FA. PROJ. NO. BRNHS-0012(35)

WBS NO. 41470.3.GV1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

DARE COUNTY

LOCATION: HERBERT C. BONNER BRIDGE LOCATED AT THE OREGON INLET ALONG NC 12 IN DARE COUNTY.

TYPE OF WORK: REPAIR OF EXISTING PILE CAPS, COLUMNS, CAPS, GIRDERS, AND DECKS

INDEX OF DRAWINGS

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2	LOCATION SKETCH AND TOTAL BILL OF MATERIAL
3	GENERAL NOTES
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18–66	SUPERSTRUCTURE REPAIR LOCATIONS
67–108	LOW LEVEL SUBSTRUCTURE REPAIR LOCATIONS (N. APPR.) END BENT #1–BENT #123
109–134	HIGH LEVEL SUBSTRUCTURE REPAIR LOCATIONS BENTS #129–#166
135–166	LOW LEVEL SUBSTRUCTURE REPAIR LOCATIONS (S. APPR.) BENT #167–END BENT #2

AERIAL VIEW OF THE VICINITY

LETTING DATE: JANUARY 15, 2008

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4911 Green Road Suite 107 Raleigh, NC 27616
Phone 919 981 0310 Fax 919 981 0451
Email info@aogroup.com www.aogroup.com
AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

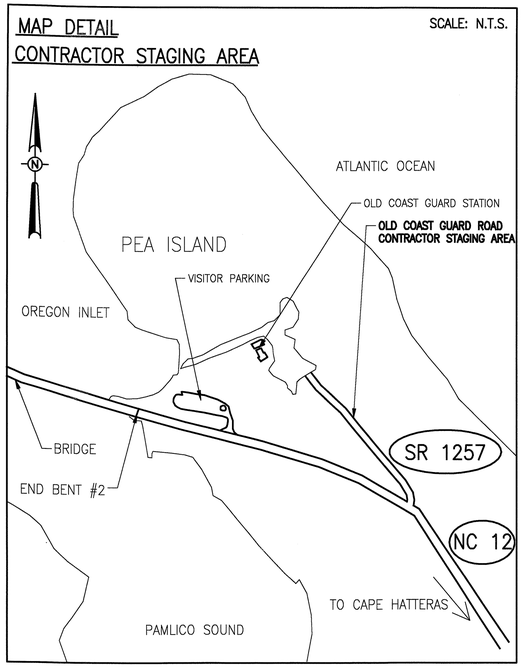
BONNER BRIDGE REPAIR
COVER SHEET

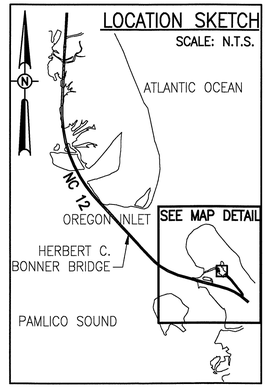
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELT
9/20/07

SEPTEMBER 2007

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	1
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G. R. COLS DATE 5/9/07
CHECKED BY T.L. BARTELT DATE 6/2007





TOTAL BILL OF MATERIAL

LOCATION	OVERHEAD SHOTCRETE (CF)	VERTICAL SHOTCRETE (CF)	HORIZONTAL SHOTCRETE (CF)	SHOTCRETE CORE SAMPLE (EA)	ADDITIONAL REINFORCING (lb.)	EPOXY MORTAR (CF) (SUPERSTRUCTURE)	EPOXY MORTAR (CF) (SUBSTRUCTURE)	EVAZOTE JOINT SEAL (LF)	POURED CONCRETE REPAIR (CF)
HIGH LEVEL BENTS (BENTS #129–#166)	174	4315	899	50	2277	–	–	–	356
HIGH LEVEL SPANS (SPANS #130–#167)	4246	40	–		–	62	–	1331	–
SOUTH APPROACH BENTS (BENTS #167–EB#2)	264	643	45	25	1692	–	190	–	–
SOUTH APPROACH SPANS (SPANS #168–#204)	5200	33	–		–	78	–	1264	–
NORTH APPROACH BENTS (BENTS EB#1–#123)	290	727	75	25	3566	–	–	–	–
NORTH APPROACH SPANS (SPANS #1–#123)	698	17	–		–	143	–	4123	–
TOTAL	10872	5775	1019	100	7535	283	190	6718	356

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DARE COUNTY
BRIDGE NO. 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
LOCATION SKETCH
AND
TOTAL BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL
9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	2
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G.R. COLS DATE 6/1/2007
CHECKED BY R.C. LARSON DATE 6/2007

GENERAL:

1. ALL WORK SHALL CONFORM TO THE 2006 EDITIONS OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES, OSHA, AND ALL APPLICABLE ASTM STANDARDS. IN CASE OF CONFLICT THE MOST STRINGENT REQUIREMENT SHALL GOVERN.

2. THE LOCATION AND EXTENT OF REPAIRS SHOWN ON THE PLANS ARE GENERAL IN NATURE. THE ENGINEER WILL DETERMINE THE EXACT EXTENT OF REMOVAL IN THE FIELD BASED ON AN EVALUATION OF THE CONDITION OF THE EXPOSED SURFACES.

3. CONSTRUCTION METHODS, PROCEDURES AND SEQUENCES ARE THE CONTRACTOR'S RESPONSIBILITY AND THE CONTRACTOR SHALL TAKE ALL THE NECESSARY MEANS TO MAINTAIN AND PROTECT THE STRUCTURAL INTEGRITY OF ALL CONSTRUCTION AT ALL STAGES.

4. ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE ACTUAL FIELD CONDITIONS SHALL BE REPORTED TO THE ENGINEER.

5. THE MANUFACTURER'S CERTIFIED DRAWINGS AND SPECIFICATIONS FOR EQUIPMENT ANCHORAGE AND DETAILS SHALL BE SUBMITTED FOR APPROVAL.

6. REPRODUCTION NOTE: THE USE OR REPRODUCTION OF THESE CONTRACT DRAWINGS BY ANY CONTRACTOR, SUBCONTRACTOR, ERECTOR, OR MATERIAL SUPPLIER IN LIEU OF PREPARATION OF SHOP DRAWINGS SIGNIFIES HIS ACCEPTANCE OF ALL INFORMATION SHOWN HEREIN AS CORRECT, AND OBLIGATES HIM TO ANY JOB EXPENSE, REAL OR IMPLIED, ARISING DUE TO ANY ERRORS THAT MAY OCCUR HEREIN. IN ADDITION, ALL REFERENCES TO ALPHA & OMEGA GROUP AND KO & ASSOCIATES, INCLUDING ALL PROFESSIONAL SEALS ARE TO BE REMOVED IF THESE CONTRACT DRAWINGS ARE TO BE USED AS SHOP DRAWINGS.

7. FOR SECURING OF VESSELS, SEE SPECIAL PROVISIONS.

8. FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

9. FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

10. SEQUENCE OF WORK:
    ① HIGH LEVEL BENTS AND SPANS #129–#166
    ② S. APPROACH BENTS AND SPANS #167–#204
    ③ N. APPROACH BENTS AND SPANS #1–#123

    OUT–OF–SEQUENCE WORK IS PERMITTED WITH THE ENGINEER'S APPROVAL.

11. FISHING WALKWAYS ADJACENT TO BRIDGE DECK SHALL REMAIN OPEN EXCEPT DURING ACTIVE WORK IN THESE AREAS.

12. OBTAIN PROPERTY OWNER'S PERMISSION IF STAGING AREAS OR ACCESS POINTS OTHER THAN THOSE SHOWN ON THE PLANS ARE USED. REPAIR ANY DAMAGED PROPERTY TO THE SATISFACTION OF THE PROPERTY OWNER.

13. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF WORK WITH OTHER CONTRACTORS AND NCDOT ACTIVITIES DURING THE LIFE OF THE PROJECT.

14. THE EXISTING BRIDGE WAS DESIGNED FOR H15–S12(44) LOADING.

SHOTCRETE:

1. THE CONTRACTOR ALONE SHALL BE FULLY RESPONSIBLE FOR THE DESIGN, STRENGTH, SAFETY AND ADEQUACY OF ALL FORMWORK, SHORING, BRACING AND ALL METHODS OF CONSTRUCTION, AND FOR STRENGTH, SLUMP, CONSISTENCY, FINISH AND GENERAL QUALITY OF THE CONCRETE USED IN THE WORK.

2. OBSERVATION, MONITORING AND TESTING SHALL IN NO WAY RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO PROVIDE QUALITY CONTROL, MATERIALS AND WORKMANSHIP ENSURING THAT HIS WORK WILL CONFORM TO THE PROJECT REQUIREMENTS.

3. ALL REINFORCING BAR DETAILING, FABRICATION, AND ERECTION SHALL CONFORM TO THE MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES: ACI 315.

4. ALL REINFORCING SHALL BE HELD RIGIDLY AND ACCURATELY IN PLACE.

5. REINFORCING STEEL SHALL NOT BE BENT AFTER BEING PARTIALLY EMBEDDED IN HARDENED CONCRETE.

6. BARS SHALL BE COLD BENT AND SHALL NOT BE HEATED FOR ANY REASON.

7. REINFORCING BARS SHALL NOT BE WELDED.

8. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4" U.N.O.

MATERIALS:

SHOTCRETE 28 DAY COMPRESSIVE STRENGTH:	5000 PSI @ 28 DAYS MIN.
REINFORCING STEEL:	ASTM A615 GRADE 60
WELDED WIRE FABRIC:	ASTM A185

ABBREVIATIONS:

A.B.	ANCHOR BOLT
BRG.	BEARING
℄	CENTERLINE
C/C	CENTER TO CENTER
CANT.	CANTILEVER
C.J.	CONSTRUCTION JOINT
CLR.	CLEAR
CTS.	CENTERS
CONC.	CONCRETE
CONN.	CONNECTION
CONT.	CONTINUOUS
EA.	EACH
E.F.	EACH FACE
EL.	ELEVATION
EMBED.	EMBEDMENT
EQ.	EQUAL
E.W.	EACH WAY
EXIST.	EXISTING
HDG	HOT DIP GALAVANIZED
HORIZ.	HORIZONTAL
LLV	LONG LEG VERTICAL
LLH	LONG LEG HORIZONTAL
MAX.	MAXIMUM
MFGR.	MANUFACTURER
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
ℙ	PLATE
REQ'D	REQUIRED
T&B	TOP & BOTTOM
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
VERT.	VERTICAL
WT.	WEIGHT
W.W.F.	WELDED WIRE FABRIC

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DARE COUNTY

BRIDGE NO. 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
GENERAL NOTES

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELT
7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	3
1			3			TOTAL SHEETS
2			4			166

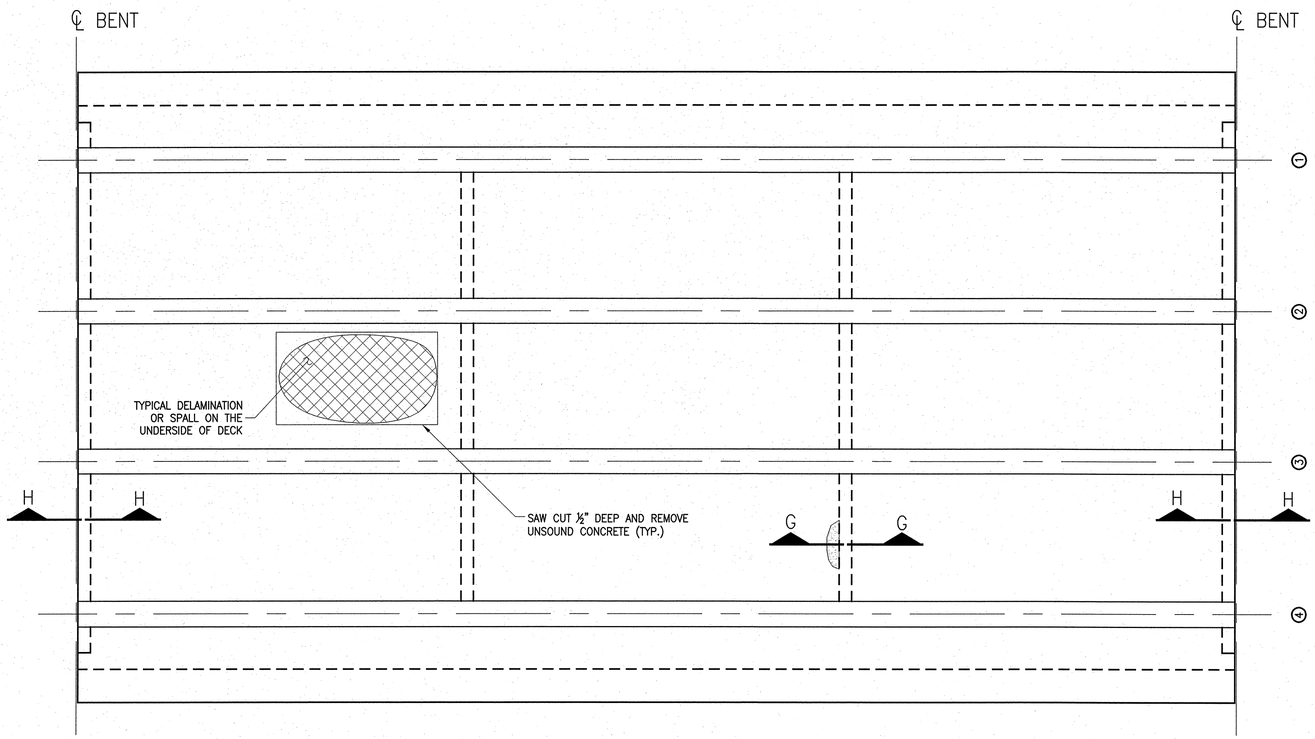
DRAWN BY G. R. COLS DATE 6/1/2007
CHECKED BY R.C. LARSON DATE 6/2007

STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

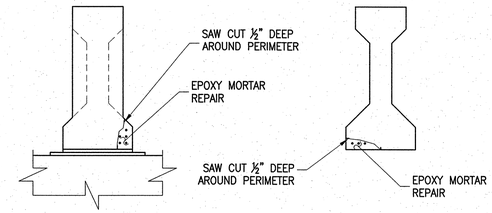
PROJECT REFERENCE No.	SHEET No.
B-5014	3-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201804

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
8867000000-E	SP	4,123	LF	GENERIC STRUCTURE ITEM EVAZOTE JOINT SEAL (SPANS #1 - #123)
8867000000-E	SP	1,331	LF	GENERIC STRUCTURE ITEM EVAZOTE JOINT SEAL (SPANS #130 - #167)
8867000000-E	SP	1,264	LF	GENERIC STRUCTURE ITEM EVAZOTE JOINT SEAL (SPANS #168 - #204)
8882000000-E	SP	190	CF	GENERIC STRUCTURE ITEM EPOXY MORTAR REPAIRS (BENTS #167 - EB2)
8882000000-E	SP	143	CF	GENERIC STRUCTURE ITEM EPOXY MORTAR REPAIRS (SPANS #1 - #123)
8882000000-E	SP	62	CF	GENERIC STRUCTURE ITEM EPOXY MORTAR REPAIRS (SPANS #130 - #167)
8882000000-E	SP	78	CF	GENERIC STRUCTURE ITEM EPOXY MORTAR REPAIRS (SPANS #168 - #204)
8882000000-E	SP	899	CF	GENERIC STRUCTURE ITEM HORIZONTAL SHOTCRETE REPAIRS (BENTS #129 - #166)
8882000000-E	SP	45	CF	GENERIC STRUCTURE ITEM HORIZONTAL SHOTCRETE REPAIRS (BENTS #167 - EB2)
8882000000-E	SP	75	CF	GENERIC STRUCTURE ITEM HORIZONTAL SHOTCRETE REPAIRS (BENTS EB1 - #123)
8882000000-E	SP	174	CF	GENERIC STRUCTURE ITEM OVERHEAD SHOTCRETE REPAIRS (BENTS #129 - #166)
8882000000-E	SP	264	CF	GENERIC STRUCTURE ITEM OVERHEAD SHOTCRETE REPAIRS (BENTS #167 - EB2)
8882000000-E	SP	290	CF	GENERIC STRUCTURE ITEM OVERHEAD SHOTCRETE REPAIRS (BENTS EB1 - #123)
8882000000-E	SP	698	CF	GENERIC STRUCTURE ITEM OVERHEAD SHOTCRETE REPAIRS (SPANS #1 - #123)
8882000000-E	SP	4,246	CF	GENERIC STRUCTURE ITEM OVERHEAD SHOTCRETE REPAIRS (SPANS #130 - #167)
8882000000-E	SP	5,200	CF	GENERIC STRUCTURE ITEM OVERHEAD SHOTCRETE REPAIRS (SPANS #168 - #204)
8882000000-E	SP	356	CF	GENERIC STRUCTURE ITEM POURED CONCRETE REPAIRS (BENTS #129 - #166)
8882000000-E	SP	4,315	CF	GENERIC STRUCTURE ITEM VERTICAL SHOTCRETE REPAIRS (BENTS #129 - #166)
8882000000-E	SP	643	CF	GENERIC STRUCTURE ITEM VERTICAL SHOTCRETE REPAIRS (BENTS #167 - EB2)
8882000000-E	SP	727	CF	GENERIC STRUCTURE ITEM VERTICAL SHOTCRETE REPAIRS (BENTS EB1 - #123)
8882000000-E	SP	17	CF	GENERIC STRUCTURE ITEM VERTICAL SHOTCRETE REPAIRS (SPANS #1 - #123)
8882000000-E	SP	40	CF	GENERIC STRUCTURE ITEM VERTICAL SHOTCRETE REPAIRS (SPANS #130 - #167)
8882000000-E	SP	33	CF	GENERIC STRUCTURE ITEM VERTICAL SHOTCRETE REPAIRS (SPANS #168 - #204)
8889000000-E	SP	2,277	LB	GENERIC STRUCTURE ITEM ADDITIONAL REINFORCING STEEL (BENTS #129 - #166)
8889000000-E	SP	1,692	LB	GENERIC STRUCTURE ITEM ADDITIONAL REINFORCING STEEL (BENTS #167 - EB2)
8889000000-E	SP	3,566	LB	GENERIC STRUCTURE ITEM ADDITIONAL REINFORCING STEEL (BENTS EB1 - #123)
8897000000-N	SP	35	EA	GENERIC STRUCTURE ITEM SHOTCRETE CORE SAMPLES (BENTS #129 - #166)
8897000000-N	SP	10	EA	GENERIC STRUCTURE ITEM SHOTCRETE CORE SAMPLES (BENTS #167 - EB2)
8897000000-N	SP	10	EA	GENERIC STRUCTURE ITEM SHOTCRETE CORE SAMPLES (BENTS EB1 - #123)
8897000000-N	SP	15	EA	GENERIC STRUCTURE ITEM SHOTCRETE CORE SAMPLES (SPANS #1 - #123)
8897000000-N	SP	15	EA	GENERIC STRUCTURE ITEM SHOTCRETE CORE SAMPLES (SPANS #130 - #167)
8897000000-N	SP	15	EA	GENERIC STRUCTURE ITEM SHOTCRETE CORE SAMPLES (SPANS #168 - #204)

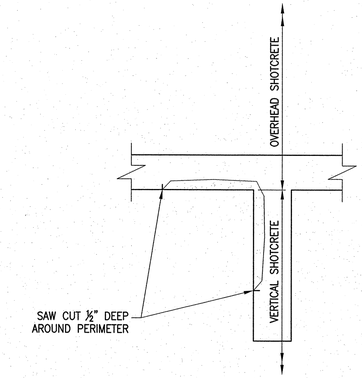


TYPICAL DECK SPAN PLAN



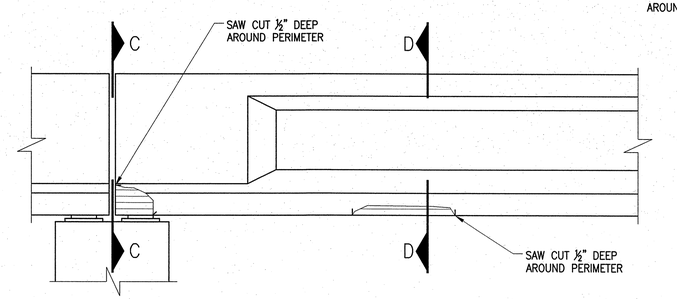
SECTION C–C

SECTION D–D

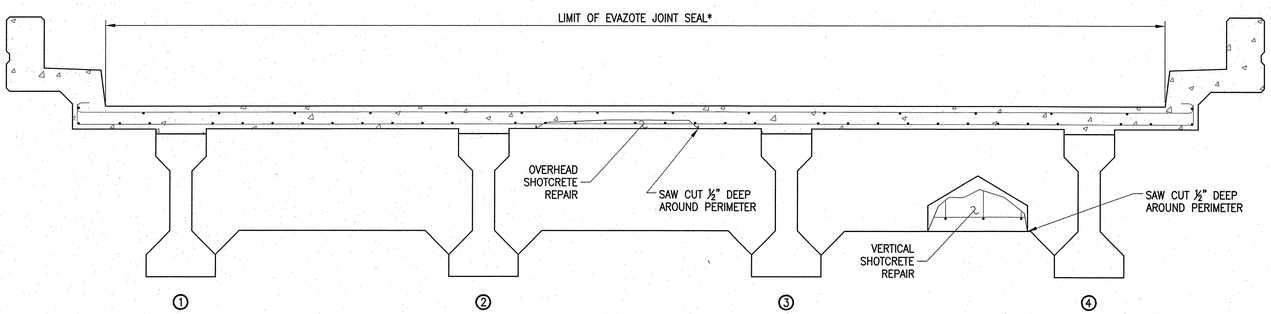


SECTION G–G

(SHOWING PAY LIMITS)



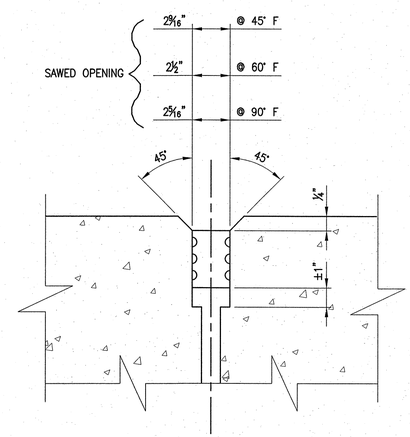
TYPICAL ELEVATION AT CONCRETE GIRDER



TYPICAL DECK SECTION

* PROVIDE AND INSTALL EVAZOTE JOINT SEAL AT THESE LOCATIONS:
℄ BENTS #1–#123
℄ BENTS #129–#142
℄ OPEN JOINTS IN SPANS #144– #146 (INCL. ℄ BENTS #144 AND #145)
℄ BENTS #147–#203

COMPLETELY REMOVE EXISTING COMPRESSION JOINT SEAL.
DO NOT DISTURB JOINTS @ ℄ BENTS #124 – #128B, BENT #143, OR BENT #146.



SECTION H–H

(THRU PROPOSED EVAZOTE JOINT SEAL)
NOMINAL UNCOMPRESSED WIDTH SHALL BE 3⅛"

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
TYPICAL DETAILS
SUPERSTRUCTURE

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	4
1			3			TOTAL SHEETS
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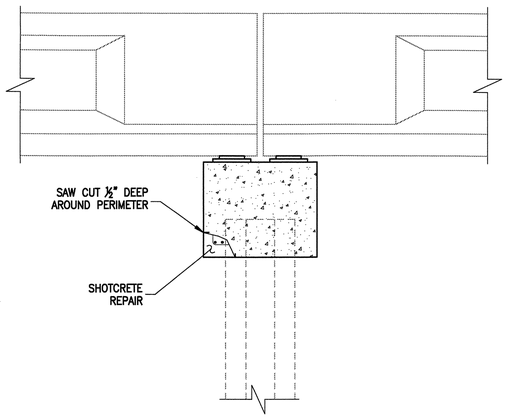
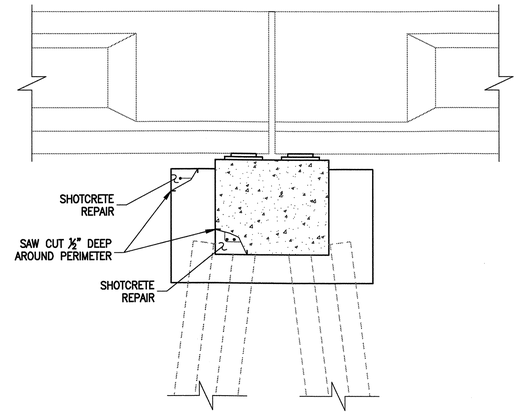
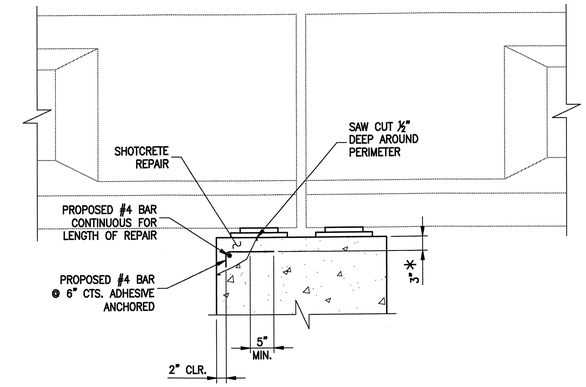
DRAWN BY: F.E. ROBBINS DATE: 4/07
CHECKED BY: R.C. LARSON DATE: 5/07



SECTION A–A



SECTION B–B



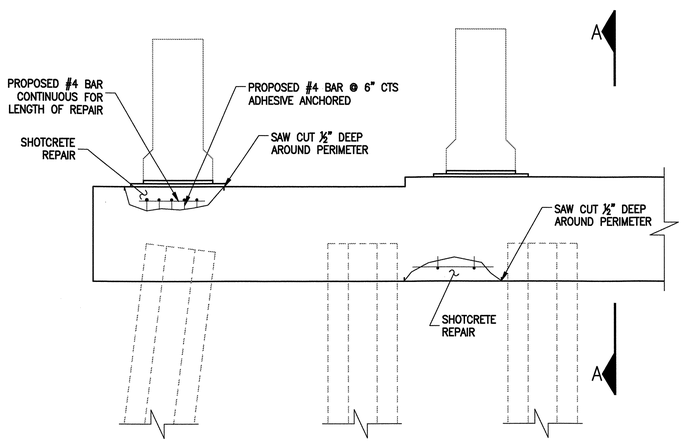
TYPICAL REPAIR @ GIRDER BEARING

* ADJUST THIS DIMENSION AS NECESSARY TO AVOID DAMAGING EXISTING REINFORCING STEEL.

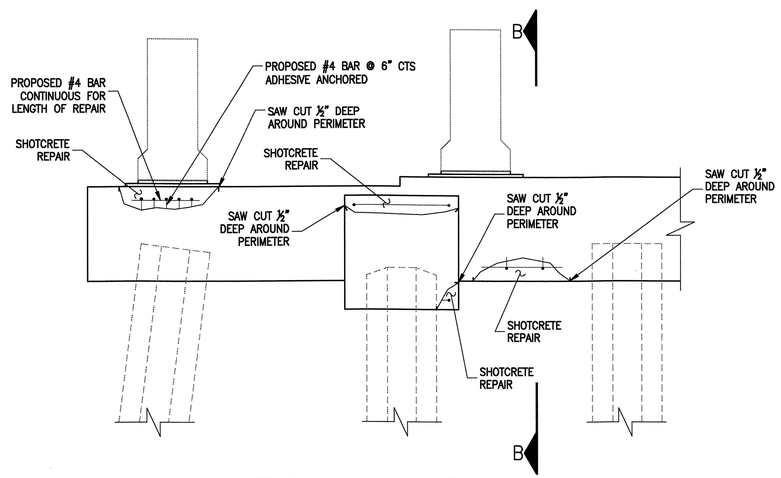
NOTES

RAISE GIRDER ½" BY JACKING BEFORE REMOVING CONCRETE. DO NOT LOWER SUPERSTRUCTURE UNTIL REPAIR HAS CURED AND REACHED A COMPRESSIVE STRENGTH OF 3000 psi.

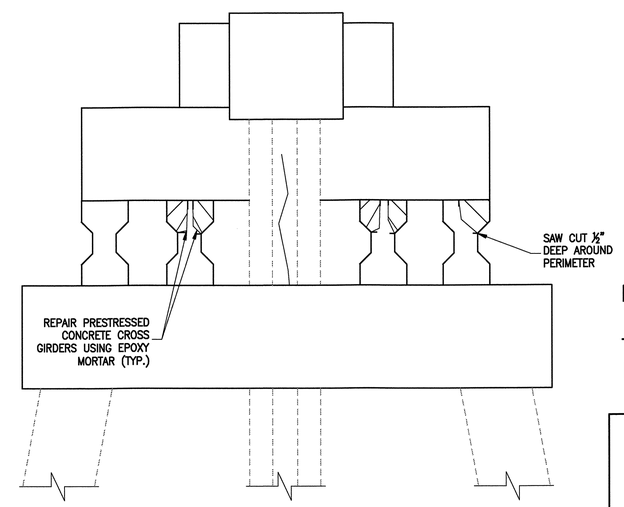
PROTECT GIRDER FROM SHOTCRETE OVERSPRAY.



TYPICAL ELEVATION AT PILE CAP



TYPICAL ELEVATION AT BRACE PILE CAP



TYPICAL END ELEVATION (BENTS 167 THRU 172)

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
TYPICAL DETAILS
SUBSTRUCTURE

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5
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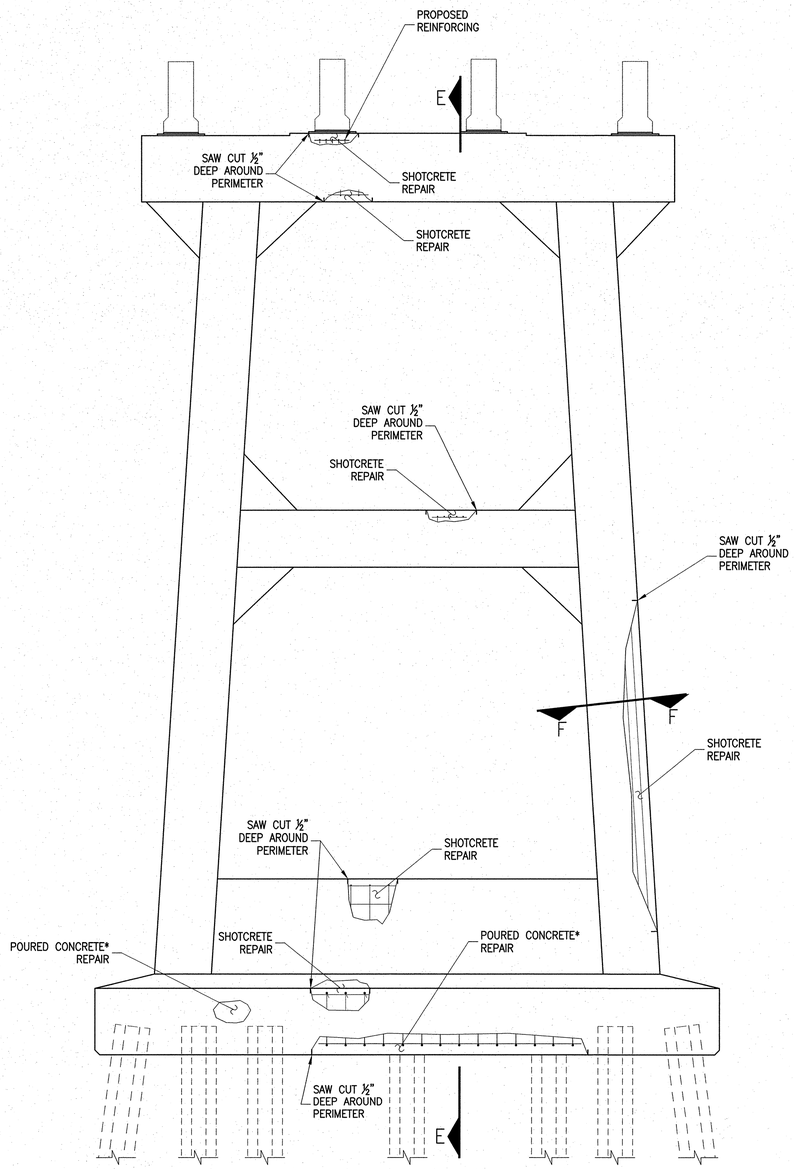
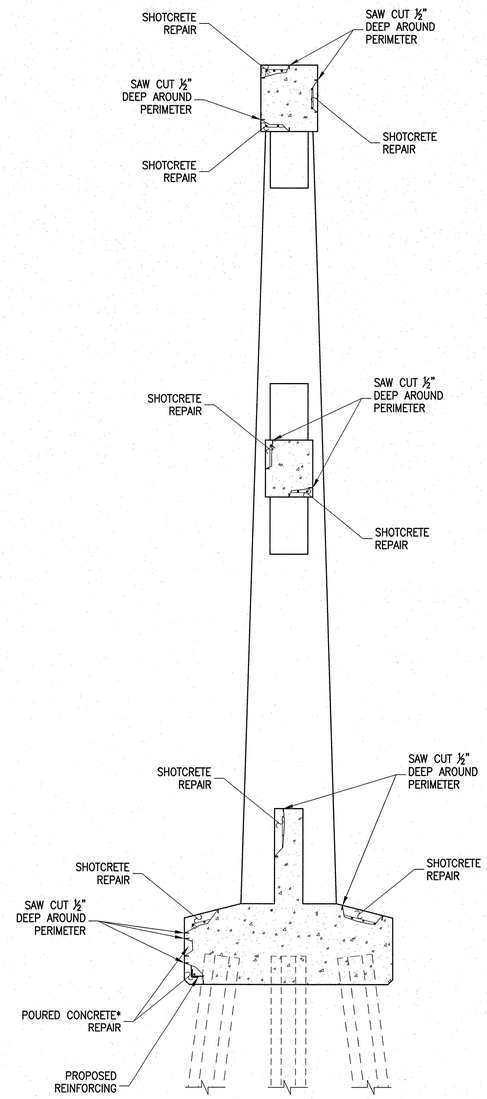
CHECKED BY R.C. LARSON DATE 5/07

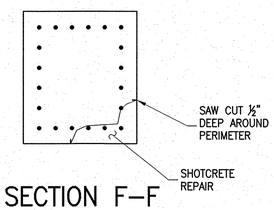


TYPICAL ELEVATION HIGH LEVEL BENT

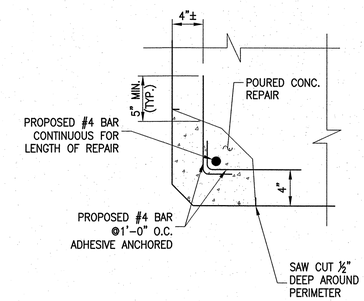
* AT THE CONTRACTOR'S OPTION, AND WITH ENGINEERS APPROVAL, ANY REPAIRS TO THE PILE CAP MAY BE DONE USING SHOTCRETE. REPAIR WILL BE PAID FOR AT THE UNIT PRICE FOR REPAIR TYPE ACTUALLY USED.



SECTION E–E



SECTION F–F



TYPICAL REPAIR ON BOTTOM OF PILE CAP

PLAN PREPARED BY:

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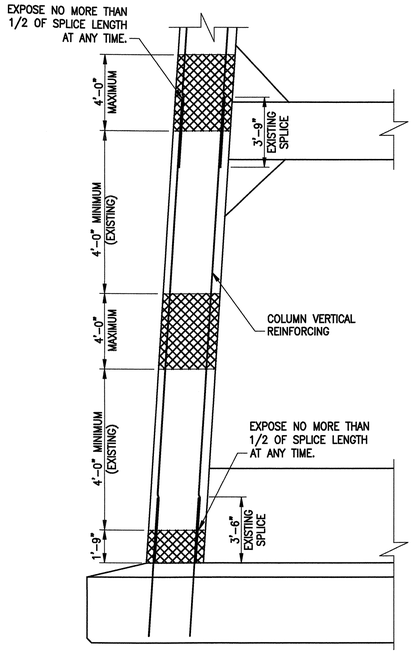
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
TYPICAL DETAILS
SUBSTRUCTURE

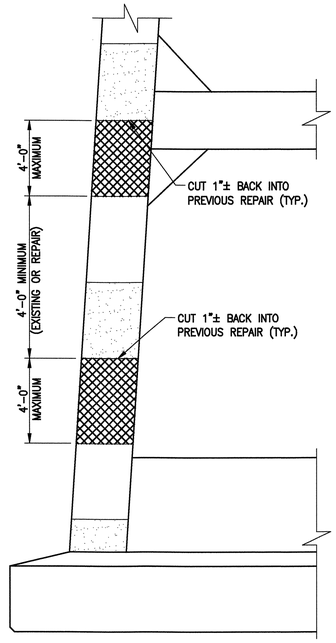
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL
9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	6
1			3			TOTAL SHEETS
2			4			166

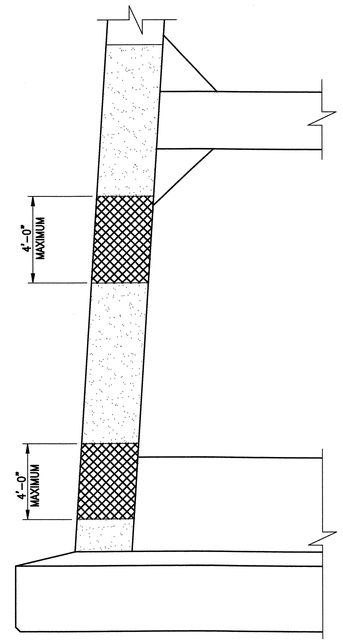
DRAWN BY F.E. ROBBINS DATE 4/07
CHECKED BY R.C. LARSON DATE 5/07



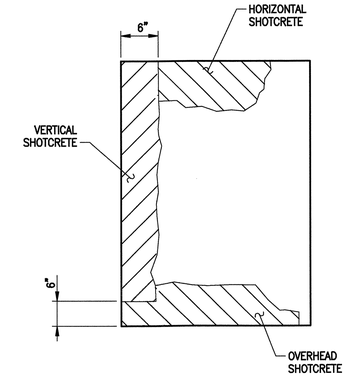
ELEVATION FOR STEP 1



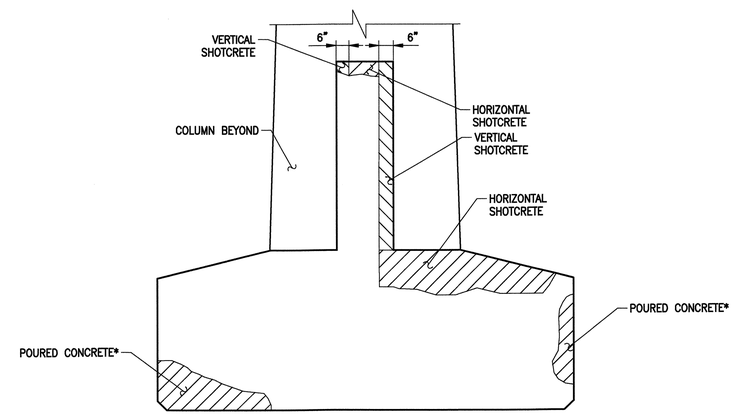
ELEVATION FOR STEP 2



ELEVATION FOR STEP 3



BENT CAP OR STRUT



PILE CAP (BENTS #129–#166)

CONCRETE REMOVAL PHASING AT COLUMNS (BENTS #129–#166)

SEQUENCE SHOWN IS AN EXAMPLE ONLY. SUBMIT A DETAILED CONSTRUCTION SEQUENCING PLAN FOR APPROVAL PRIOR TO BEGINNING WORK ON COLUMNS. ADHERE TO THE FOLLOWING REQUIREMENTS:

BEGIN WORK AT TOP OF COLUMN AND PROCEED DOWNWARD TO REDUCE THE POSSIBILITY OF DETERIORATED CONCRETE FALLING ON PERSONNEL.

UNCOVER NO MORE THAN HALF THE LENGTH OF ANY COLUMN REINFORCING SPLICE AT ANY TIME. FIELD VERIFY EXISTING SPLICE LENGTHS AND REPORT ANY DISCREPANCIES TO THE ENGINEER.

UNCOVER NO MORE THAN 4'-0" LENGTH OF ANY VERTICAL COLUMN REINFORCIING AT ANY TIME.

LEAVE A MINIMUM OF 4'-0" LENGTH OF VERTICAL COLUMN REINFORCING COVERED BY EXISTING OR CURED REPAIR ADJACENT TO EACH SIDE OF ANY ACTIVE REPAIR WITH UNCOVERED REINFORCING. A REPAIR IS CONSIDERED CURED WHEN IT HAS REACHED A COMPRESSIVE STRENGTH OF 3000 psi.

REMOVE CONCRETE ON A MAXIMUM OF TWO FACES (EITHER OPPOSITE FACES OR ADJACENT) AT ANY SECTION AT ANY ONE TIME.

INDICATES CONCRETE REMOVAL

INDICATES AREAS REPAIRED IN PREVIOUS STEPS

TYPICAL SECTIONS SHOWING PAY LIMITS FOR SHOTCRETE/ POURED CONCRETE

* SEE NOTE ON SHEET 6

NOTES

ALL SHOTCRETE ON COLUMNS WILL BE PAID FOR AS "VERTICAL SHOTRCETE".

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

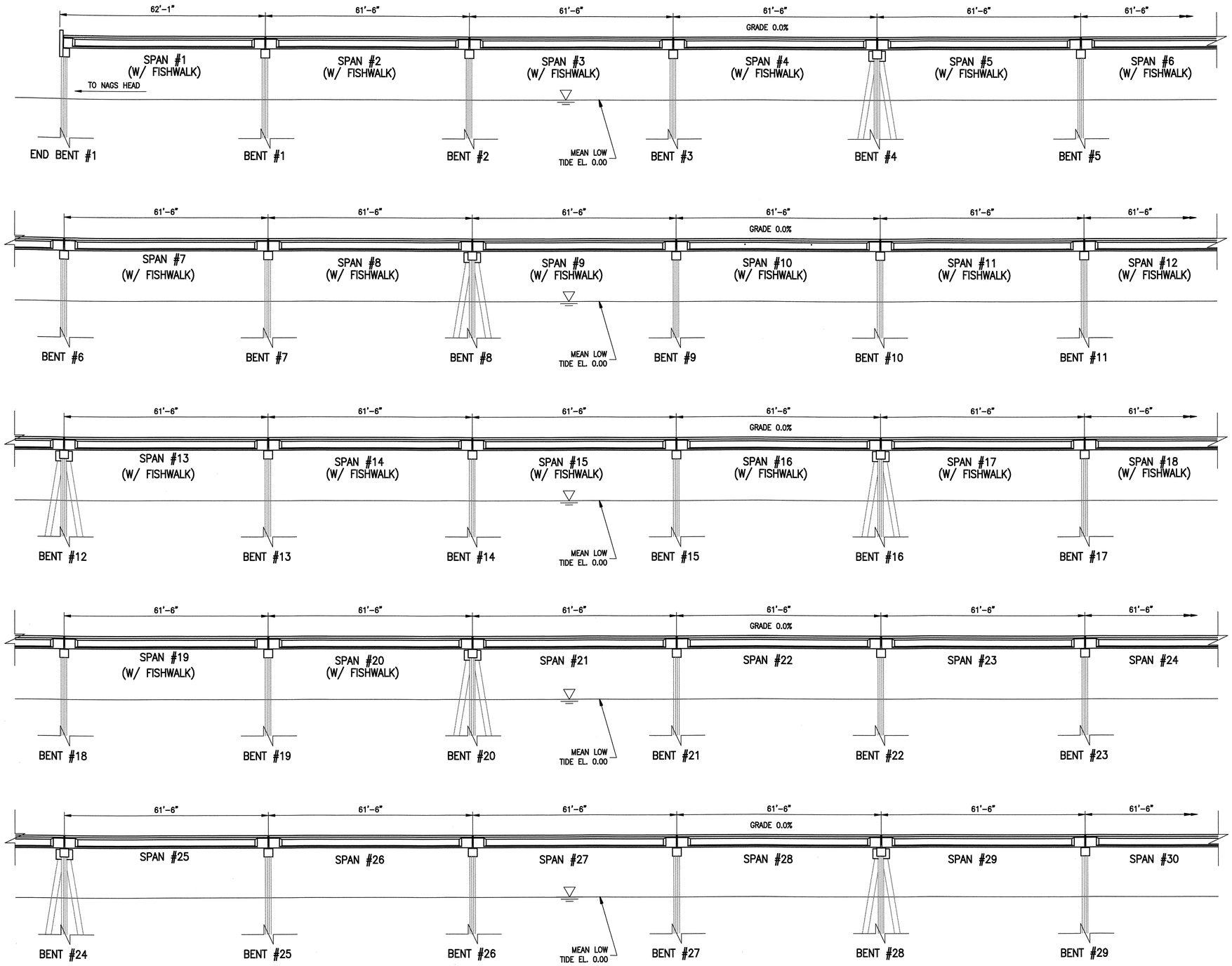
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
TYPICAL DETAILS
SUBSTRUCTURE

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTLETT 5/26/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	7
1			3			TOTAL SHEETS
2			4			166

DRAWN BY F.E. ROBBINS DATE 5/07
CHECKED BY R.C. LARSON DATE 5/07



BRIDGE PROFILE

SPANS #1–#30

DRAWN BY G. R. COLS DATE 5/9/07
CHECKED BY F.E. ROBBINS DATE 4/07

PLAN PREPARED BY:

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AOG PROJ. NO. 2007.015

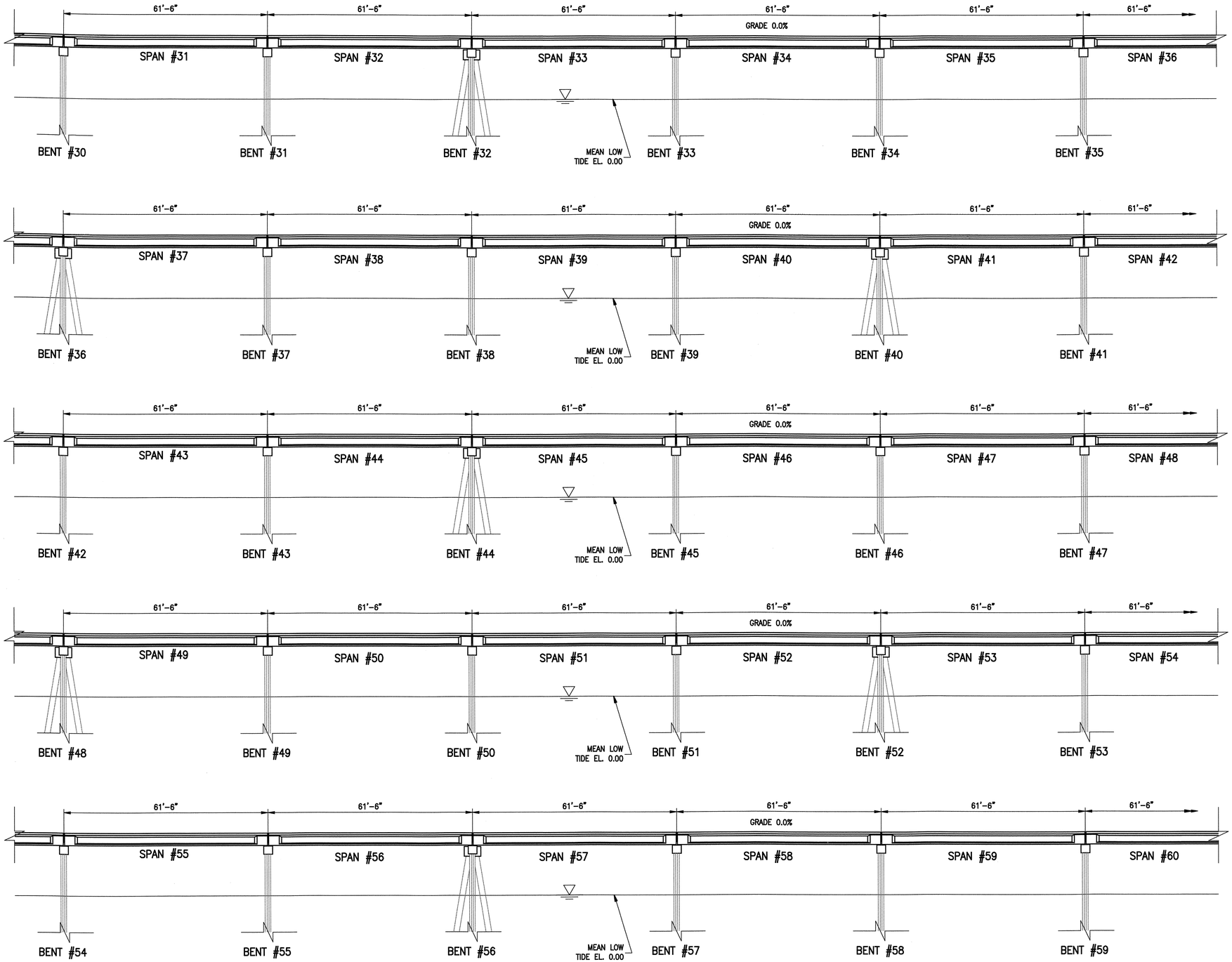
PROJECT NO. B-5014
DARE COUNTY
BRIDGE NO. 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
BRIDGE PROFILE
SPAN(S) #1–#30

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	8
1			3			TOTAL SHEETS
2			4			166



BRIDGE PROFILE

SPANS #31-#60

DRAWN BY:	G. R. COLS	DATE	5/9/07
CHECKED BY:	F.E. ROBBINS	DATE	4/07

PLAN PREPARED BY:

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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

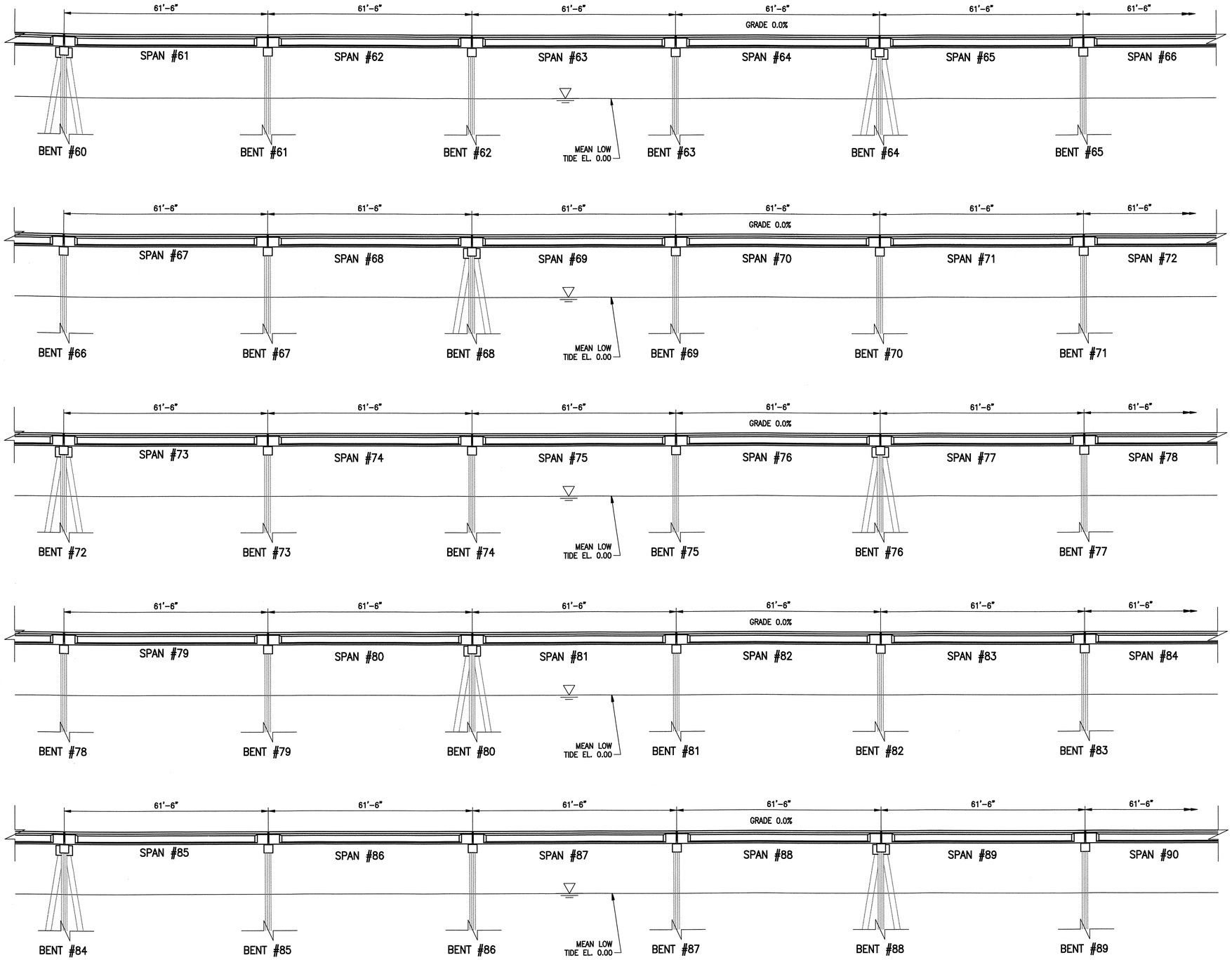
BRIDGE NO. 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
BRIDGE PROFILE
SPAN(S) #31-#60

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL 1/28/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	9
1			3			TOTAL SHEETS
2			4			166



BRIDGE PROFILE

SPANS #61–#90

DRAWN BY	G.R. COLS	DATE	5/9/07
CHECKED BY	F.E. ROBBINS	DATE	4/07

PLAN PREPARED BY:

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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

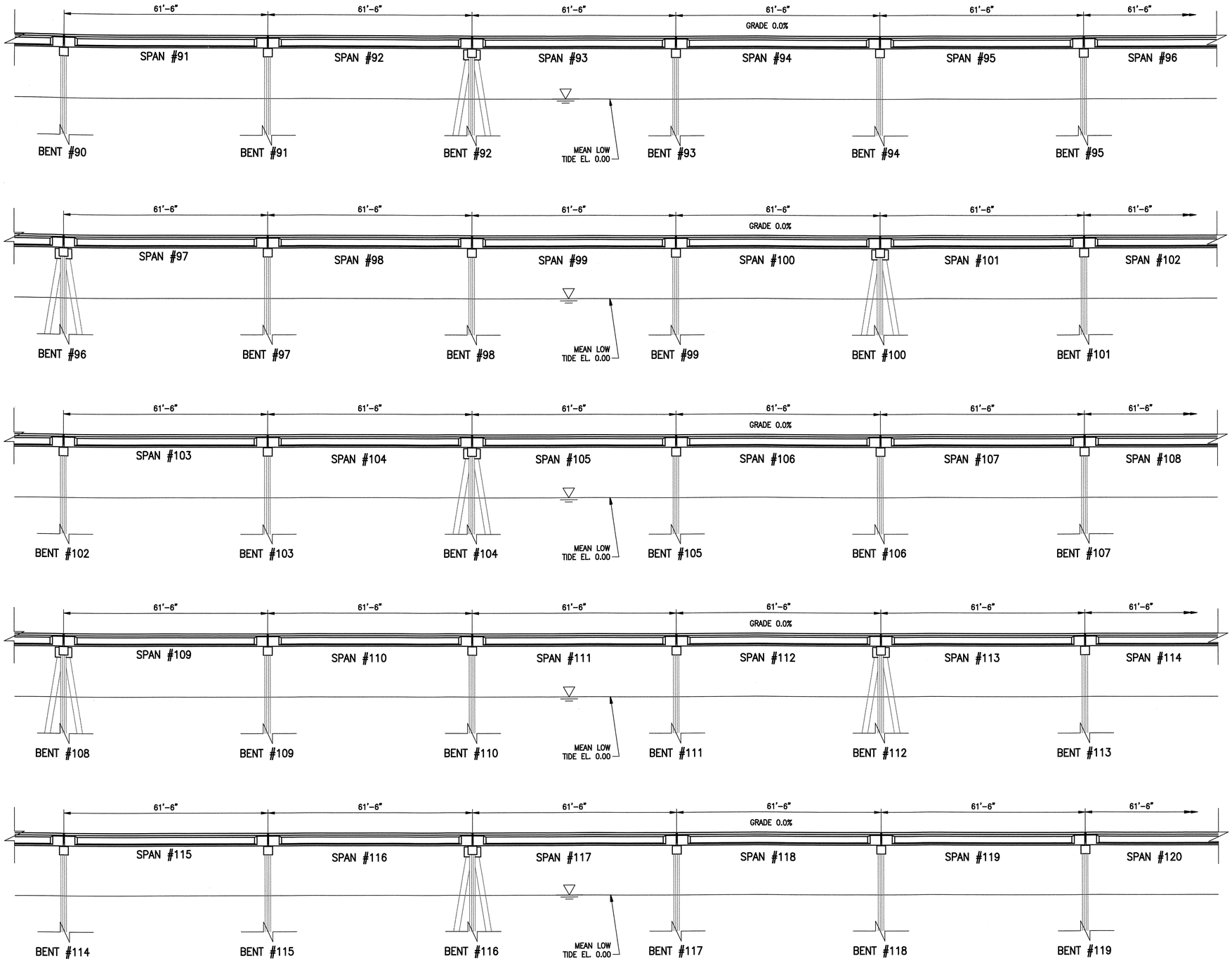
BRIDGE NO. 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
BRIDGE PROFILE
SPAN(S) #61–#90

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	10
1			3			TOTAL SHEETS
2			4			166



BRIDGE PROFILE

SPANS #91–#120

DRAWN BY	G. R. COLS	DATE	5/10/07
CHECKED BY	F.E. ROBBINS	DATE	4/07

PLAN PREPARED BY:

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PROJECT NO. B-5014

DARE COUNTY

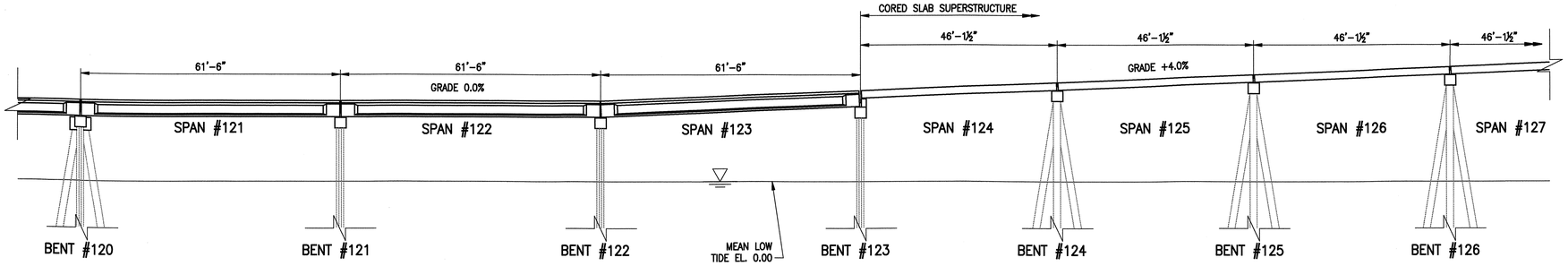
BRIDGE NO. 11

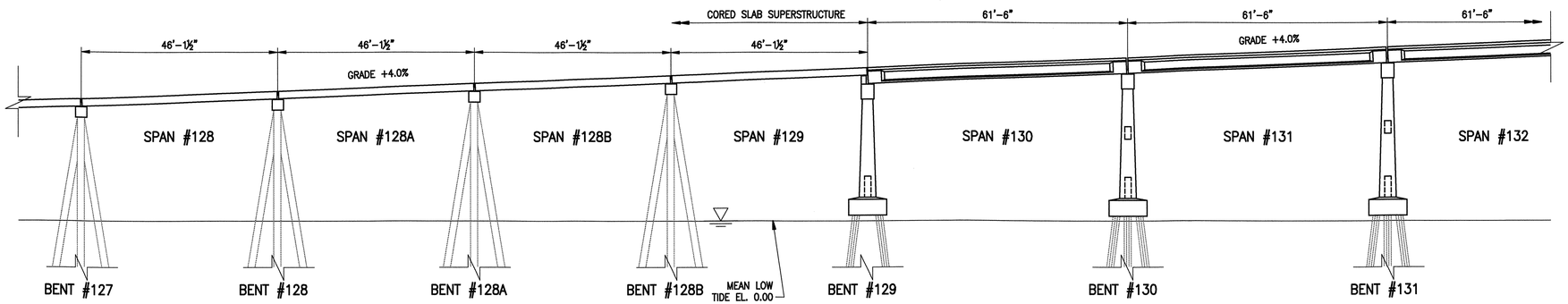
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

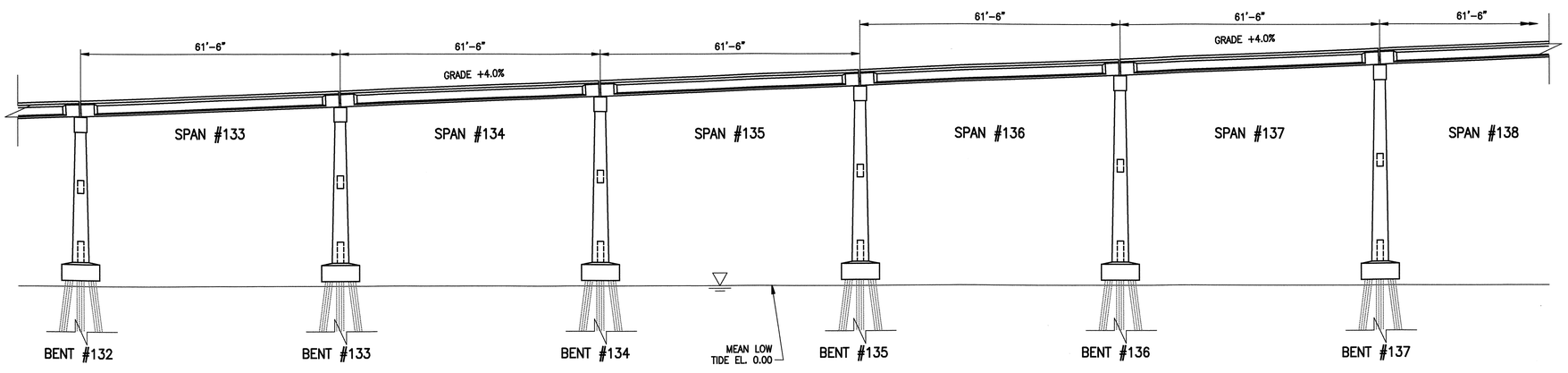
BONNER BRIDGE REPAIR
BRIDGE PROFILE
SPAN(S) #91–#120

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTELL
9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	11
1			3			TOTAL SHEETS
2			4			166







BRIDGE PROFILE

SPANS #121–#138

PLAN PREPARED BY:

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

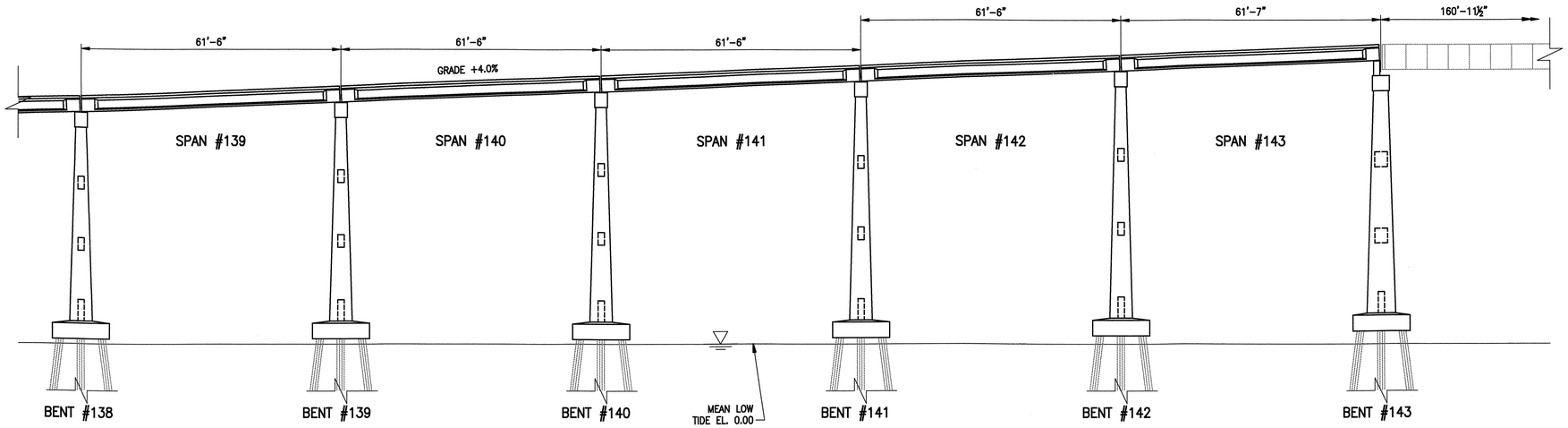
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

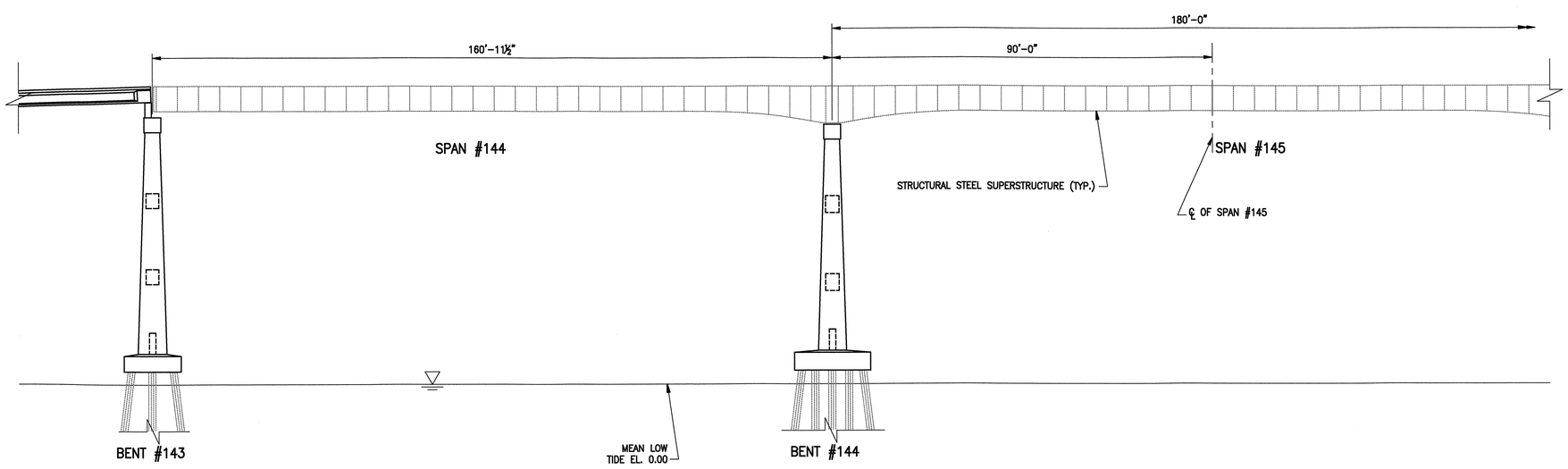
BONNER BRIDGE REPAIR
BRIDGE PROFILE
SPAN(S) #121–#138

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTLETT 9/25/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	12
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G. R. COLS DATE 5/10/07
CHECKED BY F.E. ROBBINS DATE 4/07





BRIDGE PROFILE

SPANS #139–#145

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

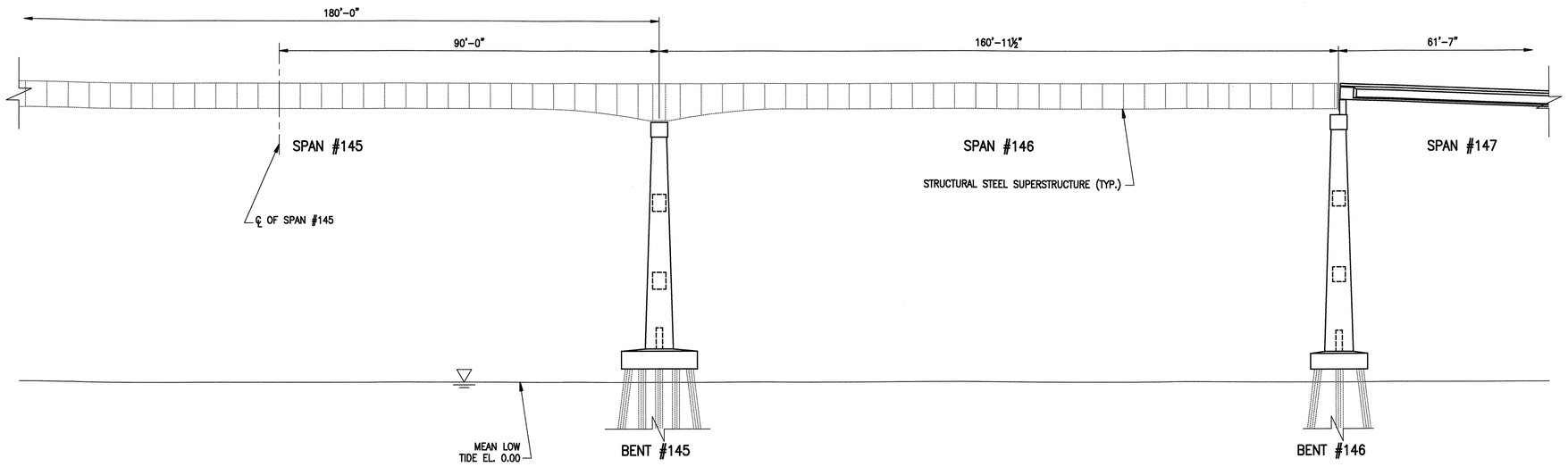
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

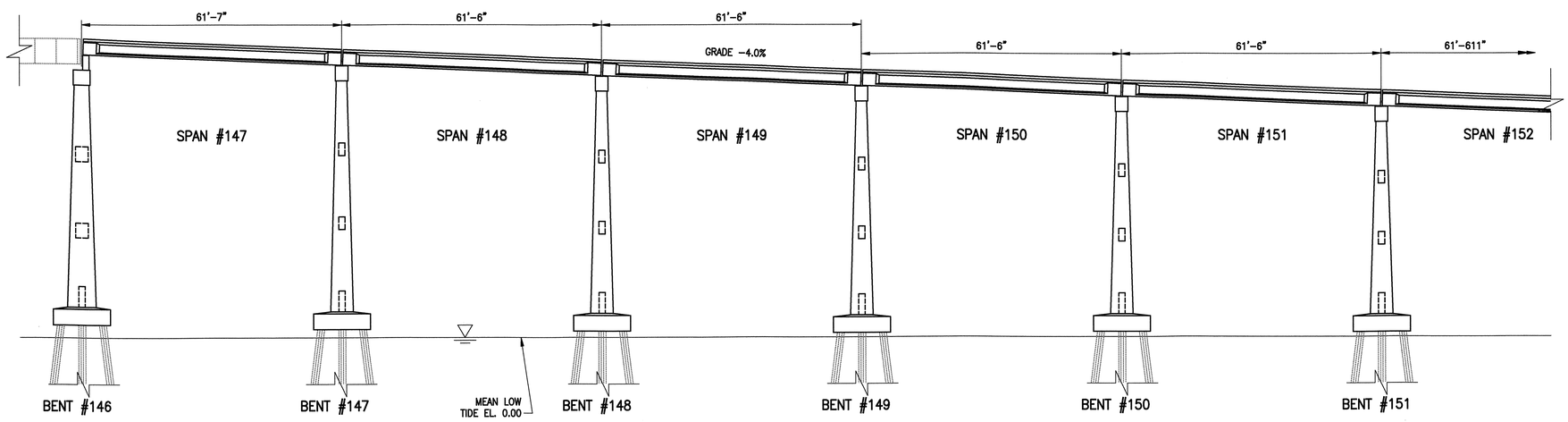
BONNER BRIDGE REPAIR
BRIDGE PROFILE
SPAN(S) #139–#145

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELT
7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	13
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G. R. COLS DATE 5/10/07
CHECKED BY F.E. ROBBINS DATE 4/07





BRIDGE PROFILE

SPANS #145-#152

DRAWN BY	G. R. COLS	DATE	5/10/07
CHECKED BY	F.E. ROBBINS	DATE	4/07

PLAN PREPARED BY:

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PROJECT NO. B-5014

DARE COUNTY

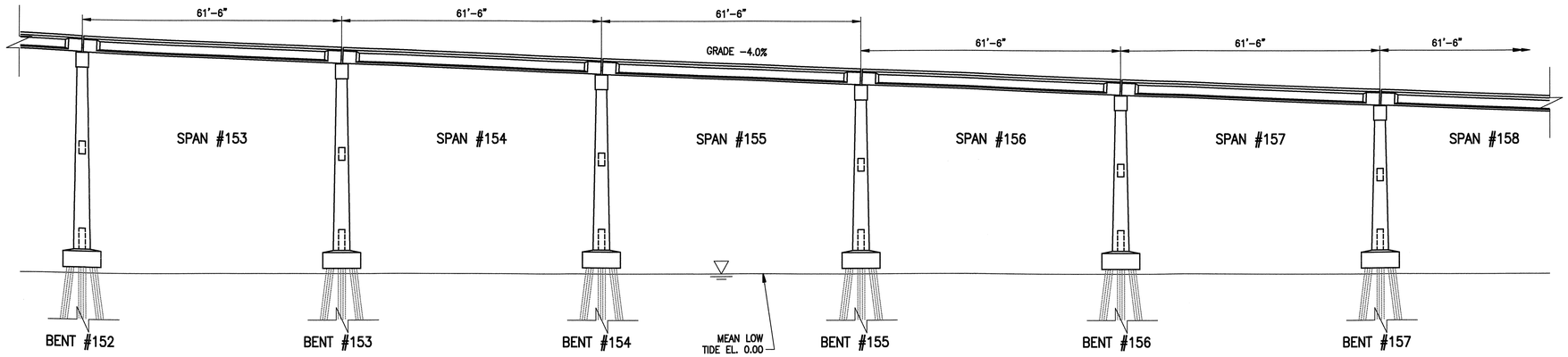
BRIDGE NO. 11

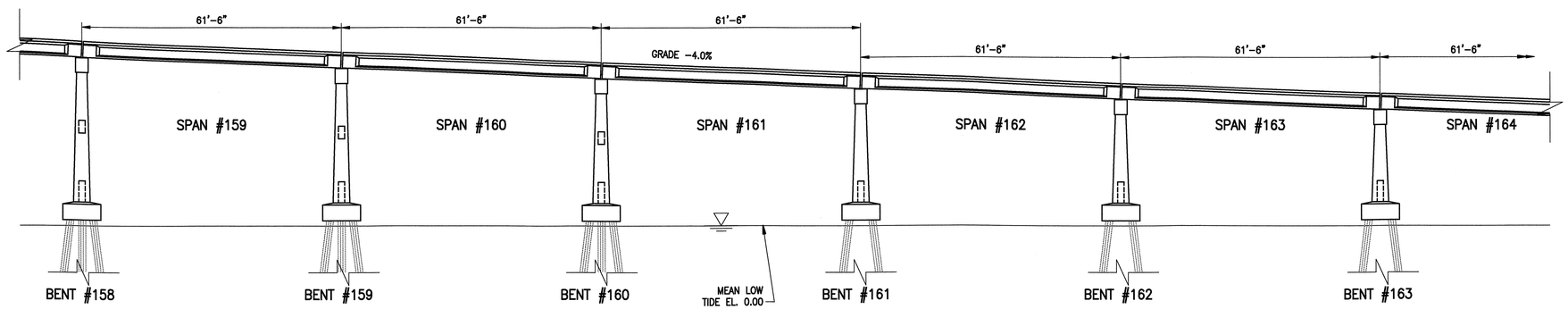
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

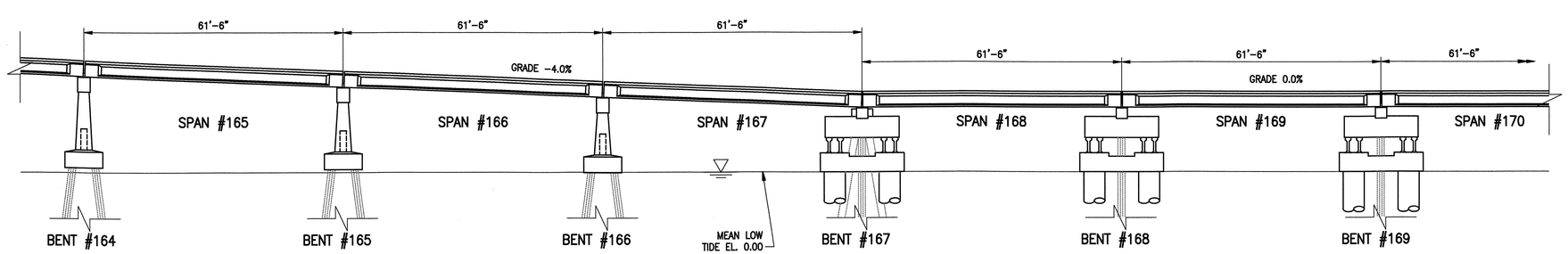
BONNER BRIDGE REPAIR
BRIDGE PROFILE
SPAN(S) #145-#152

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL
9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	14
1			3			TOTAL SHEETS
2			4			166







BRIDGE PROFILE

SPANS #153–#170

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

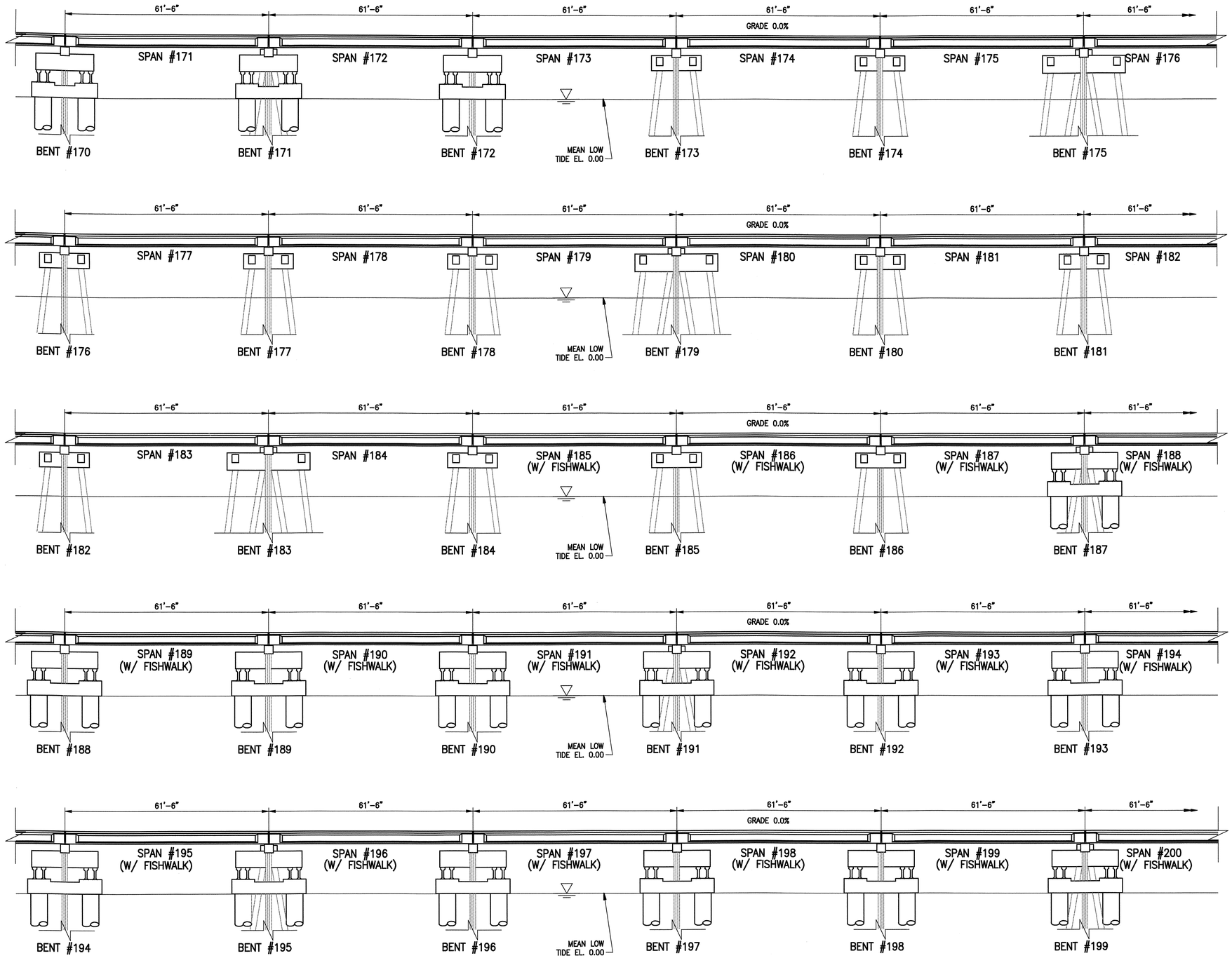
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
BRIDGE PROFILE
SPAN(S) #153–#170

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELT 7/26/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	15
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G. R. COLS DATE 5/10/07
CHECKED BY F.E. ROBBINS DATE 4/07



BRIDGE PROFILE

SPANS #171–#200

PLAN PREPARED BY:

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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

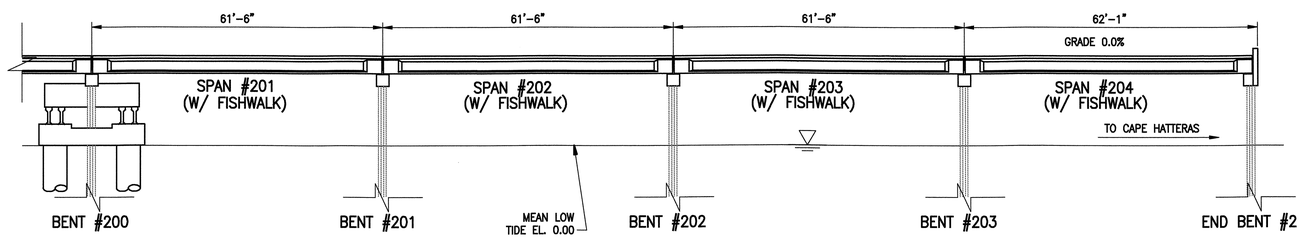
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
BRIDGE PROFILE
SPAN(S) #171–#200

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	16
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G. R. COLS DATE 5/10/07
CHECKED BY F.E. ROBBINS DATE 4/07



BRIDGE PROFILE

SPANS #201-#204

PLAN PREPARED BY:

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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

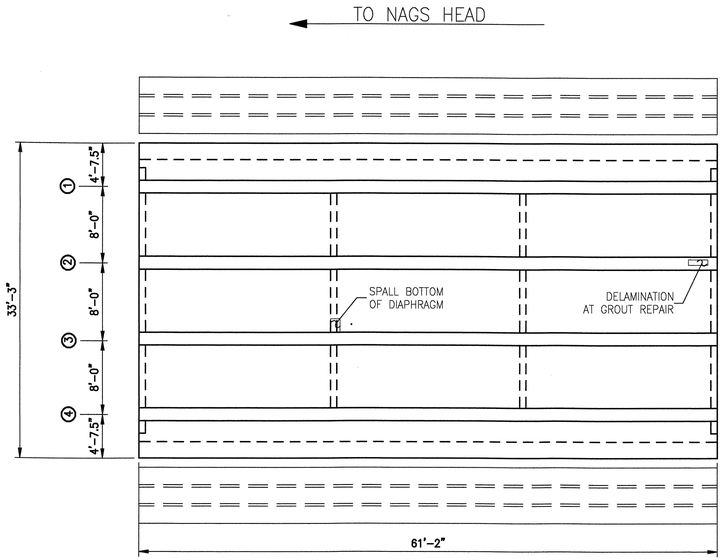
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
BRIDGE PROFILE
SPAN(S) #201-#204

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL
9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	17
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G. R. COLS DATE 5/10/07
CHECKED BY F.E. ROBBINS DATE 4/07



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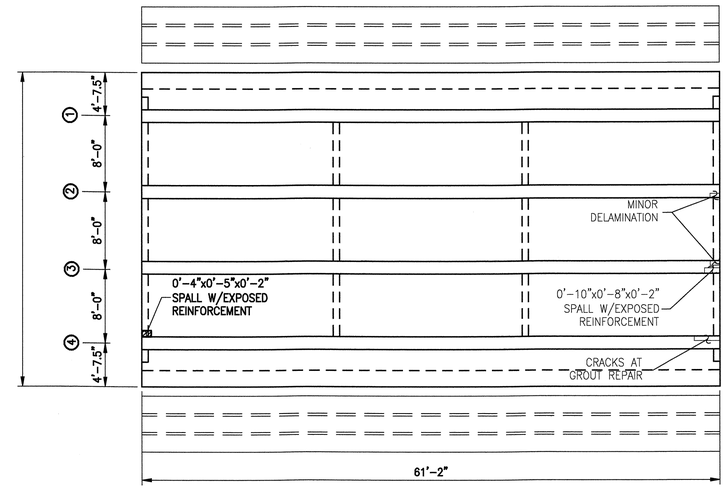
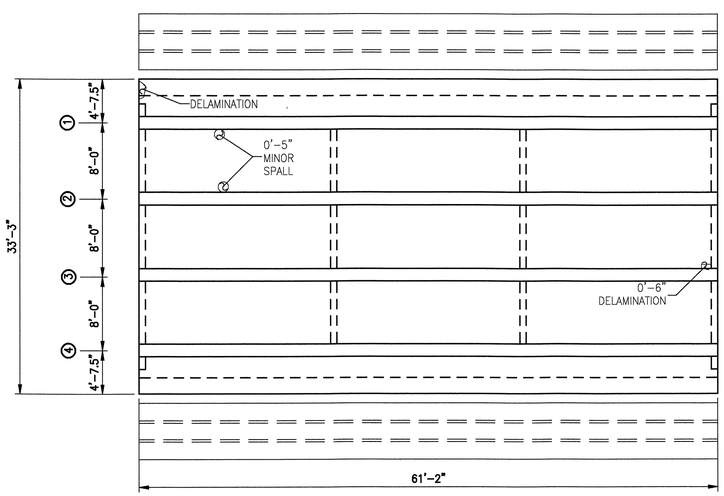


BENT #1 — SPAN #2–UNDERSIDE — BENT #2



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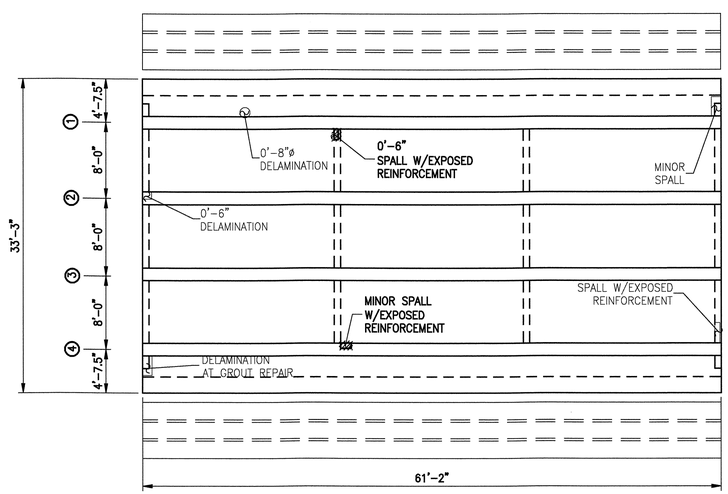

BENT #3 — SPAN #4–UNDERSIDE — BENT #4

BILL OF MATERIAL

SPAN #1

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

SPAN #2

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

SPAN #3

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

SPAN #4

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

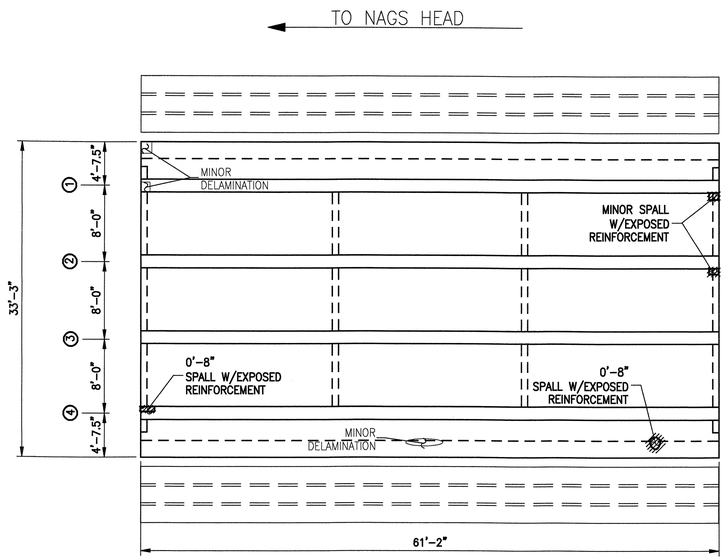
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #1–#4

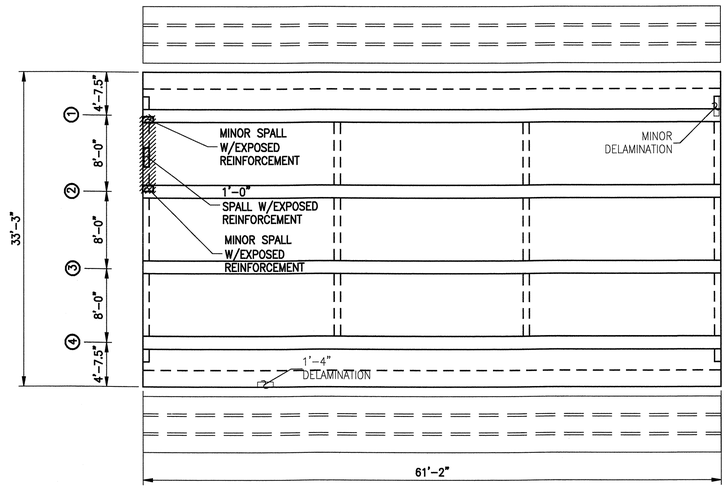
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	18
1			3			TOTAL SHEETS
2			4			166

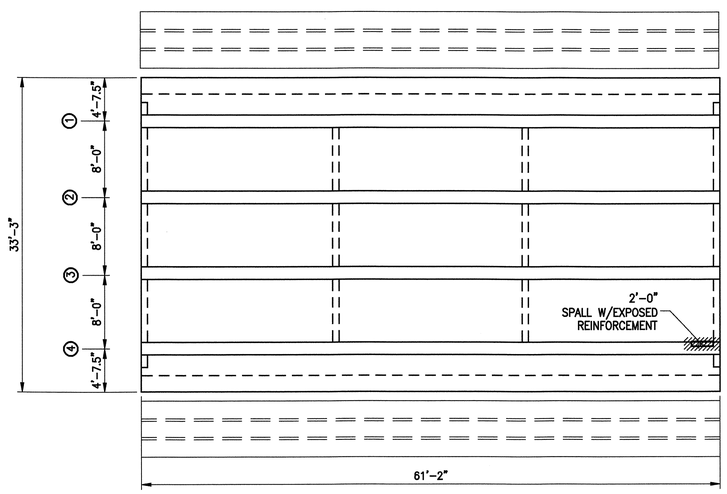
DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



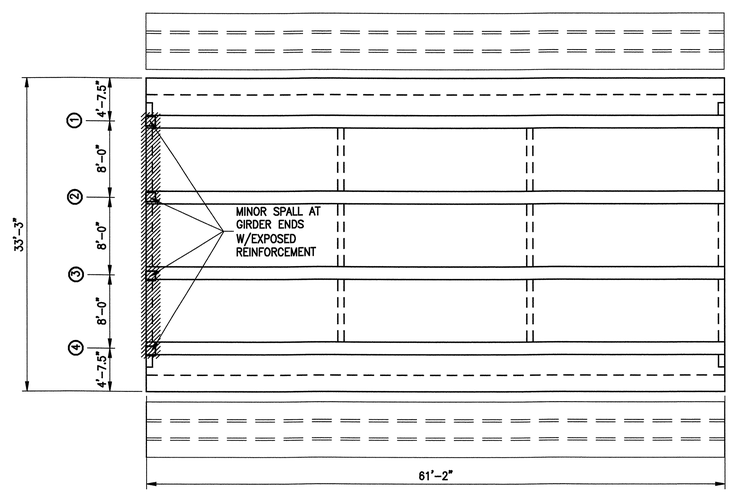
BENT #4 — SPAN #5–UNDERSIDE — BENT #5



BENT #5 — SPAN #6–UNDERSIDE — BENT #6



BENT #6 — SPAN #7–UNDERSIDE — BENT #7



BENT #7 — SPAN #8–UNDERSIDE — BENT #8

BILL OF MATERIAL

SPAN #5

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #6

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

SPAN #7

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #8

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

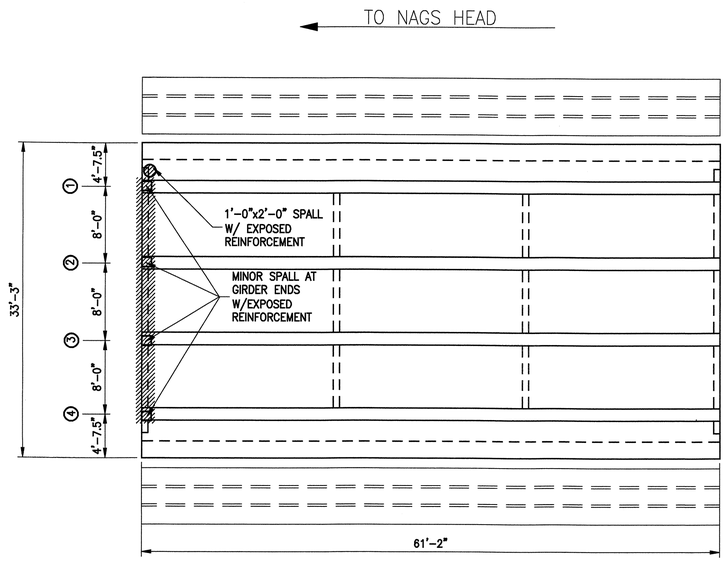
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #5–#8

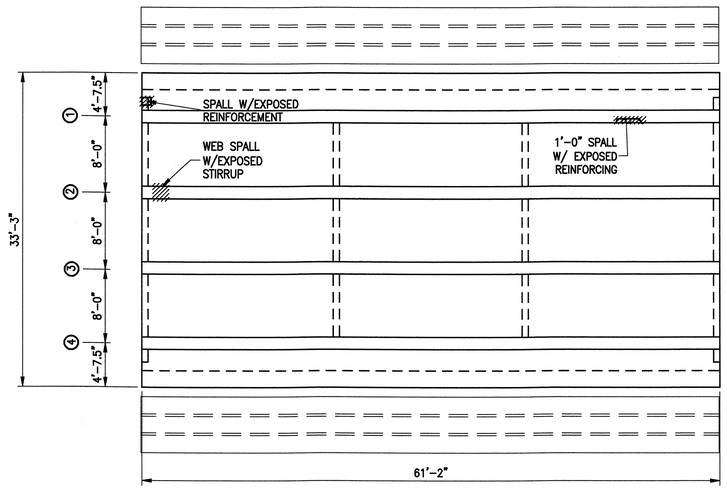
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL 4/26/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	19
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/26/07
CHECKED BY G.R. COLS DATE 5/14/07



SPAN #9–UNDERSIDE



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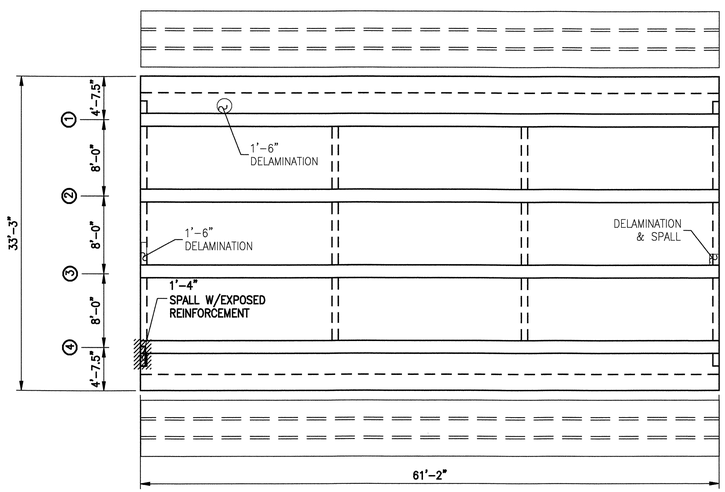
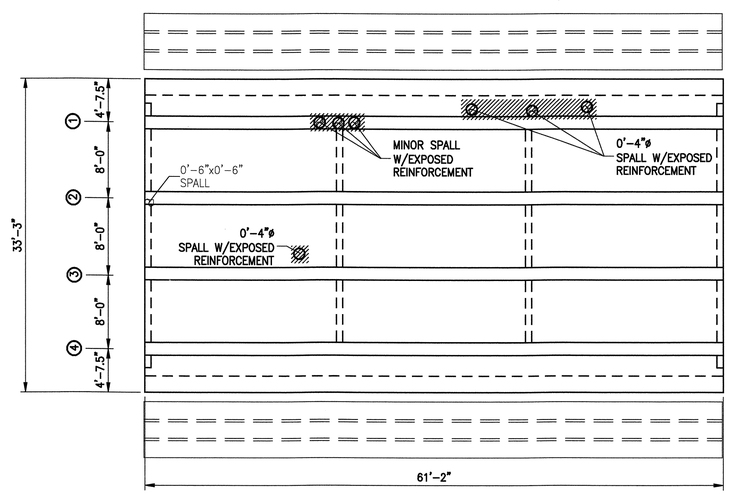


SPAN #11–UNDERSIDE



SPAN #12–UNDERSIDE

BILL OF MATERIAL

SPAN #9			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #10			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #11			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

SPAN #12			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

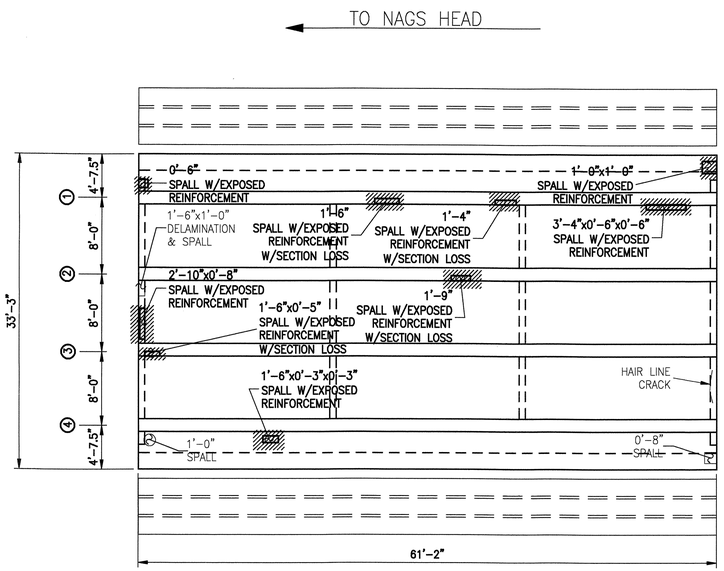
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #9–#12

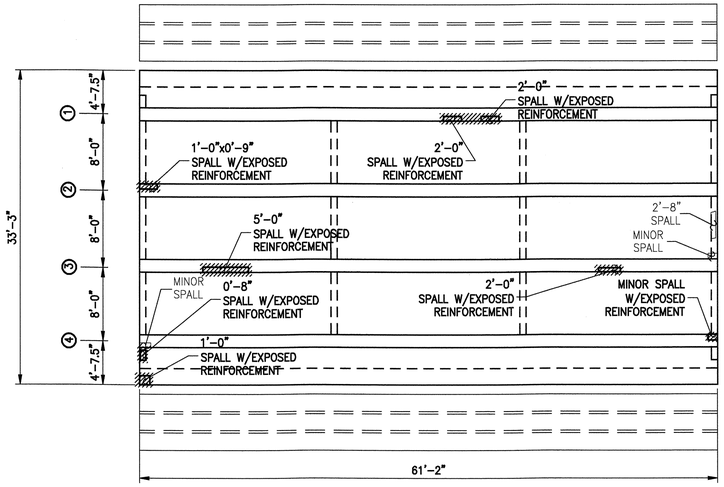
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL 7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	20
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



BENT #12 — SPAN #13—UNDERSIDE — BENT #13



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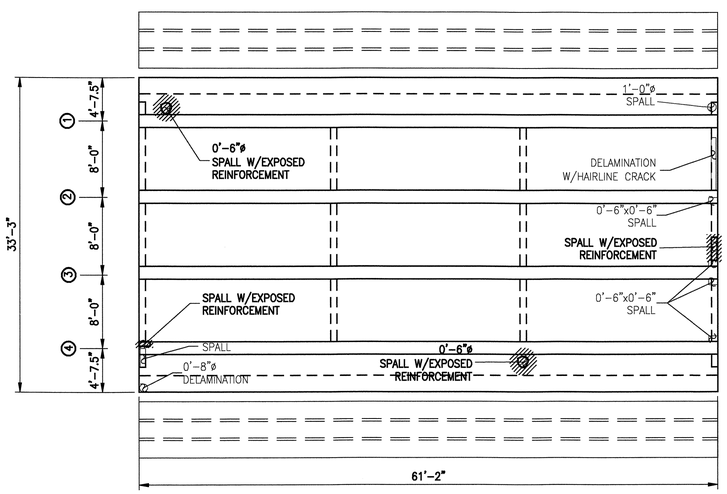

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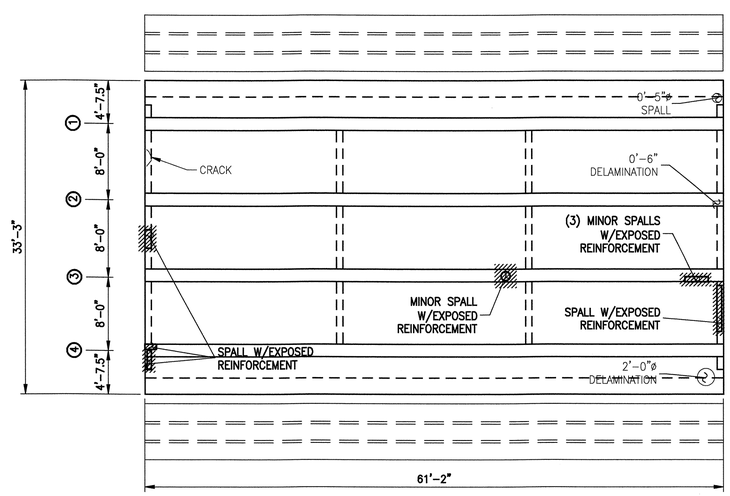

BENT #15 — SPAN #16—UNDERSIDE — BENT #16

BILL OF MATERIAL

SPAN #13			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #14			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #15			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #16			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

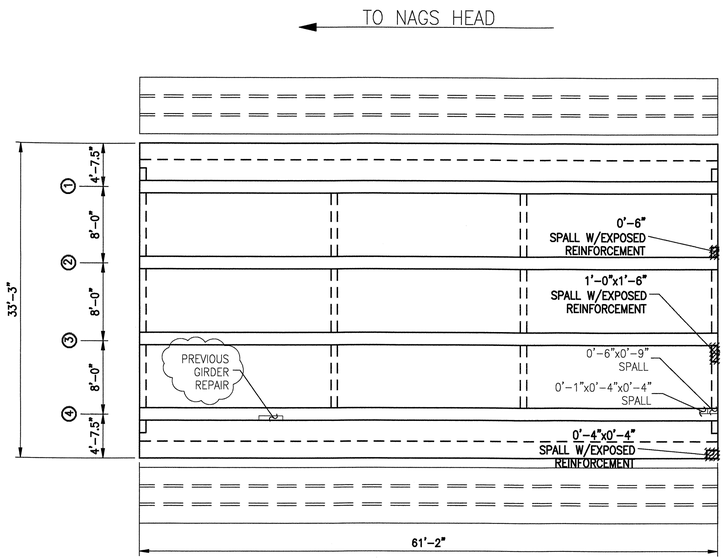
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #13–#16

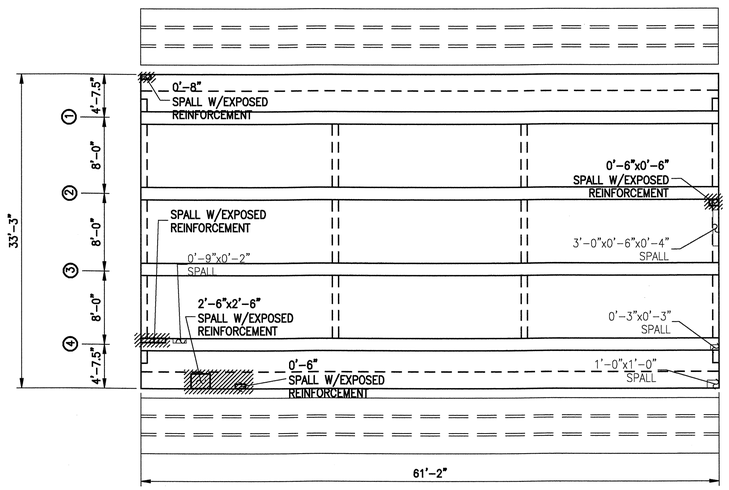
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTLETT 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	21
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/07
CHECKED BY G.R. COLS DATE 5/07



BENT #16 SPAN #17–UNDERSIDE BENT #17



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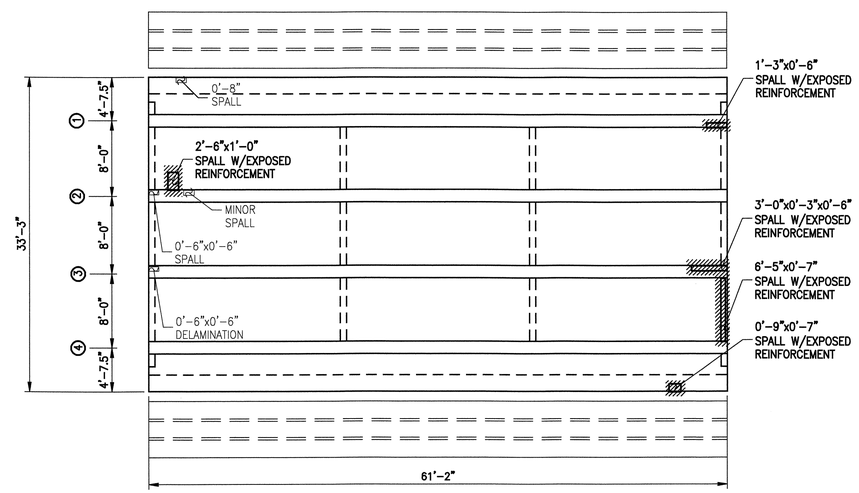

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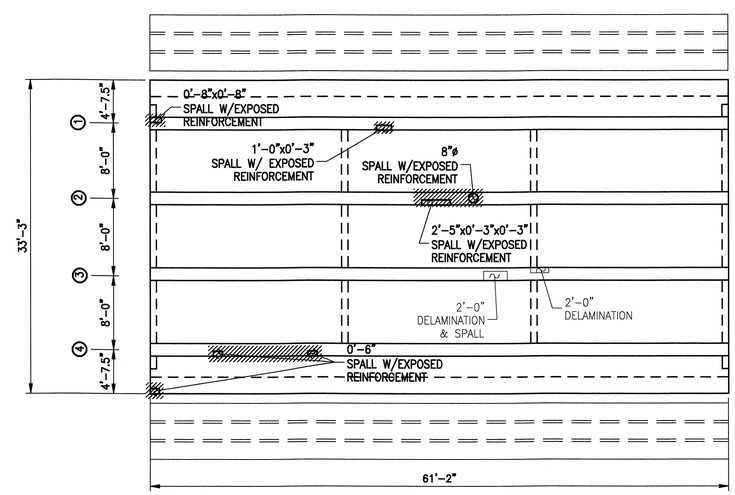

BENT #19 SPAN #20–UNDERSIDE BENT #20

BILL OF MATERIAL

SPAN #17

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

SPAN #18

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #19

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #20

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

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DARE COUNTY

BRIDGE NO. 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

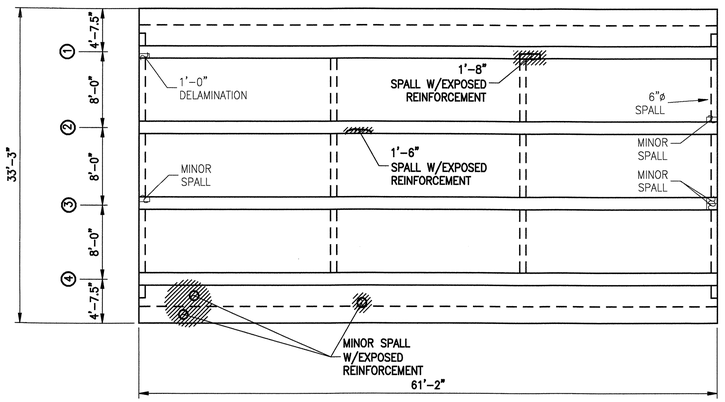
BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #17–#20

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	22
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07

TO NAGS HEAD



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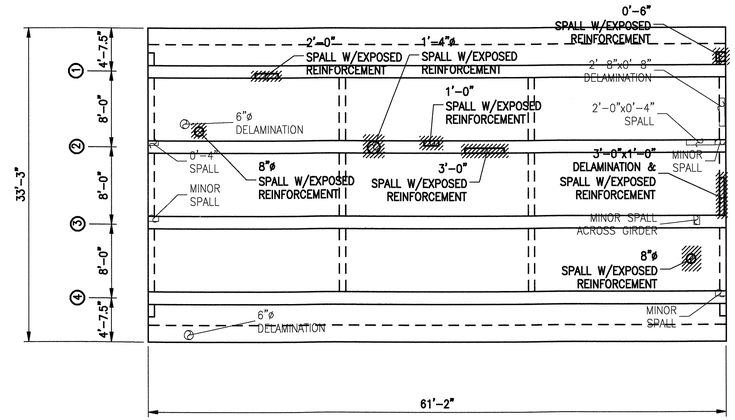

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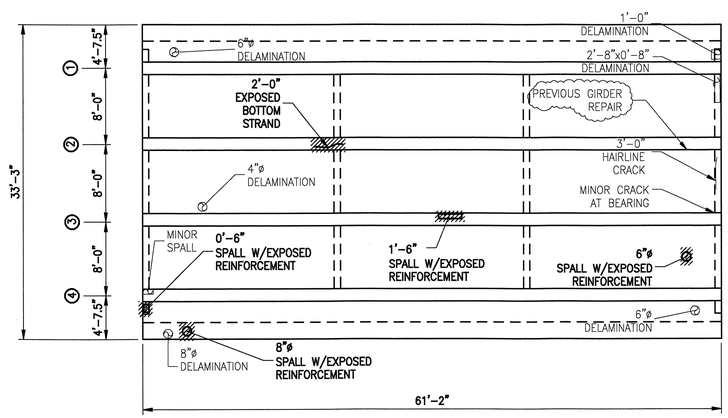

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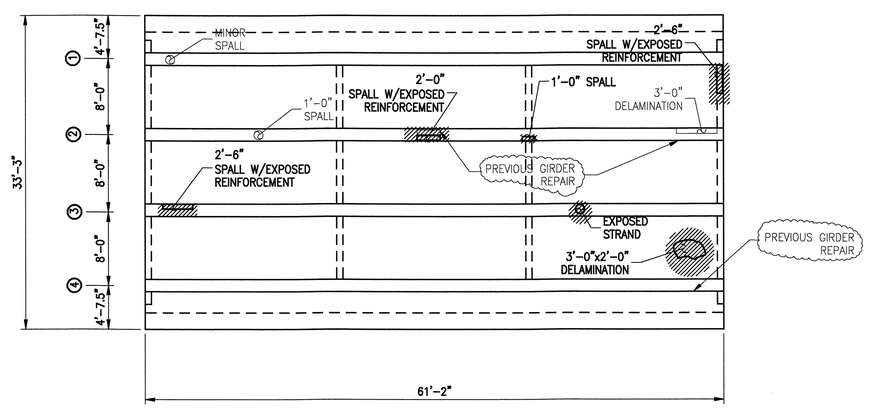

BENT #23 — SPAN #24–UNDERSIDE — BENT #24

BILL OF MATERIAL

SPAN #21

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #22

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #23

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #24

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

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DARE COUNTY

BRIDGE NO. 11

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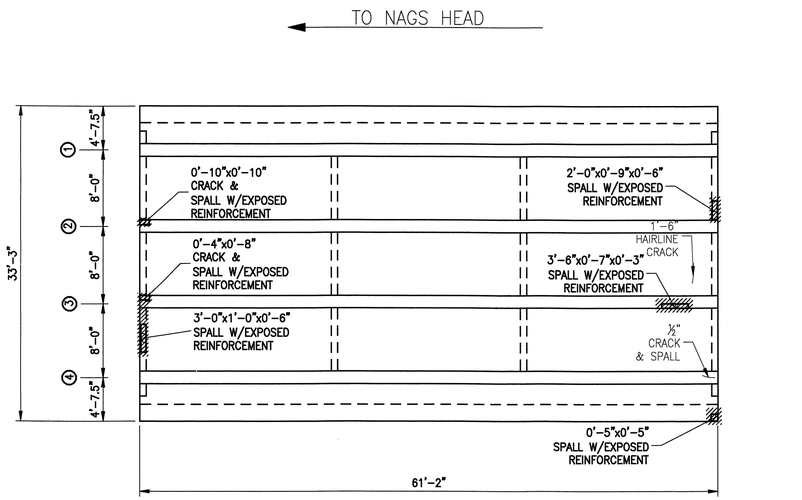
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #21–#24

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FRED L. BARTLETT 1/2/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	23
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



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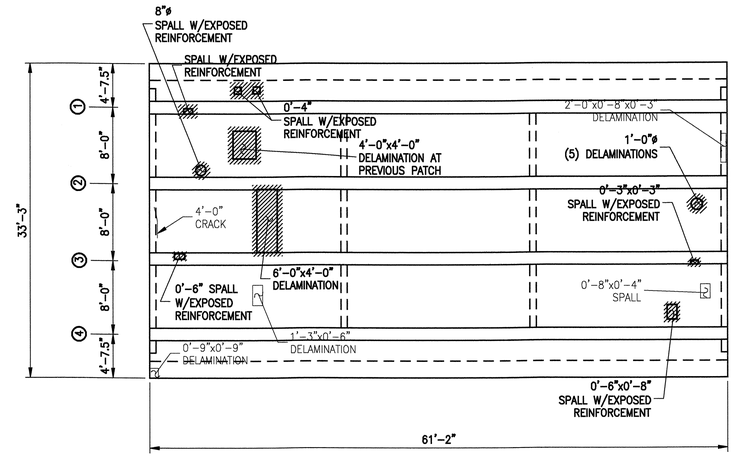

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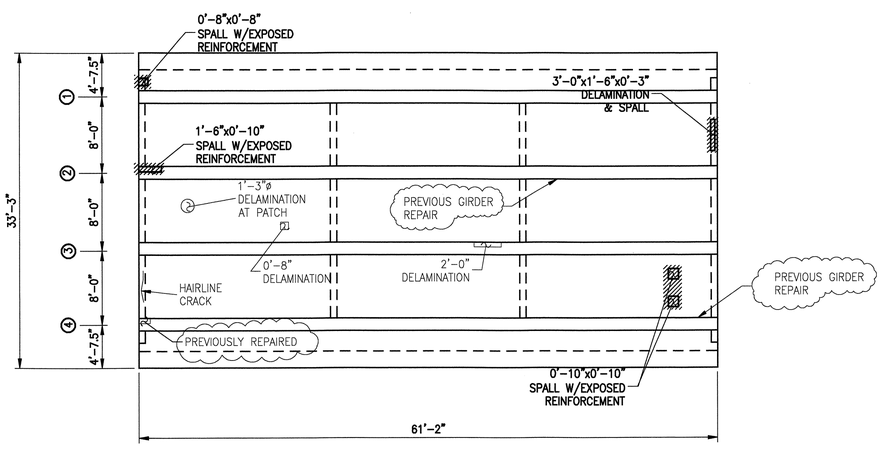

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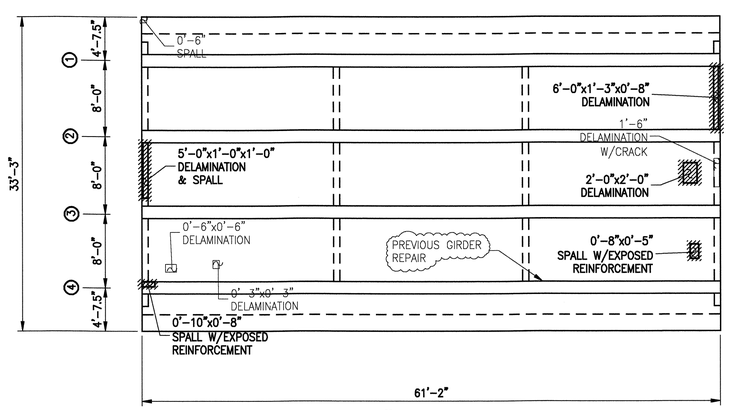

BENT #27 — SPAN #28–UNDERSIDE — BENT #28

BILL OF MATERIAL

SPAN #25

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #26

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	10	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #27

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #28

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	5	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

- DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
- GENERAL SHOPE OF DEFICIENCY
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT
- GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4911 Green Road Suite 107 Raleigh, NC 27616
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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

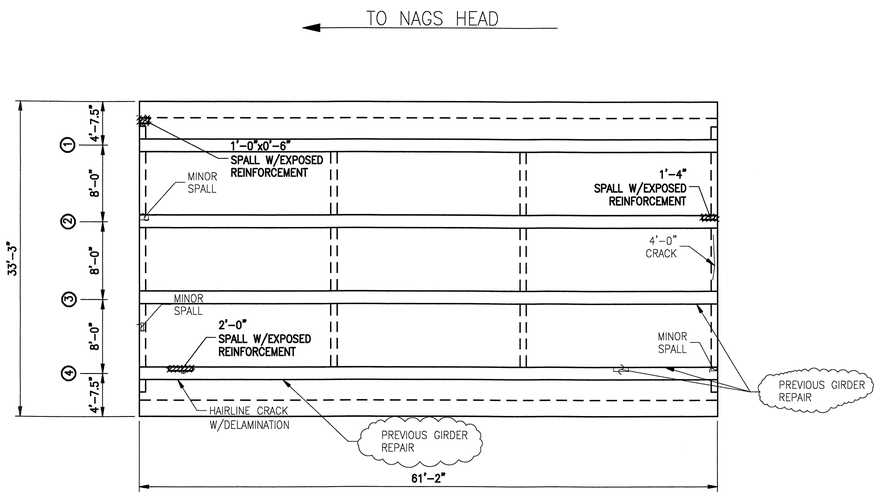
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #25–#28

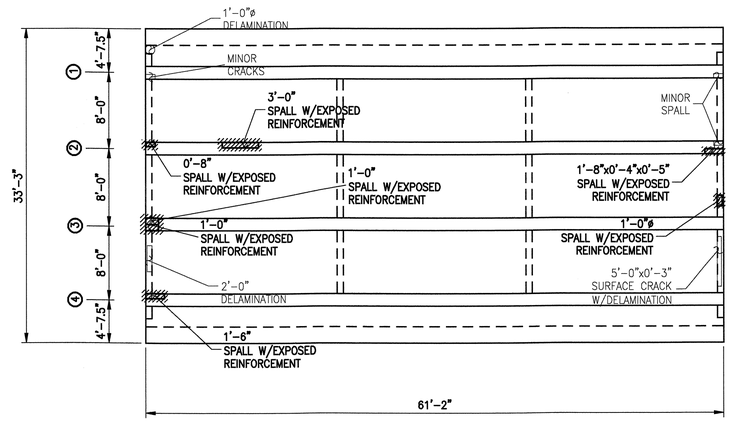
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	24
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



BENT #28 — SPAN #29–UNDERSIDE — BENT #29



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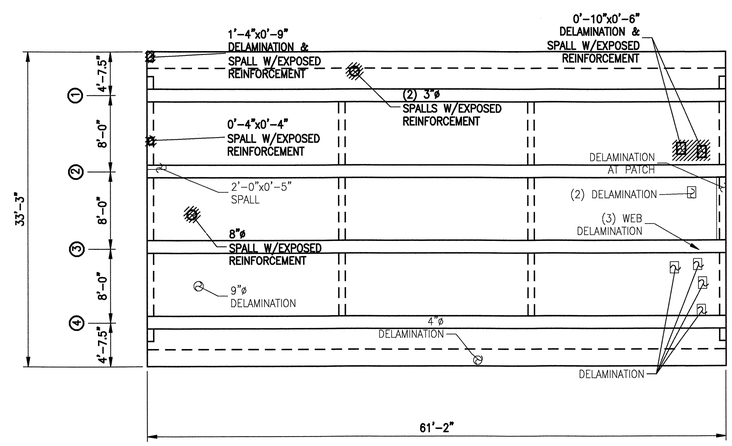

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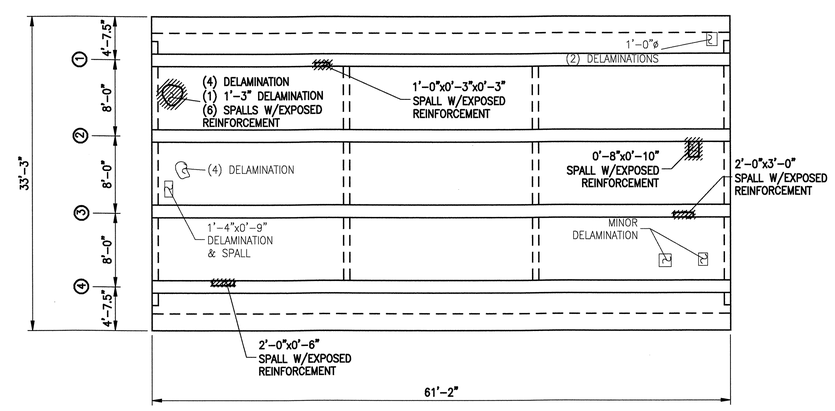

BENT #31 — SPAN #32–UNDERSIDE — BENT #32

BILL OF MATERIAL

SPAN #29

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #30

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #31

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

SPAN #32

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

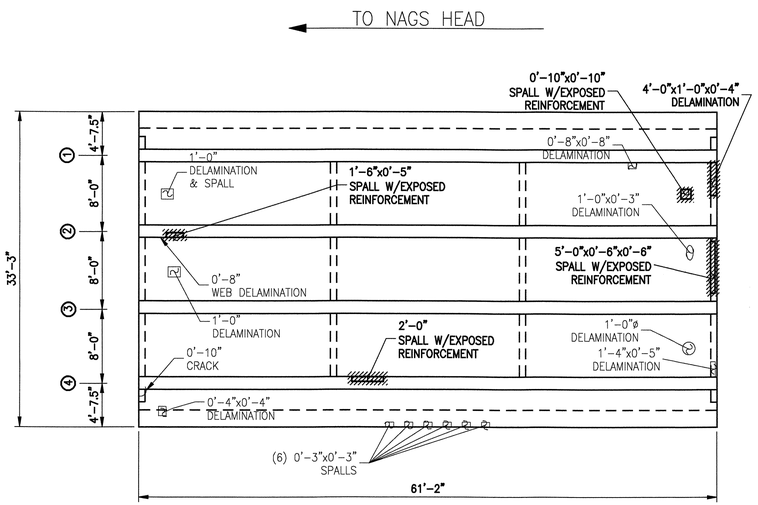
BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #29–#32

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL 7/26/07

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

SHEET NO. 25
TOTAL SHEETS 166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



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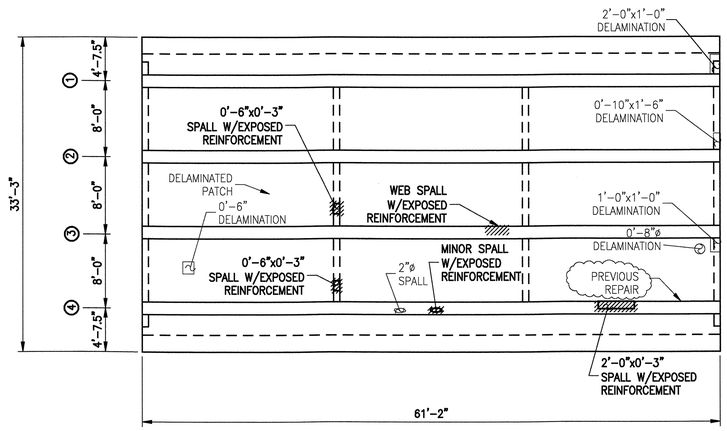

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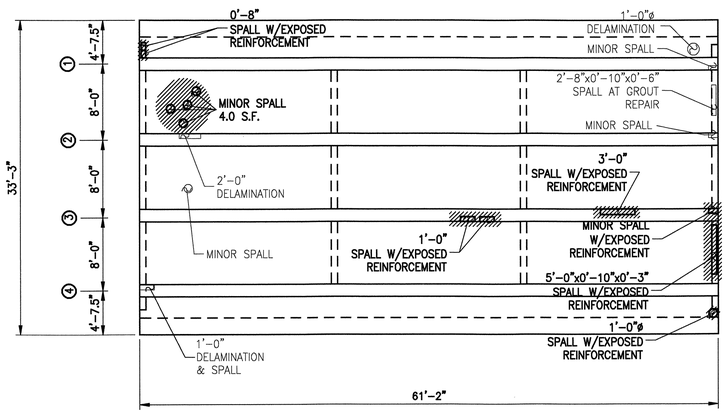

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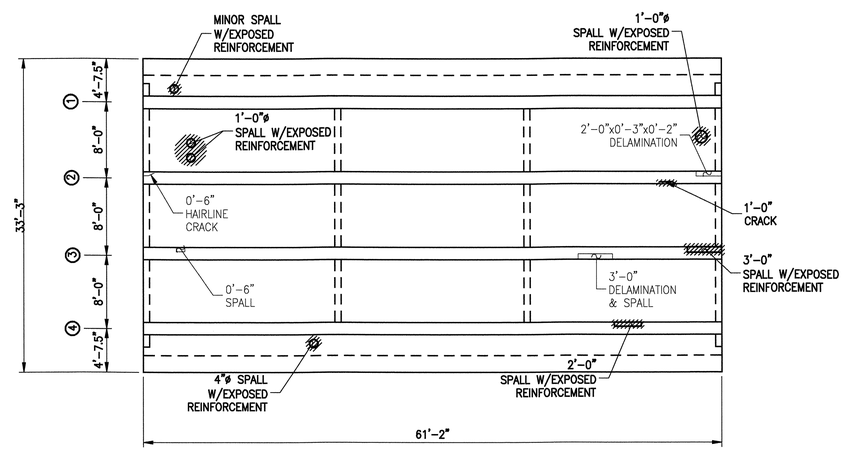

BENT #35 — SPAN #36–UNDERSIDE — BENT #36

BILL OF MATERIAL

SPAN #33

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #34

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #35

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #36

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

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– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

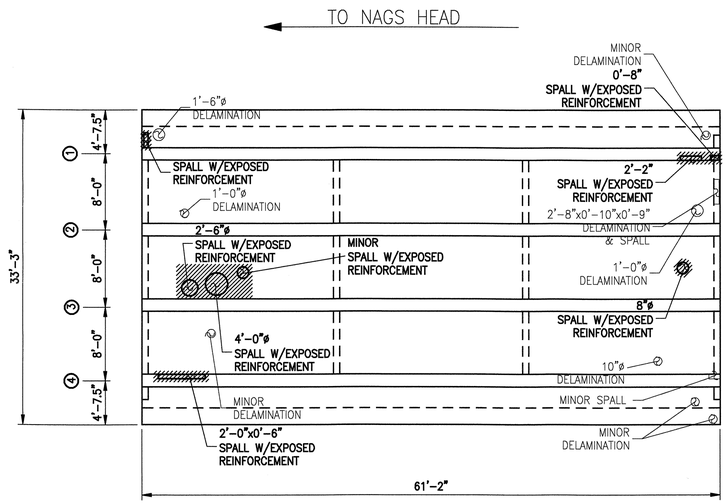
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #33–#36

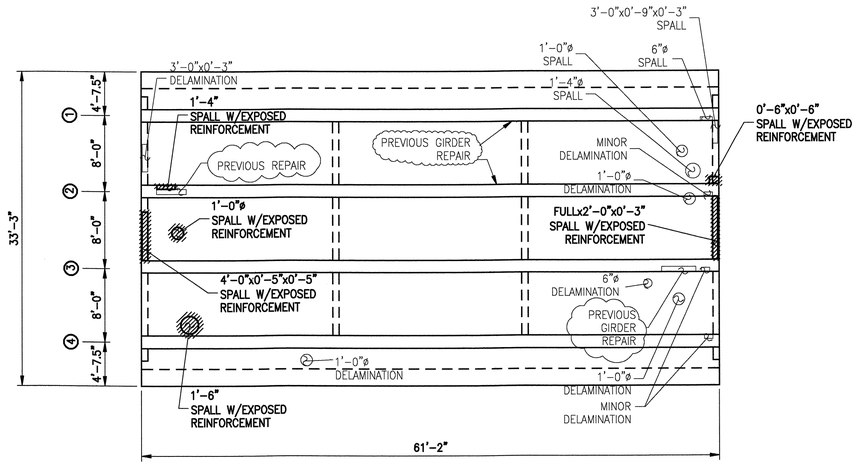
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	26
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



BENT #36 — SPAN #37–UNDERSIDE — BENT #37



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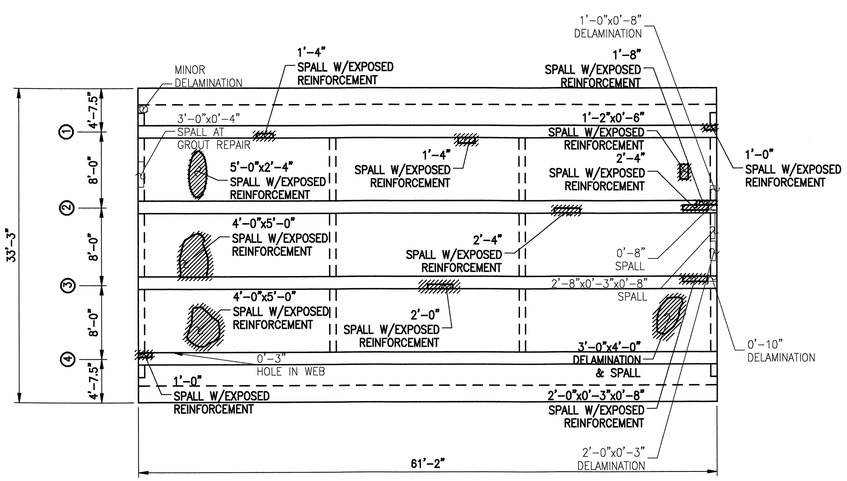

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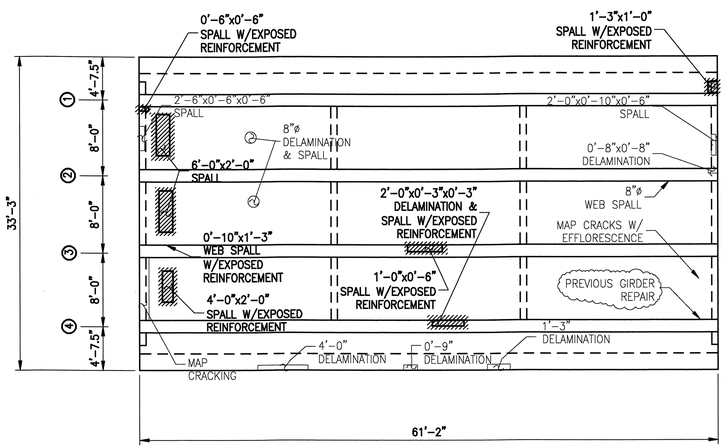

BENT #39 — SPAN #40–UNDERSIDE — BENT #40

BILL OF MATERIAL

SPAN #37

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	5	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #38

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	3	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #39

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	16	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #40

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	8	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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DARE COUNTY

BRIDGE NO. 11

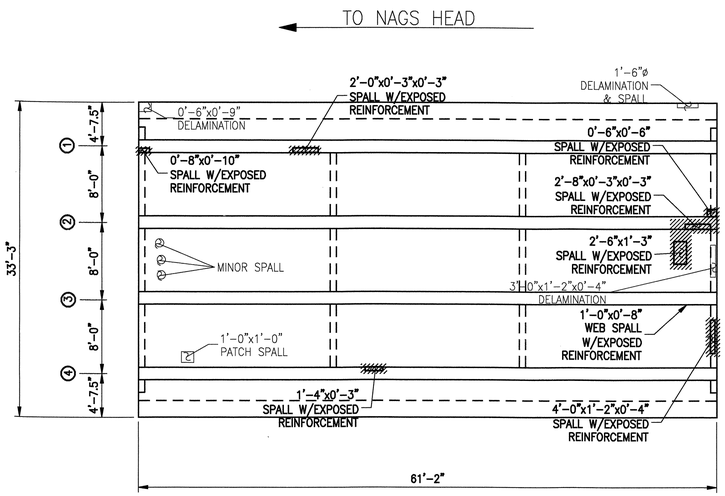
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #37–#40

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL 7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	27
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



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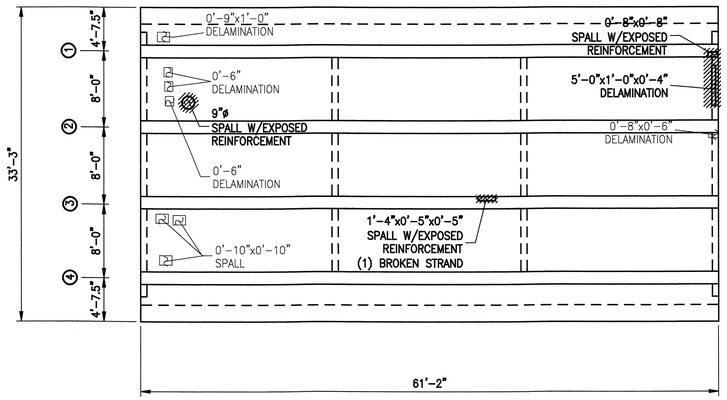

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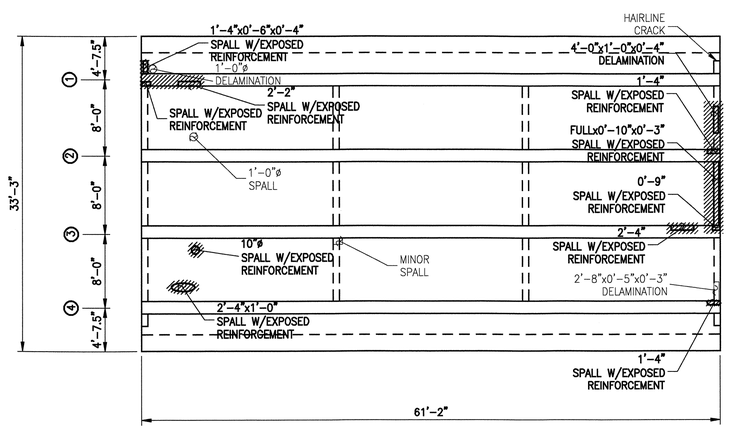

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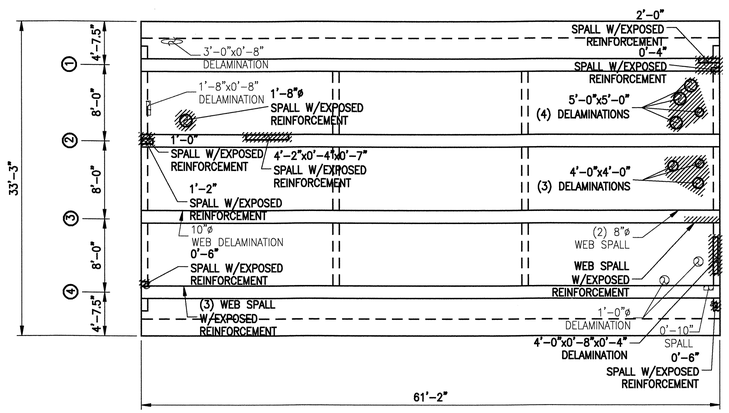

BENT #43 — SPAN #44–UNDERSIDE — BENT #44

BILL OF MATERIAL

SPAN #41			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #42			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #43			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	4	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #44			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	12	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

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– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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DARE COUNTY

BRIDGE NO. 11

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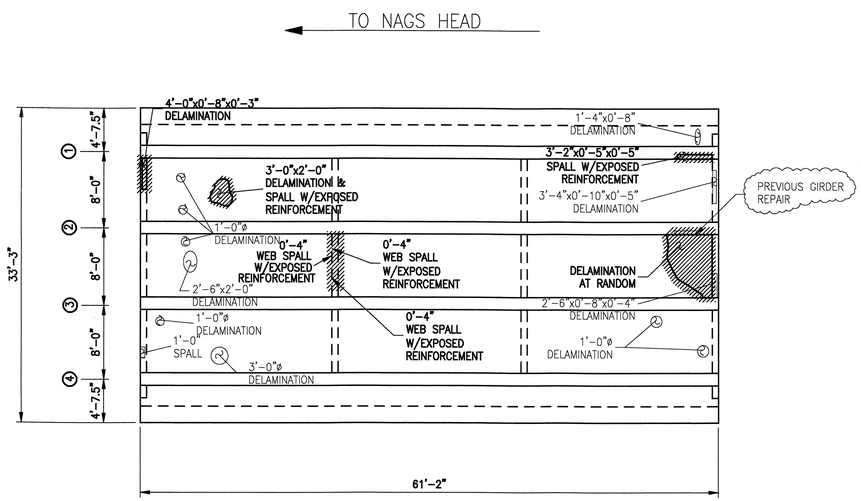
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #41–#44

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL 7/12/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	28
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



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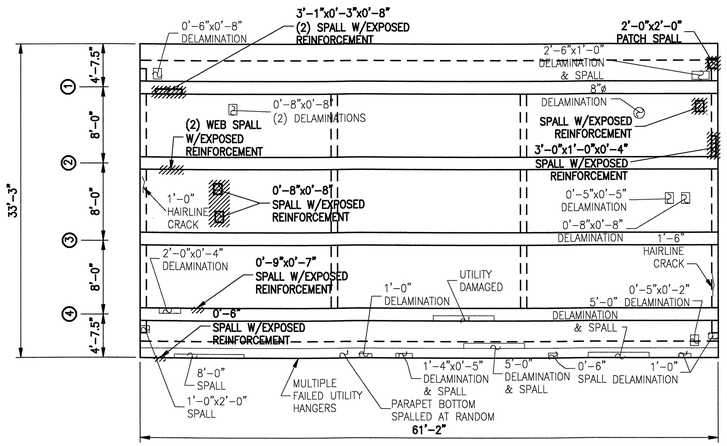

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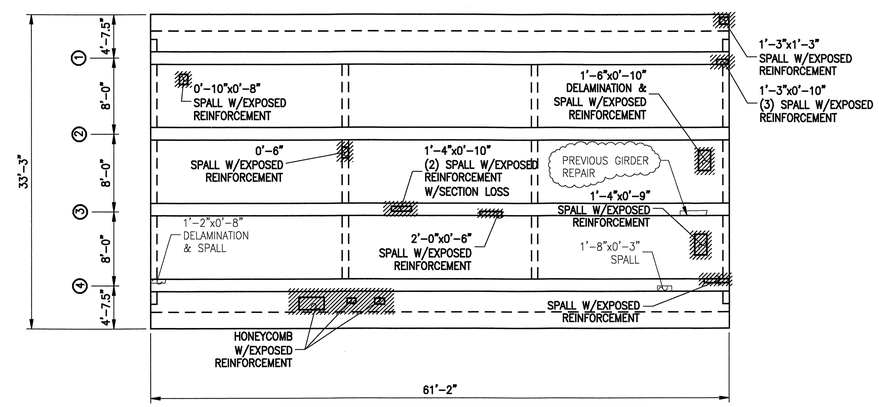

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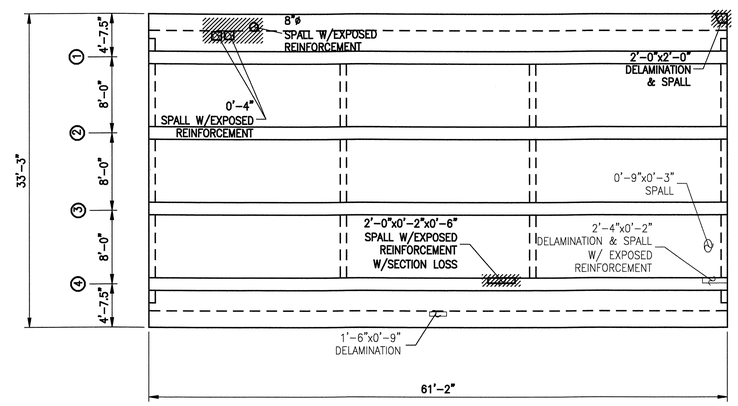

BENT #47 — SPAN #48–UNDERSIDE — BENT #48

BILL OF MATERIAL

SPAN #45

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	14	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #46

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #47

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #48

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

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– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4911 Green Road Suite 107 Raleigh, NC 27616
Phone 919 981 0310 Fax 919 981 0451
Email info@aogroup.com www.aogroup.com
AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

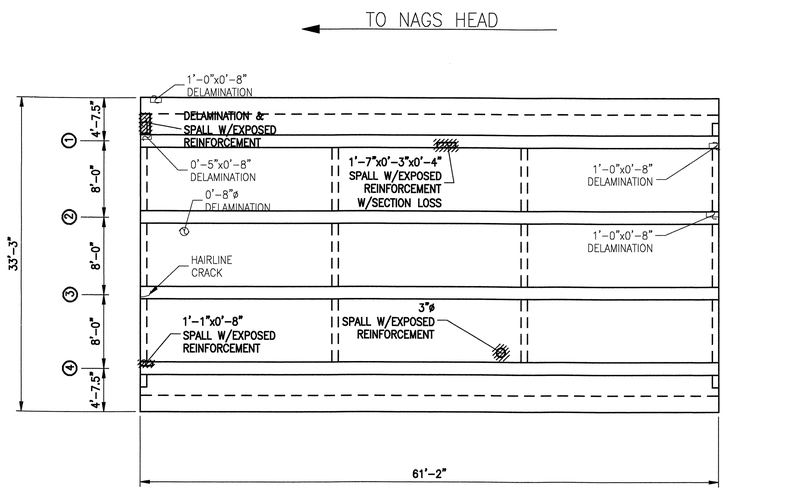
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #45–#48

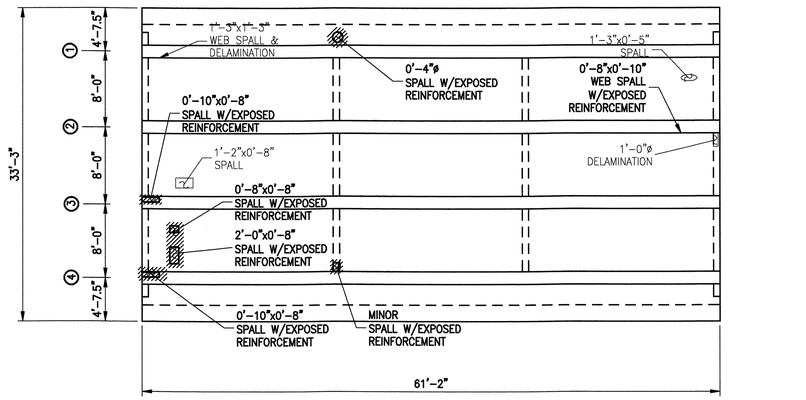
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELT
5/22/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	29
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



SPAN #49–UNDERSIDE



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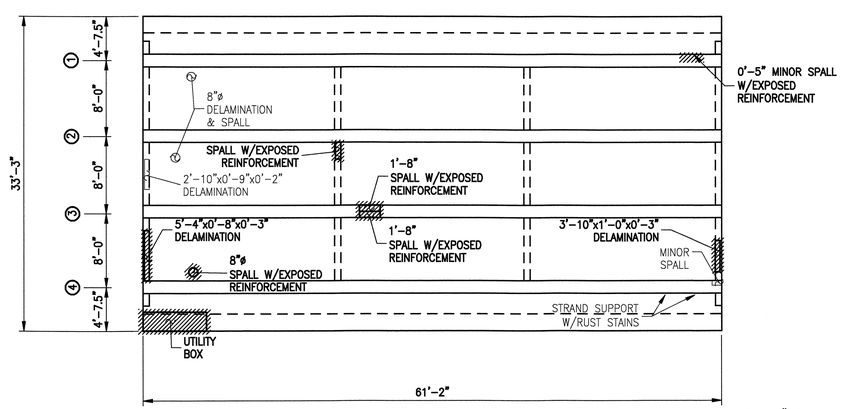

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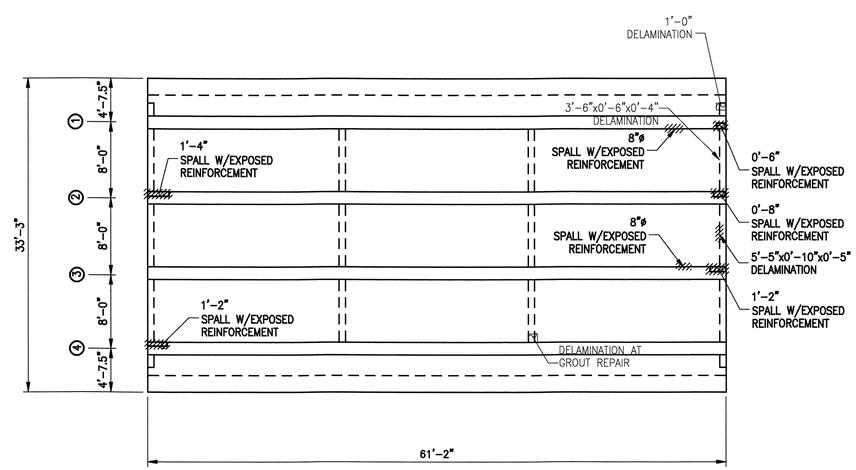

SPAN #52–UNDERSIDE

BILL OF MATERIAL

SPAN #49

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #50

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #51

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	8	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #52

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

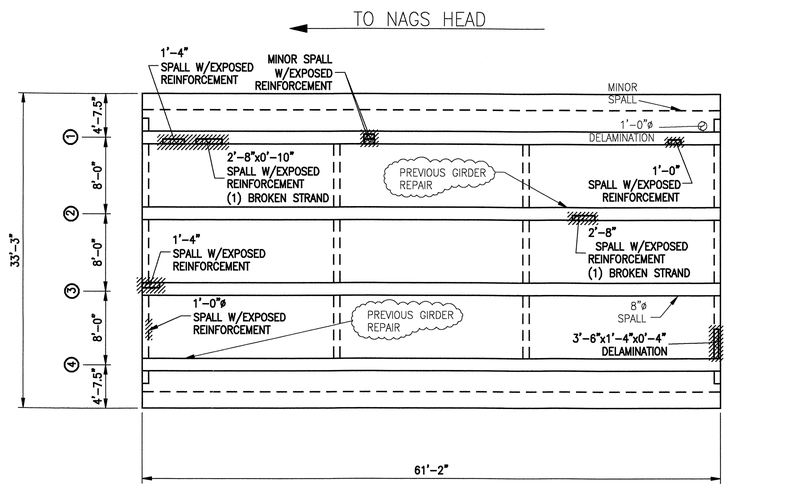
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #49–#52

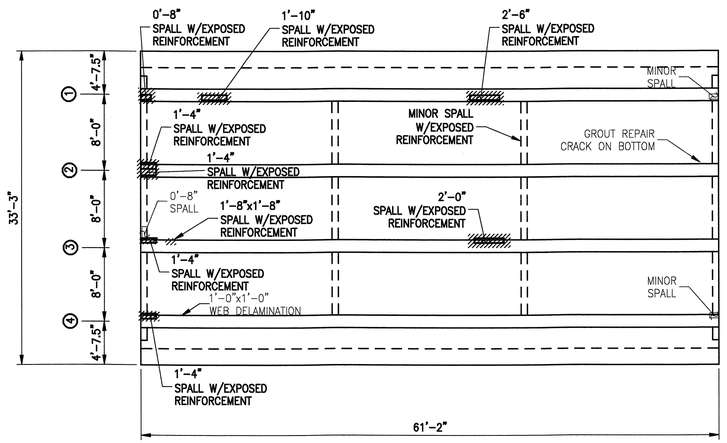
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTLETT 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	30
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



BENT #52 — SPAN #53–UNDERSIDE — BENT #53



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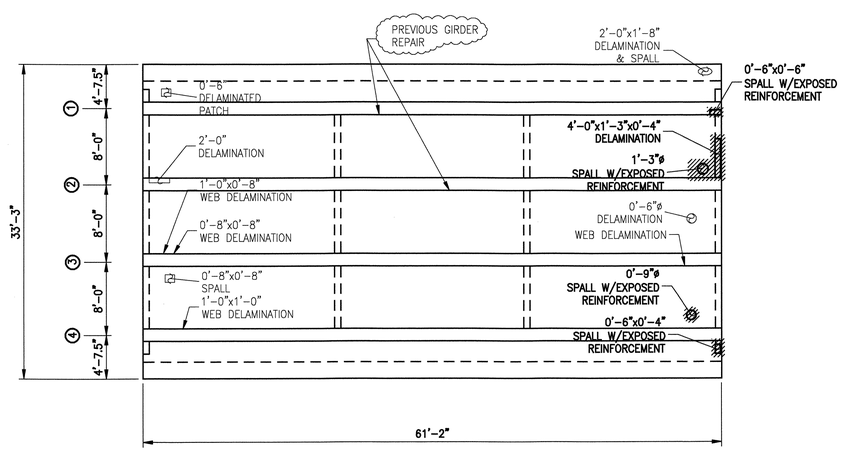

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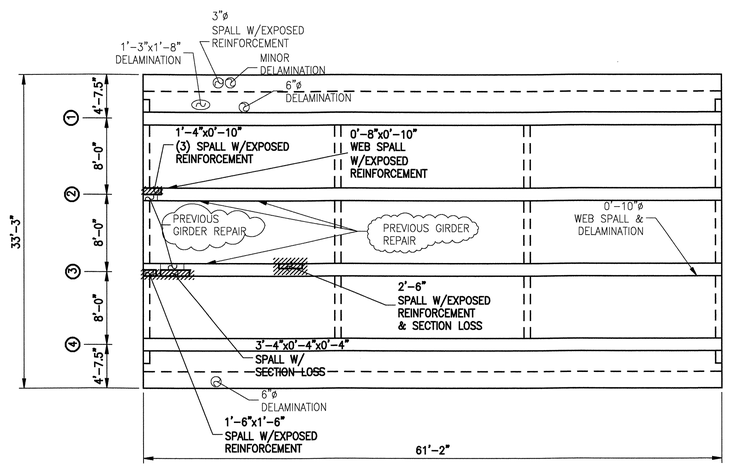

BENT #55 — SPAN #56–UNDERSIDE — BENT #56

BILL OF MATERIAL

SPAN #53			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #54			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #55			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #56			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

KEY

- – DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
- – GENERAL SHAPE OF DEFICIENCY
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT
- – GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

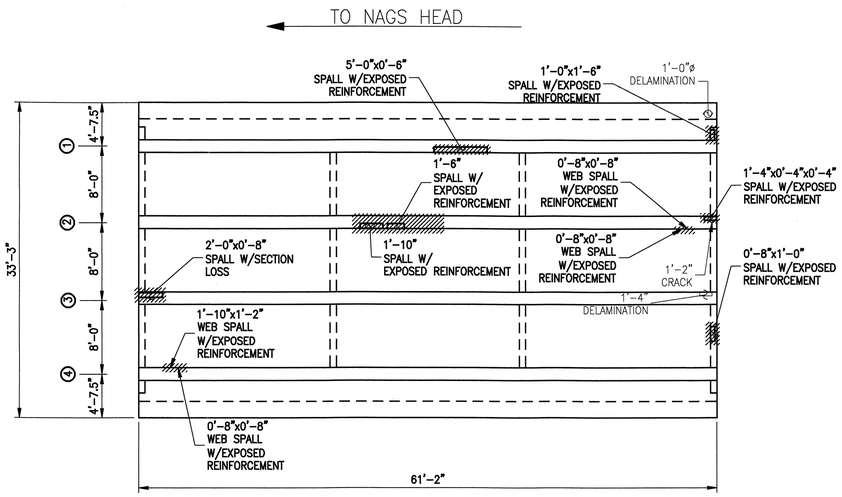
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #53–#56

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELT 7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	31
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



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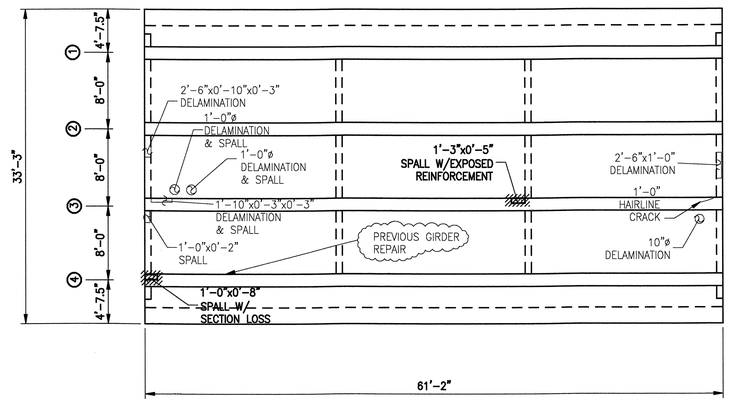

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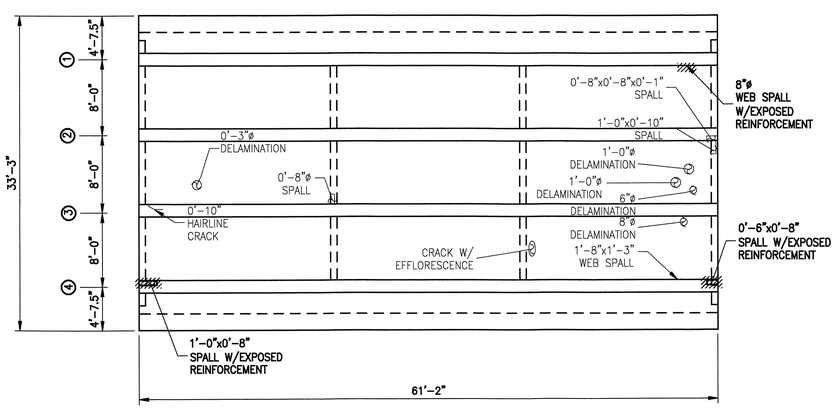

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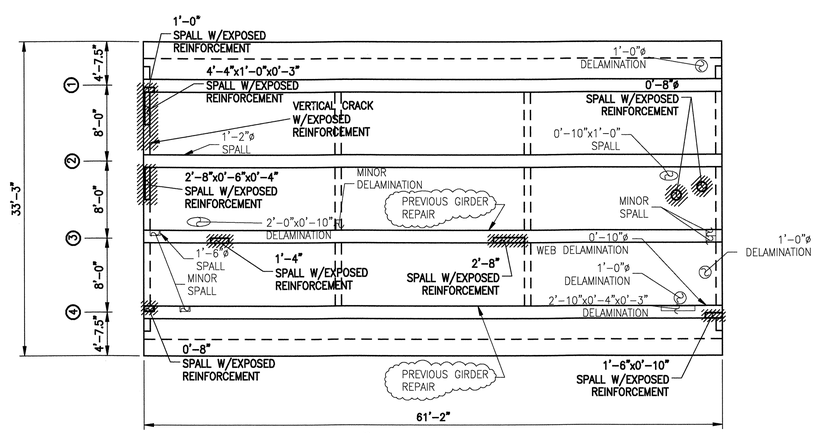

BENT #59 — SPAN #60–UNDERSIDE — BENT #60

BILL OF MATERIAL

SPAN #57

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	3	

SPAN #58

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #59

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #60

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

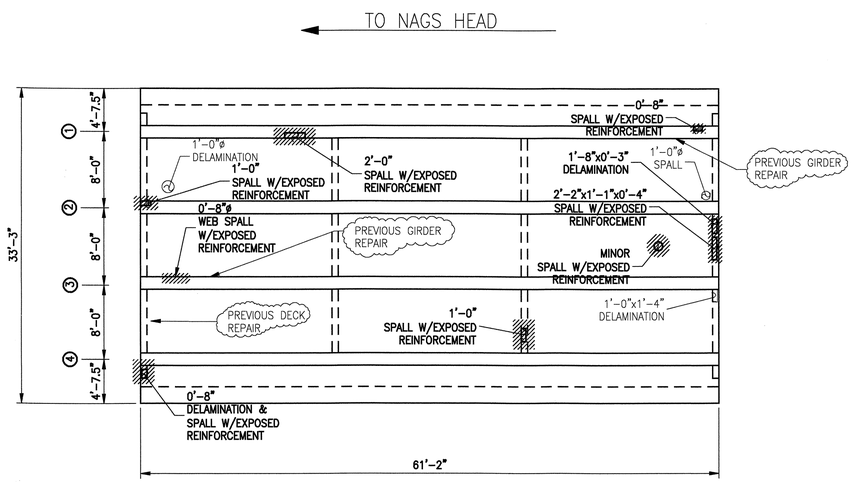
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #57–#60

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	32
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



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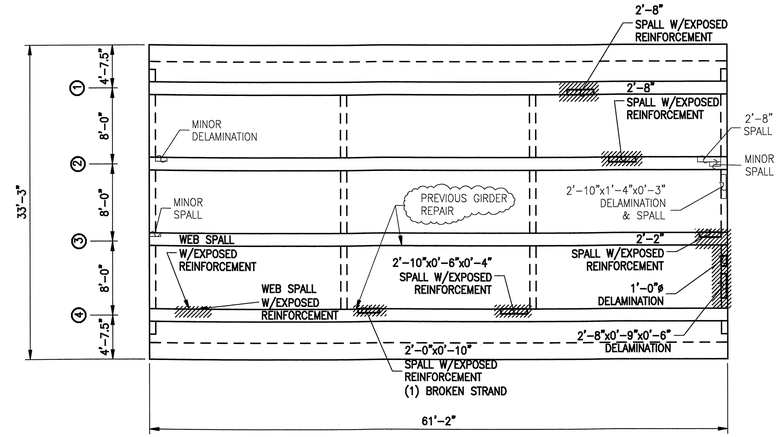

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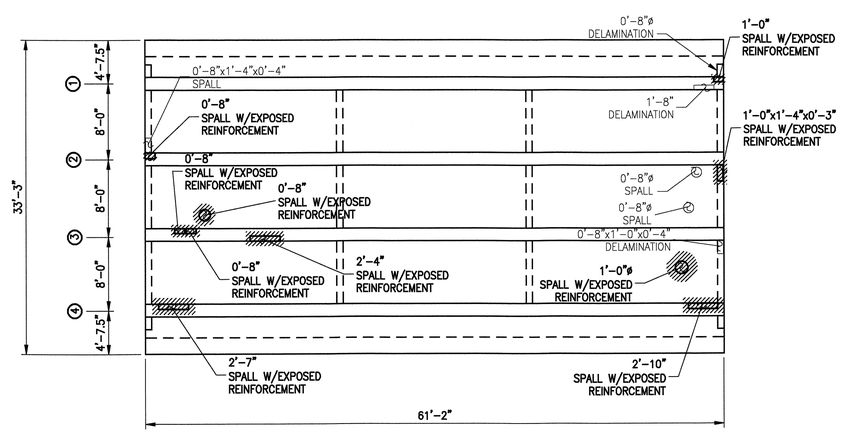

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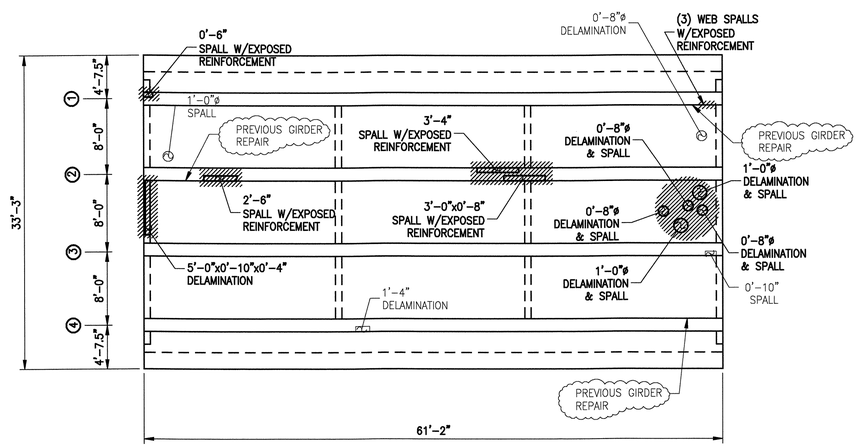

BENT #63 — SPAN #64–UNDERSIDE — BENT #64

BILL OF MATERIAL

SPAN #61

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #62

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #63

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #64

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

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– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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DARE COUNTY

BRIDGE NO. 11

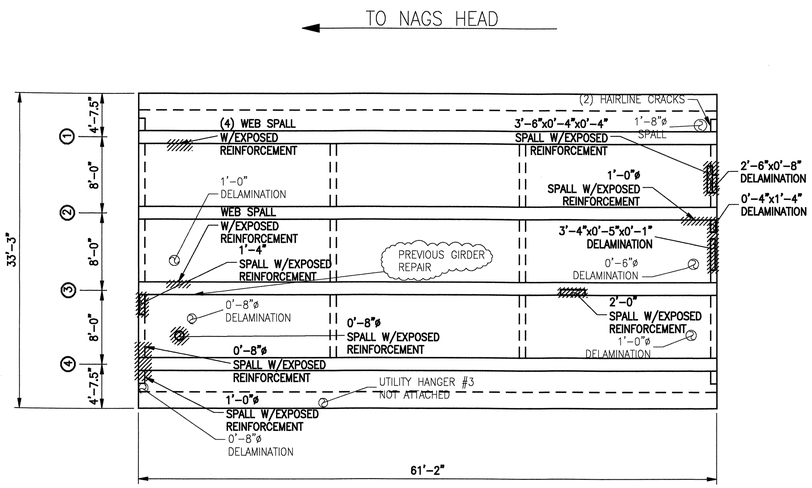
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #61–#64

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FEDL. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	33
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



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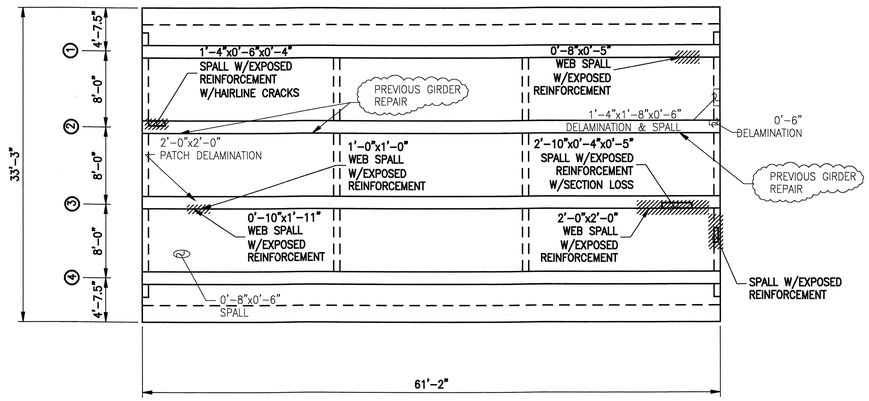

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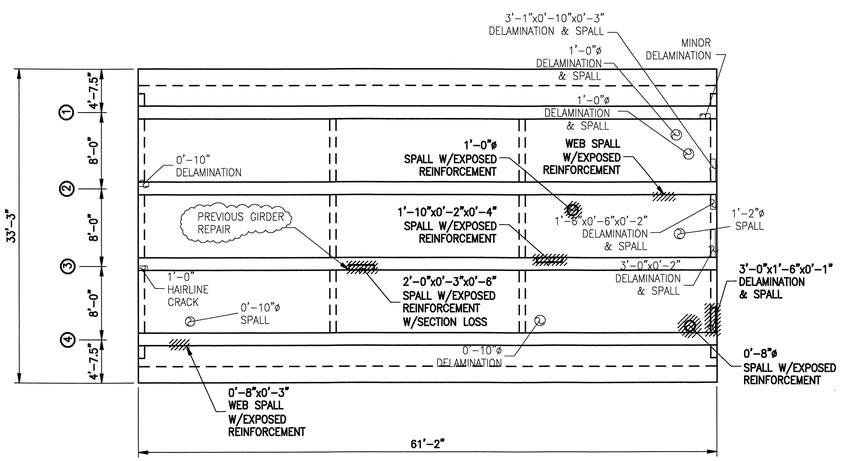

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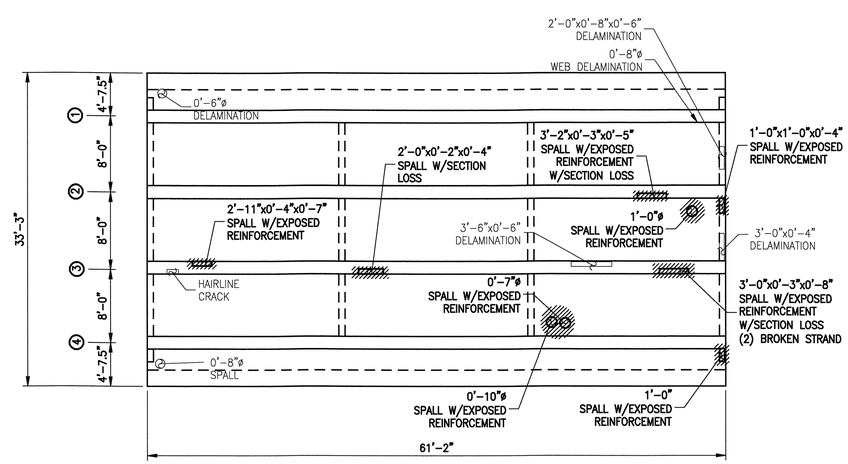

SPAN #68–UNDERSIDE

BILL OF MATERIAL

SPAN #65

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #66

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #67

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #68

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

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DARE COUNTY

BRIDGE NO. 11

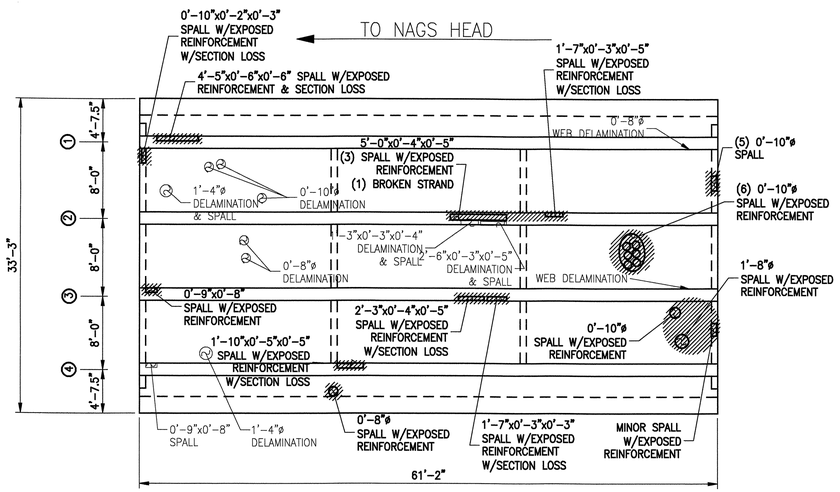
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #65–#68

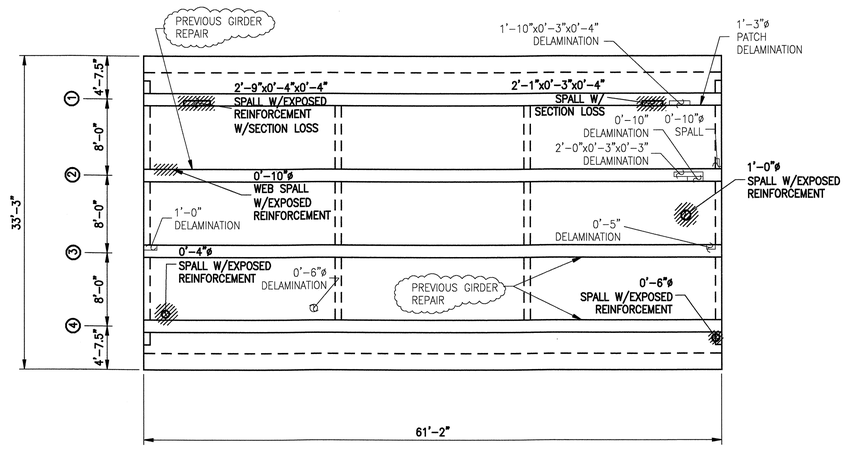
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	34
1			3			TOTAL SHEETS
2			4			166

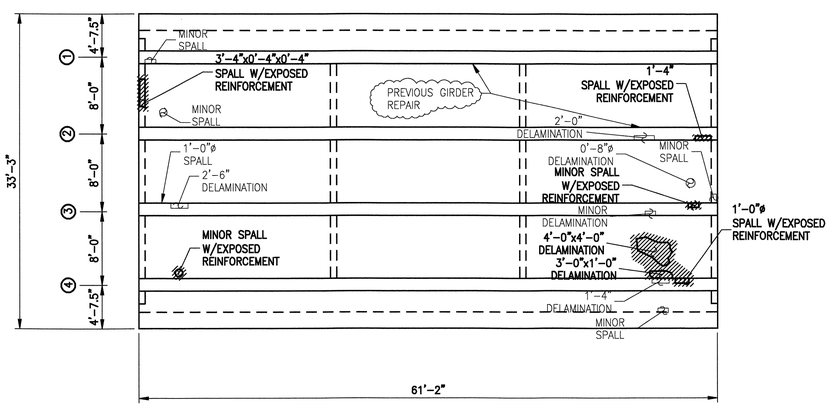
DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



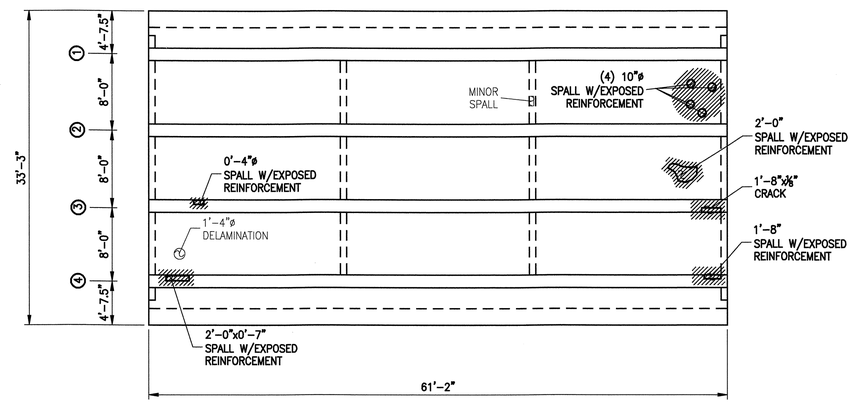
BENT #68 — SPAN #69–UNDERSIDE — BENT #69



BENT #69 — SPAN #70–UNDERSIDE — BENT #70



BENT #70 — SPAN #71–UNDERSIDE — BENT #71



BENT #71 — SPAN #72–UNDERSIDE — BENT #72

BILL OF MATERIAL

SPAN #69

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #70

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #71

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	5	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #72

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

- DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
- GENERAL SHAPE OF DEFICIENCY
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- GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

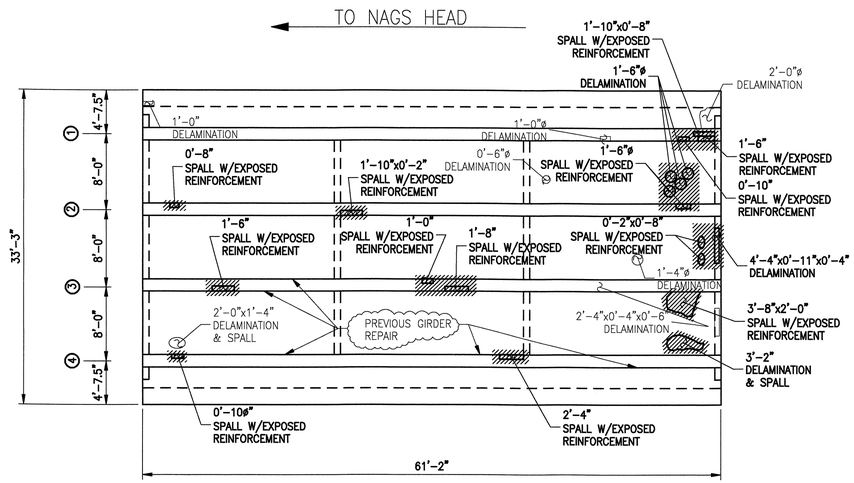
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #69–#72

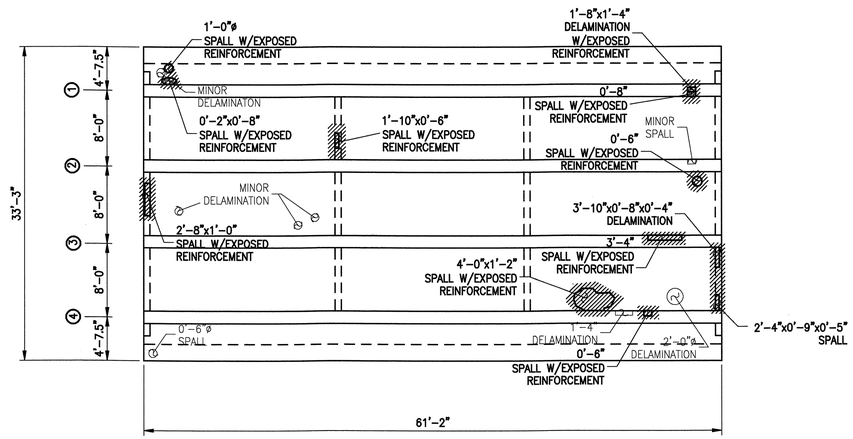
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	35
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



SPAN #73–UNDERSIDE



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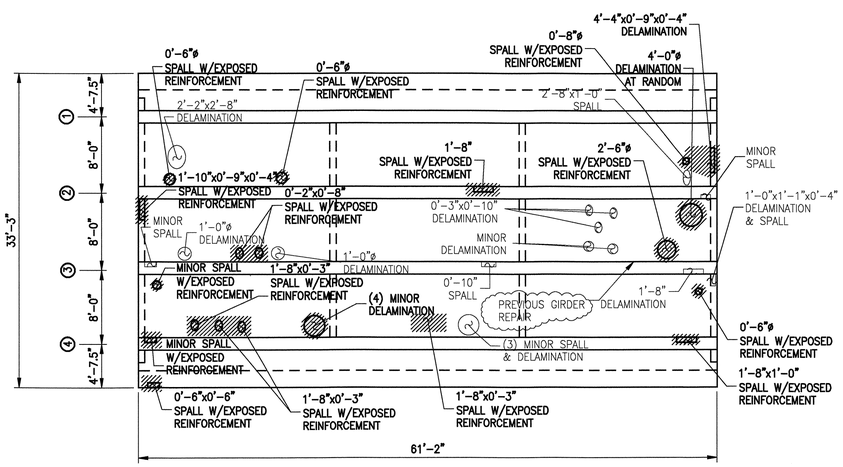

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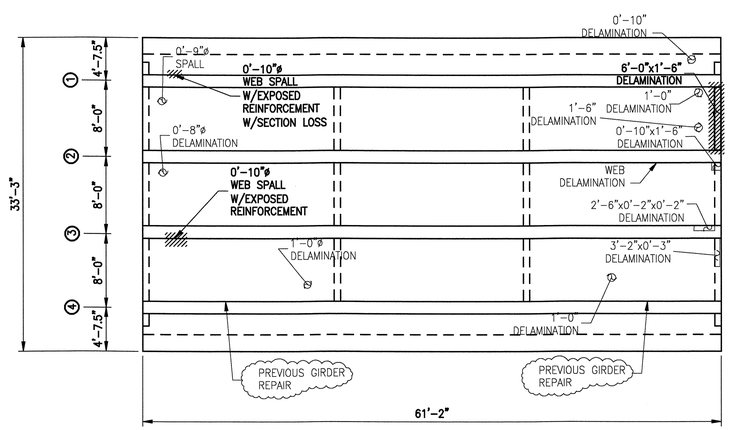

SPAN #76–UNDERSIDE

BILL OF MATERIAL

SPAN #73

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	4	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #74

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	3	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #75

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	8	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #76

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

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PLAN PREPARED BY:

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR SUPERSTRUCTURE REPAIR LOCATIONS SPAN(S) #73–#76

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL 4/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	36
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07

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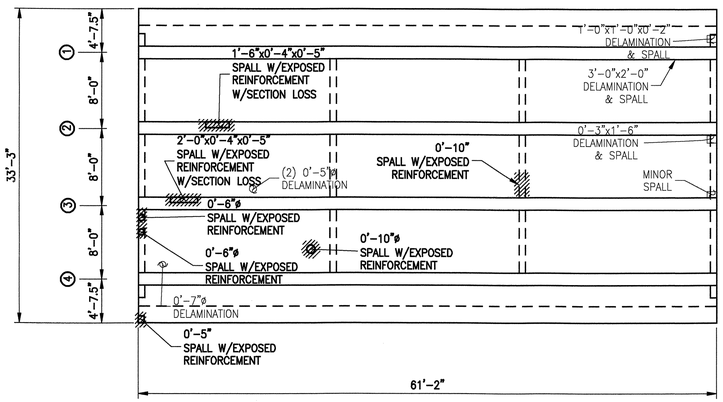
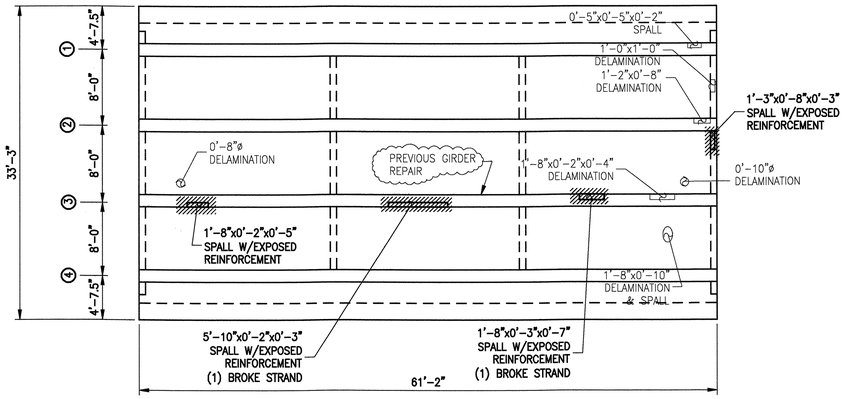


BENT #76 — SPAN #77–UNDERSIDE — BENT #77



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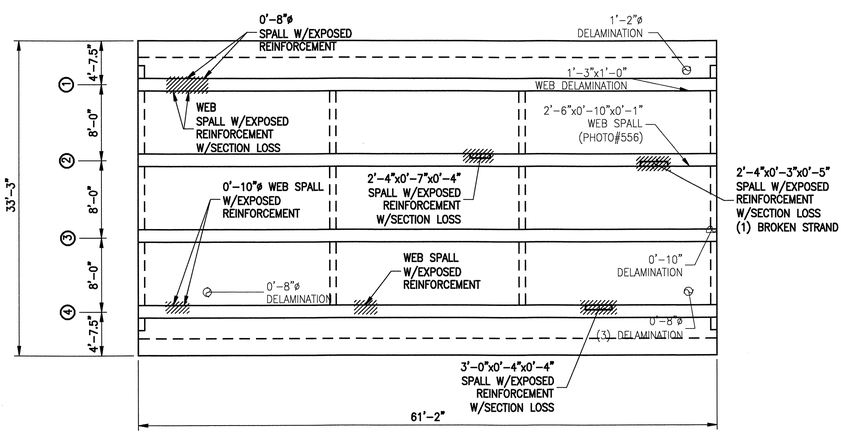

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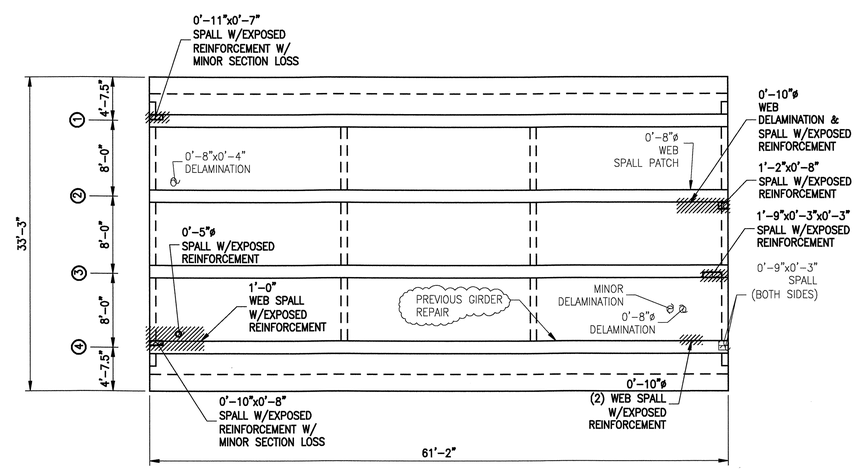

BENT #79 — SPAN #80–UNDERSIDE — BENT #80

BILL OF MATERIAL

SPAN #77

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #78

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #79

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #80

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

- DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

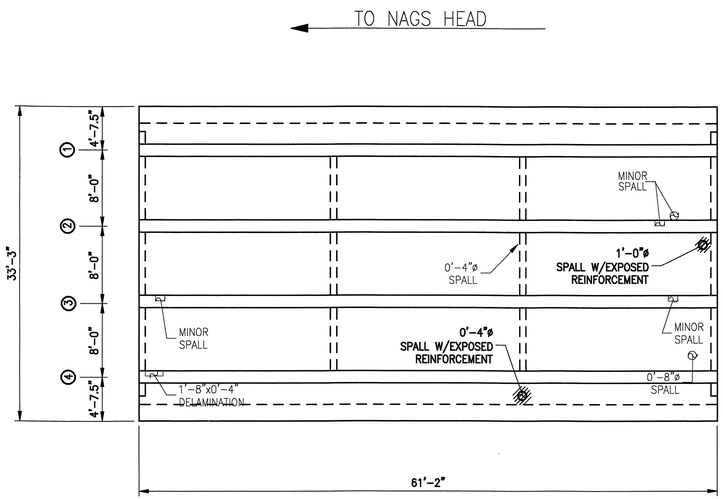
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #77–#80

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL 7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	37
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



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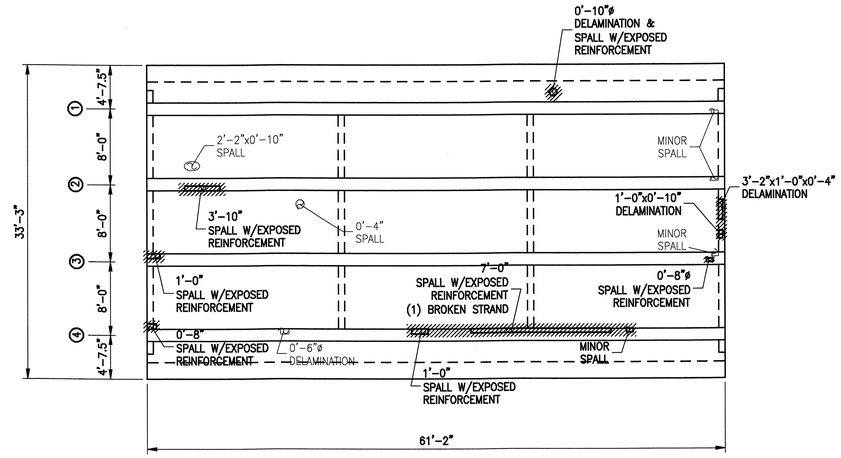

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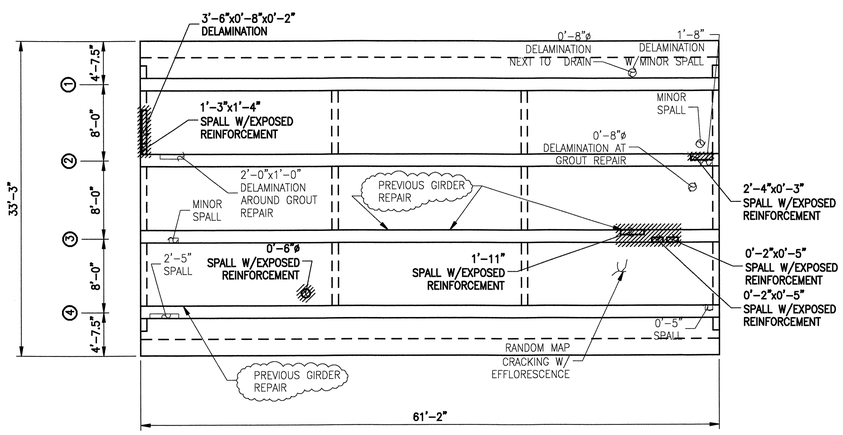

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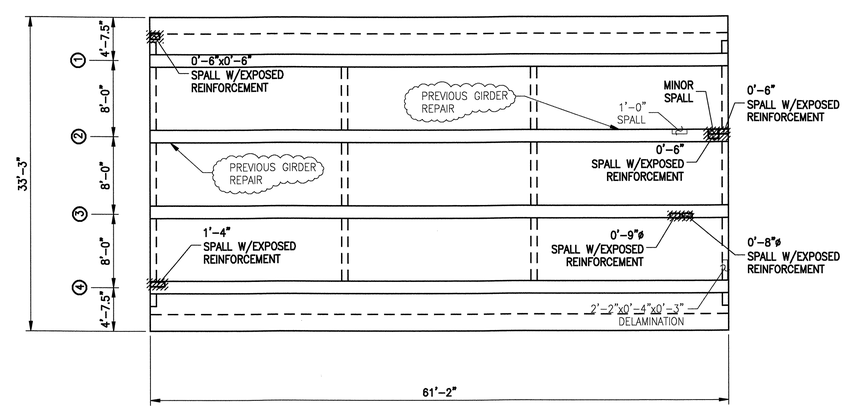

BENT #83 — SPAN #84–UNDERSIDE — BENT #84

BILL OF MATERIAL

SPAN #81

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

SPAN #82

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #83

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #84

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

- DENOTES GENERAL AREA OF REPAIR
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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

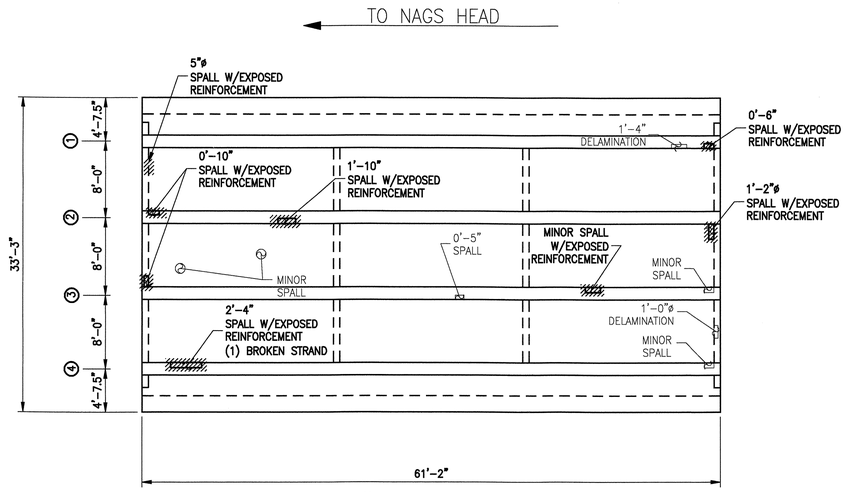
BONNER BRIDGE REPAIR SUPERSTRUCTURE REPAIR LOCATIONS SPAN(S) #81–#84

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL 9/20/07

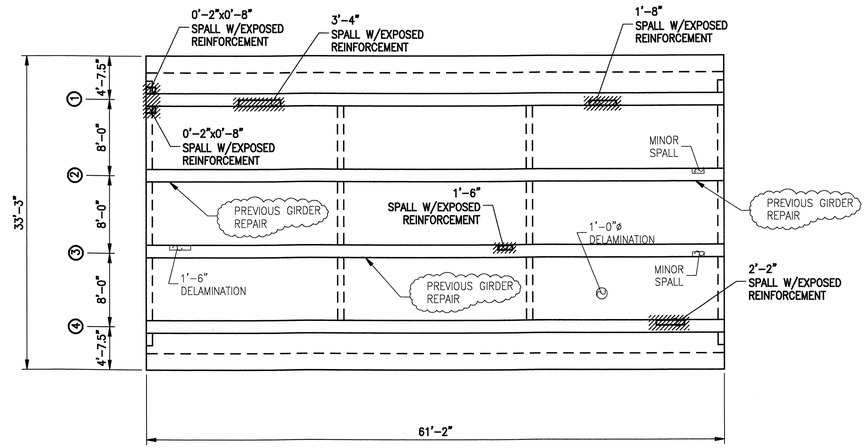
REVISIONS NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. 38
TOTAL SHEETS 166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



BENT #84 — SPAN #85–UNDERSIDE — BENT #85



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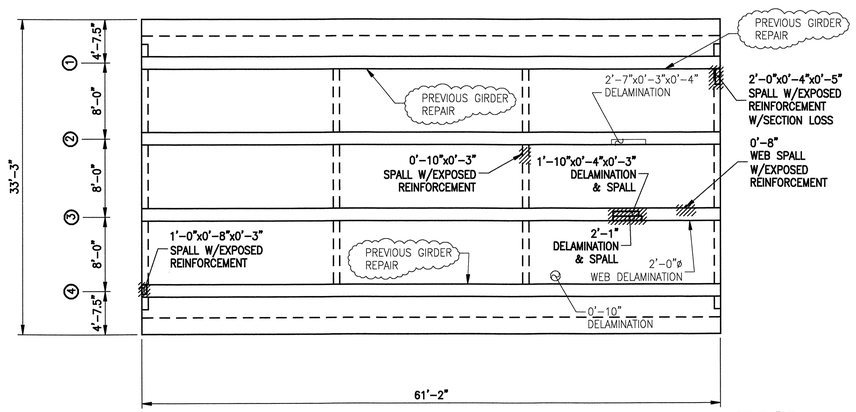

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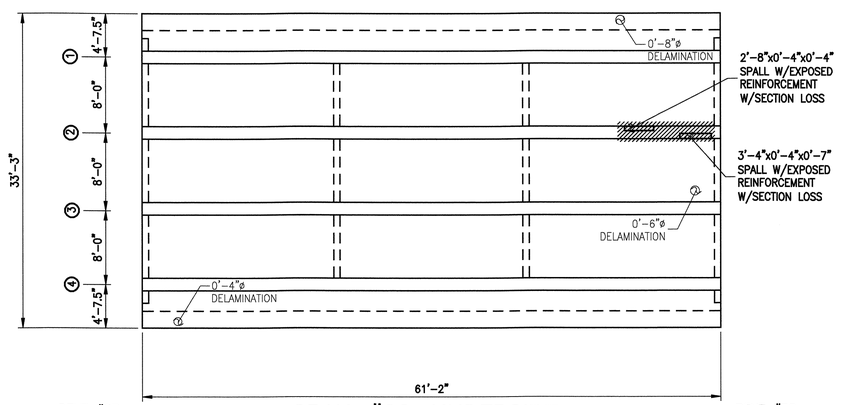

BENT #87 — SPAN #88–UNDERSIDE — BENT #88

BILL OF MATERIAL

SPAN #85

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #86

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #87

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #88

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

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– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

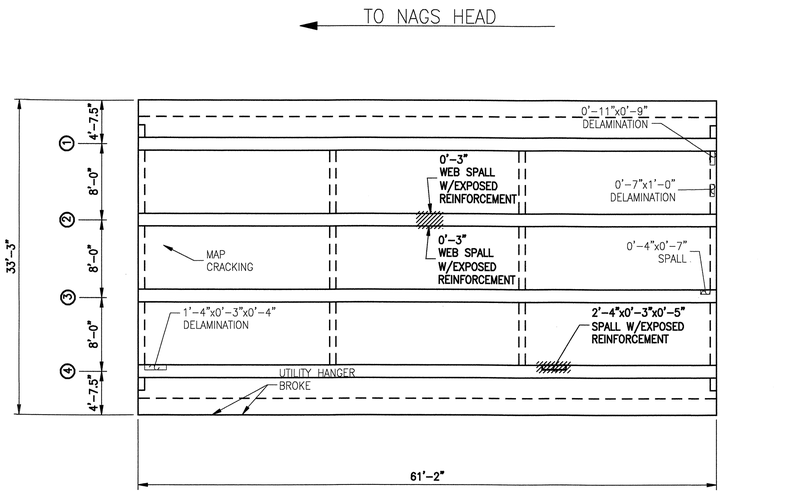
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #85–#88

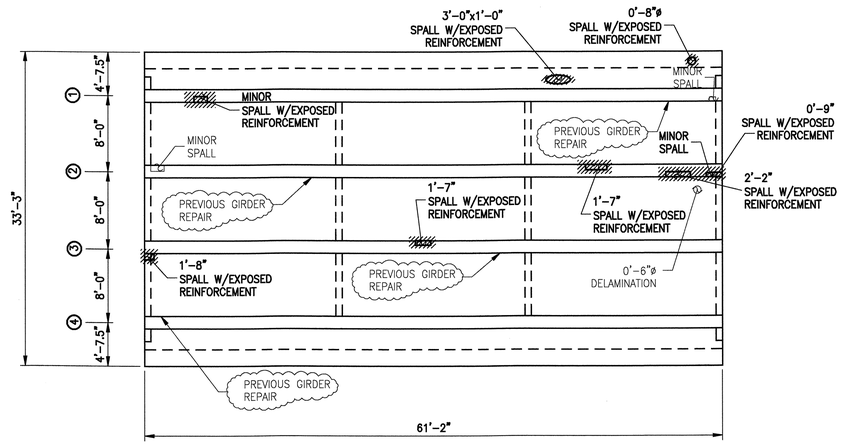
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELT 7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	39
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



SPAN #89-UNDERSIDE



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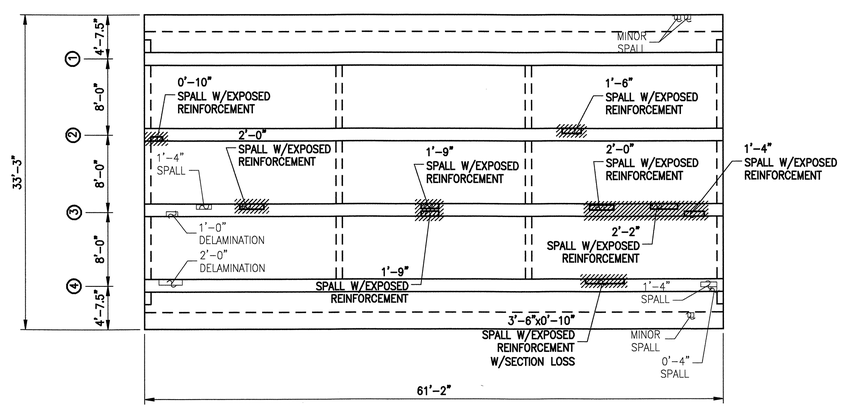

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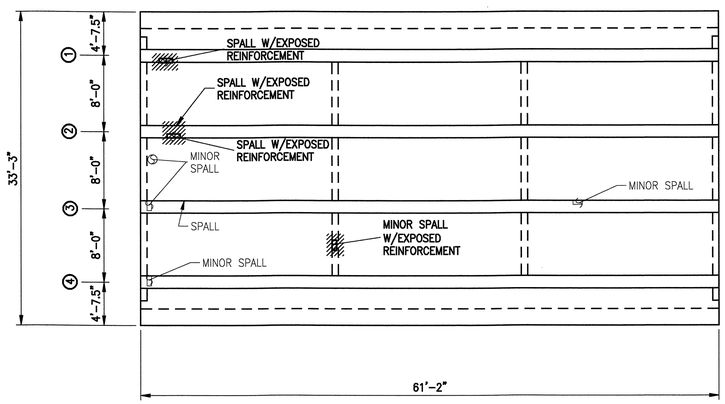

SPAN #92-UNDERSIDE

BILL OF MATERIAL

SPAN #89

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #90

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #91

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #92

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4911 Green Road Suite 107 Raleigh, NC 27616
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Email info@aogroup.com www.aogroup.com
AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

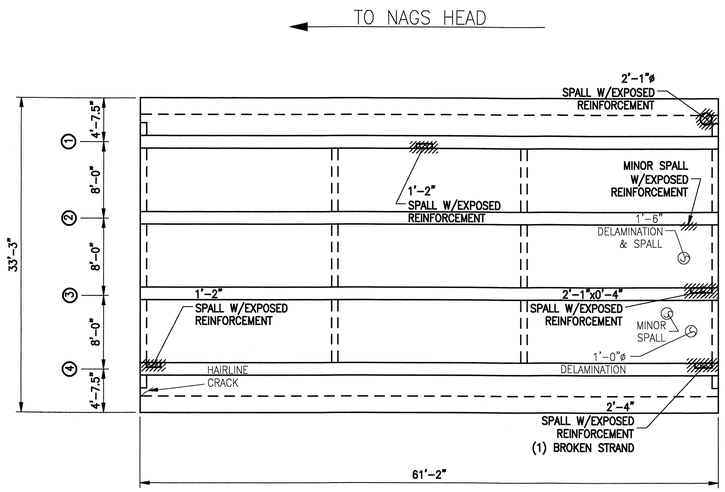
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #89-#92

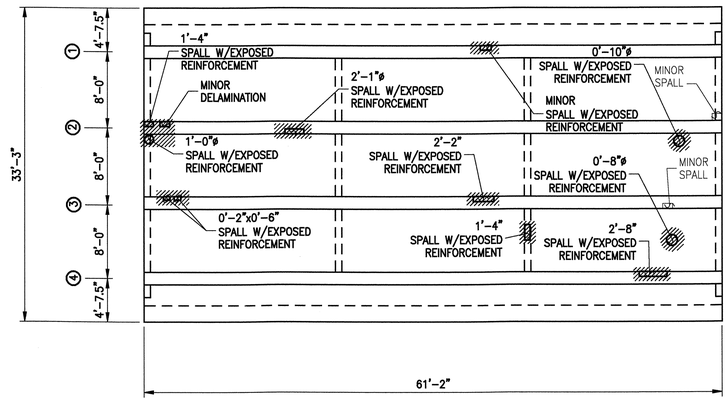
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTLETT 4/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	40
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



BENT #92 — SPAN #93—UNDERSIDE — BENT #93



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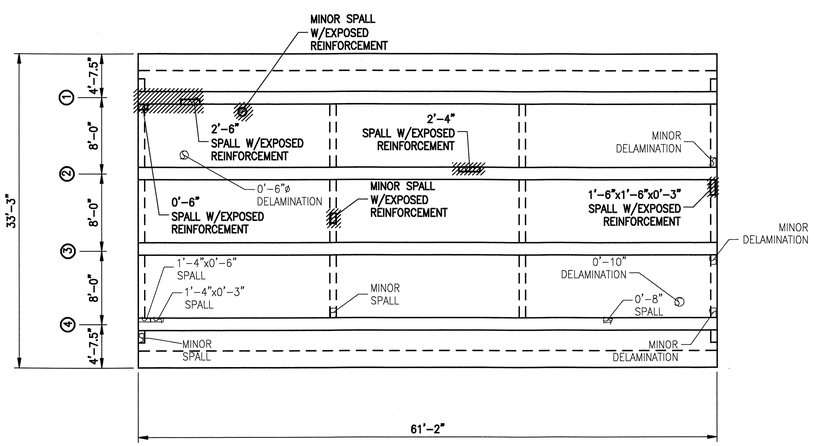

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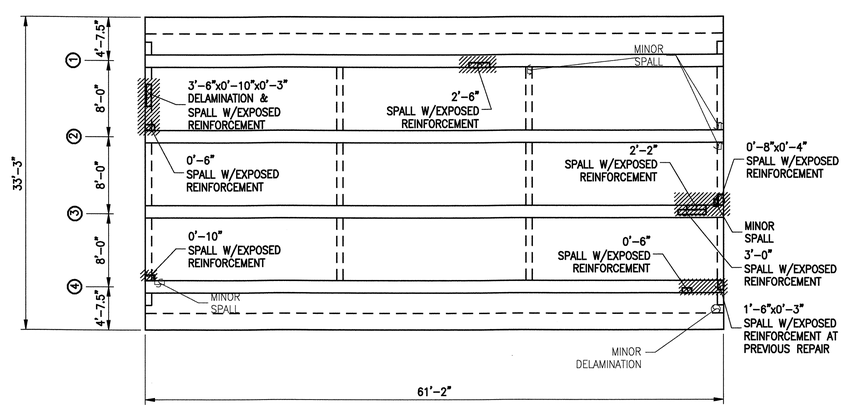

BENT #95 — SPAN #96—UNDERSIDE — BENT #96

BILL OF MATERIAL

SPAN #93			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #94			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #95			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #96			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

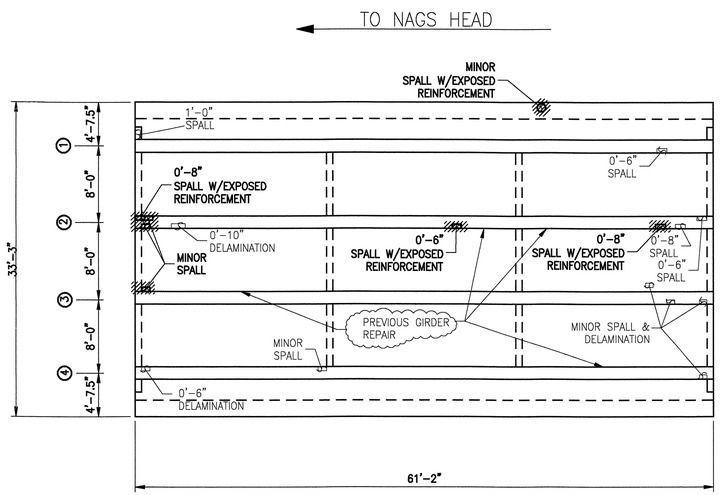
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR SUPERSTRUCTURE REPAIR LOCATIONS SPAN(S) #93–#96

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTELL 7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	41
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



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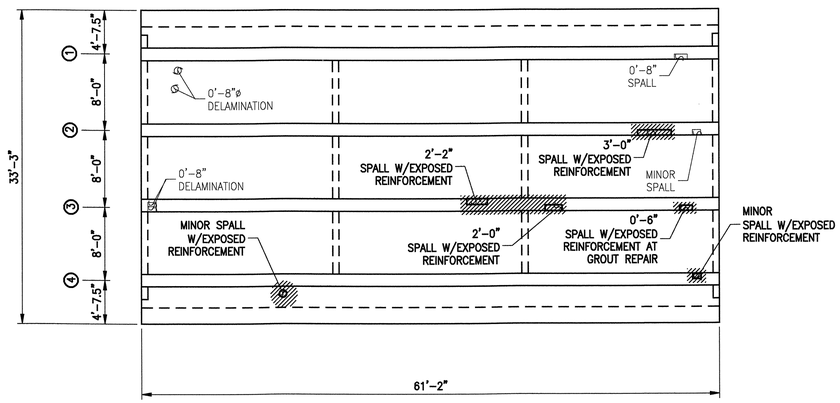

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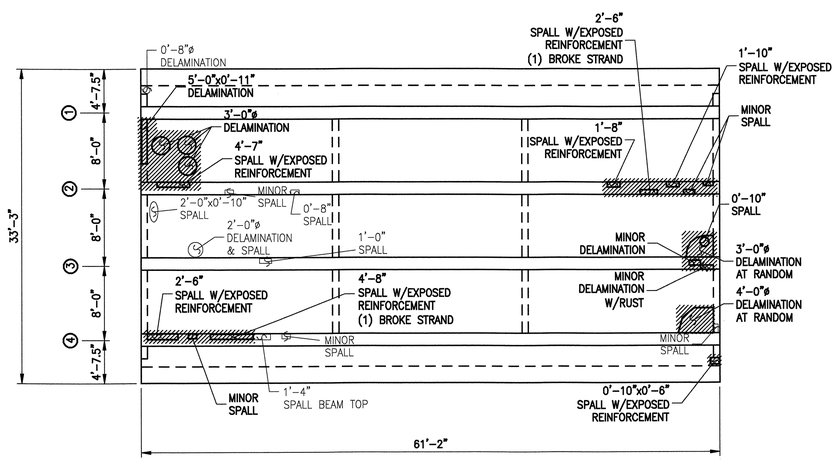

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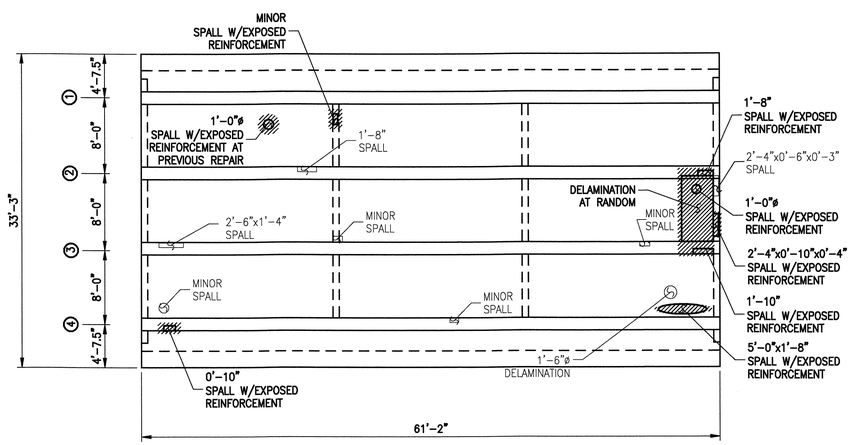

BENT #99 — SPAN #100–UNDERSIDE — BENT #100

BILL OF MATERIAL

SPAN #97			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #98			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #99			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	12	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #100			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	11	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

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– GENERAL SHAPE OF DEFICIENCY

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

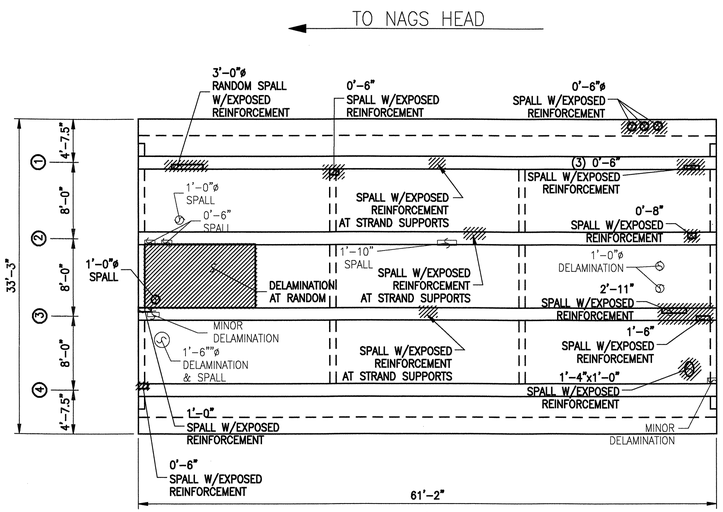
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #97–#100

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14455 JEDL BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	42
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



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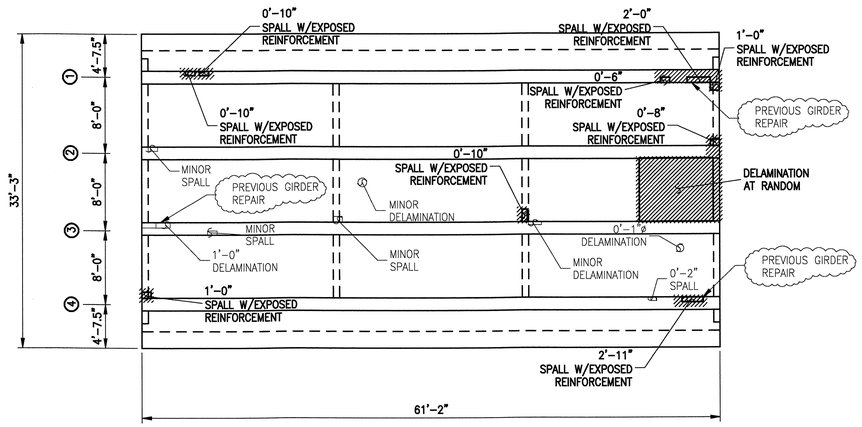

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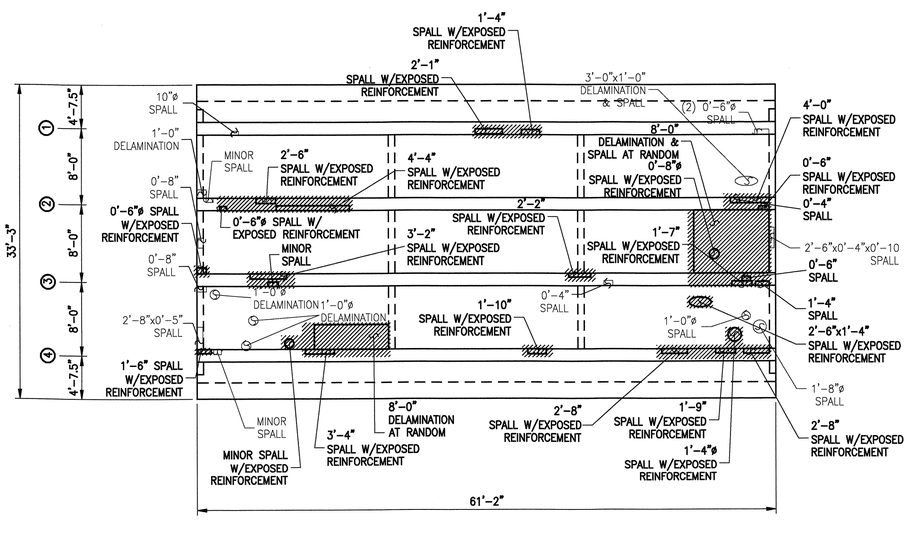

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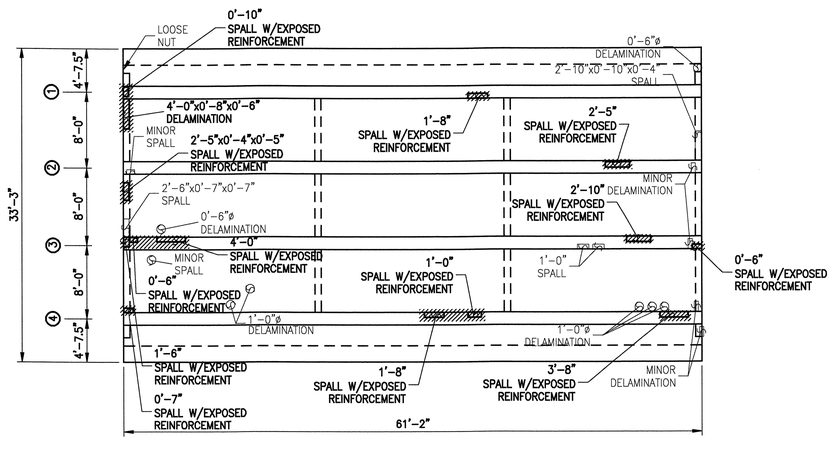

BENT #103 — SPAN #104–UNDERSIDE — BENT #104

BILL OF MATERIAL

SPAN #101

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	21	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	3	

SPAN #102

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	16	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #103

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	18	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	4	

SPAN #104

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

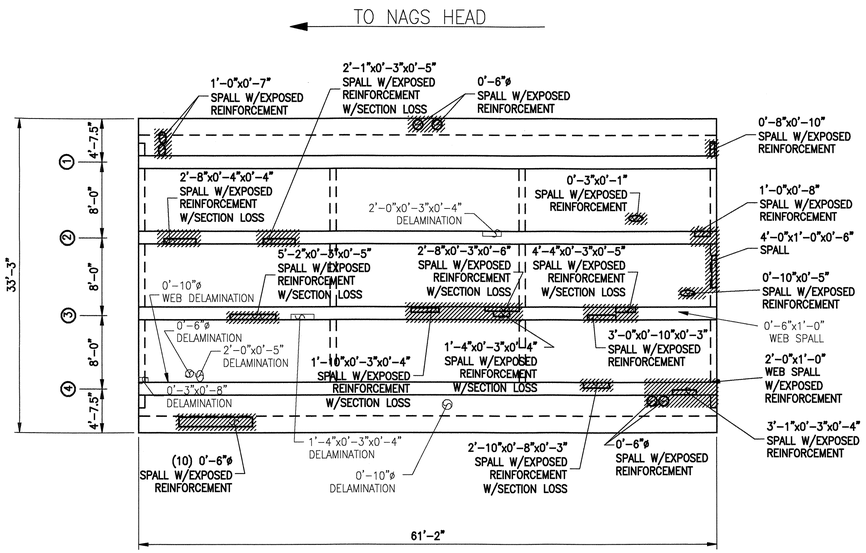
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #101–#104

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTELL 4/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	43
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY GRC DATE 5/14/07



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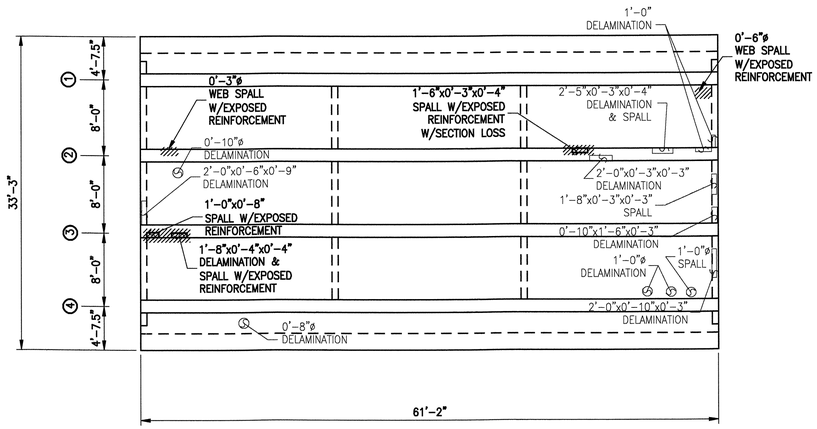

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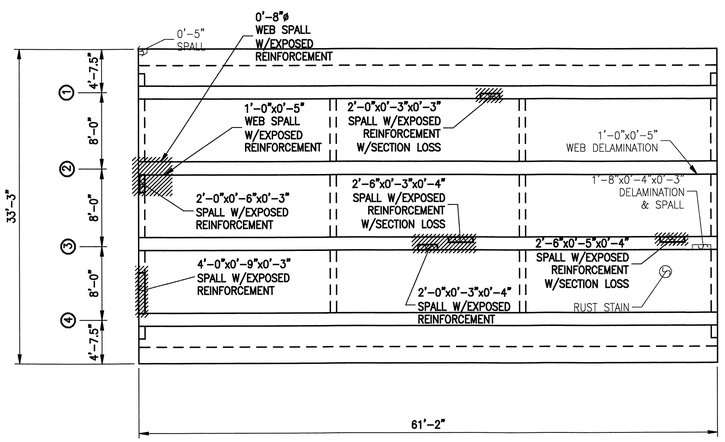

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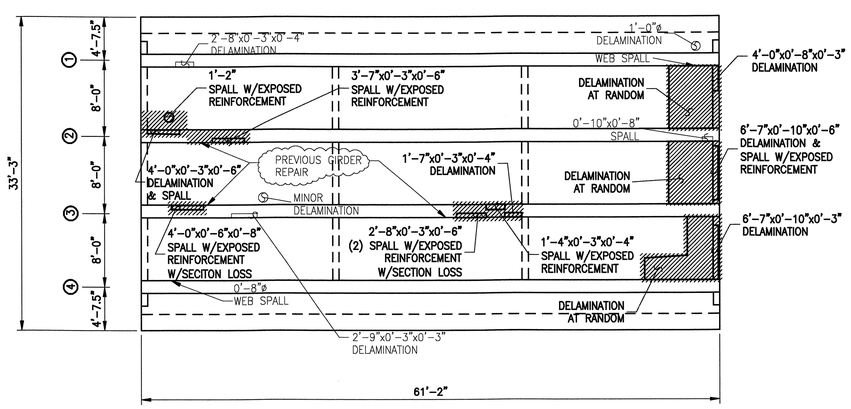

BENT #107 — SPAN #108–UNDERSIDE — BENT #108

BILL OF MATERIAL

SPAN #105

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	3	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	4	

SPAN #106

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #107

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #108

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	36	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

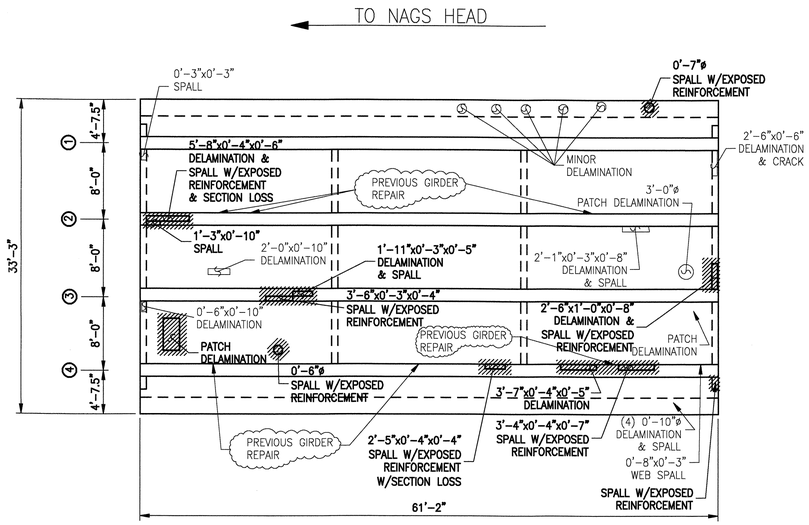
BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #105–#108

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTLETT 7/20/07

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

SHEET NO. 44
TOTAL SHEETS 166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/14/07



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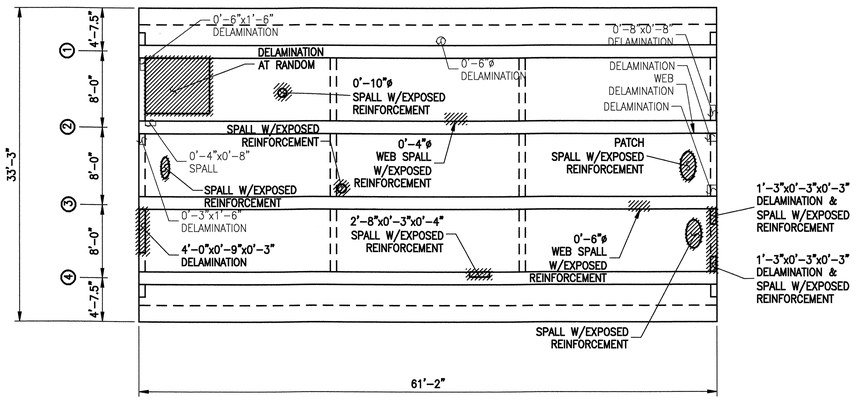

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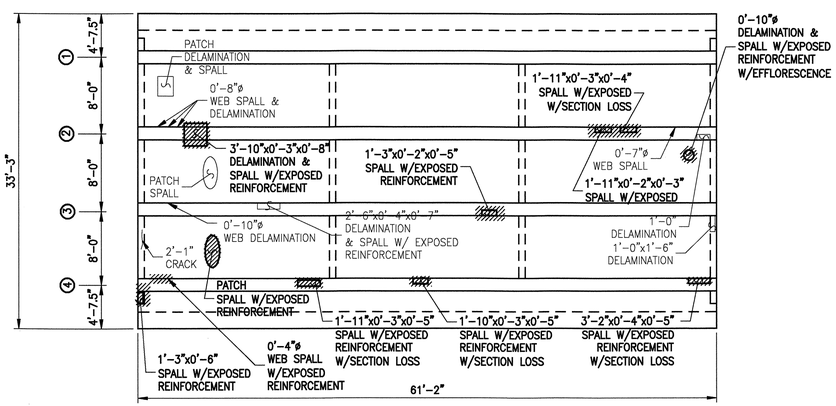

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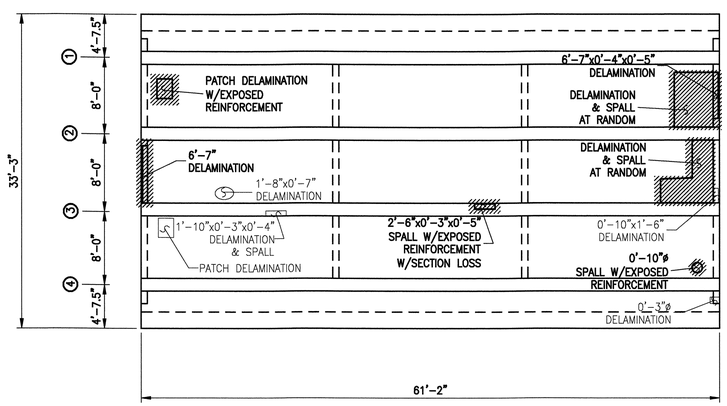

BENT #111 — SPAN #112–UNDERSIDE — BENT #112

BILL OF MATERIAL

SPAN #109			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	3	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	3	

SPAN #110			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	15	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #111			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #112			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	18	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

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Email info@aogroup.com www.aogroup.com
AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

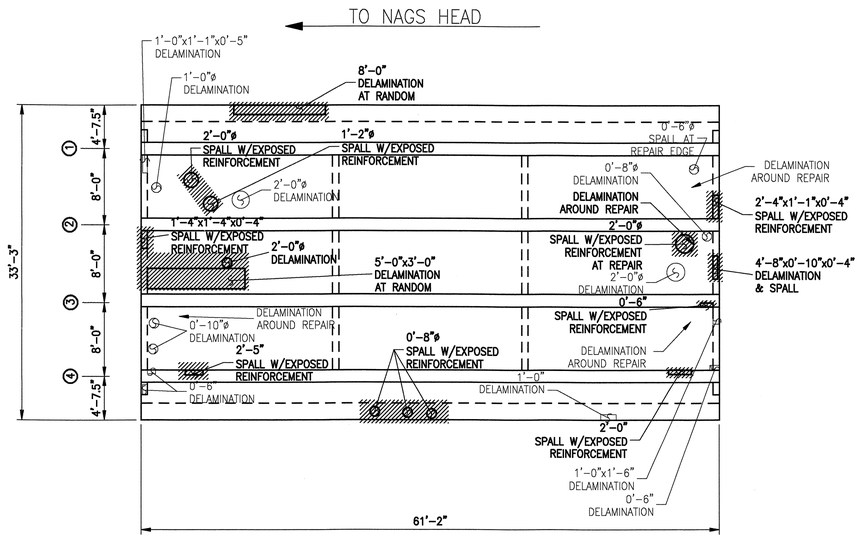
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #109–#112

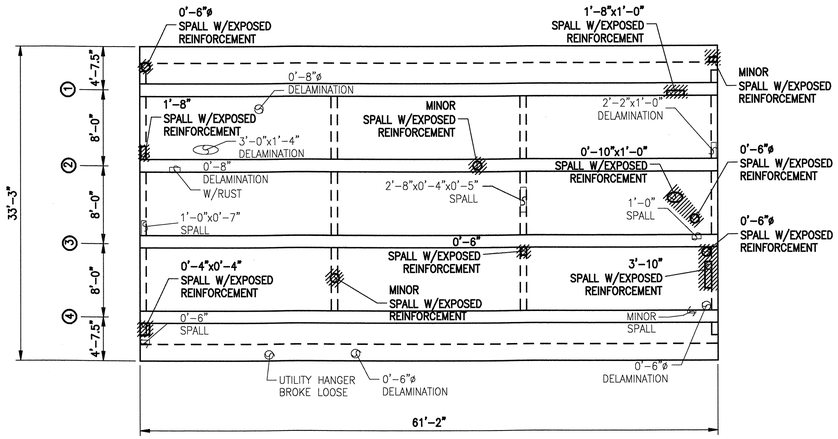
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTELL 9/25/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	45
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07



BENT #112 — SPAN #113–UNDERSIDE — BENT #113



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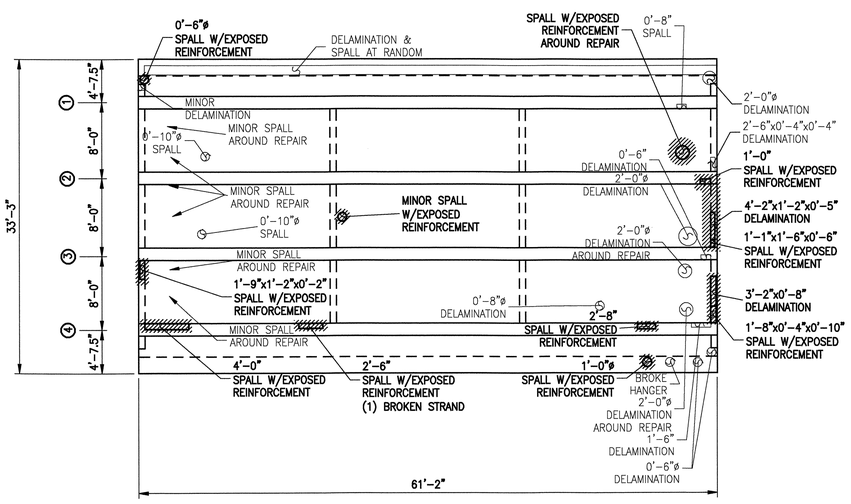

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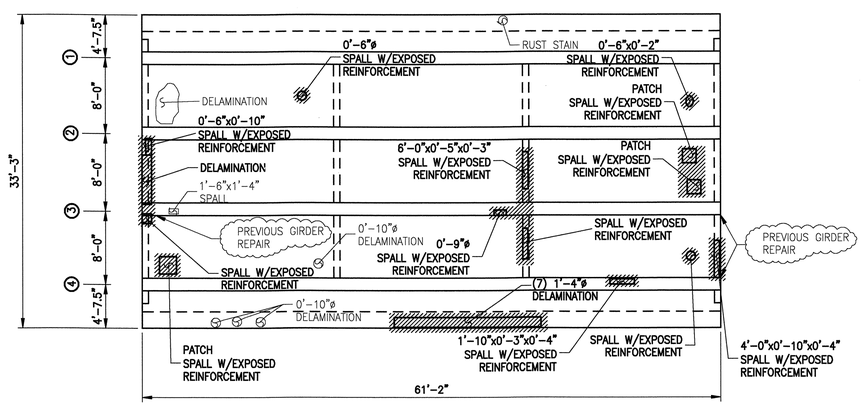


BENT #115 — SPAN #116–UNDERSIDE — BENT #116

BILL OF MATERIAL

SPAN #113

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	13	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #114

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #115

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	3	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #116

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	8	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

- – DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
- – GENERAL SHAPE OF DEFICIENCY
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT
- – GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4911 Green Road Suite 107 Raleigh, NC 27616
Phone 919 981 0310 Fax 919 981 0451
Email info@aogroup.com www.aogroup.com
AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

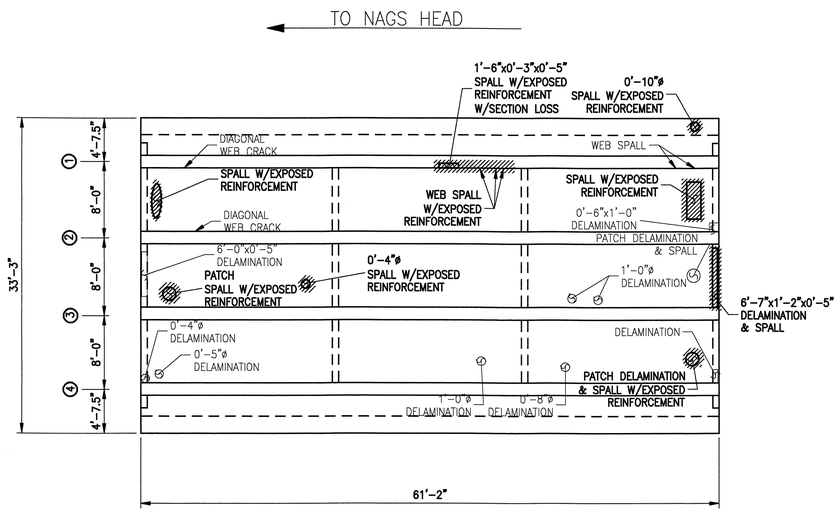
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #113–#116

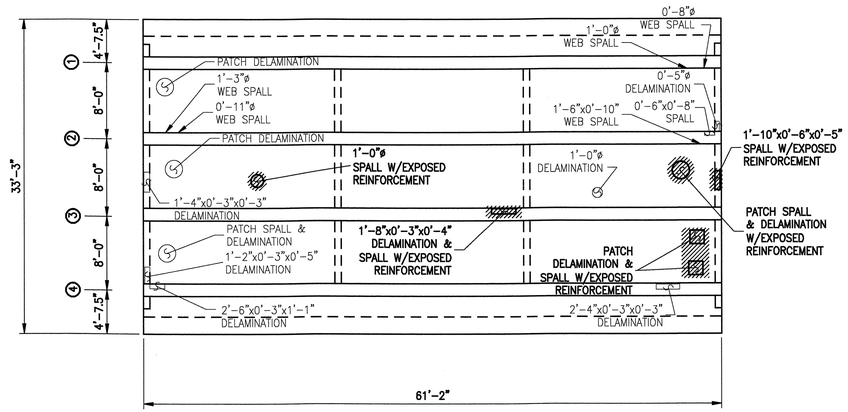
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FRED L. BARTELT 7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	46
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07



BENT #116 — SPAN #117—UNDERSIDE — BENT #117



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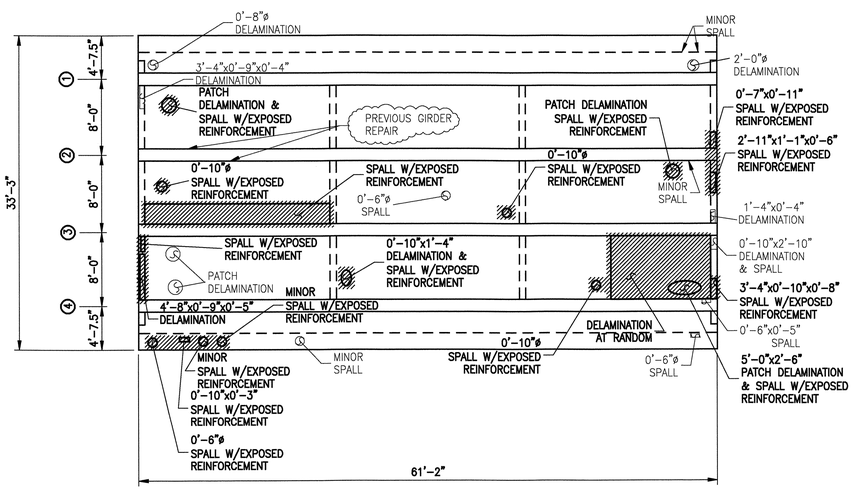

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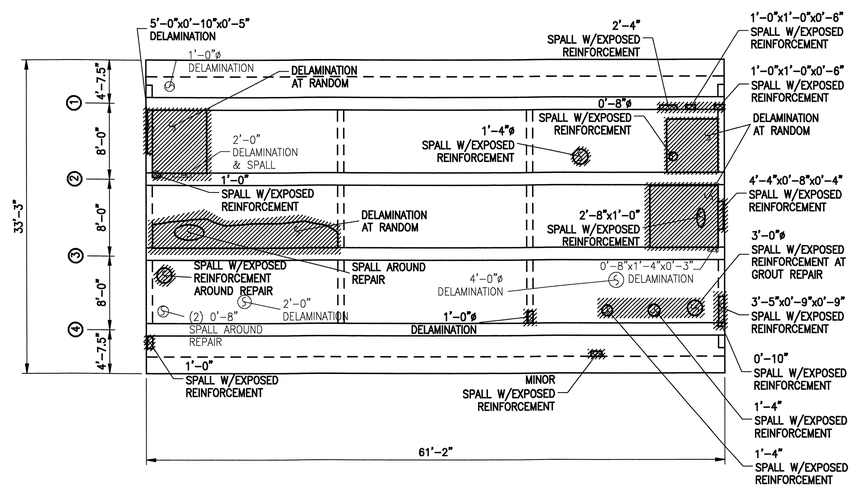

BENT #119 — SPAN #120—UNDERSIDE — BENT #120

BILL OF MATERIAL

SPAN #117			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	5	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #118			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #119			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	18	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

SPAN #120			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	64	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

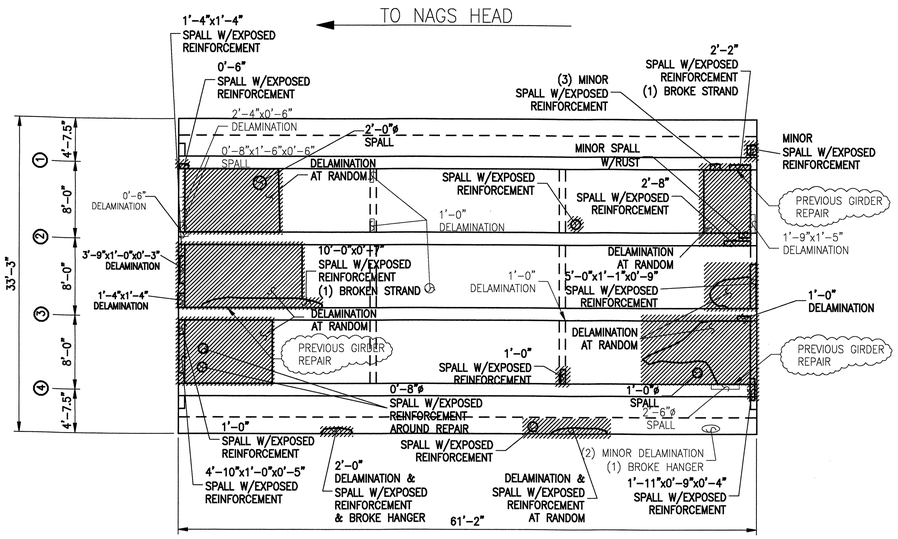
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR SUPERSTRUCTURE REPAIR LOCATIONS SPAN(S) #117–#120

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	47
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07



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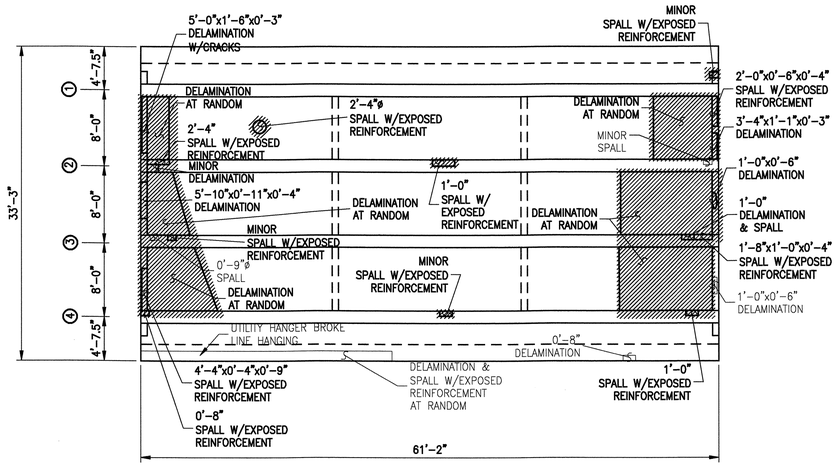

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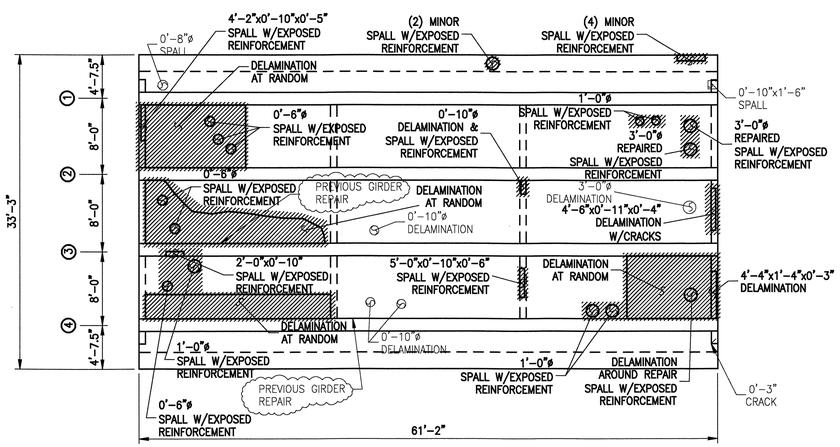

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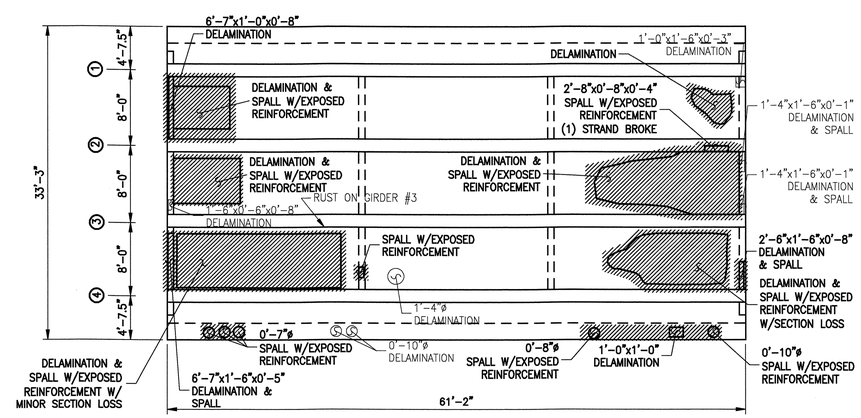

BENT #129 — SPAN #130–UNDERSIDE — BENT #130

BILL OF MATERIAL

SPAN #121

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	79	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #122

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	76	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #123

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	78	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #130

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	3	
OVERHEAD SHOTCRETE	CF	98	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

- DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
- GENERAL SHAPE OF DEFICIENCY
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT
- GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

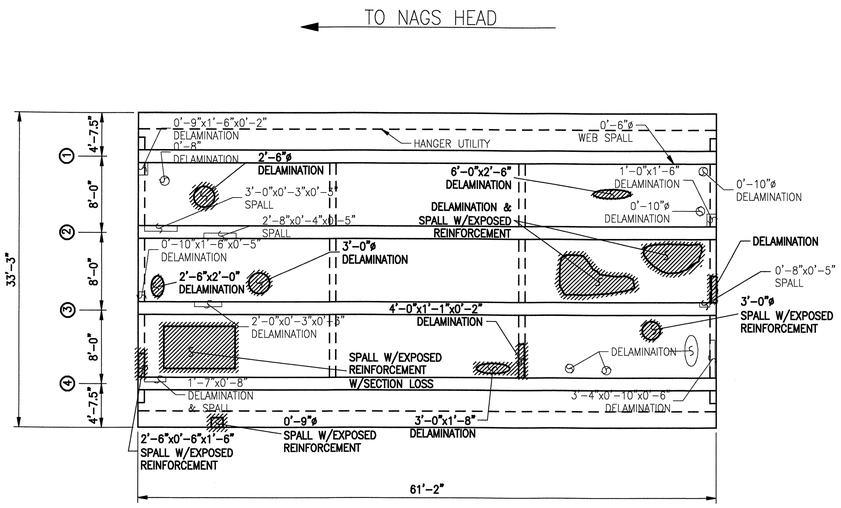
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #121–#123 & #130

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	48
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07



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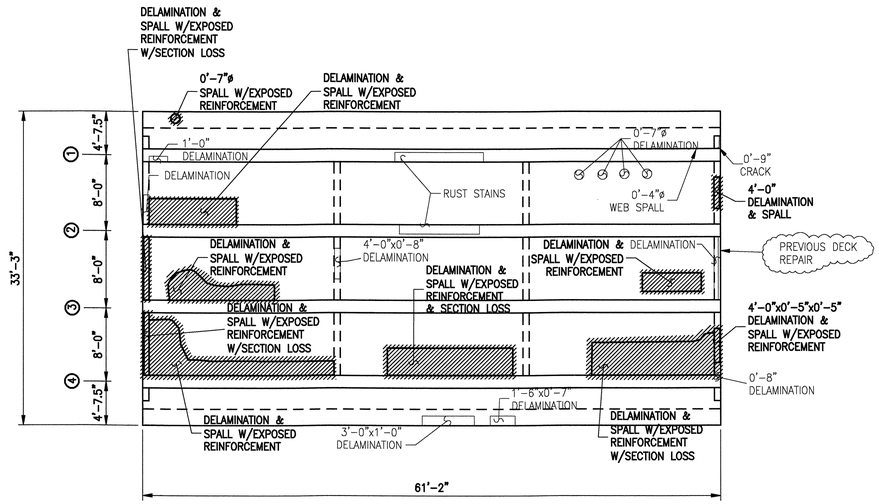

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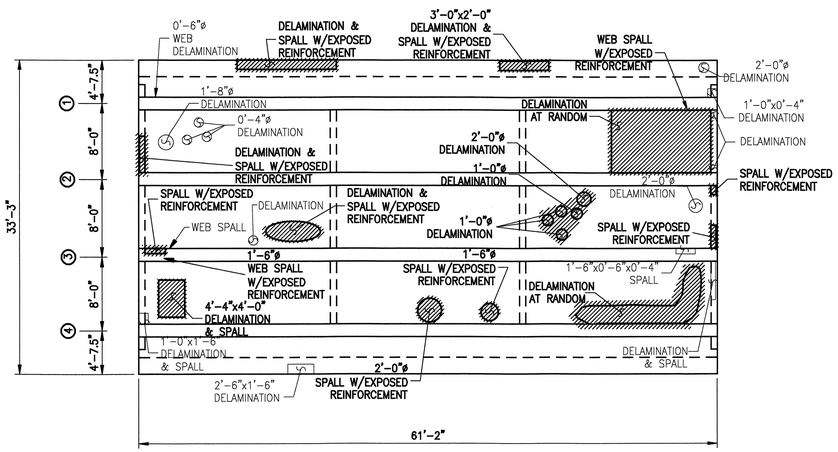

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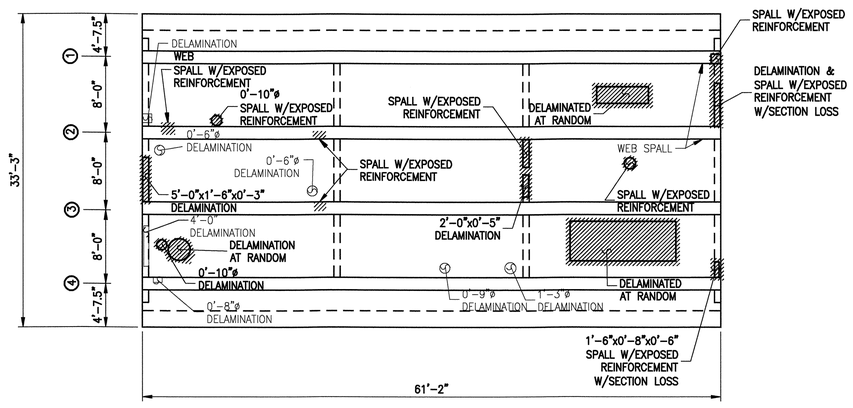

BENT #133 — SPAN #134—UNDERSIDE — BENT #134

BILL OF MATERIAL

SPAN #131

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	32	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

SPAN #132

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	60	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

SPAN #133

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	42	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #134

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	21	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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DARE COUNTY

BRIDGE NO. 11

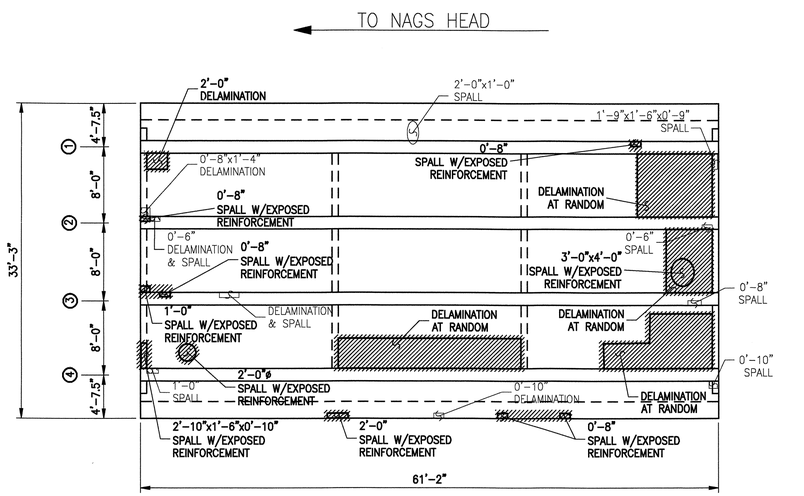
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #131–#134

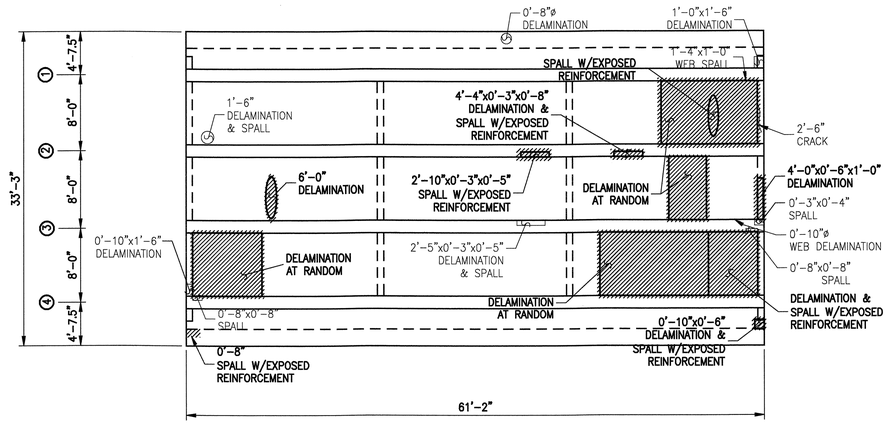
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTELL 11/2007

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	49
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07



SPAN #135–UNDERSIDE



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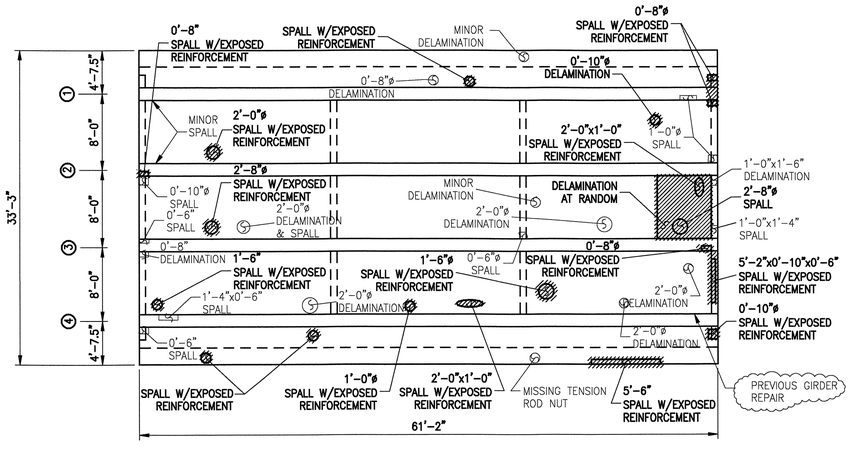

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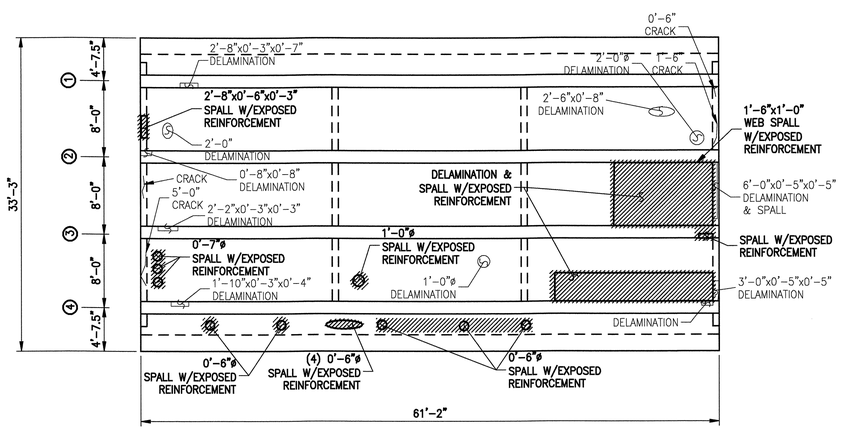

SPAN #138–UNDERSIDE

BILL OF MATERIAL

SPAN #135

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	58	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #136

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	78	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #137

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	18	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #138

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	35	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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DARE COUNTY

BRIDGE NO. 11

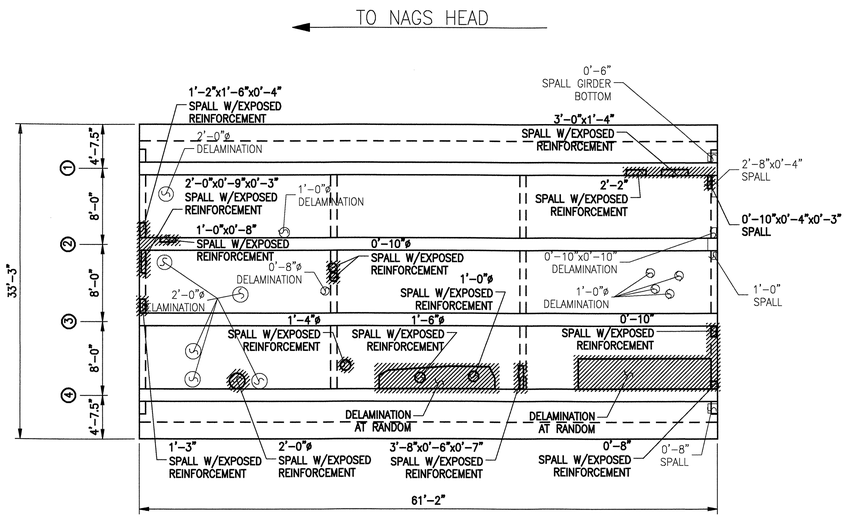
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #135–#138

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTELL 4/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	50
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07



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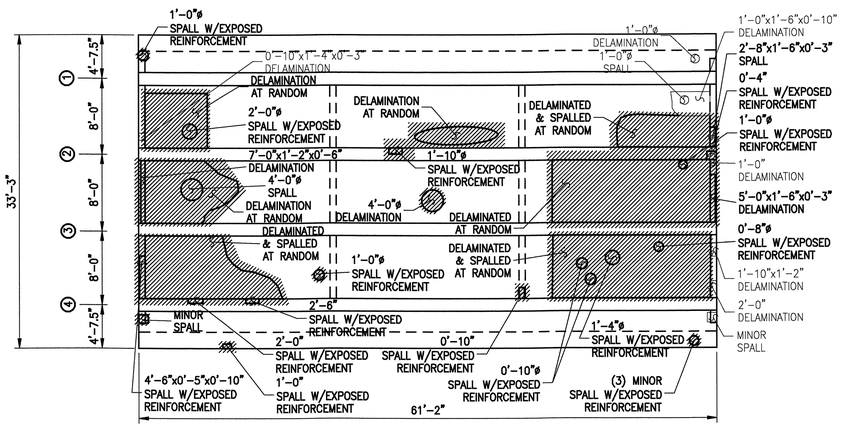


BENT #139 — SPAN #140–UNDERSIDE — BENT #140

BILL OF MATERIAL

SPAN #139

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	23	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #140

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	3	
OVERHEAD SHOTCRETE	CF	136	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #141

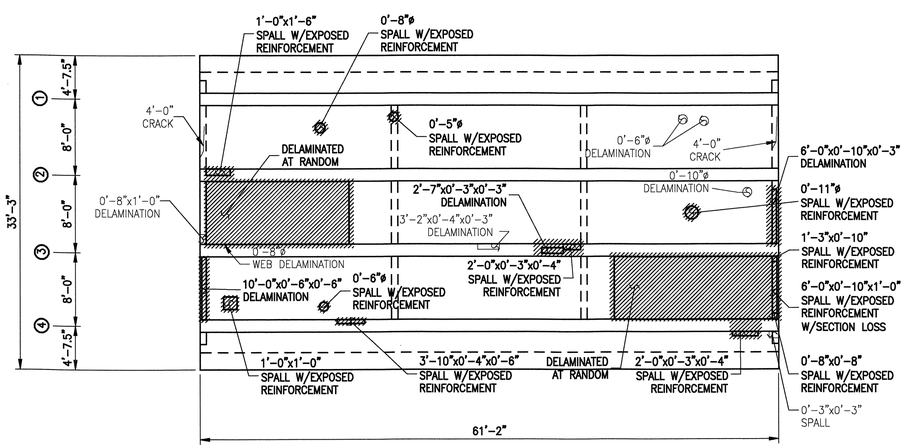
REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	70	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #142

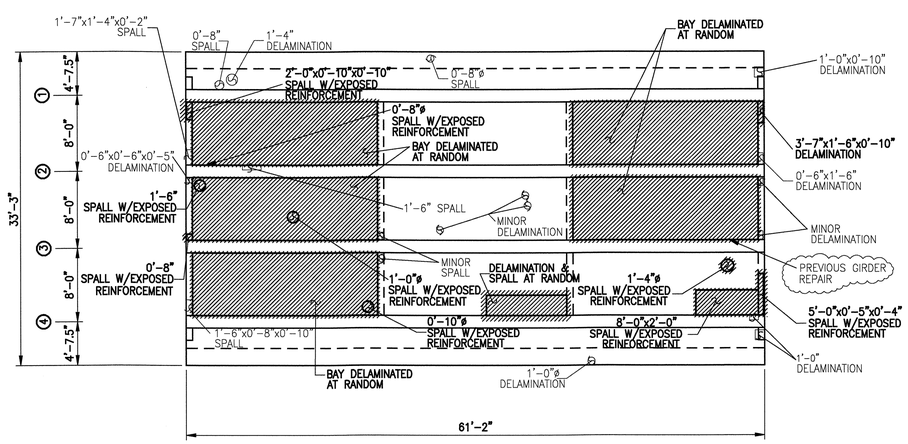
REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	204	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

- DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
- GENERAL SHAPE OF DEFICIENCY
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT
- GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT



BENT #140 — SPAN #141–UNDERSIDE — BENT #141



BENT #141 — SPAN #142–UNDERSIDE — BENT #142

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4911 Green Road Suite 107 Raleigh, NC 27616
Phone 919 981 0310 Fax 919 981 0451
Email info@aogroup.com www.aogroup.com
AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

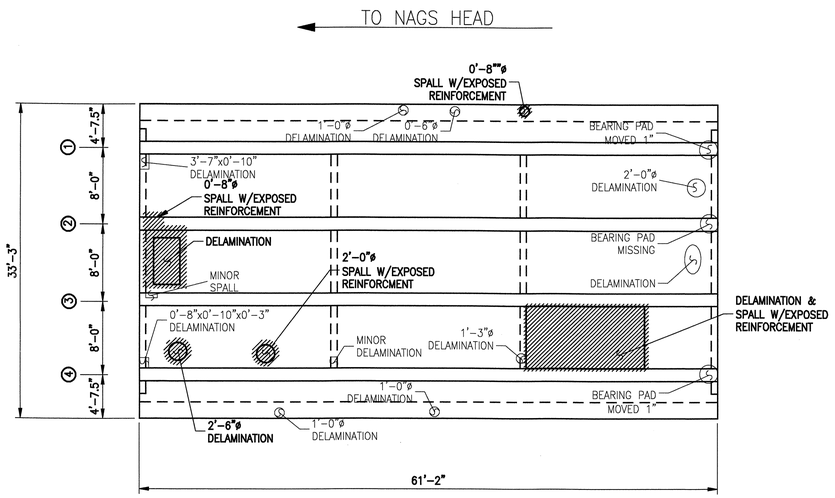
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #139–#142

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTELL 9/12/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	51
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07



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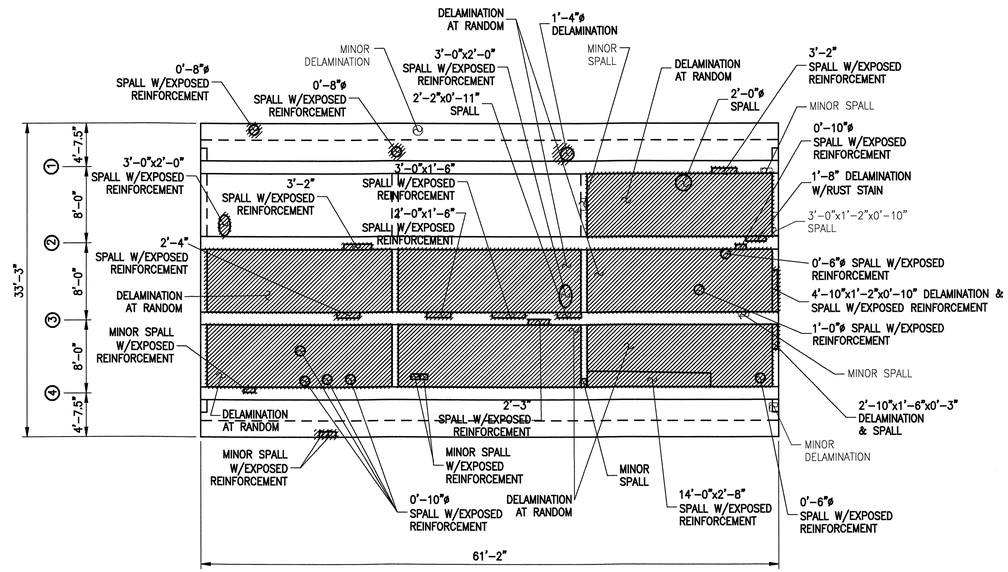

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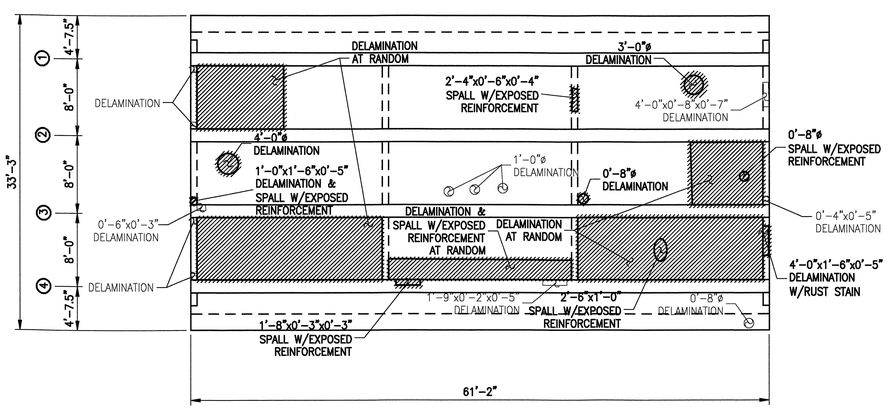

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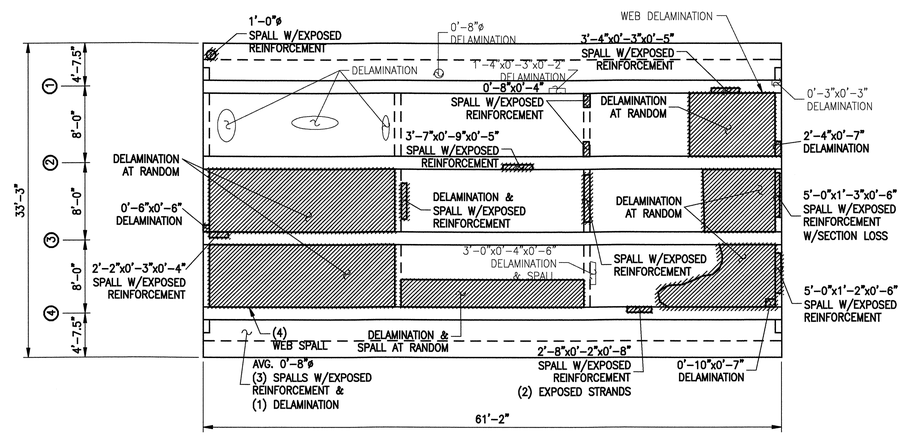

BENT #148 — SPAN #149–UNDERSIDE — BENT #149

BILL OF MATERIAL

SPAN #143

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	28	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

SPAN #147

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	283	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	4	

SPAN #148

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	130	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #149

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	151	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

KEY

- DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
- GENERAL SHAPE OF DEFICIENCY
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT
- GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR SUPERSTRUCTURE REPAIR LOCATIONS SPAN(S) #143 & #147–#149

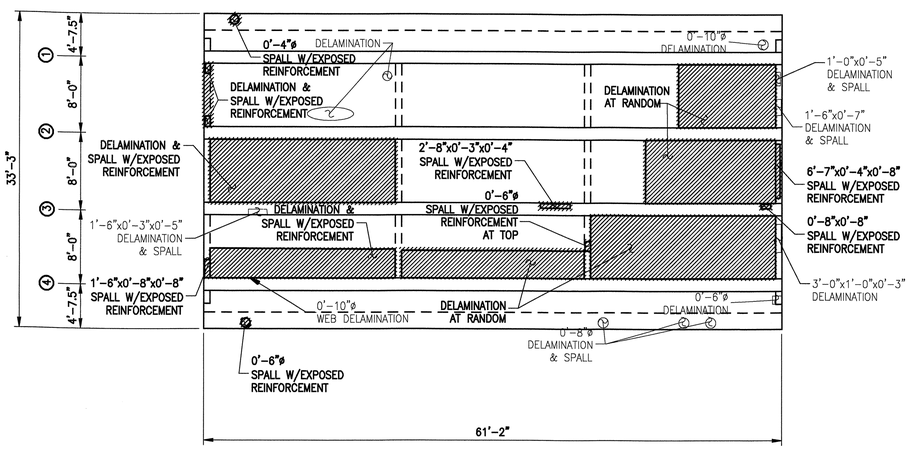
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14455 TED L. BARTELL 1/24/07

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

SHEET NO. 52
TOTAL SHEETS 166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07

TO NAGS HEAD



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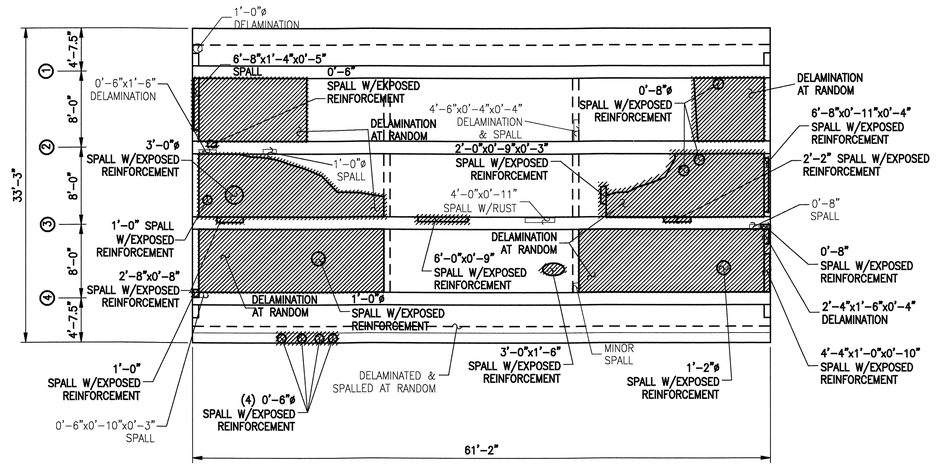

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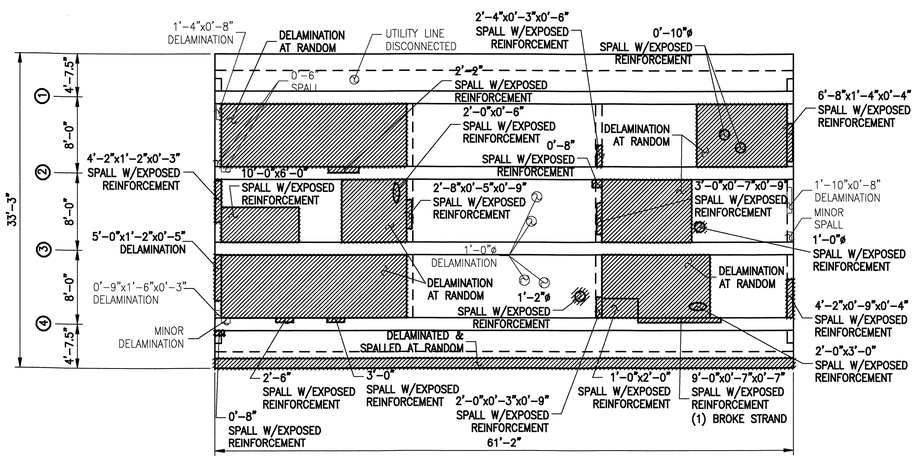

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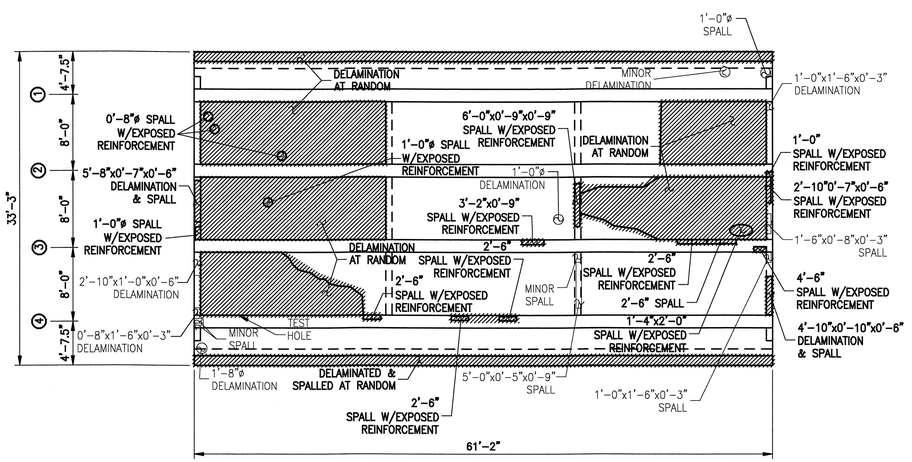

BENT #152 — SPAN #153—UNDERSIDE — BENT #153

BILL OF MATERIAL

SPAN #150

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	160	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #151

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	162	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #152

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	3	
OVERHEAD SHOTCRETE	CF	201	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	3	

SPAN #153

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	211	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

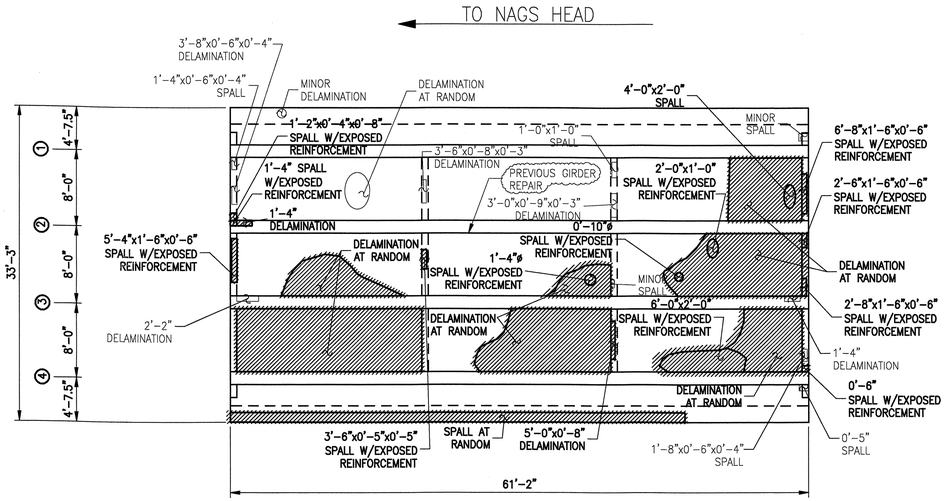
BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #150–#153

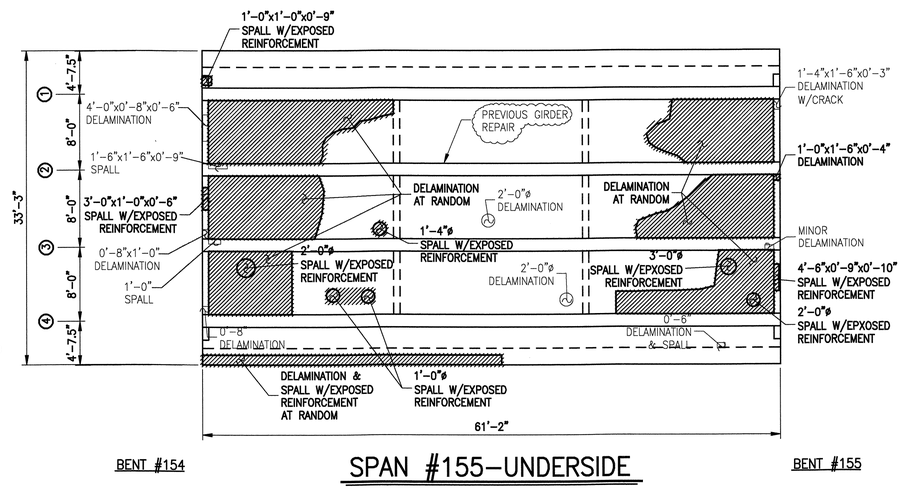
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTLETT 7/20/07

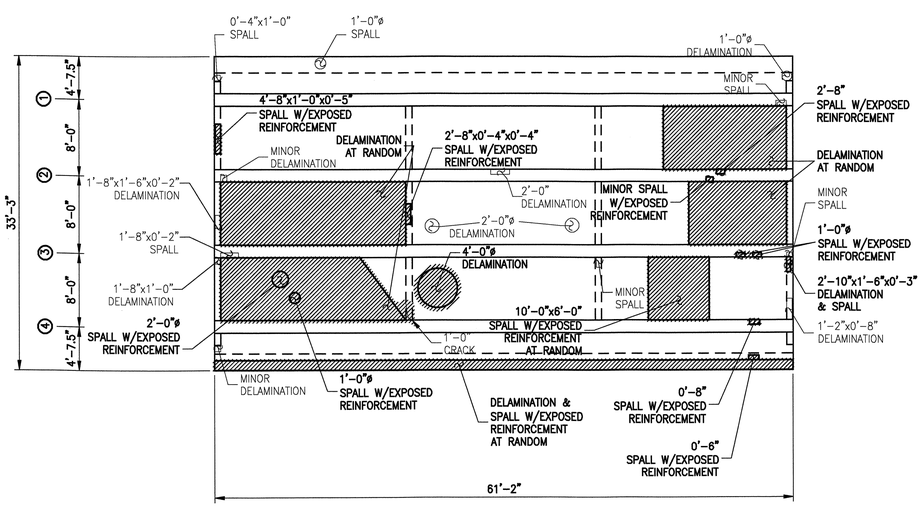
REVISIONS NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

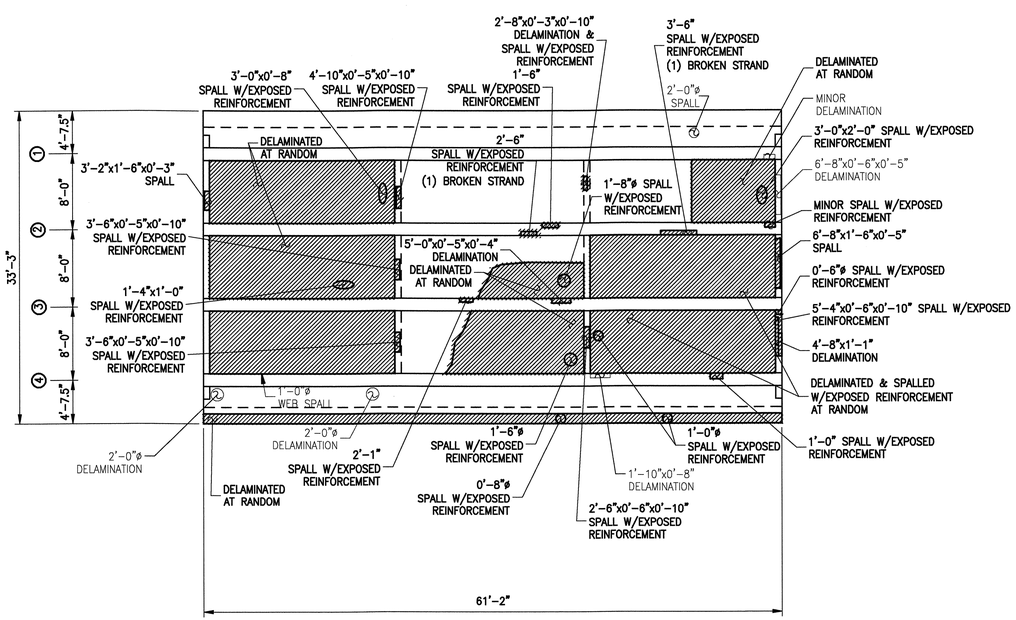
SHEET NO. 53
TOTAL SHEETS 166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07









BILL OF MATERIAL

SPAN #154

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	157	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #155

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	139	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

SPAN #156

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	159	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #157

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	4	
OVERHEAD SHOTCRETE	CF	264	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

KEY

- DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
- GENERAL SHOTCRETE OF DEFICIENCY
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT
- GENERAL SHOTCRETE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

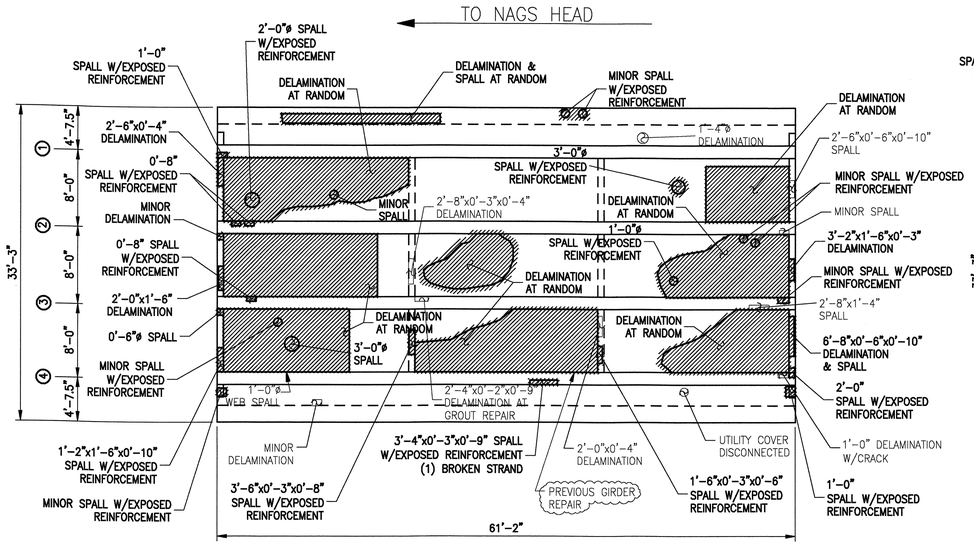
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #154–#157

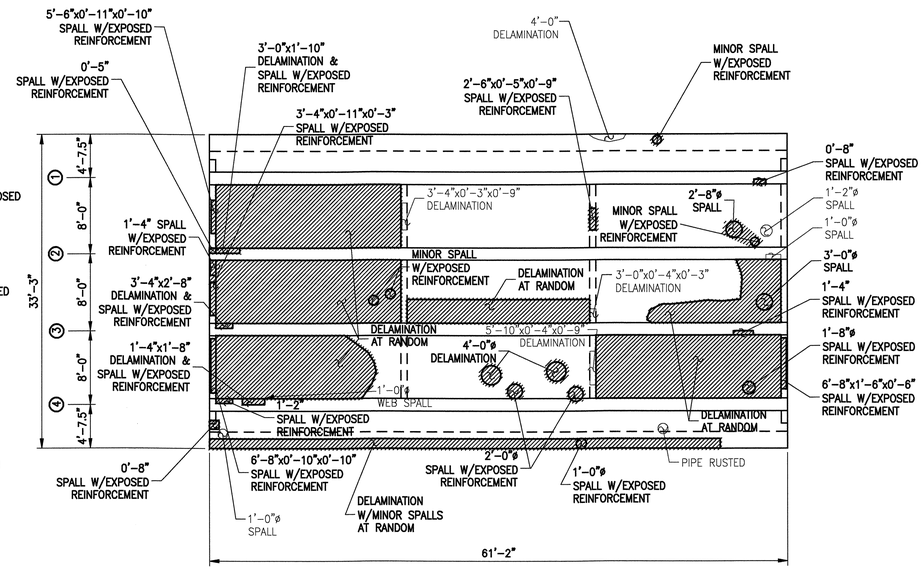
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FEDL BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	54
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07



BENT #157 — SPAN #158–UNDERSIDE — BENT #158



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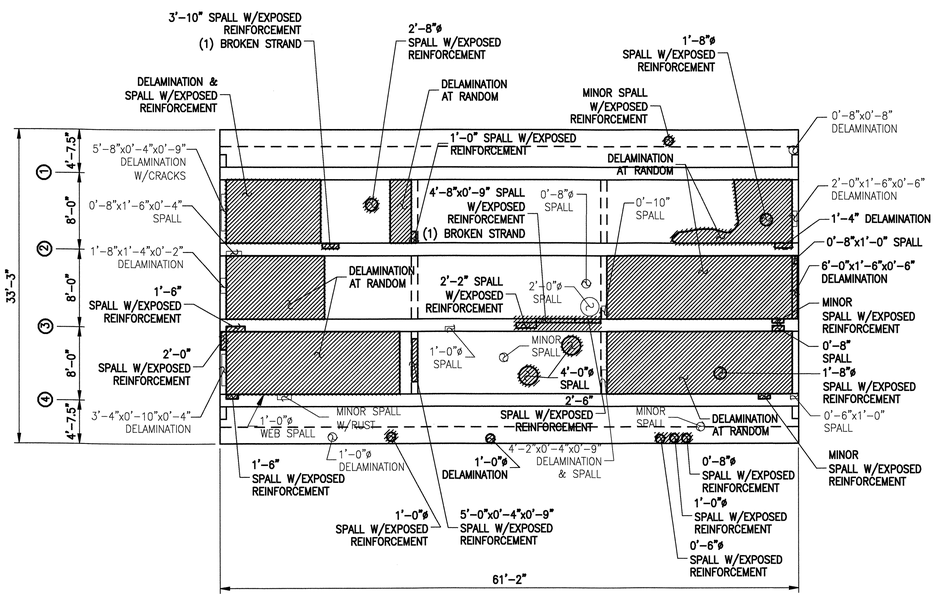

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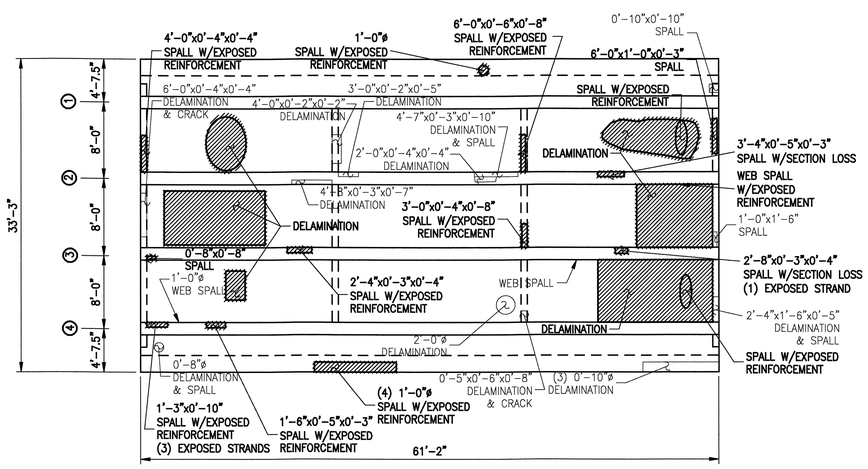

BENT #160 — SPAN #161–UNDERSIDE — BENT #161

BILL OF MATERIAL

SPAN #158

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	197	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #159

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	212	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	5	

SPAN #160

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	178	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	3	

SPAN #161

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	74	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

- – DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
- – GENERAL SHAPE OF DEFICIENCY
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT
- – GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

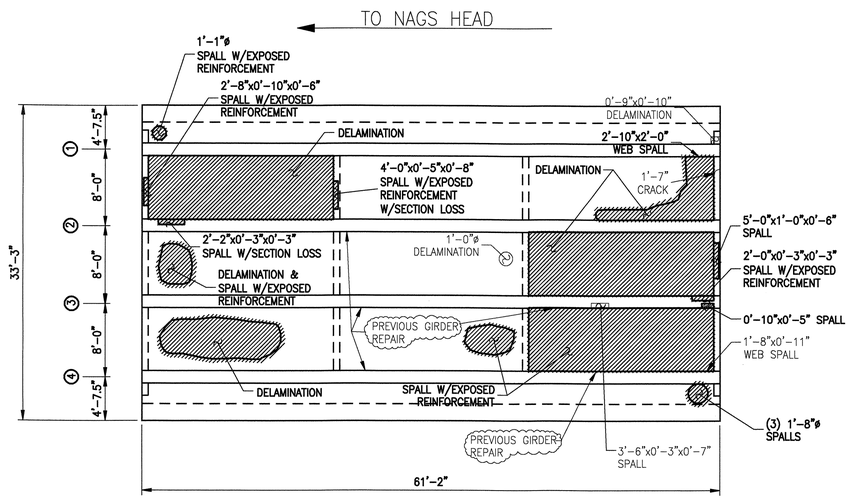
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #158–#161

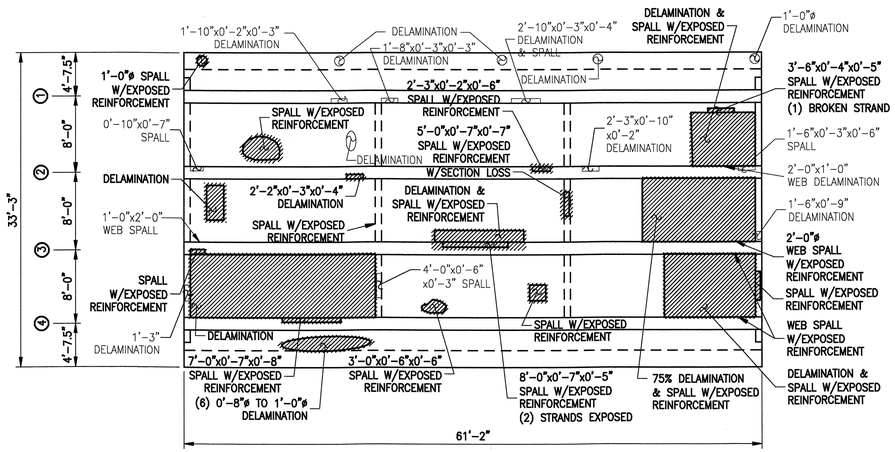
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTELL 7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	55
1			3			TOTAL SHEETS
2			4			166

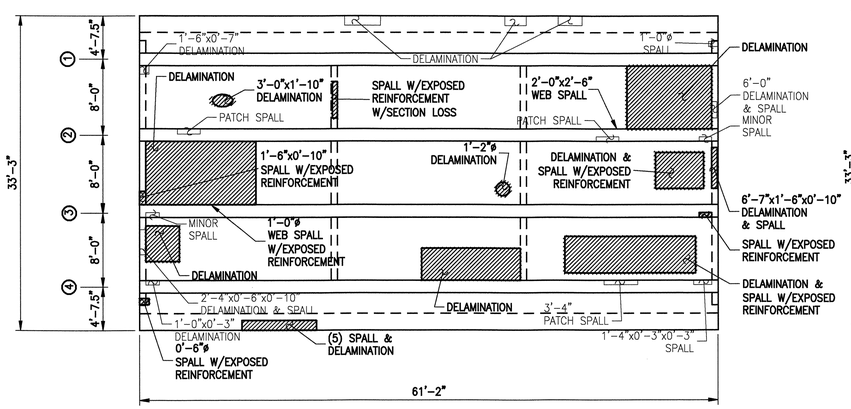
DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07



BENT #161 — SPAN #162–UNDERSIDE — BENT #162



BENT #162 — SPAN 163–UNDERSIDE — BENT #163



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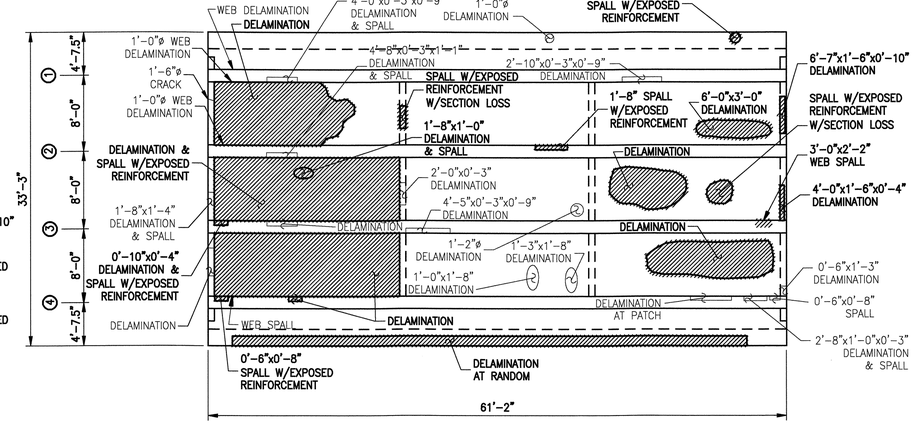


BENT #164 — SPAN #165–UNDERSIDE — BENT #165

BILL OF MATERIAL

SPAN #162

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	143	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #163

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	98	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	5	

SPAN #164

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	77	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #165

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	3	
OVERHEAD SHOTCRETE	CF	141	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4911 Green Road Suite 107 Raleigh, NC 27616
Phone 919 981 0310 Fax 919 981 0451
Email info@aogroup.com www.aogroup.com
AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

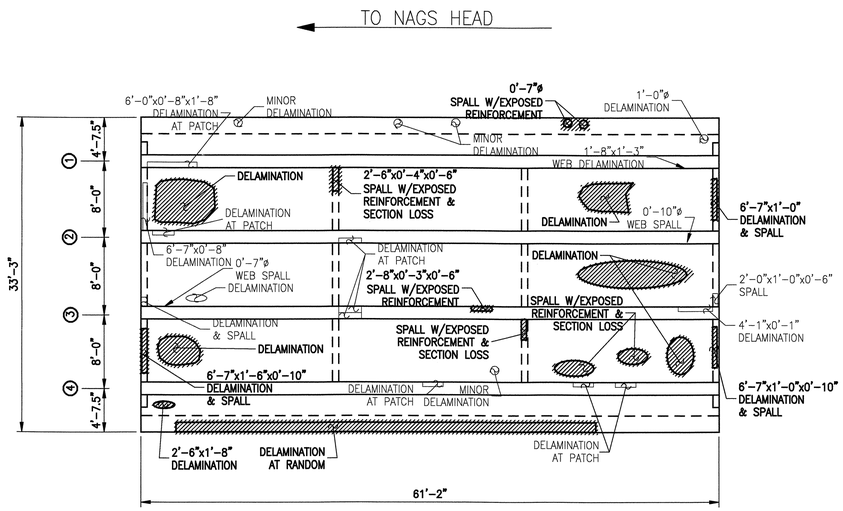
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #162–#165

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTEL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	56
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07



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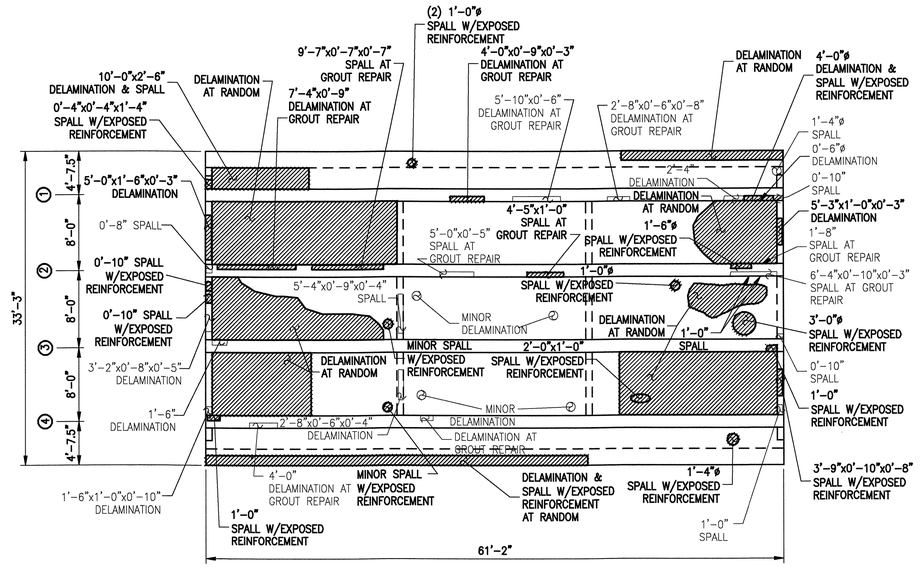

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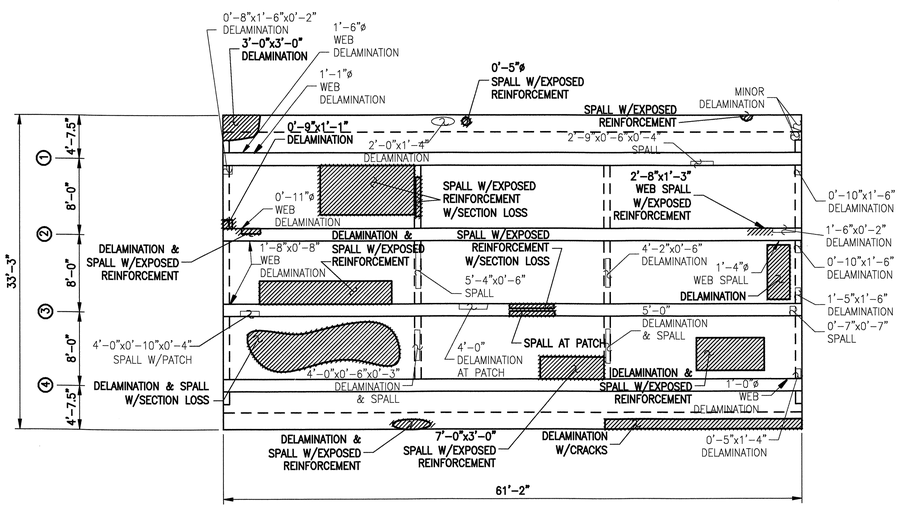

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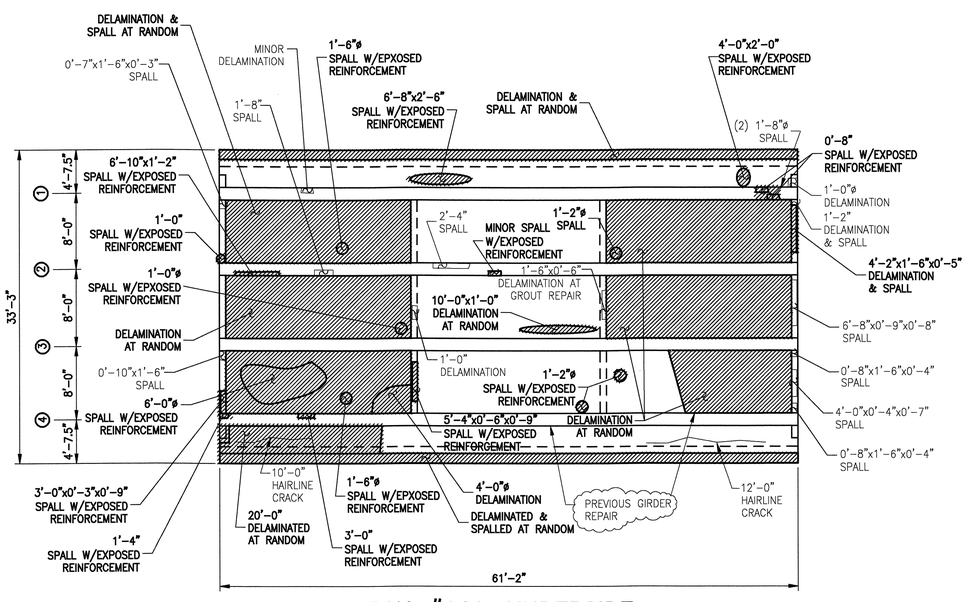

BENT #168 — SPAN #169–UNDERSIDE — BENT #169

BILL OF MATERIAL

SPAN #166

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	49	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #167

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	157	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	10	

SPAN #168

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	76	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #169

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	239	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	3	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

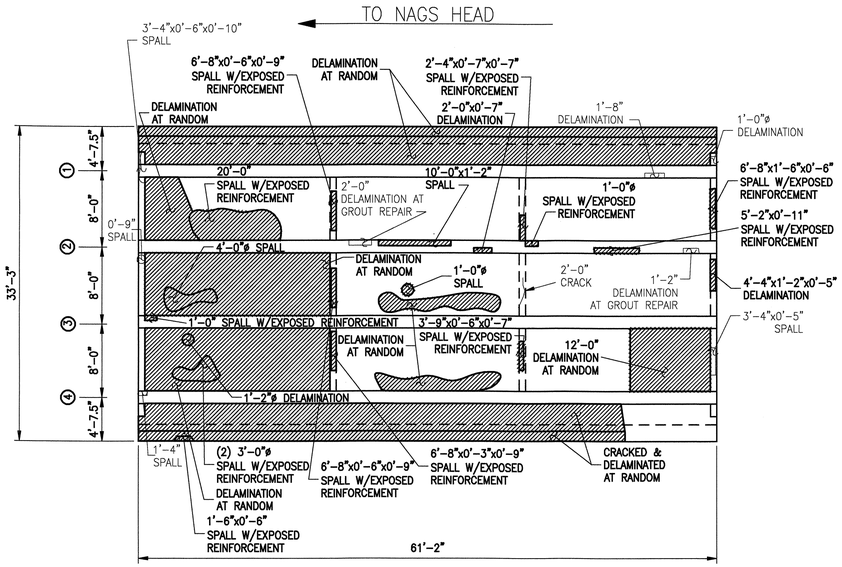
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #166–#169

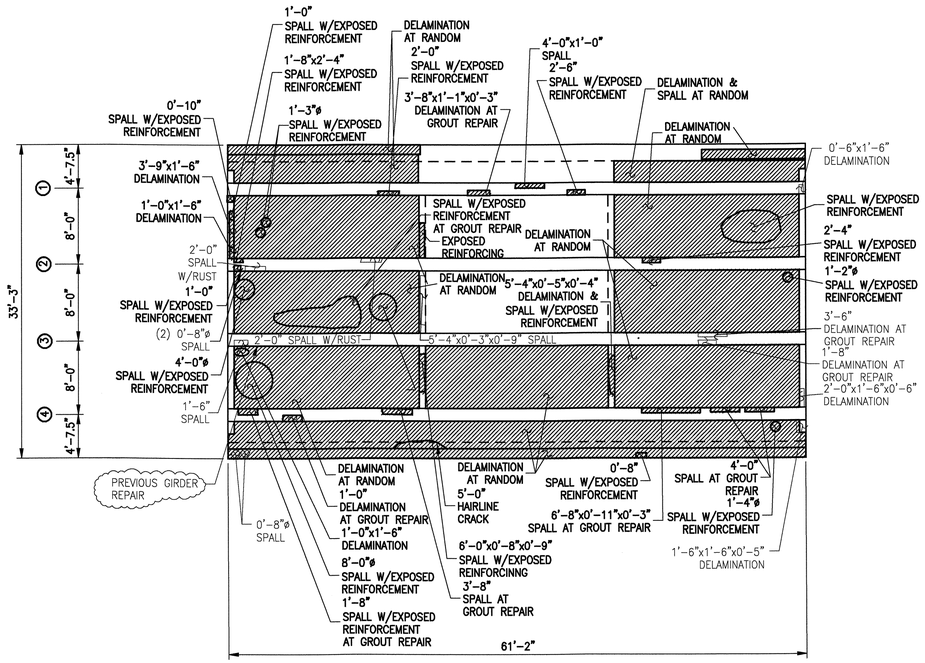
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL 7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	57
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE DATE
CHECKED BY G.R. COLS DATE DATE



BENT #169 — SPAN #170–UNDERSIDE — BENT #170



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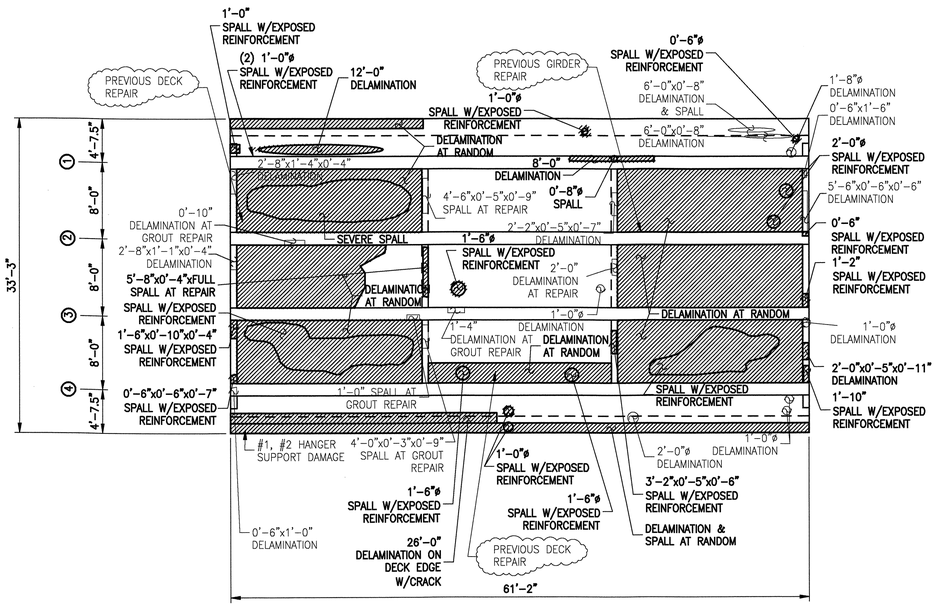

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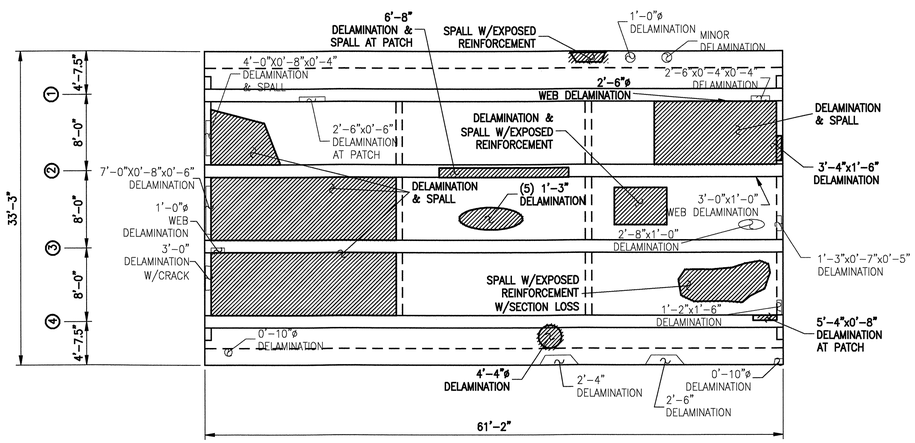

BENT #172 — SPAN #173–UNDERSIDE — BENT #173

BILL OF MATERIAL

SPAN #170

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	300	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	5	

SPAN #171

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	409	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	7	

SPAN #172

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	320	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #173

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	132	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	3	

KEY

- DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
- GENERAL SHAPE OF DEFICIENCY
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT
- GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

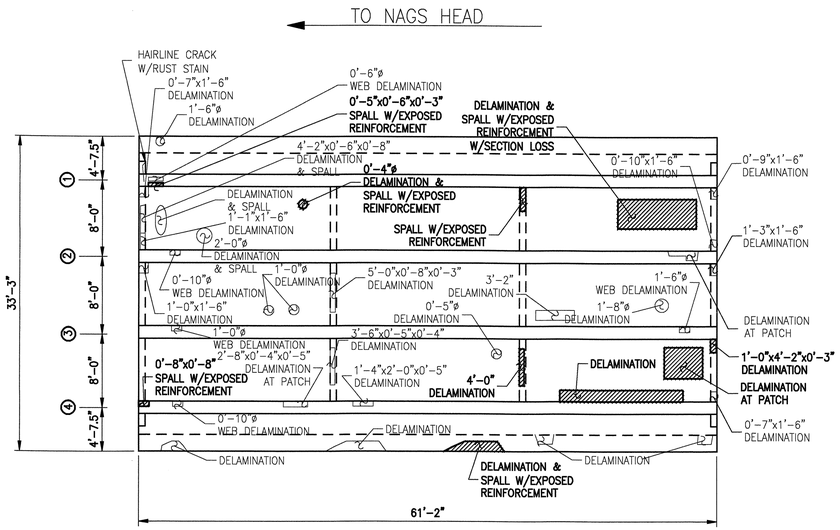
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #170–#173

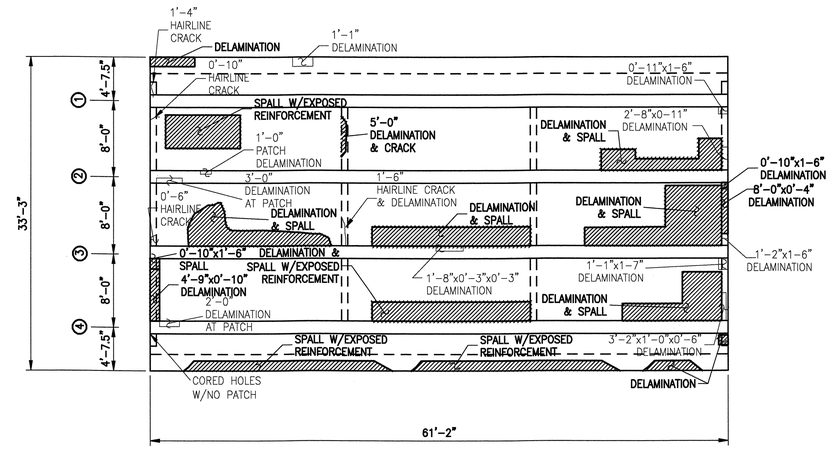
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTELL 7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	58
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07



SPAN #174–UNDERSIDE



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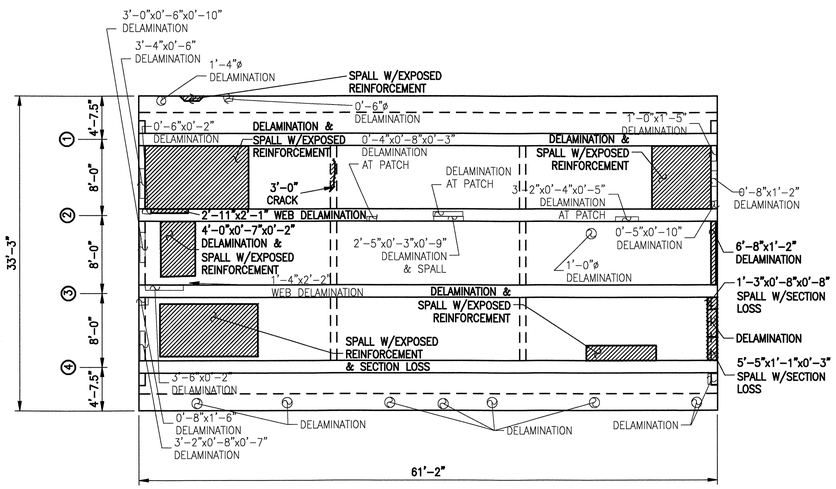

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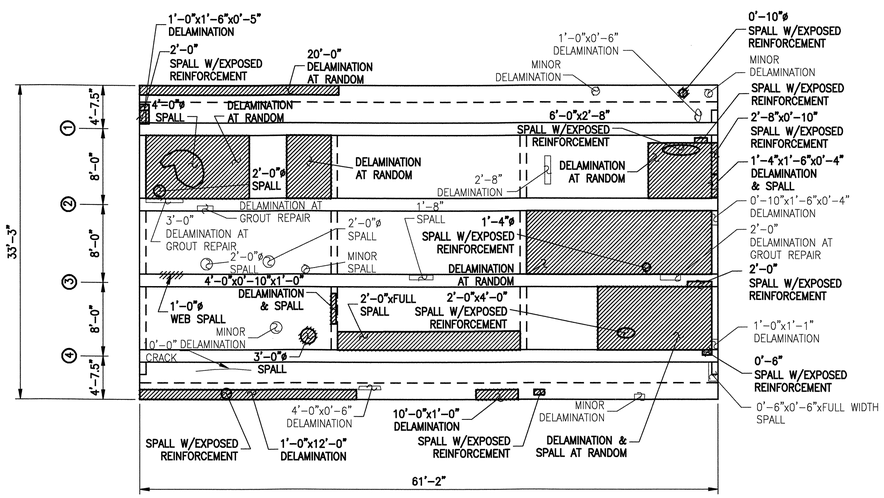

SPAN #177–UNDERSIDE

BILL OF MATERIAL

SPAN #174

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	18	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #175

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	88	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

SPAN #176

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	3	
OVERHEAD SHOTCRETE	CF	63	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #177

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	128	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

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DARE COUNTY

BRIDGE NO. 11

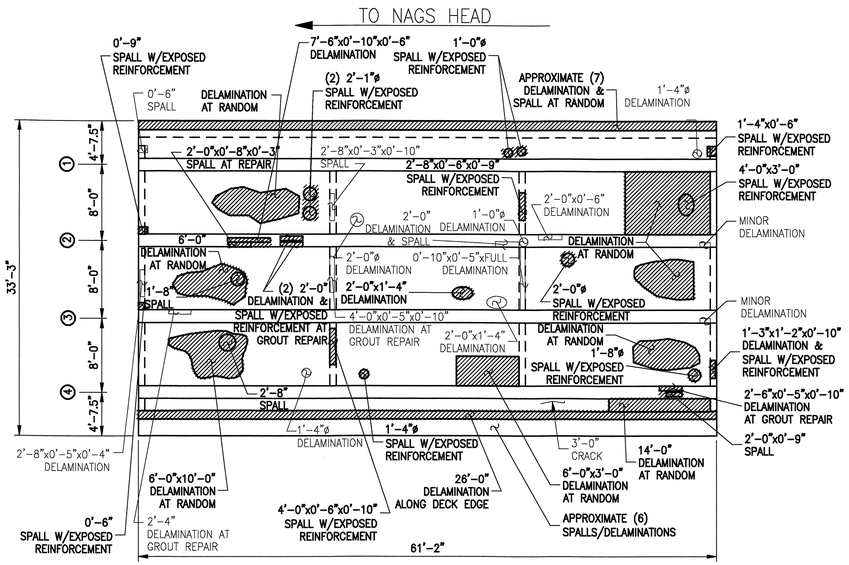
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #174–#177

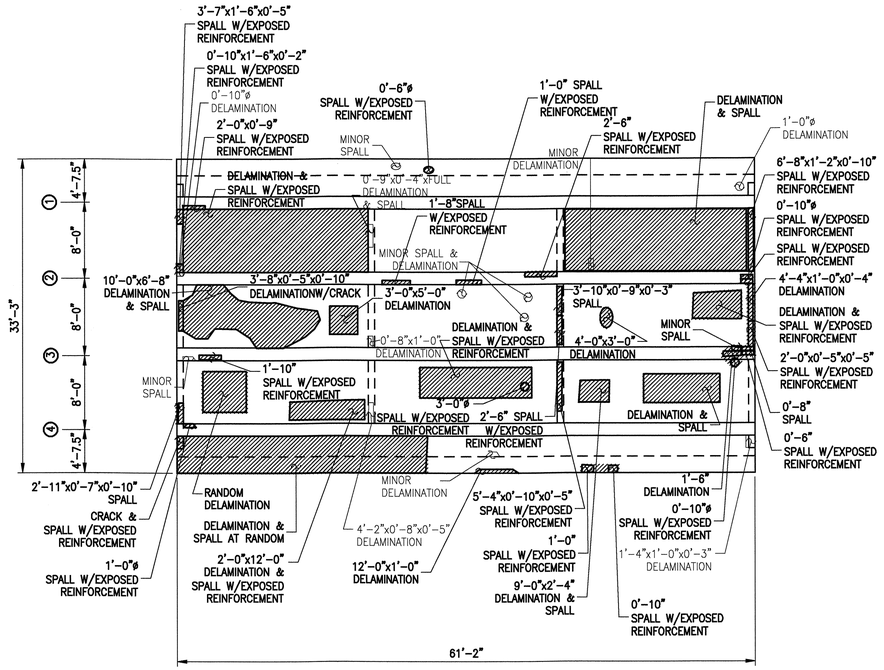
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	59
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07



BENT #177 — SPAN #178–UNDERSIDE — BENT #178



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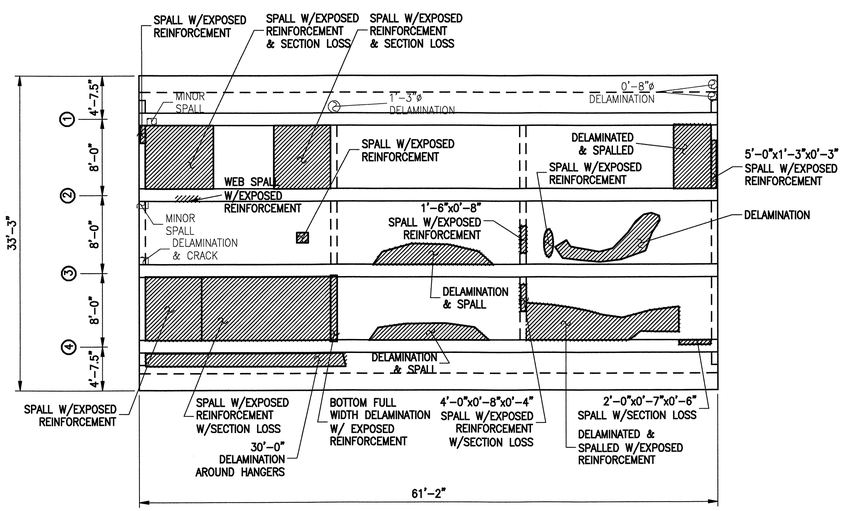

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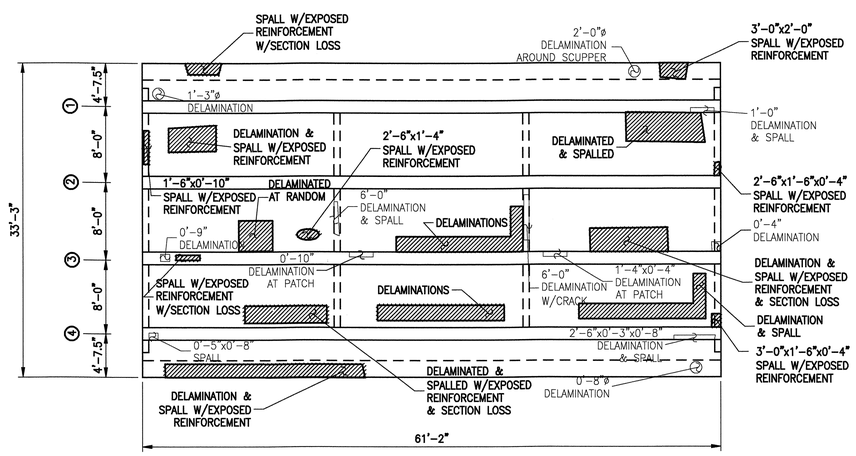

BENT #180 — SPAN #181–UNDERSIDE — BENT #181

BILL OF MATERIAL

SPAN #178

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	91	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	4	

SPAN #179

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	170	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #180

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	119	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #181

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	50	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

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0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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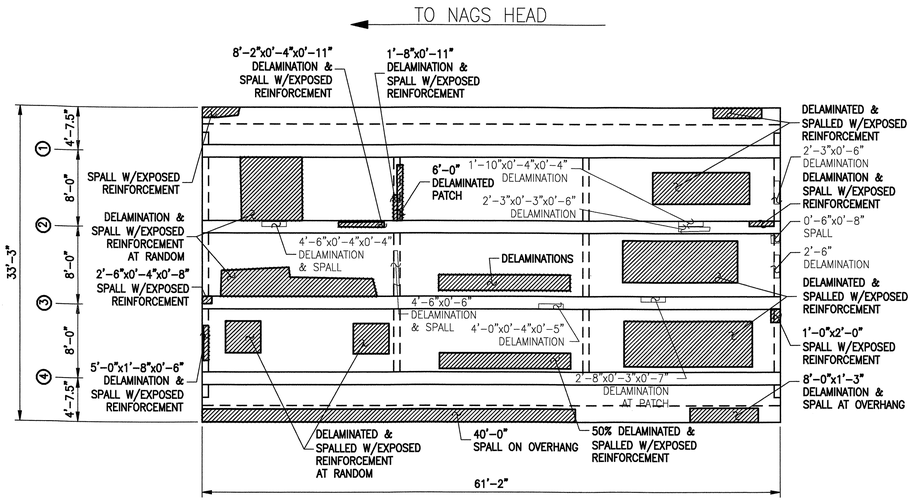
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #178–#181

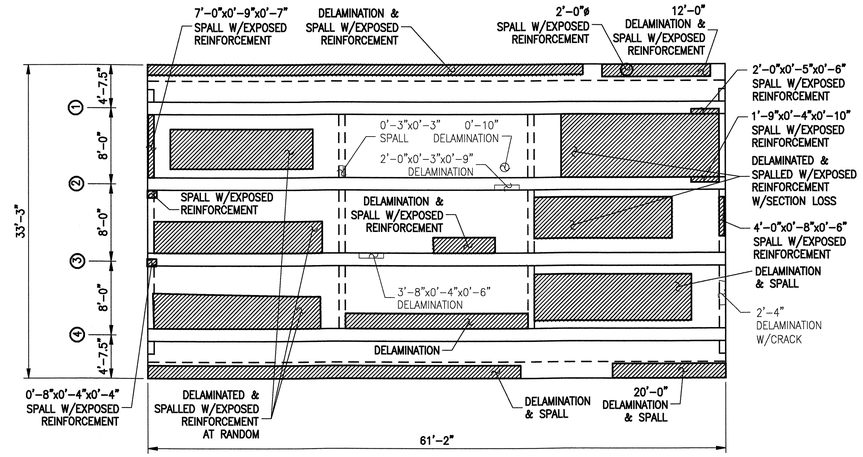
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	60
1			3			TOTAL SHEETS
2			4			166

DRAWN BY: S.M. SULLIVAN DATE 4/20/07
CHECKED BY: G.R. COLS DATE 5/15/07



BENT #181 — SPAN #182–UNDERSIDE — BENT #182



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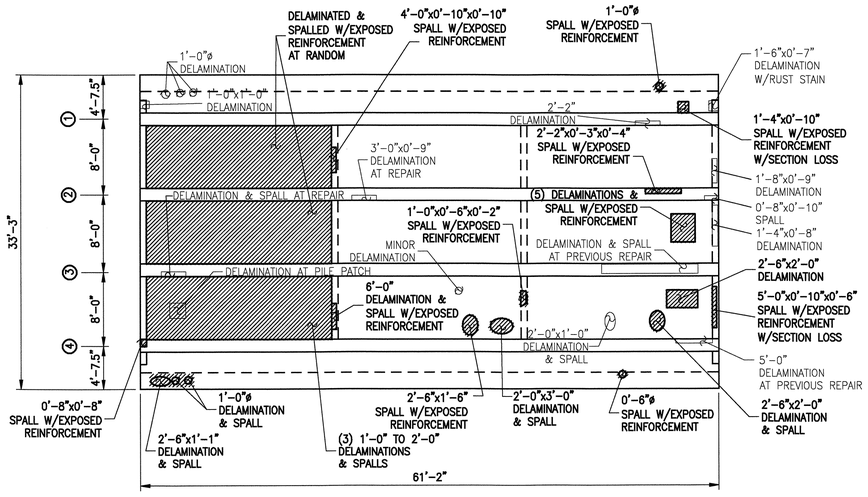

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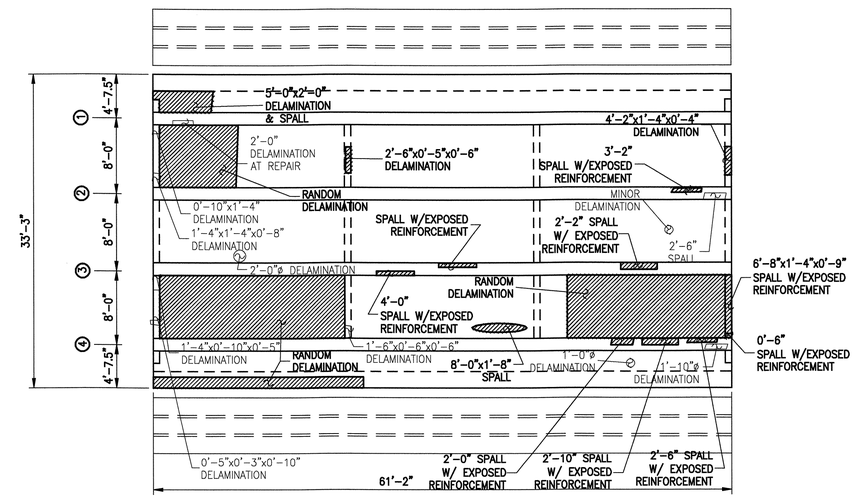

BENT #184 — SPAN #185–UNDERSIDE — BENT #185

BILL OF MATERIAL

SPAN #182

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	99	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	3	

SPAN #183

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	162	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #184

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	168	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #185

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	103	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	5	

KEY

– DENOTES GENERAL AREA OF REPAIR

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0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

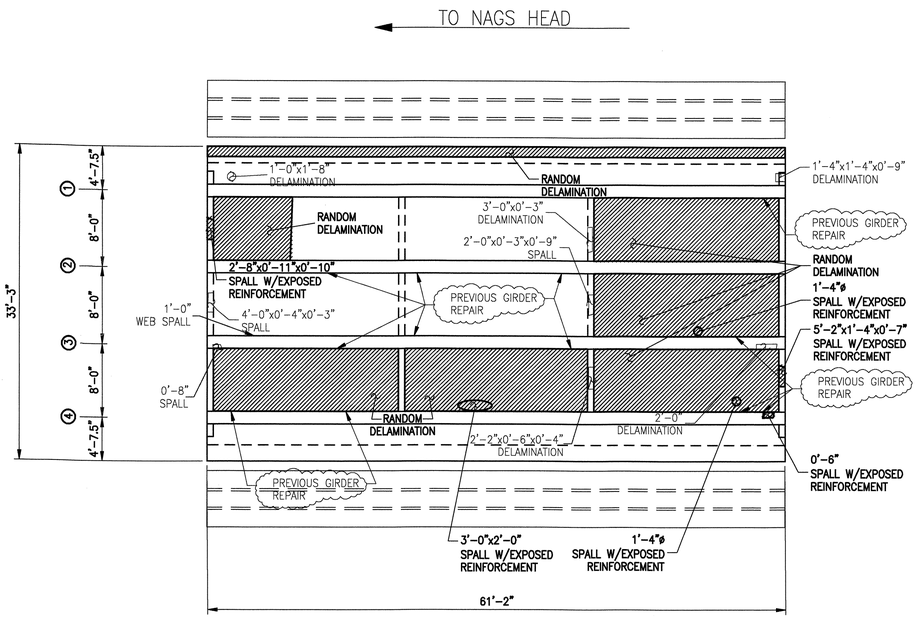
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #182–#185

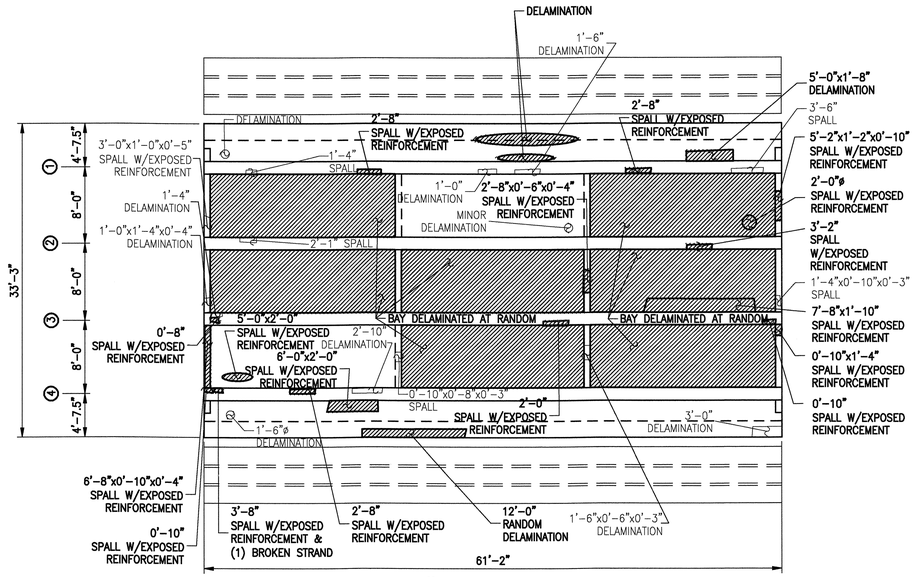
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER E. L. BARTLETT 4/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	61
1			3			TOTAL SHEETS
2			4			166

DRAWN BY: S.M. SULLIVAN DATE: 4/20/07
CHECKED BY: G.R. COLS DATE: 5/15/07



BENT #185 — SPAN #186–UNDERSIDE — BENT #186



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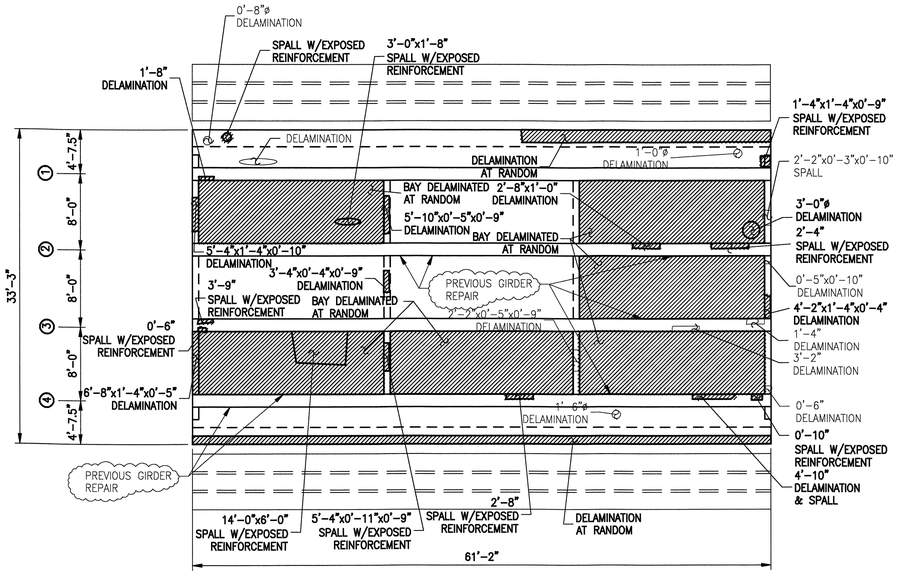

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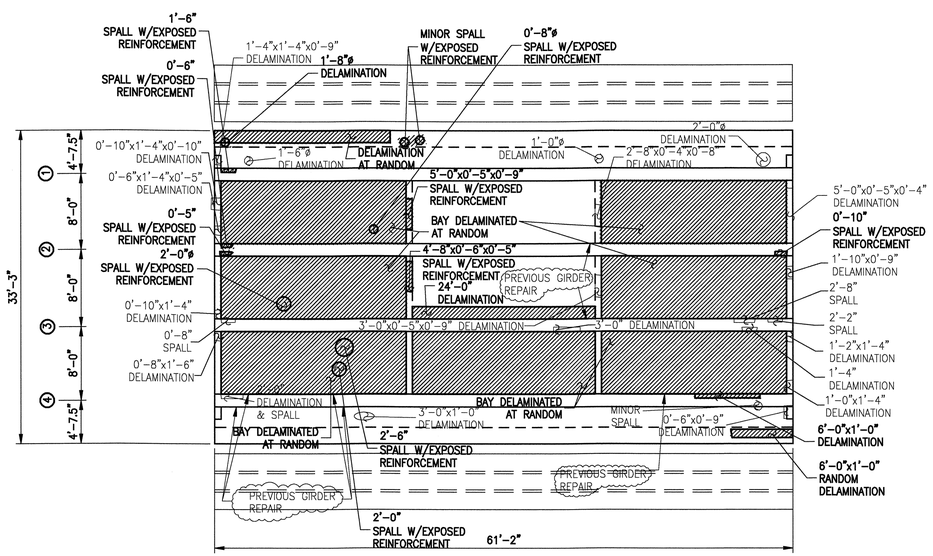

BENT #188 — SPAN #189–UNDERSIDE — BENT #189

BILL OF MATERIAL

SPAN #186			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	224	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #187			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	294	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #188			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	261	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #189			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	283	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

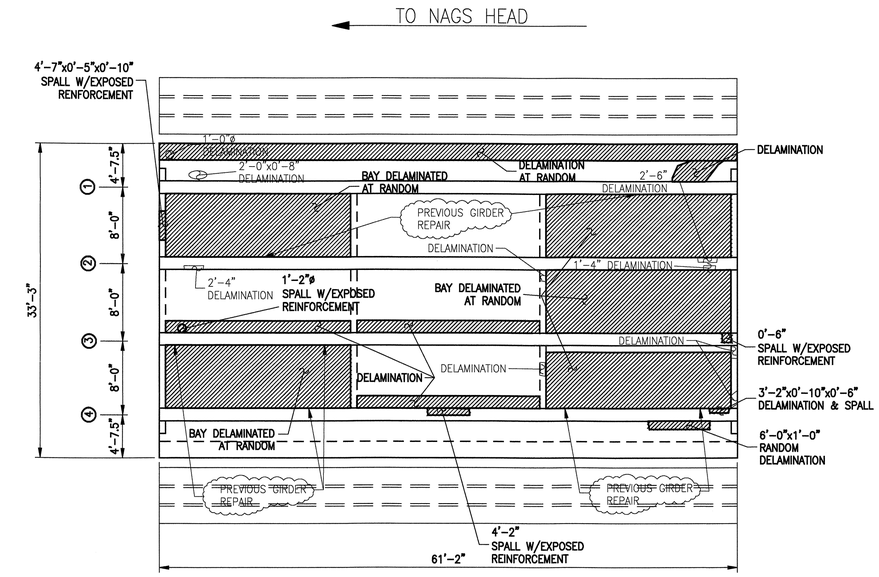
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #186–#189

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL 8/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	62
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07



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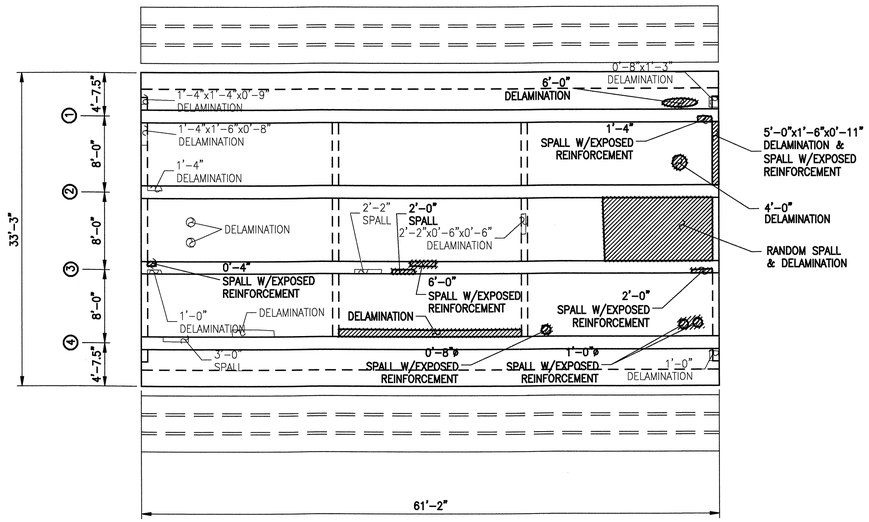

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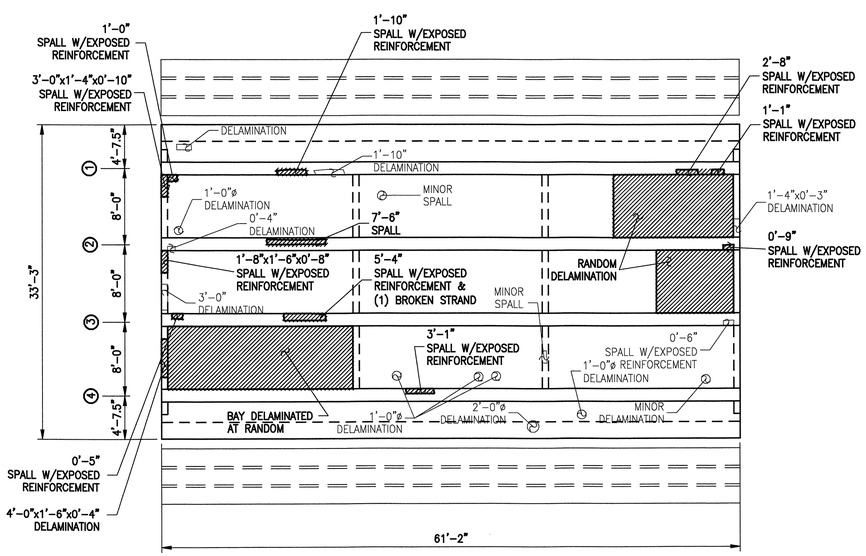

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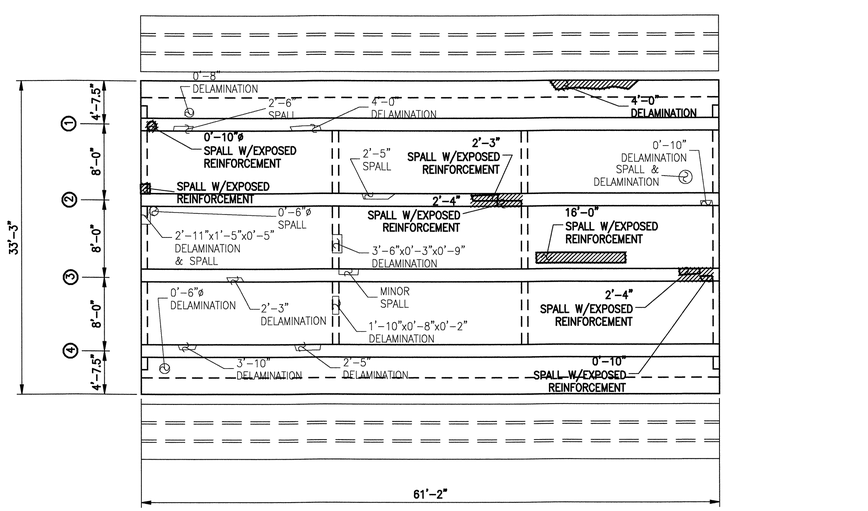

BENT #192 — SPAN #193–UNDERSIDE — BENT #193

BILL OF MATERIAL

SPAN #190

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	233	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #191

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	32	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #192

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	84	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #193

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	5	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

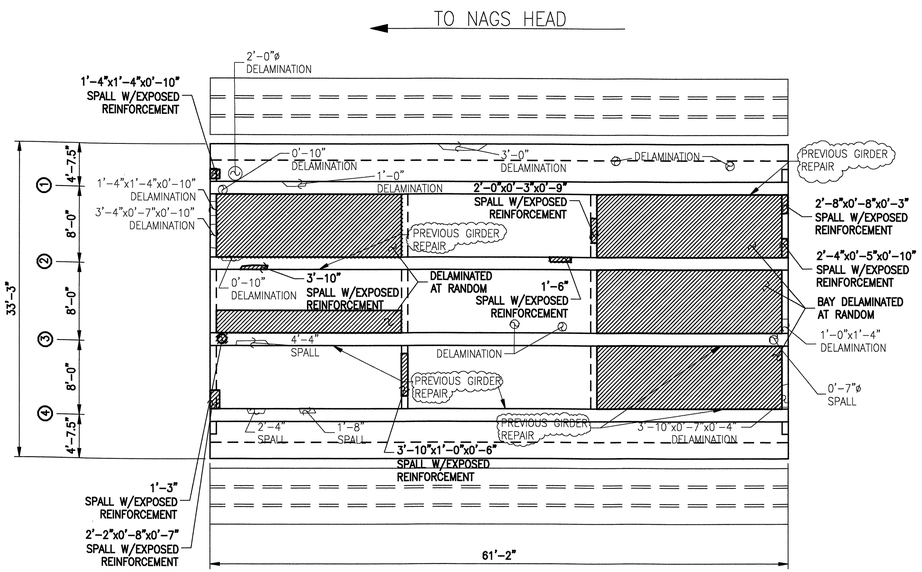
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #190–#193

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL 7/20/07

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		63
1			3				TOTAL SHEETS
2			4				166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07



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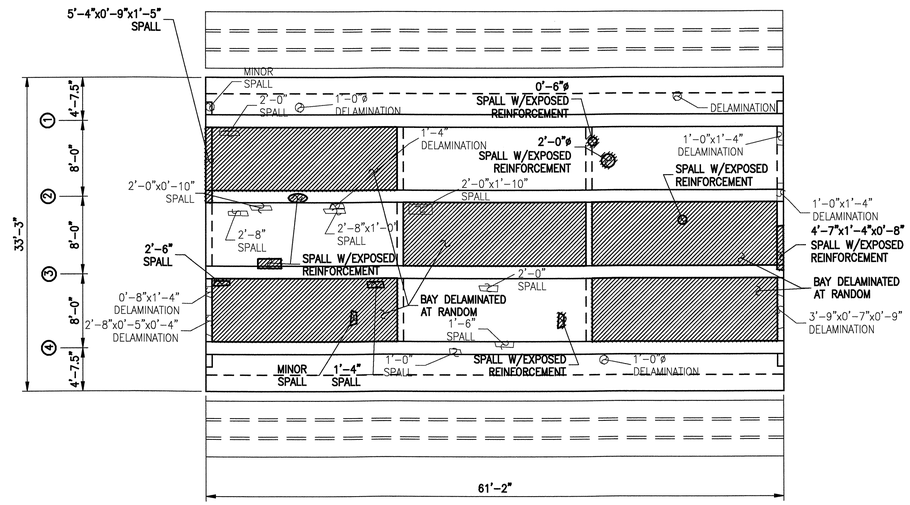

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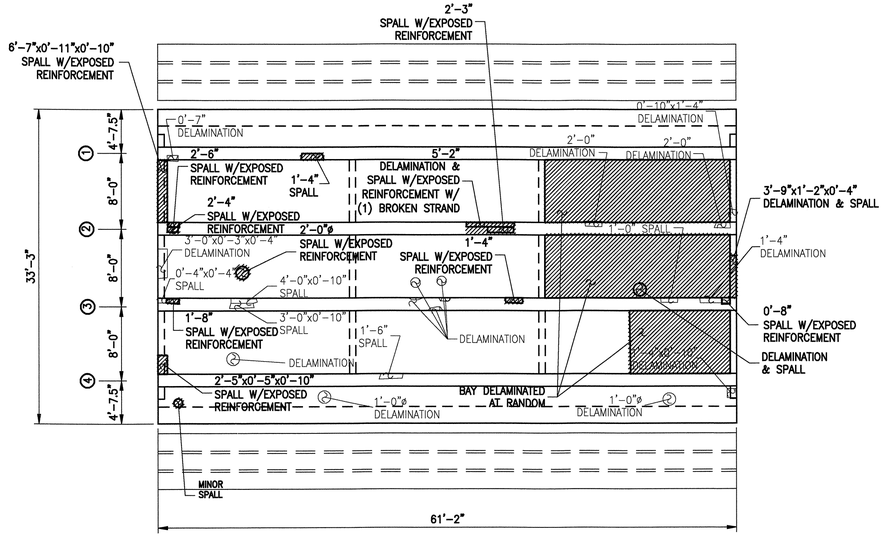

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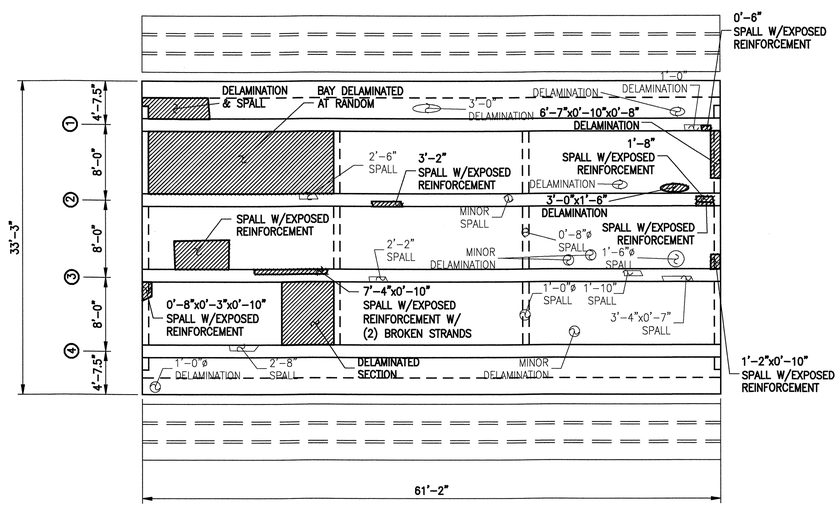

BENT #196 — SPAN #197–UNDERSIDE — BENT #197

BILL OF MATERIAL

SPAN #194			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	169	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #195			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	203	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #196			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	105	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #197			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	64	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

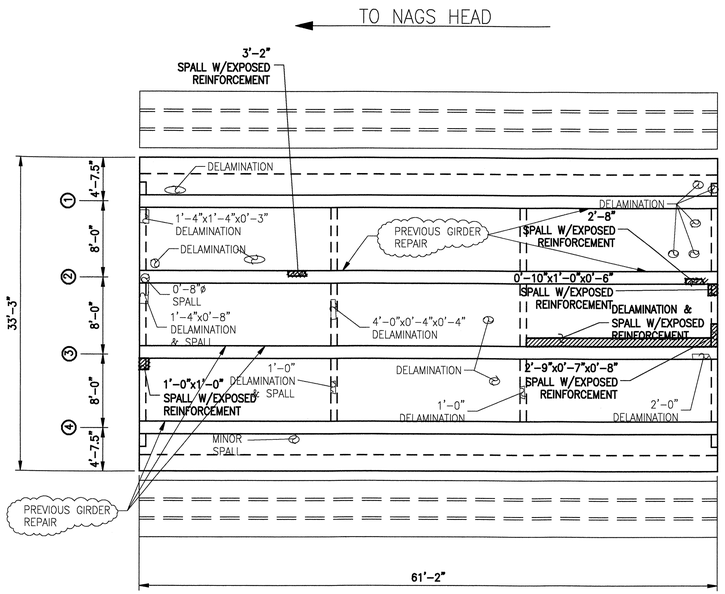
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR SUPERSTRUCTURE REPAIR LOCATIONS SPAN(S) #194–#197

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELT 7/2/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	64
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07



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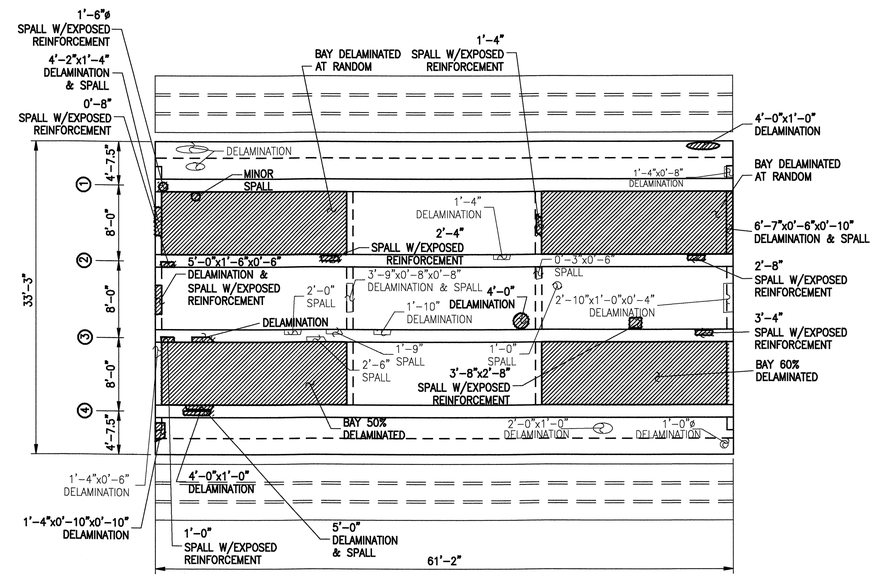

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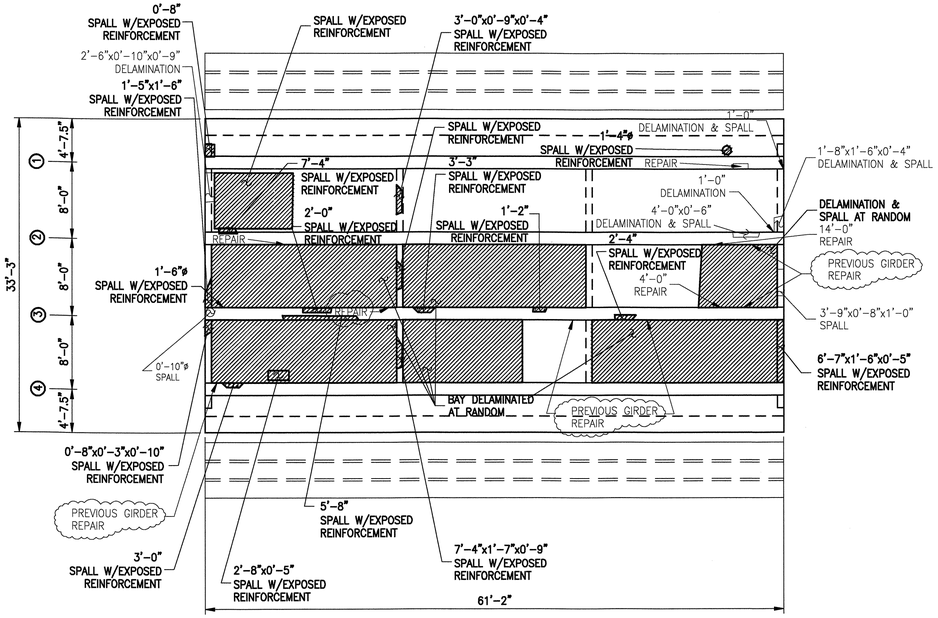

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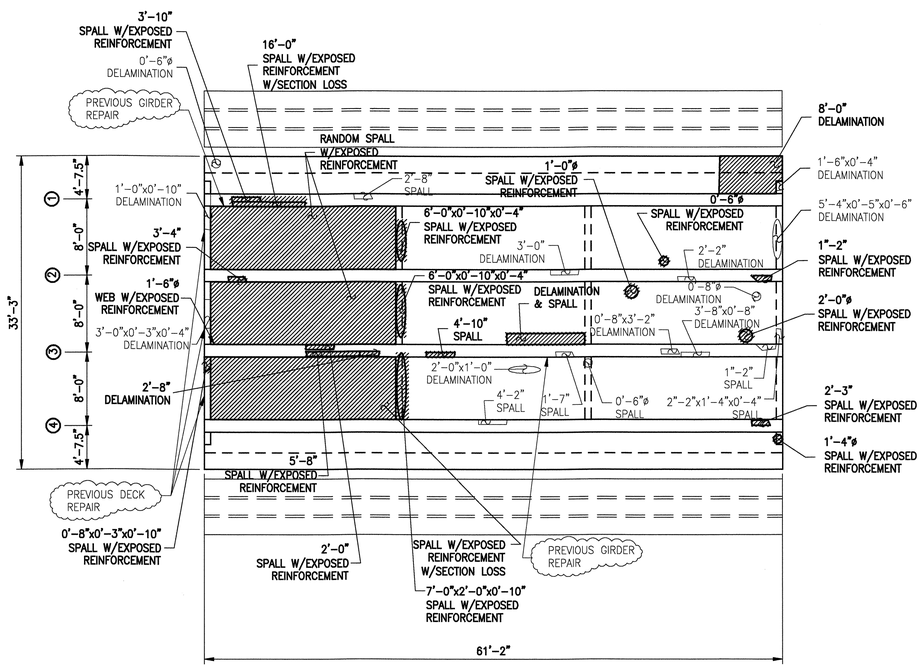

BENT #200 — SPAN #201—UNDERSIDE — BENT #201

BILL OF MATERIAL

SPAN #198

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	6	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

SPAN #199

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	129	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	3	

SPAN #200

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	216	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #201

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	3	
OVERHEAD SHOTCRETE	CF	131	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	5	

KEY

- – DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
- – GENERAL SHAPE OF DEFICIENCY
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT
- – GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

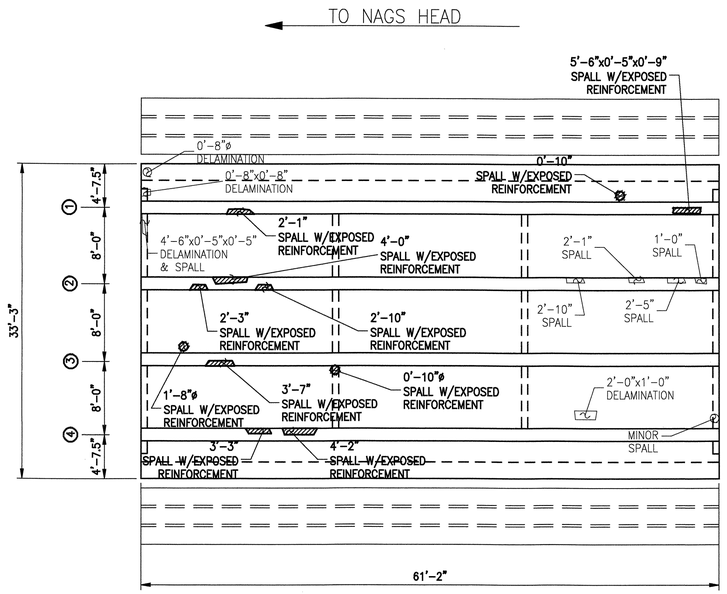
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #198–#201

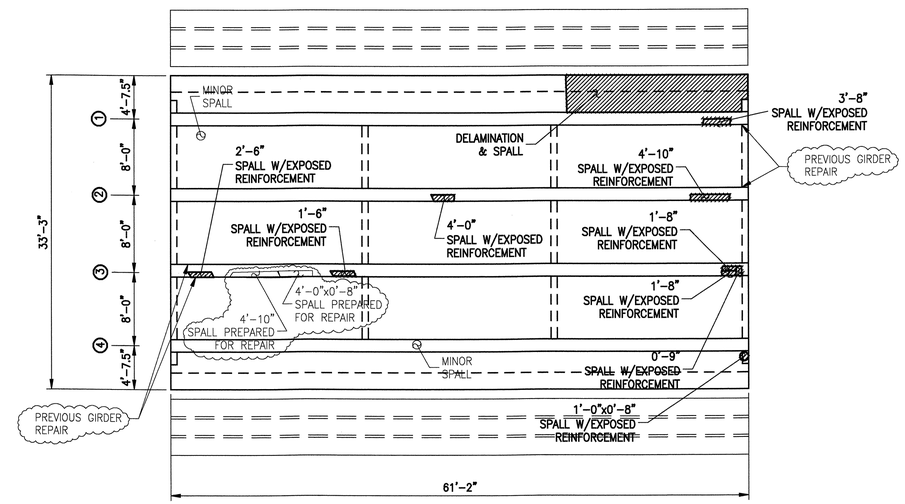
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTELL 4/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	65
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07



BENT #201 SPAN #202–UNDERSIDE BENT #202



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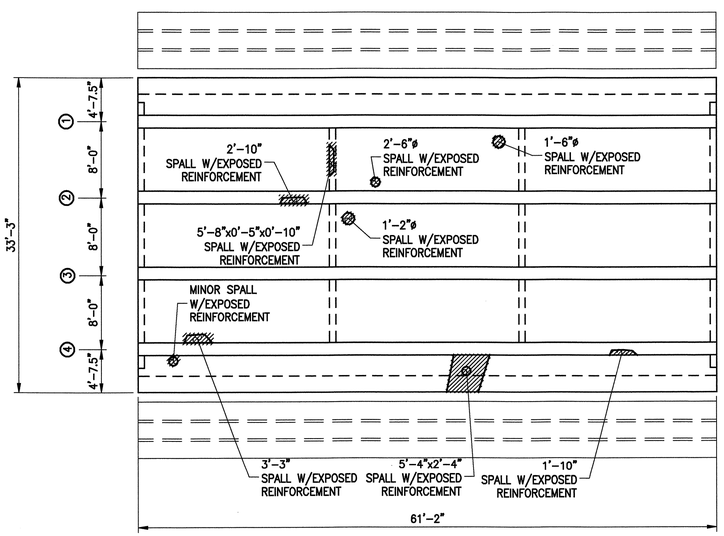

BENT #203 SPAN #204–UNDERSIDE BENT #204

BILL OF MATERIAL

SPAN #202

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	4	

SPAN #203

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	19	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	2	

SPAN #204

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	6	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	1	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

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0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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DARE COUNTY

BRIDGE NO. 11

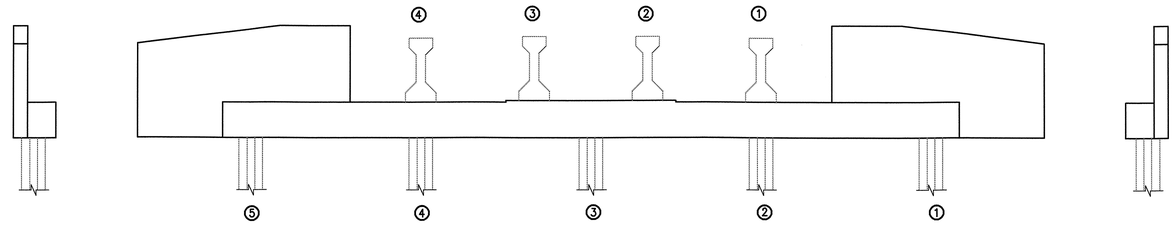
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
SUPERSTRUCTURE
REPAIR LOCATIONS
SPAN(S) #202–#204

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTELL 7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	66
1			3			TOTAL SHEETS
2			4			166

DRAWN BY S.M. SULLIVAN DATE 4/20/07
CHECKED BY G.R. COLS DATE 5/15/07

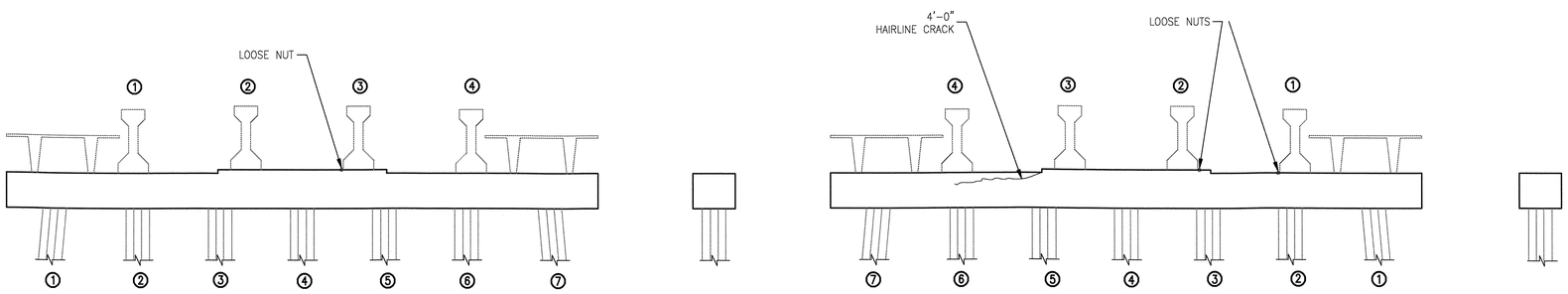


WEST ELEVATION

SOUTH ELEVATION

EAST ELEVATION

END BENT #1



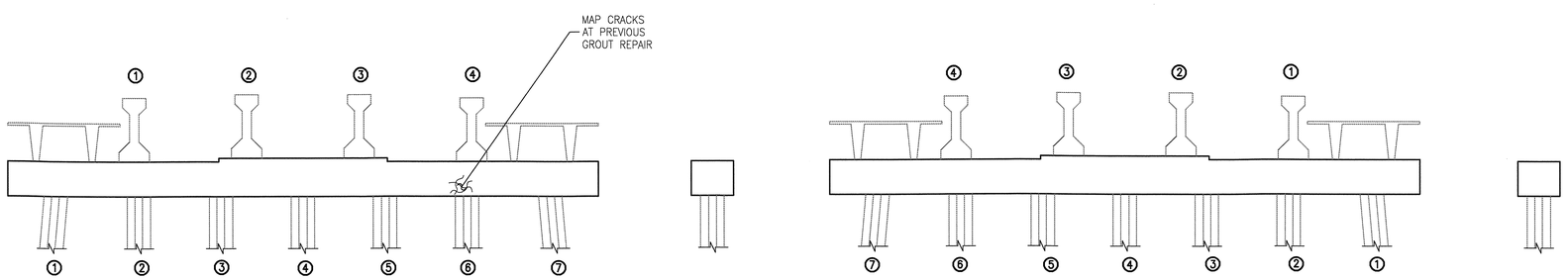
NORTH ELEVATION

WEST ELEVATION

SOUTH ELEVATION

EAST ELEVATION

BENT #1



NORTH ELEVATION

WEST ELEVATION

SOUTH ELEVATION

EAST ELEVATION

BENT #2

BILL OF MATERIAL

END BENT #1

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

BENT #1

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

BENT #2

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4911 Green Road Suite 107 Raleigh, NC 27616
Phone 919 981 0310 Fax 919 981 0451
Email info@aogroup.com www.aogroup.com
AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

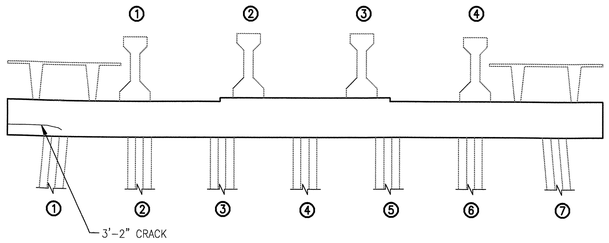
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
LOW LEVEL SUBSTRUCTURE
REPAIR LOCATIONS
END BENT #1 – BENT #2

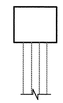
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL
9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	67
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G.R. COLS DATE 4/26/07
CHECKED BY F.E. ROBBINS DATE 4/26/07



NORTH ELEVATION



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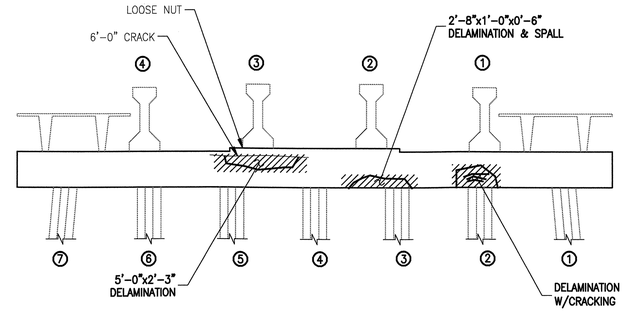

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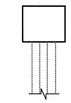

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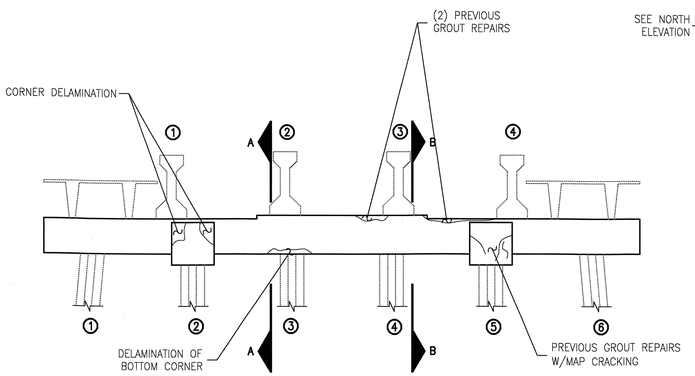
BENT #3



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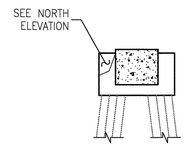
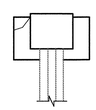


SECTION A-A



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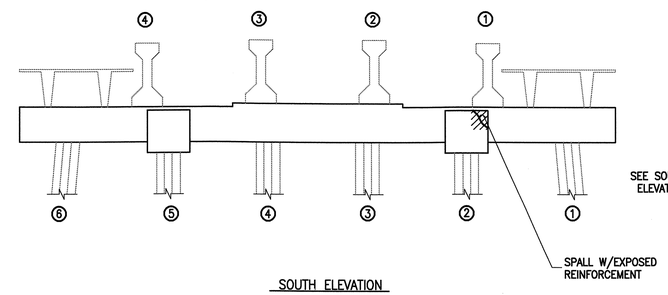

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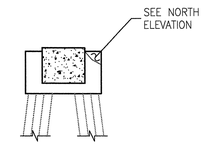

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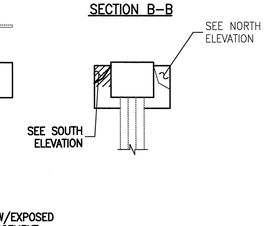
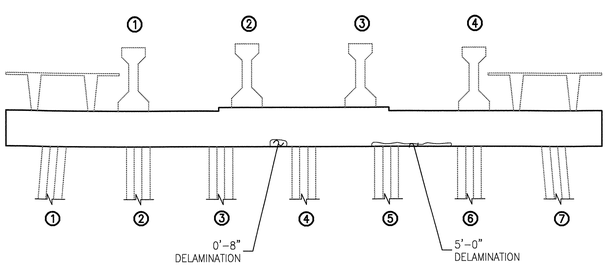


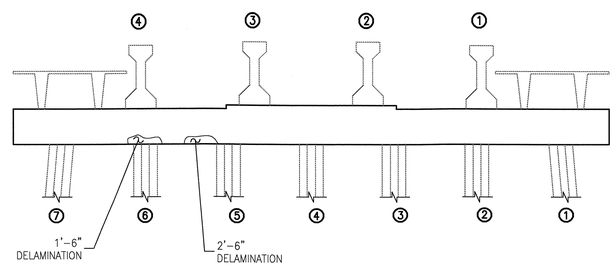
EAST ELEVATION

BENT #4



NORTH ELEVATION

WEST ELEVATION



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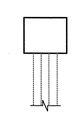

EAST ELEVATION

BENT #5

BILL OF MATERIAL

BENT #3			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	5	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

BENT #4			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	1	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

BENT #5			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

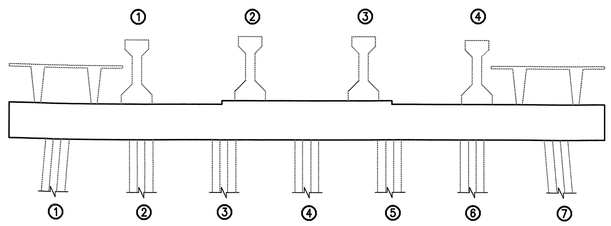
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
LOW LEVEL SUBSTRUCTURE
REPAIR LOCATIONS
BENT(S) #3-#5

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14455 FED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	68
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G.R. COLS DATE 4/26/07
CHECKED BY F.E. ROBBINS DATE 4/26/07



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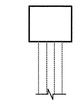

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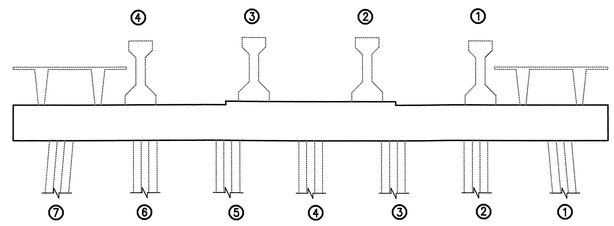

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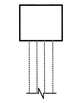
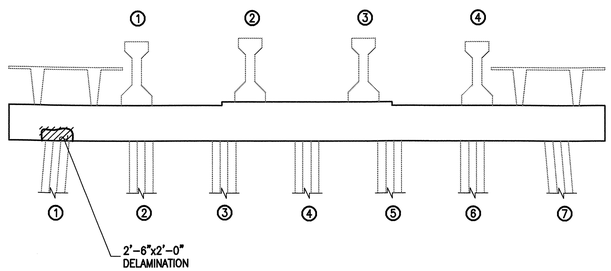


EAST ELEVATION

BENT #6



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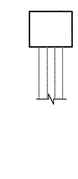

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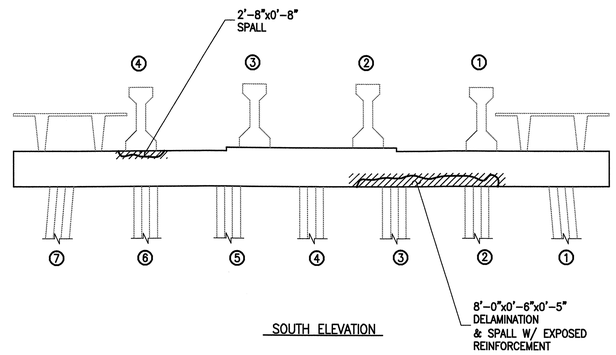
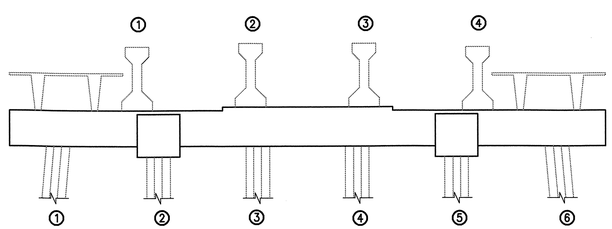


SOUTH ELEVATION

EAST ELEVATION

BENT #7



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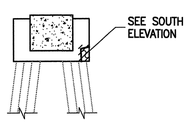
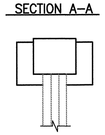


SECTION A-A



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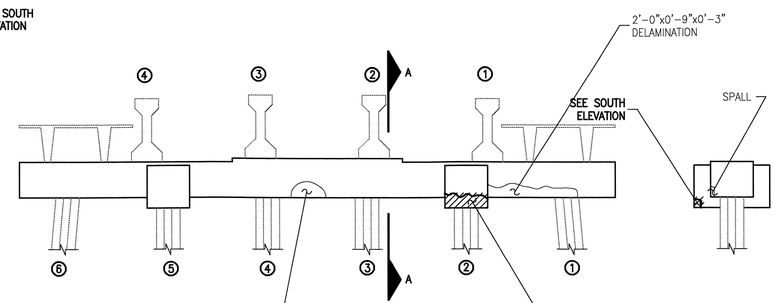

SOUTH ELEVATION

EAST ELEVATION

BENT #8

BILL OF MATERIAL

BENT #6			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	–	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

BENT #7			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	7	
EPOXY MORTAR (FORMED)	CF	–	

BENT #8			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

KEY

- DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
- GENERAL SHAPE OF DEFICIENCY
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT
- GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

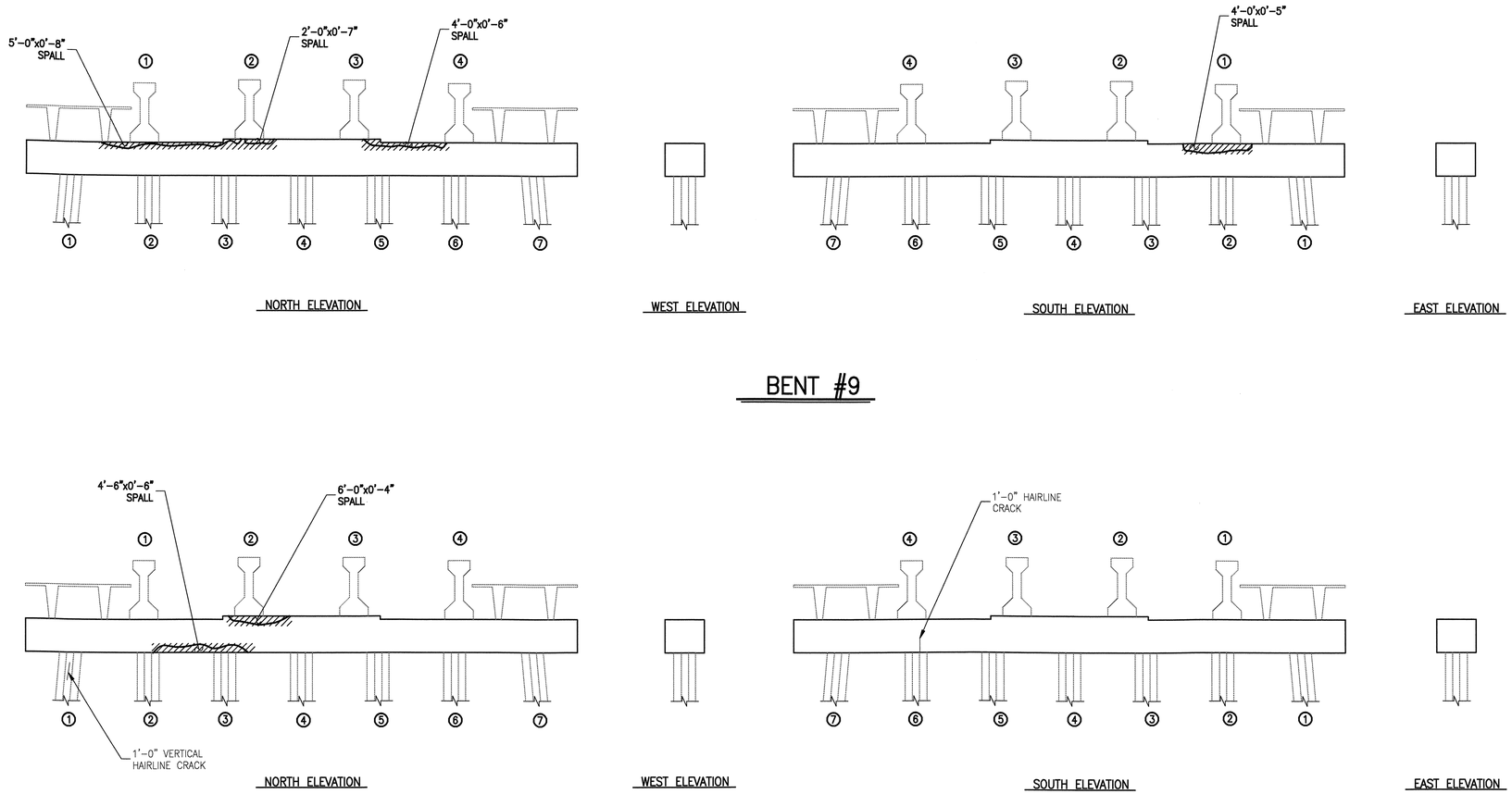
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
LOW LEVEL SUBSTRUCTURE
REPAIR LOCATIONS
BENT(S) #6–#8

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER E.D.L. BARTLETT 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	69
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G.R. COLS DATE 4/26/07
CHECKED BY F.E. ROBBINS DATE 4/26/07



BENT #9

BENT #10

BENT #11

BILL OF MATERIAL

BENT #9			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	3	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	40	
EPOXY MORTAR (FORMED)	CF	–	

BENT #10			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	16	
EPOXY MORTAR (FORMED)	CF	–	

BENT #11			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

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0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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DARE COUNTY

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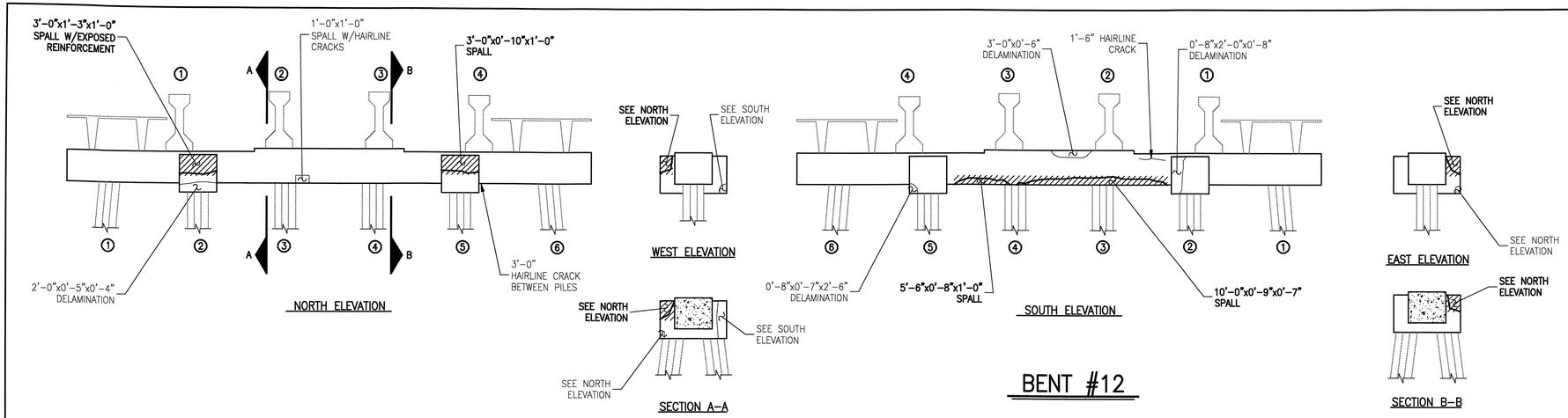
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
LOW LEVEL SUBSTRUCTURE
REPAIR LOCATIONS
BENT(S) #9–#11

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTLETT 7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	70
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G.R. COLS DATE 4/26/07
CHECKED BY F.E. ROBBINS DATE 4/26/07



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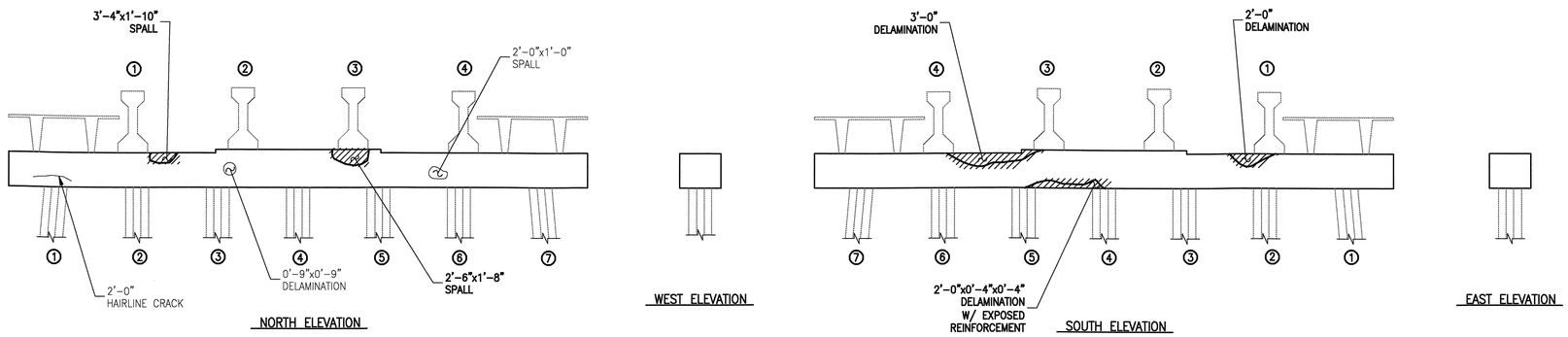

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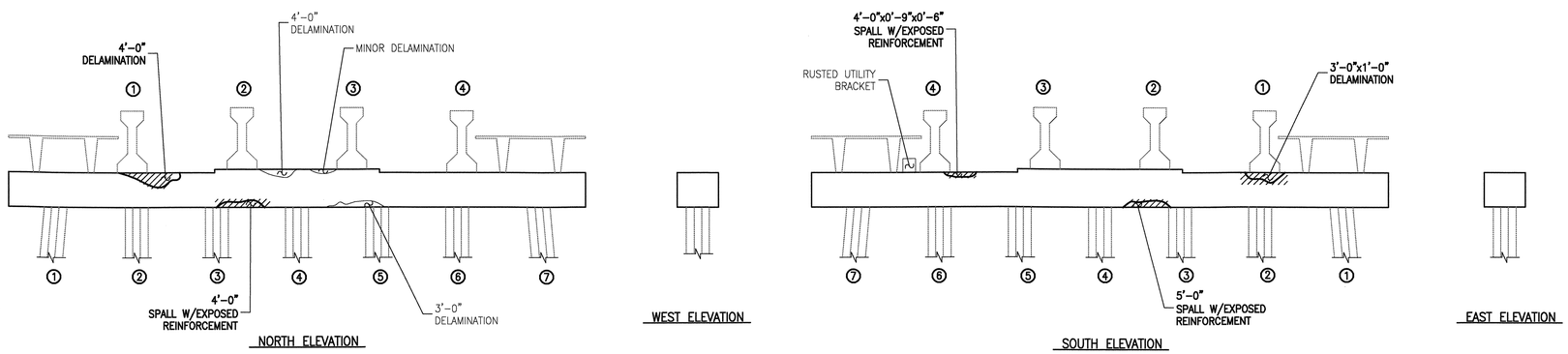

BENT #14

BILL OF MATERIAL

BENT #12			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	1	
VERTICAL SHOTCRETE	CF	5	
OVERHEAD SHOTCRETE	CF	5	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

BENT #13			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	5	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	22	
EPOXY MORTAR (FORMED)	CF	–	

BENT #14			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	4	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	29	
EPOXY MORTAR (FORMED)	CF	–	

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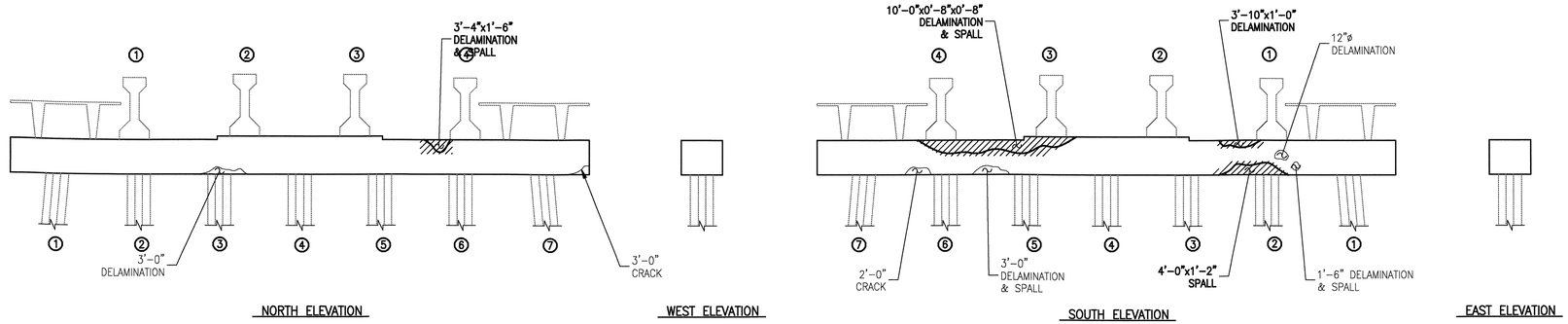
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
LOW LEVEL SUBSTRUCTURE
REPAIR LOCATIONS
BENT(S) #12–#14

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELT
7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	71
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G.R. COLS DATE 4/26/07
CHECKED BY F.E. ROBBINS DATE 4/26/07



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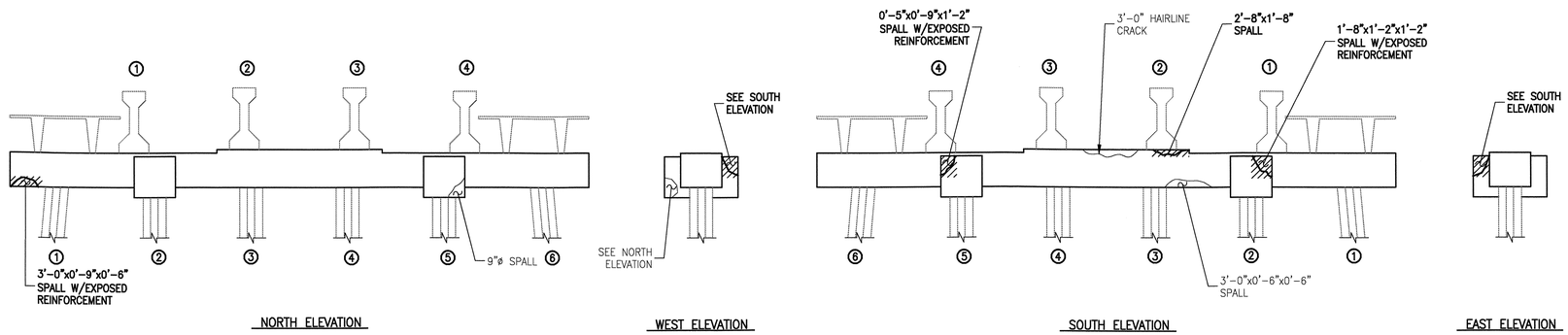

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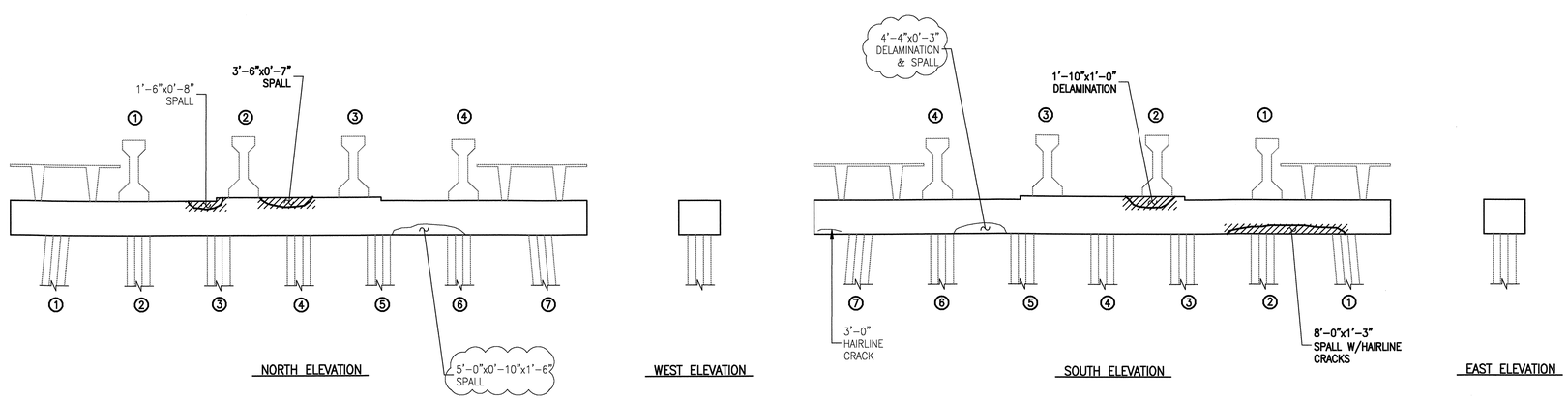

BENT #17

BILL OF MATERIAL

BENT #15			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	1	
VERTICAL SHOTCRETE	CF	7	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	46	
EPOXY MORTAR (FORMED)	CF	–	

BENT #16			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	1	
VERTICAL SHOTCRETE	CF	3	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	7	
EPOXY MORTAR (FORMED)	CF	–	

BENT #17			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	3	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	14	
EPOXY MORTAR (FORMED)	CF	–	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4911 Green Road Suite 107 Raleigh, NC 27616
Phone 919 981 0310 Fax 919 981 0451
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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

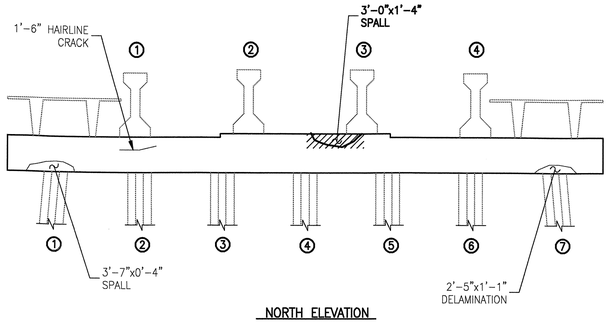
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
LOW LEVEL SUBSTRUCTURE
REPAIR LOCATIONS
BENT(S) #15–#17

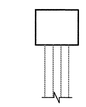
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER F.D.L. BARTLETT 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	72
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G.R. COLS DATE 4/26/07
CHECKED BY F.E. ROBBINS DATE 4/26/07



NORTH ELEVATION



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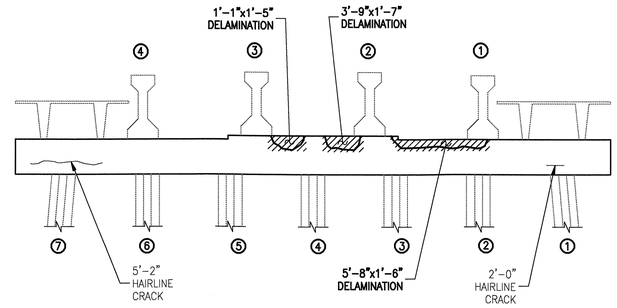

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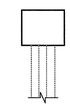
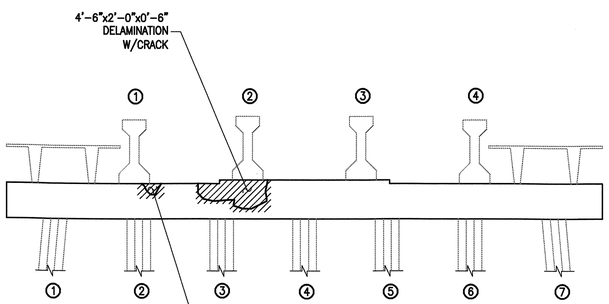


EAST ELEVATION

BENT #18



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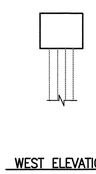

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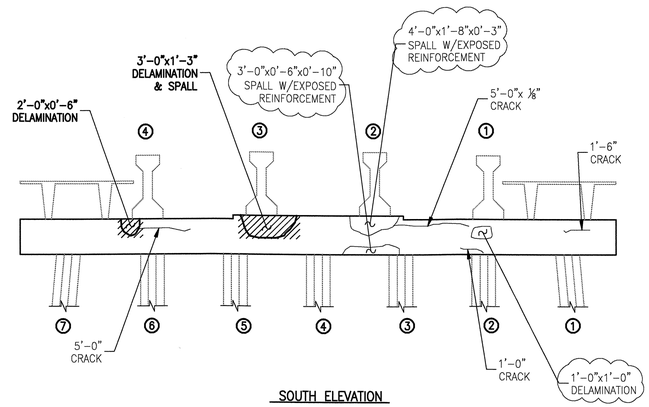

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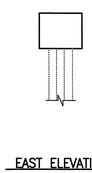
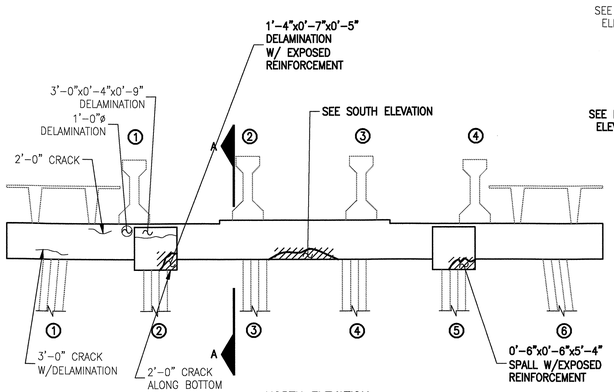


EAST ELEVATION

BENT #19



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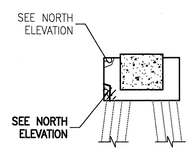
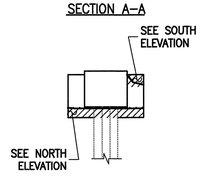


SECTION A-A



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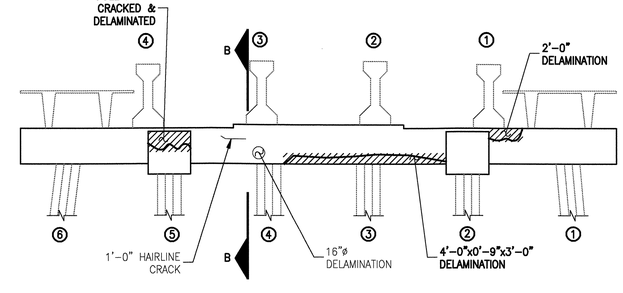

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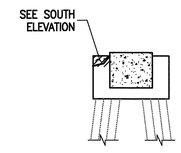

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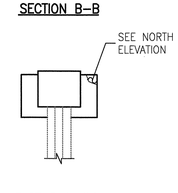

EAST ELEVATION

BENT #20

BILL OF MATERIAL

BENT #18			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	7	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	36	
EPOXY MORTAR (FORMED)	CF	–	

BENT #19			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	5	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	27	
EPOXY MORTAR (FORMED)	CF	–	

BENT #20			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	1	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	6	
ADDITIONAL REINFORCING	LBS	5	
EPOXY MORTAR (FORMED)	CF	–	

KEY

- DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
- GENERAL SHAPE OF DEFICIENCY
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT
- GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

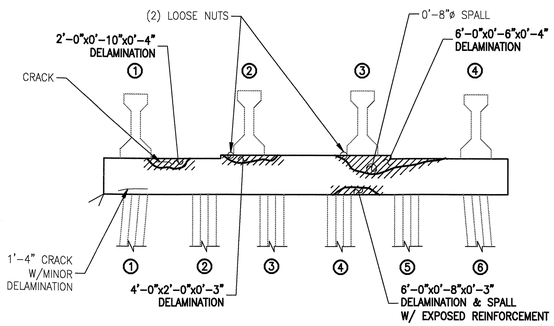
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
LOW LEVEL SUBSTRUCTURE
REPAIR LOCATIONS
BENT(S) #18–#20

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	73
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G.R. COLS DATE DATE
CHECKED BY F.E. ROBBINS DATE 4/26/07



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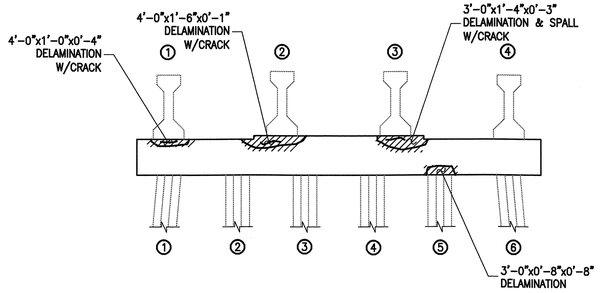

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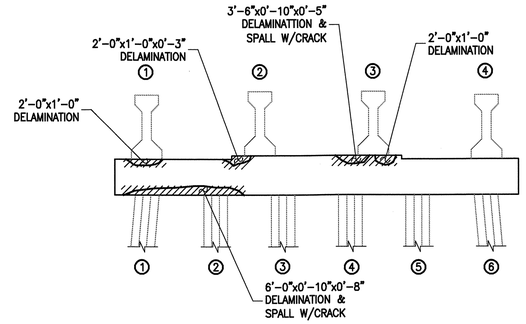


NORTH ELEVATION

EAST ELEVATION

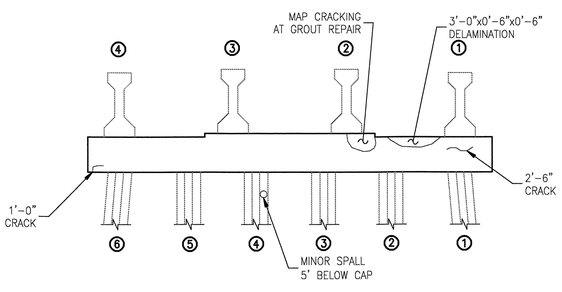
WEST ELEVATION

EAST ELEVATION

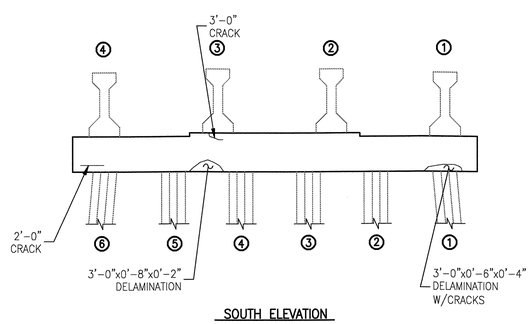
WEST ELEVATION

EAST ELEVATION

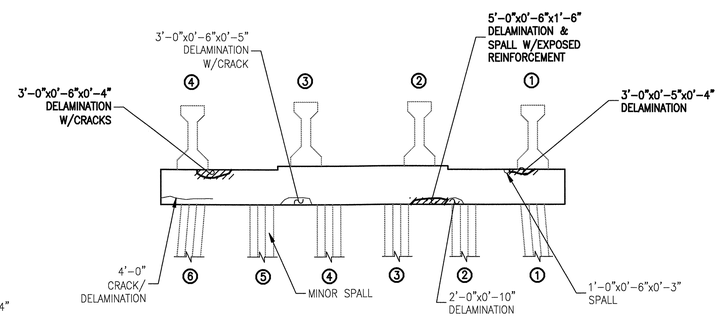
WEST ELEVATION



SOUTH ELEVATION



SOUTH ELEVATION



SOUTH ELEVATION

BENT #21

BENT #22

BENT #23

BILL OF MATERIAL

BENT #21

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	5	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	32	
EPOXY MORTAR (FORMED)	CF	–	

BENT #22

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	5	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	29	
EPOXY MORTAR (FORMED)	CF	–	

BENT #23

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	5	
OVERHEAD SHOTCRETE	CF	4	
ADDITIONAL REINFORCING	LBS	41	
EPOXY MORTAR (FORMED)	CF	–	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

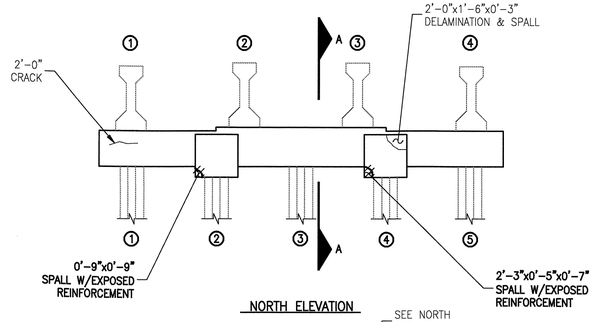
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
LOW LEVEL SUBSTRUCTURE
REPAIR LOCATIONS
BENT(S) #21–#23

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL
7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	74
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G.R. COLS DATE 4/26/07
CHECKED BY F.E. ROBBINS DATE 4/26/07



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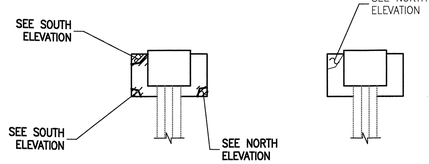
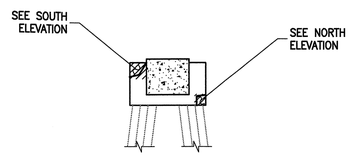
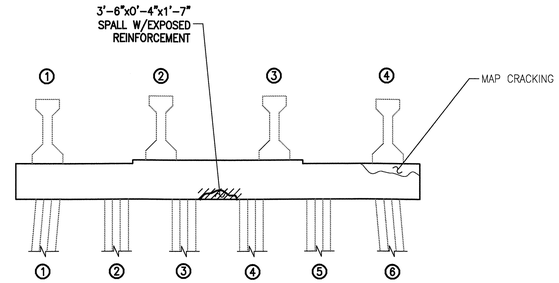


EAST ELEVATION WEST ELEVATION



SECTION A-A



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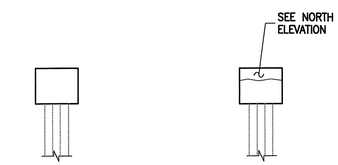

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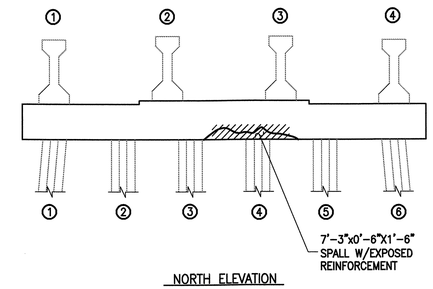
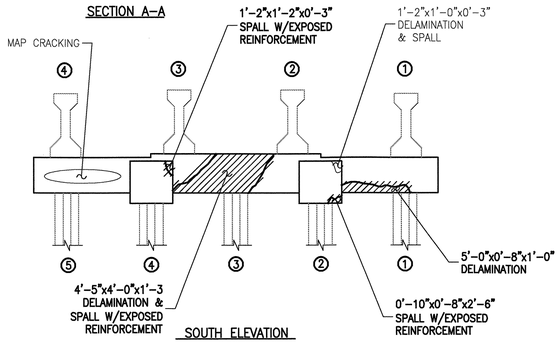


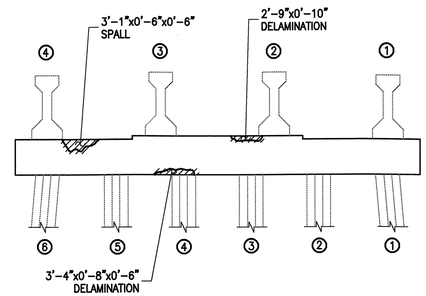
NORTH ELEVATION

EAST ELEVATION WEST ELEVATION



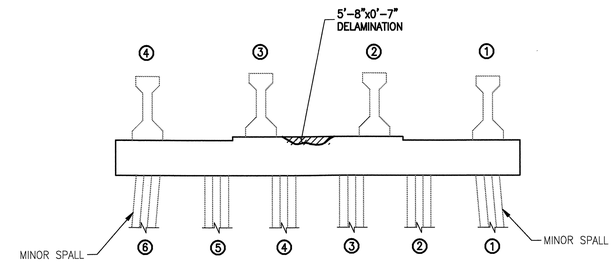
SOUTH ELEVATION

BENT #24



SOUTH ELEVATION

BENT #25



SOUTH ELEVATION

BENT #26

BILL OF MATERIAL

BENT #24

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	1	
VERTICAL SHOTCRETE	CF	6	
OVERHEAD SHOTCRETE	CF	6	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

BENT #25

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	3	
ADDITIONAL REINFORCING	LBS	16	
EPOXY MORTAR (FORMED)	CF	–	

BENT #26

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	4	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

KEY

- DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
- GENERAL SHAPE OF DEFICIENCY
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT
- GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

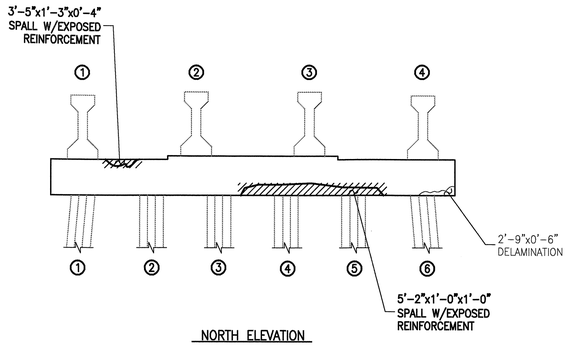
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
LOW LEVEL SUBSTRUCTURE
REPAIR LOCATIONS
BENT(S) #24–#26

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELT 4/26/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	75
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G.R. COLS DATE 4/26/17
CHECKED BY F.E. ROBBINS DATE 4/26/07



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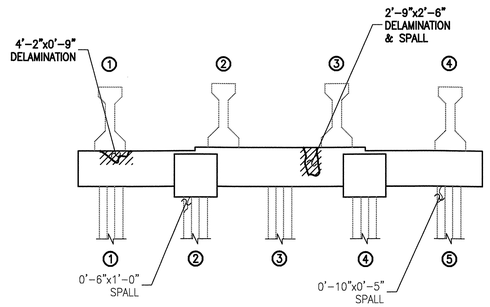

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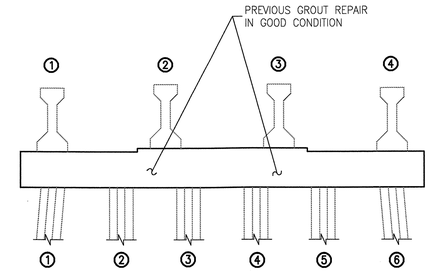
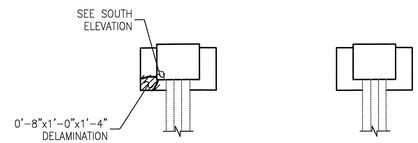
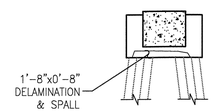


NORTH ELEVATION

EAST ELEVATION WEST ELEVATION

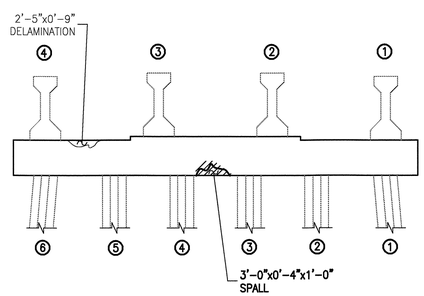


EAST ELEVATION WEST ELEVATION



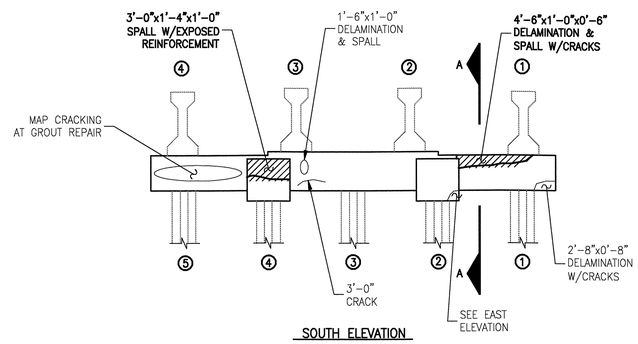
SECTION A-A

EAST ELEVATION WEST ELEVATION



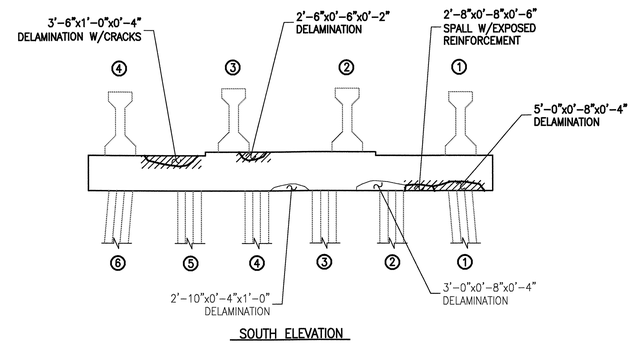
SOUTH ELEVATION

BENT #27



SOUTH ELEVATION

BENT #28



SOUTH ELEVATION

BENT #29

BILL OF MATERIAL

BENT #27			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	3	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

BENT #28			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	1	
VERTICAL SHOTCRETE	CF	7	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	23	
EPOXY MORTAR (FORMED)	CF	–	

BENT #29			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4911 Green Road Suite 107 Raleigh, NC 27616
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Email info@aogroup.com www.aogroup.com
AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

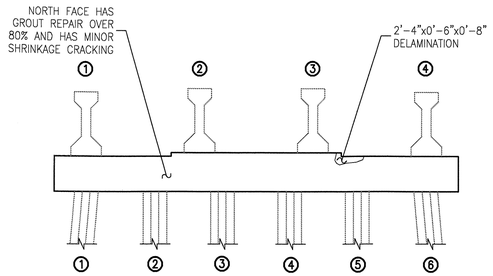
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
LOW LEVEL SUBSTRUCTURE
REPAIR LOCATIONS
BENT(S) #27–#29

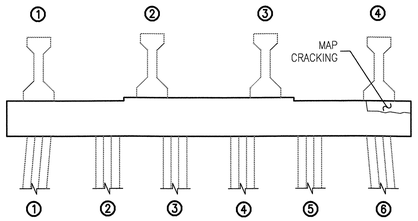
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL 9/20/07

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		76
1			3				TOTAL SHEETS
2			4				166

DRAWN BY G.R. COLS DATE 4/07
CHECKED BY M.T. MILLS DATE 4/07



NORTH ELEVATION



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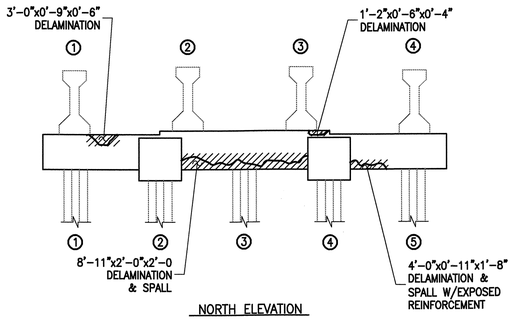
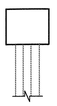


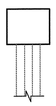
NORTH ELEVATION

EAST ELEVATION

WEST ELEVATION



EAST ELEVATION



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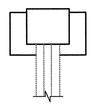

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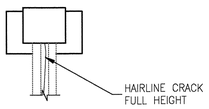
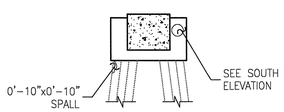
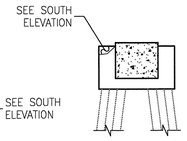


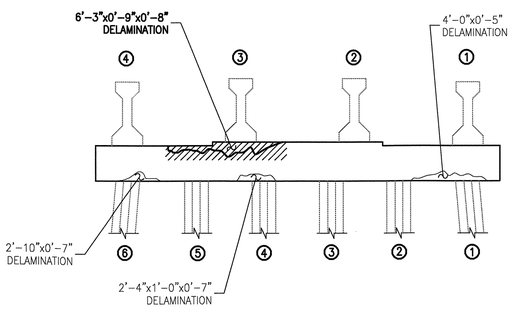
WEST ELEVATION



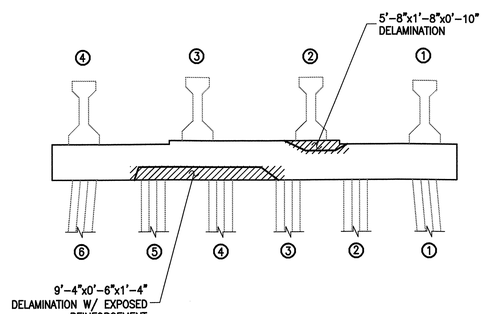
SECTION A-A



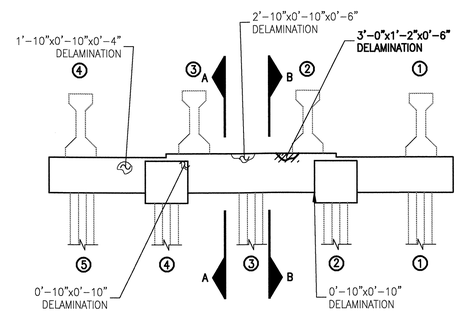
SECTION B-B



SOUTH ELEVATION



SOUTH ELEVATION



SOUTH ELEVATION

BENT #30

BENT #31

BENT #32

BILL OF MATERIAL

BENT #30			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	1	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	17	
EPOXY MORTAR (FORMED)	CF	–	

BENT #31			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	1	
VERTICAL SHOTCRETE	CF	3	
OVERHEAD SHOTCRETE	CF	5	
ADDITIONAL REINFORCING	LBS	15	
EPOXY MORTAR (FORMED)	CF	–	

BENT #32			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	7	
OVERHEAD SHOTCRETE	CF	9	
ADDITIONAL REINFORCING	LBS	19	
EPOXY MORTAR (FORMED)	CF	–	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

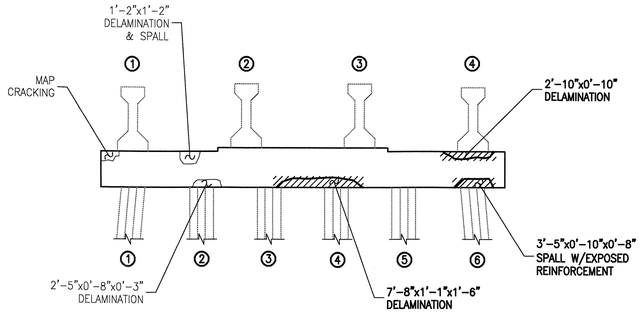
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
LOW LEVEL SUBSTRUCTURE
REPAIR LOCATIONS
BENT(S) #30–#32

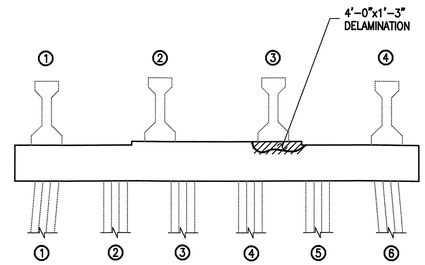
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER JED L. BARTELL 4/26/07

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		77
1			3				TOTAL SHEETS
2			4				166

DRAWN BY G.R. COLS DATE 4/26/07
CHECKED BY F.E. ROBBINS DATE 4/26/07



NORTH ELEVATION



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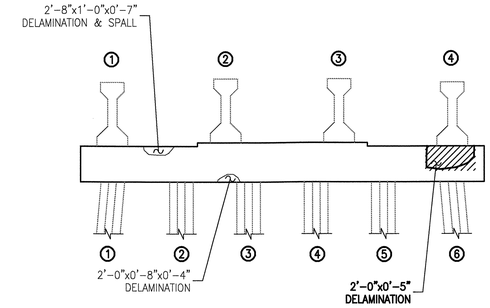
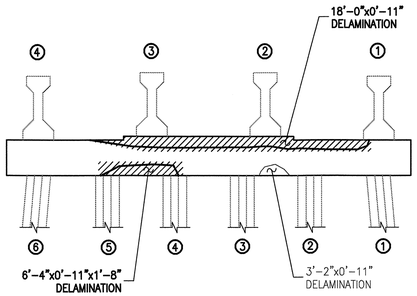


NORTH ELEVATION

EAST ELEVATION WEST ELEVATION

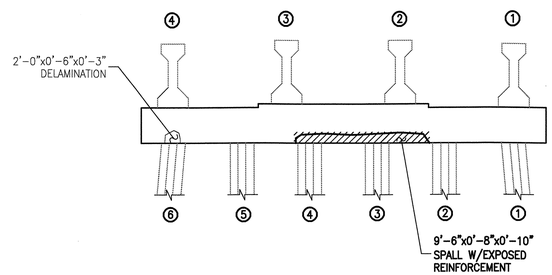
EAST ELEVATION WEST ELEVATION

EAST ELEVATION WEST ELEVATION



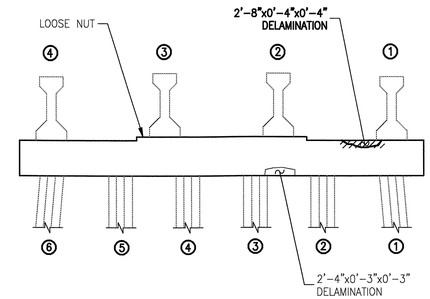
SOUTH ELEVATION

BENT #33



SOUTH ELEVATION

BENT #34



SOUTH ELEVATION

BENT #35

BILL OF MATERIAL

BENT #33

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	9	
OVERHEAD SHOTCRETE	CF	8	
ADDITIONAL REINFORCING	LBS	56	
EPOXY MORTAR (FORMED)	CF	–	

BENT #34

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	3	
ADDITIONAL REINFORCING	LBS	11	
EPOXY MORTAR (FORMED)	CF	–	

BENT #35

REPAIR TYPE	QUANTITIES UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	7	
EPOXY MORTAR (FORMED)	CF	–	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHAPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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CIVIL & STRUCTURAL ENGINEERS
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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

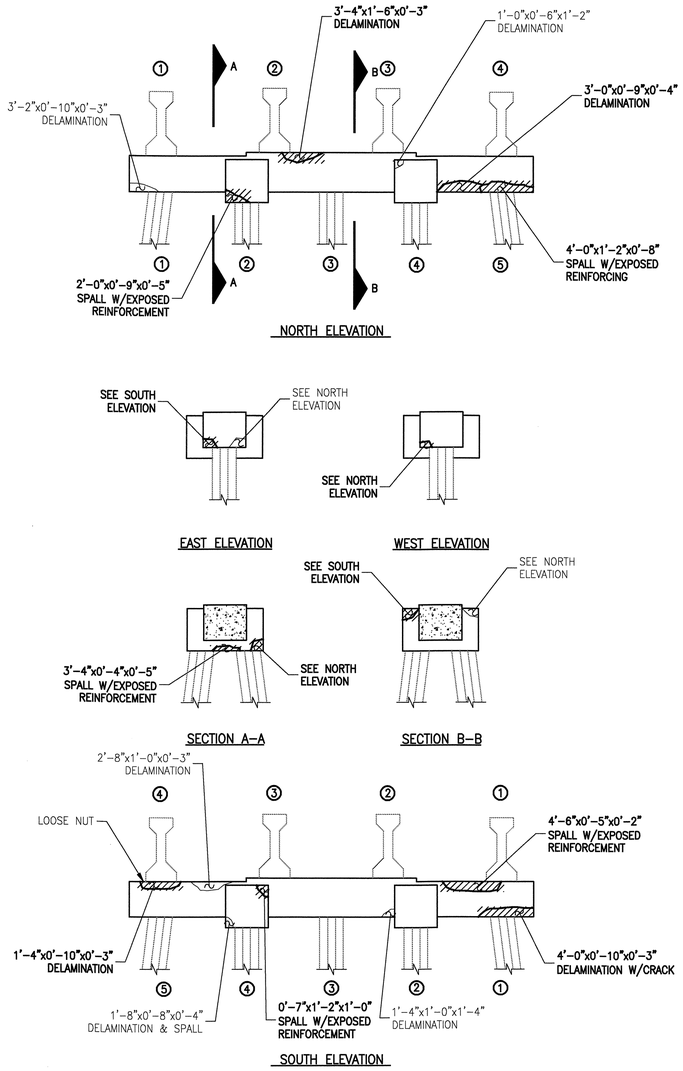
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
LOW LEVEL SUBSTRUCTURE
REPAIR LOCATIONS
BENT(S) #33–#35

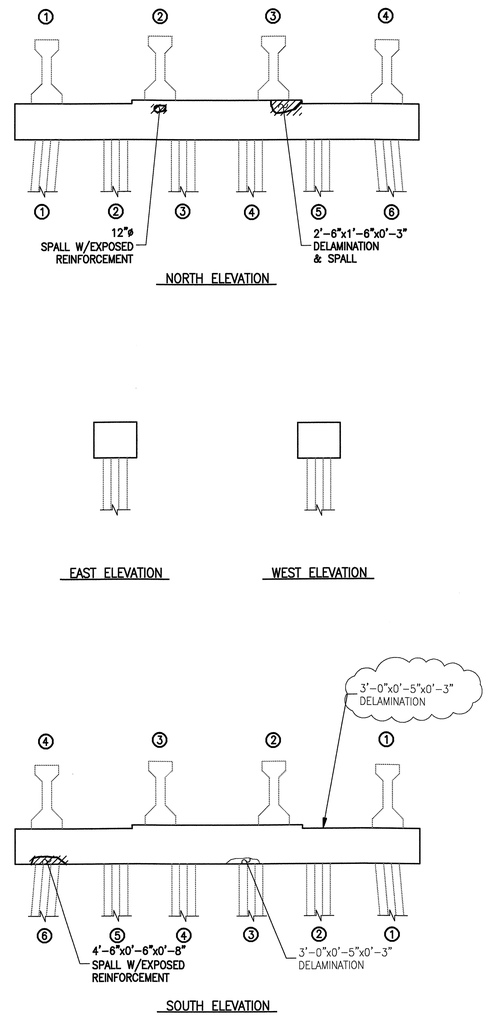
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	78
1			3			TOTAL SHEETS
2			4			166

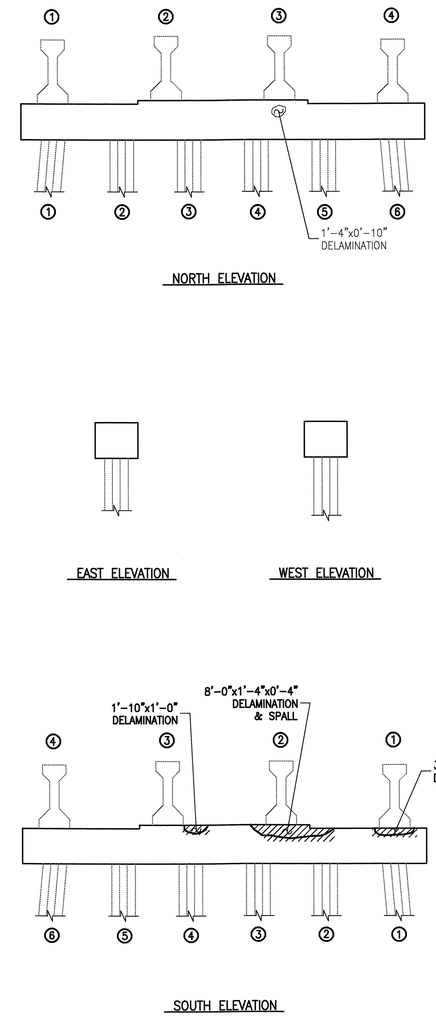
DRAWN BY G.R. COLS DATE 4/26/07
CHECKED BY F.E. ROBBINS DATE 4/26/07



BENT #36



BENT #37



BENT #38

BILL OF MATERIAL

BENT #36			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	1	
VERTICAL SHOTCRETE	CF	4	
OVERHEAD SHOTCRETE	CF	5	
ADDITIONAL REINFORCING	LBS	24	
EPOXY MORTAR (FORMED)	CF	–	

BENT #37			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	7	
EPOXY MORTAR (FORMED)	CF	–	

BENT #38			
REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	5	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	34	
EPOXY MORTAR (FORMED)	CF	–	

KEY

- ▨ – DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
- ⬭ – GENERAL SHAPE OF DEFICIENCY
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT
- ⬭ – GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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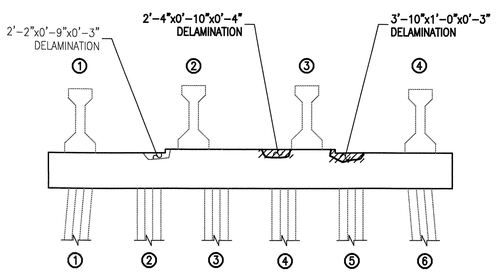
BONNER BRIDGE REPAIR
LOW LEVEL SUBSTRUCTURE
REPAIR LOCATIONS
BENT(S) #36–#38

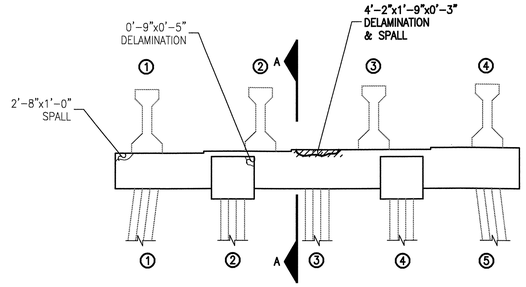
NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER EDIL BARTELL 7/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	79
1			3			TOTAL SHEETS
2			4			166

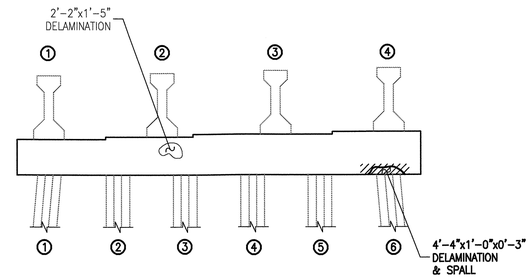
DRAWN BY G.R. COLS DATE 4/26/07
CHECKED BY F.E. ROBBINS DATE 4/26/07



NORTH ELEVATION



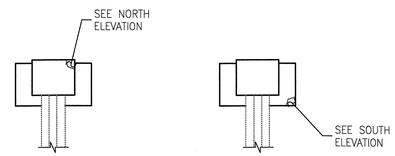
NORTH ELEVATION



NORTH ELEVATION

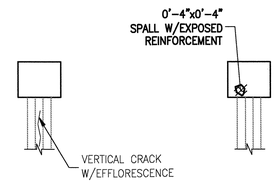
EAST ELEVATION

WEST ELEVATION



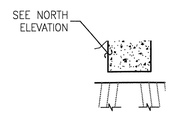
EAST ELEVATION

WEST ELEVATION

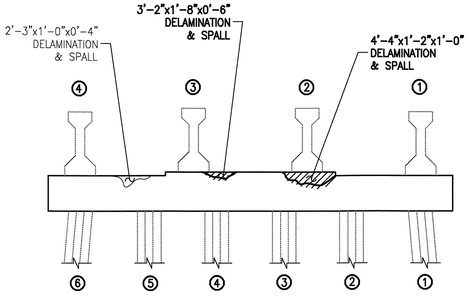


EAST ELEVATION

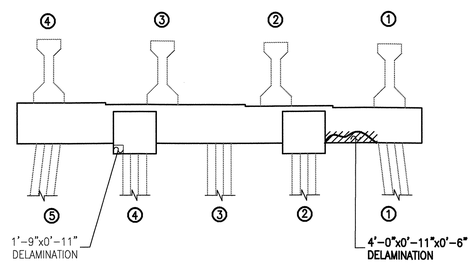
WEST ELEVATION



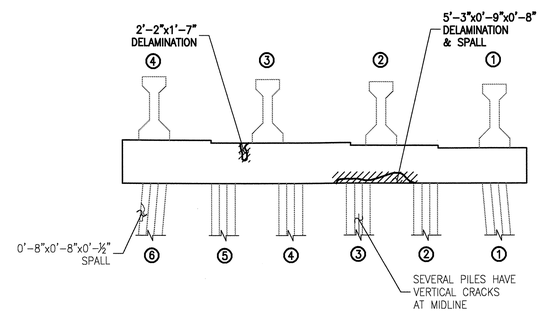
SECTION A–A



SOUTH ELEVATION



SOUTH ELEVATION



SOUTH ELEVATION

BENT #39

BENT #40

BENT #41

BILL OF MATERIAL

BENT #39

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	1	
VERTICAL SHOTCRETE	CF	6	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	26	
EPOXY MORTAR (FORMED)	CF	–	

BENT #40

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	3	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

BENT #41

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	2	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

KEY

– DENOTES GENERAL AREA OF REPAIR

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION

– GENERAL SHOPE OF DEFICIENCY

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT

– GENERAL SHOPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT

0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

PLAN PREPARED BY:

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AOG PROJ. NO. 2007.015

PROJECT NO. B-5014

DARE COUNTY

BRIDGE NO. 11

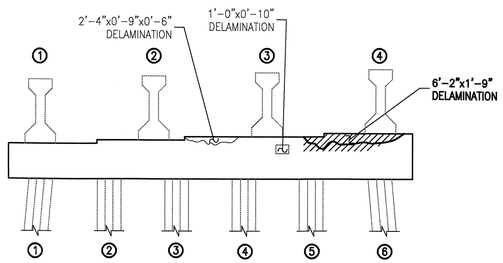
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BONNER BRIDGE REPAIR
LOW LEVEL SUBSTRUCTURE
REPAIR LOCATIONS
BENT(S) #39–#41

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL 9/20/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	80
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G.R. COLS DATE 4/26/07
CHECKED BY F.E. ROBBINS DATE 4/26/07



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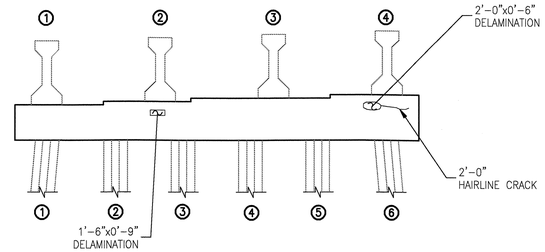

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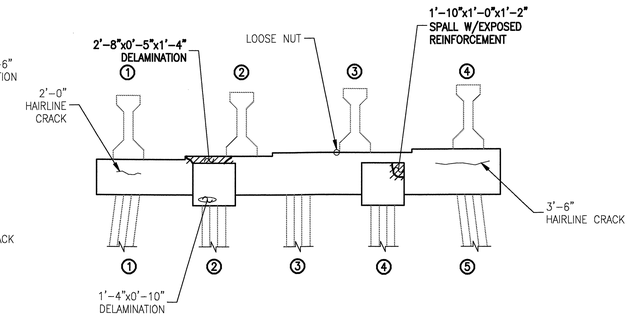
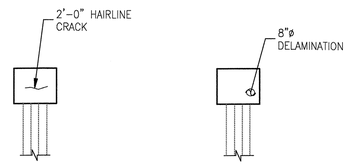


NORTH ELEVATION

EAST ELEVATION

WEST ELEVATION



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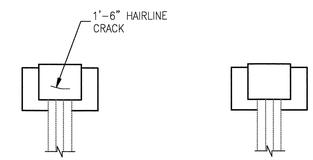
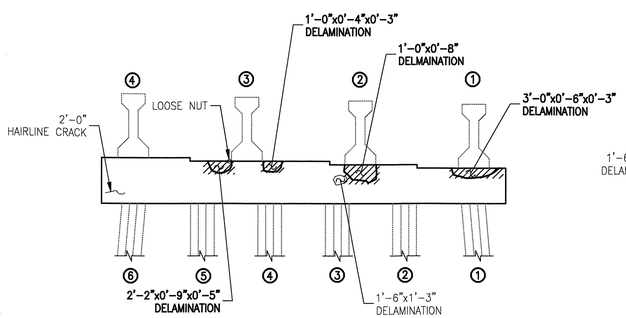
WEST ELEVATION

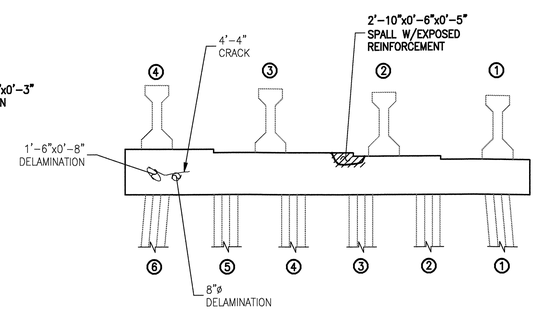


EAST ELEVATION

WEST ELEVATION



SOUTH ELEVATION



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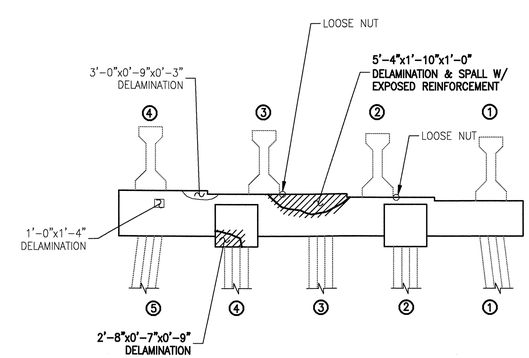

SOUTH ELEVATION

BENT #42

BENT #43

BENT #44

BILL OF MATERIAL

BENT #42

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	5	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	36	
EPOXY MORTAR (FORMED)	CF	–	

BENT #43

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	–	
VERTICAL SHOTCRETE	CF	1	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	–	
EPOXY MORTAR (FORMED)	CF	–	

BENT #44

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	2	
VERTICAL SHOTCRETE	CF	5	
OVERHEAD SHOTCRETE	CF	1	
ADDITIONAL REINFORCING	LBS	21	
EPOXY MORTAR (FORMED)	CF	–	

KEY

- DENOTES GENERAL AREA OF REPAIR
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION
- GENERAL SHAPE OF DEFICIENCY
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES FIELD MEASURED AREA IN 4/06 INSPECTION NOT REPAIRED IN THIS CONTRACT
- GENERAL SHAPE OF DEFICIENCY NOT REPAIRED IN THIS CONTRACT
- 0'-9"x8'-1"x0'-6" (HORIZ)x(VERT)x(DEPTH) – DENOTES AREA PREVIOUSLY REPAIRED NOT REPAIRED IN THIS CONTRACT

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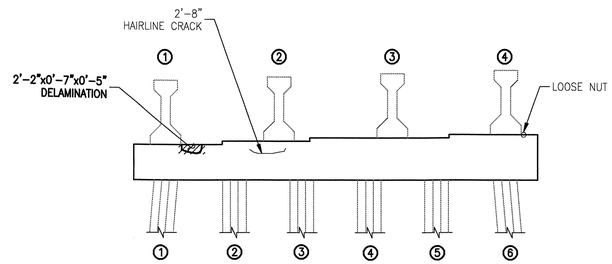
RALEIGH

BONNER BRIDGE REPAIR
LOW LEVEL SUBSTRUCTURE
REPAIR LOCATIONS
BENT(S) #42–#44

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER 14455 TED L. BARTELL 4/26/07

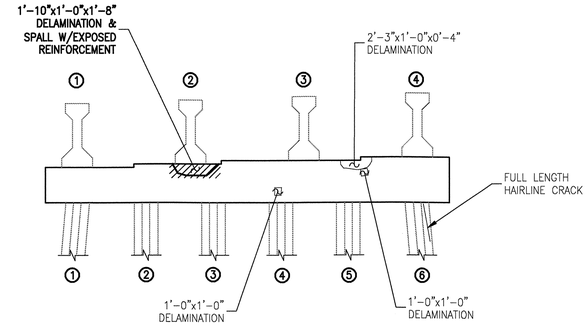
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	81
1			3			TOTAL SHEETS
2			4			166

DRAWN BY G.R. COLS DATE 4/26/07
CHECKED BY F.E. ROBBINS DATE 4/26/07



NORTH ELEVATION

EAST ELEVATION WEST ELEVATION



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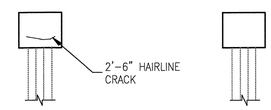
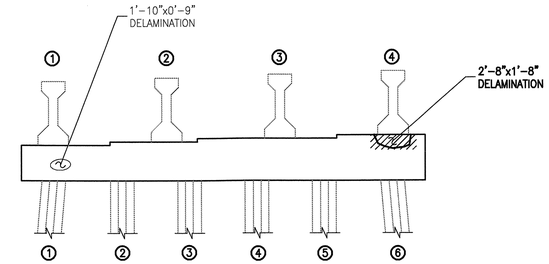


EAST ELEVATION WEST ELEVATION



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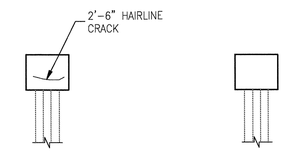

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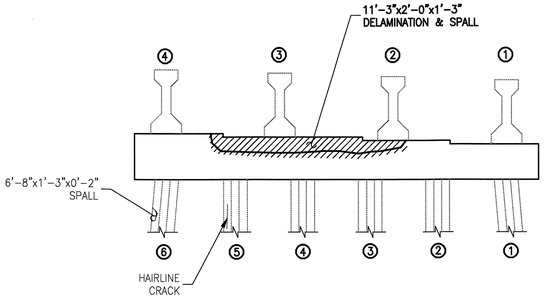
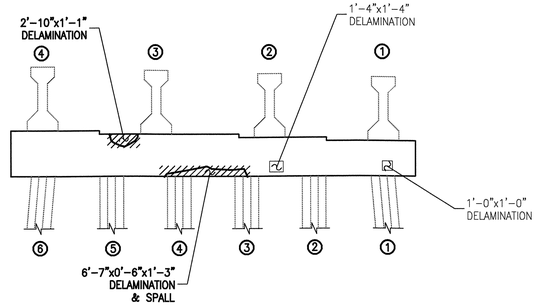


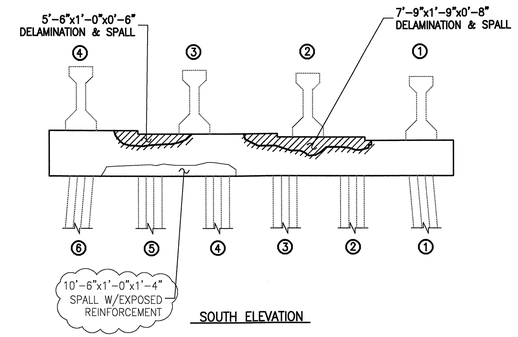
SOUTH ELEVATION

BENT #45



SOUTH ELEVATION

BENT #46



SOUTH ELEVATION

BENT #47

BILL OF MATERIAL

BENT #45

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	3	
VERTICAL SHOTCRETE	CF	9	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	36	
EPOXY MORTAR (FORMED)	CF	–	

BENT #46

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	1	
VERTICAL SHOTCRETE	CF	2	
OVERHEAD SHOTCRETE	CF	3	
ADDITIONAL REINFORCING	LBS	5	
EPOXY MORTAR (FORMED)	CF	–	

BENT #47

REPAIR TYPE	QUANTITIES		
	UNIT		ACTUAL
HORIZONTAL SHOTCRETE	CF	1	
VERTICAL SHOTCRETE	CF	9	
OVERHEAD SHOTCRETE	CF	–	
ADDITIONAL REINFORCING	LBS	43	
EPOXY MORTAR (FORMED)	CF	–	

KEY

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BONNER BRIDGE REPAIR
LOW LEVEL SUBSTRUCTURE
REPAIR LOCATIONS
BENT(S) #45–#47

NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER FED L. BARTELL
7/26/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	82
1			3			TOTAL SHEETS
2			4			166

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