

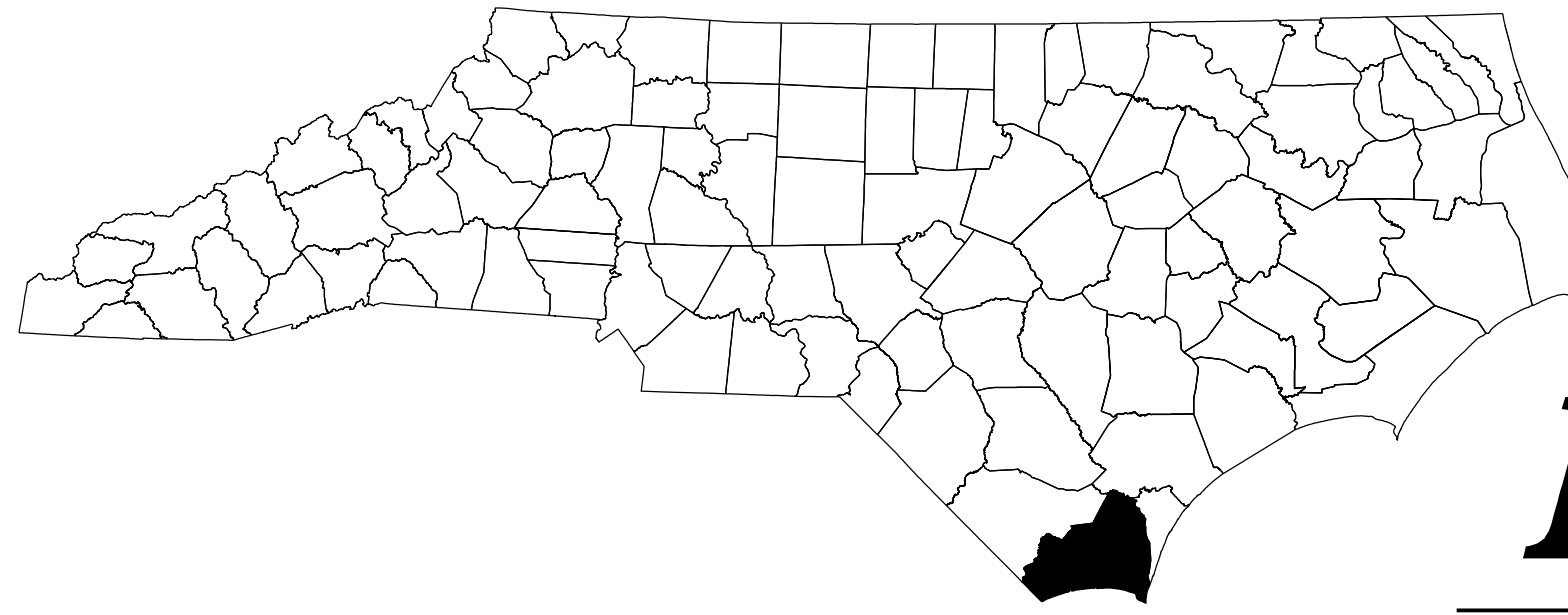
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PROJECT: 15BPR.16

CONTRACT: C204200



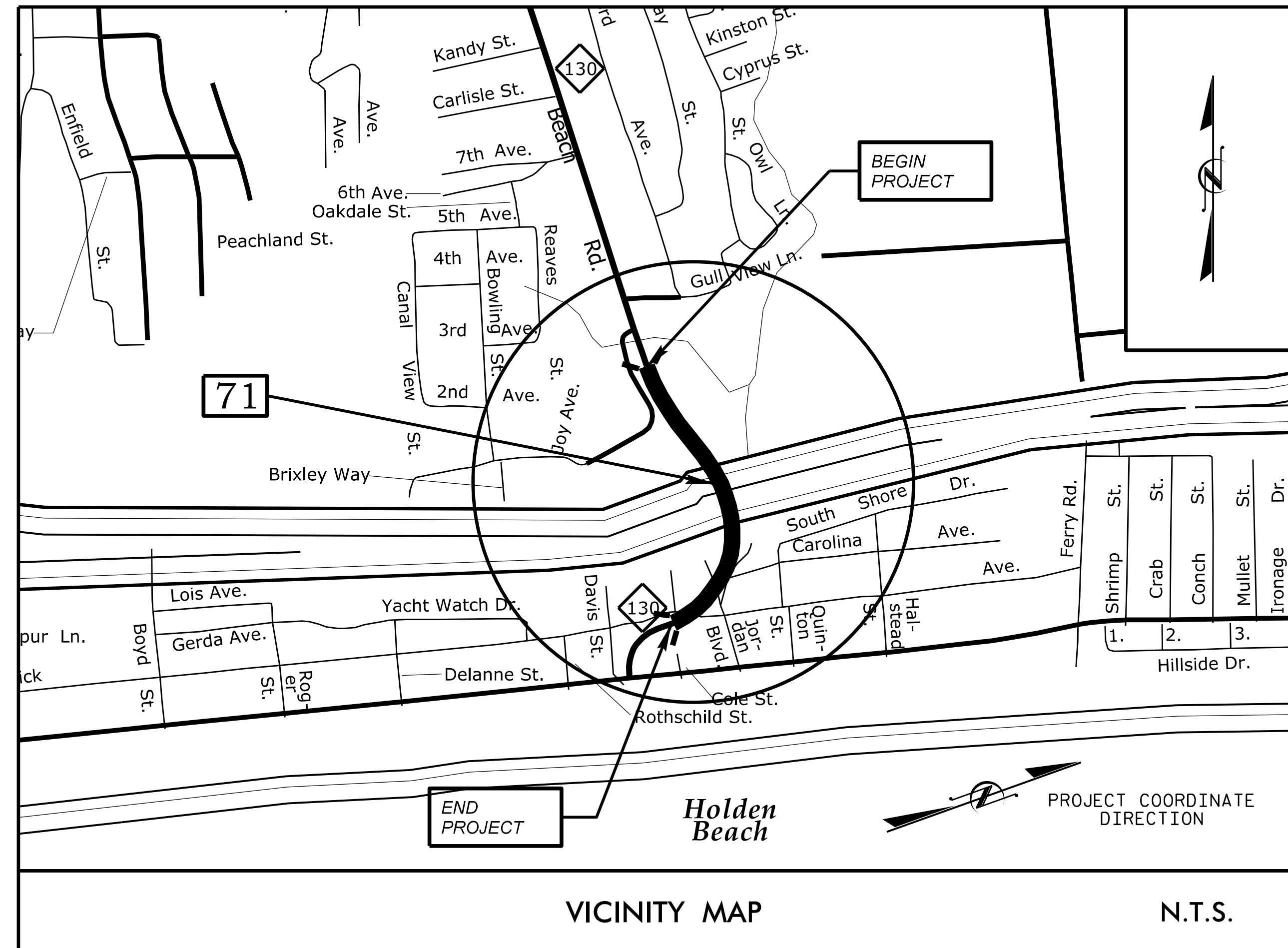
STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

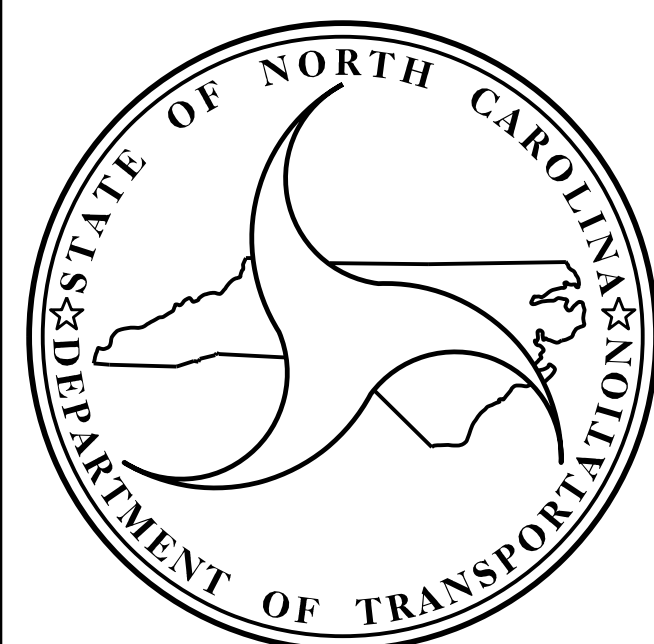
BRUNSWICK COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15BPR.16	1	73
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
15BPR.16	-	P.E.	
15BPR.16	-	CONST.	

LOCATION: BRUNSWICK COUNTY
BRIDGE #71 ON NC 130 OVER THE INTRACOASTAL WATERWAY
TYPE OF WORK: BRIDGE PRESERVATION - DECK, SUPERSTRUCTURE AND SUBSTRUCTURE REPAIR, JOINT REPAIR AND FENDER RETROFIT



STRUCTURES



DESIGN DATA
 BRUNSWICK COUNTY
 #71 ADT 2018 = 7,900

PROJECT LENGTH
 BRUNSWICK COUNTY
 #71 = 0.34 MILE

2018 STANDARD SPECIFICATIONS
LETTING DATE :
 JUNE 19, 2018

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

KCA 4800 SIX FORKS ROAD SUITE 120
 RALEIGH, NC 27609
 (919) 882-7839

DocuSigned by:
 Samuel Cullum
 15C3D709C75A487

5/17/2018 10:17:39 AM PDT

SAMUEL L. CULLUM, P.E.
 PROJECT ENGINEER

JACOB H. DUKE, P.E.
 PROJECT DESIGN ENGINEER

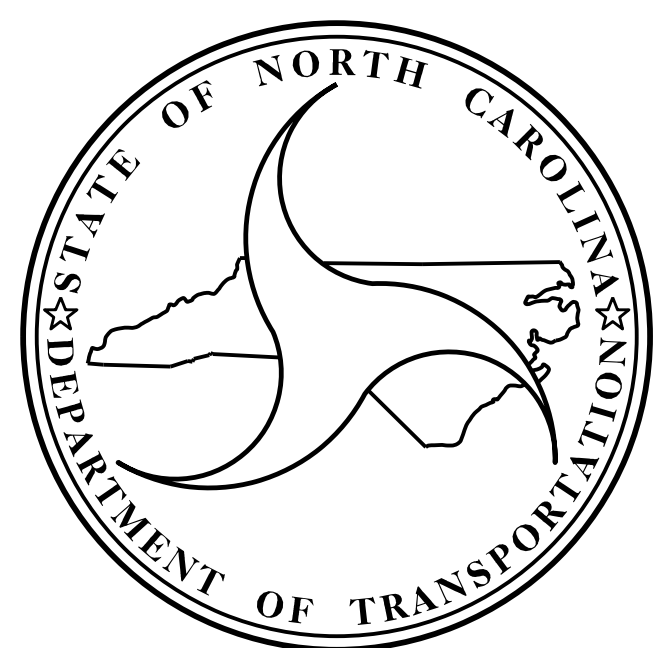
PROJECT: 15BPR.16

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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15BPR.16	1A	73
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
15BPR.16	-	P.E.	
15BPR.16	-	CONST.	



KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

PROJECT: 15BPR.16

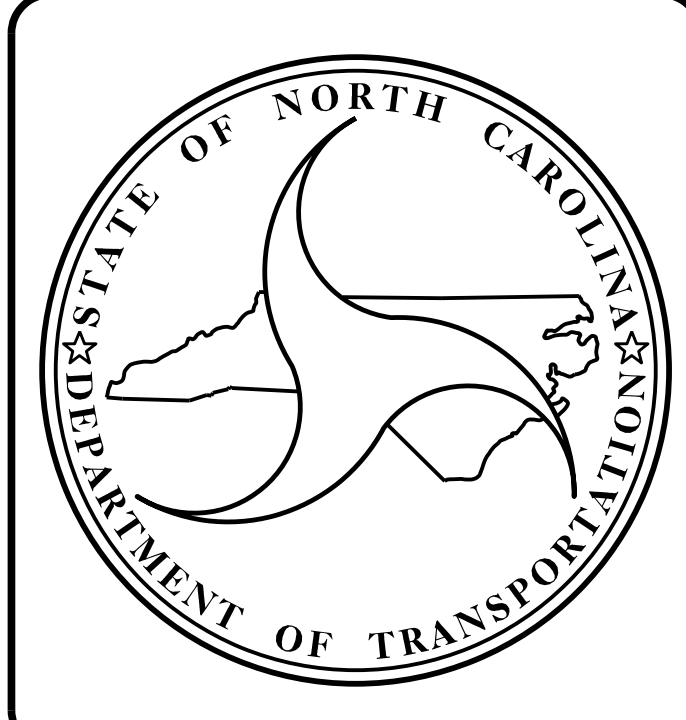
CONTRACT: C204200

SUMMARY OF QUANTITIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	15BPR.16	S-1	73
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
15BPR.16	-	P.E.	
15BPR.16	-	CONST.	

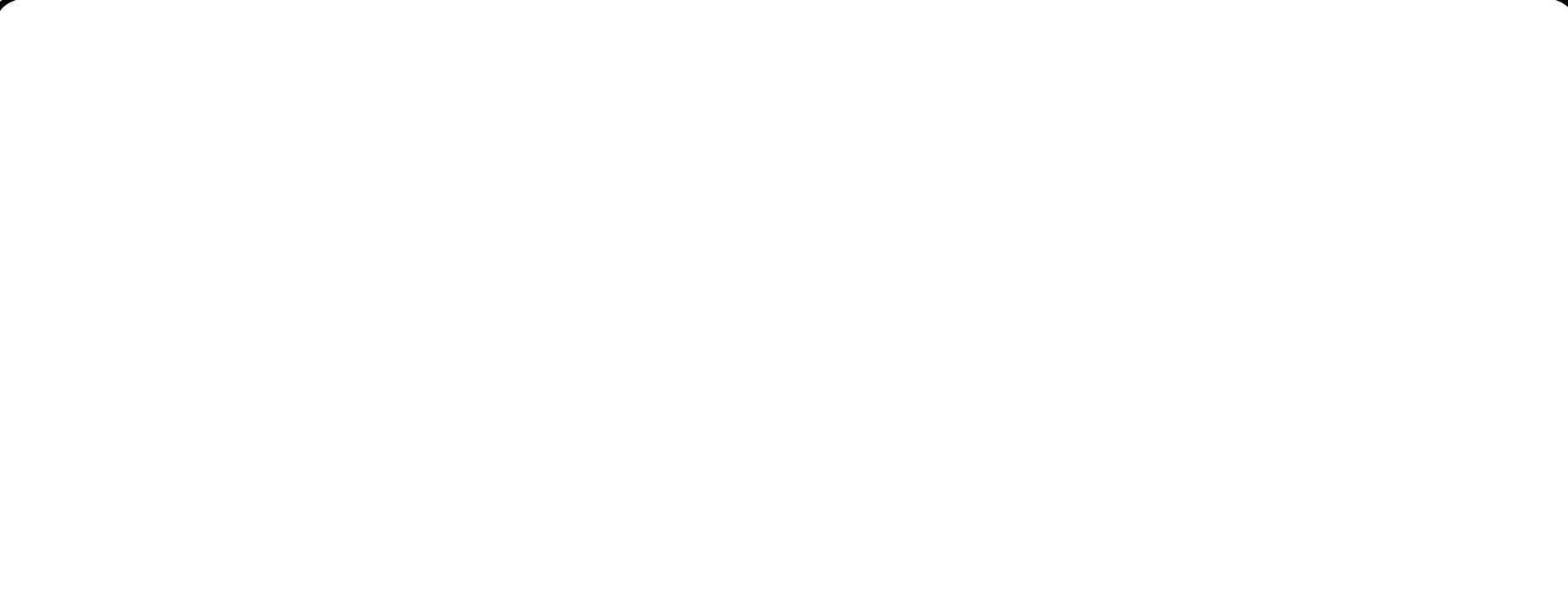
TOTAL BILL OF MATERIAL - STRUCTURES														
	GROOVING BRIDGE FLOORS	POLLUTION CONTROL	CLASS II, SURFACE PREPARATION	ELASTOMERIC BEARINGS	REPAIRS TO PRESTRESSED CONCRETE GIRDERS	CONCRETE REPAIRS	SHOTCRETE REPAIRS	EPOXY RESIN INJECTION	REMOVAL OF EXISTING FENDER SYSTEM	COMPOSITE FENDER SYSTEM	BRIDGE JOINT REMOVAL	SILICONE JOINT SEALANT	PPC MATERIALS	CP SYSTEM ZINC ALUMINUM SPRAY
	SO. FT.	LUMP SUM	SO. YDS.	LUMP SUM	CU. FT.	CU. FT.	CU. FT.	LIN. FT.	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	CU. YDS.	SO. FT.
SUPERSTRUCTURE	53721		6		210	46		534			132	788	192	
SUBSTRUCTURE						145	1031	606						975
TOTAL	53721	LUMP SUM	6	LUMP SUM	210	191	1031	1140	LUMP SUM	LUMP SUM	132	788	192	975

TOTAL BILL OF MATERIAL - STRUCTURES CONT.										
	EPOXY PROTECTIVE COATING	SCARIFYING BRIDGE DECK	SHOTBLASTING BRIDGE DECK	PLACING AND FINISHING PPC OVERLAY	CONCRETE DECK REPAIR FOR PPC OVERLAY	SINGLE PILE JACKET	THREE PILE JACKET	SEVEN PILE JACKET	CP SYSTEM (ZINC BULK ANODES)	BRIDGE JACKING (TYPE I)
	SO. FT.	SO. YDS.	SO. YDS.	SO. YDS.	SO. YDS.	EA.	EA.	EA.	EA.	EA.
SUPERSTRUCTURE		6674	6674	6674	6					
SUBSTRUCTURE	3527					16	68	4	22	
TOTAL	3527	6674	6674	6674	6	16	68	4	22	3



KCA
KISINGER CAMPO & ASSOCIATES
4800 SIX FORKS ROAD SUITE 120
RALEIGH, NC 27609
(919) 882-7839

Professional Seal
SEAL 043571
ENGINEER
SAMUEL L. CULLUM
DocuSigned by:
Samuel Cullum
19C97895C75A487...
5/17/2018 10:17:39 AM PDT



DRAWINGS AND DIMENSIONS:

- DO NOT SCALE DRAWINGS FOR DIMENSIONS NOT GIVEN.
- VERIFY ALL EXISTING FIELD CONDITIONS AND DIMENSIONS (INCLUDING MINIMUM VERTICAL CLEARANCE) PRIOR TO COMMENCING REPAIRS OR ORDERING ANY MATERIAL. NOTIFY ENGINEER OF ANY DISCREPANCIES FOUND.
- ALL DIMENSIONS ARE IN FEET AND INCHES.

DESIGN SPECIFICATIONS:

- LRFD BRIDGE DESIGN SPECIFICATIONS (8TH EDITION, 2017)
- 2018 NCDOT STANDARD SPECIFICATIONS AND PROJECT SPECIAL PROVISIONS.

PROJECT SCOPE:

- POLYESTER POLYMER CONCRETE (PPC) OVERLAY
- SUPERSTRUCTURE CONCRETE REPAIRS
- SUBSTRUCTURE CONCRETE REPAIRS
- EXPANSION JOINT REPLACEMENT/INSTALLATION
- BEARING REPLACEMENT
- GALVANIC CATHODIC PROTECTION - METALIZING
- GALVANIC CATHODIC PROTECTION - BULK ANODE
- FENDER SYSTEM REHABILITATION
- APPROACH ROADWAY MILLING AND RESURFACING

GENERAL NOTES:

- IT IS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL STATE AND FEDERAL REQUIREMENTS.
- FOR SUBMITTAL OF FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR CONTROL OF TRAFFIC AND LIMITS ON PHASING CONSTRUCTION, SEE TRANSPORTATION MANAGEMENT PLAN.
- FOR SURFACE PREPARATION FOR PPC OVERLAY, SEE SPECIAL PROVISIONS.
- FOR POLYESTER POLYMER CONCRETE (PPC), 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 CONCRETE DECK REPAIR FOR PPC OVERLAY, SEE SPECIAL PROVISIONS.
- FOR ADHESIVELY ANCHORED RODS AND DOWELS, SEE ARTICLE 420-13 OF THE STANDARD SPECIFICATIONS.
- ALL PROPOSED EXPANSION JOINT DIMENSIONS, OPENINGS AND BLOCKOUTS ARE SHOWN AT 60°F. CONTRACTOR SHALL FOLLOW MANUFACTURER'S INSTALLATION GUIDELINES AND MAKE ANY NECESSARY ADJUSTMENTS.
- 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.
- 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.
- ANY DAMAGE TO EXISTING REINFORCING STEEL, DURING CONTRACTOR'S OPERATIONS, SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER AND PERFORMED AT NO ADDITIONAL COST.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR MAINTENANCE OF WATER TRAFFIC, SEE SPECIAL PROVISIONS.
- FOR WORK IN, OVER OR ADJANCE TO NAVIGABLE WATERS, SEE SPECIAL PROVISIONS.

PROJECT COORDINATES:

NC 130/HOLDEN BEACH ROAD IS AN EAST/WEST ROUTE AND THE BRIDGE BEGINS ON THE MAINLAND SIDE AND ENDS ON THE BEACH SIDE. ALTHOUGH THE BRIDGE IS ORIENTED IN THE NORTH/SOUTH CARDINAL DIRECTION, REFERENCE IN THESE PLANS, BRIDGE INSPECTION REPORTS, AND OTHER DATA IS BASED ON END BENT 1 BEING LOCATED AT THE MAINLAND SIDE AND END BENT 2 BEING LOCATED AT THE BEACH SIDE. IN AN ATTEMPT TO BE CONSISTENT WITH THE CURRENT BRIDGE INSPECTION REPORT, END BENT 1 WILL BE LABELED THE "WEST" END OF THE BRIDGE AND END BENT 2 WILL BE LABELED THE "EAST" END.

DATUM:

ALL ELEVATIONS REFER TO NGVD '29 UNLESS NOTED OTHERWISE.

ENVIRONMENT:

SUPERSTRUCTURE: EXTREMELY AGGRESSIVE - COASTAL
 SUBSTRUCTURE: EXTREMELY AGGRESSIVE - COASTAL

SITE CONDITIONS:

HABITAT BEYOND THE LIMITS OF CONSTRUCTION SHALL NOT BE DISTURBED.

CONCRETE CLASS:

SEE PROJECT SPECIAL PROVISIONS FOR CONCRETE REPAIR MATERIALS.

CONCRETE COVER:

- 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.
- CONSTRUCTION JOINTS ARE PERMITTED ONLY AT LOCATIONS SPECIFIED IN THE PLANS. ADDITIONAL CONSTRUCTION JOINTS OR ALTERATIONS TO THOSE SHOWN REQUIRE THE ENGINEER'S APPROVAL.

CONCRETE FINISHES:

FINISH 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.

REINFORCING STEEL:

- ALL REINFORCING STEEL SHALL BE ASTM A615-96, GRADE 60.
- ALL DIMENSIONS PERTAINING TO LOCATION OF REINFORCEMENT ARE TO CENTERLINE OF BARS EXCEPT WHERE THE CLEAR DIMENSION IS SHOWN TO FACE OF CONCRETE.
- REINFORCEMENT DETAIL DIMENSIONS ARE OUT-TO-OUT OF BARS.

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
 CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

ADJACENT EDGE CONCRETE REPAIRS:

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. CONTRACTOR IS RESPONSIBLE FOR THIS REPAIR AT ALL LOCATIONS REGARDLESS OF CALL-OUT ON RESPECTIVE SHEET(S).

LIMIT OF REPAIRS:

- 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.

FORMS CONSTRUCTION:

FORMS MUST BE SUPPORTED BY THE EXISTING STRUCTURE. FULL DEPTH COFFERDAMS WILL NOT BE ACCEPTED. THE CONTRACTOR SHALL SUBMIT DETAILED PLANS FOR FORMS AND FALSEWORK TO BE USED FOR CONSTRUCTION OF THE PIER AND CONCRETE REPAIR.

CONSTRUCTION SURVEYING:

ALL SURVEYING AND STAKING NECESSARY TO COMPLETE THE PROPOSED WORK IS INCIDENTAL TO ALL OTHER PAY ITEMS FOR THIS PROJECT.

ENVIRONMENTAL NOTES:

STANDARD CONSTRUCTION CONDITIONS SHALL BE IMPLEMENTED FOR THE FOLLOWING PROTECTED/ENDANGERED SPECIES AS APPLICABLE AND INCLUDED IN CONTRACT DOCUMENTS.

- WEST INDIAN MANATEE
- VARIOUS SEA TURTLE SPECIES
- ATLANTIC STURGEON

POLLUTION CONTROL:

- THE CONTRACTOR SHALL SUBMIT A POLLUTION CONTROL PLAN TO THE ENGINEER IN ACCORDANCE THE NCDOT STANDARD SPECIFICATIONS, PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITIES.
- THE CONTRACTOR SHALL NOT ALLOW, AT ANY TIME, ANY DISCHARGE OR MATERIALS TO FALL INTO THE WATERWAY.
- THE CONTRACTORS SHALL SUBMIT TO THE ENGINEER AN EROSION CONTROL PLAN AS REQUIRED BY THE NCDOT STANDARD SPECIFICATIONS AND BEST MANAGEMENT PRACTICES.
- NO OFFSITE IMPACTS SHALL BE PERMITTED.
- A CONTAINMENT PLAN IS REQUIRED FOR FENDER PILE CLEANING AND COATING, AS WELL AS, CONCRETE REPAIR.

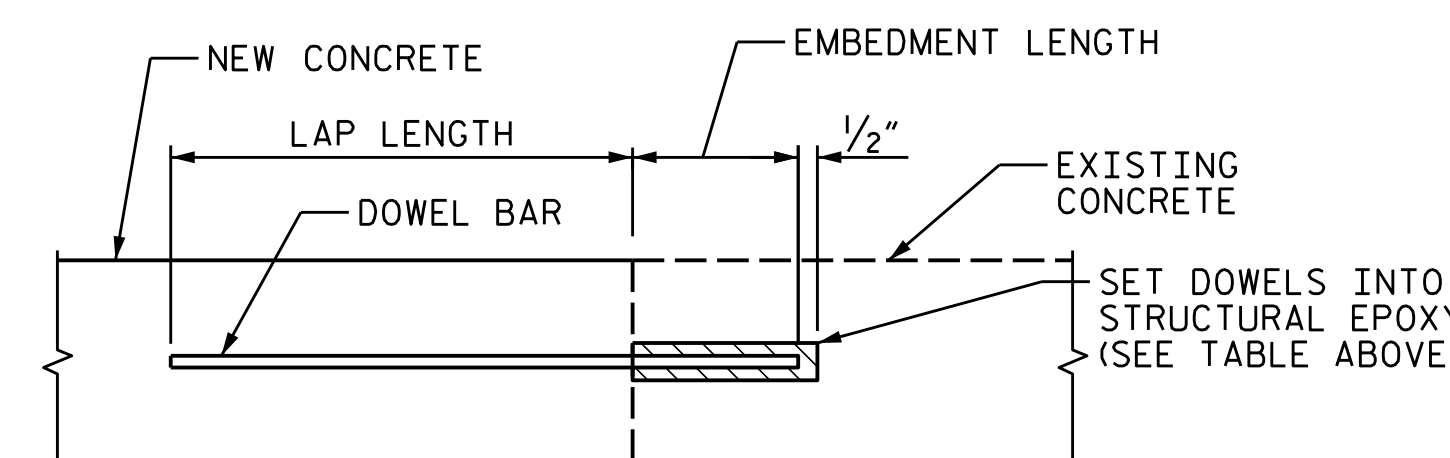
MISCELLANEOUS NOTES:

- THE CONTRACTOR IS RESPONSIBLE TO SUBMIT A JACKING PLAN FOR EACH OPERATION TO THE ENGINEER FOR APPROVAL PRIOR TO BRIDGE JACKING.
- THE CONTRACTOR WILL BE RESPONSIBLE FOR SECURING PLANS FOR POLYMERIC FENDER REPLACEMENT, SEE PLANS AND SPECIFICATIONS FOR FURTHER DETAILS.
- PAYMENT FOR INCIDENTAL ITEMS NOT SPECIFICALLY COVERED IN THE INDIVIDUAL BID ITEMS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR THE BID ITEMS CONTAINED IN THE CONTRACT.
- FOR ICT, SEE CONTRACT DOCUMENTS AND TRANSPORTATION MANAGEMENT PLANS.

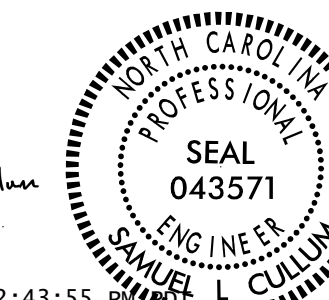
DOWEL DETAIL:

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"

- 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:
 Samuel Cullum
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PROJECT NO. 15BPR.16
 BRUNSWICK COUNTY
 BRIDGE NO. 71

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL NOTES

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONSTRUCTION OPERATIONS:

- FOR WORK ADJACENT TO THE PUBLIC, THE CONTRACTOR IS RESPONSIBLE TO ADEQUATELY PROTECT THE TRAVELING PUBLIC. THIS INCLUDES, BUT IS NOT LIMITED TO FENCING OFF OPERATIONS, SIDEWALK CLOSURES, LANE CLOSURES, DEBRIS SHIELDS, ETC.
- COORDINATE ANY FACILITY CLOSURES IN ACCORDANCE WITH THE TRAFFIC MANAGEMENT PLANS AND THE SPECIAL PROVISIONS.

WORK ON THE WATER:

- CONTACT THE US COAST GUARD 30 DAYS PRIOR TO IN-WATER CONSTRUCTION ACTIVITIES. THE NAVIGABLE CHANNEL SHALL NOT BE BLOCKED DURING CONSTRUCTION. FOR U.S. COAST GUARD CONTACT INFORMATION, SEE SPECIAL PROVISION FOR "COORDINATION WITH THE U.S. COAST GUARD".
- THE CONTRACTOR SHALL LIMIT SUBSTRUCTURE REPAIRS AND CONTAINMENT, TO HALF OF THE CHANNEL SPAN AT A TIME IN ORDER TO REDUCE THE IMPACTS TO BOATERS.
- THE CONTRACTOR SHALL MONITOR VHF RADIO AND COMMUNICATE WITH MARINE TRAFFIC AS NECESSARY. CONTRACTOR SHALL MONITOR CHANNEL 16.
- THE CONTRACTOR SHALL NOTIFY AND/OR COORDINATE WITH THE COAST GUARD WHENEVER THE CONTRACTOR PLANS TO BE IN THE WATER FOR ANY PERIOD OF TIME.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND ADJUSTING ALL NAVIGATIONAL LIGHTS AS NECESSARY THROUGHOUT THE LIFE OF THE PROJECT.

MARINE TRAFFIC:

MARINE TRAFFIC CONSTRUCTION SIGNS SHALL BE PLACED ON BOTH FACES OF EACH BRIDGE AT THE LOCATIONS WHERE WORK IS BEING PERFORMED. PLACEMENT OF THE SIGNS SHALL BE SUCH THAT THEY ARE CLEARLY VISIBLE TO THE APPROACHING MARINE TRAFFIC. BARGES LEFT IN WATER IN LOW-LIGHT CONDITIONS SHALL BE ILLUMINATED SO AS TO BE VISIBLE TO MARINE TRAFFIC.

LOCAL TRAFFIC AND PUBLIC USAGE:

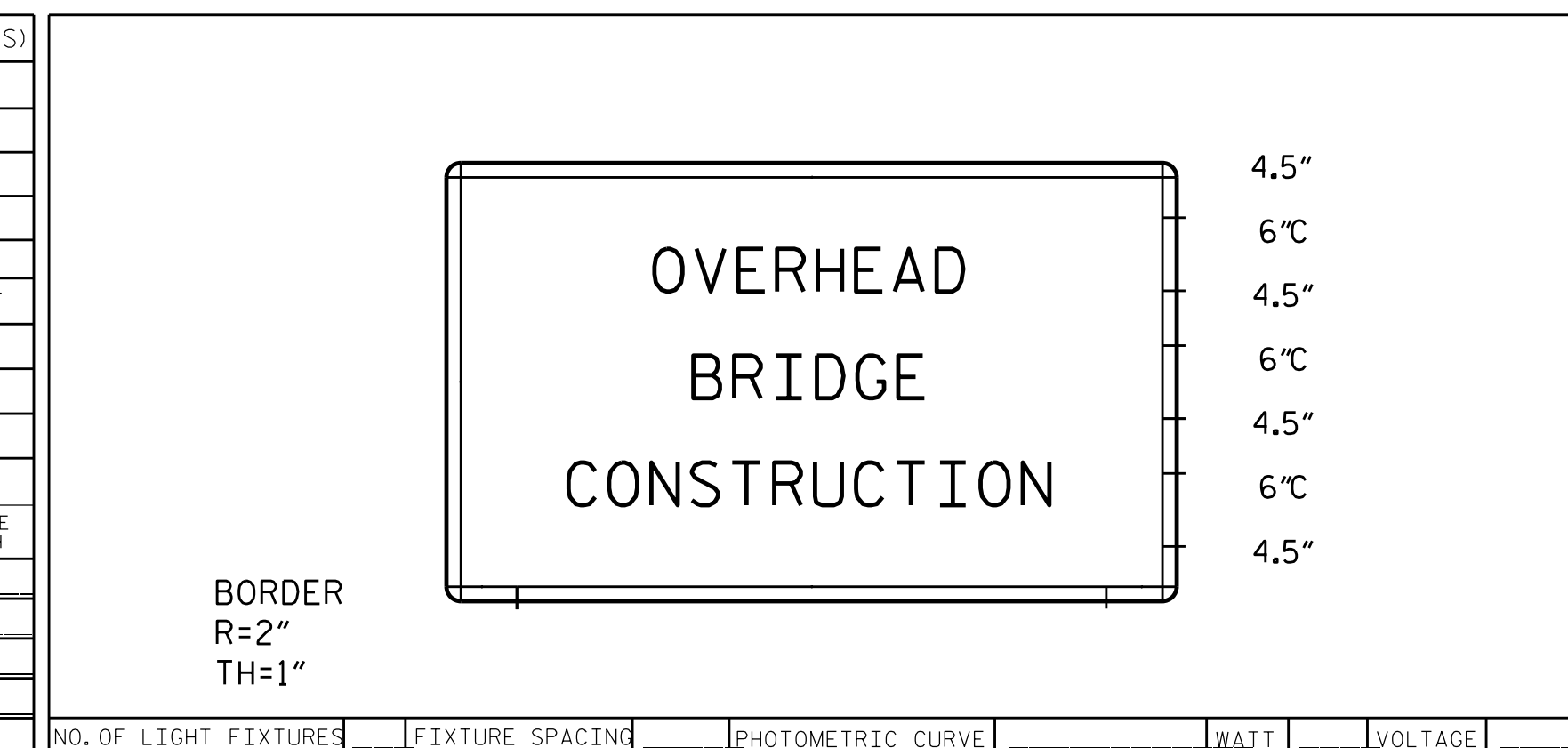
- FOR LANE CLOSURE TIMES AND RESTRICTIONS, SEE TRANSPORTATION MANAGEMENT PLAN.
- ONLY CLOSE OR NARROW LANES UNDER THE BRIDGE AT AREAS WHERE WORK IS BEING PERFORMED. DO NOT CLOSE OR NARROW LANES IN AREAS UNDER THE BRIDGE IF NO WORK IS BEING PERFORMED.
- ACCESS TO ALL PUBLIC FACILITIES SHALL REMAIN OPEN THROUGHOUT THE LIFE OF THE PROJECT. SUCH FACILITIES ARE INCLUDED BUT ARE NOT LIMITED TO: BOAT RAMPS, GAZEBOS, PARKING AREAS, RESTROOMS, ETC.

FINAL PAVEMENT MARKINGS AND MARKERS

- FOR FINAL PAVEMENT MARKING PLANS, SEE TRANSPORTATION MANAGEMENT PLANS.
- FOR FINAL PAVEMENT MARKINGS AND MARKERS, SEE STANDARD SPECIFICATIONS.
- PLACE (PERMANENT) (4") THERMOPLASTIC MARKINGS ON FINAL ASPHALT SURFACES.
- PLACE (PERMANENT) (4") COLD APPLIED PLASTIC MARKINGS ON FINAL CONCRETE SURFACES.
- ANY UNANTICIPATED REMOVAL OF PAVEMENT MARKINGS AND MARKERS SHALL BE REPLACED IN KIND.

CONSTRUCTION SEQUENCE				
BRIDGE PRESERVATION PHASE	1	ELECTRICAL REPAIRS TO NAVIGATIONAL LIGHT SYSTEM		
	2	DECK CONCRETE REPAIRS		
	3	BEARING REPLACEMENT		
	4	PPC OVERLAY	SUPERSTRUCTURE CONCRETE REPAIRS	SUBSTRUCTURE CONCRETE REPAIRS FENDER RETROFIT
	5	ASPHALT ROADWAY MILLING AND RESURFACING		
	6	EXPANSION JOINT REPLACEMENT/INSTALLATION		GALVANIC CATHODIC PROTECTION

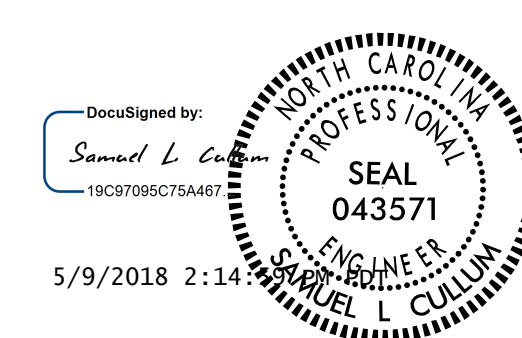
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HEIGHT	3'-0"	RADII	2"				
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COLOR	Yellow						
SYMBOL(S)	ANGLE	X	Y	WID	HT		
SIGN NO.	NO. OF POSTS	EDGE OF LINE CLEARANCE	COLUMN SIZE	AVERAGE LENGTH			



COPY		O	V	E	R	H	E	A	D	L									
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COPY		B	R	I	D	G	E	L											
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COPY																			
SPACE																			
COPY																			
SPACE																			

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL NOTES

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
 CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

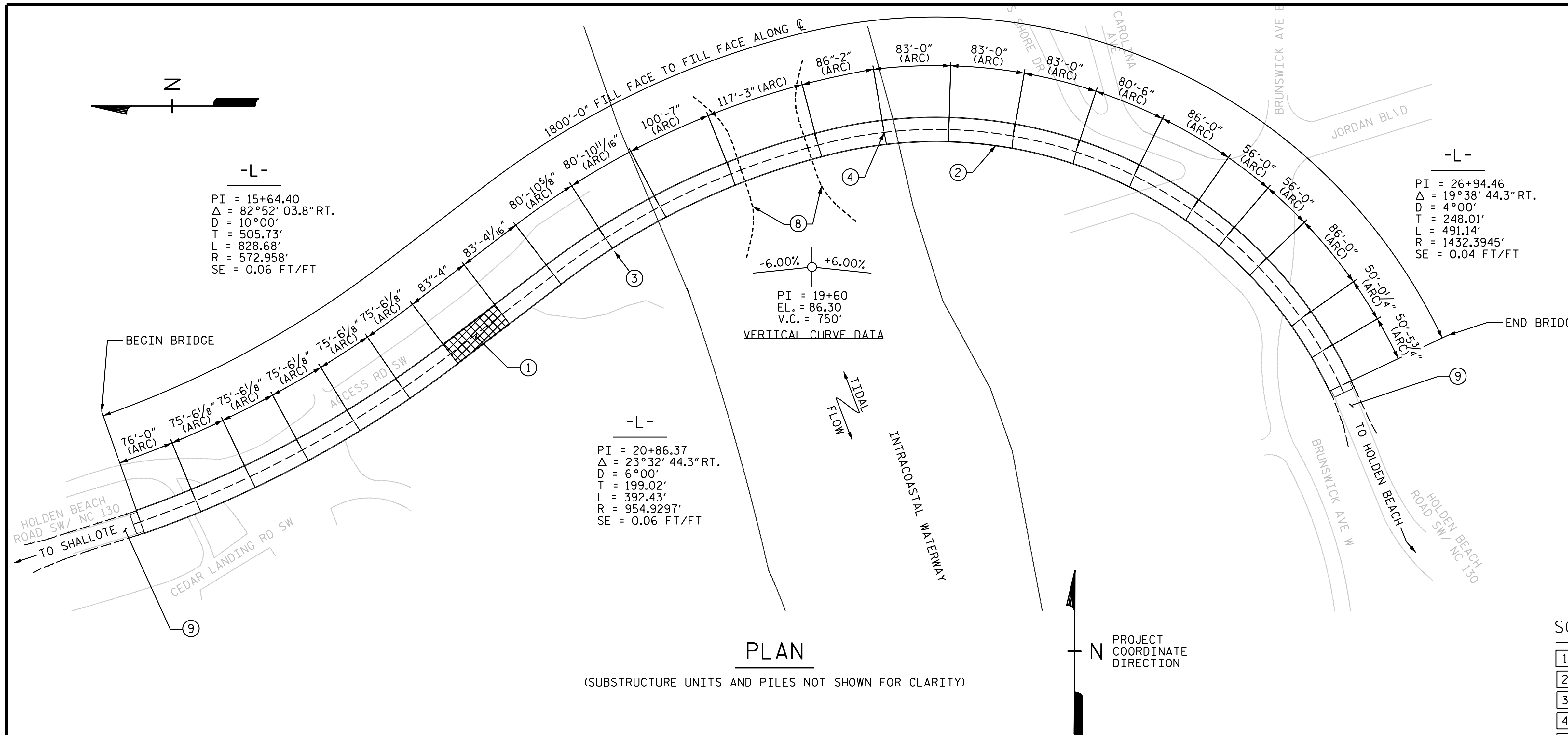
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	REVISIONS						SHEET NO.
	NO.	BY:	DATE:	NO.	BY:	DATE:	S-2B
	1			3			TOTAL SHEETS
	2			4			73

HYDRAULIC DATA FROM INITIAL DESIGN:

DESIGN HIGH WATER ELEVATION: 2.4 FT.
(MEAN HIGH TIDE)
FREQUENCY OF FLOOD: 100 YR.
(HURRICANE BACKWATER)
FLOOD ELEVATION: 14.8 FT.

NOTES:

CURVE DATA BASED ON INITIAL DESIGN.
STATIONING, SPAN AND BENT NUMBERS BASED ON PLAN SET AND CURRENT INSECTION REPORT.



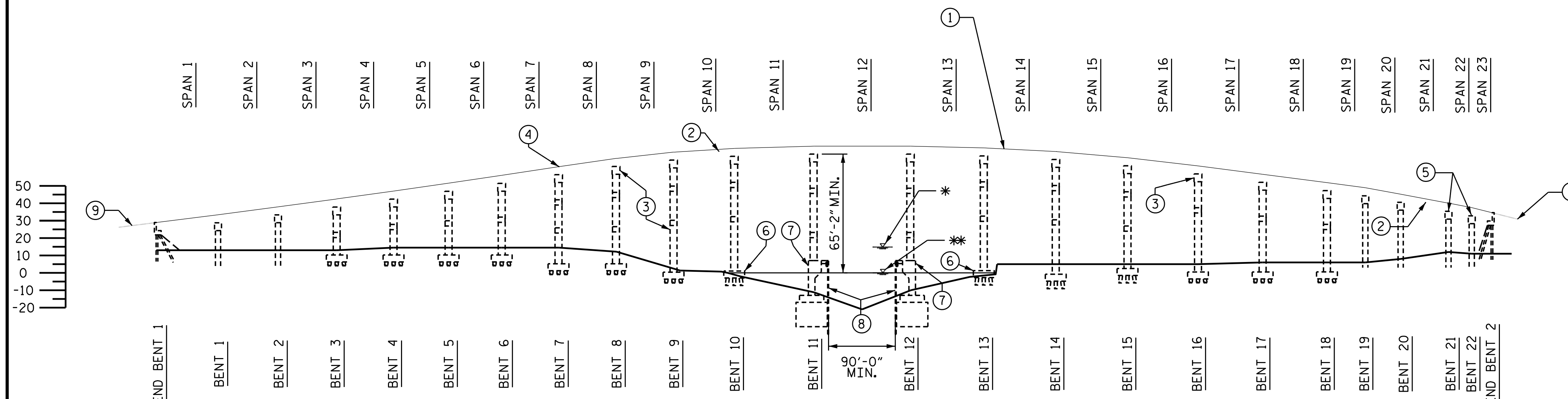
PLAN

(SUBSTRUCTURE UNITS AND PILES NOT SHOWN FOR CLARITY)

SCOPE LEGEND:

- 1 PPC OVERLAY (TYP)
- 2 SUPERSTRUCTURE CONCRETE REPAIRS (TYP)
- 3 SUBSTRUCTURE CONCRETE REPAIRS (TYP)
- 4 EXPANSION JOINT REPLACEMENT/INSTALLATION (TYP.)
- 5 BEARING REPLACEMENT
- 6 GALVANIC CATHODIC PROTECTION - METALIZING
- 7 GALVANIC CATHODIC PROTECTION - BULK ANODE
- 8 FENDER SYSTEM REHABILITATION
- 9 APPROACH ROADWAY MILLING AND RESURFACING

NOTE: REPAIRS TYPICAL THROUGHOUT BRIDGE.



ELEVATION

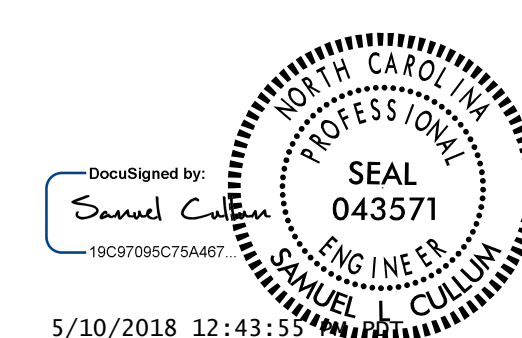
* MAX. HIGH WATER EL. 14.8
HURRICANE HAZEL SEPT. 1954
** WATER EL. 0.0
MEAN HIGH TIDE EL. 2.4
MEAN LOW TIDE EL. -2.2

BENT #	STATION	BENT #	STATION	BENT #	STATION	BENT #	STATION	BENT #	STATION
END BENT 1	10+00.00	BENT 5	13+78.04	BENT 10	17+82.00	BENT 15	22+52.00	BENT 20	26+13.50
BENT 1	10+76.00	BENT 6	14+53.55	BENT 11	18+82.58	BENT 16	23+35.00	BENT 21	26+99.50
BENT 2	11+51.51	BENT 7	15+36.88	BENT 12	19+99.83	BENT 17	24+15.50	BENT 22	27+49.52
BENT 3	12+27.02	BENT 8	16+20.22	BENT 13	20+86.00	BENT 18	25+01.50	END BENT 2	28+00.00
BENT 4	13+02.53	BENT 9	17+01.11	BENT 14	21+69.00	BENT 19	25+57.50		

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018



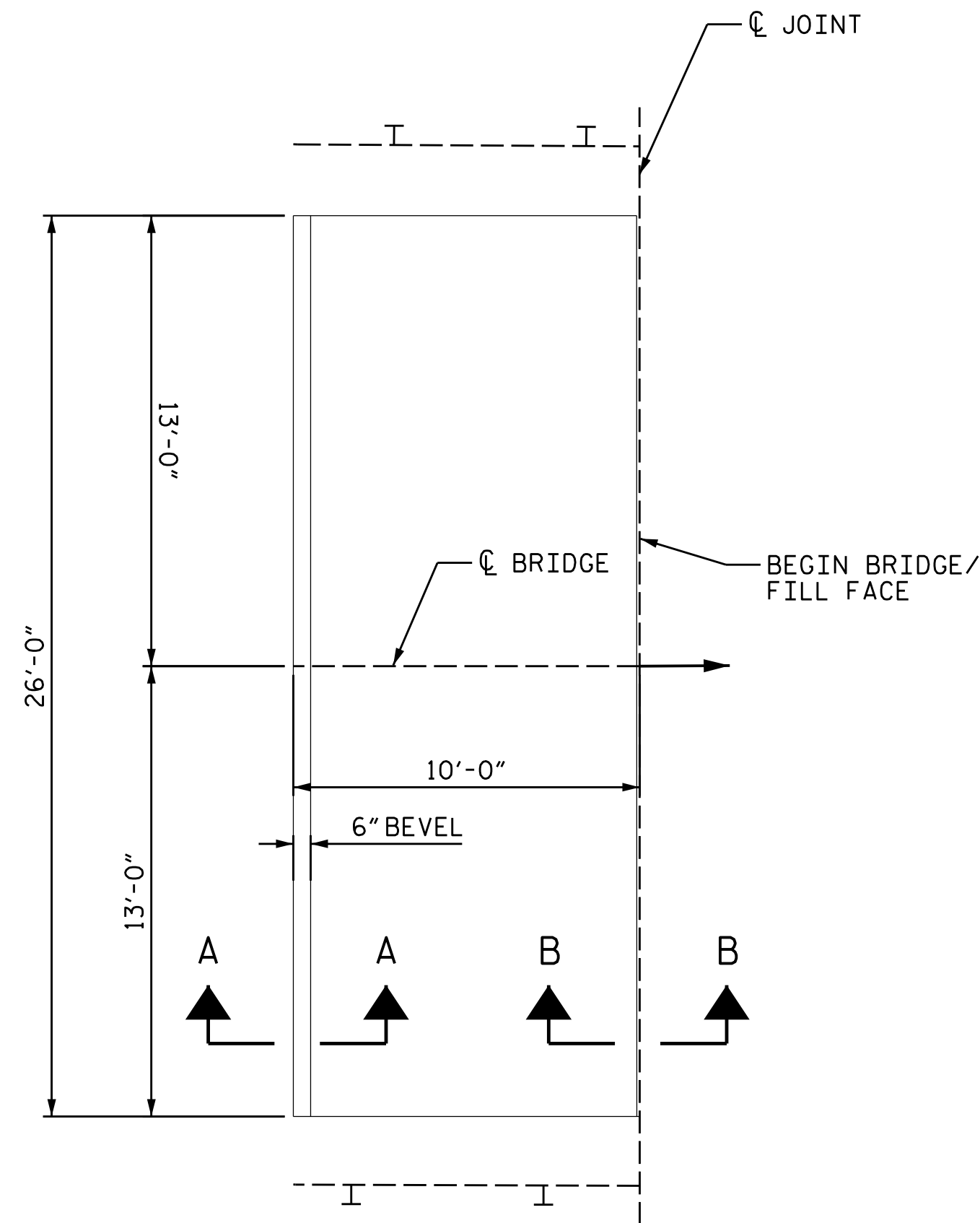
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING

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

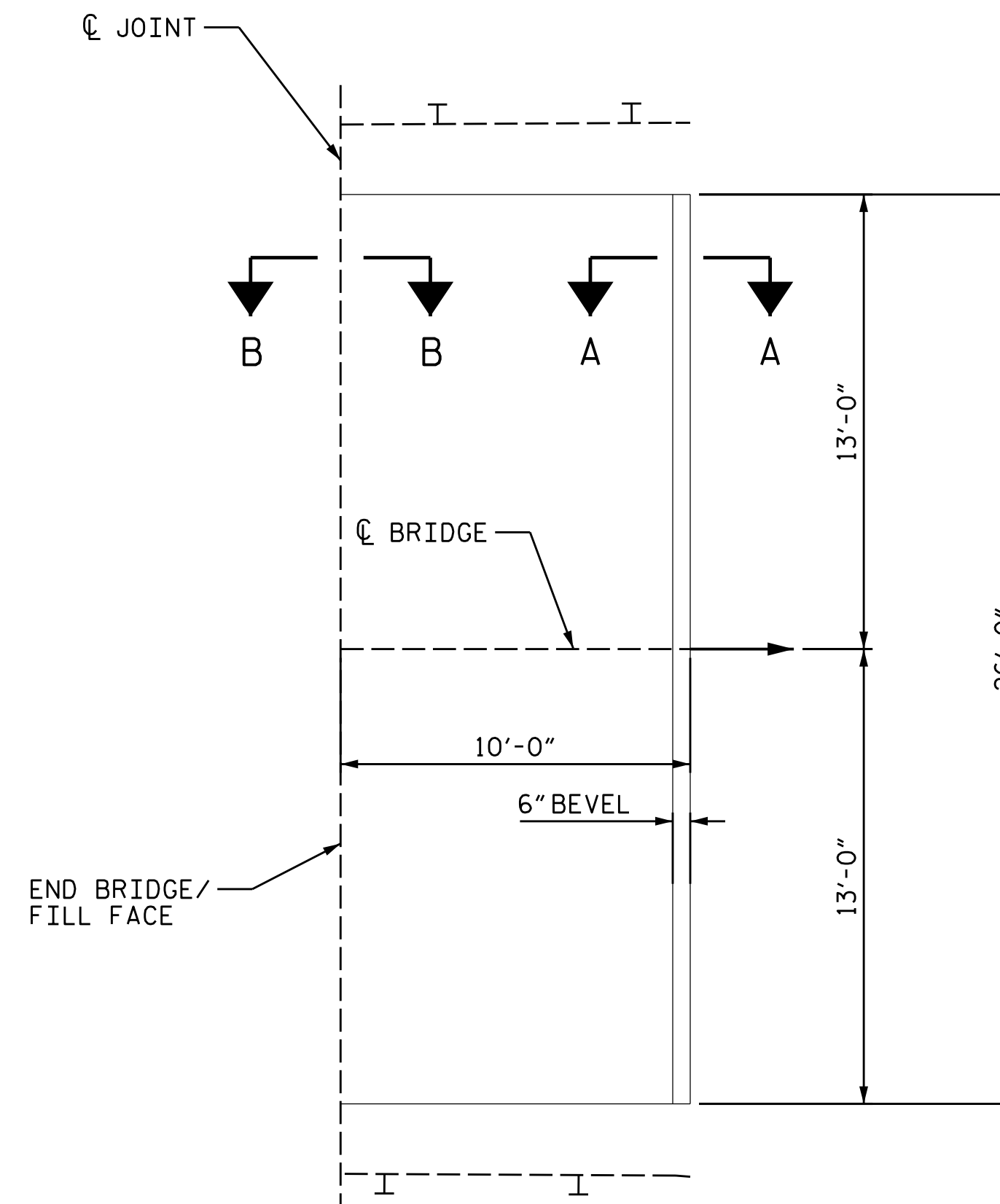
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← TO SHALOTTE

TO HOLDEN BEACH →



WEST APPROACH SLAB



EAST APPROACH SLAB

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS		
WEST APPROACH SLAB		
	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	29 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
PPC MATERIALS	1.1 CY	
PLACING & FINISHING PPC OVERLAY	29 SY	
GROOVING BRIDGE FLOORS	222 SF	
EAST APPROACH SLAB		
	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	29 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
PPC MATERIALS	1.1 CY	
PLACING & FINISHING PPC OVERLAY	29 SY	
GROOVING BRIDGE FLOORS	222 SF	

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 AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2 1/2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 1 1/2" TO 2 1/2" BASED ON VISUAL INSPECTION.

* MINOR QUANTITIES OF CLASS II AREAS ARE ANTICIPATED, PARTICULARLY NEAR JOINTS. HOWEVER, DUE TO THEIR SMALL SIZE, THE CLASS II LOCATIONS HAVE NOT BEEN DELINEATED ON THESE PLANS. THE CLASS II QUANTITIES INDICATED ARE ANTICIPATED TO BE SUFFICIENT FOR THE ACTUAL QUANTITIES ENCOUNTERED.

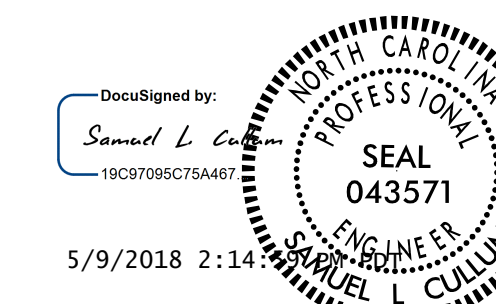
GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

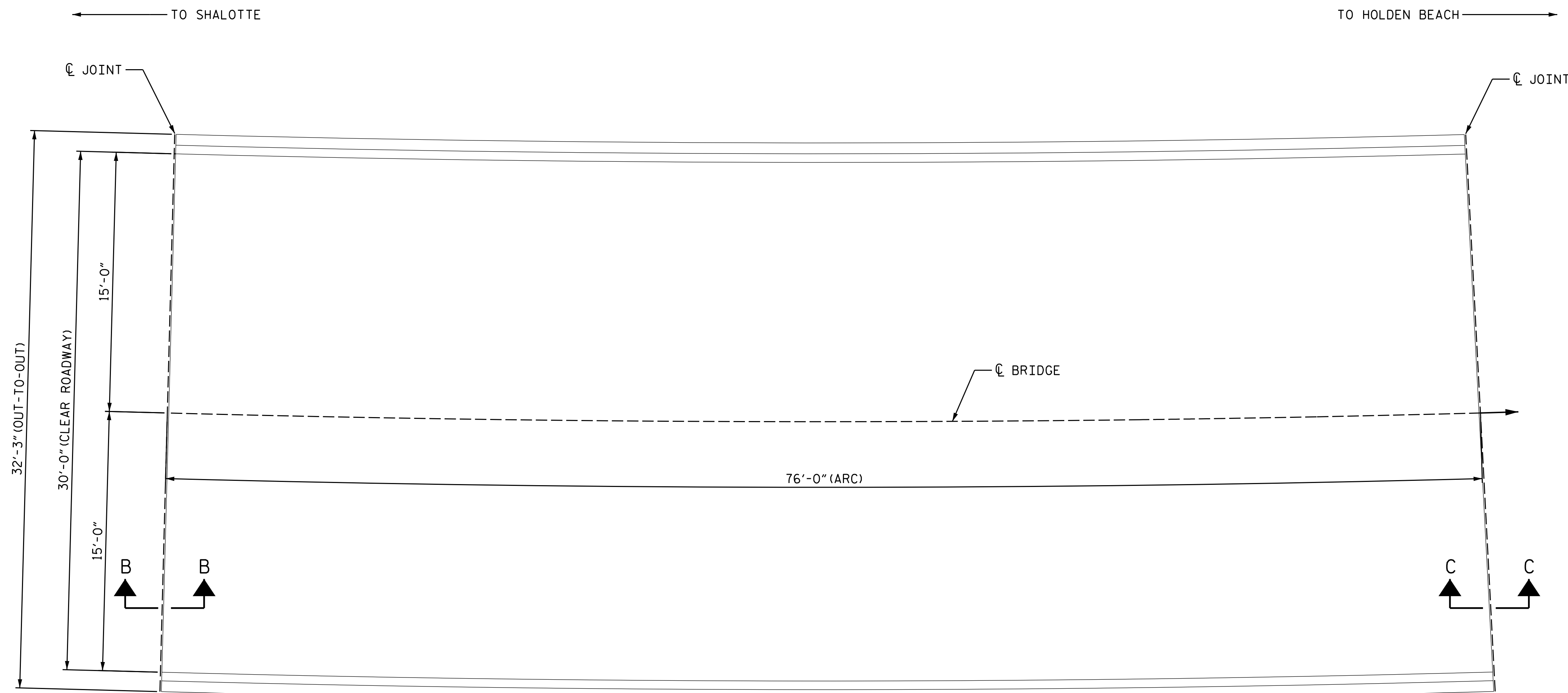
 PLAN OF SPANS
 APPROACH SLABS 1 & 2

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

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

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PLAN

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS		
SPAN 1		
	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	254 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	254 SY	
PPC MATERIALS	7.3 CY	
PLACING & FINISHING PPC OVERLAY	254 SY	
GROOVING BRIDGE FLOORS	2043 SF	

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 AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2 1/2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

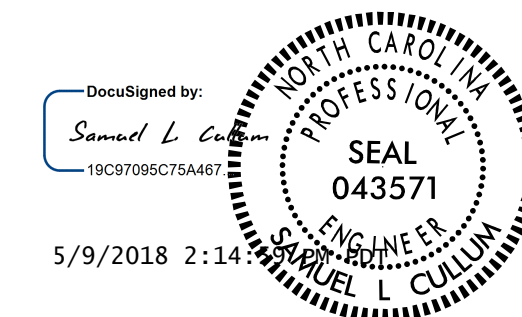
FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
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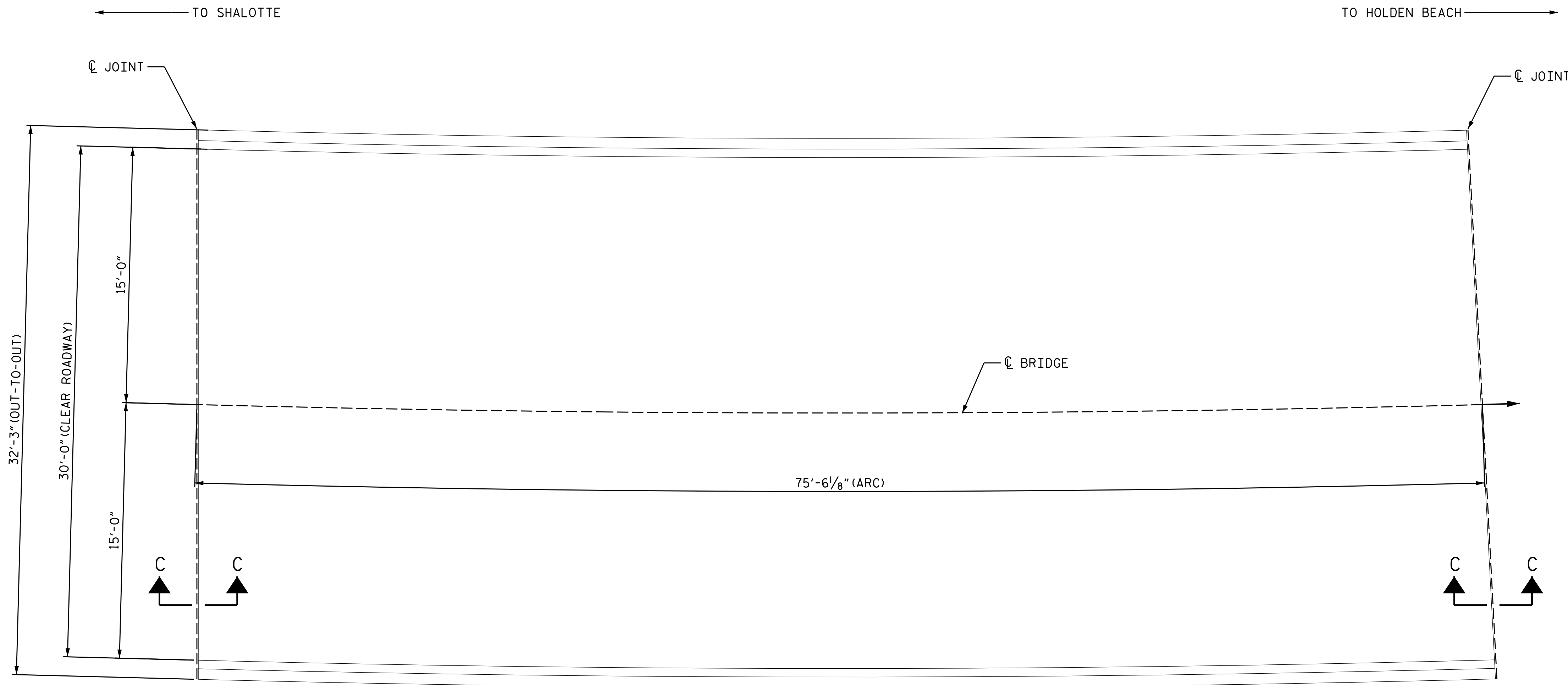


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF SPAN
 SPAN 1

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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-5
2			4			TOTAL SHEETS 73

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PLAN

AS-BUILT REPAIR QUANTITY TABLE		
TOP OF DECK REPAIRS		
SPAN 2		
	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	252 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	252 SY	
PPC MATERIALS	7.2 CY	
PLACING & FINISHING PPC OVERLAY	252 SY	
GROOVING BRIDGE FLOORS	2030 SF	

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 AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2 1/2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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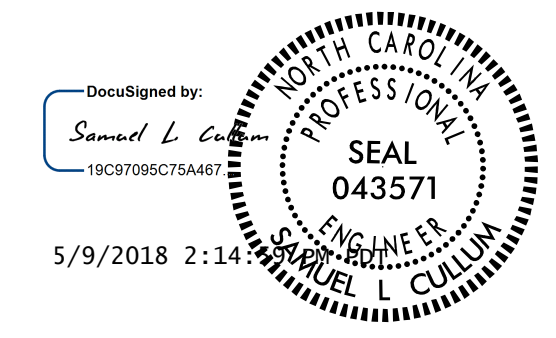
GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

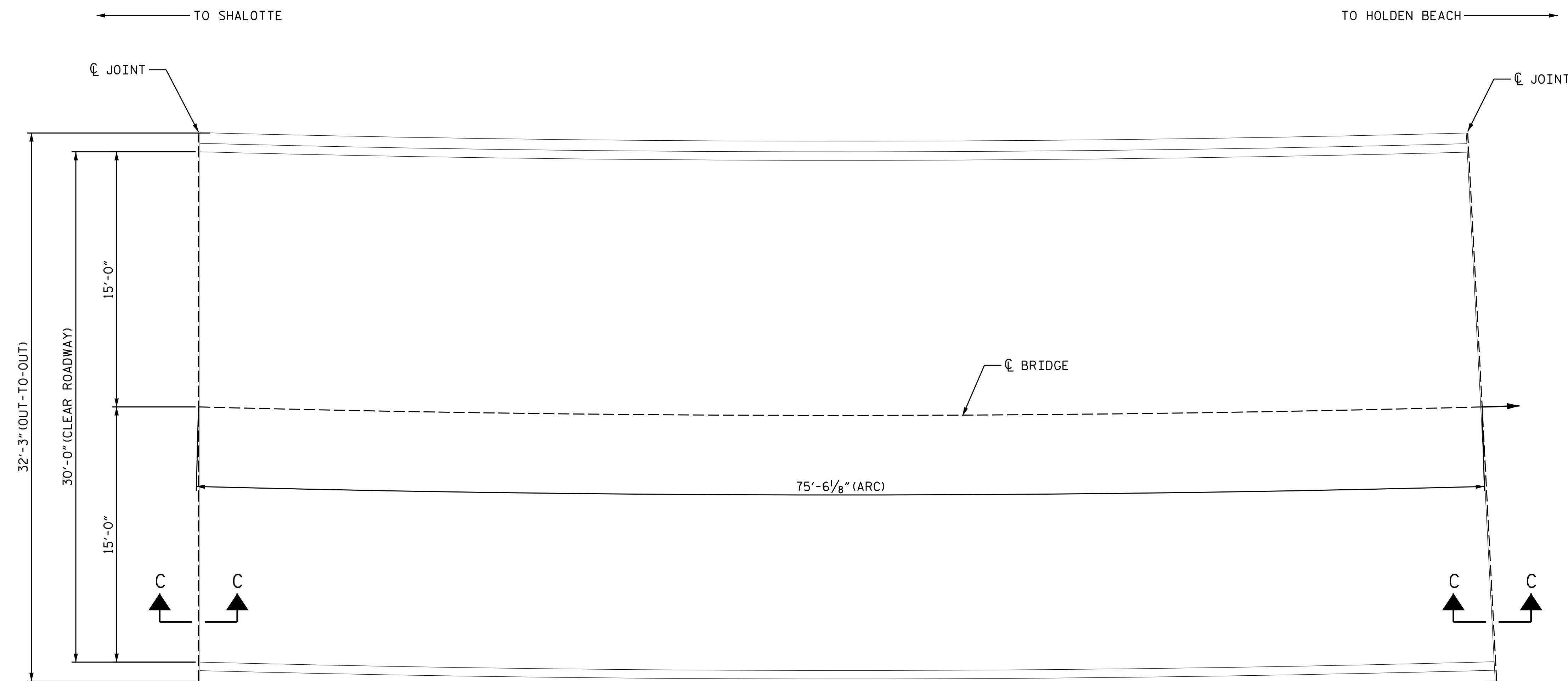
PLAN OF SPAN
 SPAN 2

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY :	DIEGO A. AGUIRRE	DATE :	03-2018
CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

REVISIONS						SHEET NO.
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1			3			S-6
2			4			TOTAL SHEETS 73

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PLAN

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS		
SPAN 3		
	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	252 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	252 SY	
PPC MATERIALS	7.2 CY	
PLACING & FINISHING PPC OVERLAY	252 SY	
GROOVING BRIDGE FLOORS	2030 SF	

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 AS-BUILT REPAIR QUANTITY TABLE.

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GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

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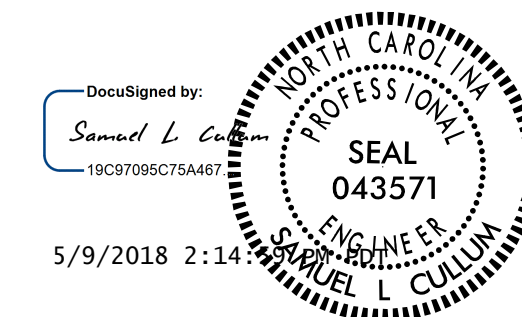
FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 PLAN OF SPAN
 SPAN 3

REVISIONS						SHEET NO.
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2			4			TOTAL SHEETS 73

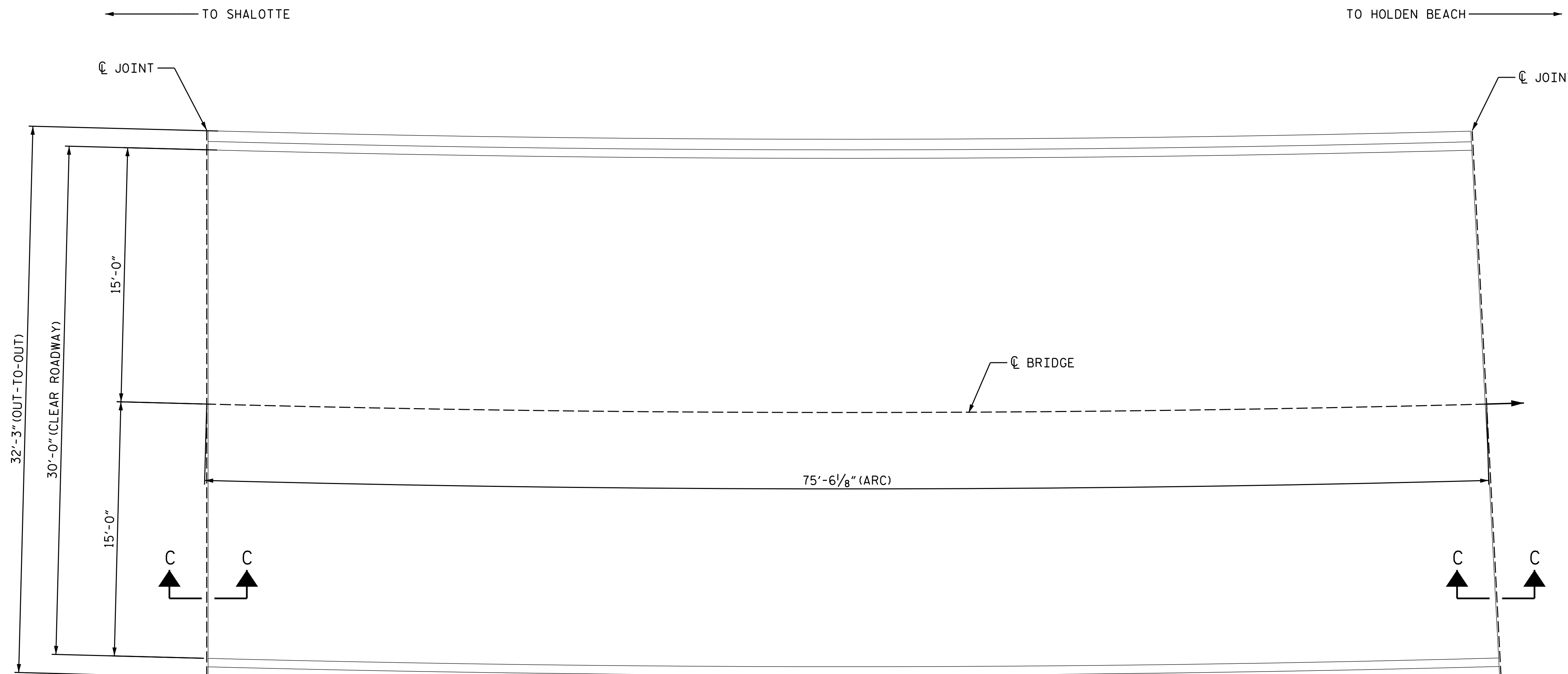
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AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPAN 4

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	252 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	252 SY	
PPC MATERIALS	7.2 CY	
PLACING & FINISHING PPC OVERLAY	252 SY	
GROOVING BRIDGE FLOORS	2030 SF	



PLAN

NOTES:

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GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

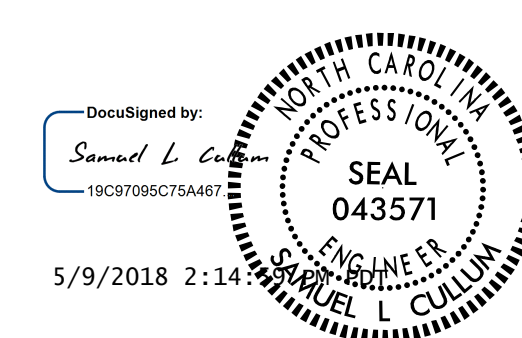
FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

 PLAN OF SPAN
 SPAN 4

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			73

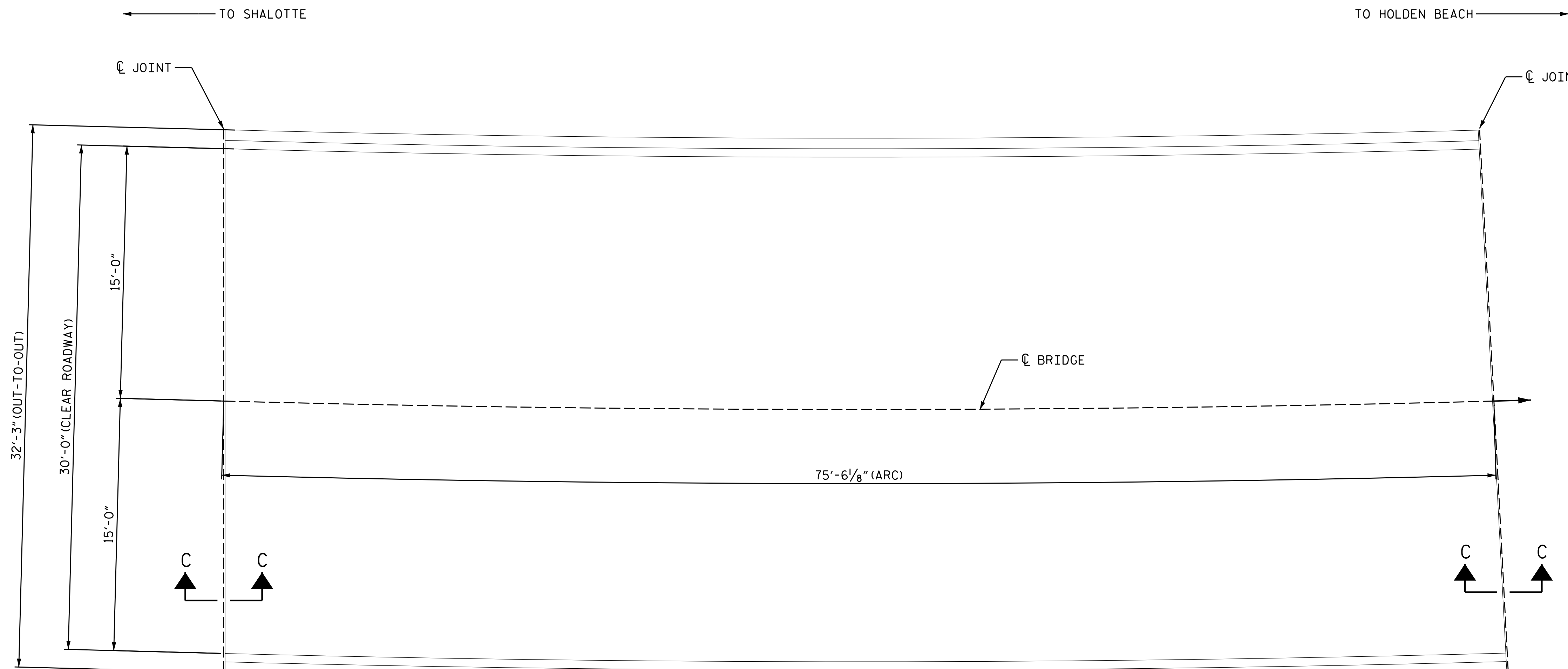
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AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPAN 5

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	252 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	252 SY	
PPC MATERIALS	7.2 CY	
PLACING & FINISHING PPC OVERLAY	252 SY	
GROOVING BRIDGE FLOORS	2030 SF	



PLAN

NOTES:

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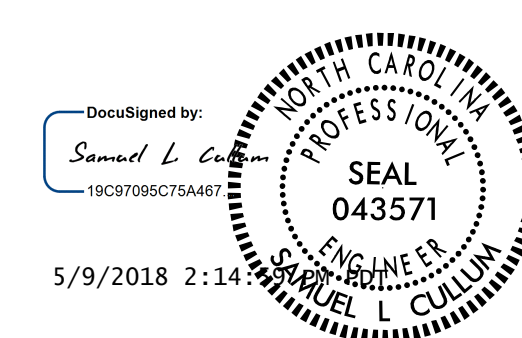
GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF SPAN
 SPAN 5

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY :	DIEGO A. AGUIRRE	DATE :	03-2018
CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-9
2			4			TOTAL SHEETS 73

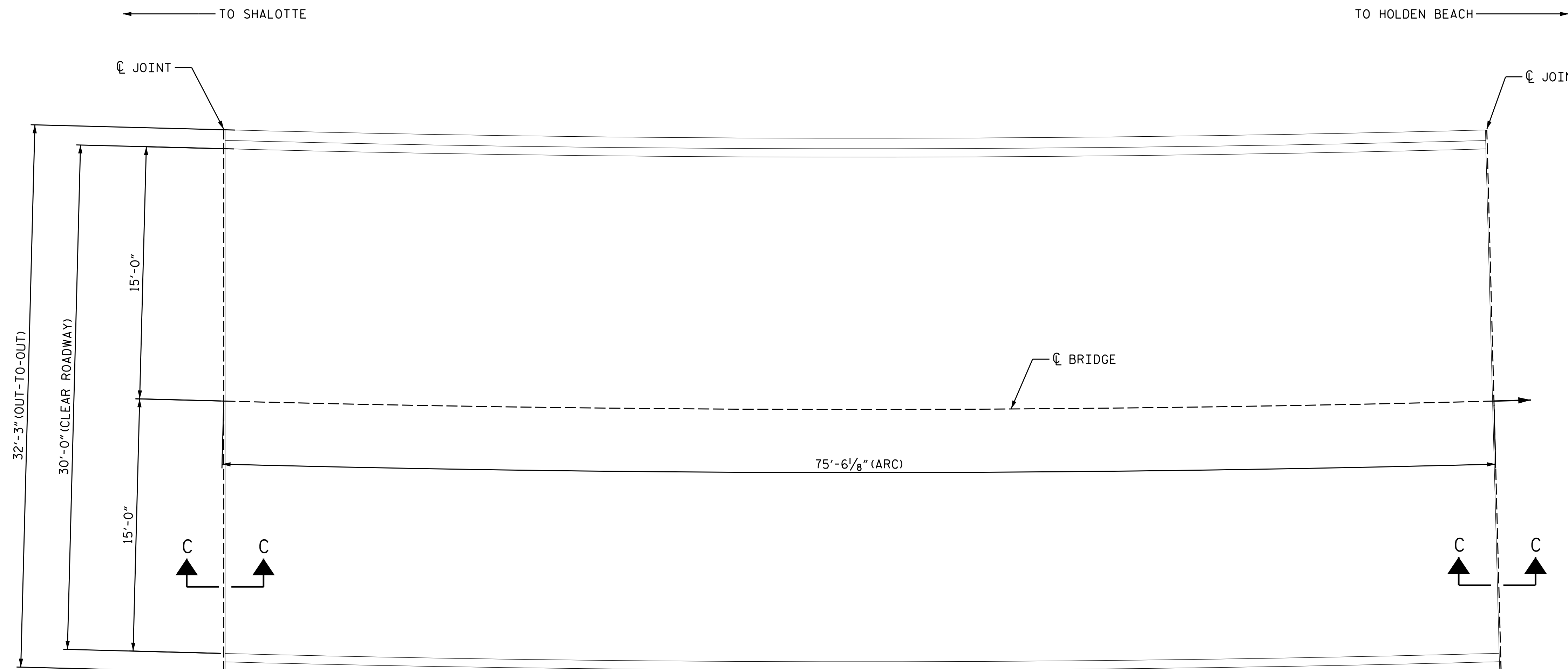
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AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPAN 6

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	252 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	252 SY	
PPC MATERIALS	7.2 CY	
PLACING & FINISHING PPC OVERLAY	252 SY	
GROOVING BRIDGE FLOORS	2030 SF	



PLAN

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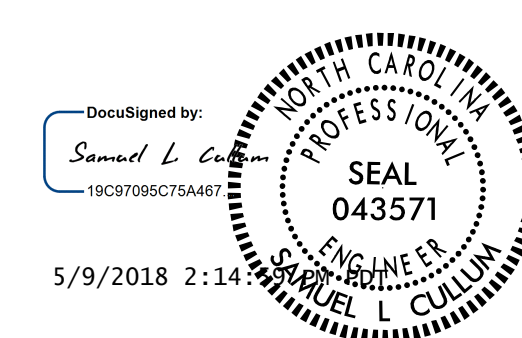
GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

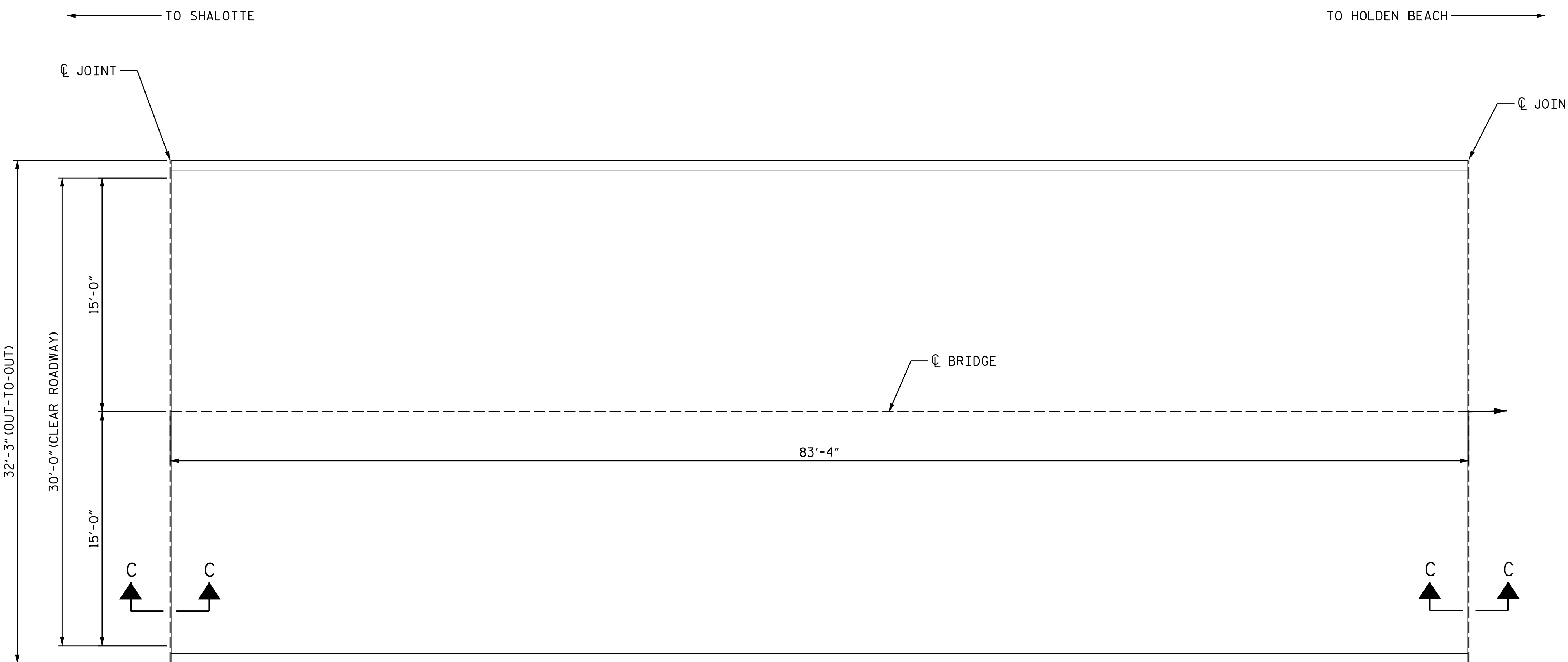
PLAN OF SPAN
 SPAN 6

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			73

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PLAN

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS		
SPAN 7		
	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	278 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	278 SY	
PPC MATERIALS	8.0 CY	
PLACING & FINISHING PPC OVERLAY	278 SY	
GROOVING BRIDGE FLOORS	2241 SF	

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 AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2 1/2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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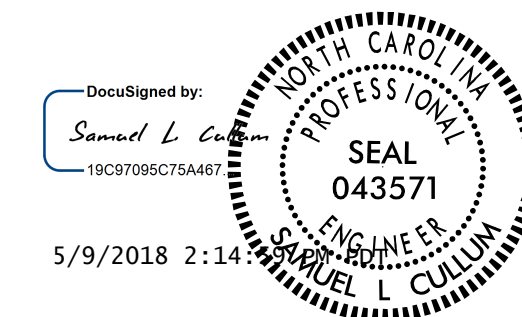
GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

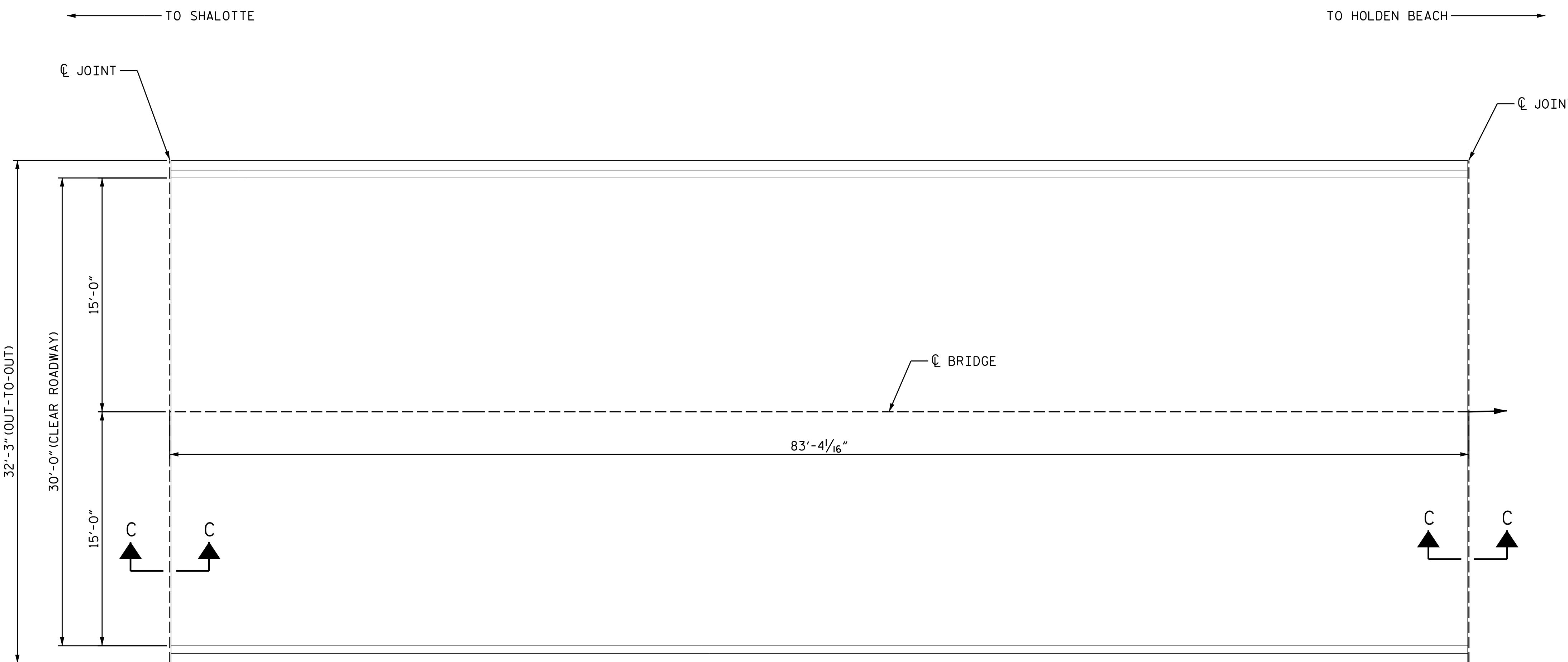
PLAN OF SPAN
 SPAN 7

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY :	DIEGO A. AGUIRRE	DATE :	03-2018
CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			73

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PLAN

AS-BUILT REPAIR QUANTITY TABLE		
TOP OF DECK REPAIRS		
SPAN 8		
	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	278 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	278 SY	
PPC MATERIALS	8.0 CY	
PLACING & FINISHING PPC OVERLAY	278 SY	
GROOVING BRIDGE FLOORS	2241 SF	

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 AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2 1/2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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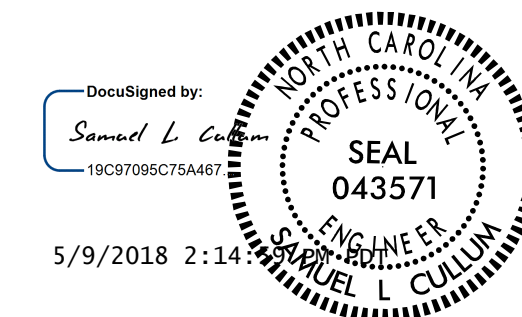
GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF SPAN
 SPAN 8

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY :	DIEGO A. AGUIRRE	DATE :	03-2018
CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

REVISIONS						SHEET NO.
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2			4			TOTAL SHEETS 73

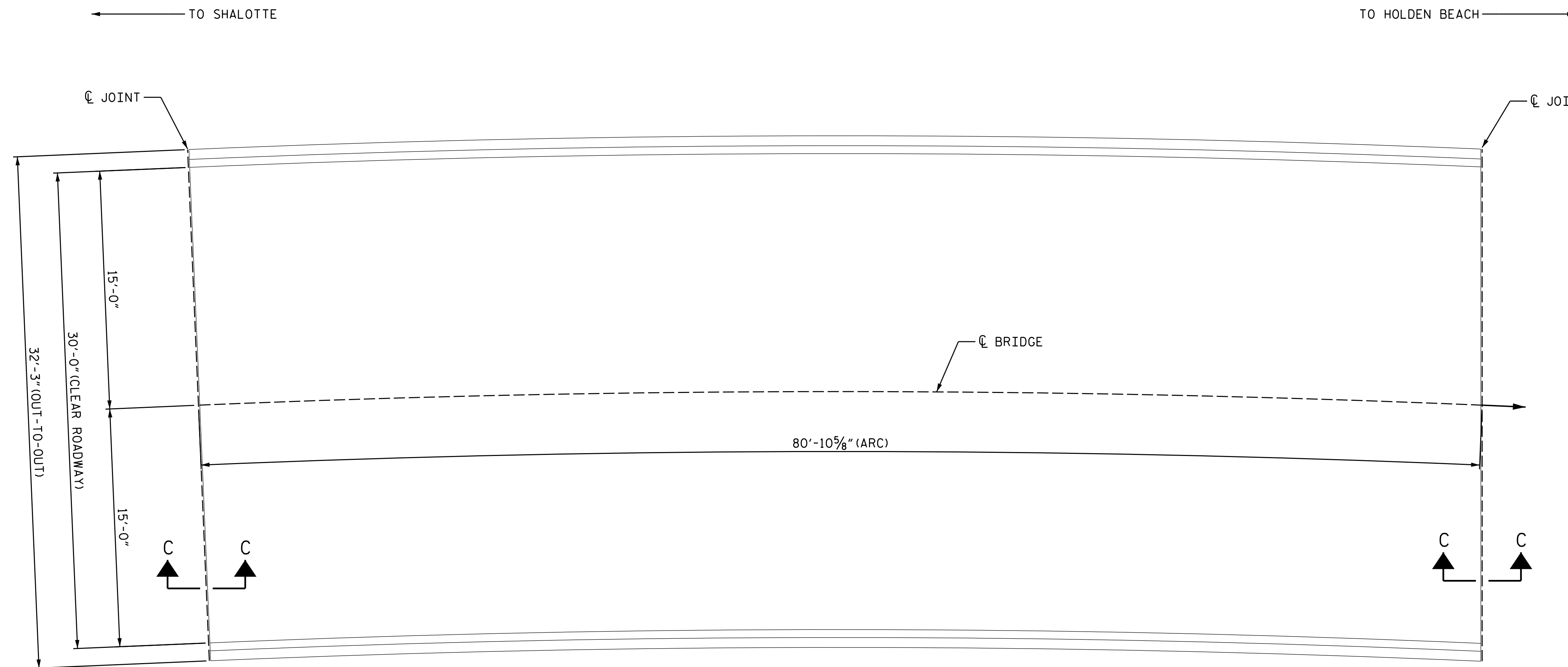
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AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPAN 9

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	270 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	270 SY	
PPC MATERIALS	7.7 CY	
PLACING & FINISHING PPC OVERLAY	270 SY	
GROOVING BRIDGE FLOORS	2173 SF	



PLAN

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 AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2 1/2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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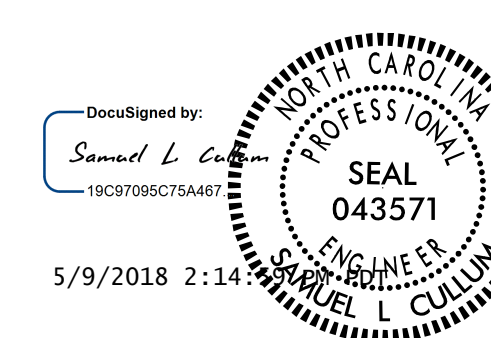
GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF SPAN
 SPAN 9

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY :	DIEGO A. AGUIRRE	DATE :	03-2018
CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			TOTAL SHEETS 73

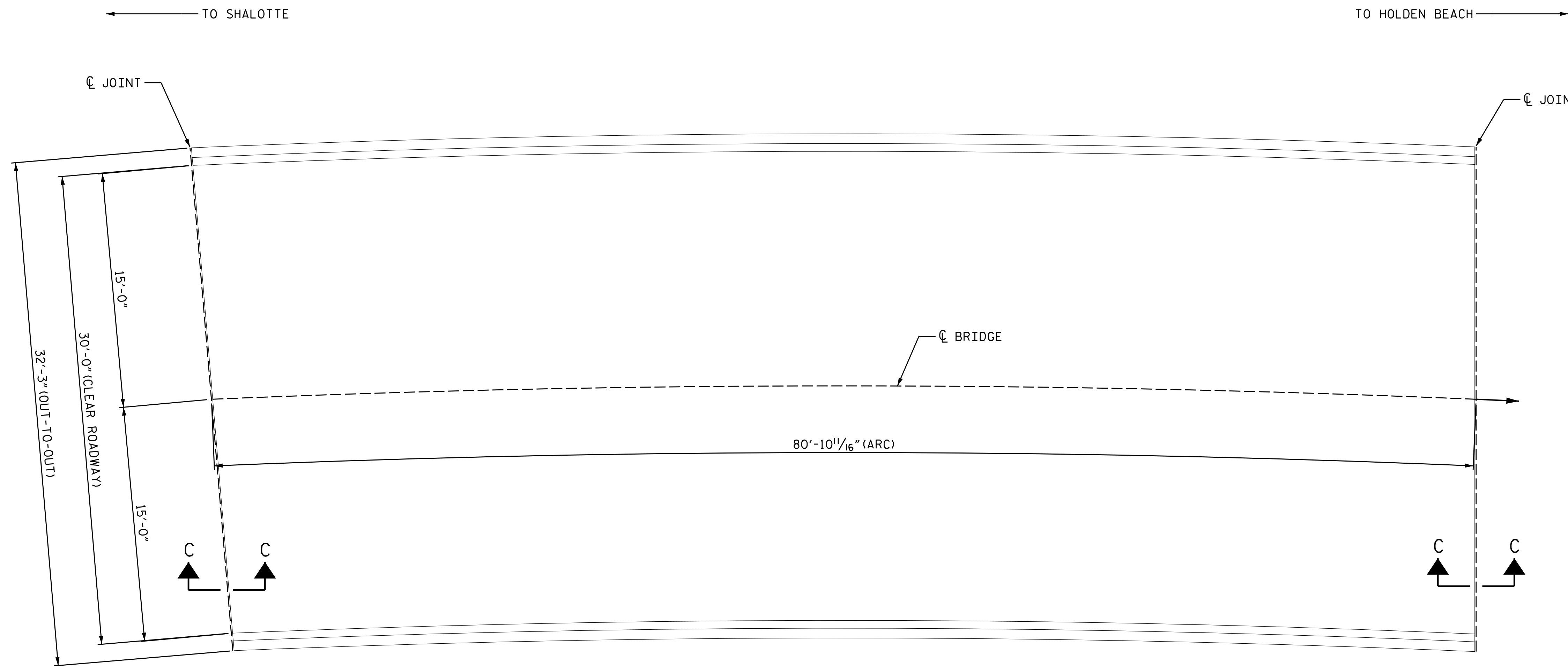
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AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPAN 10

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	270 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	270 SY	
PPC MATERIALS	7.7 CY	
PLACING & FINISHING PPC OVERLAY	270 SY	
GROOVING BRIDGE FLOORS	2175 SF	



PLAN

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 AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2 1/2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

DocuSigned by:
 Samuel L. Cullum
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 PROFESSIONAL SEAL
 043571
 ENGINEER
 SAMUEL L. CULLUM

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 PLAN OF SPAN
 SPAN 10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-14
2			4			TOTAL SHEETS 73

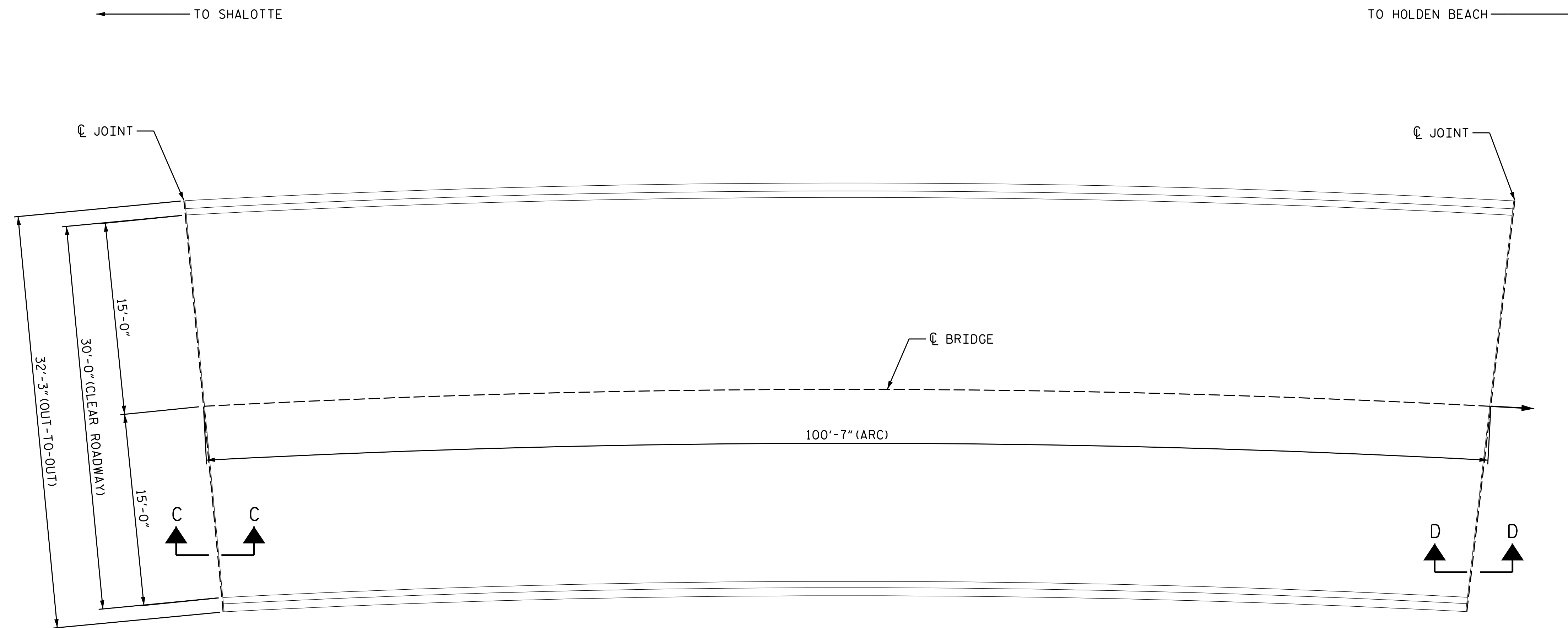
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 SIGNATURES COMPLETED

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPAN 11

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	336 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	336 SY	
PPC MATERIALS	9.6 CY	
PLACING & FINISHING PPC OVERLAY	336 SY	
GROOVING BRIDGE FLOORS	2707 SF	



PLAN

NOTES:

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GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

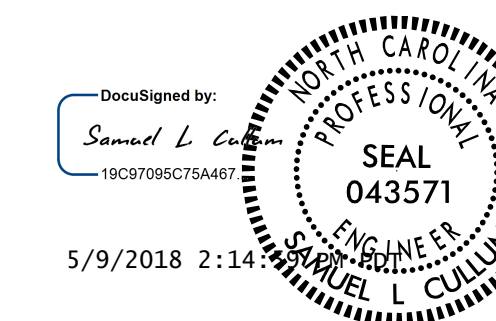
FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF SPAN
 SPAN 11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			TOTAL SHEETS 73

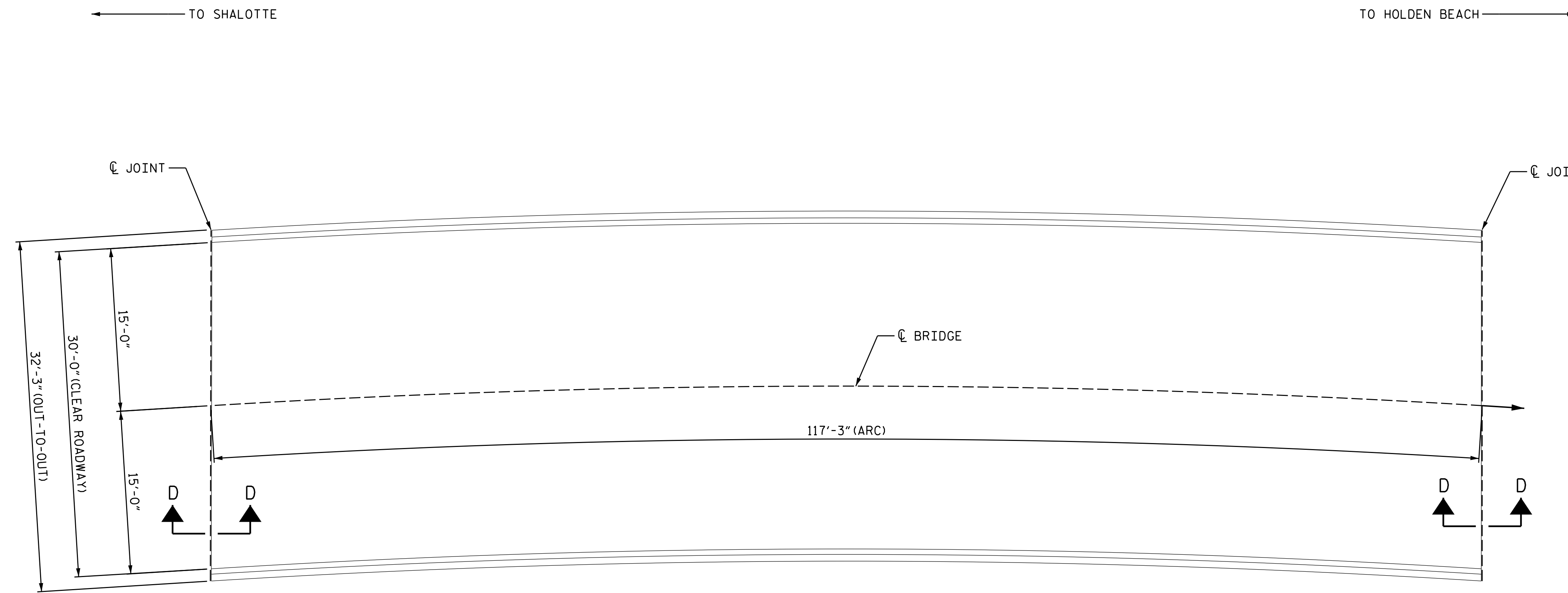
DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPAN 12

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	391 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	391 SY	
PPC MATERIALS	11.1 CY	
PLACING & FINISHING PPC OVERLAY	391 SY	
GROOVING BRIDGE FLOORS	3157 SF	



PLAN

NOTES:

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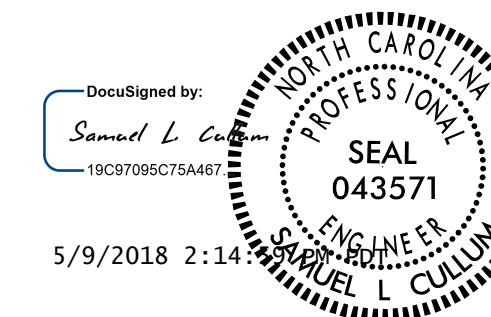
GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

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FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF SPAN
 SPAN 12

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			TOTAL SHEETS 73

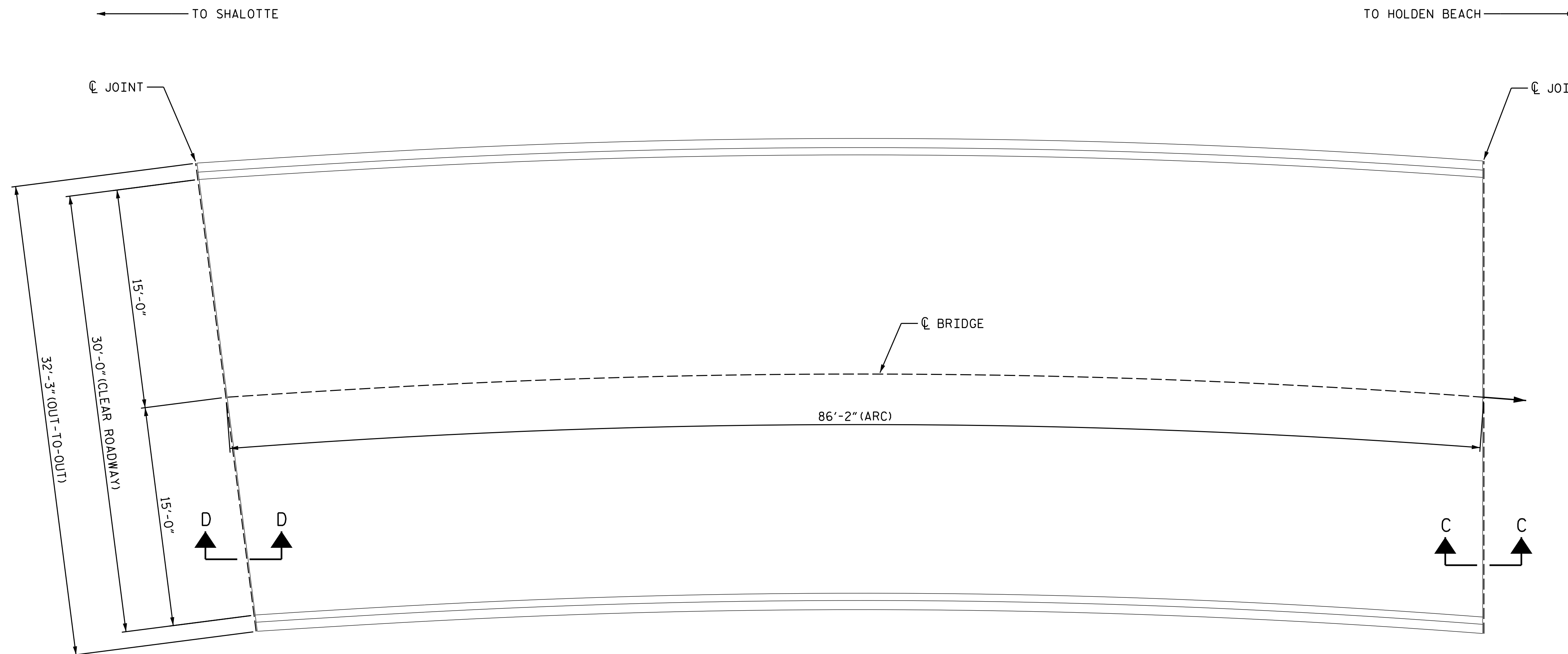
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AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPAN 13

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	287 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	287 SY	
PPC MATERIALS	8.2 CY	
PLACING & FINISHING PPC OVERLAY	287 SY	
GROOVING BRIDGE FLOORS	2318 SF	



PLAN

NOTES:

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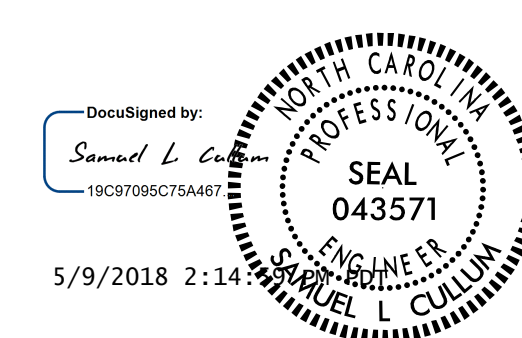
GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF SPAN
 SPAN 13

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			TOTAL SHEETS 73

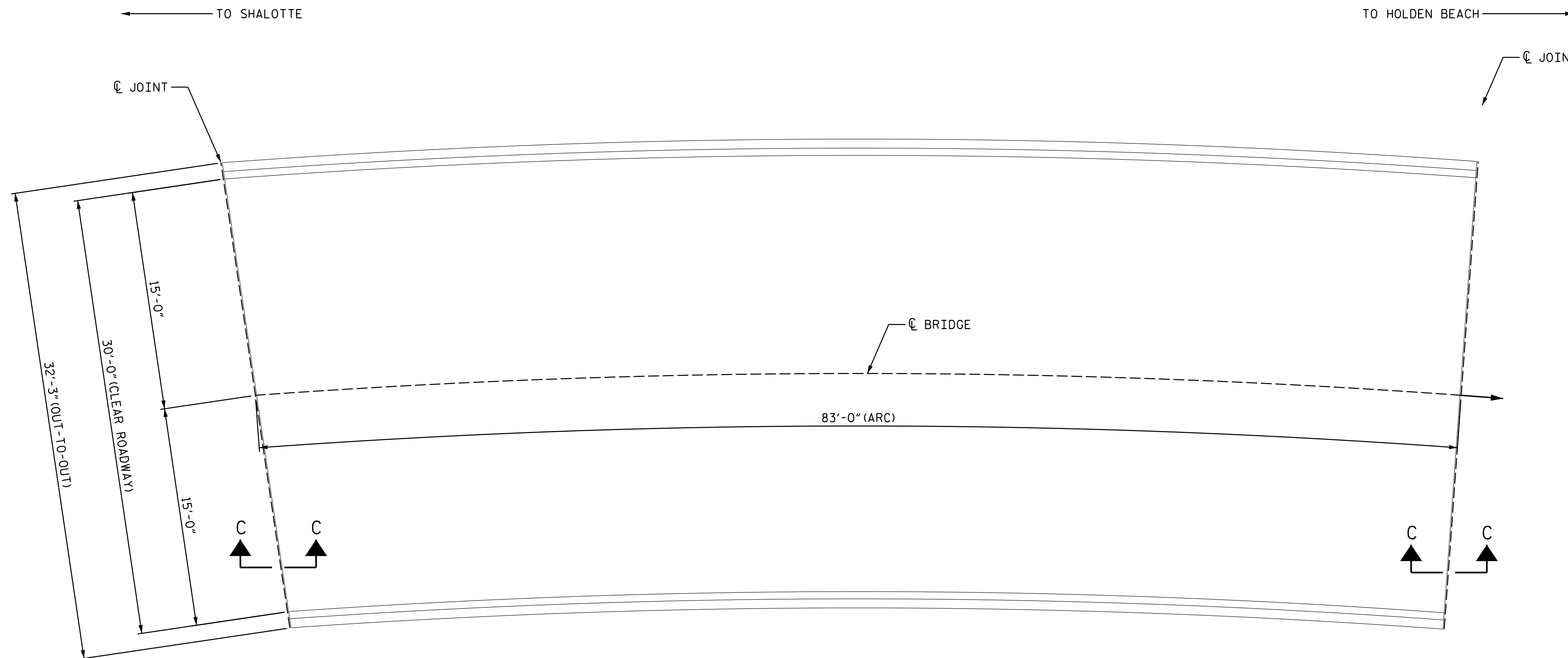
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AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPAN 14

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	277 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	277 SY	
PPC MATERIALS	7.9 CY	
PLACING & FINISHING PPC OVERLAY	277 SY	
GROOVING BRIDGE FLOORS	2232 SF	



PLAN

NOTES:

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CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2/2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

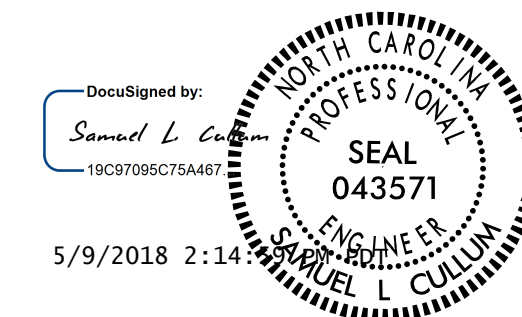
FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 PLAN OF SPAN
 SPAN 14

REVISIONS						SHEET NO.
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1			3			S-18
2			4			TOTAL SHEETS 73

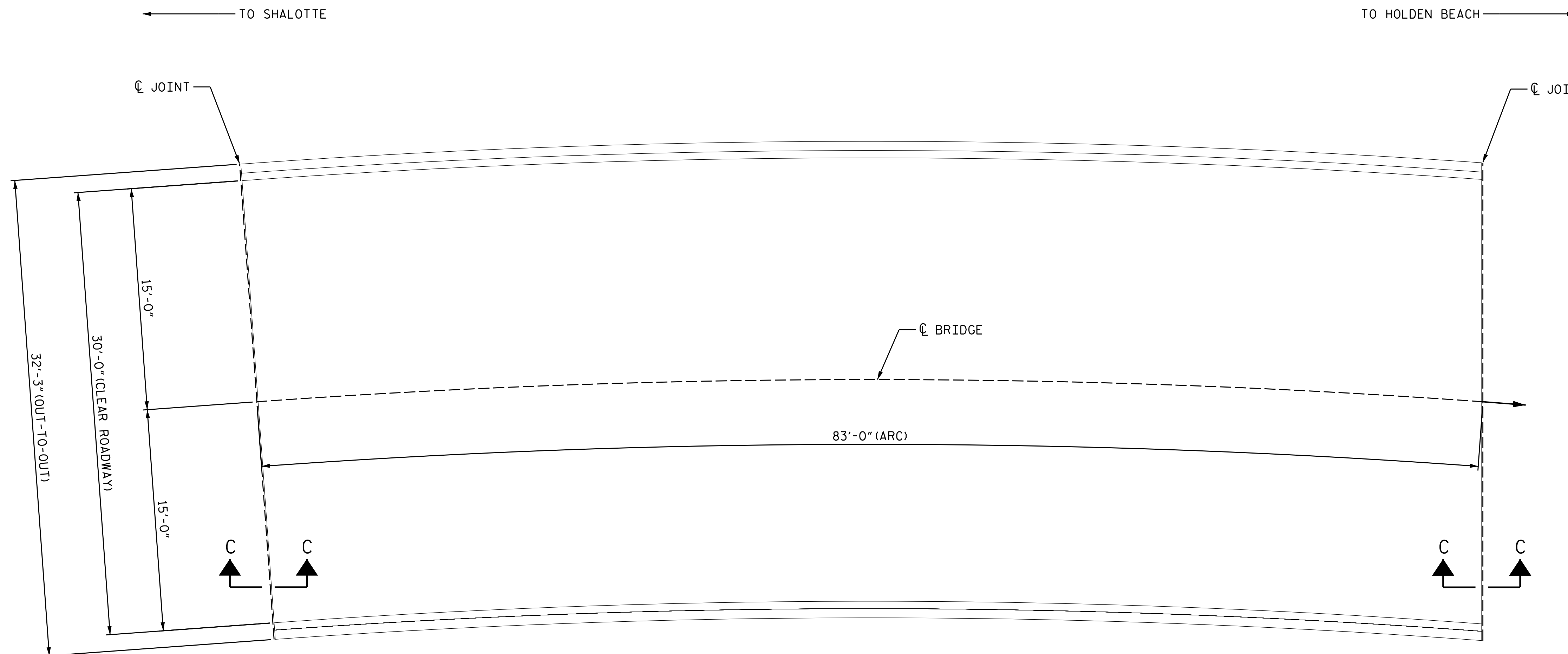
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AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPAN 15

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	277 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	277 SY	
PPC MATERIALS	7.9 CY	
PLACING & FINISHING PPC OVERLAY	277 SY	
GROOVING BRIDGE FLOORS	2232 SF	



PLAN

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 AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2/2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 1/2" TO 2/2" BASED ON VISUAL INSPECTION.

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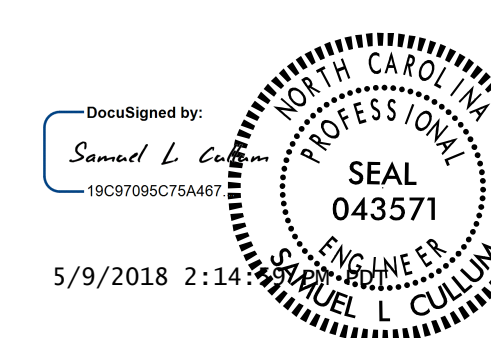
GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
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PLAN OF SPAN
 SPAN 15

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY :	DIEGO A. AGUIRRE	DATE :	03-2018
CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-19
2			4			TOTAL SHEETS 73

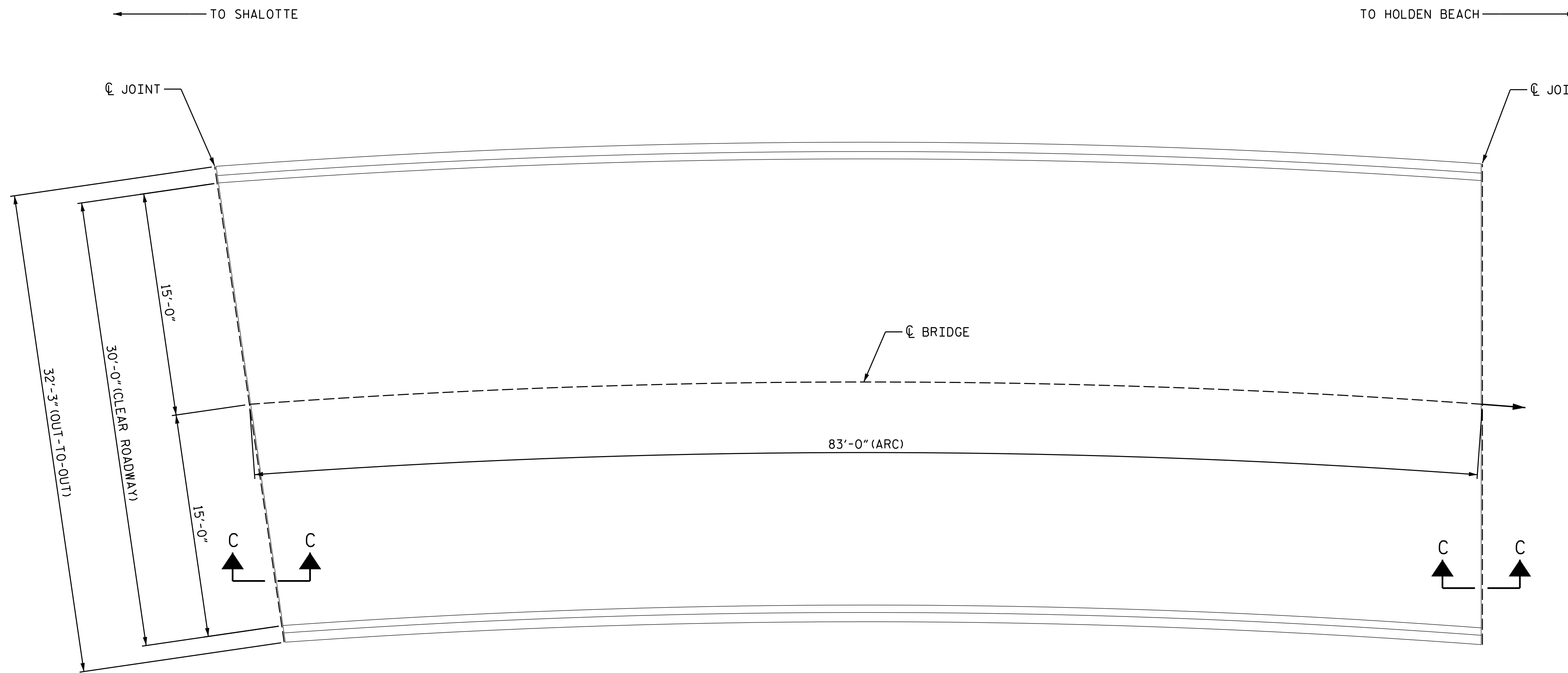
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AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPAN 16

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	277 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	277 SY	
PPC MATERIALS	7.9 CY	
PLACING & FINISHING PPC OVERLAY	277 SY	
GROOVING BRIDGE FLOORS	2232 SF	



PLAN

NOTES:

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CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2 1/2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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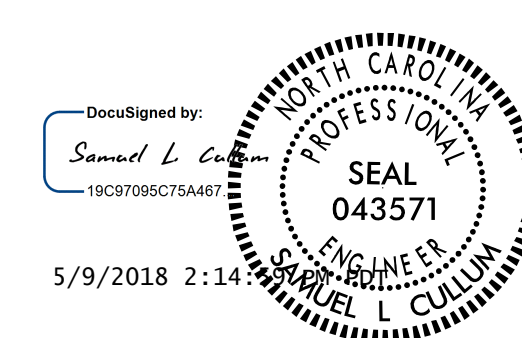
GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

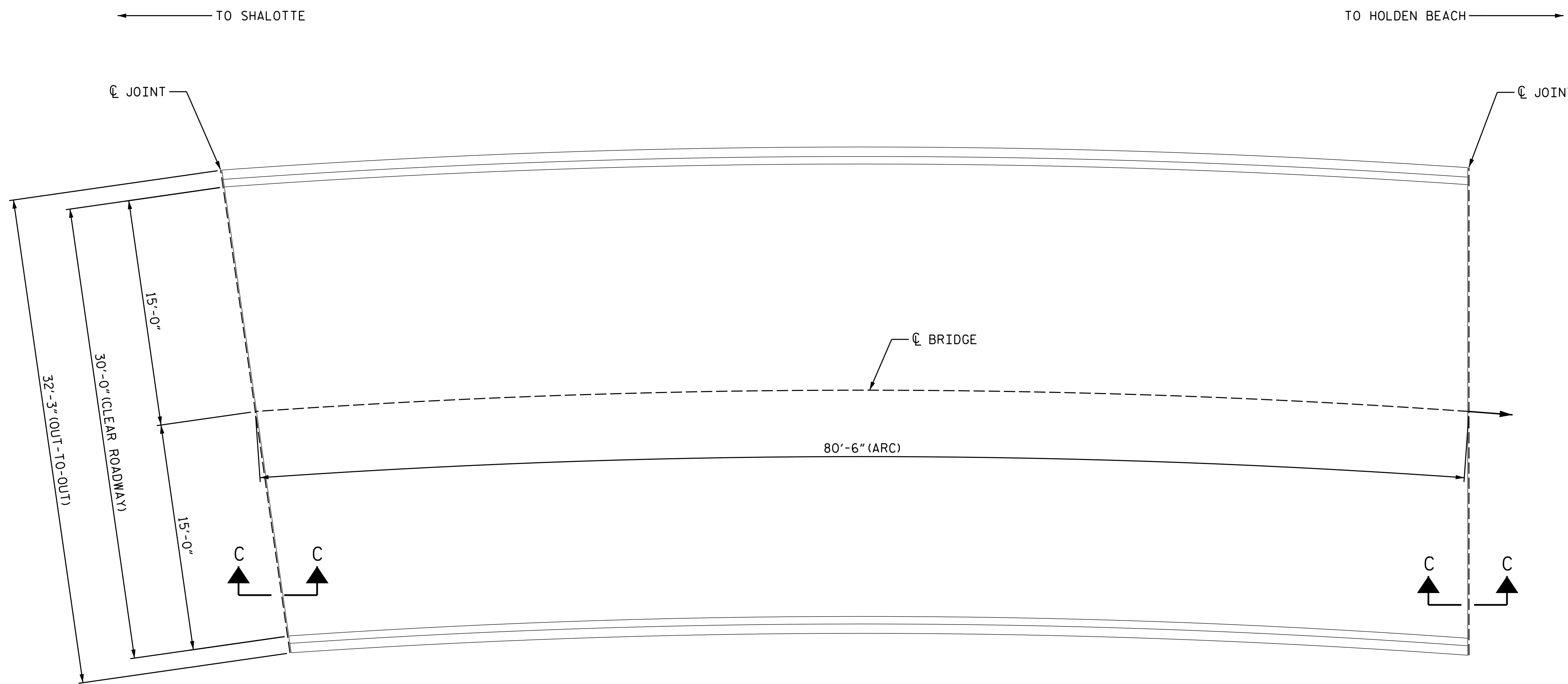
PLAN OF SPAN
 SPAN 16

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
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DRAWN BY :	DIEGO A. AGUIRRE	DATE :	03-2018
CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-20
2			4			TOTAL SHEETS 73

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PLAN

AS-BUILT REPAIR QUANTITY TABLE		
TOP OF DECK REPAIRS		
SPAN 17		
	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	269 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	269 SY	
PPC MATERIALS	7.9 CY	
PLACING & FINISHING PPC OVERLAY	269 SY	
GROOVING BRIDGE FLOORS	2165 SF	

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 AS-BUILT REPAIR QUANTITY TABLE.

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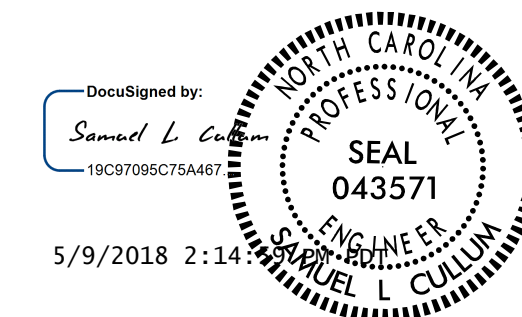
GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF SPAN
 SPAN 17

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

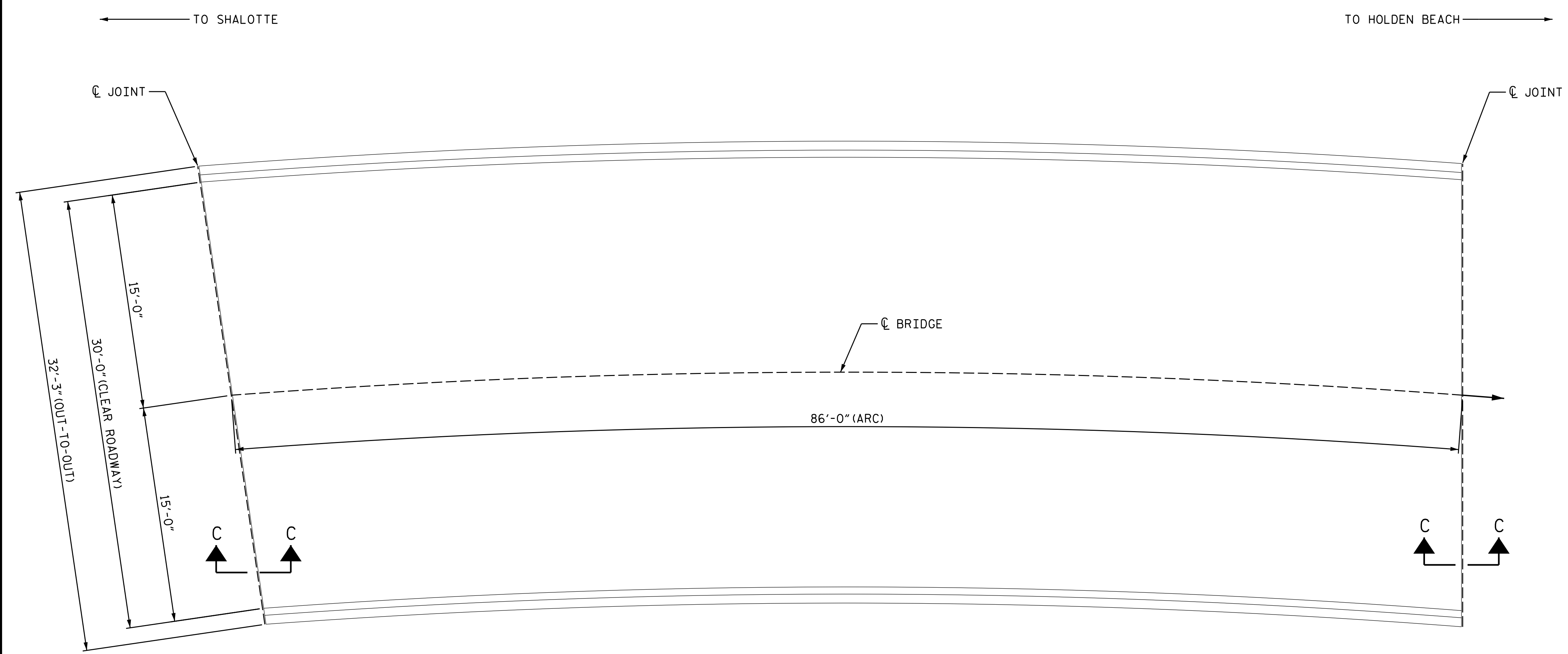
DRAWN BY :	DIEGO A. AGUIRRE	DATE :	03-2018
CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-21
2			4			TOTAL SHEETS 73

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AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS		
SPAN 18		
	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	287 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	287 SY	
PPC MATERIALS	8.2 CY	
PLACING & FINISHING PPC OVERLAY	287 SY	
GROOVING BRIDGE FLOORS	2313 SF	



PLAN

NOTES:

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COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

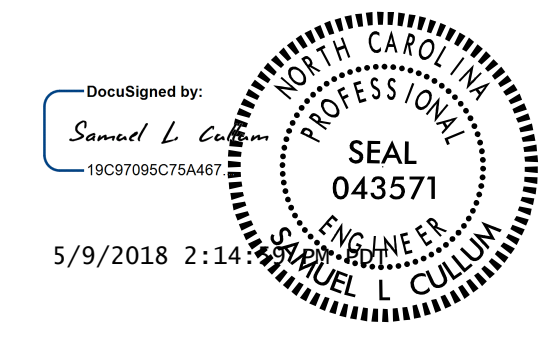
FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF SPAN
 SPAN 18

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			TOTAL SHEETS 73

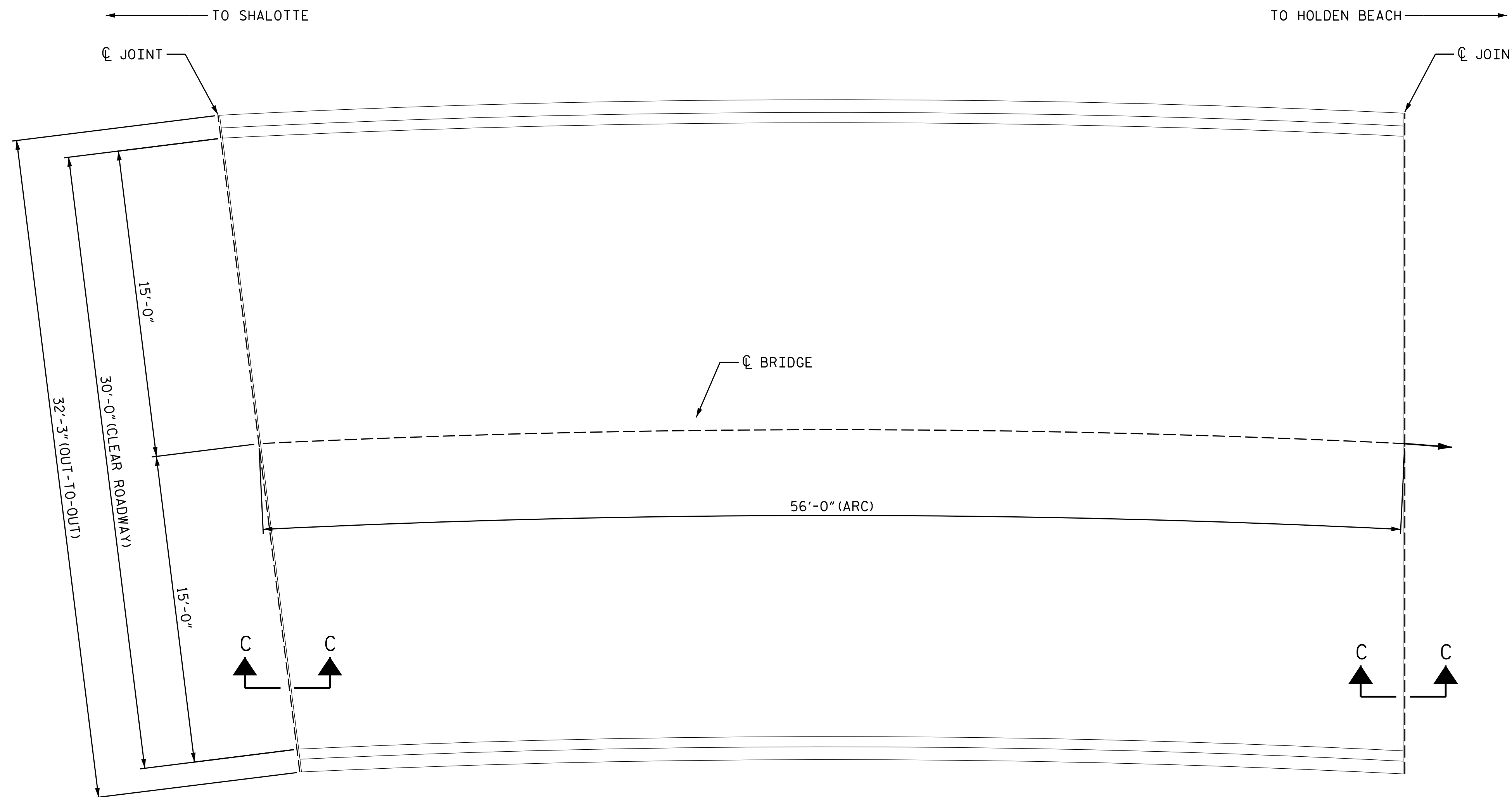
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPAN 19

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	187 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	187 SY	
PPC MATERIALS	5.4 CY	
PLACING & FINISHING PPC OVERLAY	187 SY	
GROOVING BRIDGE FLOORS	1503 SF	



PLAN

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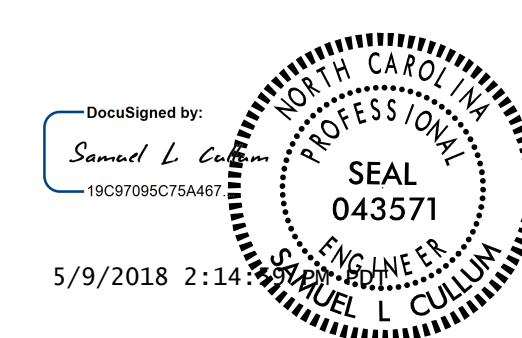
GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF SPAN
 SPAN 19

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY :	DIEGO A. AGUIRRE	DATE :	03-2018
CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
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2			4			73

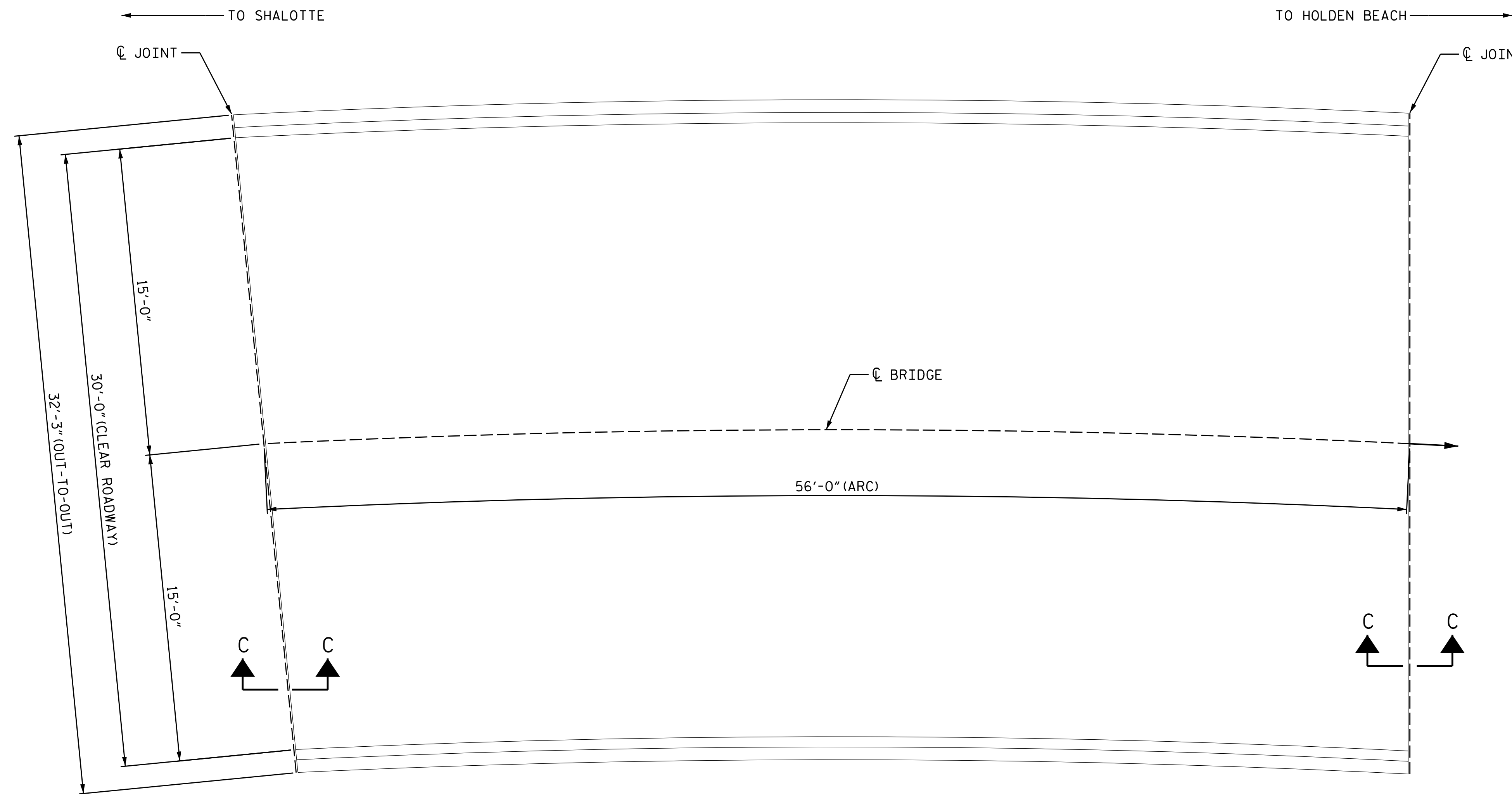
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AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPAN 20

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	187 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	187 SY	
PPC MATERIALS	5.4 CY	
PLACING & FINISHING PPC OVERLAY	187 SY	
GROOVING BRIDGE FLOORS	1503 SF	



PLAN

NOTES:

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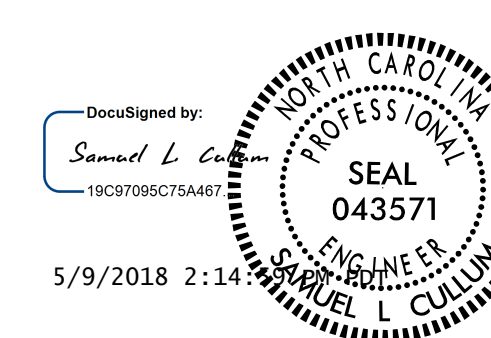
GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF SPAN
 SPAN 20

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY :	DIEGO A. AGUIRRE	DATE :	03-2018
CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			TOTAL SHEETS 73

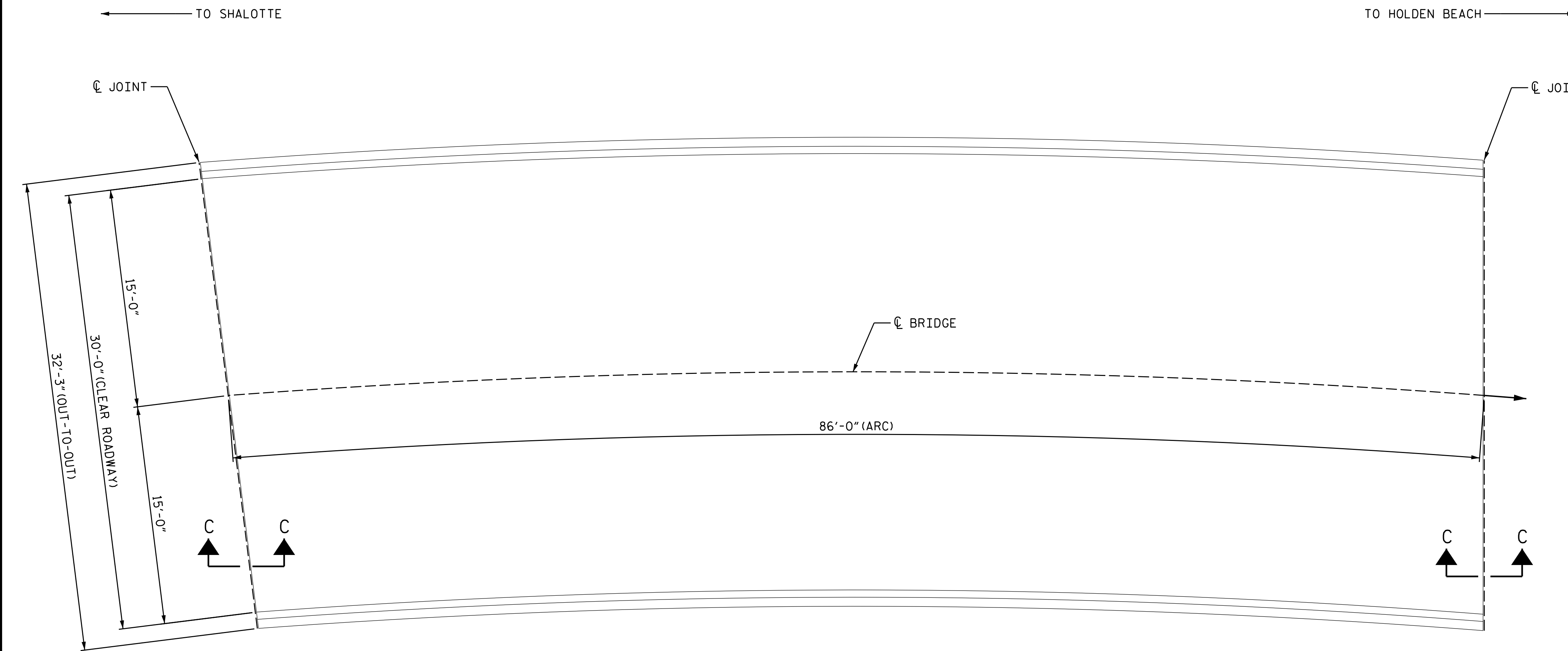
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AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPAN 21

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	287 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	287 SY	
PPC MATERIALS	8.2 CY	
PLACING & FINISHING PPC OVERLAY	287 SY	
GROOVING BRIDGE FLOORS	2313 SF	



PLAN

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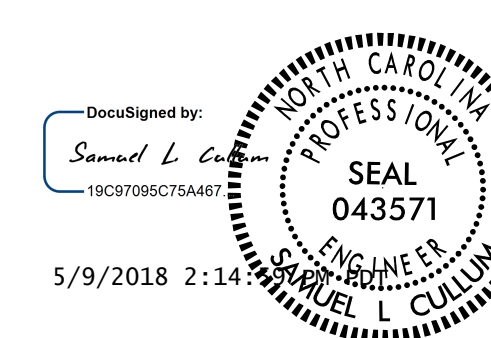
GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

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PROJECT NO. 15BPR.16
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STATE OF NORTH CAROLINA
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PLAN OF SPAN
 SPAN 21

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
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DRAWN BY :	DIEGO A. AGUIRRE	DATE :	03-2018
CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

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2			4			TOTAL SHEETS 73

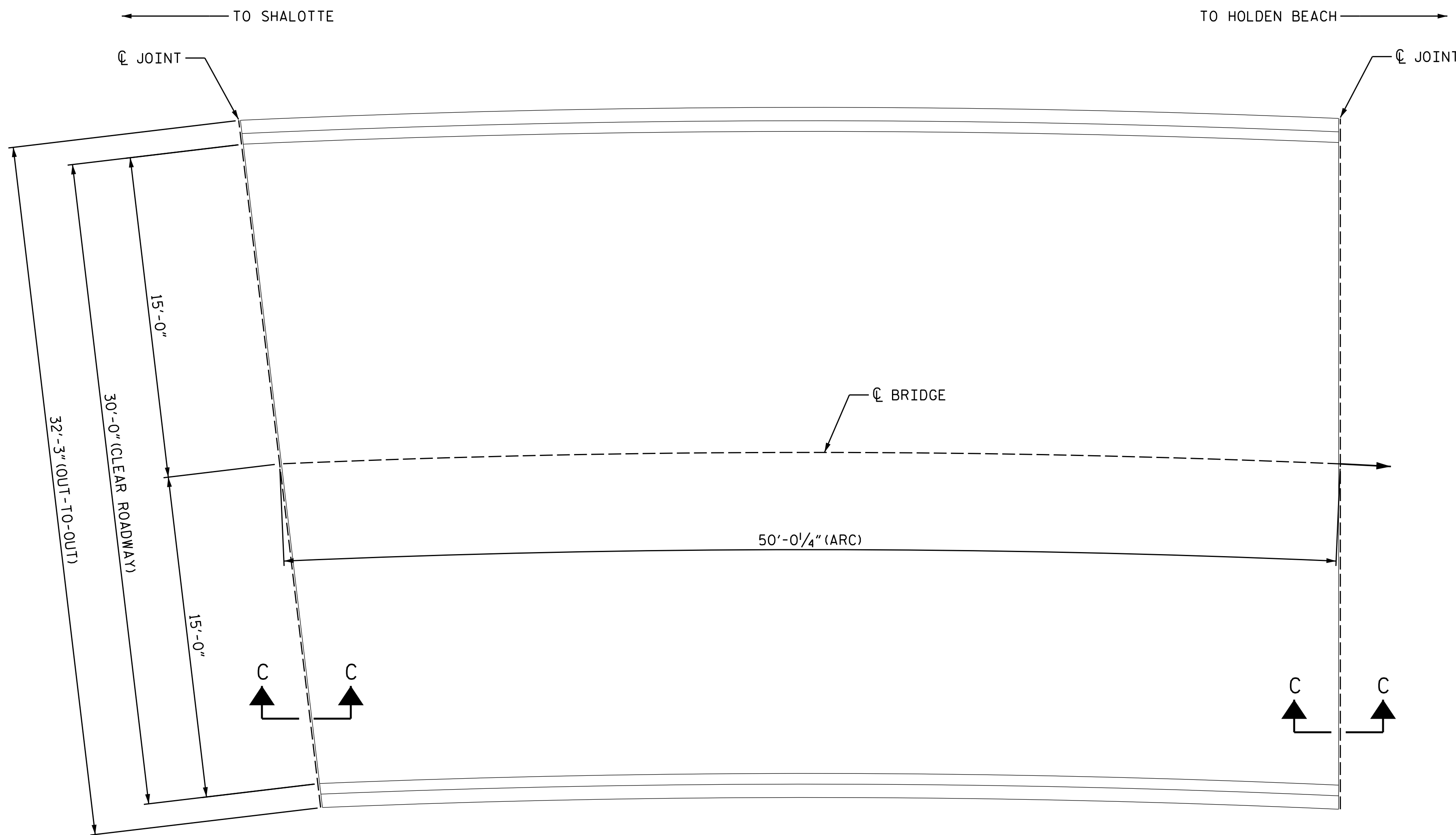
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AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

SPAN 22

	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	167 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	167 SY	
PPC MATERIALS	4.9 CY	
PLACING & FINISHING PPC OVERLAY	167 SY	
GROOVING BRIDGE FLOORS	1342 SF	



PLAN

NOTES:

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CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2 1/2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 1 1/2" TO 2 1/2" BASED ON VISUAL INSPECTION.

* MINOR QUANTITIES OF CLASS II AREAS ARE ANTICIPATED, PARTICULARLY NEAR JOINTS. HOWEVER, DUE TO THEIR SMALL SIZE, THE CLASS II LOCATIONS HAVE NOT BEEN DELINEATED ON THESE PLANS. THE CLASS II QUANTITIES INDICATED ARE ANTICIPATED TO BE SUFFICIENT FOR THE ACTUAL QUANTITIES ENCOUNTERED.

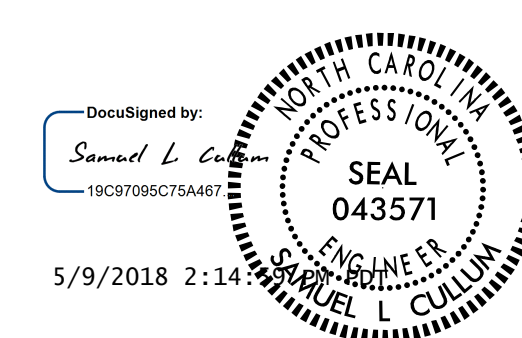
GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF SPAN
 SPAN 22

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

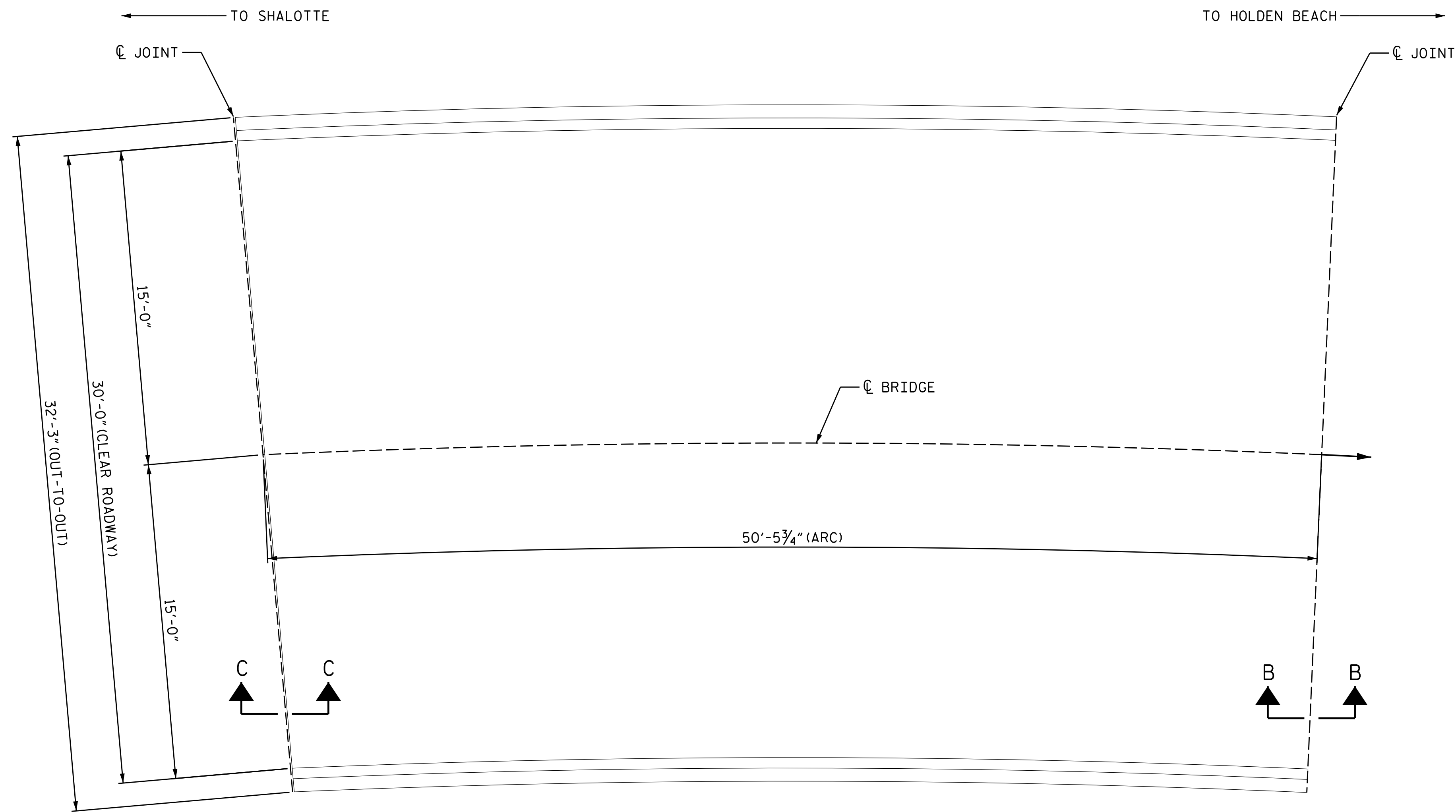
DRAWN BY :	DIEGO A. AGUIRRE	DATE :	03-2018
CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-26
2			4			TOTAL SHEETS 73

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS		
SPAN 23		
	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	169 SY	
CLASS II SURFACE PREPARATION	0.2 SY *	
CONCRETE DECK REPAIR FOR PPC OVERLAY	0.2 SY *	
SHOTBLASTING BRIDGE DECK	169 SY	
PPC MATERIALS	4.9 CY	
PLACING & FINISHING PPC OVERLAY	169 SY	
GROOVING BRIDGE FLOORS	1354 SF	



PLAN

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 AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2 1/2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 1 1/2" TO 2 1/2" BASED ON VISUAL INSPECTION.

* MINOR QUANTITIES OF CLASS II AREAS ARE ANTICIPATED, PARTICULARLY NEAR JOINTS. HOWEVER, DUE TO THEIR SMALL SIZE, THE CLASS II LOCATIONS HAVE NOT BEEN DELINEATED ON THESE PLANS. THE CLASS II QUANTITIES INDICATED ARE ANTICIPATED TO BE SUFFICIENT FOR THE ACTUAL QUANTITIES ENCOUNTERED.

GROOVING BRIDGE FLOORS QUANTITY BASED ON WIDTHS OF TRAVEL LANES PLUS 6" ON EACH SIDE.

COORDINATE THIS SHEET WITH S-28 FOR THE PPC OVERLAY.

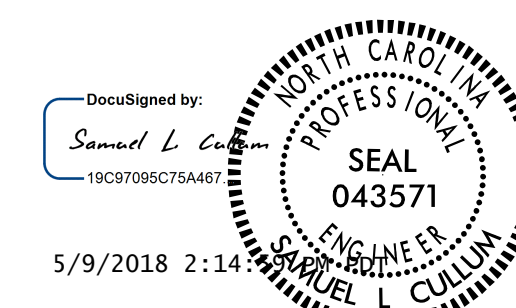
FOR SECTIONS A-A, B-B, AND C-C SEE SHEET S-29.

FOR SECTION D-D AND DETAILS OF JOINT AT BARRIER SEE SHEET S-30.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
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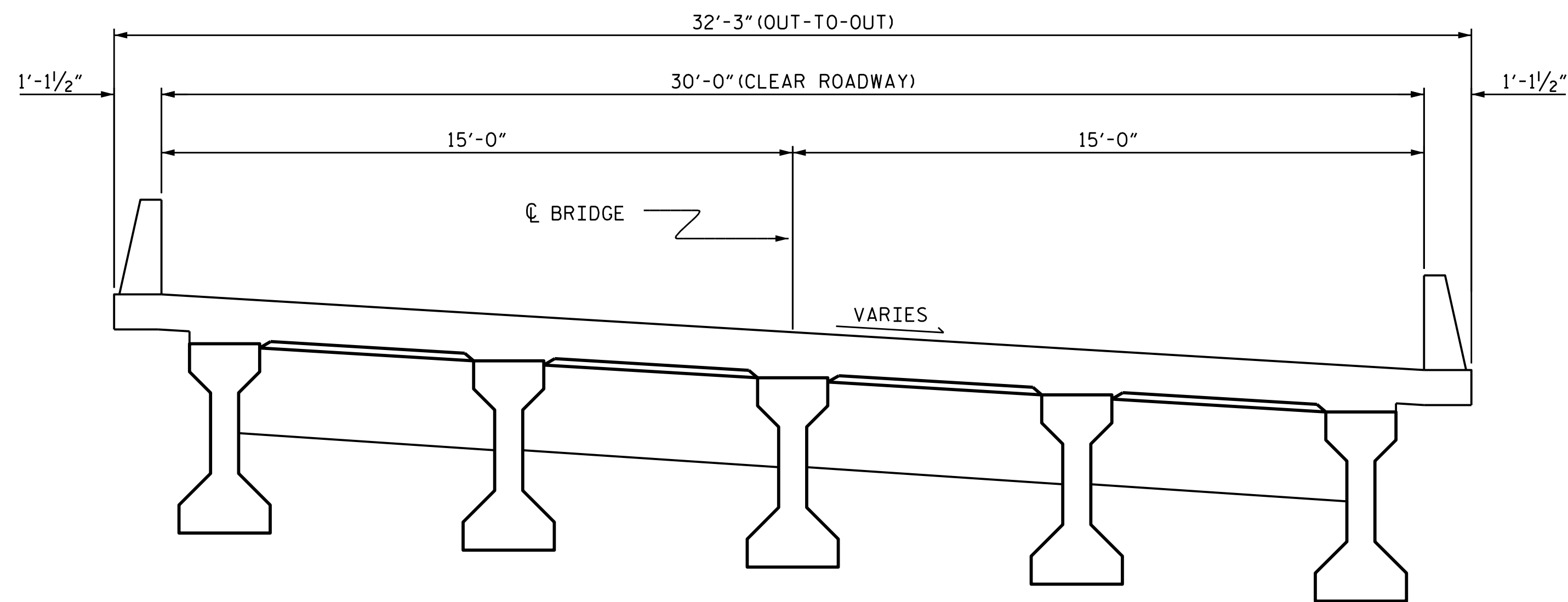
DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018



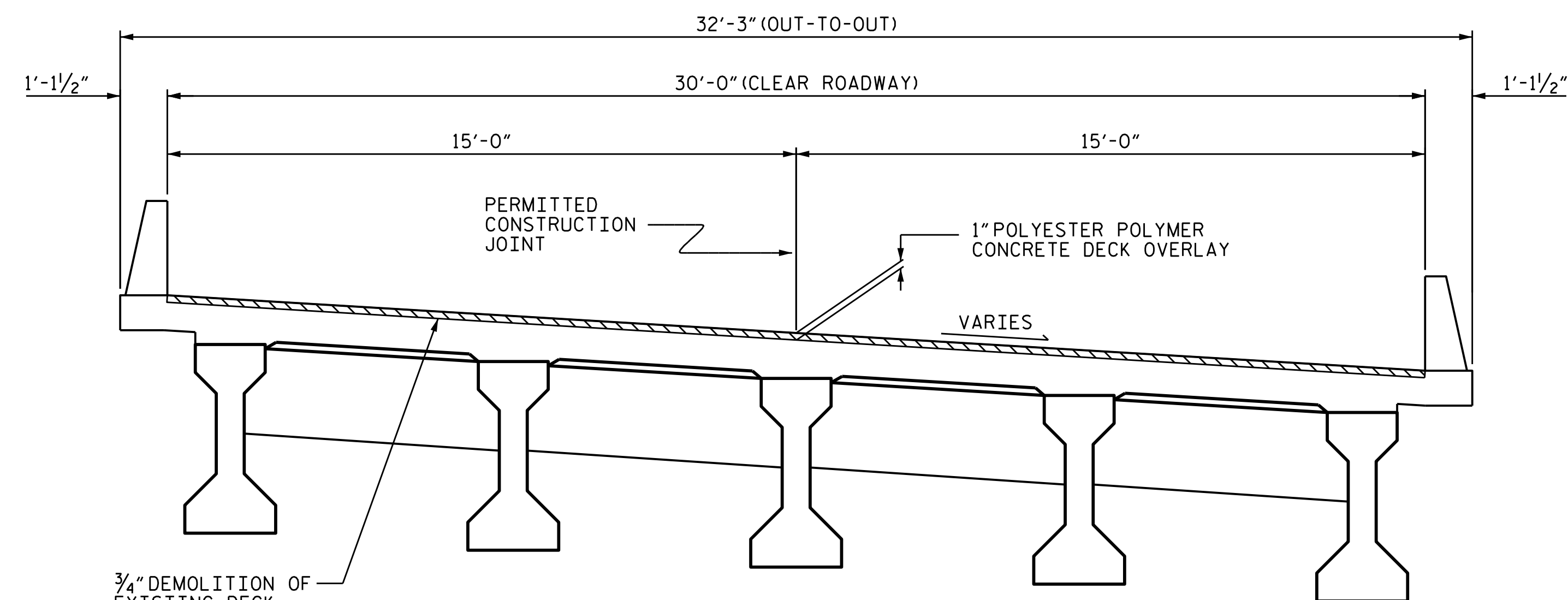
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 PLAN OF SPAN
 SPAN 23

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			73

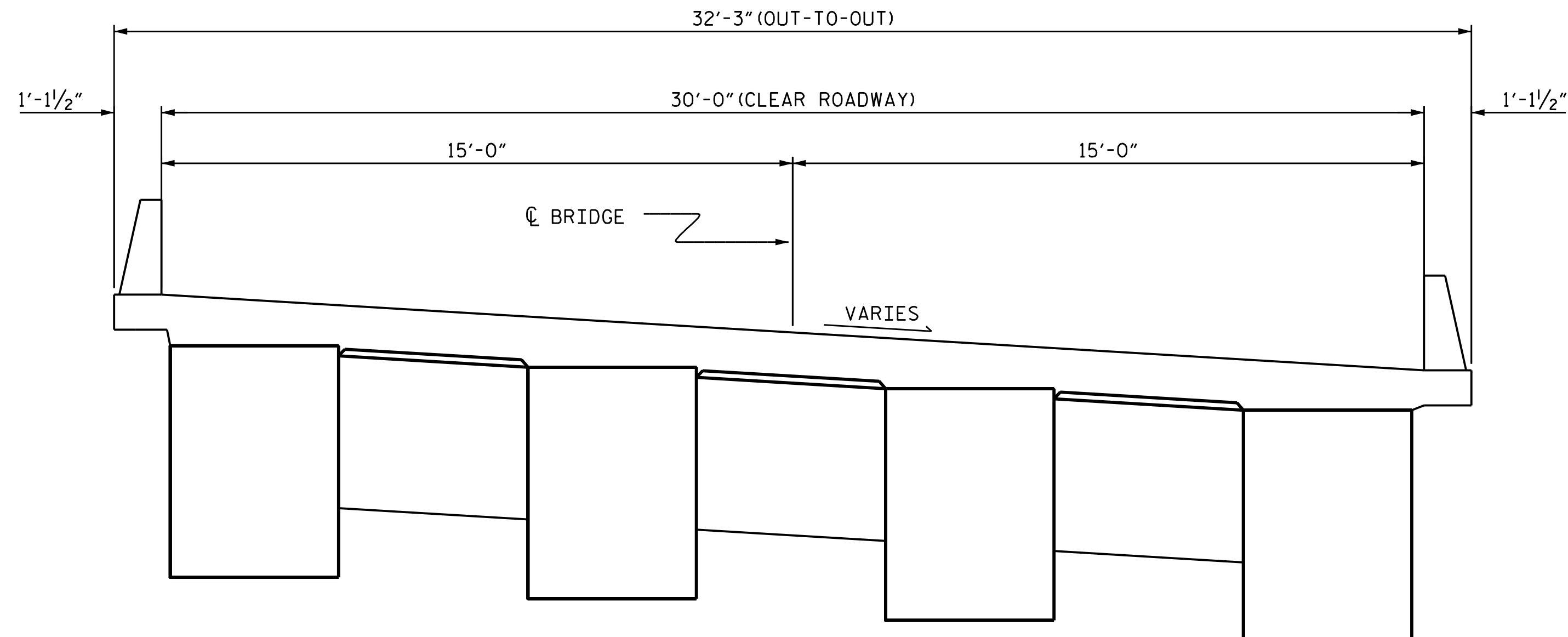
DOCUMENT NOT CONSIDERED
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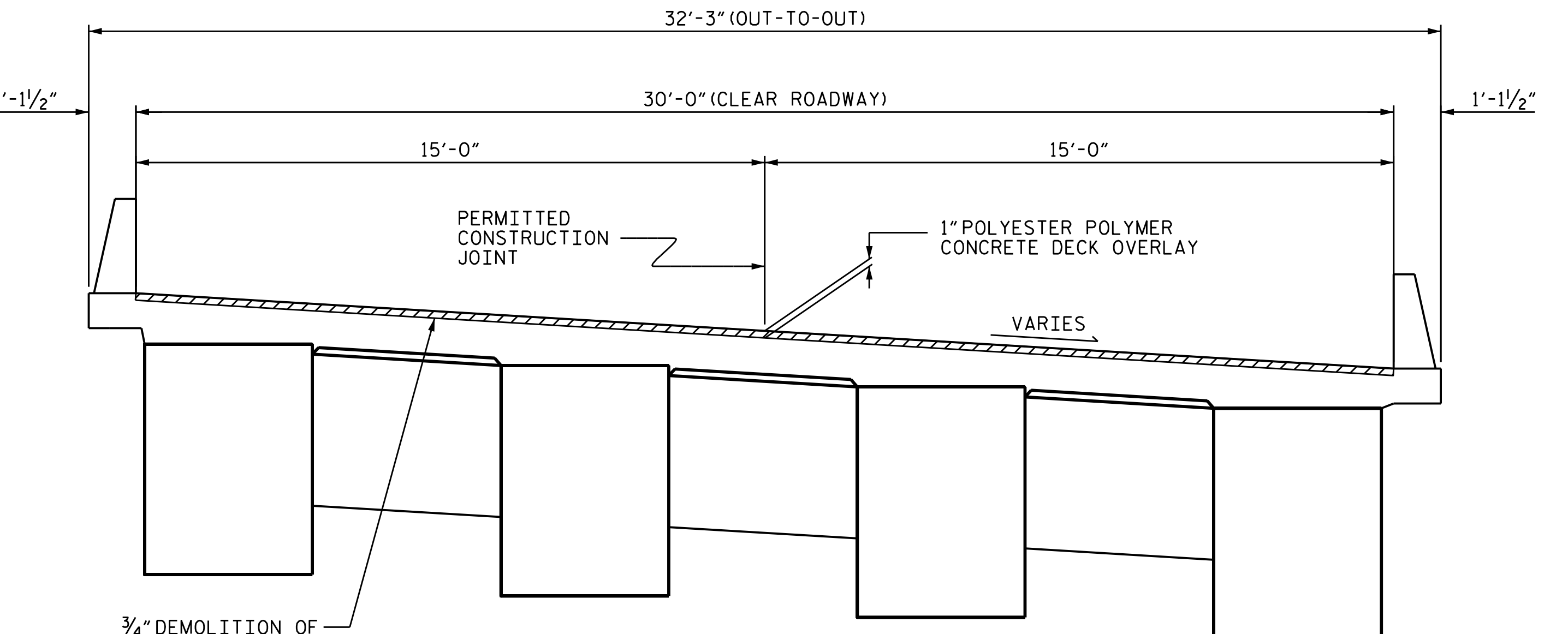
TYPICAL SECTION
(EXISTING SPANS 1-10 & 14-23)



TYPICAL SECTION
(PROPOSED SPANS 1-10 & 14-23)

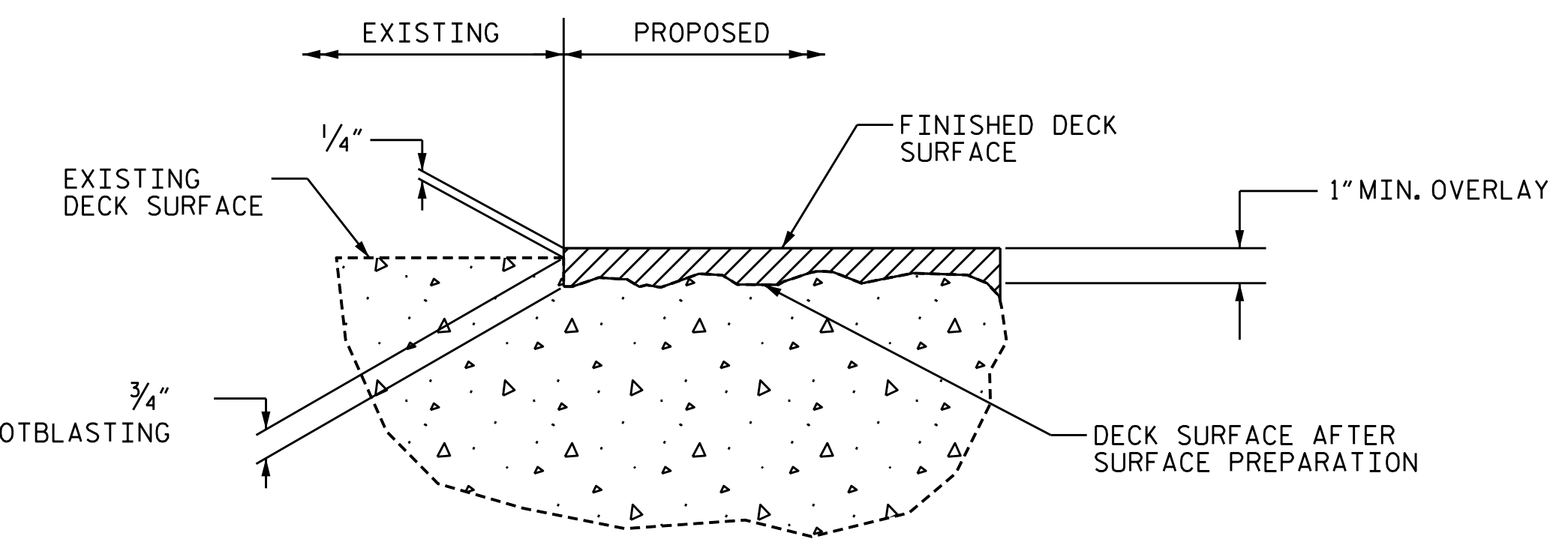


TYPICAL SECTION
(EXISTING SPANS 11-13)



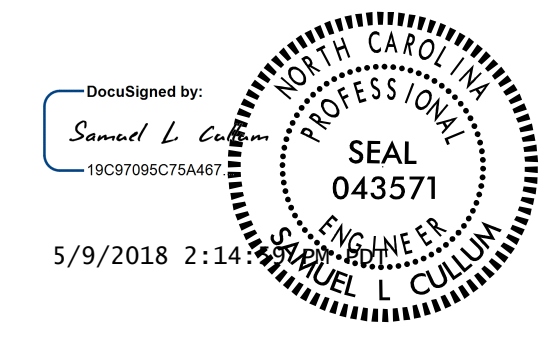
TYPICAL SECTION
(PROPOSED SPANS 11-13)

NOTES:
ONLY LONGITUDINAL CONSTRUCTION JOINTS SHALL BE ALLOWED IN THE PPC OVERLAY AND ONLY AT THE PERMITTED LOCATION SHOWN.



DETAIL FOR PPC OVERLAY

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
BRIDGE NO. 71



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**TYPICAL SECTIONS
PPC OVERLAY**

KCA 4800 SIX FORKS ROAD SUITE 120
KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			73

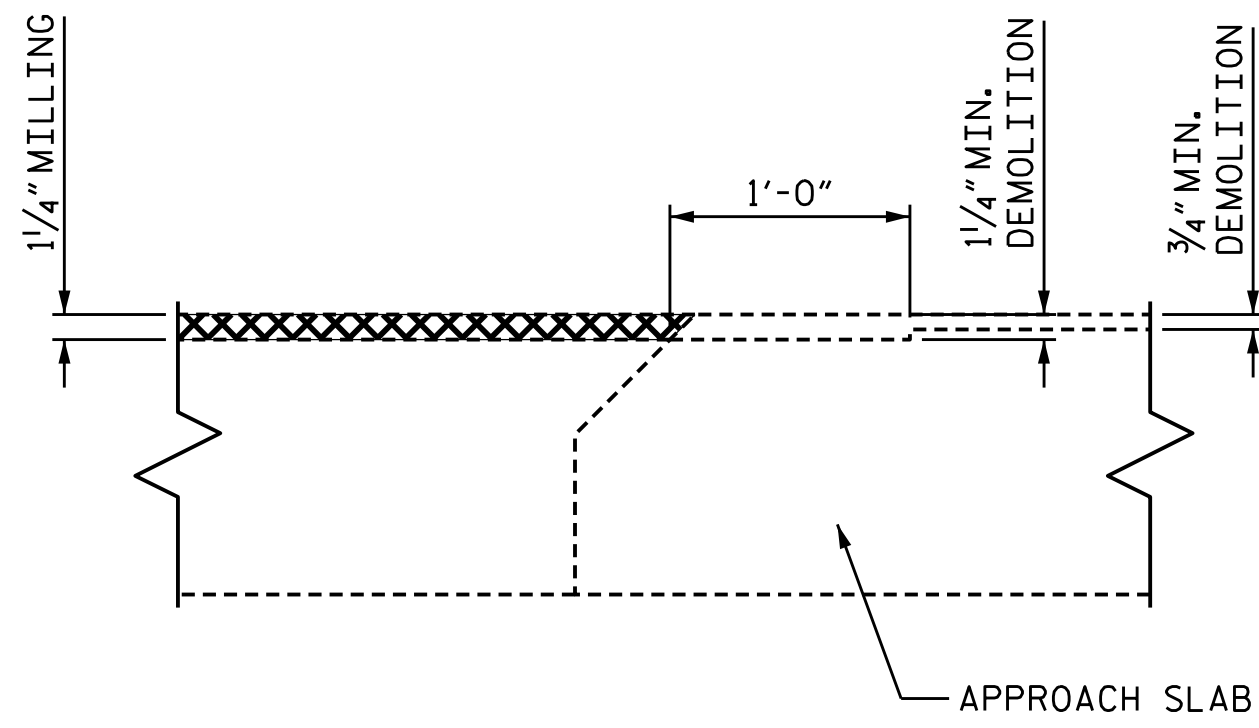
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES:

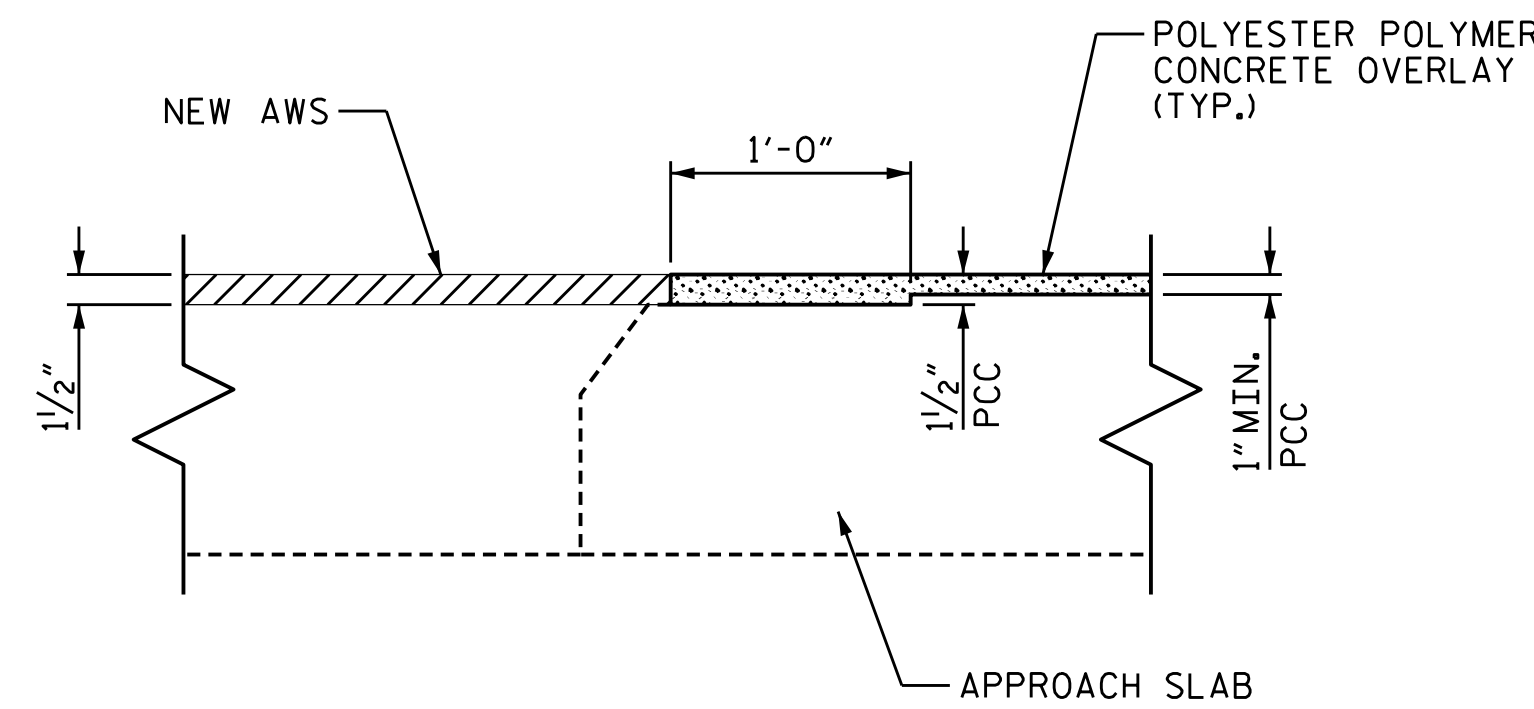
FOR SILICONE JOINT SEALANT , SEE SPECIAL PROVISIONS.

SILICONE JOINT SEALANT AND BACKER ROD SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.

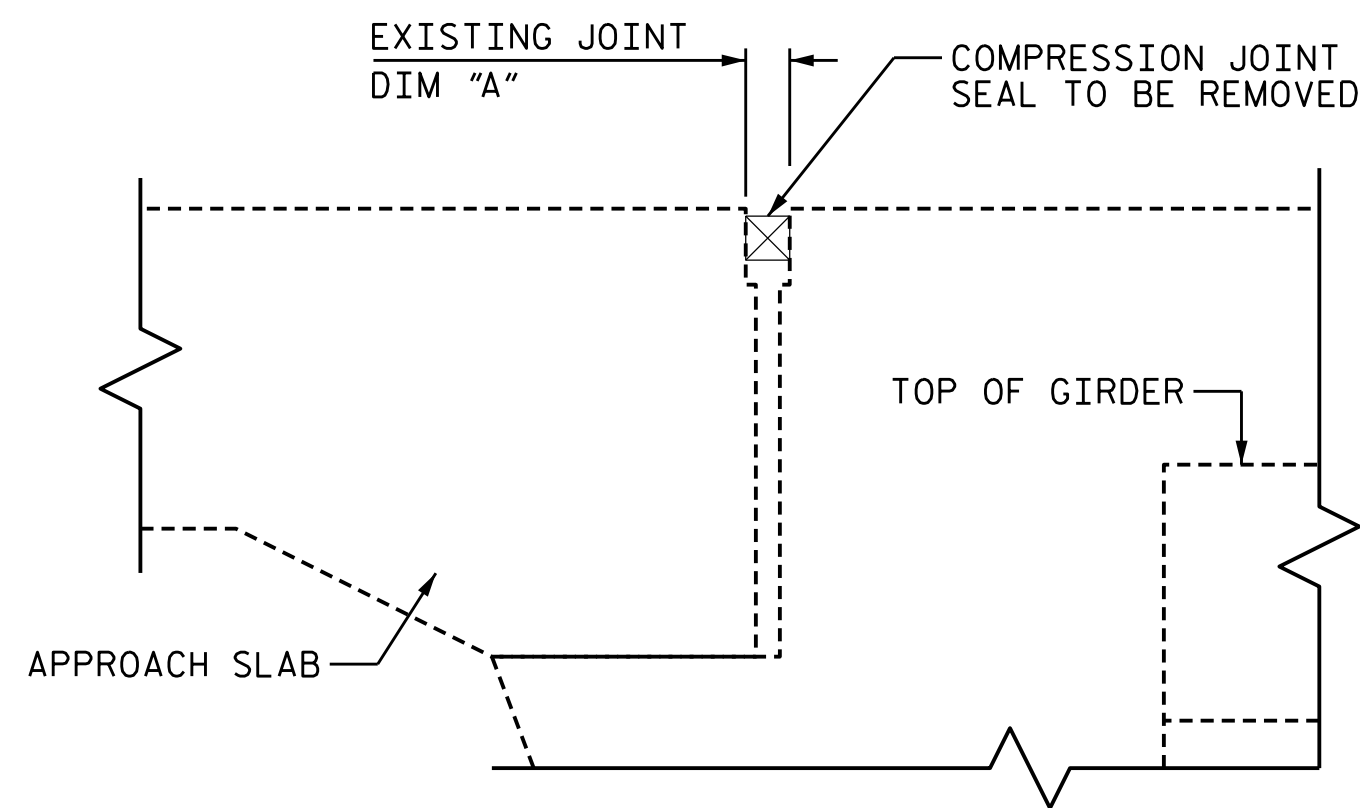
FOR DIM "A", SEE TABLE 1 ON SHEET S-30.



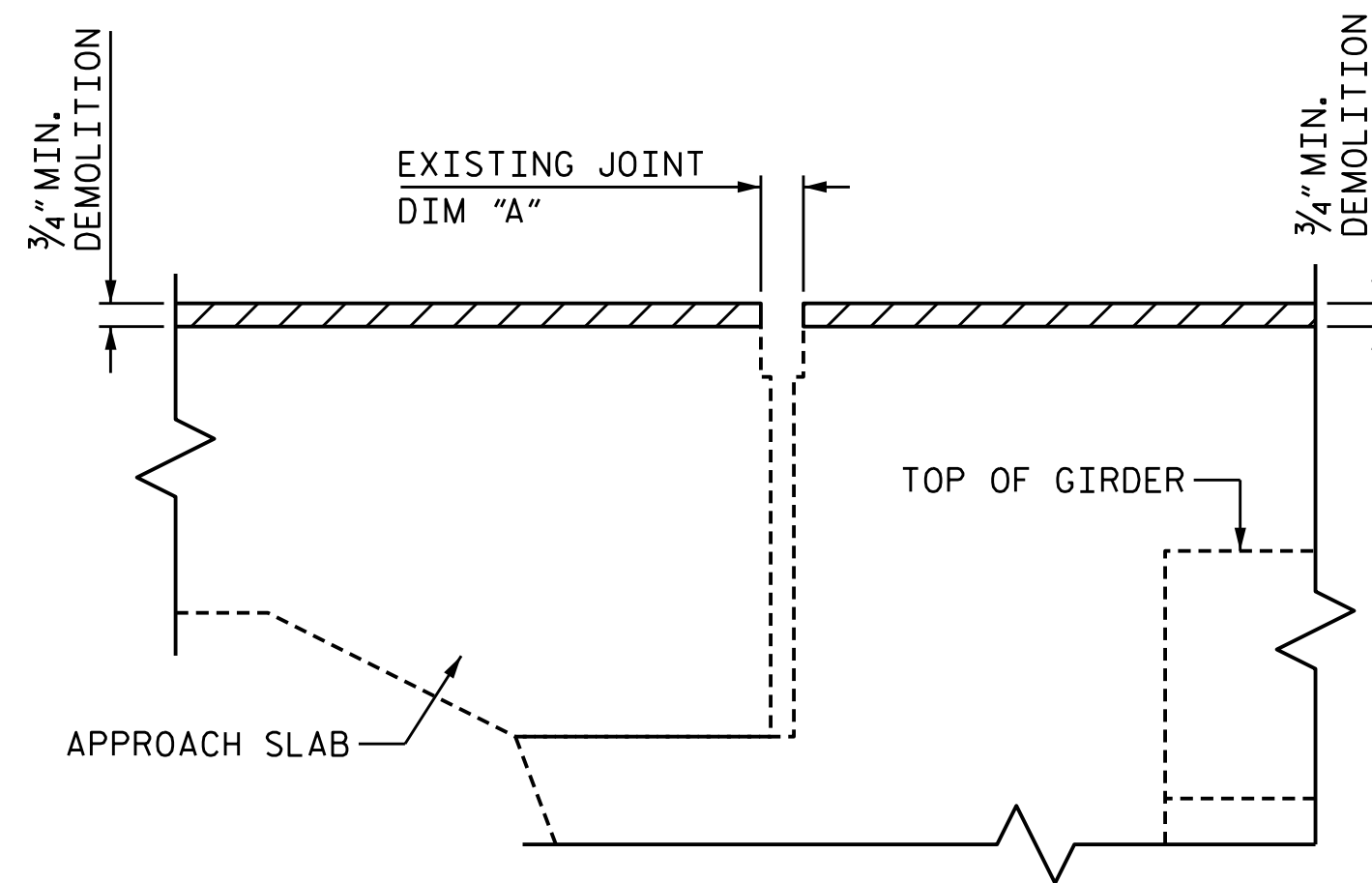
SECTION A-A
(EXISTING)



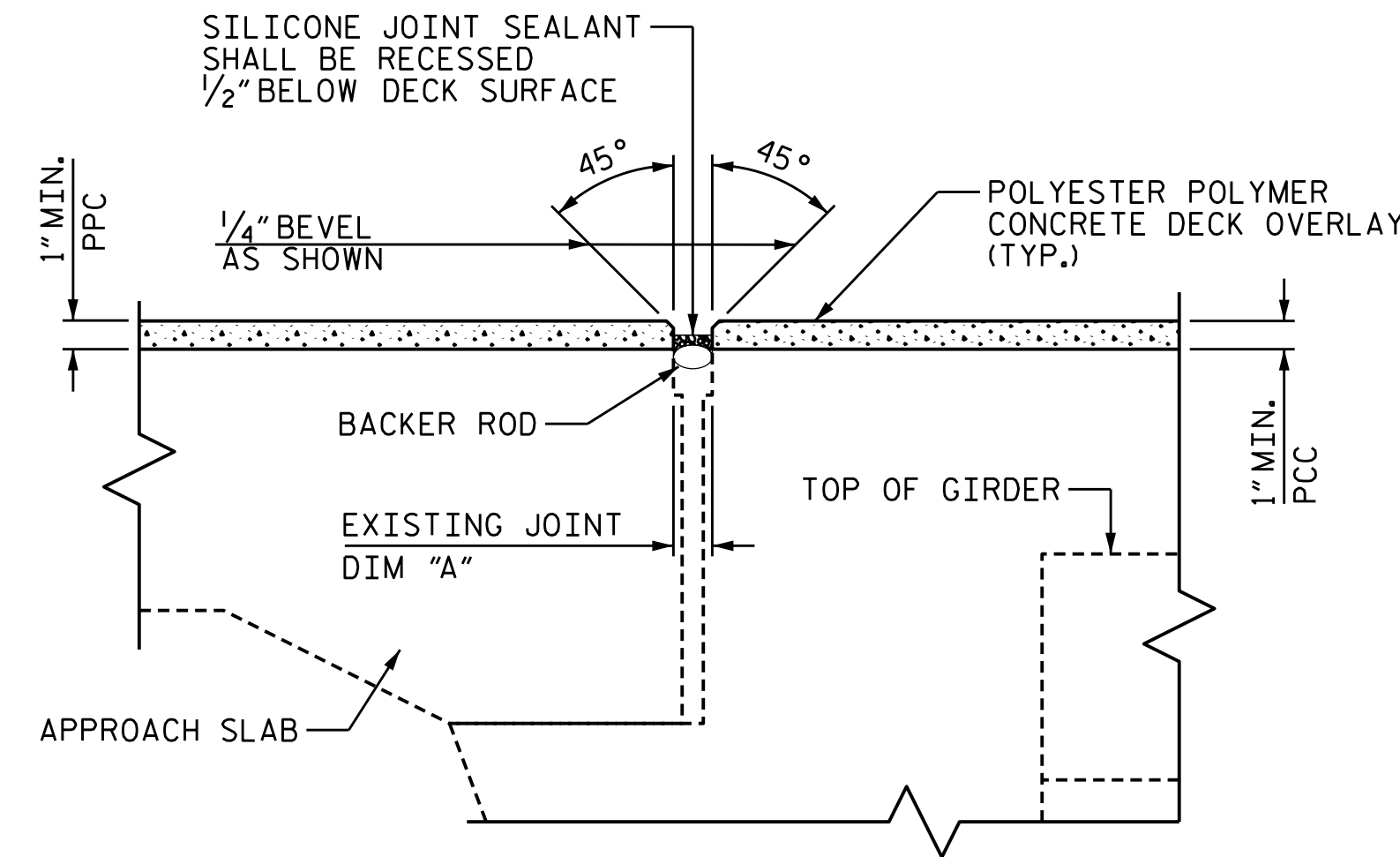
SECTION A-A
(PROPOSED)



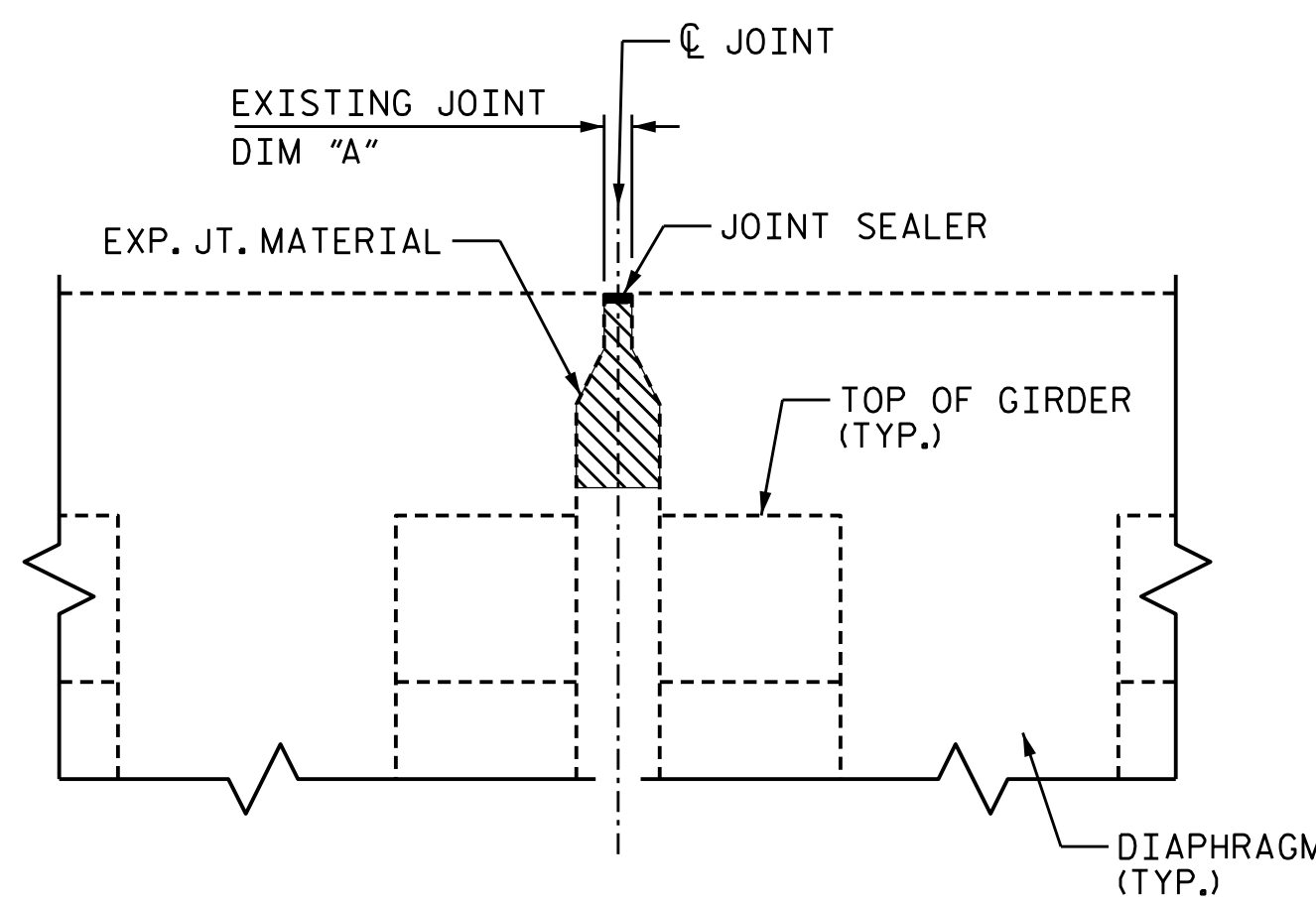
SECTION B-B
(EXISTING)



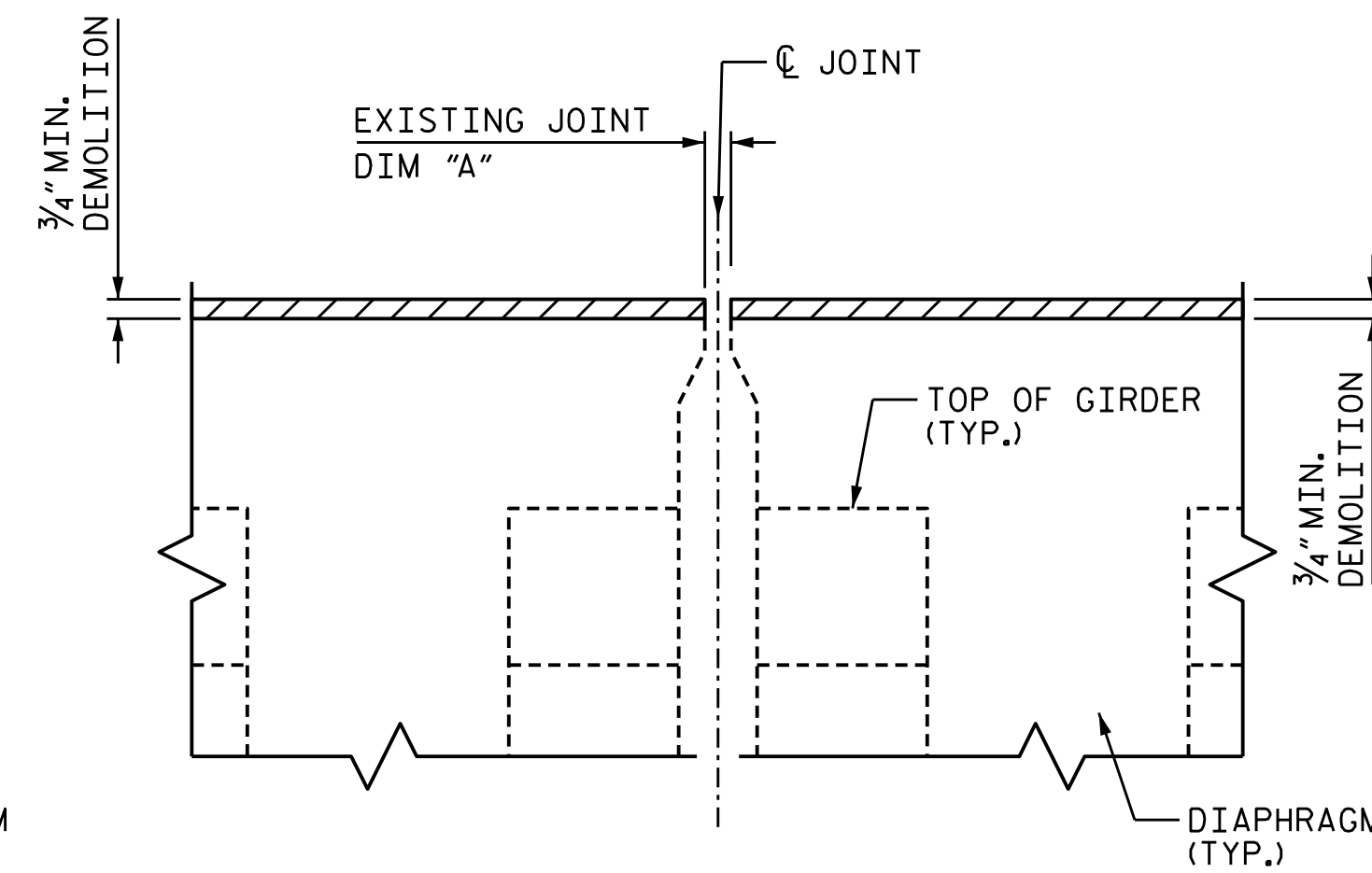
SECTION B-B
(MINIMUM EXISTING JOINT DEMOLITION)



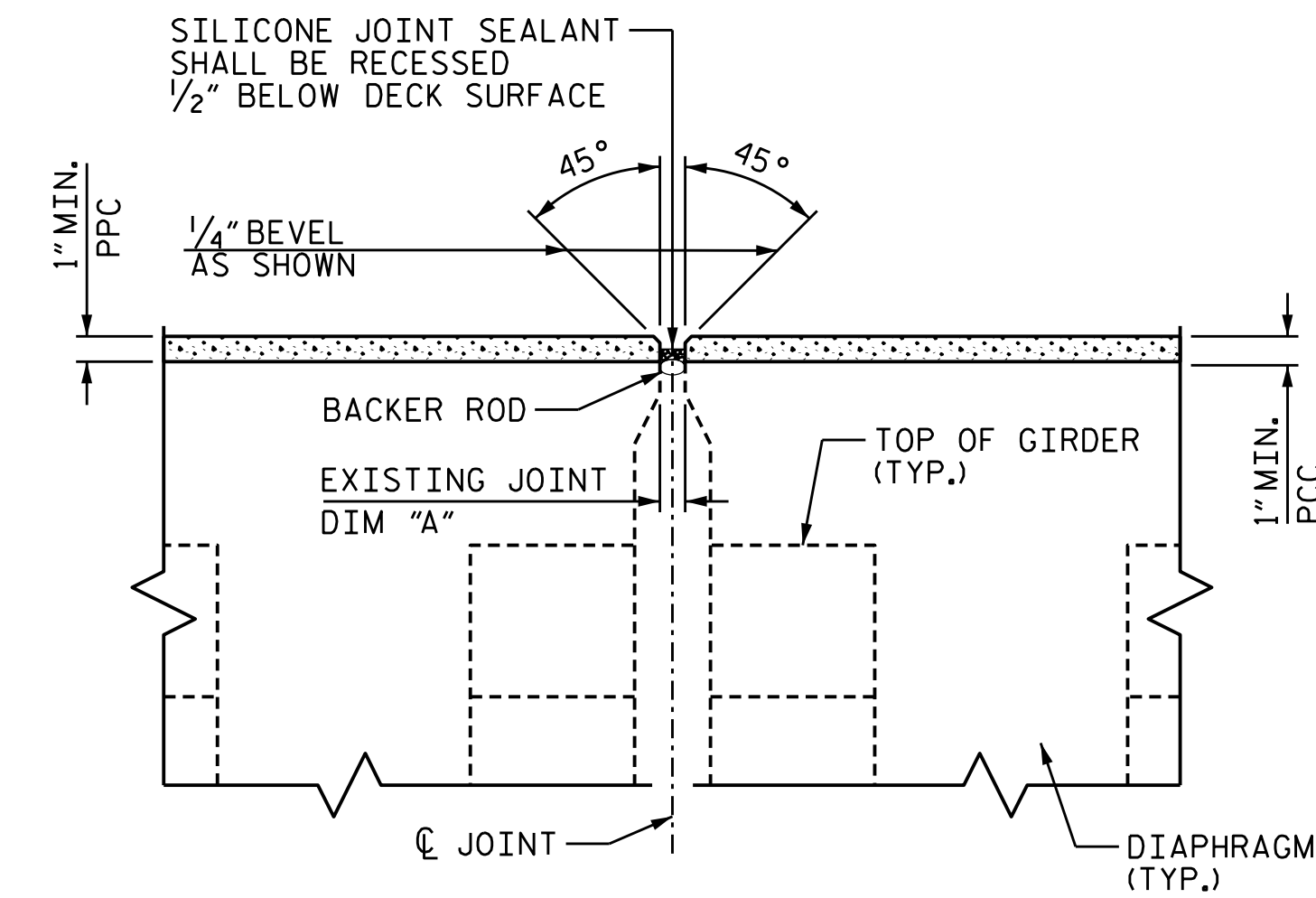
SECTION B-B
(PROPOSED JOINT SEAL)



SECTION C-C
(EXISTING)



SECTION C-C
(MINIMUM EXISTING JOINT DEMOLITION)



SECTION C-C
(PROPOSED JOINT SEAL)

KCA 4800 SIX FORKS ROAD SUITE 120
KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
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DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

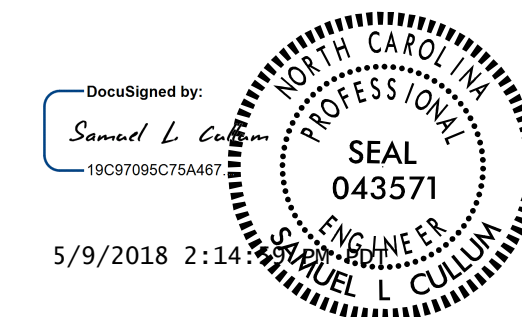
5/9/2018
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User:jduke

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
BRIDGE NO. 71

SHEET 1 OF 2

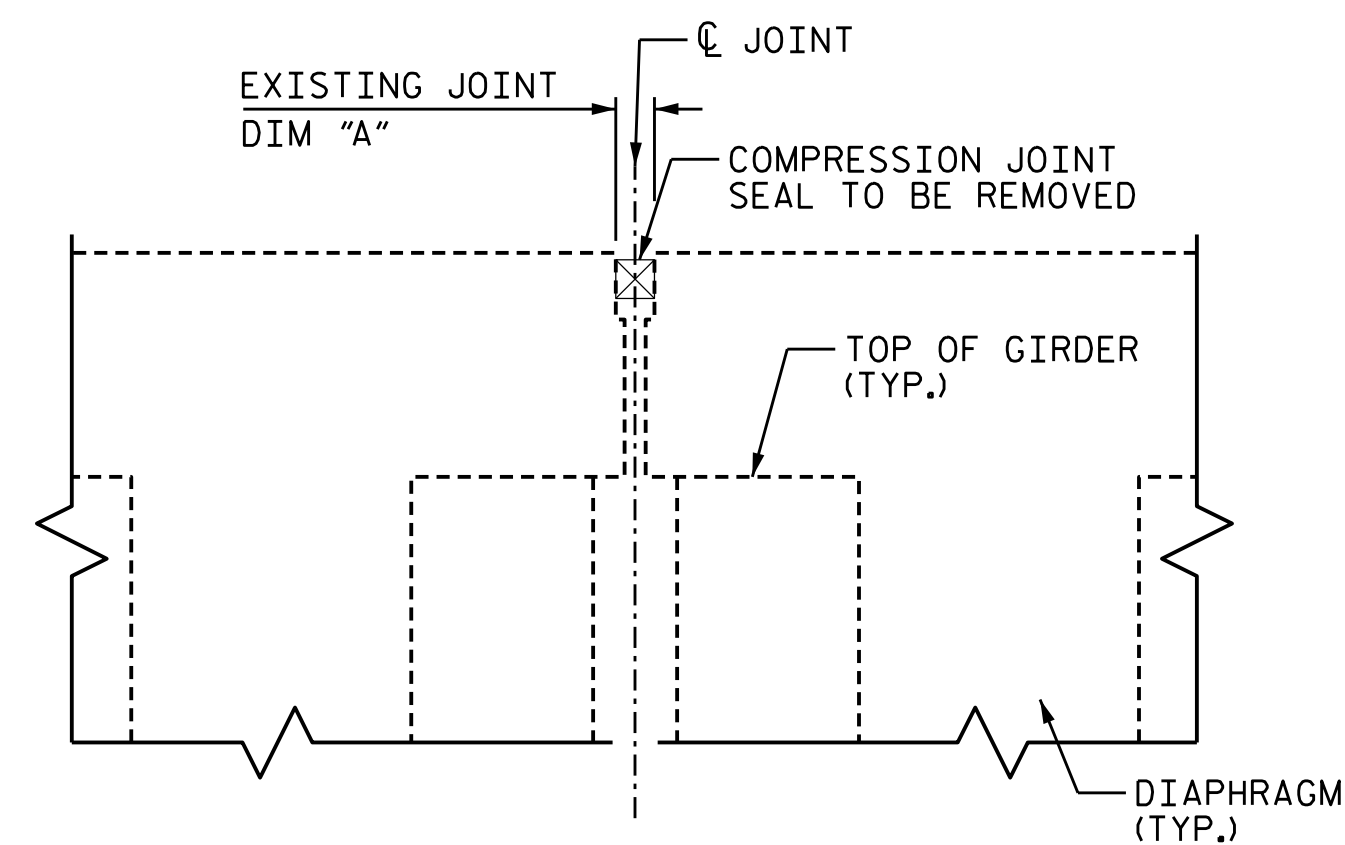
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS
APPROACH SLABS,
SPANS 1-10 AND 14-23

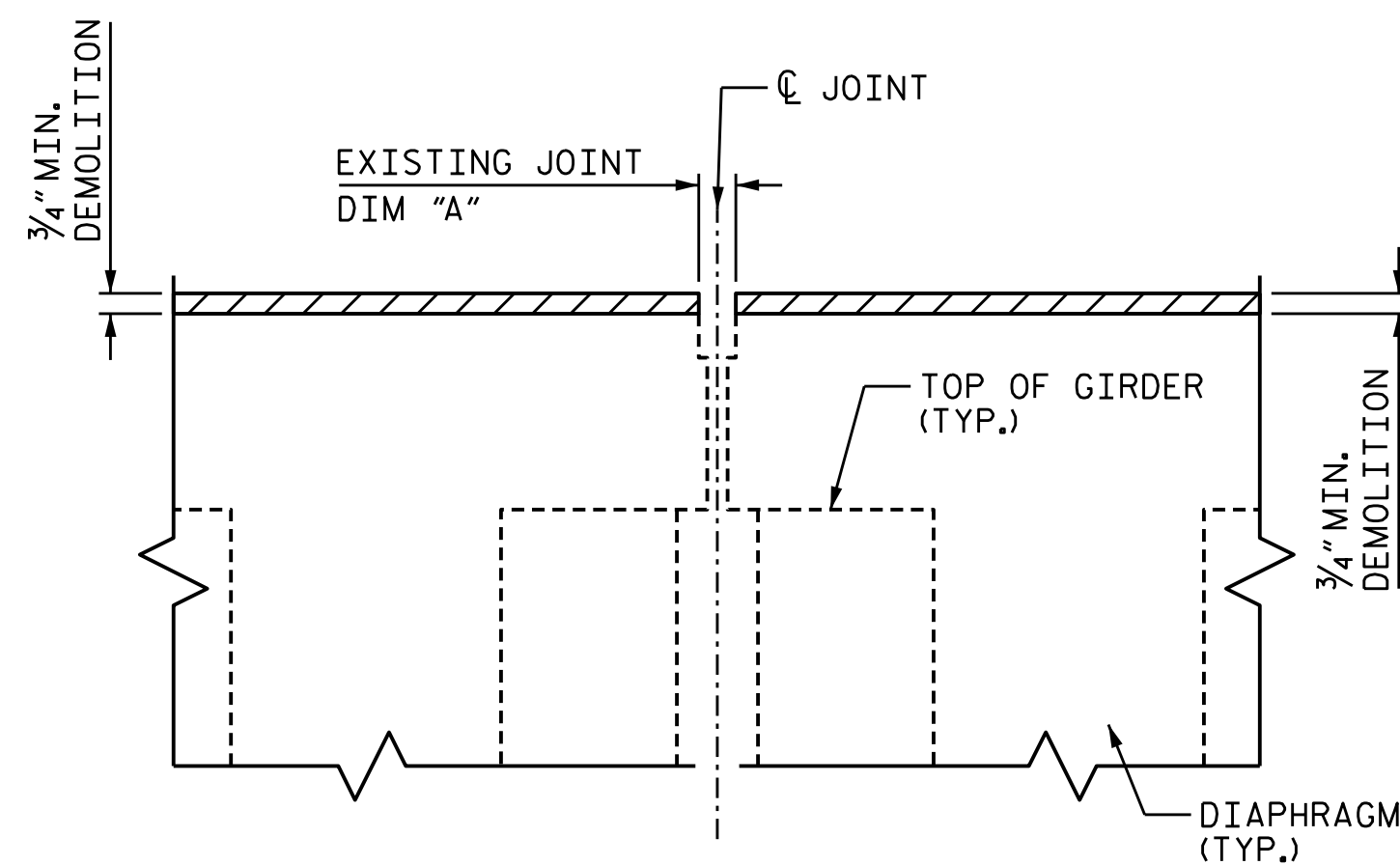


DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

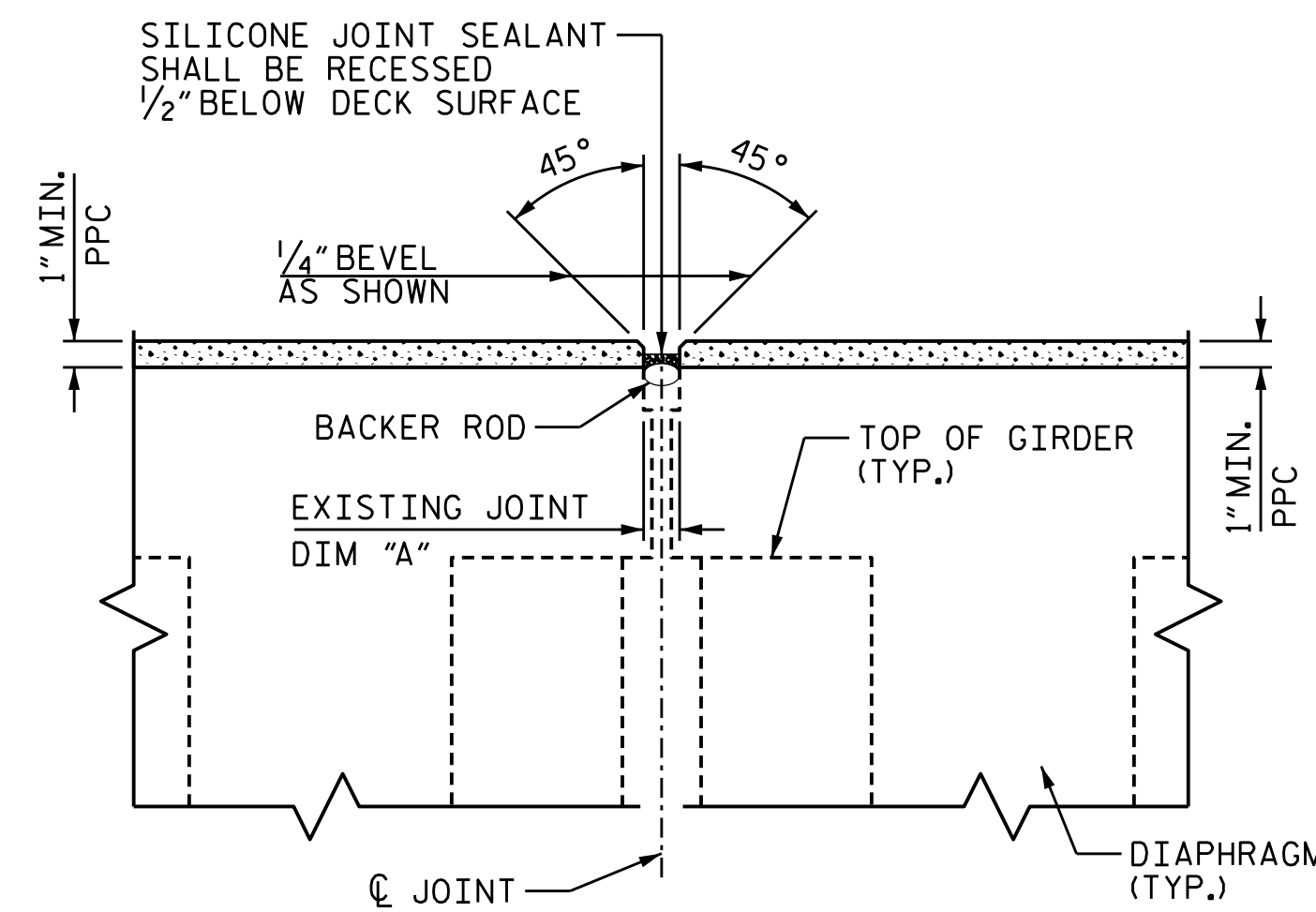
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS 73
2			4			



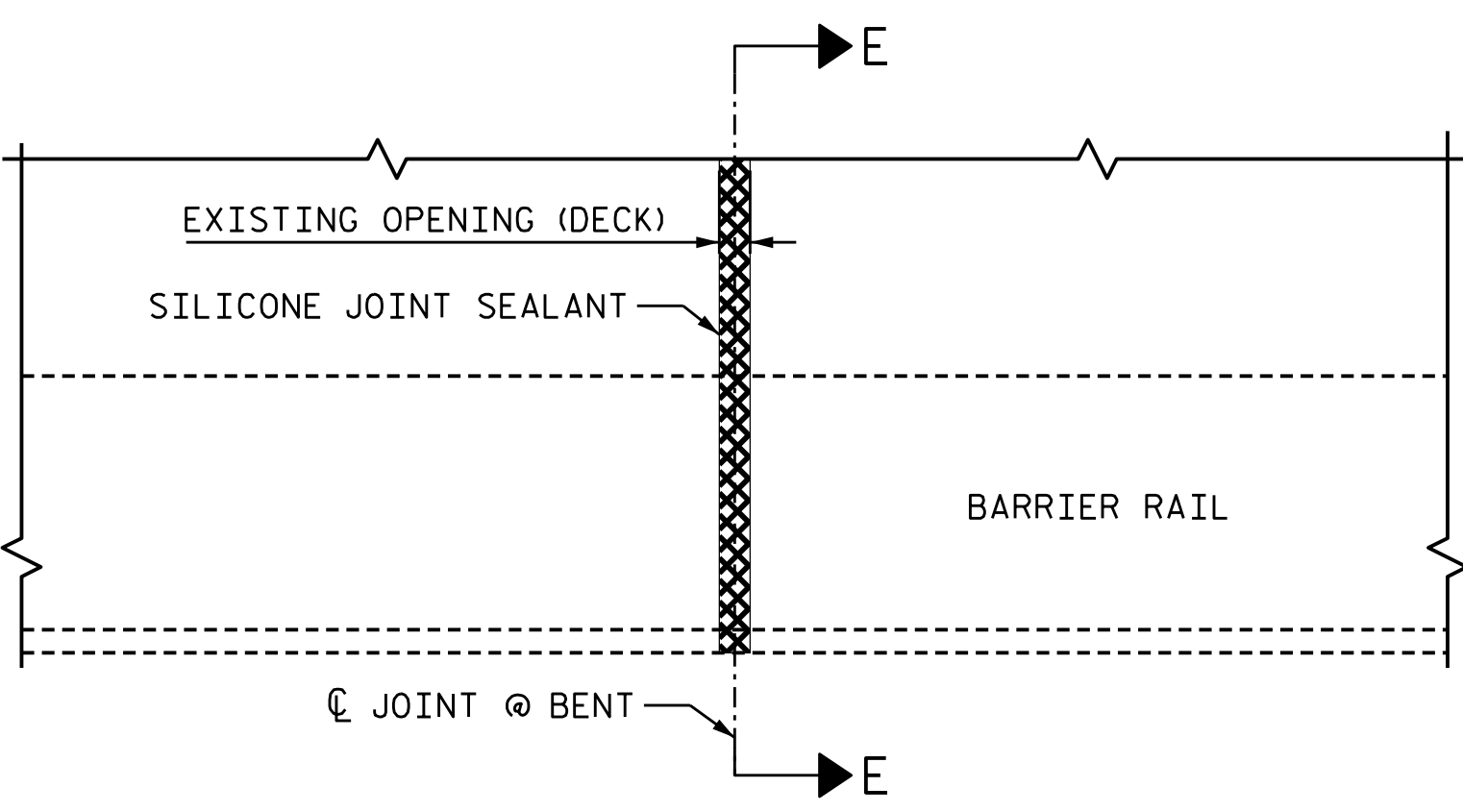
SECTION D-D
(EXISTING)



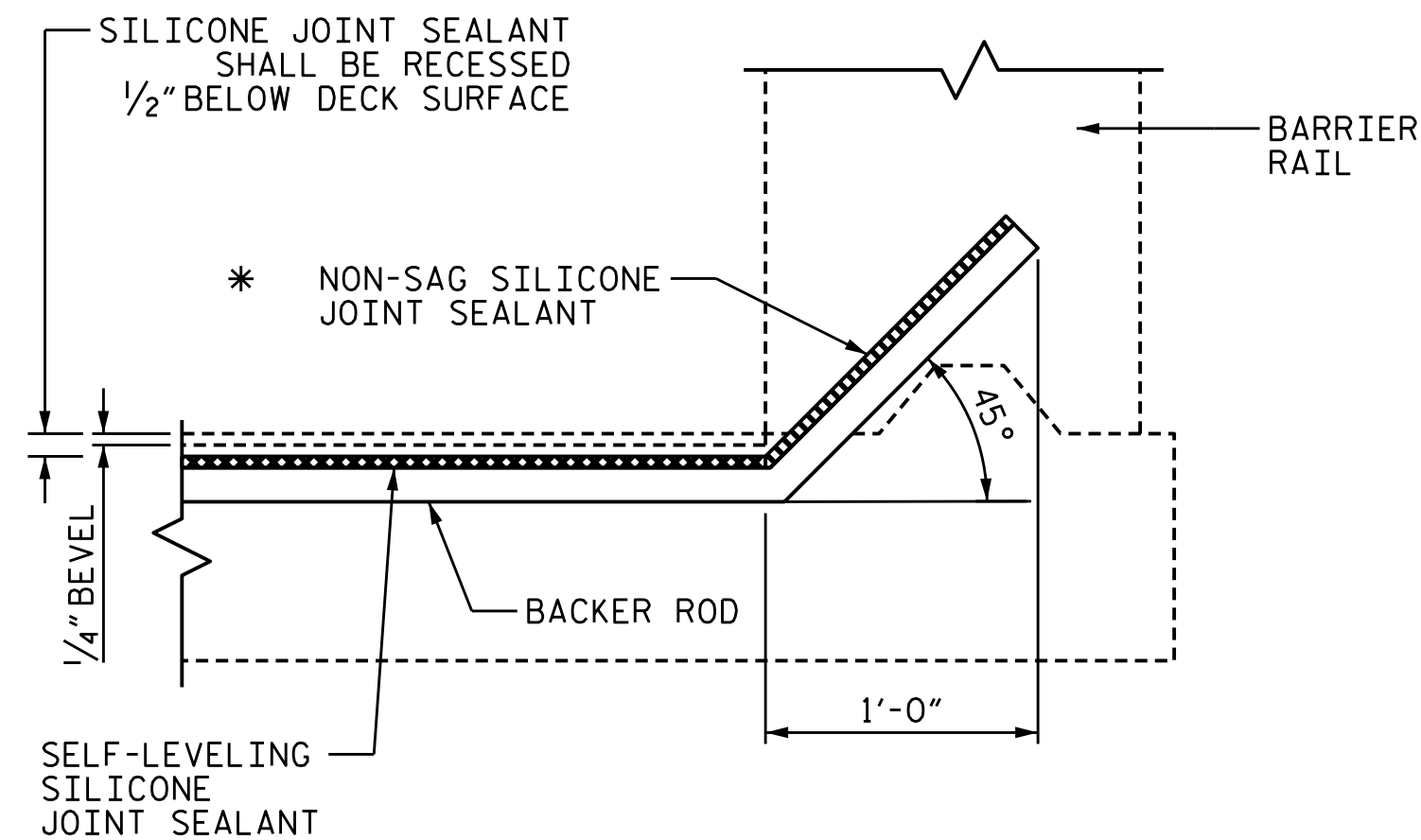
SECTION D-D
(MINIMUM EXISTING JOINT DEMOLITION)



SECTION D-D
(PROPOSED JOINT SEAL)



PLAN AT BARRIER
(EXISTING)



SECTION E-E
(PROPOSED JOINT SEAL)

NOTES:

- FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.
- SILICONE JOINT SEALANT AND BACKER ROD SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.
- FOR DIM "A", SEE TABLE 1.
- WORK THIS SHEET WITH SHEET S-29.
- * NON-SAG SILICONE JOINT SEALANT TO BE PLACED AND ALLOWED TO SET, PRIOR TO PLACEMENT OF SELF-LEVELING SILICONE JOINT SEALANT.

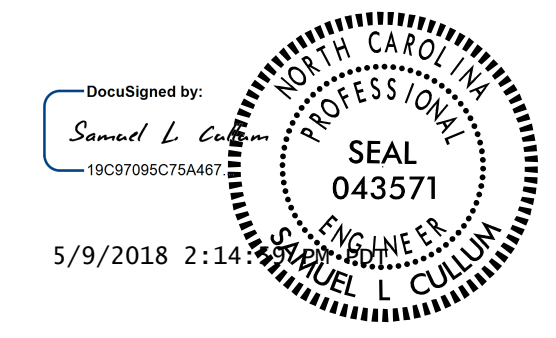
TABLE 1		Table Date 3-2018
DIM "A" @ 65°F	BENT/JOINTS	(MEASUREMENTS FROM FIELD VISIT)
1"	BENTS: 22	
1 1/4"	BENTS: 7, 17, 18, 20, 21	
1 3/8"	BENTS: 1, 16	
1 1/2"	BENTS: 4, 5, 6, 8, 9, 14, 15, 19	
1 5/8"	BENTS: 2, 3	
1 3/4"	BENTS: END BENT#1	
2"	BENTS: END BENT#2	
2 1/2"	BENTS: 10, 12, 13	
2 5/8"	BENTS: 11	

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

JOINT DETAILS
 SPANS 11, 12, AND 13
 AND JOINT TABLE

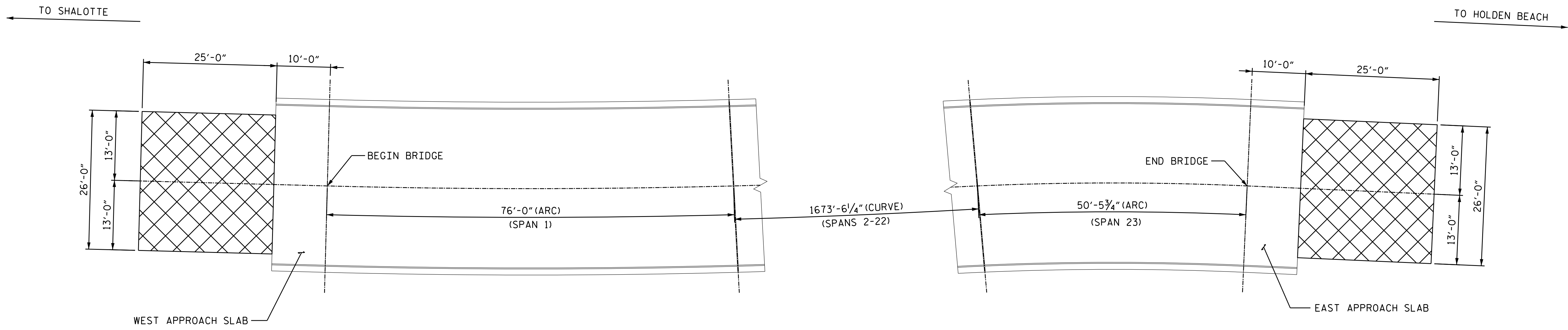


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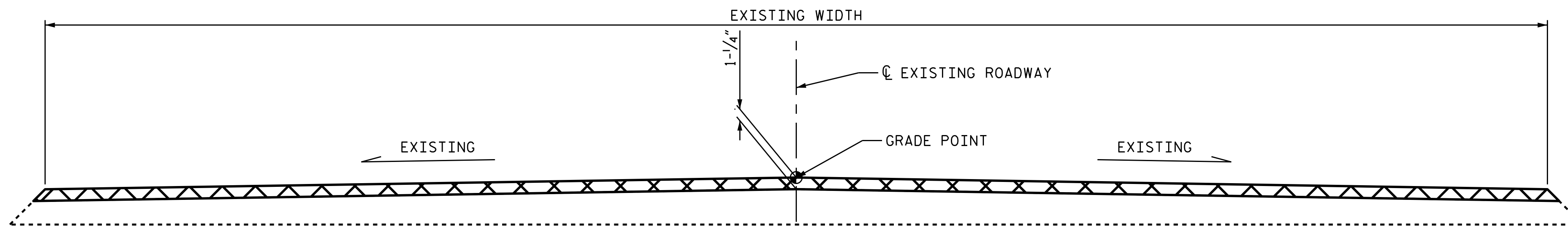
DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			73

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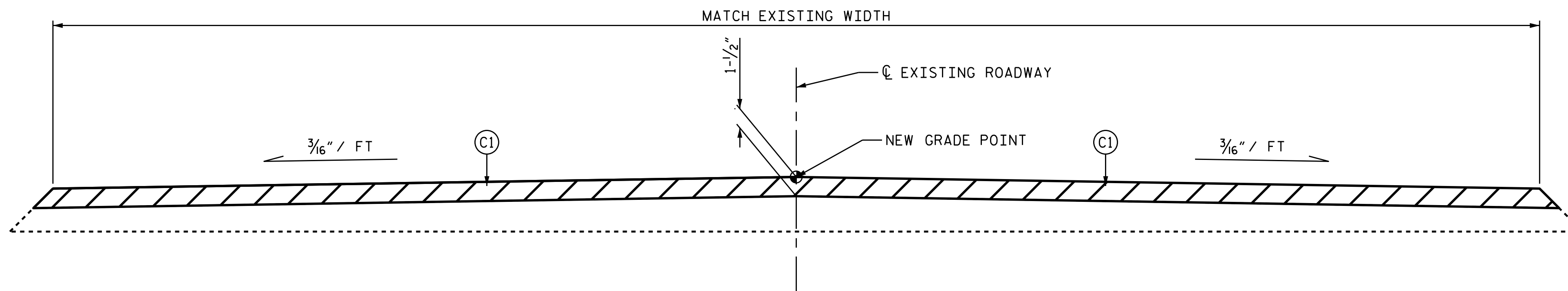
PLAN



TYPICAL ROADWAY MILLING SECTION

(MILL TO 3/4" DEPTH)

C1 PROPOSED VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" OR GREATER THAN 2" IN DEPTH.

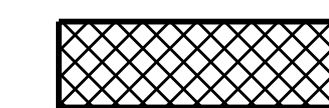


TYPICAL ROADWAY SECTION

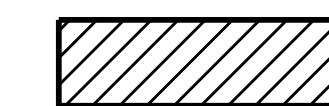
AS-BUILT QUANTITY TABLE		
	ESTIMATE	ACTUAL
INCIDENTAL MILLING	145 SY	
ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C	12.0 TONS	

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.

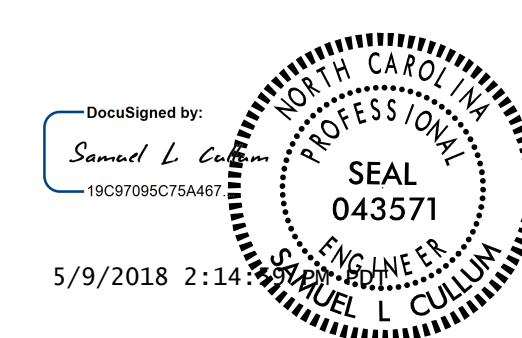


INCIDENTAL MILLING



ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



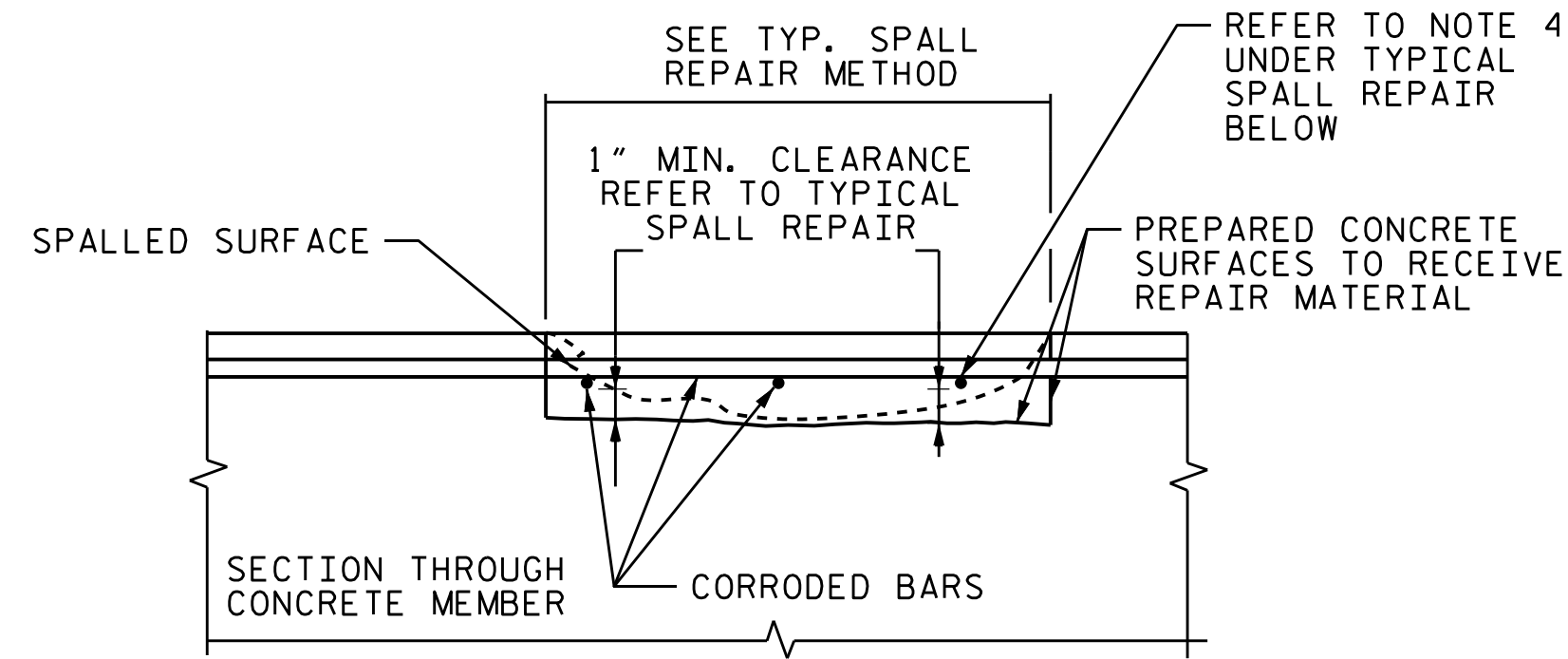
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**APPROACH
 MILLING AND
 TYPICAL ROADWAY SECTIONS**

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
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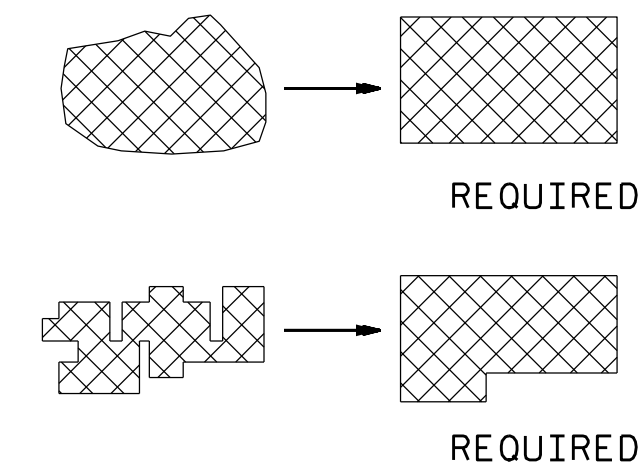
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			73

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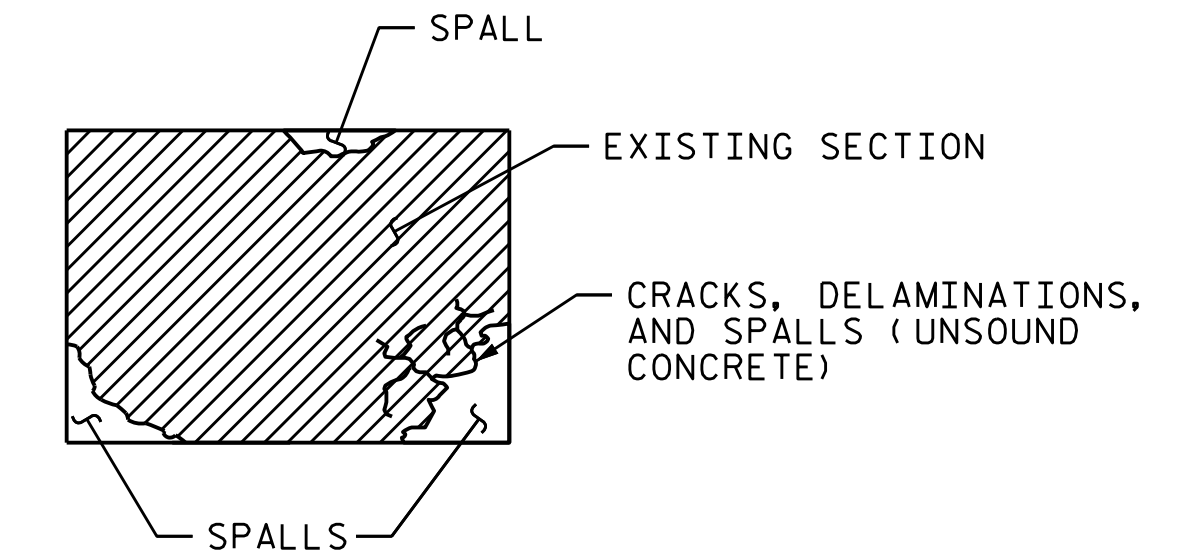
EXPOSING AND UNDERCUTTING REINFORCING STEEL

APPLICABLE TO HORIZONTAL, VERTICAL, AND OVERHEAD LOCATIONS



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.



TYPICAL DELAMINATIONS AND SPALLS

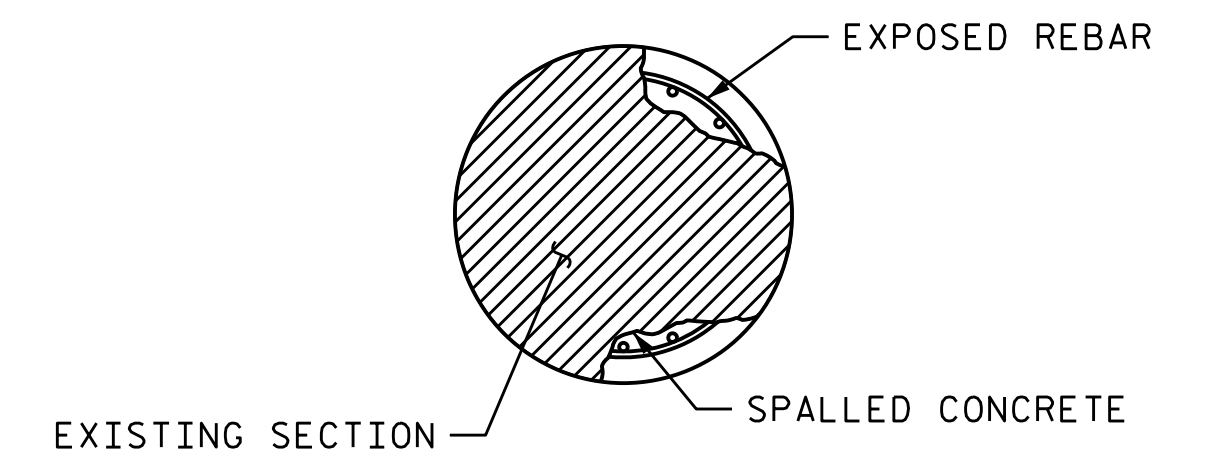
TYPICAL SPALL REPAIR

- 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.

REBAR 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"

TYPICAL CRACK REPAIR METHOD

- 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.



TYPICAL SPALL WITH EXPOSED REBAR

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 PAGES ARE BASED ON INFRARED SURVEYS, BRIDGE INSPECTION REPORT, AND PARTIAL FIELD REVIEWS OF THE STRUCTURE. AS SUCH, THEY ARE FOR INFORMATIONAL PURPOSES AND SUBJECT TO CHANGE BASED ON CONTINUED 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.

REPAIR AREA	APPROVED MATERIAL
BEAMS	CONCRETE REPAIRS (PPC GIRDERS)
PIER FOOTINGS	"FORM AND POUR" CONCRETE REPAIR
OTHER SUBSTRUCTURE	SHOTCRETE, OR CONTRACTOR OPTION

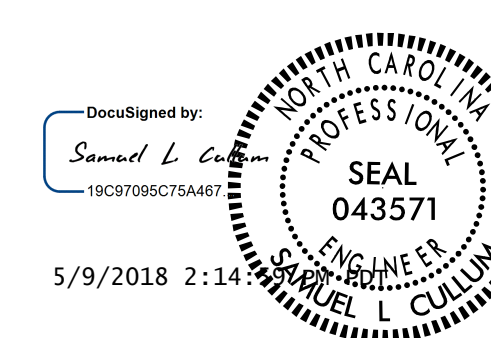
SEE PPC PLANS AND PSP FOR TOP OF DECK CONCRETE REPAIRS.

PRESTRESSED GIRDER REPAIR NOTES

IF AFTER UNSOUND CONCRETE REMOVAL ON GIRDERS, MORE THAN 50% SECTION LOSS IS NOTED ON THE PRESTRESSING STRANDS, OR A SEVERED PRESTRESSING STRAND IS ENCOUNTERED, NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONCRETE REPAIR.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

SHEET 1 OF 2



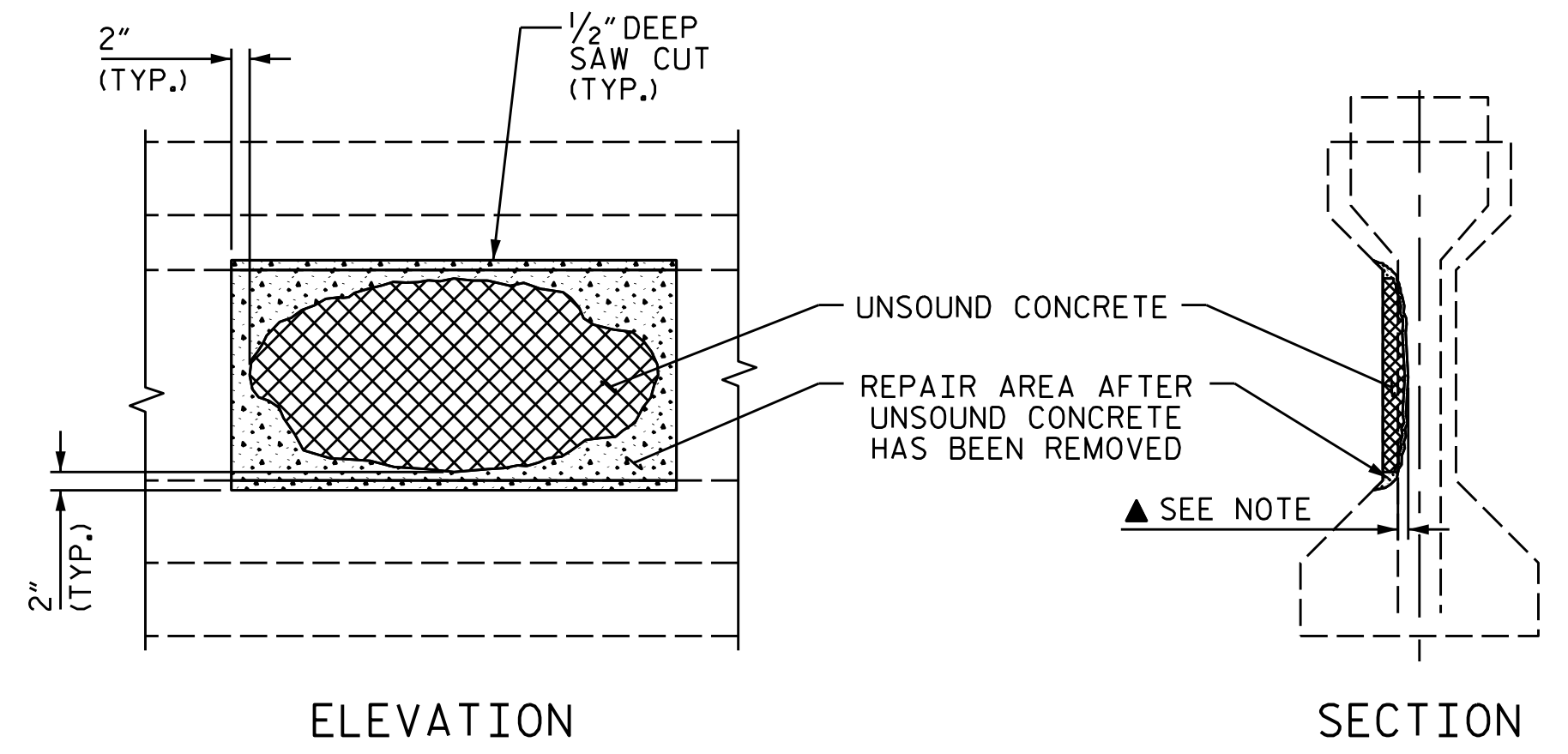
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**CONCRETE RESTORATION
 DETAILS**
 SUPERSTRUCTURE

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

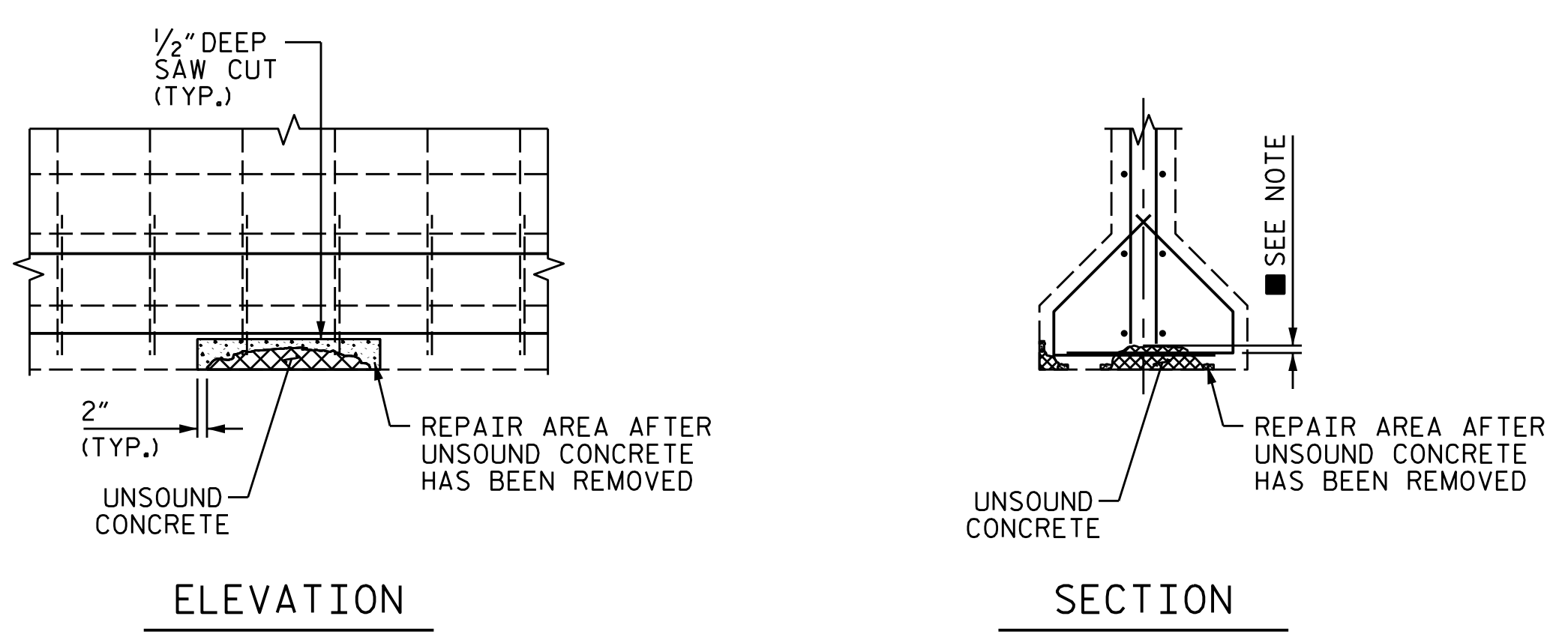
DRAWN BY : JACOB H. DUKE DATE : 03-2018
 CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			73

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



GIRDER WEB REPAIR



GIRDER FLANGE REPAIR

PRESTRESSED GIRDER REPAIR SEQUENCE:

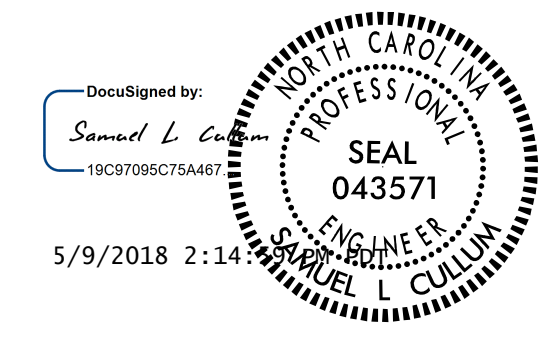
1. SOUND CONCRETE TO DETERMINE EXTENTS OF REPAIR LOCATION (PHOTO REQUIRED).
2. REMOVE SURFACE CONCRETE TO VERIFY THAT SAW CUT DEPTH WILL NOT DAMAGE EXISTING REINFORCING STEEL. SAW CUT AROUND REPAIR AREA TO A NOMINAL DEPTH OF 1/2".
3. REMOVE CONCRETE WITHIN SAW CUT AREA TO MINIMUM DEPTH 1/2" DEPTH. IF CONCRETE IS DAMAGED BEYOND THE ORIGINAL SAW CUT, A NEW SAW CUT IS REQUIRED.
4. ▲ IF MORE THAN HALF THE CIRCUMFERENCE OF A REINFORCING BAR IS EXPOSED DURING THIS PROCESS, REMOVE ADDITIONAL CONCRETE TO 1" BEHIND THE BAR. THIS DOES NOT APPLY TO PRESTRESS STRANDS.
5. ■ ALL UNSOUND CONCRETE MUST BE REMOVED. HOWEVER, PRESTRESSED STRAND SHOULD NOT BE DISTURBED UNLESS ABSOLUTELY NECESSARY. USE EXTREME CARE TO NOT DAMAGE STRANDS.
6. CLEAN ALL EXPOSED REINFORCING BARS AND PRESTRESSED STRANDS. FOR BAR WITH MORE THAN 10% SECTION LOSS, SPLICE AND SECURELY TIE SUPPLEMENTAL REINFORCING BARS AS NEEDED. NOTE AND PROVIDE DETAILED DOCUMENTATION, INCLUDING LOCATION AND SEVERITY OF ALL DAMAGE TO PRESTRESSED STRANDS THAT EXCEEDS 10% SECTION LOSS. IF FIVE OR MORE STRANDS ARE DAMAGED, NOTIFY THE ENGINEER PRIOR TO PLACEMENT OF REPAIR MATERIAL.
7. REMOVE ALL LOOSE OR WEAKENED MATERIAL THEN CLEAN THE REPAIR AREA OF DIRT, GREASE, OIL, AND FOREIGN MATTER.
8. PREPARE SURFACE AND PLACE APPROVED MATERIAL ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. MAXIMUM AGGREGATE SIZE FOR REPAIR MATERIAL SHALL NOT EXCEED 2/3 THE MINIMUM REPAIR DEPTH.
9. FOR GIRDER REPAIRS, SEE PROJECT SPECIAL PROVISION FOR REPAIRS TO PRESTRESSED CONCRETE GIRDERS AND SEE SHEETS S-60 THRU S-63 FOR DEFICIENCIES.

NOTES:

PREPACKAGED MATERIAL IS REQUIRED.
 FOR REPAIRS OVER TRAFFIC AND SHALLOW REPAIRS THAT DO NOT ENGAGE REINFORCEMENT, ANCHOR PATCH MATERIAL USING 1/4" GALVANIZED BOLTS, EPOXY ANCHORED WITH 2" EMBEDMENT. PLACE BOLTS IN A 6" GRID. USE A LATEX OR EPOXY PATCH MATERIAL FOR IMPROVED BOND. USE EXTREME CARE TO NOT DAMAGE STRANDS.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

SHEET 2 OF 2



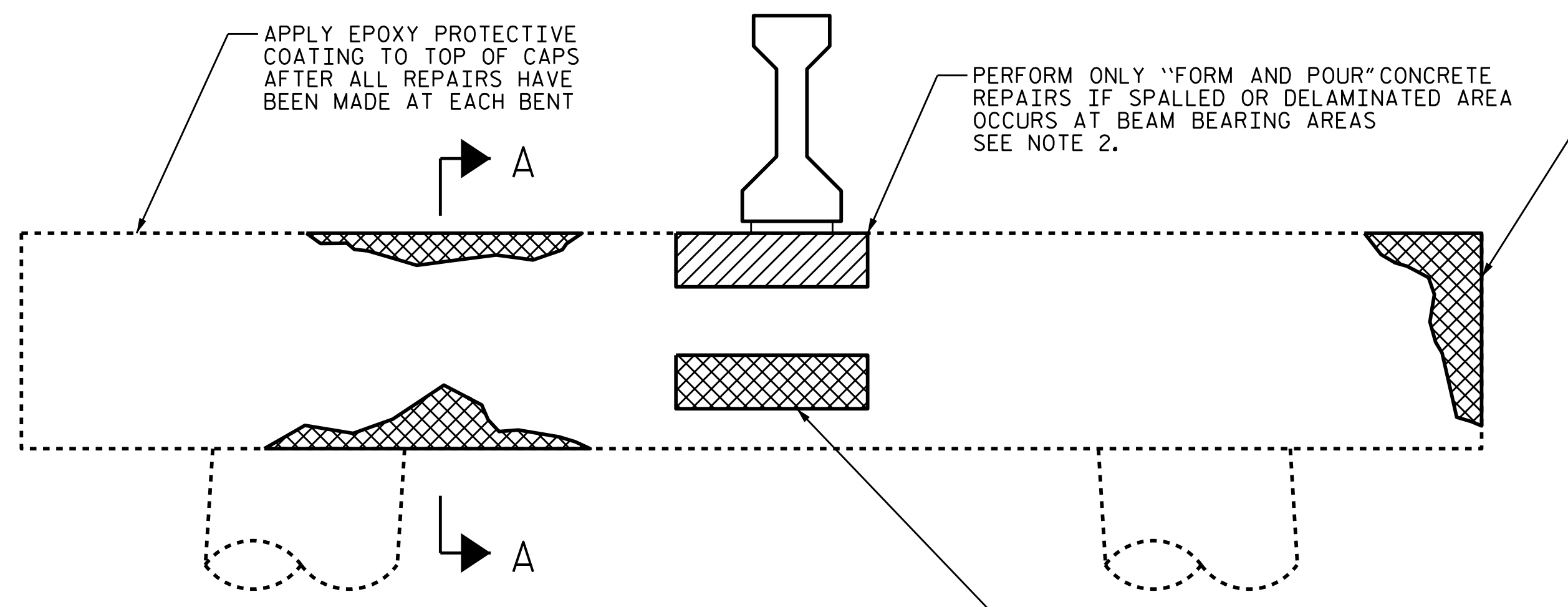
STATE OF NORTH CAROLINA
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KCA 4800 SIX FORKS ROAD SUITE 120
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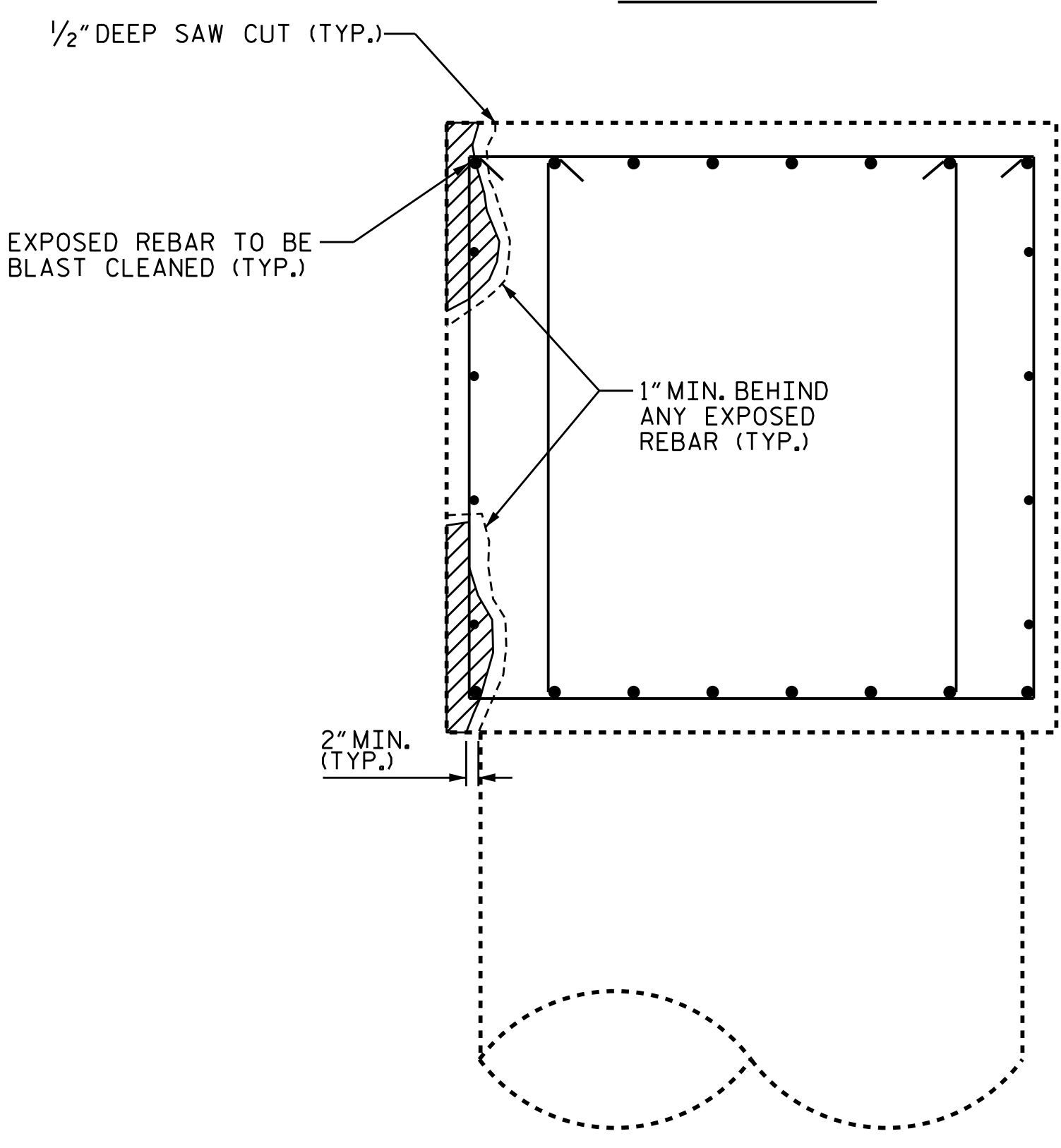
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1			3			TOTAL SHEETS
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CAP REPAIRS



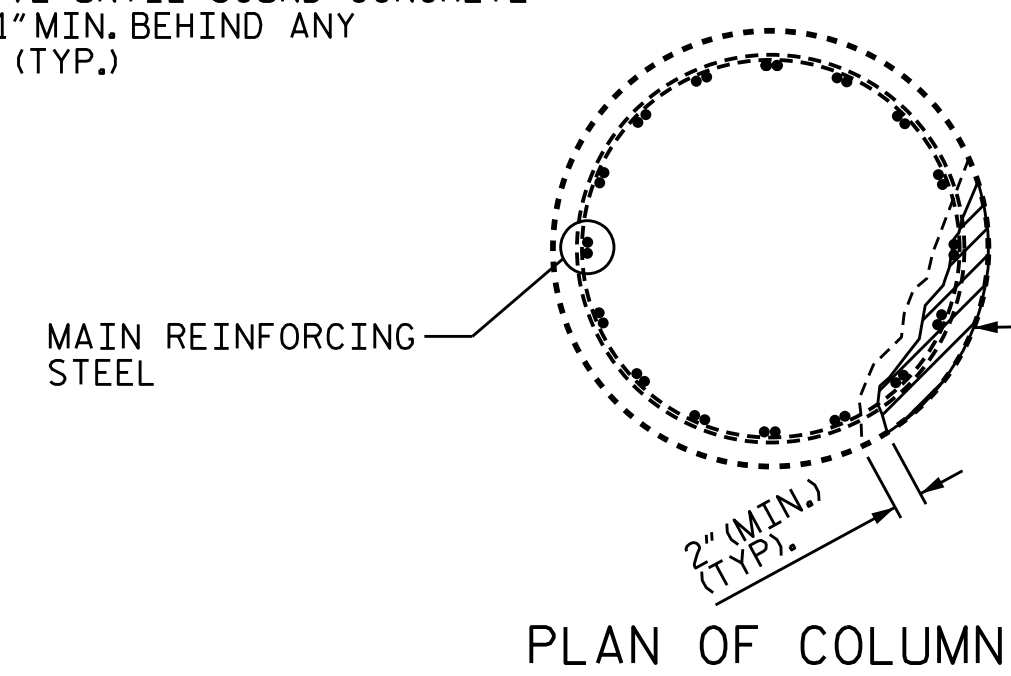
SECTION A-A

BENT CAP REPAIRS

PERFORM ONLY "FORM AND POUR" CONCRETE REPAIRS IF SPALLED OR DELAMINATED AREA OCCURS AT BEAM BEARING AREAS SEE NOTE 2.

SPALLED, DELAMINATED OR CRACKED CONCRETE (REMOVE UNTIL SOUND CONCRETE IS FOUND AND 1" MIN. BEHIND ANY EXPOSED REBAR (TYP.))

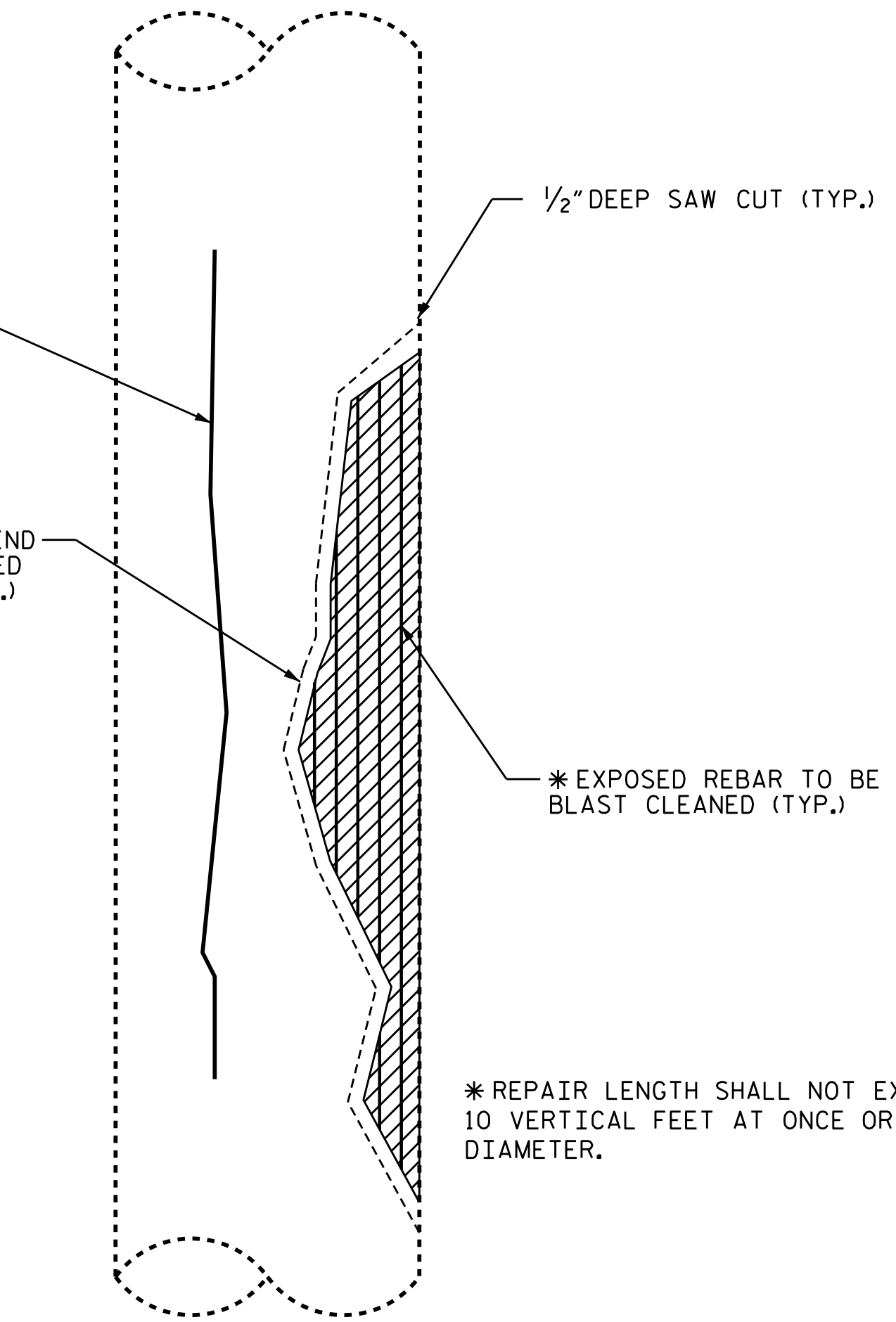
REPAIR ALL SPALLED, DELAMINATED OR CRACKED CONCRETE AREAS NOT OCCURRING AT BEAM BEARING AREAS PER PLANS AND PER THE ENGINEER AT THE USING SHOTCRETE OR "FORM AND POUR" AT THE CONTRACTOR'S OPTION SEE NOTE 2.



PLAN OF COLUMN

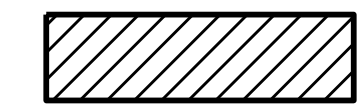
REPAIR CRACKING IN COLUMNS AND CAPS (TYP.)

1" MIN. BEHIND ANY EXPOSED REBAR (TYP.)



ELEVATION OF COLUMN

COLUMN REPAIRS



CONCRETE REPAIR AREA (FORM AND POUR)



SHOTCRETE REPAIR AREA



EPOXY RESIN INJECTION (ERI)

* REPAIR LENGTH SHALL NOT EXCEED 10 VERTICAL FEET AT ONCE OR 1/2 COLUMN DIAMETER.

* EXPOSED REBAR TO BE BLAST CLEANED (TYP.)

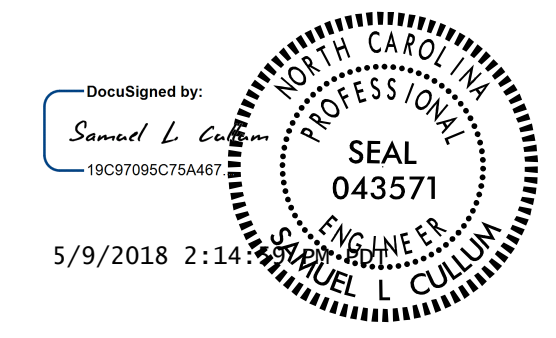
PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

NOTES:

1. WORK THIS SHEET WITH THE SUBSTRUCTURE REPAIR SHEETS.
2. 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.
3. COAT ALL SURFACE AREAS OF THE TOP OF THE CAPS INCLUDING CHAMFERS, WITH EPOXY PROTECTIVE COATING. DO NOT COAT THE AREA UNDER THE ELASTOMERIC BEARINGS.
4. FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

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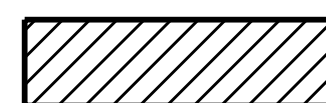


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**CONCRETE RESTORATION
 DETAILS**
 SUBSTRUCTURE

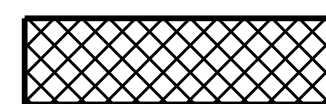
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			73

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LEGEND:



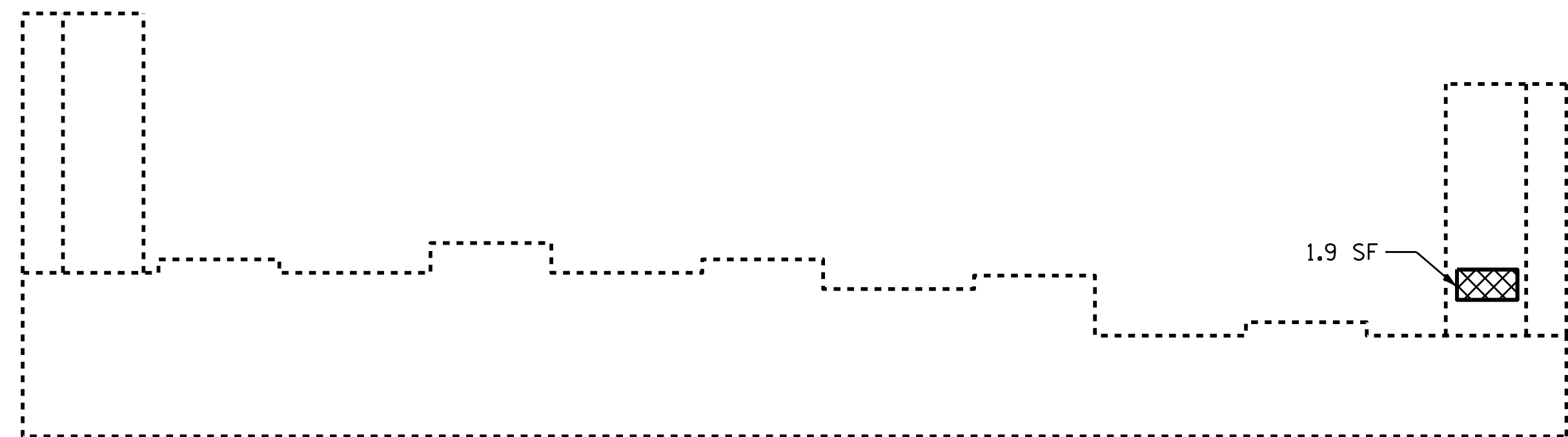
CONCRETE REPAIR AREA
(FORM AND POUR)



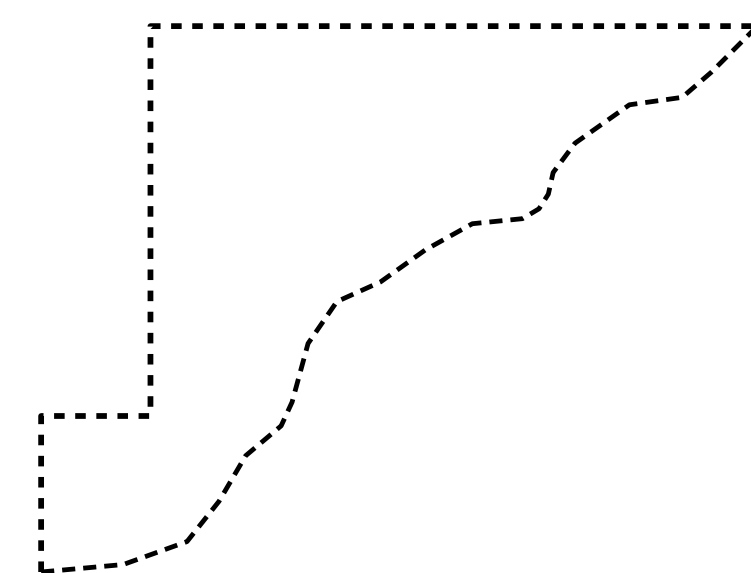
SHOTCRETE REPAIR AREA



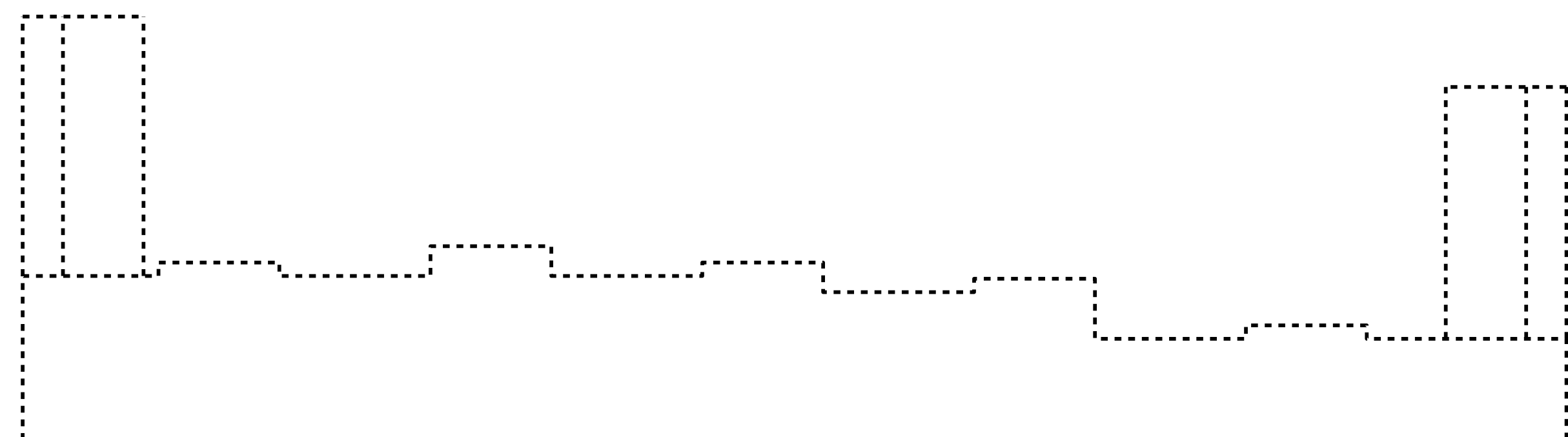
EPOXY RESIN
INJECTION (ERI)



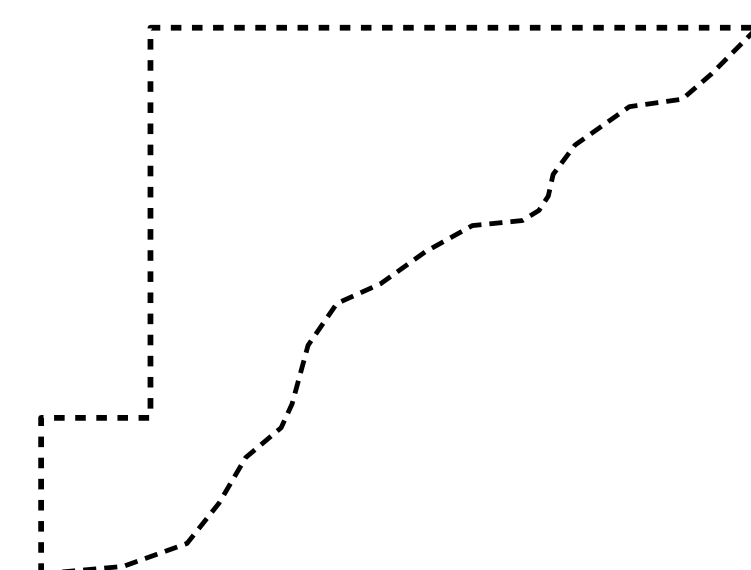
END BENT 1



ELEVATION



END BENT 2



ELEVATION

AS-BUILT REPAIR QUANTITY TABLE

END BENT 1 & 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	1.9	1.0		
COLUMN/PILE	N/A	N/A		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
COLUMN/PILE	N/A			

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 - SUBSTRUCTURE" SHEET.

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 AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2 1/2" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET AND SPECIAL PROVISIONS.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

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

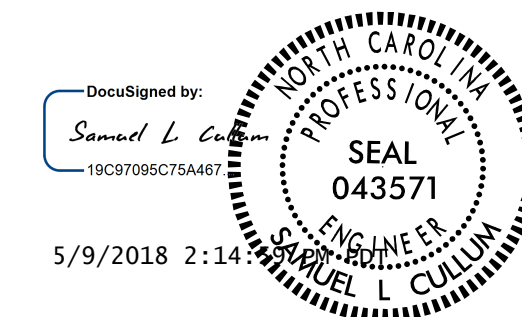
COAT ALL SURFACE AREAS OF THE TOP OF THE CAP INCLUDING CHAMFERS, WITH EPOXY PROTECTIVE COATING. DO NOT COAT THE AREA UNDER THE ELASTOMERIC BEARINGS.

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PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

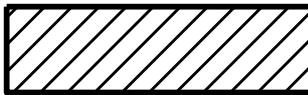
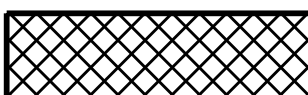



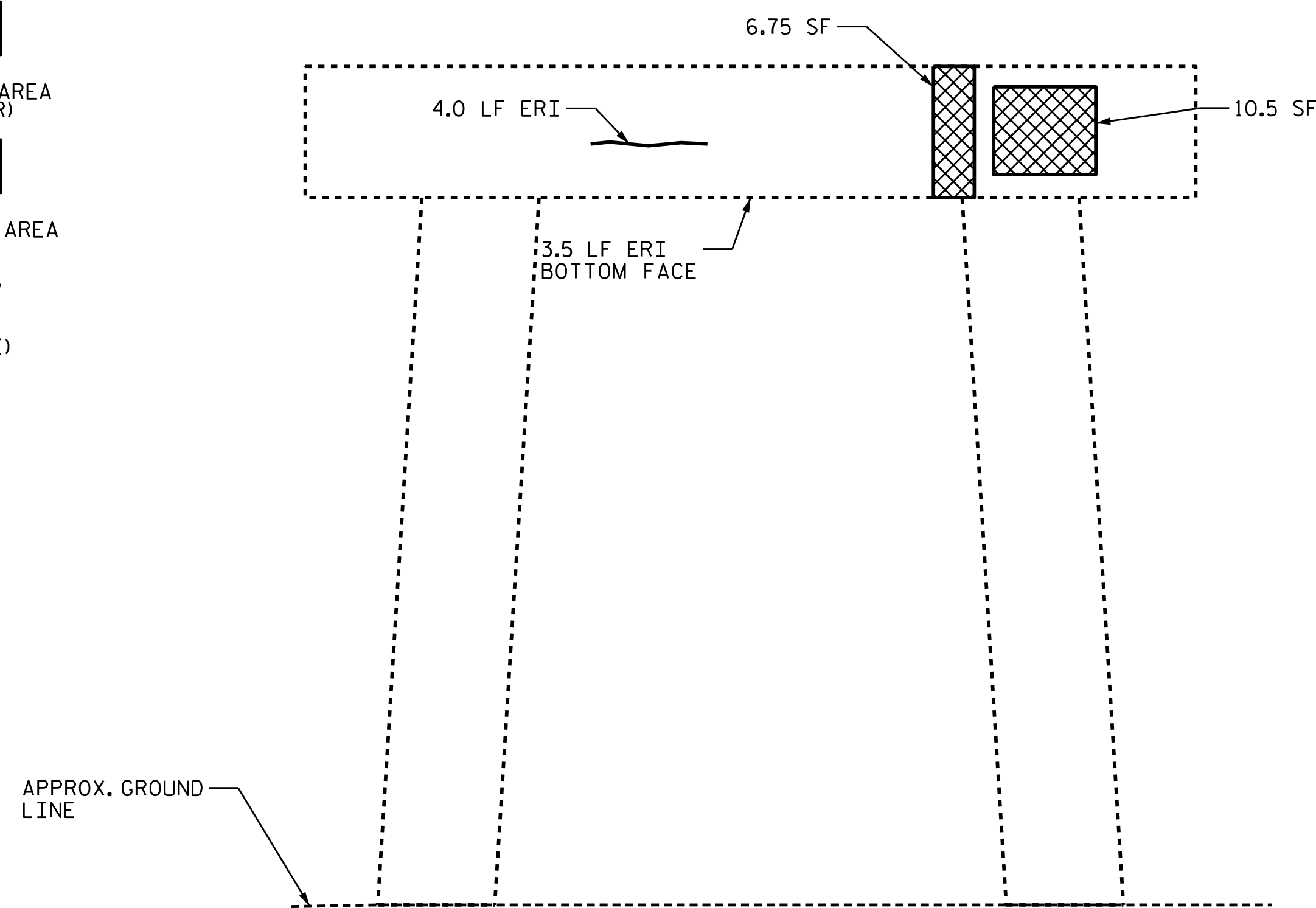
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**SUBSTRUCTURE
 CONCRETE REPAIRS
 END BENTS 1 & 2**

NO.	REVISIONS			NO.	REVISIONS			SHEET NO.
	BY:	DATE:			BY:	DATE:		
1				3			S-35	
2				4			TOTAL SHEETS 73	

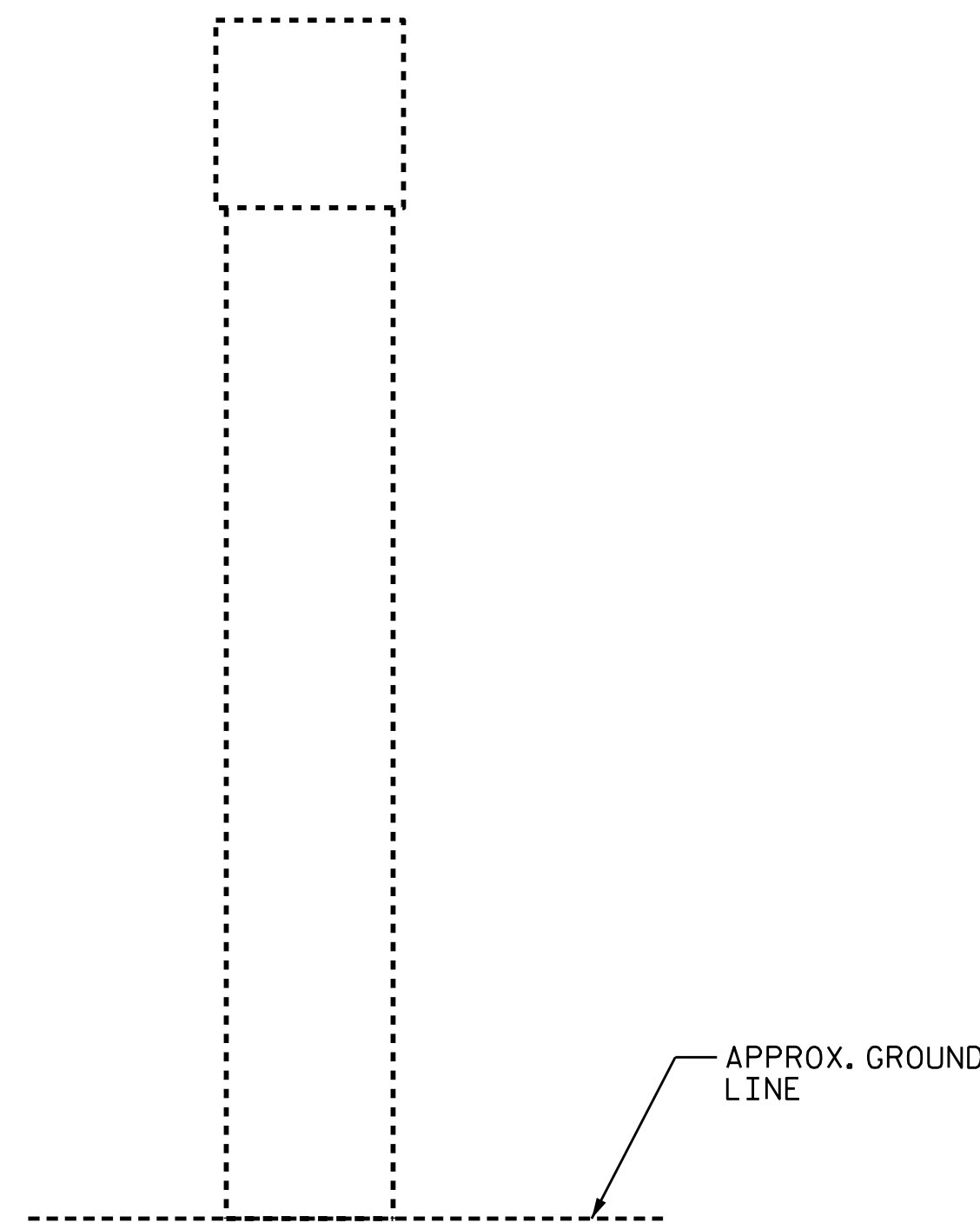
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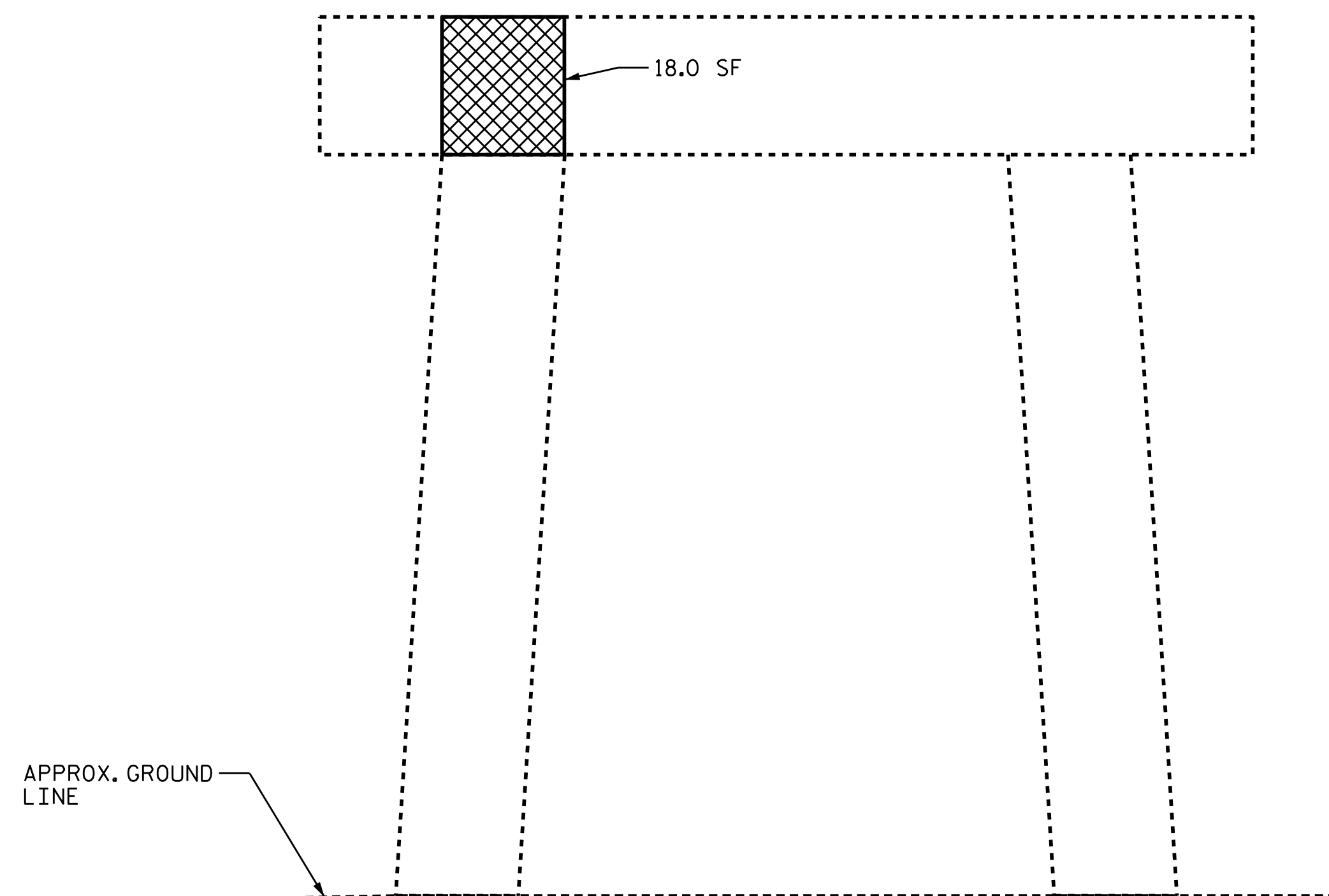
-  CONCRETE REPAIR AREA (FORM AND POUR)
-  SHOTCRETE REPAIR AREA
-  EPOXY RESIN INJECTION (ERI)



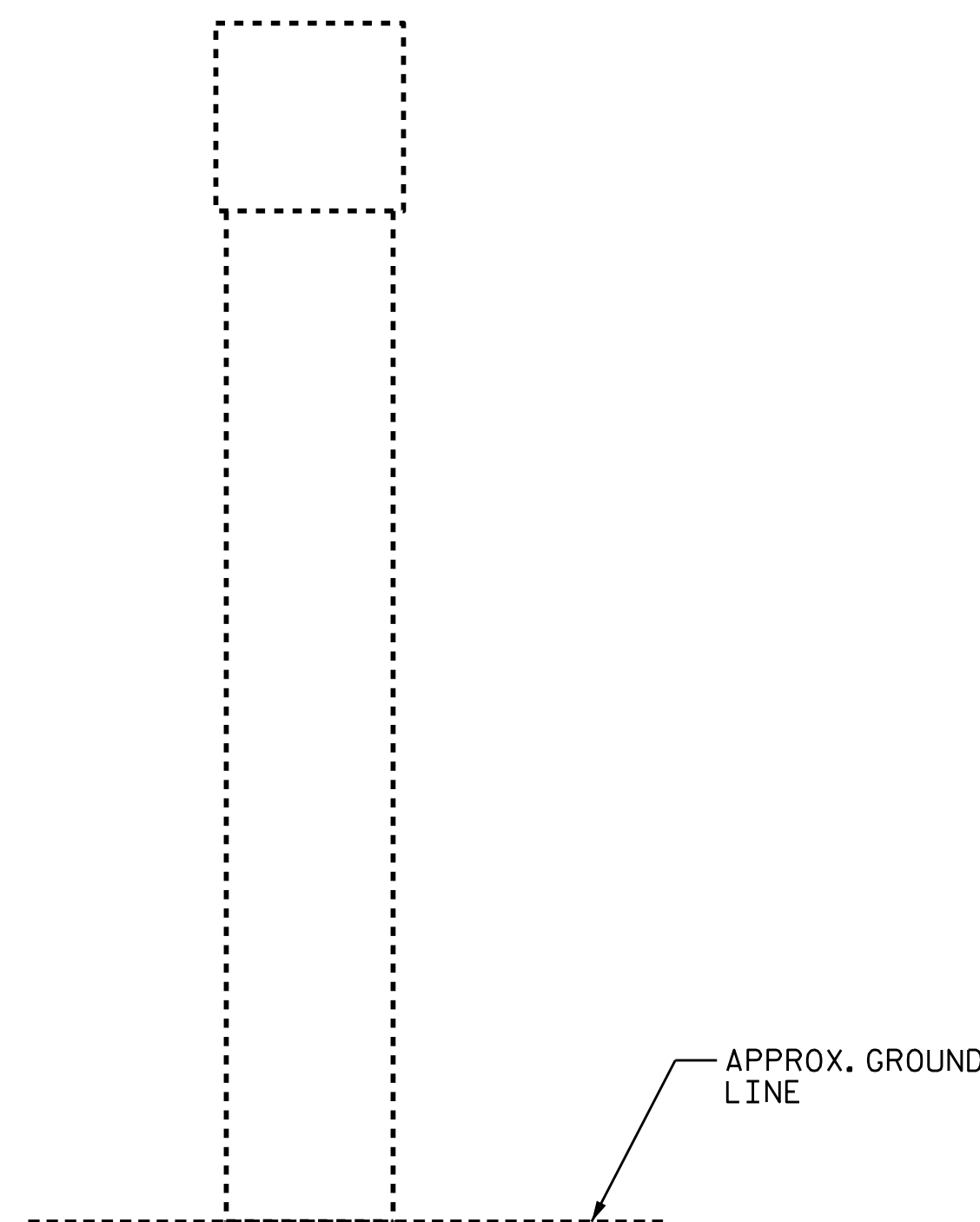
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 1	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	35.3	17.7		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	5.3	2.6		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	7.5			
COLUMN/PILE	-			

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 - SUBSTRUCTURE" SHEET.

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 AS-BUILT REPAIR QUANTITY TABLE.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

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

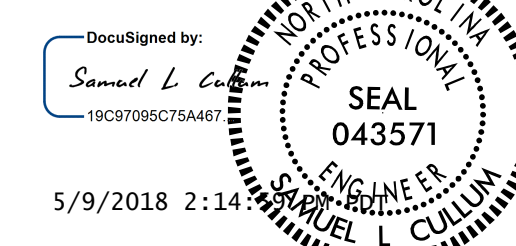
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FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

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DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018



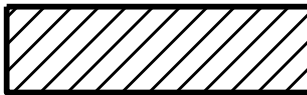
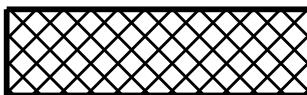

STATE OF NORTH CAROLINA
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 RALEIGH

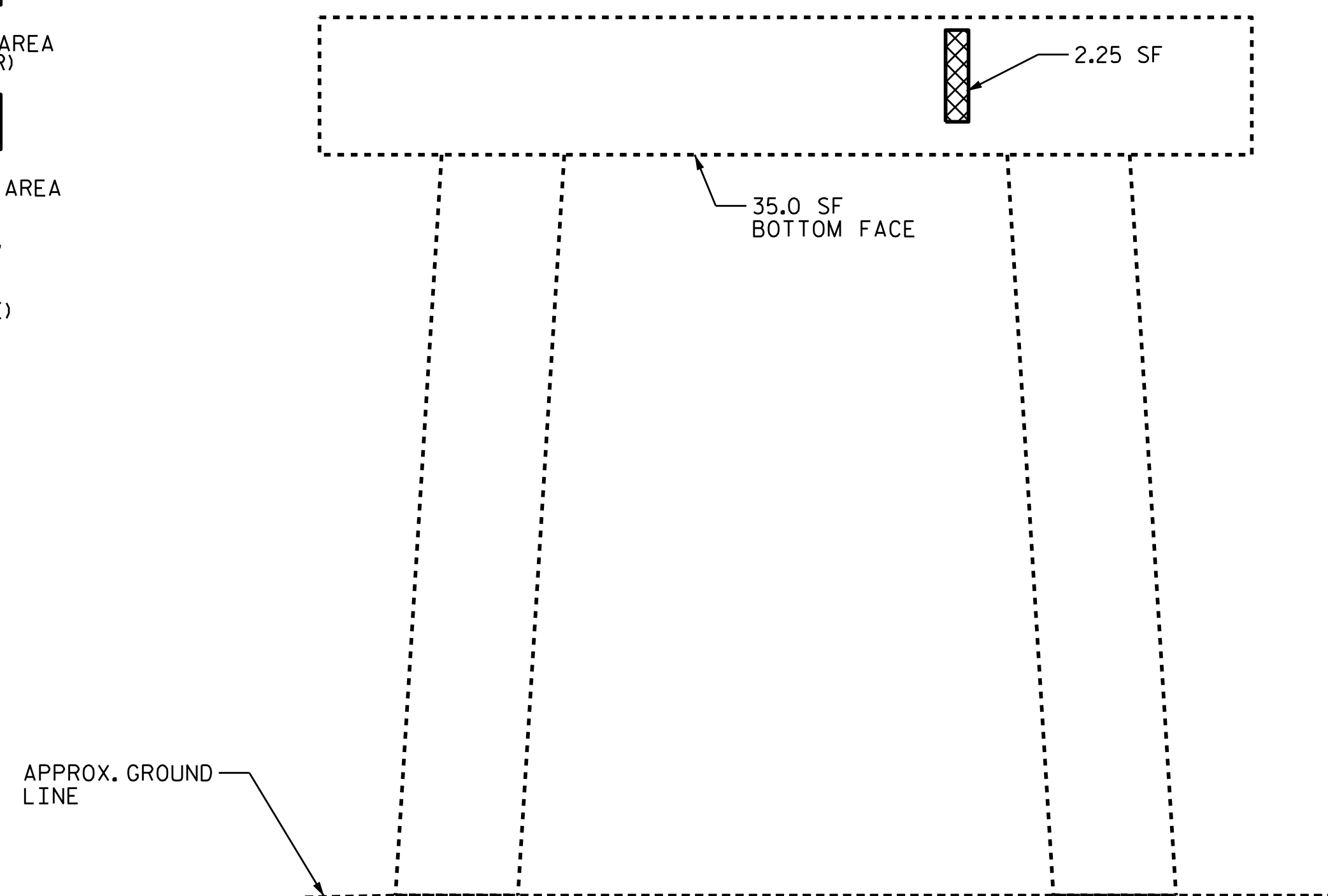
**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 1**

NO.	REVISIONS			NO.	REVISIONS			SHEET NO.
	BY:	DATE:			BY:	DATE:		
1				3			S-36	
2				4			TOTAL SHEETS 73	

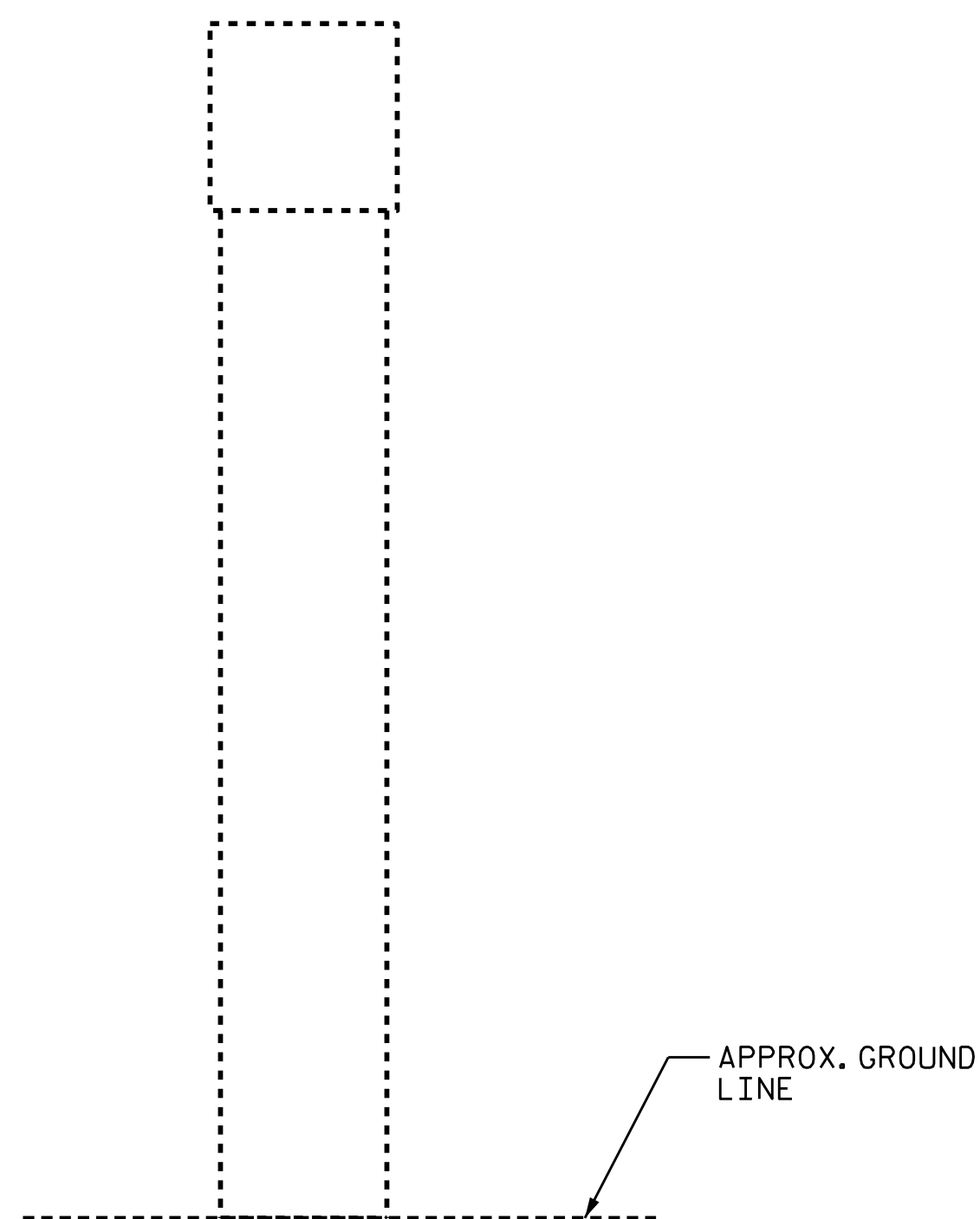
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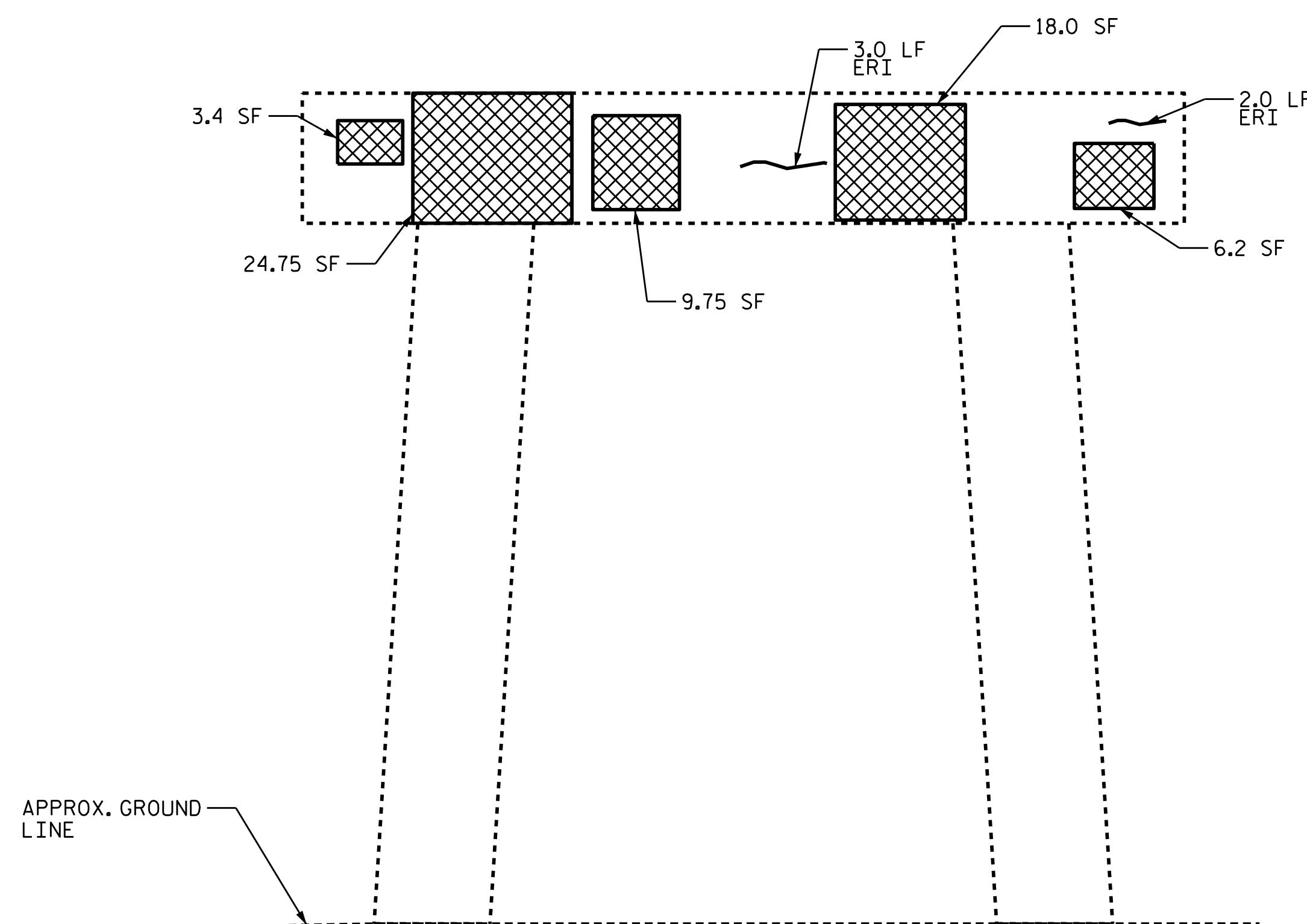
-  CONCRETE REPAIR AREA (FORM AND POUR)
-  SHOTCRETE REPAIR AREA
-  EPOXY RESIN INJECTION (ERI)



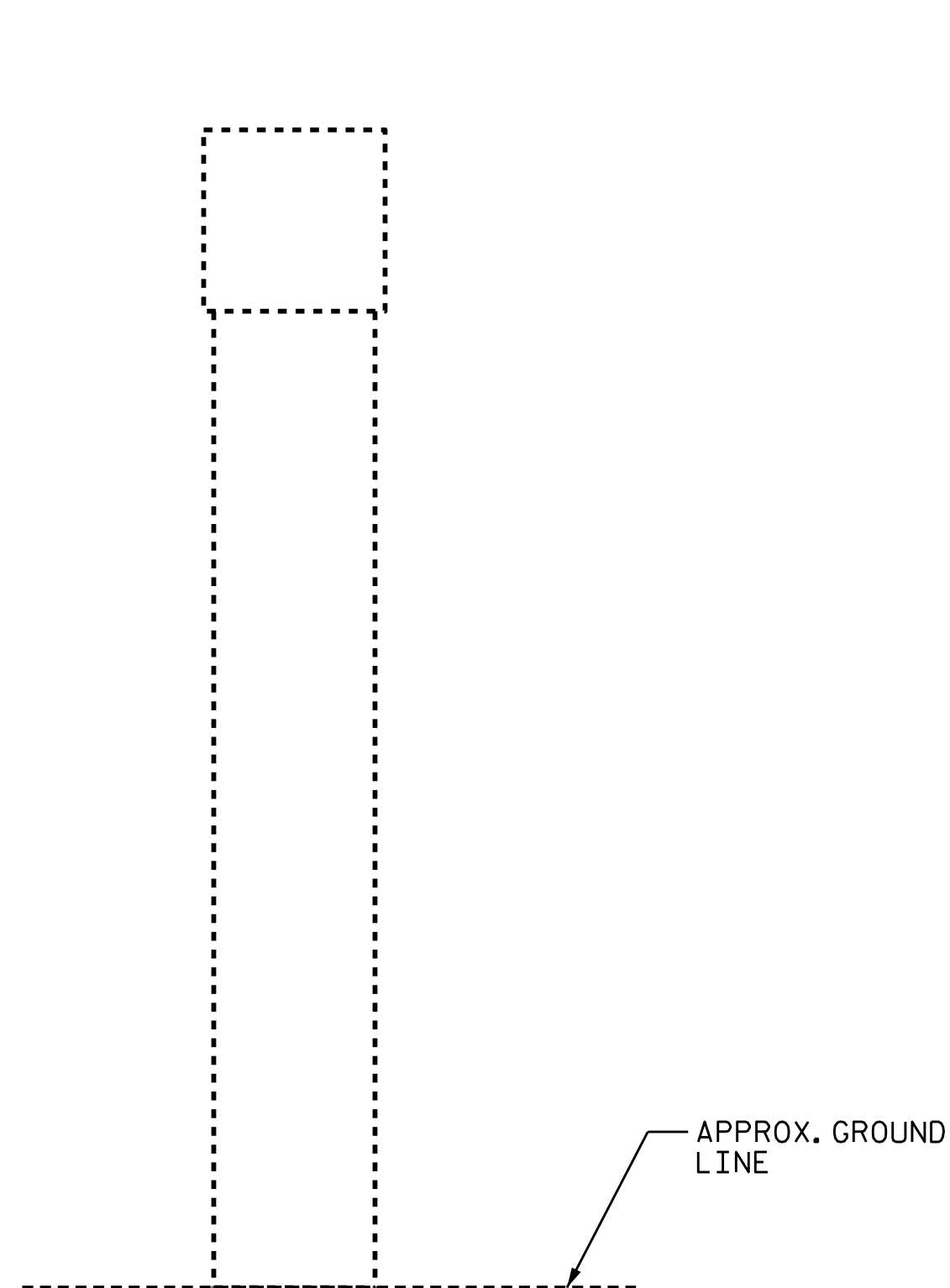
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 2	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	99.4	49.7		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	14.9	7.5		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		5.0		
COLUMN/PILE		-		

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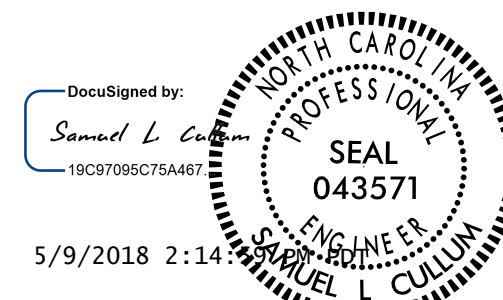
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FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

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 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018



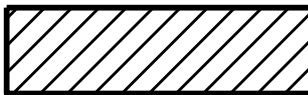
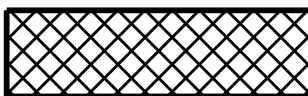

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

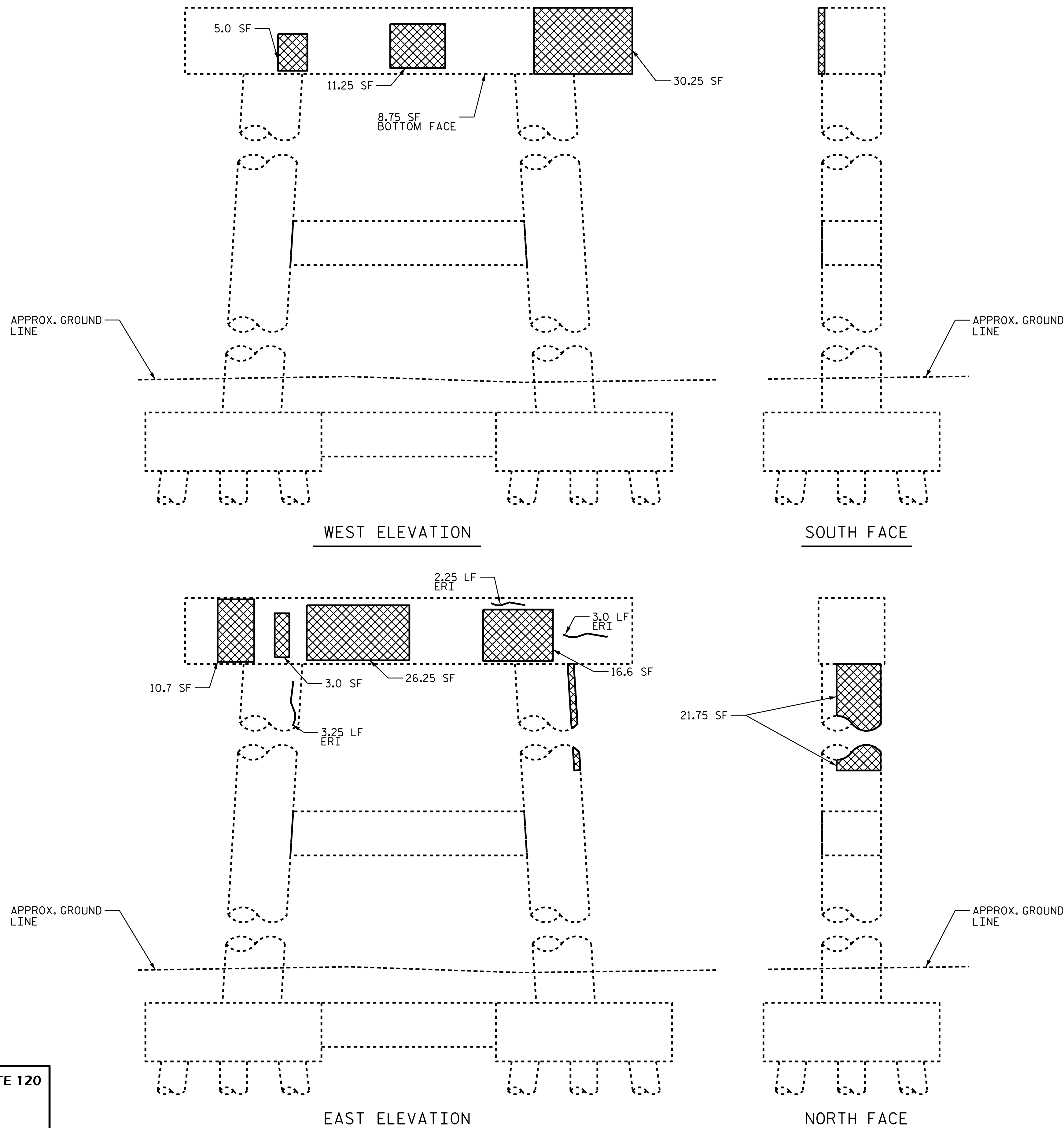
**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 2**

NO.	REVISIONS			NO.	REVISIONS			SHEET NO.
	BY:	DATE:			BY:	DATE:		
1				3			S-37	
2				4			TOTAL SHEETS 73	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LEGEND:

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



AS-BUILT REPAIR QUANTITY TABLE

BENT 3	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	111.8	55.9		
COLUMN/PILE	21.8	10.9		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	16.8	8.4		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		5.3		
COLUMN/PILE		3.3		

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 - SUBSTRUCTURE" SHEET.

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 AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET AND SPECIAL PROVISIONS.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

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

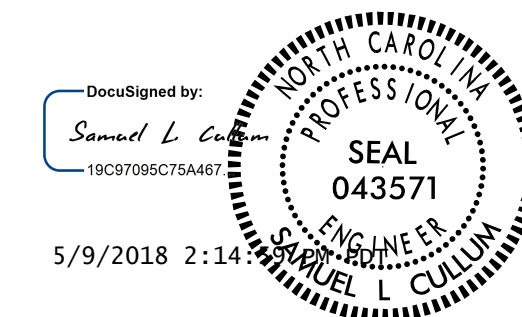
COAT ALL SURFACE AREAS OF THE TOP OF THE CAP INCLUDING CHAMFERS, WITH EPOXY PROTECTIVE COATING. DO NOT COAT THE AREA UNDER THE ELASTOMERIC BEARINGS.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

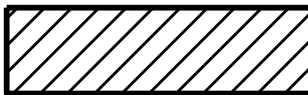
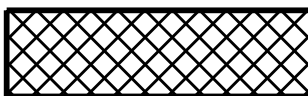



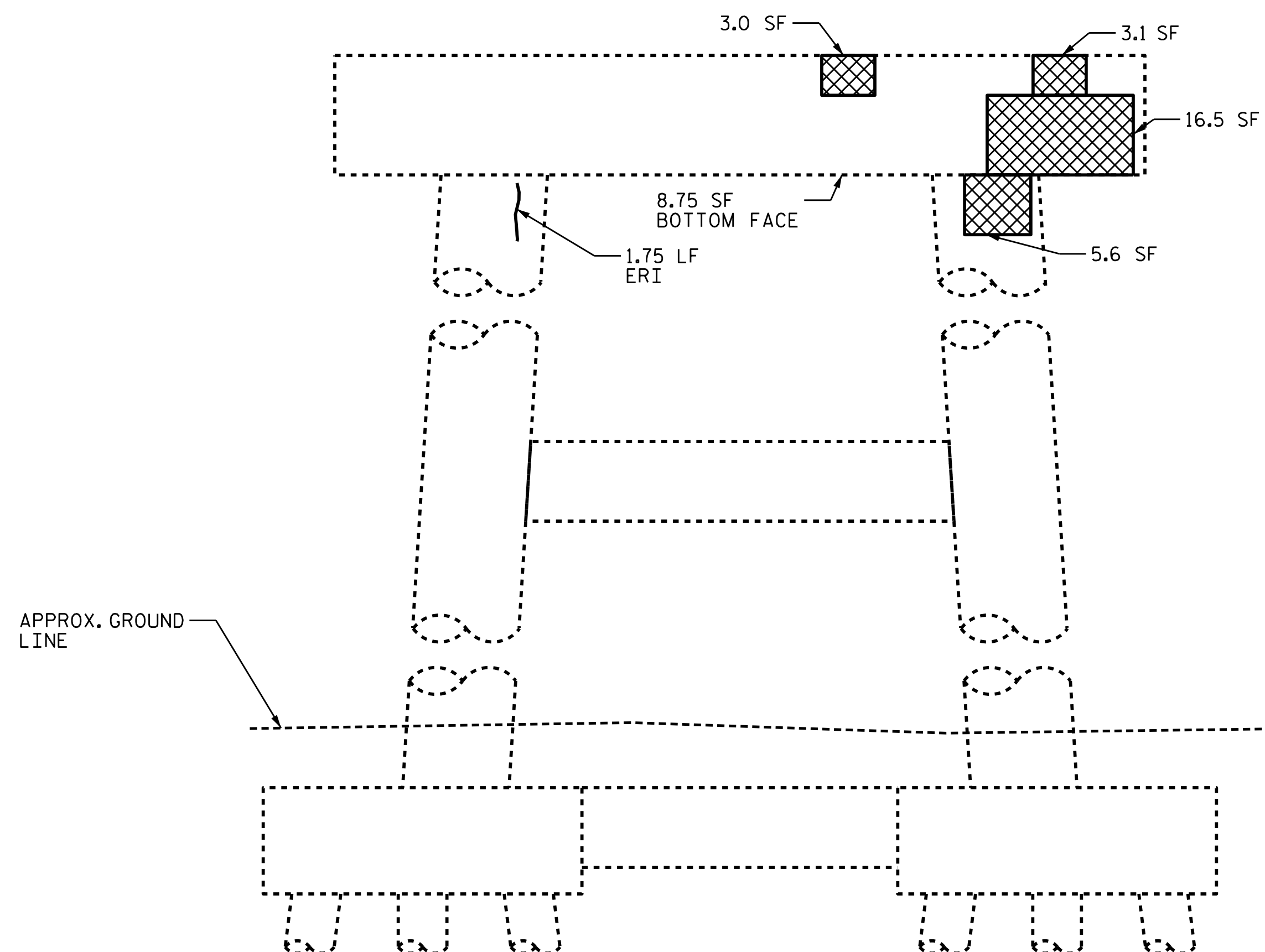
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 3**

NO.	REVISIONS			SHEET NO.
	BY:	DATE:	NO.	
1			3	S-38
2			4	TOTAL SHEETS 73

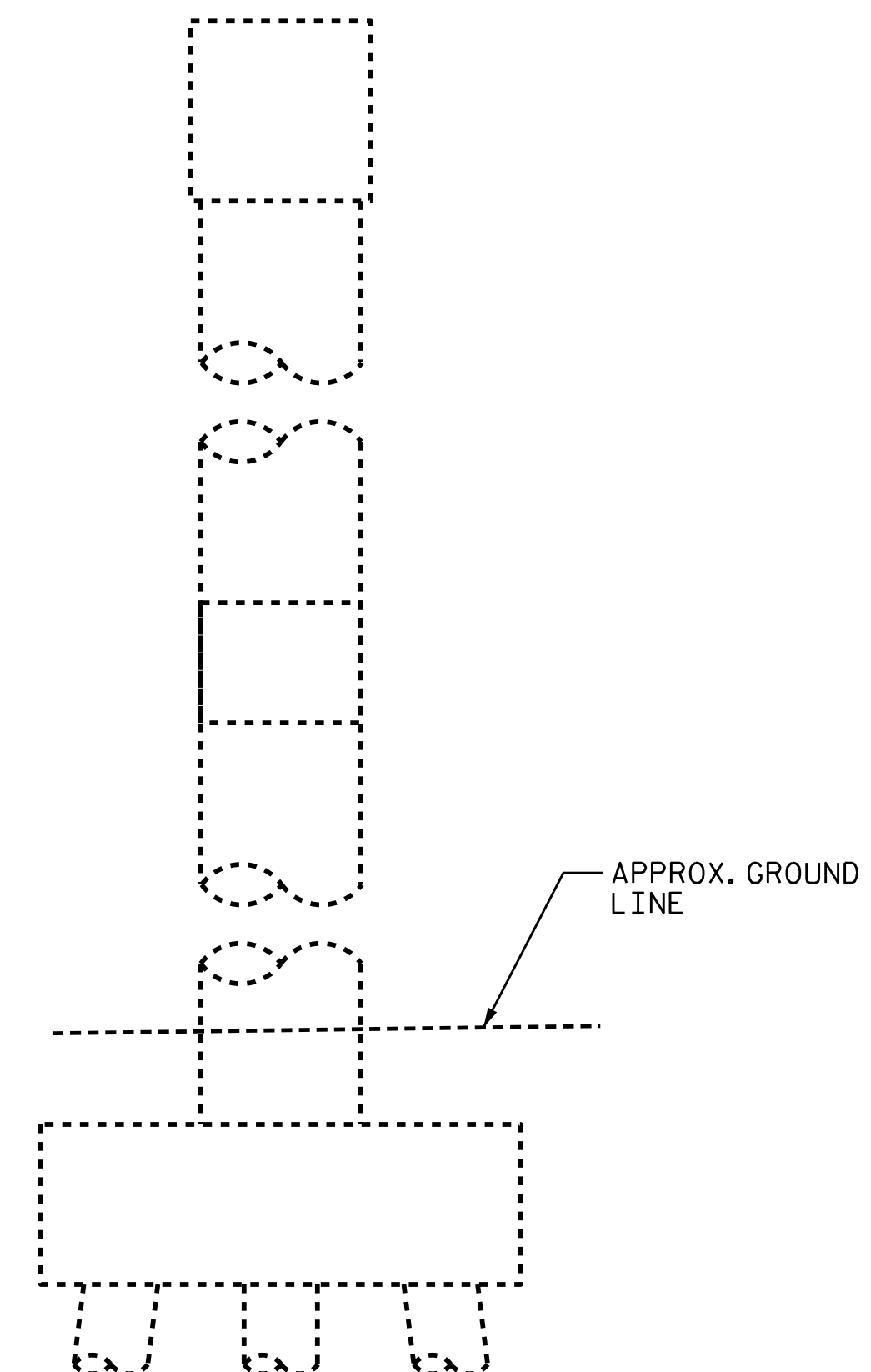
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LEGEND:

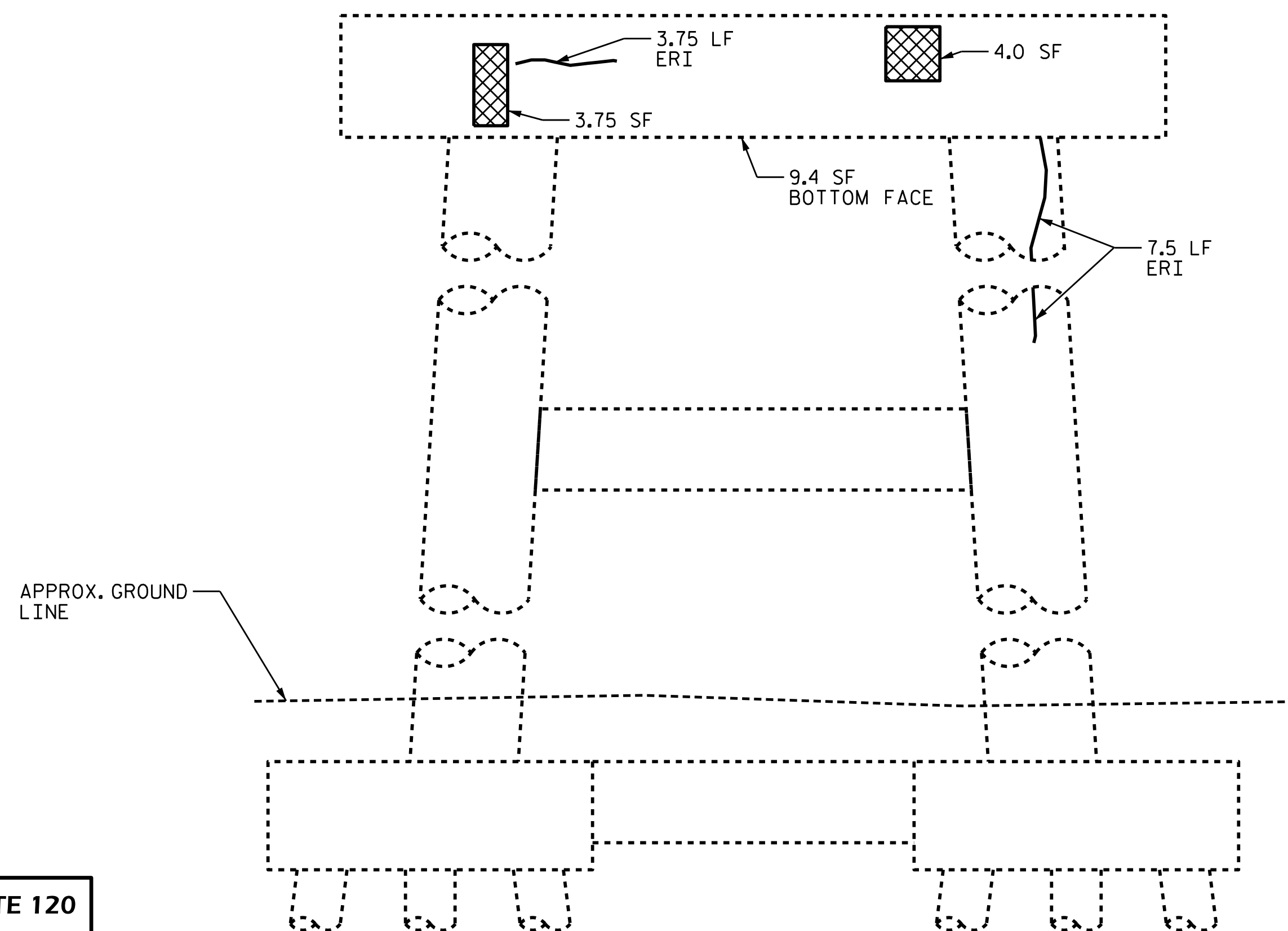
-  CONCRETE REPAIR AREA (FORM AND POUR)
-  SHOTCRETE REPAIR AREA
-  EPOXY RESIN INJECTION (ERI)



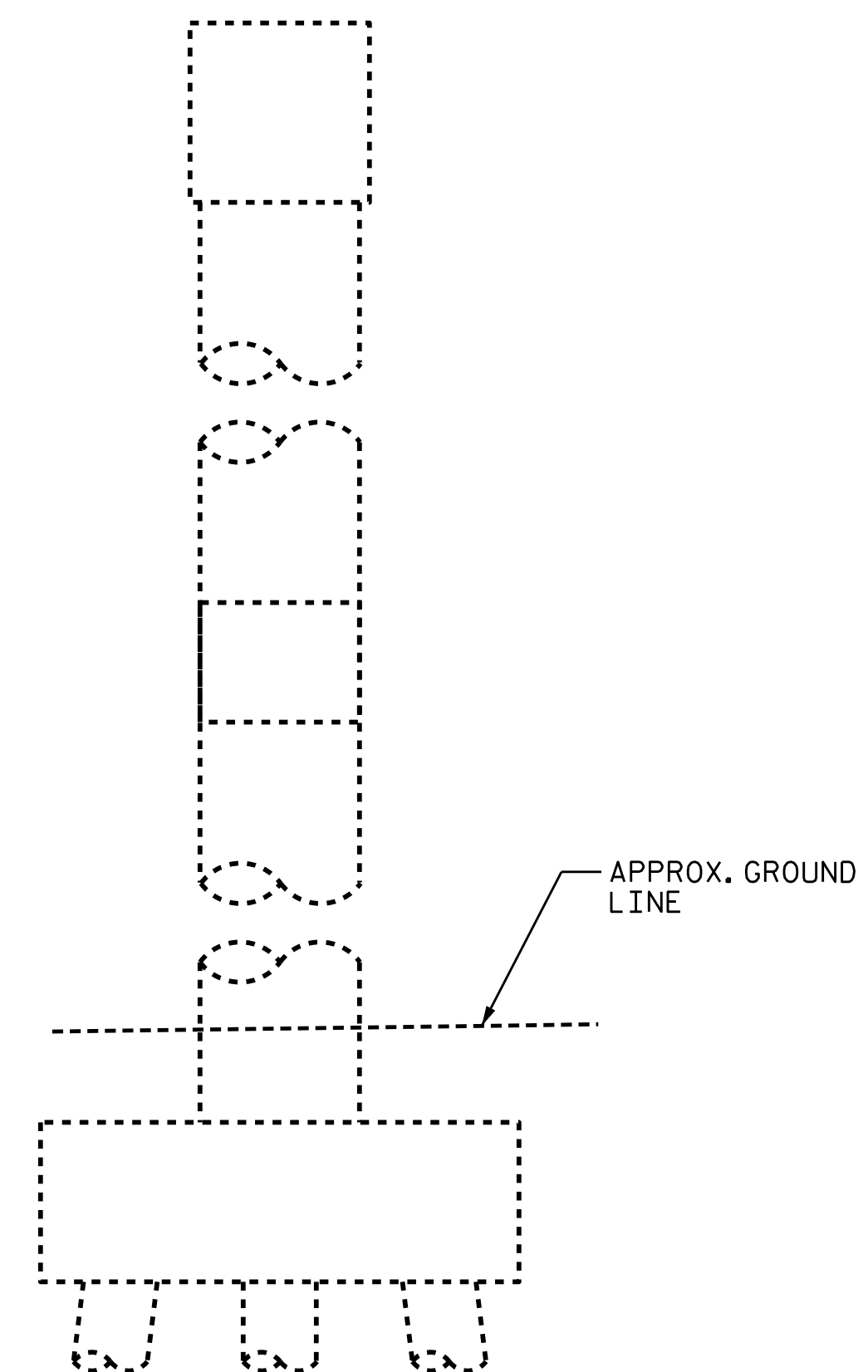
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 4	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	39.1	19.6		
COLUMN/PILE	5.6	2.8		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	5.9	2.9		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		3.8		
COLUMN/PILE		9.3		

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 - SUBSTRUCTURE" SHEET.

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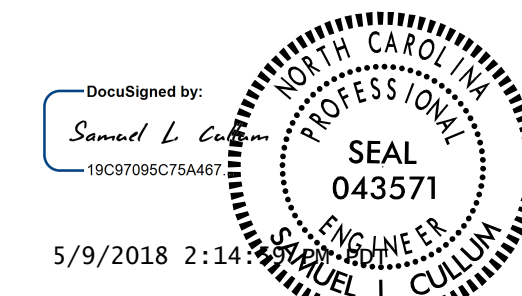
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BRUNSWICK COUNTY
 BRIDGE NO. 71

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 (919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

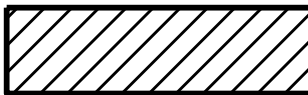
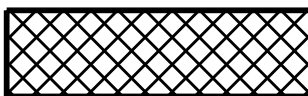



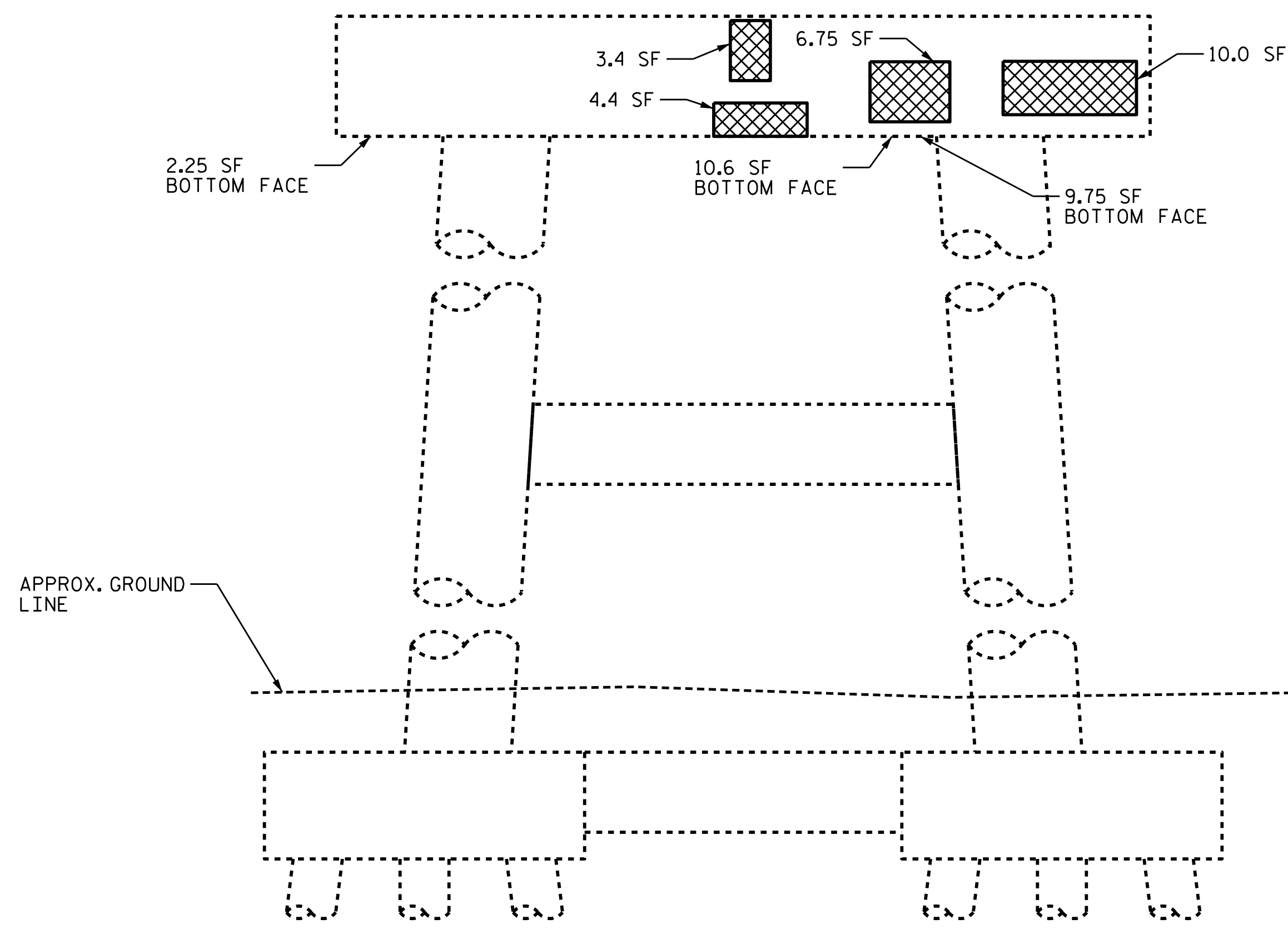
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 4**

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

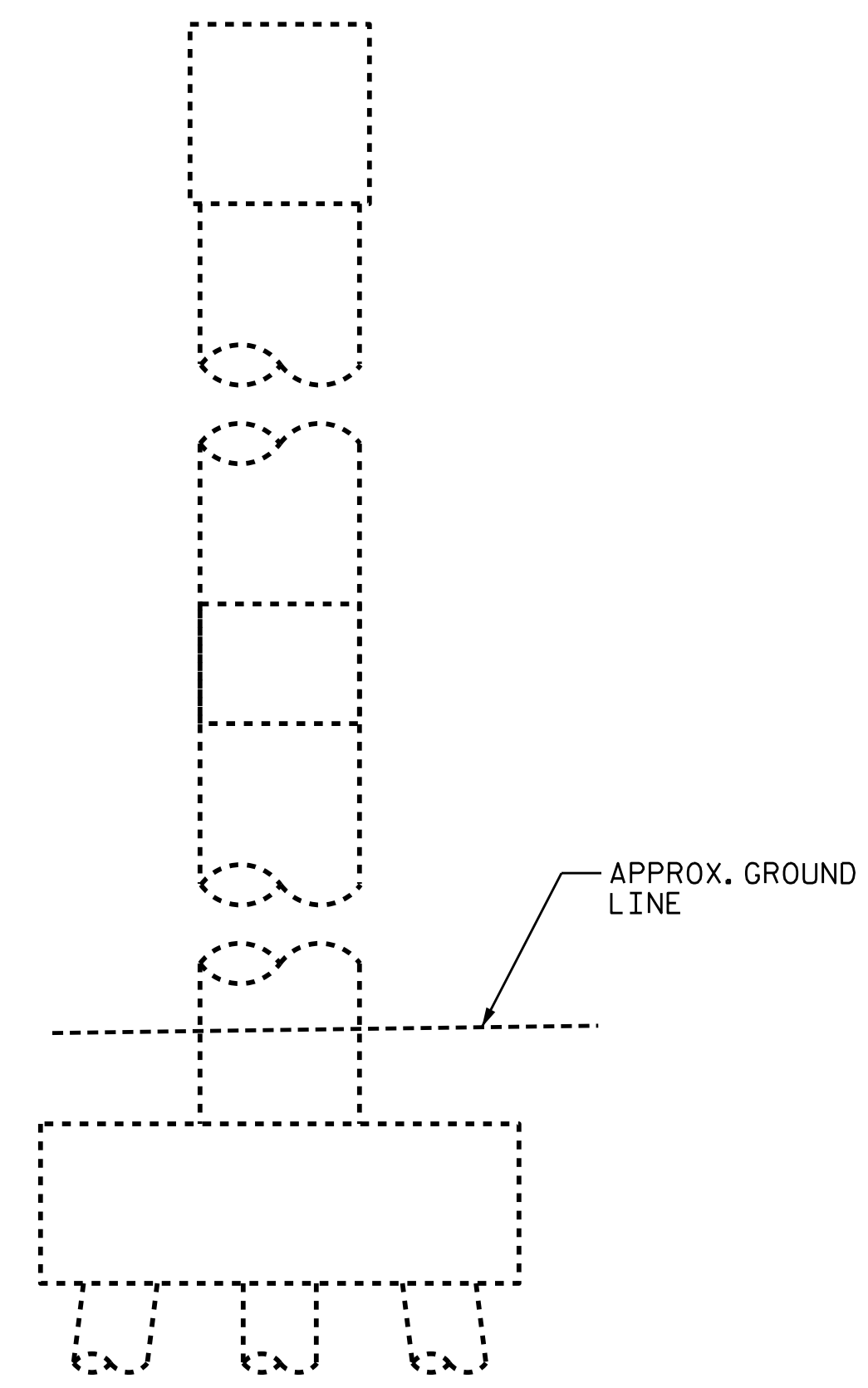
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LEGEND:

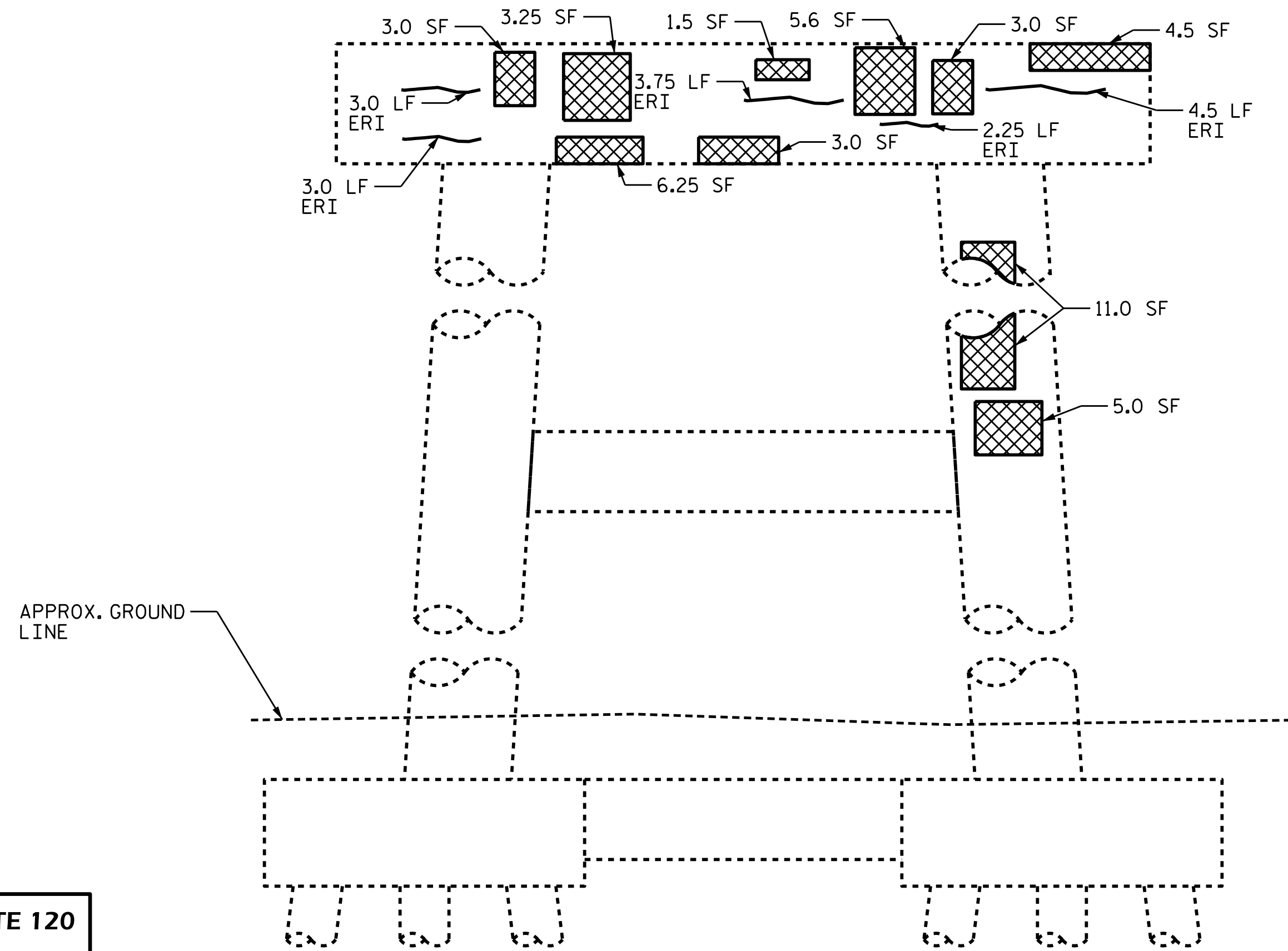
-  CONCRETE REPAIR AREA (FORM AND POUR)
-  SHOTCRETE REPAIR AREA
-  EPOXY RESIN INJECTION (ERI)



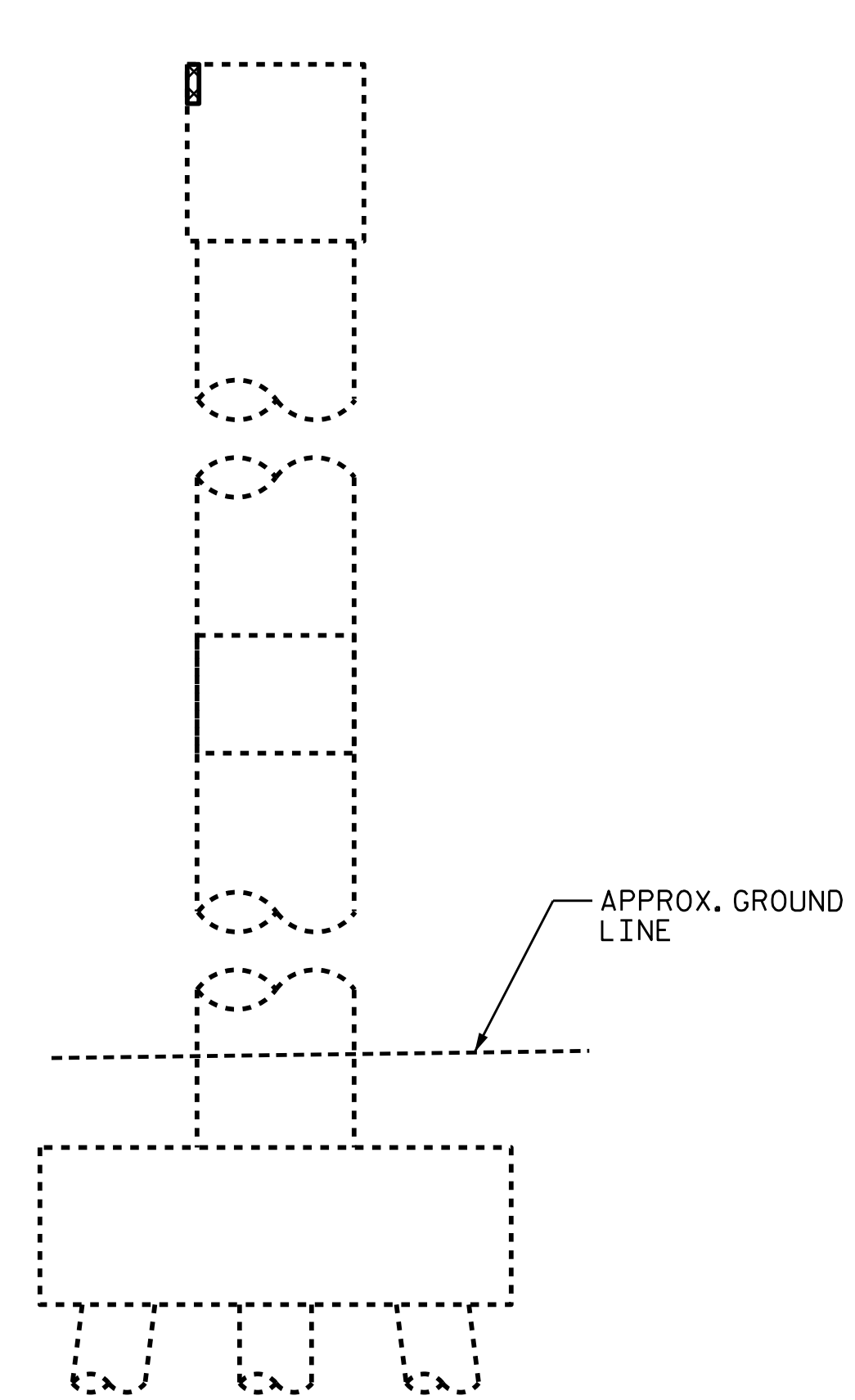
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 5	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	75.0	37.5		
COLUMN/PILE	16.0	8.0		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	11.3	5.6		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		16.5		
COLUMN/PILE		-		

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 - SUBSTRUCTURE" SHEET.

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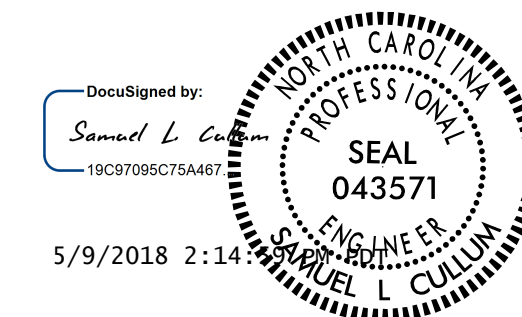
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BRUNSWICK COUNTY
 BRIDGE NO. 71

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 (919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018



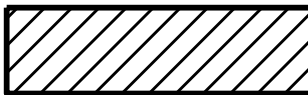
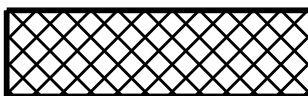

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

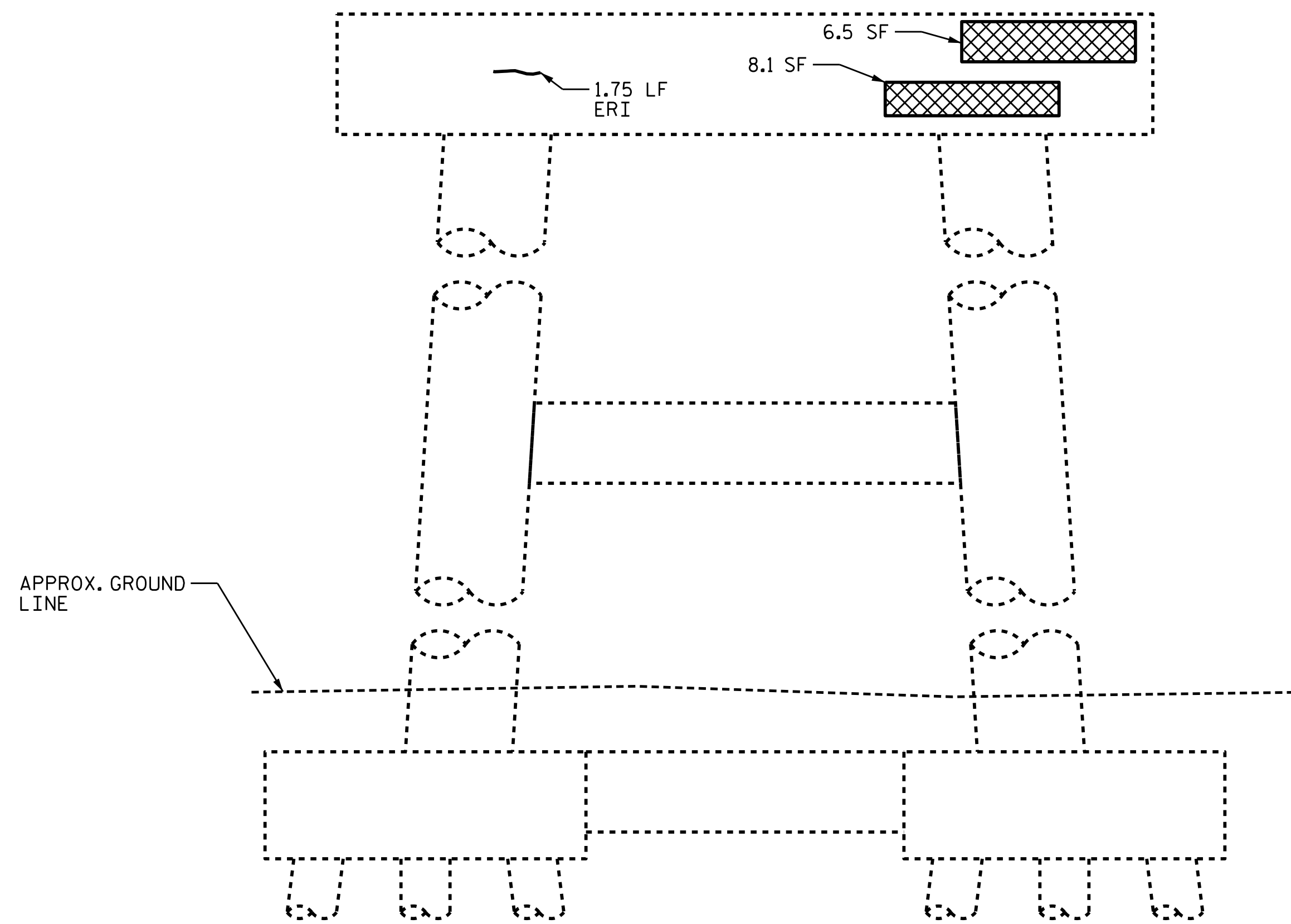
**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 5**

NO.	REVISIONS			SHEET NO.
	BY:	DATE:	NO.	
1			3	S-40 TOTAL SHEETS 73
2			4	

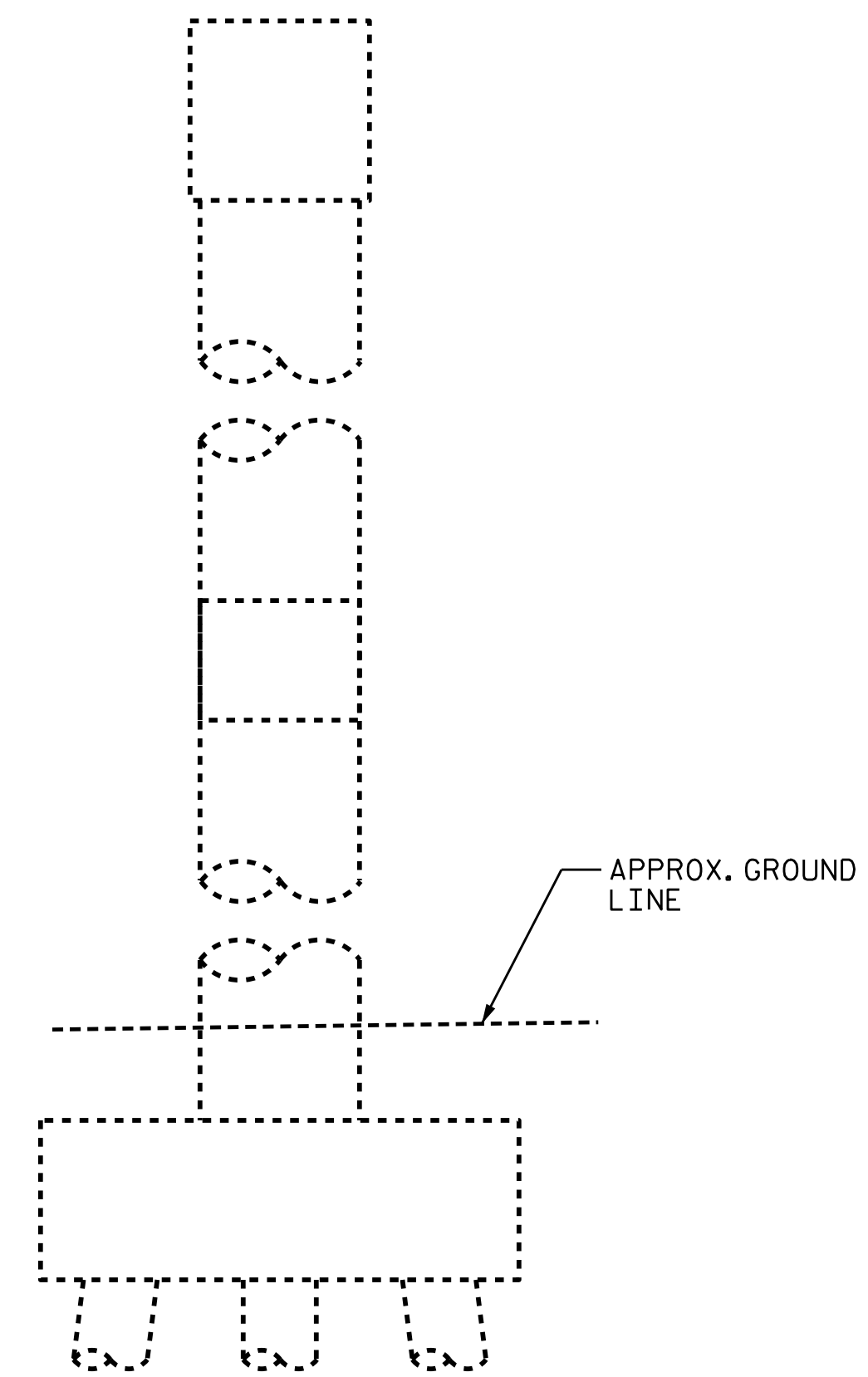
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LEGEND:

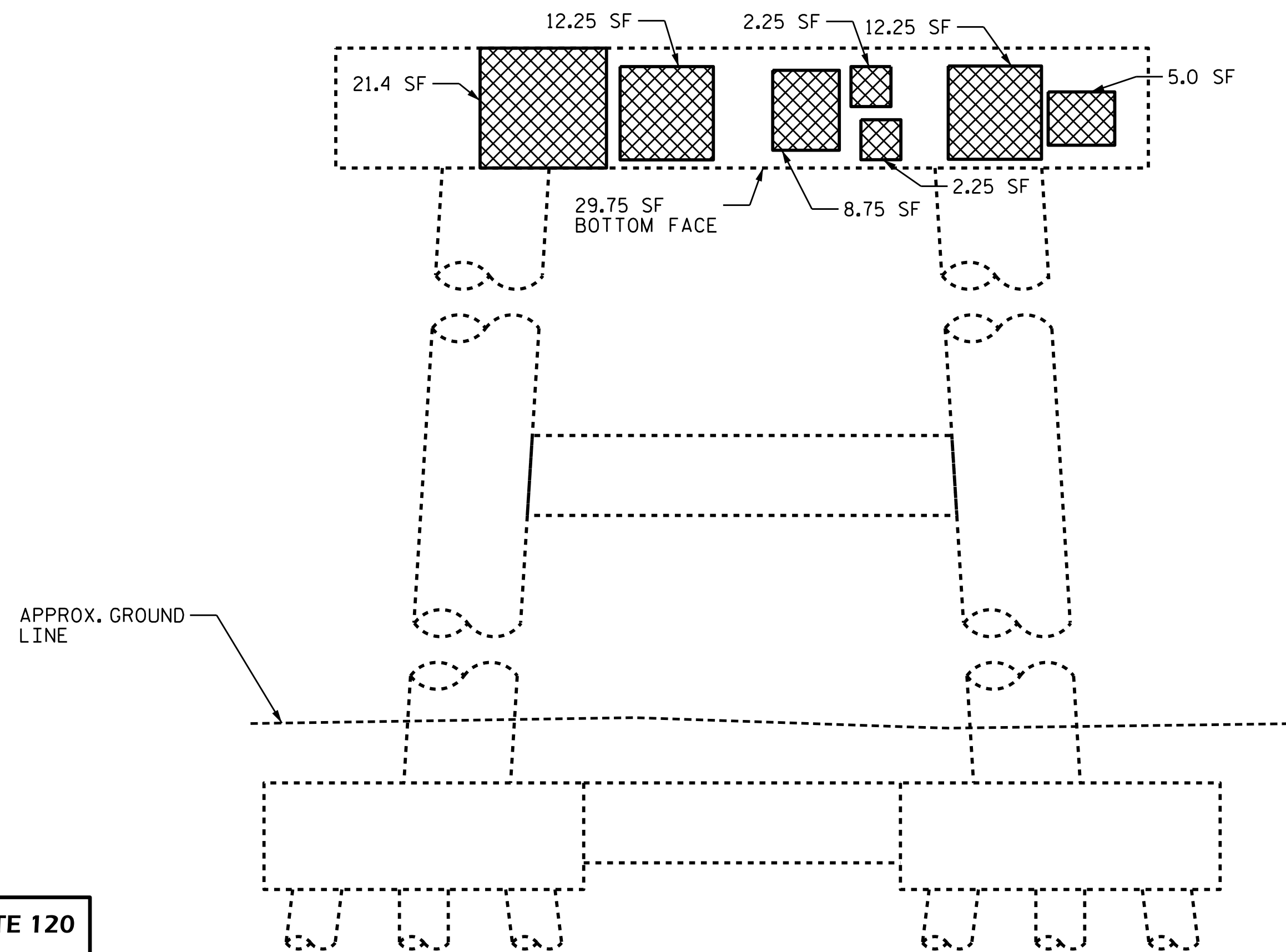
-  CONCRETE REPAIR AREA (FORM AND POUR)
-  SHOTCRETE REPAIR AREA
-  EPOXY RESIN INJECTION (ERI)



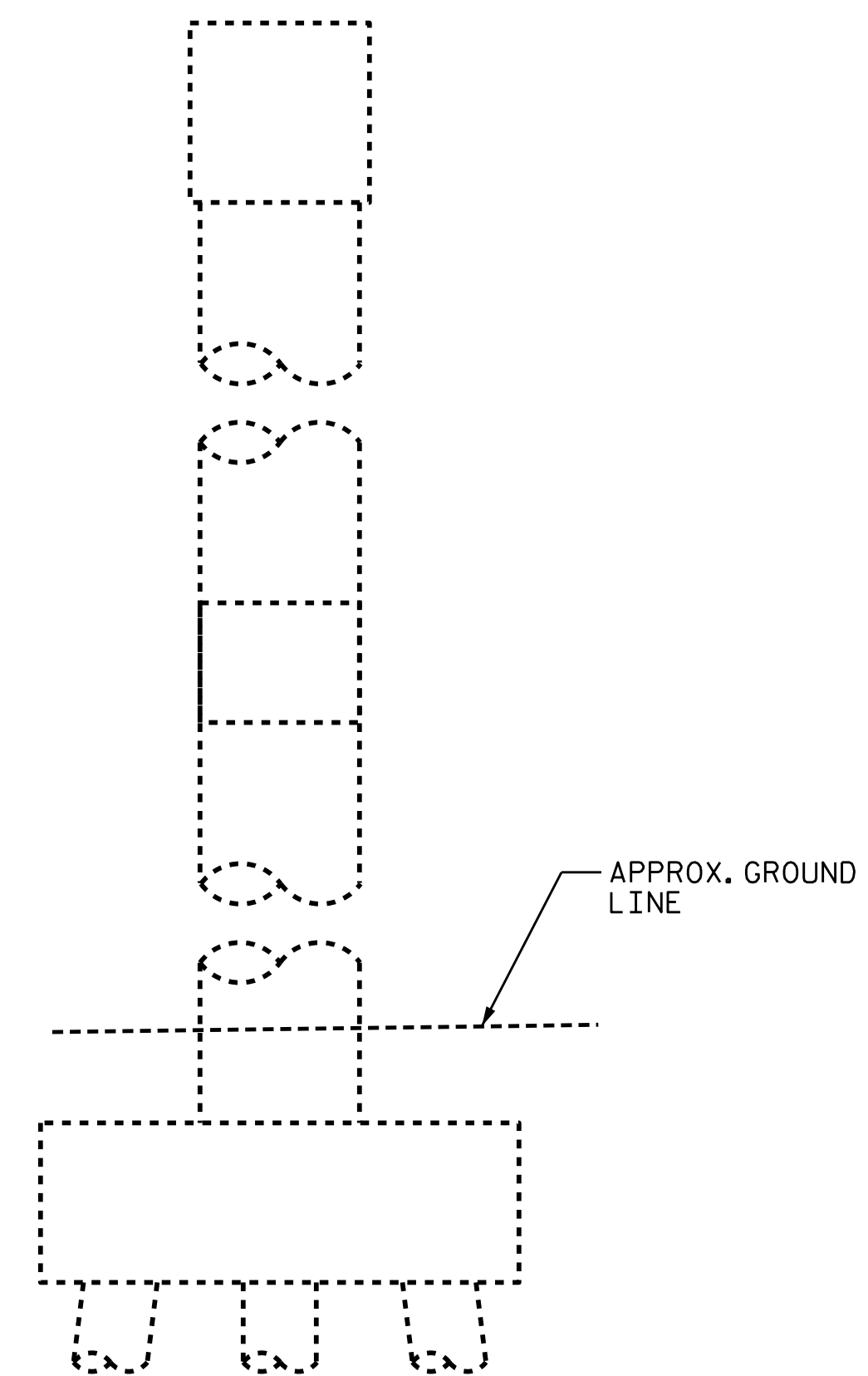
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 6	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	108.5	54.3		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	16.3	8.1		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		1.8		
COLUMN/PILE		-		

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 - SUBSTRUCTURE" SHEET.

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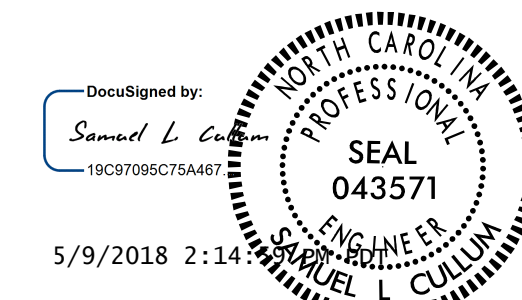
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BRUNSWICK COUNTY
 BRIDGE NO. 71

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DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018



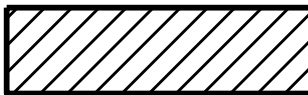


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

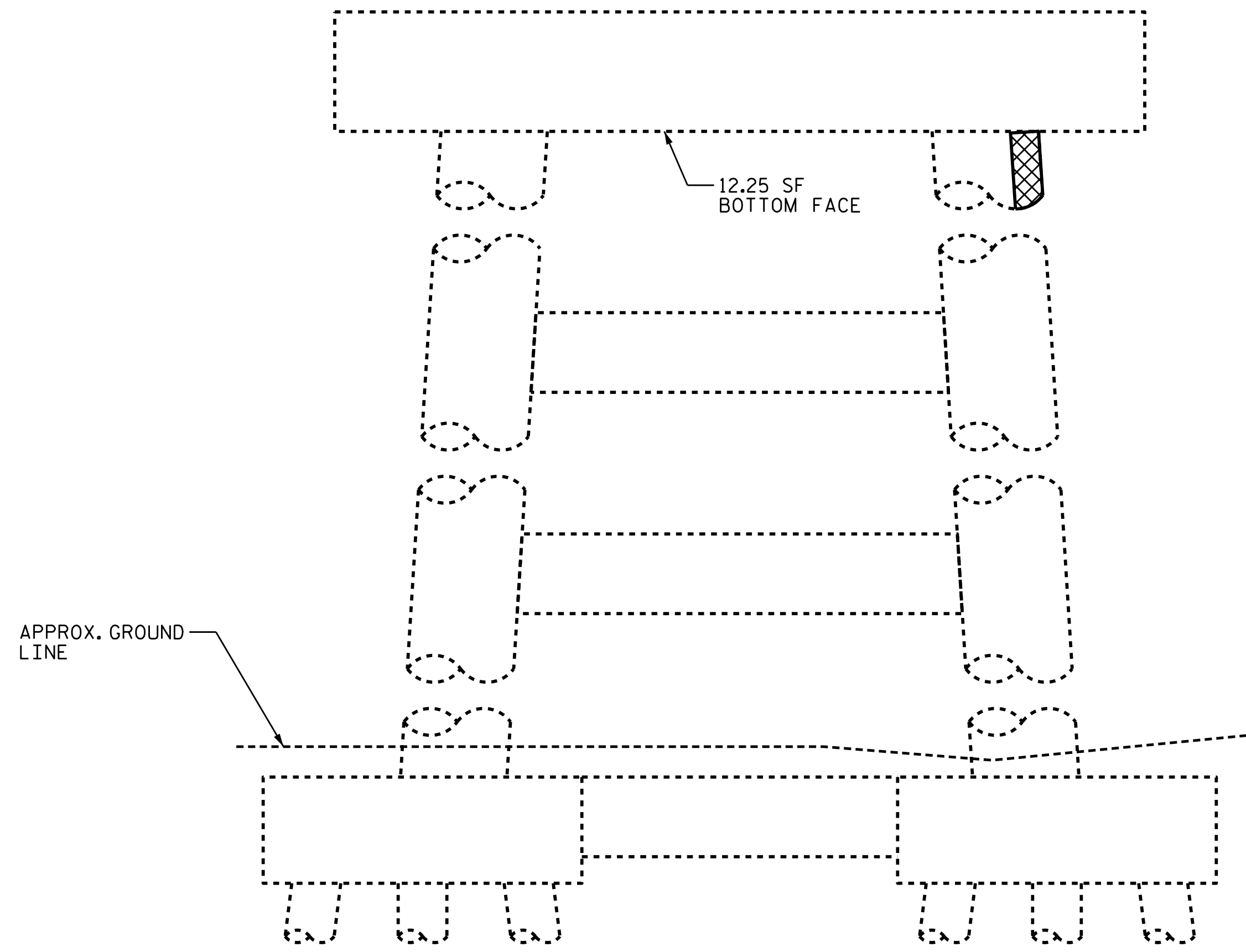
**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 6**

NO.	REVISIONS			SHEET NO.
	BY:	DATE:		
1			3	S-41
2			4	TOTAL SHEETS 73

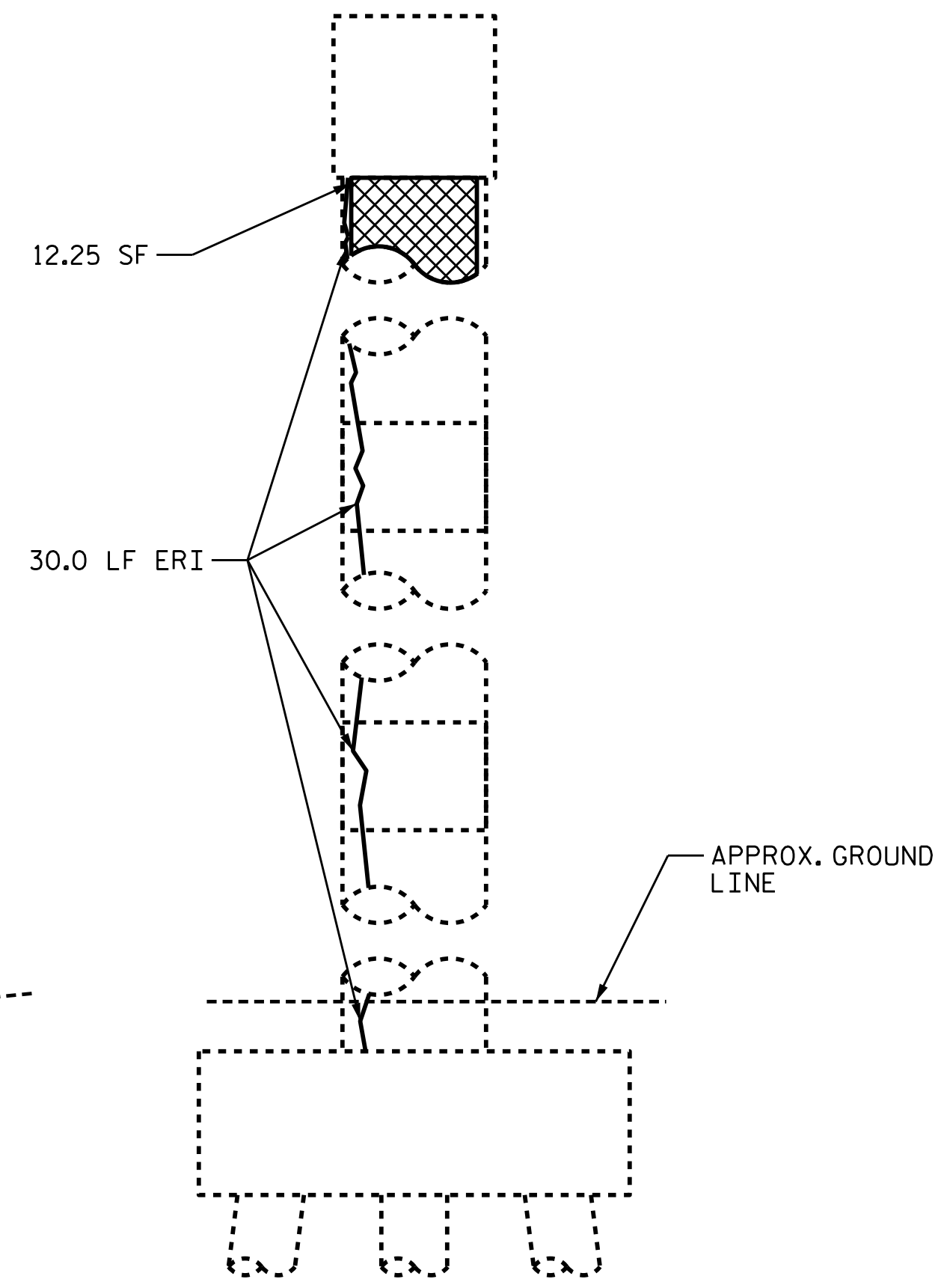
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LEGEND:

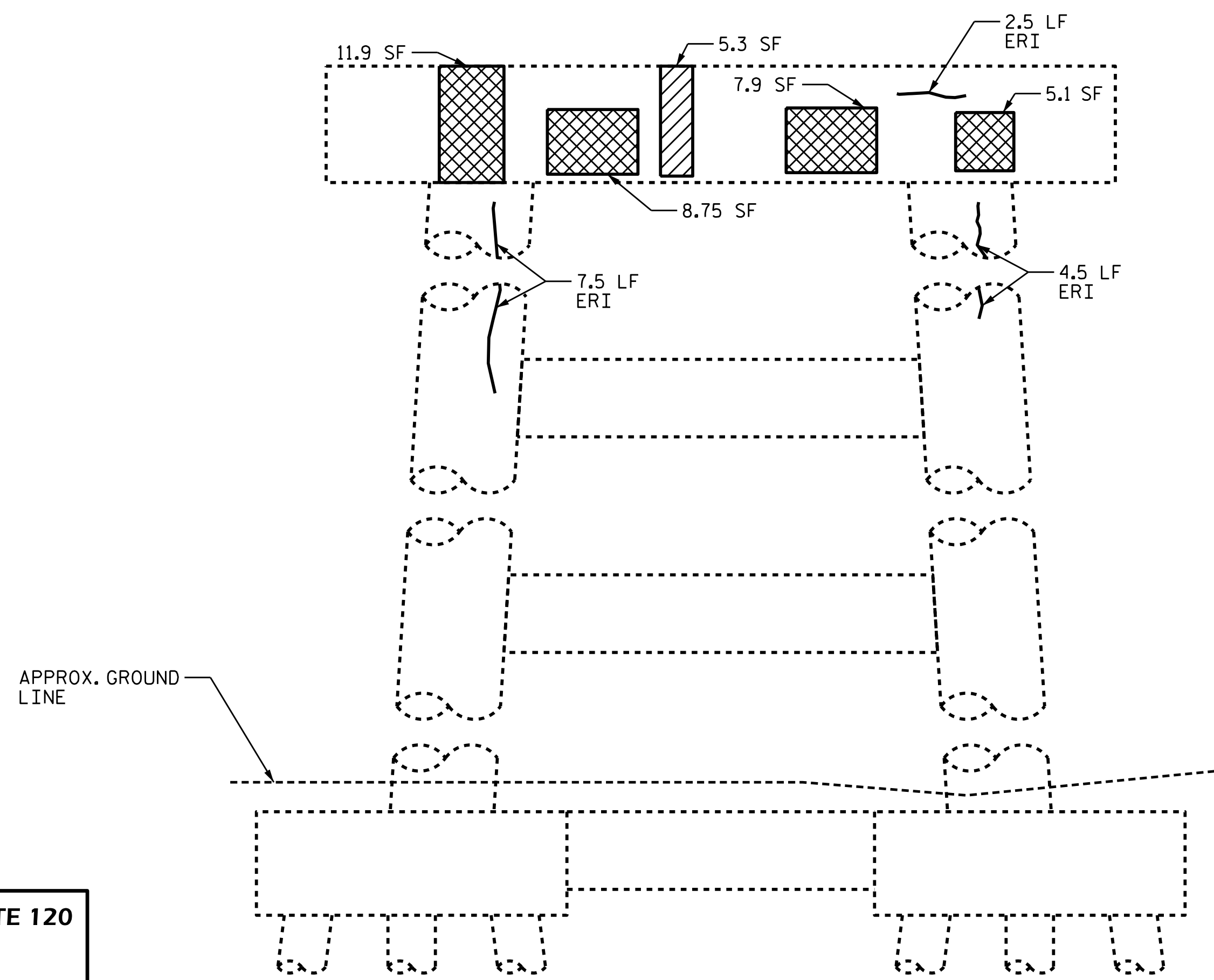
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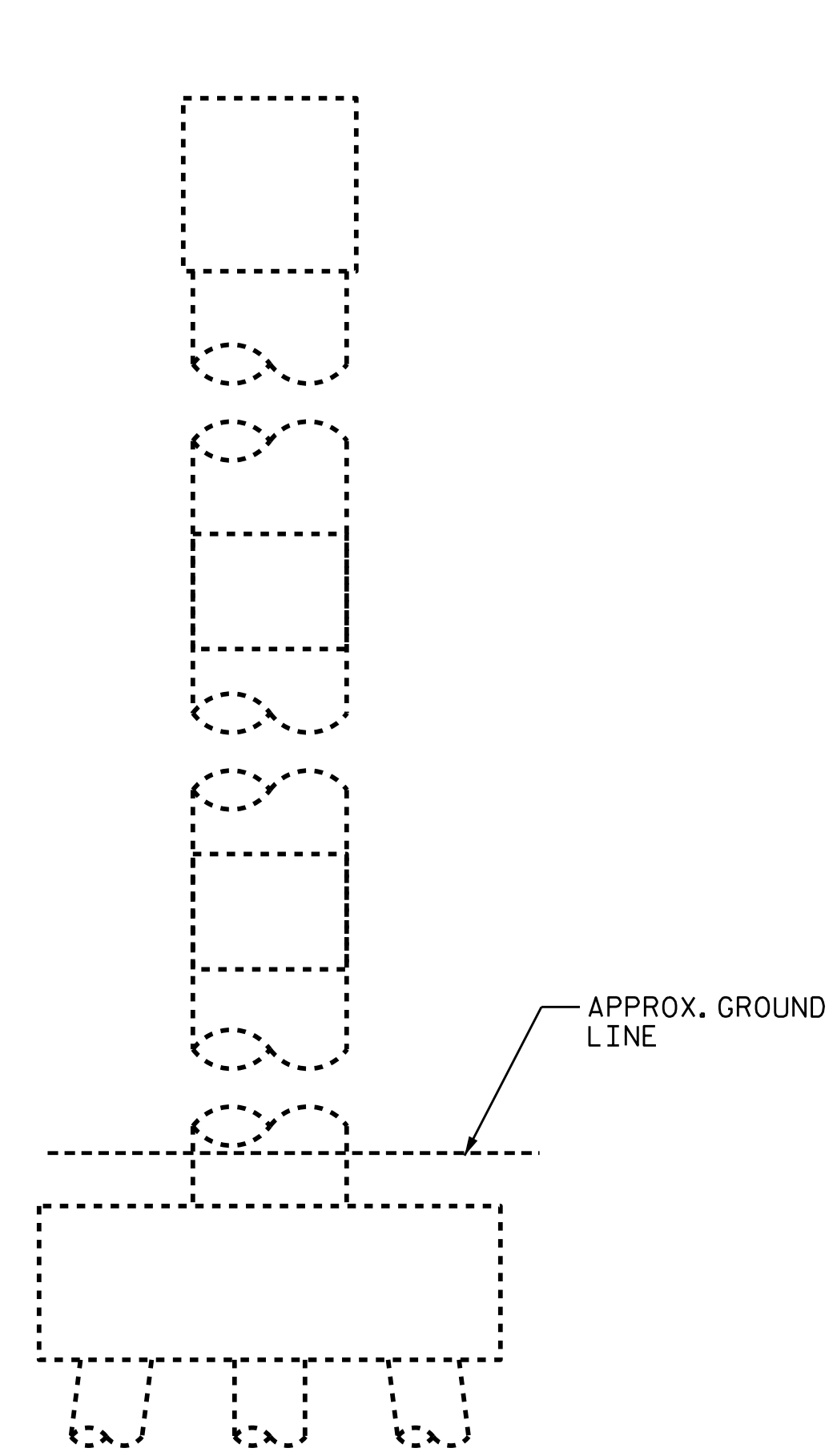
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 7	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	45.9	23.0		
COLUMN/PILE	12.3	6.1		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	6.9	3.4		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	2.5			
COLUMN/PILE	42.0			

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* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

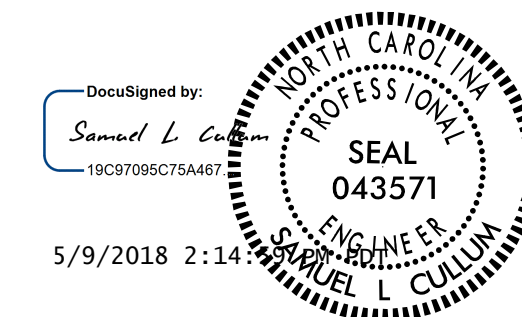
ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

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

COAT ALL SURFACE AREAS OF THE TOP OF THE CAP INCLUDING CHAMFERS, WITH EPOXY PROTECTIVE COATING. DO NOT COAT THE AREA UNDER THE ELASTOMERIC BEARINGS.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 7**

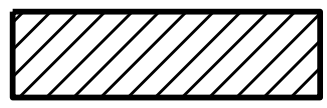


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 (919) 882-7839

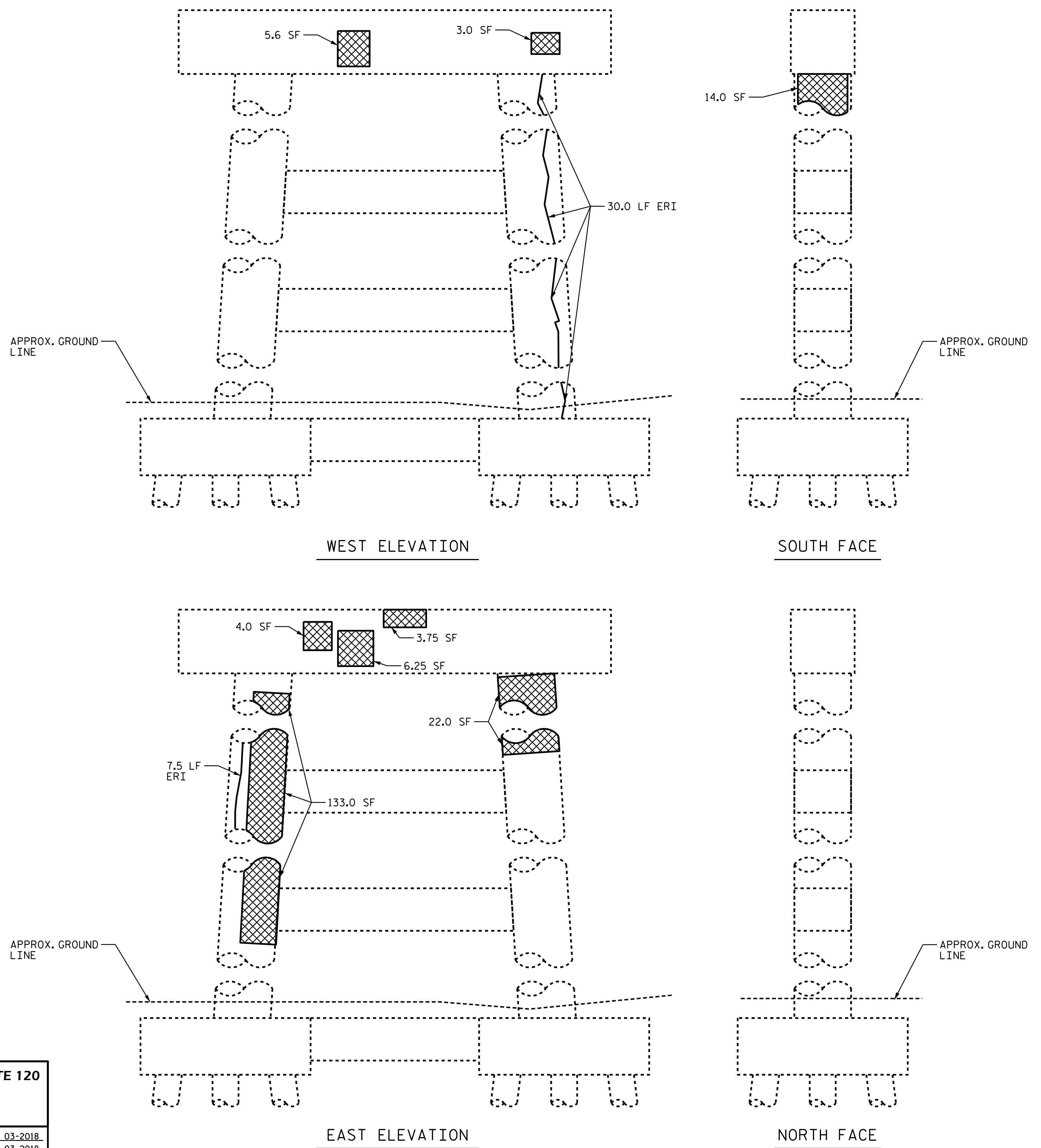
DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

NO.	BY:	DATE:	REVISIONS			SHEET NO.
			NO.	BY:	DATE:	
1			3			S-42
2			4			TOTAL SHEETS 73

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LEGEND:

-  CONCRETE REPAIR AREA (FORM AND POUR)
-  SHOTCRETE REPAIR 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	22.6	11.3		
COLUMN/PILE	169.0	84.5		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	3.4	1.7		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
COLUMN/PILE	37.5			

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 - SUBSTRUCTURE" SHEET.

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 AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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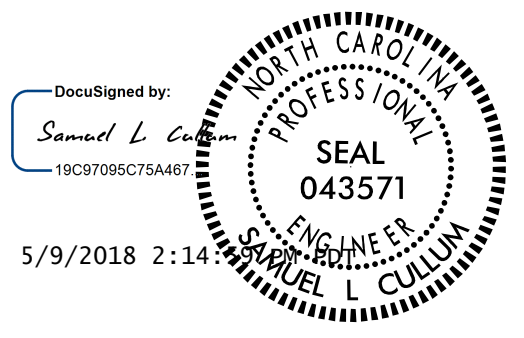
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PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 8**

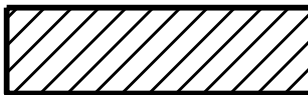
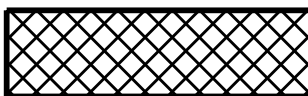

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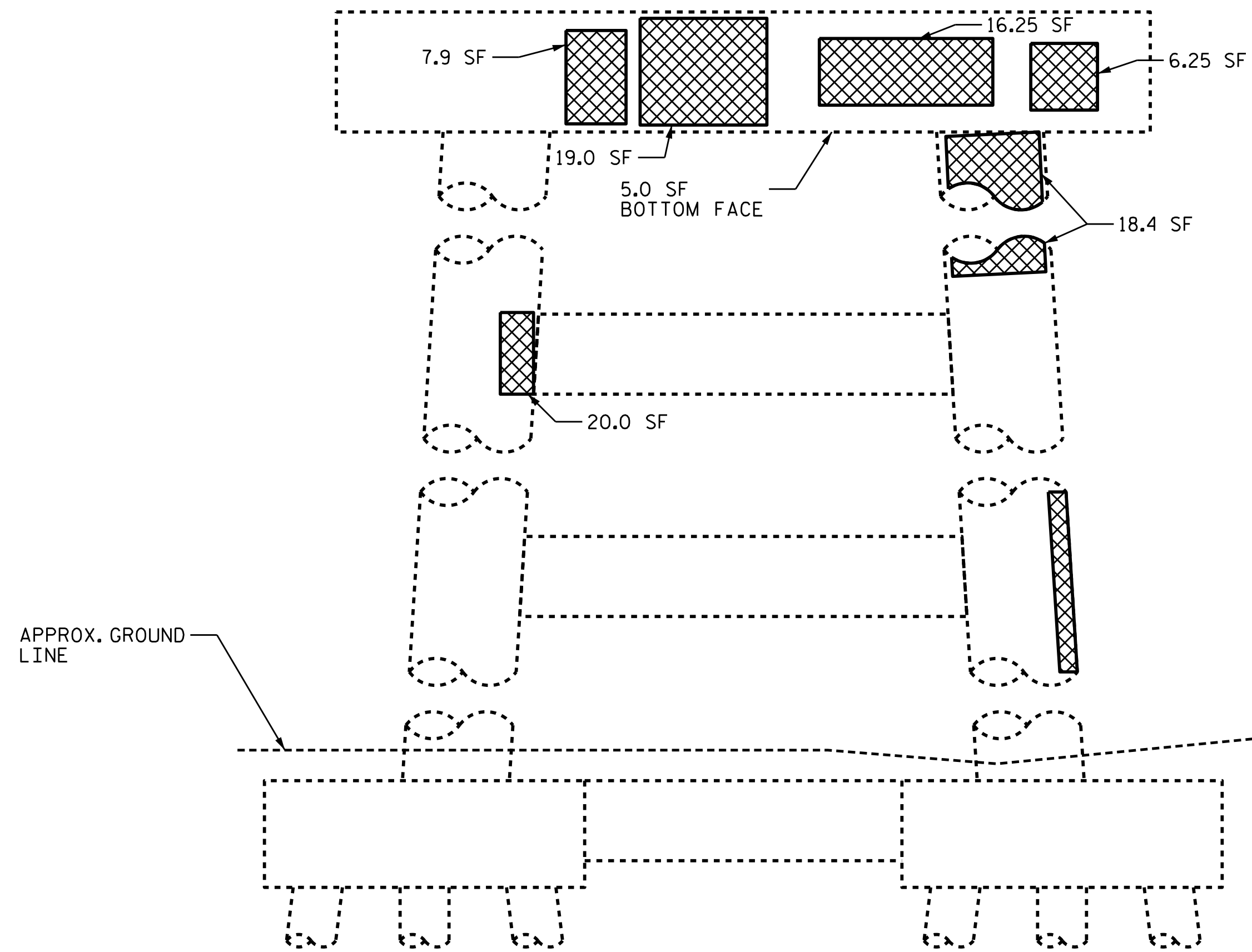
DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

NO.	REVISIONS			SHEET NO.
	BY:	DATE:	NO.	
1			3	S-43 TOTAL SHEETS 73
2			4	

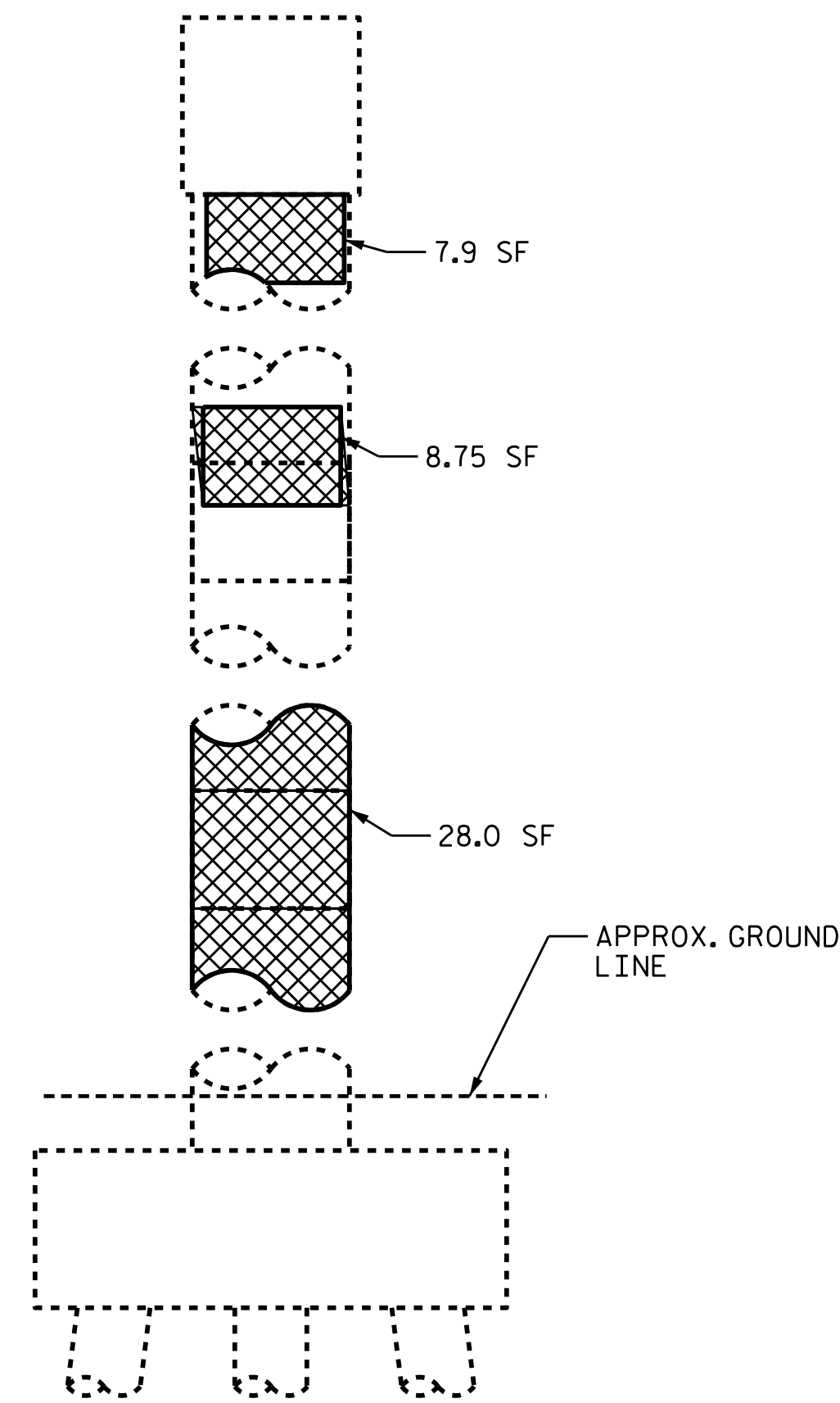
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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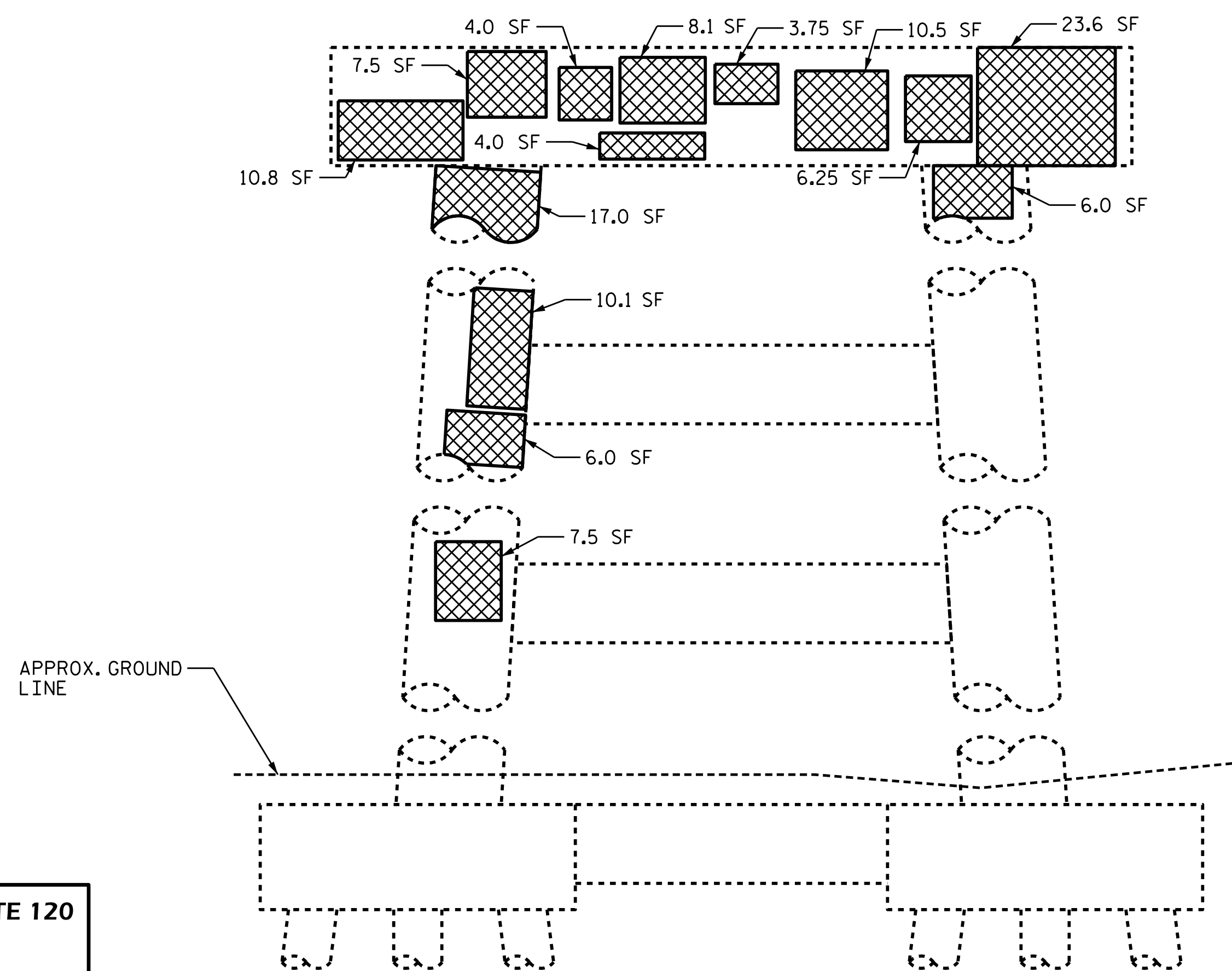
-  CONCRETE REPAIR AREA (FORM AND POUR)
-  SHOTCRETE REPAIR AREA
-  EPOXY RESIN INJECTION (ERI)



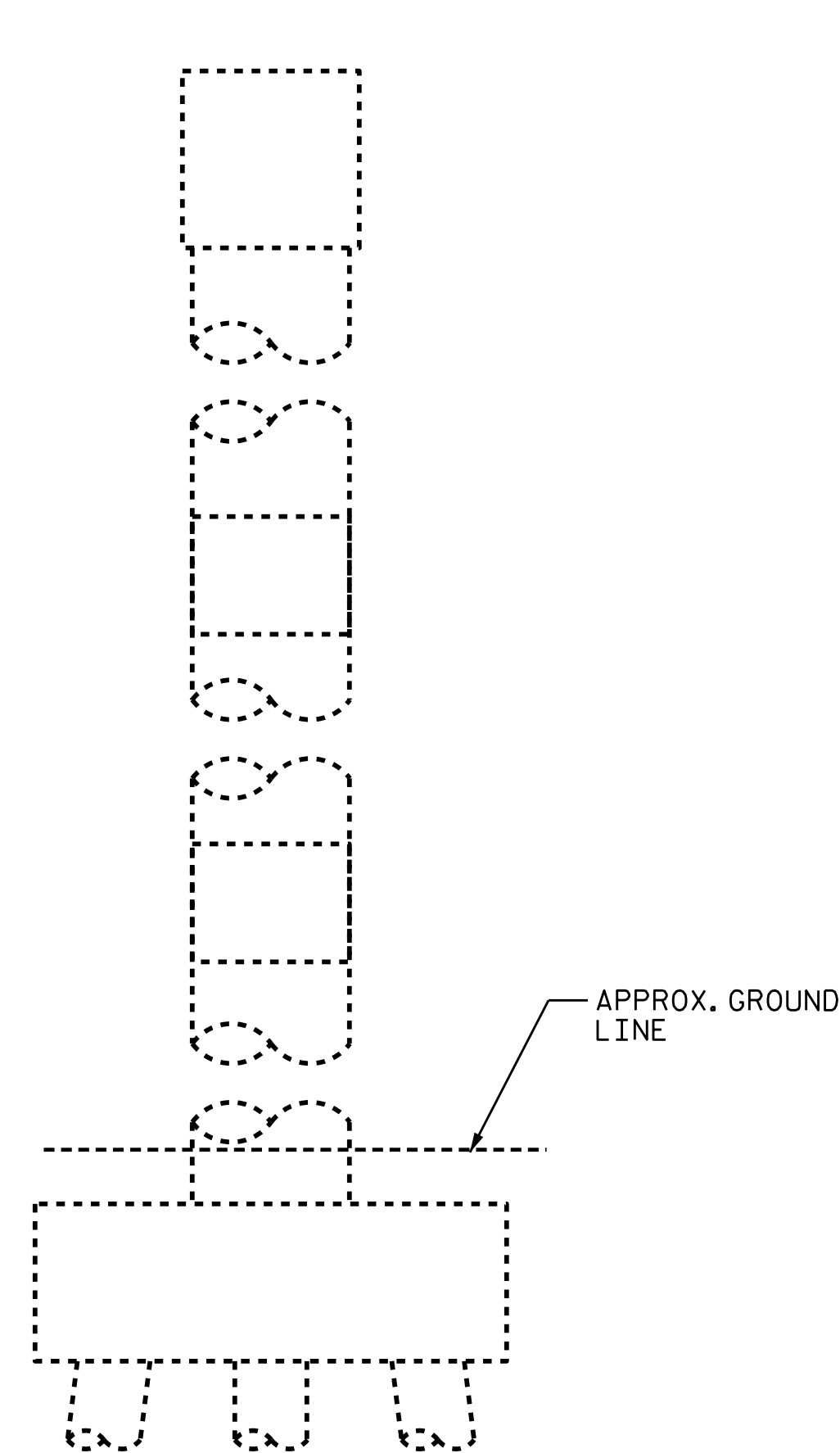
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 9	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	132.9	66.5		
COLUMN/PILE	123.7	61.8		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	19.9	10.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		

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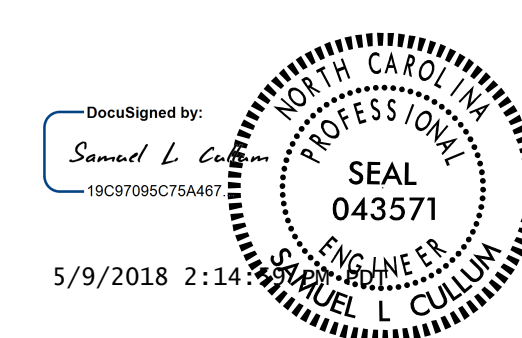
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PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 9**

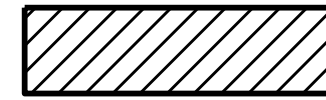
KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

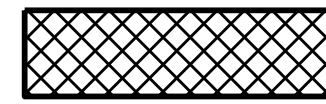
NO.	REVISIONS			SHEET NO.
	BY:	DATE:	NO.	
1			3	S-44
2			4	TOTAL SHEETS 73

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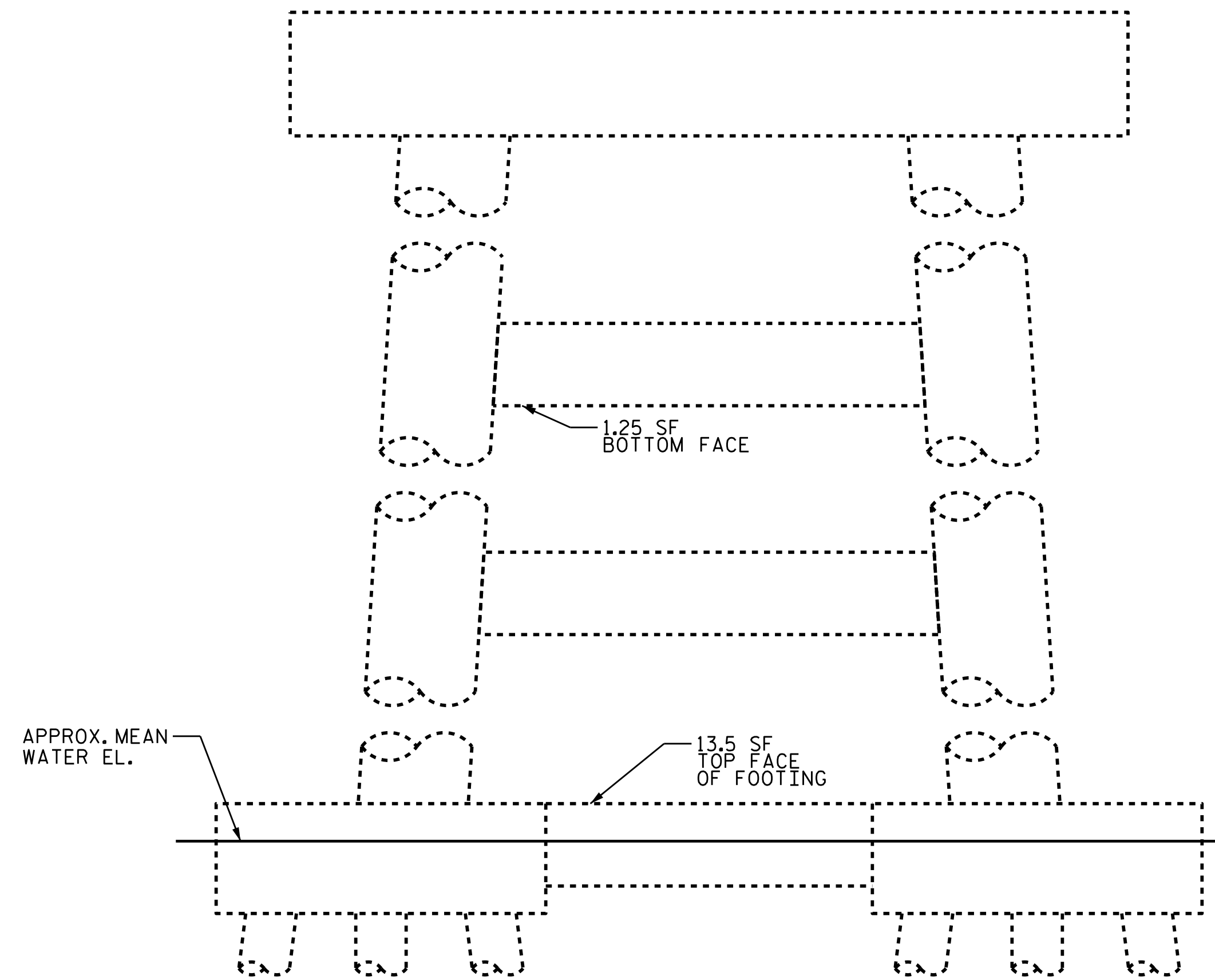
CONCRETE REPAIR AREA
(FORM AND POUR)



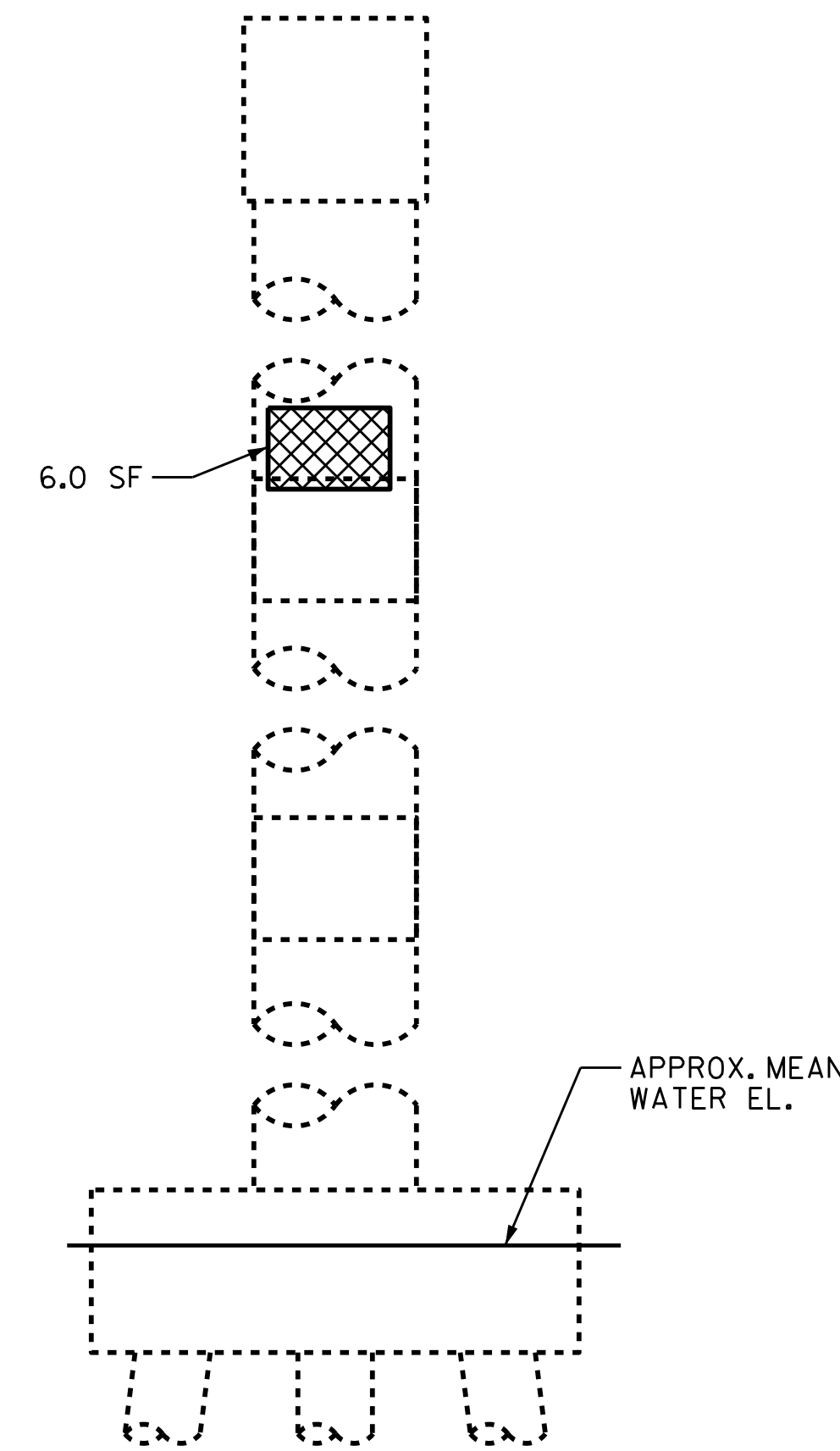
SHOTCRETE REPAIR AREA



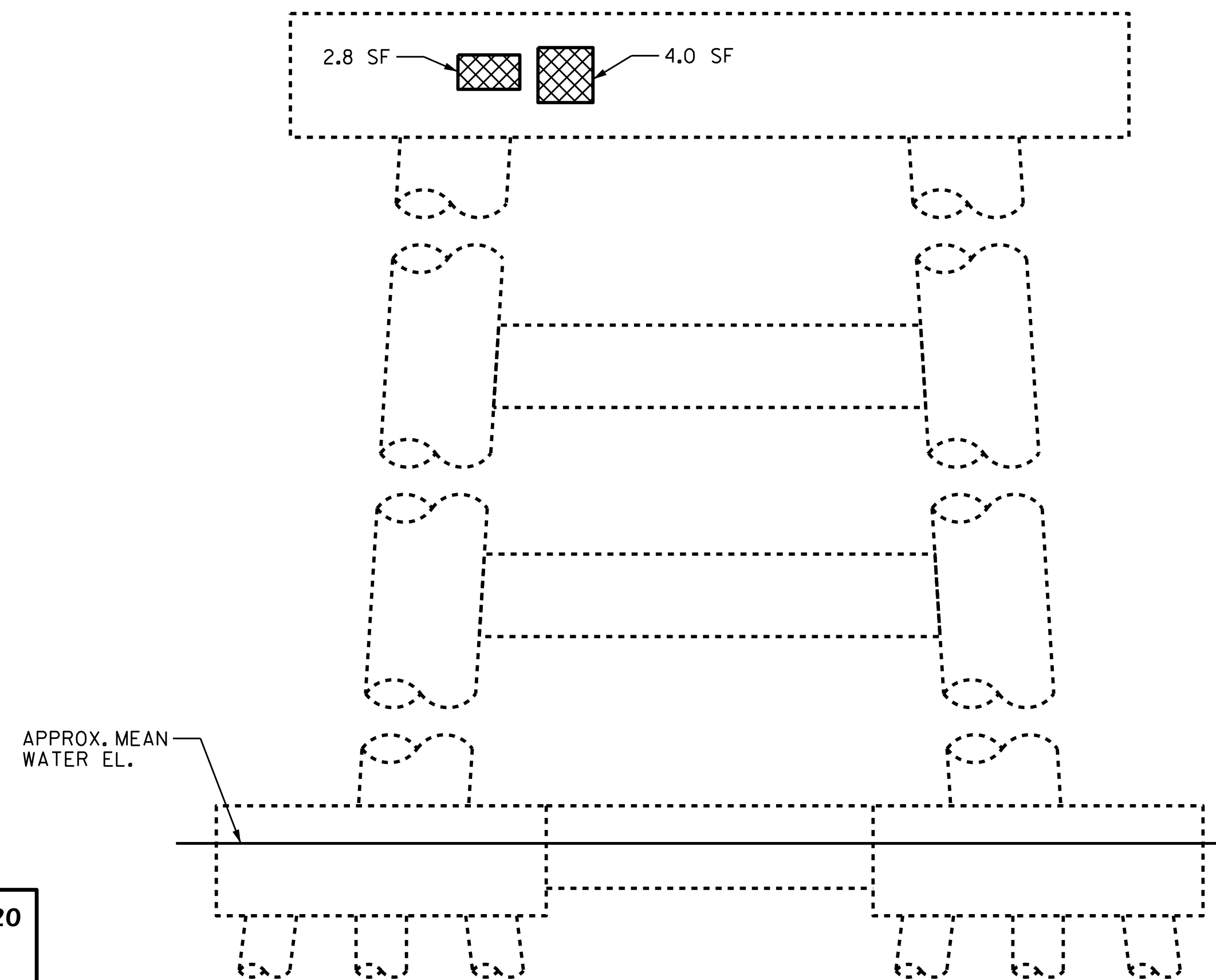
EPOXY RESIN
INJECTION (ERI)



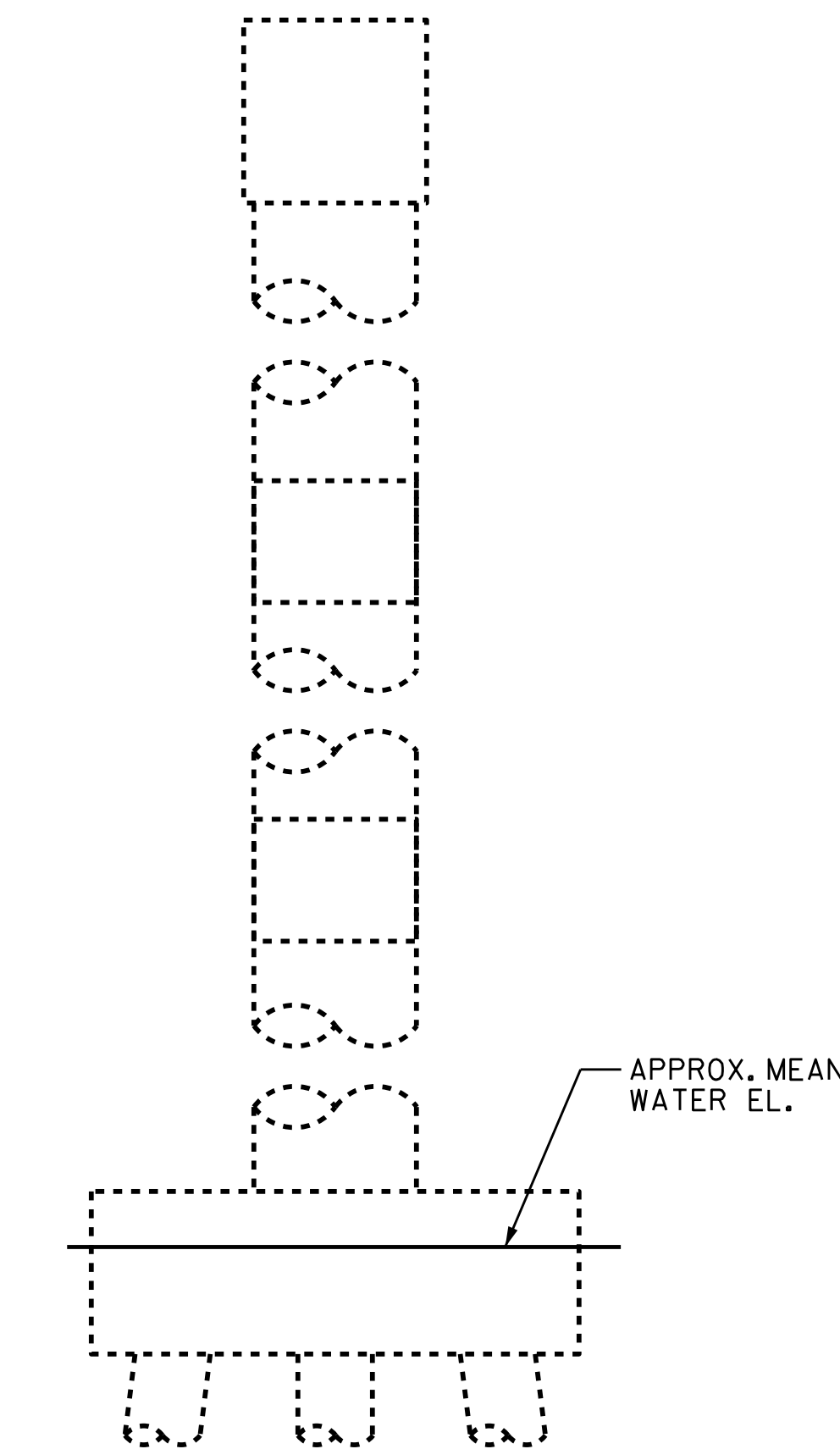
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 10	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	21.6	10.8		
COLUMN/PILE	6.0	3.0		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	13.5	6.8		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		

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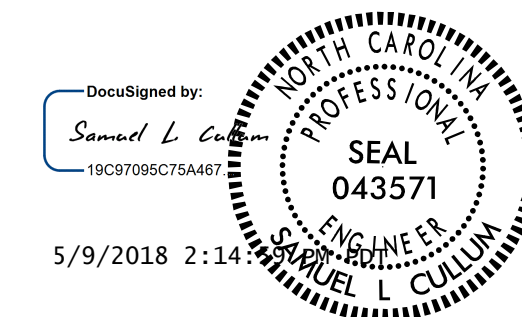
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PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018



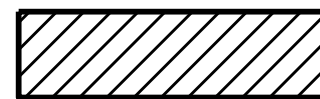
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 10**

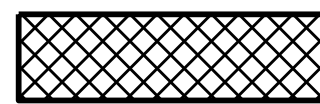
NO.	BY:	DATE:	REVISIONS			SHEET NO.
			NO.	BY:	DATE:	
1			3			S-45
2			4			TOTAL SHEETS 73

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
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LEGEND:



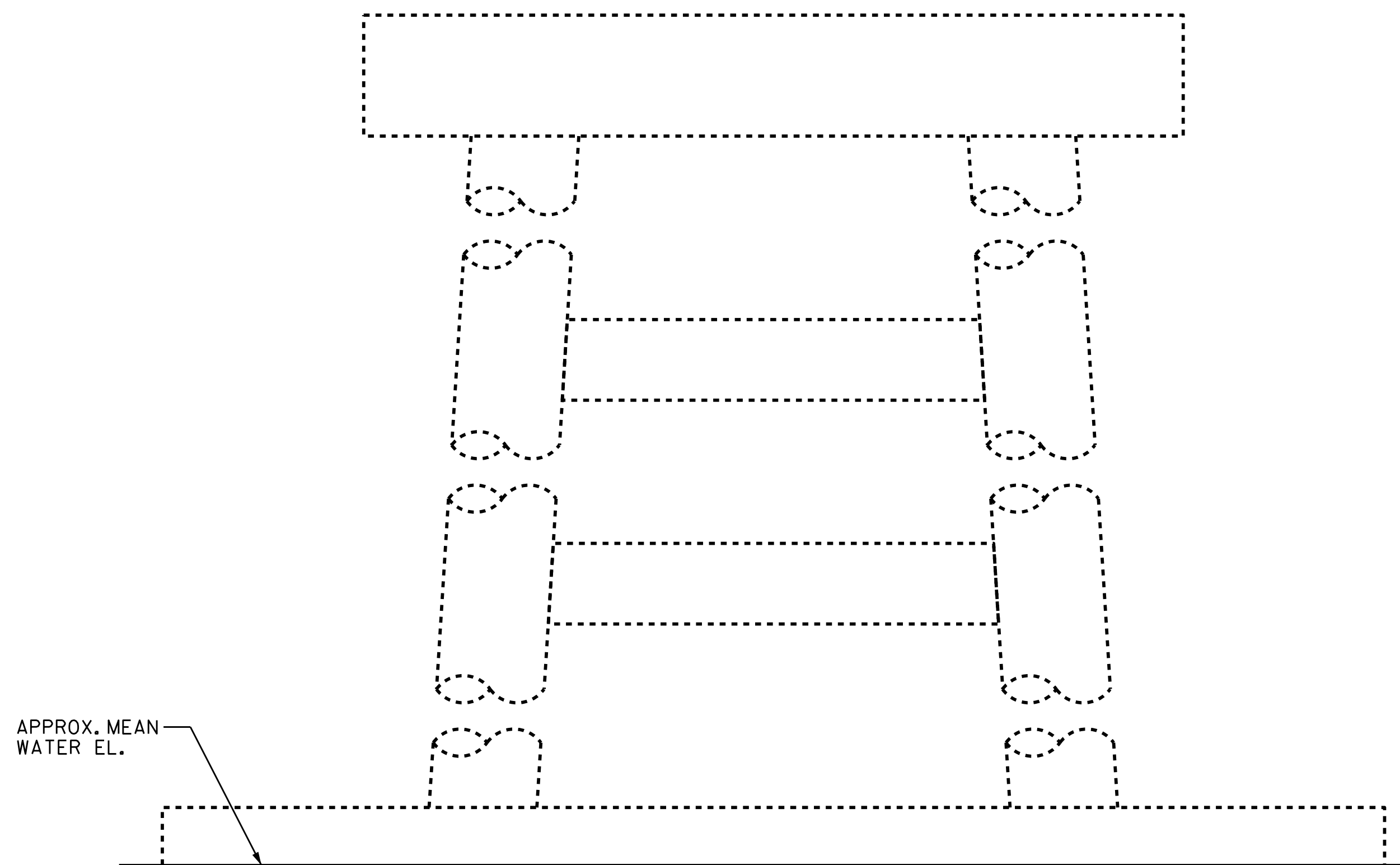
CONCRETE REPAIR AREA
(FORM AND POUR)



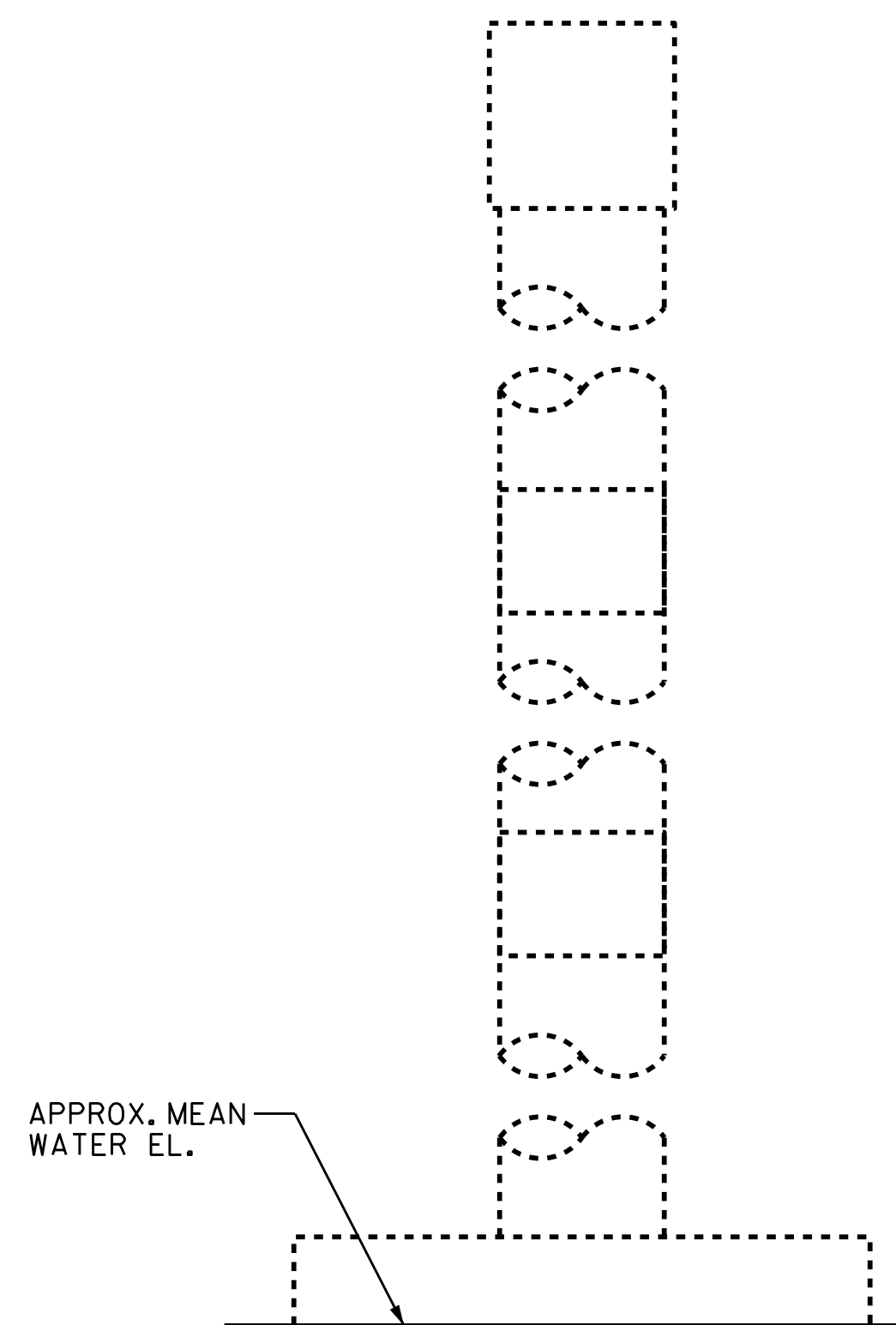
SHOTCRETE REPAIR AREA



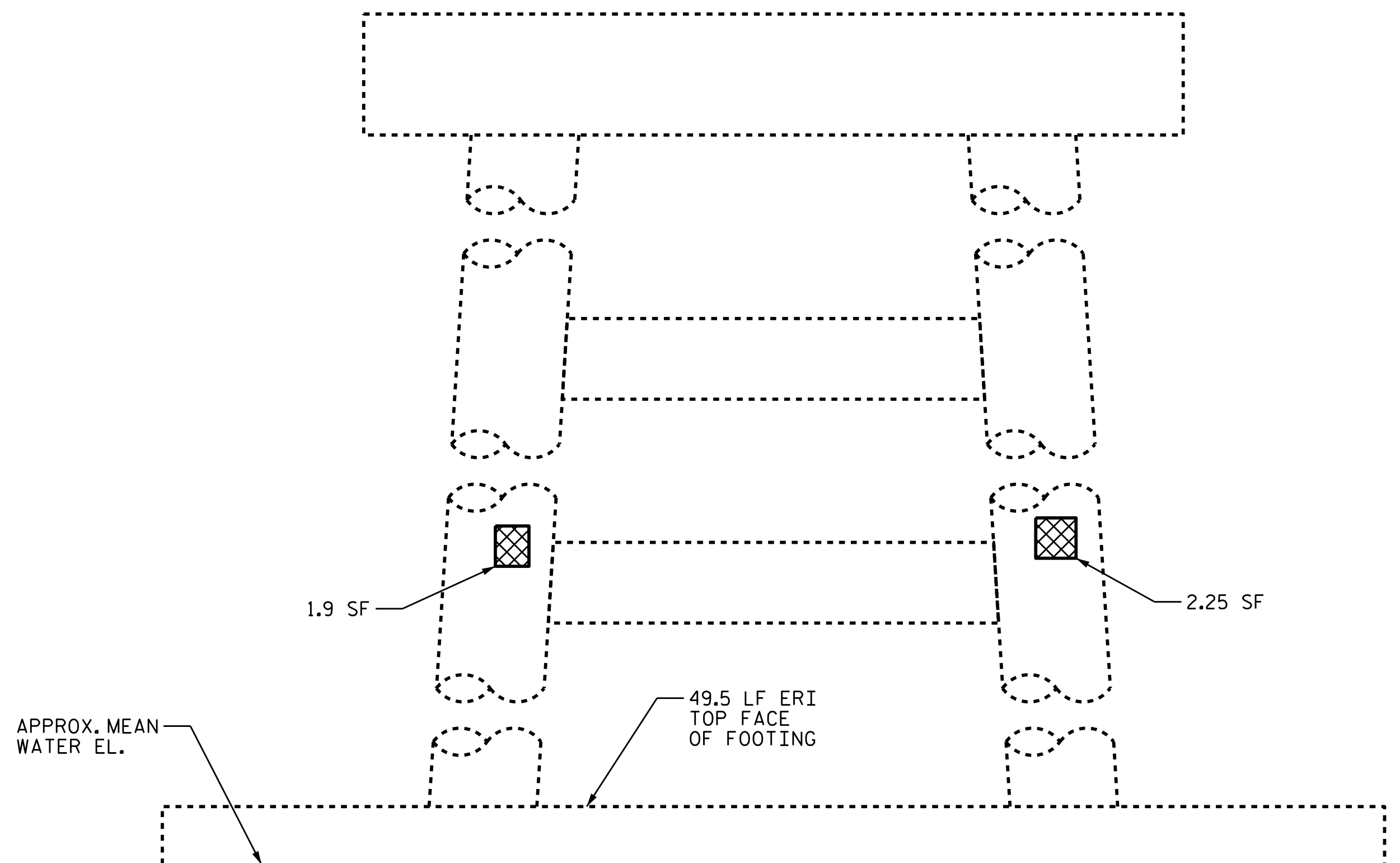
EPOXY RESIN
INJECTION (ERI)



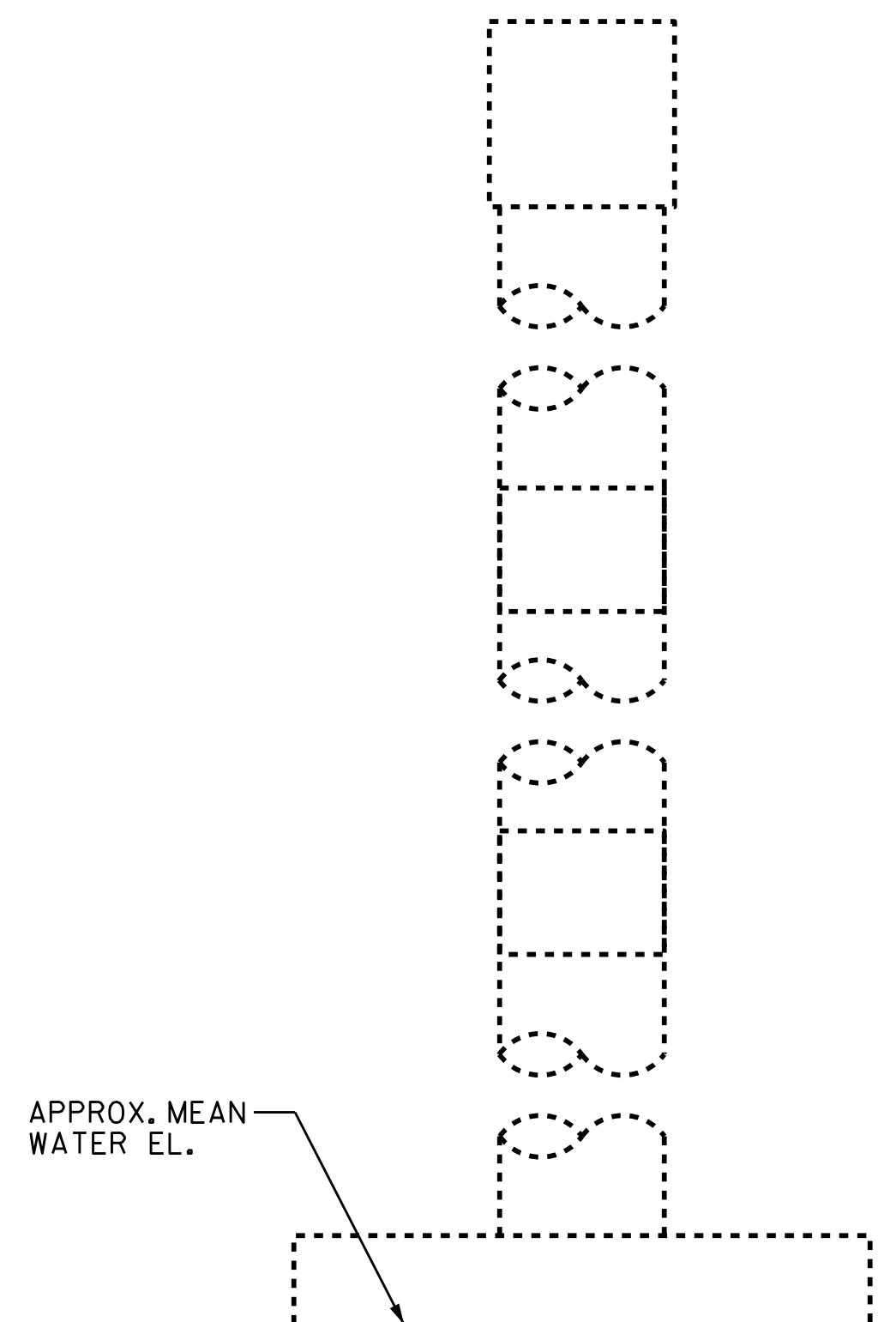
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 11	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	4.2	2.1		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	-	-		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		49.5		
COLUMN/PILE		-		

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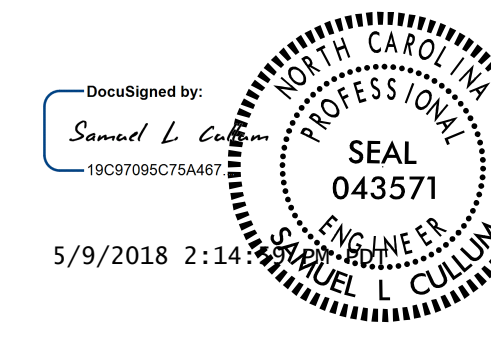
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PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 11**

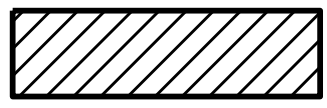
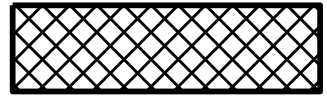

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 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

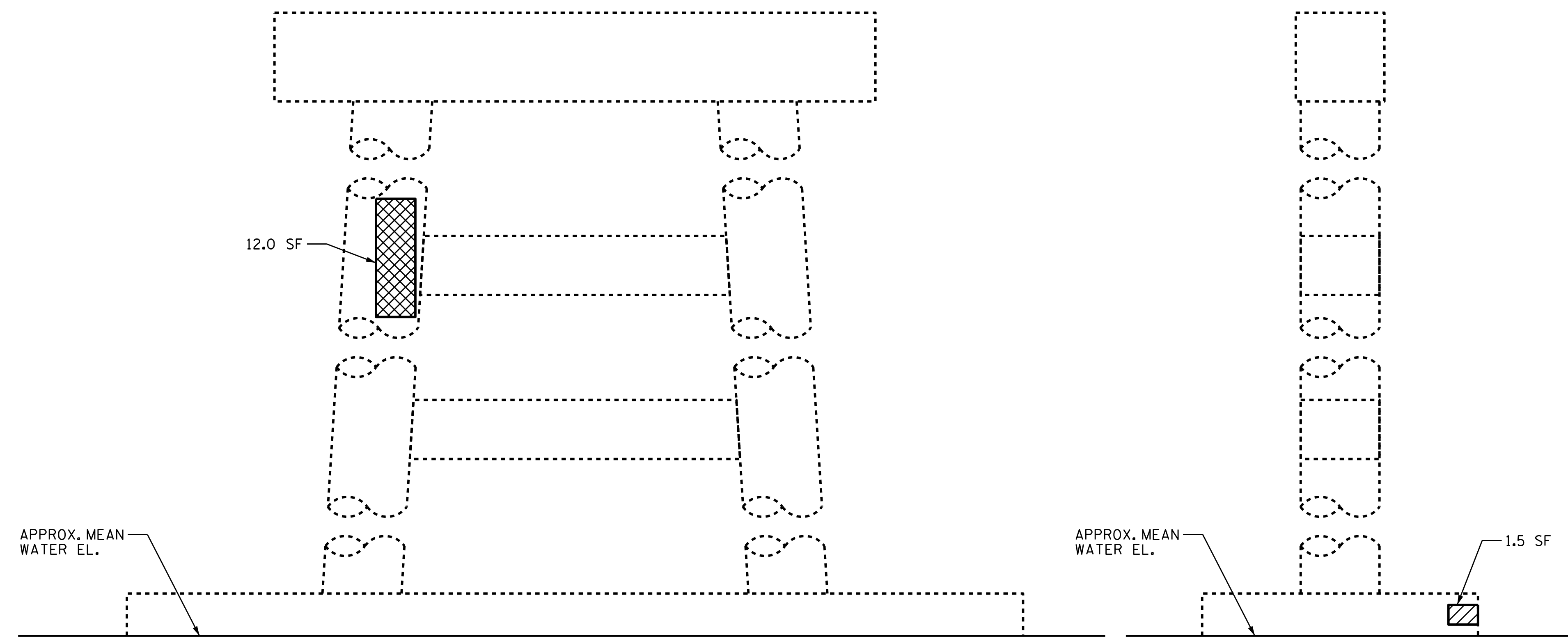
DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

NO.	REVISIONS			SHEET NO.
	BY:	DATE:	NO.	
1			3	S-46 TOTAL SHEETS 73
2			4	

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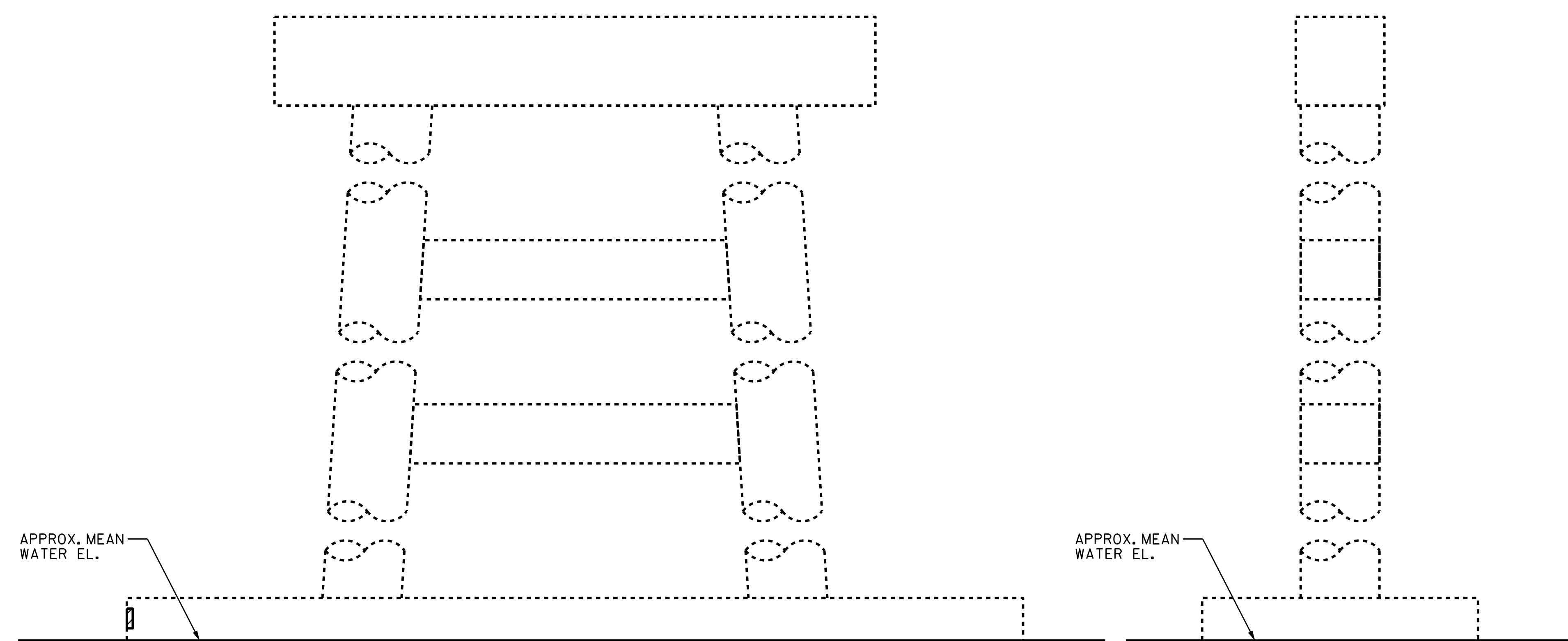
LEGEND:

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



WEST ELEVATION

SOUTH FACE



EAST ELEVATION

NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 12	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	-	-		
COLUMN/PILE	12.0	6.0		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	1.5	0.8		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
COLUMN/PILE	-			

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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 AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION. FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET AND SPECIAL PROVISIONS.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

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

COAT ALL SURFACE AREAS OF THE TOP OF THE CAP INCLUDING CHAMFERS, WITH EPOXY PROTECTIVE COATING. DO NOT COAT THE AREA UNDER THE ELASTOMERIC BEARINGS.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 12**

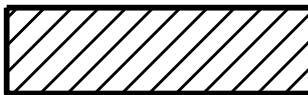
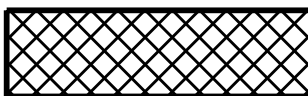

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 (919) 882-7839

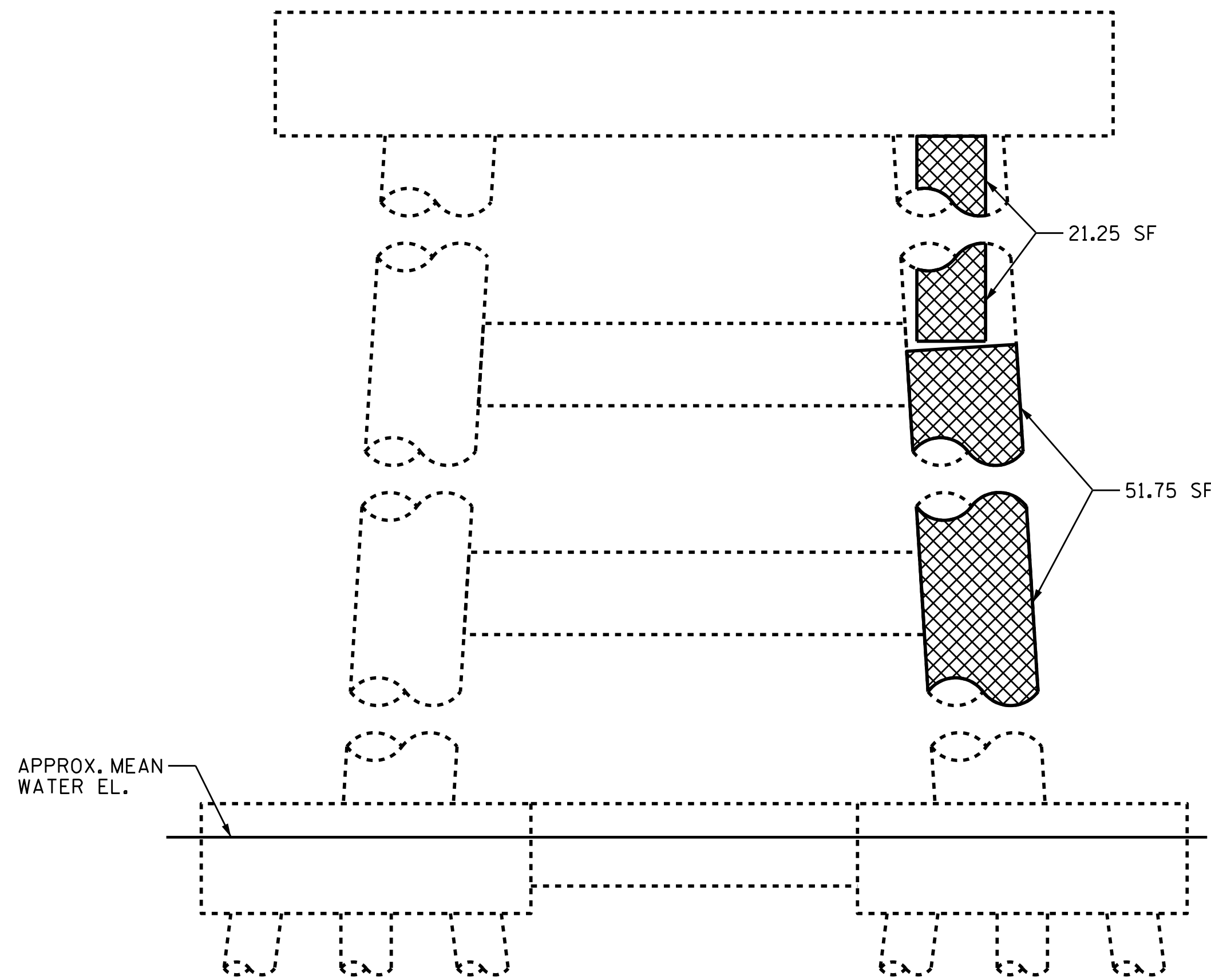
DRAWN BY :	AARON J. MCMILLAN	DATE :	03-2018
CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

NO.	REVISIONS			SHEET NO.
	BY:	DATE:		
1			3	S-47
2			4	TOTAL SHEETS 73

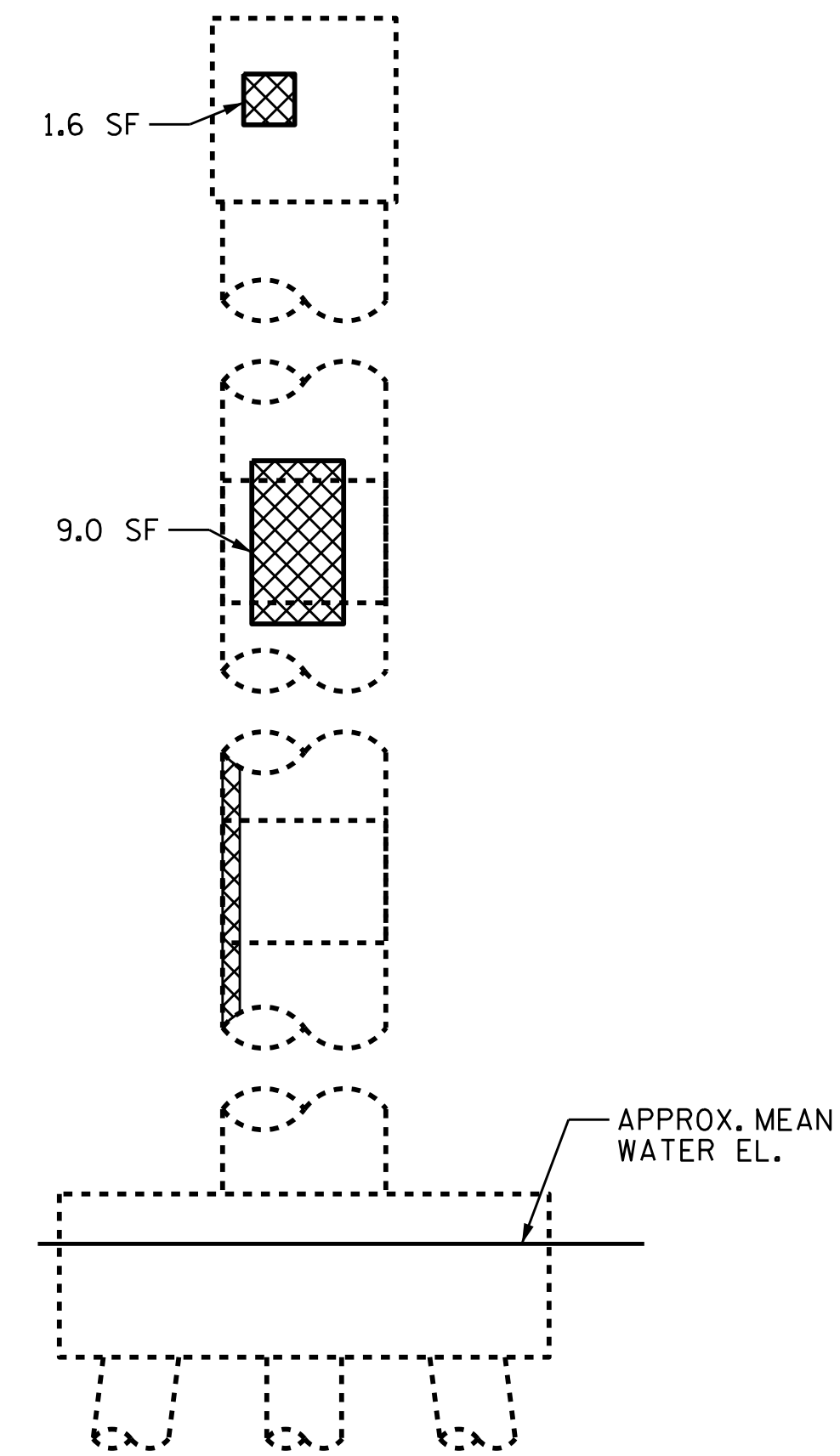
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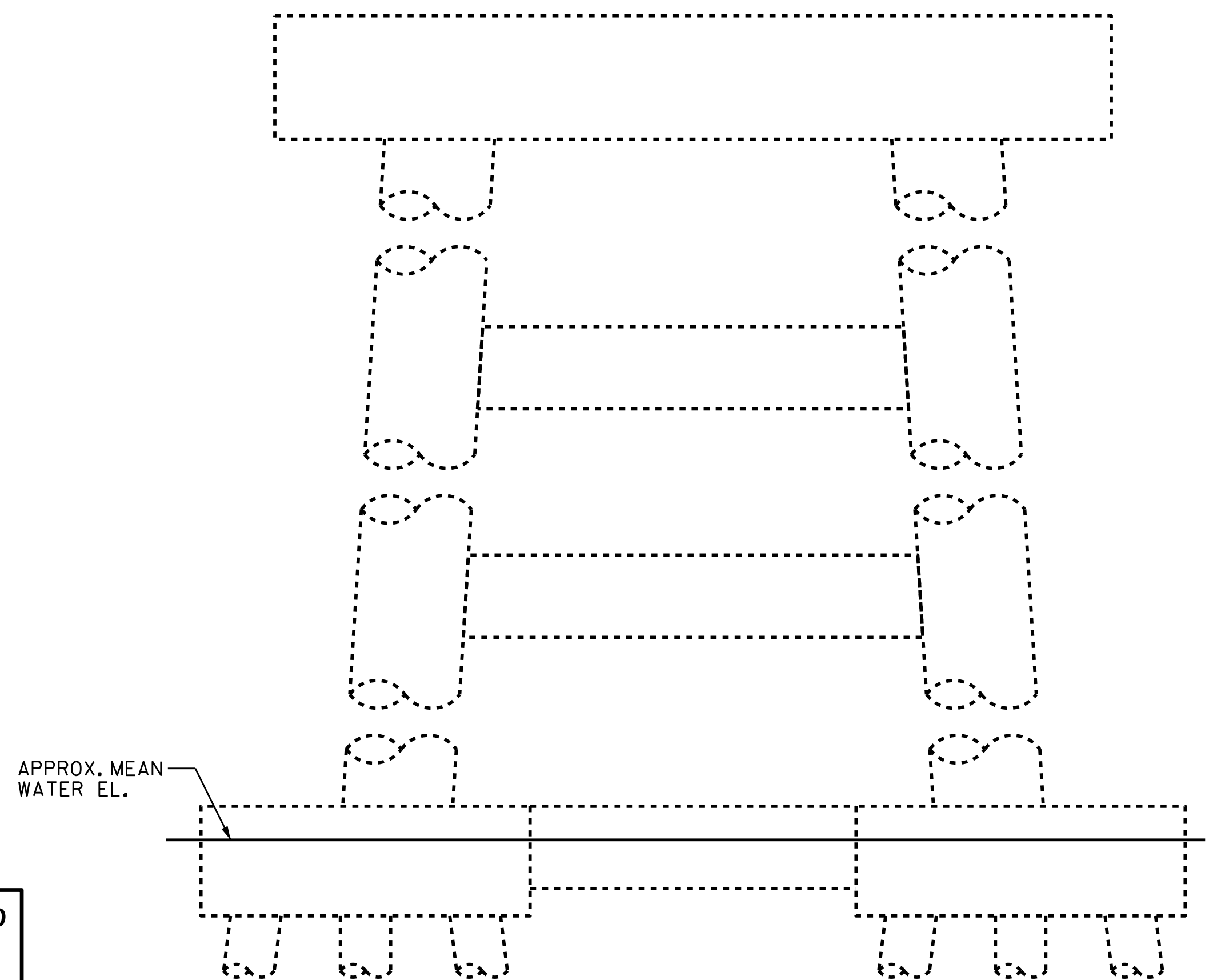
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-  SHOTCRETE REPAIR AREA
-  EPOXY RESIN INJECTION (ERI)



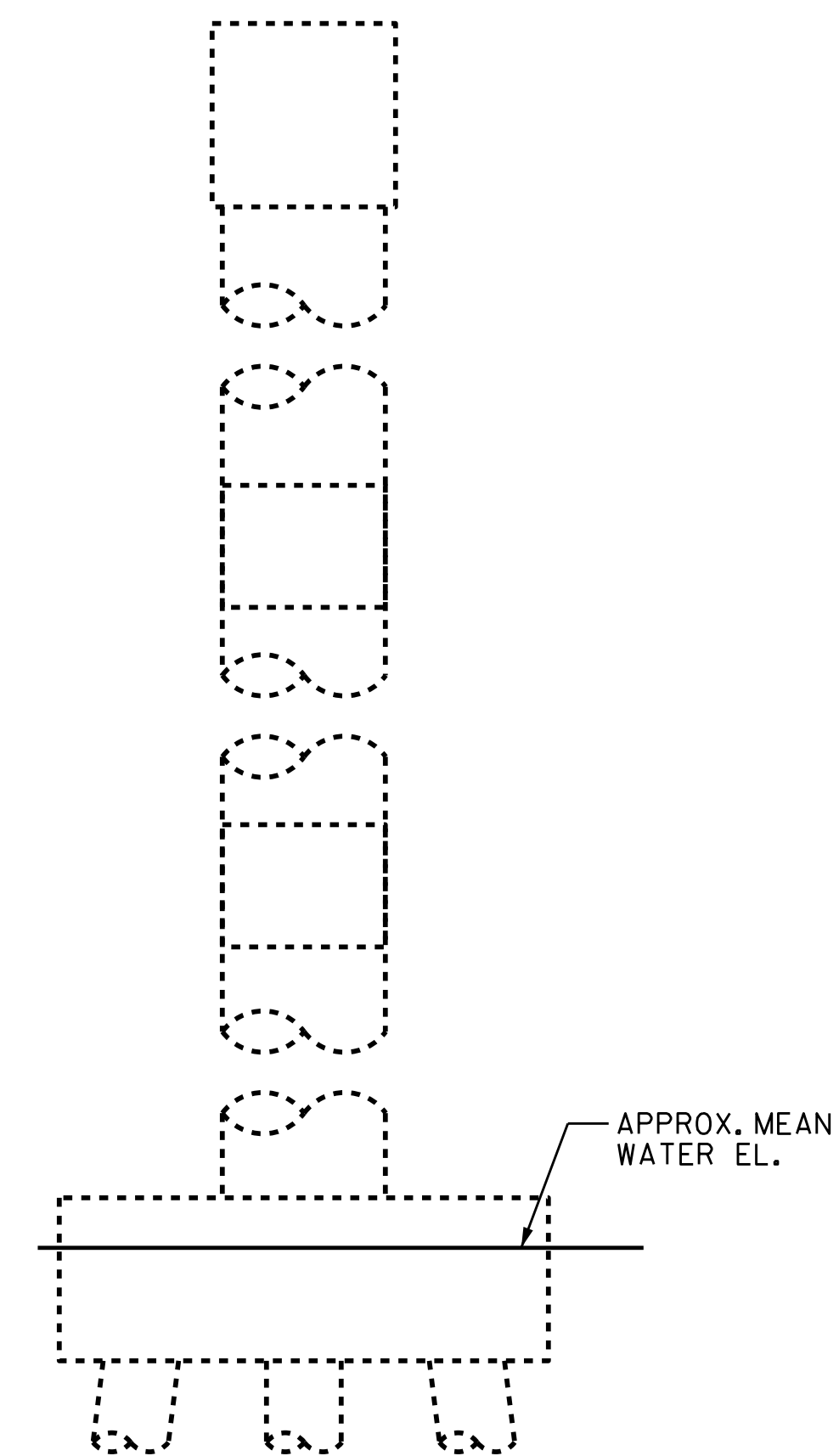
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 13	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	1.6	0.8		
COLUMN/PILE	82.0	41.0		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	0.2	0.1		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		-		
COLUMN/PILE		-		

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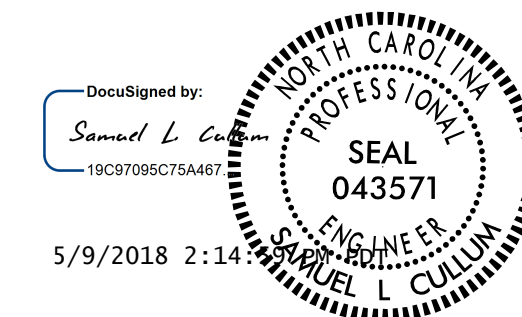
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PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018



5/9/2018 2:14 PM

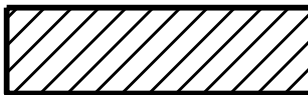
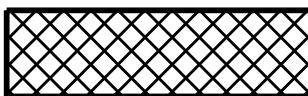

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

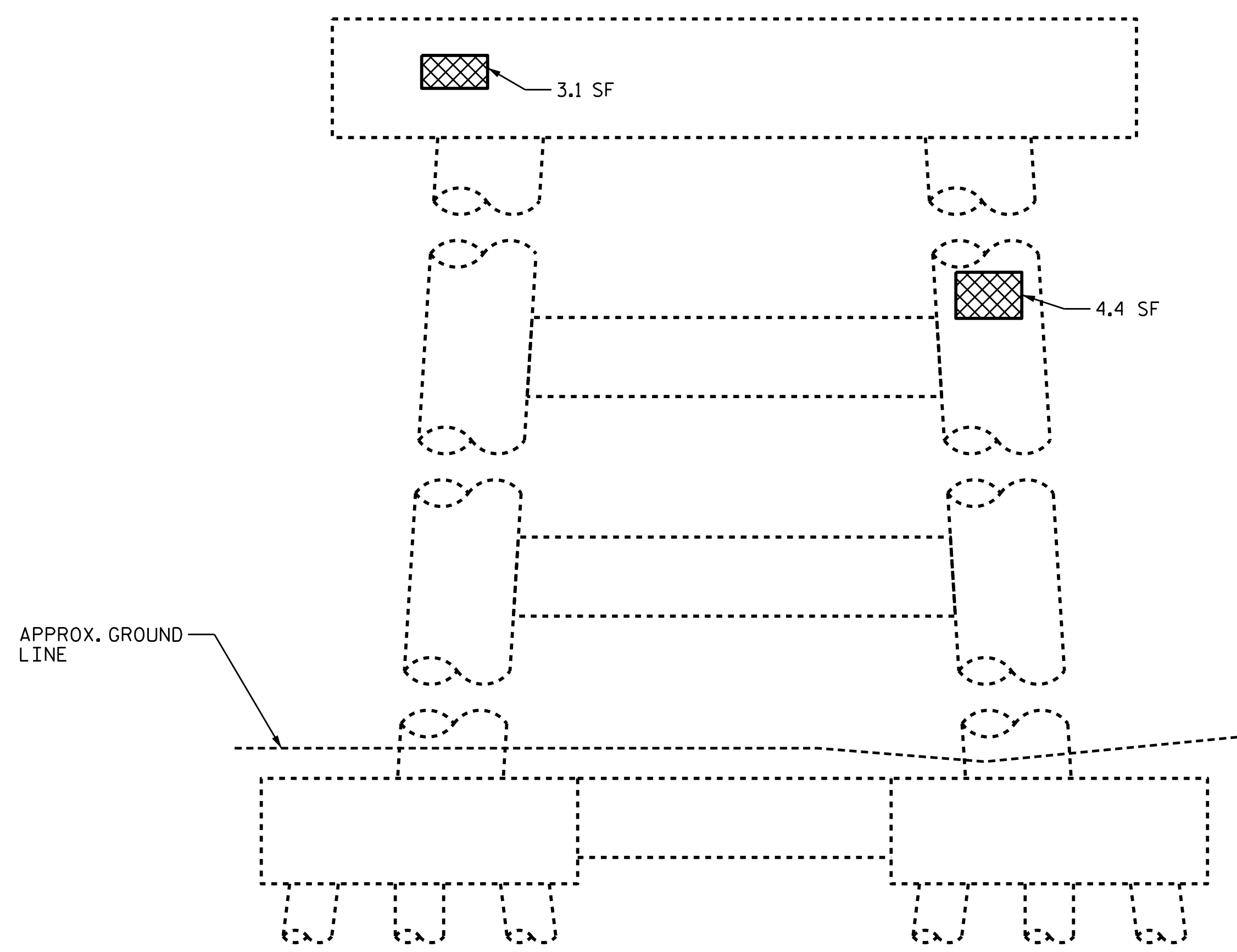
**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 13**

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-48
2			4			TOTAL SHEETS 73

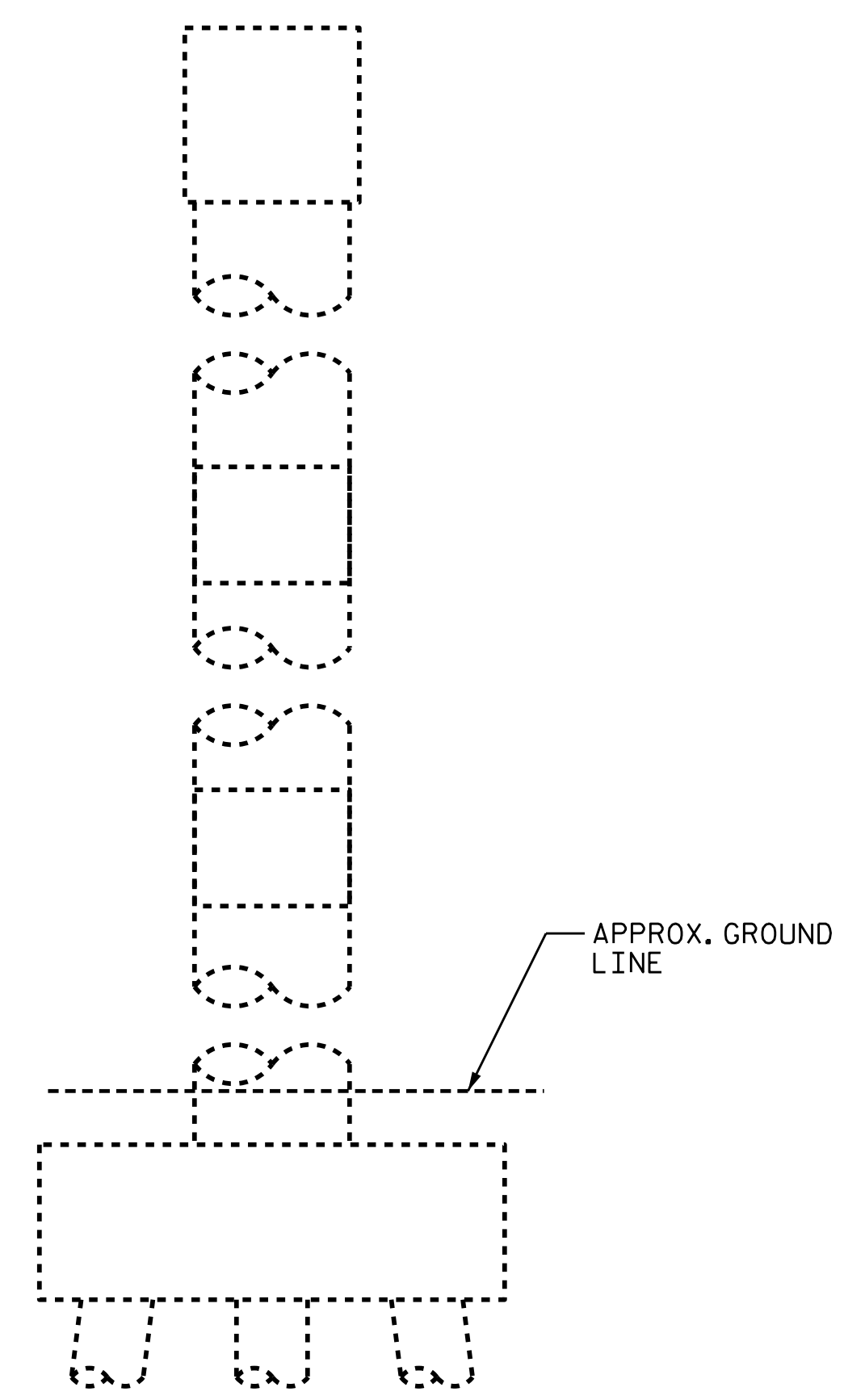
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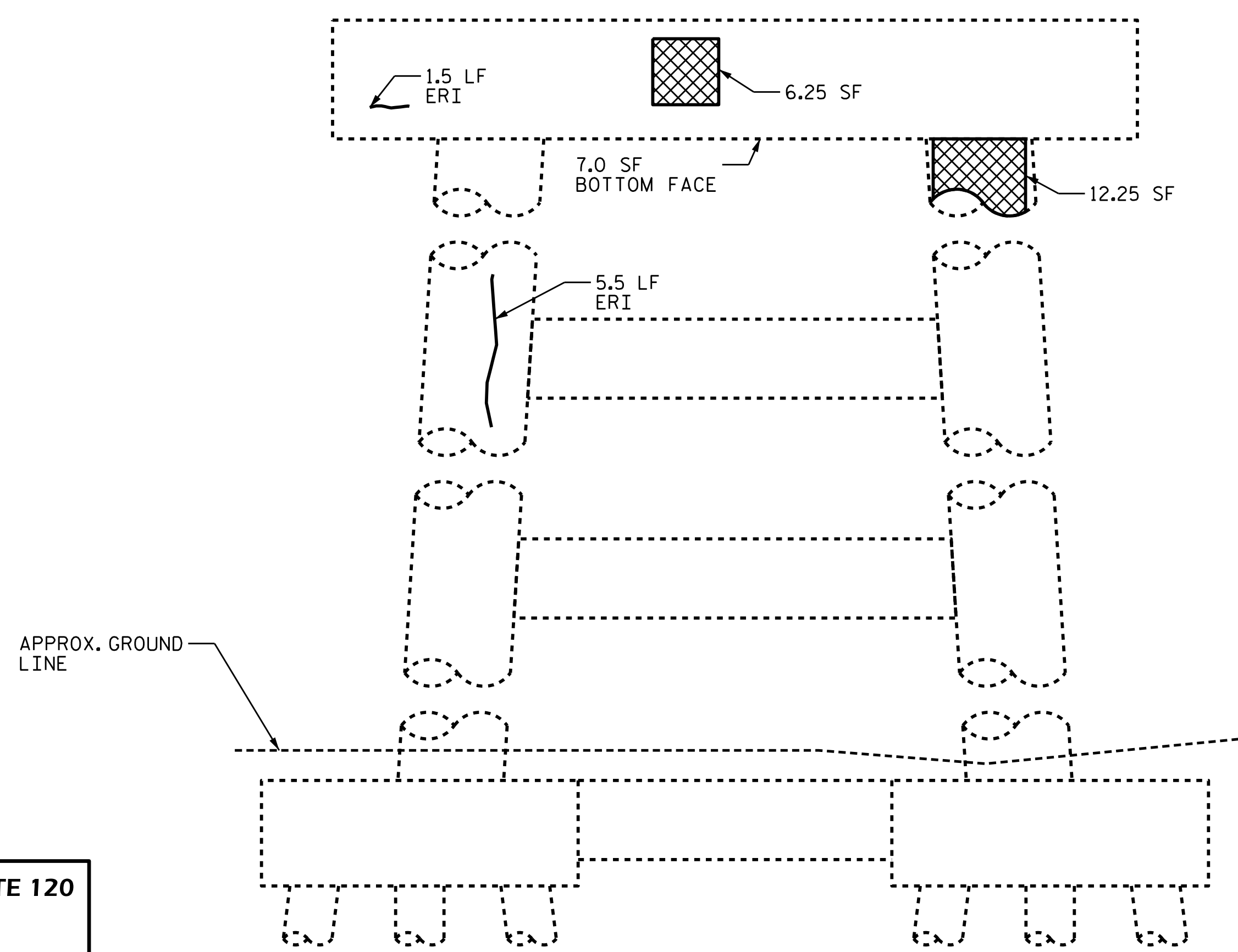
-  CONCRETE REPAIR AREA (FORM AND POUR)
-  SHOTCRETE REPAIR AREA
-  EPOXY RESIN INJECTION (ERI)



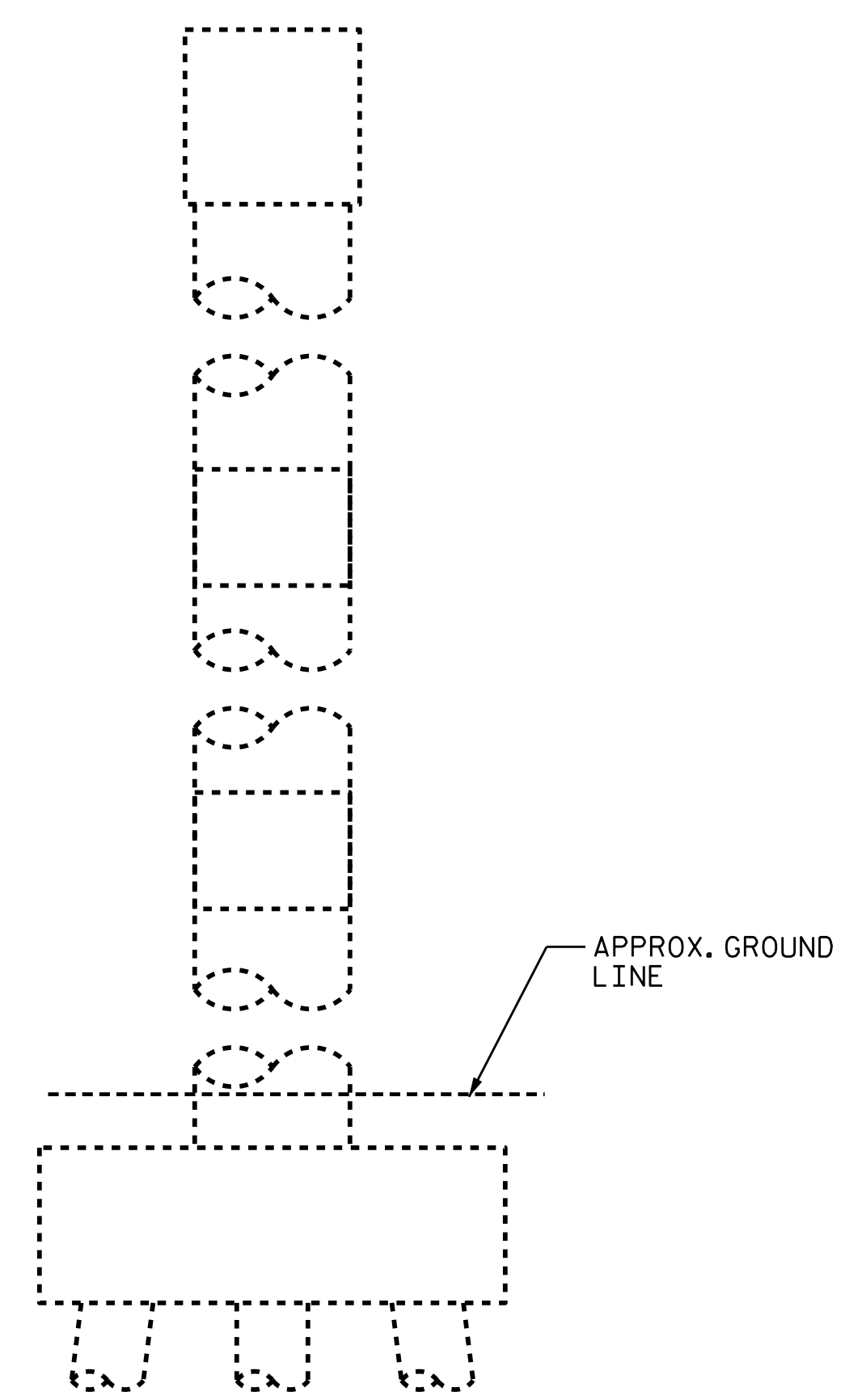
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 14	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	16.4	8.2		
COLUMN/PILE	16.7	8.3		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	2.5	1.2		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	1.5			
COLUMN/PILE	5.5			

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 - SUBSTRUCTURE" SHEET.

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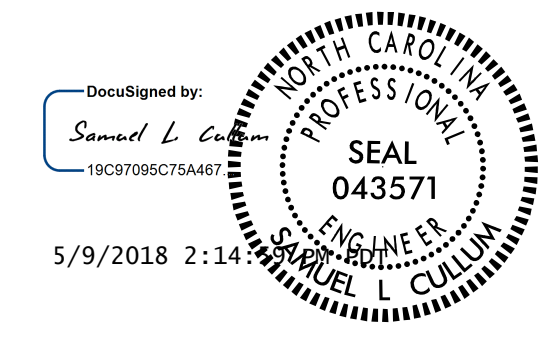
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PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 14**

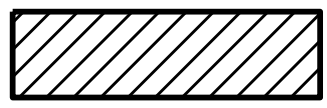


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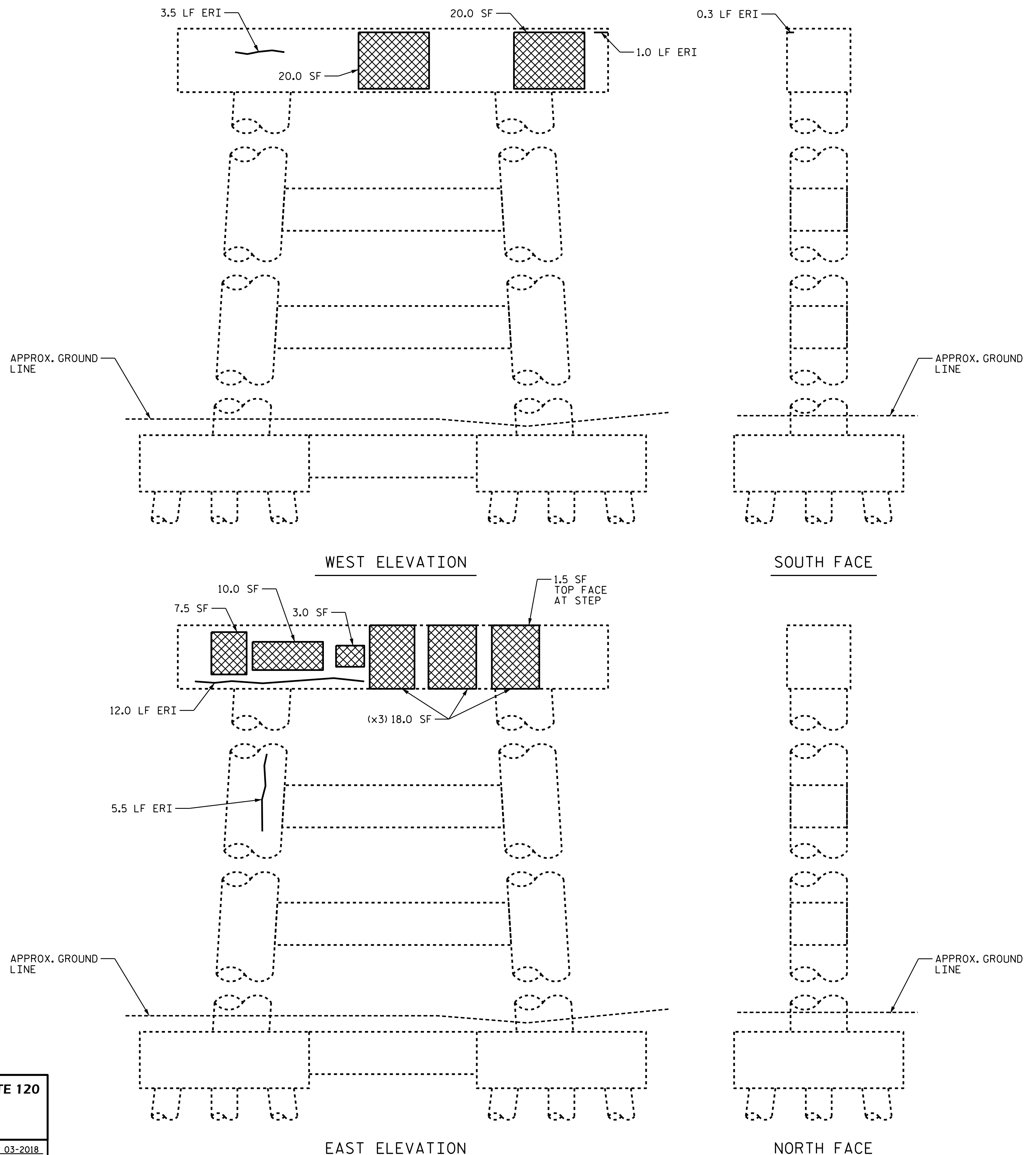
DRAWN BY :	AARON J. MCMILLAN	DATE :	03-2018
CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-49
2			4			TOTAL SHEETS 73

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LEGEND:

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



AS-BUILT REPAIR QUANTITY TABLE

BENT 15	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	116.0	58.0		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	17.4	8.7		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		16.8		
COLUMN/PILE		5.5		

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 - SUBSTRUCTURE" SHEET.

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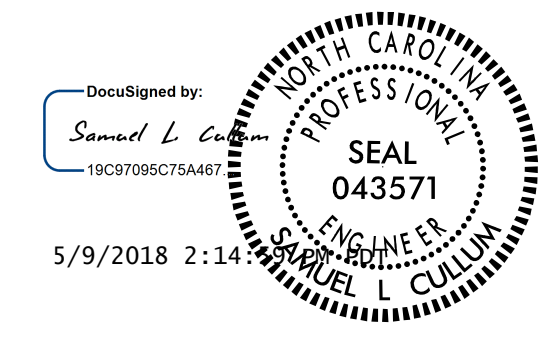
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PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 15**

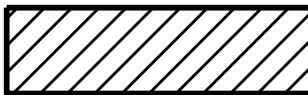


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 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

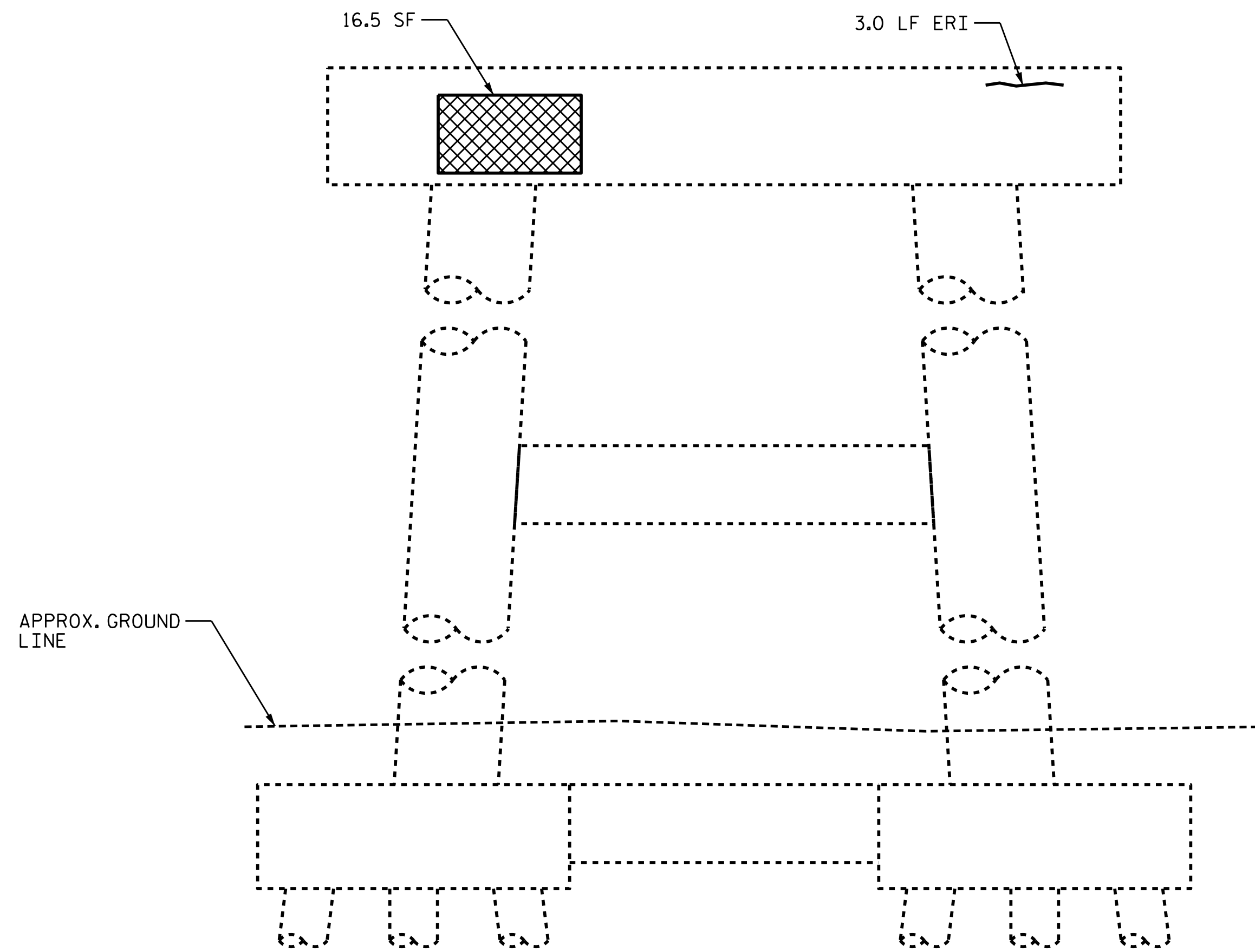
DRAWN BY :	AARON J. MCMILLAN	DATE :	03-2018
CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

NO.	REVISIONS			SHEET NO.
	BY:	DATE:		
1			3	S-50
2			4	TOTAL SHEETS 73

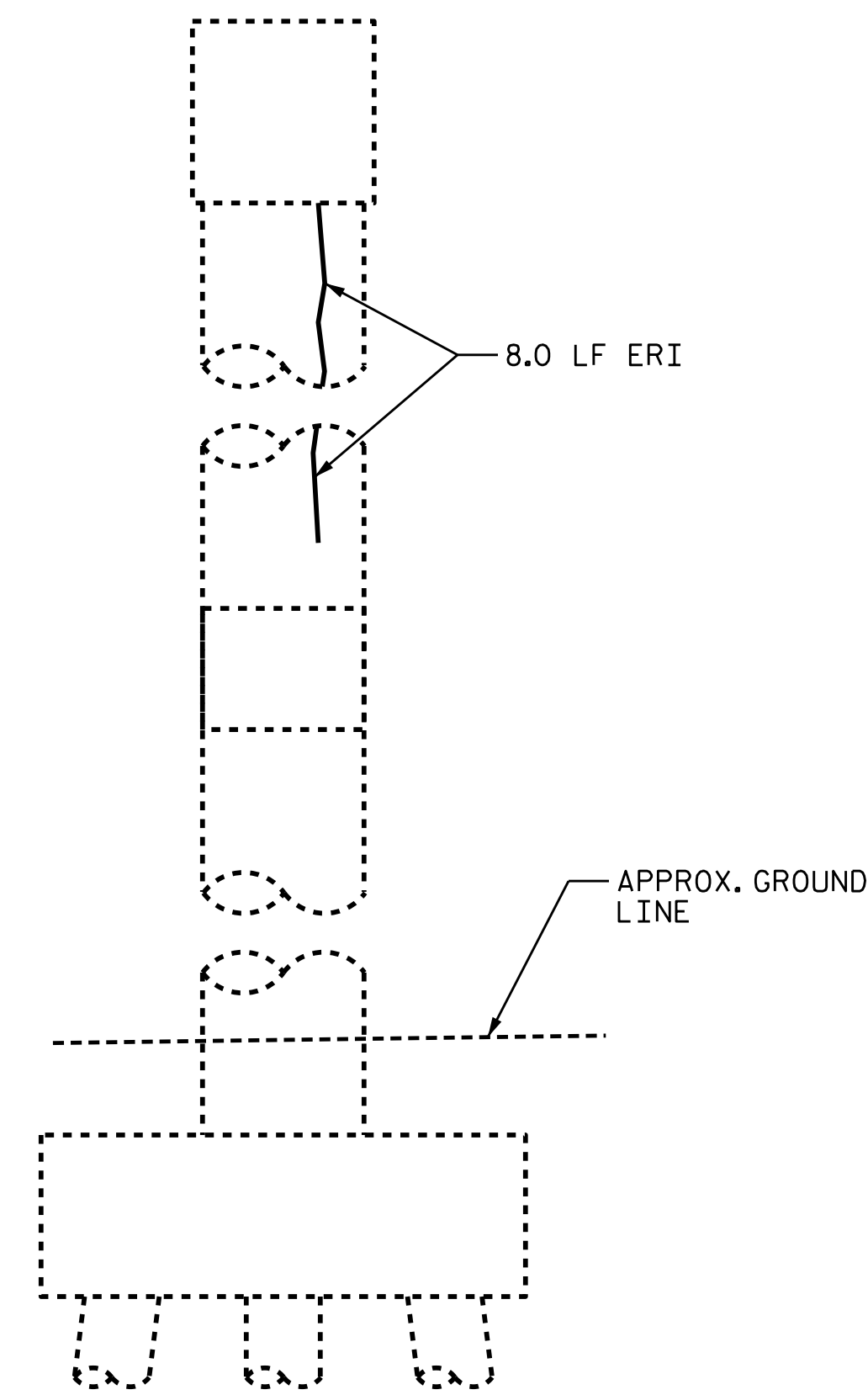
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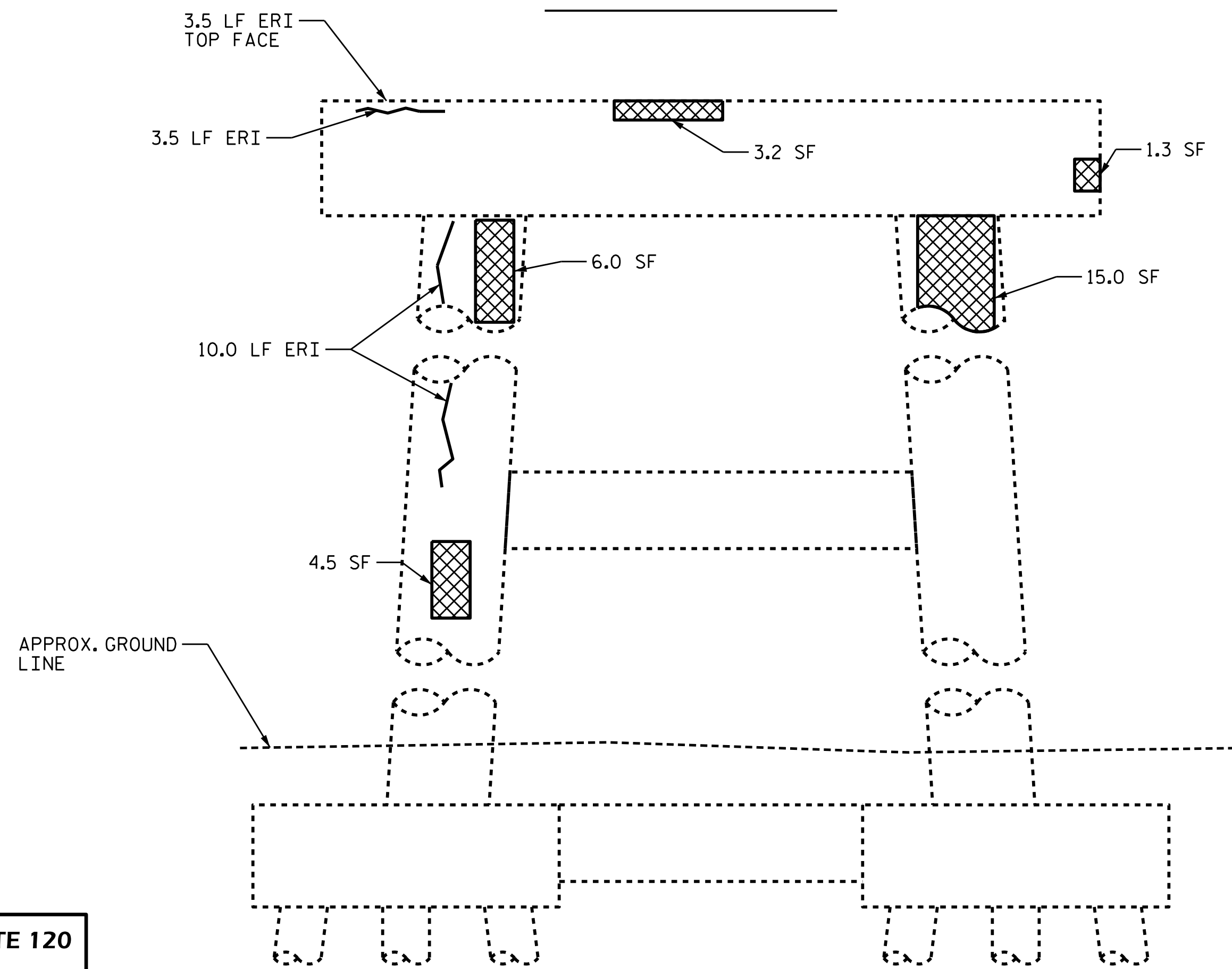
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-  SHOTCRETE REPAIR AREA
-  EPOXY RESIN INJECTION (ERI)



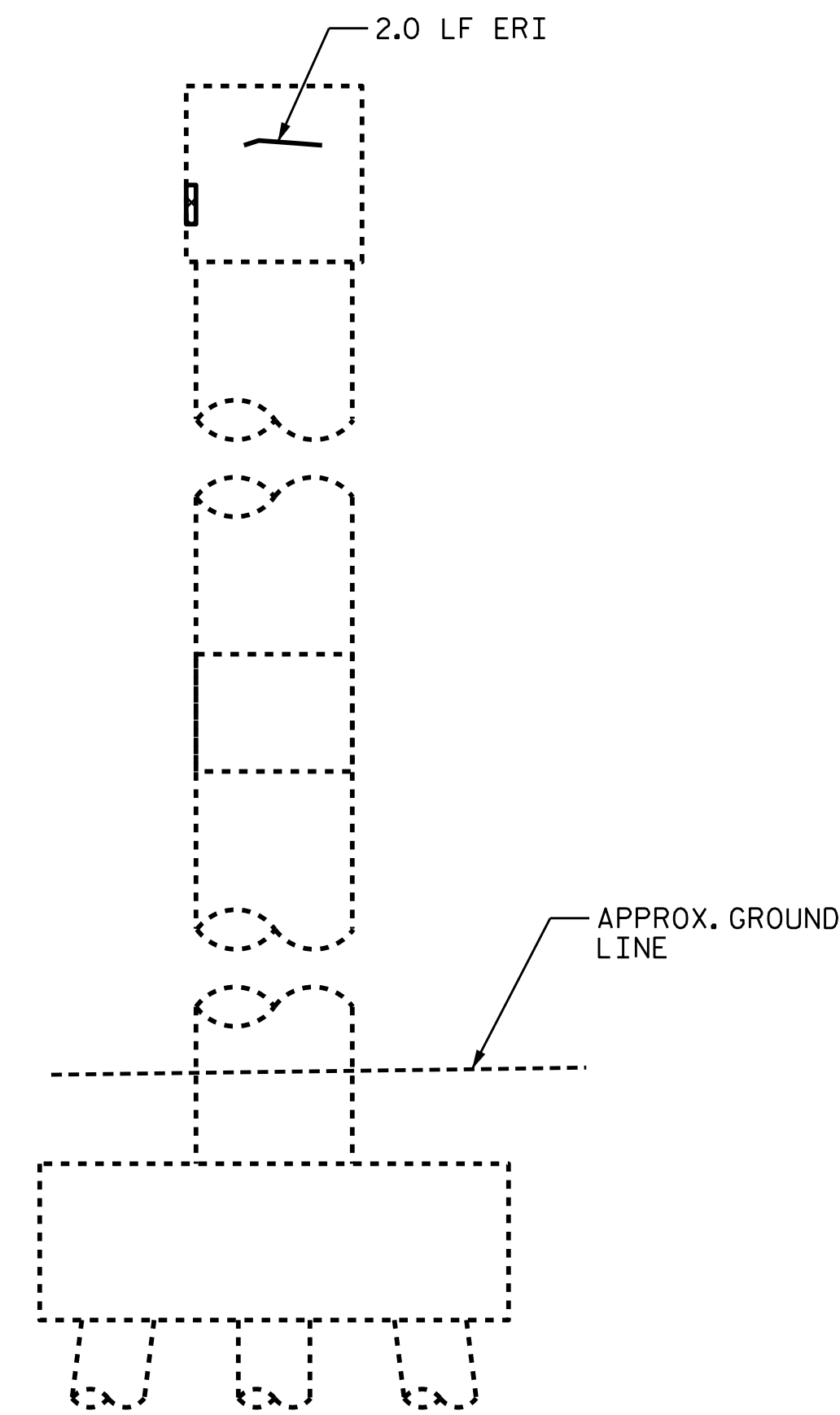
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 16	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	21.0	10.5		
COLUMN/PILE	25.5	12.8		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	3.2	1.6		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		12.0		
COLUMN/PILE		18.0		

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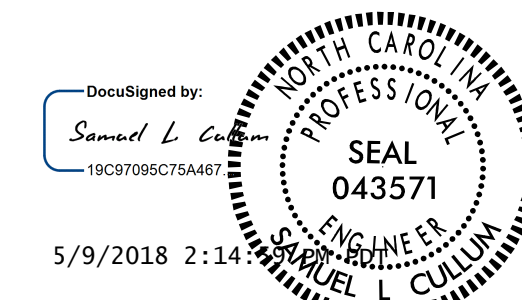
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PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018



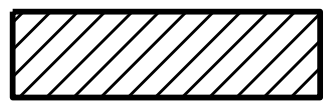


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

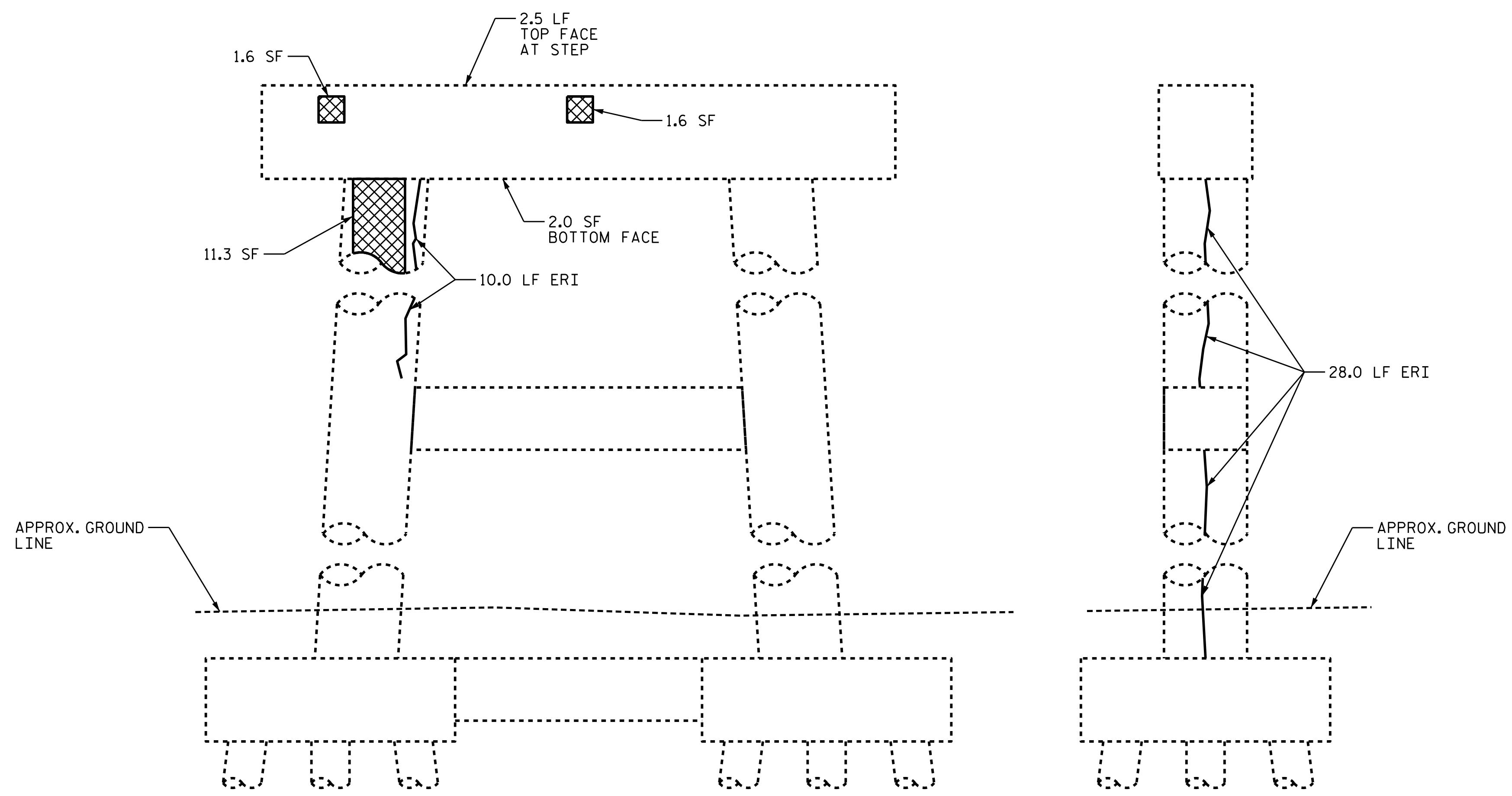
**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 16**

NO.	REVISIONS			NO.	REVISIONS			SHEET NO.
	BY:	DATE:			BY:	DATE:		
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2				4				TOTAL SHEETS 73

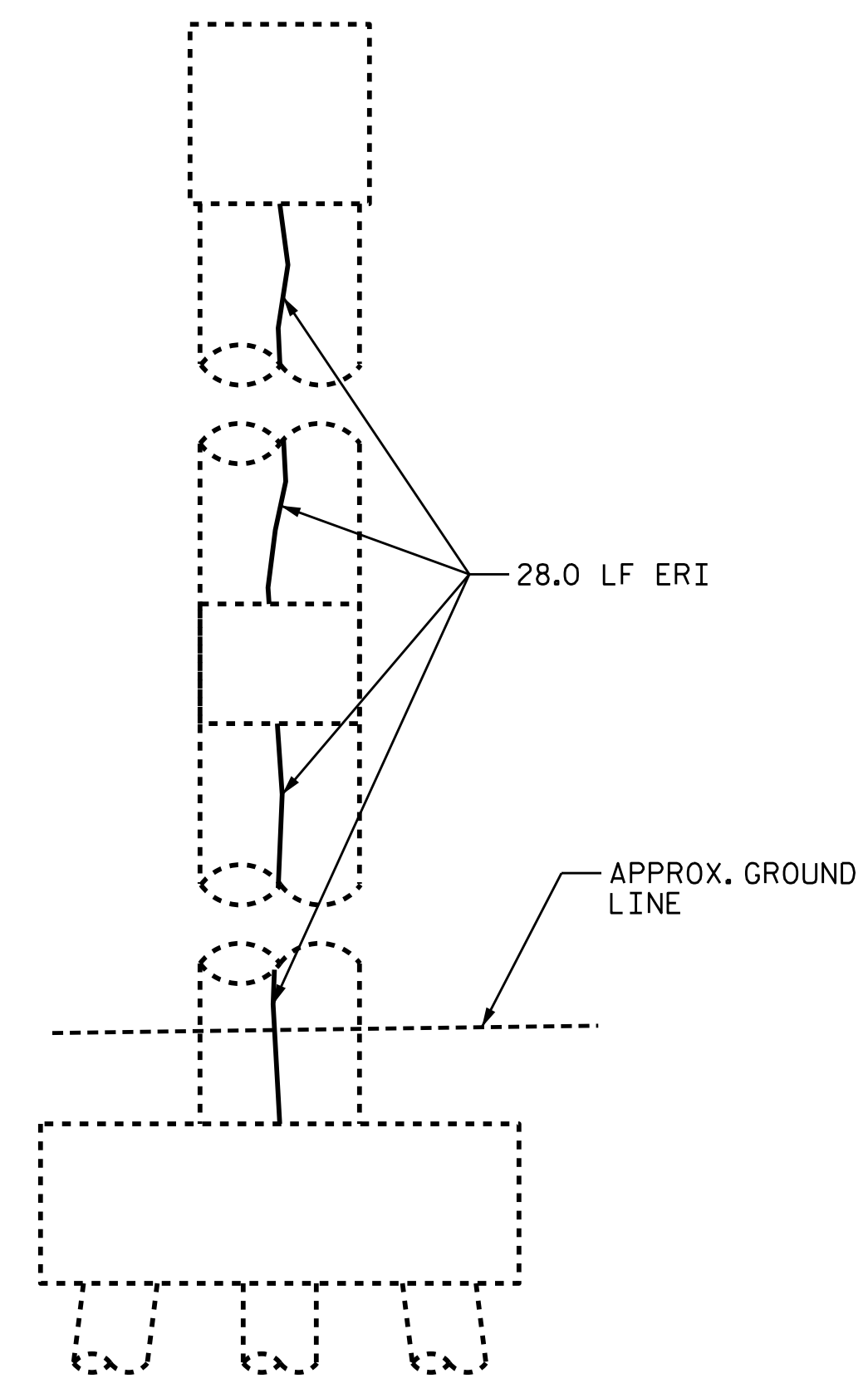
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LEGEND:

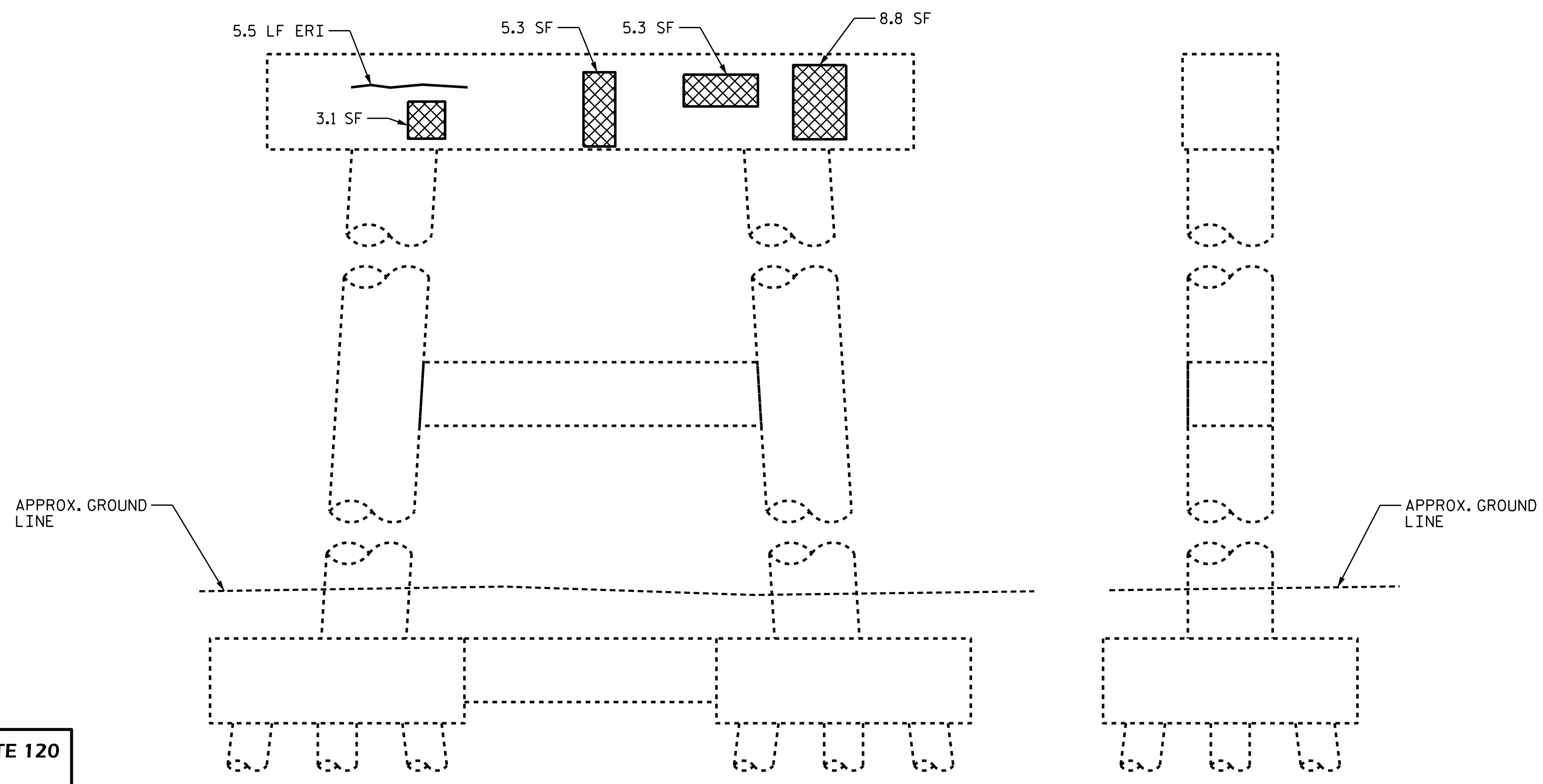
-  CONCRETE REPAIR AREA (FORM AND POUR)
-  SHOTCRETE REPAIR AREA
-  EPOXY RESIN INJECTION (ERI)



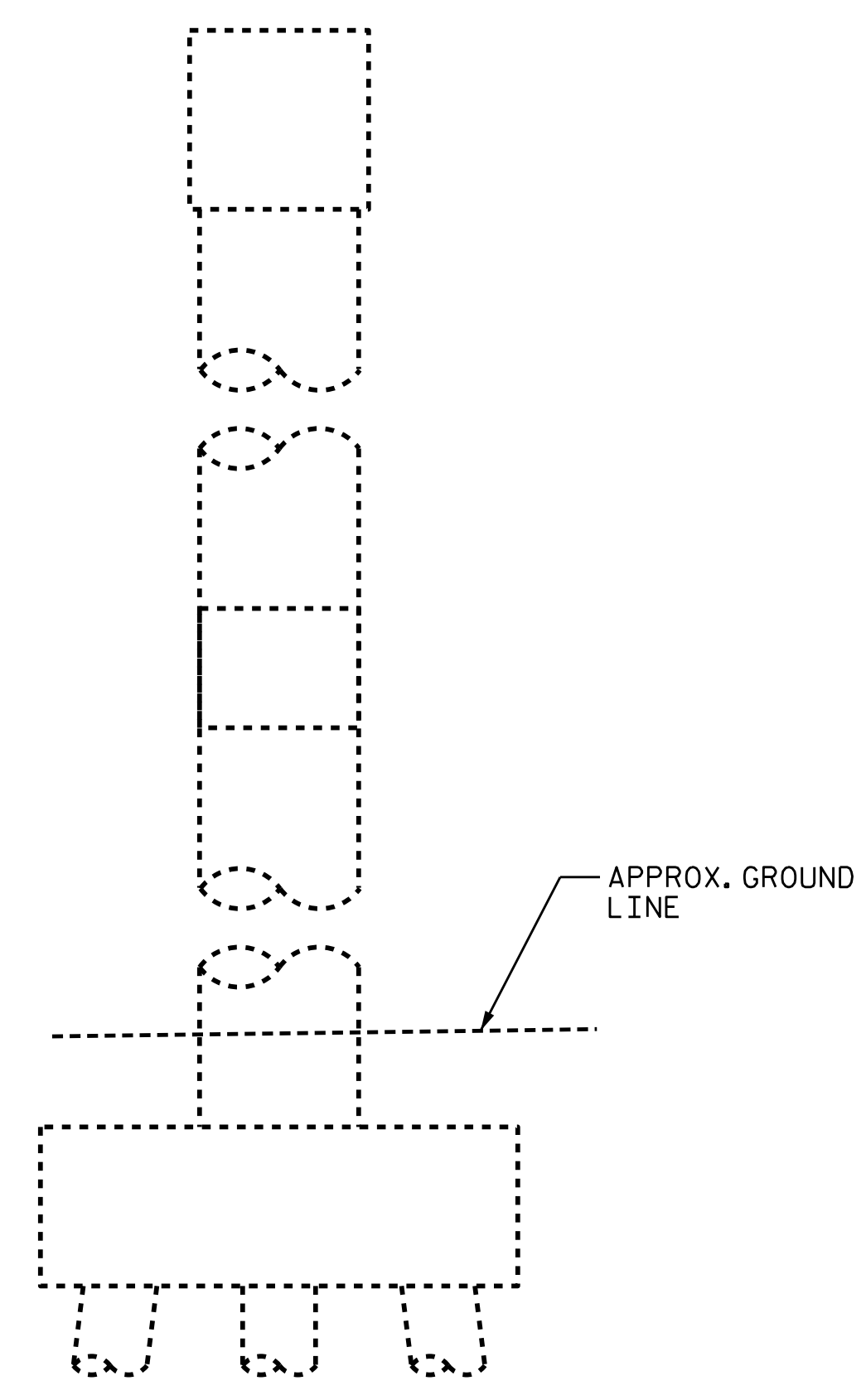
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 17	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	27.7	13.9		
COLUMN/PILE	11.3	5.7		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	4.2	2.1		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		8.0		
COLUMN/PILE		38.0		

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 - SUBSTRUCTURE" SHEET.

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 AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2 1/2" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET AND SPECIAL PROVISIONS.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

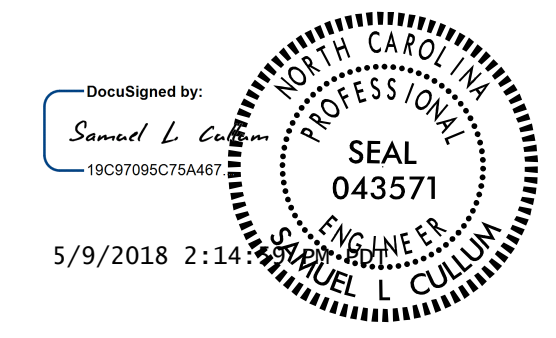
ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

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

COAT ALL SURFACE AREAS OF THE TOP OF THE CAP INCLUDING CHAMFERS, WITH EPOXY PROTECTIVE COATING. DO NOT COAT THE AREA UNDER THE ELASTOMERIC BEARINGS.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 17**

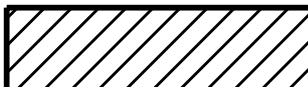


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 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

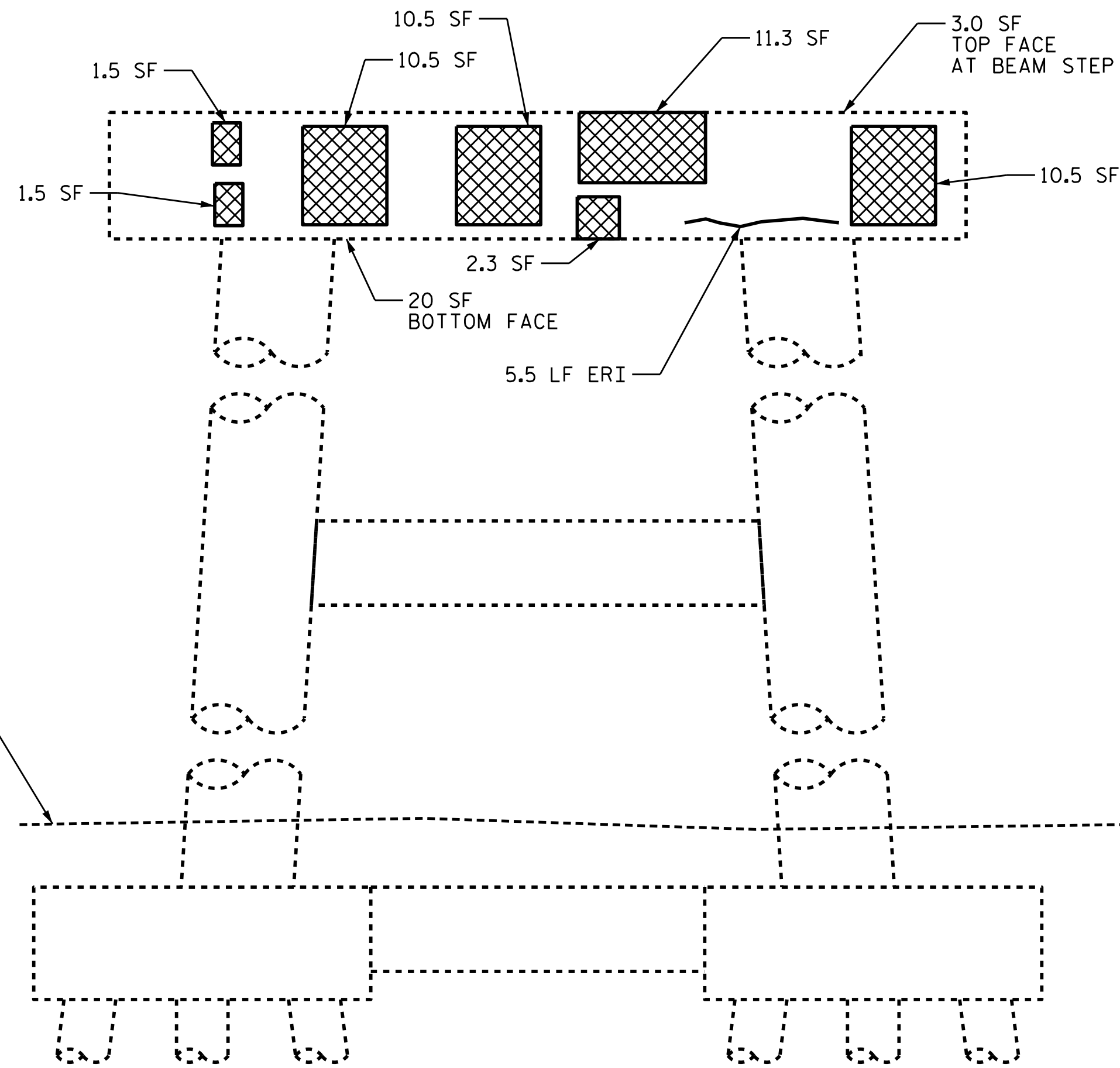
DRAWN BY :	AARON J. MCMILLAN	DATE :	03-2018
CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018

NO.	REVISIONS			SHEET NO.
	BY:	DATE:		
1			3	S-52
2			4	TOTAL SHEETS 73

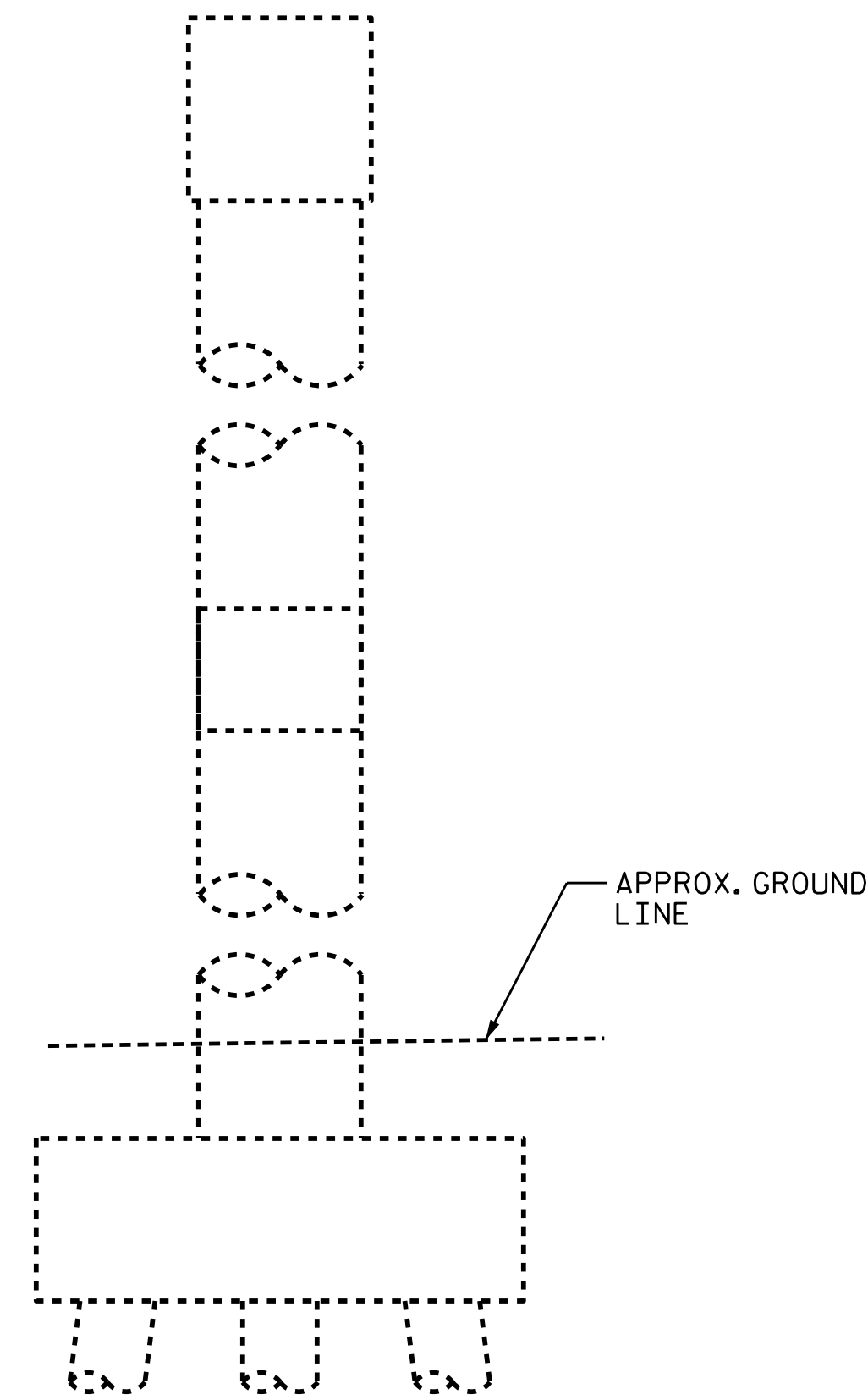
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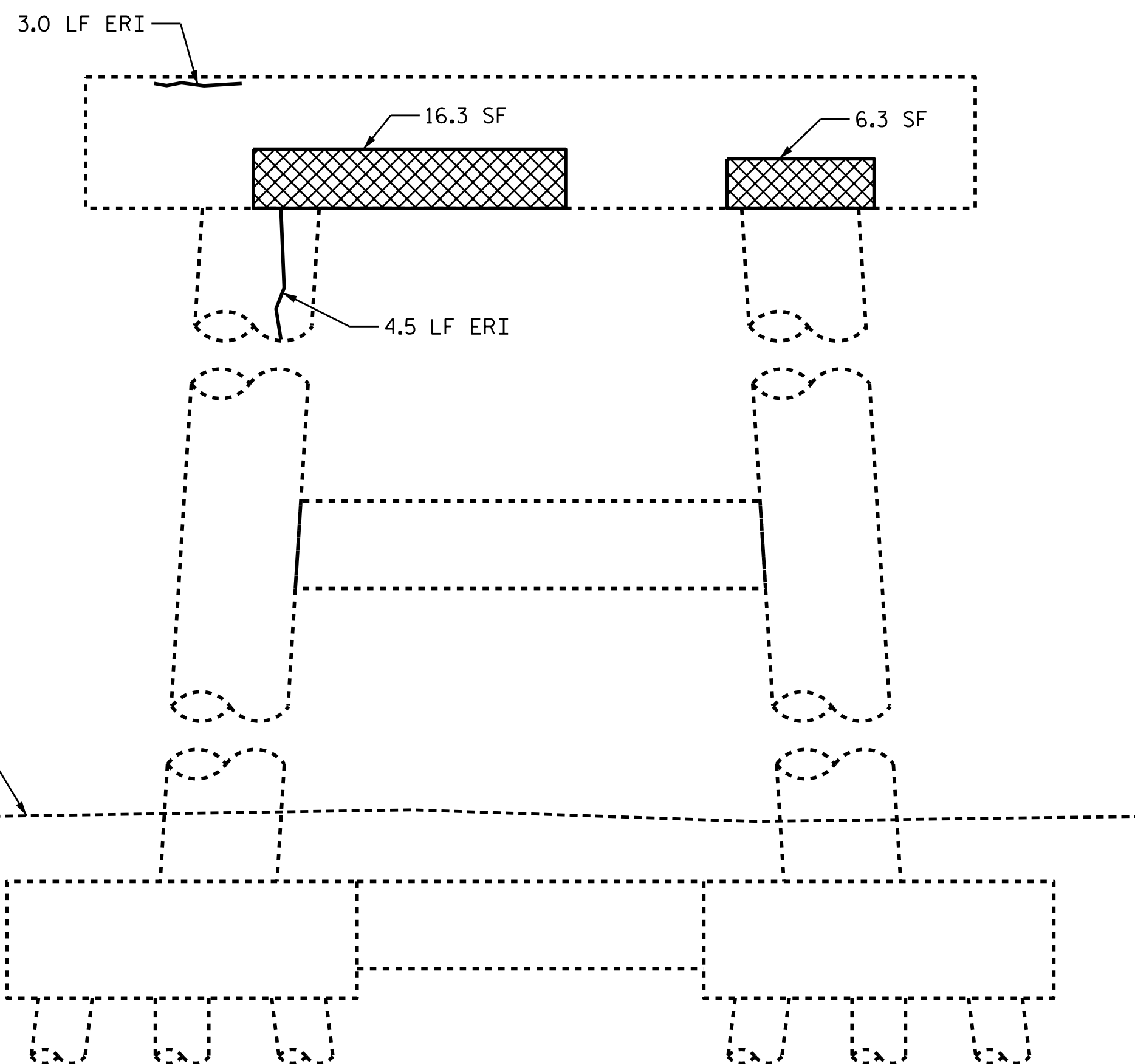
-  CONCRETE REPAIR AREA (FORM AND POUR)
-  SHOTCRETE REPAIR AREA
-  EPOXY RESIN INJECTION (ERI)



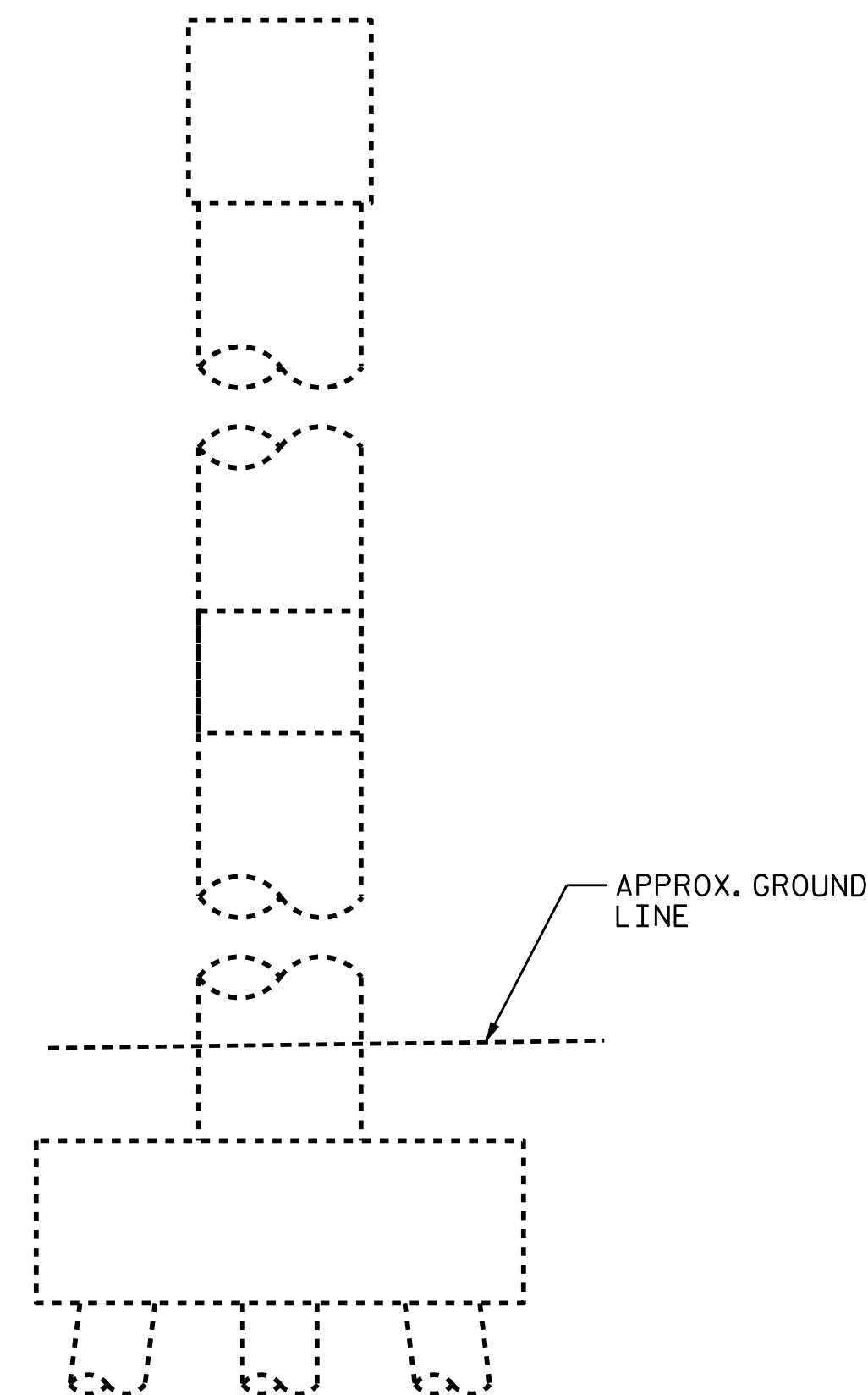
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 18	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	93.7	46.9		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	14.1	7.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		8.5		
COLUMN/PILE		4.5		

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 - SUBSTRUCTURE" SHEET.

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 AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

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

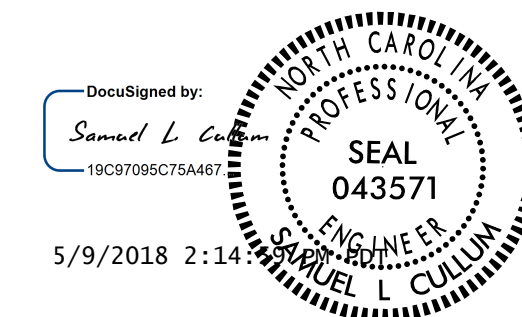
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PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
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 (919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

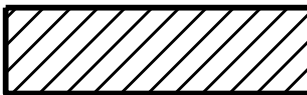




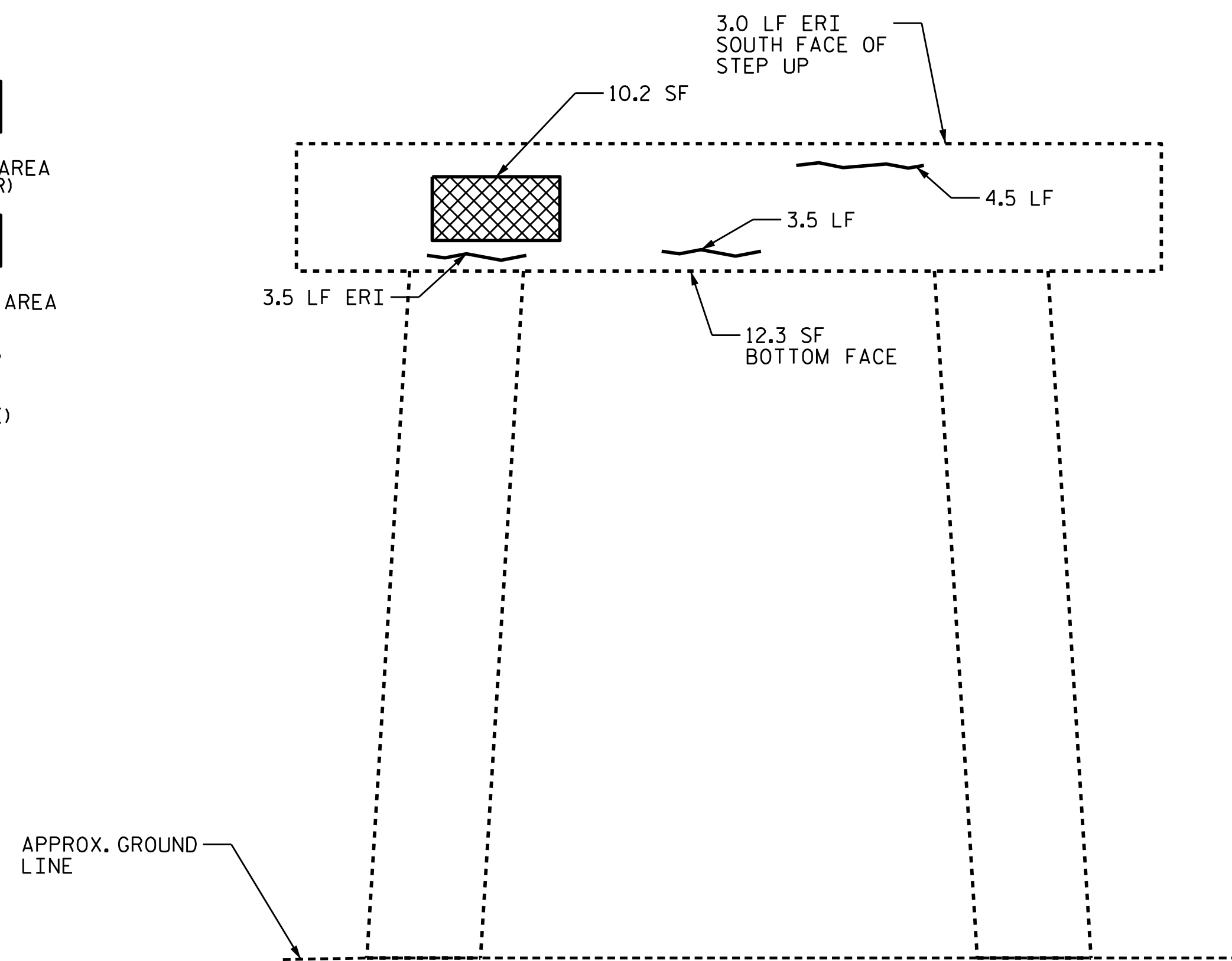
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 18**

NO.	REVISIONS			SHEET NO.
	BY:	DATE:	NO.	
1			3	S-53
2			4	TOTAL SHEETS 73

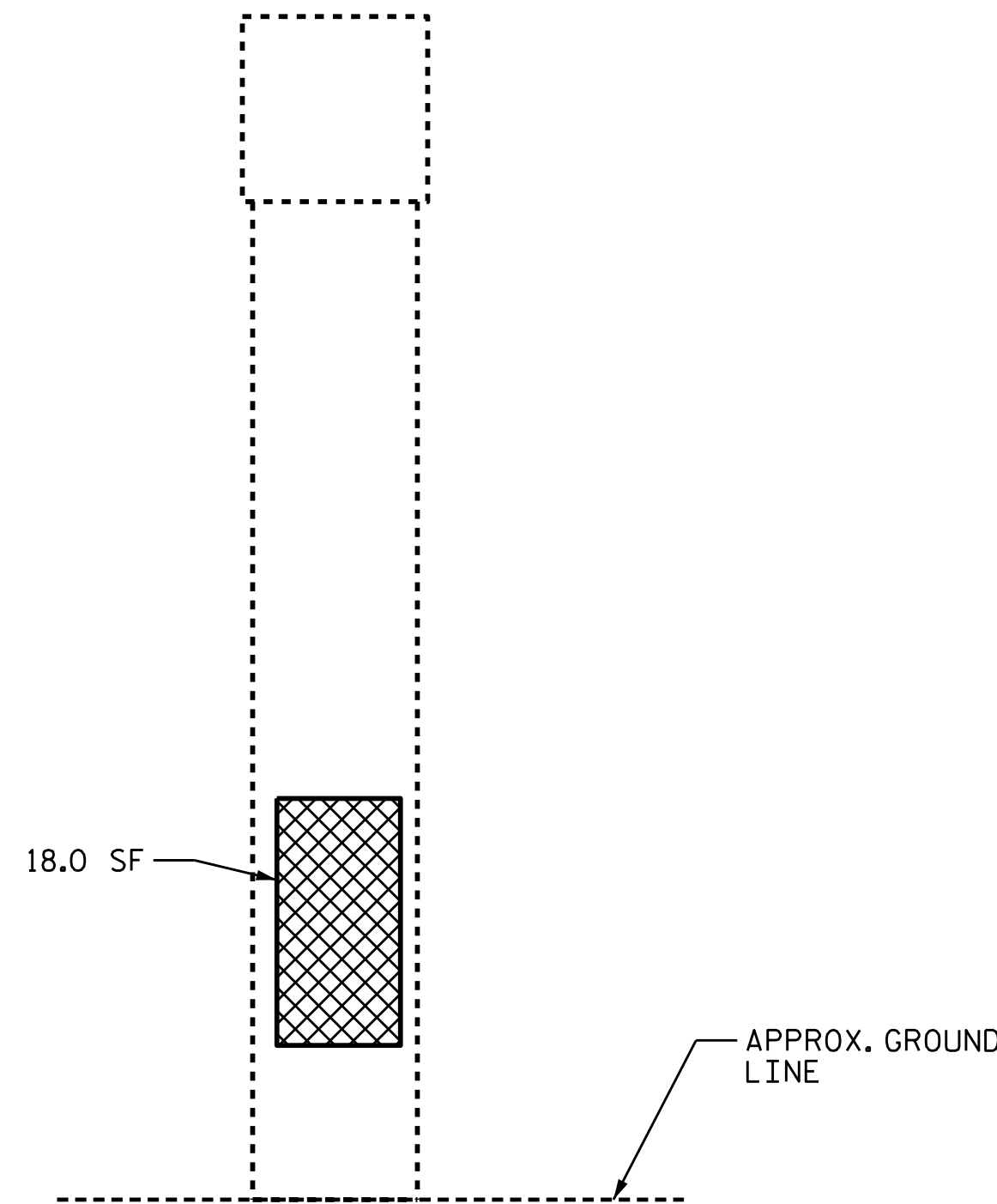
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LEGEND:

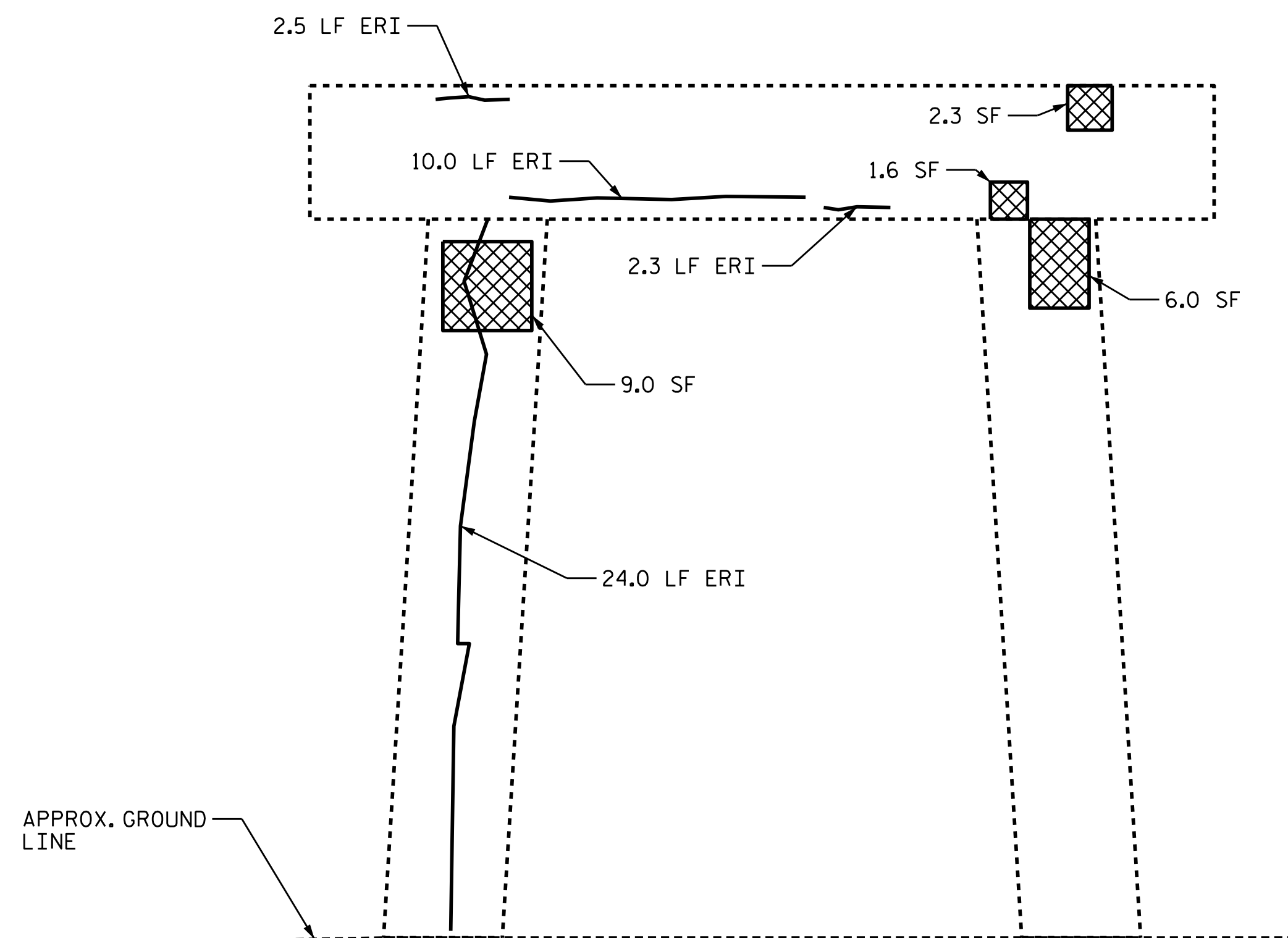
-  CONCRETE REPAIR AREA (FORM AND POUR)
-  SHOTCRETE REPAIR AREA
-  EPOXY RESIN INJECTION (ERI)



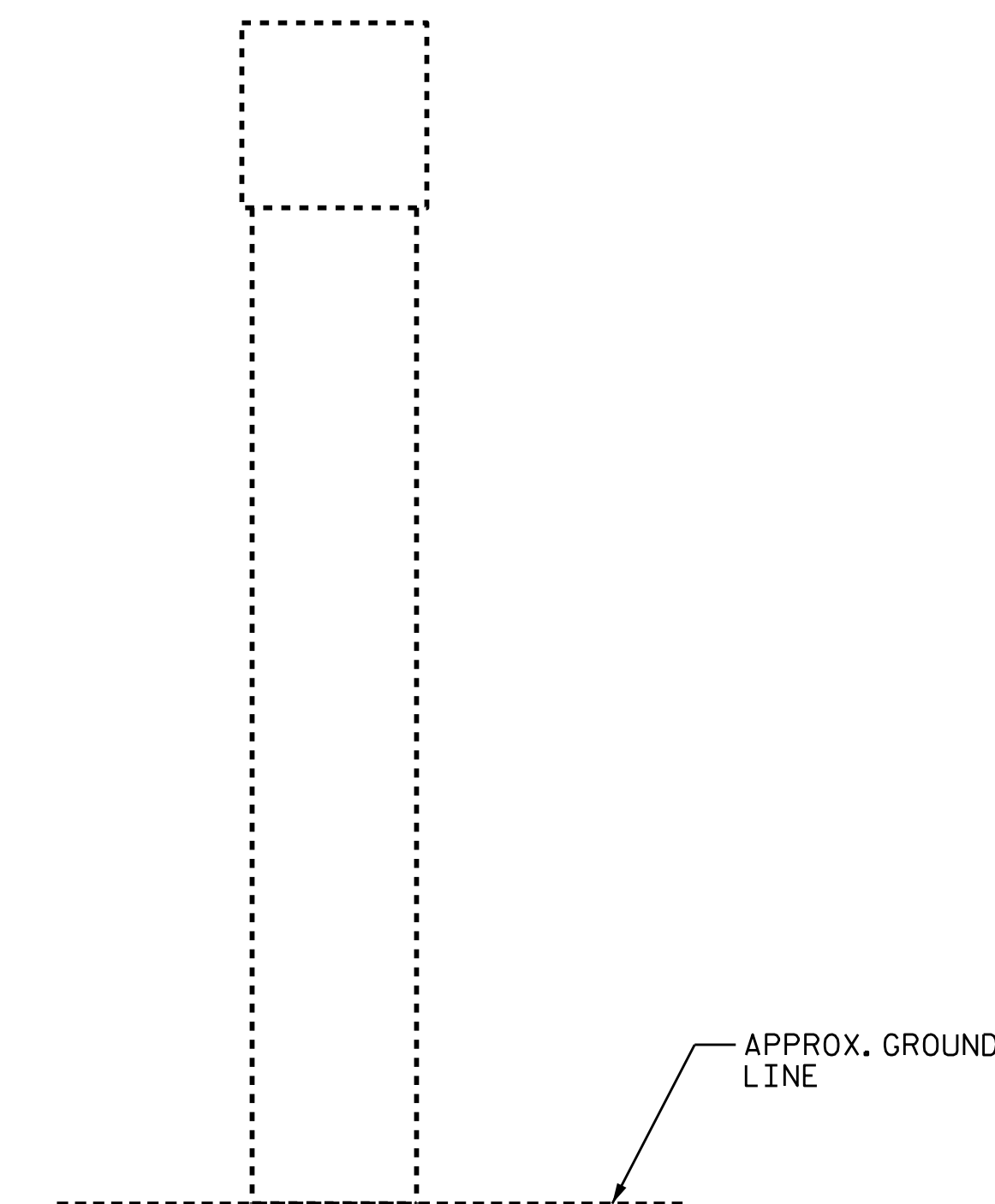
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 19	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	26.4	13.2		
COLUMN/PILE	33.0	16.5		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	4.0	2.0		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		29.3		
COLUMN/PILE		24.0		

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 - SUBSTRUCTURE" SHEET.

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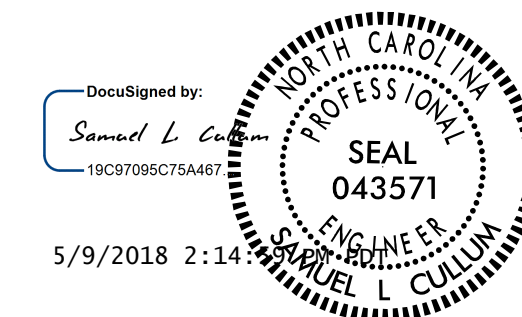
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PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018



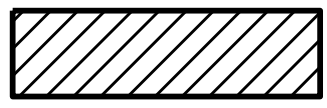


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

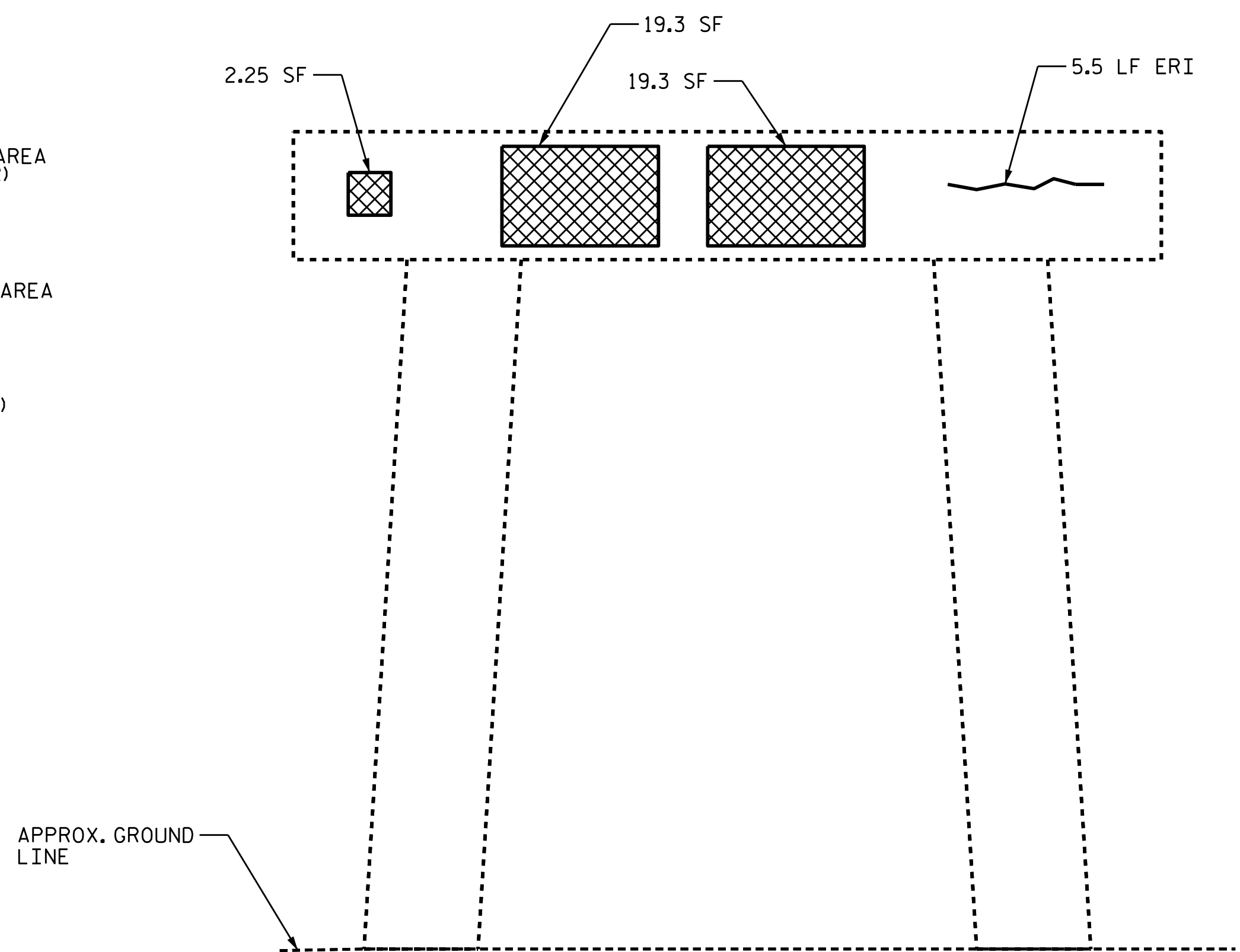
**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 19**

NO.	REVISIONS			NO.	REVISIONS			SHEET NO.
	BY:	DATE:			BY:	DATE:		
1				3			S-54	
2				4			TOTAL SHEETS 73	

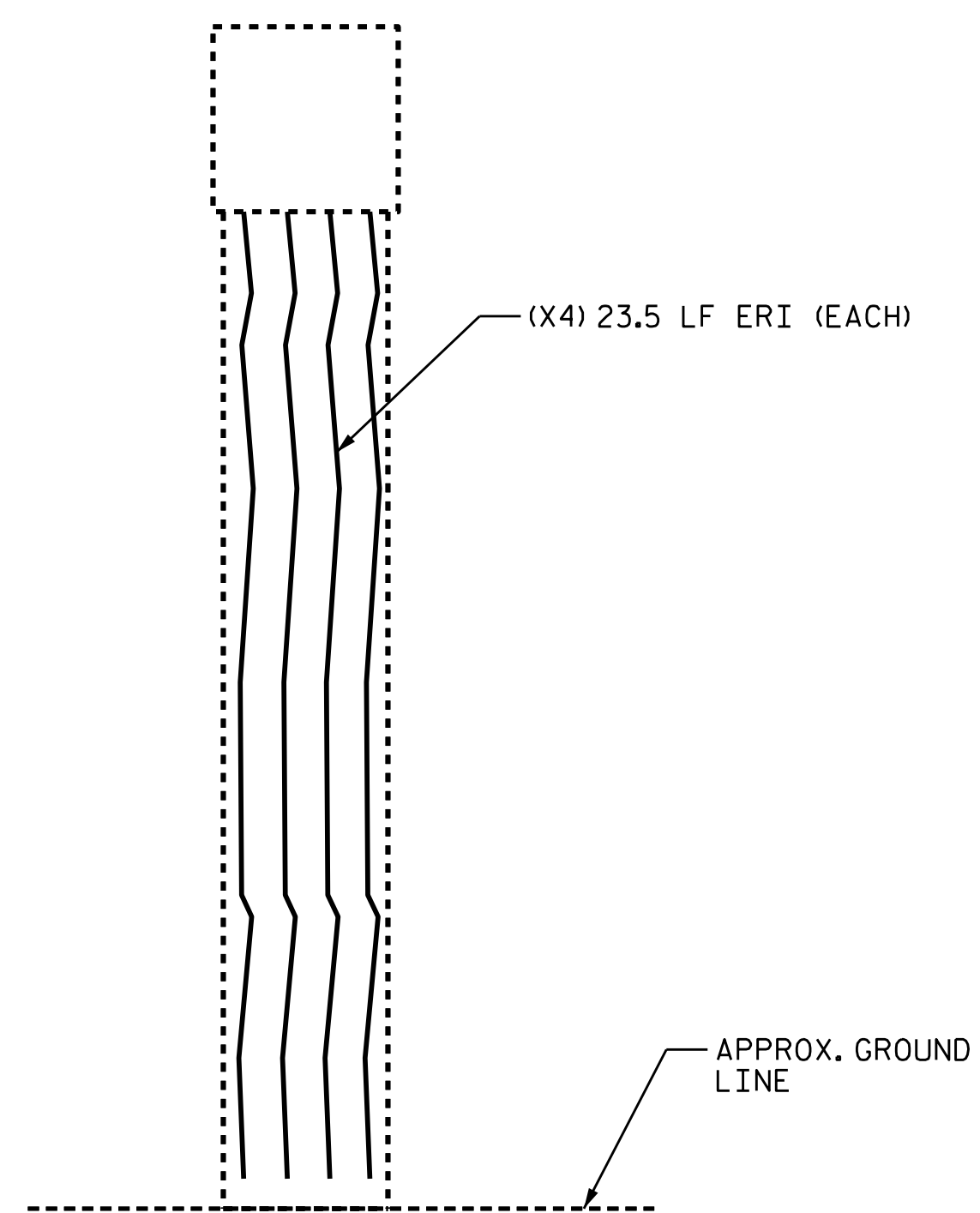
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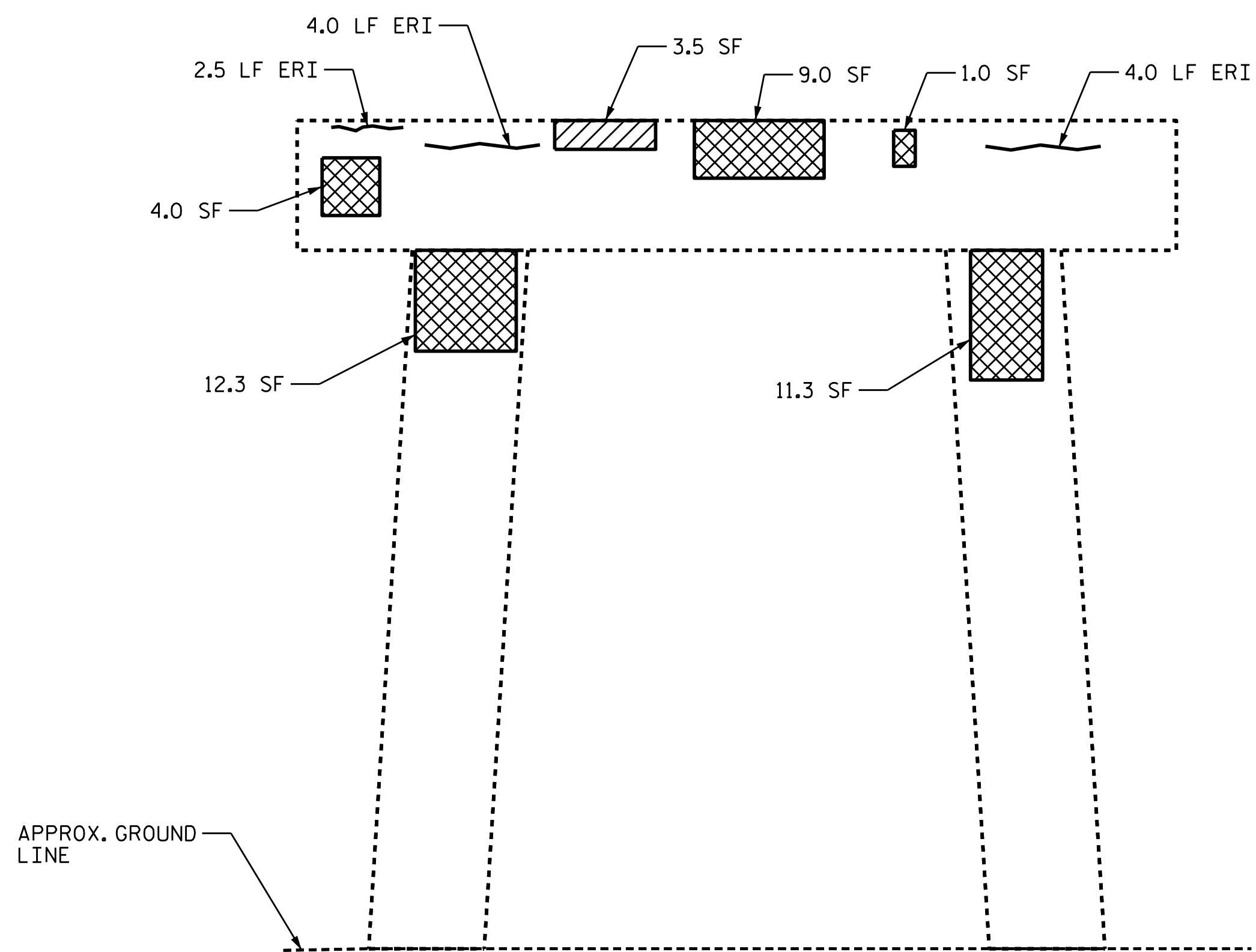
-  CONCRETE REPAIR AREA (FORM AND POUR)
-  SHOTCRETE REPAIR AREA
-  EPOXY RESIN INJECTION (ERI)



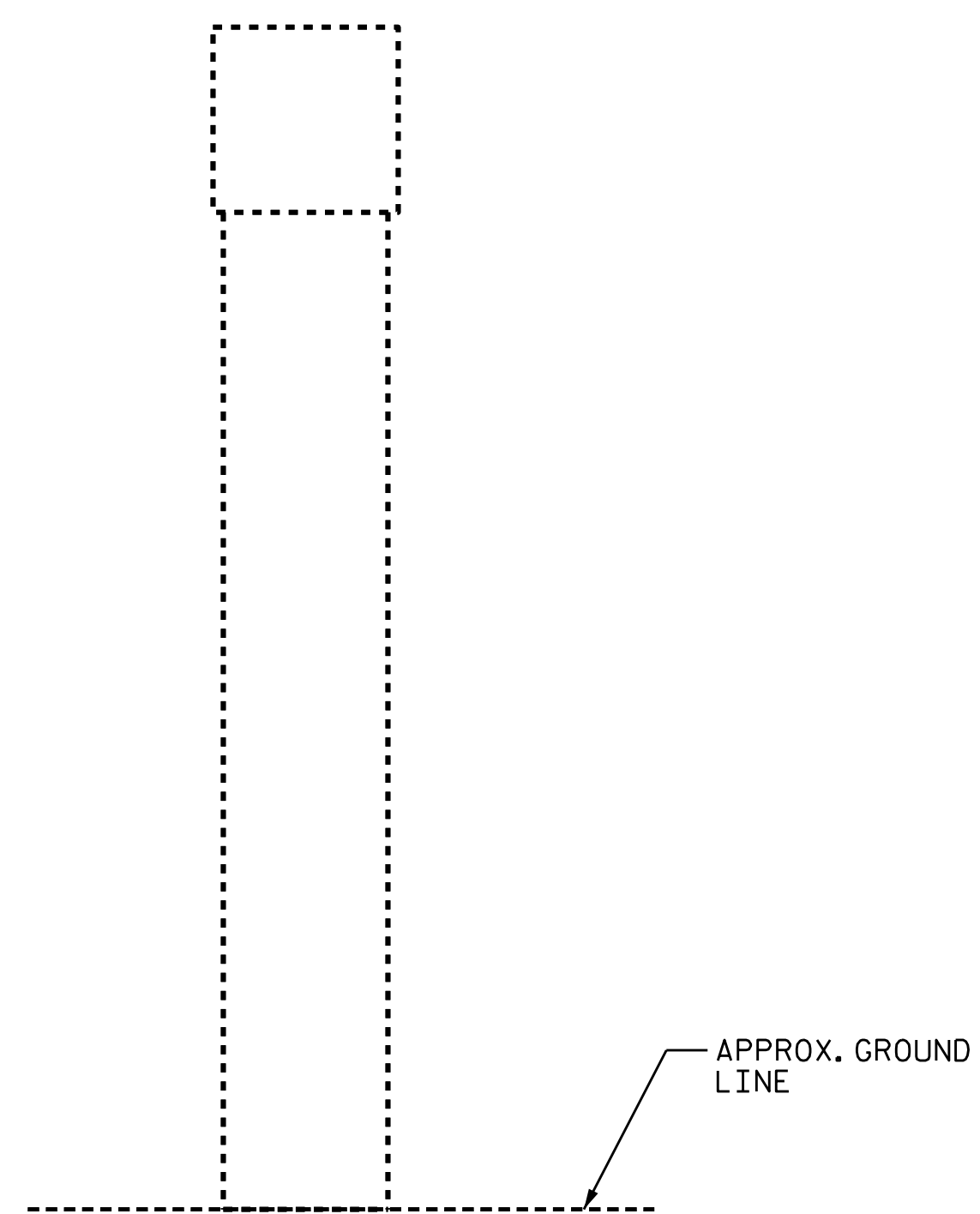
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 20	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	54.9	27.4		
COLUMN/PILE	23.6	11.8		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	8.2	4.1		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		16.0		
COLUMN/PILE		94.0		

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 - SUBSTRUCTURE" SHEET.

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CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

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SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

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ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

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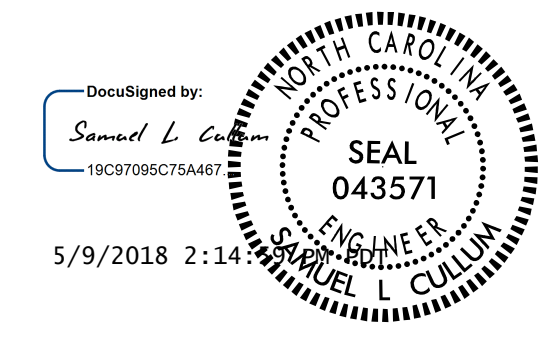
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BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

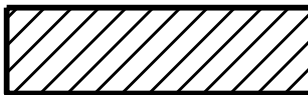




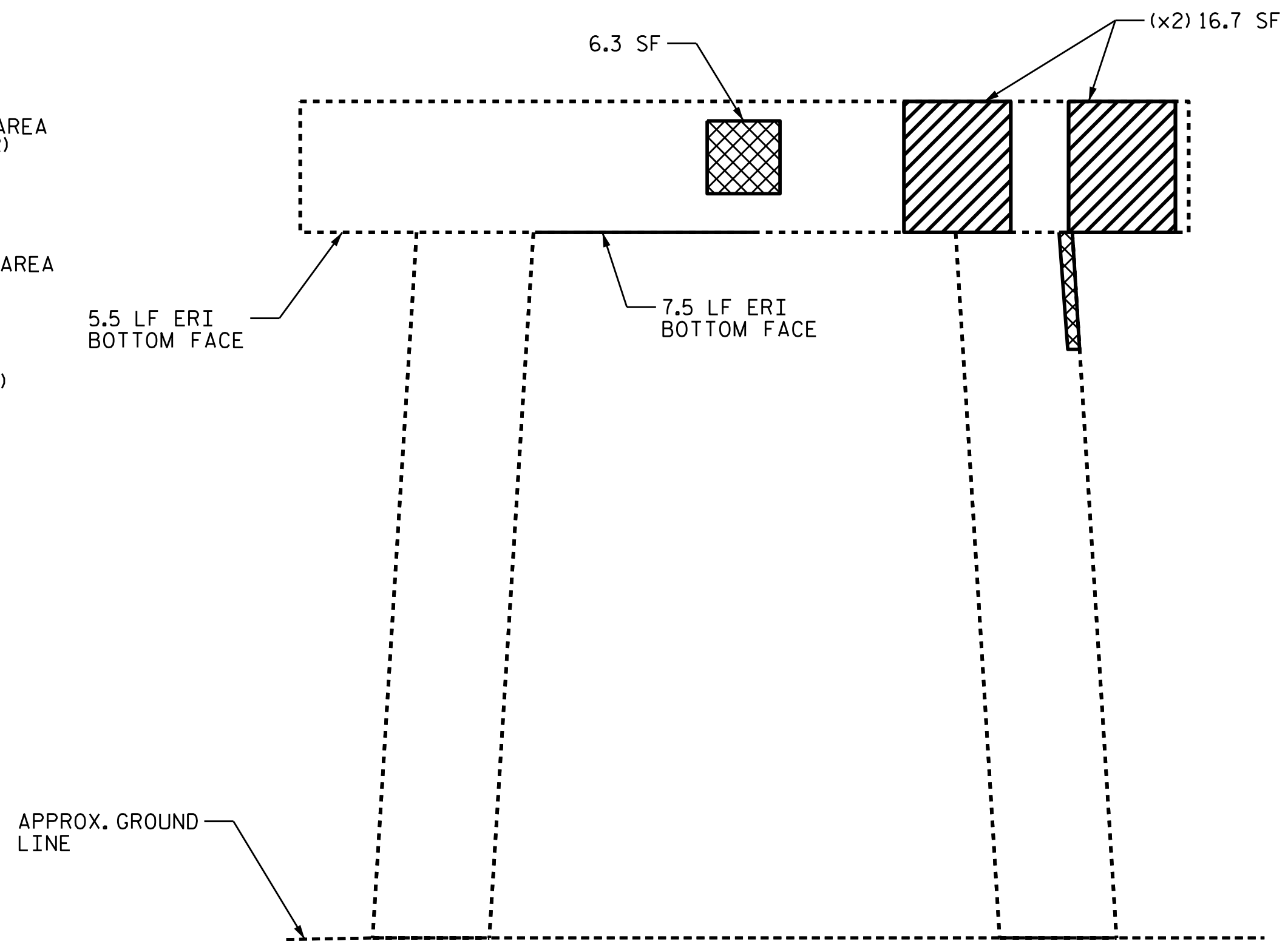
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 20**

NO.	REVISIONS			NO.	REVISIONS			SHEET NO.
	BY:	DATE:			BY:	DATE:		
1				3			S-55	
2				4			TOTAL SHEETS 73	

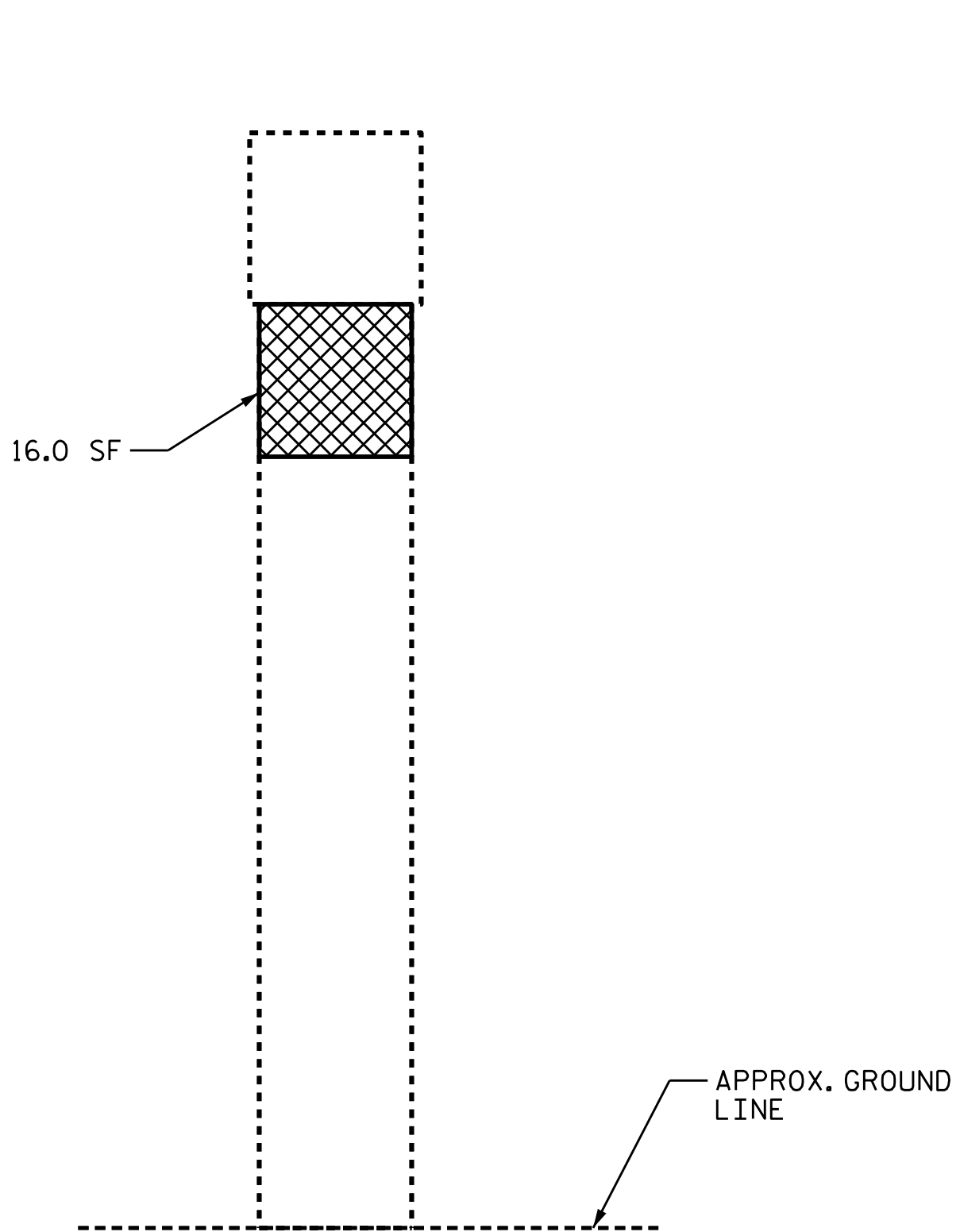
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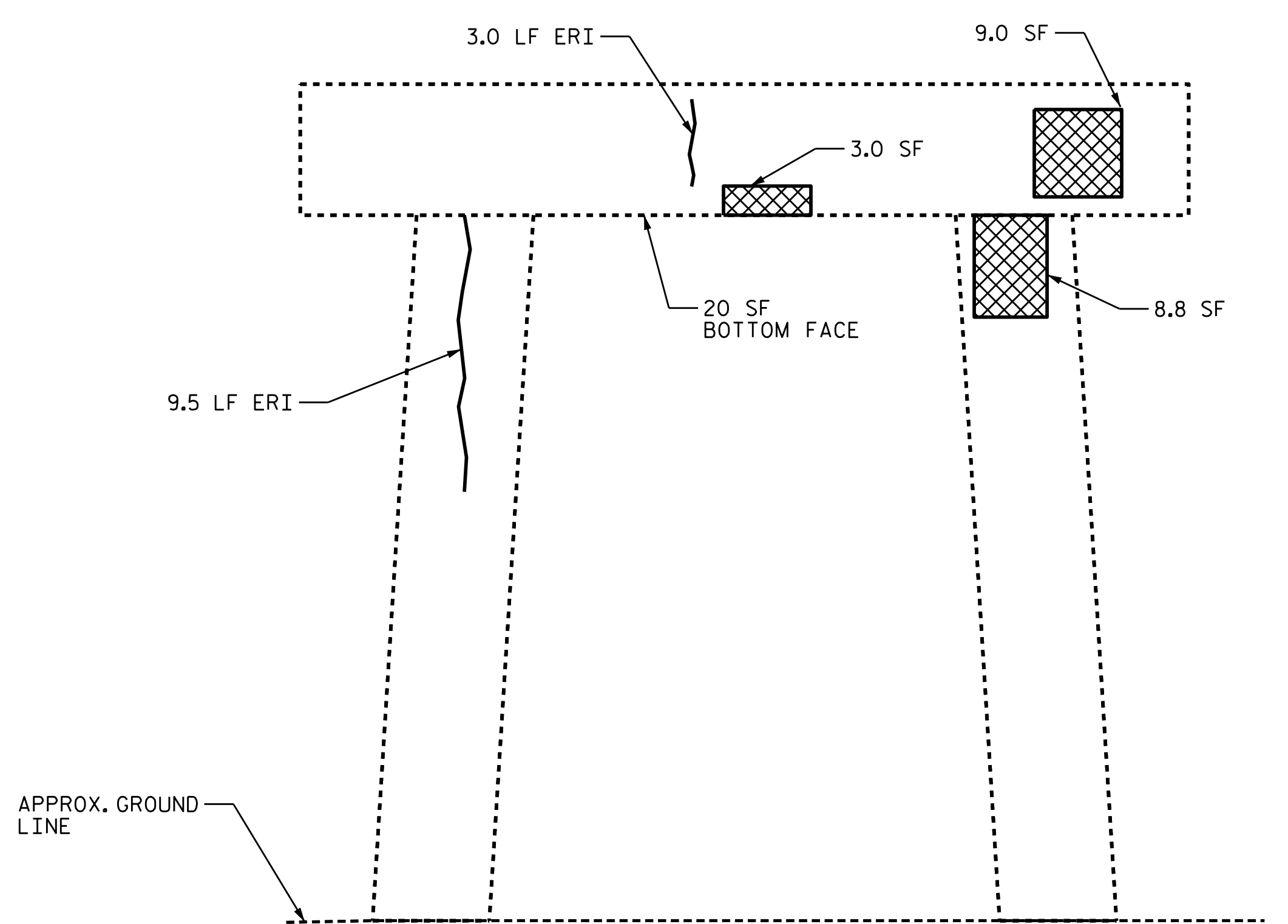
-  CONCRETE REPAIR AREA (FORM AND POUR)
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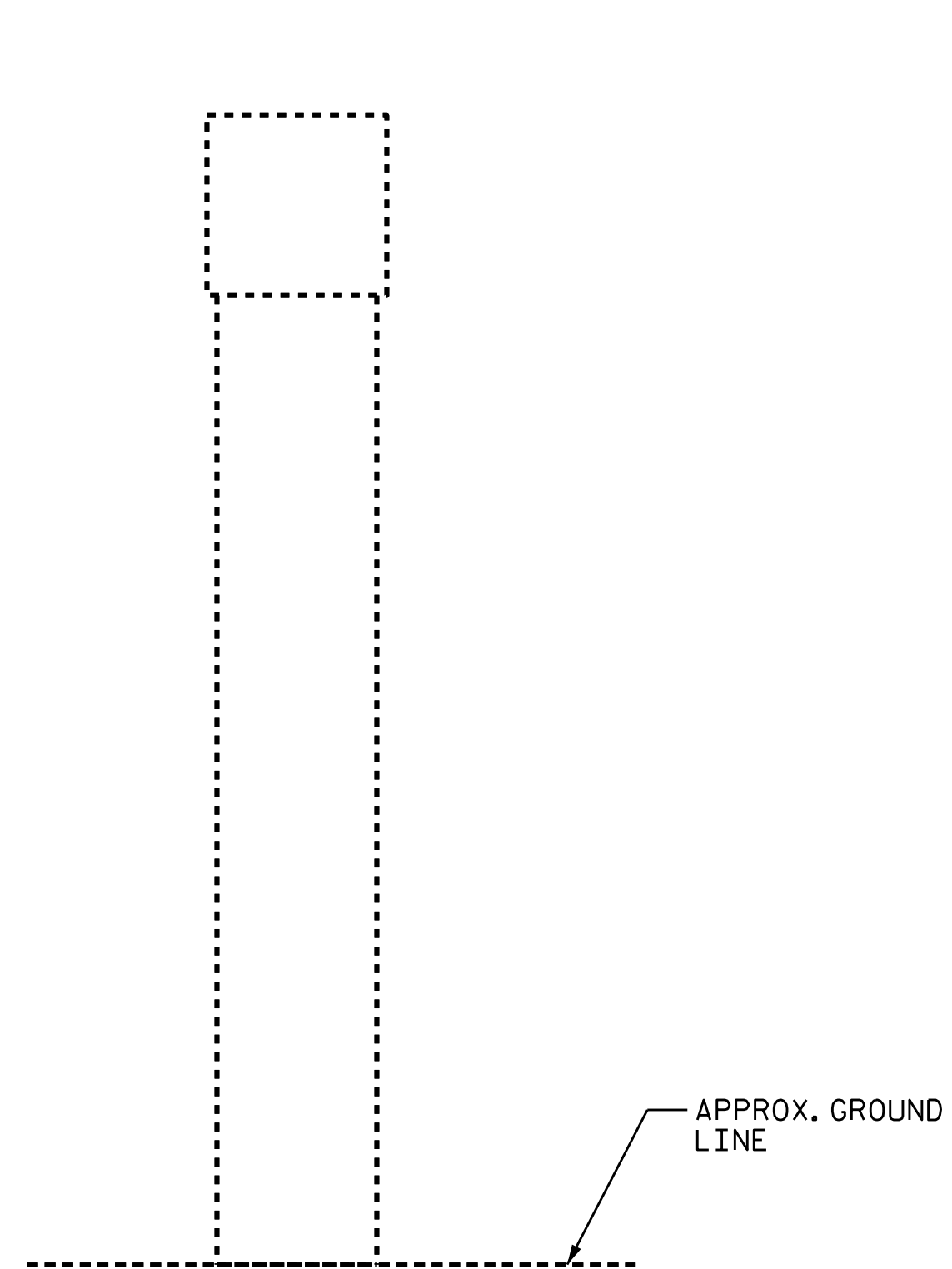
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 21	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	18.3	9.2		
COLUMN/PILE	24.8	12.4		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	33.4	16.7		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	16.0			
COLUMN/PILE	9.5			

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 - SUBSTRUCTURE" SHEET.

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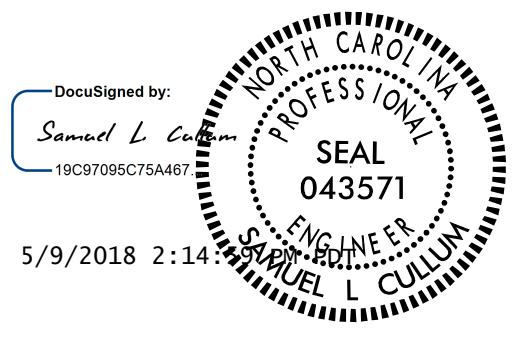
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 BRIDGE NO. 71

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DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

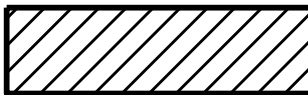
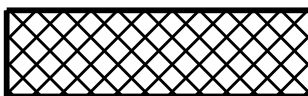



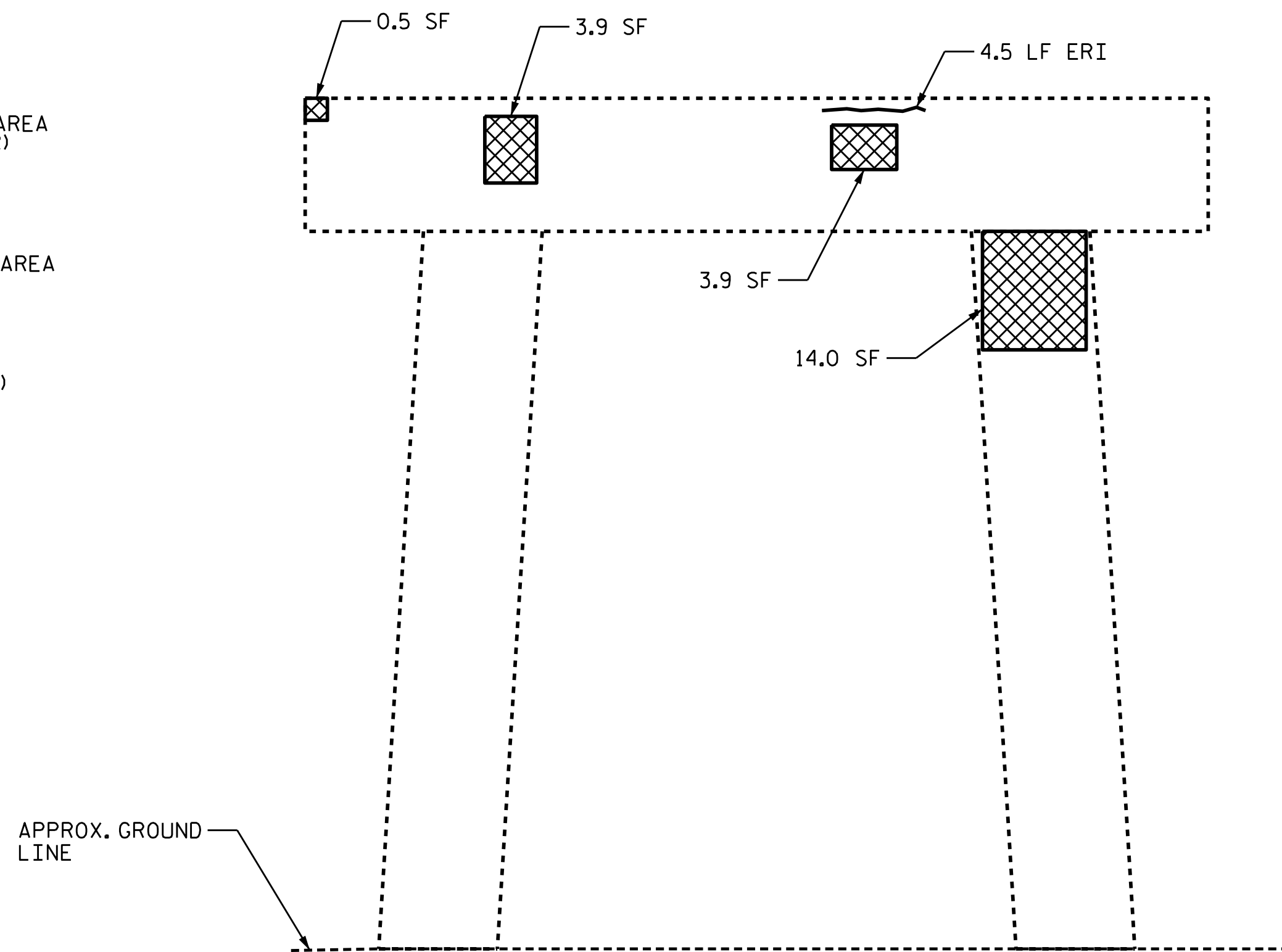
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 21**

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

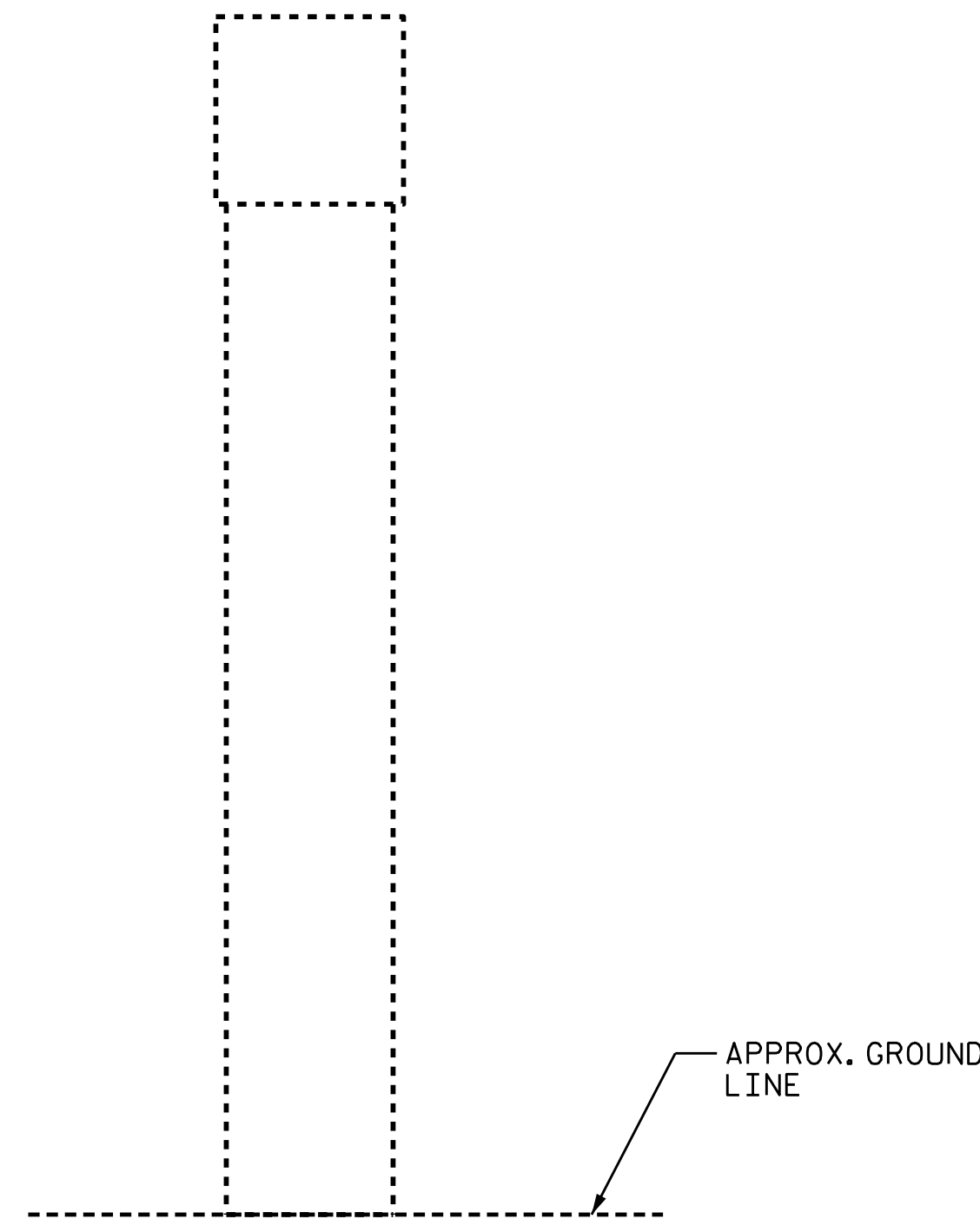
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LEGEND:

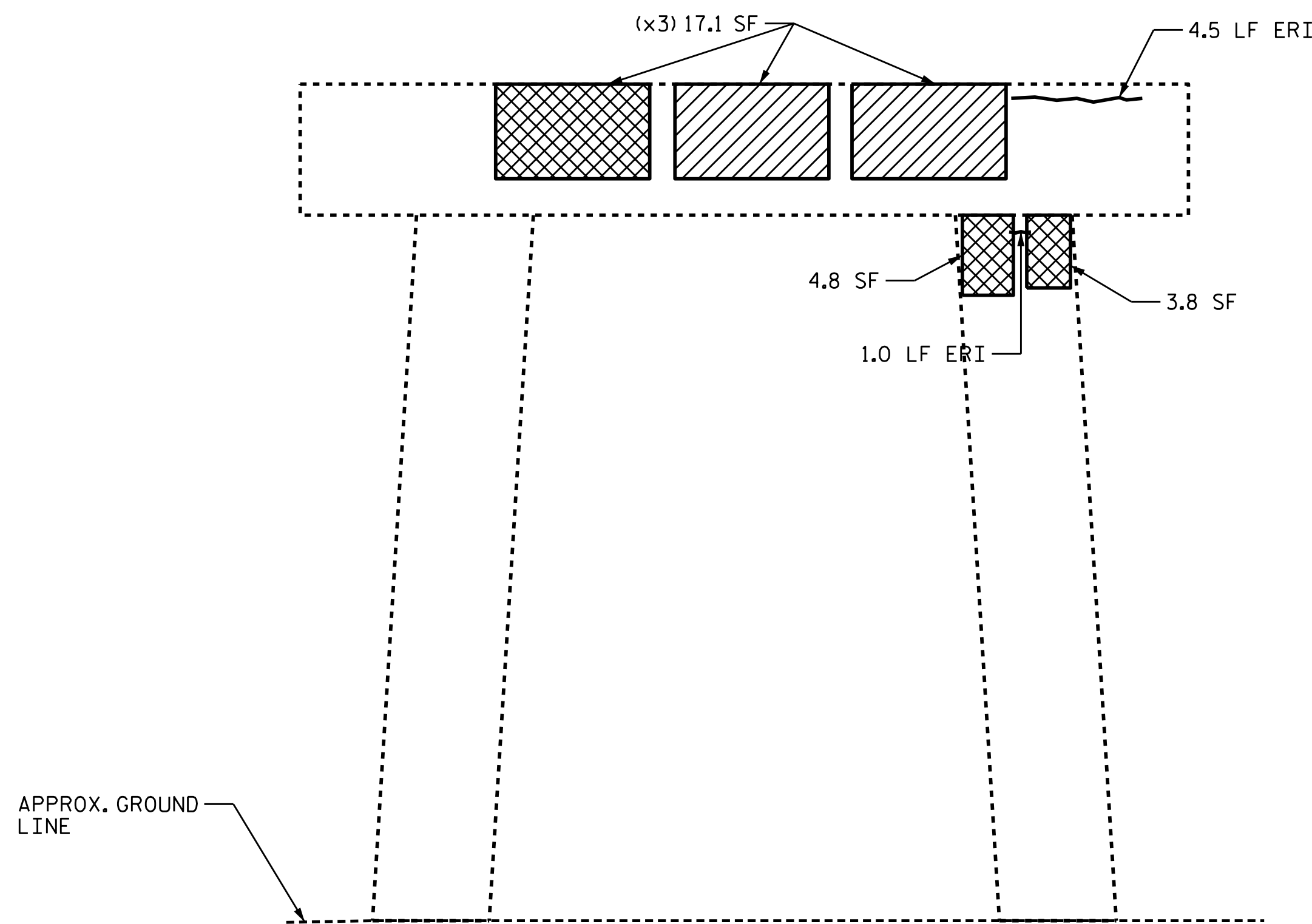
-  CONCRETE REPAIR AREA (FORM AND POUR)
-  SHOTCRETE REPAIR AREA
-  EPOXY RESIN INJECTION (ERI)



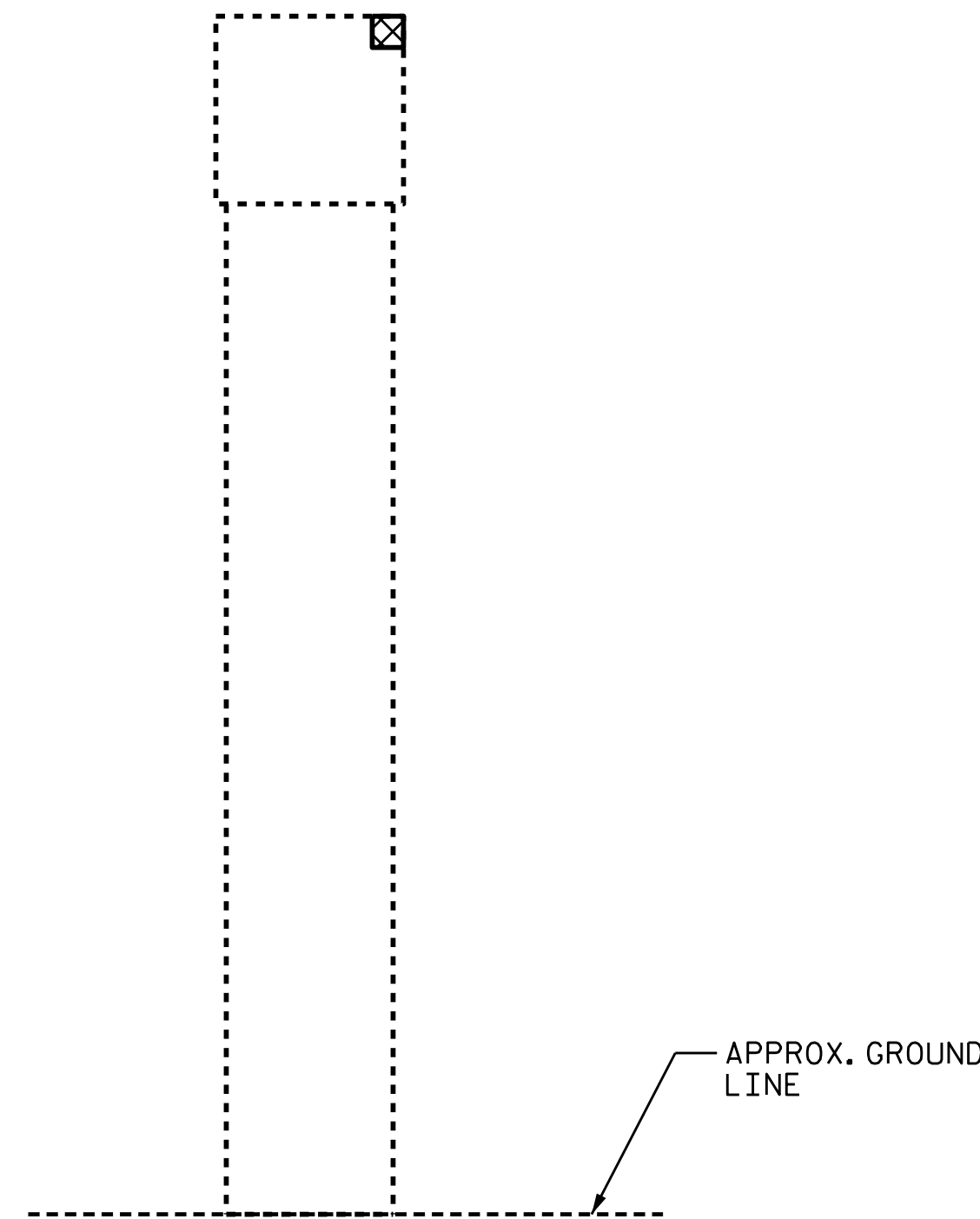
WEST ELEVATION



SOUTH FACE



EAST ELEVATION



NORTH FACE

AS-BUILT REPAIR QUANTITY TABLE

BENT 22	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	25.4	12.7		
COLUMN/PILE	22.6	11.3		
CONCRETE REPAIRS	AREA SO. FT.	VOLUME CU. FT.	AREA SO. FT.	VOLUME CU. FT.
CAP	34.2	17.1		
EPOXY RESIN INJECTION		LIN. FT.		LIN. FT.
CAP		9.0		
COLUMN/PILE		1.0		

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 - SUBSTRUCTURE" SHEET.

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 AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR EXTERIOR BARS IN THE CAP IS 3" ON THE BOTTOM FACE, 2" ELSEWHERE, AND 3" ON THE COLUMNS PER EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION.

CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 2" TO 3" ON THE CAP AND FROM 2 1/2" TO 3" ON THE COLUMNS BASED ON VISUAL INSPECTION.

SEE TITLE SHEET FOR PROJECT CARDINAL DIRECTION DESIGNATION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE CONCRETE RESTORATION DETAILS - SUBSTRUCTURE SHEET AND SPECIAL PROVISIONS.

* QUANTITIES OF CONCRETE REPAIR AREAS ARE ANTICIPATED UNDER BEARING AREAS. DUE TO LACK OF INFORMATION, ALL AREAS ARE NOT KNOWN. QUANTITY INCLUDES CONTINGENCIES AND ARE ANTICIPATED TO BE SUFFICIENT FOR ACTUAL QUANTITIES ENCOUNTERED. FOR CONCRETE REPAIRS SEE CONCRETE RESTORATION DETAILS.

ALL DEFECT QUANTITIES ON STRUTS AND COLUMN FOOTINGS ARE LISTED WITH THE QUANTITIES FOR THE CAP.

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

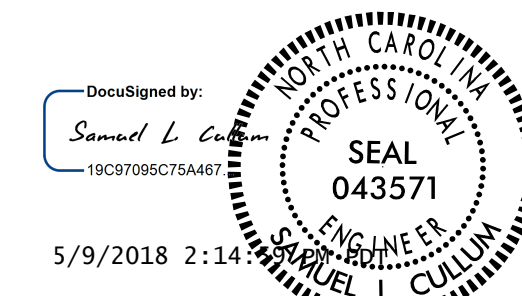
COAT ALL SURFACE AREAS OF THE TOP OF THE CAP INCLUDING CHAMFERS, WITH EPOXY PROTECTIVE COATING. DO NOT COAT THE AREA UNDER THE ELASTOMERIC BEARINGS.

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

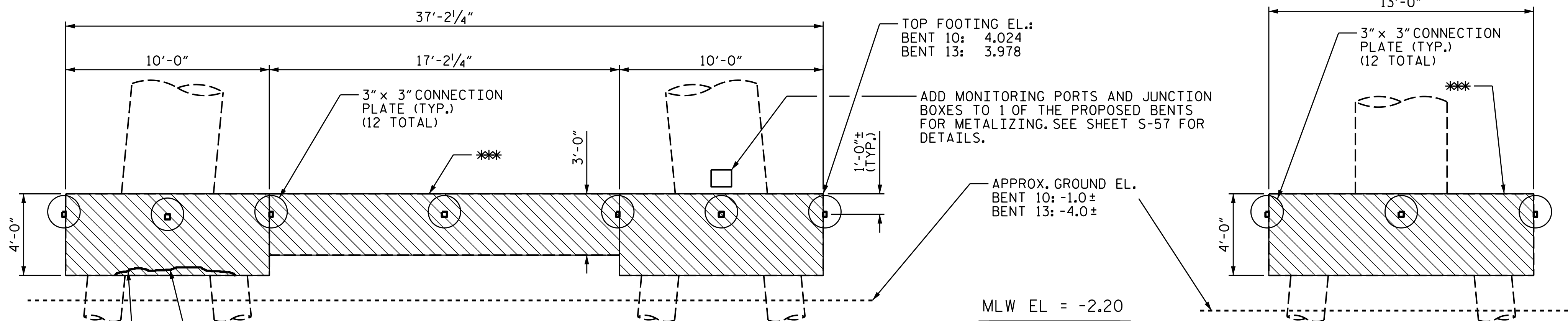


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 CONCRETE REPAIRS
 BENT 22**

NO.	REVISIONS			NO.	REVISIONS			SHEET NO.
	BY:	DATE:			BY:	DATE:		
1				3			S-57	
2				4			TOTAL SHEETS 73	

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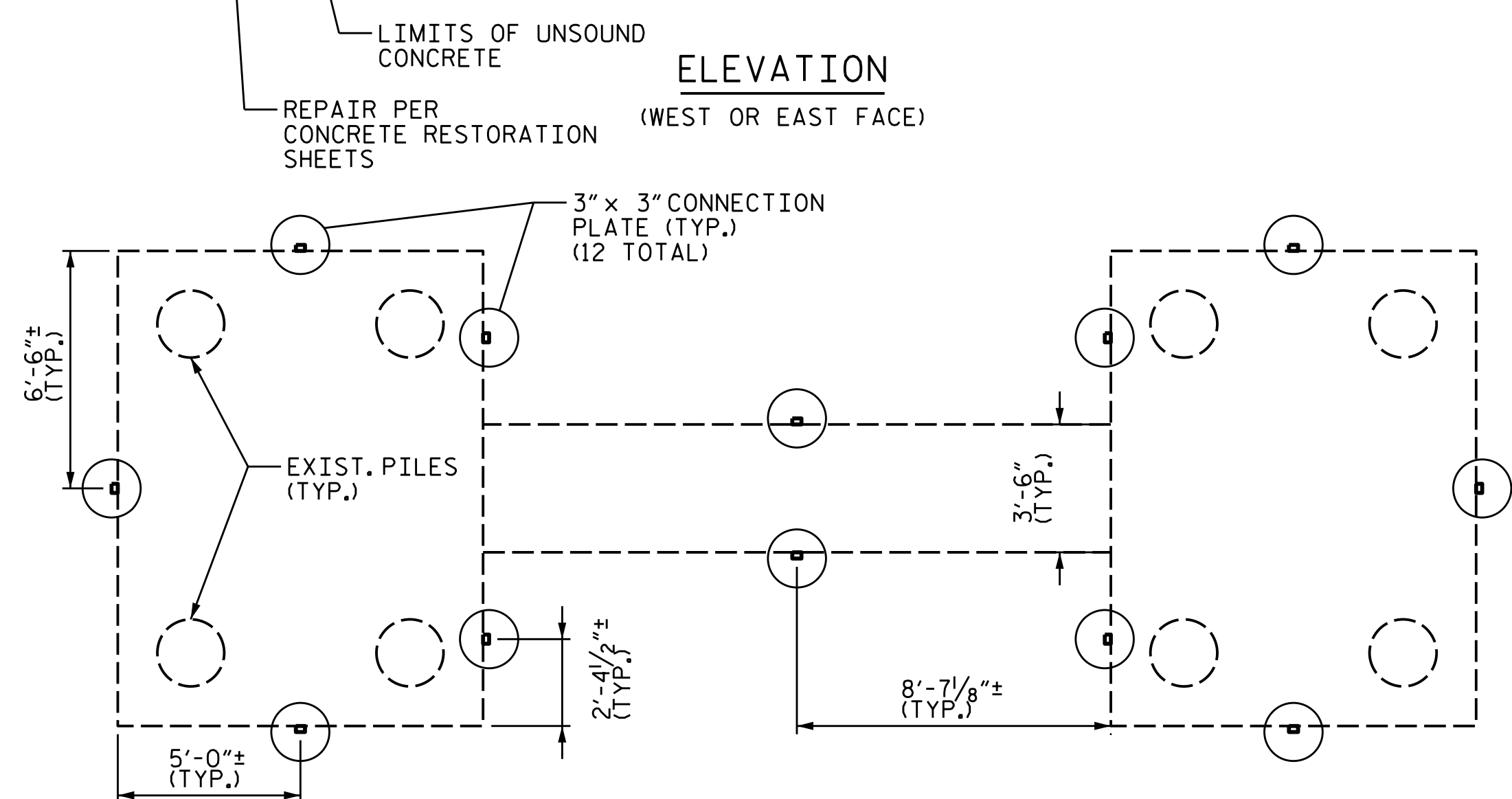


ELEVATION
(WEST OR EAST FACE)

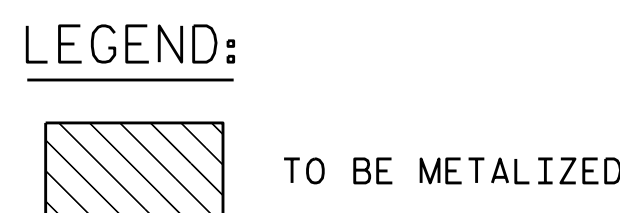
ELEVATION
(NORTH OR SOUTH FACE)

MLW EL = -2.20

*** DO NOT METALIZE TOP OF FOOTINGS



PLAN
(LOCATION OF CONNECTION PLATES)

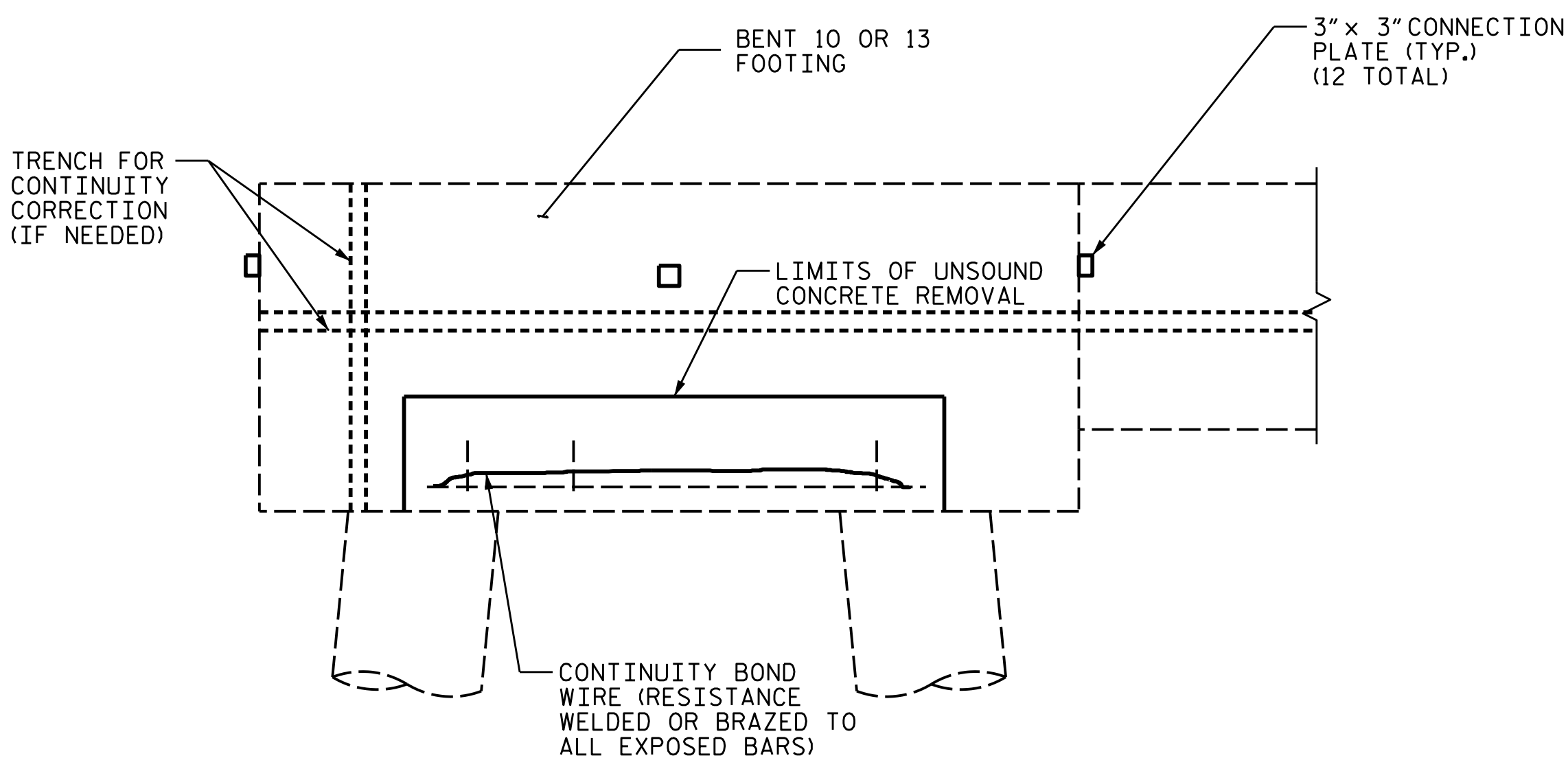


METALIZING NOTES:

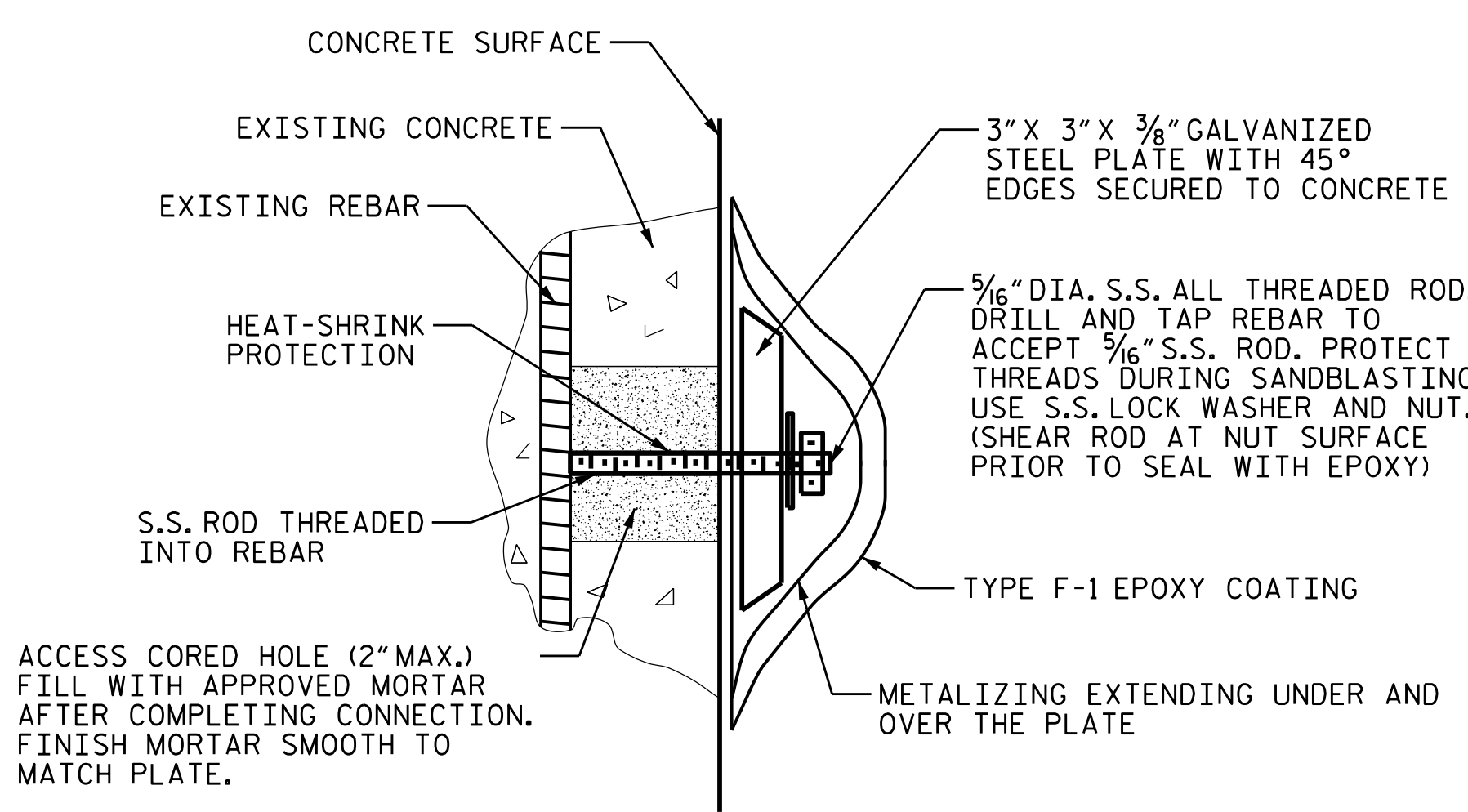
1. NO METALIZING SHALL BE PERFORMED UNTIL THE CONCRETE RESTORATION HAS BEEN APPROVED BY THE ENGINEER. METALIZE AT NO LESS THAN 10 (TEN) DAYS AFTER PLACING CONCRETE, BUT NO MORE THAN 90 (NINETY) DAYS. CONNECT METALIZING CONNECTION PLATE IMMEDIATELY AFTER COMPLETING METALIZING.
2. APPLY A ZINC SILICATE OVERCOAT AT NO MORE THAN 72 HOURS AFTER METALIZING.
3. COAT CONNECTION PLATE WITH EPOXY AT NO MORE THAN 96 HOURS AFTER APPLICATION OF ZINC SILICATE OVERCOAT.

NOTES:

1. REMOVE ALL UNSOUND CONCRETE FROM THE BENT FOOTINGS IN ACCORDANCE WITH CONCRETE RESTORATION DETAILS AND PROJECT SPECIAL PROVISIONS FOR CONCRETE REPAIR.
2. THE CONTRACTOR SHALL SUBMIT A PLAN FOR CONTROL AND DISPOSAL OF DEBRIS TO THE ENGINEER FOR APPROVAL.
3. FOR SPALLS OR DELAMINATIONS ON THE FOOTINGS GREATER THAN 2'-0" WIDE OR LONG AND GREATER THAN 1" DEEP, RESTORE CONCRETE TO ORIGINAL PROFILE IN ACCORDANCE WITH CONCRETE RESTORATION DETAILS SHEET AND PROJECT SPECIAL PROVISIONS FOR CONCRETE REPAIR.
4. FOR ANY CONCRETE AREAS THAT WOULD BE ISOLATED FROM PROPOSED CONTINUITY BY EXISTING SUPERFICIAL CRACKING, FILL CRACKS WITH EPOXY PRIOR TO METALIZING PER PROJECT SPECIAL PROVISIONS FOR EPOXY INJECTION OF CRACKS.
5. ALL VERTICAL FACES OF THE FOOTING SHALL BE METALIZED. CONNECTION BETWEEN PLATE AND REINFORCING STEEL SHALL BE PROVIDED VIA A 3/16" DIAMETER STAINLESS STEEL ALL THREADED ROD AS DESCRIBED IN THE CONNECTION PLATE DETAIL. THE CONNECTION PLATES SHALL BE LOCATED IN AREAS OF SOUND CONCRETE AS DETAILED IN THE PROJECT SPECIAL PROVISIONS FOR CATHODIC PROTECTION AND SHALL BE INSTALLED ON DIFFERENT BARS.
6. CHECK INTERBAR CONTINUITY. REINFORCING BARS REQUIRING CONTINUITY CORRECTION SHALL BE MADE CONTINUOUS USING STEEL WIRE RESISTANCE WELDED OR BRAZED TO EVERY REBAR. ALL EXPOSED BARS SHALL BE MADE CONTINUOUS. COAT ALL CONTINUITY CORRECTION WELDS WITH NON-CONDUCTIVE EPOXY.
7. CHECK ELECTRICAL CONTINUITY BETWEEN ALL PLATES IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS FOR CATHODIC PROTECTION.
8. METALIZE AND PLACE CONNECTION PLATES IN ACCORDANCE WITH PROJECT SPECIAL PROVISIONS FOR CATHODIC PROTECTION.
9. APPLY A ZINC SILICATE OVERCOAT TO THE METALIZED AREAS AS DESCRIBED IN THE PROJECT SPECIAL PROVISIONS FOR CATHODIC PROTECTION-INTERMEDIATE BENT METALIZING. THE ENGINEER MUST APPROVE THE METALIZING PRIOR TO THE OVERCOAT APPLICATION.
10. SEE PROJECT SPECIAL PROVISIONS FOR ADDITIONAL METALIZING REQUIREMENTS AND ACCEPTANCE CRITERIA. (PSP: CATHODIC PROTECTION-INTERMEDIATE BENT METALIZING)
11. SEQUENCE CLEANING AND COATING IN ORDER TO AVOID DELETERIOUS SUBSTANCES INHIBITING PROPOSED COATINGS.
12. ALL HARDWARE AND MATERIAL ITEMS ON THIS SHEET ARE INCIDENTAL TO PAY ITEM FOR ZINC ALUMINUM SPRAY.
13. THOROUGHLY CLEAR THE ALL VERTICAL FACES OF THE FOOTINGS OF ANY MARINE GROWTH AND DEBRIS BEFORE ALL PERFORMING ANY OF THE ASSOCIATED WORK FOR FOOTING METALIZATION.

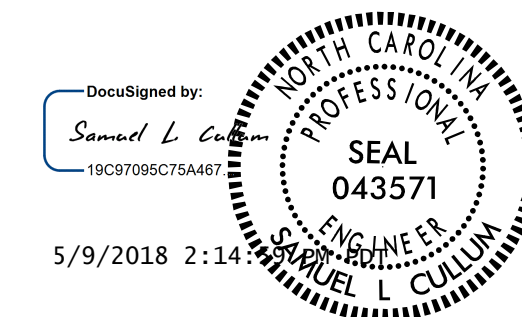


CONTINUITY DETAIL



CONNECTION PLATE DETAIL FOR REBARS

PROJECT NO. 15BPR.16
 BRUNSWICK COUNTY
 BRIDGE NO. 71



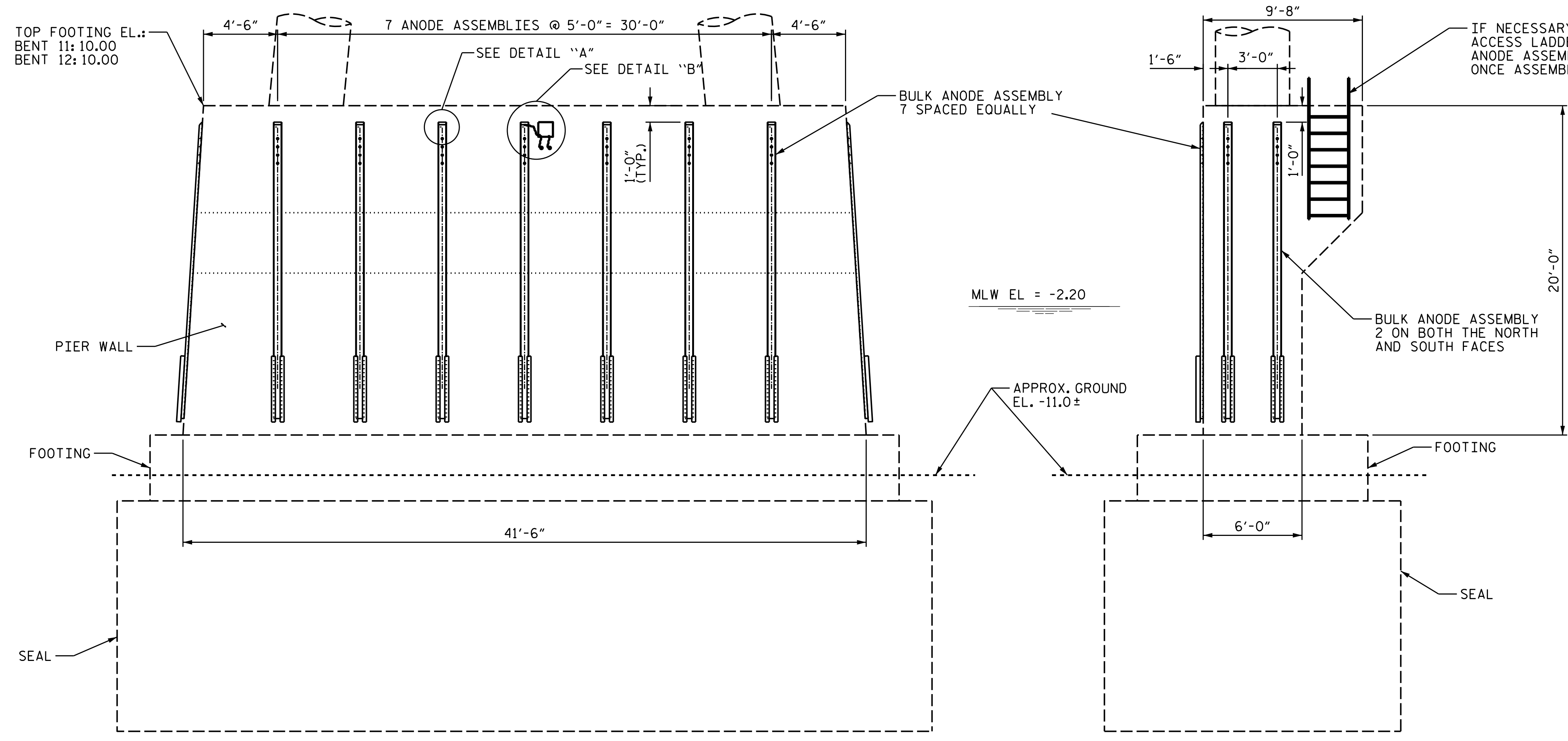
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**CHANNEL BENT
 FOOTING RESTORATION**
 ZINC METALIZING DETAILS
 BENT 10 & 13

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
 CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-58
1			3			TOTAL SHEETS
2			4			73

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ELEVATION
(WEST FACE OF BENT 11)
(EAST FACE OF BENT 12)

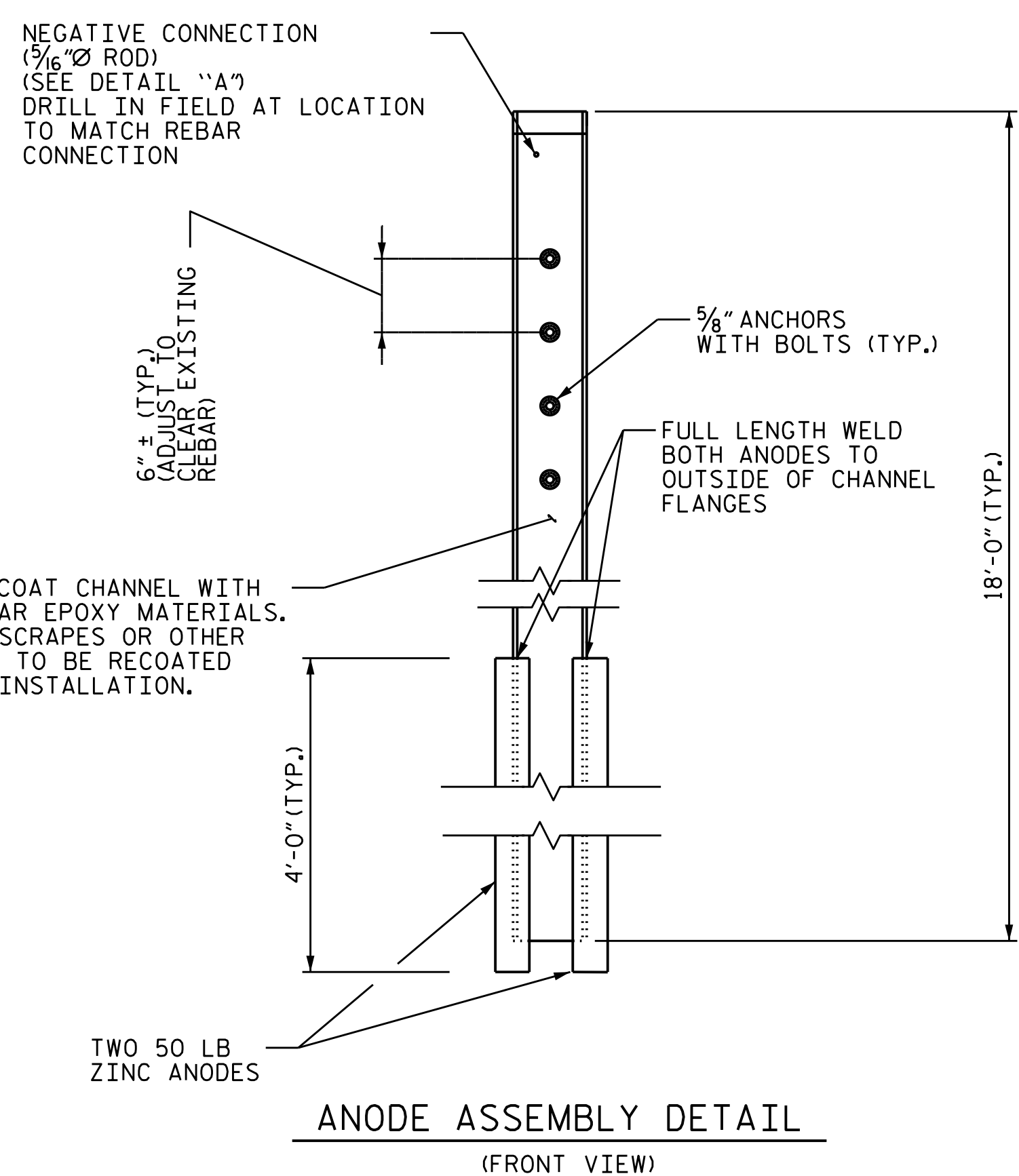
ELEVATION
(SOUTH FACE OF BENT 11)
(NORTH FACE OF BENT 12)
(ACCESS LADDER ON SOUTH FACES OF FOOTINGS ONLY)

ANODE PLACEMENT

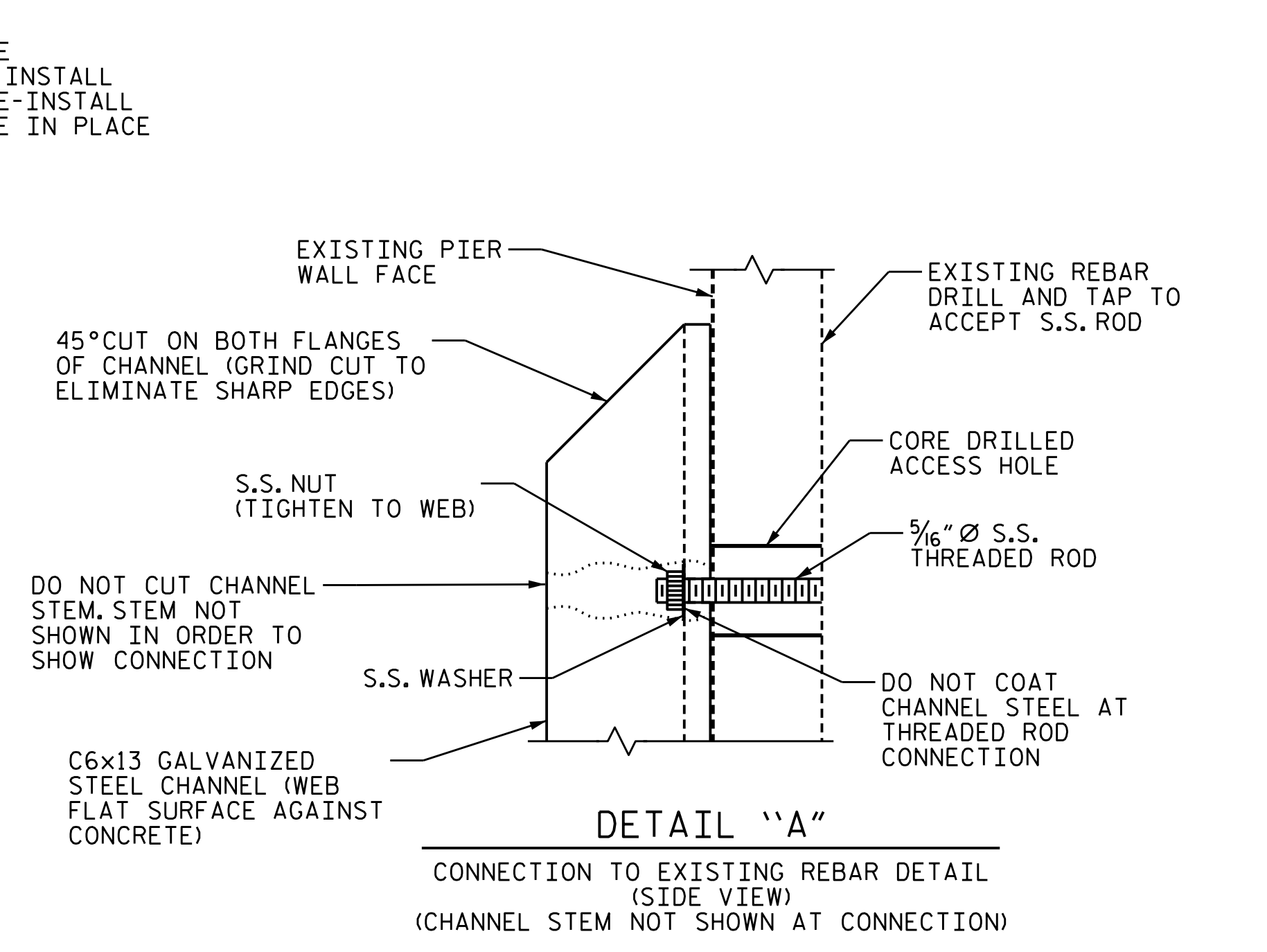
SEE DETAIL "A" FOR CONNECTION TO EXISTING REBAR
SEE DETAIL "B" FOR MONITORING JUNCTION BOX

NOTES:

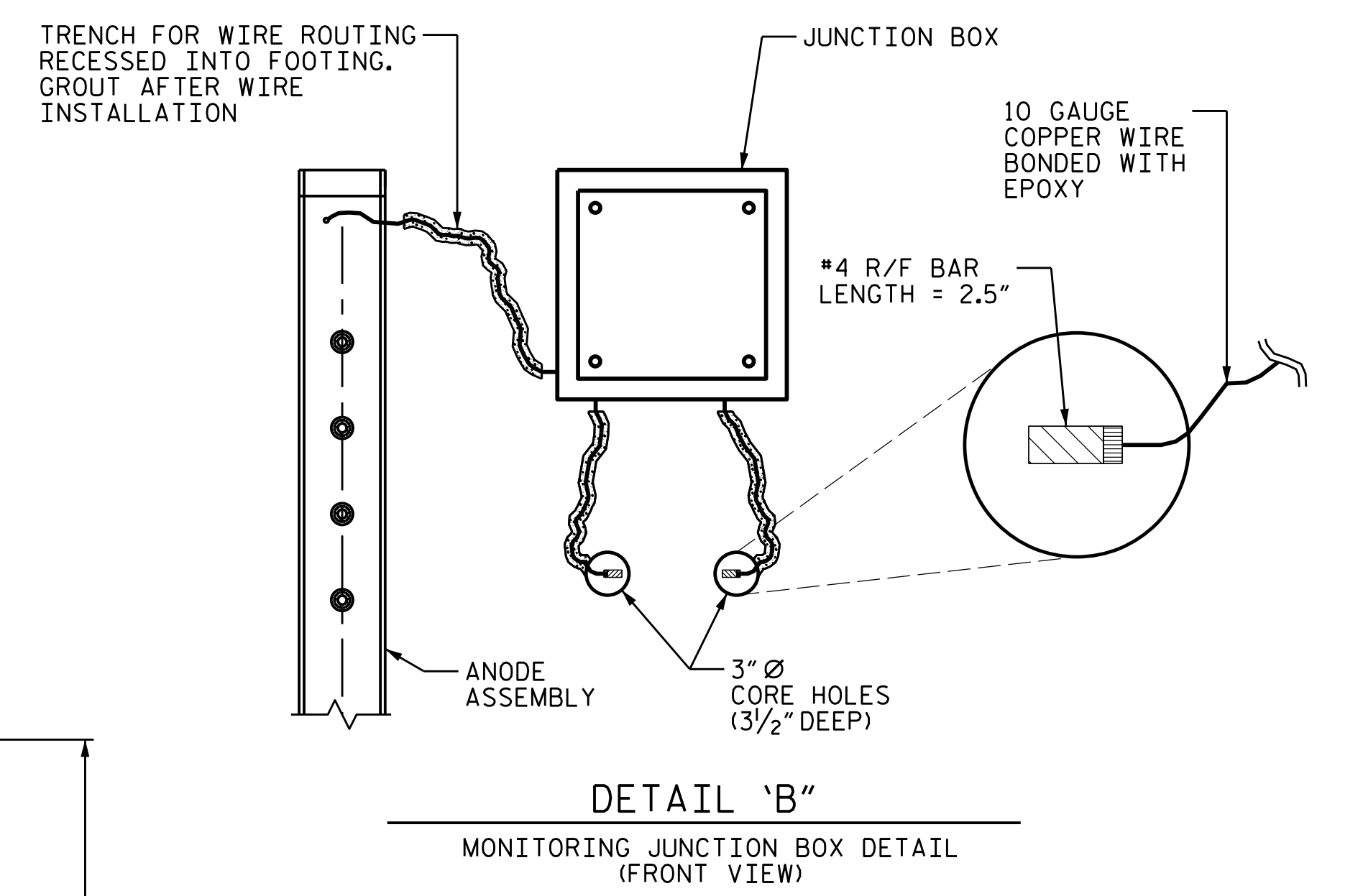
1. ANODES SHALL BE ASTM B418-01 TYPE I.
2. EXCEPT FOR ANODE WELDING, ALL CHANNEL MANUFACTURING SHALL BE PERFORMED PRIOR TO GALVANIZING.
3. ANCHORS TO BE DROP-IN TYPE 5/8" x 2 7/32" GALVANIZED HILTI HDI 243262 OR APPROVED EQUAL.
4. SEAL ACCESS HOLE WITH APPROVED EPOXY GROUT MATERIAL AFTER S.S. ROD INSTALLATION.
5. ANODE ASSEMBLIES SHALL BE PLACED SUCH THAT THE ANODE BE SUBMERGED A MINIMUM OF 3'-0" BELOW MEAN LOW WATER ELEVATION AT ALL TIMES. SPACING AND ELEVATION ADJUSTMENTS SHALL BE APPROVED BY THE ENGINEER.
6. PER EXISTING PLANS, TYPICAL CONCRETE COVER ON EXISTING PIER WALL IS 4".
7. WELDING OF S.S. ROD TO THE REBAR IN LIEU OF DRILL AND TAP MAY BE APPROVED AT THE DISCRETION OF THE ENGINEER.
8. ELECTRICAL CONTINUITY OF REINFORCING STEEL BETWEEN AT LEAST TWO OTHER CONNECTIONS SHALL BE PERFORMED PER CONNECTION PRIOR TO AND AFTER ANODE ASSEMBLY INSTALLATION.
9. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE REINFORCING STEEL AND PATCH ALL CORES WITH APPROVED CONCRETE REPAIR MATERIAL.
10. PAYMENT FOR ALL WORK AND HARDWARE DESCRIBED ASSOCIATED WITH FURNISHING AND INSTALLING OF THE ZINC ANODES SHALL BE INCIDENTAL TO THE PAY ITEM FOR "CP SYSTEM (ZINC BULK ANODES)".
11. THOROUGHLY CLEAR THE FOOTINGS OF MARINE GROWTH AND DEBRIS BEFORE PERFORMING ANY WORK ASSOCIATED WITH THE INSTALLATION OF THE PROPOSED BULK ANODES.



ANODE ASSEMBLY DETAIL
(FRONT VIEW)

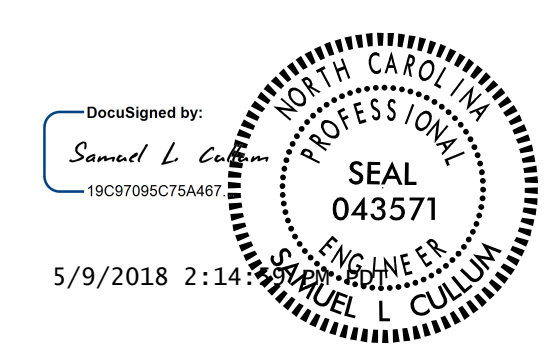


DETAIL "A"
CONNECTION TO EXISTING REBAR DETAIL
(SIDE VIEW)
(CHANNEL STEM NOT SHOWN AT CONNECTION)



DETAIL "B"
MONITORING JUNCTION BOX DETAIL
(FRONT VIEW)

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
BRIDGE NO. 71



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
**CHANNEL BENT
FOOTING RESTORATION**
BULK ANODE DETAILS
BENT 11 & 12

KCA 4800 SIX FORKS ROAD SUITE 120
KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : JACOB H. DUKE DATE : 03-2018
CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-59
1			3			TOTAL SHEETS
2			4			73

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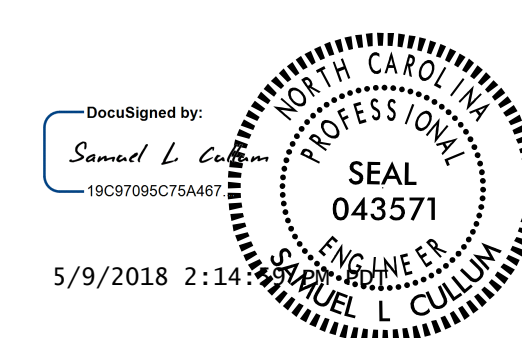
Brunswick #71								As-Built Quantities		Brunswick #71								As-Built Quantities	
Span #	Component	Location (ft. from nearest bent, etc)	Bent #	Defect Description	Length(ft.)	Width(ft.)	Assumed Depth (ft.)	Actual (C.F.)	Actual Depth (ft.)	Span #	Component	Location (ft. from nearest bent, etc)	Bent #	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	Actual (C.F.)	Actual Depth (ft.)
1	Curved Concrete Deck	in eastbound lane, at EB 1	EB 1	Delam	2.5	1.5				4	Girder 4	Bottom face, 1' from Bent	3	Delam	0.75	0.75			
1	Lt. Bridge Rail	at random throughout		(x10) Cracking (RC and Other)	10	1.5				4	Girder 5	Bottom of beam, starts 30' from Bent	3	Unsound Patched Area	5.5	1.5			
1	Lt. Bridge Rail	at random throughout		Delam	2.5	1.5				4	Girder 5	South face, 1' from Bent	3	Spall	0.75	0.75			
1	Rt. Bridge Rail	at random throughout		(x13) Cracking (RC and Other)	13	1.5				4	Lt. Bridge Rail	at random throughout		(x15) Cracking (RC and Other)	15.5	1.5			
1	Rt. Bridge Rail	at random throughout		(x3) Spalls	3.5	1.5				4	Rt. Bridge Rail	at random throughout		(x5) Cracking (RC and Other)	5.5	1.5			
2	Girder 1	South face	1	Spall	1.5	1.75	0.75			5	Girder 1	Bottom of beam, at mid span		Unsound Patched Area	22.5	2.5			
2	Girder 1	Bottom of beam, 1' from Bent	1	Unsound Patched Area	2.5	1.5				5	Girder 2	East end corner, at Bent	5	Delam	0.75	2	0.75		
2	Girder 1	North face, 1' from Bent	2	Delam	0.75	0.75				5	Girder 3	Bottom face, 31' from Bent	5	Spall	1.25	1			
2	Girder 1	South face, at Bent	2	Spall	0.75	0.75				5	Girder 4	Bottom face, 2' from Bent	5	Delam	2.25	1.5			
2	Girder 2	South face, at Bent	1	(x2) Spalls	2.5	1.5				5	Girder 5	Bottom face, 31' from Bent	5	Spall	1	1			
2	Girder 2	Bottom of beam, 1' from Bent	1	Spall	0.75	0.75				5	Lt. Bridge Rail	South face, 18" from Bent	5	Spall	0.75	1.5			
2	Girder 3	North face, at Bent	2	Spall	1.75	2				5	Lt. Bridge Rail	at random throughout		(x7) Cracking (RC and Other)	7.5				
2	Girder 3	North & South faces, at Bent	1	(x2) Delam	2	3				5	Lt. Bridge Rail	at random throughout		(x2) Spalls	0.75	0.75			
2	Girder 3	Bottom of beam, 1' from Bent	2	Spall	1	1				5	Lt. Bridge Rail	at random throughout		(x3) Spalls	0.75	1			
2	Girder 4	North face, at Bent	1	Spall	1	1.25				5	Rt. Bridge Rail	at random throughout		(x7) Cracking (RC and Other)	4.5	1.5			
2	Girder 4	Bottom of beam, 1' from Bent	2	Delam	1.25	0.75				5	Rt. Bridge Rail	at random throughout		(x2) Spalls	1.5	0.75			
2	Girder 5	South face, at Bent	1	Cracking (PSC)	3.5	2.5				5	Rt. Bridge Rail	North & South faces, 11' from Bent	5	Efflorescence/Rust Staining	5.5	3			
2	Lt. Bridge Rail	at random throughout		(x8) Cracking (RC and Other)	8.5	1.5				6	Girder 1	North face, at mid span		Spall	1.5	1.5	0.75		
2	Lt. Bridge Rail	South face, 8' from Bent	1	Exposed Rebar	1.5	1.5				6	Girder 1	South face, 1' from West end		Spall	2	2.25			
2	Rt. Bridge Rail	at random throughout		(x5) Cracking (RC and Other)	5.5	1.5				6	Girder 1	Bottom of beam, 1' from Bent	5	Unsound Patched Area	1.25	2.5			
3	Rt. Deck Overhang	at Bent	2	Spall	1.5	1				6	Girder 1	North face, 3" from West end		Cracking (PSC)	2	1.5			
3	Girder 1	Bottom of beam, starts 25' from Bent	3	Unsound Patched Area	2	1				6	Girder 1	South face, at Bent	6	Delam	3	1	1.5		
3	Girder 1	Bottom of beam, 1' from Bent	2	Unsound Patched Area	2.5	1.75				6	Girder 2	South face, at Bent	6	Delam	3	1	0.75		
3	Girder 1	Bottom of beam, starts 33' from Bent	3	Unsound Patched Area	2.5	1.75				6	Girder 2	Bottom face, 31' from Bent	5	Spall	0.75	0.75			
3	Girder 1	Bottom of beam, starts 30' from Bent	3	Unsound Patched Area	4.5	1.5				6	Girder 3	West face, Bottom flange, at Bent	6	Cracking (PSC)	2	1.5			
3	Girder 1	Bottom of beam, starts 30' from Bent	2	Unsound Patched Area	5.25	1.75				6	Girder 3	Bottom face, 31' from Bent	6	Spall	0.75	0.75			
3	Girder 1	Bottom of beam, starts 2' from Bent	3	Delam	2.75	1.75				6	Girder 4	Bottom face, 31' from Bent	6	Spall	1	0.75			
3	Girder 1	South face, 1' from Bent	2	Delam	1	1				6	Girder 5	Bottom face, 1' from Bent	5	Unsound Patched Area	1.25	2.25			
3	Girder 2	South face, 1' from Bent	2	(x2) Delam	2.5	2				6	Lt. Bridge Rail	at random throughout		(x8) Cracking (RC and Other)	8.5	1.5			
3	Girder 2	East face, at Bent	3	Spall	0.75	0.75	2			6	Lt. Bridge Rail	South face, 13' from Bent	5	Efflorescence/Rust Staining	3.5	1.5			
3	Girder 2	Bottom of beam, at Bent	2	Unsound Patched Area	2.5	1.5				6	Rt. Bridge Rail	North face, 14' from Bent	6	Unsound Patched Area	2	2			
3	Girder 2	Bottom face, starts at Bent	3	Failed Patched Area	3.5	1.5				6	Rt. Bridge Rail	at random throughout		(x2) Cracking (RC and Other)	2.5	1.5			
3	Girder 2	North face, 1' from Bent	2	(x2) Delam	3	1.25				7	Girder 1	North face, at mid span		Unsound Patched Area	1	1			
3	Girder 2	Bottom of beam, 30' from Bent	3	Delam	1.5	1.25				7	Girder 1	North face, at Bent	6	(x2) Spalls	2	1			
3	Girder 2	South face, at Bent	2	Delam	1.25	1.5				7	Girder 1	Bottom face, 31' from Bent	6	Spall	0.75	1			
3	Girder 3	Bottom of beam, 1' from Bent	2	Unsound Patched Area	1.25	2.25				7	Girder 2	Bottom face, 31' from Bent	6	Spall	0.75	0.75			
3	Girder 3	North face, at Bent	3	Delam	1	1.25				7	Girder 2	North face, at Bent	7	Spall	0.75	1			
3	Girder 4	Bottom of Beam, 30' from Bent	2	Delam	0.75	0.75				7	Girder 2	North face, at Bent	6	Spall	1	1			
3	Girder 5	North face, at Bent	2	Spall	1.5	1				7	Girder 3	Bottom face, at Bent	6	Spall	1.25	2			
3	Girder 5	Bottom face, 1' from Bent	2	Spall	1	1.25				7	Girder 3	Bottom face, 31' from Bent	6	Spall	0.75	0.75			
3	Lt. Bridge Rail	at random throughout		(x4) Cracking (RC and Other)	6.5	1.5				7	Girder 4	North & South faces, at Bent	6	(x3) Spalls	6	1.75			
3	Rt. Bridge Rail	at random throughout		(x8) Cracking (RC and Other)	8.5	1.5				7	Girder 4	South face, at Bent	7	(x2) Delams	2.5	1			
4	Girder 1	East face, at Bent	4	Spall	0.75	2	0.75			7	Girder 4	Bottom face, 2' from Bent	7	Delam	2	1.25			
4	Girder 1	South face, 1' from Bent	4	Spall	1	1.25				7	Girder 4	Bottom face, 1' from Bent	7	Spall	0.75	1			
4	Girder 1	Bottom face, at Bent	3	Unsound Patched Area	1.5	2.25				7	Girder 5	Bottom face, 1' from Bent	6	Spall	0.75	1.75			
4	Girder 1	Bottom face, at Bent	4	Unsound Patched Area	6	2.5				7	Girder 5	North face, at Bent	6	Spall	2.25	2			
4	Girder 1	West face, Bottom flange, at Bent	4	Cracking (PSC)	1.25	1.5				7	Lt. Bridge Rail	at random throughout		(x8) Cracking (RC and Other)	8.5	1.5			
4	Girder 1	West face, 1' from Bent	3	Spall	0.75	1				7	Rt. Bridge Rail	at random throughout		(x3) Cracking (RC and Other)	3.5	1.5			
4	Girder 3	Bottom face, at Bent	4	Spall	1	1				7	Rt. Bridge Rail	North face, 14' from Bent	6	Delam	1	1			
4	Girder 4	South face, at Bent	3	Delam	1.75	1.75				8	Girder 1	Bottom face, at Bent	8	Spall	1	1.5			

NOTES:

- ALL DEFECTS WERE TAKEN FROM THE 2018 BRIDGE INSPECTION REPORT.
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- THE ENGINEER SHALL FILL OUT THE AS-BUILT REPAIR QUANTITY FOR EACH LISTED DEFICIENCY.
- COORDINATE THIS SHEET WITH SHEETS S-32 THRU S-57.
- IF ADDITIONAL REPAIRS, NOT SHOWN ON SHEETS S-35 THRU S-57, 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 REPAIR QUANTITIES TABLE.

PROJECT NO. 15BPR.16
 BRUNSWICK COUNTY
 BRIDGE NO. 71

SHEET 1 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE DEFICIENCIES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-60
2			4			TOTAL SHEETS 73

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

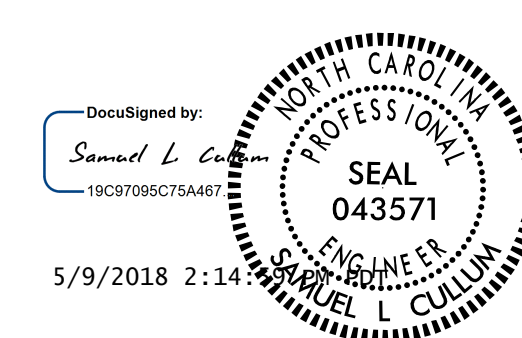
Brunswick #71								As-Built Quantities		Brunswick #71								As-Built Quantities	
Span #	Component	Location (ft. from nearest bent, etc)	Bent #	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	Actual (C.F.)	Actual Depth (ft.)	Span #	Component	Location (ft. from nearest bent, etc)	Bent #	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	Actual (C.F.)	Actual Depth (ft.)
8	Girder 1	South face, at Bent	7	Delam	1.5	1.5				10	Girder 2	North face, 3' from Bent	10	Spall	0.75	0.75			
8	Girder 1	Bottom face, 31' from Bent	7	Spall	0.75	0.75				10	Girder 3	Bottom face, at strand hold down locations		(x2) Spalls	2	1			
8	Girder 1	Bottom face, 31' from Bent	8	Spall	0.75	0.75				10	Girder 3	Bottom face, 1' from Bent	10	Spall	1	1			
8	Girder 1	North face, 3' from Bent	8	Exposed Rebar	1.5	1.5				10	Girder 4	Bottom face, at strand hold down locations		(x2) Spalls	2	1			
8	Girder 2	North & South faces, at Bent	8	(x2) Spalls	1	1.25				10	Girder 4	North face, at Bent	10	Spall	0.75	0.75			
8	Girder 2	Bottom face, 1' from Bent	8	Spall	1	1.25				10	Girder 4	South face, at Bent	10	Delam	1	1.25			
8	Girder 2	Bottom face, 1' from Bent	7	Spall	1	1.25				10	Girder 5	North face, at Bent	10	Delam	1.5	1.5			
8	Girder 2	South face, at Bent	8	(x2) Spalls	1.5	1				10	Girder 5	Bottom face, 1' from Bent	10	Delam	1.25	1.5			
8	Girder 2	North & South faces, at Bent	7	(x3) Spalls	3	1				10	Lt. Bridge Rail	at random throughout		(x11) Cracking (RC and Other)	11.5	1.5			
8	Girder 2	Bottom face, 31' from Bent	7	Spall	0.75	0.75				10	Rt. Bridge Rail	at random throughout		(x13) Cracking (RC and Other)	13.5	1.5			
8	Girder 3	Bottom face, 1' from Bent	8	(x2) Spalls	3	1.75				10	Rt. Bridge Rail	North face, 3' from Bent	10	Spall	0.75	0.75			
8	Girder 3	North face, at Bent	7	Spall	2	2				11	Curved Concrete Deck	Eastbound lane, 7' from Bent	10	Spall	1.25	1.5			
8	Girder 3	South face, at Bent	8	Spall	1.25	1.5				11	Lt. Bridge Rail	at random throughout		(x23) Cracking (RC and Other)	23.5	1.5			
8	Girder 3	Bottom face, 31' from Bent	8	Spall	1.25	1				11	Rt. Bridge Rail	at random throughout		(x5) Cracking (RC and Other)	5.5	1.5			
8	Girder 3	South face, at Bent	8	Spall	0.75	0.75				11	Girder 1	North face, at diaphragm locations		(x2) Unsound Patched Area	2	1			
8	Girder 3	South face, at Bent	7	Delam	2	2				11	Girder 2	North face, at East end		Unsound Patched Area	0.75	1			
8	Girder 3	Bottom face, 31' from Bent	7	Spall	0.75	0.75				11	Girder 2	North face, starts 6' from East end.		Cracking (PSC)	1.75	1.5			
8	Girder 4	North face, at Bent	8	(x2) Spalls	2	1.25				11	Girder 2	South face, at Bent	10	Spall	0.75	0.75			
8	Girder 4	North face, at Bent	7	(x2) Spalls	2	1.25				11	Girder 3	East face		Spall	1.25	1.25	1		
8	Girder 5	South face, at East end		Cracking (PSC)	1.5	1.5				11	Girder 3	West face		(x5) Spalls	3.75	0.75			
8	Girder 5	South face, at Bent	8	Cracking (PSC)	2.25	1.5				11	Girder 3	North face, at Bent	11	Spall	0.75	1			
8	Girder 5	North & South faces, 1' from Bent	8	(x4) Spalls	5	1.75				11	Girder 4	North face, 1' from Bent	11	Spall	1	1.5			
8	Girder 5	at mid span		Spall	1.5	1.5				11	Girder 4	South face, at West end		Spall	1	2.75			
8	Girder 5	North face, 1' from Bent	7	Cracking (PSC)	1.5	1.5				11	Girder 4	South face, 1' from Bent	11	Cracking (PSC)	2	1.5			
8	Girder 5	South face, at Bent	7	Spall	1	1				12	Curved Concrete Deck	Eastbound lane, 3' from Bent	11	Unsound Patched Area	3.5	3.5			
8	Girder 5	Bottom face, starts 2' from Bent	8	Delam	5.5	1.5				12	Girder 1	South face, at Bent	12	Unsound Patched Area	2	1.5			
8	Girder 5	Bottom face, 30' from Bent	8	Delam	9.5	1.5				12	Girder 2	North face, at Bent	12	Spall	1	1	1		
8	Girder 5	North face, at Bent	7	Exposed Rebar	1.5	1.5				12	Girder 2	North face, at Bent	11	Spall	1.25	0.75	0.75		
8	Lt. Bridge Rail	at random throughout		(x9) Cracking (RC and Other)	9.5	1.5				12	Girder 3	South face, at Bent	11	Unsound Patched Area	1.5	1.75			
8	Rt. Bridge Rail	at random throughout		(x6) Cracking (RC and Other)	6.5	1.5				12	Girder 3	North face, at Bent	12	Unsound Patched Area	2.5	2.25			
9	Girder 1	North face, at mid span		Unsound Patched Area	1.5	1.5				12	Girder 3	North face, at Bent	12	Unsound Patched Area	3.25	1			
9	Girder 1	Bottom face, 31' from Bent	8	Spall	0.75	0.75				12	Girder 3	South face, 1' from Bent	11	Spall	1	1			
9	Girder 1	Bottom face, 31' from Bent	9	Spall	0.75	0.75				12	Girder 4	South face, starts at Bent	12	Cracking (PSC)	18.5	2.5			
9	Girder 2	Bottom face, 1' from Bent	9	Spall	1.5	1				12	Girder 4	South face, at Bent	12	Spall	1.25	1	0.75		
9	Girder 2	South face, at Bent	9	Delam	1.5	2.25				12	Girder 4	North face, 3' from Bent	11	Unsound Patched Area	2.5	1.25			
9	Girder 2	North face, at Bent	9	Spall	0.75	1				12	Girder 4	South face, at Bent	11	(x2) Cracking (PSC)	9	4.5			
9	Girder 3	South face, at Bent	9	Spall	0.75	0.75				12	Lt. Bridge Rail	at random throughout		(x19) Cracking (RC and Other)	19.5	1.5			
9	Girder 3	South face, starts 1' from Bent	9	Delam	3.25	1	1			12	Lt. Bridge Rail	North & South faces, 29' from Bent	12	Cracking (RC and Other)	1.25	1.5			
9	Girder 3	Bottom face, 31' from Bent	8	Spall	1	1				12	Rt. Bridge Rail	North face, at random throughout		(x2) Spalls	1.5	0.75			
9	Girder 4	Bottom face, 1' from Bent	9	Spall	0.75	1				12	Rt. Bridge Rail	at random throughout		Delam	24.5	1.5			
9	Girder 4	South face, 1' from Bent	9	Spall	0.75	1				13	Girder 2	North face, at Bent	12	(x4) Cracking (PSC)	10	1.5			
9	Girder 5	Bottom face 1' from Bent	9	Spall	1	1				13	Girder 2	North face, at Bent	13	(x2) Spalls	1.5	0.75			
9	Lt. Bridge Rail	at random throughout		(x8) Cracking (RC and Other)	8.5	1.5				13	Girder 3	South face, 1' from Bent	13	Spall	1	1.5			
9	Rt. Bridge Rail	at random throughout		(x7) Cracking (RC and Other)	7.5	1.5				13	Girder 3	North face, at Bent	12	Spall	0.75	0.75			
10	Curved Concrete Deck	Eastbound lane, at Bent Joint	10	Spall	3.5	1	1			13	Girder 3	North face, at Bent	13	Spall	0.75	1			
10	Girder 1	Bottom face, 31' from from Bent	10	Spall	1	1				13	Girder 4	South face, at Bent	13	Spall	0.75	2	0.75		
10	Girder 1	Bottom face, 31' from Bent	9	Spall	1	1				13	Girder 4	South face, 1' from Bent	12	Cracking (PSC)	2.5	2.5			
10	Girder 2	North face, at Bent	10	Spall	0.75	1.25				13	Girder 4	South face, at Bent	13	Cracking (PSC)	4.5	4.5			
10	Girder 2	Bottom face, at strand hold down locations		(x2) Spalls	2	1				13	Girder 4	North face, at Bent	12	Spall	0.75	1			
10	Girder 2	North face, at Bent	10	Delam	1.5	2				13	Girder 4	North face, at Bent	12	Spall	1	1			

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PROJECT NO. 15BPR.16
 BRUNSWICK COUNTY
 BRIDGE NO. 71

SHEET 2 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE DEFICIENCIES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-61
2			4			TOTAL SHEETS 73

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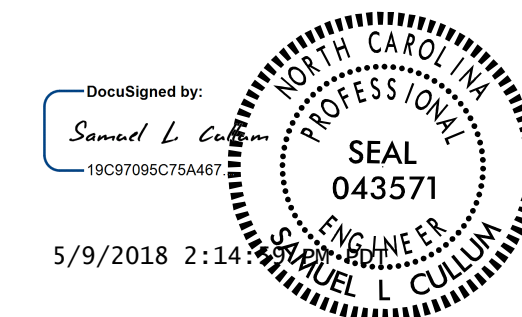
Brunswick #71								As-Built Quantities		Brunswick #71								As-Built Quantities	
Span #	Component	Location (ft. from nearest bent, etc)	Bent #	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	Actual (C.F.)	Actual Depth (ft.)	Span #	Component	Location (ft. from nearest bent, etc)	Bent #	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	Actual (C.F.)	Actual Depth (ft.)
13	Lt. Bridge Rail	at random throughout		(x11) Cracking (PSC)	11.5	1.5				16	Girder 3	North face, at Bent	16	Delam	3	1.5			
13	Lt. Bridge Rail	North face, at random throughout		(x2) Spalls	1.5	0.75				16	Girder 3	South face, 6" from end of beam, at Bent	16	Spall	1.25	0.75			
13	Rt. Bridge Rail	at random throughout		(x9) Cracking (PSC)	9.5	1.5				16	Girder 4	South face, at Bent	16	Spall	0.75	0.75			
13	Rt. Bridge Rail	North face, at random throughout		(x2) Spalls	1.5	0.75				16	Girder 5	Bottom & South faces, 3' from Bent	15	(x2) Unsound Patched Area	13	2			
14	Curved Concrete Deck	Eastbound lane, at Bent	13	Delam	2.5	1.25				16	Girder 5	South face, 3" from end of beam, at Bent	16	Spall	1	1			
14	Girder 1	North face, at mid span		Unsound Patched Area	1	1				16	Lt. Bridge Rail	Top of North face, starts 12' from Bent	16	(x7) Spalls	10.5	1			
14	Girder 1	South face, 1" from end of beam, at Bent	14	Cracking (PSC)	1.5	1.5				16	Lt. Bridge Rail	at random throughout		(x13) Cracking (RC and Other)	13.5	1.5			
14	Girder 2	Bottom face, at Bent	13	Spall	1.5	0.75	0.75			17	Girder 1	South face, at Bent	17	Cracking (PSC)	3	1.5			
14	Girder 2	West face		(x2) Spalls	1	0.75				17	Girder 1	3" from beam end, South face, at Bent	17	Spall	0.75	0.75			
14	Girder 2	at end of beam, at Bent	14	Delam	1.5	1.5				17	Girder 1	Northeast corner, at Bent	17	Delam	1	3	0.75		
14	Girder 2	31' from Bent	14	Spall	1	1				17	Girder 2	South face, at beam end, at Bent	17	Cracking (PSC)	1.5	2			
14	Girder 3	South face, at Bent	14	Delam	1.25	2.25				17	Girder 2	Bottom of beam, at Bent	16	Spall	1.25	1.25			
14	Girder 3	West face		Spall	0.75	1.75				17	Girder 2	North face, at Bent	17	Cracking (PSC)	1.5	1.5			
14	Girder 3	Bottom face, 1' from Bent	14	Spall	1.25	1.5				17	Girder 3	South face, at Bent	17	Delam	0.75	2.5			
14	Girder 3	North face, at Bent	13	Spall	0.75	0.75				17	Girder 3	Bottom of beam, at Bent	16	Spall	1.25	1			
14	Girder 4	West face		Spall	1.5	2	1			17	Girder 4	North face, at Bent	17	Delam	4.5	2.5			
14	Girder 4	South face, at mid span		Unsound Patched Area	1	1				17	Girder 4	2" from beam end, South face, at Bent	17	Spall	0.75	1.25			
14	Girder 4	near end of beam, at Bent	14	Delam	1.75	1.5				17	Girder 4	North face, at Bent	16	Spall	0.75	2.75	0.75		
14	Lt. Bridge Rail	at random throughout		(x8) Cracking (RC and Other)	8.5	1.5				17	Girder 4	Bottom of beam, at Bent	17	Spall	1.5	1.25			
14	Lt. Bridge Rail	South face, 6' from Bent	14	(x2) Spalls	1.5	1				17	Girder 5	at mid span, South face		Spall	1.5	1.25			
14	Rt. Bridge Rail	at random throughout		(x8) Cracking (RC and Other)	8.5	1.5				17	Girder 5	North face, at Bent	17	Spall	1.5	3.5	0.75		
14	Rt. Bridge Rail	North face, at random throughout		(x2) Spalls	1.5	0.75				17	Girder 5	North face, at Bent	16	Spall	3.5	2			
14	Girder 5	Bottom face, 23' from Bent	14	Unsound Patched Area	4.5	1.25				17	Girder 5	Bottom of beam, 31' from Bent	16	Spall	1.5	1.25			
14	Girder 5	Bottom face, at Bent	13	Spall	1.5	2				17	Girder 5	South face, at Bent	17	Delam	1.5	2.75			
14	Girder 5	near end of beam, at Bent	14	Delam	1.75	1.5				17	Girder 5	Bottom face, 6' from beam end, near Bent	17	Unsound Patched Area	9.5	2	1		
14	Girder 5	Bottom face, 8' from Bent	14	Delam	2	1.25				17	Girder 5	North face, at Bent	16	Cracking (PSC)	1	2			
14	Girder 5	Bottom face, 20' from Bent	14	Delam	2.5	1.25				17	Girder 5	Bottom face, 14' from Bent	17	Delam	3.5	2			
15	Girder 1	Bottom face, at strand hold down locations		Spall	1	0.75				17	Lt. Bridge Rail	at random throughout		(x16) Cracking (RC and Other)	16.5	1.5			
15	Girder 1	Southeast corner, at Bent	15	Spall	0.75	2	0.75			17	Rt. Bridge Rail	at random throughout		(x15) Cracking (RC and Other)	15.5	1.5			
15	Girder 2	Northeast corner, at Bent	15	Delam	1.75	2				17	Rt. Bridge Rail	near Bent	17	Spall	0.75	1			
15	Girder 2	Southeast corner, at Bent	15	Spall	1	1.5	0.75			18	Girder 1	Bottom & South faces, at Bent	17	Unsound Patched Area	3.5	1			
15	Girder 3	South face, at Bent	15	Spall	1.25	1.75				18	Girder 2	Bottom flange, North face, 4' from Bent	17	Spall	1.75	0.75	0.75		
15	Girder 3	North face, at end of beam, at Bent	15	Spall	1.25	2				18	Girder 2	4" from beam end, North face, at Bent	17	Spall	0.75	0.75			
15	Girder 4	Bottom face, at Bent	14	Cracking (PSC)	3.5	1.5				18	Girder 3	North face, 1.5' from beam end, at Bent	17	Cracking (PSC)	1.75	1.5			
15	Girder 4	North face, at Bent	15	Spall	1.75	1.5				18	Girder 3	North face, 6" from end of beam, at Bent	18	Cracking (PSC)	1.75	1.5			
15	Girder 4	South face of web, 8" from end, at Bent	14	Delam	1.5	2				18	Girder 3	Bottom face, 5" from North face, 7' from Bent	17	Cracking (PSC)	3.5	1.5			
15	Girder 5	4" from beam end, at Bent	15	Cracking (PSC)	1.75	1.5				18	Girder 3	Bottom face, at Bent	17	Cracking (PSC)	3	1.5			
15	Girder 5	North face, at end of beam, at Bent	14	Spall	1	1	2.5			18	Girder 3	South face, at Bent	17	Delam	1.5	1.25			
15	Girder 5	South & Bottom faces, near mid-span		Unsound Patched Area	6.5	1.5	0.75			18	Girder 3	Bottom face, 12' from Bent	17	Delam	5.5	0.75	1.5		
15	Girder 5	South face, 3" from end of beam, at Bent	14	Cracking (PSC)	1.75	1.5				18	Girder 4	South face, 5" from end of beam, at Bent	18	Cracking (PSC)	2.25	1.5			
15	Girder 5	South face, 4" from end of beam, at Bent	15	Spall	0.75	0.75				18	Girder 4	North face, at Bent	17	Cracking (PSC)	1	2.5			
15	Girder 5	North face, at Bent	15	Spall	1	2.5	0.75			18	Girder 4	South face, at Bent	17	Spall	2	2.5			
15	Girder 5	North face, 10" from end of beam, at Bent	14	Spall	1	0.75				18	Girder 4	North face, at Bent	17	Delam	1.75	1.75			
15	Lt. Bridge Rail	at random throughout		(x9) Cracking (RC and Other)	9.5	1.5				18	Girder 4	North face, 4" from end of beam, at Bent	18	Spall	1	1			
15	Lt. Bridge Rail	South face, 35' from Bent	15	Spall	0.75	0.75				18	Girder 5	South face, 3" from end of beam, at Bent	18	Cracking (PSC)	2.75	1.5			
15	Rt. Bridge Rail	at random throughout		(x8) Cracking (RC and Other)	8.5	1.5				18	Lt. Bridge Rail	at random throughout		(x7) Cracking (RC and Other)	7.5	1.5			
15	Rt. Bridge Rail	North face, near mid span		Spall	0.75	0.75				18	Rt. Bridge Rail	at random throughout		(x6) Cracking (RC and Other)	6.5	1.5			
16	Curved Concrete Deck	Deck underside, at Beam 5, at Bent	16	Spall	4.5	1	1			18	Rt. Bridge Rail	20' from Bent	18	Spall	0.75	0.75			
16	Girder 1	South face, at Bent	16	Spall	1.25	2.75				19	Curved Concrete Deck	Deck underside, above Beam 1, at Bent	18	Spall	1	1	0.75		
16	Girder 2	South face, 3" from end of beam, at Bent	16	Spall	1.25	1				19	Girder 1	South face, 5" from beam end, at Bent	18	Delam	1.25	1.25			

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PROJECT NO. 15BPR.16
 BRUNSWICK COUNTY
 BRIDGE NO. 71

SHEET 3 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE DEFICIENCIES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-62
2			4			TOTAL SHEETS 73

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Span #	Component	Location (ft. from nearest bent, etc)	Bent #	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	Actual (C.F.)	Actual Depth (ft.)	Span #	Component	Location (ft. from nearest bent, etc)	Bent #	Defect Description	Length(ft.)	Width(ft.)	Depth(ft.)	Actual (C.F.)	Actual Depth (ft.)
19	Girder 2	North face, at end of beam, at Bent	19	Exposed Prestressing	0.75	1.5	1			23	Rt. Bridge Rail	at random throughout		(x6) Cracking (RC and Other)	6.5	1.5			
19	Girder 2	North face, 1' from beam, at Bent	18	Delam	1.25	1.25													
19	Girder 3	North face, 3" from end of beam, at Bent	19	Cracking (PSC)	2.25	1.5													
19	Girder 4	South face, 3" from end of beam, at Bent	19	Cracking (PSC)	1.75	1.5													
19	Girder 4	North face, 5" from end of beam, at Bent	18	Spall	1	1													
19	Girder 5	North face, 2" from end of beam, at Bent	18	Spall	1	1													
19	Girder 5	North face, at Bent	19	Delam	1.25	1.25													
19	Lt. Bridge Rail	at Bent	18	Spall	1	1.5	1												
19	Lt. Bridge Rail	at random throughout		(x3) Cracking (RC and Other)	3.5	1.5													
20	Girder 2	Bottom face, at Bent	19	Spall	1	1.75													
20	Girder 2	North face, 10" from end of beam, at Bent	19	Delam	1.5	1.5													
20	Girder 2	North face, 2" from end of beam, at Bent	19	Spall	1	1													
20	Girder 3	Bottom & South faces, near Bent	19	Unsound Patched Area	1	5.5													
20	Girder 3	North face, at Bent	20	Cracking (PSC)	2.75	1.5													
20	Girder 4	South face, 3" from end of beam, at Bent	19	Cracking (PSC)	1.75	1.5													
20	Girder 4	North face, 3" from end of beam, at Bent	20	Cracking (PSC)	2	1.5													
20	Girder 5	North face, at Bent	20	Cracking (PSC)	1.5	1.5													
20	Lt. Bridge Rail	at random throughout		(x8) Cracking (RC and Other)	8.5	1.5													
20	Rt. Bridge Rail	at random throughout		(x2) Cracking (RC and Other)	2.5	1.5													
21	Curved Concrete Deck	8' from left bridge rail, 14' from Bent	21	Spall	1	1													
21	Girder 1	North face, at beam end, at Bent	20	Delam	1	1													
21	Girder 2	Bottom of beam, 12' from Cap 1		Unsound Patched Area	2.5	1.5													
21	Girder 2	Bottom face, 14' from Bent	20	Delam	1.5	1.5													
21	Girder 2	East face, at Bent	21	Delam	1.5	2.25													
21	Girder 2	North face, at Bent	20	Delam	1.25	1.25													
21	Girder 2	Bottom face, 22' from Bent	20	Delam	8.5	1.5													
21	Girder 3	North face, 6" from end of beam, at Bent	20	Spall	1.5	1.5													
21	Girder 3	North & Bottom faces, 1.5' from beam end at Bent	20	Unsound Patched Area	7	1	1.25												
21	Girder 4	North face, 4" from end of beam, at Bent	20	Spall	1	0.75													
21	Girder 5	North face, at Bent	20	Cracking (PSC)	2.5	1.5													
21	Girder 5	Bottom face, at Bent	20	Spall	1	1.25													
21	Lt. Bridge Rail	at random throughout		(x7) Cracking (RC and Other)	7.5	1.5													
21	Rt. Bridge Rail	at random throughout		(x13) Cracking (RC and Other)	13.5	1.5													
22	Girder 1	Bottom face, 23' from Bent	21	Spall	1	1													
22	Girder 1	North face, 2" from end of beam, at Bent	22	Cracking (PSC)	2.5	1.5													
22	Girder 1	Bottom face, 23' from Bent	22	Spall	1	1													
22	Girder 2	North face, at Bent	21	Delam	2.5	1	0.75												
22	Girder 3	South face, at Bent	22	Cracking (PSC)	2.5	1.5													
22	Girder 3	Beam end, at Bent	22	Cracking (PSC)	0.75	2.75	0.75												
22	Girder 5	Bottom face, 22' from Bent	21	Spall	1	1													
22	Lt. Bridge Rail	at random throughout		(x4) Cracking (RC and Other)	4.5	1.5													
22	Rt. Bridge Rail	at random throughout		(x2) Cracking (RC and Other)	2.5	1.5													
23	Girder 1	Bottom face, 23' from EB 2	EB2	Spall	1	1													
23	Girder 3	North & Bottom faces, at Bent	22	Delam	3	0.75	0.75												
23	Girder 4	North corner, Bottom flange, at Bent	22	Delam	3.5	1.25	0.75												
23	Girder 4	Bottom face, 23' from EB 2	EB2	Spall	1	1													
23	Girder 5	Bottom face, 22' from EB 2	EB2	Spall	1	1													
23	Girder 5	Bottom face, 22' from Bent	22	Spall	1	1													
23	Lt. Bridge Rail	3' from Bent	22	Spall	0.75	1													
23	Lt. Bridge Rail	at random throughout		(x5) Cracking (RC and Other)	5.5	1.5													

NOTES:

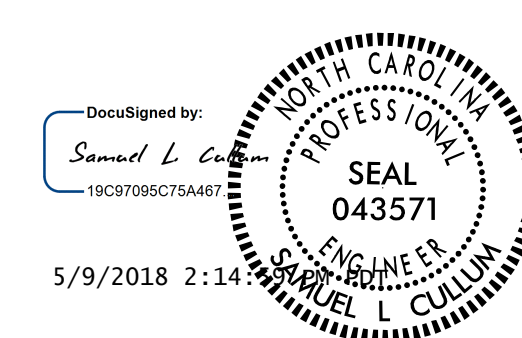
- ALL DEFECTS WERE TAKEN FROM THE 2018 BRIDGE INSPECTION REPORT.
- REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE.
- THE ENGINEER SHALL FILL OUT THE AS-BUILT REPAIR QUANTITY FOR EACH LISTED DEFICIENCY.
- COORDINATE THIS SHEET WITH SHEETS S-32 THRU S-57.
- IF ADDITIONAL REPAIRS, NOT SHOWN ON SHEETS S-35 THRU S-57, 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 REPAIR QUANTITIES TABLE.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

SHEET 4 OF 4

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : AARON J. MCMILLAN DATE : 03-2018
 CHECKED BY : DIEGO A. AGUIRRE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

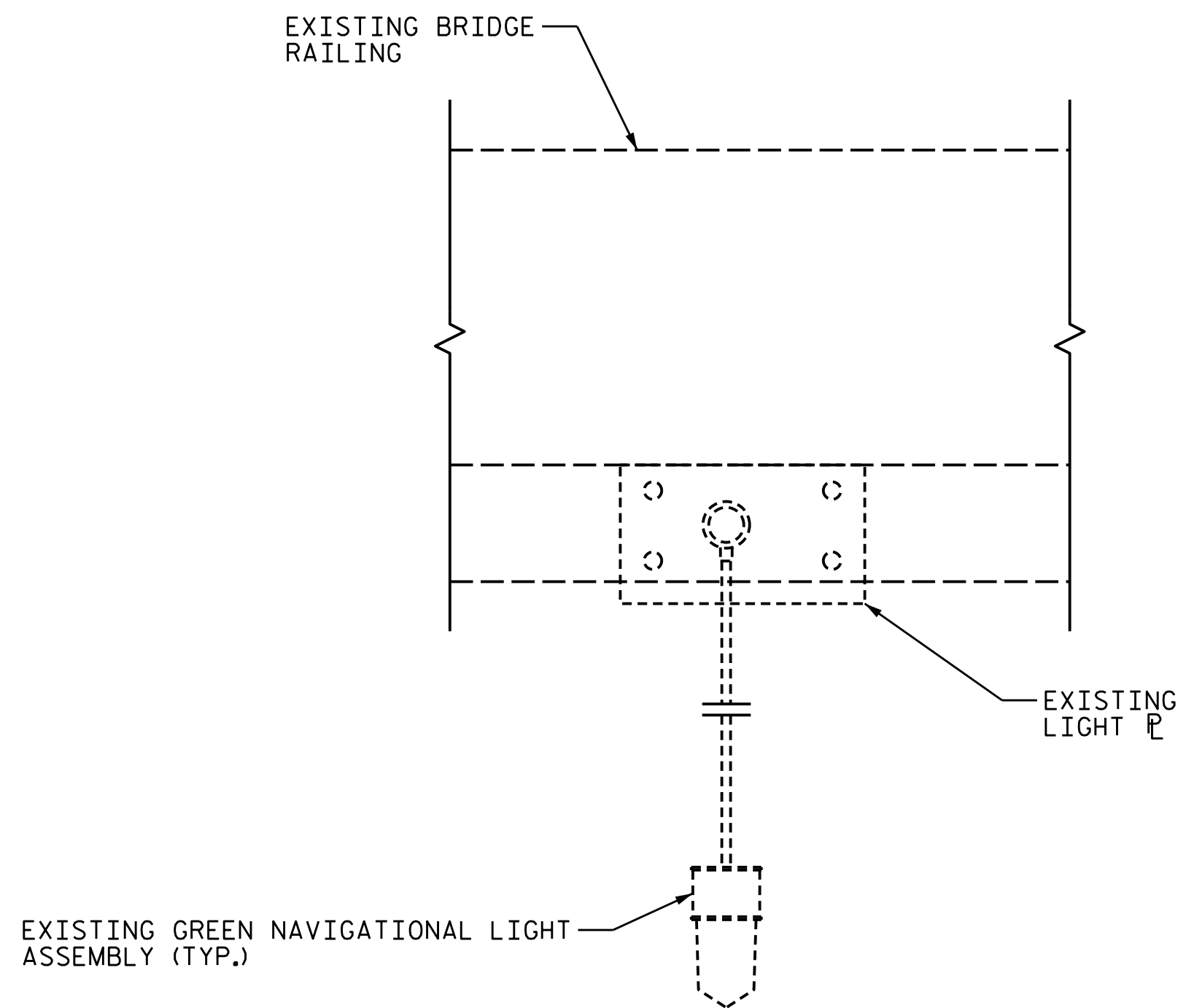


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

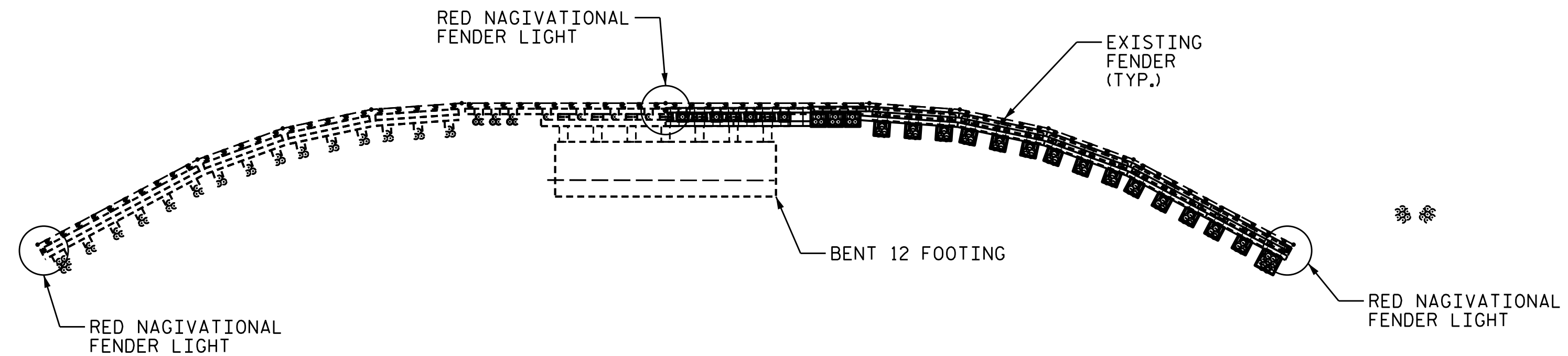
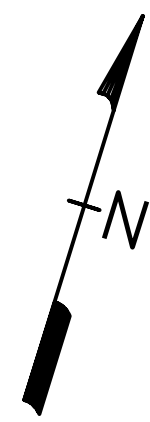
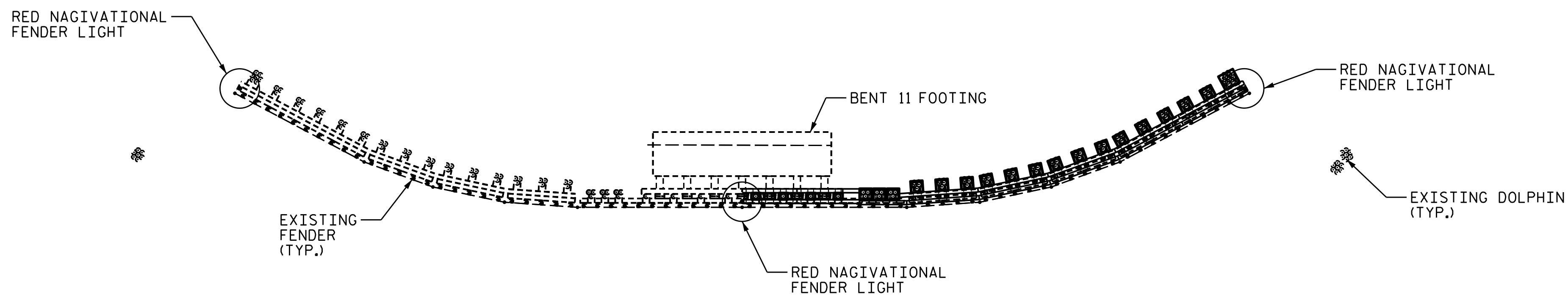
SUPERSTRUCTURE DEFICIENCIES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-63
1			3			TOTAL SHEETS
2			4			73

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



EXISTING NAVIGATION LIGHTING ON BRIDGE RAIL



EXISTING NAVIGATION LIGHTING FENDER

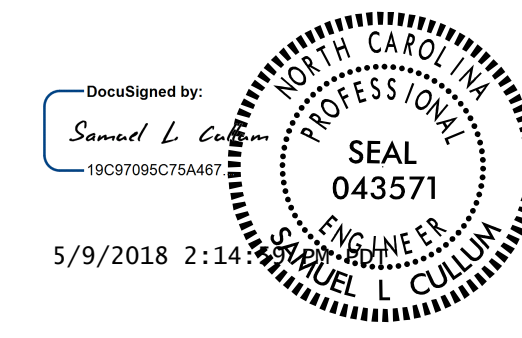
NOTES:

1. FOR NAVIGATIONAL LIGHT SYSTEM, SEE SPECIAL PROVISIONS FOR "NAVIGATIONAL LIGHT SYSTEM".
2. THE POWER SUPPLY SHALL BE TURNED OFF WHILE ANY CHANGES ARE MADE TO THE NAVIGATIONAL LIGHT SYSTEM.
3. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN AND ENSURE ALL NAVIGATIONAL LIGHTS ARE OPERATIONAL FOR THE DURATION OF THE PROJECT IN ACCORDANCE WITH THE CODE OF FEDERAL GUIDELINES. THIS INCLUDES BUT IS NOT LIMITED TO INSTALLING (6) SIX TEMPORARY BATTERY OPERATED RED LIGHTS DURING THE CONSTRUCTION OF THE PROPOSED FENDER SYSTEM.
4. THE CONTRACTOR'S ATTENTION IS BROUGHT TO NOTICE THAT THE TOP GREEN NAVIGATIONAL LIGHTS ATTACHED TO THE BRIDGE RAIL ARE CURRENTLY POWERED BY THE SOLAR ARRAY ALSO ATTACHED TO THE BRIDGE RAIL. IF THE CONTRACTOR OR ENGINEER NOTICES ANY MALFUNCTION WITH THESE LIGHTS AND NO REPAIRS CAN BE MADE CONTACT THE NCDOT IMMEDIATELY (SEE NOTE 8 FOR CONTACT INFORMATION).
5. ALL CONNECTIONS SHALL BE MADE PER NFPA 70 ELECTRIC CODE (NEC) BY A CURRENT LICENSED ELECTRICIAN.
6. ALL ITEMS REQUIRED TO INSTALL ANY TEMPORARY NAVIGATIONAL LIGHTS OR POWER SOURCES SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEM FOR THE PROJECT.
7. DECOMMISSIONING AND RECOMMISSIONING OF THE FENDER SYSTEM'S PERMANENT NAVIGATIONAL LIGHTS SHALL BE PERFORMED BY THE NCDOT AFTER THE COMPLETION OF THE PROPOSED FENDER SYSTEM.
8. THE CONTRACTOR SHALL NOTIFY THE NCDOT JOHN LANGE AT (910) 262-6319 (2) TWO WEEKS PRIOR TO THE COMPLETION OF THE PROPOSED FENDER SYSTEM TO CORRODINATE THE INSTALLATION OF THE PROPOSED NAVIGATIONAL LIGHTS.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

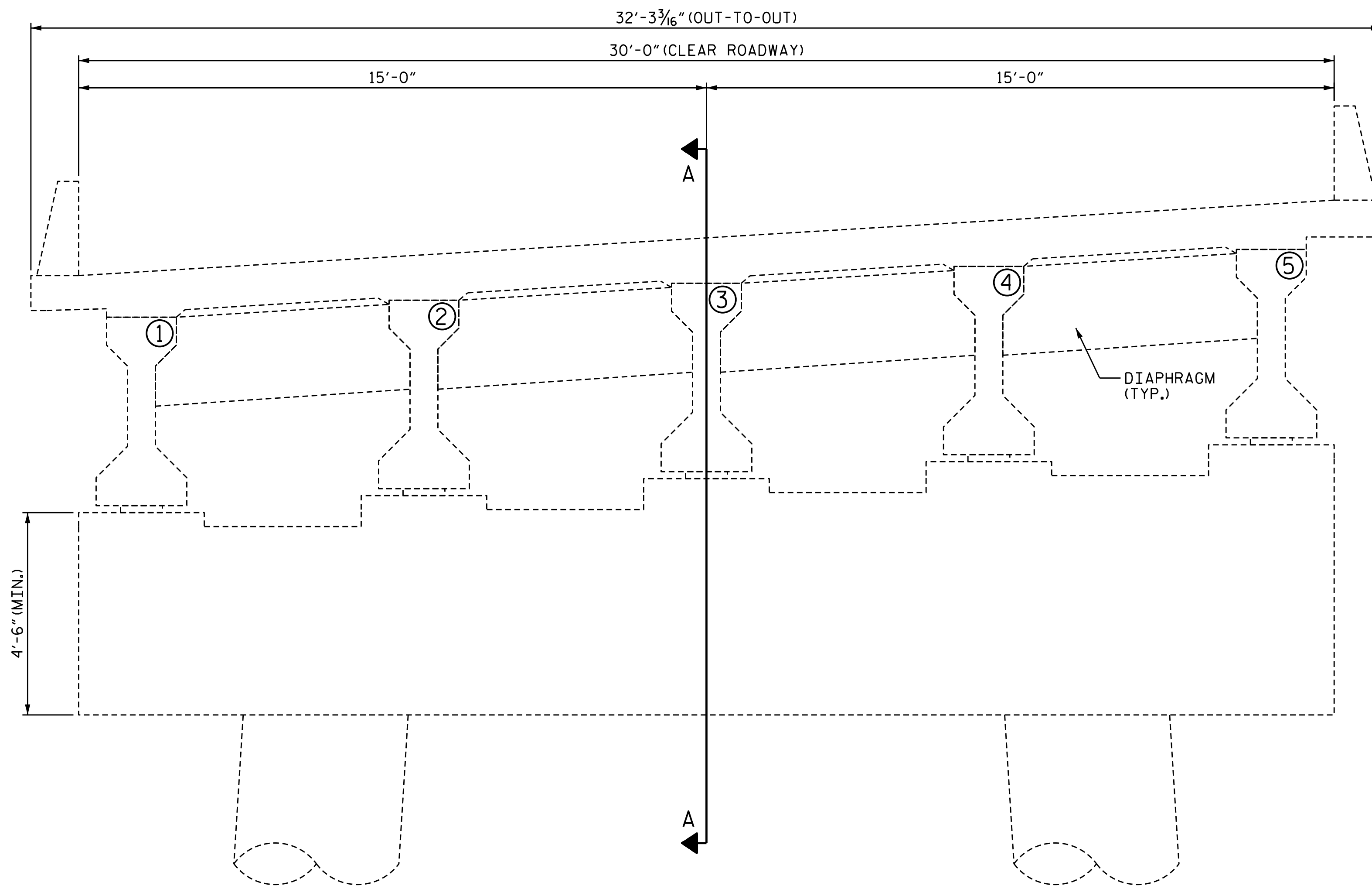
DRAWN BY : JACOB H. DUKE DATE : 03-2018
 CHECKED BY : AARON J. MCMILLAN DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018



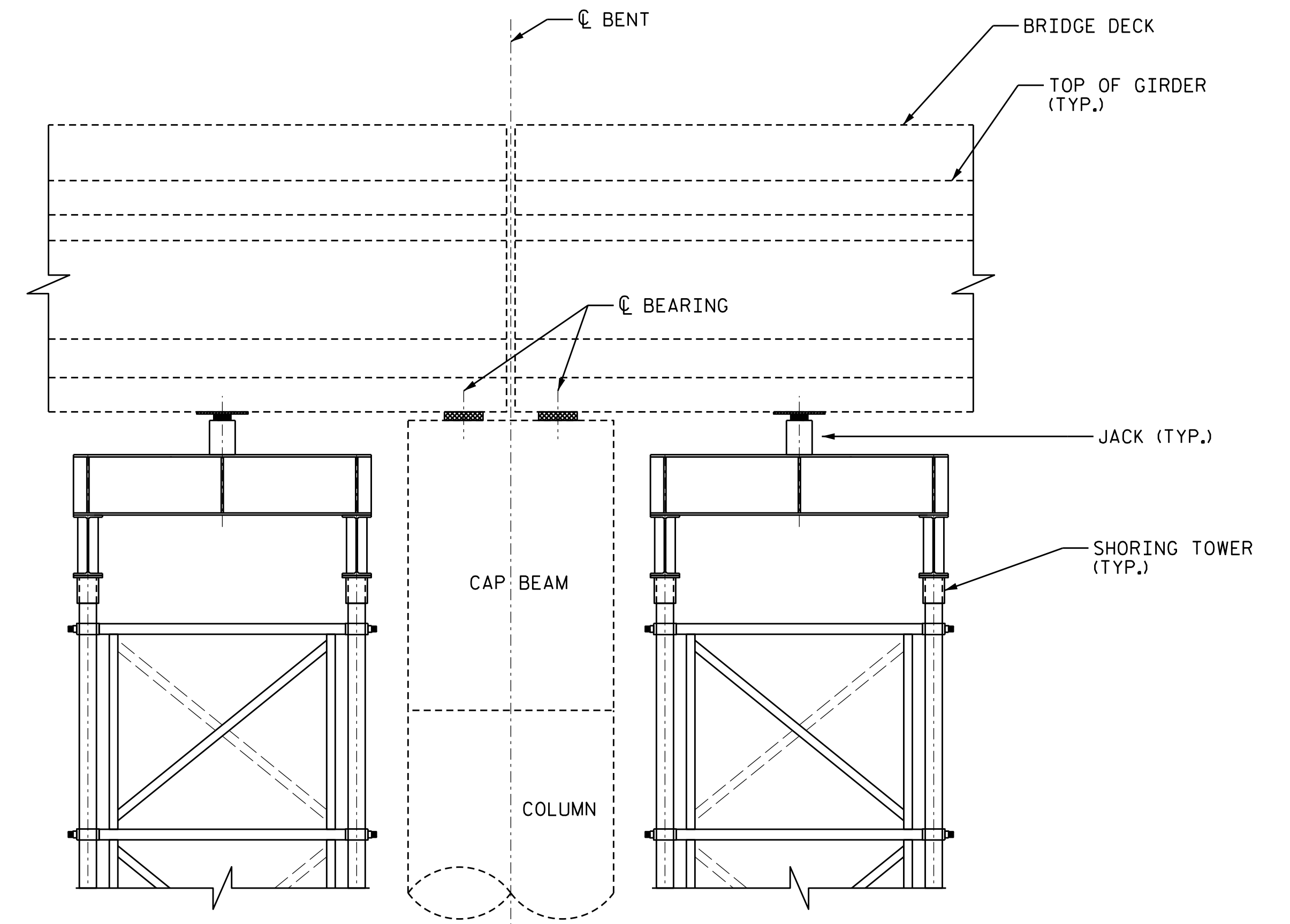
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
NAVIGATIONAL LIGHT SYSTEM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-64
1			3			TOTAL SHEETS
2			4			73

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION
(BENTS 21 AND 22)
(JACKING FRAMES NOT SHOWN FOR CLARITY)



SECTION A-A

JACKING NOTES:

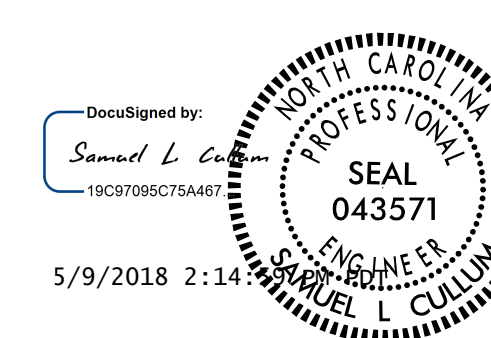
1. ANY SKETCHES OR NOTES ON THIS SHEET OR OTHERS REGARDING BRIDGE JACKING ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING A JACKING PLAN FOR PARTICULAR GEOMETRIES AND LOADS. THE JACKING PLANS MUST BE SUBMITTED FOR REVIEW AND APPROVAL.
2. PRIOR TO JACKING, LOOSEN ANY ATTACHMENTS TO ALLOW MOVEMENT DURING JACKING.
3. JACKING OF THE SUPERSTRUCTURE IS NECESSARY TO FACILITATE BEARING REPLACEMENT.
4. NO BEAMS SHALL BE LIFTED OVER 2" DURING JACKING OPERATIONS. THE JACKS SHALL BE PLACED SYMMETRICALLY AT THE CENTERLINE OF EACH GIRDER. ALL JACKS SHALL BE FED BY A COMMON MANIFOLD. JACKS SHALL BE EQUIPPED WITH A LOCKING RING WHICH WILL PREVENT MOVEMENT IN THE EVENT HYDRAULIC PRESSURE IS LOST. JACKS SHALL BE LOCKED OFF PRIOR TO REPAIRS. USE SHIMS OR OTHER APPROVED MEANS IF LOCKING RINGS ARE NOT PRACTICAL.
5. JACKS USED SHALL BE IN FULL COMPLIANCE WITH ANSI B30.1.
6. THE CONTRACTOR IS RESPONSIBLE TO ADEQUATELY SIZE JACKS AND SUPPORTS TO ALLOW FOR INDETERMINANT FACTORS SUCH AS MINOR LOAD REDISTRIBUTION AND MECHANICAL INEFFICIENCIES.
7. A PRE-JACKING MEETING SHALL BE REQUIRED BETWEEN THE CONTRACTOR, THE UTILITY REPRESENTATIVE, AND THE ENGINEER PRIOR TO ANY JACKING OPERATIONS.
8. THE CONTRACTOR SHALL BE AWARE OF UTILITY CONDUITS THROUGHOUT BRIDGE. A UTILITY REPRESENTATIVE SHALL BE ON SITE DURING JACKING OPERATIONS.
9. AS A MINIMUM, THE FULL BRIDGE WIDTH (5 BEAM LINES) AND BEAMS ON BOTH SIDES OF THE BENT SHALL BE LIFTED AT ONCE. MORE MAY BE RAISED AT ONCE AT THE DISCRETION OF THE CONTRACTOR.
10. PRIOR TO JACKING, ALL JOINT AND BARRIER SAWCUTS MUST BE COMPLETED.
11. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

PRELIMINARY JACKING LOADS

	BEAM	FACTORED DEAD LOAD (KIPS)	FACTORED LIVE LOAD NO IMPACT (KIPS)	MIN. JACK CAPACITY LIVE & DEAD LOAD (TONS)
SPAN 21 - BENT 21	1	105	150	130
	2	105	125	120
	3	105	125	120
	4	105	125	120
	5	105	150	130
SPAN 22 & 23 - BENT 22	1	65	130	100
	2	65	110	90
	3	65	110	90
	4	65	110	90
	5	65	130	100

NOTES:
DL FACTOR: 1.25
LL FACTOR: 1.75

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
BRIDGE NO. 71



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

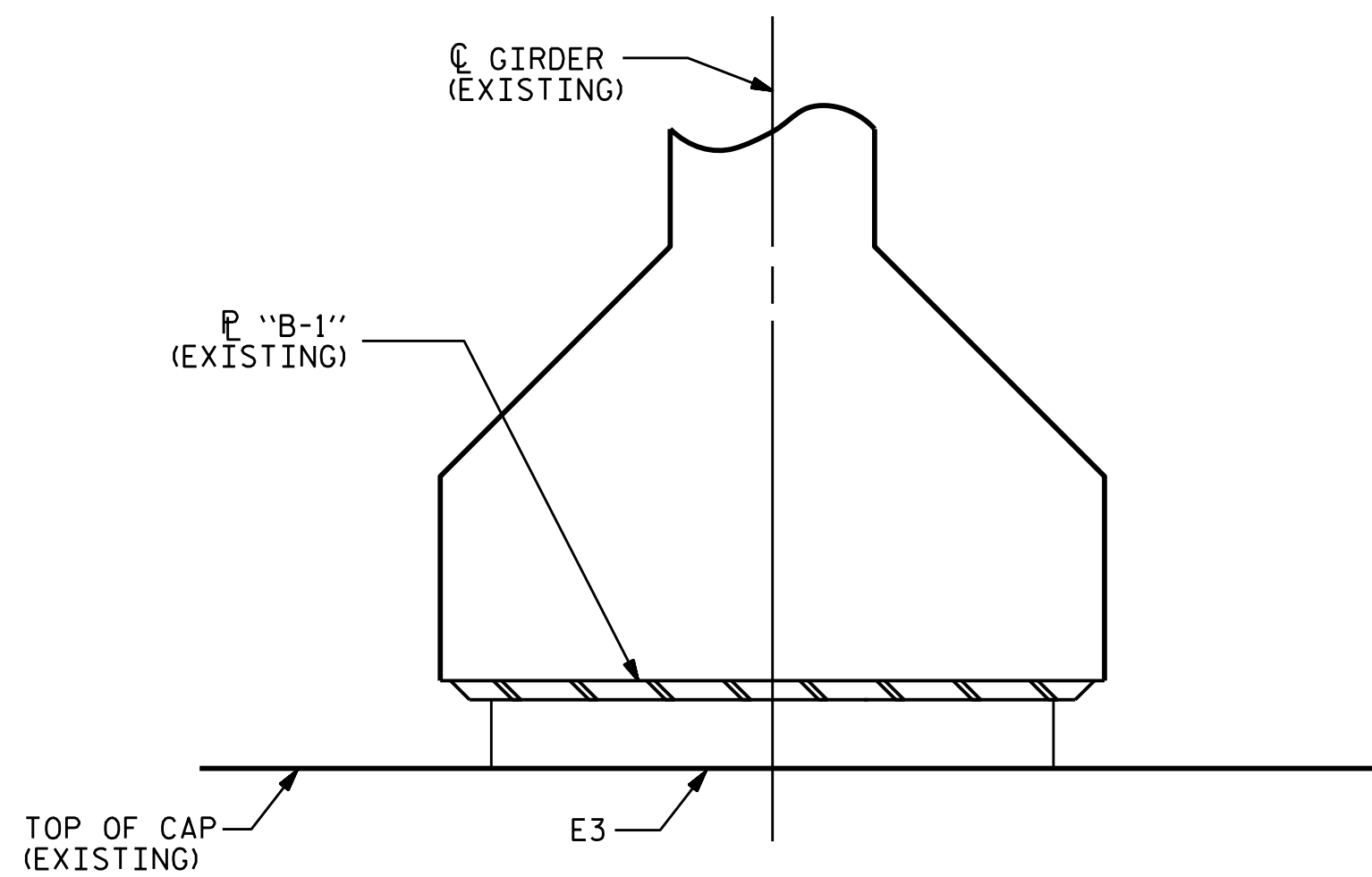
JACKING DETAILS

KCA 4800 SIX FORKS ROAD SUITE 120
KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
(919) 882-7839

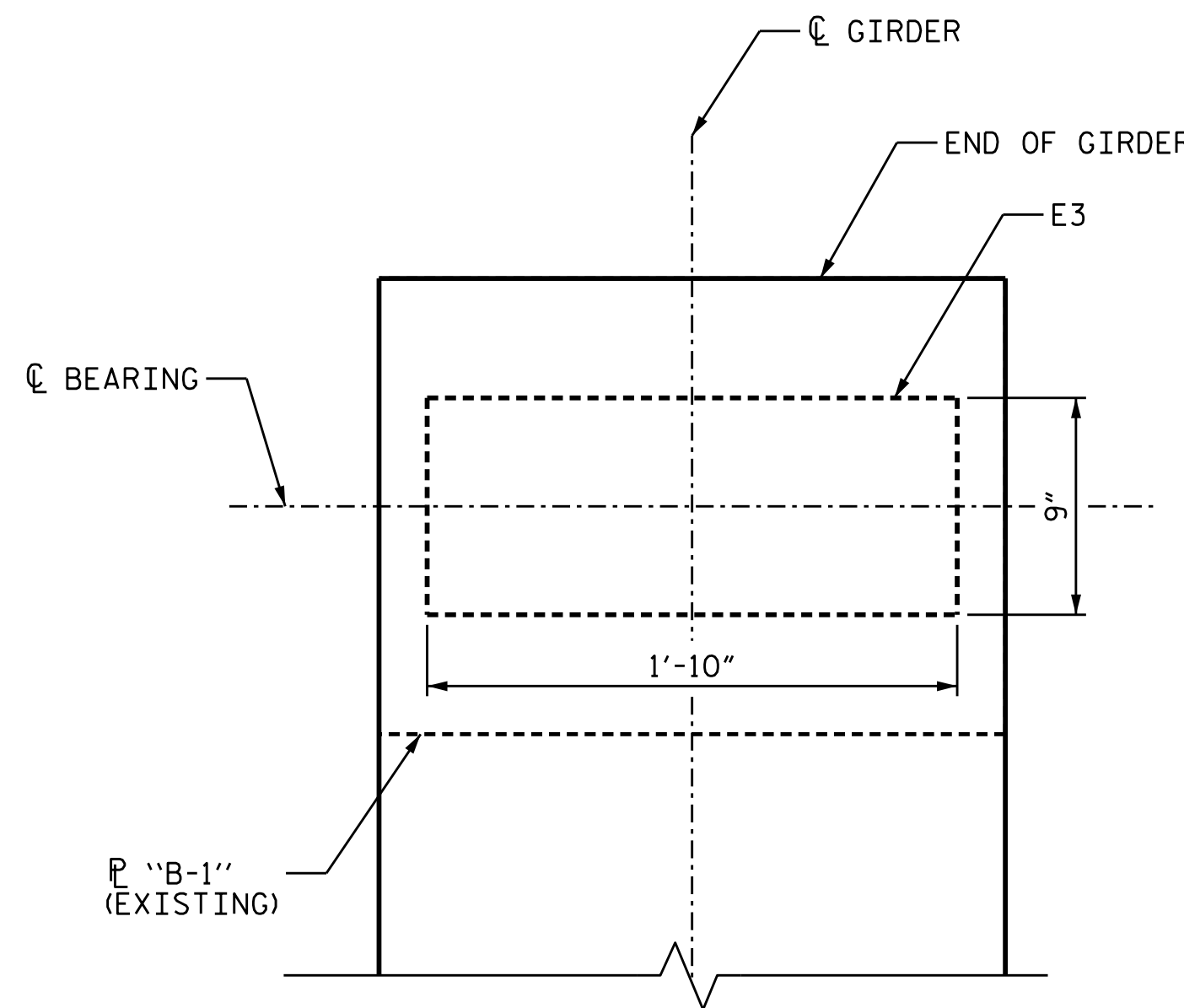
DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
CHECKED BY : JACOB H. DUKE DATE : 03-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-65
1			3			TOTAL SHEETS 73
2			4			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



EXPANSION BEARINGS



TYPICAL PLAN VIEW OF ELASTOMERIC BEARING

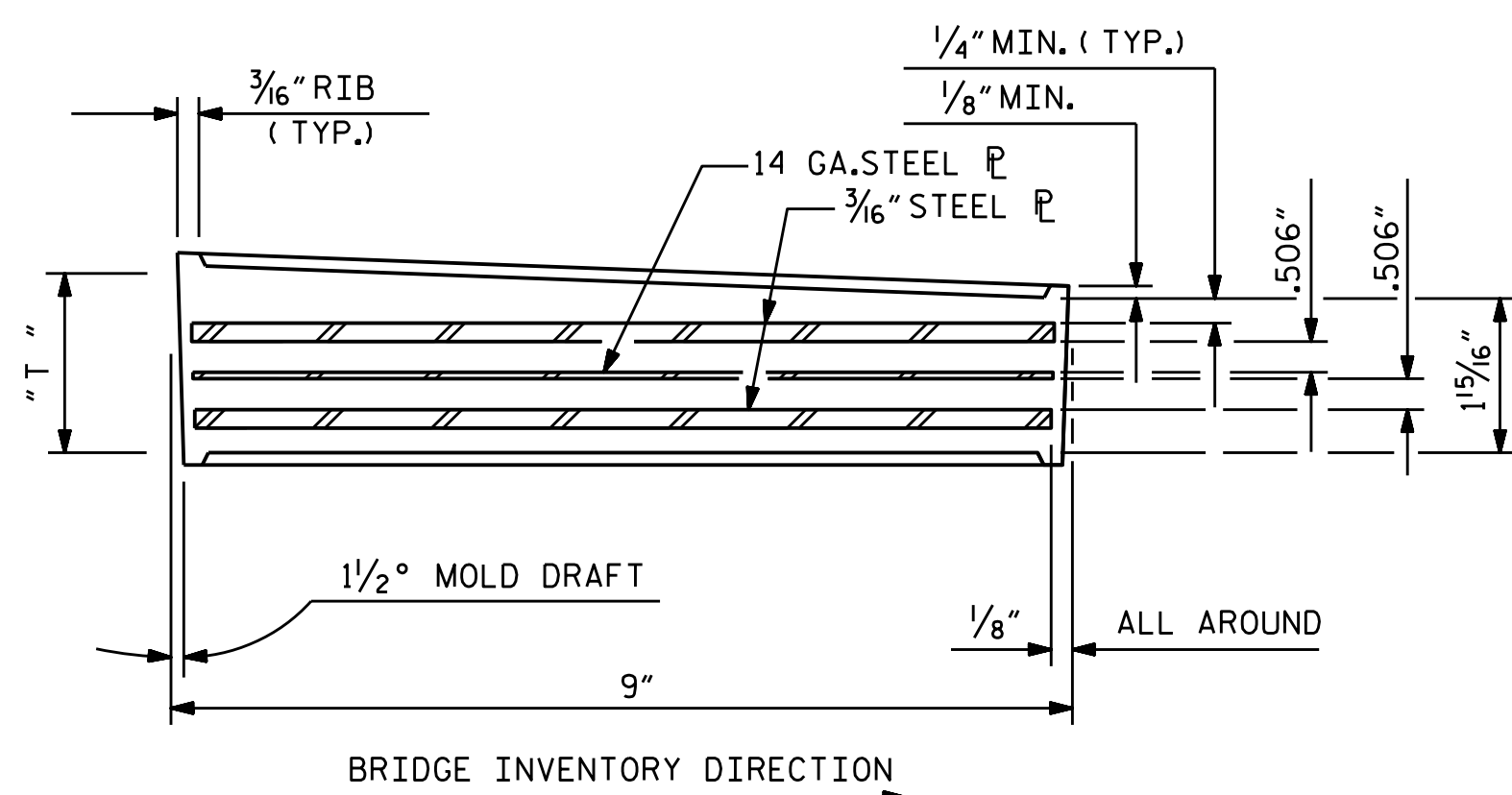
(CAP NOT SHOWN) SPAN 21, BENT 21, BRG. 4 (1 REQ'D)
 SPAN 22, BENT 22, BRG. 1 (1 REQ'D)
 SPAN 23, BENT 22, BRG. 1 (1 REQ'D)

NOTES:

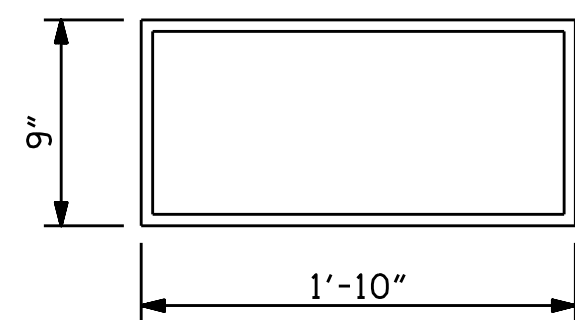
1. THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.
2. FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE STANDARD SPECIFICATIONS AND PROJECT SPECIAL PROVISIONS.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	225 k

SPAN	BENT	BEARING	TYPE	" T "	ELASTOMER VOLUME
21	21	4	E3	2 ⁷ / ₁₆ "	0.25 CF
22	22	1	E3	2 ³ / ₁₆ "	0.24 CF
23	22	1	E3	2 ³ / ₁₆ "	0.24 CF



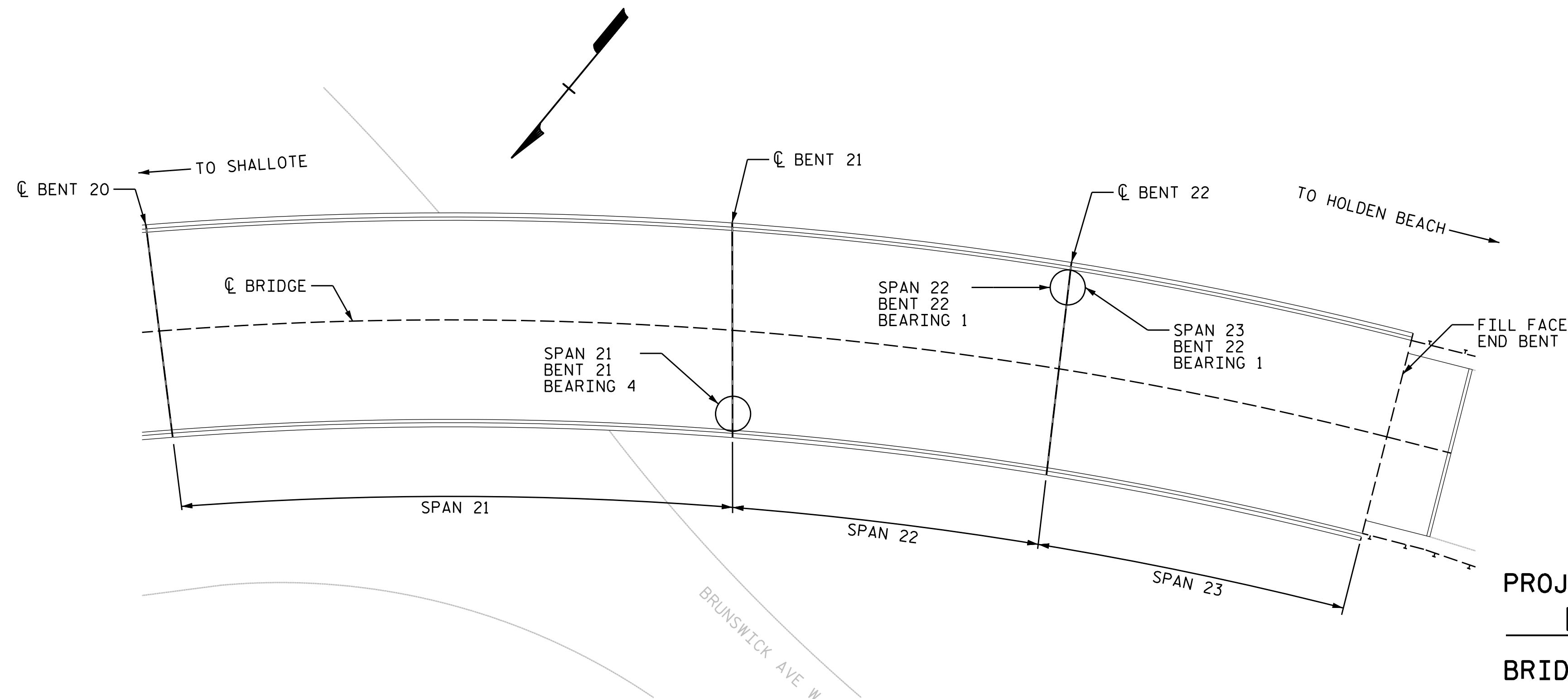
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E3 (3 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV (EXPANSION BEARING)



REPLACEMENT BEARING LOCATIONS

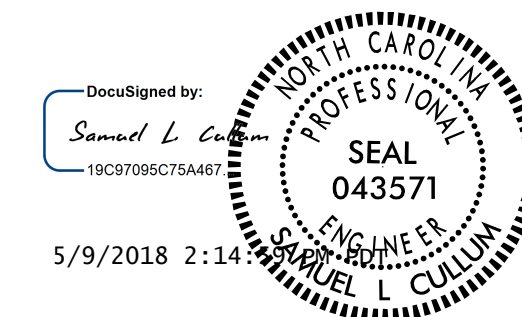
(PLAN)

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

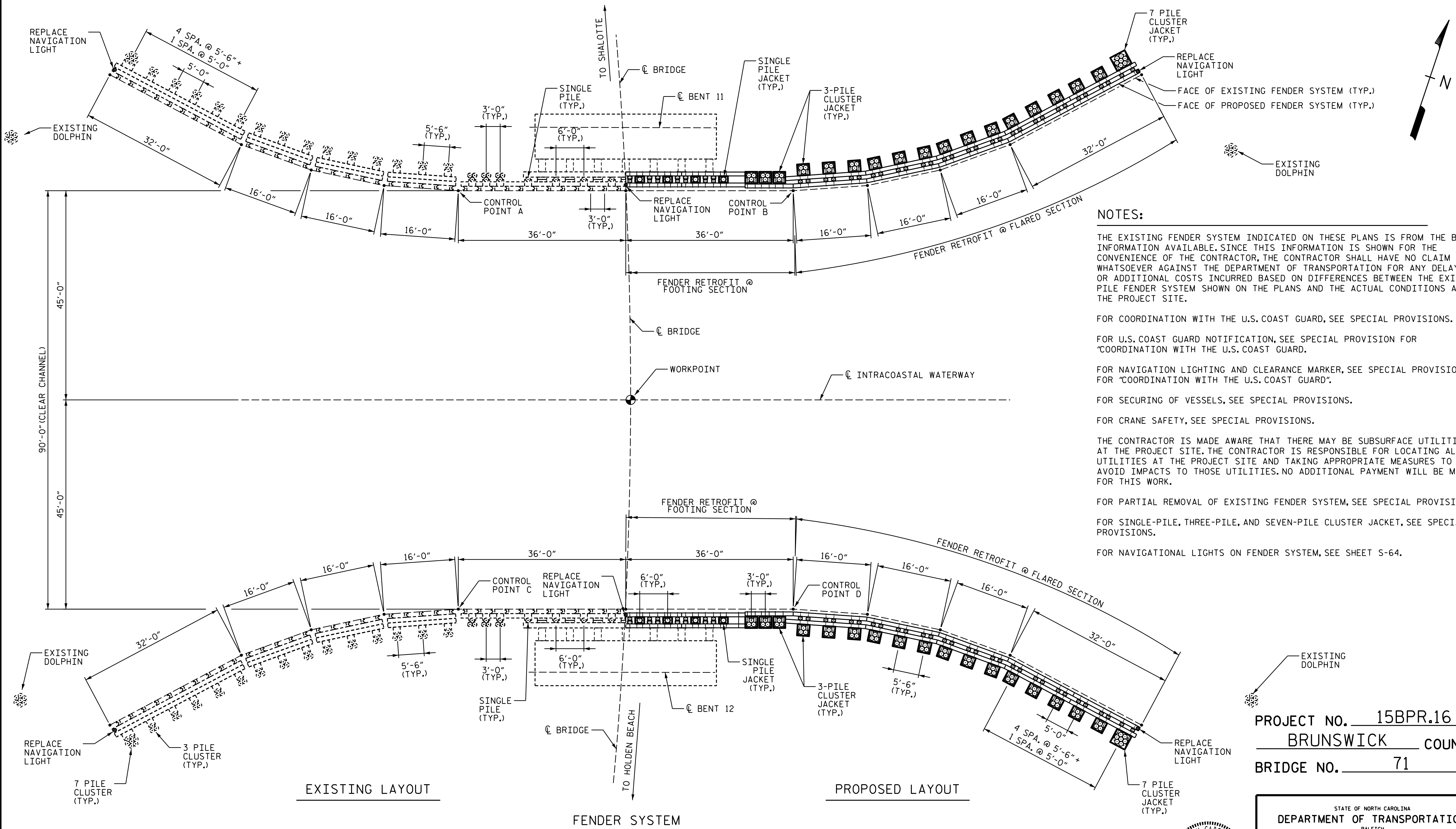
5/9/2018
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 User:jduke



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
BEARING REPLACEMENT
 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-66
1			3			TOTAL SHEETS
2			4			73

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NOTES:

THE EXISTING FENDER SYSTEM INDICATED ON THESE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COSTS INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING PILE FENDER SYSTEM SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

FOR COORDINATION WITH THE U.S. COAST GUARD, SEE SPECIAL PROVISIONS.

FOR U.S. COAST GUARD NOTIFICATION, SEE SPECIAL PROVISION FOR "COORDINATION WITH THE U.S. COAST GUARD".

FOR NAVIGATION LIGHTING AND CLEARANCE MARKER, SEE SPECIAL PROVISION FOR "COORDINATION WITH THE U.S. COAST GUARD".

FOR SECURING OF VESSELS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

THE CONTRACTOR IS MADE AWARE THAT THERE MAY BE SUBSURFACE UTILITIES AT THE PROJECT SITE. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES AT THE PROJECT SITE AND TAKING APPROPRIATE MEASURES TO AVOID IMPACTS TO THOSE UTILITIES. NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS WORK.

FOR PARTIAL REMOVAL OF EXISTING FENDER SYSTEM, SEE SPECIAL PROVISIONS.

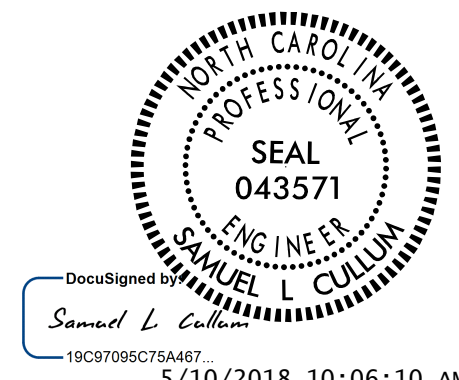
FOR SINGLE-PILE, THREE-PILE, AND SEVEN-PILE CLUSTER JACKET, SEE SPECIAL PROVISIONS.

FOR NAVIGATIONAL LIGHTS ON FENDER SYSTEM, SEE SHEET S-64.

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

EXISTING LAYOUT
 PROPOSED LAYOUT
 FENDER SYSTEM

AS-BUILT QUANTITY TABLE	
FENDER SYSTEM REPAIRS	
REMOVAL OF EXISTING FENDER SYSTEM	LUMP SUM
COMPOSITE FENDER SYSTEM	LUMP SUM



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**FENDER SYSTEM
 EXISTING & PROPOSED
 PLAN LAYOUT**

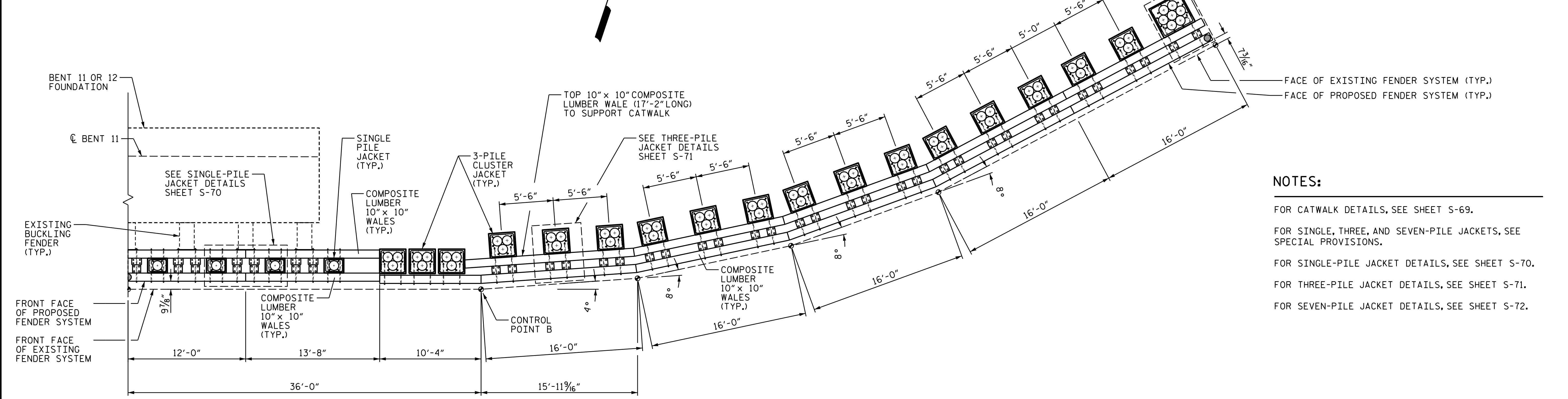
KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-67
1			3			TOTAL SHEETS
2			4			73

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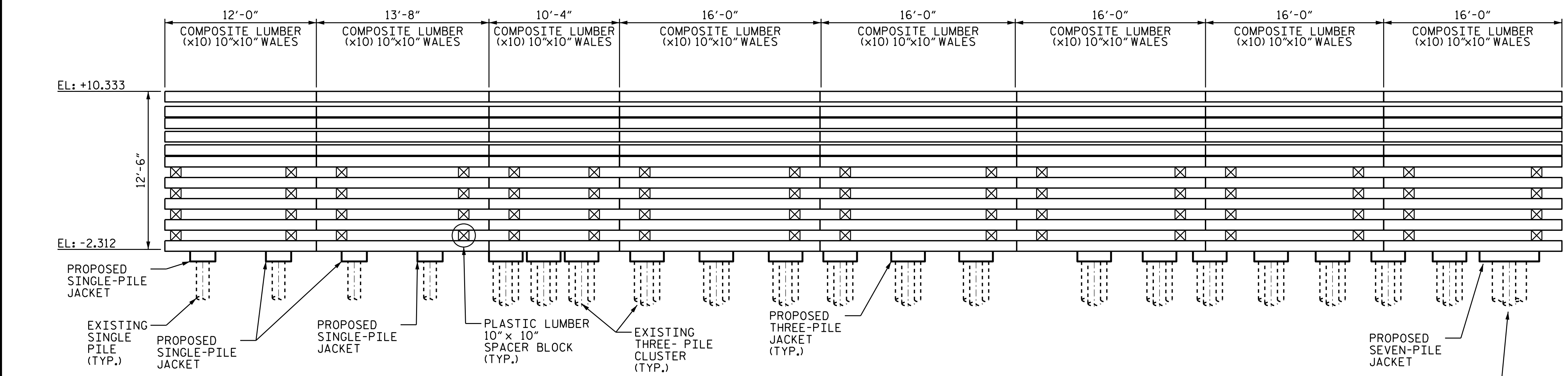
BILL OF MATERIALS FOR BOTH FENDER SYSTEMS (EXCLUDES CATWALK)				
DESCRIPTION	SIZE (ACT.)	UNIT LENGTH (FT.)	NUMBER	TOTAL LENGTH (FT.)
COMPOSITE LUMBER: HORIZONTAL WALES	10" x 10"	16'-0"	476	7616'-0"
COMPOSITE LUMBER: HORIZONTAL WALES	10" x 10"	17'-2"	4	68'-8"
COMPOSITE LUMBER: VERTICAL WALES	8" x 12"	2'-0"	28	56'-0"
COMPOSITE LUMBER: VERTICAL WALES	10" x 10"	12'-6"	148	1850'-0"
PLASTIC LUMBER: SPACER BLOCKS	10" x 10"	0'-10"	256	213'-3"
PLATES "P" STEEL		76.6 LB.	14	1072 LB.



PARTIAL PLAN VIEW (TYPICAL FLARE)

FENDER AT BENT 11 SHOWN, BENT 12 SIMILAR
(FLARE AT CONTROL POINT B SHOWN, CONTROL POINTS A, C, AND D SIMILAR)
(HANDRAIL NOT SHOWN FOR CLARITY)

- NOTES:**
- FOR CATWALK DETAILS, SEE SHEET S-69.
 - FOR SINGLE, THREE, AND SEVEN-PILE JACKETS, SEE SPECIAL PROVISIONS.
 - FOR SINGLE-PILE JACKET DETAILS, SEE SHEET S-70.
 - FOR THREE-PILE JACKET DETAILS, SEE SHEET S-71.
 - FOR SEVEN-PILE JACKET DETAILS, SEE SHEET S-72.



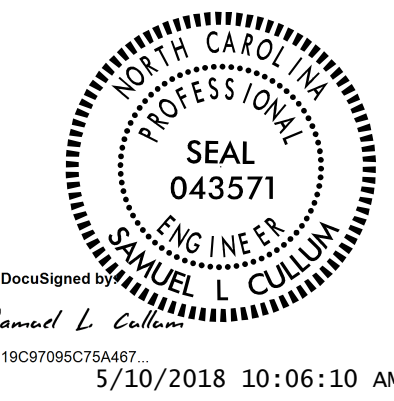
PARTIAL ELEVATION VIEW (TYPICAL FLARE)

(FLARE AT CONTROL POINT B SHOWN, CONTROL POINTS A, C, AND D SIMILAR)
(HANDRAIL NOT SHOWN FOR CLARITY)

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
BRIDGE NO. 71

KCA 4800 SIX FORKS ROAD SUITE 120
KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
(919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 05-2018
CHECKED BY : JACOB H. DUKE DATE : 05-2018
DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 05-2018



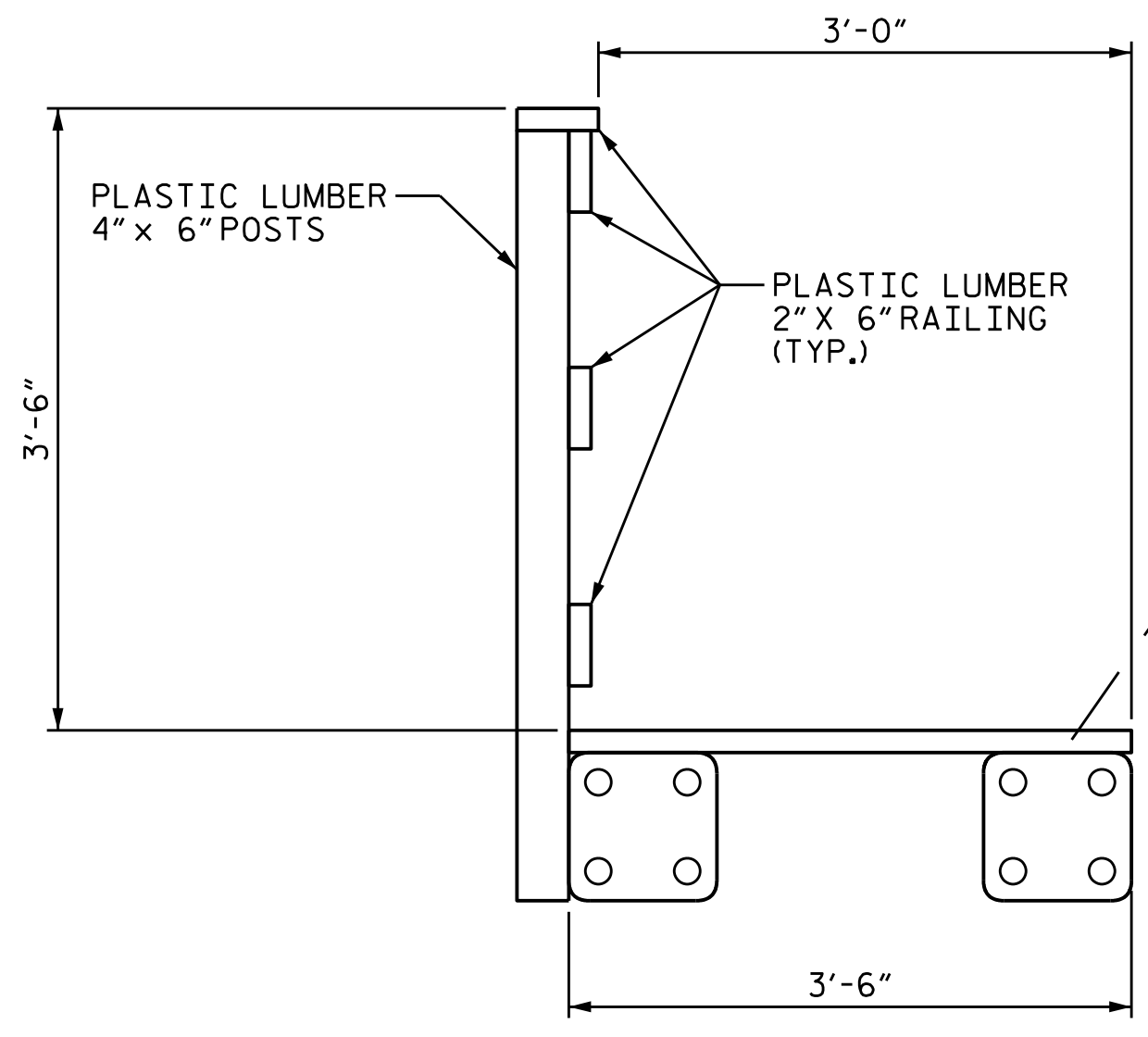
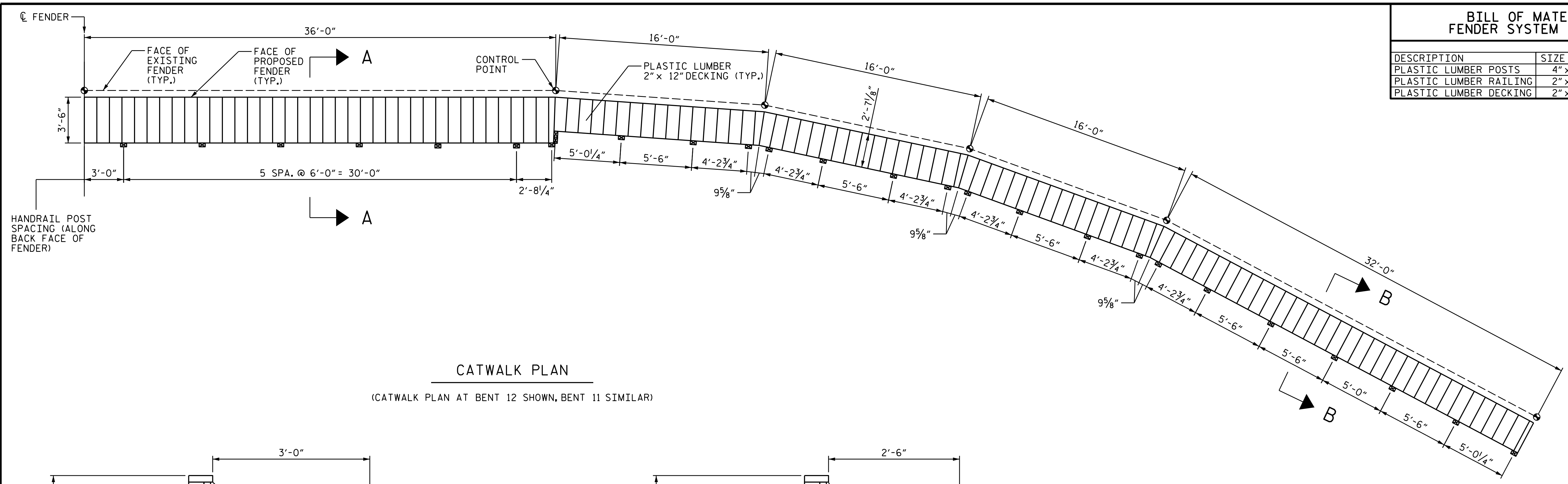
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
FENDER SYSTEM
PROPOSED LAYOUT & ELEVATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-68
1			3			TOTAL SHEETS
2			4			73

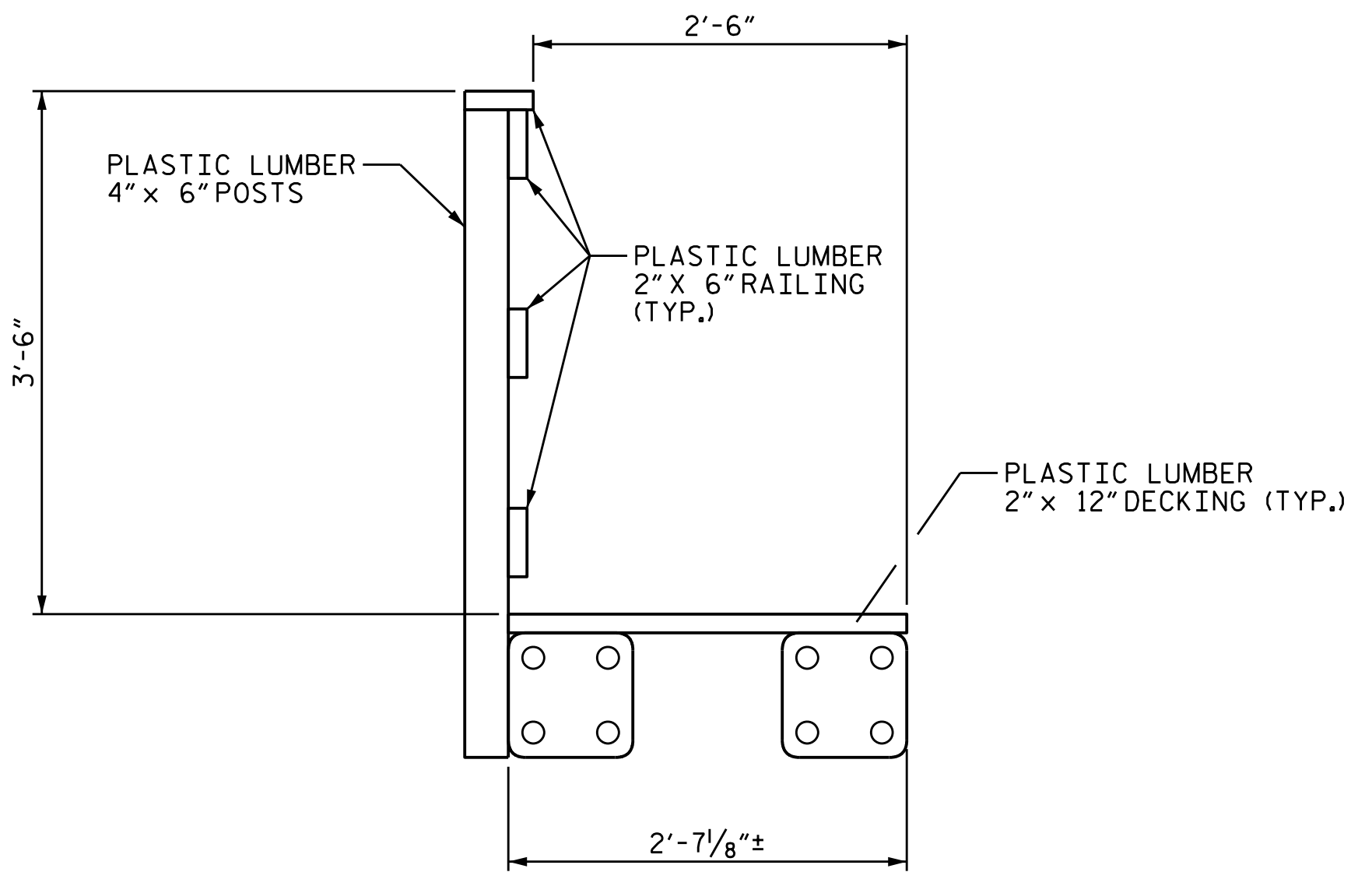
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**BILL OF MATERIALS
FENDER SYSTEM CATWALK**

DESCRIPTION	SIZE (NOM.)	LENGTH (FT.)
PLASTIC LUMBER POSTS	4" x 6"	468'-0"
PLASTIC LUMBER RAILING	2" x 6"	1868'-0"
PLASTIC LUMBER DECKING	2" x 12"	1424'-6"



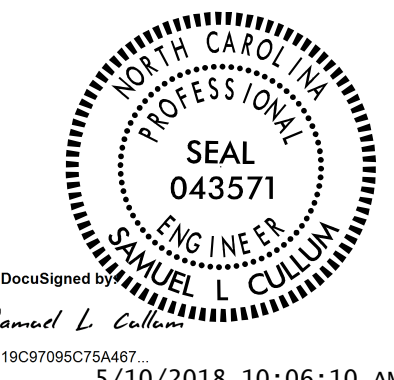
SECTION A-A



SECTION B-B

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

SHEET 1 OF 4



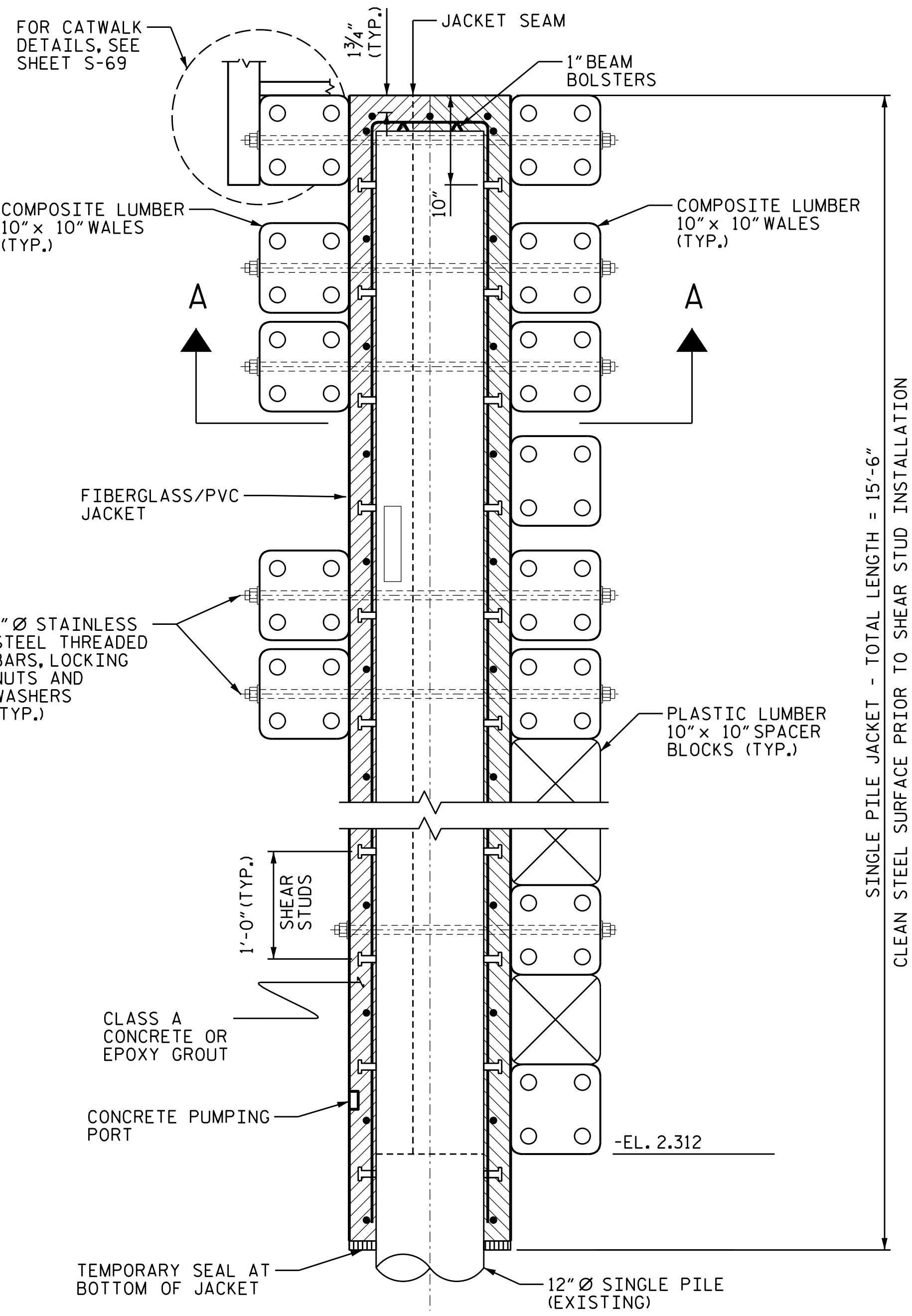
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**FENDER SYSTEM
 CATWALK LAYOUT
 &
 TYPICAL SECTIONS**

KCA 4800 SIX FORKS ROAD SUITE 120
 KISINGER CAMPO & ASSOCIATES RALEIGH, NC 27609
 (919) 882-7839

DRAWN BY : DIEGO A. AGUIRRE DATE : 03-2018
 CHECKED BY : JACOB H. DUKE DATE : 03-2018
 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

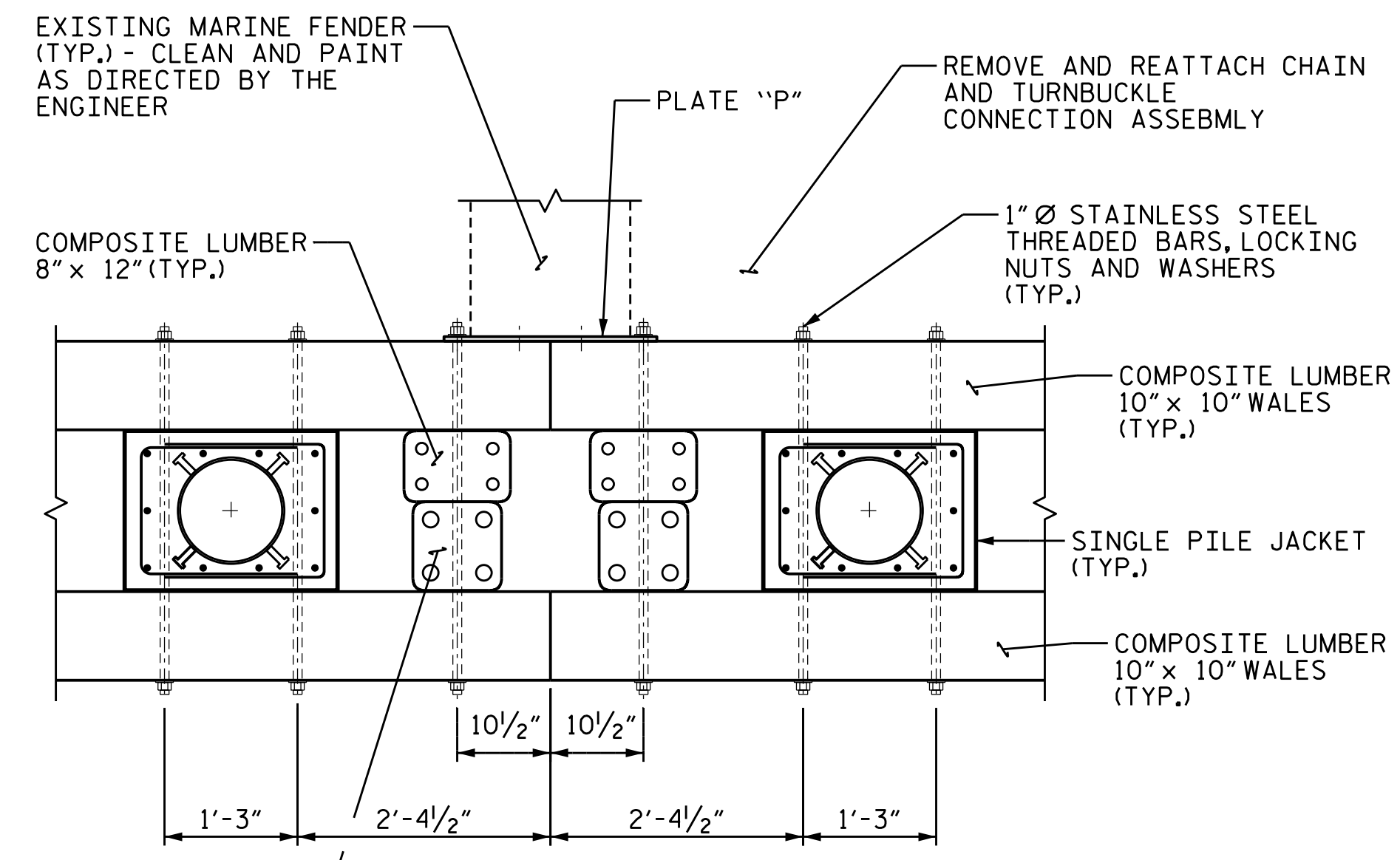
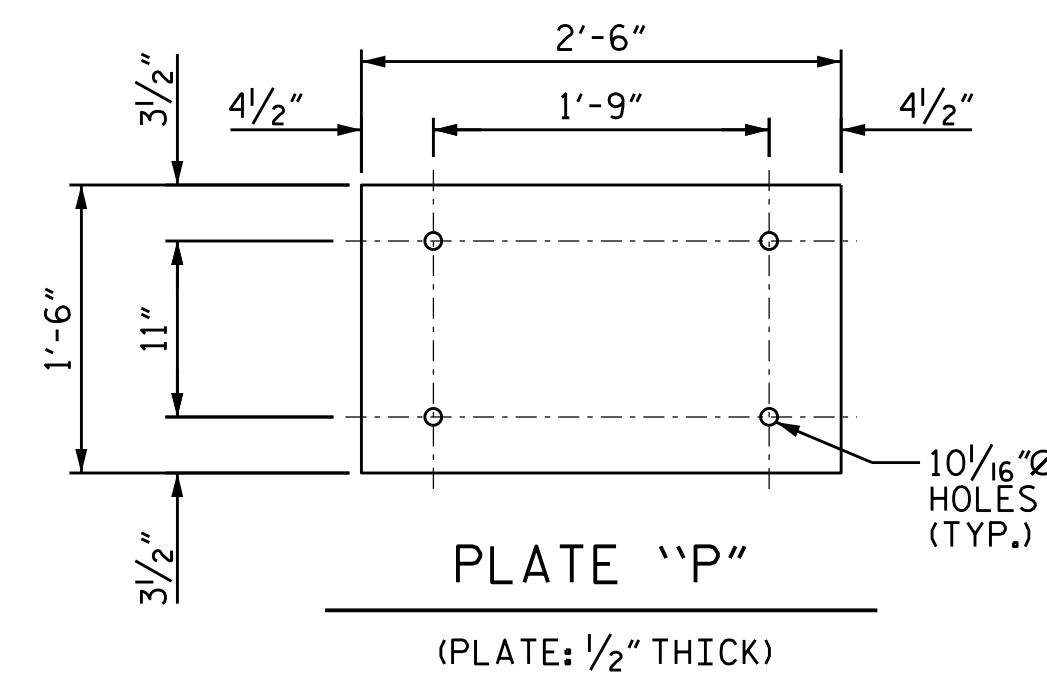
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-69
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2			4			73

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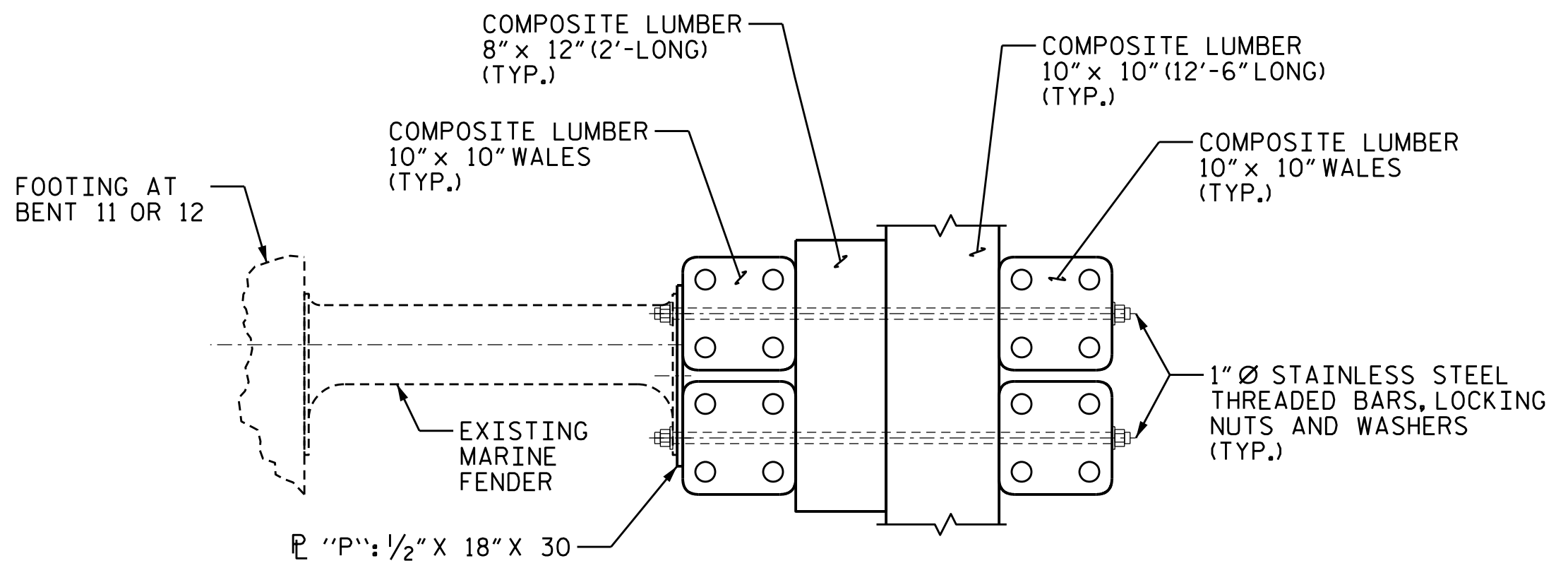


ELEVATION

(FRONT VERTICAL REBAR NOT SHOWN FOR CLARITY)
 ** INSTALL 12 ROWS OF SHEAR STUDS PER JACKET, BEGINNING AT TOP OF JACKET AS SHOWN, THE LOWER 3'-6" ± WILL NOT HAVE SHEAR STUDS INSTALLED.



PLAN VIEW



CONNECTION DETAIL AT MARINE FENDER

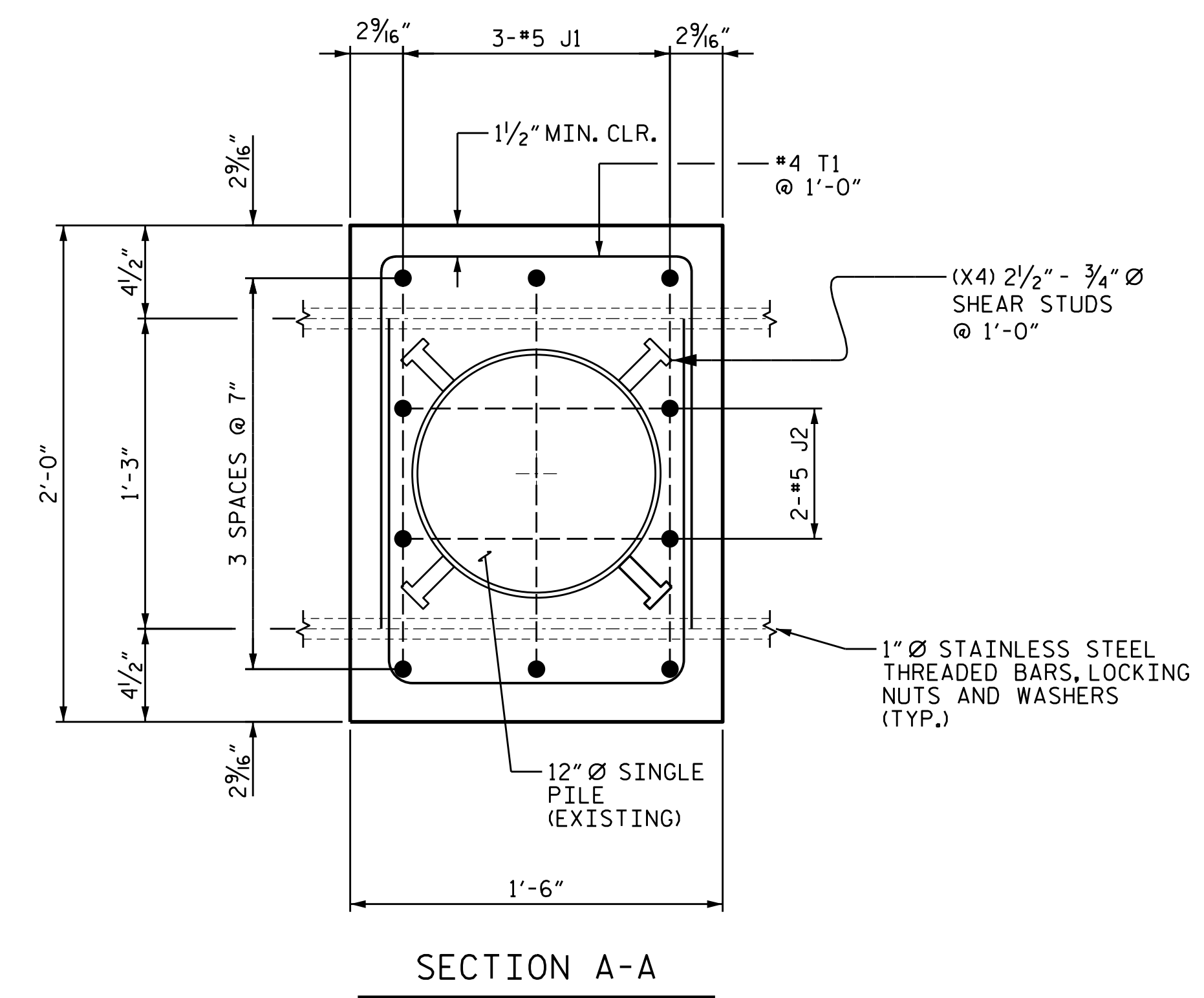
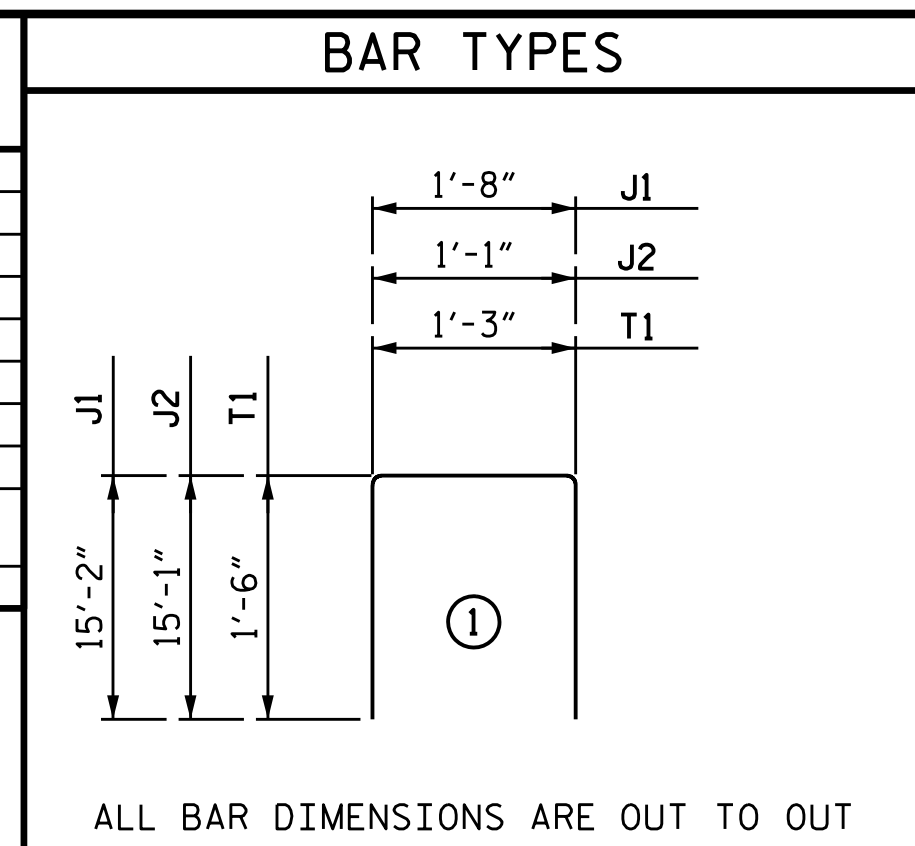
SINGLE-PILE JACKET DETAILS

FENDER SYSTEM NOTES:

- CLEAN STEEL SURFACE AT JACKET LOCATIONS PRIOR TO SHEAR STUD INSTALLATION PER THE SPECIAL PROVISIONS.
- FOR FENDER SYSTEM REPAIR JACKETS, SEE SPECIAL PROVISIONS.
- FOR PLASTIC LUMBER AND STRUCTURAL COMPOSITE LUMBER WALES, SEE SPECIAL PROVISION FOR "COMPOSITE FENDER SYSTEM". WALES SHALL BE CONTINUOUS AND SPLICED ONLY AT LOCATIONS SHOWN ON THE PLANS.
- THE STAINLESS STEEL BOLTS SHALL BE IN ACCORDANCE WITH ASTM F593 TYPE 316. FURNISH 1" Ø STAINLESS STEEL THREADED BARS IN ACCORDANCE WITH ASTM A193 GRADE B8M. FURNISH STAINLESS STEEL NUTS IN ACCORDANCE WITH ASTM F594 TYPE 316. FURNISH STAINLESS STEEL SCREWS IN ACCORDANCE WITH ASTM F593 TYPE 305. FURNISH STAINLESS STEEL WASHERS UNDER HEADS AND NUTS, COMPATIBLE WITH BOLTS, THREADED RODS, AND NUTS. KEEP THREADS ON BOLTS, THREADED RODS, AND NUTS FREE FROM DIRT, COARSE GRIME AND SAND TO PREVENT GALLING AND SEIZING DURING TIGHTENING.
- FOR EPOXY COATED REINFORCING, SEE STANDARD SPECIFICATIONS SECTION 1070-7.

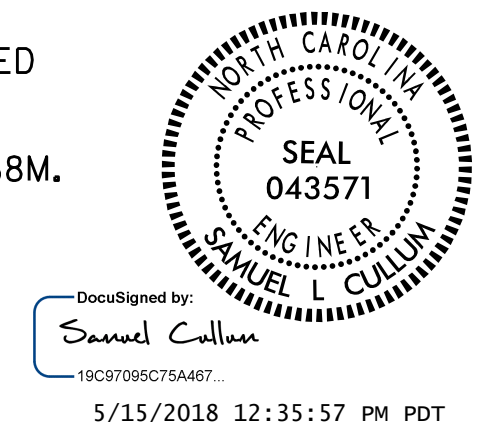
BILL OF MATERIAL FOR ONE 15'-6" SINGLE PILE JACKET

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
* T1	32	#4	1	4'-3"	95
* J1	3	#5	1	32'-0"	105
* J2	2	#5	1	31'-3"	70
SHEAR STUDS				EA.	48
* EPOXY COATED REINFORCING STEEL				LBS.	270
CONCRETE OR EPOXY GROUT				CU. YDS.	1.3



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 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018



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 BRUNSWICK COUNTY
 BRIDGE NO. 71

SHEET 2 OF 4

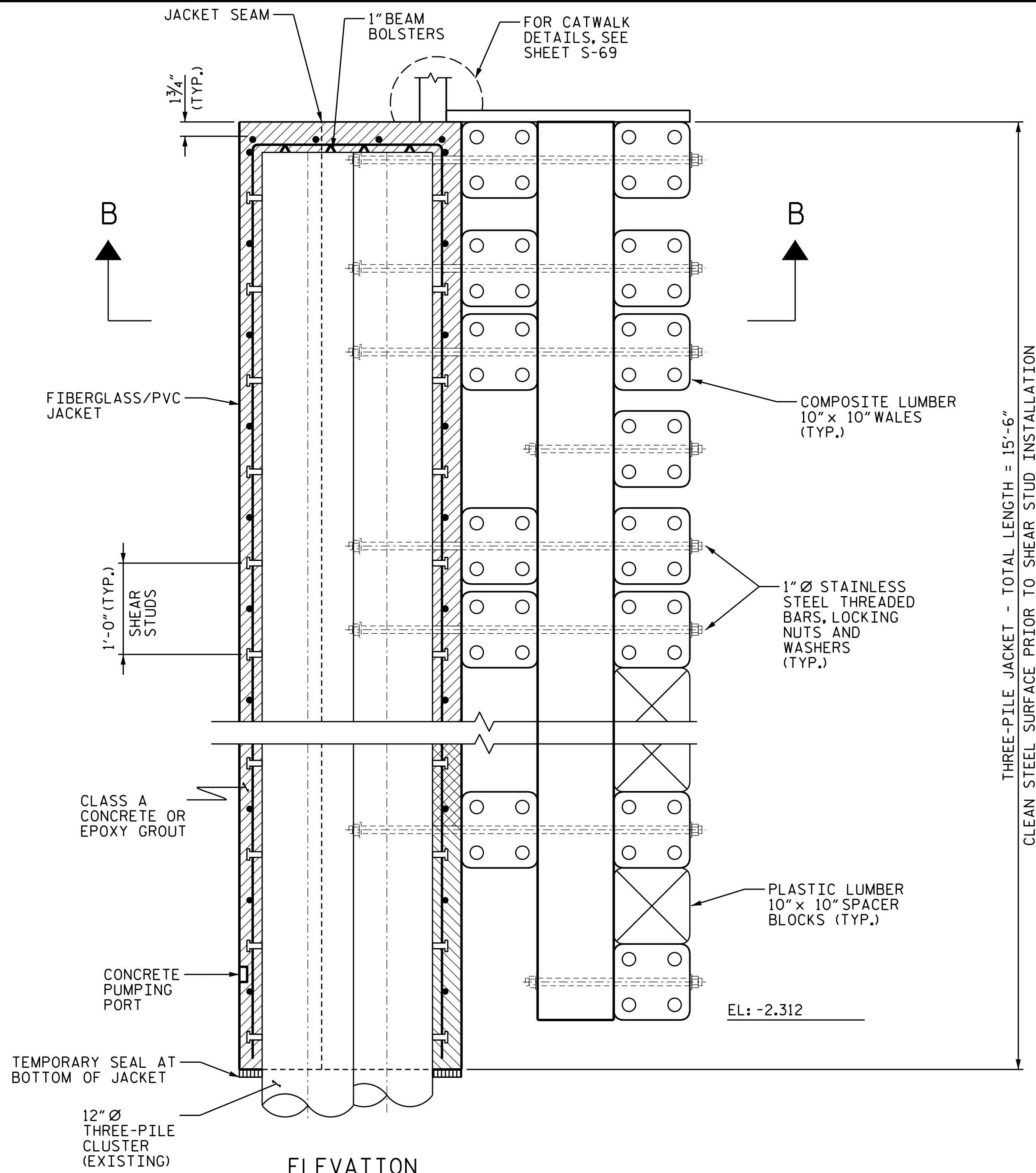
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

FENDER SYSTEM

SINGLE-PILE JACKET DETAILS

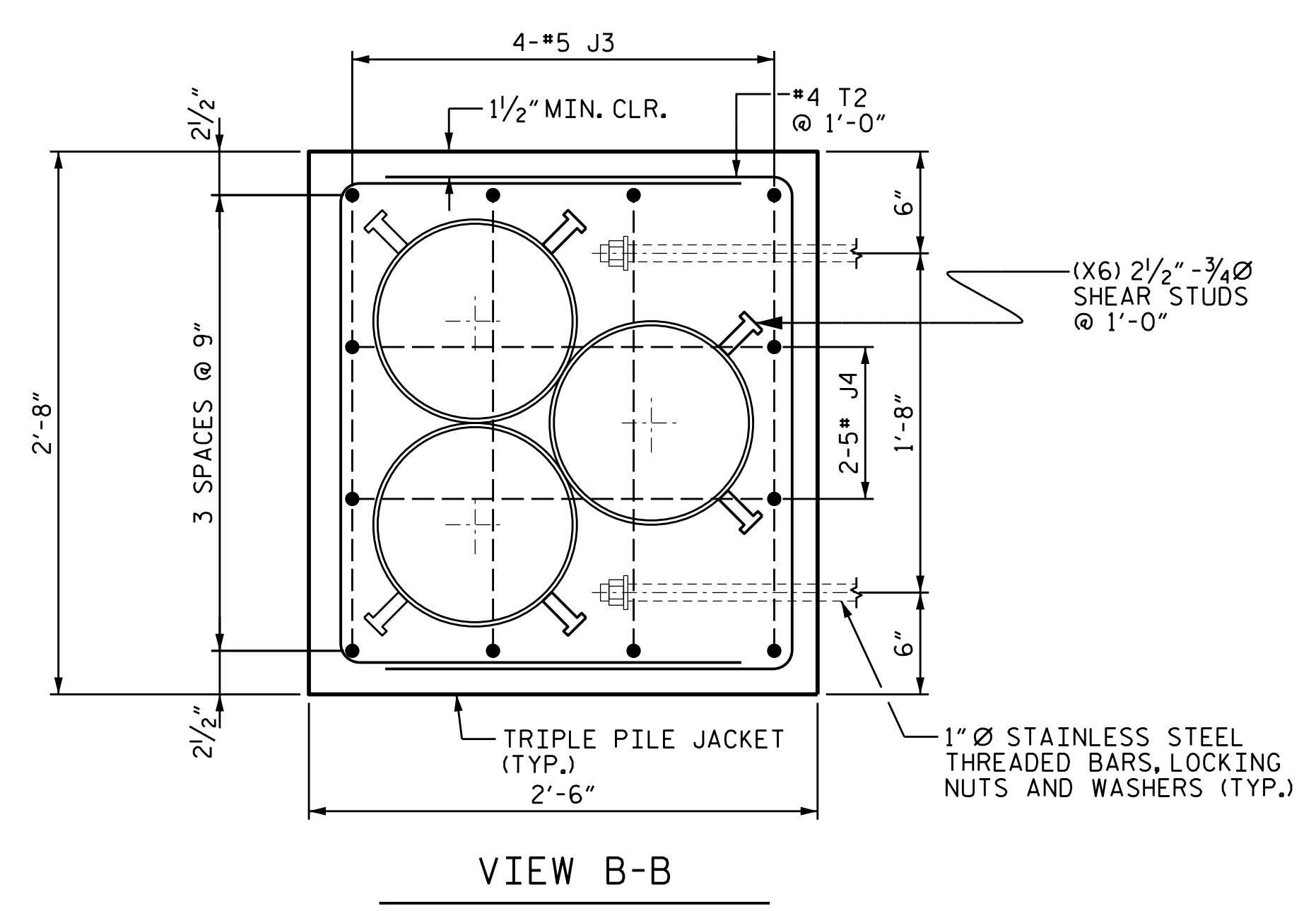
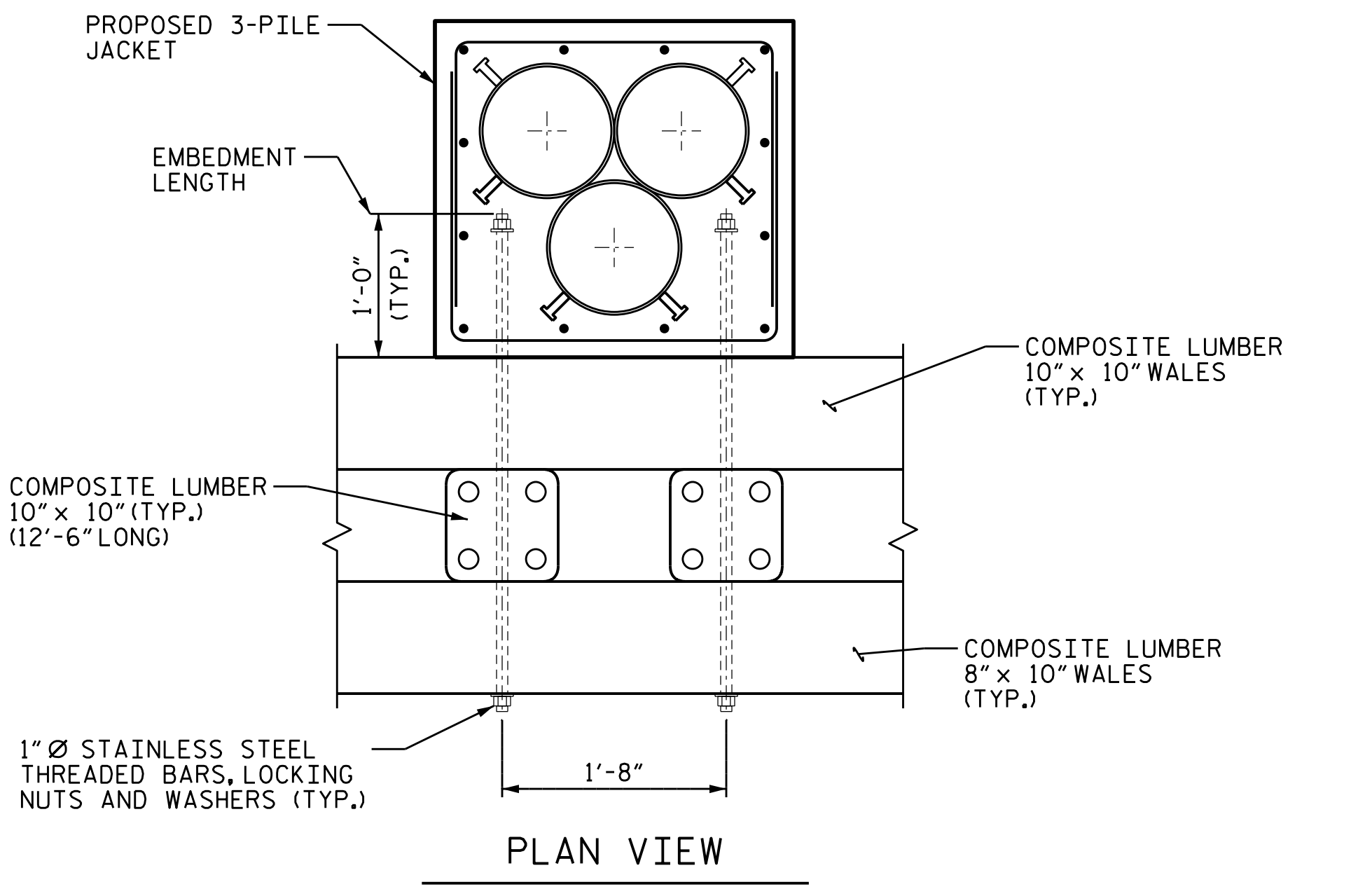
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-70
1			3			TOTAL SHEETS 73
2			4			

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(FRONT VERTICAL REBAR NOT SHOWN FOR CLARITY)
 ** INSTALL 12 ROWS OF SHEAR STUDS PER JACKET, BEGINNING AT TOP OF JACKET AS SHOWN. THE LOWER 3'-6" ± WILL NOT HAVE SHEAR STUDS INSTALLED.

THREE-PILE JACKET - TOTAL LENGTH = 15'-6"
 CLEAN STEEL SURFACE PRIOR TO SHEAR STUD INSTALLATION



THREE-PILE JACKET DETAILS

BAR TYPES	
J3	2'-4"
J4	2'-2"
T2	2'-5"
①	
ALL BAR DIMENSIONS ARE OUT TO OUT	

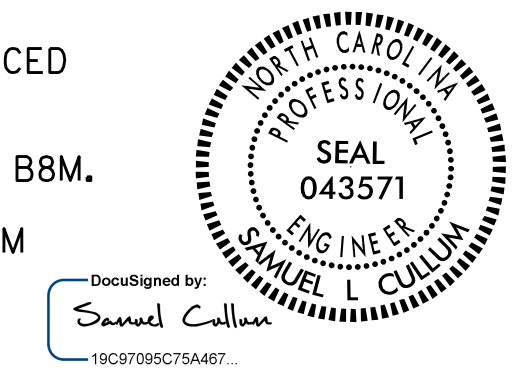
BILL OF MATERIAL FOR ONE 15'-6" THREE-PILE JACKET						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
* T2	32	#4	1	6'-5"	140	
* J3	4	#5	1	32'-8"	140	
* J4	2	#5	1	32'-4"	70	
SHEAR STUDS					EA.	72
* EPOXY COATED REINFORCING STEEL					LBS.	350
CONCRETE OR EPOXY GROUT					CU. YDS.	2.5

FENDER SYSTEM NOTES:

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CHECKED BY :	JACOB H. DUKE	DATE :	03-2018
DESIGN ENGINEER OF RECORD :	SAMUEL L. CULLUM	DATE :	03-2018



5/15/2018 12:35:57 PM PDT

PROJECT NO. 15BPR.16
BRUNSWICK COUNTY
 BRIDGE NO. 71

SHEET 3 OF 4

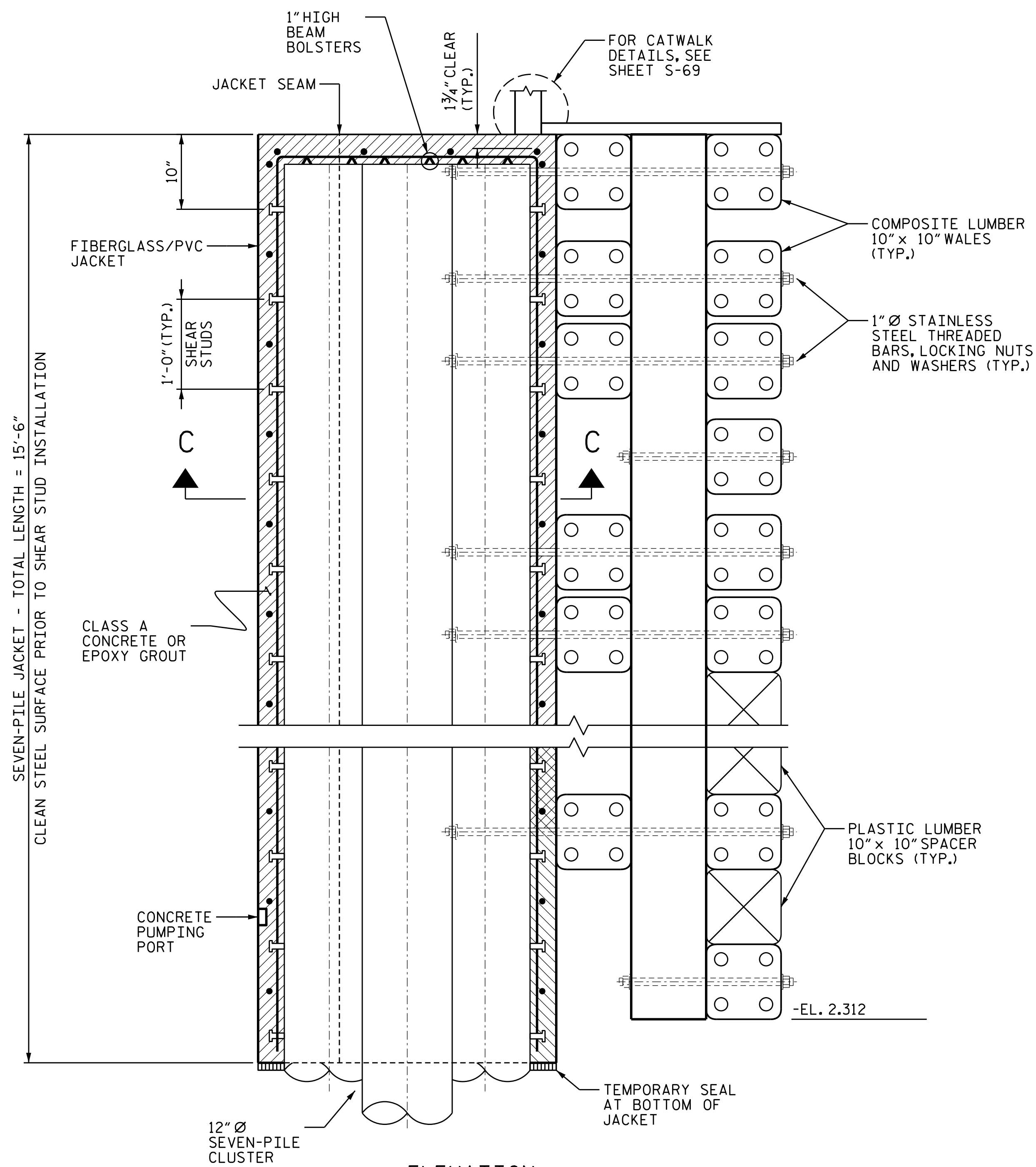
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

FENDER SYSTEM

THREE-PILE JACKET DETAILS

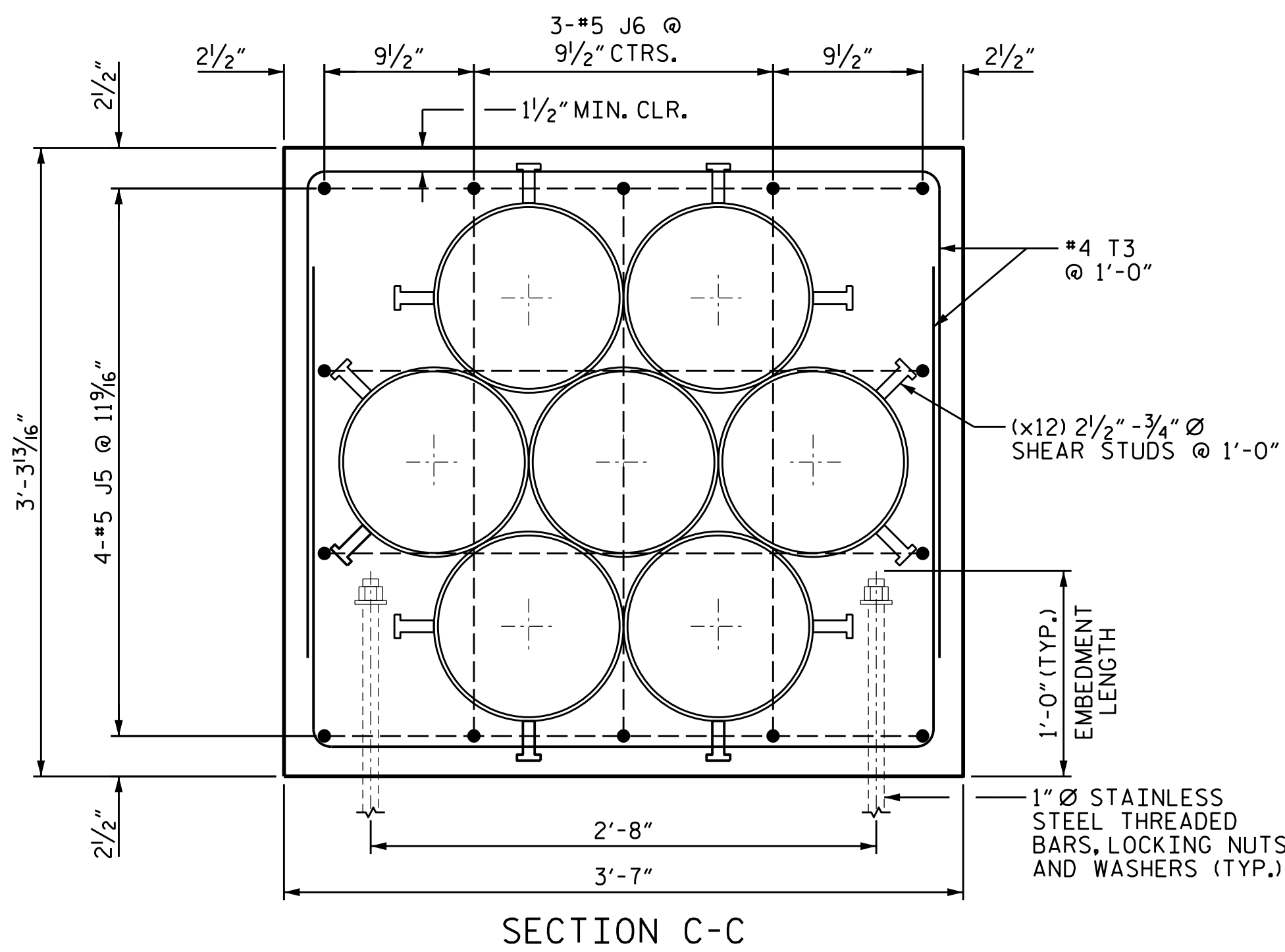
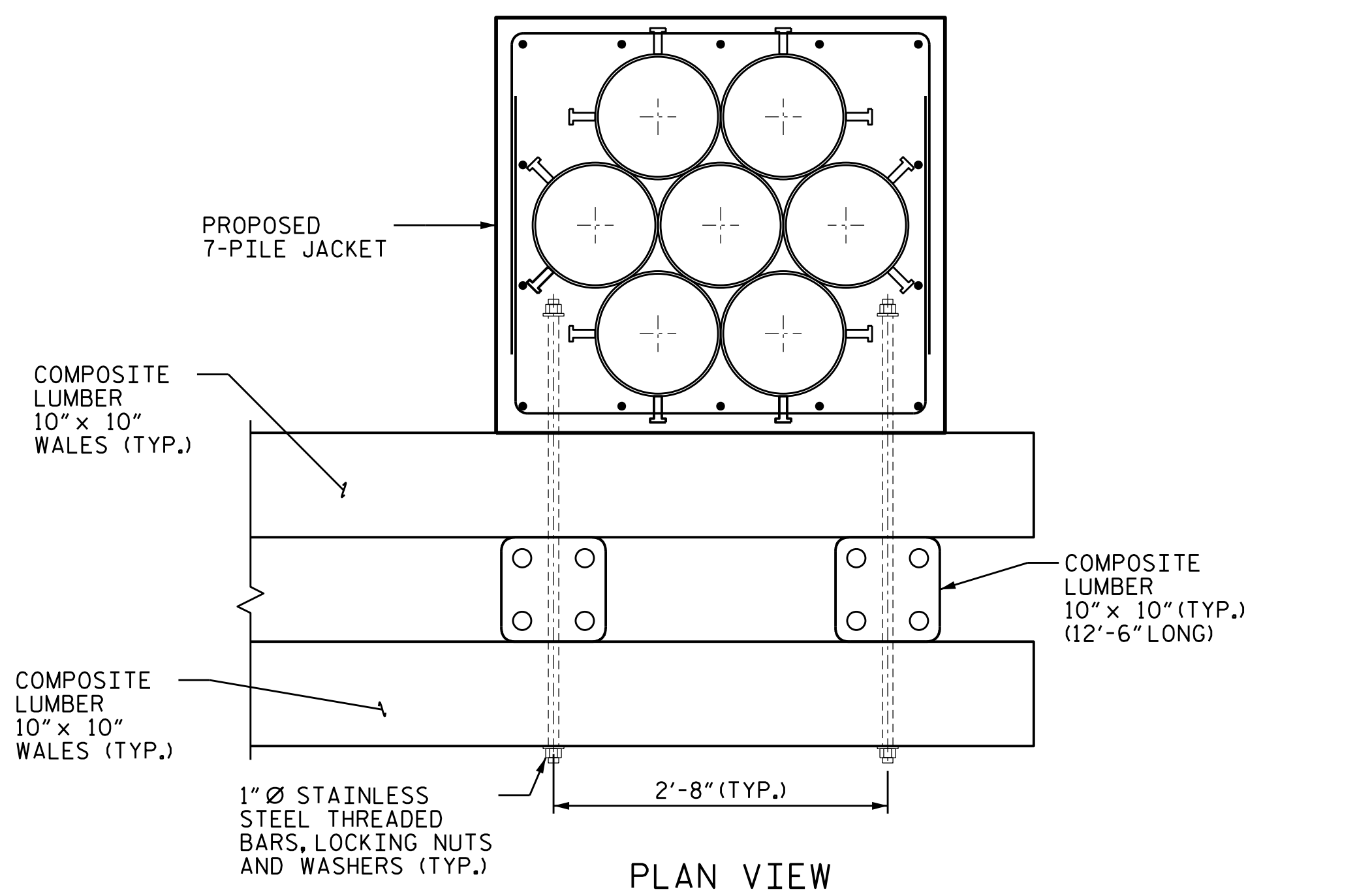
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-71
1			3			TOTAL SHEETS
2			4			73

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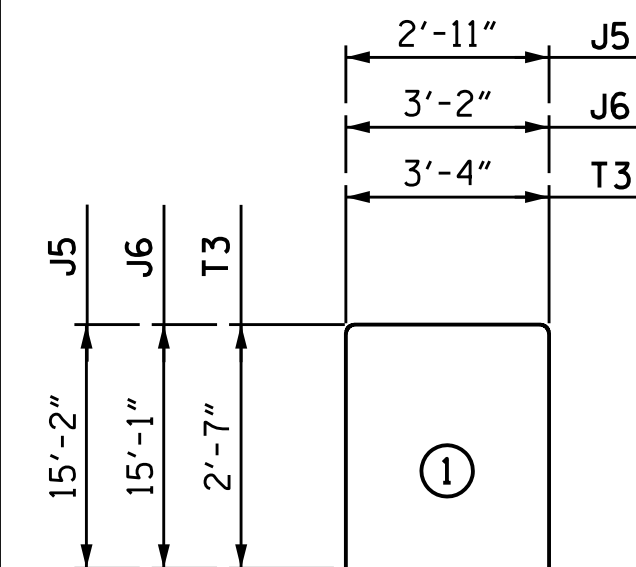
ELEVATION

(FRONT VERTICAL REBAR NOT SHOWN FOR CLARITY)
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SEVEN-PILE JACKET DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE 15'-6" SEVEN-PILE JACKET

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
* T3	32	#4	1	8'-6"	185	
* J5	3	#5	1	33'-3"	105	
* J6	4	#5	1	33'-4"	140	
SHEAR STUDS					EA.	144
* EPOXY COATED REINFORCING STEEL					LBS.	430
CONCRETE OR EPOXY GROUT					CU. YDS.	3.7

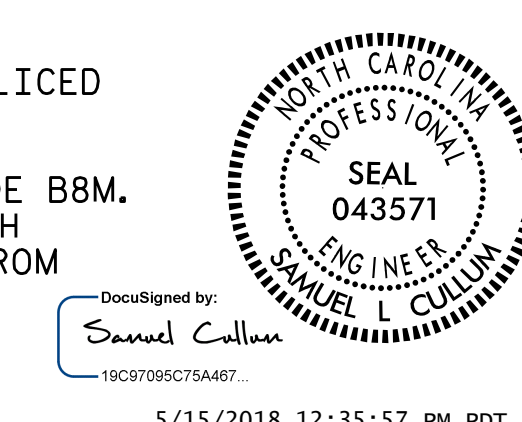
FENDER SYSTEM NOTES:

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 DESIGN ENGINEER OF RECORD : SAMUEL L. CULLUM DATE : 03-2018

5/15/2018
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PROJECT NO. 15BPR.16
 BRUNSWICK COUNTY
 BRIDGE NO. 71

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

FENDER SYSTEM

SEVEN-PILE JACKET DETAILS

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-72
1			3			TOTAL SHEETS
2			4			73

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN