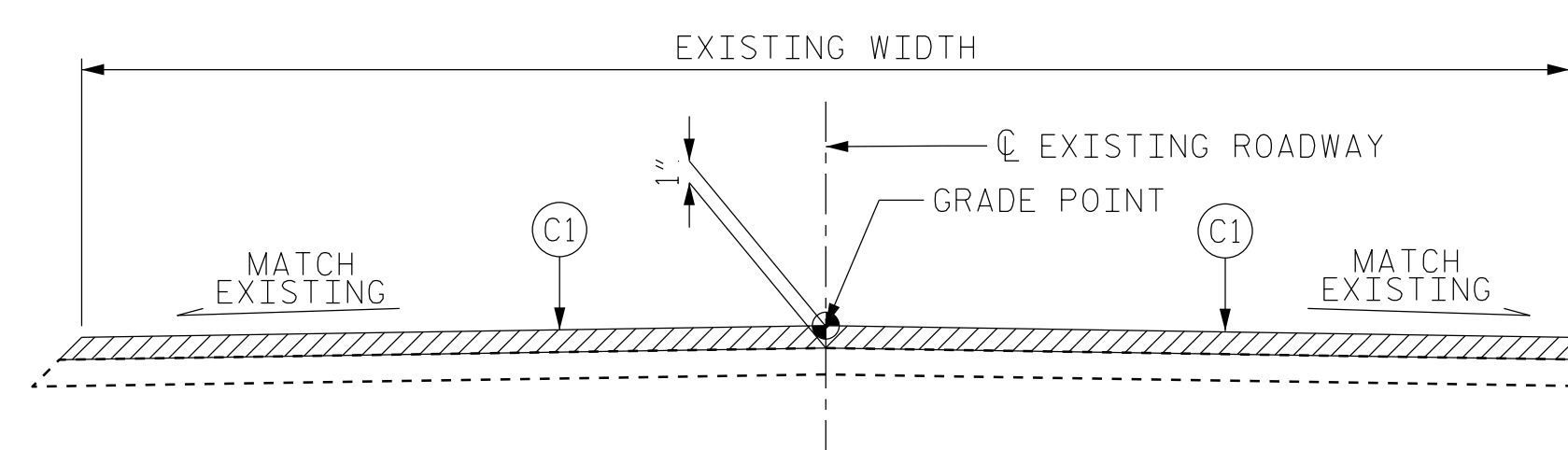


EXISTING SECTION
END BRIDGE

TYPICAL ROADWAY MILLING SECTION



PROPOSED SECTION
BEGIN BRIDGE



PROPOSED SECTION
END BRIDGE

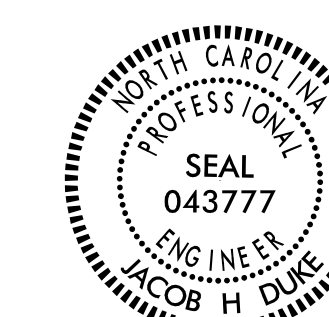
TYPICAL ROADWAY SECTION

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

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

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

3/14/2019
 15BPR.42_SMU.AR_060025.dgn
 daguirre



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

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**APPROACH ROADWAY
 MILLING & RESURFACING**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			57

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

NOTES

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL.

MATERIAL FOR WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

GENERAL NOTES

FOR 2-BAR METAL RAIL, SEE SPECIAL PROVISIONS FOR RAIL RETROFIT.

COORDINATE THIS SHEET WITH OTHER SHEETS FOR RAIL RETROFIT IN THE APPROACH SPANS.

COORDINATE THIS SHEET WITH SHEETS FOR RAIL RETROFIT IN THE SWING SPAN.

RAILING SHALL BE CONTINUOUS FROM END POST TO SWING SPAN EXCEPT WHERE SPECIFIED WITHIN THESE PLANS. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

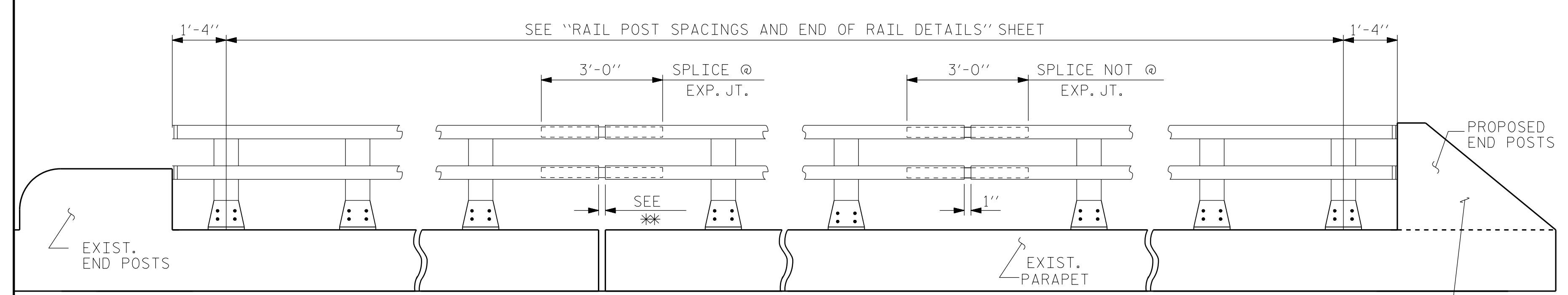
METHOD OF MEASUREMENT FOR METAL RAILS: LINEAR FEET, SEE SPECIAL PROVISIONS FOR RAIL RETROFIT.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO ENSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

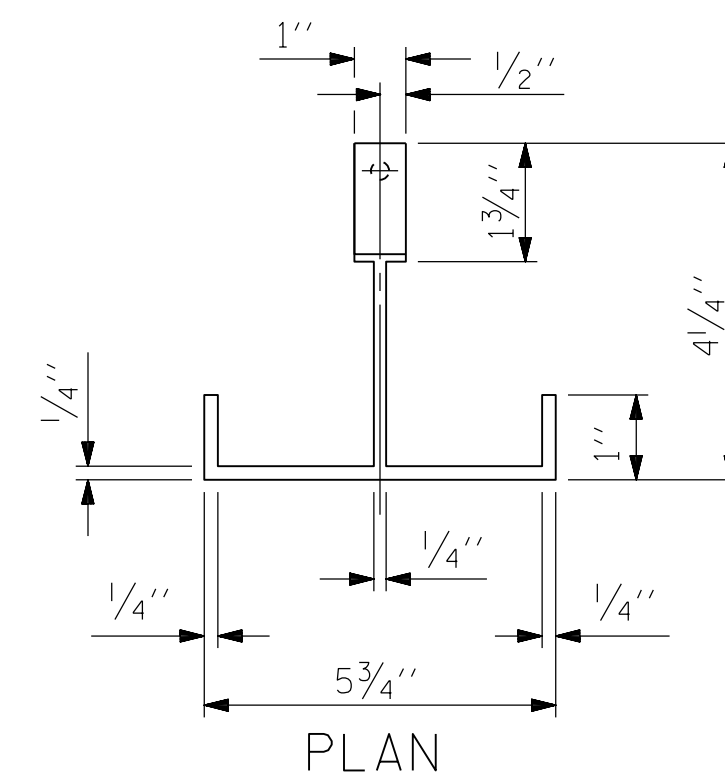
MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.



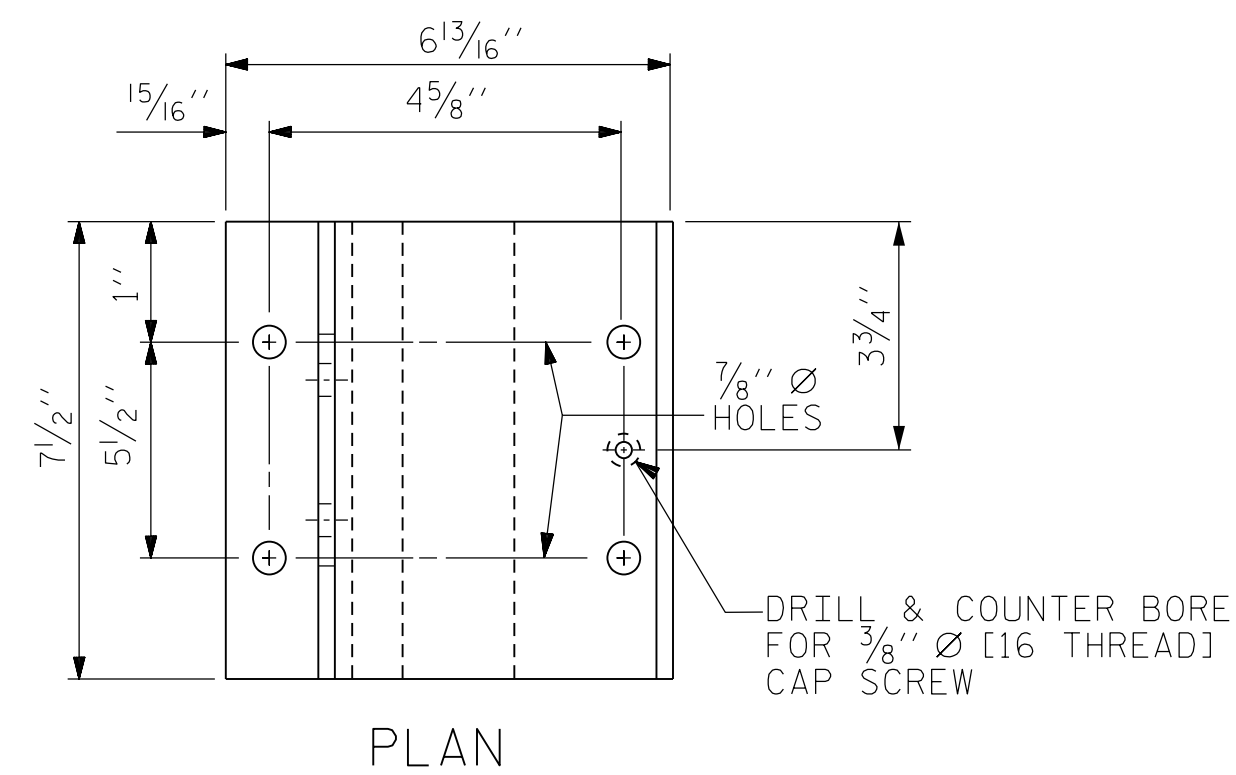
ELEVATION

NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET 3 OF 4.
 ** - MATCH EXISTING JOINT OPENINGS

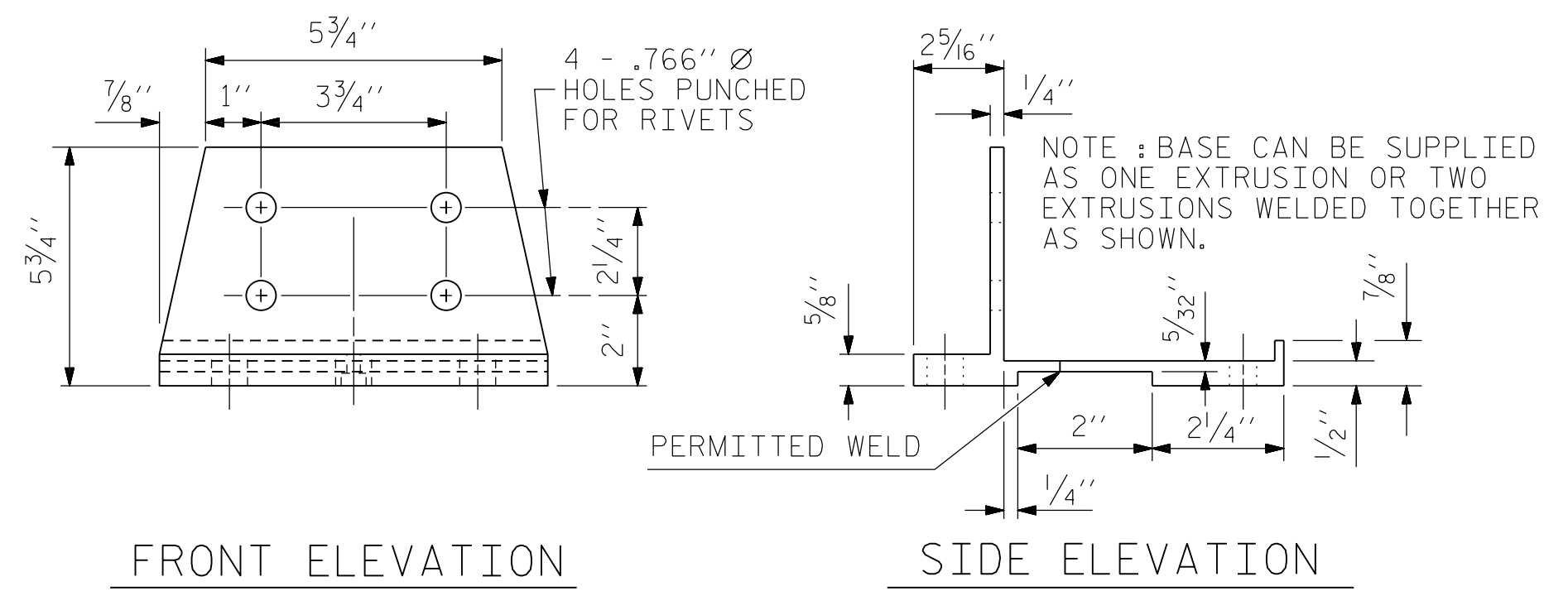
FOR PROPOSED PARAPET, SEE SHEET 2 OF 4.



PLAN



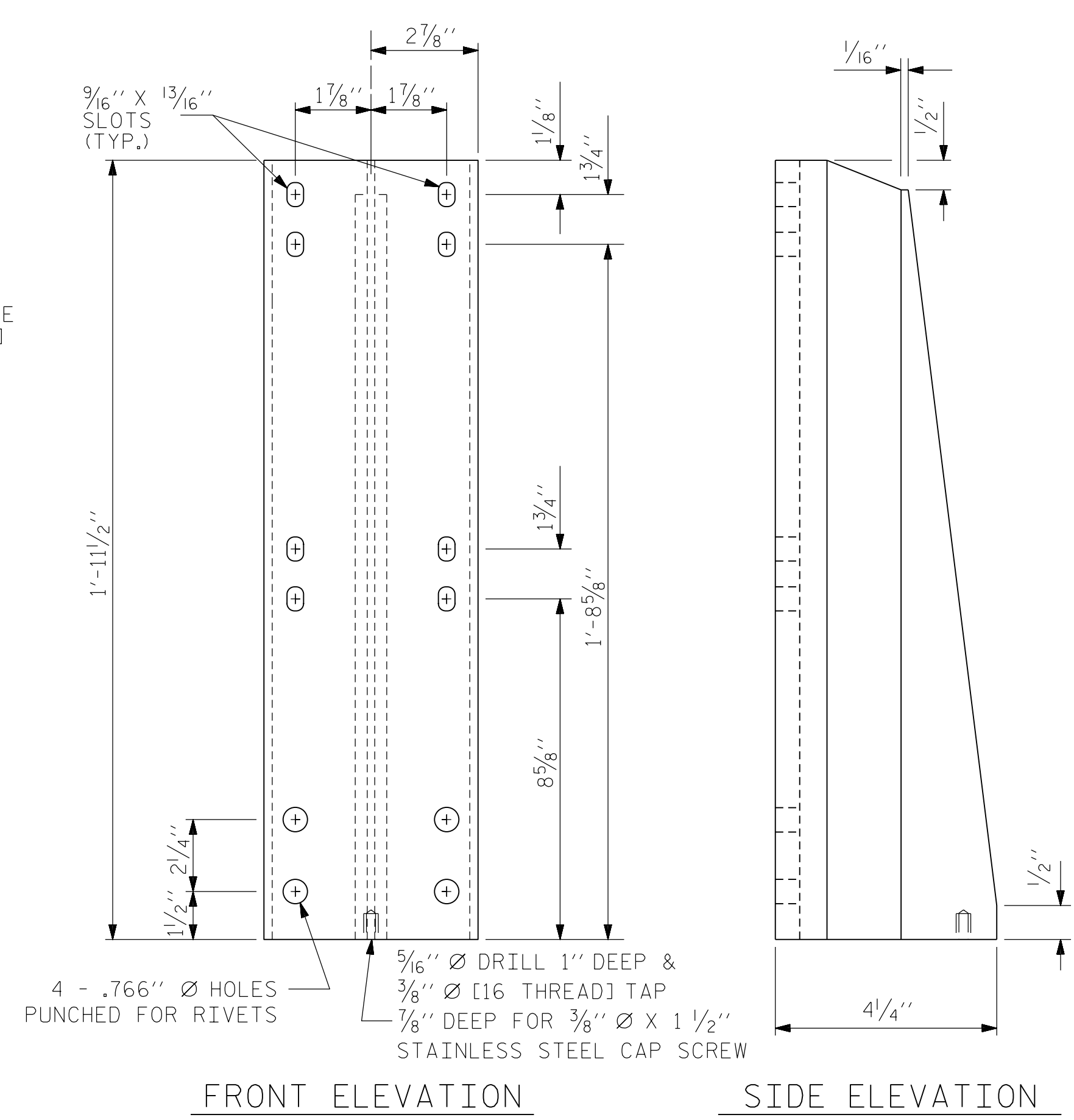
PLAN



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST

PAY LENGTH = 2079 LIN. FT.

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

SHEET 1 OF 4

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

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

DocuSigned by:
 Jacob H. Duke
 9CDB3ADC66D8400
 3/14/2019

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**RAIL RETROFIT
 IN APPROACH SPANS
 MODIFIED STANDARD
 2 BAR METAL RAIL**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			57

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES

ANCHOR SYSTEM

MATERIAL FOR ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF F593 ALLOY WITH MINIMUM 75,000 PSI TENSILE STRENGTH.

MATERIAL FOR NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY.

MATERIAL FOR WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844.

FOR ADHESIVELY ANCHORED BOLTS OR DOWELS, SEE SECTION 420-13 OF THE STANDARD SPECIFICATIONS.

ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS AND SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M111.

THE COST OF THE METAL RAIL ANCHOR SYSTEM WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF RAIL RETROFIT (2-BAR METAL RAIL).

BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

CERTIFIED MILL REPORTS ARE REQUIRED FOR ALL MATERIALS OF THE ANCHOR SYSTEM.

LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø ANCHOR BOLTS IS 10 KIPS.

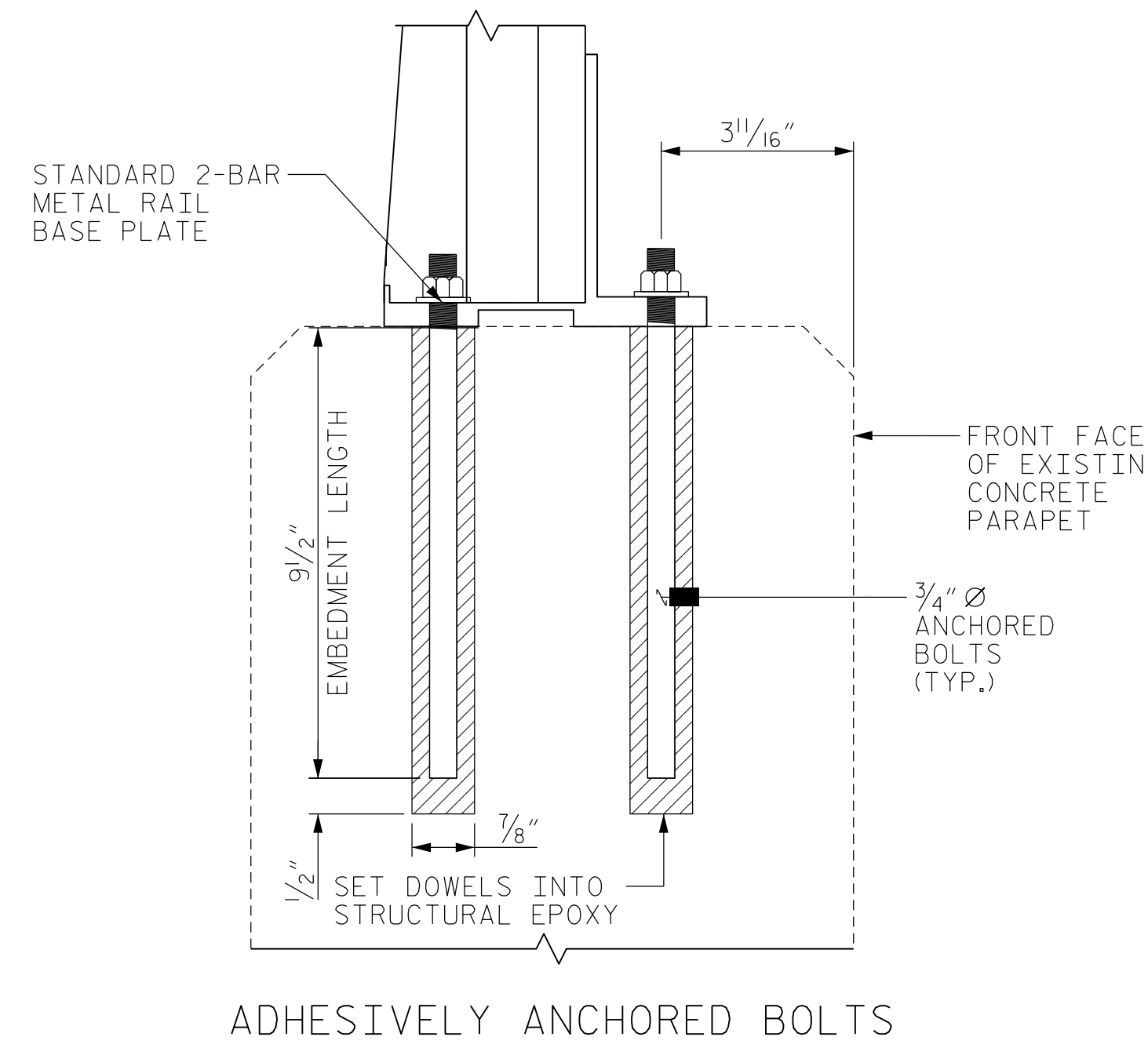
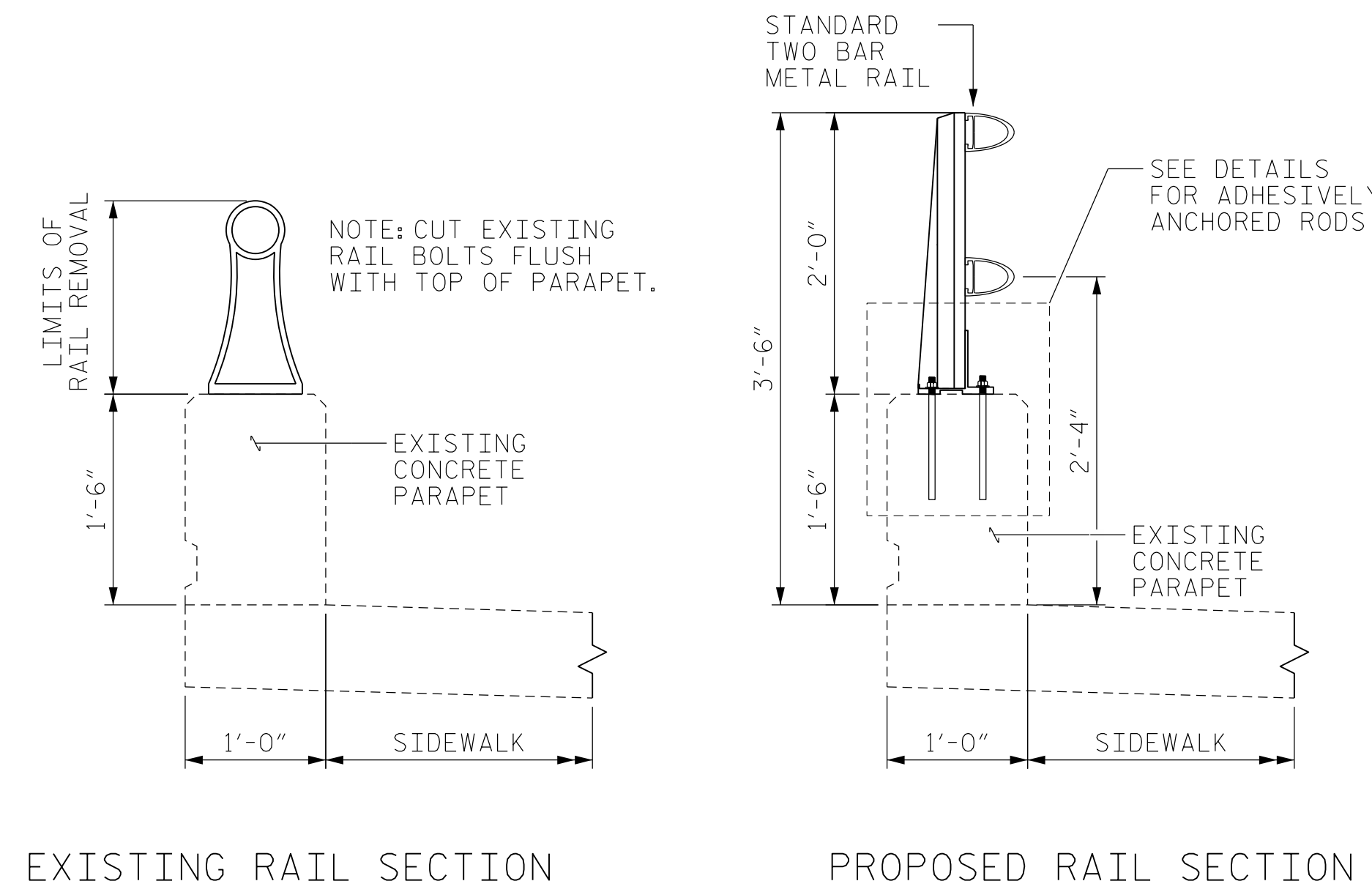
GENERAL NOTES

FOR 2-BAR METAL RAIL, SEE SPECIAL PROVISIONS FOR RAIL RETROFIT.

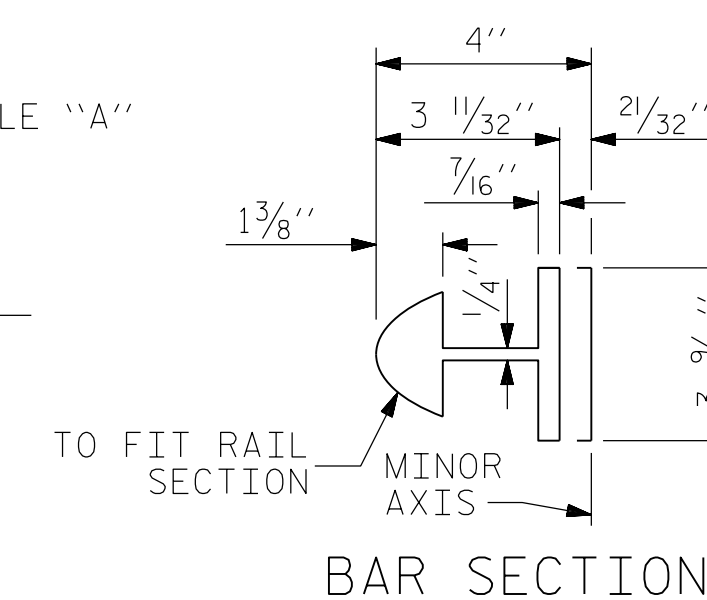
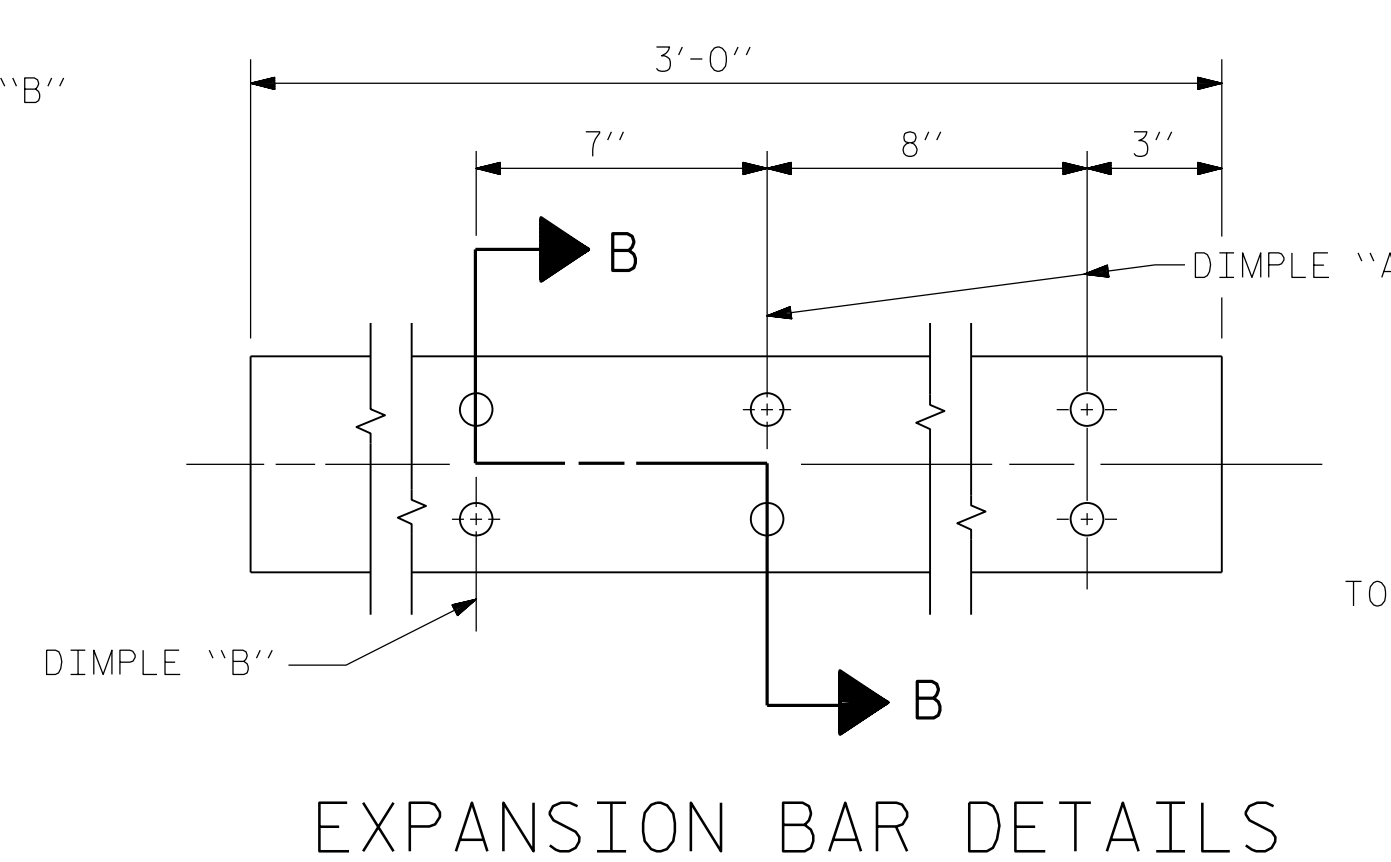
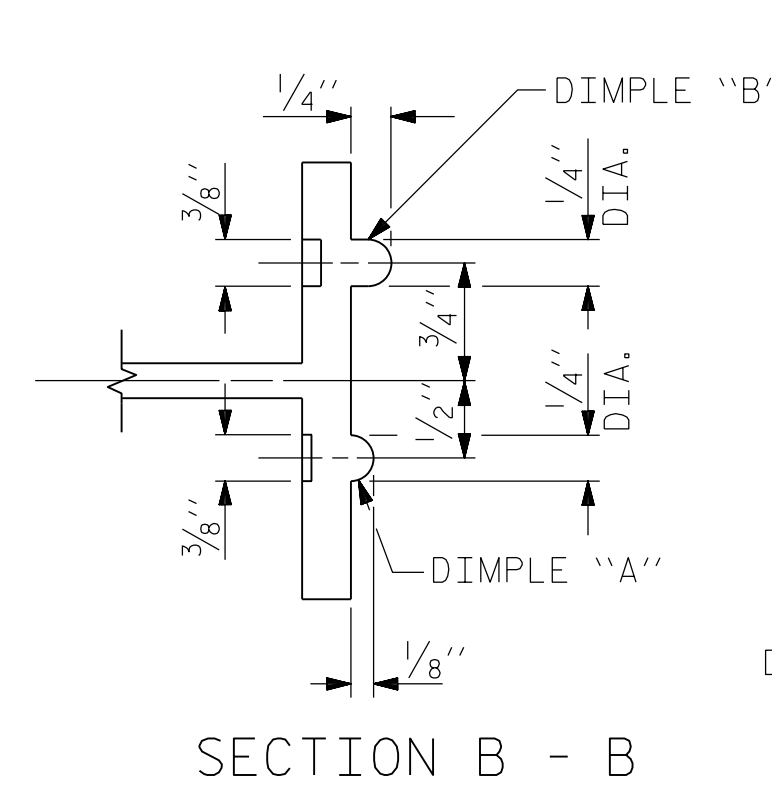
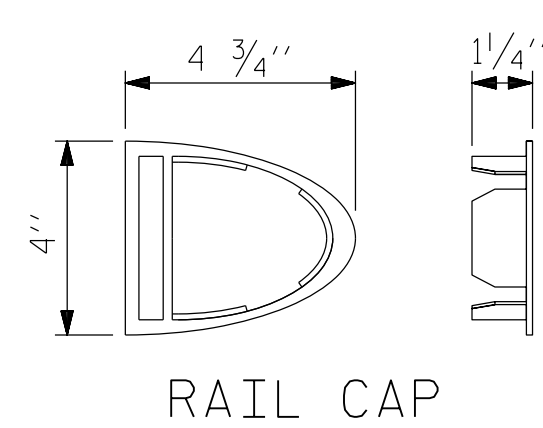
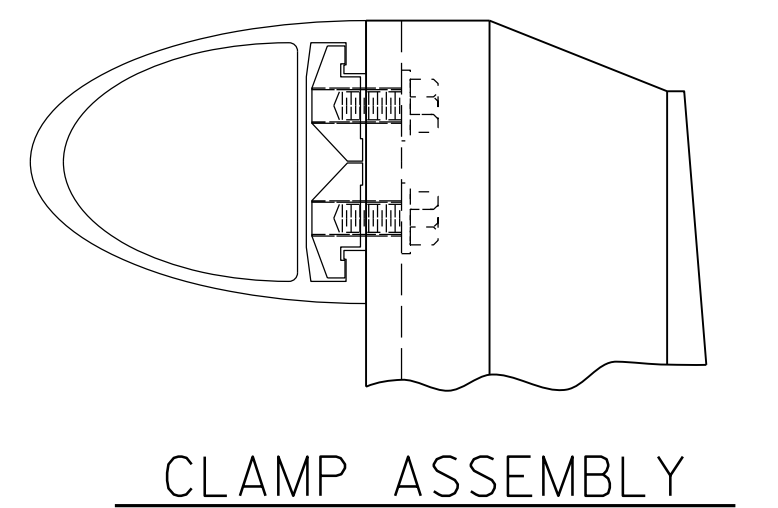
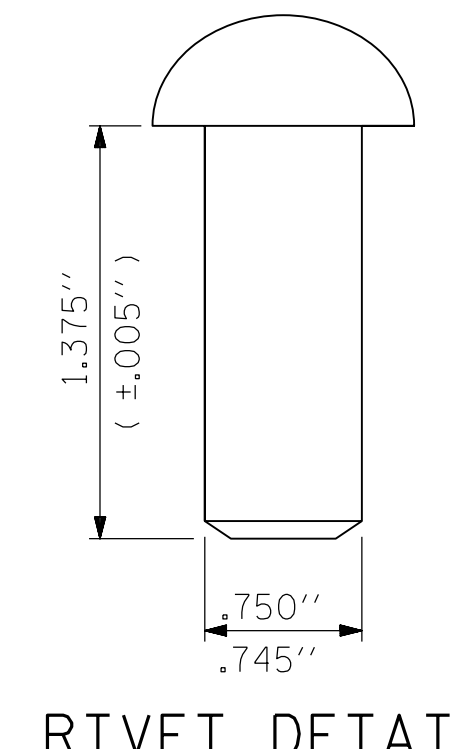
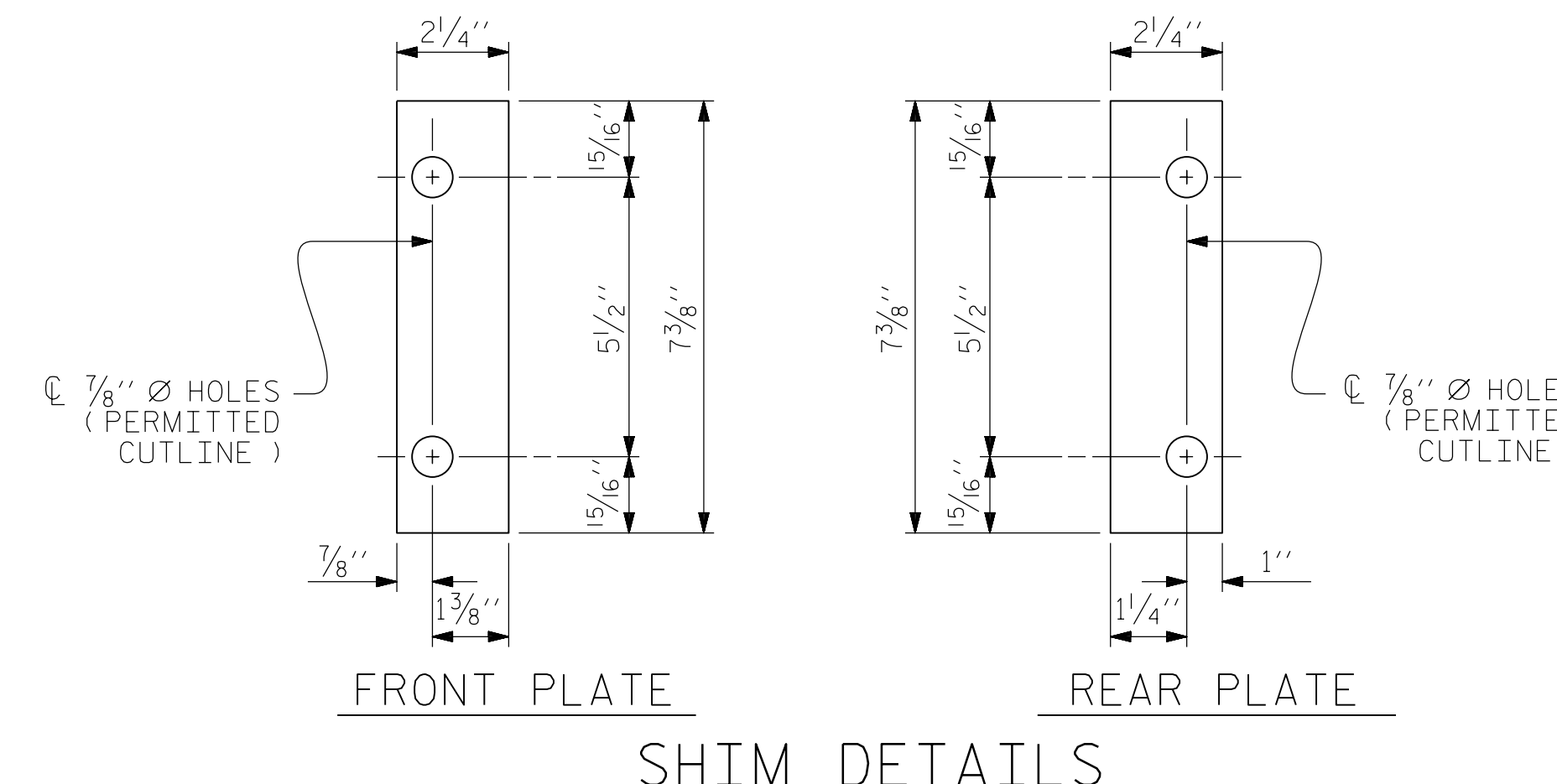
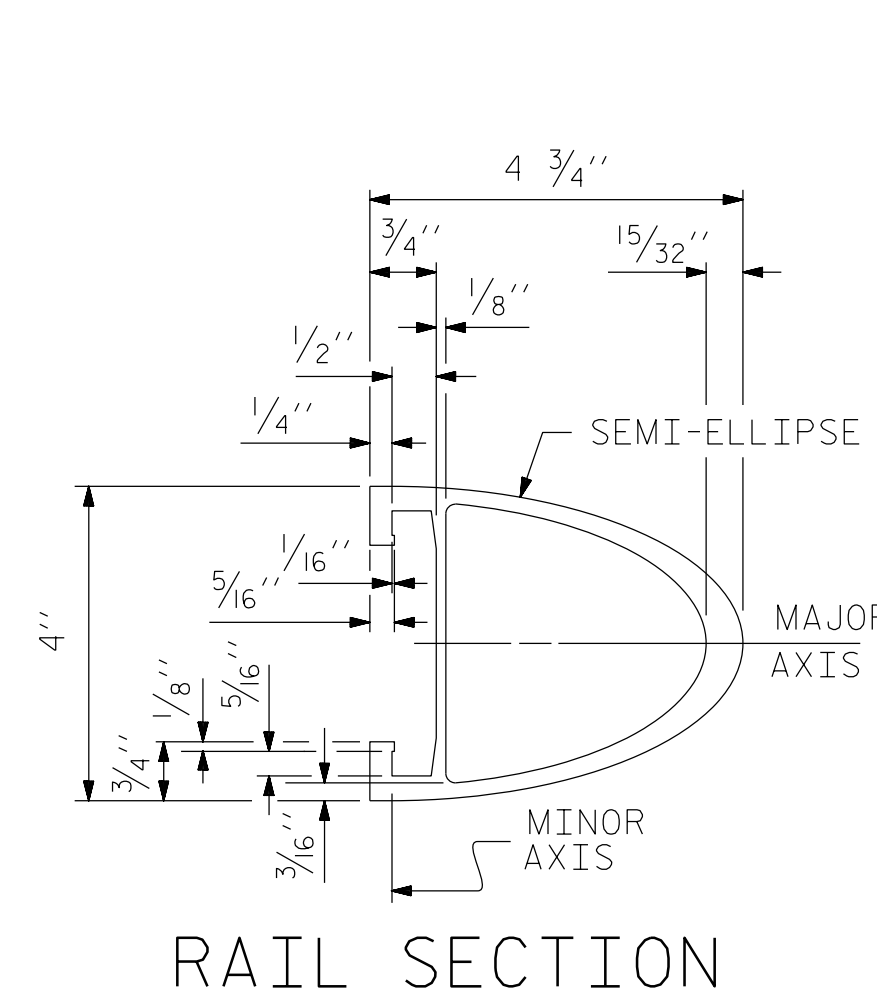
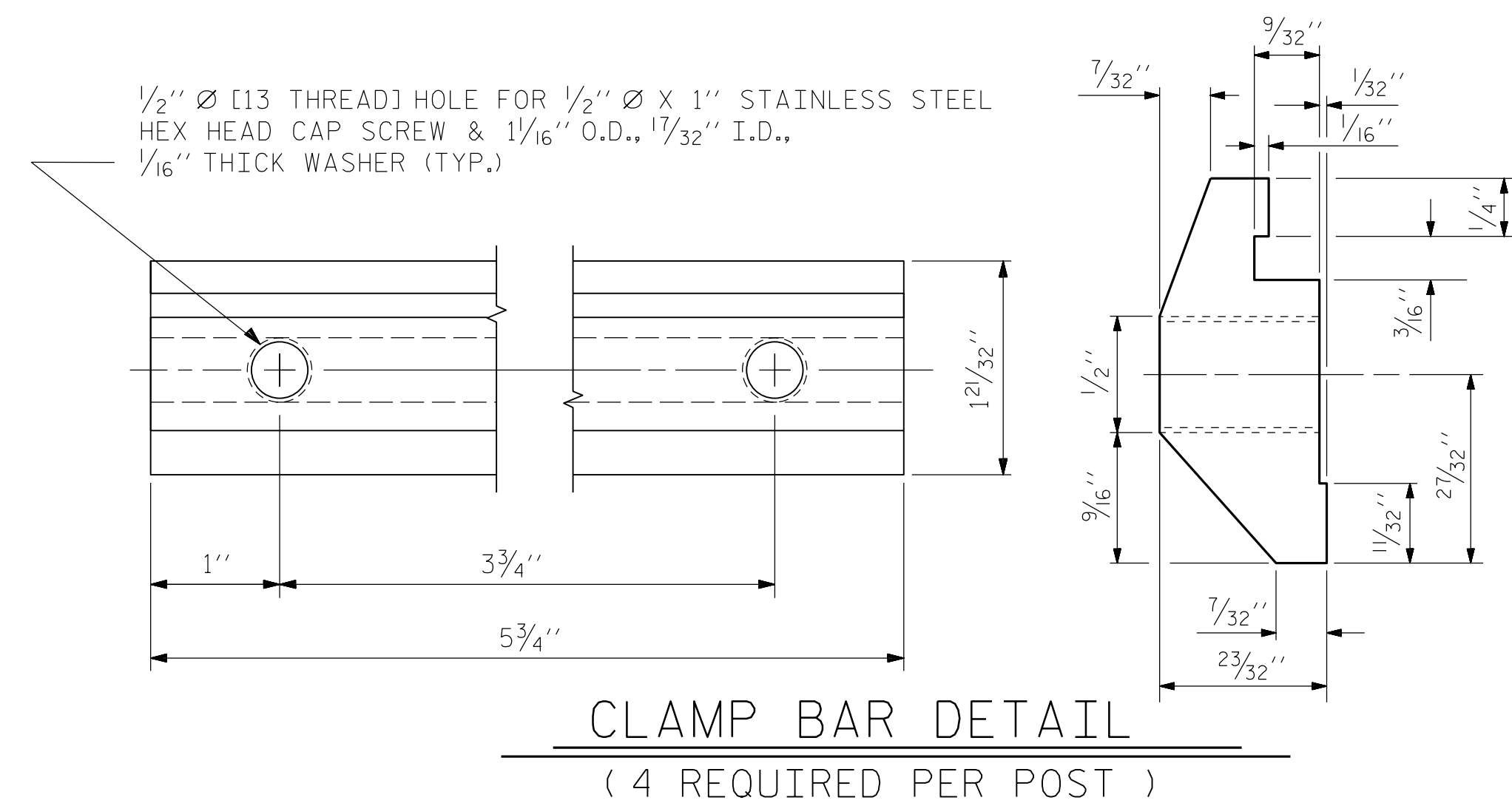
TORCH-CUT EXISTING BOLTS IN 1-BAR METAL RAIL AND EPOXY-COAT.

COORDINATE THIS SHEET WITH OTHER SHEETS FOR RAIL RETROFIT IN APPROACH SPANS.

COORDINATE THIS SHEET WITH SHEETS FOR RAIL RETROFIT IN THE SWING SPAN.



RAIL RETROFIT SECTIONS



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

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 RAIL RETROFIT
 IN APPROACH SPANS
 MODIFIED STANDARD
 2 BAR METAL RAIL

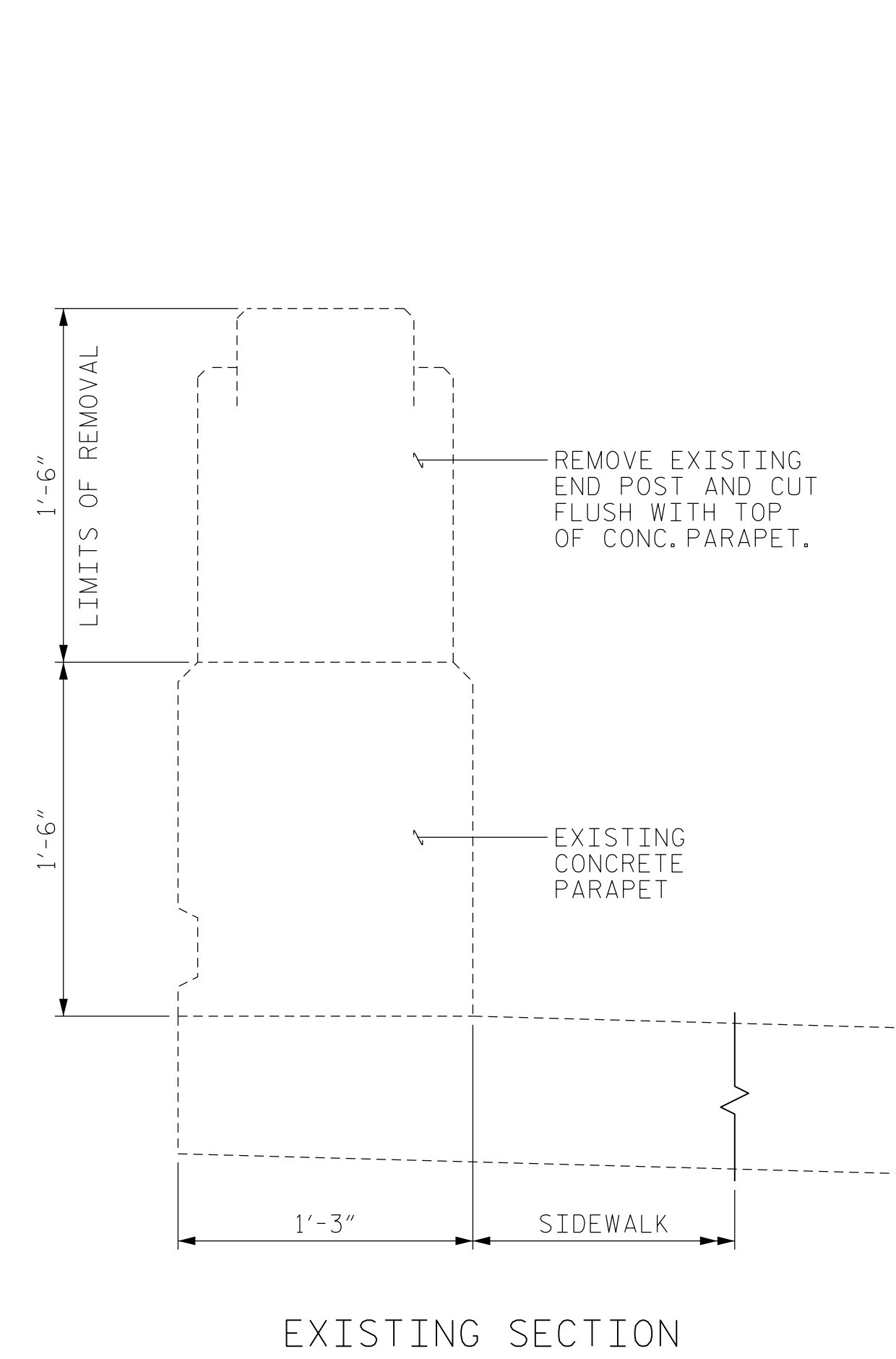
KCA 301 FAYETTEVILLE ST., SUITE 1500
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601
 (919) 882-7839
 LICENSE #: C-1506

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

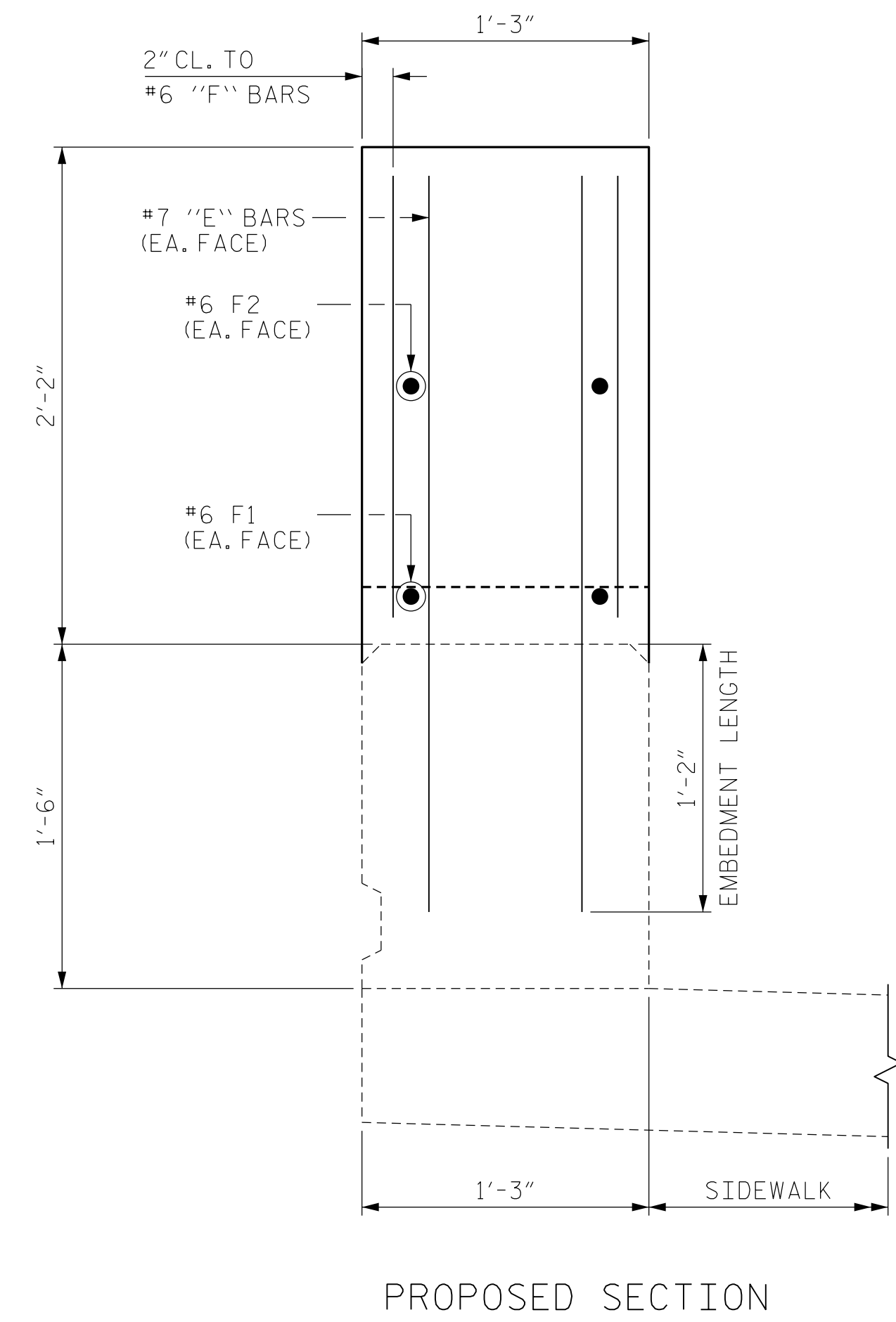
3/14/2019
 15BPR.42_SMU_RF22_060025.dgn
 daguirre

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

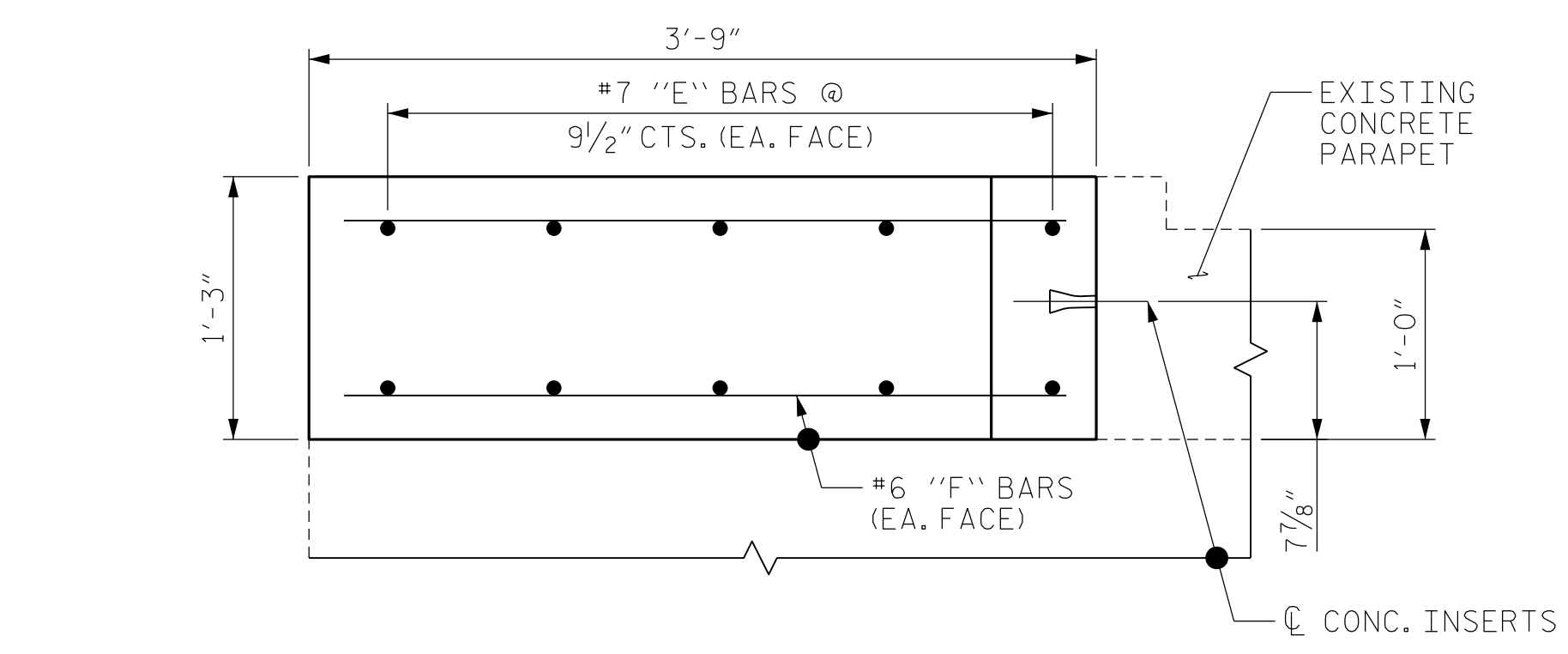
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			57



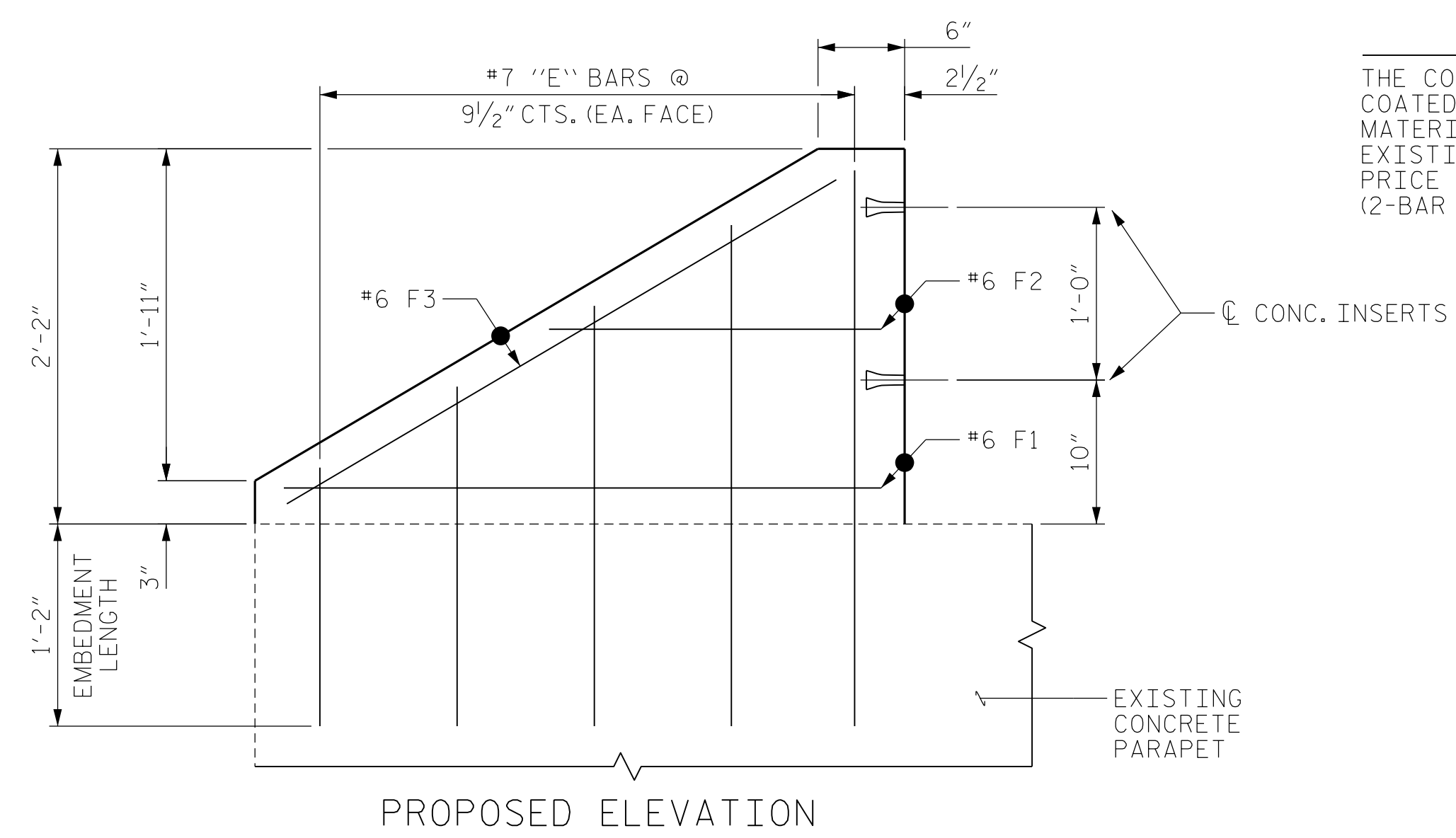
EXISTING SECTION



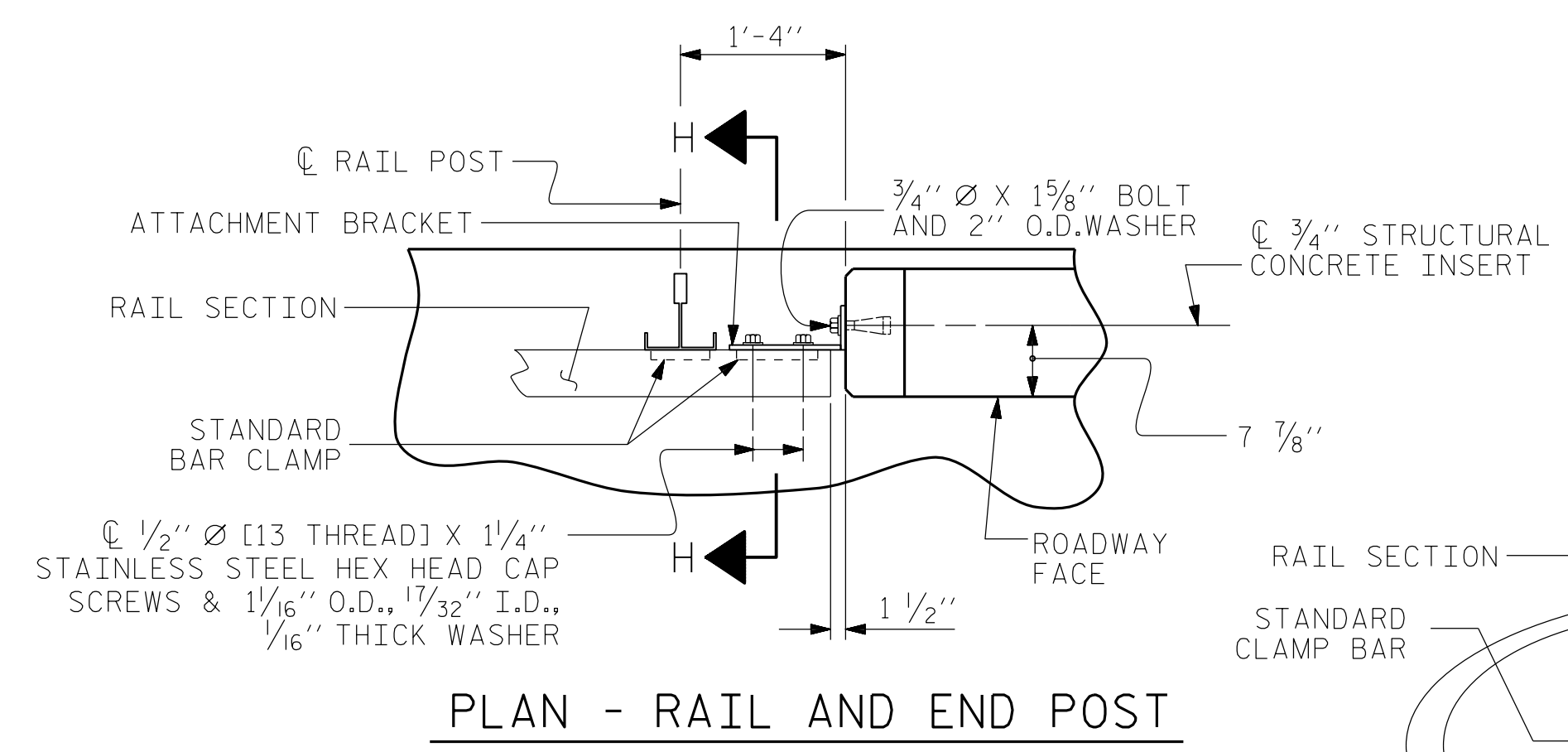
PROPOSED SECTION



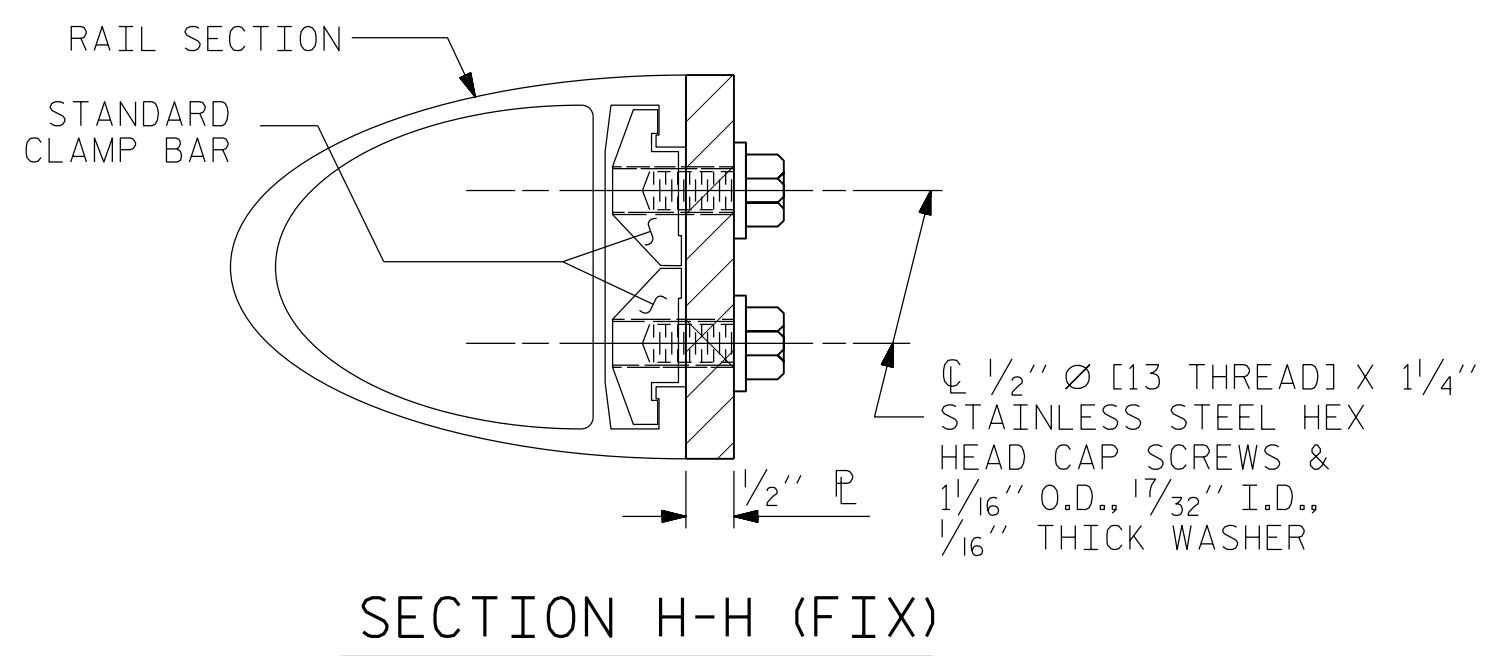
PROPOSED ELEVATION



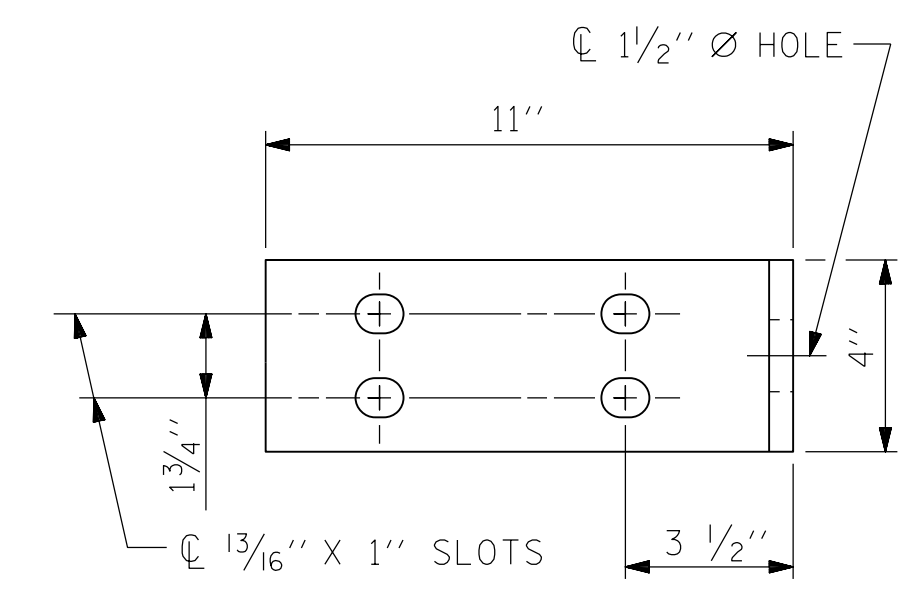
END POST FOR 2 BAR METAL RAIL



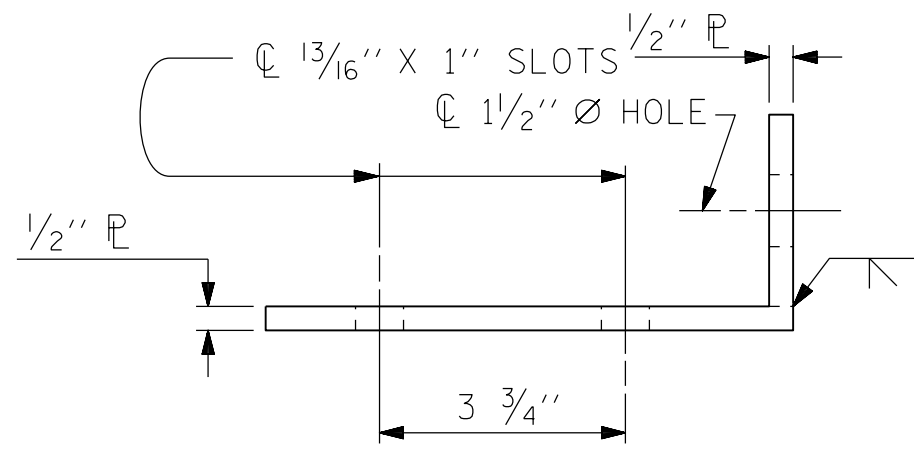
PLAN - RAIL AND END POST



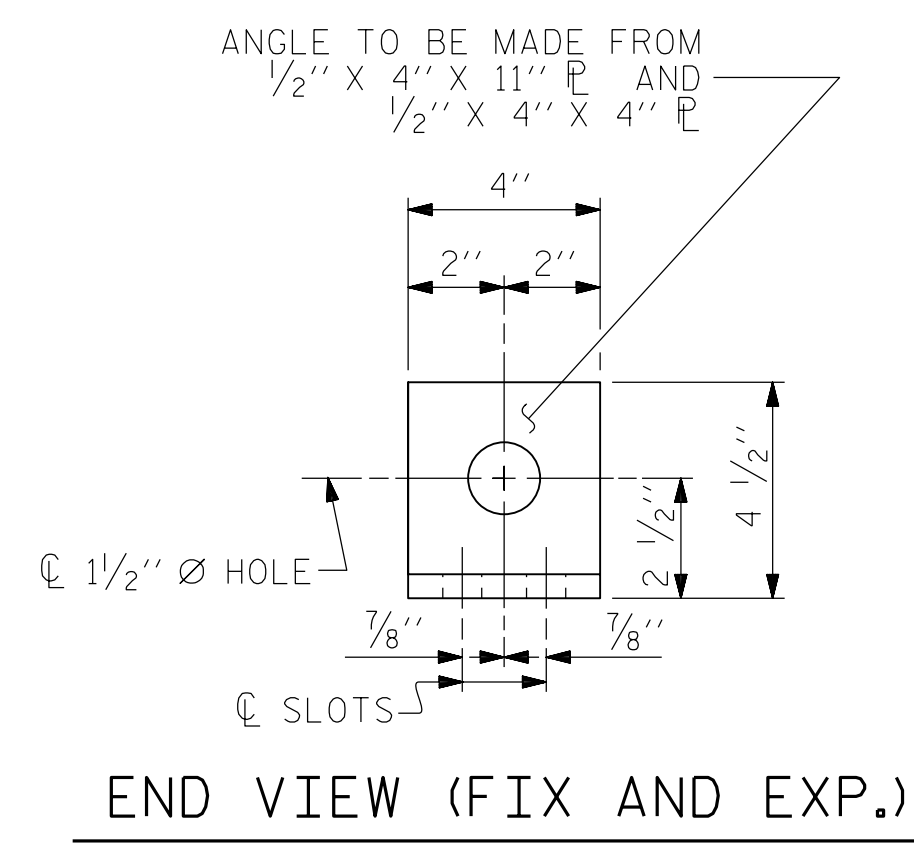
SECTION H-H (FIX)



ELEVATION

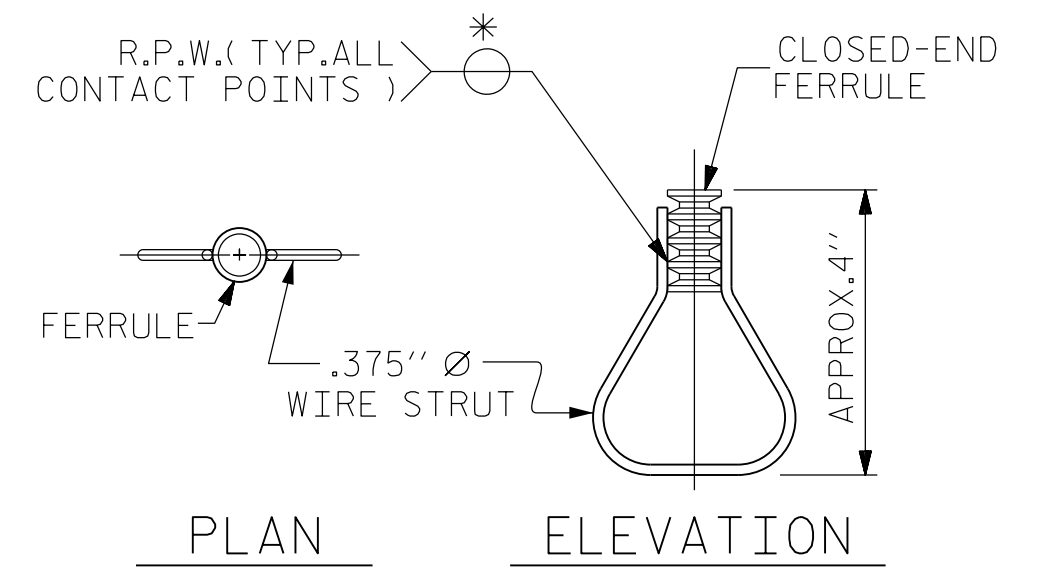


TOP VIEW



END VIEW (FIX AND EXP.)

FIXED



STRUCTURAL CONCRETE INSERT

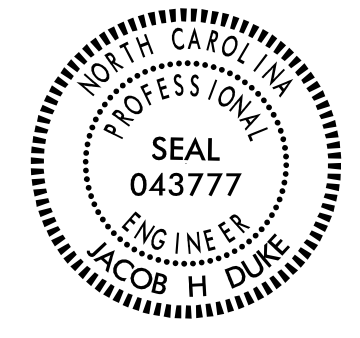
* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

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

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

RAIL RETROFIT
 IN APPROACH SPANS
 MODIFIED STANDARD
 2 BAR METAL RAIL



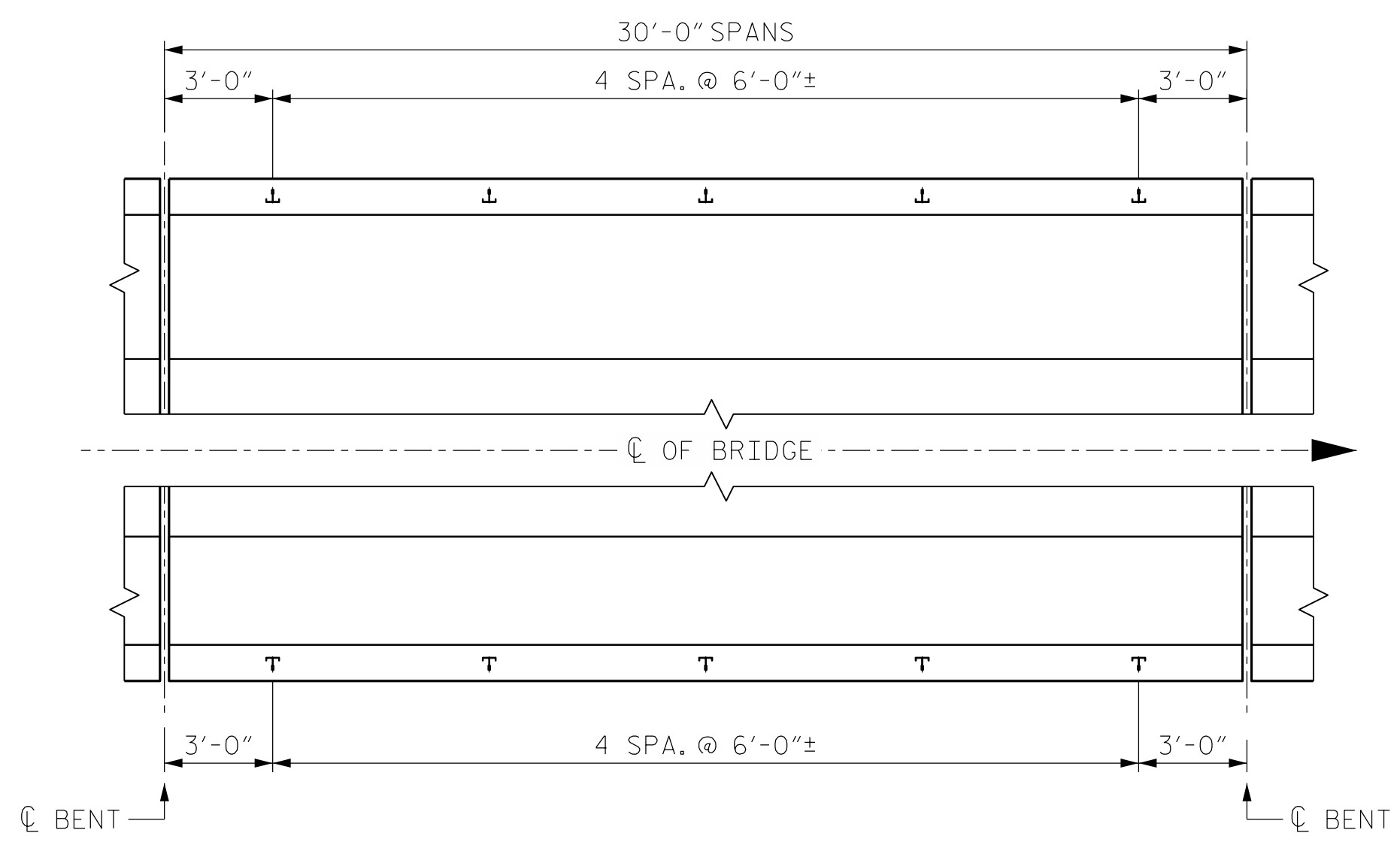
DocuSigned by:
 Jacob H. Duke
 9CDB3ADC66D6400
 3/14/2019

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			57

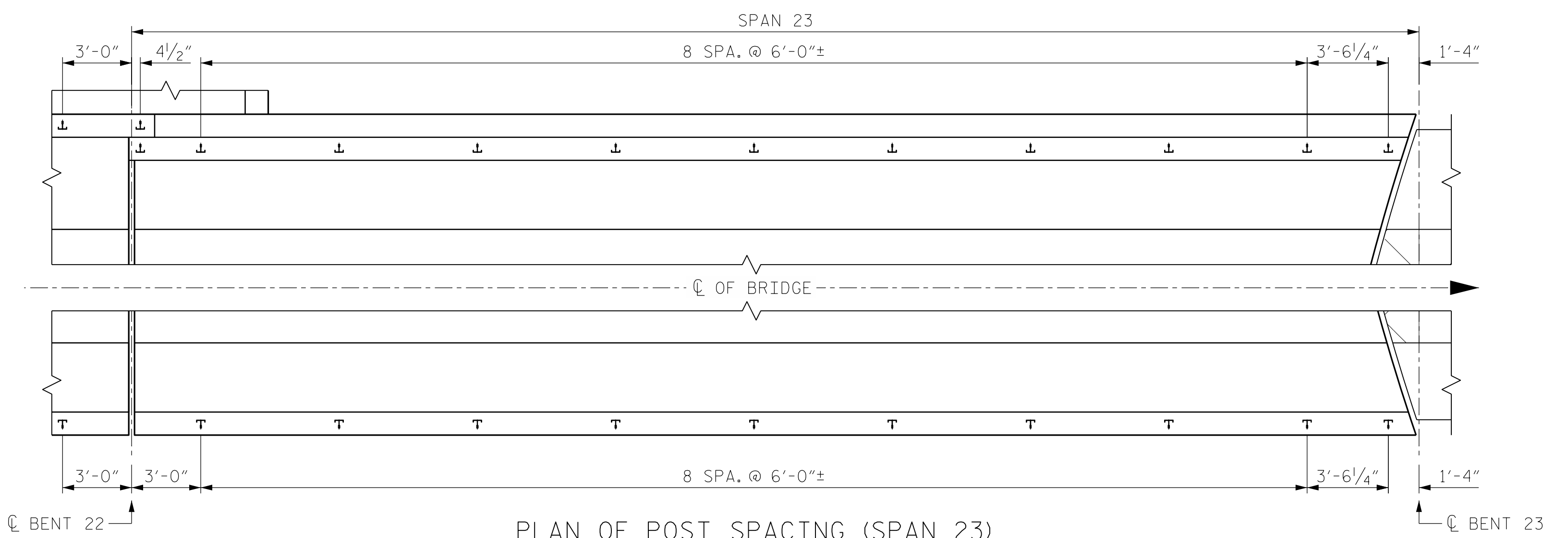
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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

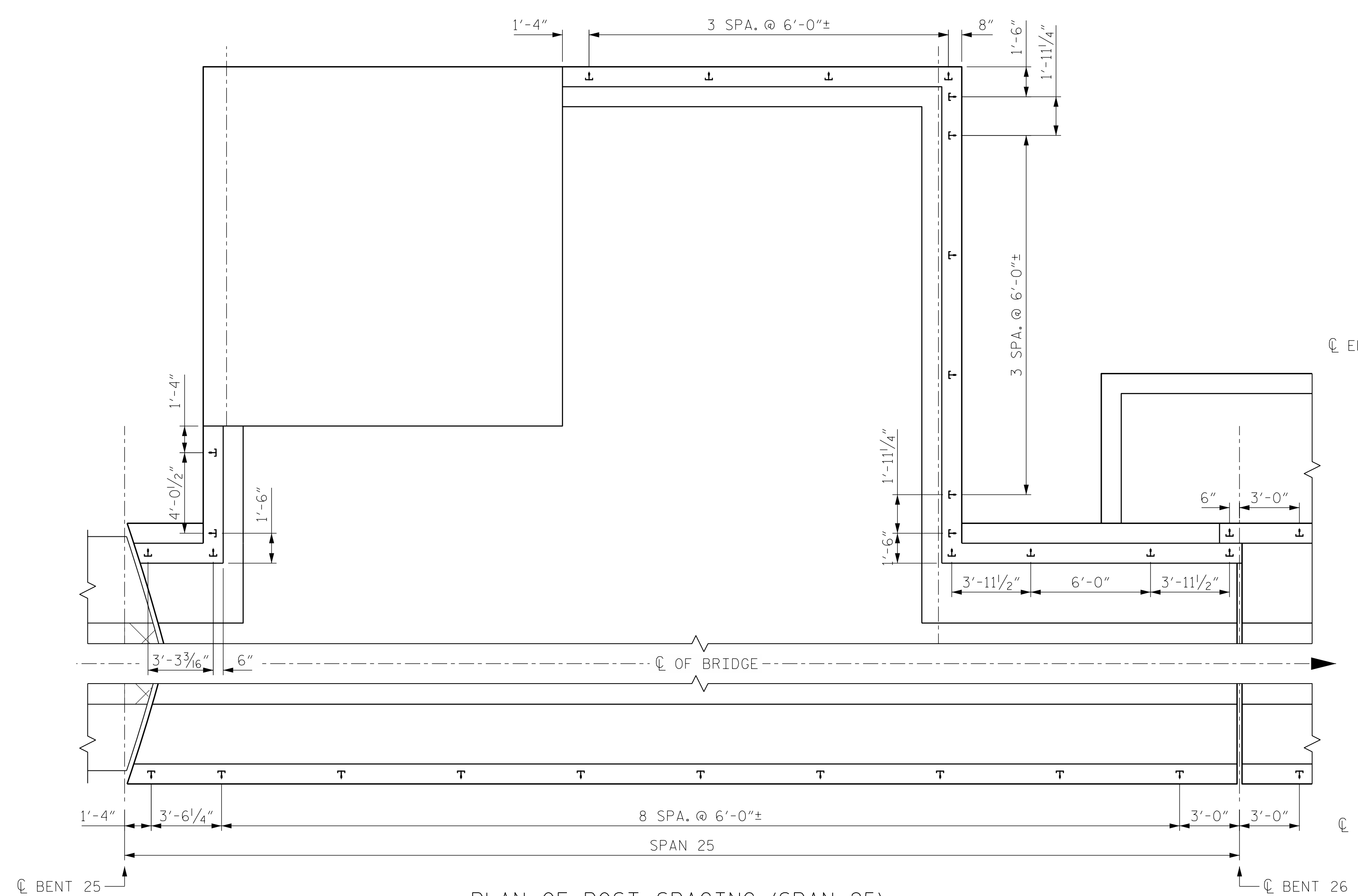
DRAWN BY : JACOB H. DUKE DATE : 2/5/2019
 CHECKED BY : DIEGO A. AGUIRRE DATE : 2/5/2019
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019



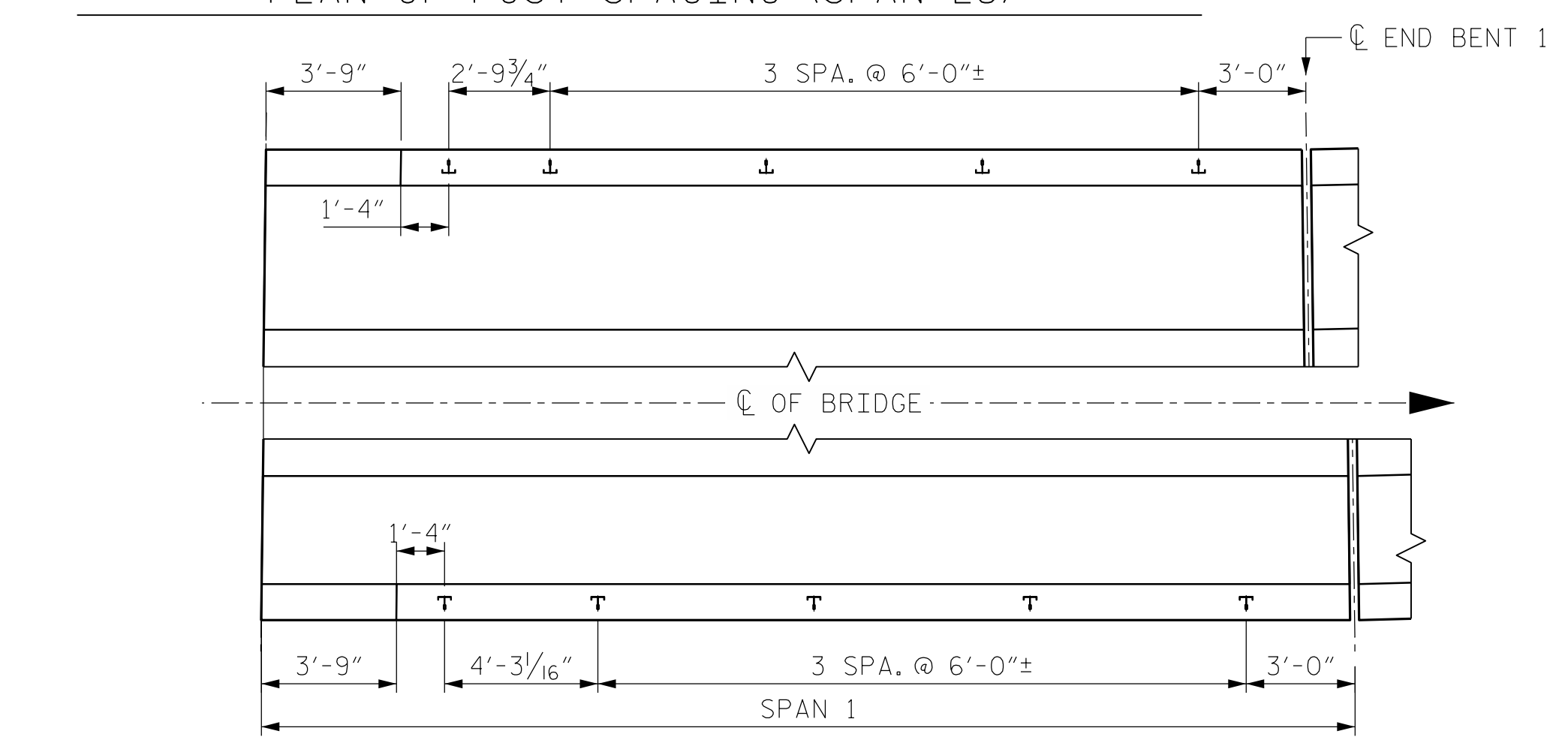
TYPICAL PLAN OF POST SPACING (30FT SPANS)
(SPANS 2-22 AND 26-33)



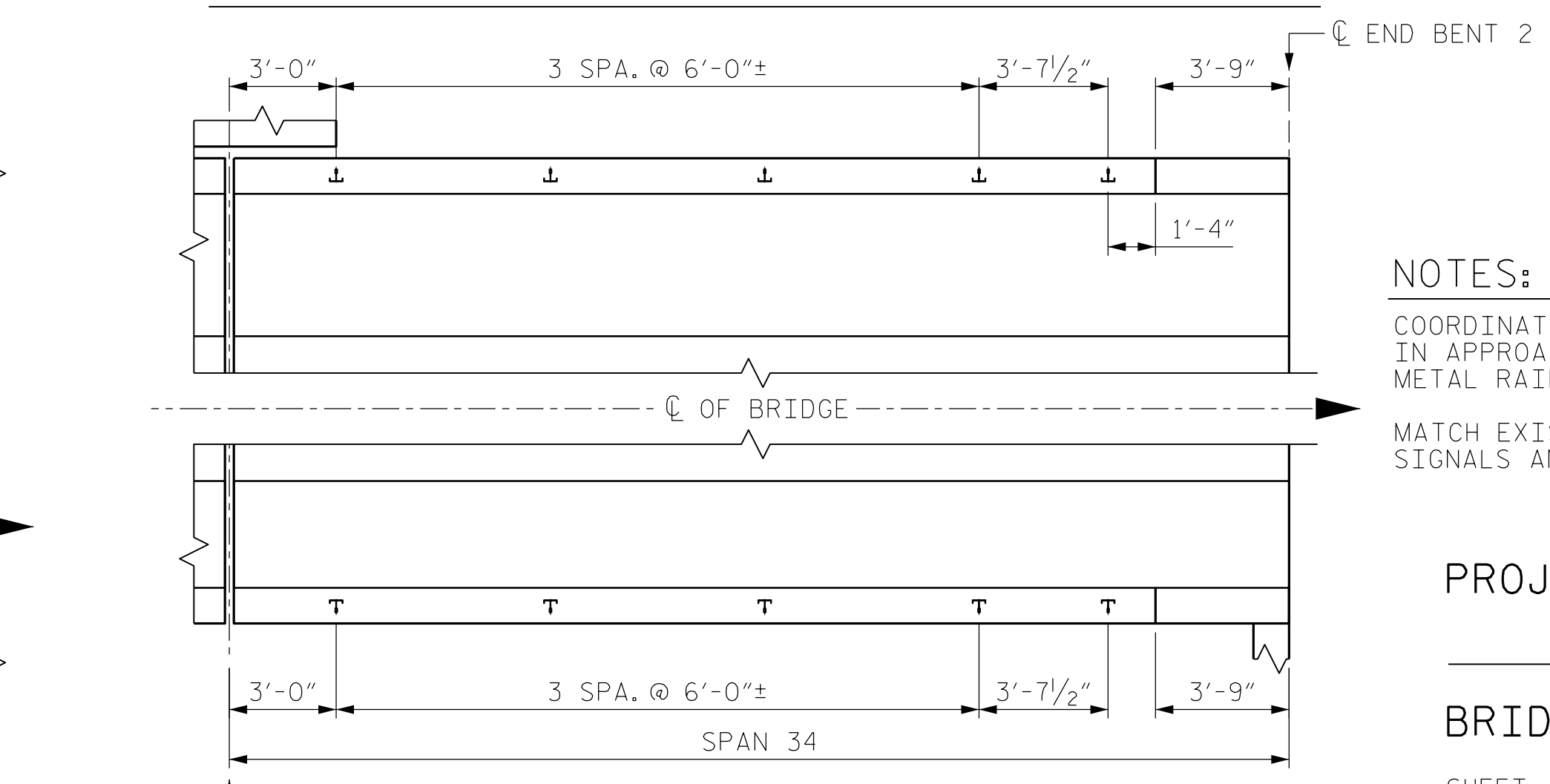
PLAN OF POST SPACING (SPAN 23)



PLAN OF POST SPACING (SPAN 25)



PLAN OF POST SPACING (SPAN 1)



PLAN OF POST SPACING (SPAN 34)

NOTES:
COORDINATE THIS SHEET WITH "RAIL RETROFIT IN APPROACH SPANS - MODIFIED STANDARD 2-BAR METAL RAIL" SHEETS.
MATCH EXISTING RAIL GAPS AT ALL TRAFFIC SIGNALS AND LIGHTS.

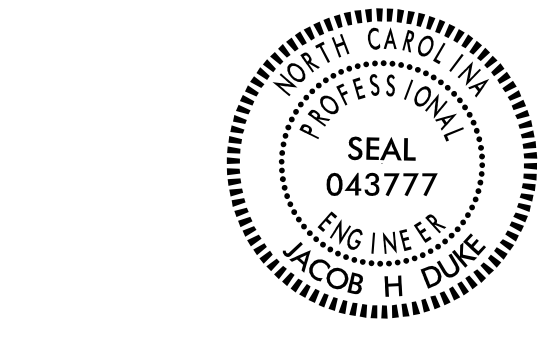
PROJECT NO. 15BPR.42
BEAUFORT COUNTY
BRIDGE NO. 060025

SHEET 4 OF 4

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

3/14/2019
15BPR.42_SMU_RF24_060025.dgn
daguirre

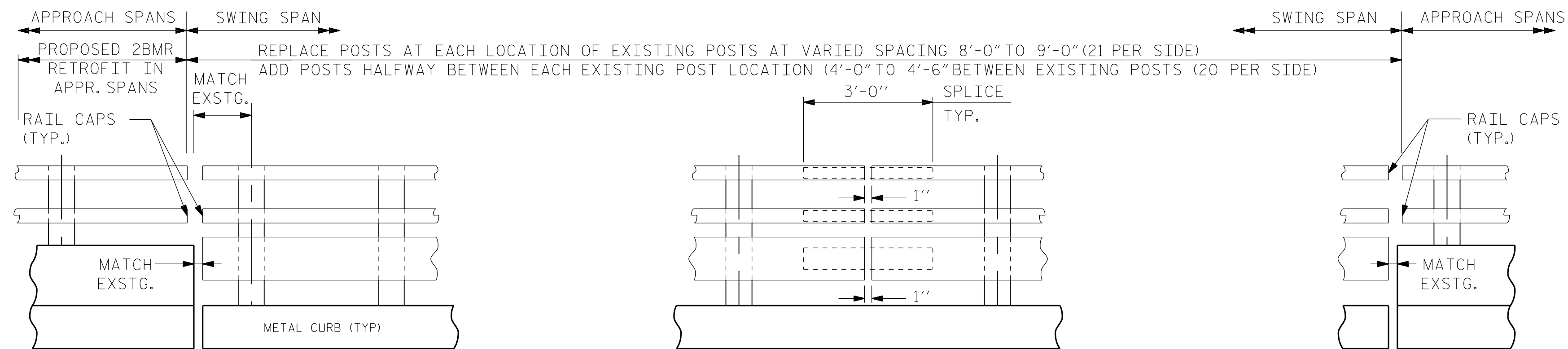


DocuSigned by:
Jacob H. Duke
9CD53ADD66D6400
3/14/2019

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
RAIL RETROFIT
IN APPROACH SPANS
MODIFIED STANDARD
2 BAR METAL RAIL

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13	
1			3			TOTAL SHEETS	57
2			4				



ELEVATION

FOR SECTIONS THRU RAIL, SEE SHEET 2 OF 3.

NOTES

ALUMINUM RAILS

MATERIAL FOR POSTS, RAILS, EXPANSION BARS, AND CLAMP BARS SHALL BE ASTM B221 ALLOY 6061-T6.
 MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6.
 MATERIAL FOR WASHERS SHALL MEET REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

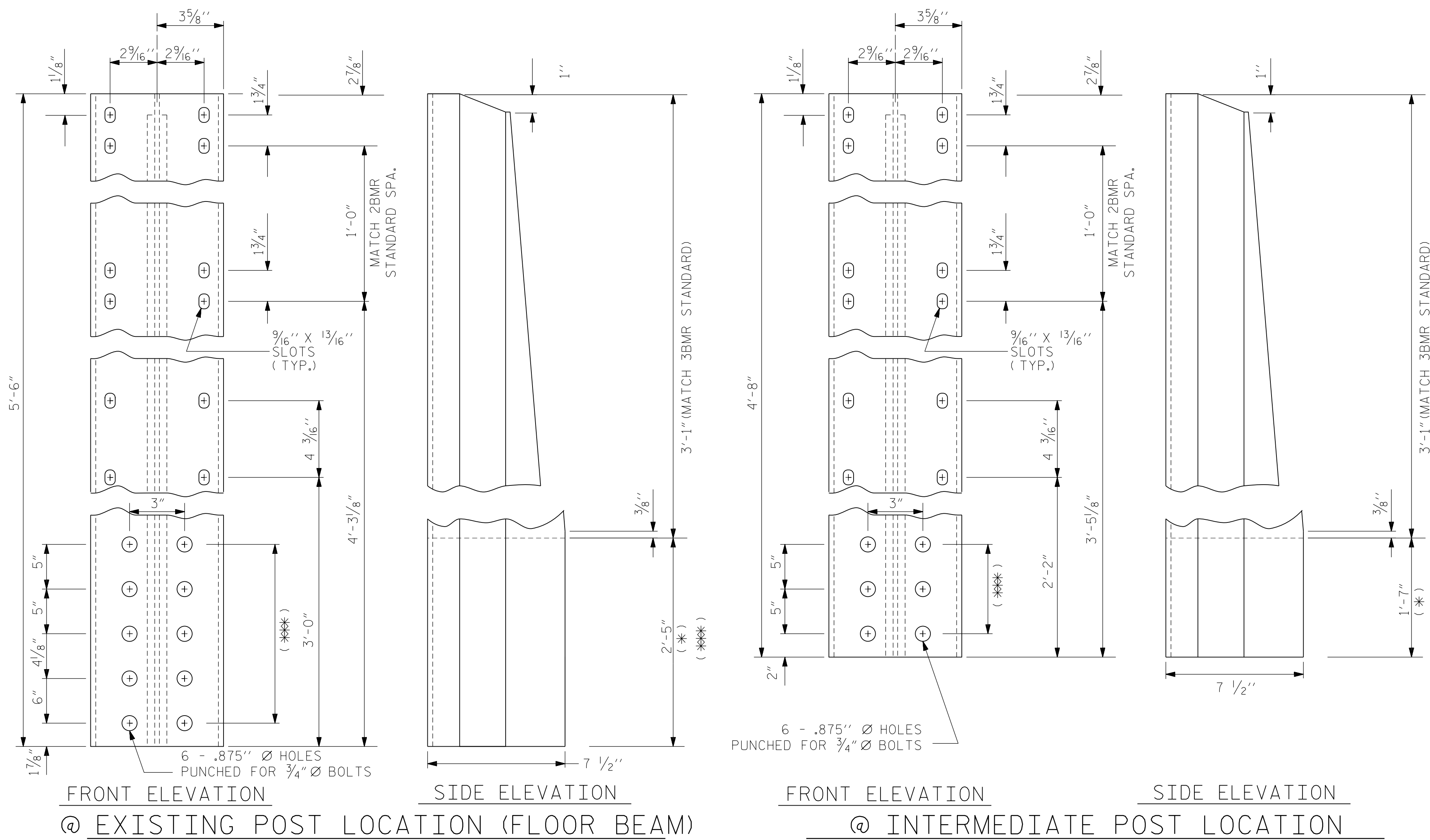
GENERAL NOTES

COORDINATE THIS SHEET WITH OTHER SHEETS FOR RAIL RETROFIT IN THE SWING SPAN.
 COORDINATE THIS SHEET WITH SHEETS FOR RAIL RETROFIT IN APPROACH SPANS.
 FOR 3-BAR METAL RAIL, SEE SPECIAL PROVISIONS FOR RAIL RETROFIT.
 REMOVE THE EXISTING RAIL IN THE SWING SPANS, AS SHOWN IN SHEET 2 OF 3.
 RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF SWING SPAN. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS. PLACE ONE JOINT SPLICE JUST BEYOND THE 3RD RAIL POST FROM EACH END, TYPICALLY 14' FROM THE END. PLACE OTHER JOINTS AS NEEDED.
 FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, MATCH THE EXISTING CONDITION.
 CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.
 METAL RAIL POSTS SHALL BE SET AS SHOWN ON PLANS.
 METHOD OF MEASUREMENT FOR METAL RAILS: LINEAR FEET, SEE SPECIAL PROVISIONS FOR RAIL RETROFIT.
 TO ENSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.
 MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

THERE ARE THREE (3) EXISTING ACCESS LADDERS ON THE EAST SWING SPAN(S) RAIL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND REINSTALLATION OF THE EXISTING LADDERS UPON THE PROPOSED 3-BAR METAL RAIL INSTALLATION. THE CONTRACTOR SHALL PROVIDE CONNECTION DETAILS, BETWEEN THE EXISTING LADDERS AND THE PROPOSED 3-BAR METAL RAIL SYSTEM, AND THESE SHALL BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING WORK. AT THE CONTRACTOR'S OPTION, A NEW ACCESS LADDER SYSTEM MAY BE PROVIDED FOR THE PROPOSED 3-BAR METAL RAIL. IF THE CONTRACTOR SELECTS THIS OPTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF THE EXISTING ACCESS LADDERS, AS WELL AS PROVIDING DETAILS OF THE NEW LADDERS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING WORK. AT MINIMUM, THE NEW LADDERS SHALL BE INSTALLED AT THE APPROXIMATE LOCATIONS OF THE EXISTING LADDERS, SHALL BE STABLE, SHALL PROVIDE THE SAME WIDTH AND VERTICAL DROP TO THE FENDER SYSTEM AS THE EXISTING LADDERS, AND SHALL BE MADE OF ALUMINUM OR GALVANIZED STEEL MEETING CURRENT STATE AND NATIONAL SAFETY REQUIREMENTS.

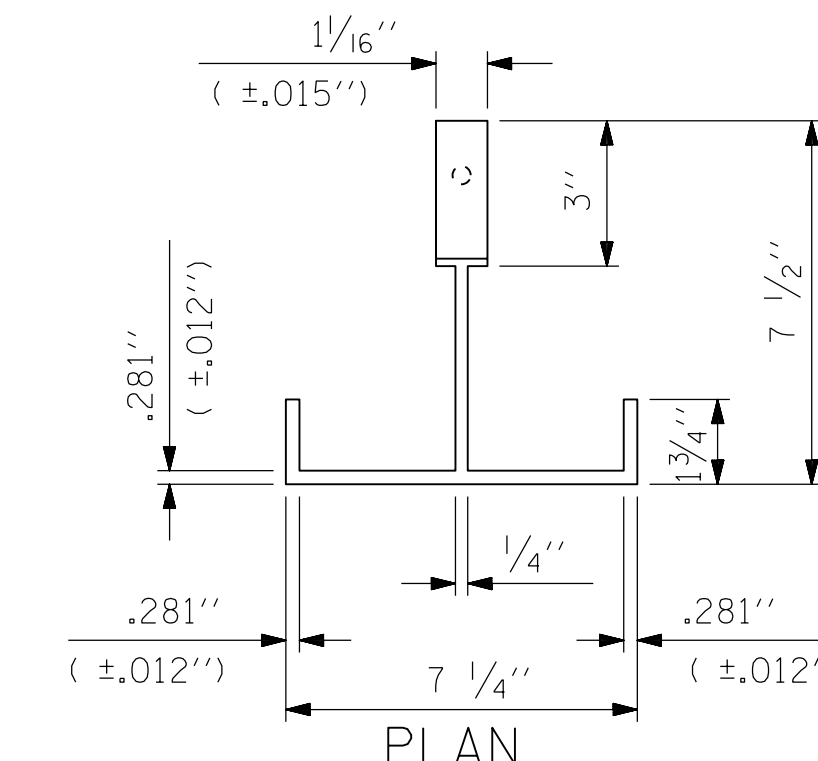
*** PRIOR TO ORDERING MATERIALS, THE CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY THE LOCATIONS OF THE LOWER CONNECTION BOLTS ON THE EXISTING METAL CURB.

PAY LENGTH = 360 LIN.FT.



DETAILS OF POST

(*) CONTINUOUS CROSS-SECTION TO BOTTOM OF POST
 (***) SEE NOTES



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

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**RAIL RETROFIT
 IN SWING SPAN**

**MODIFIED STANDARD
 3 BAR METAL RAIL**



DocuSigned by:
 Jacob H. Duke
 9CDB3ADC6ED6400
 3/14/2019

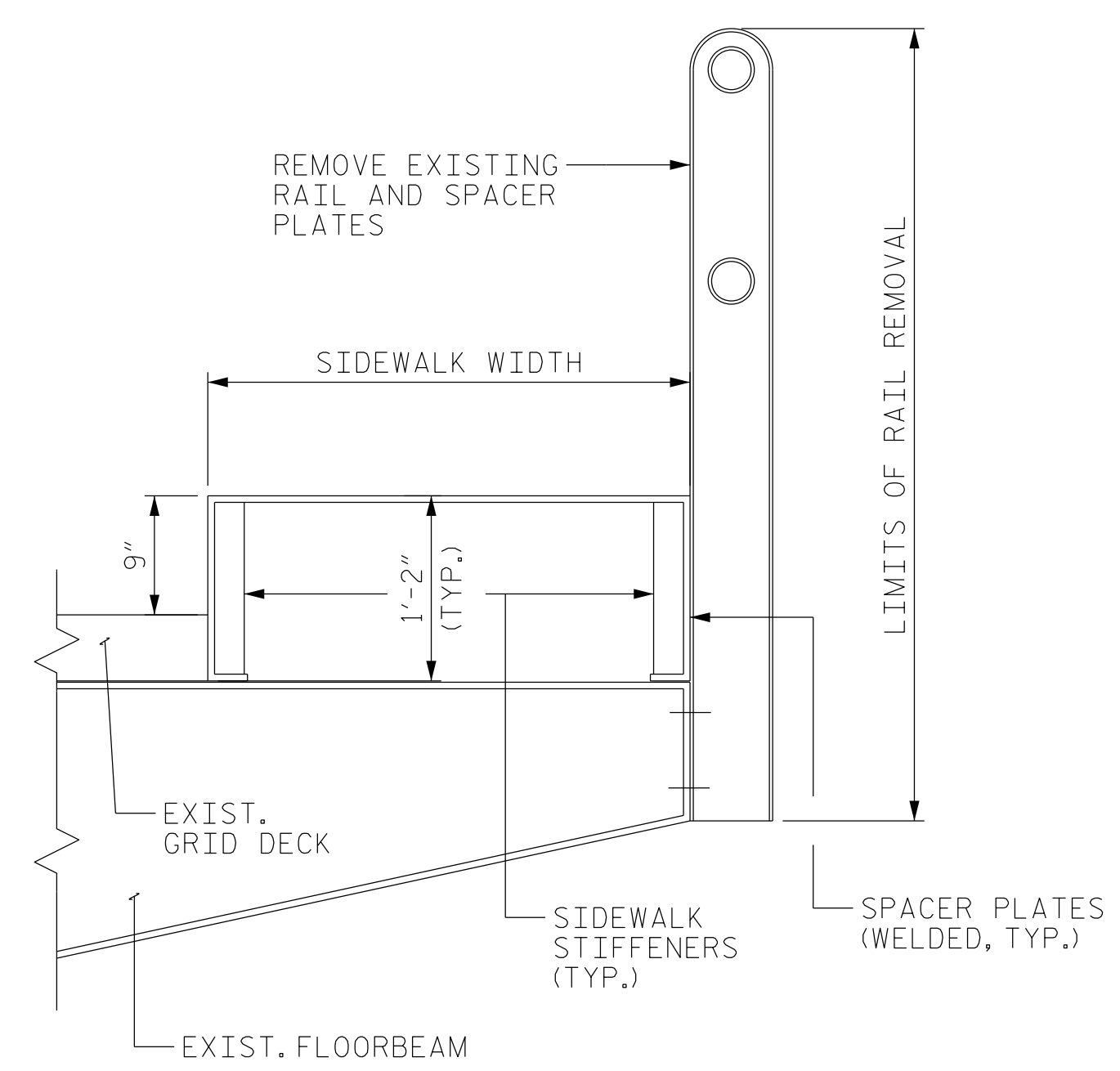
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			57

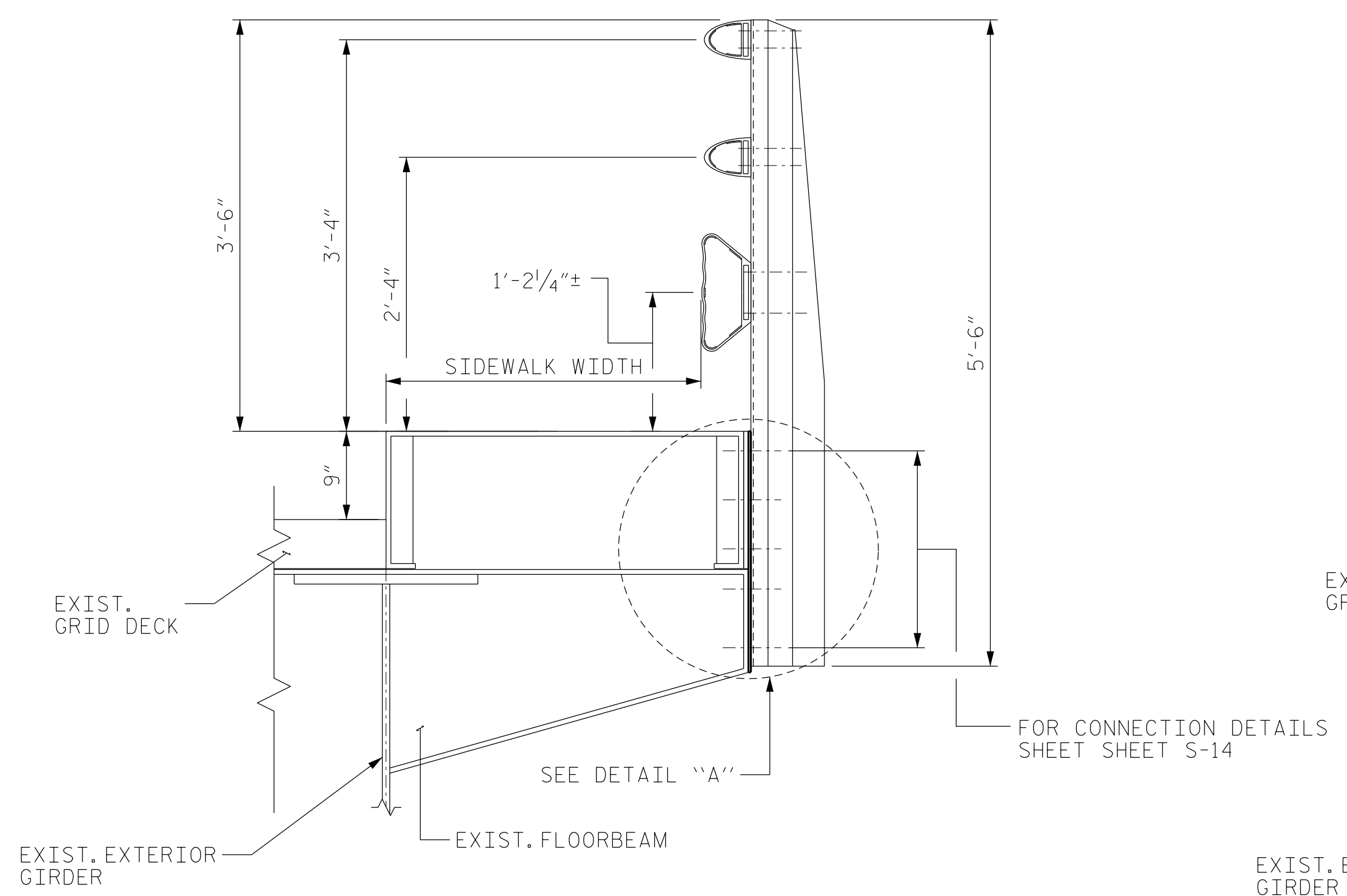
LEGEND:
 2BMR: 2-BAR METAL RAIL
 3BMR: 3-BAR METAL RAIL

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

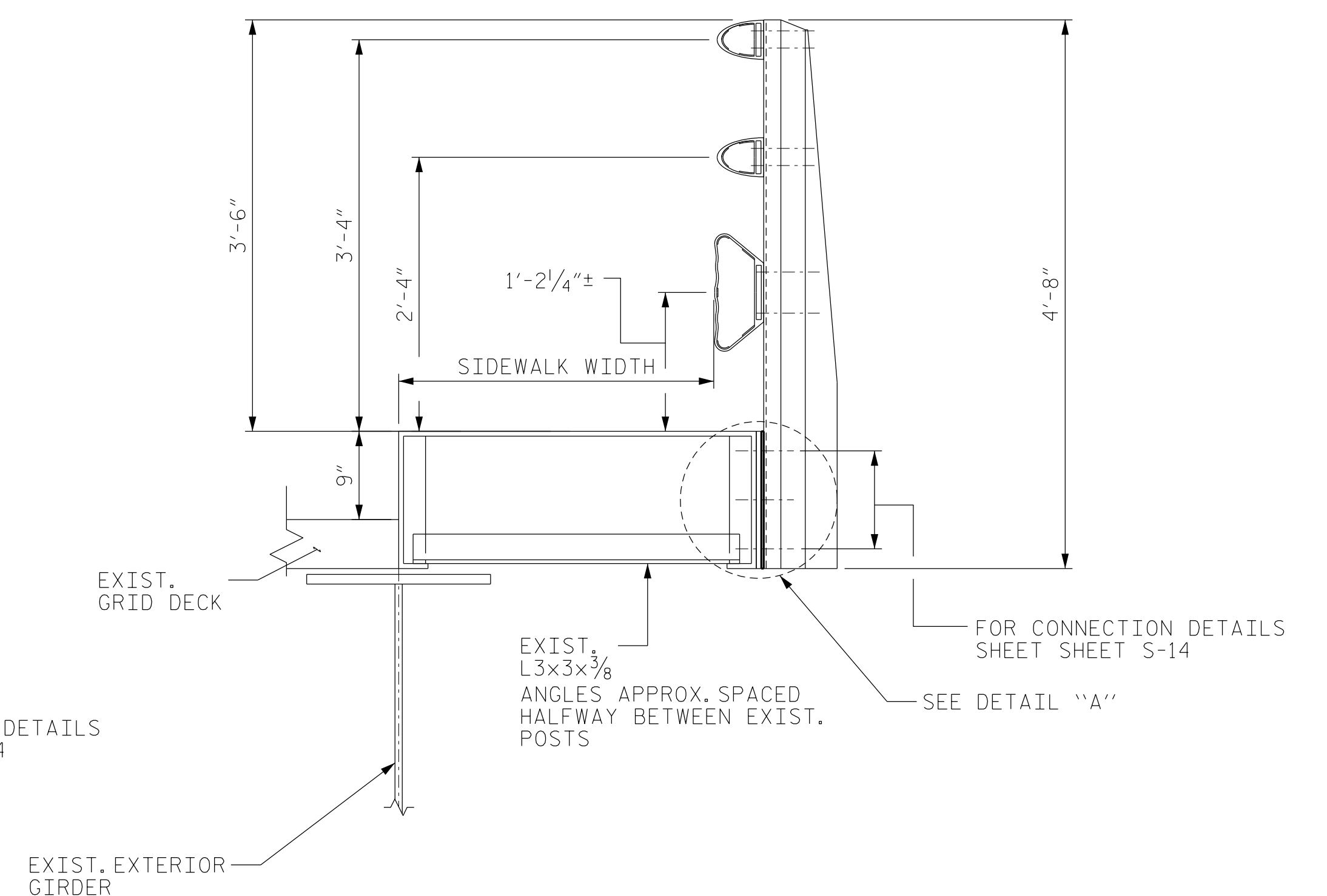
DRAWN BY : JACOB H. DUKE DATE : 2/5/2019
 CHECKED BY : DIEGO A. AGUIRRE DATE : 2/5/2019
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019



EXISTING SECTION



PROPOSED SECTION @ FLOORBEAMS



PROPOSED SECTION BETWEEN FLOORBEAMS

THREE BAR METAL RAIL SECTIONS

NOTES

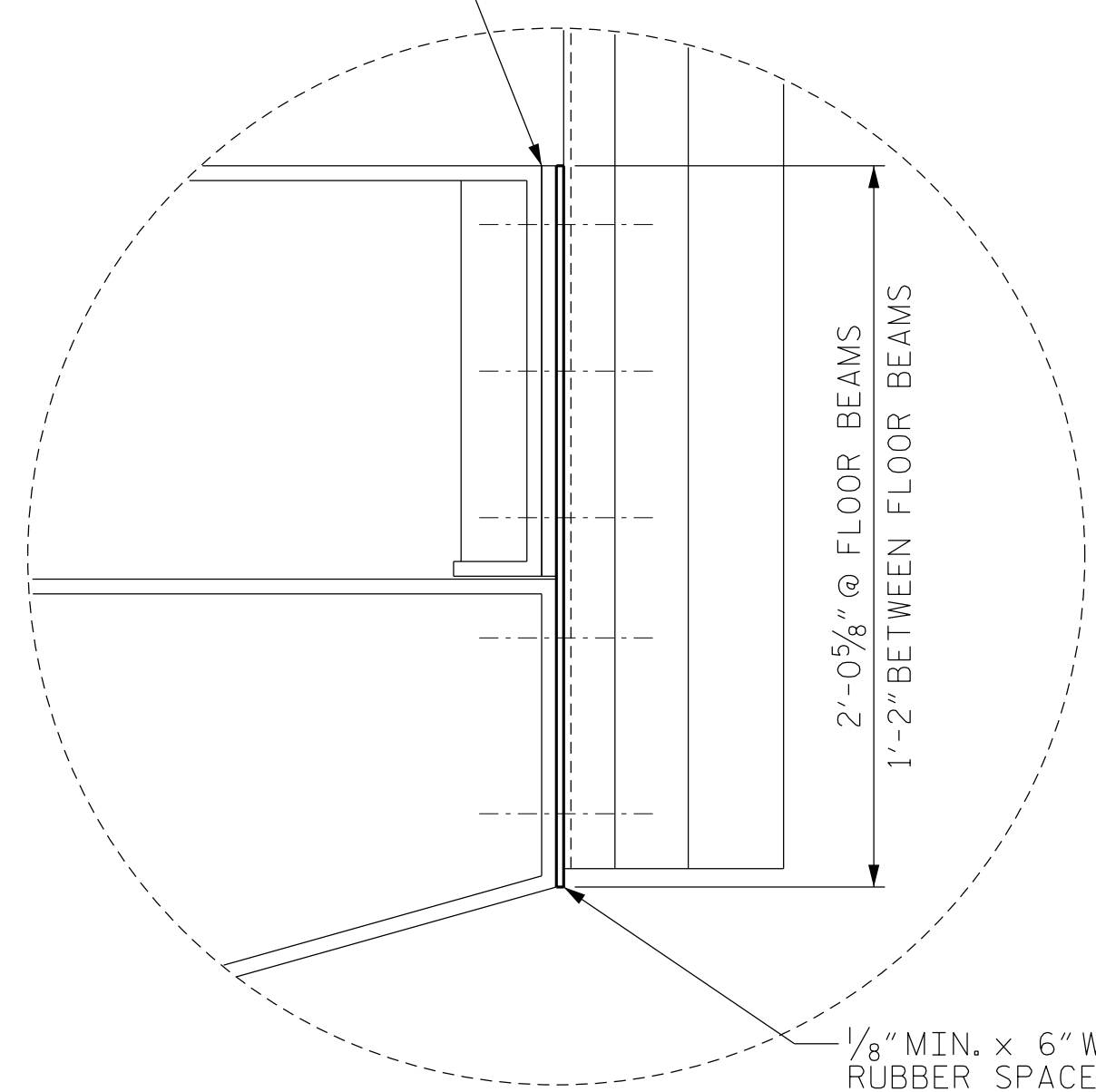
ATTACHMENT ASSEMBLY

FOR ATTACHMENT OF THE 3-BAR METAL RAIL TO THE EXISTING STRUCTURE:
 MATERIAL FOR BOLTS SHALL BE ASTM A325.
 BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.
 MATERIAL FOR NUTS SHALL BE ASTM A563DH.
 MATERIAL FOR WASHERS SHALL BE ASTM F436-1. USE ISOLATION WASHERS SUITABLE FOR EXTERIOR USE.
 RUBBER SHIMS SHALL BE 60 DUROMETER HARDNESS.
 SPACER PLATES SHALL BE ASTM A36.
 ALL MATERIALS AND HARDWARE FOR ATTACHMENT TO THE EXISTING STRUCTURE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS AND SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M111.
 THE COST OF THE ATTACHMENT ASSEMBLY WITH BOLTS, NUTS, WASHERS, SPACER PLATES, AND RUBBER SHIMS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF RAIL RETROFIT (3-BAR METAL RAIL).
 CERTIFIED MILL REPORTS ARE REQUIRED FOR ALL THE MATERIALS OF THE ATTACHEMENT ASSEMBLY.

GENERAL NOTES

COORDINATE THIS SHEET WITH OTHER SHEETS FOR RAIL RETROFIT IN THE SWING SPAN.
 COORDINATE THIS SHEET WITH SHEETS FOR RAIL RETROFIT IN APPROACH SPANS.
 FOR 3-BAR METAL RAIL, SEE SPECIAL PROVISIONS FOR RAIL RETROFIT.
 REMOVE THE EXISTING RAIL IN THE SWING SPANS, AS SHOWN IN THIS SHEET.
 PRIOR TO ORDERING MATERIALS, THE CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY THE LOCATIONS OF THE LOWER CONNECTION BOLTS ON THE EXISTING METAL CURB.

ADDITIONAL SPACER PLATES MAY BE REQUIRED AT ENDS OF SPAN TO ALIGN TOP 2 METAL RAILS WITH APPROACH SPAN METAL RAILS



DETAIL "A"

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

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

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

SHEET 2 OF 3

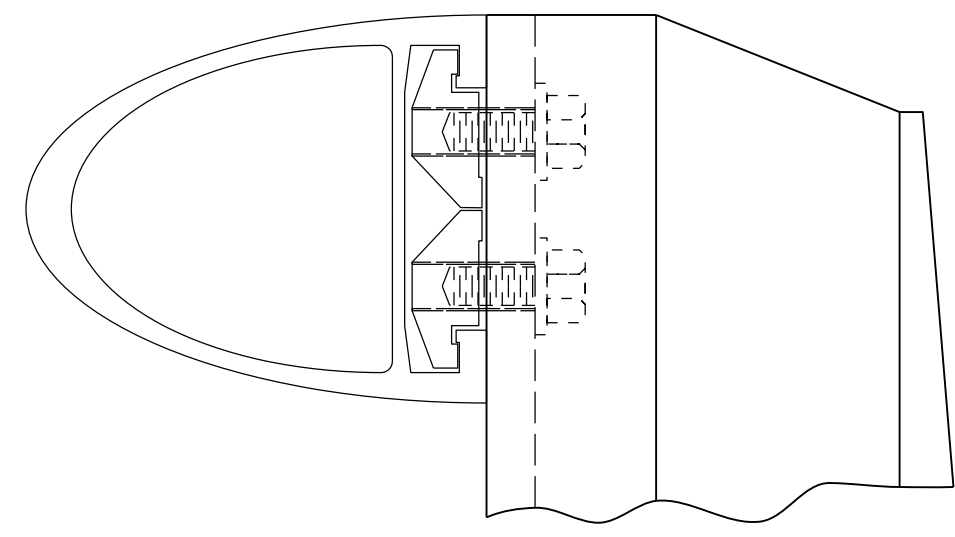


DocuSigned by:
 Jacob H. Duke
 9CD53ADCC66D6400
 3/14/2019

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**RAIL RETROFIT
 IN SWING SPAN**
 MODIFIED STANDARD
 3 BAR METAL RAIL

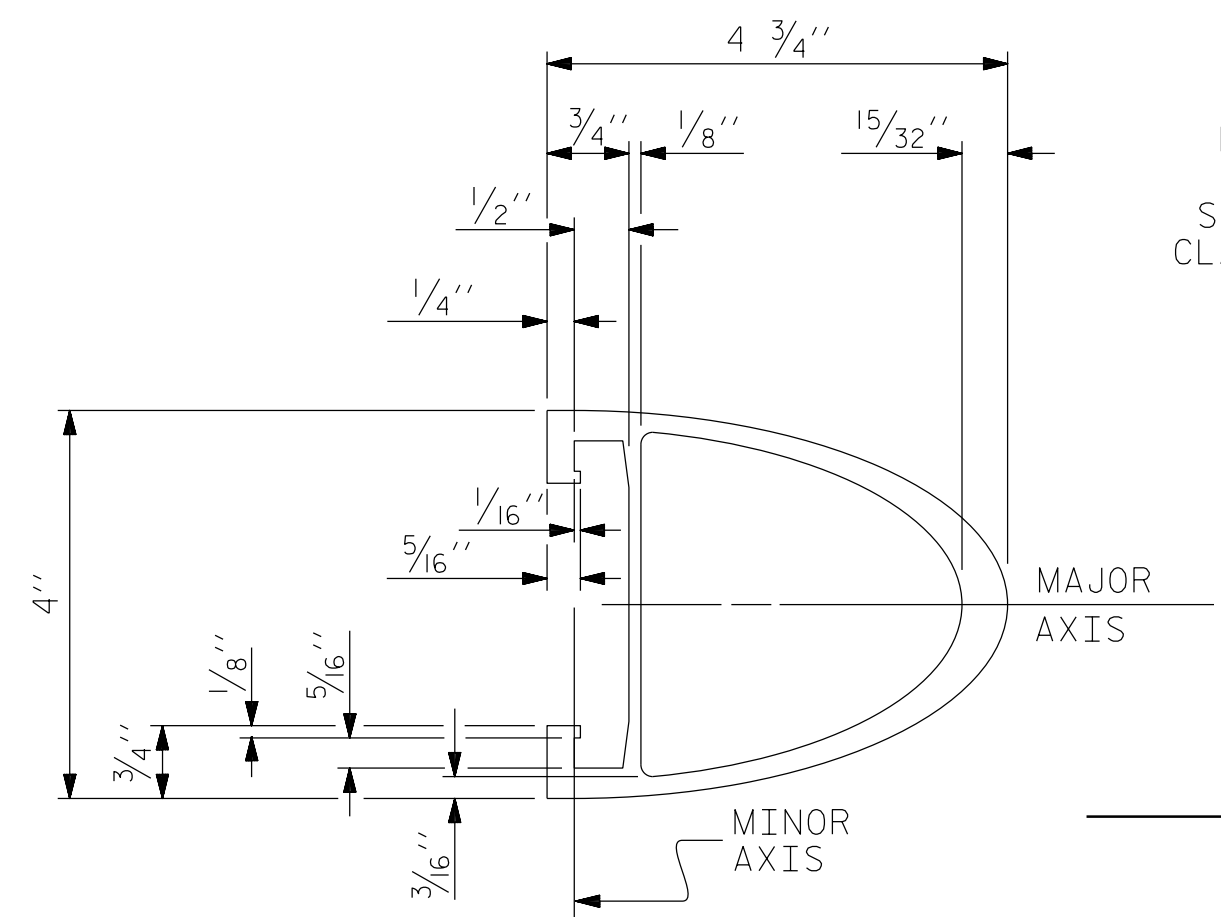
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			57

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

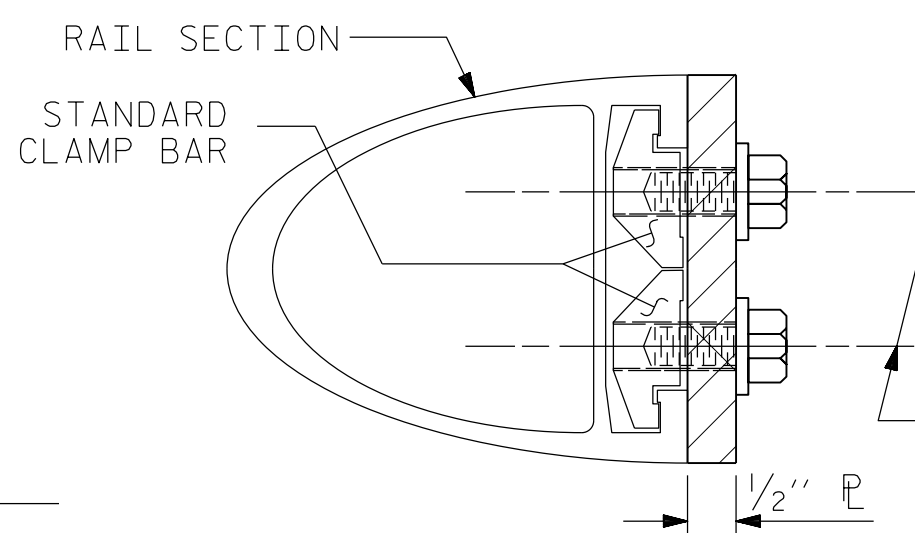


CLAMP ASSEMBLY

TOP RAIL SHOWN
(MIDDLE & BOTTOM RAIL ARE SIMILAR)

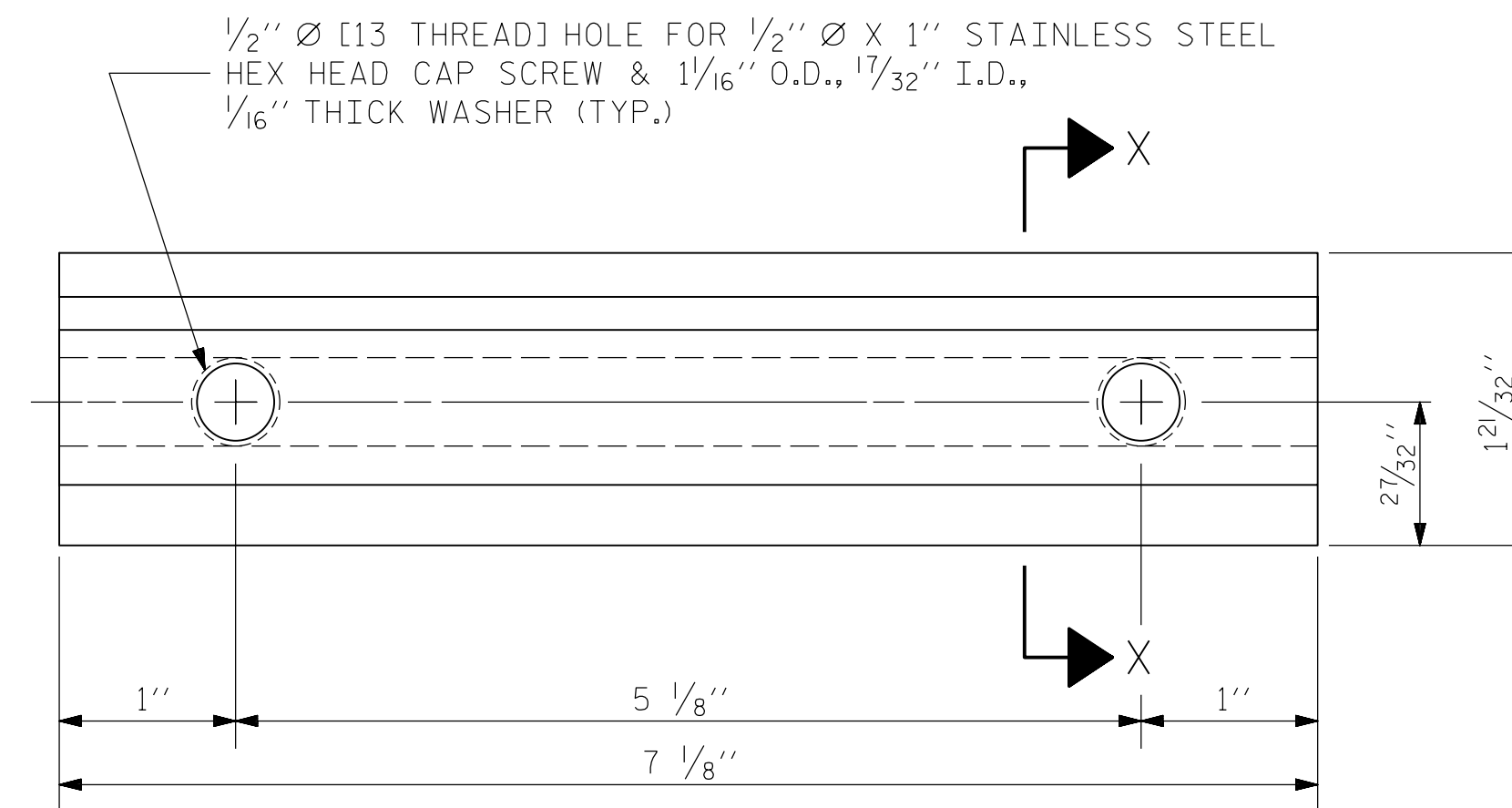


TOP & MIDDLE RAIL SECTION

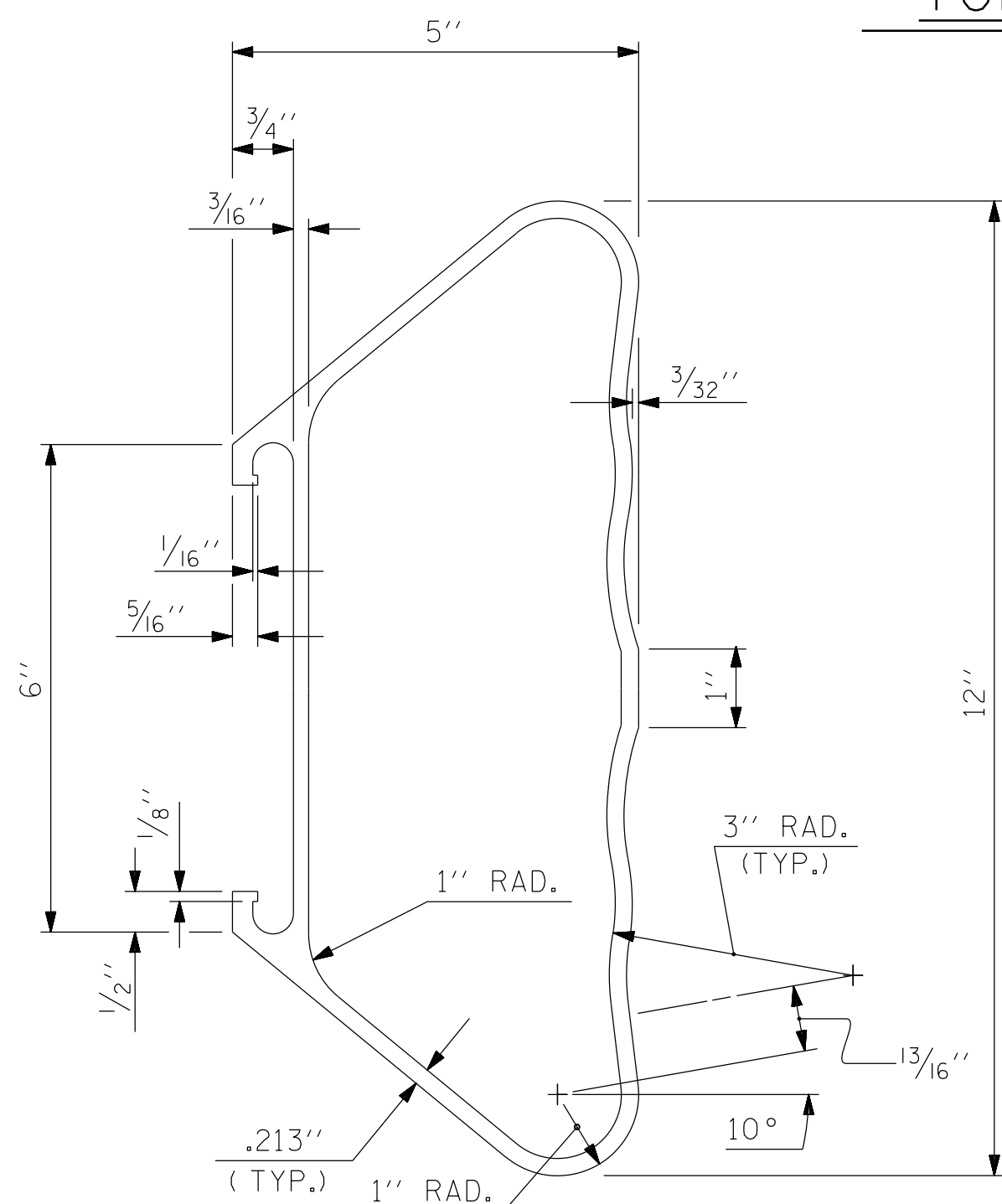


SECTION WITH CLAMP BARS

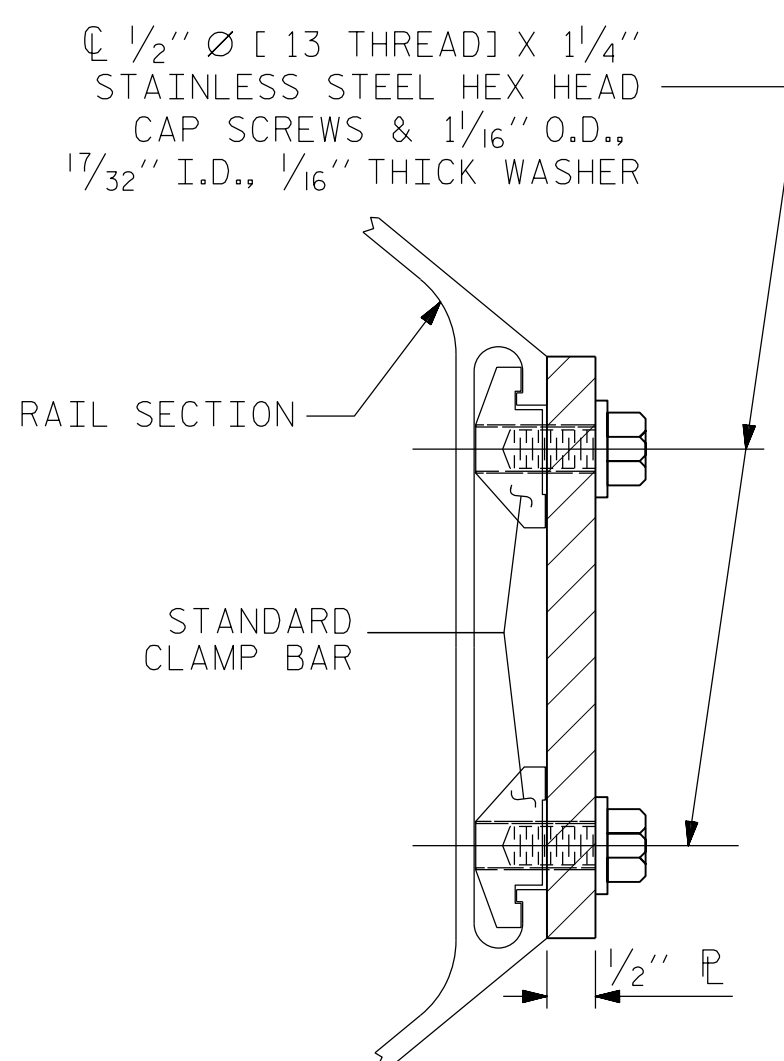
(FOR TOP & MIDDLE RAIL)



ELEVATION

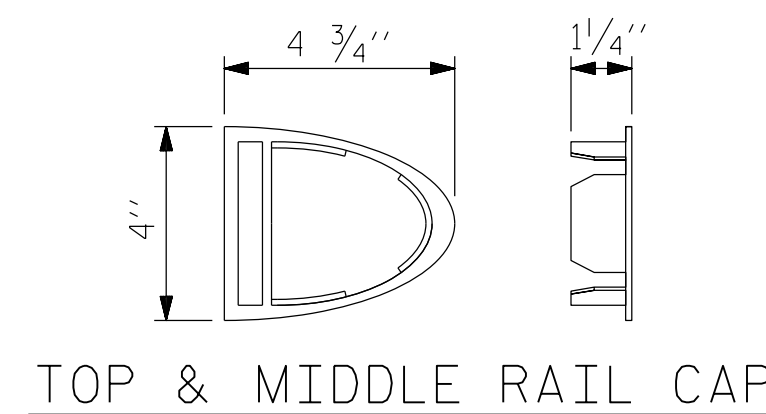


BOTTOM RAIL SECTION

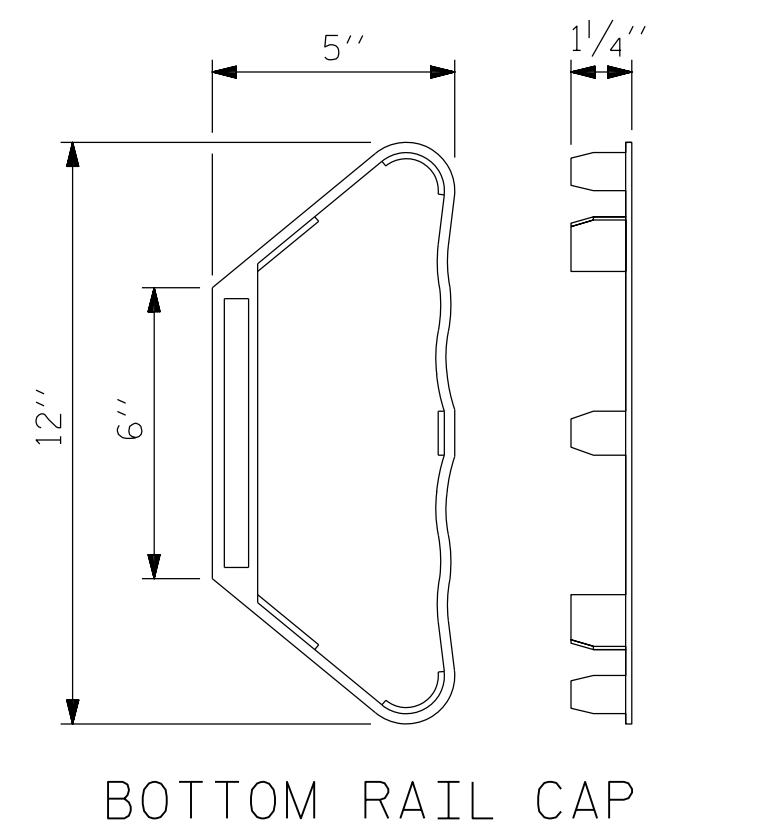


SECTION WITH CLAMP BARS

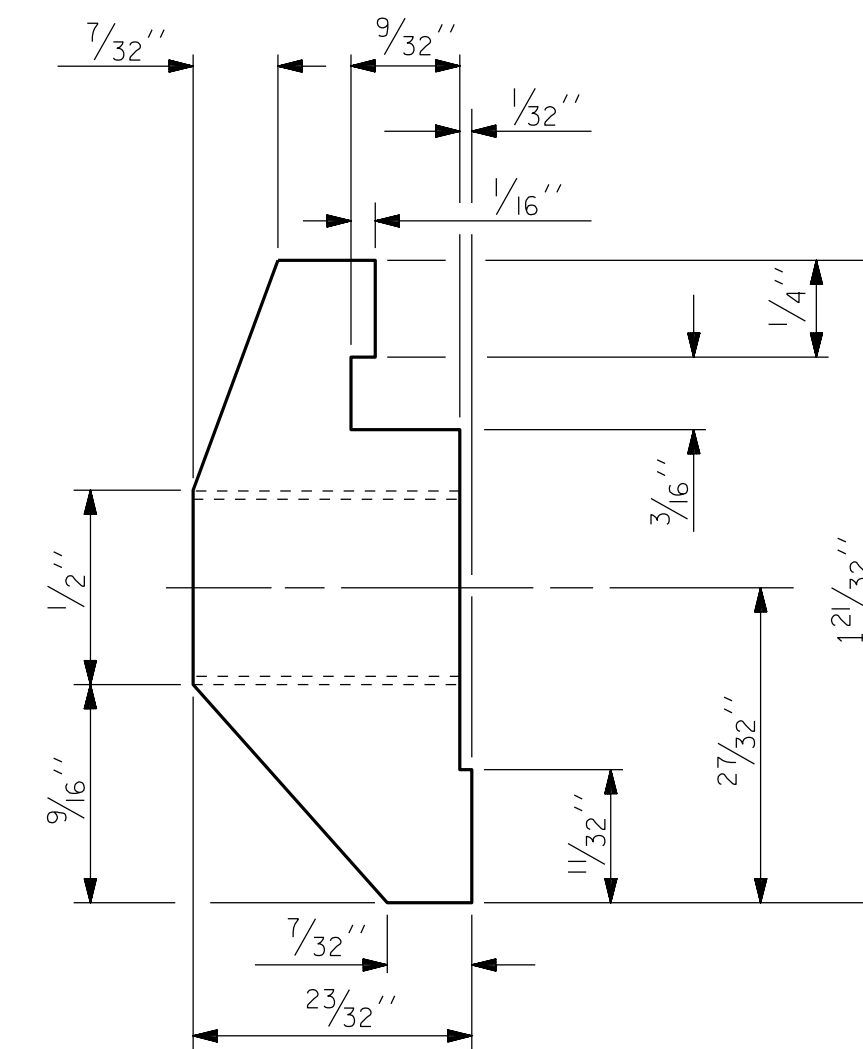
(FOR BOTTOM RAIL)



TOP & MIDDLE RAIL CAP



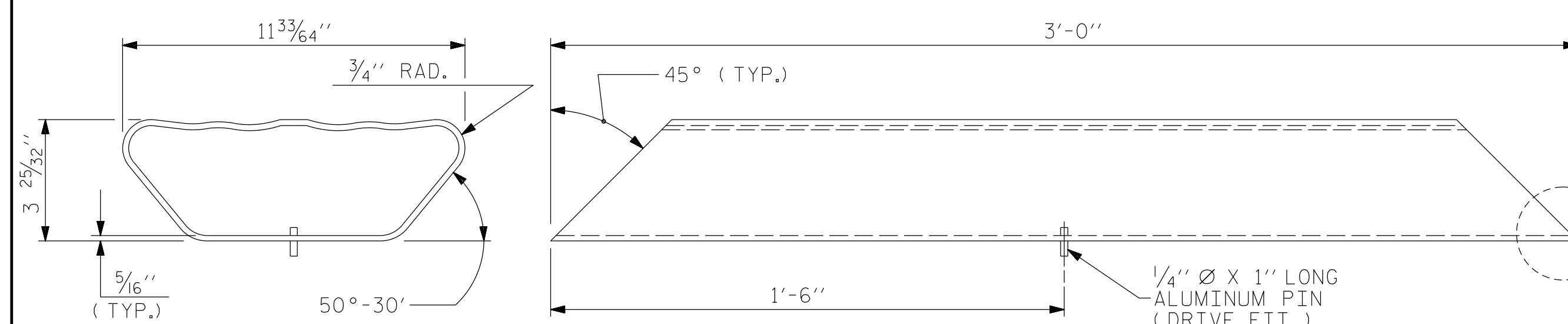
BOTTOM RAIL CAP



SECTION X-X

CLAMP BAR DETAIL

(6 REQUIRED PER POST)

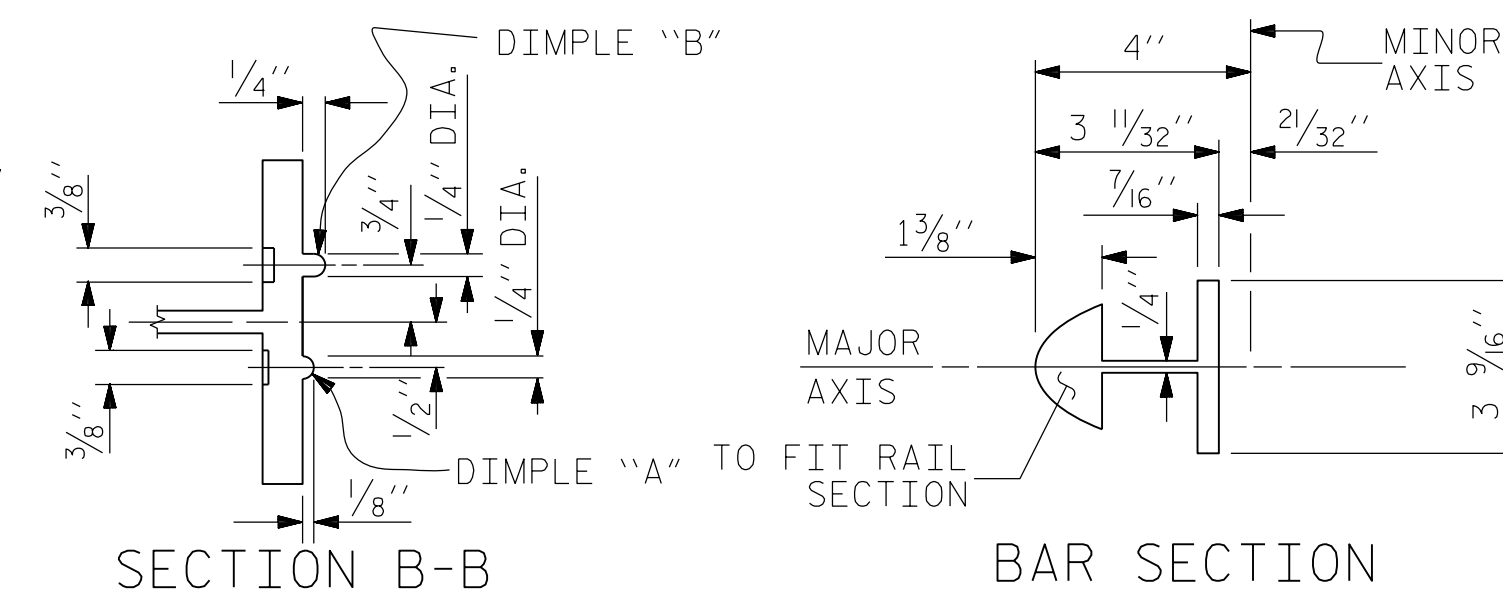


END VIEW

PLAN VIEW

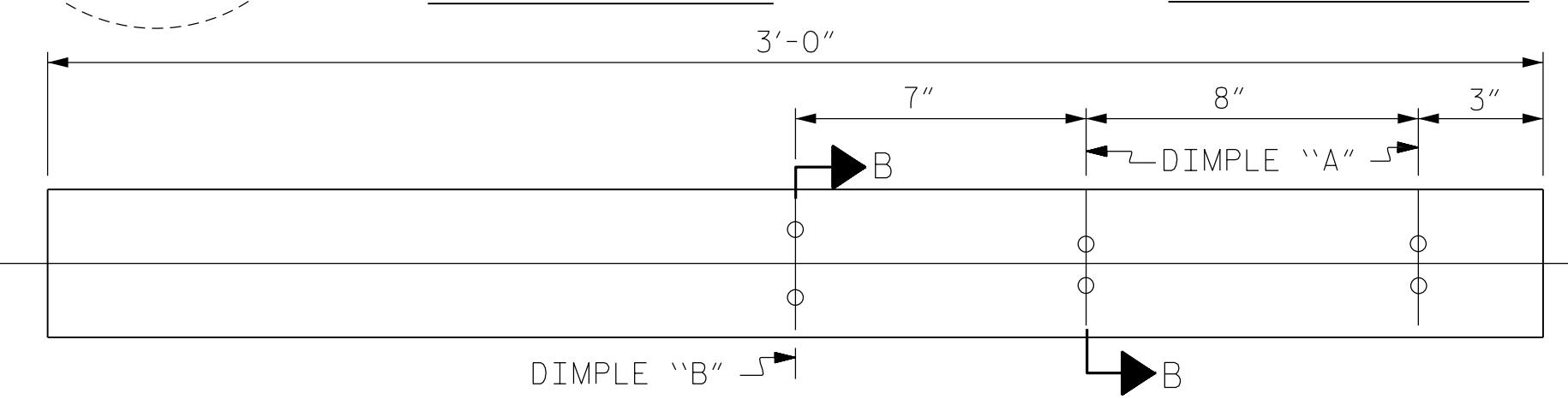
BOTTOM RAIL EXPANSION BAR

BREAK 1/8" RAD. WITH GRINDER - BOTH ENDS



SECTION B-B

BAR SECTION



BACK ELEVATION

TOP & MIDDLE RAIL EXPANSION BAR

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

SHEET 3 OF 3



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

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**RAIL RETROFIT
 IN SWING SPAN
 MODIFIED STANDARD
 3 BAR METAL RAIL**

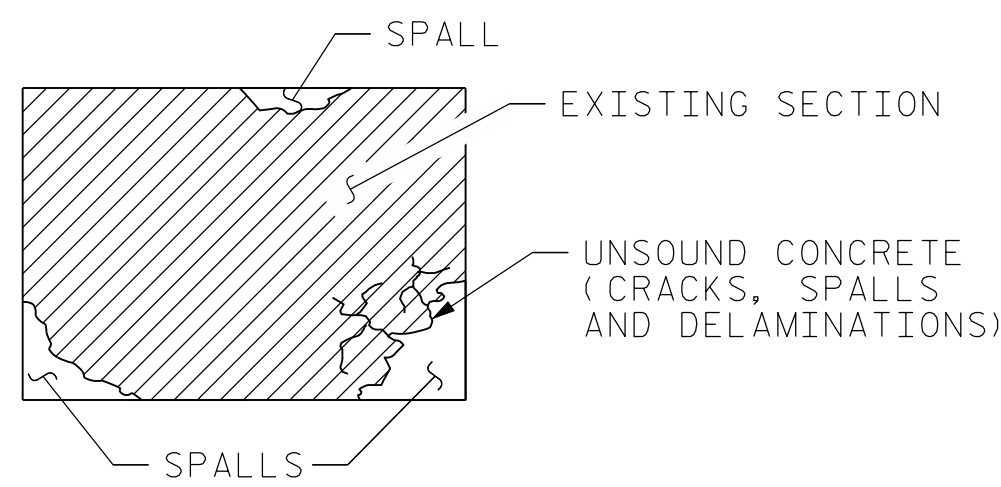
KCA 301 FAYETTEVILLE ST., SUITE 1500
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601
 (919) 882-7839
 LICENSE #: C-1506

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

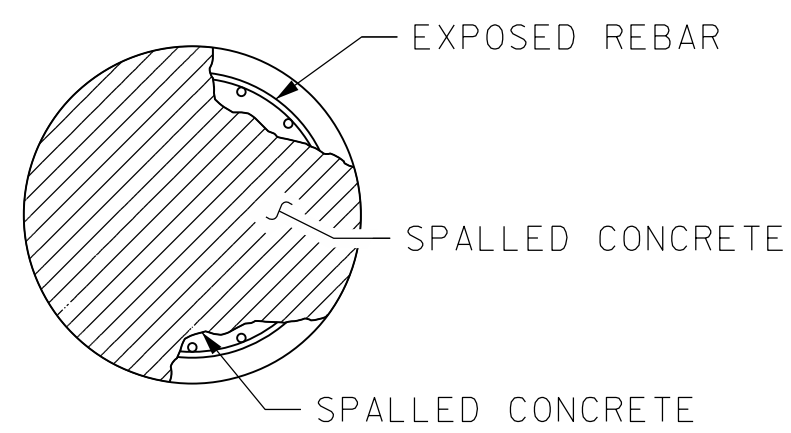
3/14/2019
 15BPR.42_SMU_RF33_060025.dgn
 daguirre

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

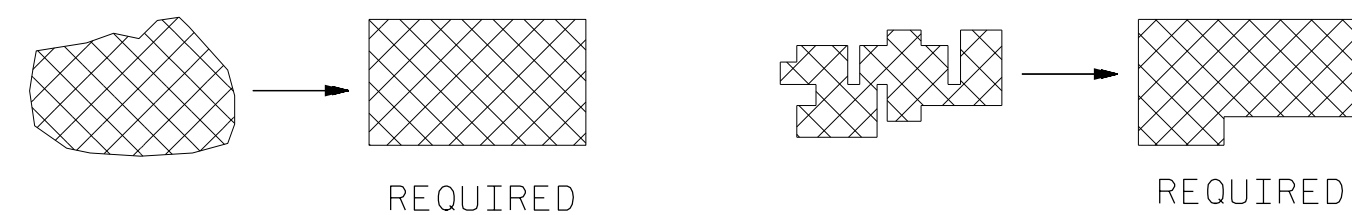
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			57



TYPICAL DELAMINATIONS AND SPALLS



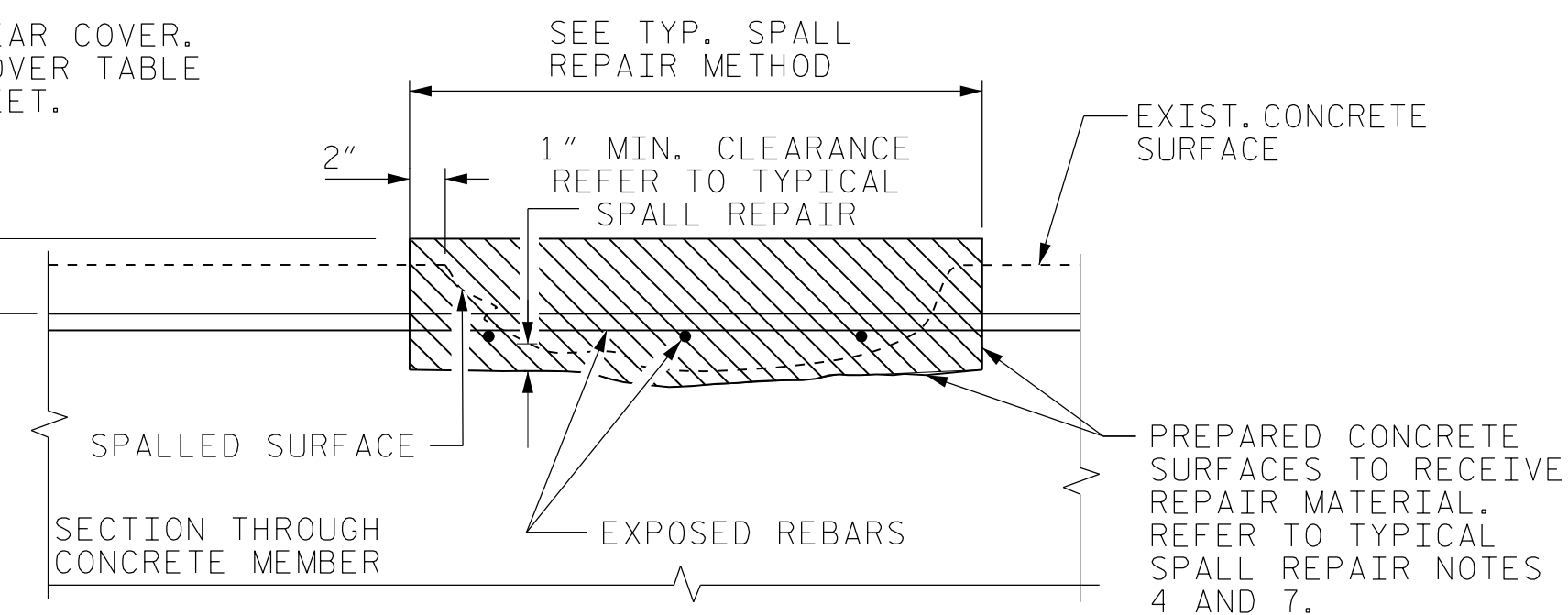
TYPICAL SPALL WITH EXPOSED REBAR



SIMPLE PATCH CONFIGURATION

AT CORNER LOCATIONS PROVIDE RIGHT ANGLE CUTS. PATCH CONFIGURATION SHALL BE KEPT AS SIMPLE AS POSSIBLE. INDIVIDUAL REPAIR AREAS WITHIN 2 FEET SHALL BE JOINED AT THE DIRECTION OF THE ENGINEER.

MINIMUM CLEAR COVER. SEE MIN. COVER TABLE IN THIS SHEET.



EXPOSING AND UNDERCUTTING REINFORCING STEEL

APPLICABLE TO HORIZONTAL, VERTICAL, AND OVERHEAD LOCATIONS

STRUCTURE ELEMENT	COVER	
	ALL OTHER SITES	CORROSIVE SITES
Bridge Deck to top of slab to bottom of slab	2 1/2" (65mm) 1 1/4" (32mm)	2 1/2" (65mm) 1 1/4" (32mm)*
Footings and Pile Caps to top face to all other faces	2" (50mm) 3" (75mm)	4" (100mm) 4" (100mm)
Bent Caps to bottom of cap to ends of cap to top of cap to sides of cap	3" (75mm) 2" (50mm) 3" (75mm) 2" (50mm)	4" (100mm) 3" (75mm) 3" (75mm) 3" (75mm)
Columns (spiral)	2" (50mm)	3" (75mm)
Drilled Piers (spiral)	5" (125mm)**	6" (150mm)**
Culverts to bottom of bottom slabs and footings to all other faces	3" (75mm) 2" (50mm)	3" (75mm) 2" (50mm)
Approach Slabs	2" (50mm)	2" (50mm)

* WHEN USING REMOVEABLE FORMS, COVER SHALL BE INCREASED TO 2 1/2"

** IN THE EVENT THE DRILLED PIER EXTENDS INTO A BENT CAP OR PILE CAP, THE COVER MAY BE REDUCED TO 4"

TYPICAL SPALL REPAIR

- FOR CONCRETE RESTORATION, REMOVE AND REPAIR UNSOUND CONCRETE FROM AREAS TO BE REPAIRED IN ACCORDANCE WITH THIS SHEET AND THE PROJECT SPECIAL PROVISIONS. AREAS WELL ADHERED TO EXISTING STRAND OR REINFORCEMENT SHALL REMAIN.
- ALL UNSOUND CONCRETE MUST BE REMOVED. HOWEVER, PRESTRESSED STRANDS SHOULD NOT BE DISTURBED UNLESS ABSOLUTELY NECESSARY. USE EXTREME CARE TO NOT DAMAGE STRANDS.
- ALL REPAIRS SHALL BE MARKED FOR APPROVAL OF APPROXIMATE PERIMETER PRIOR TO INITIATION OF WORK.
- THE CONTRACTOR SHALL SUBMIT A PLAN FOR CONTROL AND DISPOSAL OF DEBRIS TO THE ENGINEER FOR APPROVAL.
- ANY REINFORCEMENT WHICH IS LOOSE SHALL BE SECURED IN PLACE BY TYING TO OTHER SECURED BARS OR BY OTHER APPROVED METHODS. LAP SPLICES SHALL BE INSTALLED IN ACCORDANCE WITH THE TABLE BELOW. REFER TO GENERAL NOTES FOR DOWEL DETAIL (IF NECESSARY).
- CLEAN EXPOSED REBARS AND ANY LOOSE CONCRETE OR ABRASIVES BY SANDBLASTING OR APPROVED ALTERNATE. CLEANED STEEL SHALL NOT BE LEFT EXPOSED FOR MORE THAN 72 HOURS PRIOR TO ENCAPSULATION OF CONCRETE.
- AN APPROVED CEMENTITIOUS BASED BONDING AGENT SHALL BE USED ON ALL EXPOSED CONCRETE SURFACES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS BEFORE THE REPAIR MATERIAL IS APPLIED.
- FILL VOIDS WITH REPAIR MATERIAL IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS AND NCDOT SPECIFICATIONS. NOTE THAT ANY REPAIR MATERIAL APPLIED TO OVERHEAD LOCATIONS SHALL BE SPECIFICALLY DESIGNATED FOR OVERHEAD USE BY THE MANUFACTURER'S SPECIFICATIONS.

TYPICAL CRACK REPAIR

- OBTAIN ENGINEER'S APPROVAL TO CARRY OUT CRACK REPAIR (IN LIEU OF SPALL REPAIR) FOR CASES WHERE ADJACENT CONCRETE IS OTHERWISE SOUND AND CRACKING IS NOT A RESULT OF CORRODING REINFORCEMENT.
- ADDRESS CRACKS IN NEW CONSTRUCTION IN ACCORDANCE WITH PROJECT SPECIAL PROVISIONS. ADDRESS EXISTING CRACKS IN ACCORDANCE WITH THIS SHEET AND PROJECT SPECIAL PROVISIONS.
- REMOVE UNSOUND CONCRETE FROM CRACK AREA.
- THE CONTRACTOR SHALL SUBMIT A PLAN FOR CONTROL AND DISPOSAL OF DEBRIS TO THE ENGINEER FOR APPROVAL.
- FOR CRACKS UP TO 1/8" USE AN EPOXY RESIN WITH MINIMUMS OF VISCOSITY OF 325 CPS, 28 DAY COMPRESSIVE STRENGTH OF 13000 PSI. FOR CRACKS 1/8" TO 1/4", USE AN INJECTION GEL OR EQUAL NON-SAG PASTE WITH 28 DAY COMPRESSIVE STRENGTH OF 10000 PSI.
- TO SEAL CRACK SURFACES PRIOR TO CRACK INJECTION, USE INJECTION GEL WITH MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 12000 PSI.
- ENGINEER TO APPROVE CRACK AND CAP SEAL MATERIAL PRIOR TO BEGINNING OF CONSTRUCTION.
- APPLY CLASS II FINISH AT COMPLETION OF CRACK REPAIR TO REMOVE FINS OR KNOBS.

RC GIRDER REPAIR

- SOUND CONCRETE TO DETERMINE EXTENTS OF REPAIR LOCATION.
- REMOVE SURFACE CONCRETE TO VERIFY THAT SAW CUT DEPTH WILL NOT DAMAGE EXISTING REINFORCING STEEL. SAW CUT AROUND REPAIR AREA TO A NOMINAL DEPTH OF 1/2".
- IF AFTER UNSOUND CONCRETE REMOVAL ON GIRDERS, MORE THAN 50% SECTION LOSS IS NOTED ON THE REBAR, OR IF SEVERED REBAR IS ENCOUNTERED, NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONCRETE REPAIR.
- REMOVE CONCRETE WITHIN SAW CUT AREA TO A MINIMUM 1/2" DEPTH. IF CONCRETE IS DAMAGED BEYOND THE ORIGINAL SAW CUT, A NEW SAW CUT IS REQUIRED.
- IF MORE THAN HALF THE CIRCUMFERENCE OF A REINFORCING BAR IS EXPOSED DURING THIS PROCESS, REMOVE ADDITIONAL CONCRETE TO 1" BEHIND THE BAR.
- CLEAN ALL EXPOSED REINFORCING BARS. FOR BARS WITH MORE THAN 10% SECTION LOSS, SPLICE AND SECURELY TIE SUPPLEMENTAL REINFORCING BARS AS NEEDED.
- REMOVE ALL LOOSE OR WEAKENED MATERIAL. THEN, CLEAN THE REPAIR AREA OF DIRT, GREASE, OIL, AND FOREIGN MATTER.
- PREPARE SURFACE AND PLACE APPROVED PREPACKAGED MATERIAL ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. MAXIMUM AGGREGATE SIZE FOR REPAIR MATERIAL SHALL NOT EXCEED 2/3 THE MINIMUM REPAIR DEPTH.
- FOR GIRDER REPAIRS, SEE "SUPERSTRUCTURE DEFICIENCIES" SHEETS AND SPECIAL PROVISIONS FOR CONCRETE REPAIRS.

CONCRETE REPAIR NOTES

- PERFORM A SOUNDING SURVEY IN THE PRESENCE OF THE ENGINEER TO IDENTIFY ALL LOCATIONS IN NEED OF CONCRETE REPAIR.
- GAIN CONCURRENCE ON ALL REPAIR AREAS AT EACH LOCATION PRIOR TO COMMENCING WORK AT THE BENT.
- THE DETERIORATED AREAS SHOWN ON OTHER SHEETS ARE BASED ON THE BRIDGE INSPECTION REPORT, AND PARTIAL FIELD REVIEWS OF THE STRUCTURE. AS SUCH, THEY ARE FOR INFORMATIONAL PURPOSES, SUBJECT TO CHANGE BASED ON CONTINUING DETERIORATION.
- GENERALLY EXTEND REPAIR AREAS 2"-3" INTO SOUND CONCRETE BEYOND EDGE OF SPALLS AND SQUARE OFF AREAS IN ACCORDANCE WITH DETAILS ON THIS SHEET.
- THE METHOD USED TO DELINEATE THE AREAS OF UNSOUND CONCRETE TO BE REPAIRED SHALL NOT PERMANENTLY MARK THE CONCRETE, LEAVE ANY RESIDUE AFTER REMOVAL, OR REQUIRE HARS CHEMICALS TO REMOVE.
- THE CONTRACTOR SHALL REMOVE THE DETIRIORATED CONCRETE IN ACCORDANCE WITH THE GUIDELINES SET IN THESE NOTES, IN THE PROJECT SPECIAL PROVISIONS, AND THE STANDARD SPECIFICATIONS.
- REMOVE UNSOUND CONCRETE TO THE EXTENT NECESSARY. MINIMUM OF 1" BEHIND REBAR AND MINIMUM OF 2" CLEARANCE TO SAWCUT.
- REINFORCING STEEL, WHICH IS DETERMINED BY THE ENGINEER TO BE REPLACED, SHALL BE REMOVED TO A POINT WHERE IT IS SOUND. THE PATCH SHALL EXTEND A SUFFICIENT DISTANCE BEYOND THIS POINT TO DEVELOP A SPLICE LENGTH SPECIFIED IN THE TABLE ON THIS SHEET.
- 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.
- CONCRETE COVER SHOWN IN THE PLANS DOES NOT INCLUDE PLACEMENT OR FABRICATION TOLERANCES UNLESS SHOWN AS "MINIMUM COVER". SEE NCDOT SPECIFICATIONS FOR ALLOWABLE REINFORCEMENT PLACEMENT TOLERANCES.
- WHEN PROPOSED CONCRETE REPAIRS (OR DETERMINED LOCATIONS) ARE ADJACENT TO A CORNER, REPAIR ON THE ADJACENT EDGE SHOULD BE ANTICIPATED IN ADDITION TO THE AREA SHOWN ON SUBSTRUCTURE CONCRETE REPAIR SHEETS. THE CONTRACTOR IS RESPONSIBLE FOR THIS REPAIR AT ALL LOCATIONS REGARDLESS OF CALL-OUT(S) ON RESPECTIVE SHEET(S).
- FINISH CONCRETE SURFACES IN ACCORDANCE WITH THE LATEST NCDOT SPECIFICATIONS. MATCH EXISTING FINISH ON ALL EXPOSED EDGES UNLESS OTHERWISE NOTED. A CLASS 5 FINISH COATING SHALL BE APPLIED TO THE BEAM ENDS WHERE CONCRETE REPAIRS HAVE BEEN PERFORMED, MATCHING THE COLOR OF SURROUNDING CONCRETE.
- ALL REINFORCING STEEL SHALL BE ASTM A615-96, GRADE 60. REINFORCEMENT DETAIL DIMENSIONS ARE OUT-TO-OUT OF BARS. ALL DIMENSIONS PERTAINING TO LOCATION OF REINFORCEMENT ARE TO CENTERLINE OF BARS EXCEPT WHERE THE CLEAR DIMENSION IS SHOWN TO FACE OF CONCRETE. ANY DAMAGE TO EXISTING REINFORCING STEEL, DURING CONTRACTOR'S OPERATIONS, SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER AND PERFORMED AT NO ADDITIONAL COST TO THE DEPARTMENT.
- FOR ADHESIVELY ANCHORED DOWELS OR ANCHOR BOLTS, SE STANDARD SPECIFICATIONS.
- FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.
- FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.
- FOR EPOXY RESIN INJECTION (ERI), SEE SPECIAL PROVISIONS.
- FOR SUPERSTRUCTURE REPAIRS SEE "SUPERSTRUCTURE REPAIRS" SHEETS.
- FOR SUBSTRUCTURE REPAIRS SEE "CONCRETE RESTORATION DETAILS" SHEET 2 OF 2 AND "SUBSTRUCTURE CONCRETE REPAIRS" SHEETS.
- FOR DOWEL DETAILS, MINIMUM COVER, AND LAP SPLICE LENGTHS, SEE "CONCRETE RESTORATION DETAILS" SHEET 2.

BAR SIZE	LAP SPLICE LENGTH
4	1'-9"
5	2'-2"
6	2'-7"
7	3'-6"
8	4'-6"
9	5'-10"
10	7'-4"

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

SHEET 1 OF 2



DocuSigned by:
 Jacob H. Duke
 9C053AD6606400
 3/14/2019

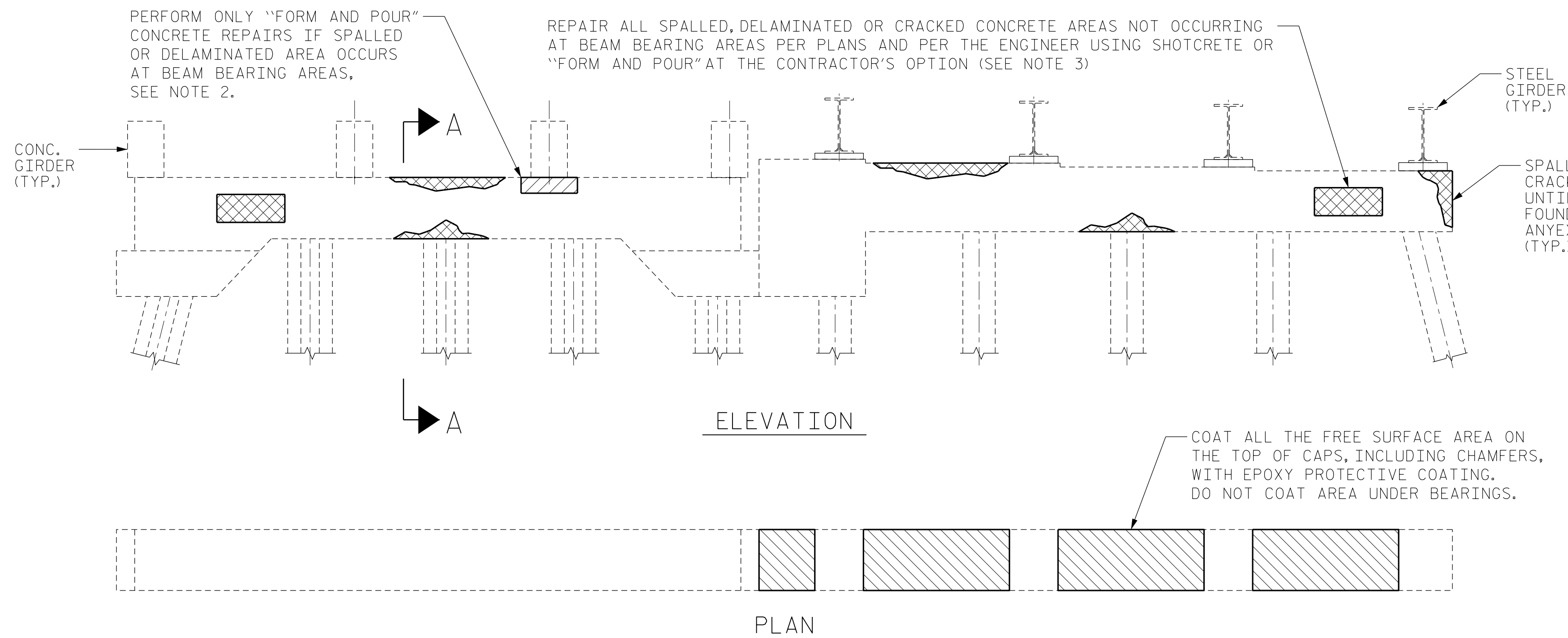
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 CONCRETE RESTORATION DETAILS

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

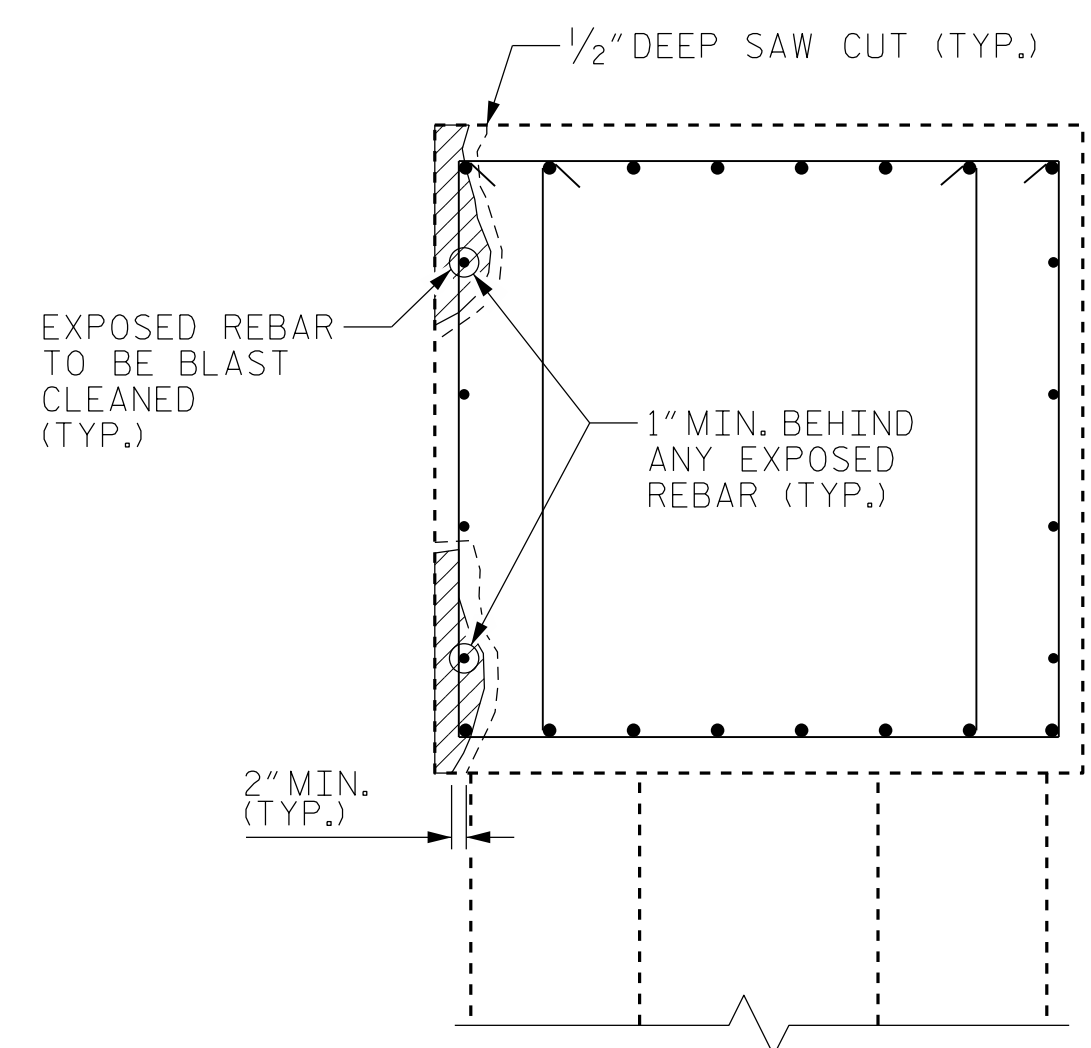
DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

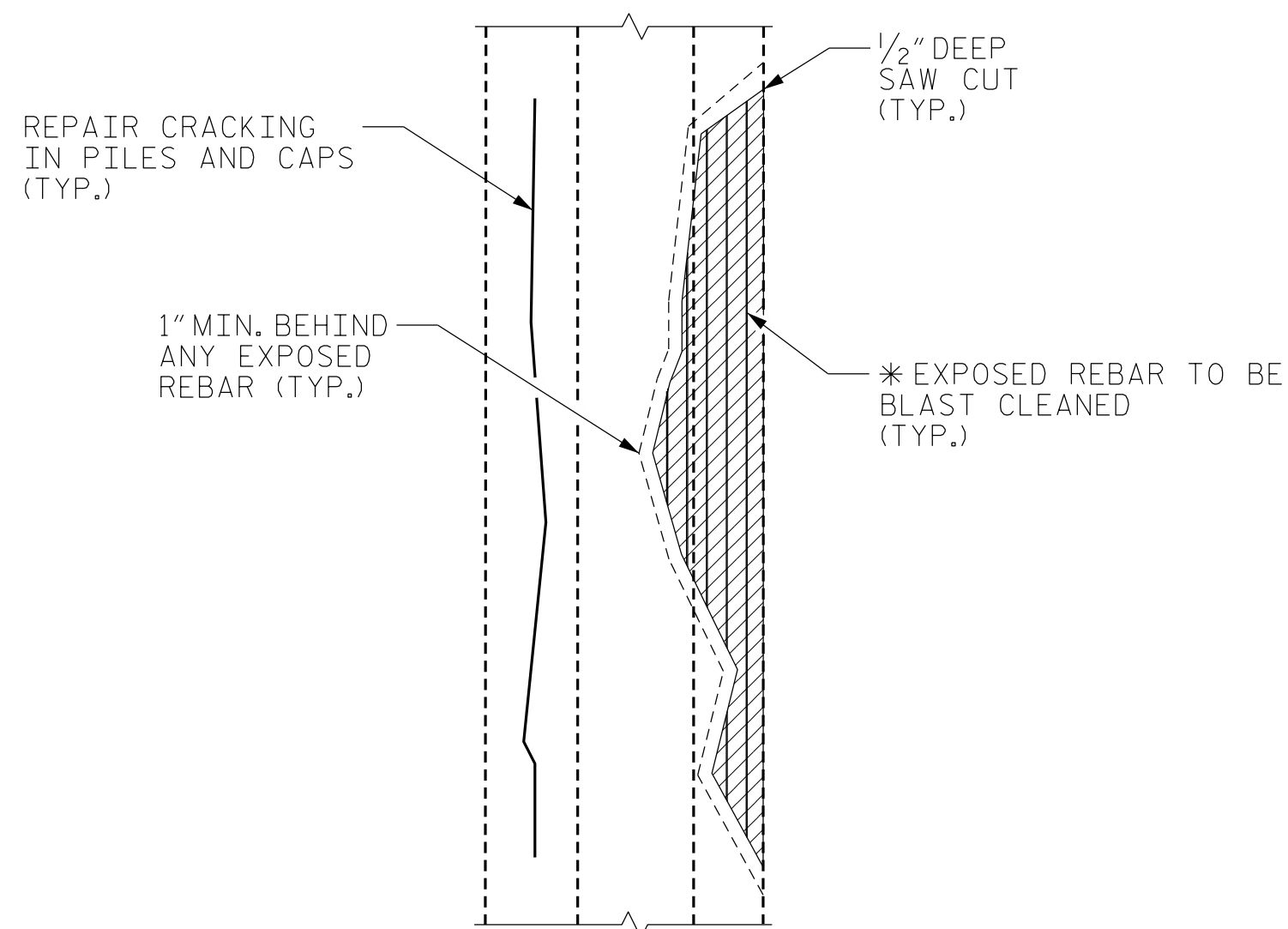
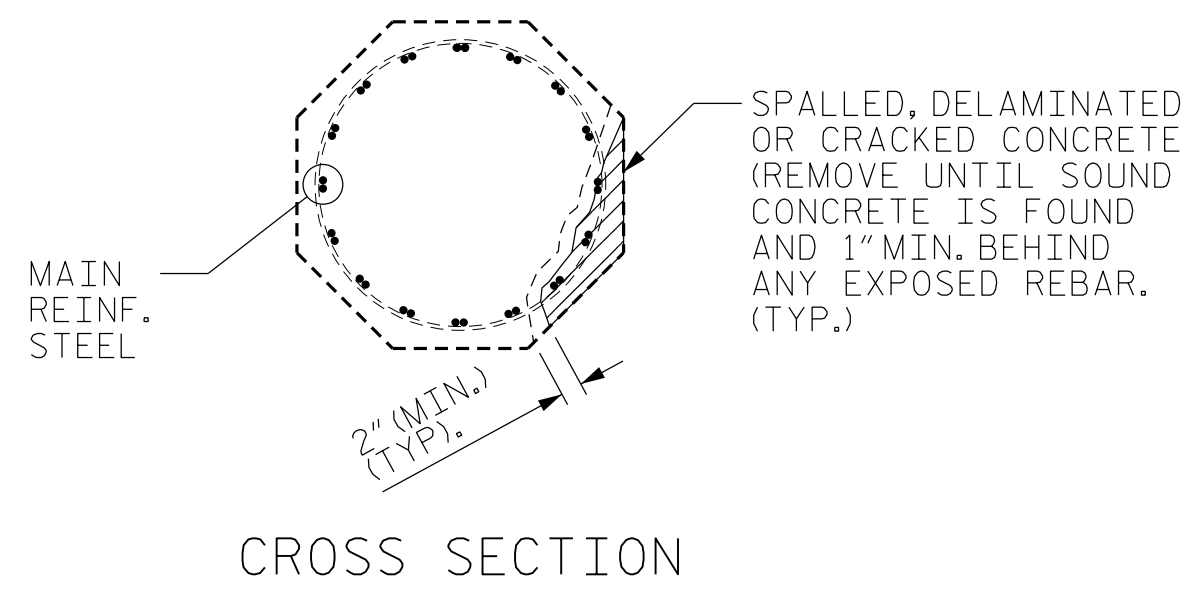
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			57



BENT CAP REPAIRS



(CIRCULAR SECTION SHOWN, SIMILAR FOR OTHER SHAPES)



PILE REPAIRS

(PILE SHAPE VARIES, SIMILAR FOR OTHER SHAPES)
 * REPAIR LENGTH SHALL NOT EXCEED 10 VERTICAL FEET AT ONCE OR 1/2 PILE DIAMETER.

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

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

3/14/2019
 15BPR.42_SMU.CR02.060025.dgn
 daguirre

SUBSTRUCTURE REPAIR NOTES:

- WORK THIS SHEET WITH REPAIR METHODS AND CONCRETE REPAIR NOTES IN "CONCRETE RESTORATION DETAILS" SHEET 1 OF 2.
- TYPICAL BENT CAP REPAIRS ARE SHOWN IN THIS SHEET. REPAIR DETAILS SIMILAR FOR END BENT CAPS.
- THE METHOD USED TO DELINEATE THE AREAS OF UNSOUND CONCRETE TO BE REPAIRED SHALL NOT PERMANENTLY MARK THE CONCRETE, LEAVE ANY RESIDUE AFTER REMOVAL, OR REQUIRE HARSH CHEMICALS TO REMOVE.
- THE CONTRACTOR SHALL REMOVE THE DETERIORATED CONCRETE IN ACCORDANCE WITH THE GUIDELINES SET IN THESE NOTES, IN THE SPECIAL PROVISIONS, AND THE STANDARD SPECIFICATIONS.
- REMOVE UNSOUND CONCRETE TO THE EXTENT NECESSARY, A MINIMUM OF 1" BEHIND REBAR AND MINIMUM CLEARANCE OF 2" TO SAWCUT.
- REINFORCING STEEL WHICH IS DETERMINED BY THE ENGINEER TO BE REPLACED, SHALL BE REMOVED TO A POINT WHERE IT IS SOUND. THE PATCH SHALL EXTEND A SUFFICIENT DISTANCE BEYOND THIS POINT TO DEVELOP A SPLICE LENGTH SPECIFIED IN THE TABLE ON THIS SHEET.
- IF ANY AREA IS DETERMINED TO BE UNSTABLE DURING THE REPAIR PROCESS AS DETERMINED BY THE ENGINEER, STOP THE CURRENT REPAIR PROCEDURE, SHORE THE AREA AND PERFORM A "FORM AND POUR" CONCRETE REPAIR.
- NO MORE THAN 30% OF THE CAP OR PILE CROSS SECTIONAL AREA SHALL BE REMOVED AT ONE TIME. SHOULD IT BECOME NECESSARY TO REMOVE MORE THAN 30% OF THE CROSS SECTIONAL AREA, NOTIFY THE ENGINEER PRIOR TO PROCEEDING.
- SIMULTANEOUS REMOVAL OF UNSOUND CONCRETE MAY BE PERMITTED ON MORE THAN ONE FACE OF A CAP AND/OR PILE, SO LONG AS THE AREAS OF REMOVAL ARE NOT ADJACENT TO OR DIRECTLY OPPOSITE ONE ANOTHER. IF REMOVAL EXTENDS MORE THAN 1/2" BEHIND THE MAIN REINFORCING BARS, NOTIFY THE ENGINEER PRIOR TO PROCEEDING.
- COAT ALL THE FREE SURFACE AREA ON THE TOP OF CAPS, INCLUDING CHAMFERS, WITH EPOXY PROTECTIVE COATING. DO NOT COAT AREA UNDER BEARINGS.
- SHOTCRETE REPAIRS TO THE BENT CAPS MAY REQUIRE BRIDGE JACKING. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.
- AT THE TIME OF PREPARATION OF THESE PLANS, IT WAS NOT ANTICIPATED THAT "BRIDGE JACKING" WOULD BE REQUIRED. HOWEVER, IT MAY BE DETERMINED IN THE FIELD THAT "BRIDGE JACKING", 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.
- FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.
- FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.
- FOR EPOXY RESIN INJECTION (ERI), SEE SPECIAL PROVISIONS.
- FOR SUBSTRUCTURE REPAIRS, SEE "SUBSTRUCTURE REPAIRS" SHEETS.
- FOR EPOXY COATING, SEE SPECIAL PROVISIONS AND STANDARD SPECIFICATIONS SECTION 420-18.

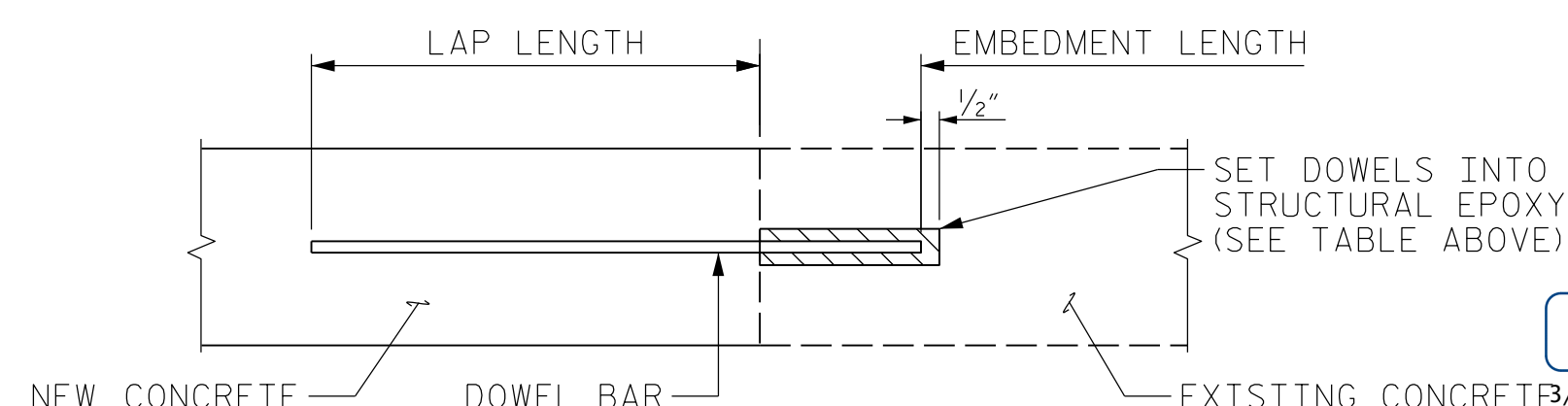
DOWEL DETAILS & NOTES

DOWEL DIMENSIONS (UNLESS OTHERWISE NOTED)			
DOWEL SIZE	HOLE DIAMETER	EMBEDMENT LENGTH	MIN LAP LENGTH
4	5/8"	8"	1'-9"
5	3/4"	9"	2'-2"
6	7/8"	11"	2'-7"
8	1 1/8"	1'-4"	4'-6"

NOTES: ANY REQUIRED DOWEL HOLES SHALL BE DRILLED INTO EXISTING CONCRETE ACCORDING TO THE DETAIL AND NCDOT SPECIFICATIONS.

NOTIFY THE ENGINEER OF ANY BROKEN BARS OR BARS WHICH ARE DETERMINED TO HAVE A SECTION LOSS OF 25% OR GREATER.

INSTALL DOWELS IN ACCORDANCE WITH NCDOT SPECIFICATIONS.



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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
CONCRETE RESTORATION DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.	S-18
TOTAL SHEETS	57

Beaufort 25								As-Built Quantities		
Span #	Component	Location (ft. from nearest bent, etc)	Bent #	Defect Description	Length (ft.)	Width (ft.)	Assumed Depth (ft.)	Actual Resin Repairs (ft.)	Actual Concrete Repairs (C.F.)	Actual Depth (ft.)
1	Deck	Along bay 4, end diaphragm at bent 1	1	Spall	3.5	1	0.5			
1	Deck	Along underside bay 6, 10' from bent 1	1	Spall	1.5	3.5	0.5			
1	Right Bridge Rail	East curb at south approach		Cracking	4					
2	Deck	Along bay 1, end of diaphragm at bent 1	1	Spall	2	2.5	0.5			
6	Deck	Along underside bay 6, 8' from bent 5	7	Spall	1.5	2	0.5			
6	Deck	Along underside bay 5, 1'-6" from bent 5	5	Spall	5.5	3.5	0.5			
6	Deck	Along underside bay 5, at bent 5	5	Spall	3.5	1	0.5			
6	Wearing Surface	Left northbound lane at bent 7	7	Spall	1	0.5	0.5			
6	Wearing Surface	Left southbound lane at bent 6	6	Spall	8.5	1	0.5			
7	Deck	Along the underside in bay 7 at bent 6	6	Spall	1.5	1.5	0.5			
7	Deck	Along the underside in bay 3, 11' from bent 7	7	Spall	2	1	0.5			
8	Deck	Along undrside in bay 7 at midspan		Spall	2	1.25	0.5			
10	Deck	Along underside in bay 5, 6' from bent 11	11	Spall	1.25	1.5	0.5			
10	Deck	In right overhang		Spall	1	0.75	0.5			
11	Deck	Along the bay 5, end diaphragm to girder 5 at bent 11	11	Spall	0.5	0.5	0.5			
11	Deck	Along the underside in bay 5 at bent 10	10	Spall	1.5	1.5	0.5			
11	Deck	Underside in bay 6 adjacent to girder 6		Spall	1	0.5	0.5			
11	Deck	Underside in bay 7 adjacent to girder 8, 2' from bent 10	10	Spall	1.5	1.5	0.5			
11	Girder 6	6' from bent 10	10	Cracking	2.5					
11	Girder 6	Along the bottom right edge, 9'-10" from bent 11	11	Spall	2.5	1	0.5			
12	Girder 7	Adjacent to bent 11	11	Cracking	2.5					
13	Girder 6	At midspan		Cracking	3.5					
13	Girder 7	Along east face at bent 12	12	Cracking	2					
14	Deck	Along bay 5, end diaphragm at bent 13	13	Cracking	2					
14	Deck	Along the under in bay 6 at midpsan		Spall	1.25	1	0.5			
14	Deck	Along the underside in bay 5 at bent 14 to midspan	14	Spall (x3)	5.5	3	0.5			
14	Girder 6	Along the east face, 6' from bent 13	13	Spall	3	1	0.5			
14	Girder 6	Along the west face, 6' from bent 13	13	Spall	3	1	0.5			
16	Deck	Along the bay 7, end diaphragm at bent 16	16	spall	2	0.5	0.5			
16	Deck	Along the west face at bent 15	15	Spall	0.5	1	0.5			
16	Deck	Along the underside in bay 7at midspan		Spall	1.5	1.5	0.5			
16	Deck	Underside in bay 6, 6" from bent 16	16	Spall	1	1	0.5			
17	Deck	Along underside in bay 5 at bent 17	17	Spall	1.5	1.5	0.5			
17	Deck	Along underside in bay 5, 8' from bent 17	17	Spall	2	2	0.5			
17	Deck	Adjacent to bent 17	17	Spall	3.5	3.5	0.5			
18	Deck	Along bay 1, end of diaphragm at bent 18	18	Spall	1	1	0.5			
20	Deck	along east face at bent 19	19	Spall	3	1.5	0.5			
20	Deck	Along underside in bay 7 at midspan		Spall	1	1	0.5			
20	Girder 2	Adjacent to bent 19	19	Spall	1.5	1.5	0.5			
21	Deck	Along the bay 5, end diaphragm to girder 5 at bent 20	20	Spall	1	1	0.5			
21	Deck	Along bay 4, end diaphragm west face at bent 21	21	Spall	1	1				
22	Deck	Along the bay 5, end diaphragm at bent 21	21	Spall	1.5	1	0.5			
22	Deck	Along the Along east overhang at bent 21	21	Spall	2.5	1.5	0.5			
22	Right Bridge Rail	Along east sidewalk at bent 21	21	Failed patched area	1.5	1	0.5			
23	Deck	Along the bays 2 and 5 end diaphragmss at bent 22	22	Spall	3.5	1	0.5			
24	Left bridge rail	Bottom of 4th post from north end		Damage	1	1	0.5			
25	Deck	Along bay 5 end diaphragm at bent 26	26	Spall	1	1	0.5			
26	Deck	Bay 1 bent 26, end diaphragm	26	Spall	1.5	1	0.5			
26	Deck	Bay 1		Water Leakage	2	1				
26	Deck	Along bay 1 end diaphragm adjacent to girder 1	26	Spall	1	1	0.5			
27	Deck	Along bay 1, end diaphragm at bent 26	26	Spall	2.5	1	0.5			
27	Girder 8	West face at midspan		Spall	1.5	1.5	0.5			
28	Deck	Bay 7 at drain		Spall	1.5	1.5	0.5			
32	Deck	In bay 3 at midspan		Cracking	4.5					
34	Deck	Along bay 5, end diaphragm at bent 34	34	Spall	3	1	0.5			

NOTES:

1. WORK THIS SHEET WITH "CONCRETE RESTORATION DETAILS" SHEET 1 OF 2.
2. ALL DEFECTS WERE TAKEN FROM THE 2018 BRIDGE INSPECTION REPORT. REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE.
3. THE ENGINEER SHALL FILL OUT THE AS-BUILT REPAIR QUANTITY FOR EACH LISTED DEFICIENCY.
4. IF ADDITIONAL REPAIRS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE CORRESPONDING SHEET THE APPROXIMATE LOCATIONS AND THE DESCRIPTION OF THE REPAIRS, AND WILL ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT QUANTITIES TABLE.

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




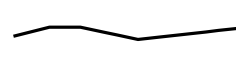
SUPERSTRUCTURE REPAIRS

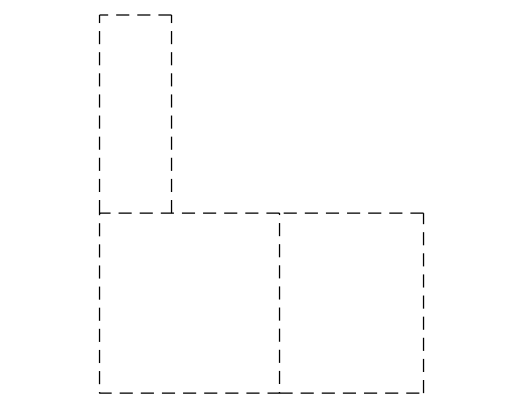
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			57

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

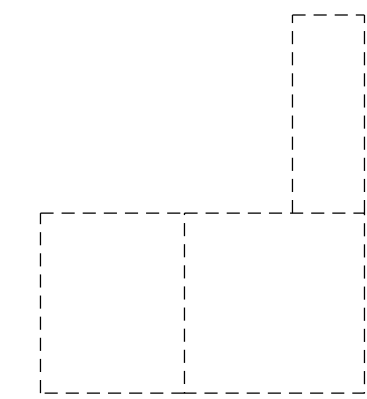
DRAWN BY : OMAR M. KHALAFALLA DATE : 2/5/2019
 CHECKED BY : DIEGO A. AGUIRRE DATE : 2/5/2019
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

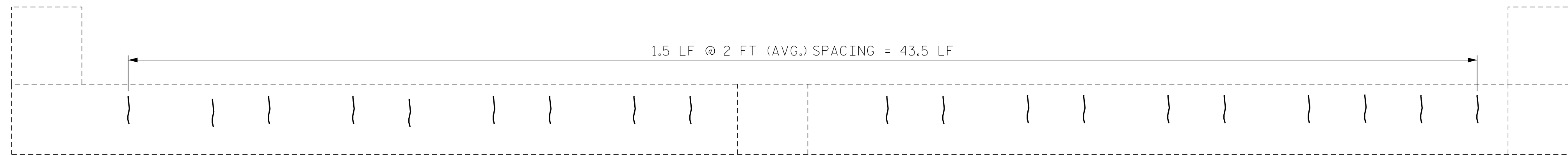
LEGEND	
	CONCRETE REPAIR AREA
	SHOTCRETE REPAIR AREA
	EPOXY COATING AREA
	EPOXY RESIN INJECTION (ERI)



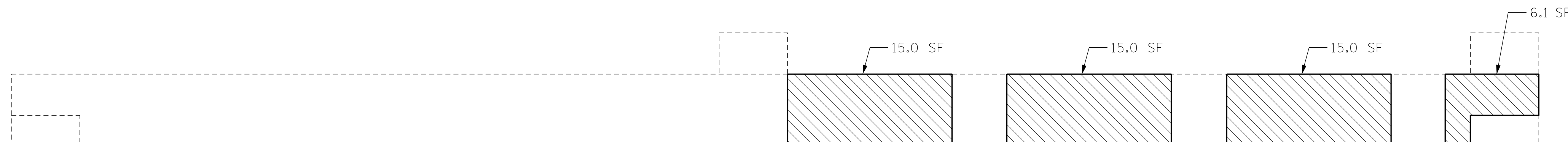
EAST ELEVATION



WEST ELEVATION

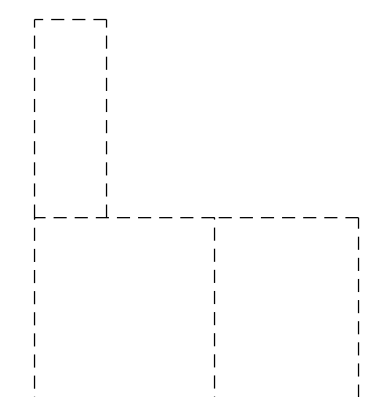


ELEVATION

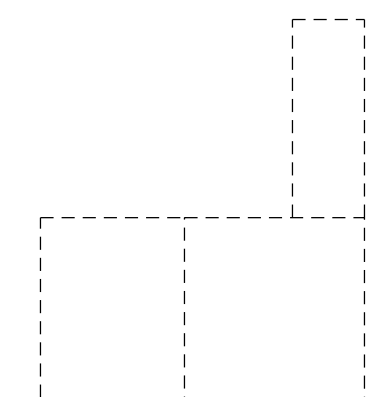


PLAN
(TOP OF CAP)
(PILES AND BEAMS NOT SHOWN FOR CLARITY)

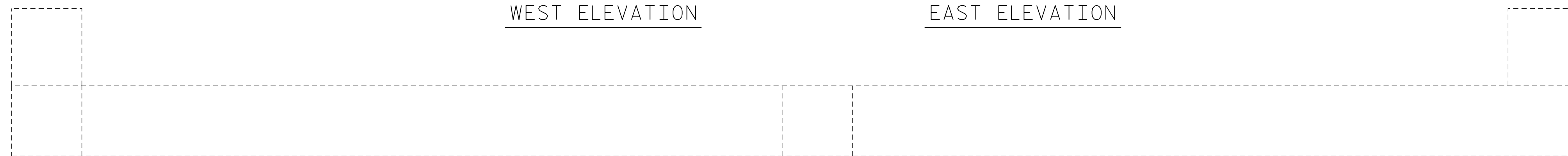
END BENT 1



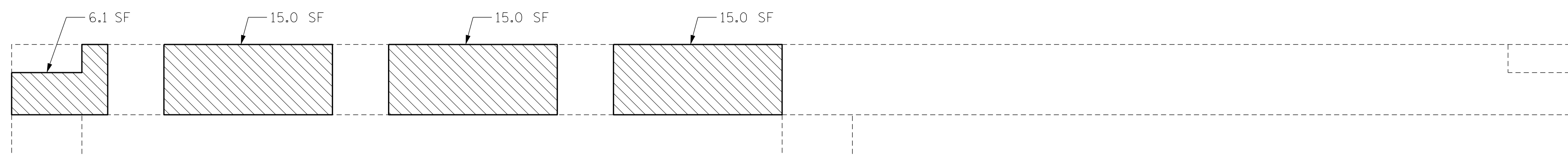
WEST ELEVATION



EAST ELEVATION



ELEVATION



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

END BENT 2

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

AS-BUILT REPAIR QUANTITY TABLE

END BENTS 1 & 2	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	43.5			
PILE	-			
EPOXY COATING	AREA SQ. FT.		AREA SQ. FT.	
CAP	102.2			

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.

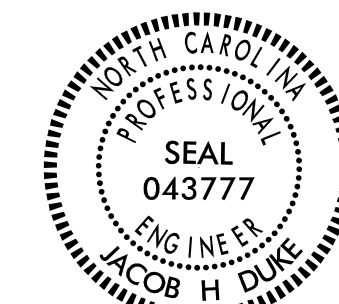
SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

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




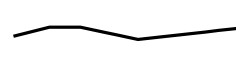


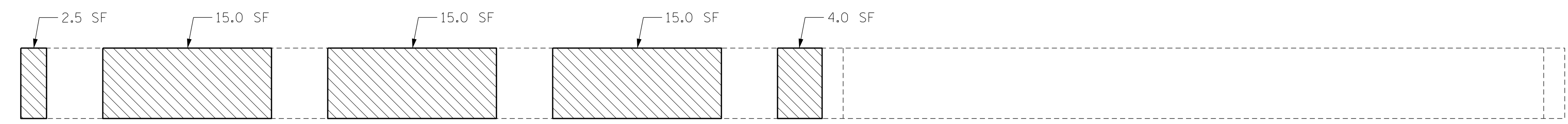
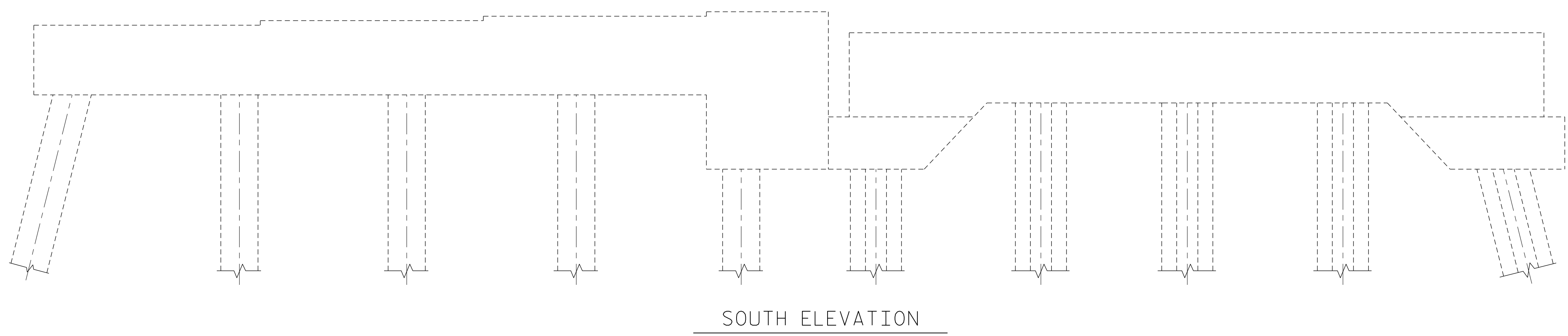
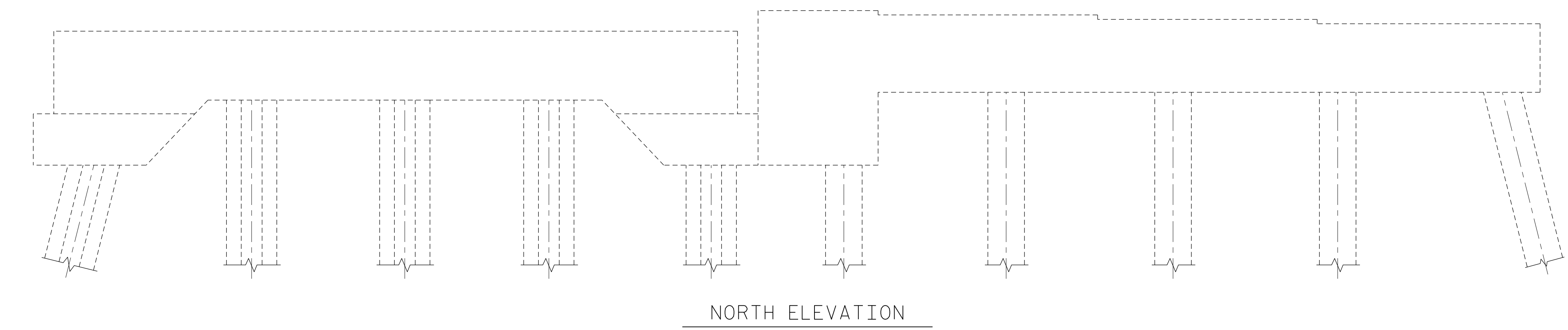
DocuSigned by:
 Jacob H. Duke
 9CDB3ADC66D6400
 3/14/2019

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE REPAIRS					
END BENTS 1 & 2					
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)



AS-BUILT REPAIR QUANTITY TABLE				
BENT 1	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:
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
 9CD53ADC66D6400...
 3/14/2019

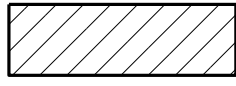
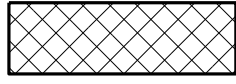
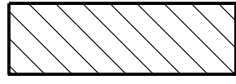

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**SUBSTRUCTURE
 REPAIRS**
 BENT 1

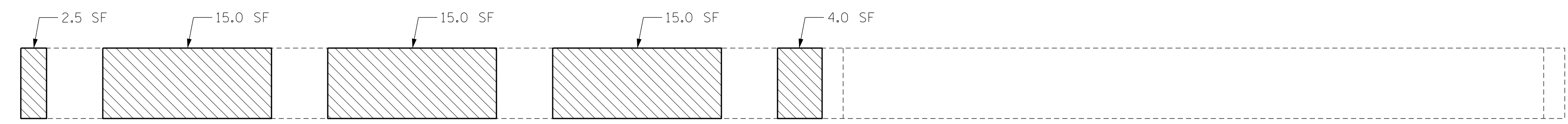
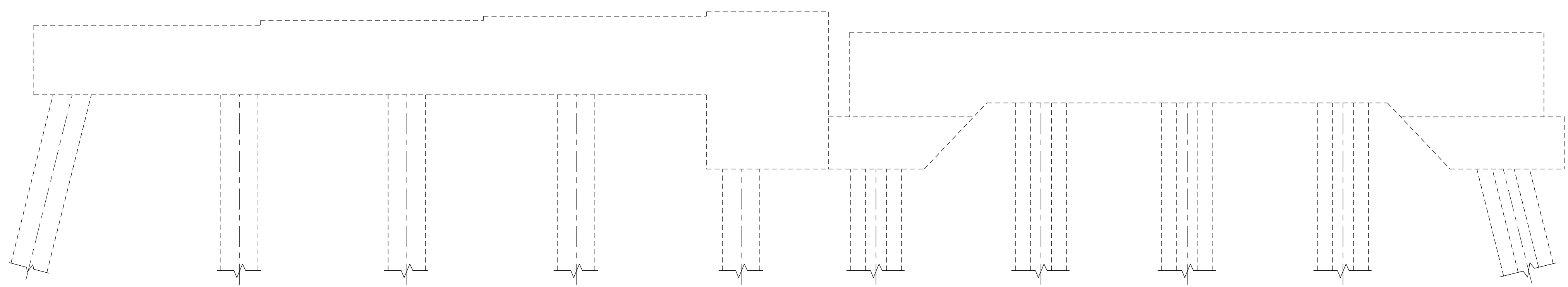
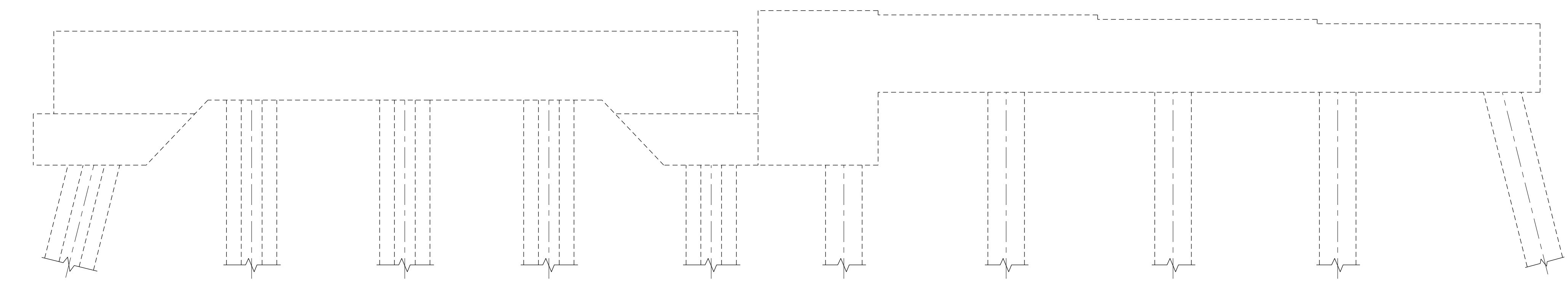
KCA 301 FAYETTEVILLE ST., SUITE 1500
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601
 (919) 882-7839
 LICENSE #: C-1506

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			57

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 2	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:
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.

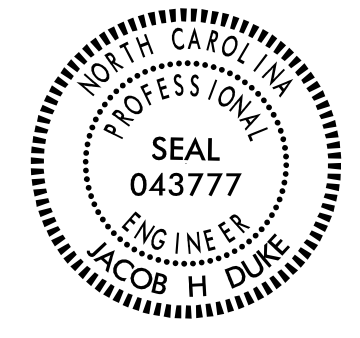
SHOTCRETE REPAIRS MAY BE REPLACED WITH CONCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

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
9CDB3ADC66D6400
3/14/2019

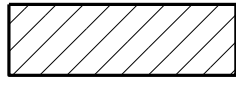
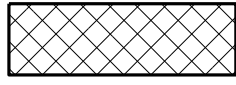
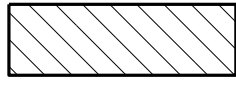

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE REPAIRS
 BENT 2

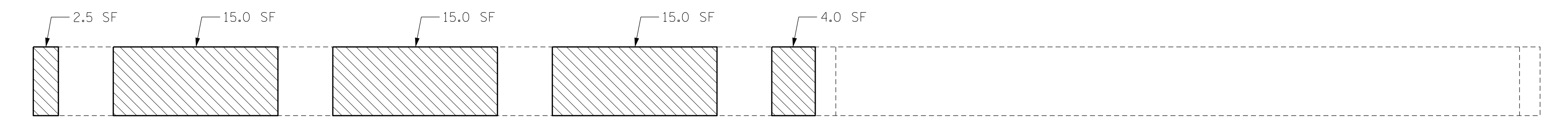
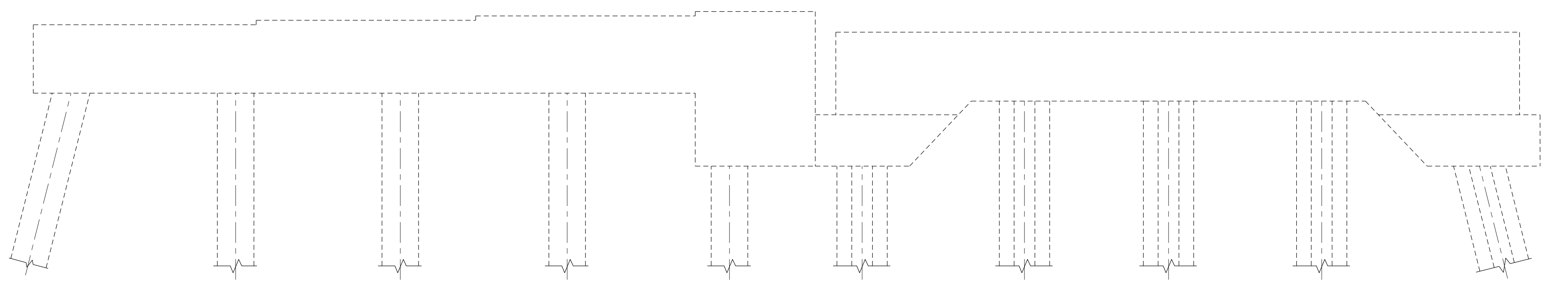
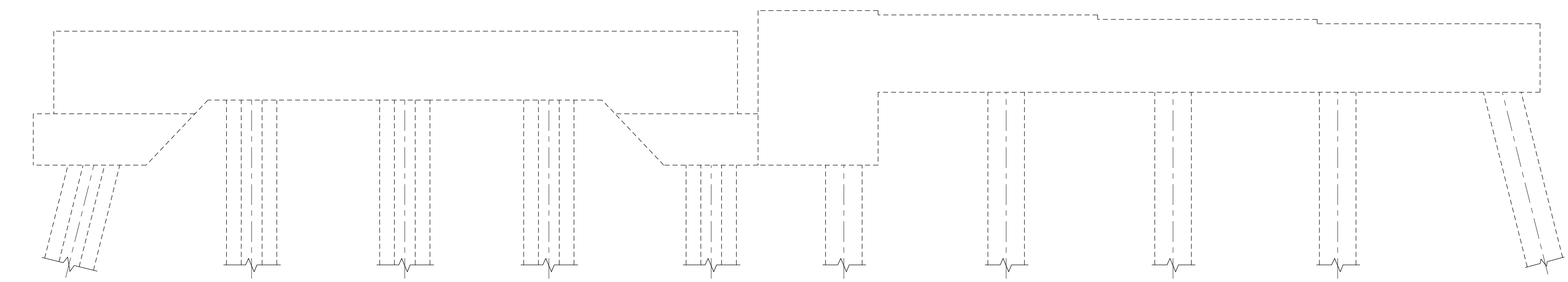
KCA 301 FAYETTEVILLE ST., SUITE 1500
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601
 (919) 882-7839
 LICENSE #: C-1506

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-22
2			4			57

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 3	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:
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



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE REPAIRS
 BENT 3

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

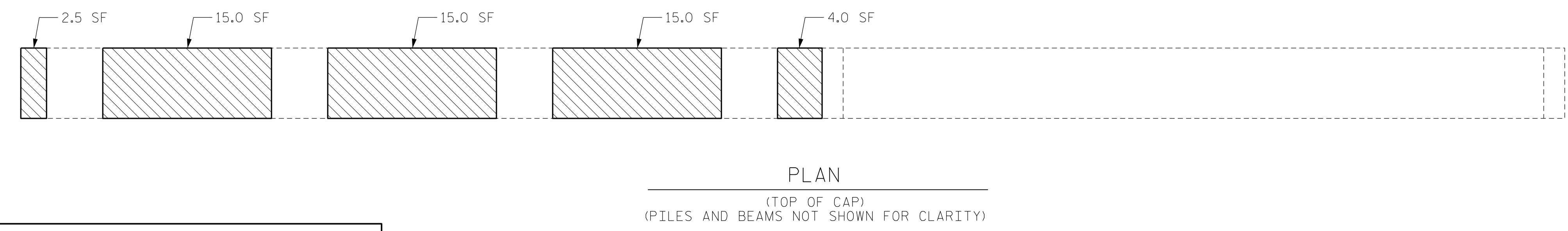
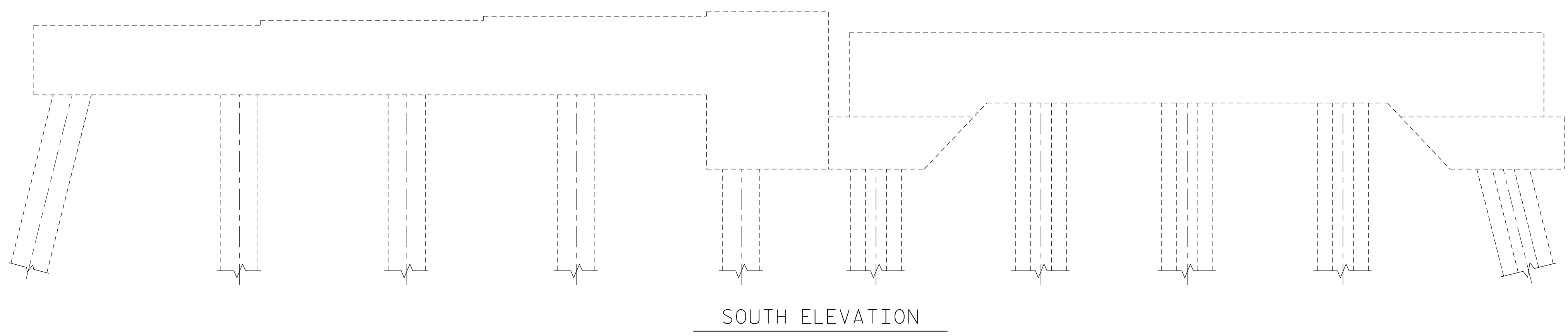
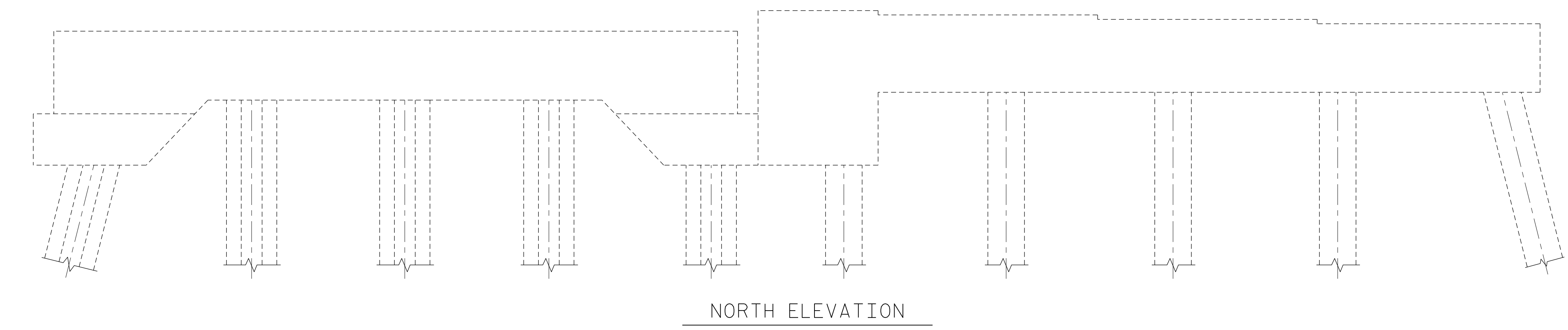
DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

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

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-23
2			4			57

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



AS-BUILT REPAIR QUANTITY TABLE				
BENT 4	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:
 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







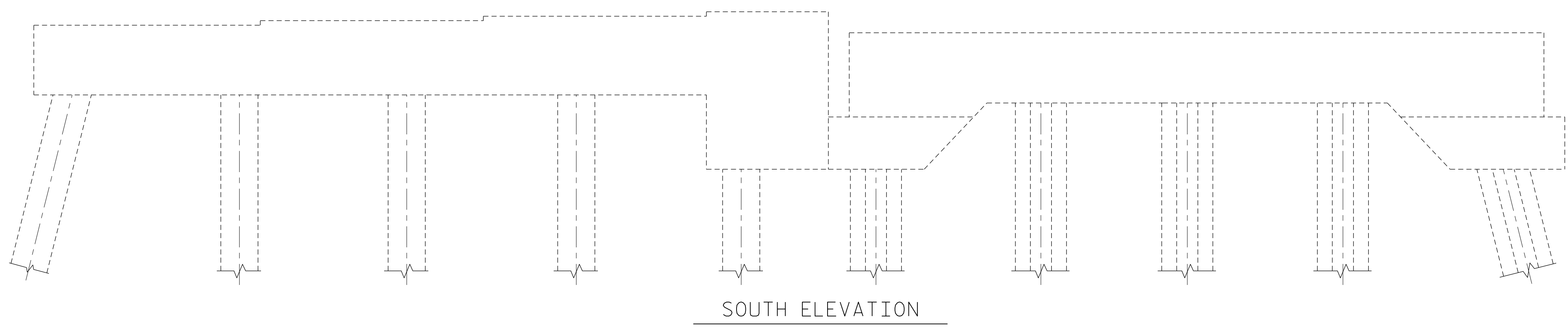
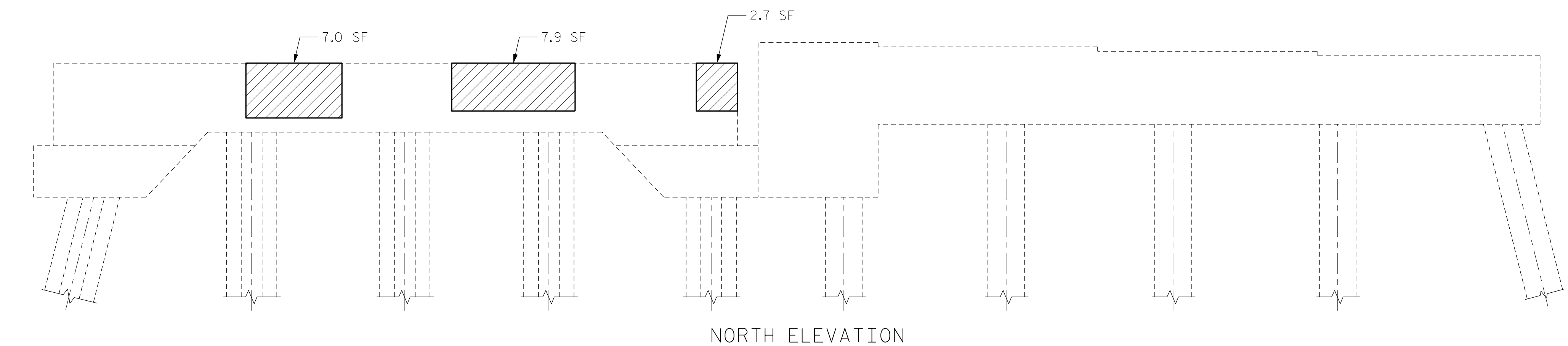
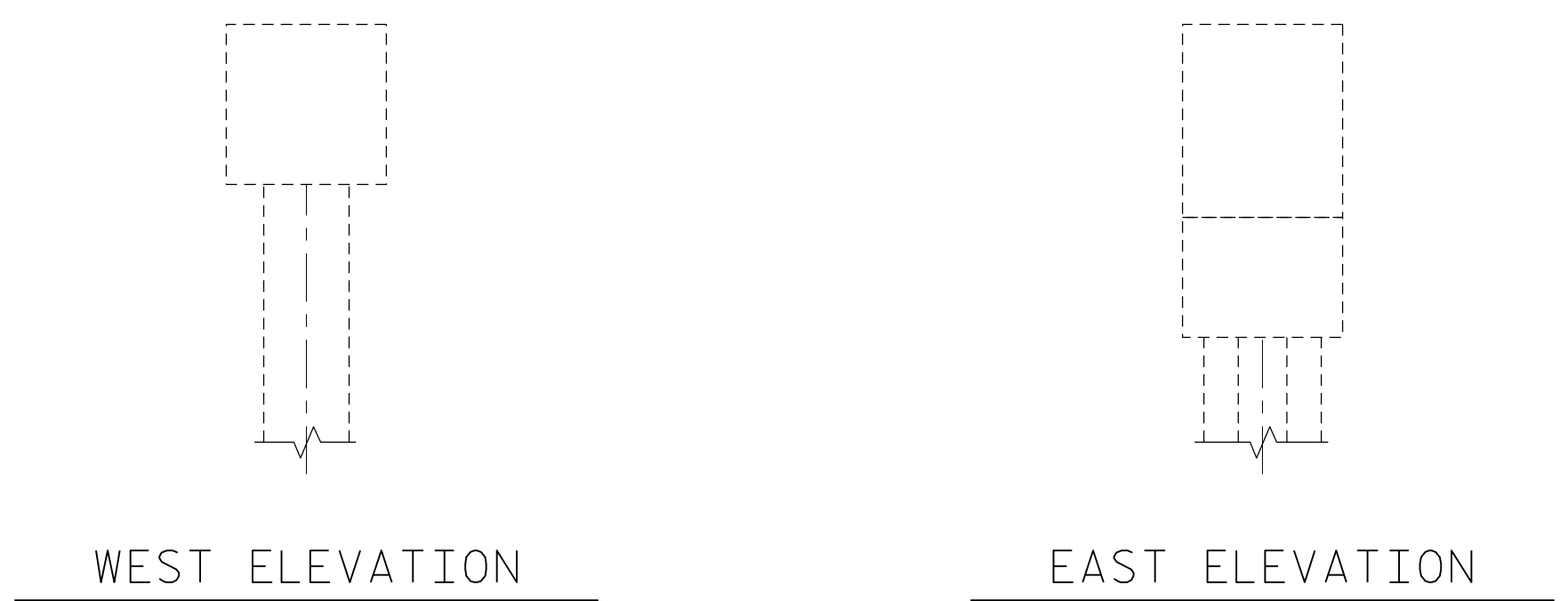
DocuSigned by:
 Jacob H. Duke
 9CDB3ADC66D6400
 3/14/2019

STATE OF NORTH CAROLINA		DEPARTMENT OF TRANSPORTATION		RALEIGH	
SUBSTRUCTURE REPAIRS					
BENT 4					
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 5	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	17.6	8.8		
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.

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
9CDB3ADCC668400
3/14/2019

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH




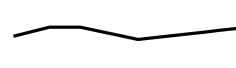
SUBSTRUCTURE REPAIRS

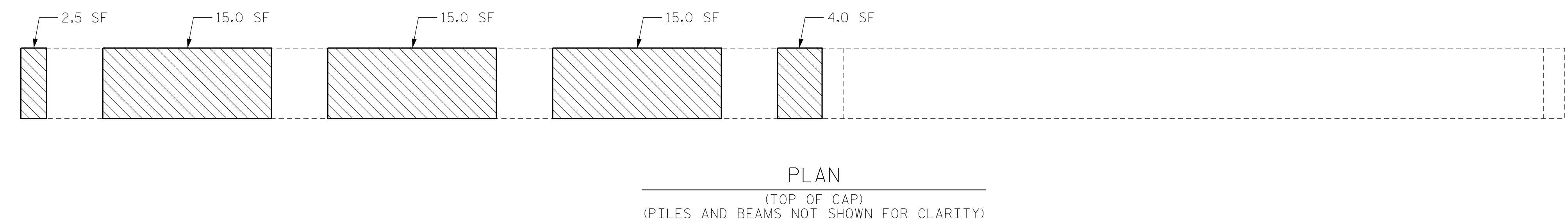
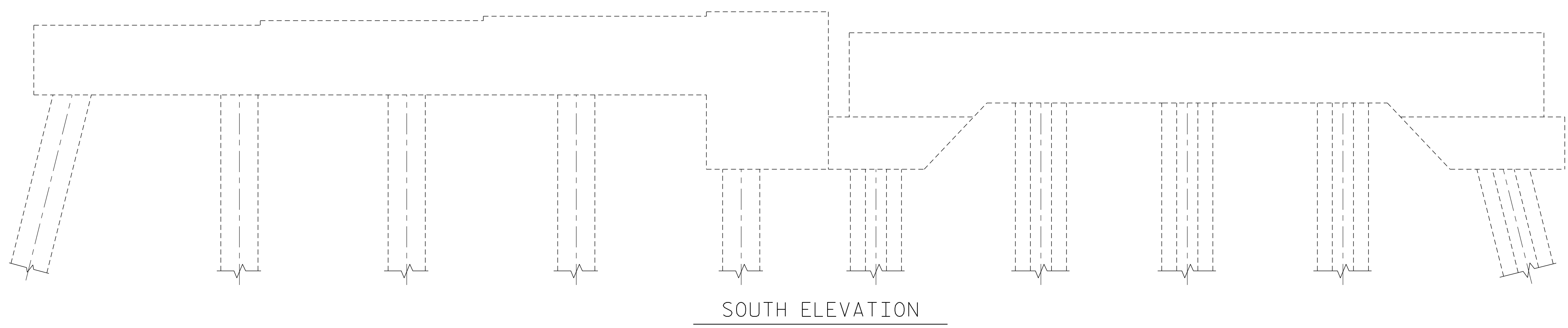
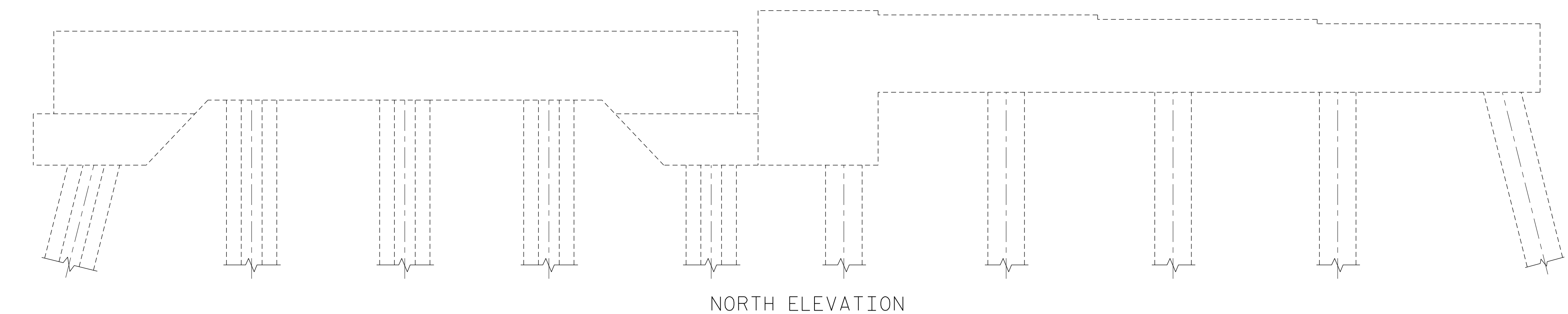
BENT 5

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-25
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 6	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:
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



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE REPAIRS
 BENT 6

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

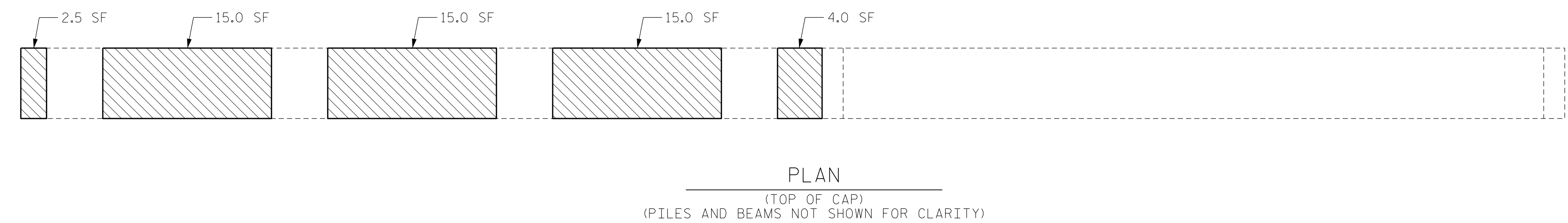
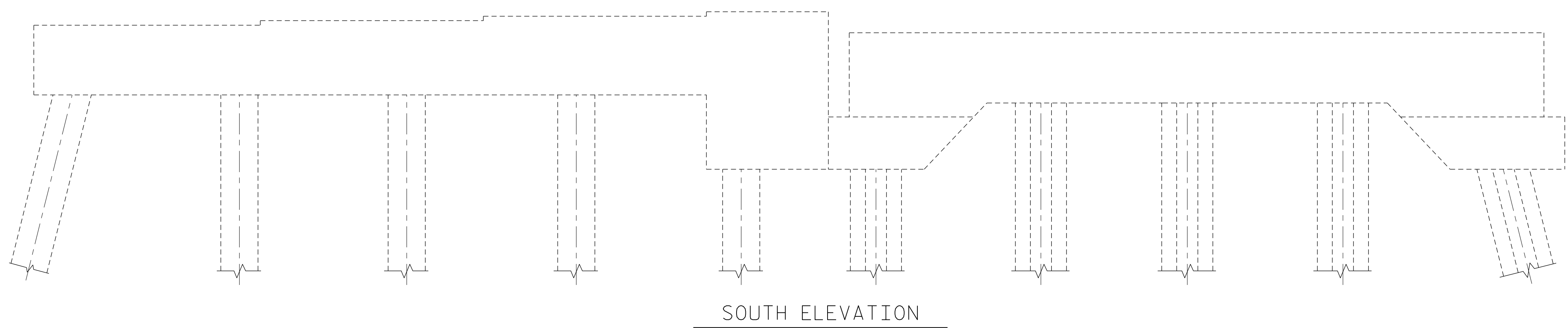
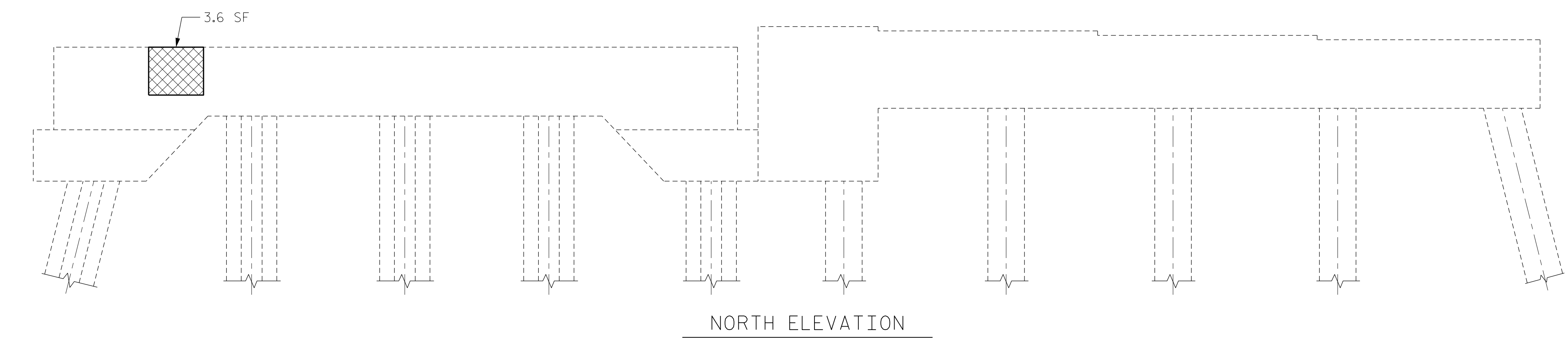
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-26
2			4			57

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 7	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	3.6	1.8		
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.

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



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




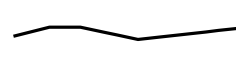
KCA 301 FAYETTEVILLE ST., SUITE 1500
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601
 (919) 882-7839
 LICENSE #: C-1506

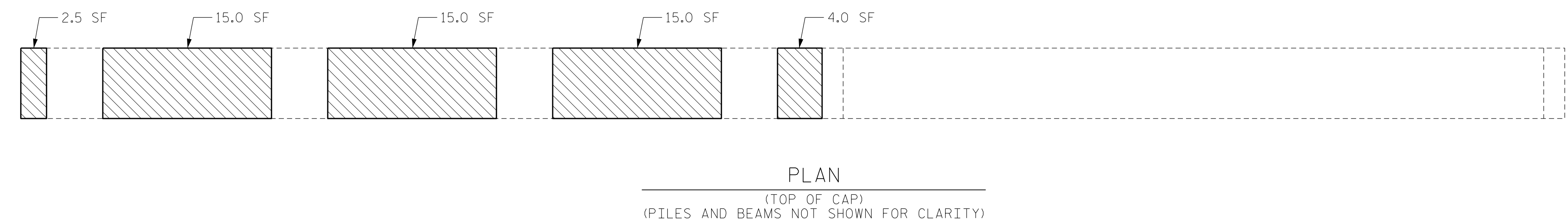
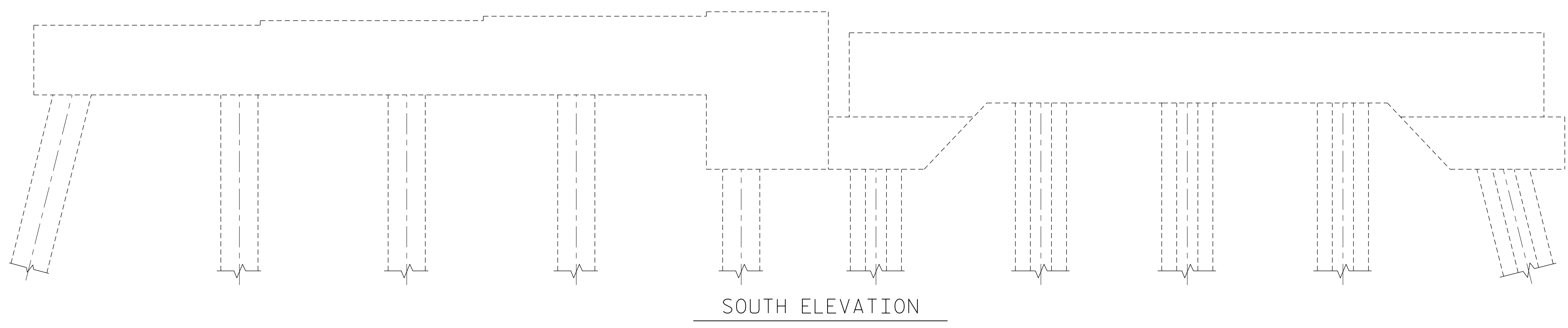
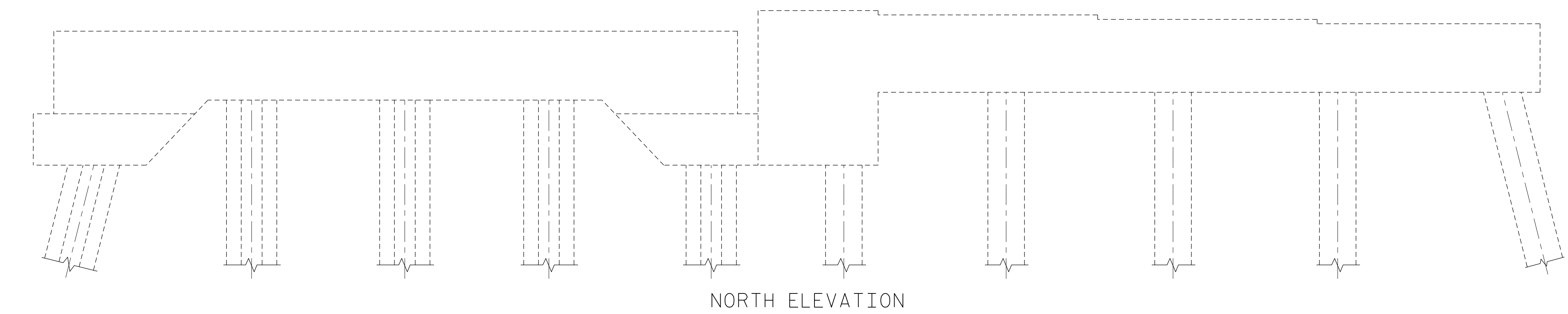
DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

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

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-27
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 8	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:
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
 9CDB3ADC66D6400...
 3/14/2019

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE REPAIRS

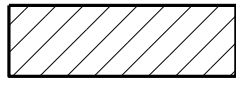
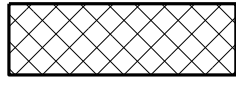
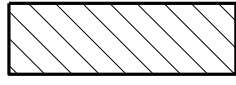
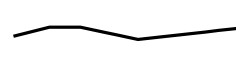
BENT 8

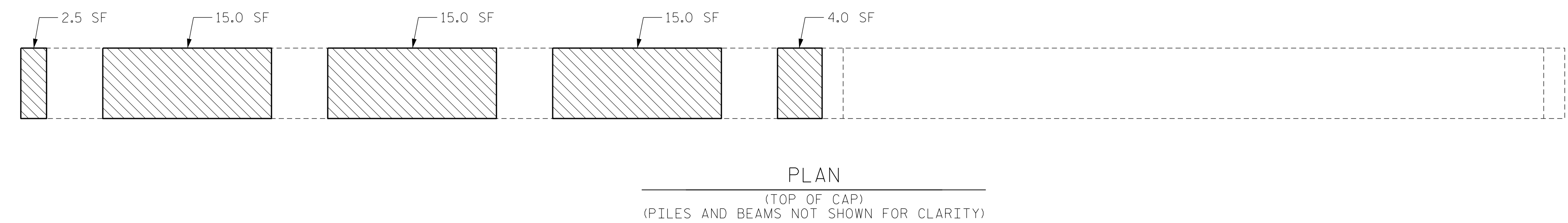
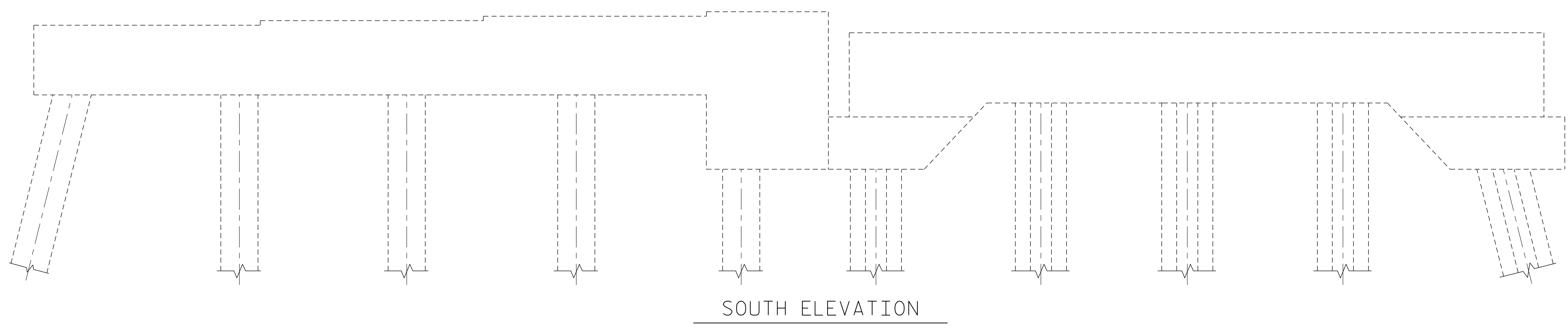
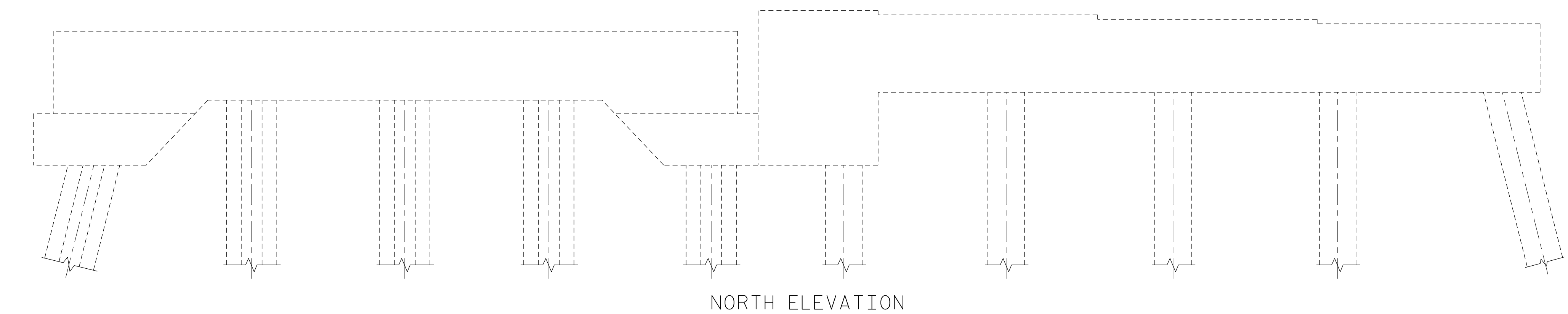
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-28
2			4			57

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 9	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:
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
 9CDB3ADC66D6400...
 3/14/2019

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE REPAIRS
 BENT 9

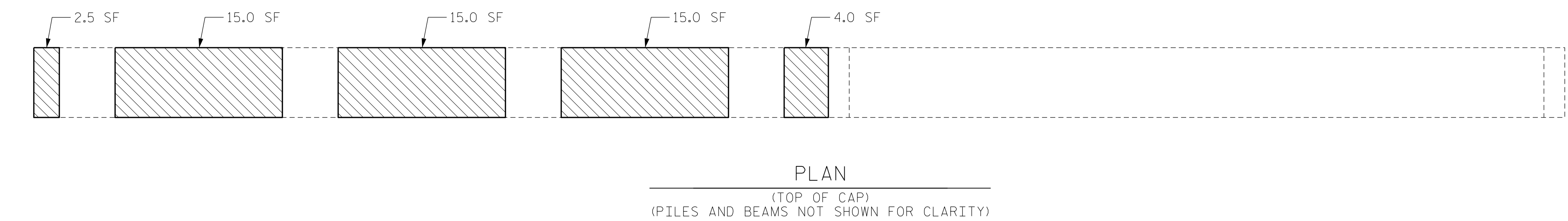
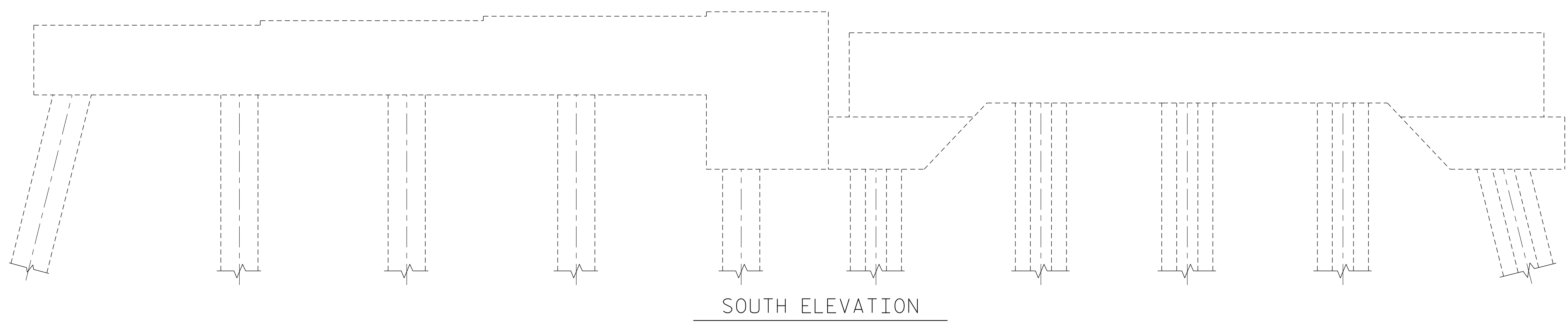
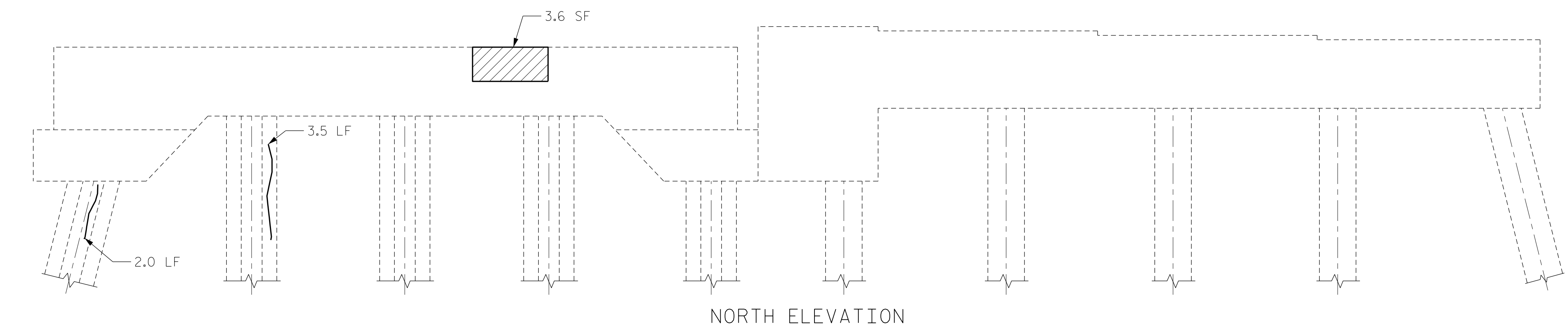
KCA 301 FAYETTEVILLE ST., SUITE 1500
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601
 (919) 882-7839
 LICENSE #: C-1506

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-29
2			4			57

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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



AS-BUILT REPAIR QUANTITY TABLE				
BENT 10	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	3.6	1.8		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
PILE	5.5			
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.

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



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE REPAIRS
 BENT 10

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

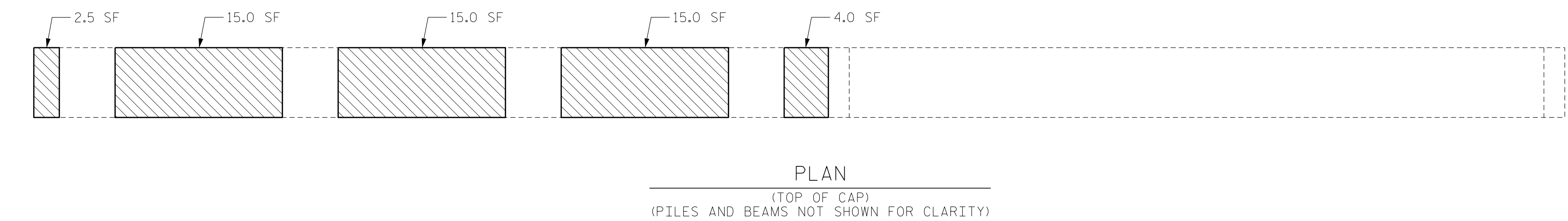
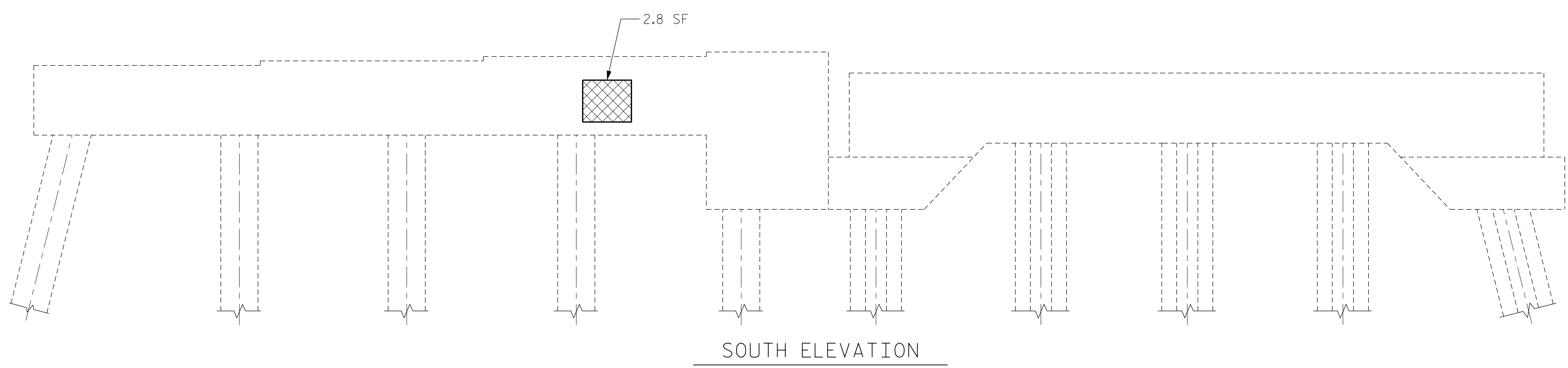
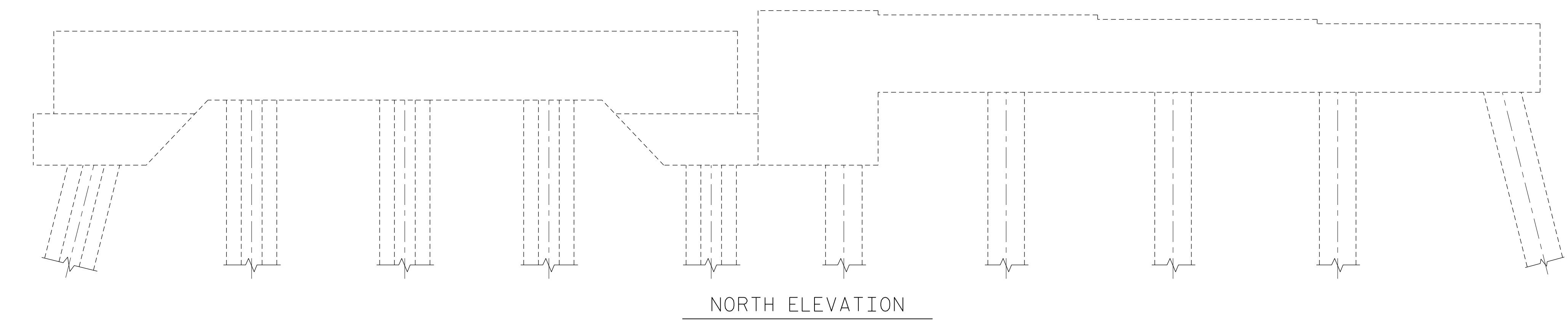
DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-30
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 11	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	2.8	1.4		
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.

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



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE REPAIRS
 BENT 11

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

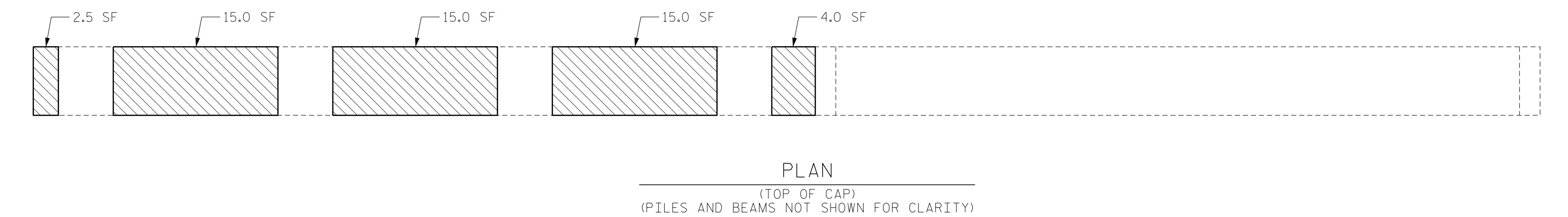
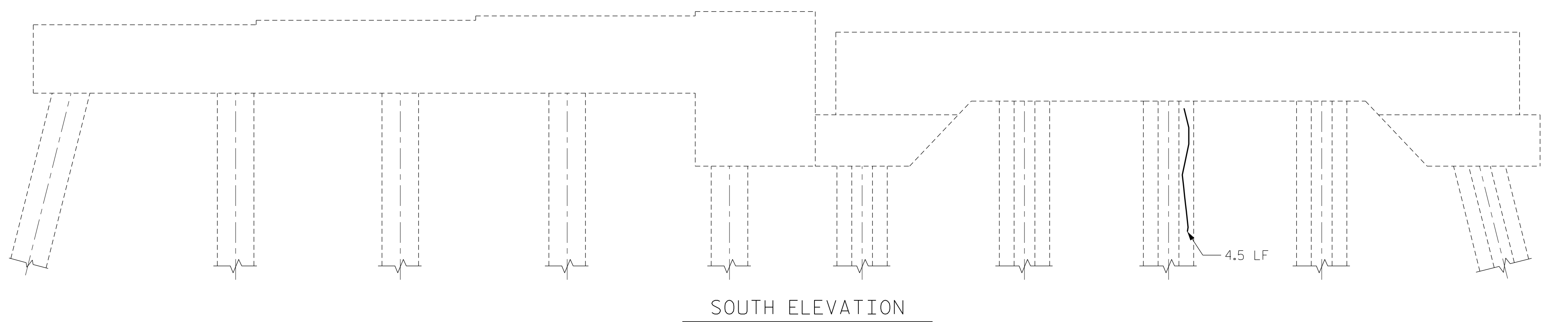
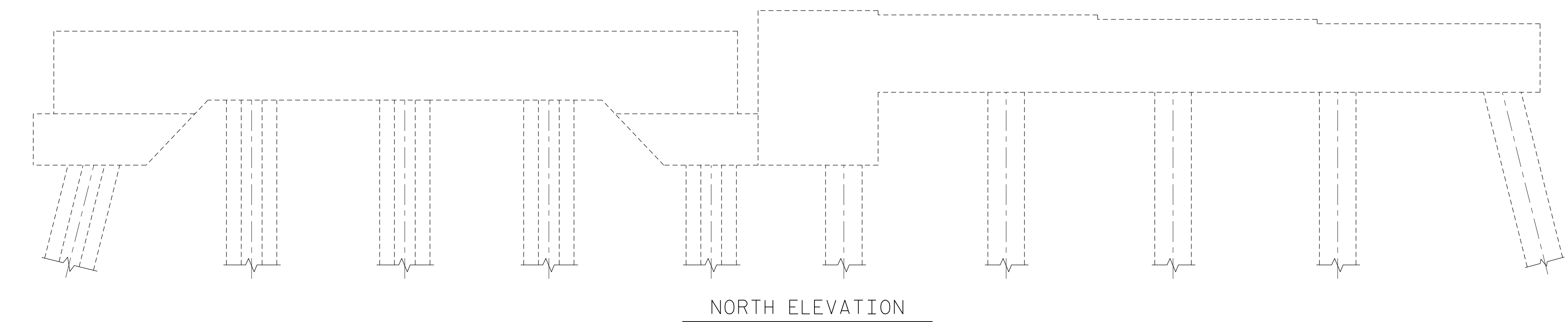
DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-31
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 12	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	4.5			
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.

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



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE REPAIRS
 BENT 12

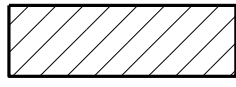
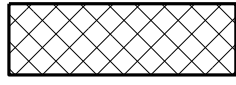
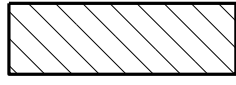

KCA 301 FAYETTEVILLE ST., SUITE 1500
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601
 (919) 882-7839
 LICENSE #: C-1506

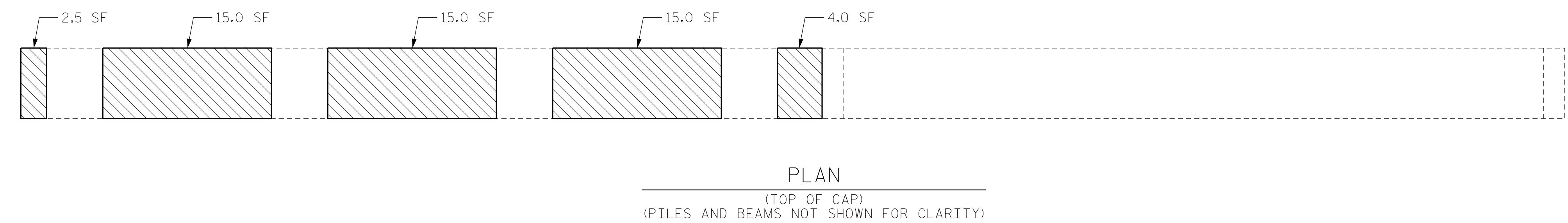
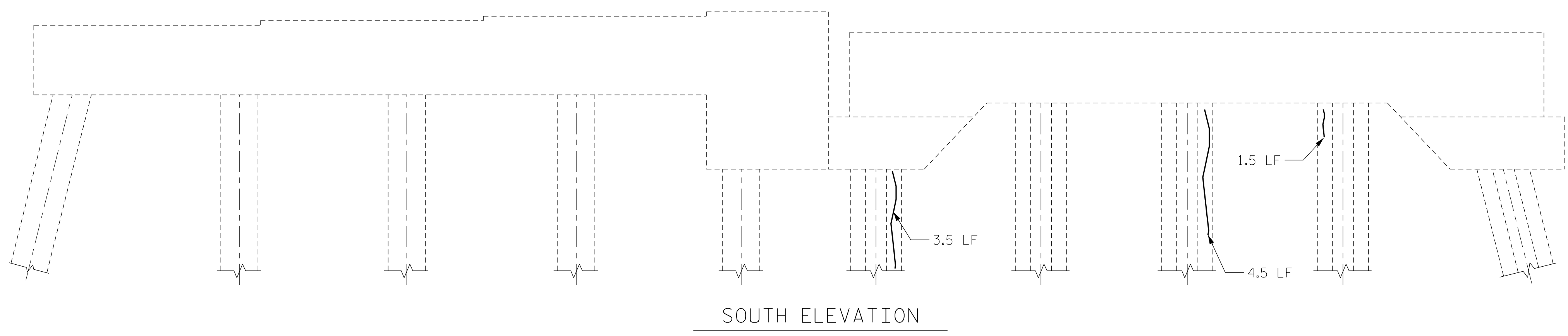
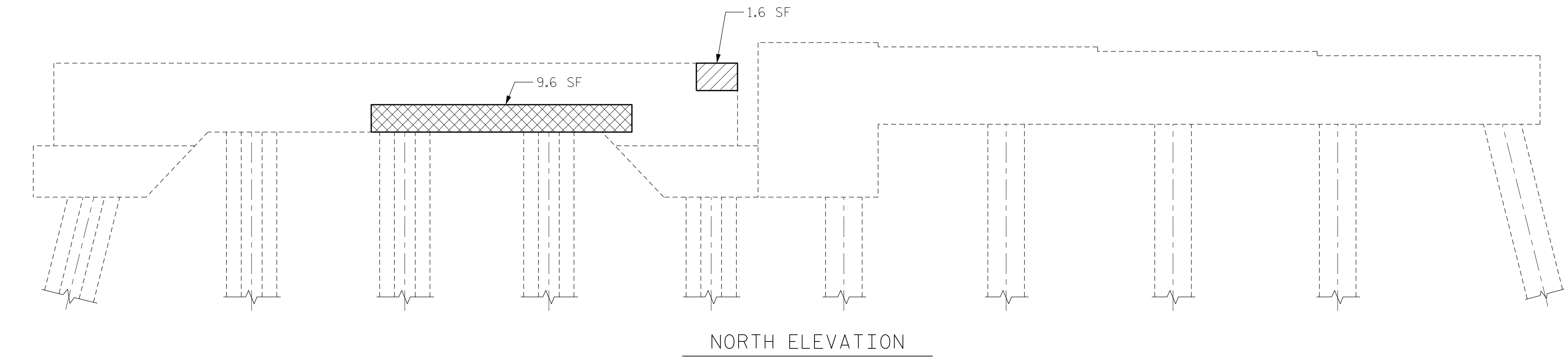
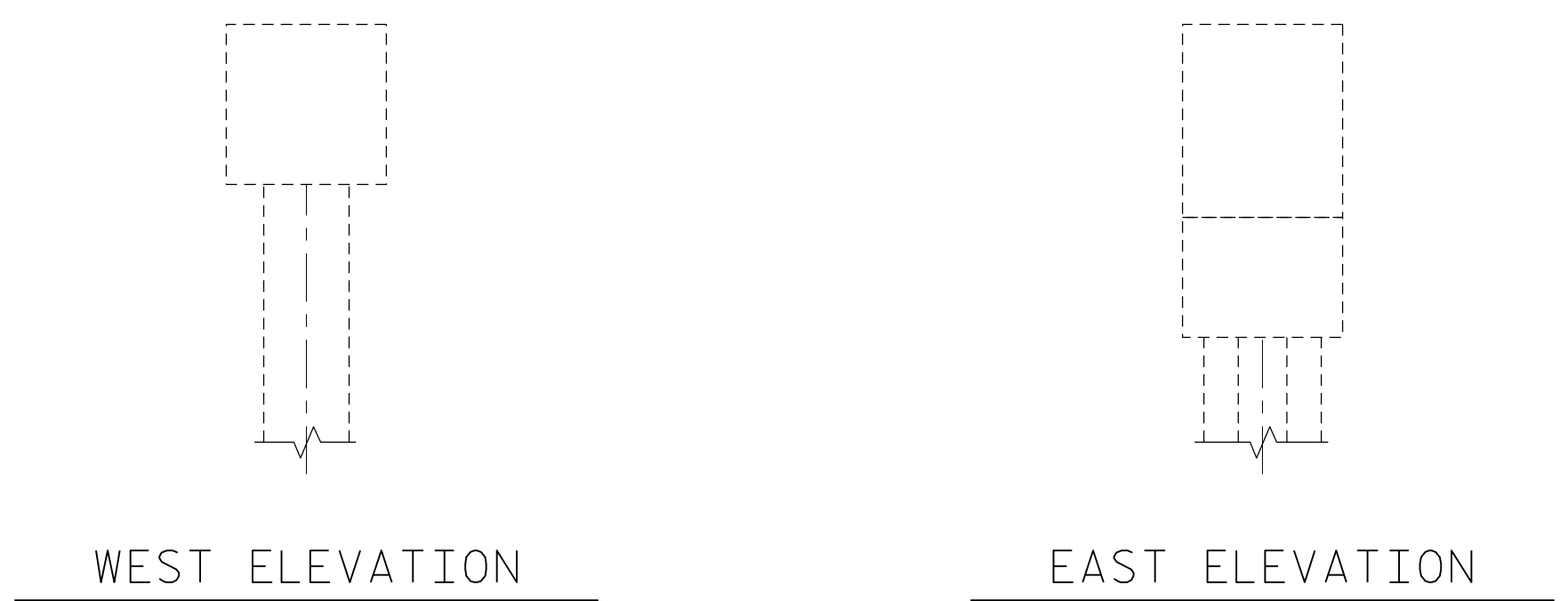
DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-32
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 13	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	9.6	4.8		
PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
* CAP	1.6	0.8		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
PILE	9.5			
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.

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

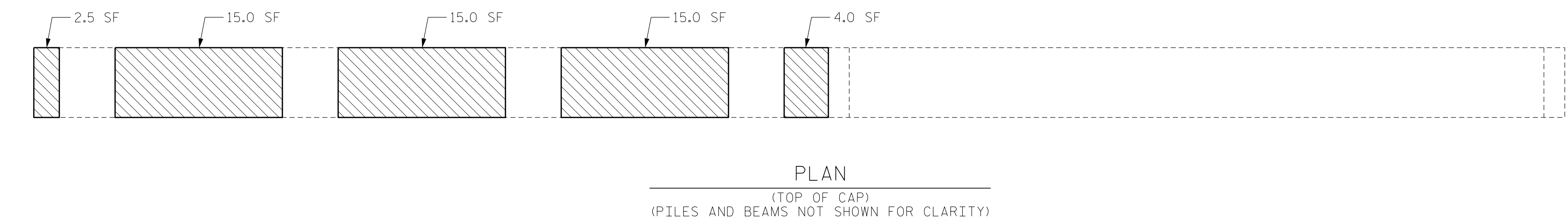
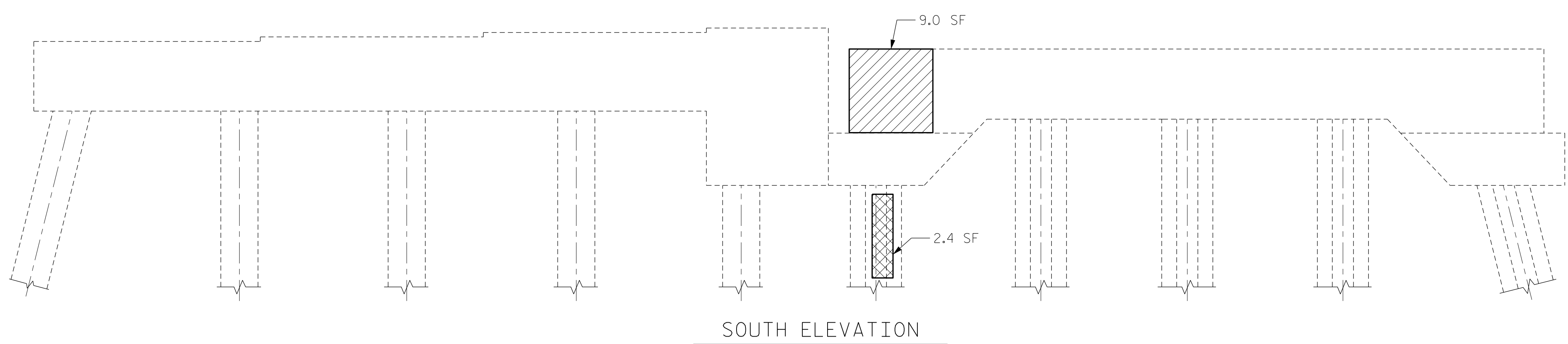
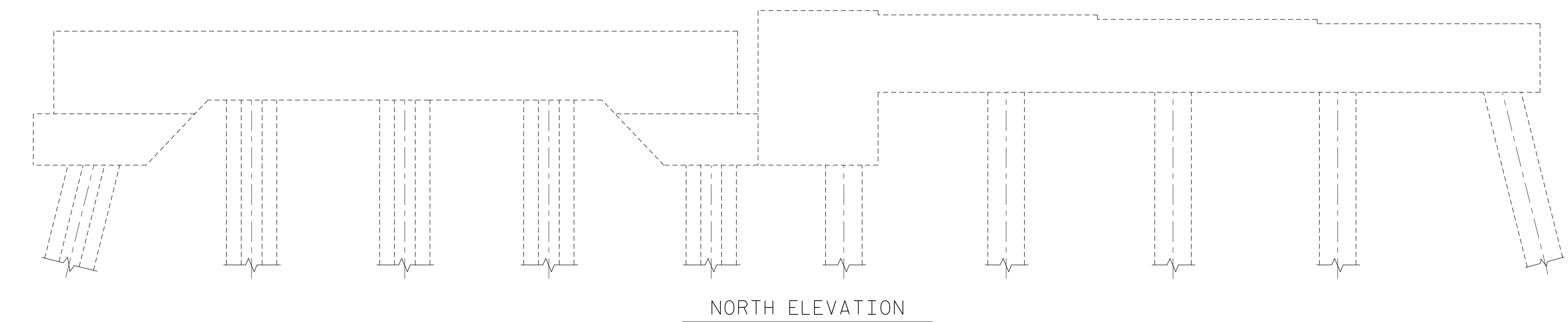
BENT 13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-33
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 14	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	-	-		
PILE	2.4	1.2		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
* CAP	9.0	4.5		
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.

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







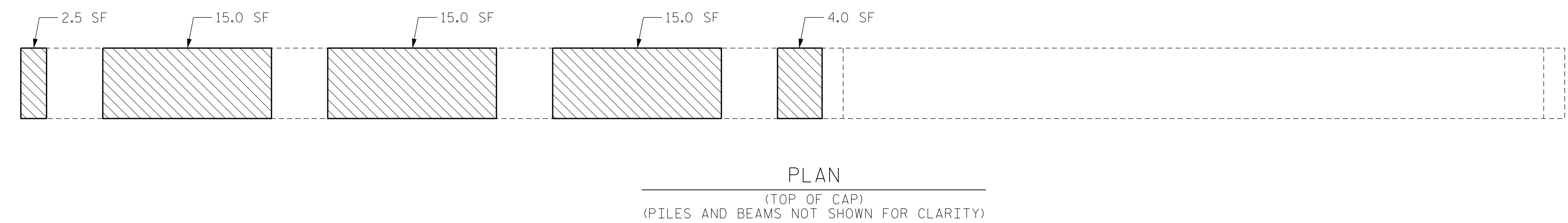
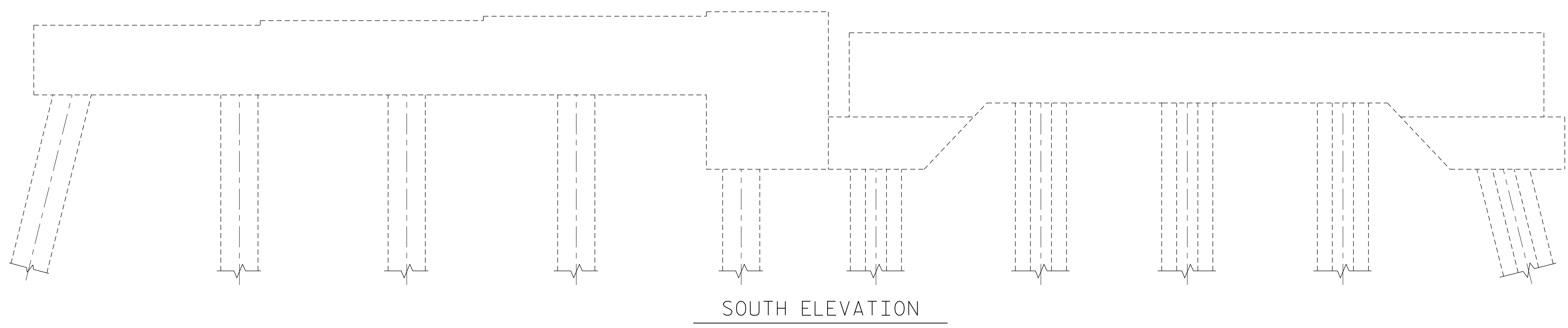
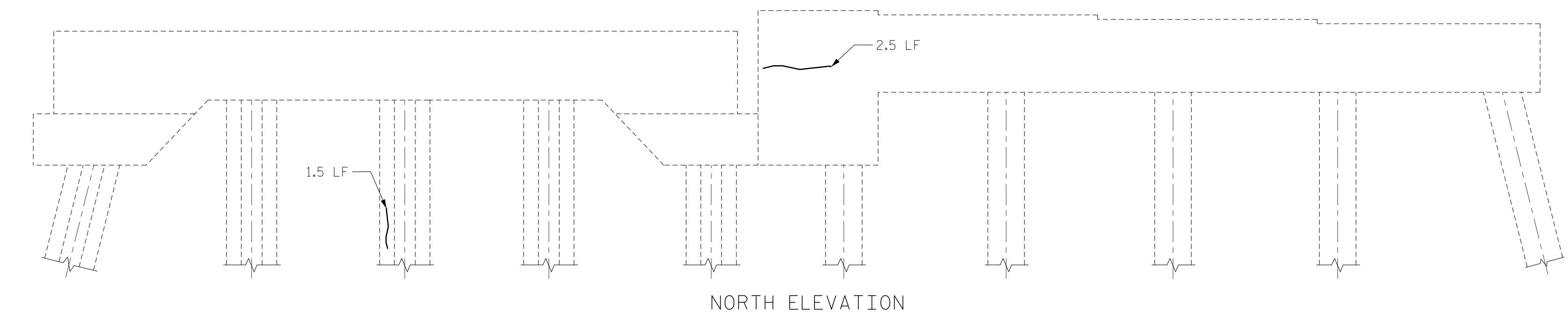
DocuSigned by:
 Jacob H. Duke
 9CDB3ADC66D6400
 3/14/2019

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE REPAIRS					
BENT 14					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-34
					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 15	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	2.5			
PILE	1.5			
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.

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
 9CDB3ADC66D6400
 3/14/2019

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE REPAIRS

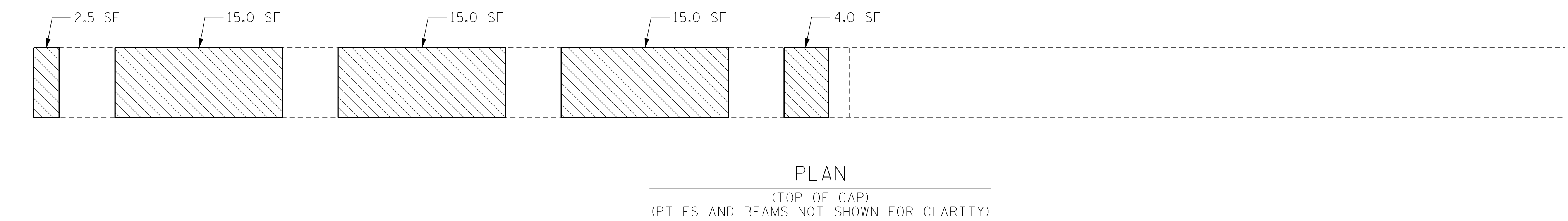
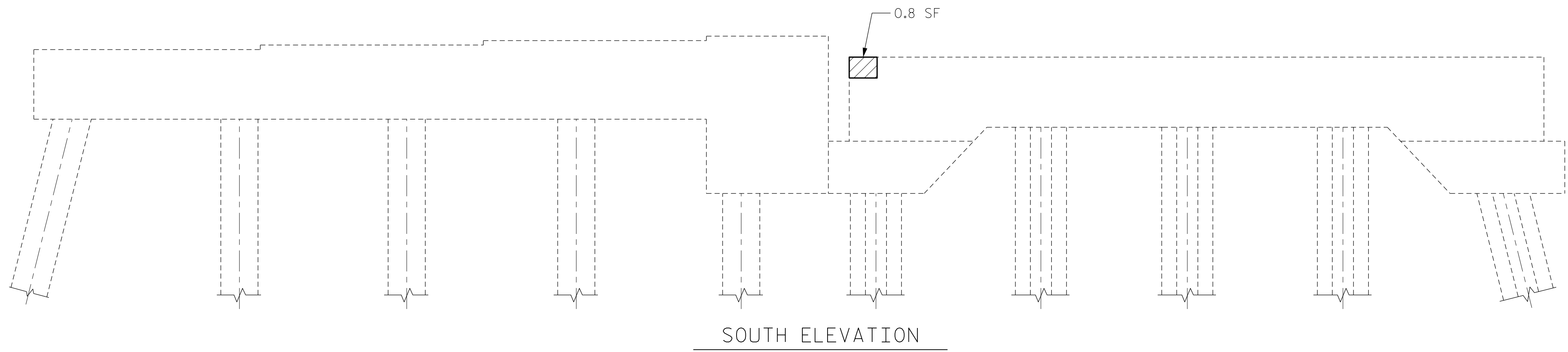
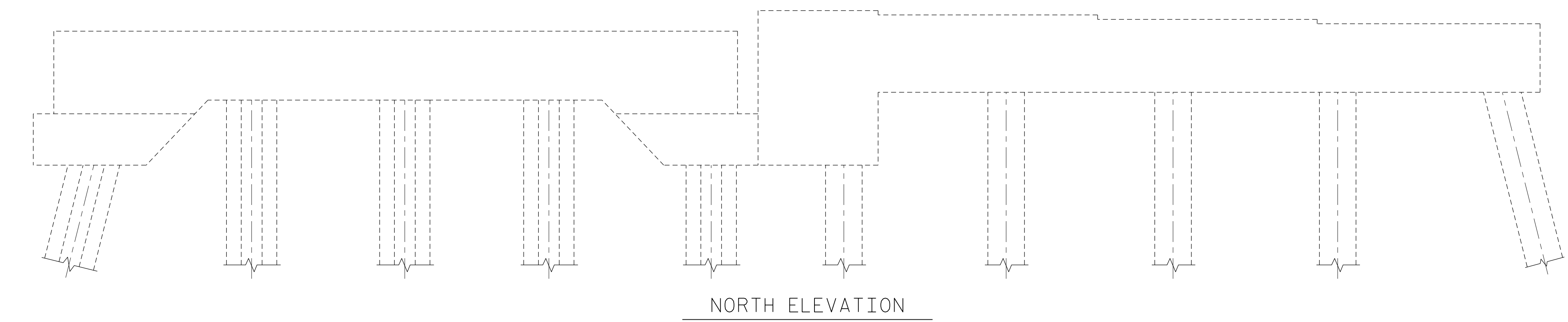
BENT 15

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-35
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 16	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	0.8	0.4		
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.

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



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE REPAIRS
 BENT 16




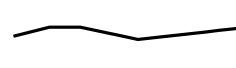
KCA 301 FAYETTEVILLE ST., SUITE 1500
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601
 (919) 882-7839
 LICENSE #: C-1506

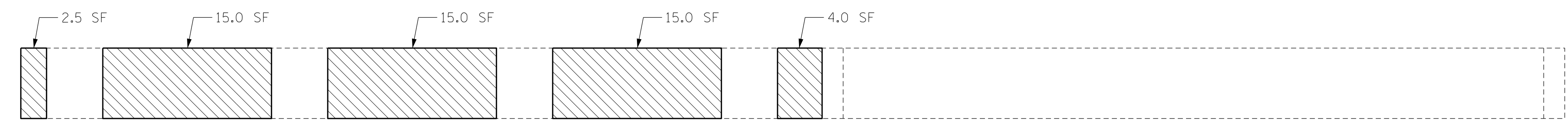
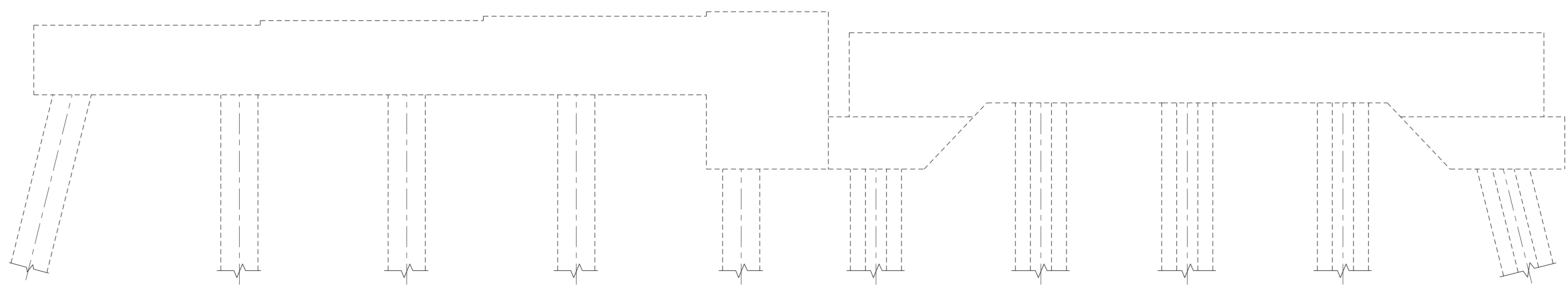
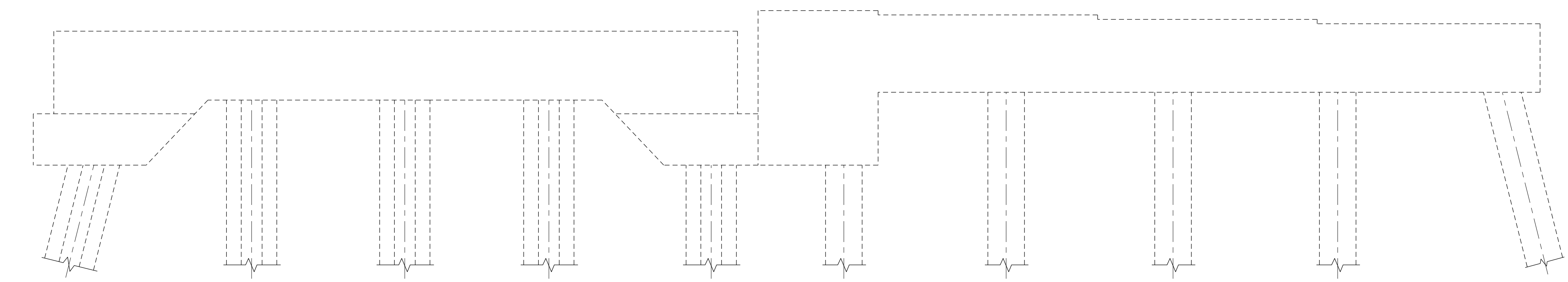
DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-36
2			4			TOTAL SHEETS 57

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 17	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:
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
9CDB3ADC66D6400
3/14/2019

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIRS





BENT 17

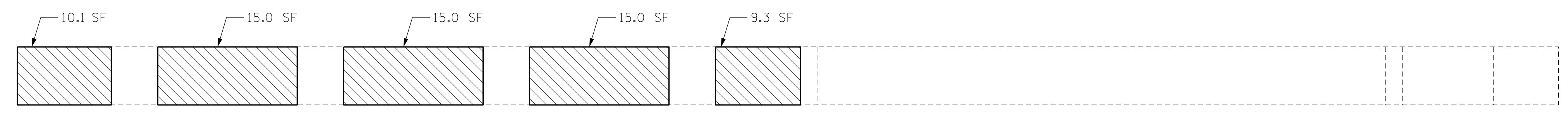
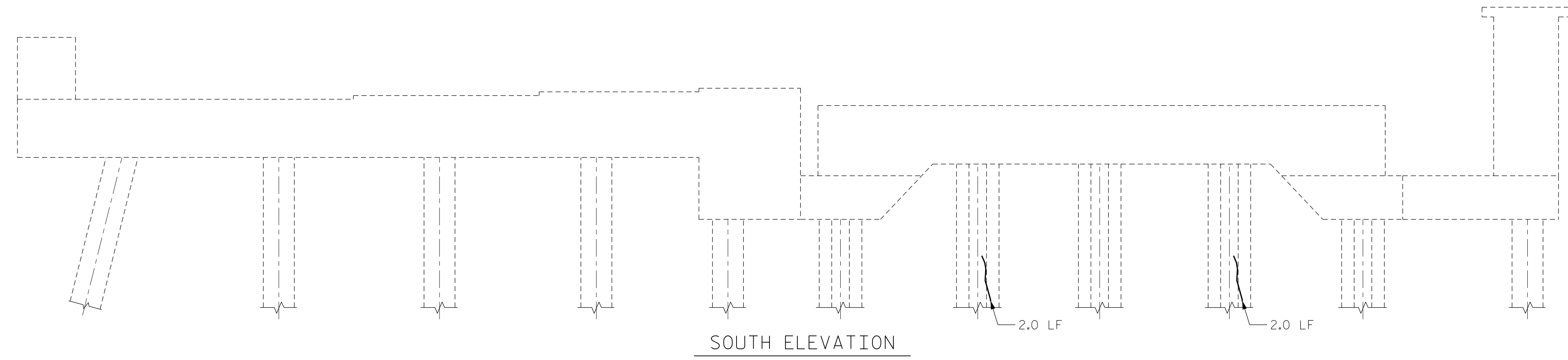
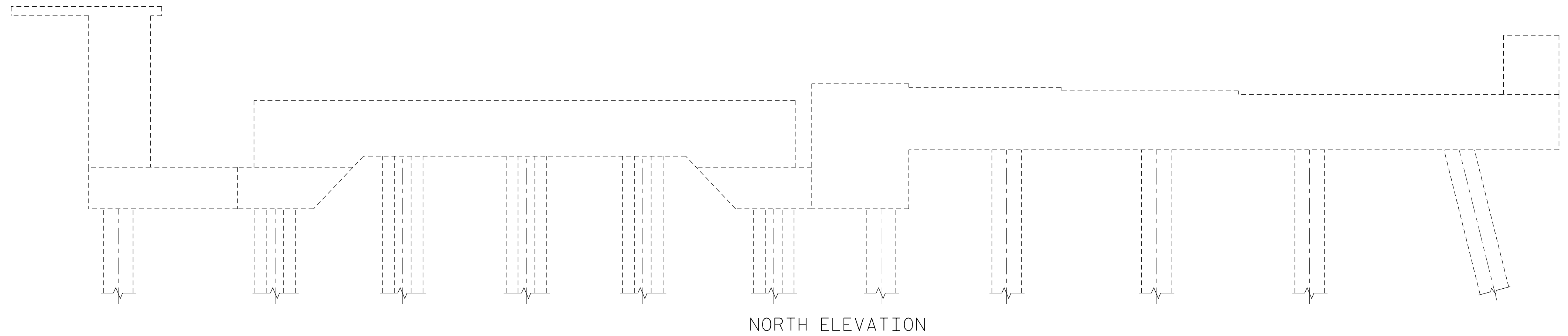
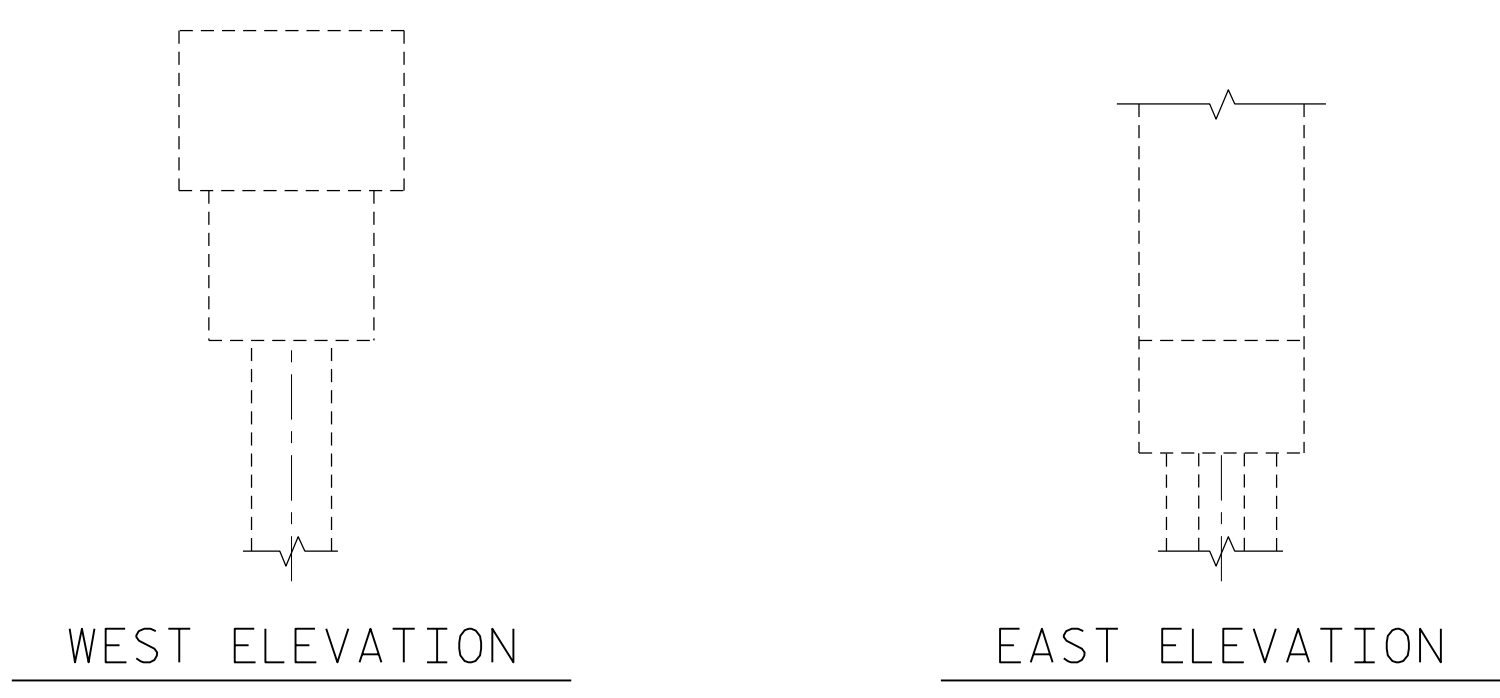
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-37
2			4			TOTAL SHEETS 57

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 18	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	4.0			
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.

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



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE REPAIRS
 BENT 18

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

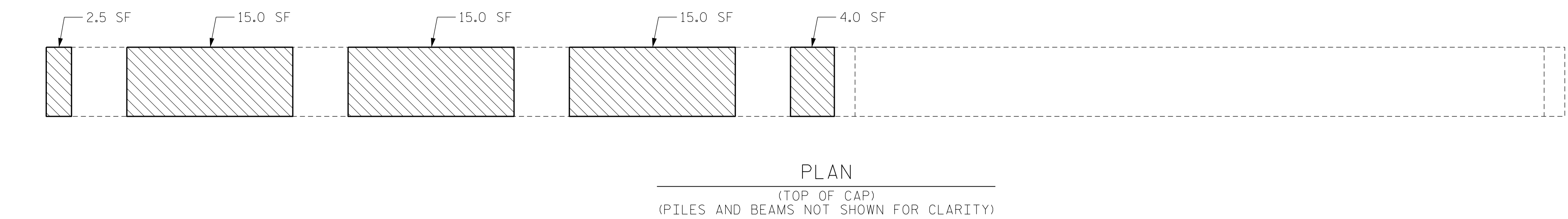
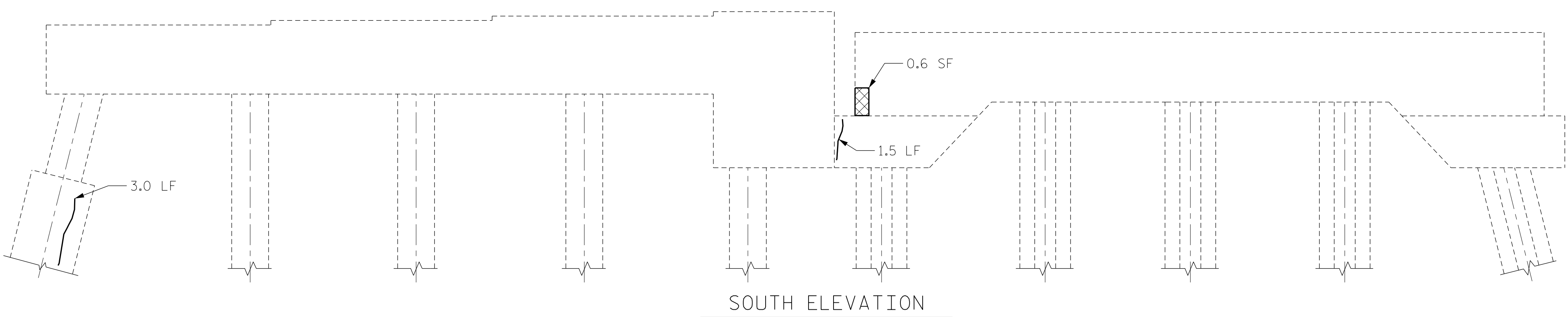
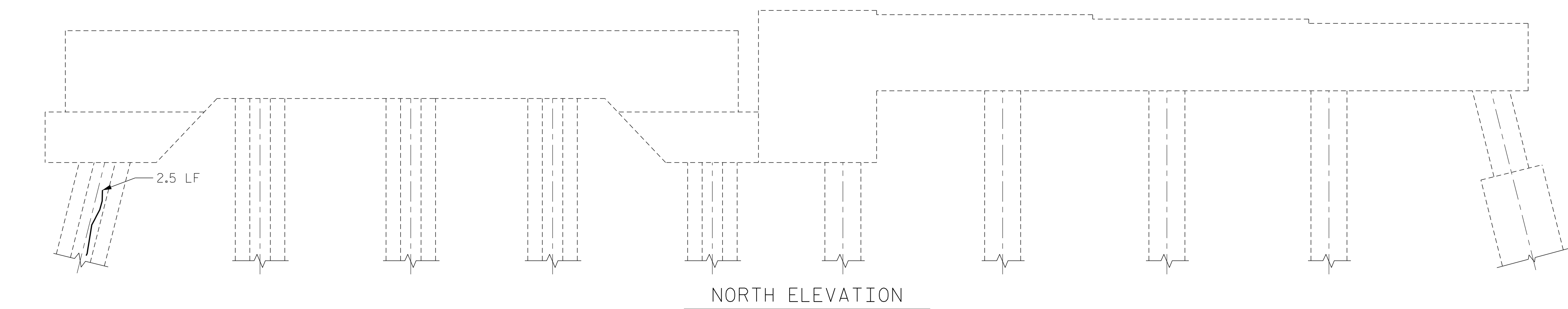
DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-38
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 19	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	0.6	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	1.5			
PILE	5.5			
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.

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
 9CDB3ADC66D6400...
 3/14/2019

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH




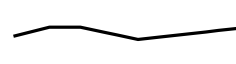
SUBSTRUCTURE REPAIRS

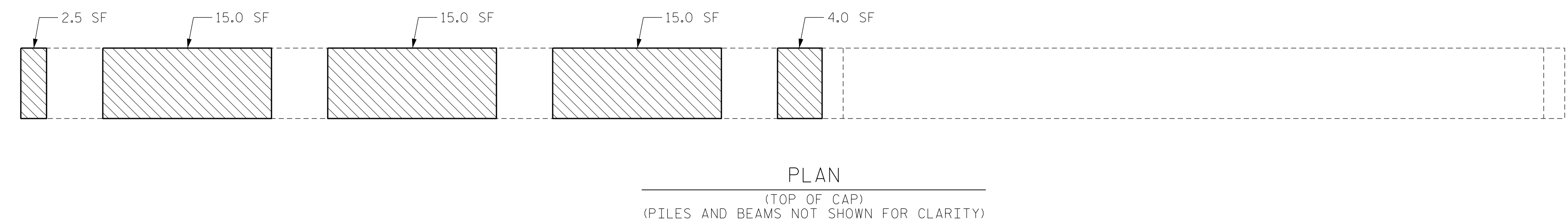
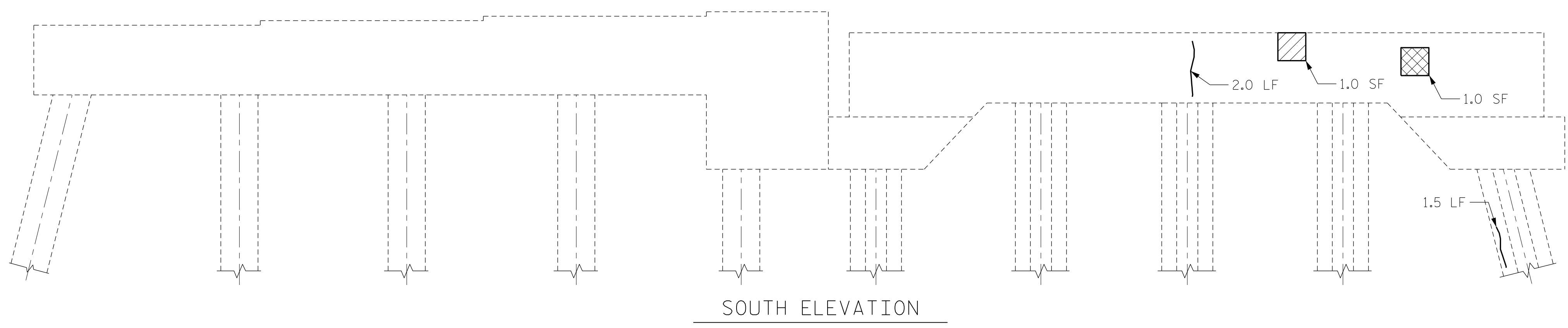
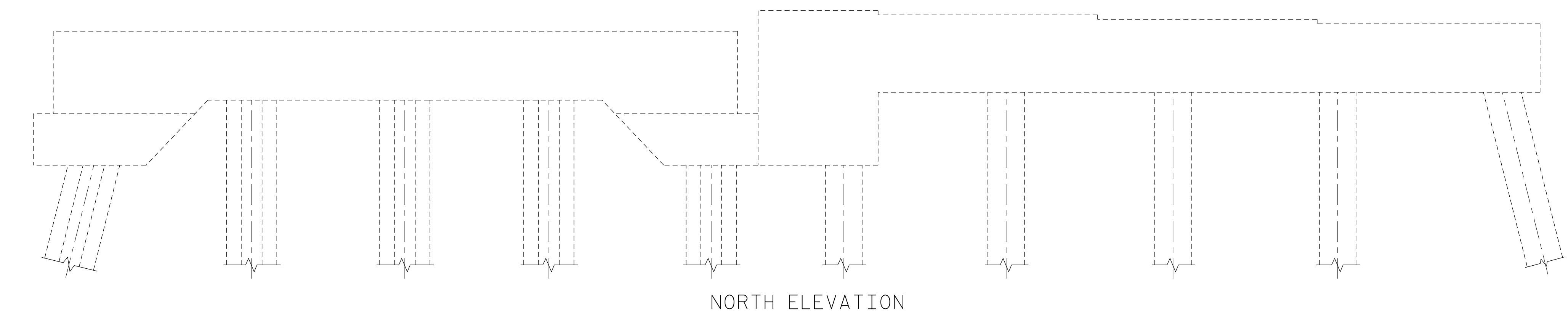
BENT 19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-39
2			4			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 20	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	1.0	0.5		
PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
* CAP	1.0	0.5		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	2.0			
PILE	1.5			
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.

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



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE REPAIRS
 BENT 20

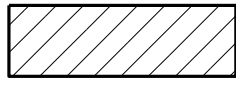
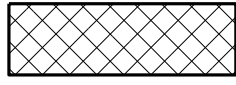
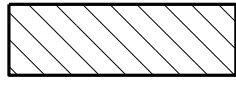
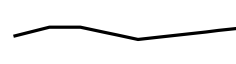
KCA 301 FAYETTEVILLE ST., SUITE 1500
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601
 (919) 882-7839
 LICENSE #: C-1506

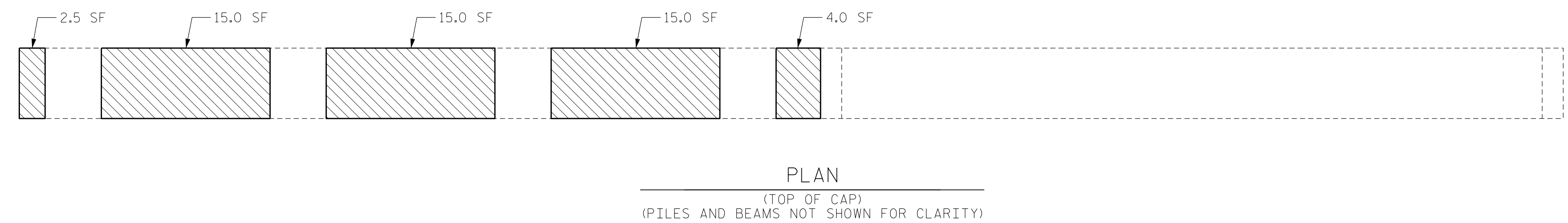
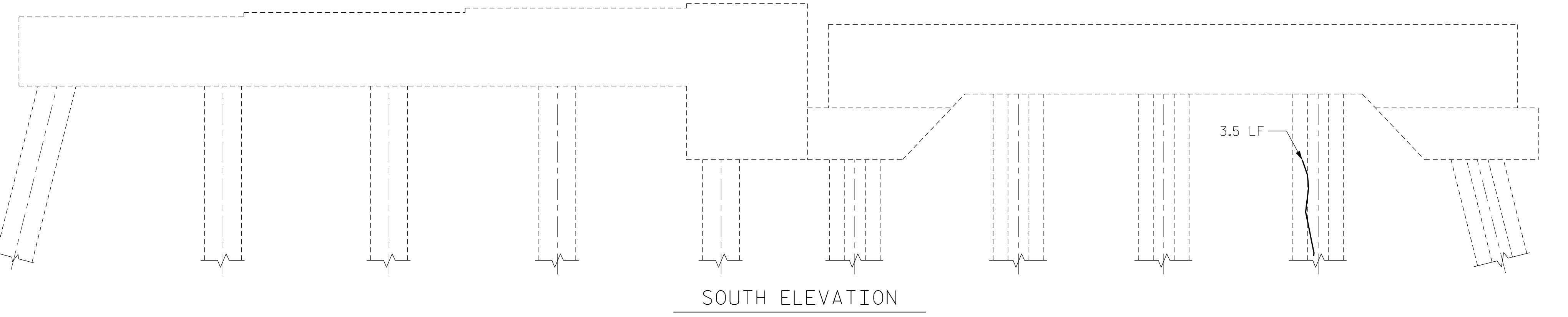
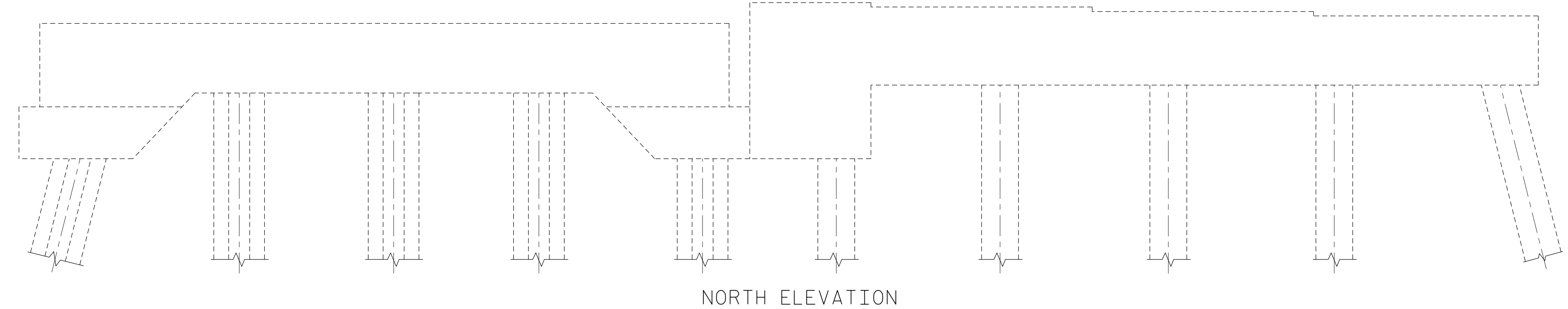
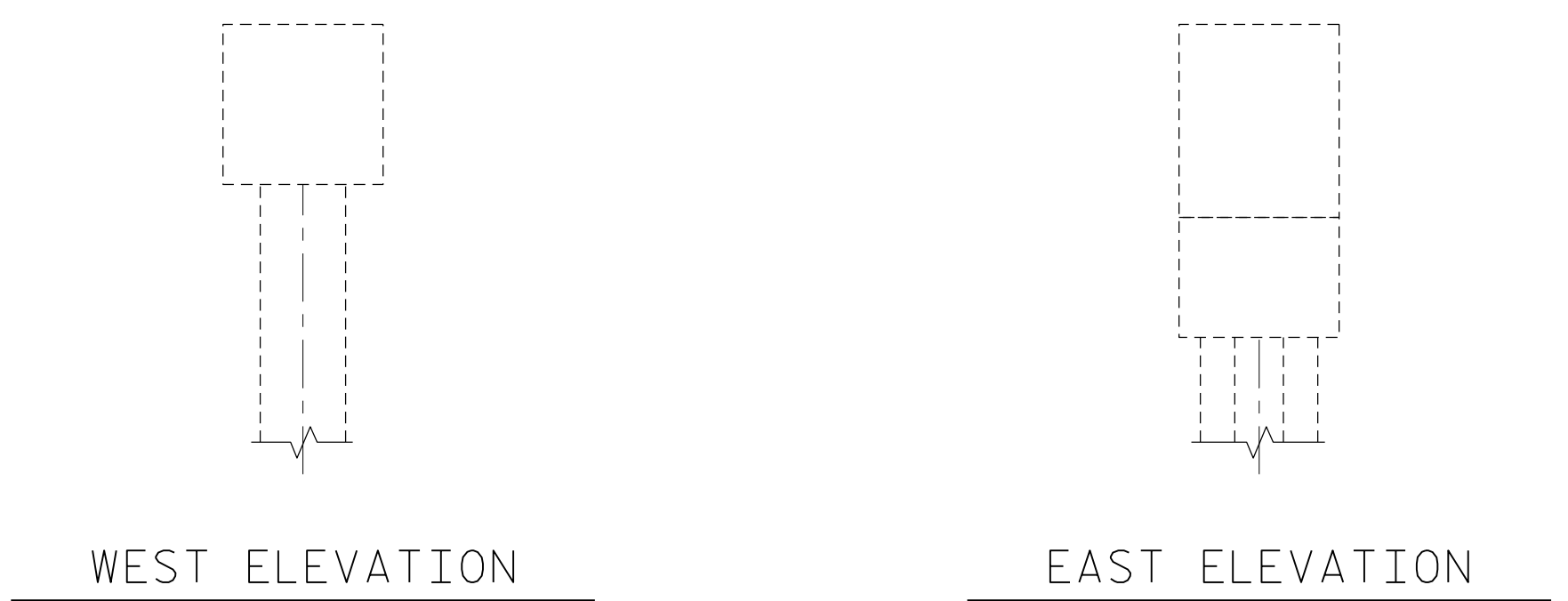
DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

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-40
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 21	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	3.5			
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.

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



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE REPAIRS
 BENT 21




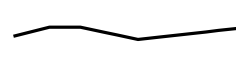
KCA 301 FAYETTEVILLE ST., SUITE 1500
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601
 (919) 882-7839
 LICENSE #: C-1506

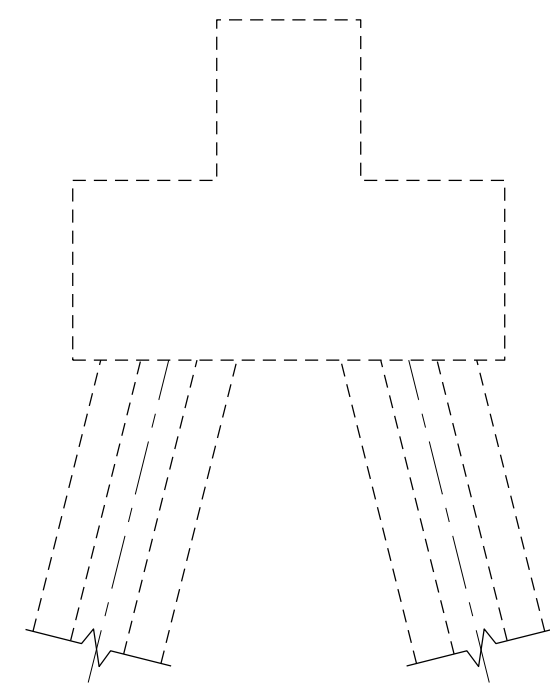
DRAWN BY : DIEGO A. AGUIRRE DATE : 2/5/2019
 CHECKED BY : OMAR M. KHALAFALLA DATE : 2/5/2019
 DESIGN ENGINEER OF RECORD : JACOB H. DUKE DATE : 2/5/2019

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

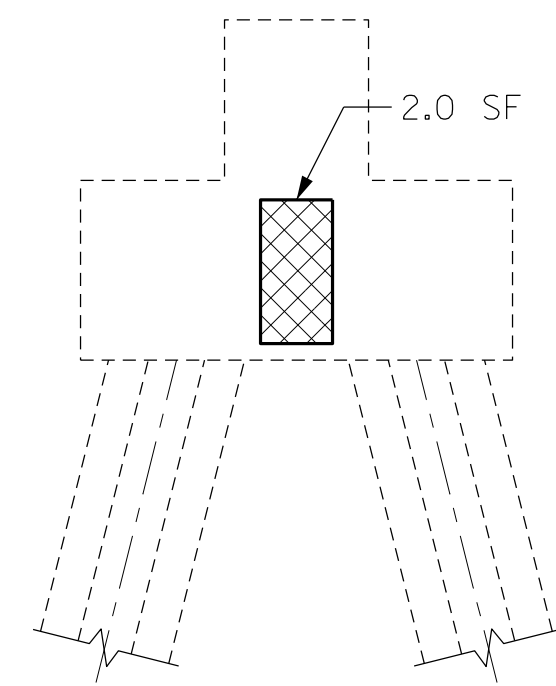
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-41
2			4			TOTAL SHEETS 57

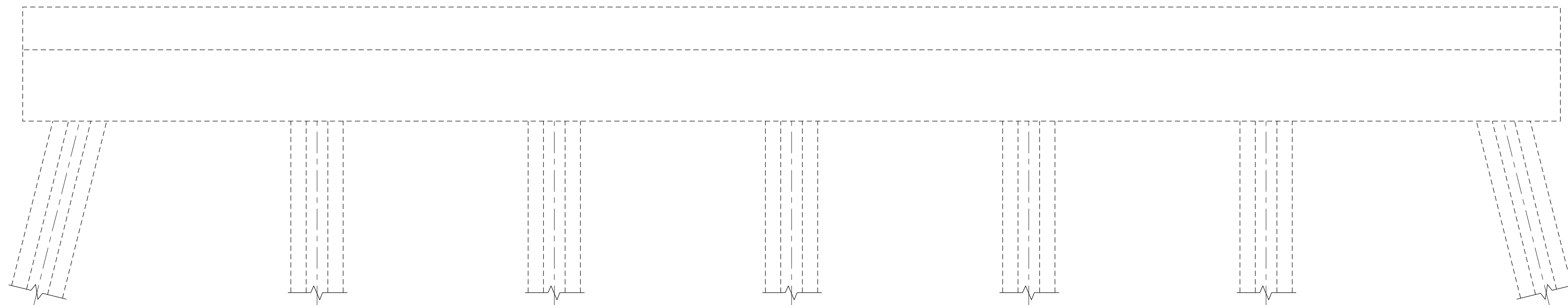
LEGEND	
	CONCRETE REPAIR AREA
	SHOTCRETE REPAIR AREA
	EPOXY COATING AREA
	EPOXY RESIN INJECTION (ERI)



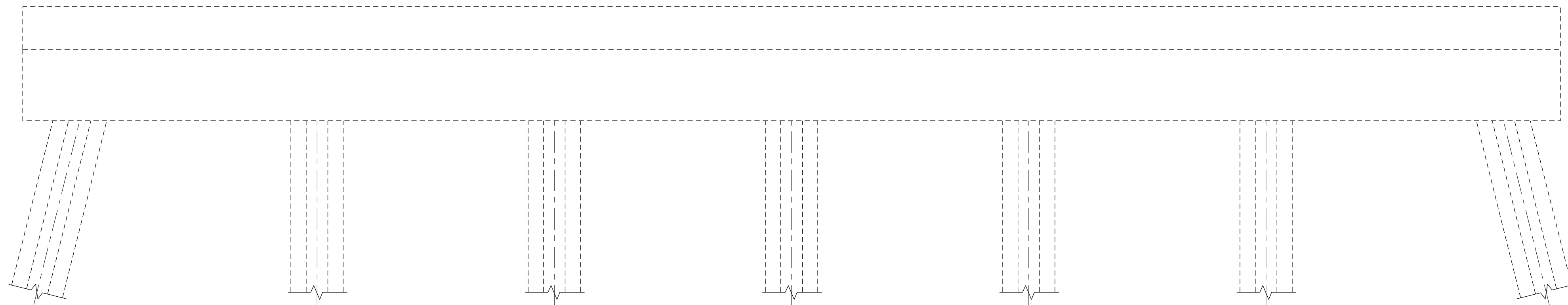
WEST ELEVATION



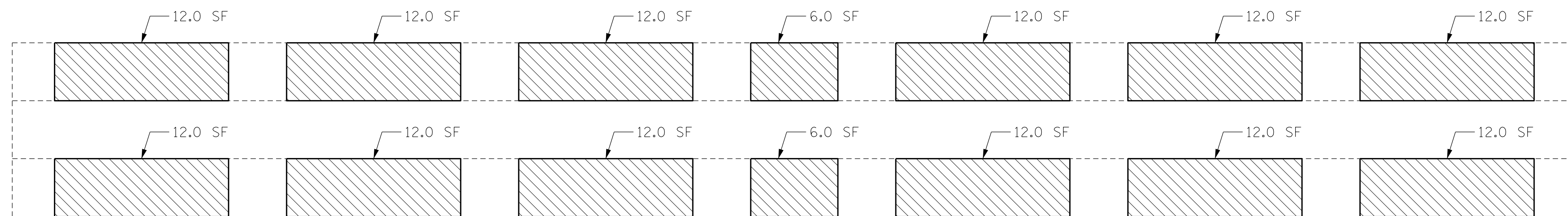
EAST ELEVATION



NORTH ELEVATION



SOUTH ELEVATION



PLAN

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

AS-BUILT REPAIR QUANTITY TABLE

BENT 22	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	2.0	1.0		
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	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.

* 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
 9CD53ADC66D6400
 3/14/2019

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE REPAIRS

BENT 22

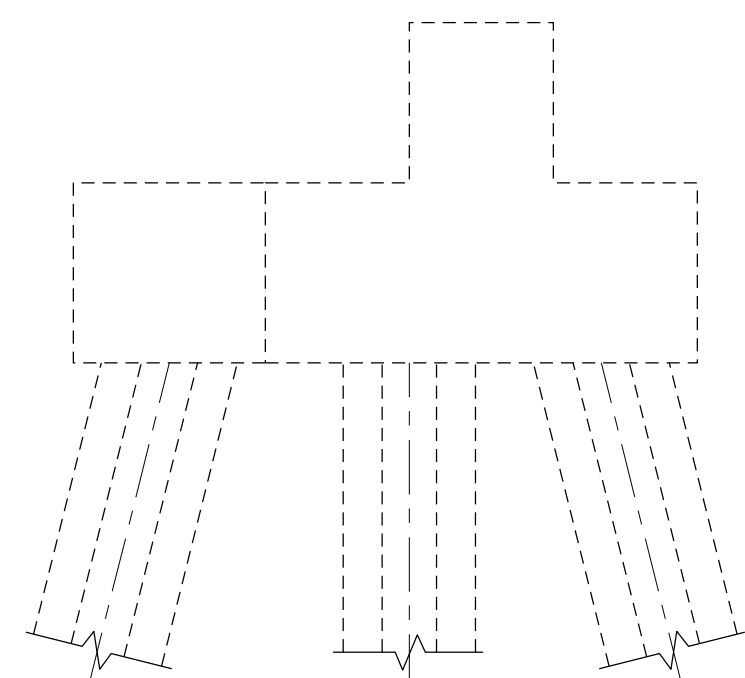
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			57

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

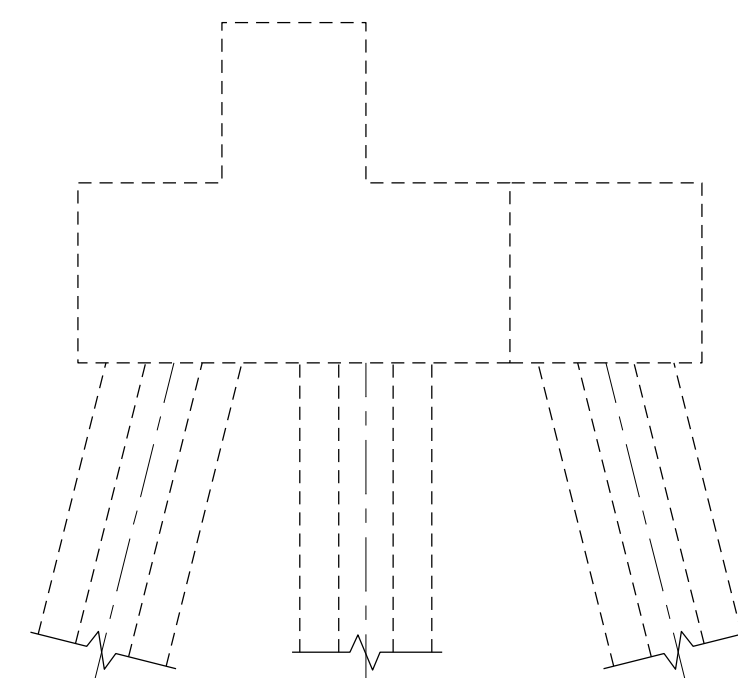
KCA 301 FAYETTEVILLE ST., SUITE 1500
 RALEIGH, NC 27601
 (919) 882-7839
 LICENSE #: C-1506

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

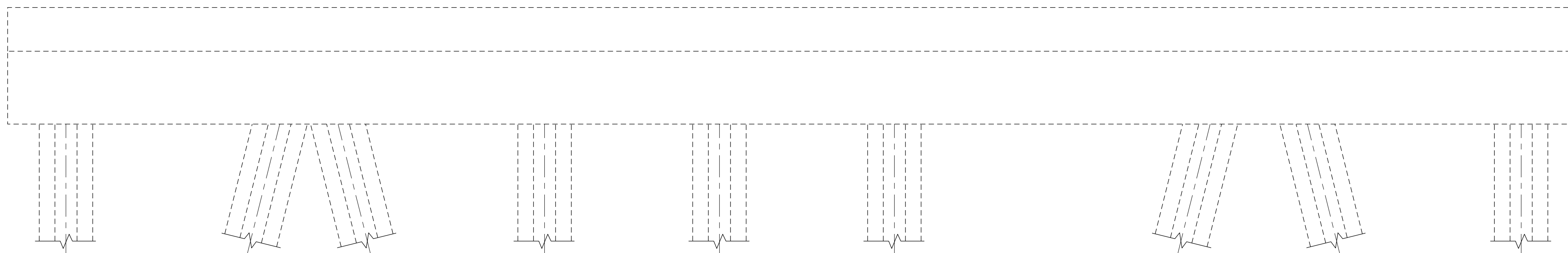
LEGEND	
	CONCRETE REPAIR AREA
	SHOTCRETE REPAIR AREA
	EPOXY COATING AREA
	EPOXY RESIN INJECTION (ERI)



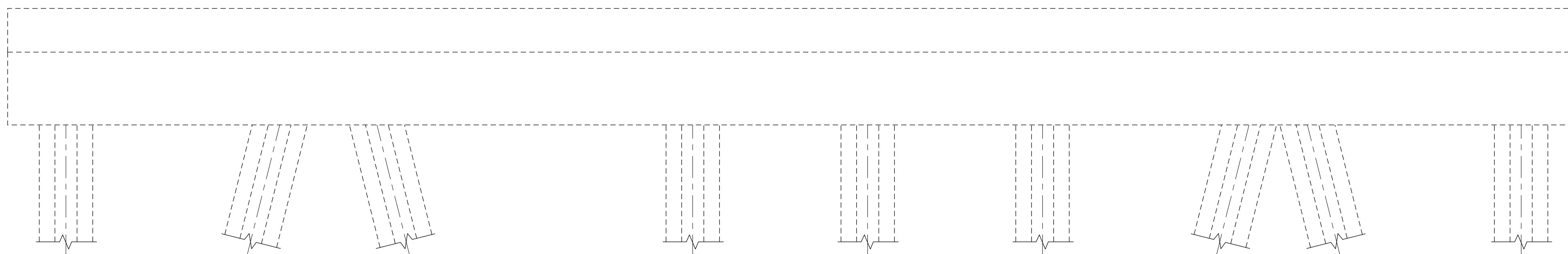
WEST ELEVATION



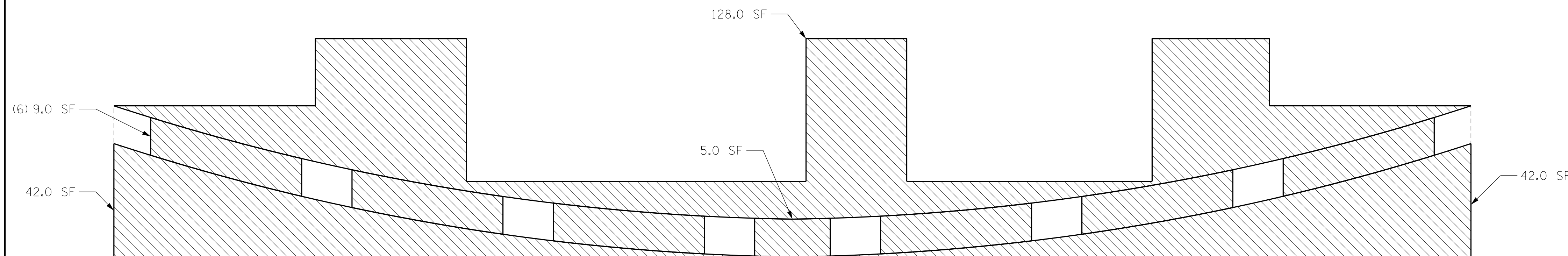
EAST ELEVATION



NORTH ELEVATION



SOUTH ELEVATION



PLAN

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

AS-BUILT REPAIR QUANTITY TABLE

BENT 23	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	271.0			

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.

* 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
9CDB3ADC66D6400
3/14/2019

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIRS

BENT 23




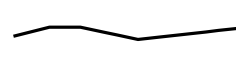
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-43
2			4			TOTAL SHEETS 57

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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)



NORTH ELEVATION



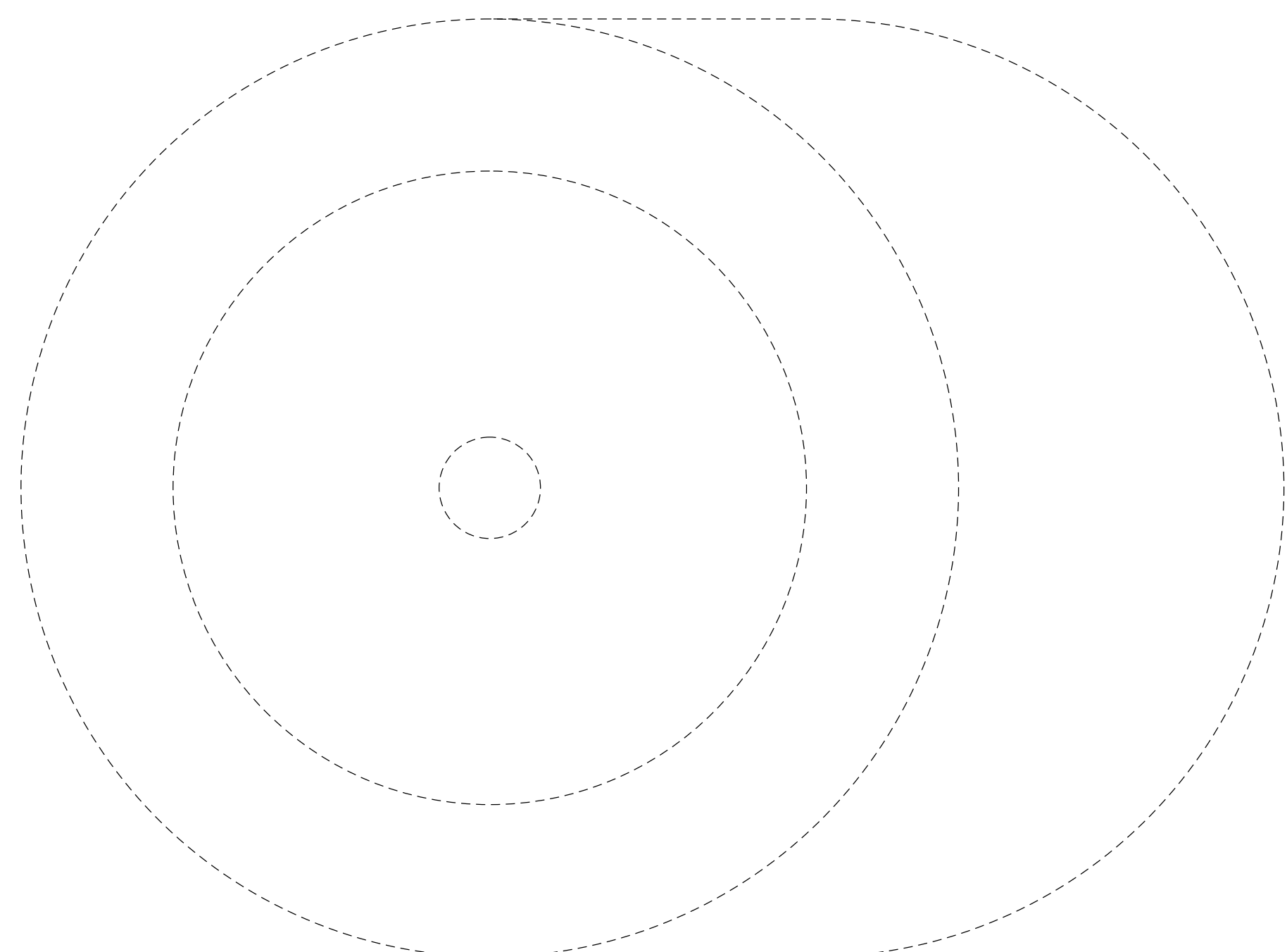
WEST ELEVATION



SOUTH ELEVATION



EAST ELEVATION



PLAN

(PILES NOT SHOWN FOR CLARITY)

AS-BUILT REPAIR QUANTITY TABLE

BENT 24	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 AREAS 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

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



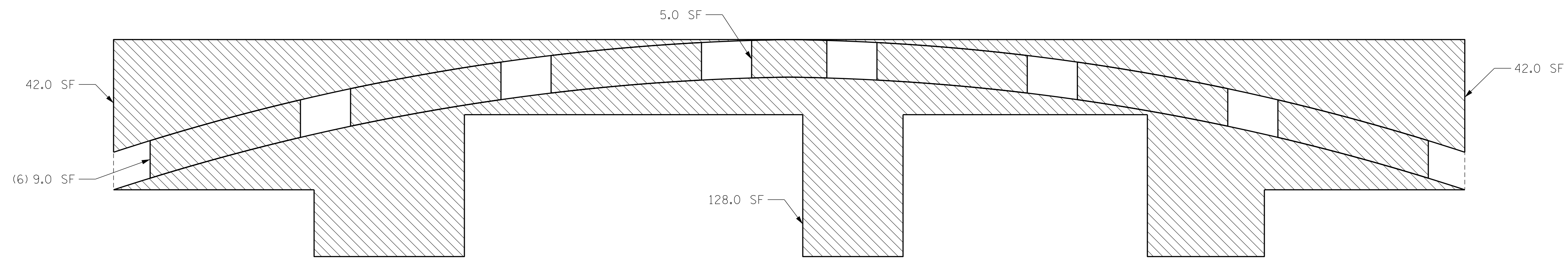
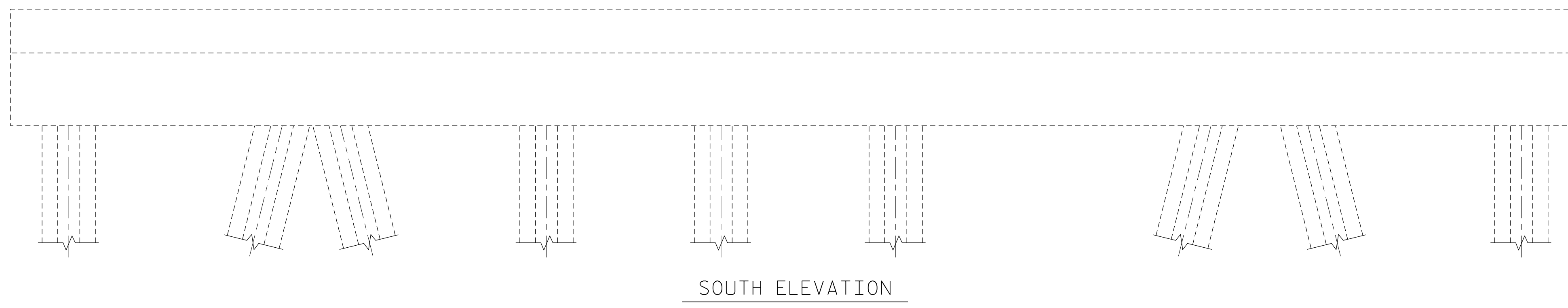
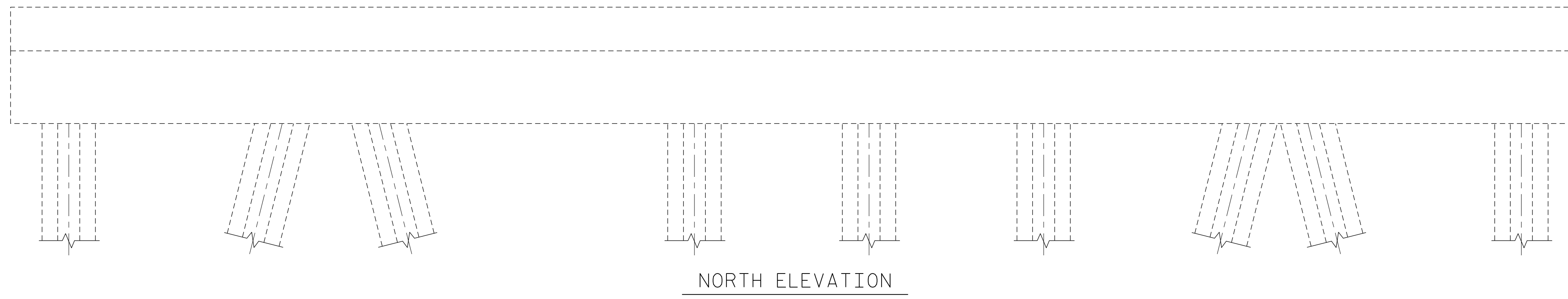
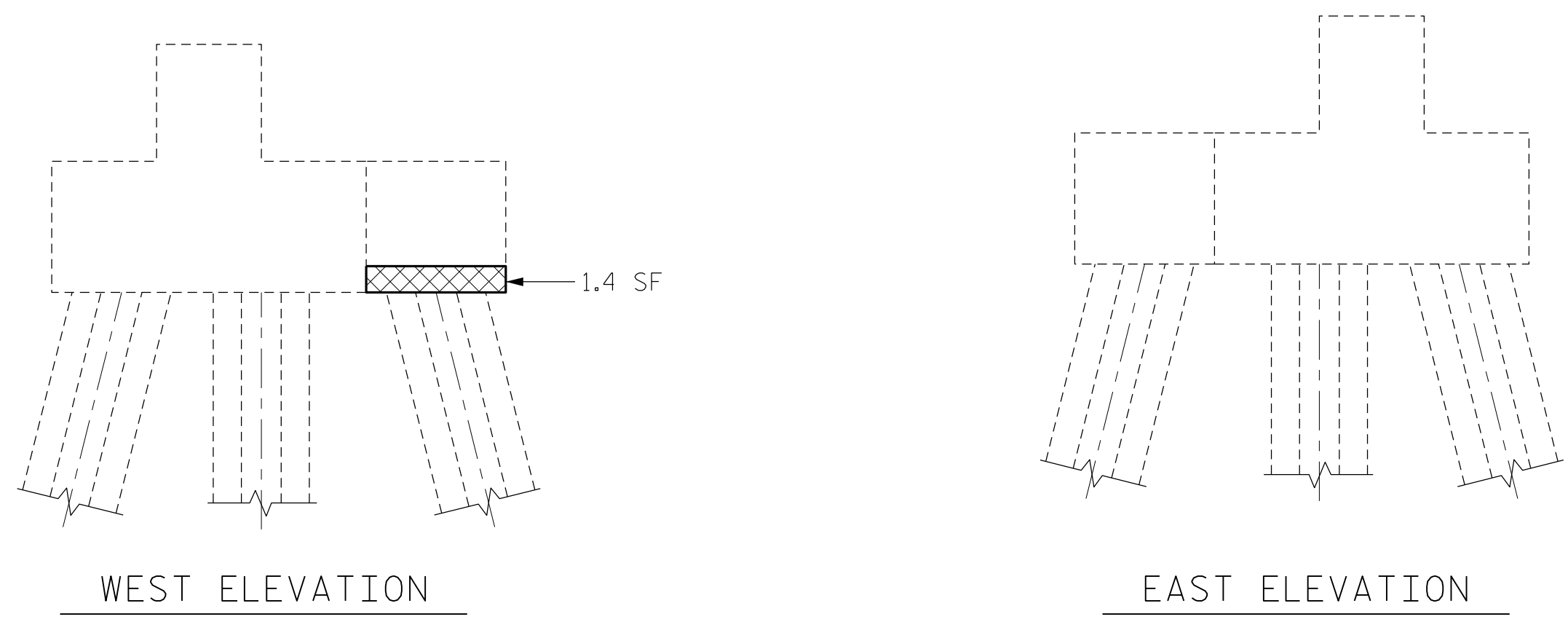
DocuSigned by:
 Jacob H. Duke
 9CD53ADC66D6400
 3/14/2019

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE REPAIRS
 BENT 24

NO.	REVISIONS			NO.	REVISIONS			SHEET NO.
	BY:	DATE:			BY:	DATE:		
1				3				S-44
2				4				TOTAL SHEETS 57

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 25	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/FOOTING	1.4	0.7		
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	271.0			

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.

* 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
9CDB3AD0C66D6400
3/14/2019





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

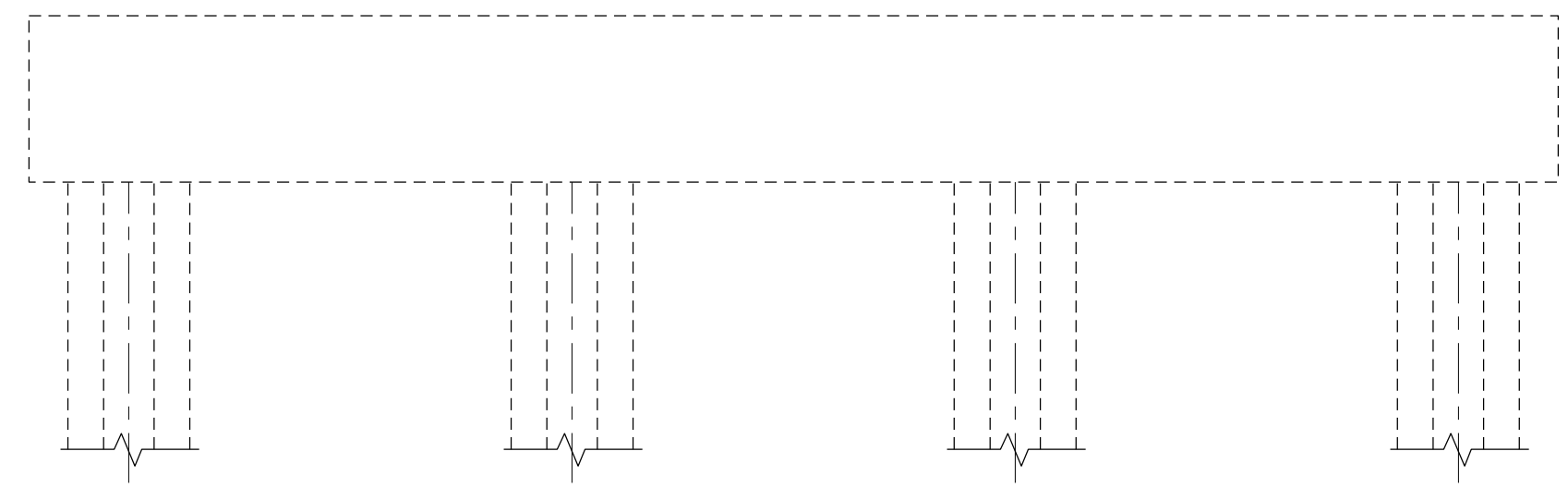
KCA 301 FAYETTEVILLE ST., SUITE 1500
KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27601
(919) 882-7839
LICENSE #: C-1506

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

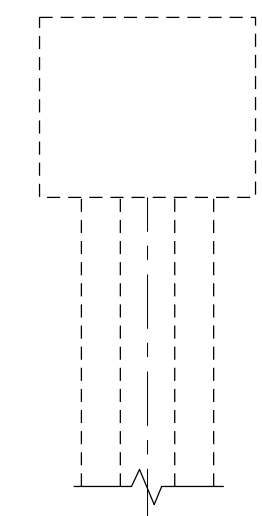
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45	
1			3			TOTAL SHEETS	
2			4			57	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

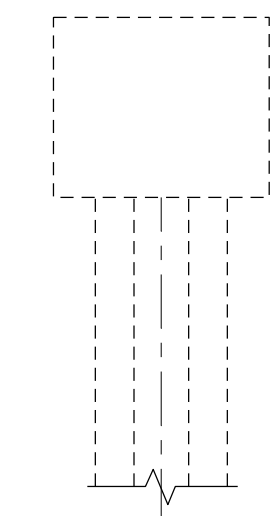
LEGEND	
	CONCRETE REPAIR AREA
	SHOTCRETE REPAIR AREA
	EPOXY COATING AREA
	EPOXY RESIN INJECTION (ERI)



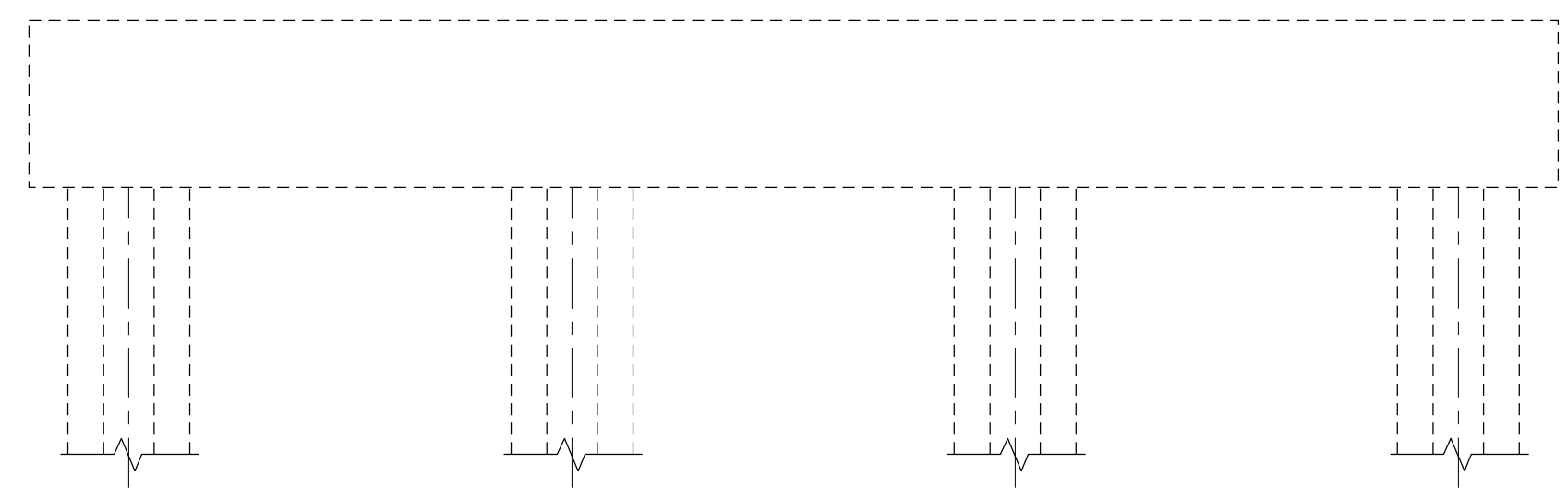
NORTH ELEVATION



WEST ELEVATION



EAST ELEVATION



SOUTH ELEVATION



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

AS-BUILT REPAIR QUANTITY TABLE				
BENT 25A	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

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
 9CD53ADC66D6400
 3/14/2019

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE REPAIRS
 BENT 25A

NO.	BY:	DATE:	REVISIONS			SHEET NO.
			NO.	BY:	DATE:	
1			3			S-46
2			4			TOTAL SHEETS 57

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED