17BP.5.P.2

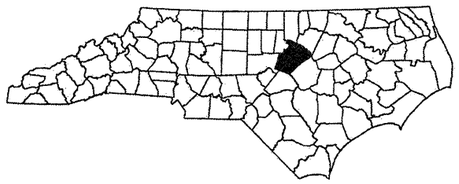
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.P.2	1	

STATE PROJ.NO.	F.A. PROJ.NO.	DESCRIPTION
17BP.5.P.2		P.E.
17BP.5.P.2		CONST.

STATE OF NORTH CAROLINA

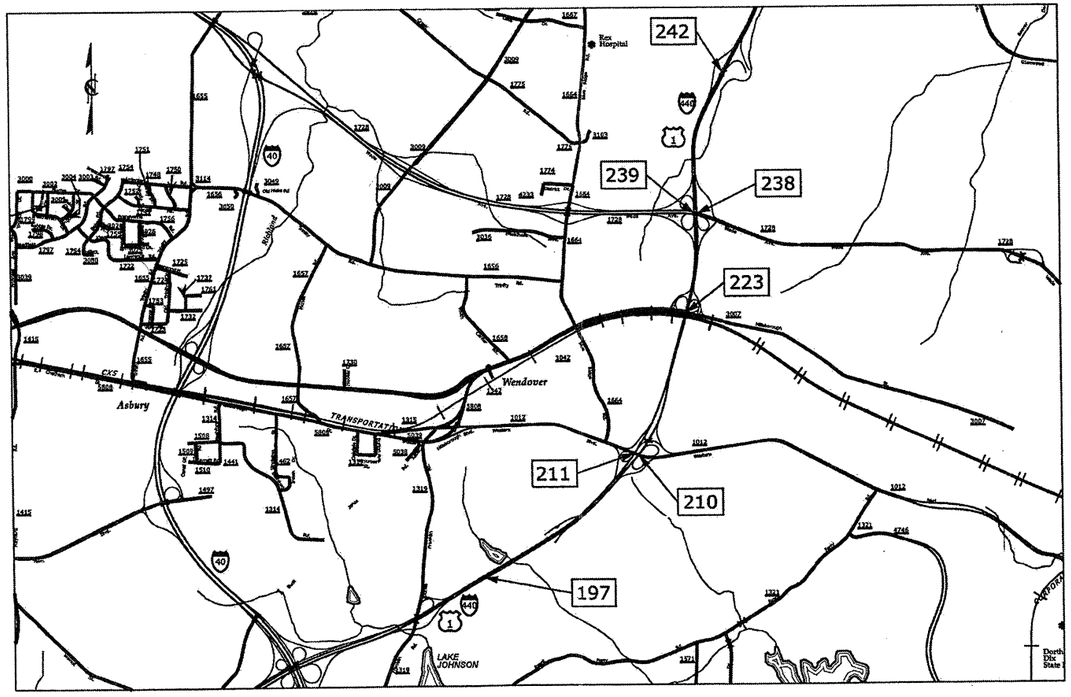
DIVISION OF HIGHWAYS

WAKE COUNTY



LOCATION: BRIDGE NO. 197 ON ATHENS DRIVE OVER I-440, BRIDGE NO. 210 & NO. 211 ON I-440 OVER SR1012 (WESTERN BLVD.), BRIDGE NO. 223 ON I-440 OVER SR3007 (HILLSBOROUGH ST.) & NS RAILROAD, BRIDGE NO. 238 & NO. 239 ON I-440 OVER SR 1728 (WADE AVE.) AND BRIDGE NO. 242 ON I-440 OVER SR1676 (LAKE BOONE TRAIL)

TYPE OF WORK: BRIDGE PRESERVATION: HYDRODEMOLITION, LMC OVERLAY, EPOXY OVERLAY & SUBSTRUCTURE REPAIRS



STRUCTURES

DESIGN DATA

PROJECT LENGTH

LENGTH ROADWAY OF PROJECT = 0.01 MILES
LENGTH STRUCTURE OF PROJECT = 0.33 MILES
TOTAL LENGTH OF STATE PROJECT = 0.34 MILES

Prepared In the Office of:
HDR Engineering, Inc. of the Carolinas
N.C.B.E.L.S. License Number: F-0116
3733 National Drive, Suite 207 Raleigh, N.C. 27612

2012 STANDARD SPECIFICATIONS

LETTING DATE :

May 15, 2012

MATTHEW MOYER, P.E.
PROJECT ENGINEER

STRUCTURES MANAGMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

NORTH CAROLINA PROFESSIONAL SEAL 20208 ENGINEER ERIC B. NELSON, JR. 2/15/12

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER 2-15-12

P.E.
BRIDGE DESIGN ENGINEER

CONTRACT: C202963

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17BP.5.P.2

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.P.2	1A	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
17BP.5.P.2		P.E.
17BP.5.P.2		CONST.

LOCATION: BRIDGE NO. 197 ON ATHENS DRIVE OVER I-440, BRIDGE NO. 210 & NO. 211 ON I-440 OVER SR1012 (WESTERN BLVD.), BRIDGE NO. 223 ON I-440 OVER SR3007 (HILLSBOROUGH ST.) & NS RAILROAD, BRIDGE NO. 238 & NO. 239 ON I-440 OVER SR 1728 (WADE AVE.) AND BRIDGE NO. 242 ON I-440 OVER SR1676 (LAKE BOONE TRAIL)

TYPE OF WORK: BRIDGE PRESERVATION: HYDRODEMOLITION, LMC OVERLAY, EPOXY OVERLAY & SUBSTRUCTURE REPAIRS

INDEX OF SHEETS

STRUCTURES

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Prepared In the Office of:
HDR Engineering, Inc. of the Carolinas
N.C.B.E.L.S. License Number: F-0116
3733 National Drive, Suite 207 Raleigh, N.C. 27612

2012 STANDARD SPECIFICATIONS

LETTING DATE :
May 15, 2012

MATTHEW MOYER, P.E.
PROJECT ENGINEER

STRUCTURES MANAGMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

NORTH CAROLINA PROFESSIONAL SEAL 20208 ENGINEER ERIC B. NELSON, JR.
2/15/12

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER
2-15-12

P.E.
BRIDGE DESIGN ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
WBS 17BP.5.P.2	2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202963

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
1297000000-E	607	771	SY	MILLING ASPHALT PAVEMENT, ***" DEPTH (5/8")
1330000000-E	607	156	SY	INCIDENTAL MILLING
1525000000-E	610	13	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1575000000-E	620	1	TON	ASPHALT BINDER FOR PLANT MIX
4400000000-E	1110	224	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	664	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	64	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	4	EA	FLASHING ARROW BOARD
4420000000-N	1120	4	EA	PORTABLE CHANGEABLE MESSAGE SIGN
4430000000-N	1130	101	EA	DRUMS
4435000000-N	1135	26	EA	CONES
4445000000-E	1145	100	LF	BARRICADES (TYPE III)
4455000000-N	1150	20	DAY	FLAGGER
4480000000-N	1165	3	EA	TMA
4510000000-N	SP	1,000	HR	LAW ENFORCEMENT
4516000000-N	1180	35	EA	SKINNY DRUM
4726100000-E	1205	4	EA	HEATED-IN-PLACE THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS)
4810000000-E	1205	428	LF	PAINT PAVEMENT MARKING LINES (4")
4815000000-E	1205	5,583	LF	PAINT PAVEMENT MARKING LINES (6")
4845000000-N	1205	4	EA	PAINT PAVEMENT MARKING SYMBOL
4847000000-E	1205	856	LF	POLYUREA PAVEMENT MARKING LINES (4", **********) (HIGHLY REFLECTIVE ELEMENTS)
4847100000-E	1205	5,583	LF	POLYUREA PAVEMENT MARKING LINES (6", **********) (HIGHLY REFLECTIVE ELEMENTS)

ItemNumber	Sec #	Quantity	Unit	Description
4900000000-N	1251	64	EA	PERMANENT RAISED PAVEMENT MARKERS
5255000000-N	1413	Lump Sum		PORTABLE LIGHTING
8161000000-E	420	36,756	SF	GROOVING BRIDGE FLOORS
8217000000-E	425	40	LB	REINFORCING STEEL (BRIDGE)
8660000000-E	SP	58	CF	CONCRETE REPAIRS
8664000000-E	SP	83	CF	SHOTCRETE REPAIRS
8692000000-N	SP	Lump Sum		FOAM JOINT SEALS
8860000000-N	SP	Lump Sum		GENERIC STRUCTURE ITEM BRIDGE JACKING
8860000000-N	SP	Lump Sum		GENERIC STRUCTURE ITEM CLEANING & PAINTING EXISTING BEARING PLATES
8881000000-E	SP	239	CY	GENERIC STRUCTURE ITEM LATEX MODIFIED CONCRETE OVER-LAY - VERY EARLY STRENGTH
8892000000-E	SP	19,486	SF	GENERIC STRUCTURE ITEM CLASS II CONC DECK REPAIRS FOR EPOXY OR ASPHALT OVERLAY
8892000000-E	SP	62,450	SF	GENERIC STRUCTURE ITEM PLACEMENT OF EPOXY OVERLAY
8892000000-E	SP	62,450	SF	GENERIC STRUCTURE ITEM PLACEMENT OF PRE-TREATMENT
8893000000-E	SP	4,439	SY	GENERIC STRUCTURE ITEM HYDRO-DEMOLITION OF BRIDGE DECK
8893000000-E	SP	4,439	SY	GENERIC STRUCTURE ITEM PLACING & FINISHING LATEX MOD CONC OVERLAY - VERY EARLY STRENGTH
8893000000-E	SP	4,439	SY	GENERIC STRUCTURE ITEM SCARIFYING BRIDGE DECK

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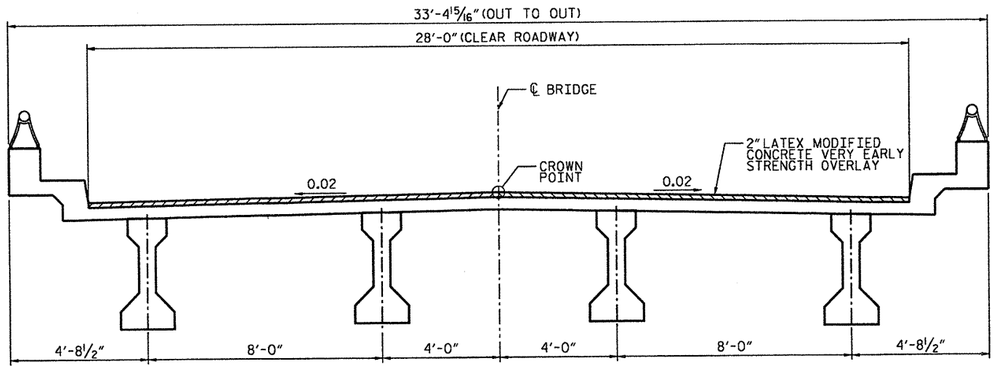
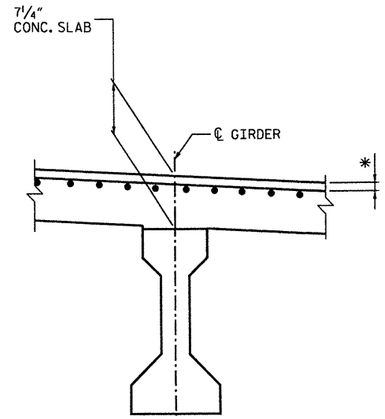


TYPICAL SECTION



EXISTING SLAB SECTION

BOTTOM MAT OF REINFORCING NOT SHOWN FOR CLARITY.
* SEE "REIFORCEMENT DEPTH TABLE.

REINFORCEMENT DEPTH	
SPAN	AVERAGE TOP BAR COVER (IN)
1	1.45
2	1.94
3	0.99
4	1.64

NOTES

FOR "HYDRO-DEMOLITION OF BRIDGE DECK", SEE SPECIAL PROVISIONS.

THE CONTRACTOR MUST COLLECT, TREAT AND DISPOSE OF RUN-OFF WATER FROM THE HYDRO-DEMOLITION PROCESS. SEE "MANAGING HYDRO-DEMOLITION WATER" SPECIAL PROVISIONS.

THE BOUNDARIES OF AREAS IDENTIFIED FOR CLASS III SURFACE PREPARATION ARE APPROXIMATE. IF ANY CLASS III LOCATIONS ARE ENCOUNTERED PRIOR TO OR DURING HYDRO-DEMOLITION, SEE "TYPICAL "BLOW THRU" CONTAINMENT AND FORMWORK" DETAIL. THE CONTRACTOR SHALL PROVIDE A METHOD OF HANDLING UNEXPECTED BLOW THROUGH WORK OF THE DECK.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2 1/2" AT BENTS. FOR "FOAM JOINT SEALS", SEE SPECIAL PROVISIONS.

FOR "ELASTOMERIC CONCRETE", SEE SPECIAL PROVISIONS.

LATEX MODIFIED CONCRETE SHALL BE LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH.

FOR "LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH", SEE SPECIAL PROVISIONS.

FOR GROOVING BRIDGE FLOORS INFORMATION, SEE "LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH" SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

EXISTING JOINTS AND BRIDGE DECK DRAINS SHALL BE SEALED PRIOR TO BEGINNING SURFACE PREPARATION OF BRIDGE DECK.

EXISTING DIMENSIONS AND BRIDGE CONDITION ARE FROM THE BEST INFORMATION AVAILABLE. THE CONTRACTOR SHALL VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.

FOR SCARIFYING BRIDGE DECK, SEE SPECIAL PROVISIONS.

FOR CLEANING AND PAINTING EXISTING BEARING PLATES, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

SCARIFYING BRIDGE DECK	* CLASS I SURFACE PREPARATION	* CLASS II SURFACE PREPARATION	* CLASS III SURFACE PREPARATION	CONCRETE REPAIRS	* CLASS AA CONCRETE	HYDRO-DEMOLITION OF BRIDGE DECK	LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH OVERLAY	PLACING & FINISHING LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH OVERLAY	FOAM JOINT SEALS	GROOVING BRIDGE FLOORS	CLEANING AND PAINTING EXISITNG BEARING PLATES	SHOTCRETE REPAIRS	REINFORCING STEEL	ASPHALT CONCRETE SURFACE COURSE TYPE SF 9.5A	INCIDENTAL MILLING	BRIDGE JACKING
SQ. YDS.	SQ. YDS.	SQ. YDS.	SQ. YDS.	CU. FT.	CU. YDS.	SQ. YDS.	CU. YDS.	SQ. YDS.	LUMP SUM	SQ. FT.	LUMP SUM	CU. FT.	LBS.	TONS	SQ. YDS.	LUMP SUM
666	0	0	0	58	0	666	42	666	LUMP SUM	5229	LUMP SUM	83	40	13	156	LUMP SUM

* QUANTITY SHOWN IS FOR INFORMATION ONLY.

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO.: 197

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION FOR BRIDGE NO. 197

(ATHENS DRIVE OVER I-440)

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER
2-15-12

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

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

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

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USER: dwagner DATE: 2/15/2012
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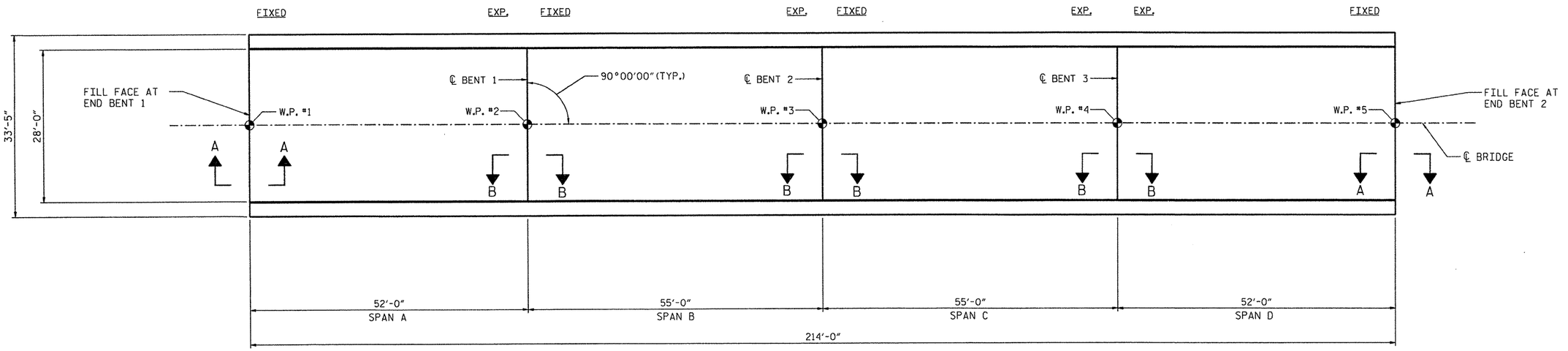
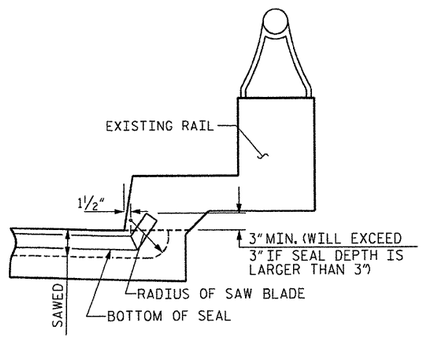
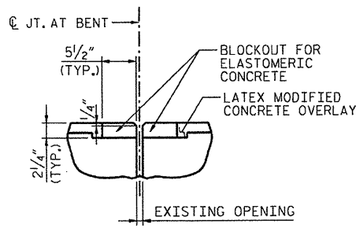


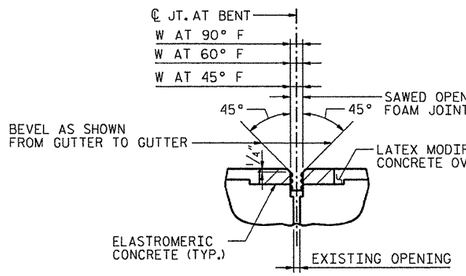
PLAN VIEW



JOINT DETAIL AT RAIL



FOAM JOINT SEAL
PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS

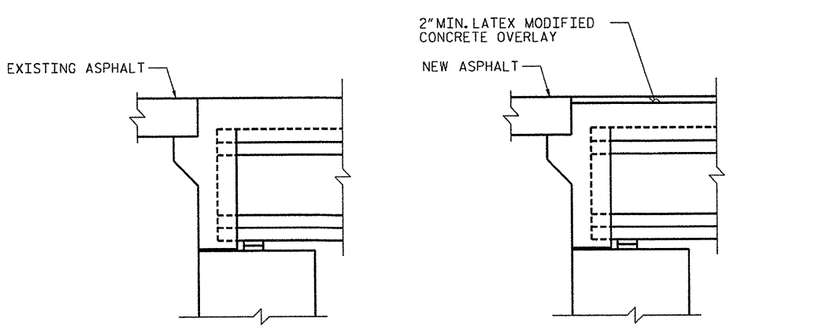


PROPOSED JOINT AT BENTS
FOAM JOINT SEAL EXPANSION

ELASTOMERIC CONCRETE	
BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
BENT 1	4.8
BENT 2	4.8
BENT 3	4.8
TOTAL	14.4

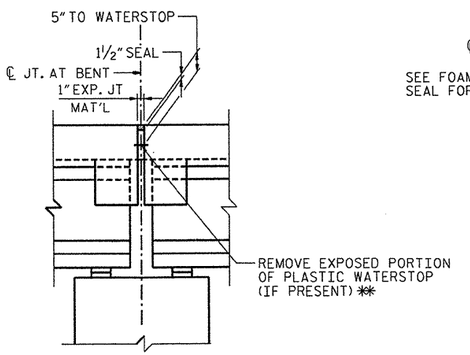
*BASED ON THE MINIMUM BLOCKOUT SHOWN

SAWED OPENING FOR FOAM JOINT			
BENT NO.	W AT 90°F	W AT 60°F	W AT 45°F
BENT 1	1 7/8	2	2 1/16
BENT 2	1 13/16	2	2 1/16
BENT 3	1 11/16	2	2 1/8

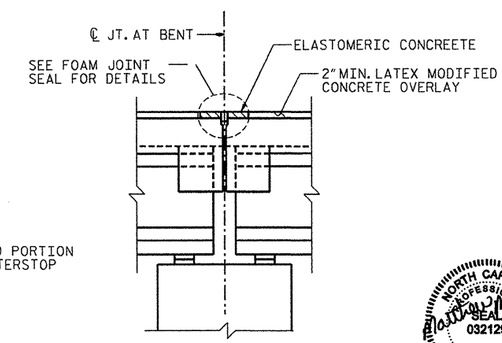


EXISTING SECTION AT END BENT
PROPOSED SECTION AT END BENT

SECTION A-A



EXISTING JOINT AT BENTS



PROPOSED JOINT AT BENTS

SECTION B-B

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO.: 197

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN VIEW AND JOINT DETAILS FOR BRIDGE NO. 197

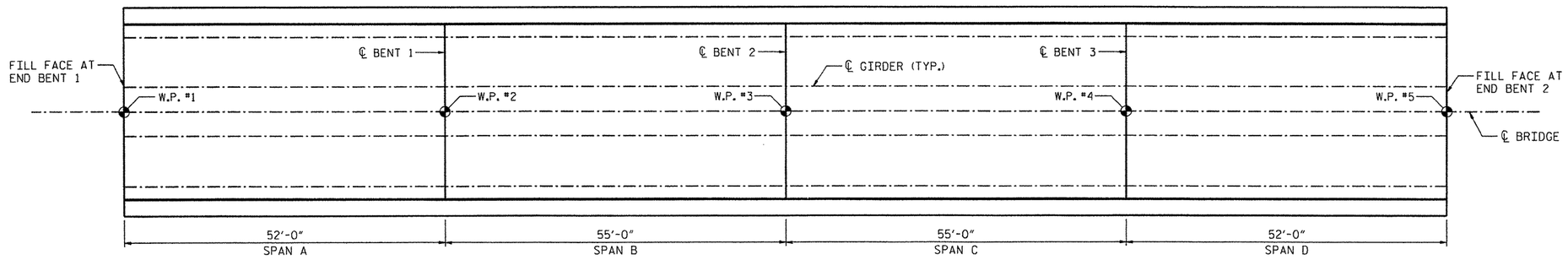
REVISIONS						SHEET NO. S-2
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER
1-19-2012

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

**ALL LOOSE AND UNSOUND CONCRETE SHALL BE REMOVED. IF THE EMBEDDED PORTION OF THE EXISTING PLASTIC WATERSTOP IS EXPOSED DURING REMOVAL OF UNSOUND CONCRETE, THE ENTIRE WATERSTOP SHALL BE REMOVED. OTHERWISE, TRIM WATERSTOP FLUSH WITH EXISTING CONCRETE SURFACE.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

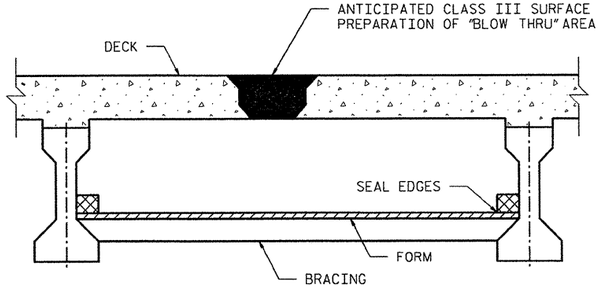


PLAN OF SPANS-DECK REPAIRS

APPROX. AREA: CLASS I REPAIR

APPROX. AREA: CLASS II REPAIR

APPROX. AREA: CLASS III REPAIR

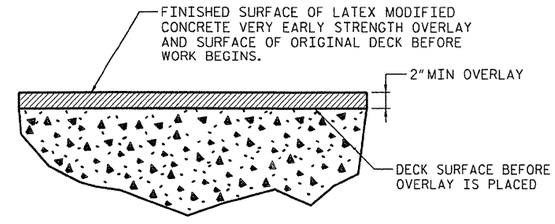


TYPICAL "BLOW THRU" CONTAINMENT AND FORMWORK

A METHOD TO CAPTURE WATER AND DEBRIS FROM BLOW THRU DURING HYDRO-DEMOLITION SHALL BE INSTALLED IN AREAS INDICATED AS CLASS III SURFACE PREPARATION.

SUBMIT DETAILS OF PROPOSED FORM WORK FOR APPROVAL PRIOR TO BEGINNING WORK.

COST FOR INSTALLING AND REMOVING FORM WORK SHALL BE INCIDENTAL TO THE PRICE PER SQ. YARD OF HYDRO-DEMOLITION.



DETAIL FOR LATEX MODIFIED CONCRETE OVERLAY

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO.: 197

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER

1-19-2012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK REPAIR DETAILS FOR BRIDGE NO. 197

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

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PLOT DRIVER: NCDOT_pdf_mono_eng_50.plt
USER: msells
DATE: 1/19/2012
FILE: North Carolina_Dept_of_Transportation\NCDOT_DOC_CEI_BM_LSC_MASTER\NCDOT_Wake_LMC_Epoxy\13.00_CAD\Wake 197\Drawings\
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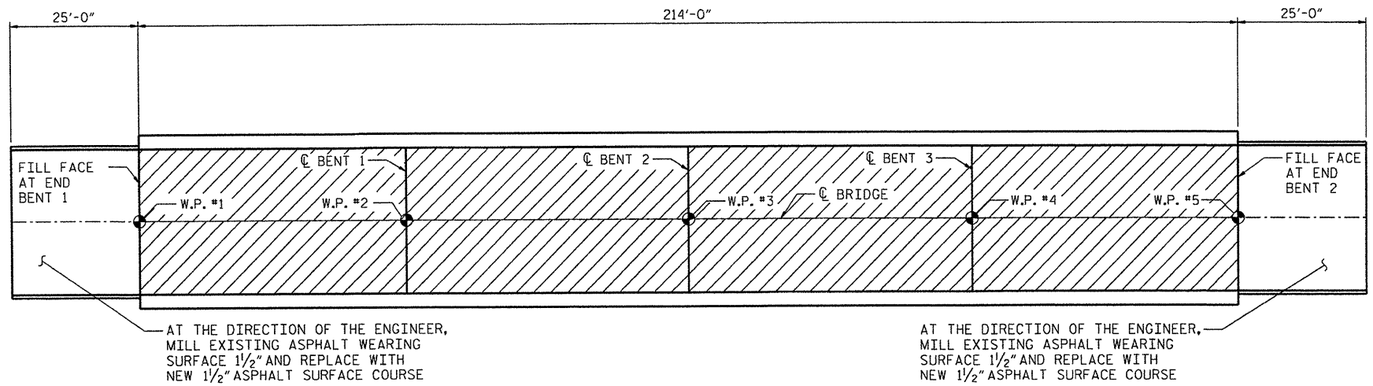
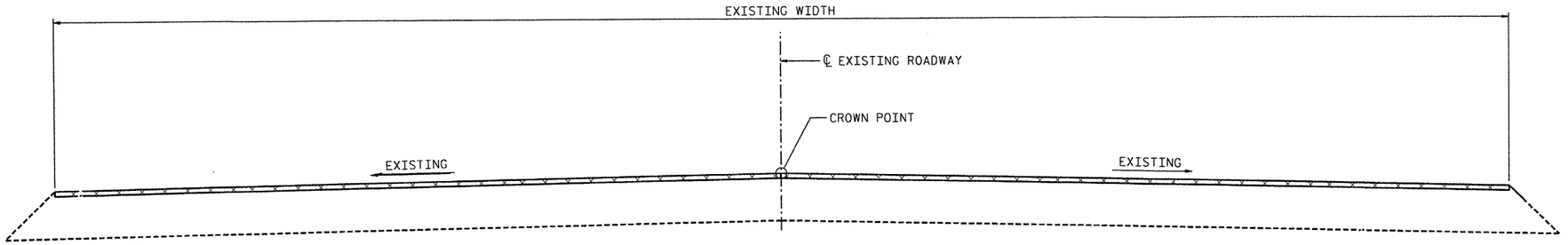


PLAN VIEW

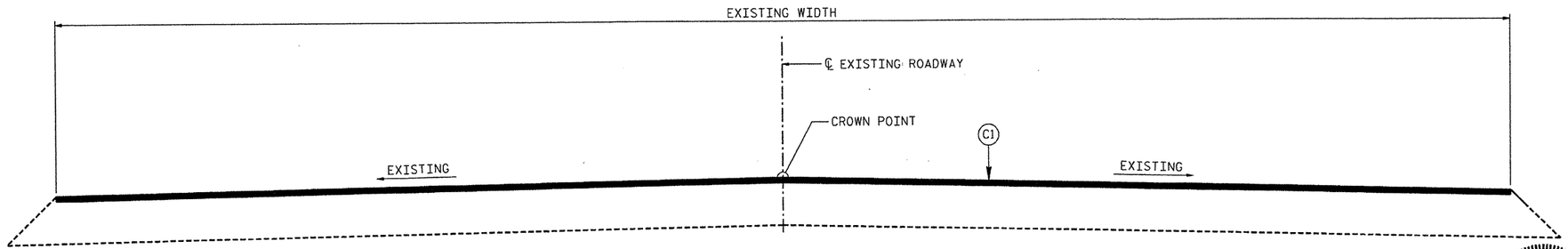
DECK SCARIFICATION AND HYDRO-DEMOLITION

C1	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH.



TYPICAL ROADWAY MILLING SECTION

ASPHALT MILLING



TYPICAL ROADWAY SECTION

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER
1-19-2012

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO.: 197

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION & MILLING DETAILS FOR BRIDGE NO. 197 (STAGE I)

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

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

DRAWN BY : L. PATTERSON 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

PLOT DRIVER: NCDOT_pdf_mono_eng_50.plt + PENTABLE: Wake LMC_Epoxy.tbl
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PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO.: 197

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION
& MILLING DETAILS
FOR BRIDGE NO. 197
(STAGE II)

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER
1-19-2012

REVISIONS						SHEET NO. S-5
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

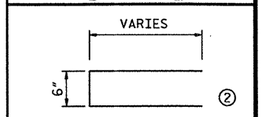
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

DRAWN BY : L. PATTERSON 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

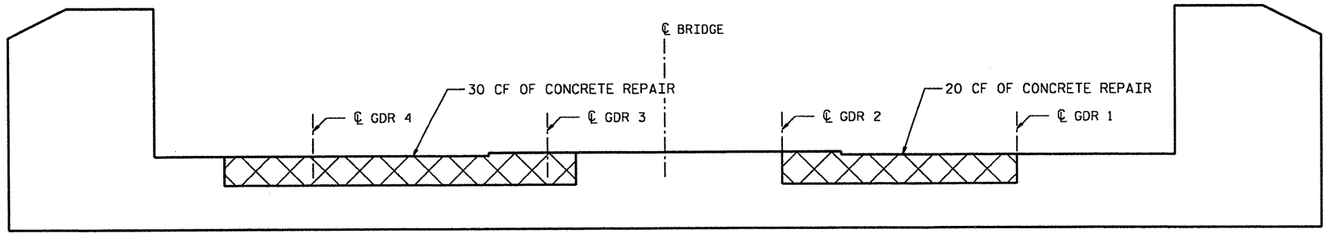
PLOT DRIVER: NCDOT_pdf_mono.eng.50.plt
USER: nsells
FILE: North Carolina.Dept. of Transportation\NCDOT_DDO.CEI_BM.LSC_MASTER\NCDOT_Wake_LMC_Epoxy\13.00.CAD\Wake 197\Drawings\WAKE-197_STR.dgn
PENTABLE: Wake LMC_Epoxy.tbl
DATE: 1/19/2012
TIME: 9:19:03 AM

BILL OF MATERIAL				
END BENT 1				
BAR	NO.	SIZE	TYPE	LENGTH
S2	VAR.	#5	2	VARIES
CONCRETE REPAIR			CF	50
SHOTCRETE REPAIR			CF	0
REINFORCING STEEL			LBS	10

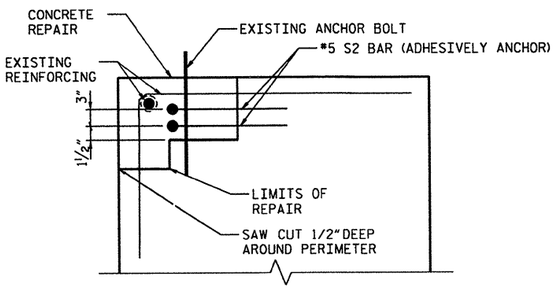
BAR TYPE



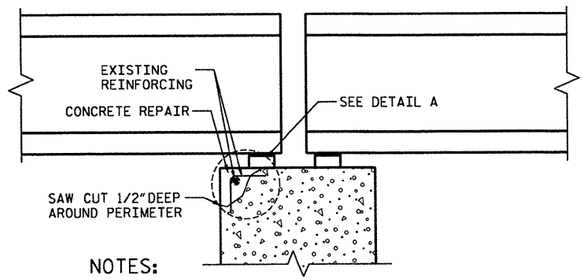
(BAR DIMENSIONS ARE OUT TO OUT)



END BENT 1 - ELEVATION



DETAIL A



NOTES:

RAISE GIRDER 1/2"BY JACKING BEFORE REMOVING CONCRETE. DO NOT LOWER SUPERSTRUCTURE UNTIL REPAIR HAS CURED AND REACHED A COMPRESSIVE STRENGTH OF 3000 PSI.

TYPICAL REPAIR AT GIRDER BEARING

NOTES:

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.

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.

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

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

FOR "COLUMN REPAIR DETAIL" SEE DRAWING "BENT 1 FOR BRIDGE NO. 197"

FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FIELD TESTING OF THE ADHESIVELY ANCHORED DOWELS IS NOT REQUIRED.

CONCRETE REPAIR

SHOTCRETE REPAIR

JACKING NOTES

JACKING SHALL BE CONDUCTED IN A MANNER SUCH THAT THE SUPERSTRUCTURE WILL NOT BE DAMAGED.

THE MAXIMUM ALLOWABLE VERTICAL JACKING DISPLACEMENT SHALL BE ½ INCH WITH RESPECT TO BEARINGS OF ADJACENT PIERS.

BEARING NUTS SHALL BE LOOSENED TO PROVIDE A MINIMUM OF 5/64 INCH GAP TO ALLOW FOR JACKING.

ALL GIRDERS AT A PIER SHALL BE JACKED SIMULTANEOUSLY AND SHALL BE RAISED THE SAME AMOUNT AND AT THE SAME RATE. THE HYDRAULIC PRESSURE OF THE JACKS SHALL BE ADJUSTED AS REQUIRED TO ALLOW FOR EQUAL MOVEMENTS. JACKING DEVICES SHALL BE EQUIPPED WITH LOCKING RINGS. USE BEVELED JACKING PLATES AS NEEDED TO PROVIDE A LEVEL JACKING SURFACE.

EFFECT OF VIBRATIONS FROM TRAFFIC SHOULD BE CONSIDERED DURING JACKING AND WHEN JACKS ARE LOCKED.

PROVISIONS SHALL BE MADE TO ACCOUNT FOR THERMAL MOVEMENTS DURING THE PERIOD THAT THE STRUCTURE IS RESTING ON TEMPORARY SUPPORTS.

THE BRIDGE SHALL BE INSPECTED PRIOR TO JACKING TO VERIFY THAT ITEMS CONNECTED TO THE SUPERSTRUCTURE OR SUBSTRUCTURE WILL NOT BE DAMAGED DURING THE JACKING AND BEARING REPLACEMENT PROCEDURE.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR PERFORMING THE JACKING TO DETERMINE A JACKING LOCATION AT EACH BEARING AND PROVIDE A DESIGN FOR THE JACKING LOADS. JACKS SHALL HAVE A MINIMUM SAFE LOAD CAPACITY OF 125% OF THE LOAD SPECIFIED IN THE JACKING LOAD TABLE. THE CONTRACTOR SHALL SUBMIT THE JACKING PLAN, DETAILS, PROCEDURES AND SUPPORTING CALCULATIONS TO THE ENGINEER FOR REVIEW AND APPROVAL.

SEVICE REACTIONS PER BEARING				
SUPPORT	DL (KIP)		LL+I (KIP)	
	BACK	AHEAD	BACK	AHEAD
END BENT 1	--	49	--	69
BENT 1	45	48	69	69
BENT 2	48	48	69	69
BENT 3	48	45	69	69
END BENT 2	49	--	69	--

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO.: 197

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 1
FOR BRIDGE NO. 197

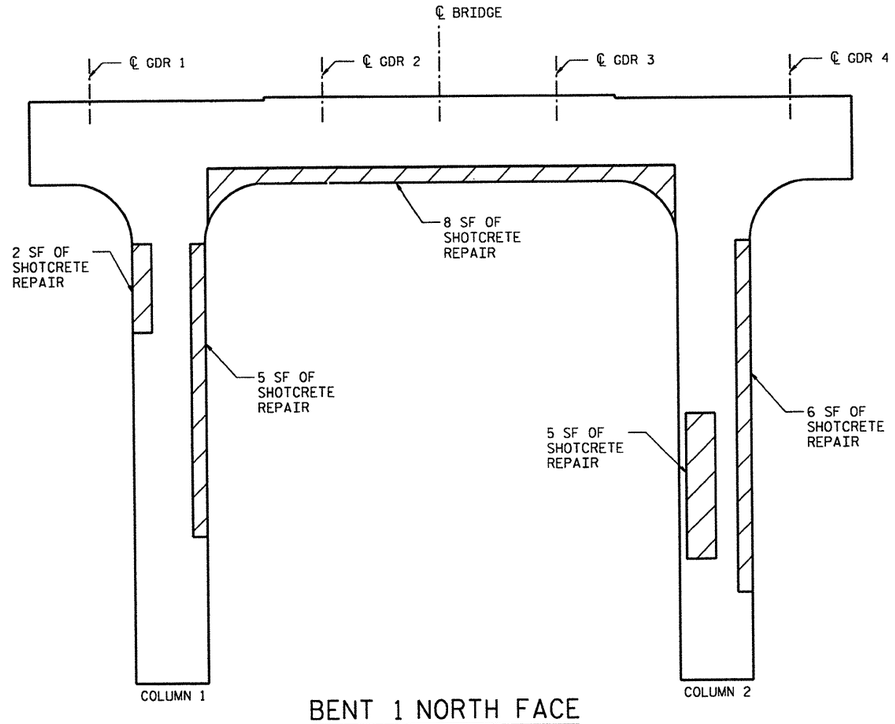
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-6

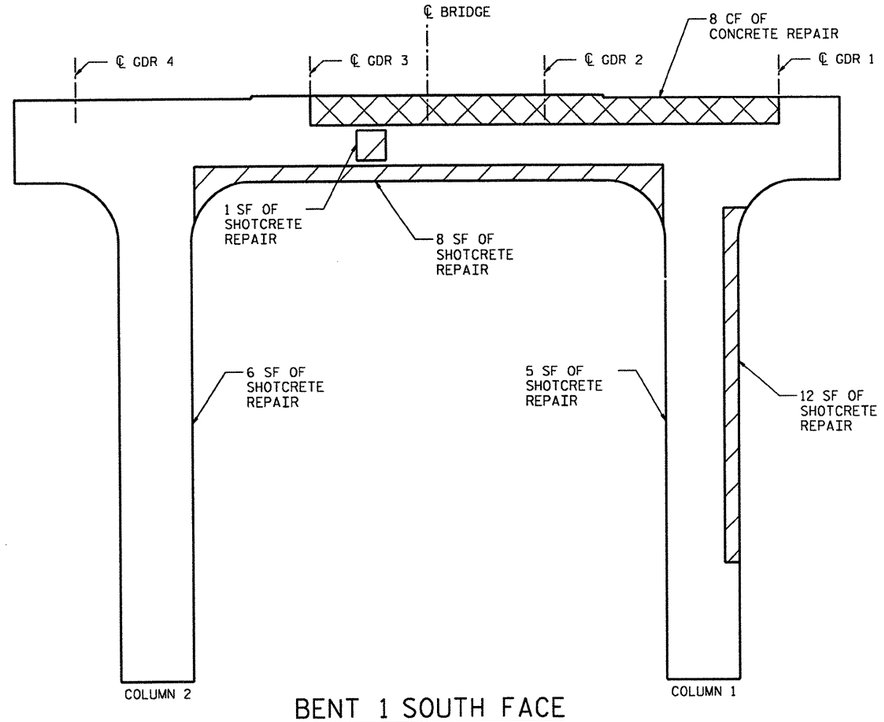
TOTAL SHEETS 26

DRAWN BY : D. WAGNER DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116



BENT 1 NORTH FACE



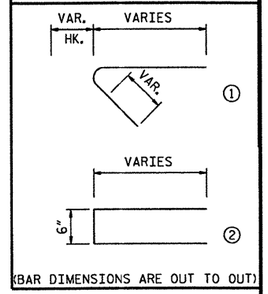
BENT 1 SOUTH FACE

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH
S1	VAR.	#4	1	VARIES
S2	VAR.	#5	2	VARIES
CONCRETE REPAIR			CF	8
SHOTCRETE REPAIR			CF	45
REINFORCING STEEL			LBS	10

BAR TYPE



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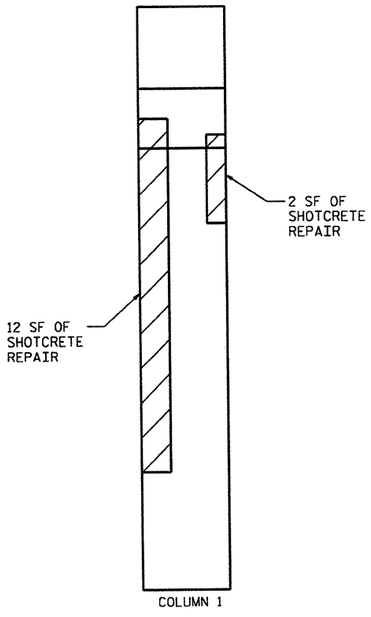

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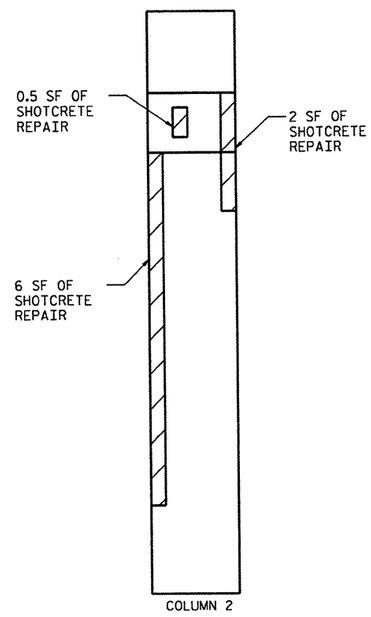
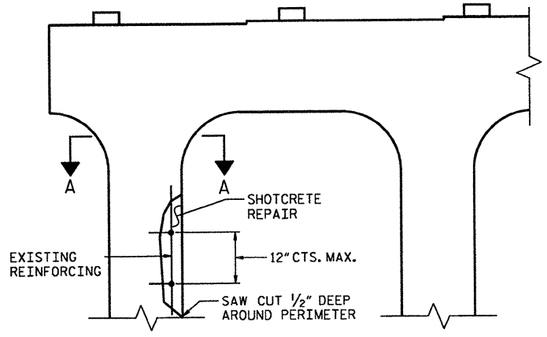


BENT 1 WEST FACE



COLUMN REPAIR DETAIL

AFTER DETERIORATED CONCRETE HAS BEEN REMOVED THE EXPOSED VERTICAL COLUMN STEEL SHALL BE ENCLOSED BY EITHER EXISTING STIRRUPS OR ADHESIVELY ANCHOR S1 BARS AS SHOWN IN SECTION A-A.

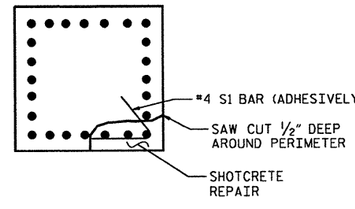
NOTES

FOR NOTES, SEE DRAWING "END BENT 1 BRIDGE NO. 197".

FOR "TYPICAL REPAIR AT GIRDER BEARING" SEEING DRAWING" END BENT 1 FOR BRIDGE NO. 197".

CONCRETE REPAIR

SHOTCRETE REPAIR



SECTION A-A

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO.: 197

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 1
FOR BRIDGE NO. 197

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER
12-9-11

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : D. WAGNER DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

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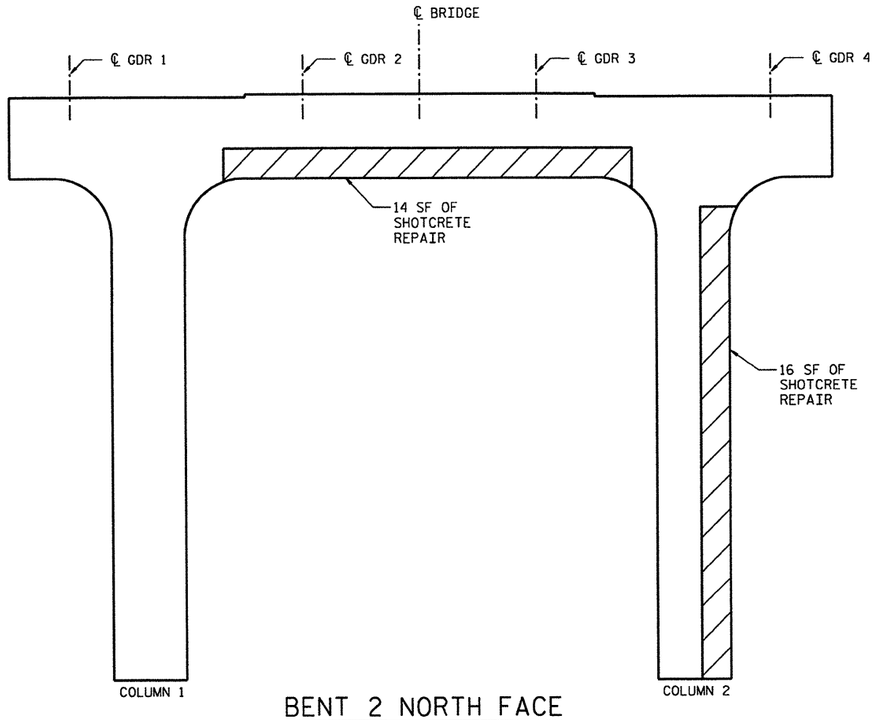

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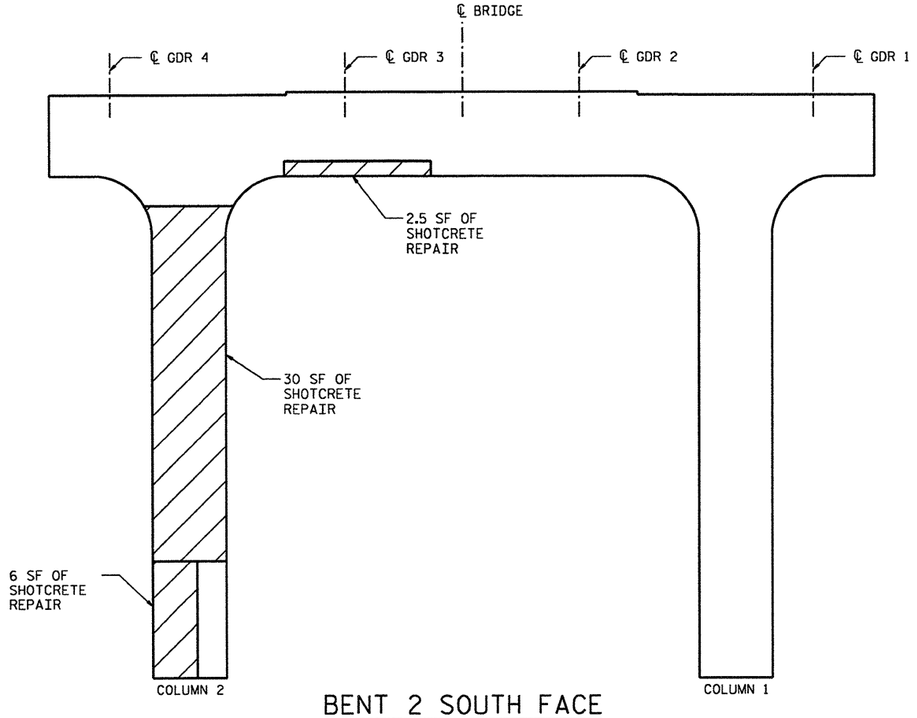

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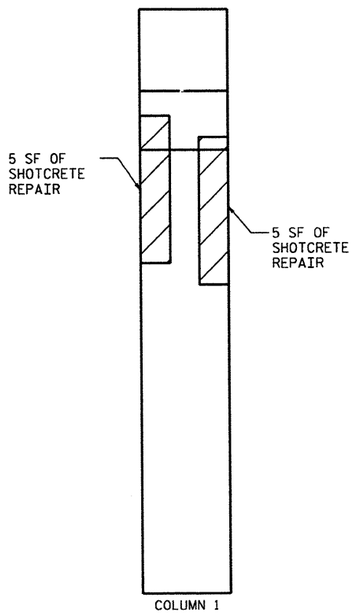

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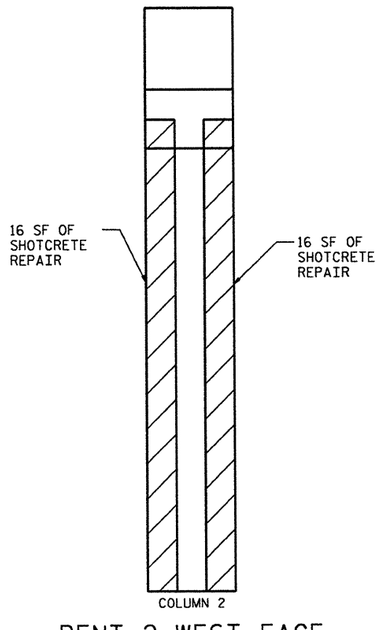


BENT 2 WEST FACE

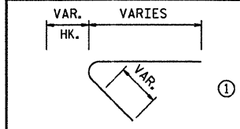
BILL OF MATERIAL

BENT 2

BAR	NO.	SIZE	TYPE	LENGTH
S1	VAR.	#4	1	VARIES

CONCRETE REPAIR	CF	0
SHOTCRETE REPAIR	CF	28
REINFORCING STEEL	LBS	10

BAR TYPE



(BAR DIMENSIONS ARE OUT TO OUT)

NOTES

FOR NOTES, SEE DRAWING "END BENT 1 BRIDGE NO. 197".

FOR "COLUMN REPAIR DETAIL", SEE DRAWING "BENT 1 FOR BRIDGE NO. 197".

CONCRETE REPAIR

SHOTCRETE REPAIR

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER

12-19-11

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO.: 197

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 2
FOR BRIDGE NO. 197

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : D. WAGNER DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

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USER: mseils DATE: 12/9/2011 TIME: 2:32:35 PM
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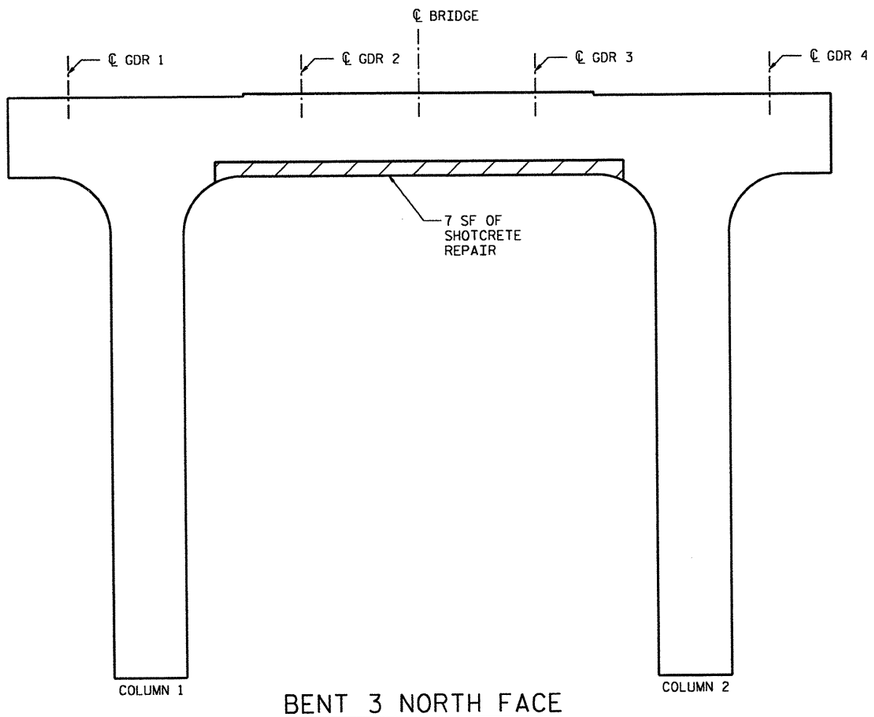

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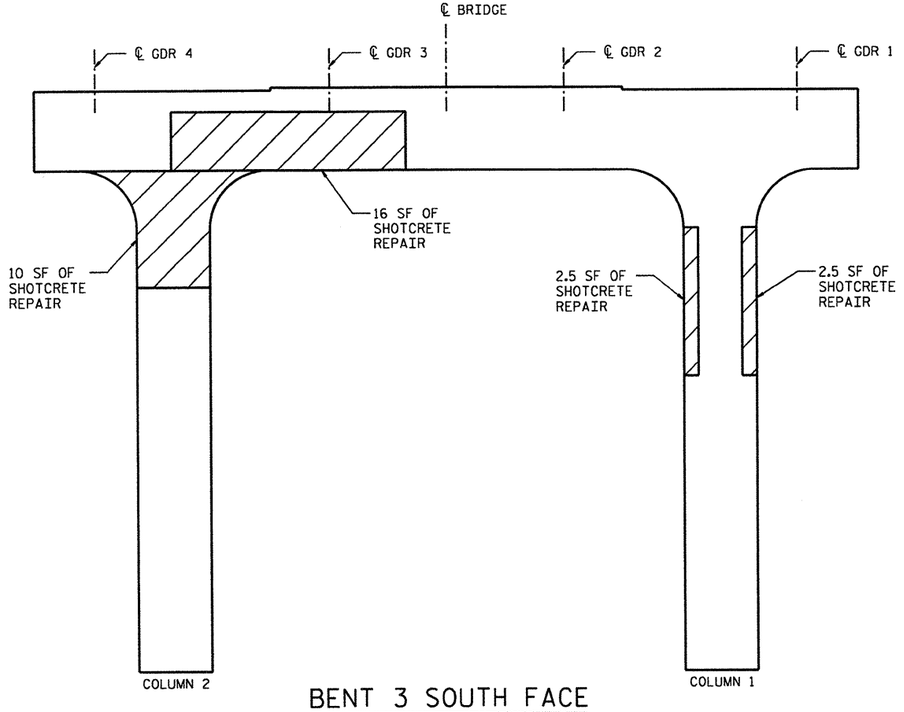


BENT 3 SOUTH FACE

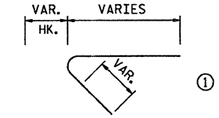
BILL OF MATERIAL

BENT 3

BAR	NO.	SIZE	TYPE	LENGTH
S1	VAR.	#4	1	VARIES

CONCRETE REPAIR	CF	0
SHOTCRETE REPAIR	CF	10
REINFORCING STEEL	LBS	10

BAR TYPE



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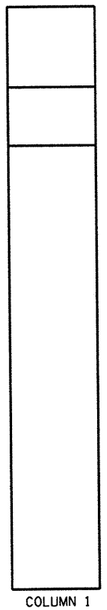

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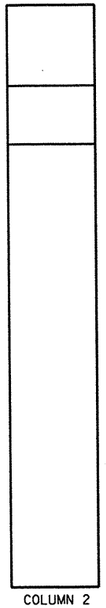

BENT 3 WEST FACE

NOTES

FOR NOTES, SEE DRAWING "END BENT 1 BRIDGE NO. 197".

FOR "COLUMN REPAIR DETAIL", SEE DRAWING "BENT 1 FOR BRIDGE NO. 197".

XXX CONCRETE REPAIR

/// SHOTCRETE REPAIR

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER

12-9-11

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO.: 197

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BENT 3
FOR BRIDGE NO. 197

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : D. WAGNER DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

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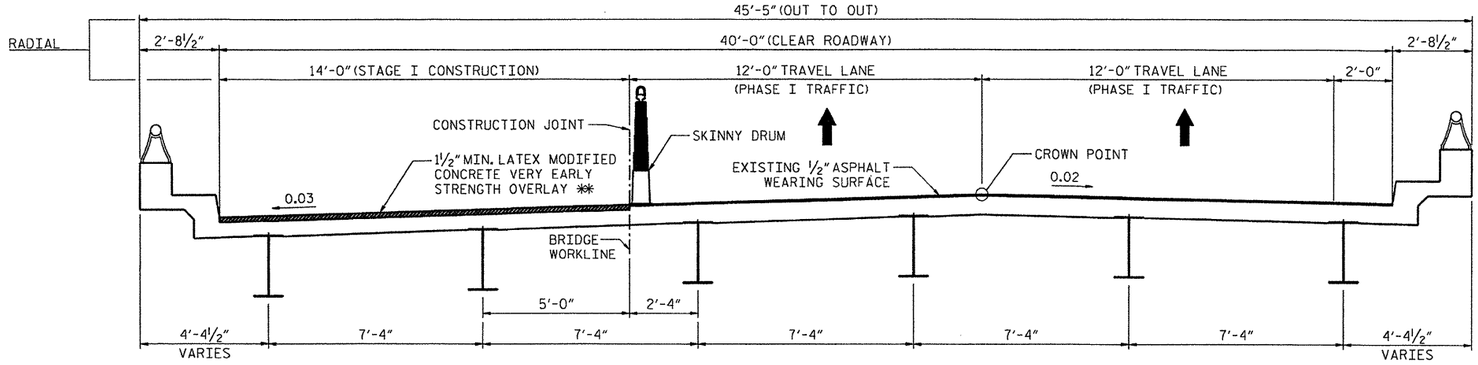
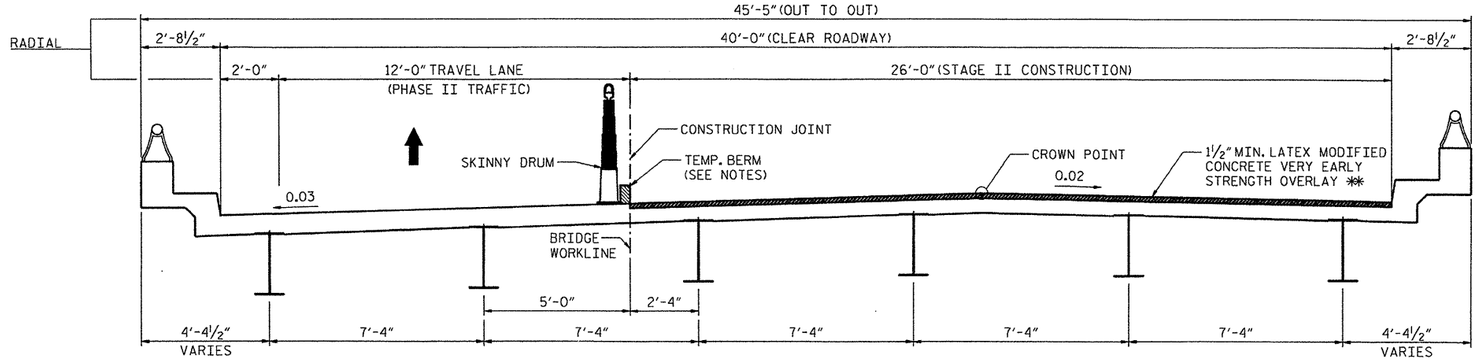


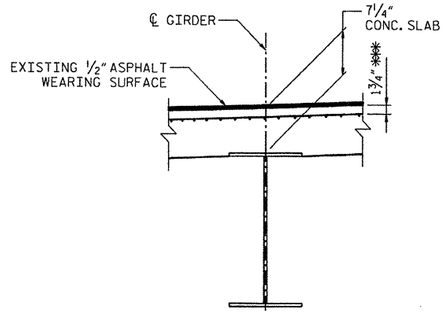
TYPICAL SECTION - STAGE I

** THE FINISHED SURFACE OF THE LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH OVERLAY SHALL BE ½" ABOVE THE ORIGINAL DECK SURFACE.



TYPICAL SECTION - STAGE II

** THE FINISHED SURFACE OF THE LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH OVERLAY SHALL BE ½" ABOVE THE ORIGINAL DECK SURFACE.



EXISTING SLAB SECTION

BOTTOM MAT OF REINFORCING NOT SHOWN FOR CLARITY.
*** CONCRETE COVER PER "AS-BUILT PLANS"

NOTES

FOR "HYDRO-DEMOLITION OF BRIDGE DECK", SEE SPECIAL PROVISIONS.

THE CONTRACTOR MUST COLLECT, TREAT AND DISPOSE OF RUN-OFF WATER FROM THE HYDRO-DEMOLITION PROCESS. SEE "MANAGING HYDRO-DEMOLITION WATER" SPECIAL PROVISIONS.

THE BOUNDARIES OF AREAS IDENTIFIED FOR CLASS III SURFACE PREPARATION ARE APPROXIMATE. IF ANY CLASS III LOCATIONS ARE ENCOUNTERED PRIOR TO OR DURING HYDRO-DEMOLITION, SEE "TYPICAL "BLOW THRU" CONTAINMENT AND FORMWORK" DETAIL. THE CONTRACTOR SHALL PROVIDE A METHOD OF HANDLING UNEXPECTED BLOW THROUGH WORK OF THE DECK.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2½" AT BENTS. FOR "FOAM JOINT SEALS", SEE SPECIAL PROVISIONS.

FOR "ELASTOMERIC CONCRETE", SEE SPECIAL PROVISIONS.

LATEX MODIFIED CONCRETE SHALL BE LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH.

FOR "LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH", SEE SPECIAL PROVISIONS.

FOR GROOVING BRIDGE FLOORS INFORMATION, SEE "LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH" SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

EXISTING JOINTS AND BRIDGE DECK DRAINS SHALL BE SEALED PRIOR TO BEGINNING SURFACE PREPARATION OF BRIDGE DECK.

EXISTING DIMENSIONS AND BRIDGE CONDITION ARE FROM THE BEST INFORMATION AVAILABLE. THE CONTRACTOR SHALL VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.

FOR SCARIFYING BRIDGE DECK, SEE SPECIAL PROVISIONS.

WATER AND CONCRETE SLURRY FROM HYDRO-DEMOLITION SHALL NOT BE ALLOWED TO DRAIN ACROSS TRAVEL LANES. CONTRACTOR SHALL PROVIDE A METHOD TO CONTROL WATER.

TOTAL BILL OF MATERIAL

SCARIFYING BRIDGE DECK	*CLASS I SURFACE PREPARATION	*CLASS II SURFACE PREPARATION	*CLASS III SURFACE PREPARATION	*CLASS AA CONCRETE	HYDRO-DEMOLITION OF BRIDGE DECK	LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH OVERLAY	PLACING & FINISHING LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH OVERLAY	FOAM JOINT SEALS	GROOVING BRIDGE FLOORS
SQ. YDS.	SQ. YDS.	SQ. YDS.	SQ. YDS.	CU. YDS.	SQ. YDS.	CU. YDS.	SQ. YDS.	LUMP SUM	SQ. FT.
923	206	0	0	0	923	58	923	LUMP SUM	7506

*QUANTITY SHOWN IS FOR INFORMATION ONLY.

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

1-19-2012

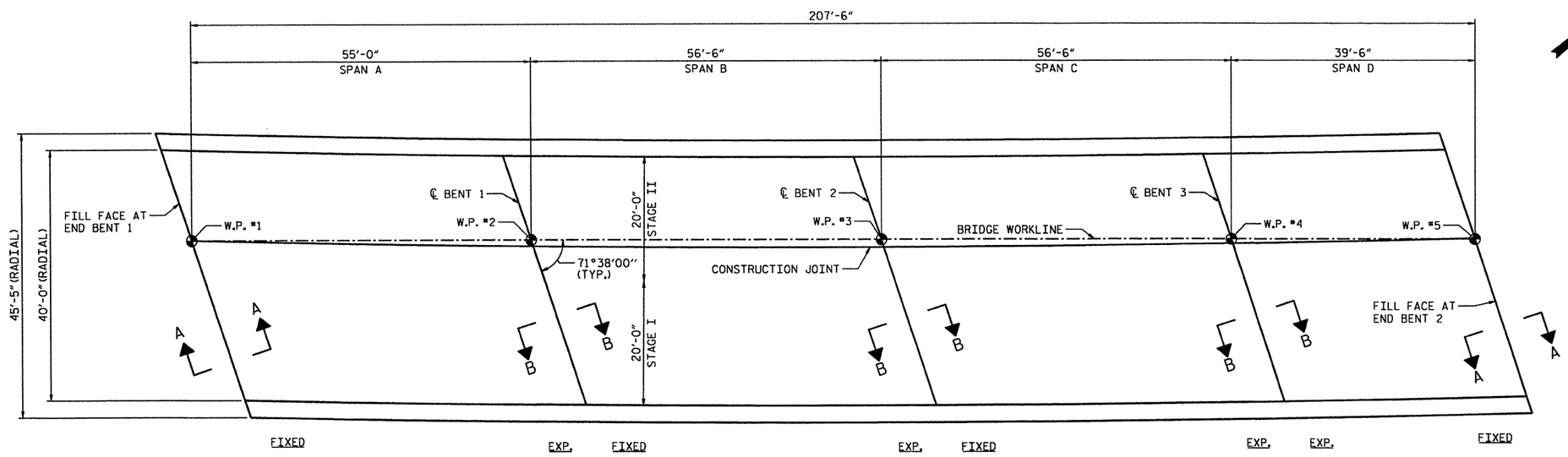
PROJECT NO. WBS 17BP.5.P.2
WAKE COUNTY
BRIDGE NO. 210

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

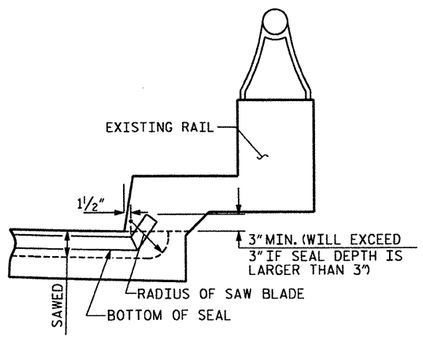
TYPICAL SECTION FOR BRIDGE NO. 210
(I-440 NORTH OVER SR 1012)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			26

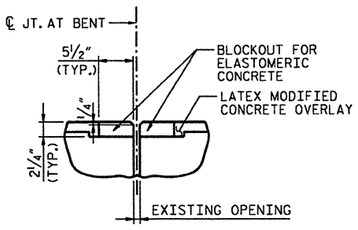
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L. License Number: F-0116



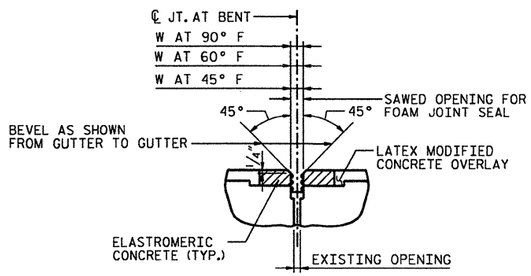
PLAN OF SPANS



JOINT DETAIL AT RAIL



FOAM JOINT SEAL
PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS

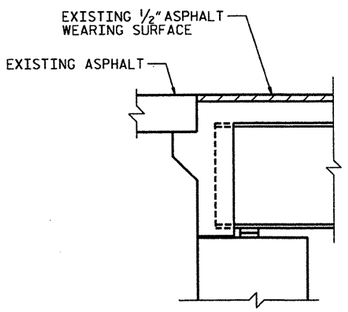


PROPOSED JOINT AT BENTS
FOAM JOINT SEAL EXPANSION

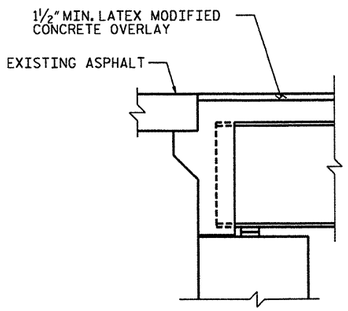
ELASTOMERIC CONCRETE	
BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
BENT 1	7.2
BENT 2	7.2
BENT 3	7.2
TOTAL	21.6

*BASED ON THE MINIMUM BLOCKOUT SHOWN

SAWED OPENING FOR FOAM JOINT			
BENT NO.	W AT 90°F	W AT 60°F	W AT 45°F
BENT 1	1 11/16	1⅞	1 15/16
BENT 2	1 11/16	1⅞	1 15/16
BENT 3	1⅞	1⅞	2

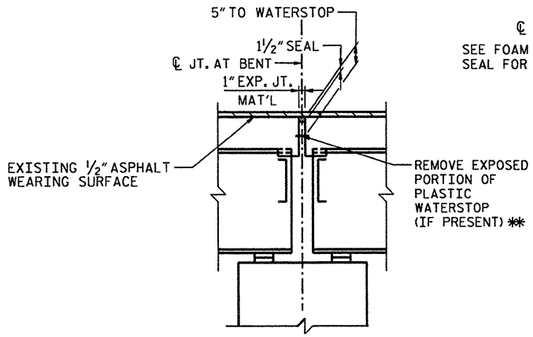


EXISTING SECTION AT END BENT

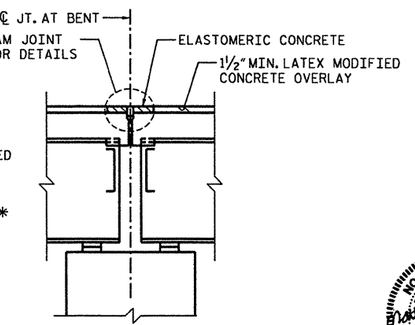


PROPOSED SECTION AT END BENT

SECTION A-A



EXISTING JOINT AT BENTS



PROPOSED JOINT AT BENTS

SECTION B-B

** ALL LOOSE AND UNSOUND CONCRETE SHALL BE REMOVED. IF THE EMBEDDED PORTION OF THE EXISTING PLASTIC WATERSTOP IS EXPOSED DURING REMOVAL OF UNSOUND CONCRETE, THE ENTIRE WATERSTOP SHALL BE REMOVED. OTHERWISE, TRIM WATERSTOP FLUSH WITH EXISTING CONCRETE SURFACE.

PROJECT NO. WBS 17BP.5.P.2
WAKE COUNTY
BRIDGE NO. 210

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN VIEW AND JOINT DETAILS FOR BRIDGE NO. 210

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER
12-9-11

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

REVISIONS						SHEET NO. S-11
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

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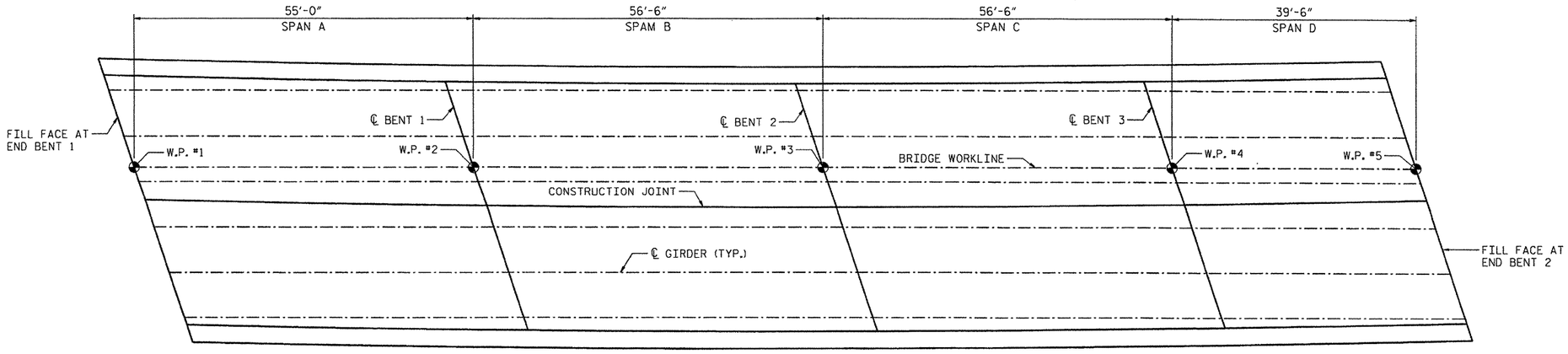
FILE: North Carolina_Dept_of_Transportation\NCDOT_DDO_CEI_BM_LSC_MASTER\NCDOT_Wake_LMC_Epoxy\13.00_CAD\Wake 210\WAKE 210 LMC.dgn
PENTABLE: Wake LMC_Epoxy.tbl
TIME: 2:32:57 PM
DATE: 12/9/2011

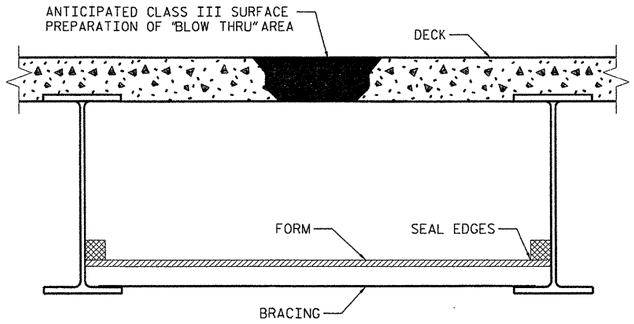


PLAN OF SPANS - DECK REPAIRS

APPROX. AREA: CLASS I REPAIR

APPROX. AREA: CLASS II REPAIR

APPROX. AREA: CLASS III REPAIR

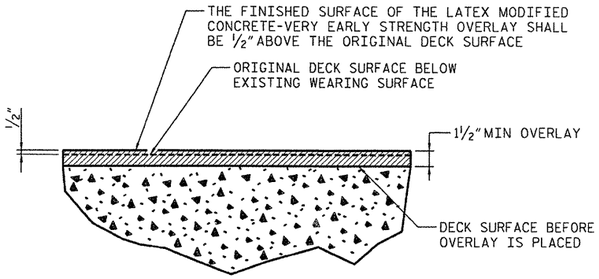


TYPICAL "BLOW THRU" CONTAINMENT AND FORMWORK

A METHOD TO CAPTURE WATER AND DEBRIS FROM BLOW THRU DURING HYDRO-DEMOLITION SHALL BE INSTALLED IN AREAS INDICATED AS CLASS III SURFACE PREPARATION.

SUBMIT DETAILS OF PROPOSED FORMWORK FOR APPROVAL PRIOR TO BEGINNING WORK.

COST FOR INSTALLING AND REMOVING FORMWORK SHALL BE INCIDENTAL TO THE PRICE PER SQ. YARD OF HYDRO-DEMOLITION.



DETAIL FOR LATEX MODIFIED CONCRETE OVERLAY

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO. 210

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER

1-19-2012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK REPAIR DETAILS FOR BRIDGE NO. 210

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			26

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3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

PLOT DRIVER: NCDOT_pdf_mono_eng_50.pit PENTABLE: Wake LMC_Epoxy.tbl
USER: mgallo DATE: 1/19/2012 TIME: 9:19:35 AM
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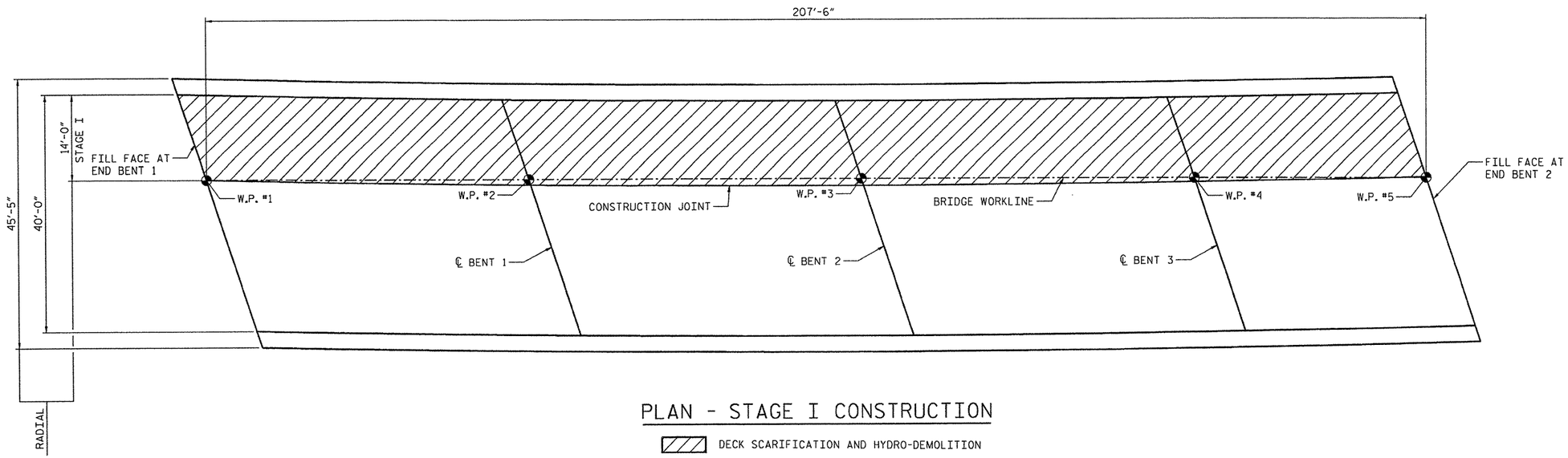
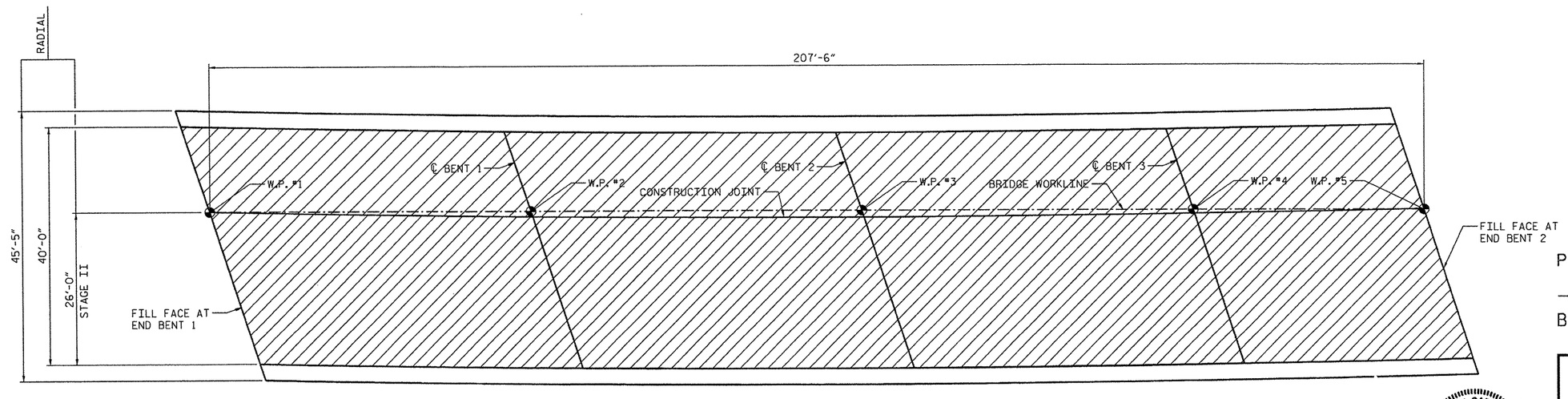


PLAN - STAGE I CONSTRUCTION

DECK SCARIFICATION AND HYDRO-DEMOLITION



PLAN - STAGE II CONSTRUCTION

DECK SCARIFICATION AND HYDRO-DEMOLITION

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO. 210

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK SCARIFICATION FOR BRIDGE NO. 210

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER
1-19-2012

REVISIONS						SHEET NO. S-13
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

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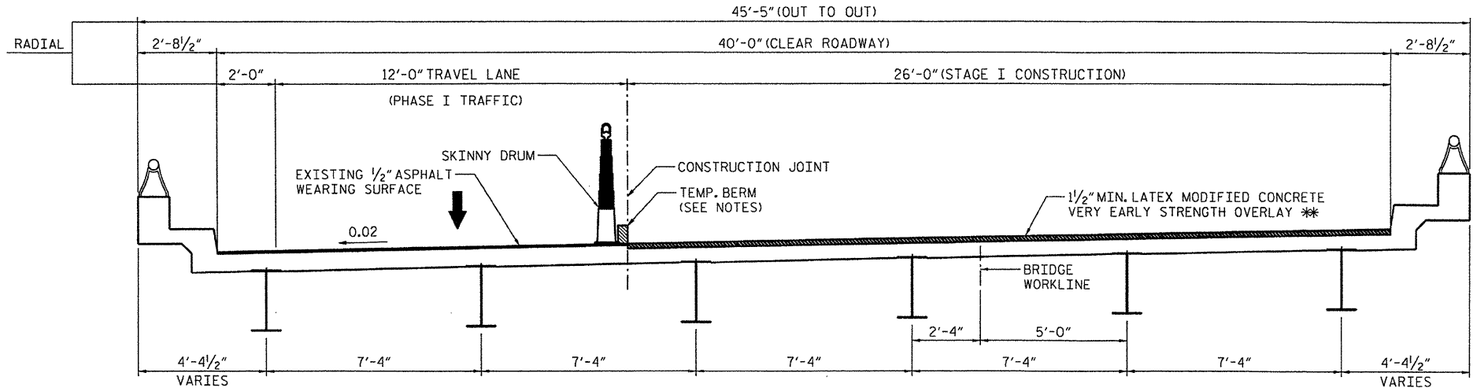
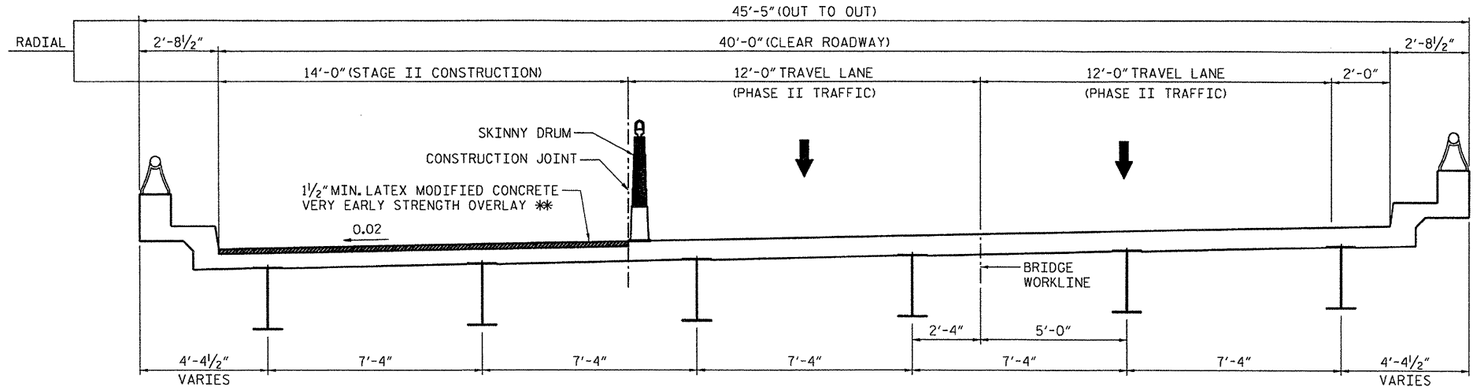


TYPICAL SECTION - STAGE I

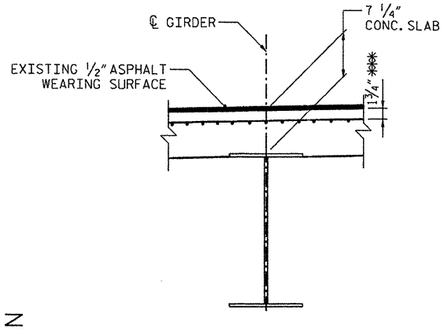
** THE FINISHED SURFACE OF THE LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH OVERLAY SHALL BE ½" ABOVE THE ORIGINAL DECK SURFACE.



TYPICAL SECTION - STAGE II

** THE FINISHED SURFACE OF THE LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH OVERLAY SHALL BE ½" ABOVE THE ORIGINAL DECK SURFACE.

I-440 MEDIAN



EXISTING SLAB SECTION

BOTTOM MAT OF REINFORCING NOT SHOWN FOR CLARITY

*** CONCRETE COVER PER "AS-BUILT PLANS"

I-440 MEDIAN

NOTES

FOR "HYDRO-DEMOLITION OF BRIDGE DECK", SEE SPECIAL PROVISIONS.

THE CONTRACTOR MUST COLLECT, TREAT AND DISPOSE OF RUN-OFF WATER FROM THE HYDRO-DEMOLITION PROCESS. SEE "MANAGING HYDRO-DEMOLITION WATER" SPECIAL PROVISIONS.

THE BOUNDARIES OF AREAS IDENTIFIED FOR CLASS III SURFACE PREPARATION ARE APPROXIMATE. IF ANY CLASS III LOCATIONS ARE ENCOUNTERED PRIOR TO OR DURING HYDRO-DEMOLITION, SEE "TYPICAL "BLOW THRU" CONTAINMENT AND FORMWORK" DETAIL. THE CONTRACTOR SHALL PROVIDE A METHOD OF HANDLING UNEXPECTED BLOW THROUGH WORK OF THE DECK.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2½" AT BENTS. FOR "FOAM JOINT SEALS", SEE SPECIAL PROVISIONS.

FOR "ELASTOMERIC CONCRETE", SEE SPECIAL PROVISIONS.

LATEX MODIFIED CONCRETE SHALL BE LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH.

FOR "LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH", SEE SPECIAL PROVISIONS.

FOR GROOVING BRIDGE FLOORS INFORMATION, SEE "LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH" SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

EXISTING JOINTS AND BRIDGE DECK DRAINS SHALL BE SEALED PRIOR TO BEGINNING SURFACE PREPARATION OF BRIDGE DECK.

EXISTING DIMENSIONS AND BRIDGE CONDITION ARE FROM THE BEST INFORMATION AVAILABLE. THE CONTRACTOR SHALL VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.

FOR SCARIFYING BRIDGE DECK, SEE SPECIAL PROVISIONS.

WATER AND CONCRETE SLURRY FROM HYDRO-DEMOLITION SHALL NOT BE ALLOWED TO DRAIN ACROSS TRAVEL LANES, CONTRACTOR SHALL PROVIDE A METHOD TO CONTROL WATER.

TOTAL BILL OF MATERIAL

SCARIFYING BRIDGE DECK	*CLASS I SURFACE PREPARATION	*CLASS II SURFACE PREPARATION	*CLASS III SURFACE PREPARATION	*CLASS AA CONCRETE	HYDRO-DEMOLITION OF BRIDGE DECK	LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH OVERLAY	PLACING & FINISHING LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH OVERLAY	FOAM JOINT SEALS	GROOVING BRIDGE FLOORS
SQ. YDS.	SQ. YDS.	SQ. YDS.	SQ. YDS.	CU. YDS.	SQ. YDS.	CU. YDS.	SQ. YDS.	LUMP SUM	SQ. FT.
925	254	0	0	0	925	58	925	LUMP SUM	7524

*QUANTITY SHOWN IS FOR INFORMATION ONLY.

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO. 211

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION FOR BRIDGE NO. 211
(I-440 SOUTH OVER SR1012)

REVISIONS						SHEET NO. S-14
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 26
1			3			
2			4			

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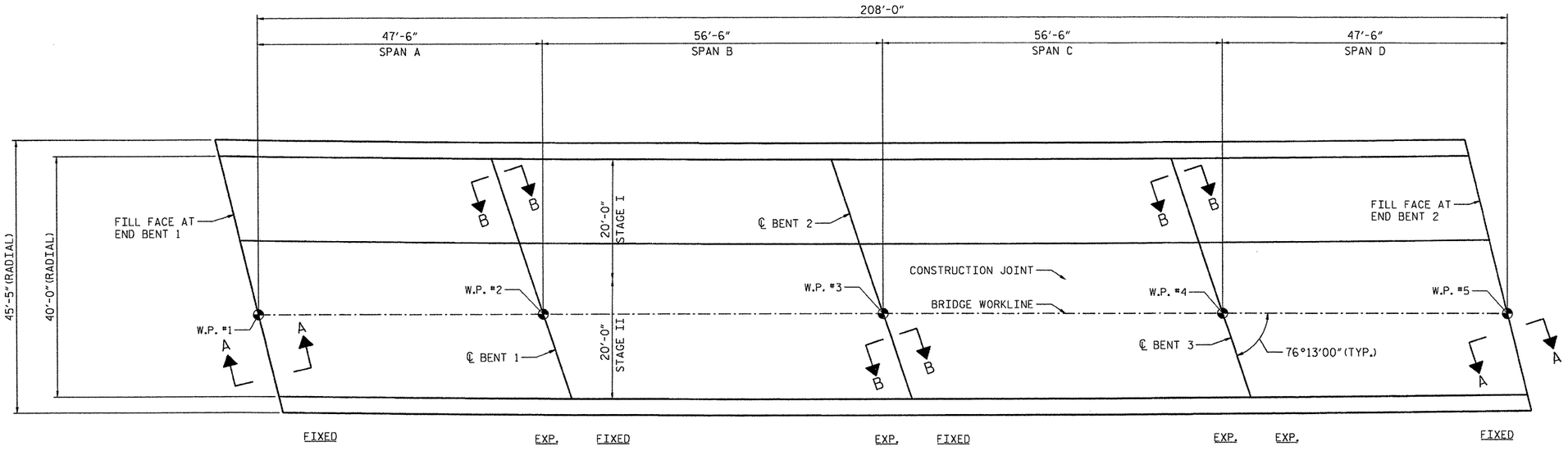
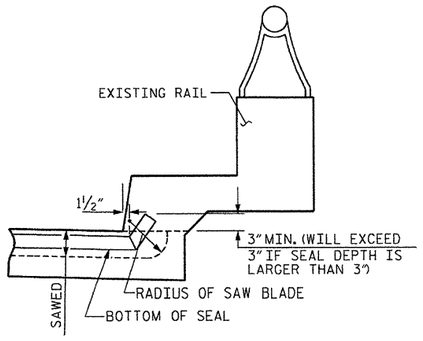
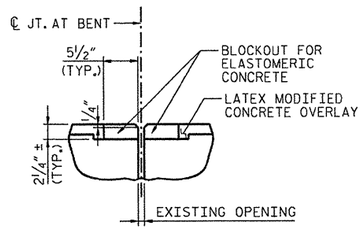


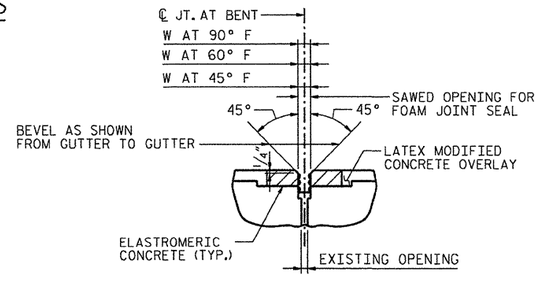
PLAN OF SPANS



JOINT DETAIL AT RAIL



FOAM JOINT SEAL
PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS

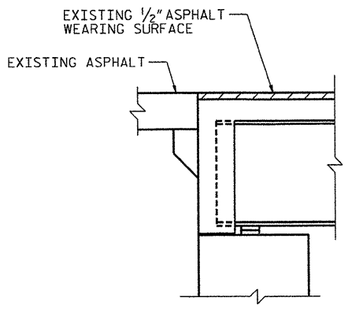


PROPOSED JOINT AT BENTS
FOAM JOINT SEAL EXPANSION

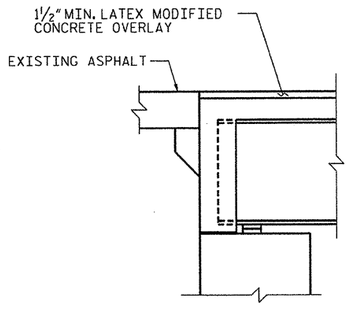
ELASTOMERIC CONCRETE	
BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
BENT 1	7.1
BENT 2	7.1
BENT 3	7.1
TOTAL	21.3

* BASED ON THE MINIMUM BLOCKOUT SHOWN

SAWED OPENING FOR FOAM JOINT			
BENT NO.	W AT 90°F	W AT 60°F	W AT 45°F
BENT 1	1¾	1⅞	1 15/16
BENT 2	1 11/16	1⅞	1 15/16
BENT 3	1⅝	1⅞	2

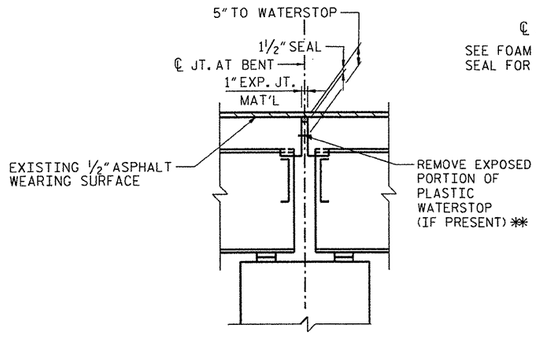


EXISTING SECTION AT END BENT

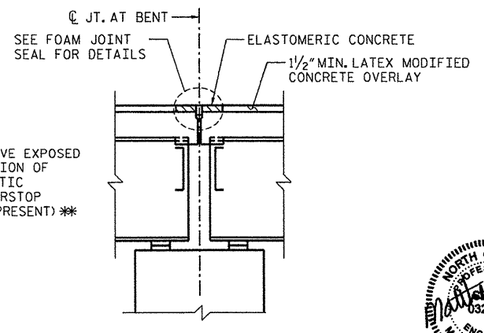


PROPOSED SECTION AT END BENT

SECTION A-A



EXISTING JOINT AT BENTS



PROPOSED JOINT AT BENTS

SECTION B-B

** ALL LOOSE AND UNSOUND CONCRETE SHALL BE REMOVED. IF THE EMBEDDED PORTION OF THE EXISTING PLASTIC WATERSTOP IS EXPOSED DURING REMOVAL OF UNSOUND CONCRETE, THE ENTIRE WATERSTOP SHALL BE REMOVED. OTHERWISE, TRIM WATERSTOP FLUSH WITH EXISTING CONCRETE SURFACE.

PROJECT NO. WBS 17BP.5.P.2
WAKE COUNTY
BRIDGE NO. 211

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN VIEW AND JOINT DETAILS FOR BRIDGE NO. 211

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

REVISIONS						SHEET NO. S-15
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

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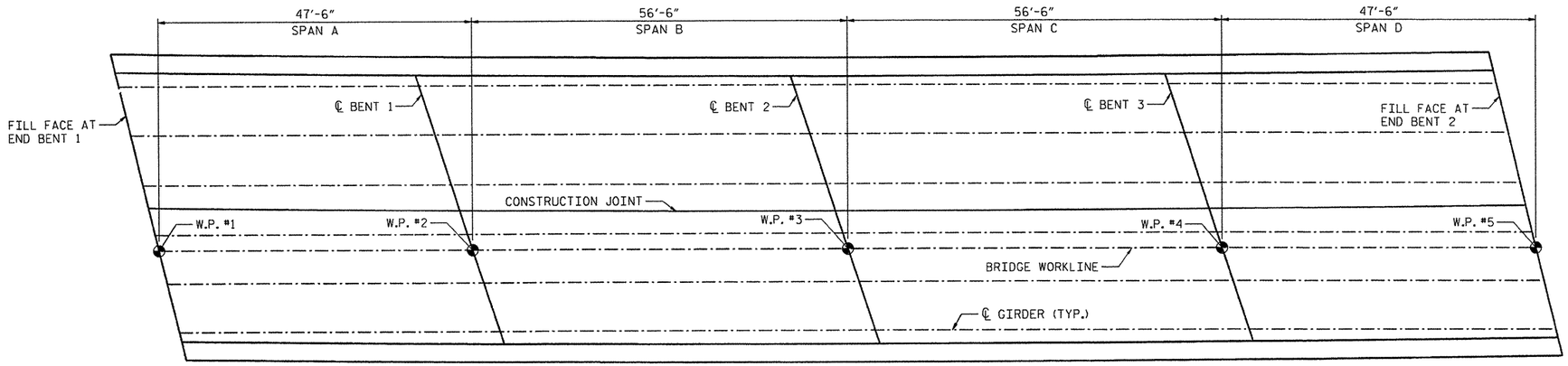
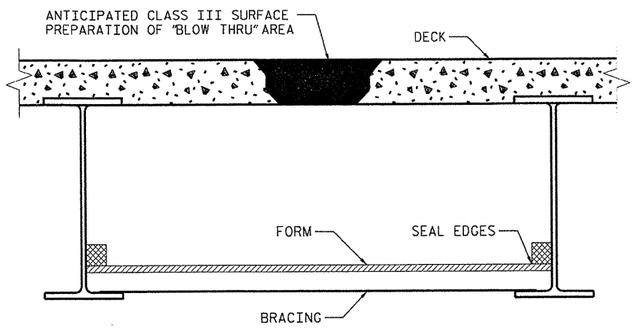


PLAN OF SPANS - DECK REPAIRS

APPROX. AREA: CLASS I REPAIR

APPROX. AREA: CLASS II REPAIR

APPROX. AREA: CLASS III REPAIR

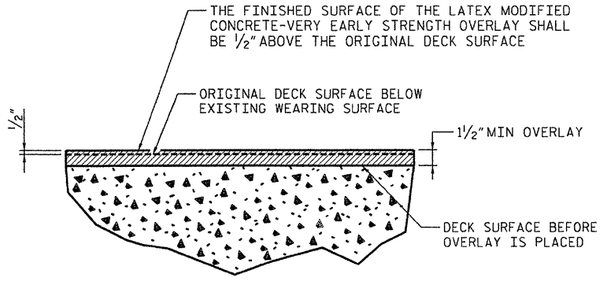


TYPICAL "BLOW THRU" CONTAINMENT AND FORMWORK

A METHOD TO CAPTURE WATER AND DEBRIS FROM BLOW THRU DURING HYDRO-DEMOLITION SHALL BE INSTALLED IN AREAS INDICATED AS CLASS III SURFACE PREPARATION.

SUBMIT DETAILS OF PROPOSED FORMWORK FOR APPROVAL PRIOR TO BEGINNING WORK.

COST FOR INSTALLING AND REMOVING FORMWORK SHALL BE INCIDENTAL TO THE PRICE PER SQ. YARD OF HYDRO-DEMOLITION.



DETAIL FOR LATEX MODIFIED CONCRETE OVERLAY

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO. 211

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER

1-19-2012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK REPAIR DETAILS FOR BRIDGE NO. 211

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			26

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
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DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

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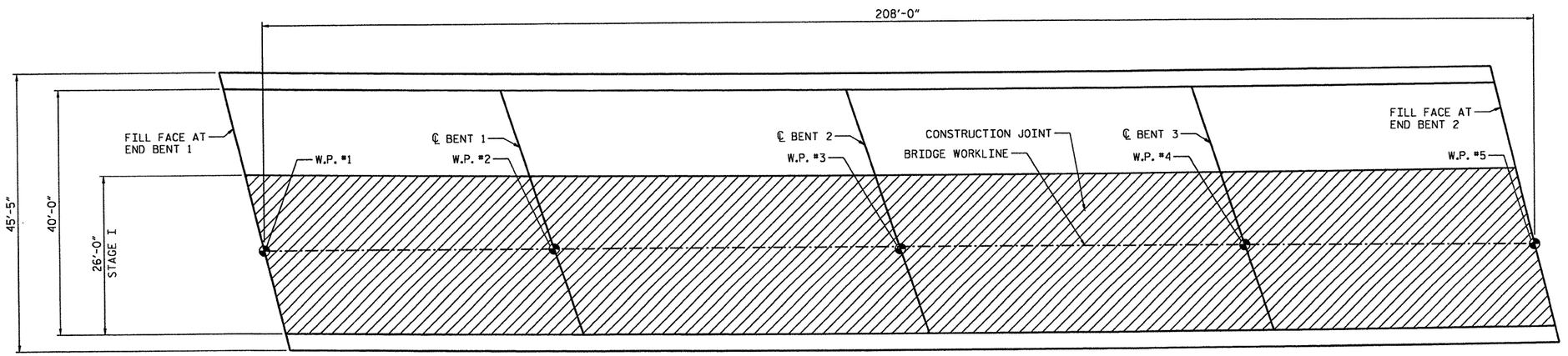
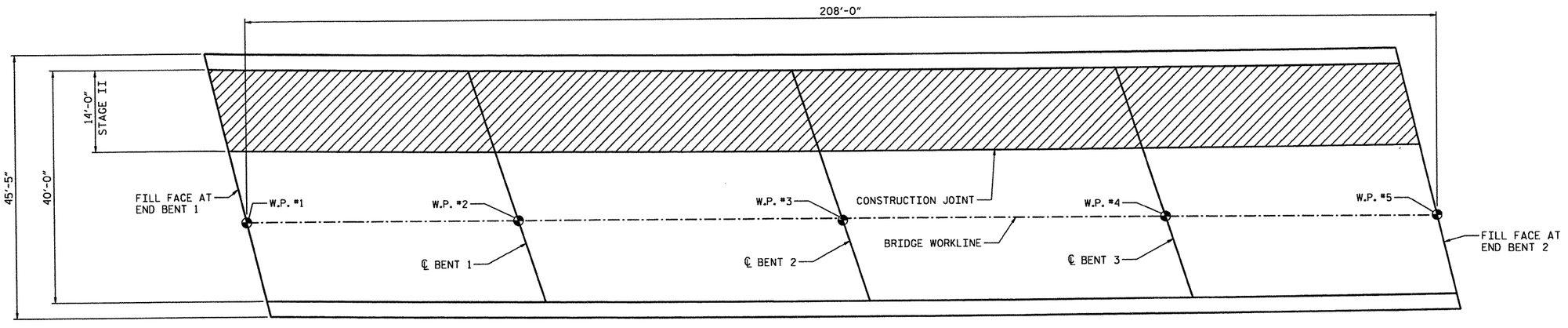


PLAN - STAGE I CONSTRUCTION

▨ DECK SCARIFICATION AND HYDRO-DEMOLITION



PLAN - STAGE II CONSTRUCTION

▨ DECK SCARIFICATION AND HYDRO-DEMOLITION

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO. 211

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK SCARIFICATION FOR BRIDGE NO. 211

NORTH CAROLINA PROFESSIONAL 032129 ENGINEER MATTHEW J. MOYER

12-9-11

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0716

REVISIONS						SHEET NO. S-17
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

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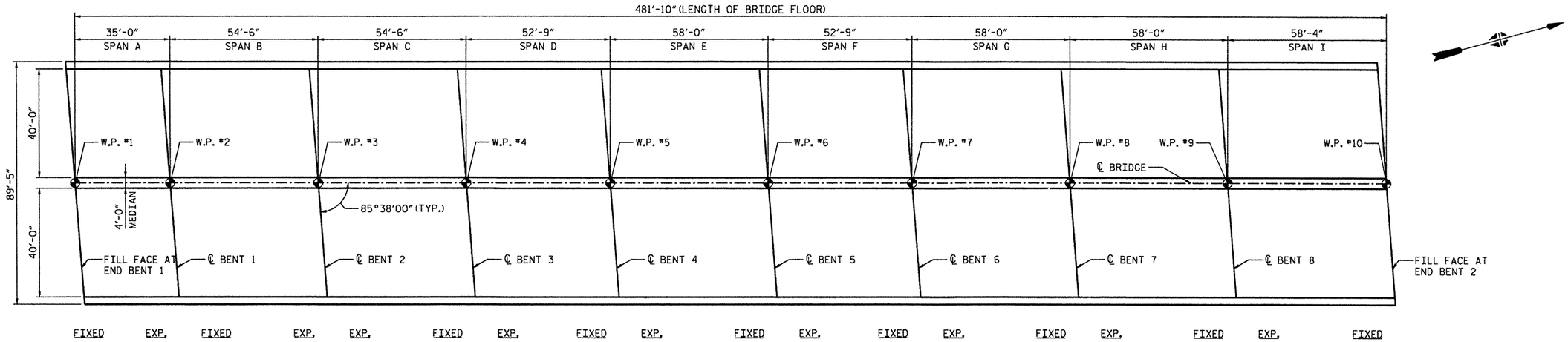


PLAN OF SPANS - DECK REPAIRS

SAWED OPENING FOR FOAM JOINT			
BENT NO.	W AT 90°F	W AT 60°F	W AT 45°F
BENT 1	1 7/8	2	2 1/16
BENT 2	1 11/16	2	2 3/16
BENT 3	1 7/8	2	2 1/16
BENT 4	1 13/16	2	2 1/16
BENT 5	1 7/8	2	2 1/16
BENT 6	1 13/16	2	2 1/16
BENT 7	1 13/16	2	2 1/16
BENT 8	1 13/16	2	2 1/16

NOTES

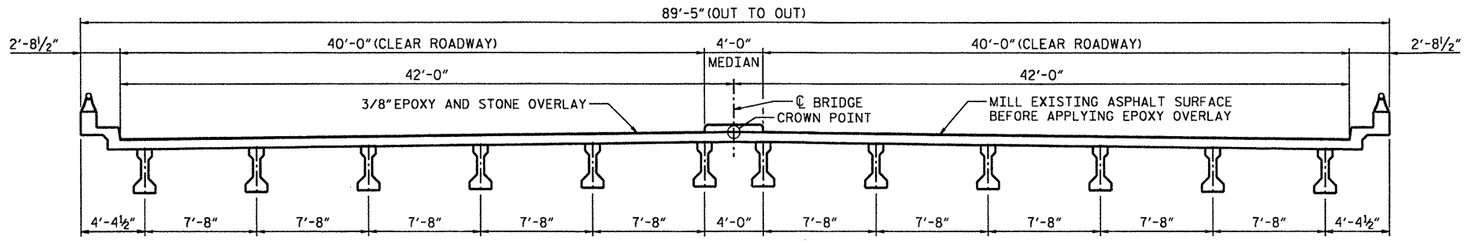
FOR REPAIR OF BRIDGE WITH EPOXY AND STONE OVERLAY, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2½" AT BENTS.

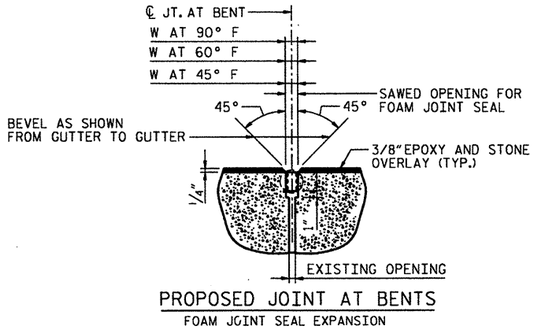
FOR OVER-SAWED JOINTS, THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE DETERMINED BY THE ENGINEER.

AFTER MILLING THE EXISTING ASHPALT WEARING SURFACE THE CONTRACTOR SHALL SOUND THE DECK AND REPAIR DETERIORATED AREAS BEFORE APPLING THE EPOXY OVERLAY.



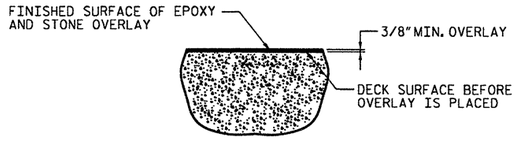
TYPICAL SECTION

TOTAL BILL OF MATERIAL				
MILLING ASPHALT PAVEMENT, 5/8" DEPTH	PLACEMENT OF EPOXY OVERLAY	FOAM JOINT SEALS	CLASS II CONCRETE DECK REPAIR FOR EPOXY OR ASPHALT OVERLAY	PLACEMENT OF PRE-TREATMENT
SQ. YDS.	SQ. FT.	LUMP SUM	SQ. FT.	SQ. FT.
476	38,546	LUMP SUM	13,860	38,546



PROPOSED JOINT AT BENTS

FOAM JOINT SEAL EXPANSION



DETAIL FOR EPOXY AND STONE OVERLAY

PROJECT NO. WBS17BP.5.P.2

WAKE COUNTY

BRIDGE NO.: 223

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WAKE 223 EPOXY OVERLAY

(I-440 OVER SR3007)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032129 ENGINEER MATTHEW J. MOYER
2-15-12

REVISIONS						SHEET NO. S-18
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

HDR Engineering, Inc. of the Carolinas
2733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

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USER: dwagner
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PENTABLE: Wake LMC-Epoxy.tbl
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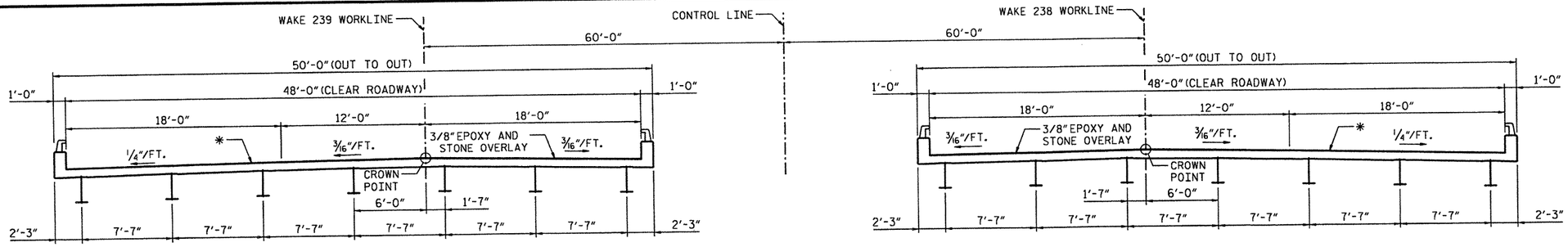
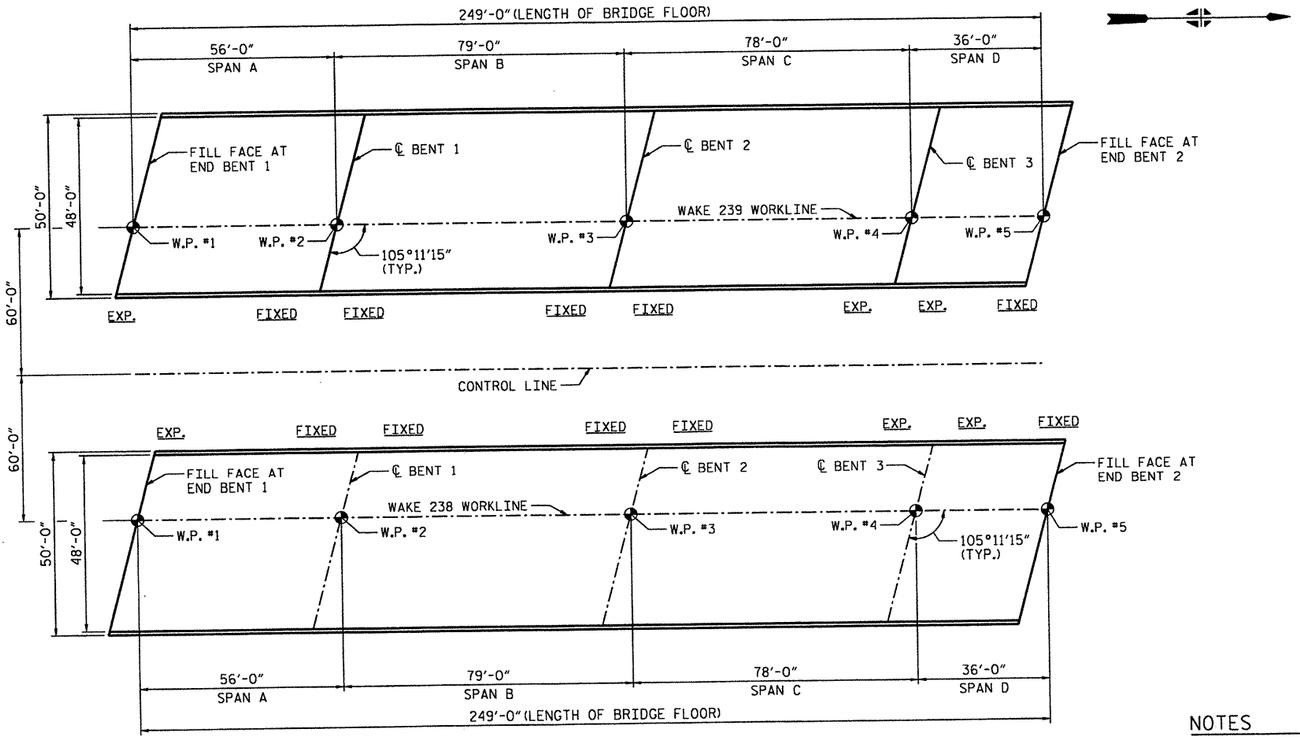
DATE: 2/15/2012

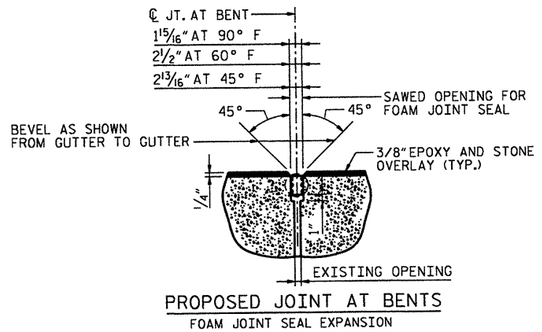


TYPICAL SECTION

* MILL EXISTING ASPHALT WEARING SURFACE BEFORE APPLYING EPOXY OVERLAY

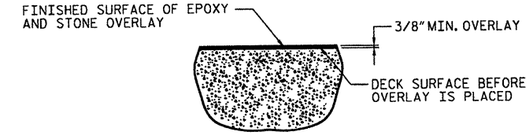


PLAN OF SPANS - DECK REPAIRS



PROPOSED JOINT AT BENTS

FOAM JOINT SEAL EXPANSION



DETAIL FOR EPOXY AND STONE OVERLAY

TOTAL BILL OF MATERIAL				
MILLING ASPHALT PAVEMENT, 5/8" DEPTH	PLACEMENT OF EPOXY OVERLAY	FOAM JOINT SEALS	CLASS II CONCRETE DECK REPAIR FOR EPOXY OR ASPHALT OVERLAY	PLACEMENT OF PRE-TREATMENT
SQ. YDS.	SQ. FT.	LUMP SUM	SQ. FT.	SQ. FT.
295	23,904	LUMP SUM	5626	23,904

NOTES

FOR REPAIR OF BRIDGE WITH EPOXY AND STONE OVERLAY, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2 1/2" AT BENTS.

FOR OVER-SAWED JOINTS, THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE DETERMINED BY THE ENGINEER.

AFTER MILLING THE EXISTING ASPHALT WEARING SURFACE THE CONTRACTOR SHALL SOUND THE DECK AND REPAIR DETERIORATED AREAS BEFORE APPLING THE EPOXY OVERLAY.

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO.: 238 AND 239

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WAKE 238 AND WAKE 239 EPOXY OVERLAY

(I-440 OVER SR1728)

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER
2-15-12

REVISIONS						SHEET NO. S-19
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

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3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

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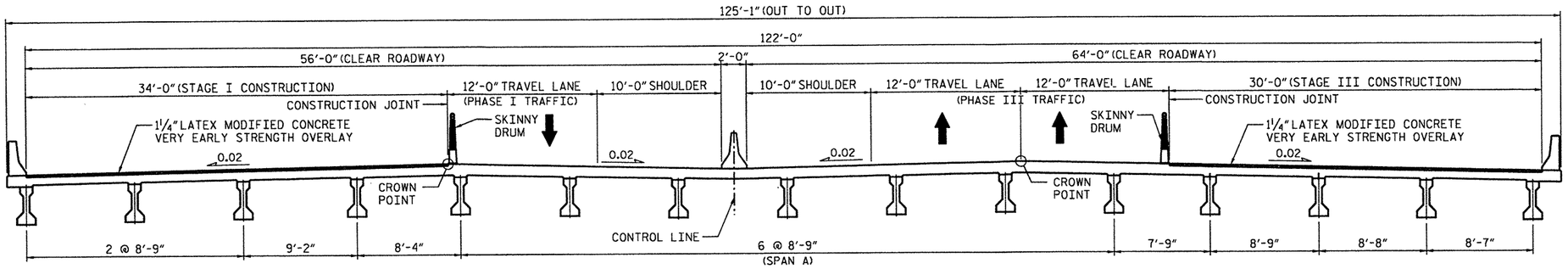
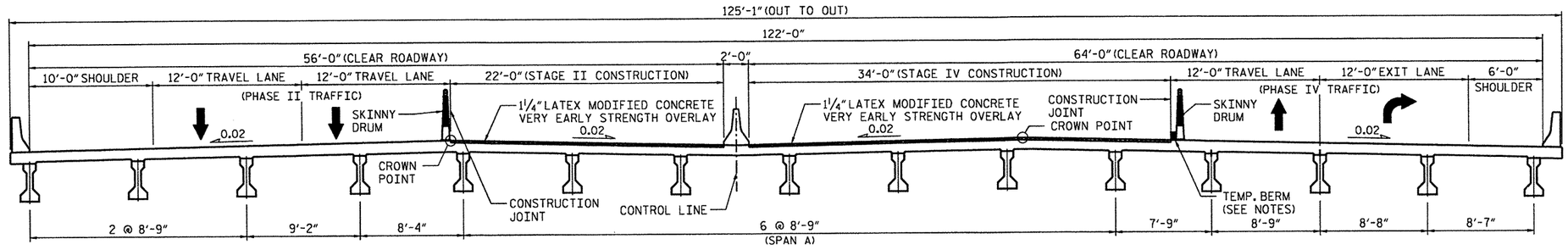
DATE: 2/15/2012



TYPICAL SECTION - STAGE I AND STAGE III

(SPANS A AND C SHOWN. SPAN B SIMILAR.)



TYPICAL SECTION - STAGE II AND STAGE IV

(SPANS A AND C SHOWN. SPAN B SIMILAR.)

NOTES

FOR "HYDRO-DEMOLITION OF BRIDGE DECK", SEE SPECIAL PROVISIONS.

THE CONTRACTOR MUST COLLECT, TREAT AND DISPOSE OF RUN-OFF WATER FROM THE HYDRO-DEMOLITION PROCESS. SEE "MANAGING HYDRO-DEMOLITION WATER" SPECIAL PROVISIONS.

THE BOUNDARIES OF AREAS IDENTIFIED FOR CLASS III SURFACE PREPARATION ARE APPROXIMATE. IF ANY CLASS III LOCATIONS ARE ENCOUNTERED PRIOR TO OR DURING HYDRO-DEMOLITION, SEE "TYPICAL 'BLOW THRU' CONTAINMENT AND FORMWORK" DETAIL. THE CONTRACTOR SHALL PROVIDE A METHOD OF HANDLING UNEXPECTED BLOW THROUGH WORK OF THE DECK.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2½" AT BENTS. FOR "FOAM JOINT SEALS", SEE SPECIAL PROVISIONS.

FOR "ELASTOMERIC CONCRETE", SEE SPECIAL PROVISIONS.

LATEX MODIFIED CONCRETE SHALL BE LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH.

FOR "LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH", SEE SPECIAL PROVISIONS.

FOR GROOVING BRIDGE FLOORS INFORMATION, SEE "LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH" SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

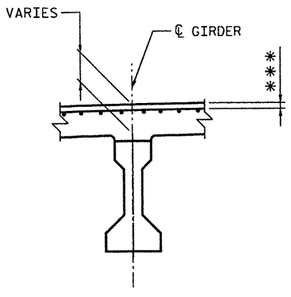
FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

EXISTING JOINTS AND BRIDGE DECK DRAINS SHALL BE SEALED PRIOR TO BEGINNING SURFACE PREPARATION OF BRIDGE DECK.

EXISTING DIMENSIONS AND BRIDGE CONDITION ARE FROM THE BEST INFORMATION AVAILABLE. THE CONTRACTOR SHALL VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.

FOR SCARIFYING BRIDGE DECK, SEE SPECIAL PROVISIONS.

WATER AND CONCRETE SLURRY FROM HYDRO-DEMOLITION SHALL NOT BE ALLOWED TO DRAIN ACROSS TRAVEL LANES. CONTRACTOR SHALL PROVIDE A METHOD TO CONTROL WATER.



EXISTING SLAB SECTION

BOTTOM MAT OF REINFORCING NOT SHOWN FOR CLARITY
*** SEE DRAWING "BRIDGE DECK EVALUATION TEST LOCATIONS FOR BRIDGE NO. 242"

TOTAL BILL OF MATERIAL

SCARIFYING BRIDGE DECK	*CLASS I SURFACE PREPARATION	*CLASS II SURFACE PREPARATION	*CLASS III SURFACE PREPARATION	*CLASS AA CONCRETE	HYDRO-DEMOLITION OF BRIDGE DECK	LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH OVERLAY	PLACING & FINISHING LATEX MODIFIED CONCRETE-VERY EARLY STRENGTH OVERLAY	FOAM JOINT SEALS	GROOVING BRIDGE FLOORS
SQ. YDS.	SQ. YDS.	SQ. YDS.	SQ. YDS.	CU. YDS.	SQ. YDS.	CU. YDS.	SQ. YDS.	LUMP SUM	SQ. FT.
1925	0	0	0	0	1925	81	1925	LUMP SUM	16497

*QUANTITY SHOWN IS FOR INFORMATION ONLY.

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

PROJECT NO. WBS 17BP.5.P.2
WAKE COUNTY
BRIDGE NO.: 242

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032129 MATTHEW J. MOYER
2-15-12

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION FOR BRIDGE NO. 242
(I-440 OVER SR1676)

REVISIONS						SHEET NO. S-20
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

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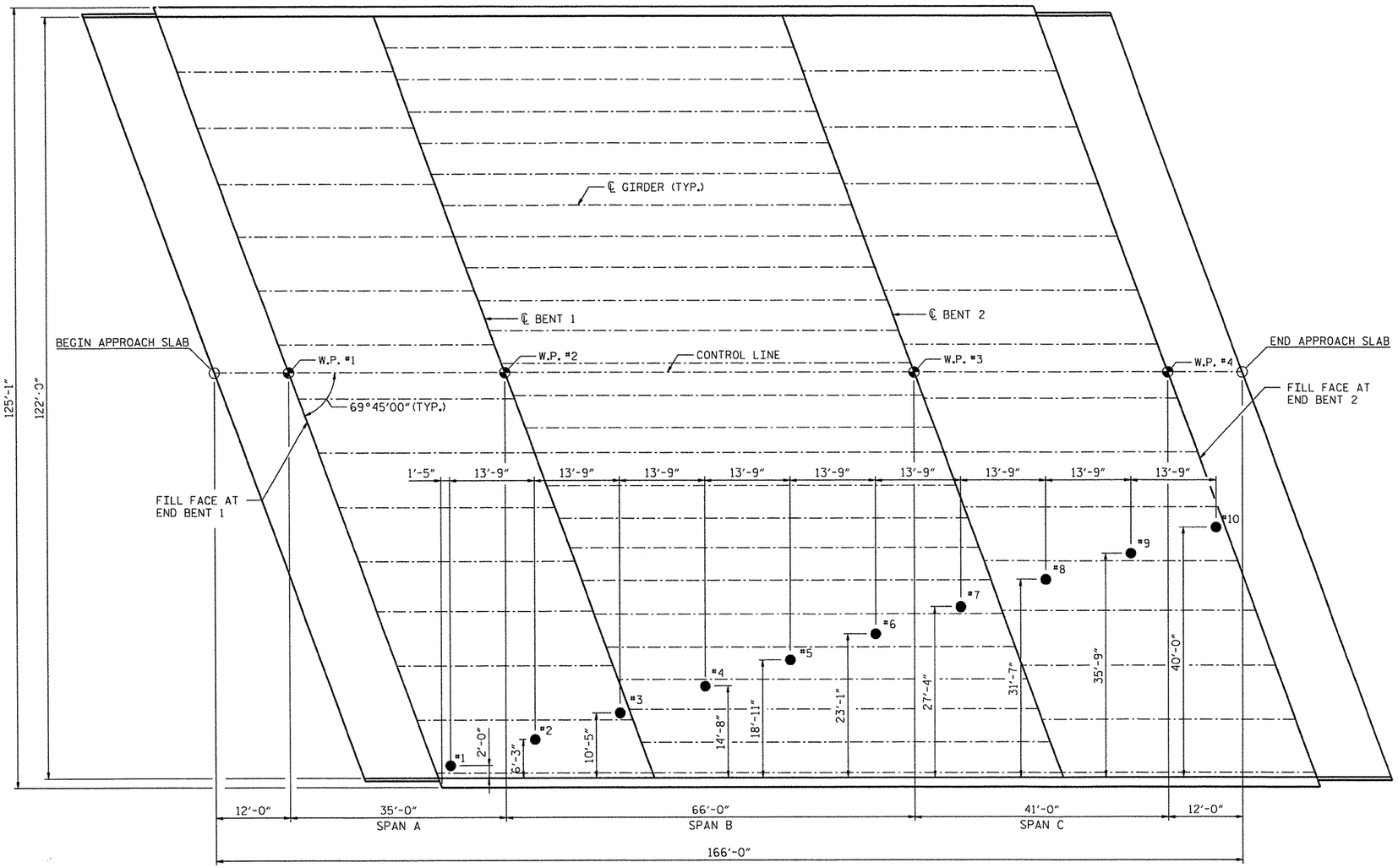

PLAN VIEW - TEST LOCATIONS

CONCRETE & REINFORCING		
TEST LOCATION	TOP BAR COVER (in)	CONCRETE STRENGTH (psi)
1	2 3/4"	3700
2	2 3/4"	3900
3	3 1/4"	4500
4	2 7/8"	3500
5	3 5/8"	3500
6	3 1/8"	3700
7	3"	4100
8	3 1/8"	4300
9	3 1/8"	3900
10	3 1/8"	4300

NOTE: ALL TEST LOCATIONS ARE TAKEN FROM THE GUTTERLINE

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO.: 242

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE DECK EVALUATION TEST LOCATIONS FOR BRIDGE NO. 242

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER
1-19-2012

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

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

SHEET NO. S-21
TOTAL SHEETS 26

DRAWN BY : L. PATTERSON DATE : DATE
CHECKED BY : M. MOYER DATE : DATE

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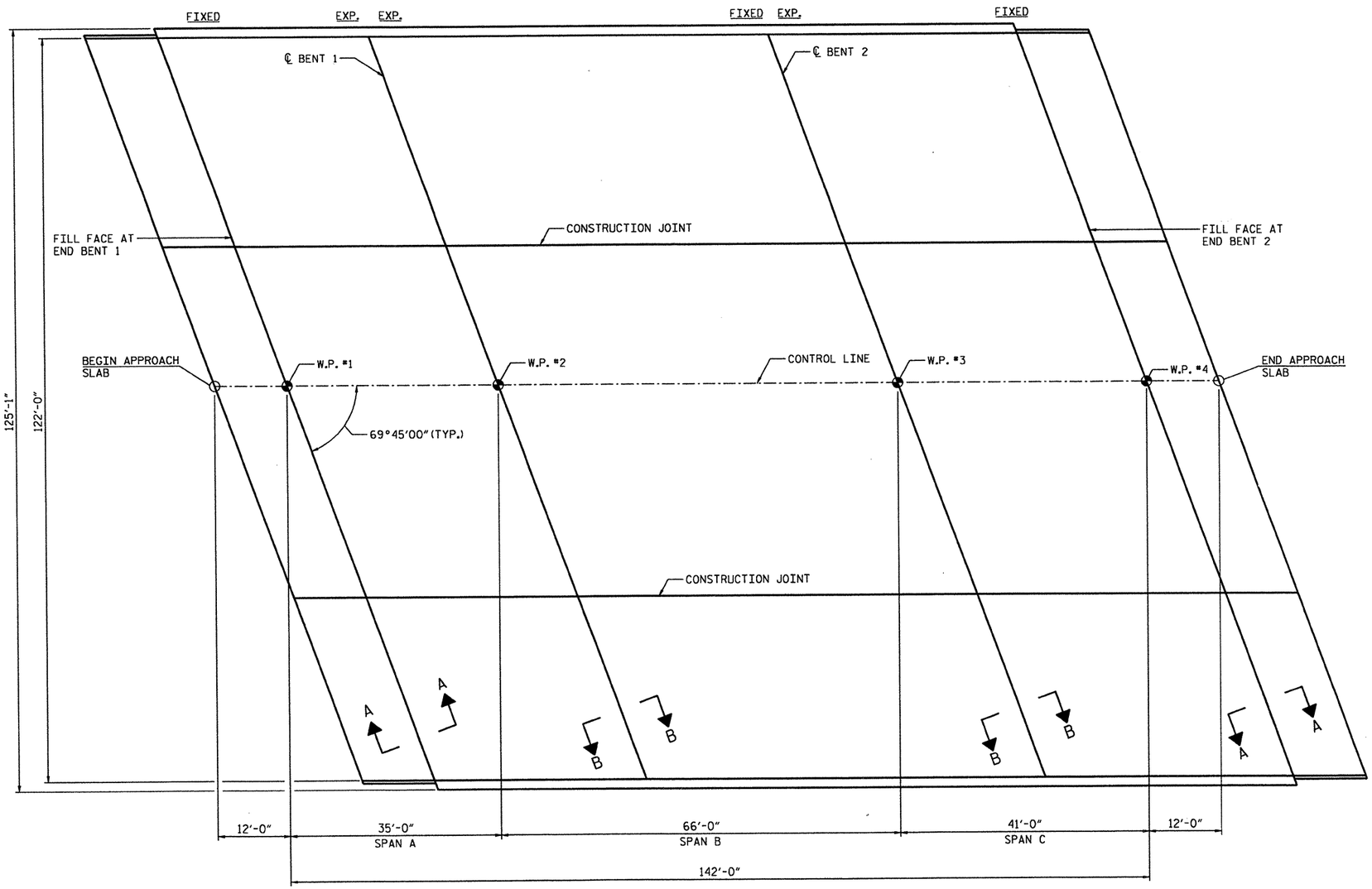
USER: mells
FILE: North Carolina Dept of Transportation\NCDOT_DDO_CEI_BM_LSC_MASTER\NCDOT_Wake_LMC_Epoxy\13.00_CAD\Wake 242\Drawings\WAKE-242_STR.dgn
PENTABLE: Wake LMC_Epoxy.tbl
DATE: 1/19/2012
TIME: 9:21:01 AM

NOTE: FOR SECTIONS A-A AND B-B, SEE SHEET "JOINT DETAILS FOR BRIDGE NO. 242".



PLAN VIEW

ELASTOMERIC CONCRETE	
BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
BENT 1	22.3
BENT 2	22.3
TOTAL	44.6

* BASED ON THE MINIMUM BLOCKOUT SHOWN

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO.: 242

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN VIEW
FOR BRIDGE NO. 242

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER

12-9-11

REVISIONS						SHEET NO. S-22
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

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N.C.B.E.L.S. License Number: F-0116

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

PLOT DRIVER: NCDOT_pdf_mono_eng_50.plt
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FILE: North Carolina_Dept_of_Transportation\NCDOT_DOO_CEI_BM_LSC_MASTER\NCDOT_Wake_LMC_Epoxy\13.00_CAD\Wake 242\Drawings\WAKE-242_STR.dgn
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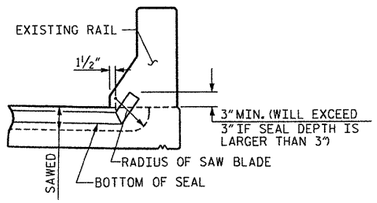
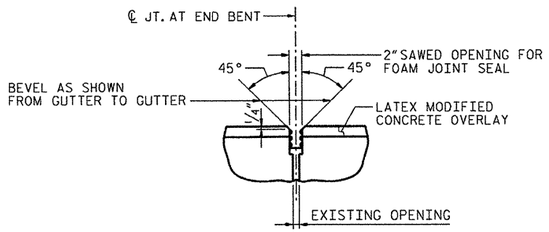
TIME: 2:34:44 PM
DATE: 12/9/2011

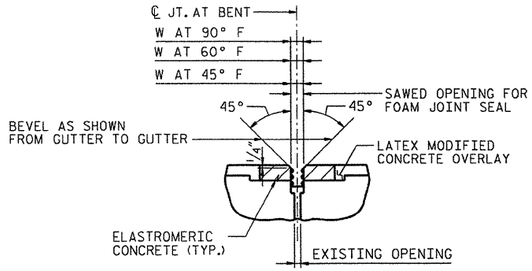
SAWED OPENING FOR FOAM JOINT			
BENT NO.	W AT 90°F	W AT 60°F	W AT 45°F
BENT 1	1¾	2	2⅛
BENT 2	1⅞	2	2 1/16



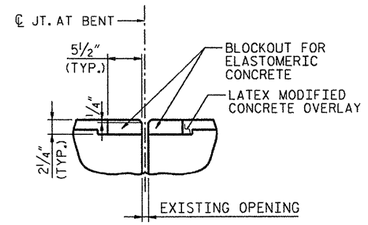
JOINT DETAIL AT RAIL



PROPOSED JOINT AT END BENTS
FOAM JOINT SEAL EXPANSION



PROPOSED JOINT AT BENTS
FOAM JOINT SEAL EXPANSION



FOAM JOINT SEAL AT BENTS
PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS

EXISTING SECTION AT END BENT

PROPOSED SECTION AT END BENT

SECTION A-A

EXISTING JOINT AT BENTS

PROPOSED JOINT AT BENTS

SECTION B-B

** ALL LOOSE AND UNSOUND CONCRETE SHALL BE REMOVED. IF THE EMBEDDED PORTION OF THE EXISTING PLASTIC WATERSTOP IS EXPOSED DURING REMOVAL OF UNSOUND CONCRETE, THE ENTIRE WATERSTOP SHALL BE REMOVED. OTHERWISE, TRIM WATERSTOP FLUSH WITH EXISTING CONCRETE SURFACE.

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO.: 242

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS FOR BRIDGE NO. 242

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER
1-19-2012

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

REVISIONS						SHEET NO. S-23
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

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USER: mgolls
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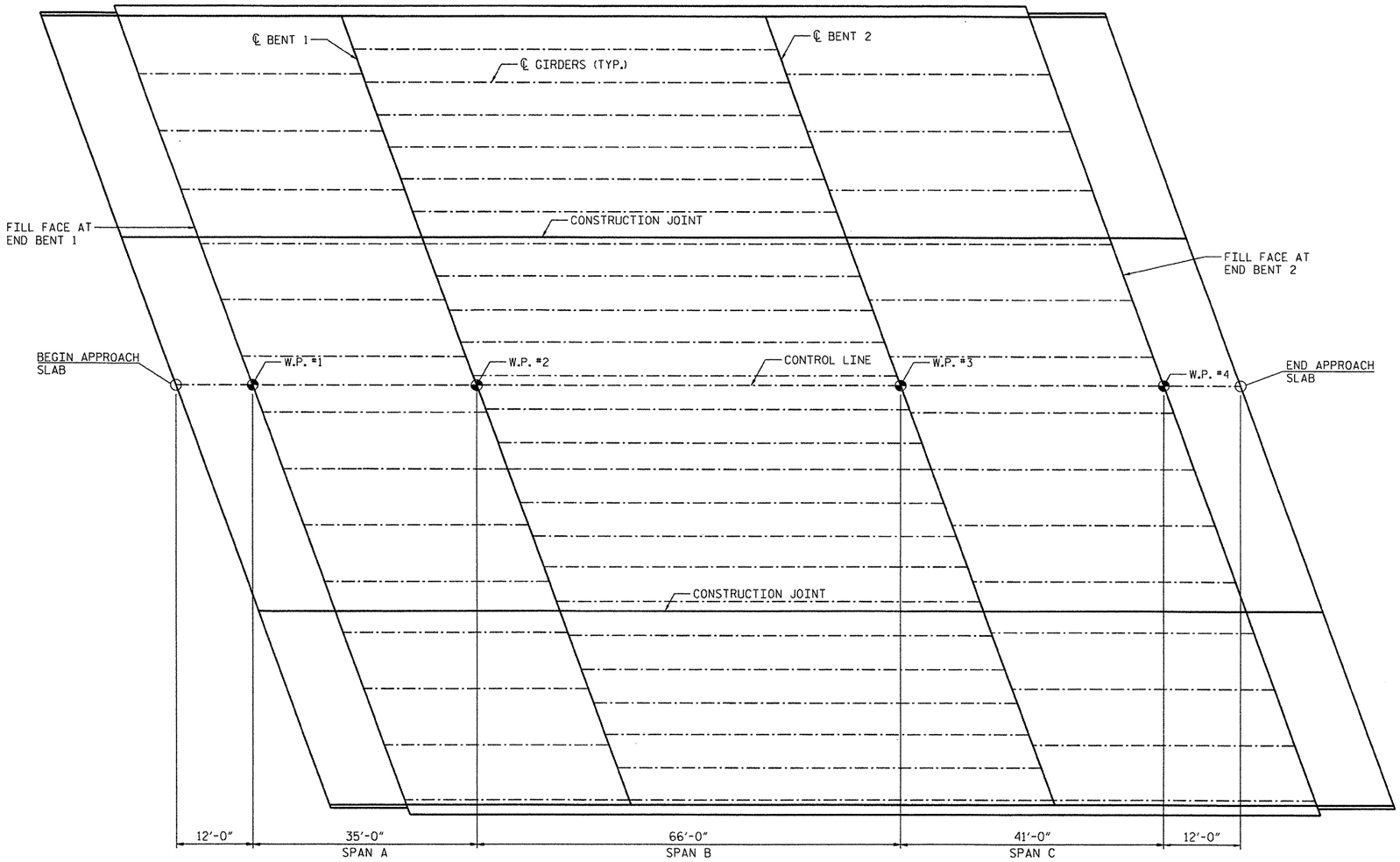
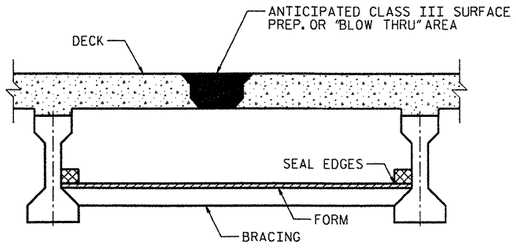




"BLOW THRU" CONTAINMENT AND FORMWORK

A METHOD TO CAPTURE WATER AND DEBRIS FROM BLOW THRU DURING HYDRO-DEMOLITION SHALL BE INSTALLED IN AREAS INDICATED AS CLASS III SURFACE PREPARATION.

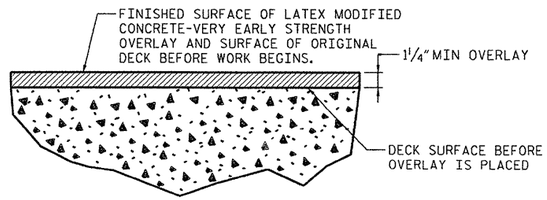
SUBMIT DETAILS OF PROPOSED FORMWORK FOR APPROVAL PRIOR TO BEGINNING WORK.

COST FOR INSTALLING REMOVING FORMWORK SHALL BE INCIDENTAL TO THE PER SQ. YARD OF HYDRO-DEMOLITION.

DRAWN BY : L. PATTERSON ;ATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

PLAN OF SPANS - DECK REPAIRS

APPROX. AREA: CLASS I REPAIR
APPROX. AREA: CLASS II REPAIR
APPROX. AREA: CLASS III REPAIR



DETAIL FOR LATEX MODIFIED CONCRETE OVERLAY

PROJECT NO. WBS 17BP.5.P.2
WAKE COUNTY
BRIDGE NO.: 242

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK REPAIR DETAILS FOR BRIDGE NO. 242

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER
1-19-2012

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			26

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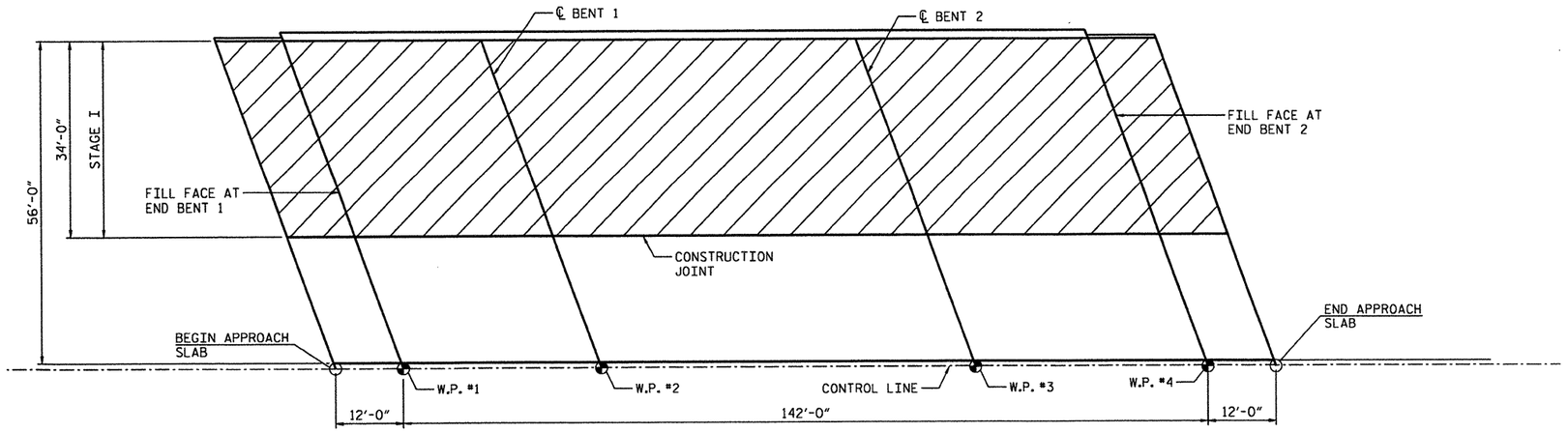
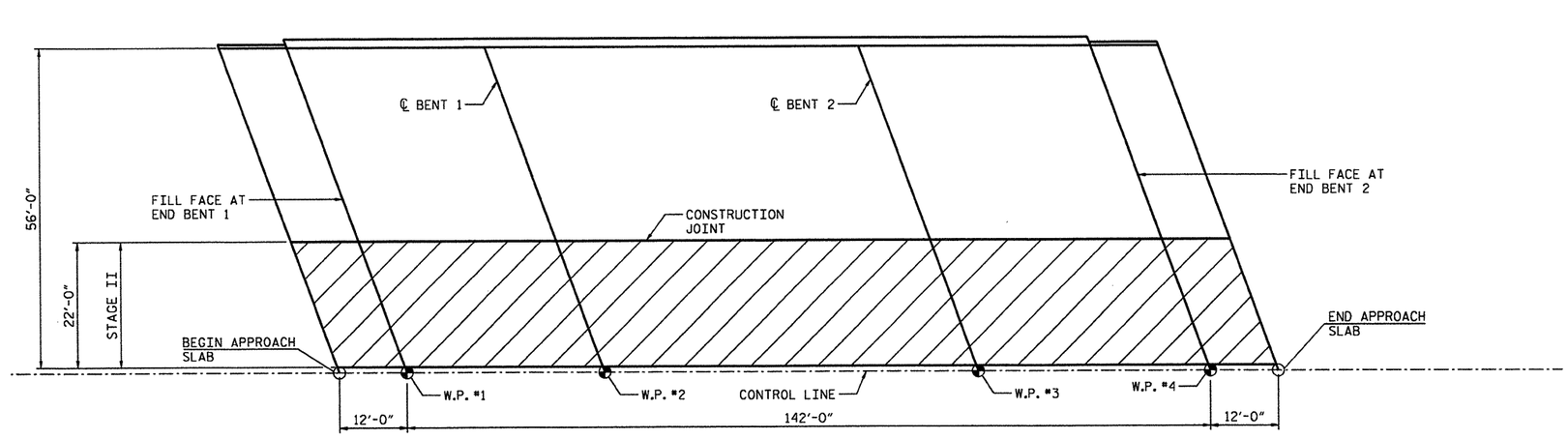


PLAN - STAGE I CONSTRUCTION

DECK SCARIFICATION AND HYDRO-DEMOLITION



PLAN - STAGE II CONSTRUCTION

DECK SCARIFICATION AND HYDRO-DEMOLITION

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO.: 242

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION & MILLING DETAILS FOR BRIDGE NO. 242 (STAGES I AND II)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032129 ENGINEER MATTHEW J. MOYER
12-9-11

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

REVISIONS						SHEET NO. S-25
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

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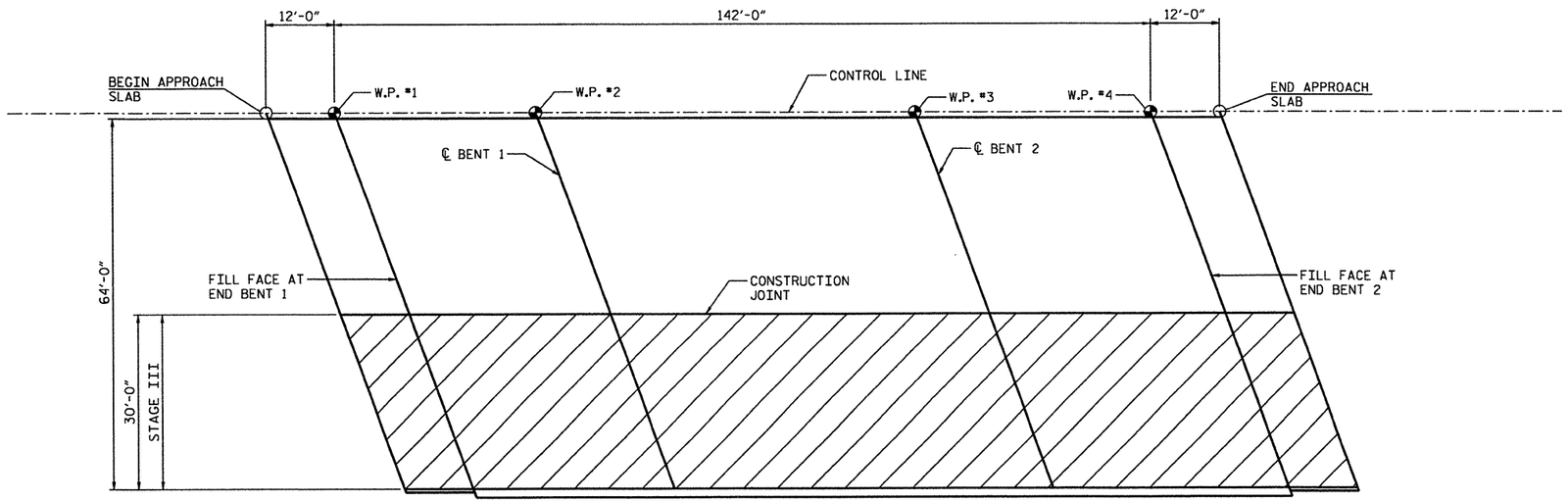
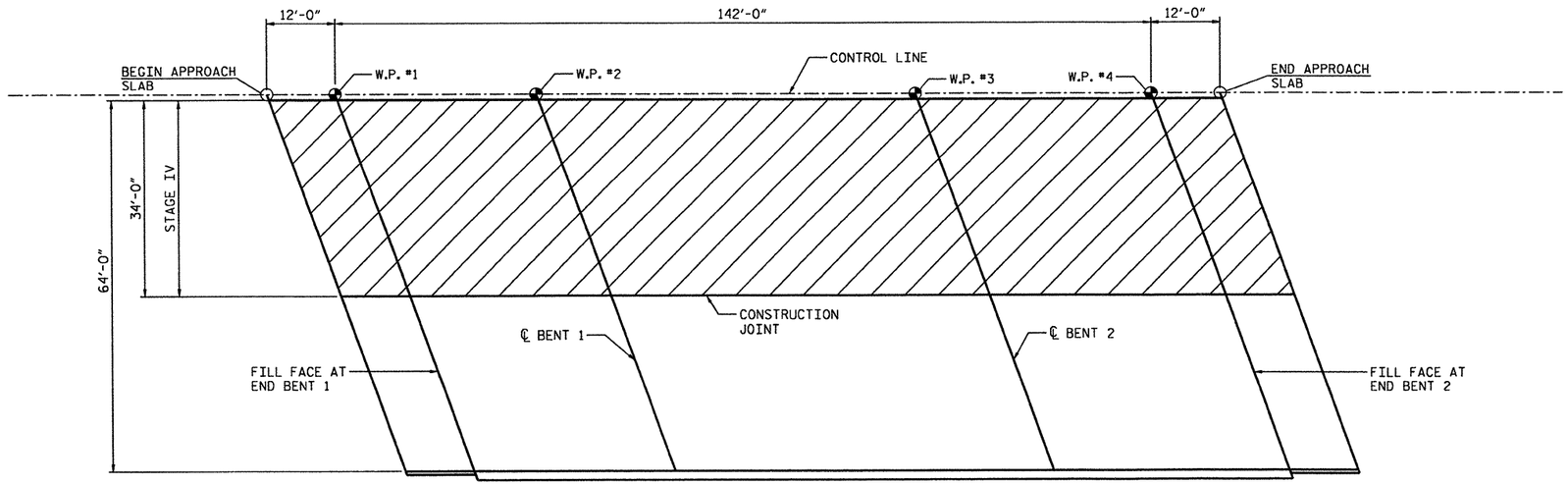


PLAN - STAGE III CONSTRUCTION

▨ DECK SCARIFICATION AND HYDRO-DEMOLITION



PLAN - STAGE IV CONSTRUCTION

▨ DECK SCARIFICATION AND HYDRO-DEMOLITION

PROJECT NO. WBS 17BP.5.P.2

WAKE COUNTY

BRIDGE NO.: 242

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION & MILLING DETAILS FOR BRIDGE NO. 242 (STAGES III AND IV)

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

NORTH CAROLINA PROFESSIONAL SEAL 032129 ENGINEER MATTHEW J. MOYER
12-9-11

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

DRAWN BY : L. PATTERSON DATE : 10/2011
CHECKED BY : M. MOYER DATE : 10/2011

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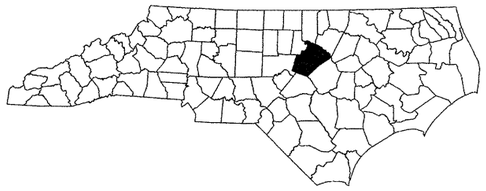
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

WAKE COUNTY



LOCATION: ***BRIDGE 197 ON ATHENS DRIVE OVER I–440***
BRIDGE 210 & 211 ON I–440 OVER SR 1012 (WESTERN BLVD)
BRIDGE 223 ON I–440 OVER SR 3007 (HILLSBOROUGH ST.) & CSX RAILROAD
BRIDGE 238 & 239 ON I–440 OVER SR 1728 (WAVE AVE)
BRIDGE 242 ON I–440 OVER SR 1676 (LAKE BOONE TRAIL)
(SEE SHEET TMP–2 FOR VICINITY MAP)

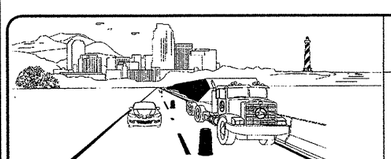
TYPE OF WORK: TRAFFIC CONTROL FOR BRIDGE DECK PRESERVATION

INDEX OF SHEETS

SHEET NO.
TMP-1

17BP.5.P.2

PROJECT:



WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699–1561
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)
PHONE: (919) 773–2800 FAX: (919) 771–2745

J. S. BOURNE, P.E. — *STATE TRAFFIC MANAGEMENT ENGINEER*
MATTHEW MOYER, P.E. — *PROJECT MANAGER*
MICHELLE WARD, P.E. — *TRAFFIC CONTROL PROJECT DESIGN ENGINEER*
CHRIS HARNDEN — *TRAFFIC CONTROL DESIGN ENGINEER*

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

PLAN PREPARED BY:
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
1/20/12

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PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-1A

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARDS
1130.01	DRUM
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1165.01	WORK VECHICLE LIGHTING SYSTEMS AND TMA DELINEATION
1180.01	SKINNY-DRUM
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1205.03	PAVEMENT MARKINGS - EXIT AND ENTRANCE RAMPS
1205.06	PAVEMENT MARKINGS - LANE DROPS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.12	PAVEMENT MARKINGS - BRIDGES
1205.13	PAVEMENT MARKINGS - LANE REDUCTIONS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM SKINNY DRUM TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW PANEL (TYPE C)
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

SIGNALS

EXISTING PROPOSED TEMP TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
1/20/12

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

ROADWAY STANDARD DRAWINGS & LEGEND

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GENERAL NOTES

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-1B

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS, OR RESULT IN DUPLICATE, OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATIONS MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR AS DIRECTED BY THE ENGINEER.

TIME RESTRICTIONS

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAMES	DAY & TIME RESTRICTIONS	
1.) I-440 (BRIDGE 210, 211 & 242) WESTERN BLVD. (SR 1012) LAKE BOONE TRAIL (SR 1676)	MONDAY-FRIDAY: SATURDAY: SUNDAY:	5:00 AM TO 9:00 PM 9:00 AM TO 10:00 PM 11:00 AM TO 9:00 PM
I-440 (BRIDGE 197, 223, 238 & 239) HILLSBOROUGH STREET (SR 3007) WADE AVENUE (SR 1728)	MONDAY-FRIDAY: SATURDAY: SUNDAY:	5:00 AM TO 9:00 PM 6:00 AM TO 10:00 PM 7:00 AM TO 9:00 PM
2.) ATHENS DR.	MONDAY-FRIDAY:	6:00 AM TO 9:00 AM 3:00 PM TO 6:00 PM

B) DO NOT CLOSE OR NARROW TRAVEL LANES DURING HOLIDAYS AND SPECIAL EVENTS AS FOLLOWS:

ROAD NAME

I-440, WESTERN BLVD. (SR 1012), LAKE BOONE TRAIL (SR 1676), HILLSBOROUGH ST. (SR 3007) & WADE AVENUE (SR 1728)

1) FOR ANY UNEXPECTED OCCURRENCE THAT CREATES UNUSUALLY HIGH TRAFFIC VOLUMES, AS DIRECTED BY THE ENGINEER.

2) FOR NEW YEAR'S, BETWEEN THE HOURS OF 5 A.M. DECEMBER 31ST TO 9 P.M. JANUARY 2ND. IF NEW YEARS DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OF MONDAY THEN UNTIL 9 P.M. THE FOLLOWING TUESDAY.

3) FOR EASTER, BETWEEN THE HOURS OF 5 A.M. THURSDAY AND 9 P.M. MONDAY.

4) FOR MEMORIAL DAY, BETWEEN THE HOURS OF 5 A.M. FRIDAY AND 9 P.M. TUESDAY.

5) FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 5 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 9 P.M. THE DAY AFTER INDEPENDENCE DAY. IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN BETWEEN THE HOURS OF 5 A.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 9 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.

6) FOR LABOR DAY, BETWEEN THE HOURS OF 5 A.M. FRIDAY AND 9 P.M. TUESDAY.

7) FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 5 A.M. TUESDAY AND 9 P.M. MONDAY.

8) FOR CHRISTMAS, BETWEEN THE HOURS OF 5 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 9 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

9) FOR NC STATE MEN'S BASKETBALL GAMES AND CAROLINA HURRICANES HOCKEY GAMES AT THE RBC CENTER, BETWEEN 2 HOURS BEFORE THE START AND 2 HOURS AFTER THE END OF THE EVENT.

10) FOR NC STATE FOOTBALL GAMES AT CARTER FINLEY STADIUM, BETWEEN 2 HOURS BEFORE THE START AND 2 HOURS AFTER THE END OF THE EVENT.

11) FOR THE NC STATE FAIR, BETWEEN THE HOURS OF 5 A.M. THE WEDNESDAY OF THE WEEK OF THE NC STATE FAIR AND 9 P.M. THE FOLLOWING MONDAY AFTER THE WEEK OF THE NC STATE FAIR.

ROAD NAME

ATHENS DRIVE

1) FOR ANY UNEXPECTED OCCURRENCE THAT CREATES UNUSUALLY HIGH TRAFFIC VOLUMES, AS DIRECTED BY THE ENGINEER.

2) FOR NEW YEAR'S, BETWEEN THE HOURS OF 6 A.M. DECEMBER 31ST TO 6 P.M. JANUARY 2ND. IF NEW YEARS DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OF MONDAY THEN UNTIL 6 P.M. THE FOLLOWING TUESDAY.

3) FOR EASTER, BETWEEN THE HOURS OF 6 A.M. THURSDAY AND 6 P.M. MONDAY.

4) FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6 A.M. FRIDAY AND 6 P.M. TUESDAY.

5) FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 6 P.M. THE DAY AFTER INDEPENDENCE DAY. IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN BETWEEN THE HOURS OF 6 A.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 6 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.

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7) FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 6 A.M. TUESDAY AND 6 P.M. MONDAY.

8) FOR CHRISTMAS, BETWEEN THE HOURS OF 6 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 6 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

C) DO NOT CLOSE ROADS AS FOLLOWS:

ROAD NAMES	DAY & TIME RESTRICTIONS	
WESTERN BLVD. RAMPS/LOOPS LAKE BOONE TRAIL RAMPS/LOOPS	MONDAY-FRIDAY: SATURDAY: SUNDAY:	5:00 AM TO 9:00 PM 9:00 AM TO 10:00 PM 11:00 AM TO 9:00 PM
WADE AVENUE RAMPS/LOOPS HILLSBOROUGH ST. RAMPS/LOOPS	MONDAY-FRIDAY: SATURDAY: SUNDAY:	5:00 AM TO 9:00 PM 6:00 AM TO 10:00 PM 7:00 AM TO 9:00 PM

D) DO NOT STOP TRAFFIC AS FOLLOWS:

ROAD NAMES	DAY & TIME RESTRICTIONS		DURATION & OPERATION
1.) I-440 (BRIDGE 210, 211 & 242) WESTERN BLVD. (SR 1012) LAKE BOONE TRAIL (SR 1676)	MONDAY-FRIDAY: SATURDAY: SUNDAY:	5:00 AM TO 9:00 PM 9:00 AM TO 10:00 PM 11:00 AM TO 9:00 PM	30 MINUTES FOR JACKING OR HYDRO-DEMOLITION
I-440 (BRIDGE 197, 223, 238 & 239) HILLSBOROUGH STREET (SR 3007) WADE AVENUE (SR 1728)	MONDAY-FRIDAY: SATURDAY: SUNDAY:	5:00 AM TO 9:00 PM 6:00 AM TO 10:00 PM 7:00 AM TO 9:00 PM	30 MINUTES FOR JACKING OR HYDRO-DEMOLITION
2.) ATHENS DRIVE	MONDAY-FRIDAY: SATURDAY: SUNDAY:	5:00 AM TO 9:00 PM 6:00 AM TO 10:00 PM 7:00 AM TO 9:00 PM	30 MINUTES FOR JACKING OR HYDRO-DEMOLITION

E) DO NOT CONDUCT ANY HAULING OPERATIONS AGAINST THE FLOW OF TRAFFIC OF AN OPEN TRAVELWAY UNLESS THE HAULING OPERATION IS PROTECTED BY BARRIER OR GUARDRAIL OR AS DIRECTED BY THE ENGINEER.

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
3/13/12

DIVISION OF HIGHWAYS * STATE OF NORTH CAROLINA * DEPARTMENT OF TRANSPORTATION * WORK ZONE TRAFFIC CONTROL

GENERAL NOTES

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PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-1C

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

GENERAL NOTES

LANE AND SHOULDER CLOSURE REQUIREMENTS

F) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED, OR AS DIRECTED BY THE ENGINEER.

G) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT. OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

H) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT. OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN DIVIDED FACILITY AND WITHIN 10 FT. OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

I) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

J) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT. ON BOTH SIDES OF AN OPEN TRAVELWAY RAMP OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH BARRIER OR GUARDRAIL.

K) DO NOT INSTALL MORE THAN 2 MILES OF LANE CLOSURES ON I-440 MEASURED FROM THE BEGINNING OF THE MERGE TAPER TO THE END OF THE LANE CLOSURE.

L) DO NOT INSTALL MORE THAN ONE LANE CLOSURE IN ANY ONE DIRECTION ON I-440.

PAVEMENT EDGE DROP OFF REQUIREMENTS

M) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREA ADJACENT TO AN OPEN TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

N) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 500 FT. IN ADVANCE AND A MINIMUM OF ONCE EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

O) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

P) INSTALL ADVANCE WORK ZONE SIGNS WHEN WORK IS WITHIN 40 FT. FROM THE EDGE OF TRAVEL LANE AND NO MORE THAT THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

Q) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.

R) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

S) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC CONTROL DEVICES

T) WHEN LANE CLOSURES ARE IN EFFECT, SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH), EXCEPT 10 FT. ON-CENTER IN RADII, AND 3 FT. OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATION FOR ROADS & STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES), & 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

U) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE THE ENTIRE ROADWAY.

V) PLACE ADDITIONAL SETS OF THREE CHANNELIZING DEVICES PERPENDICULAR TO THE EDGE OF TRAVELWAY ON 500 FT. CENTERS WHEN UNOPENED LANES ARE CLOSED TO TRAFFIC.

PAVEMENT MARKINGS AND MARKERS

W) INSTALL FINAL PAVEMENT MARKINGS AND PAVEMENT MARKERS AS FOLLOWS:

ROAD NAME	MARKING	MARKER
ALL ROADS	POLYUREA COLD APPLIED PLASTIC (FOR SYMBOLS)	PERMANENT RAISED

X) INSTALL TEMPORARY PAVEMENT MARKINS AND TEMPORARY PAVEMENT MARKERS AS FOLLOWS:

ROAD NAME	MARKING	MARKER
ALL ROADS	PAINT	NONE

Y) TIE PROPOSED MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

Z) REMOVE/REPLACE ANY CONFLICTING OR DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATIONS, WITH ONE APPLICATION OF PAINT.

MISCELLANEOUS

AA) LAW ENFORCEMENT SHALL BE USED TO MAINTAIN TRAFFIC THROUGH THE WORK AREA AND/OR INTERSECTIONS, AS DIRECTED BY THE ENGINEER.

BB) ENGINEER WILL NOTIFY THE OVERSIZE/OVERWIEGHT PERMIT UNIT AT 919-733-4740 TWO WEEKS PRIOR TO TRAFFIC BEING PLACED IN A ONE-LANE TRAFFIC PATTERN AND WHEN TRAFFIC IS RESTORED TO THE EXISTING PATTERN.

CC) DO NOT ALLOW WATER AND CONCRETE SLURRY FROM HYDRO-DEMOLITION TO DRAIN ACROSS TRAVEL LANES.

DD) COMPLETE PROPOSED CONSTRUCTION IN SUCH A MANNER THAT PONDING OF WATER DOES NOT OCCUR IN THE TRAVEL LANES.

EE) MEET & COORDINATE WITH EMS & LAW ENFORCEMENT AT LEAST 7 DAYS PRIOR TO BEGINNING WORK ON ANY BRIDGE.

FF) DO NOT PERFORM WORK ON MORE THAN ONE BRIDGE SIMULTANEOUSLY, UNLESS DIRECTED BY THE ENGINEER.

GG) MAINTAIN ACCESS TO EMERGENCY SERVICES THROUGH THE WORK ZONE AND ON CLOSED RAMPS AND LOOPS AT ALL TIMES.

HH) RECORD ALL EXISTING MARKINGS ON BRIDGE AND APPROACHES IN ORDER TO REPLACE MARKINGS AT THE END OF THE WORK DAY AND ONCE CONSTRUCTION IS COMPLETE.

II) COORDINATE WITH CSX RAILROAD PRIOR TO BEGINNING ANY WORK ON BRIDGE NO. 223.

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
3/13/12

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

GENERAL NOTES

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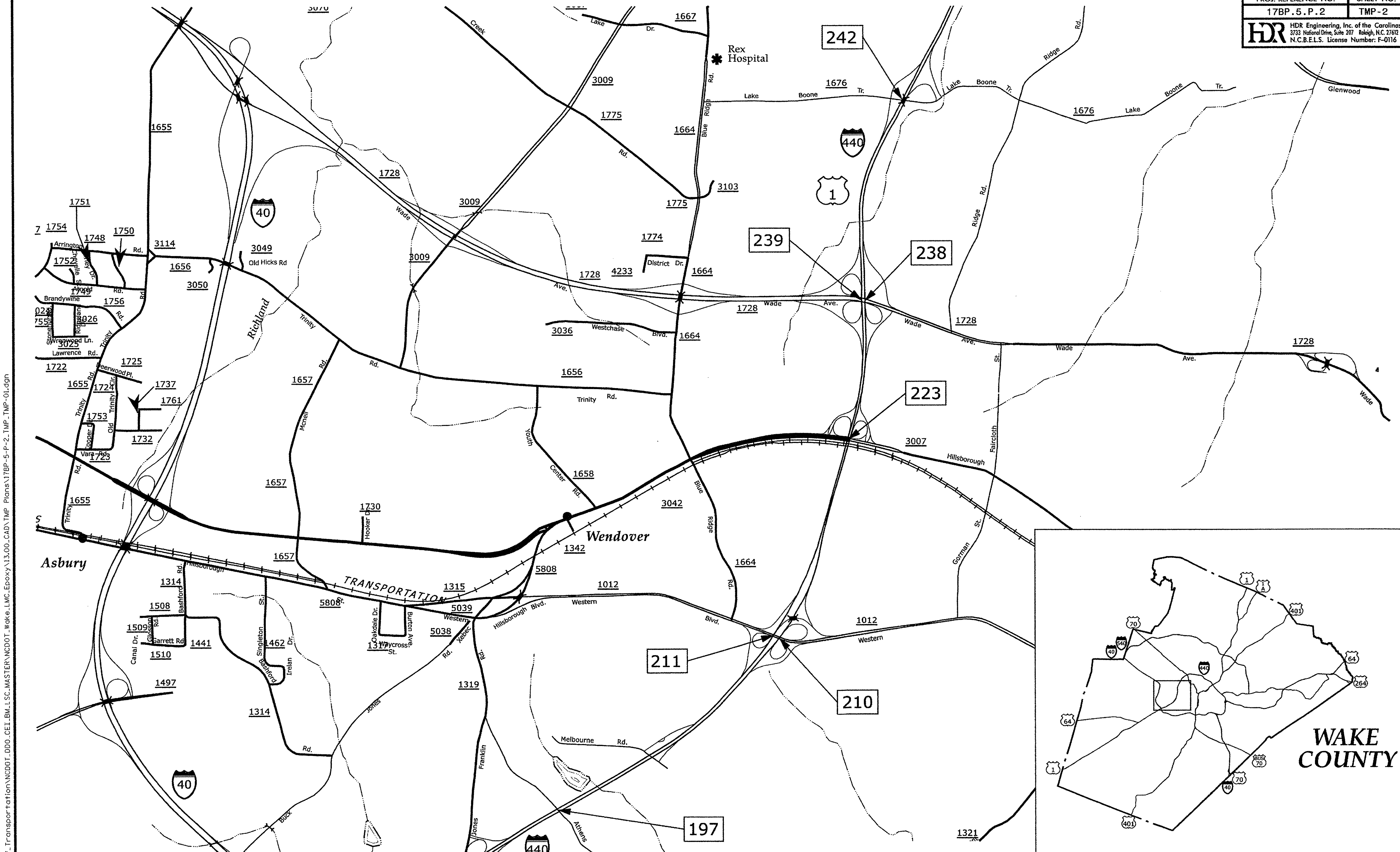
PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-2

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116



SEAL

NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD

1/20/12

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PROJECT VICINITY MAP

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PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-3

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

STAGING

STAGING NOTES - BRIDGE 197

NOTE: AT THE END OF THE WORK DAY, REMOVE ALL TRAFFIC CONTROL DEVICES, COVER OR REMOVE ALL ADVANCED TRAFFIC CONTROL SIGNS FOR THE LANE CLOSURE OPERATION, AND RETURN TRAFFIC TO ITS EXISTING PATTERN.

NOTE: SEE TMP-3A FOR DETOUR ROUTING PLAN AND SIGN SCHEDULE.

NOTE: WHEN PERFORMING WORK ON BRIDGE NO. 197, UTILIZE RSD 1101.03, SHEET 9 OF 9 (ROLLING ROAD BLOCK) ON I-440 DURING HYDRO-DEMOLITION OPERATIONS, IF NEEDED, AS DIRECTED BY THE ENGINEER.

NOTE: MINIMUM 100* BUFFER SPACE MAY BE USED ON RSD 1101.02, SHEET 1 OF 15 DUE TO CLOSE PROXIMITY TO KAPLAN DRIVE.

STAGE I

STEP 1: USING ONE OF THE FOLLOWING, PERFORM SUBSTRUCTURE WORK ON BRIDGE NO. 197:

I-440
RSD 1101.02, SHEET 3 AND 9 OF 15
RSD 1101.03, SHEET 9 OF 9 (FOR JACKING, SEE GENERAL NOTE D, TMP-1B)
RSD 1101.04

ATHENS DRIVE
RSD 1101.03, SHEET 8 OF 9 (FOR JACKING, SEE GENERAL NOTE D, TMP-1B)

ICT

COMPLETE THE WORK REQUIRED FOR BRIDGE NO. 197 IN STEPS 2 THRU 4 BETWEEN JULY 9 AND AUGUST 15 IN TWO SEPARATE WEEKENDS FROM 9:00 P.M. FRIDAY TO 5:00 A.M. MONDAY. (SEE SPECIAL PROVISIONS & LIQUIDATED DAMAGES)

STEP 2: USING SHEET TMP-3A AND RSD 1101.03, SHEET 1 OF 9, CLOSE ATHENS DRIVE & PLACE TRAFFIC IN AN OFFSITE DETOUR.

STEP 3: COMPLETE THE BRIDGE DECK WORK ON BRIDGE NO. 197 AS SHOWN IN THE STRUCTURE PLANS.

(NOTE: THE CONTRACTOR MAY CHOOSE TO COMPLETE THE ROADWAY APPROACH WORK ON BRIDGE NO. 197, REQUIRED IN STEP 5, DURING ROAD CLOSURE, IF TIME PERMITS.)

STEP 4: REMOVE ALL SIGNS AND TRAFFIC CONTROL DEVICES FOR THE DETOUR AND OPEN ATHENS DRIVE TO TRAFFIC.

STEP 5: USING RSD 1101.02, SHEET 1 OF 15, COMPLETE ROADWAY APPROACH WORK AT BRIDGE NO. 197.

STEP 6: USING RSD 1101.02, SHEET 1 OR 11 OF 15, PLACE FINAL MARKINGS AND MARKERS ON BRIDGE NO. 197 AND APPROACHES, AND OPEN TO TRAFFIC.

STEP 7: REMOVE ALL REMAINING TRAFFIC CONTROL DEVICES.

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SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
3/13/12

DIVISION OF HIGHWAYS * STATE OF NORTH CAROLINA * DEPARTMENT OF TRANSPORTATION * WORK ZONE TRAFFIC CONTROL

BRIDGE 197 STAGING

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-3A

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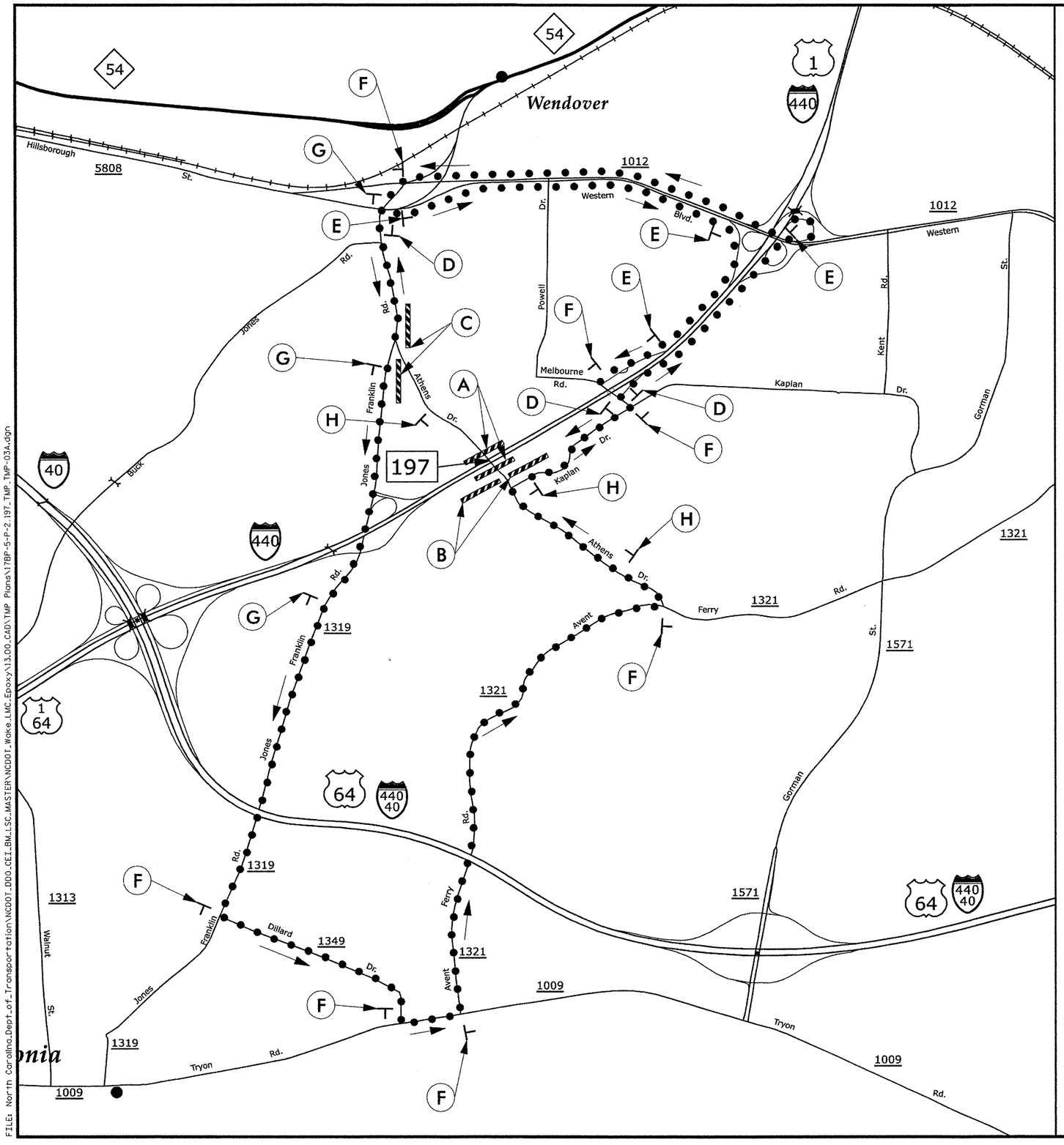
N.C.B.E.L.S. License Number: F-0116



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TIME: 10:40:55 AM
DATE: 1/20/2012

A
R11-2
48" x 30"
ROAD CLOSED
TYPE III BARRICADE(S)

B
R11-4
60" x 30"
ROAD CLOSED TO THRU TRAFFIC
DETOUR
M4-10R
48" x 18"
TYPE III BARRICADE

C
R11-4
60" x 30"
ROAD CLOSED TO THRU TRAFFIC
TYPE III BARRICADE

D
DETOUR M4-8 24" X 12"
M6-1 21" X 15"

E
DETOUR M4-8 24" X 12"
M6-2 21" X 15"

F
DETOUR M4-8 24" X 12"
M6-1 L 21" X 15"

G
DETOUR M4-8 24" X 12"
M6-3 21" X 15"

H
END DETOUR M4-8 A 24" X 18"

NOTE: SEE ROADWAY STANDARD DRAWING 1101.03, SHEET 1 OF 9 FOR SIGN SPACING, NOTES, AND FOR PLACEMENT OF ADDITIONAL SIGNS AND BARRICADES.

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DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

BRIDGE 197 DETOUR ROUTING PLAN

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-4

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STAGING

STAGING NOTES - BRIDGE 210

AT THE END OF THE WORK PERIOD, REMOVE ALL TRAFFIC CONTROL DEVICES, COVER OR REMOVE ALL ADVANCED WARNING SIGNS FOR THE LANE CLOSURES & DETOURS, AND RETURN TRAFFIC TO ITS EXISTING PATTERN.

IF NEEDED AND AS DIRECTED BY THE ENGINEER, USE RSD 1101.02, SHEET 3, 5 OR 6 OF 15, LAW ENFORCEMENT, AND/OR RSD 1101.03, SHEET 9 OF 9, TO DIRECT TRAFFIC ON WESTERN BLVD. UNDER BRIDGE NO. 210 WHEN PERFORMING WORK ON THE BRIDGE.

STAGE I

STEP 1: USING LAW ENFORCEMENT AND AND RSD 1101.02, SHEET 3 OF 15, CLOSE LEFT LANE AND COMPLETE BRIDGE WORK ON THE INSIDE MEDIAN LANE.

STAGE II

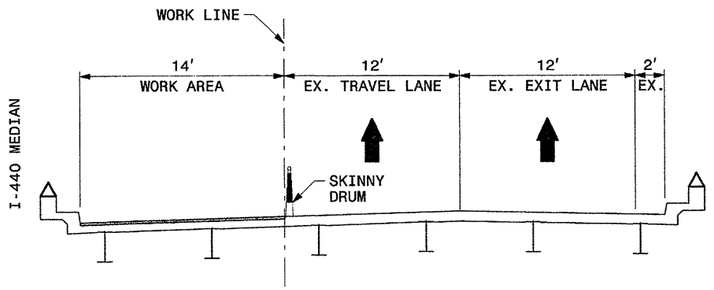
STEP 1: PLACE ALL DETOUR SIGNS AS SHOWN ON TMP-5, THEN CLOSE LOOP FROM EB WESTERN BLVD. TO EB/NB I-440 AND LOOP FROM EB/NB I-440 TO WB WESTERN BLVD. AND PLACE TRAFFIC ON OFFSITE DETOUR.

STEP 2: USING LAW ENFORCEMENT AND RSD 1101.02, SHEET 6 OF 15, CLOSE THE LEFT LANE AS THE INITIAL LANE CLOSURE. PLACE "CLOSURE SWITCH" (WEAVE LANE CLOSURE) USING RSD 1101.02, SHEET 6 OF 15, SHIFTING TRAFFIC TO THE MEDIAN LANE, THEN COMPLETE ALL BRIDGE WORK ON THE OUTSIDE LANE AND LOOP LANE (WEAVE AREA).

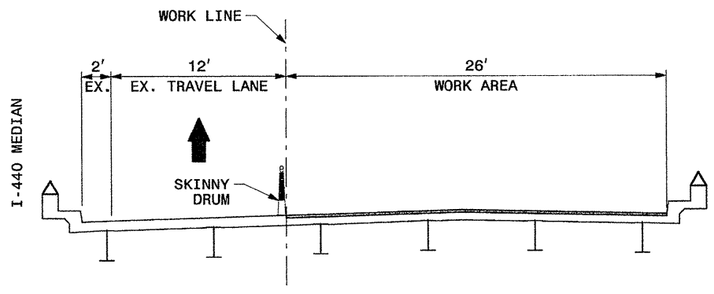
STEP 3: USING LAW ENFORCEMENT, LOOP CLOSURES AS SHOWN IN STEP 1 ABOVE, AND RSD 1101.02, SHEET 12 OF 15, PLACE FINAL PAVEMENT MARKINGS AND MARKERS, THEN OPEN TRAFFIC TO FINAL PATTERN.

STEP 4: REMOVE ALL REMAINING TRAFFIC CONTROL DEVICES.

TYPICALS



TYPICAL SECTION ACROSS BRDIGE - STAGE I



TYPICAL SECTION ACROSS BRDIGE - STAGE II

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
11/20/12

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

BRIDGE 210 (I-440 NORTH) STAGING & TYPICALS

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TIME: 10:41:06 AM
17BP-5-P-2.210_TMP_TMP-04.dgn

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-5

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MESSAGE NO. 1	MESSAGE NO. 2
I-440 NB LOOP CLOSED	FOLLOW DETOUR

CHANGEABLE MESSAGE SIGN

MESSAGE NO. 1	MESSAGE NO. 2
WESTERN BLVD LOOP	CLOSED FOLLOW DETOUR

CHANGEABLE MESSAGE SIGN

R11-2
48" x 30"
ROAD CLOSED
DETOUR
M4-10L
48" x 18"
TYPE III BARRICADE

R11-2
48" x 30"
ROAD CLOSED
DETOUR
M4-10L
48" x 18"
TYPE III BARRICADE

WESTERN BLVD.

HILLSBOROUGH ST.

EXIT 2B

EXIT 2A

EXIT 3

SOUTH BOUND I-440

NORTH BOUND I-440

CLOSE EB WESTERN BLVD ON-RAMP TO NB I-440.

END DETOUR M4-8 A 24" X 18"

DETOUR M4-8 24" X 12" M6-2 21" X 15"

DETOUR M4-8 24" X 12" M6-3 21" X 15"

DETOUR M4-8 24" X 12" M5-1 21" X 15"

DETOUR M4-8 24" X 12" M6-2 21" X 15"

TRUCK M4-4 24" X 12"
DETOUR M4-8 24" X 12" SP-M6-8 21" X 15"
DETOUR M4-8 24" X 12" M6-3 21" X 15"

TRUCK M4-4 24" X 12"
DETOUR M4-8 24" X 12" M6-1 L 21" X 15"

TRUCK M4-4 24" X 12"
DETOUR M4-8 24" X 12" M6-3 21" X 15"

TRUCK M4-4 24" X 12"
DETOUR M4-8 24" X 12" M6-1 L 21" X 15"

KENT RD.

METHOD RD.

GORMAN ST.

GORMAN ST.

LIGON ST.

SULLIVAN DR.

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
1/20/12

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

BRIDGE 210
STAGE 1
DETOUR ROUTING

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USER: BLibby
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TIME: 10:41:18 AM
DATE: 1/20/2012

STAGING

STAGING NOTES - BRIDGE 211

AT THE END OF THE WORK PERIOD, REMOVE ALL TRAFFIC CONTROL DEVICES, COVER OR REMOVE ALL ADVANCED WARNING SIGNS FOR THE LANE CLOSURES & DETOURS, AND RETURN TRAFFIC TO ITS EXISTING PATTERN.

IF NEEDED AND AS DIRECTED BY THE ENGINEER, USE RSD 1101.02, SHEET 3, 5 OR 6 OF 15, LAW ENFORCEMENT, AND/OR RSD 1101.03, SHEET 9 OF 9, TO DIRECT TRAFFIC ON WESTERN BLVD. UNDER BRIDGE NO. 211 WHEN PERFORMING WORK ON THE BRIDGE.

STAGE I

STEP 1: PLACE ALL DETOUR SIGNS AS SHOWN ON TMP-7 FOR STAGE I, THEN CLOSE RAMP FROM WB WESTERN BLVD. TO WB/SB I-440 AND PLACE TRAFFIC ON THE OFFSITE DETOUR.

STEP 2: USING LAW ENFORCEMENT AND RSD 1101.02, SHEET 3 OF 15, CLOSE THE LEFT LANE AND COMPLETE BRIDGE WORK ON THE MEDIAN LANE AND RAMP ACCELERATION LANE.

STAGE II

STEP 1: PLACE ALL DETOUR SIGNS AS SHOWN ON TMP-7 FOR STAGE II, THEN CLOSE LOOP FROM WB/SB I-440 TO EB WESTERN BLVD. AND PLACE TRAFFIC ON THE OFFSITE DETOUR.

STEP 2: USING LAW ENFORCEMENT AND RSD 1101.02, SHEET 6 OF 15, CLOSE THE LEFT LANE AS THE INITIAL LANE CLOSURE. PLACE "CLOSURE SWITCH" (WEAVE LANE CLOSURE) USING RSD 1101.02, SHEET 6 OF 15, SHIFTING TRAFFIC TO THE MEDIAN LANE , THEN COMPLETE ALL BRIDGE WORK ON THE OUTSIDE LOOP LANE.

STEP 3: USING LAW ENFORCEMENT, LOOP CLOSURES AS SHOWN ABOVE IN STEP 1 OF STAGES 1 & 2, AND RSD 1101.02, SHEET 12 OF 15, PLACE FINAL PAVEMENT MARKINGS AND MARKERS, THEN OPEN TRAFFIC TO FINAL PATTERN.

STEP 4: REMOVE ALL REMAINING TRAFFIC CONTROL DEVICES.

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TIME: 10:41:28 AM

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-6

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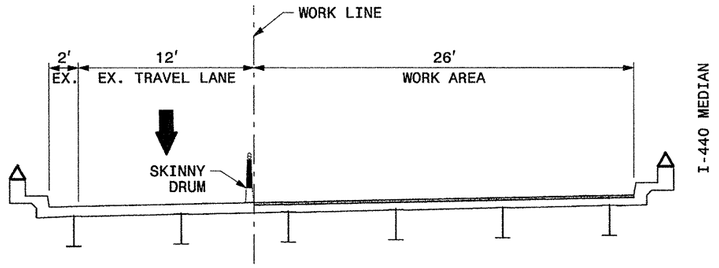
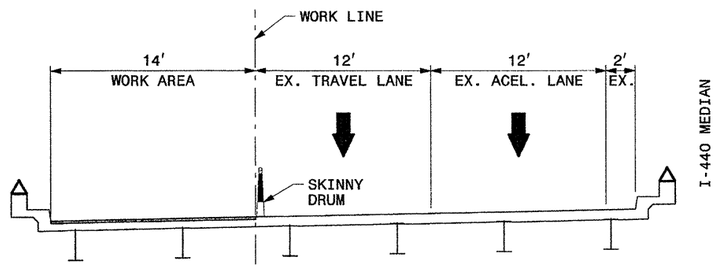
TYPICALS



TYPICAL SECTION ACROSS BRDIGE - STAGE I



TYPICAL SECTION ACROSS BRDIGE - STAGE II

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
11/20/12

DIVISION OF HIGHWAYS * STATE OF NORTH CAROLINA * DEPARTMENT OF TRANSPORTATION * WORK ZONE TRAFFIC CONTROL

BRIDGE 211 (I-440 SOUTH) STAGING & TYPICALS

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-7

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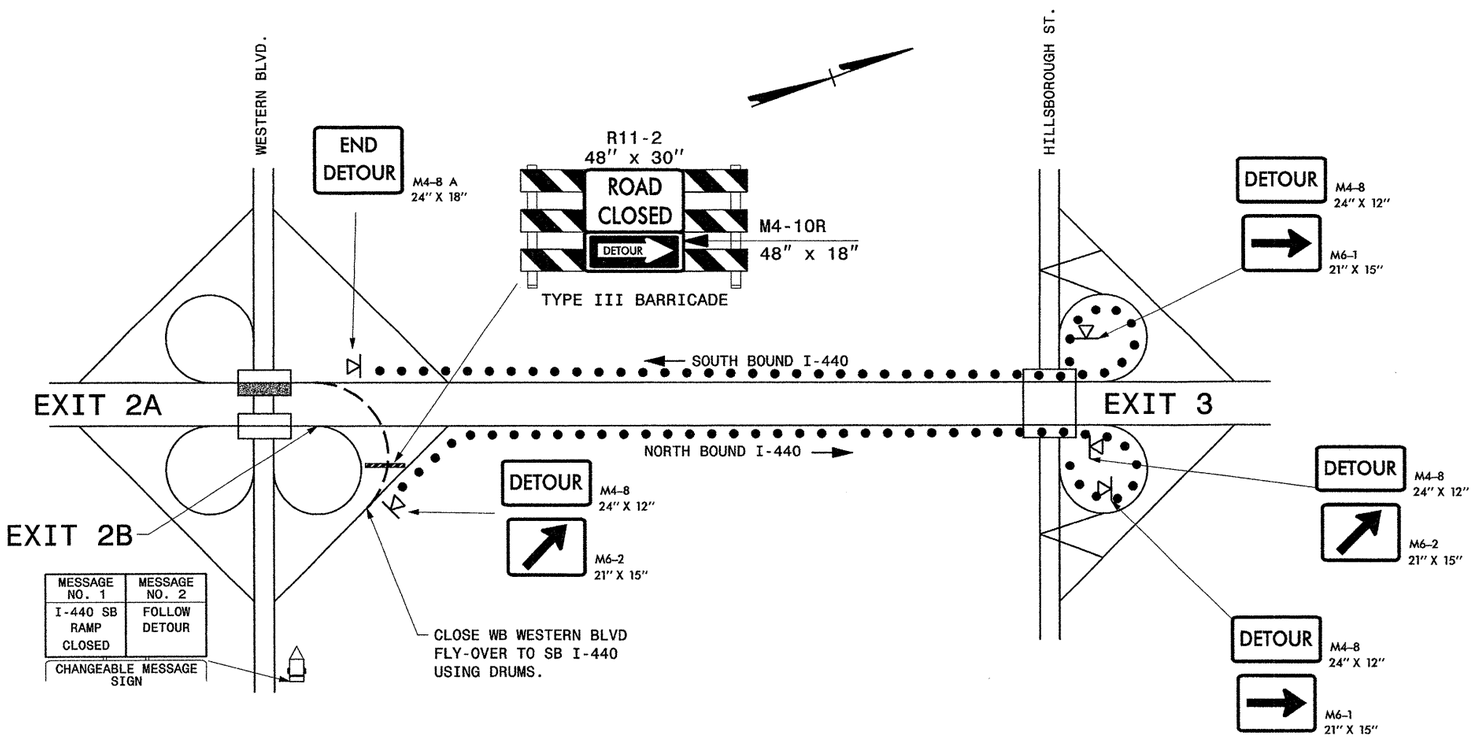
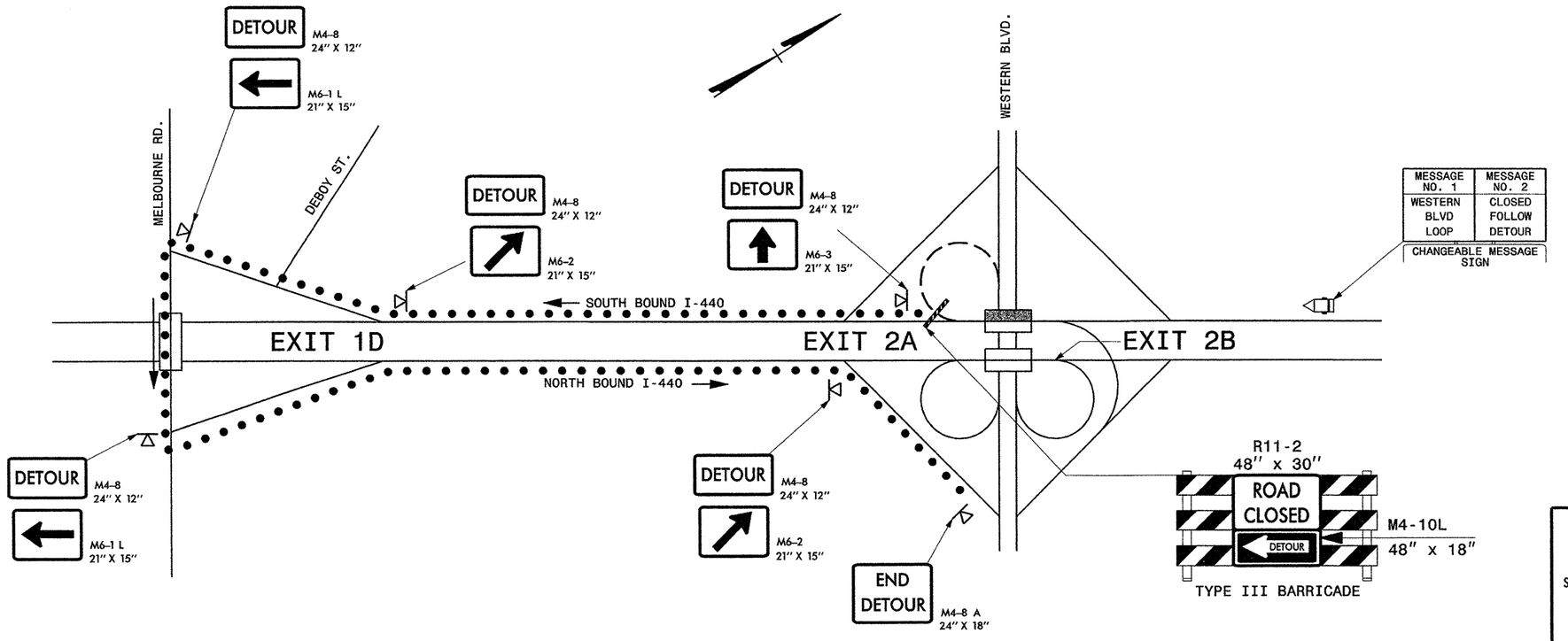


STAGE I



STAGE II

BRIDGE 211 DETOUR ROUTING

SEAL 033789 ENGINEER MICHELLE WARD 11/20/12

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

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STAGING

STAGING NOTES - BRIDGE 223

AT THE END OF THE WORK DAY, REMOVE ALL TRAFFIC CONTROL DEVICES, COVER OR REMOVE ALL ADVANCED WARNING SIGNS FOR THE LANE CLOSURES & DETOURS, AND RETURN TRAFFIC TO ITS EXISTING PATTERN.

IF NEEDED AND AS DIRECTED BY THE ENGINEER, USE RSD 1101.02, SHEET 3, 5 OR 6 OF 15, LAW ENFORCEMENT, AND/OR RSD 1101.03, SHEET 9 OF 9 TO DIRECT TRAFFIC ON HILLSBOROUGH STREET UNDER BRIDGE #223 WHEN PERFORMING WORK ON THE BRIDGE.

STAGE I

STEP 1: USING LAW ENFORCEMENT AND AND RSD 1101.02, SHEET 3 OF 15, CLOSE LEFT LANE ON I-440 WB/SB AND COMPLETE BRIDGE WORK ON THE INSIDE MEDIAN LANE.

STAGE II

STEP 1: PLACE ALL DETOUR SIGNS AS SHOWN ON TMP-10, THEN CLOSE LOOP FROM HILLSBOROUGH ST. TO WB/SB I-440 AND PLACE TRAFFIC ON OFFSITE DETOUR.

STEP 2: USING LAW ENFORCEMENT AND RSD 1101.02, SHEET 6 OF 15, CLOSE THE LEFT LANE AS THE INITIAL LANE CLOSURE. PLACE "CLOSURE SWITCH" (WEAVE LANE CLOSURE) USING RSD 1101.02, SHEET 6 OF 15, SHIFTING TRAFFIC TO THE MEDIAN LANE , THEN COMPLETE ALL BRIDGE WORK ON THE OUTSIDE LANE AND LOOP LANE.

STEP 3: USING LAW ENFORCEMENT, LOOP CLOSURE AS SHOWN IN STEP 1 ABOVE, AND RSD 1101.02, SHEET 12 OF 15, PLACE FINAL PAVEMENT MARKINGS AND MARKERS, THEN OPEN TRAFFIC TO FINAL PATTERN.

STEP 4: REMOVE ALL REMAINING TRAFFIC CONTROL DEVICES.

TYPICALS

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-8

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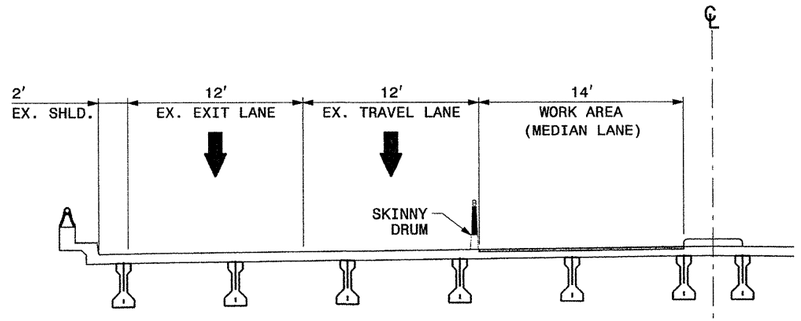
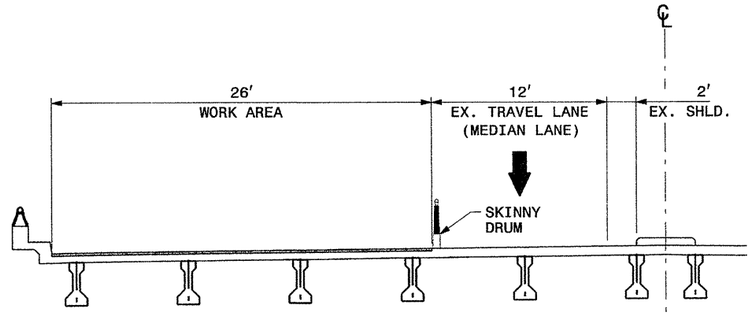


TYPICAL SECTION ACROSS BRDIGE - STAGE I



TYPICAL SECTION ACROSS BRDIGE - STAGE II

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
11/20/12

DIVISION OF HIGHWAYS * STATE OF NORTH CAROLINA * DEPARTMENT OF TRANSPORTATION * WORK ZONE TRAFFIC CONTROL *

BRIDGE 223 SB (I-440 SOUTH) STAGING & TYPICALS

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DATE: 1/20/2012
TIME: 10:41:50 AM

STAGING

STAGING NOTES - BRIDGE 223 (CONT)

AT THE END OF THE WORK DAY, REMOVE ALL TRAFFIC CONTROL DEVICES, COVER OR REMOVE ALL ADVANCED WARNING SIGNS FOR THE LANE CLOSURES AND DETOURS, AND RETURN TRAFFIC TO ITS EXISTING PATTERN.

IF NEEDED AND AS DIRECTED BY THE ENGINEER, USE RSD 1101.02, SHEET 3, 5 OR 6 OF 15, LAW ENFORCEMENT, AND/OR RSD 1101.03, SHEET 9 OF 9 TO DIRECT TRAFFIC ON HILLSBOROUGH STREET UNDER BRIDGE #223 WHEN PERFORMING WORK ON THE BRIDGE.

STAGE III

STEP 1: USING LAW ENFORCEMENT AND AND RSD 1101.02, SHEET 3 OF 15, CLOSE LEFT LANE ON I-440 EB/NB AND COMPLETE BRIDGE WORK ON THE INSIDE MEDIAN LANE.

STAGE IV

STEP 1: PLACE ALL DETOUR SIGNS AS SHOWN ON TMP-11, THEN CLOSE LOOP FROM EB/NB I-440 TO HILLSBOROUGH ST. AND PLACE TRAFFIC ON OFFSITE DETOUR.

STEP 2: USING LAW ENFORCEMENT AND RSD 1101.02, SHEET 6 OF 15, CLOSE THE LEFT LANE OF EB/NB I-440 AS THE INITIAL LANE CLOSURE. PLACE "CLOSURE SWITCH" (WEAVE LANE CLOSURE) USING RSD 1101.02, SHEET 6 OF 15, SHIFTING TRAFFIC TO THE MEDIAN LANE , THEN COMPLETE ALL BRIDGE WORK ON THE OUTSIDE LANE AND LOOP LANE.

STEP 3: USING LAW ENFORCEMENT, LOOP CLOSURE AS SHOWN IN STEP 1 ABOVE, AND RSD 1101.02, SHEET 12 OF 15, PLACE FINAL PAVEMENT MARKINGS AND MARKERS, THEN OPEN TRAFFIC TO FINAL PATTERN.

STEP 4: REMOVE ALL REMAINING TRAFFIC CONTROL DEVICES.

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TIME: 10:42:01 AM

TYPICALS

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-9

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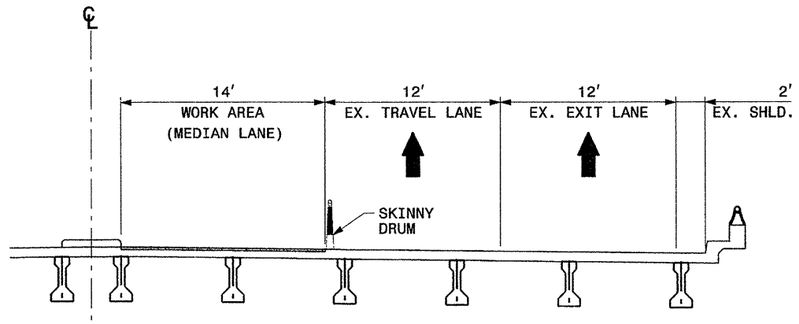
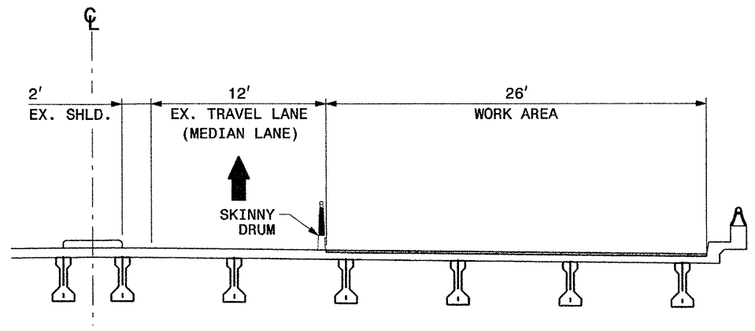
N.C.B.E.L.S. License Number: F-0116



TYPICAL SECTION ACROSS BRDIGE - STAGE III



TYPICAL SECTION ACROSS BRDIGE - STAGE IV

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
1/20/12

DIVISION OF HIGHWAYS * STATE OF NORTH CAROLINA * DEPARTMENT OF TRANSPORTATION * WORK ZONE TRAFFIC CONTROL

BRIDGE 223 NB (I-440 NORTH) STAGING & TYPICALS

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-10

HDR Engineering, Inc. of the Carolinas
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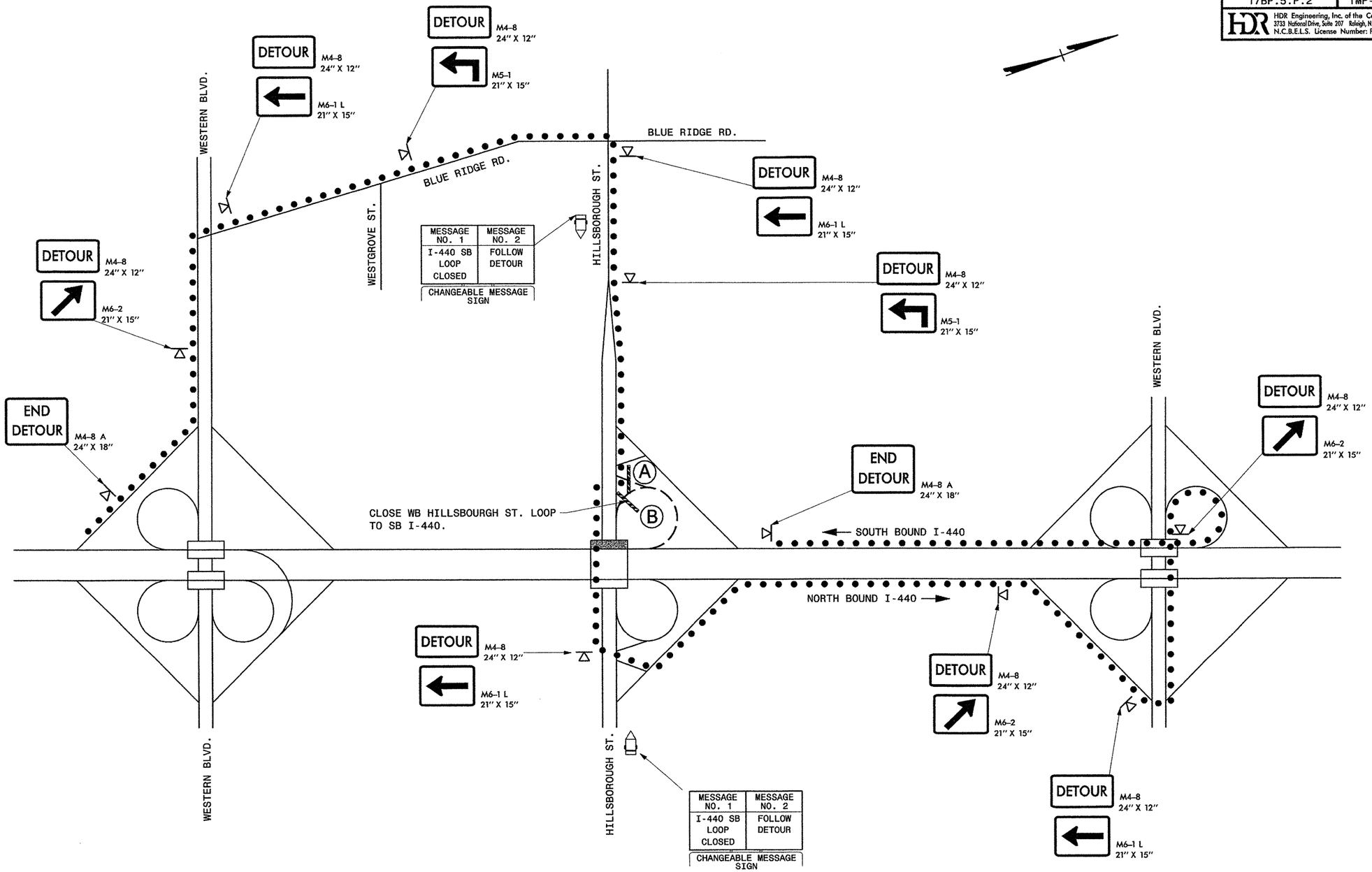
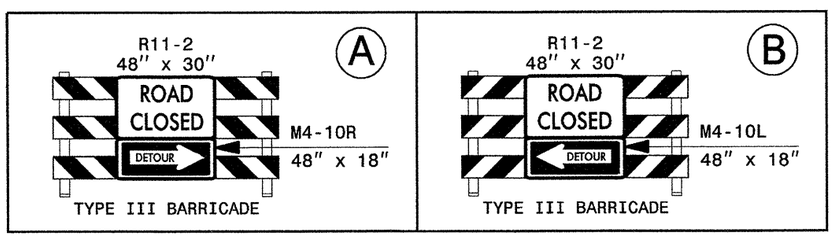
N.C.B.E.L.S. License Number: F-0116





SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
11/29/12

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

BRIDGE 223
STAGE II
DETOUR ROUTING

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
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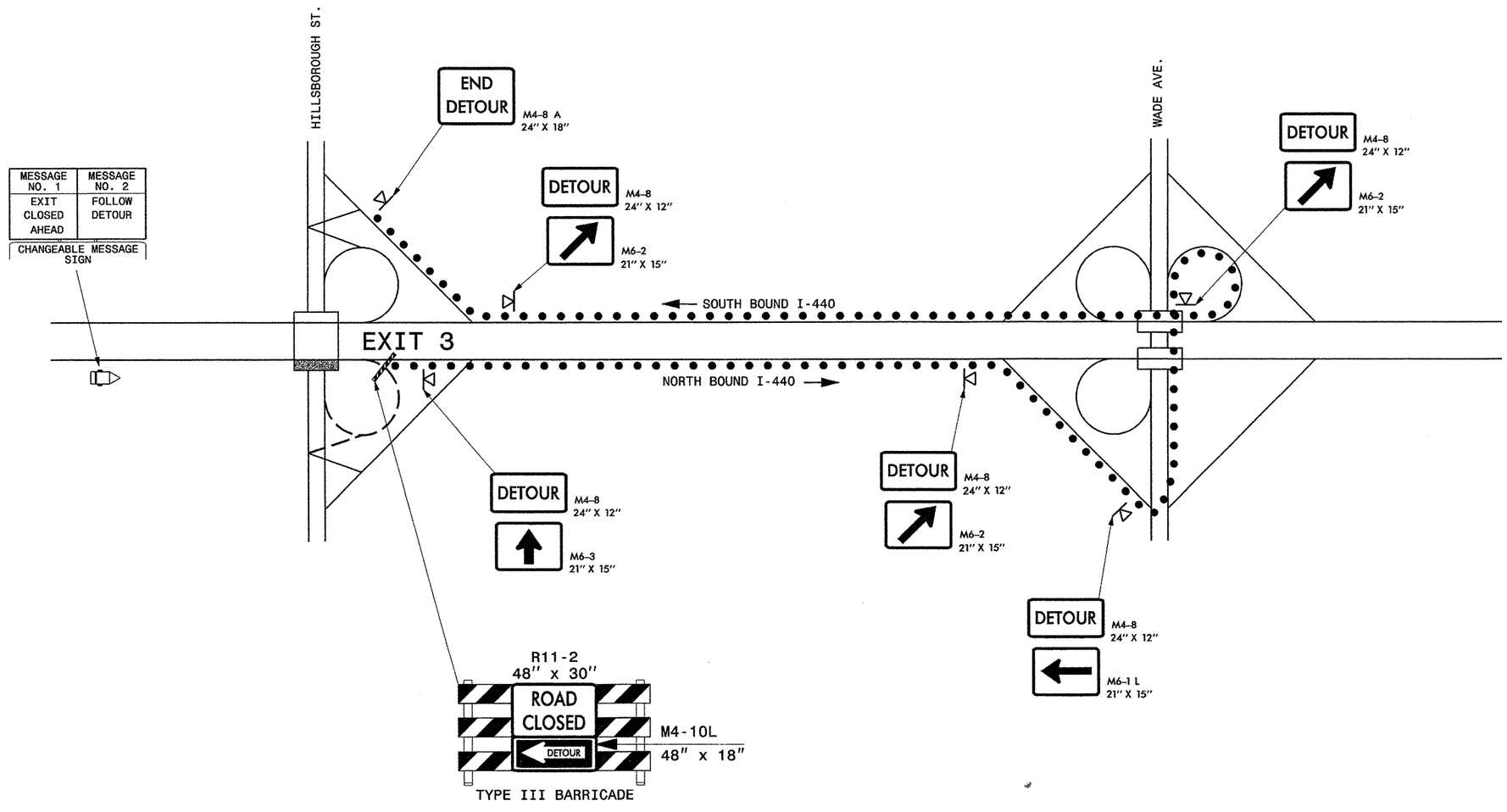
DATE: 1/20/2012

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-11

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116



SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033789 MICHELLE WARD
1/20/12

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

BRIDGE 223
STAGE IV
DETOUR ROUTING

PLOT DRIVER: NCDOT_pdf_color_eng_100.pit
USER: BLibby
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PENTABLE: NCDOT_Tcp.tbl
TIME: 10:42:22 AM
DATE: 1/20/2012

STAGING

STAGING NOTES - BRIDGE 238

AT THE END OF THE WORK DAY, REMOVE ALL TRAFFIC CONTROL DEVICES, COVER OR REMOVE ALL ADVANCED WARNING SIGNS FOR THE LANE CLOSURES AND DETOURS, AND RETURN TRAFFIC TO ITS EXISTING PATTERN.

IF NEEDED AND AS DIRECTED BY THE ENGINEER, USE RSD 1101.02, SHEET 3, 5 OR 6 OF 15, LAW ENFORCEMENT, AND/OR RSD 1101.03, SHEET 9 OF 9 TO DIRECT TRAFFIC ON WADE AVE. UNDER BRIDGE #238 WHEN PERFORMING WORK ON THE BRIDGE.

STAGE I

STEP 1: USING LAW ENFORCEMENT AND AND RSD 1101.02, SHEET 3 OF 15, CLOSE LEFT LANE ON I-440 EB/NB AND COMPLETE BRIDGE WORK ON THE INSIDE MEDIAN LANE.

STAGE II

STEP 1: PLACE ALL DETOUR SIGNS AS SHOWN ON TMP-13, THEN CLOSE LOOP FROM WADE AVE. TO EB/NB I-440 AND PLACE TRAFFIC IN OFFSITE DETOUR.

STEP 2: USING LAW ENFORCEMENT AND RSD 1101.02, SHEET 6 OF 15, CLOSE THE LEFT LANE OF EB/NB I-440 AS THE INITIAL LANE CLOSURE. PLACE "CLOSURE SWITCH" (WEAVE LANE CLOSURE) USING RSD 1101.02, SHEET 6 OF 15, SHIFTING TRAFFIC TO THE MEDIAN LANE, THEN COMPLETE ALL BRIDGE WORK ON THE OUTSIDE LANE AND LOOP LANE.

STEP 3: USING LAW ENFORCEMENT, LOOP CLOSURE AS SHOWN IN STEP 1 ABOVE, AND RSD 1101.02, SHEET 12 OF 15, PLACE FINAL PAVEMENT MARKINGS AND MARKERS, THEN OPEN TRAFFIC TO FINAL PATTERN.

STEP 4: REMOVE ALL REMAINING TRAFFIC CONTROL DEVICES.

TYPICALS

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-12

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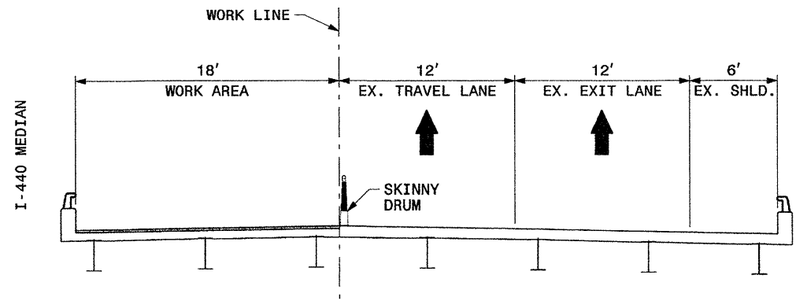
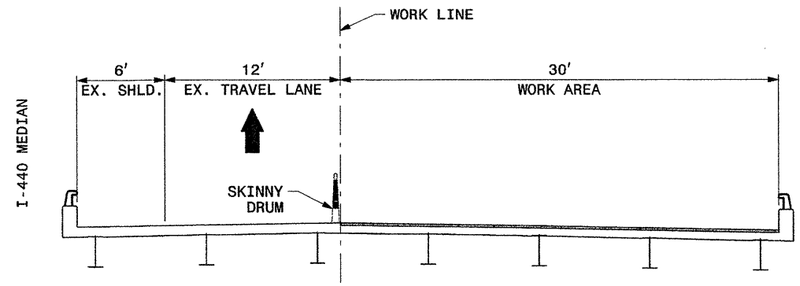


TYPICAL SECTION ACROSS BRDIGE - STAGE I



TYPICAL SECTION ACROSS BRDIGE - STAGE II

SEAL 033789 ENGINEER MICHELLE WARD 1/20/12

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

BRIDGE 238 (I-440 NORTH) STAGING & TYPICALS

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PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-13

HDR Engineering, Inc. of the Carolinas
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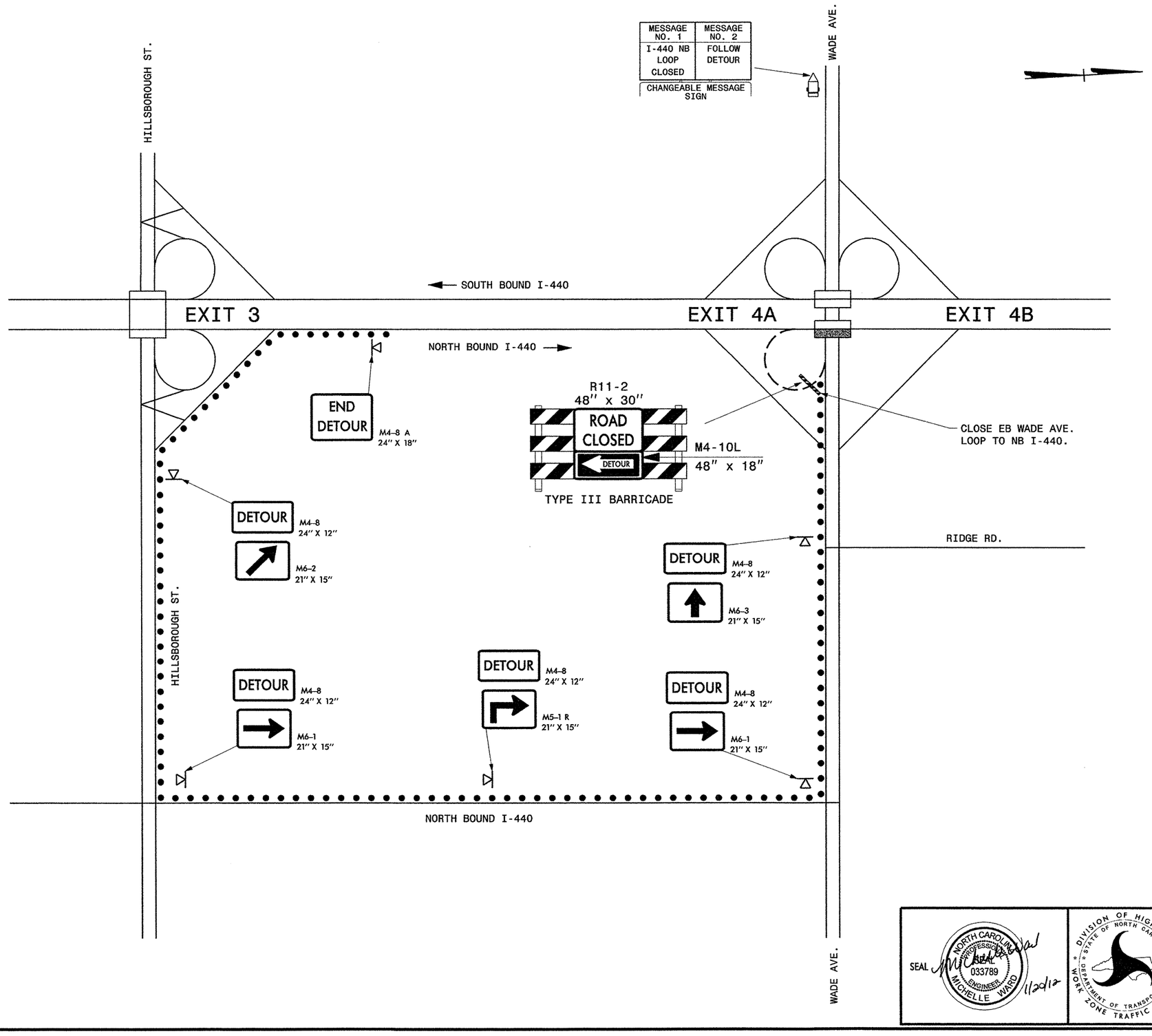

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
1/20/12

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

BRIDGE 238
STAGE II
DETOUR ROUTING

PLOT DRIVER: NCDOT_pdf_color-eng.100.plt
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DATE: 1/20/2012
TIME: 10:42:41 AM

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-14

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N.C.B.E.L.S. License Number: F-0116

STAGING

STAGING NOTES - BRIDGE 239

AT THE END OF THE WORK DAY, REMOVE ALL TRAFFIC CONTROL DEVICES, COVER OR REMOVE ALL ADVANCED WARNING SIGNS FOR THE LANE CLOSURES AND DETOURS, AND RETURN TRAFFIC TO ITS EXISTING PATTERN.

IF NEEDED AND AS DIRECTED BY THE ENGINEER, USE RSD 1101.02, SHEET 3, 5 OR 6 OF 15, LAW ENFORCEMENT, AND/OR RSD 1101.03, SHEET 9 OF 9 TO DIRECT TRAFFIC ON WADE AVE. UNDER BRIDGE #239 WHEN PERFORMING WORK ON THE BRIDGE.

STAGE I

STEP 1: USING LAW ENFORCEMENT AND AND RSD 1101.02, SHEET 4 OF 15, CLOSE LEFT LANE ON I-440 WB/SB AND COMPLETE BRIDGE WORK ON THE INSIDE MEDIAN LANE.

STAGE II

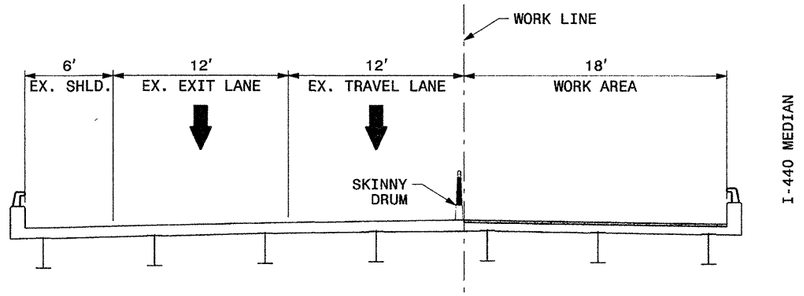
STEP 1: PLACE ALL DETOUR SIGNS AS SHOWN ON TMP-15, THEN CLOSE LOOP FROM WADE AVE. TO WB/SB I-440 AND LOOP FROM WB/SB I-440 TO EB WADE AVE. AND PLACE TRAFFIC IN OFFSITE DETOUR.

STEP 2: USING LAW ENFORCEMENT AND RSD 1101.02, SHEET 6 OF 15, CLOSE THE LEFT LANE OF WB/SB I-440 AS THE INITIAL LANE CLOSURE. PLACE "CLOSURE SWITCH" (WEAVE LANE CLOSURE) USING RSD 1101.02, SHEET 6 OF 15, SHIFTING TRAFFIC TO THE MEDIAN LANE, THEN COMPLETE ALL BRIDGE WORK ON THE OUTSIDE LANE AND LOOP LANE (WEAVE AREA).

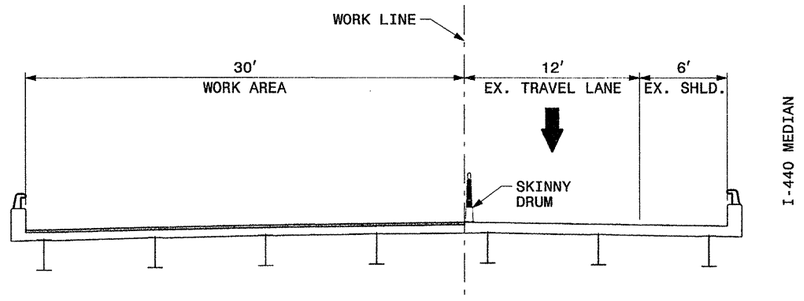
STEP 3: USING LAW ENFORCEMENT, LOOP CLOSURES AS SHOWN IN STEP 1 ABOVE, AND RSD 1101.02, SHEET 12 OF 15, PLACE FINAL PAVEMENT MARKINGS AND MARKERS, THEN OPEN TRAFFIC TO FINAL PATTERN.

STEP 4: REMOVE ALL REMAINING TRAFFIC CONTROL DEVICES.

TYPICALS



TYPICAL SECTION ACROSS BRDIGE - STAGE I



TYPICAL SECTION ACROSS BRDIGE - STAGE II

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
11/20/12

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

BRIDGE 239 (I-440 SOUTH) STAGING & TYPICALS

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DATE: 1/20/2012
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TIME: 10:42:50 AM

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-15

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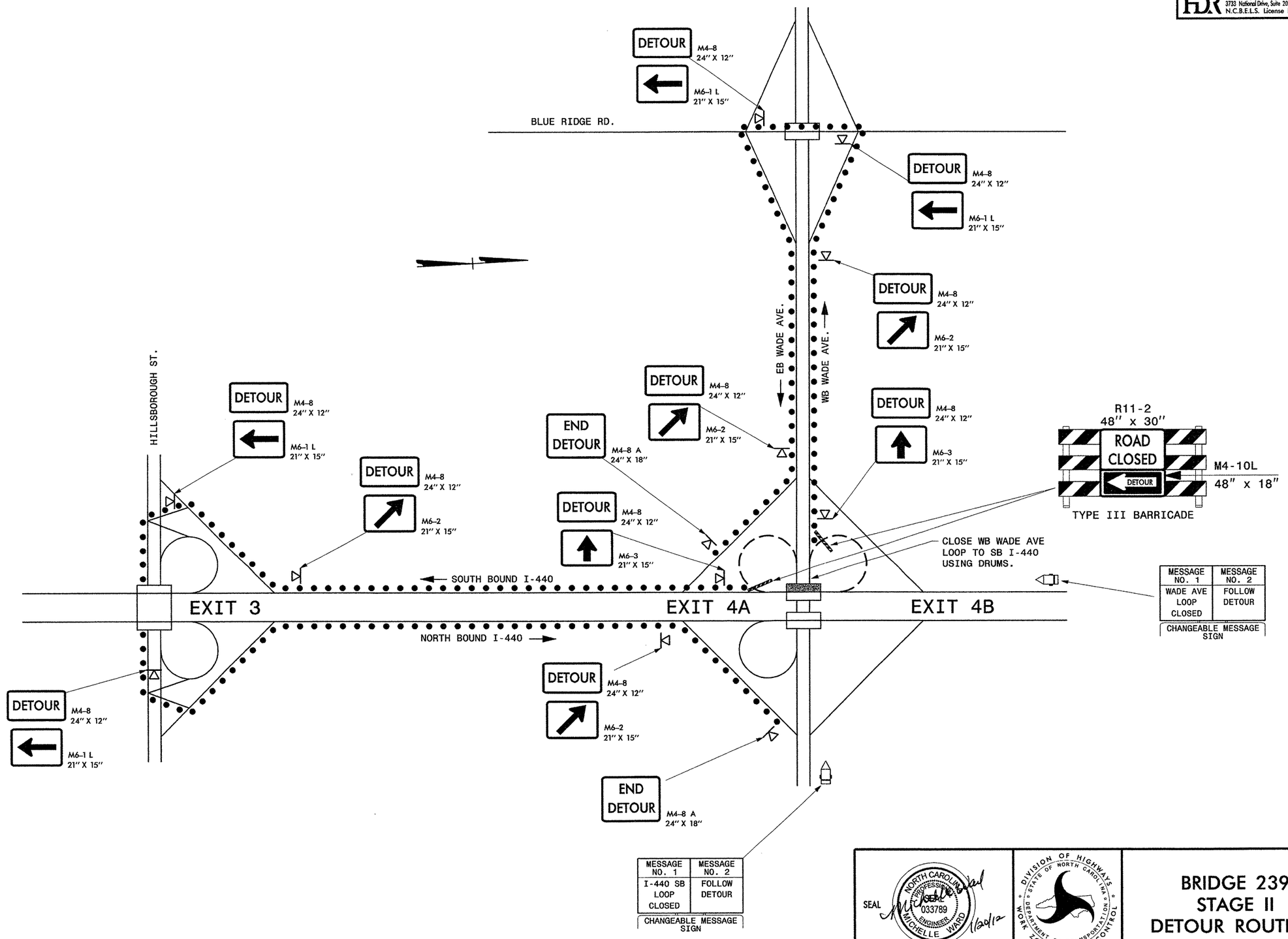

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
1/20/12

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

BRIDGE 239
STAGE II
DETOUR ROUTING

PLOT DRIVER: NCDOT.pdf_color_eng_100.plt
USER: BLibby
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TIME: 10:43:07 AM
DATE: 1/20/2012

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-16

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

STAGING

STAGING NOTES - BRIDGE 242

AT THE END OF THE WORK DAY, REMOVE ALL TRAFFIC CONTROL DEVICES, COVER OR REMOVE ALL ADVANCED WARNING SIGNS FOR THE LANE CLOSURES AND DETOURS, AND RETURN TRAFFIC TO ITS EXISTING PATTERN.

IF NEEDED AND AS DIRECTED BY THE ENGINEER, USE RSD 1101.02, SHEET 3, 5 OR 6 OF 15, LAW ENFORCEMENT, AND/OR RSD 1101.03, SHEET 9 OF 9 TO DIRECT TRAFFIC ON LAKE BOONE TRAIL UNDER BRIDGE #242 WHEN PERFORMING WORK ON THE BRIDGE.

STAGE I

STEP 1: USING LAW ENFORCEMENT AND RSD 1101.02, SHEET 8 OF 15 TO CLOSE THE RIGHT TWO LANES ON WB/SB I-44- AND RSD 1101.02, SHEET 10 OF 15 TO PROVIDE ACCESS TO LAKE BOONE TRAIL (EXIT 5), COMPLETE ALL BRIDGE WORK IN THE RIGHT TWO LANES AND SHOULDER ON I-440 WB/SB.

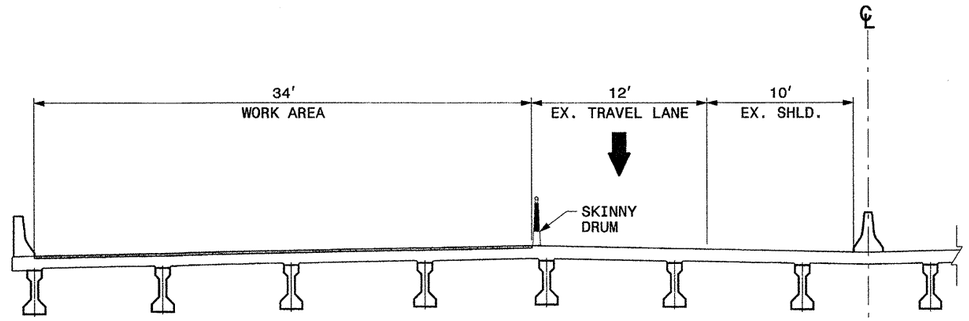
STAGE II

STEP 1: USING LAW ENFORCEMENT AND RSD 1101.02, SHEET 4 OF 15, CLOSE THE INSIDE MEDIAN LANE AND COMPLETE ALL BRIDGE WORK IN THE LEFT LANE AND SHOULDER ON I-440 WB/SB.

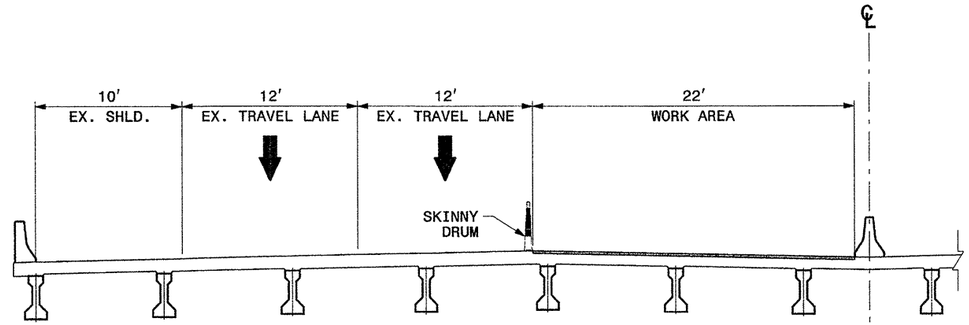
STEP 2: USING LAW ENFORCEMENT AND RSD 1101.02, SHEETS 4, 8, 10 AND 13 OF 15, PLACE FINAL PAVEMENT MARKINGS AND MARKERS, THEN OPEN TRAFFIC TO FINAL PATTERN.

STEP 4: REMOVE ALL REMAINING TRAFFIC CONTROL DEVICES.

TYPICALS



TYPICAL SECTION ACROSS BRDIGE - STAGE I



TYPICAL SECTION ACROSS BRDIGE - STAGE II

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MITCHELLE WARD

1/20/12

DIVISION OF HIGHWAYS * STATE OF NORTH CAROLINA * DEPARTMENT OF TRANSPORTATION * WORK ZONE TRAFFIC CONTROL

BRIDGE 242 SB (I-440 SOUTH) STAGING & TYPICALS

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USER: BLibby
FILE: North Carolina Dept of Transportation\NCDOT_DDO.CEI_BM_LSC-MASTER\NCDOT_Wake_LMC_Epoxy\13.00_CAD\TMP Plans\17BP-5-P-2.242_TMP_TMP-16.dgn
PENTABLE: NCDOT_4cp.tbl
DATE: 1/20/2012
TIME: 10:43:26 AM

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-17

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

STAGING

STAGING NOTES - BRIDGE 242

AT THE END OF THE WORK DAY, REMOVE ALL TRAFFIC CONTROL DEVICES, COVER OR REMOVE ALL ADVANCED WARNING SIGNS FOR THE LANE CLOSURES AND DETOURS, AND RETURN TRAFFIC TO ITS EXISTING PATTERN.

IF NEEDED AND AS DIRECTED BY THE ENGINEER, USE RSD 1101.02, SHEET 3, 5 OR 6 OF 15, LAW ENFORCEMENT, AND/OR RSD 1101.03, SHEET 9 OF 9 TO DIRECT TRAFFIC ON LAKE BOONE TRAIL UNDER BRIDGE #242 WHEN PERFORMING WORK ON THE BRIDGE.

STAGE III

STEP 1: PLACE ALL DETOUR SIGNS AS SHOWN ON TMP-18, THEN CLOSE LOOP FROM EB/NB I-440 TO LAKE BOONE TRAIL AND PLACE TRAFFIC IN THE OFFSITE DETOUR.

STEP 2: USING LAW ENFORCEMENT AND RSD 1101.02, SHEET 4 OF 15, CLOSE THE RIGHT LANE AND COMPLETE ALL THE BRIDGE WORK ON THE OUTSIDE LANE, LOOP AND SHOULDER.

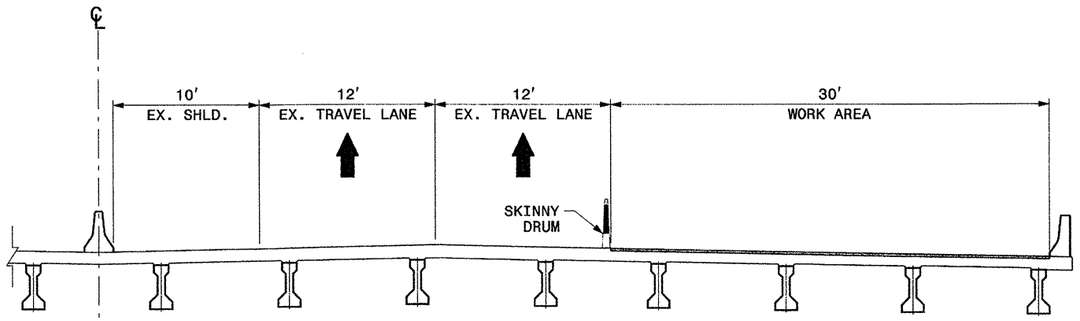
STAGE IV

STEP 1: USING LAW ENFORCEMENT AND RSD 1101.02, SHEET 8 OF 15, CLOSE THE LEFT TWO LANES AND COMPLETE ALL THE BRIDGE WORK ON THE INSIDE TWO LANES AND SHOULDER.

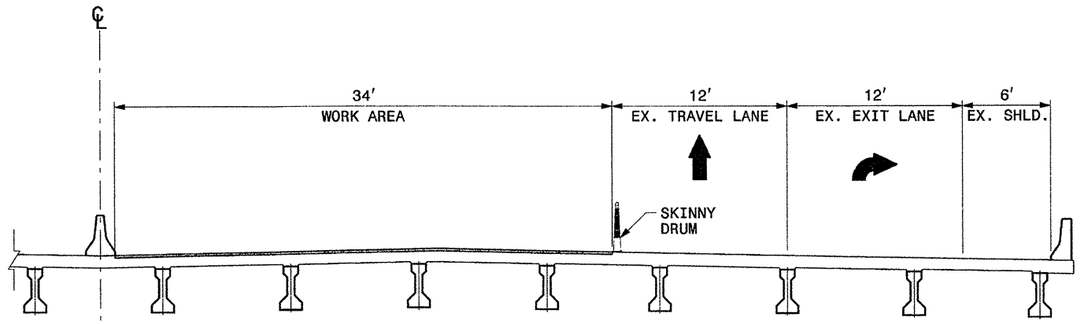
STEP 2: USING LAW ENFORCEMENT AND RSD 1101.02, SHEETS 4, 8, 10 AND 13 OF 15, PLACE FINAL PAVEMENT MARKINGS AND MARKERS, THEN OPEN TRAFFIC TO FINAL PATTERN.

STEP 3: REMOVE ALL REMAINING TRAFFIC CONTROL DEVICES.

TYPICALS



TYPICAL SECTION ACROSS BRDIGE - STAGE III



TYPICAL SECTION ACROSS BRDIGE - STAGE IV

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
11-20-12

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

BRIDGE 242 NB (I-440 NORTH) STAGING & TYPICALS

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PENTABLE: NCDOT_1cp.tbl
DATE: 1/20/2012
TIME: 10:43:45 AM

PROJ. REFERENCE NO.	SHEET NO.
17BP.5.P.2	TMP-18

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

R11-2
48" x 30"

ROAD CLOSED

DETOUR

M4-10L
48" x 18"

TYPE III BARRICADE

DETOUR M4-8 24" X 12"

M6-3 21" X 15"

NORTH BOUND I-440

END DETOUR M4-8 A 24" X 18"

DETOUR M4-8 24" X 12"

M6-1 21" X 15"

LAKE BOONE TR.

GLEN EDEN RD.

RIDGE RD.

DETOUR M4-8 24" X 12"

M6-3 21" X 15"

NORTH BOUND I-440

DETOUR M4-8 24" X 12"

M6-2 21" X 15"

EXIT 6

EXIT 7

GLENWOOD AVE.

RIDGE RD.

GLENWOOD AVE.

MESSAGE NO. 1	MESSAGE NO. 2
LAKE BOONE CLOSED	FOLLOW DETOUR

CHANGEABLE MESSAGE SIGN

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
1/20/12

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

BRIDGE 242
STAGE III
DETOUR ROUTING

PLOT DRIVER: NCDOT.pdf.color.eng.100.plt
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PENTABLE: NCDOT_tcp.tbl
DATE: 1/20/2012
TIME: 10:44:03 AM

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2006 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

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REV. 6-16-95 EEM (d) RGW REV. 6-7-03 RWW (d) JTE
REV. 8-16-99 RWW (d) LES REV. 5-1-06 TLA (d) GM

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