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PROJECT: I-5888A

CONTRACT: 204054

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BUNCOMBE COUNTY

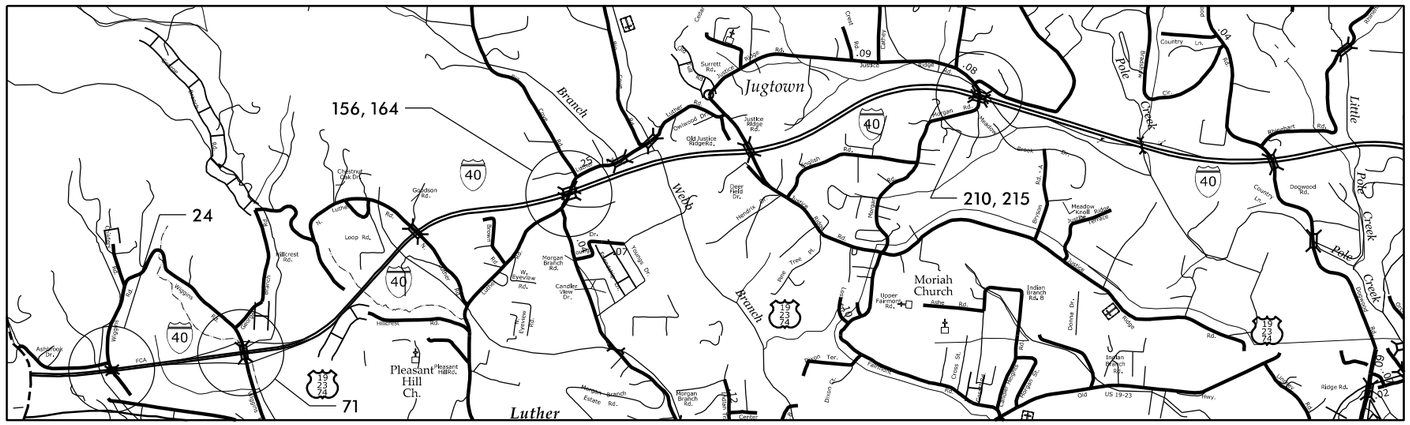
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5888A	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
46408.1.2	NHPIM-0040(061)	P.E.
46408.3.2	NHPIM-0040(061)	CONST.

LOCATION: ***BUNCOMBE COUNTY***

BRIDGE #24 ON INTERSTATE 40 OVER SR 1200
BRIDGE #71 ON INTERSTATE 40 OVER SR 1200
BRIDGE #156 ON INTERSTATE 40 EASTBOUND OVER SR 1141
BRIDGE #164 ON INTERSTATE 40 WESTBOUND OVER SR 1141
BRIDGE #210 ON INTERSTATE 40 EASTBOUND OVER SR 1210
BRIDGE #215 ON INTERSTATE 40 WESTBOUND OVER SR 1210

TYPE OF WORK: ***BRIDGE PRESERVATION – DECK REPAIR, SCARIFICATION, HYDRO-DEMOLITION, LATEX MODIFIED CONCRETE – VERY EARLY STRENGTH OVERLAY, JOINT DEMOLITION AND REPLACEMENT.***



VICINITY MAP – BUNCOMBE CO.

DESIGN DATA

BUNCOMBE COUNTY
#24 ADT 2013 = 50,000
#71 ADT 2013 = 50,000
#156 ADT 2013 = 25,000
#164 ADT 2013 = 25,000
#210 ADT 2013 = 26,500
#215 ADT 2013 = 25,750

PROJECT LENGTH

BUNCOMBE COUNTY
#24 = 0.034 MILE
#71 = 0.030 MILE
#156 = 0.034 MILE
#164 = 0.034 MILE
#210 = 0.025 MILE
#215 = 0.028 MILE

Prepared in the Office of:

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

for the North Carolina Department of Transportation

2018 STANDARD SPECIFICATIONS	*MI ENGINEERING CONTACT*
LETTING DATE: JANUARY 16, 2018	MORRIS ISRAELNAIM, P.E. *PROJECT ENGINEER*
	NCDOT CONTACT
	TIMOTHY M. SHERRILL, P.E. *PROJECT ENGINEER*

DocuSigned by:
Byron E. Atkinson
241BD0808366417...

NORTH CAROLINA PROFESSIONAL SEAL 24939 ENGINEER BYRON E. ATKINSON

11/29/2017

BYRON E. ATKINSON, P.E.
PROJECT DESIGN ENGINEER

11/29/2017
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PROJECT: I-5888A

CONTRACT: 204054

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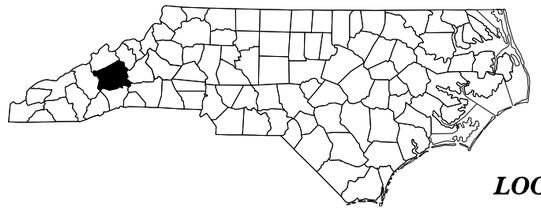
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BUNCOMBE COUNTY



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5888A	1A	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
46408.1.2	NHPIM-0040(061)	P.E.
46408.3.2	NHPIM-0040(061)	CONST.

LOCATION: ***BUNCOMBE COUNTY***

BRIDGE #24 ON INTERSTATE 40 OVER SR 1200
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TYPE OF WORK: ***BRIDGE PRESERVATION – DECK REPAIR, SCARIFICATION, HYDRO-DEMOLITION, LATEX MODIFIED CONCRETE – VERY EARLY STRENGTH OVERLAY, JOINT DEMOLITION AND REPLACEMENT.***

INDEX OF SHEETS

TOTAL BILL OF MATERIAL

BRIDGE NO.	GROOVING BRIDGE FLOORS	CLASS II SURFACE PREPARATION	LATEX MODIFIED CONCRETE - VERY EARLY STRENGTH	PLACING AND FINISHING OF LATEX MODIFIED CONCRETE OVERLAY - VERY EARLY STRENGTH	SCARIFYING BRIDGE DECK	HYDRO-DEMOLITION OF BRIDGE DECK	VOLUMETRIC MIXER	CONCRETE FOR DECK REPAIR	FOAM JOINT SEALS	SILICONE JOINT SEALANT	ELASTOMERIC CONCRETE	BRIDGE JOINT DEMOLITION
	SQ. FT.	SQ. YDS.	CU. YDS.	SQ. YDS.	SQ. YDS.	SQ. YDS.	LUMP SUM	CU. FT.	LUMP SUM	LIN. FT.	CU. FT.	SQ. FT.
24	15391	15.6	64.8	1859	1859	1859	LUMP SUM	36.6	LUMP SUM	178	89.2	357
71	9793	5.6	50.6	1212	1212	1212	LUMP SUM	11.9	LUMP SUM	98	58.6	251
156	7136	0.4	36.2	867	867	867	LUMP SUM	0.8	LUMP SUM	104	71.2	245
164	7188	0.2	36.5	874	874	874	LUMP SUM	0.3	LUMP SUM	104	71.2	245
210	5577	29.4	23.7	678	678	678	LUMP SUM	75.7	LUMP SUM	82	41.2	165
215	6053	0.5	25.7	736	736	736	LUMP SUM	1.2	LUMP SUM	84	42.0	168
TOTAL	51,138	51.7	237.5	6,226	6,226	6,226	LUMP SUM	126.5	LUMP SUM	650	373.4	1,431

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DRAWN BY : B.E. LANNING DATE : 09/17
CHECKED BY : B.E. ATKINSON DATE : 10/17
DESIGN ENGINEER OF RECORD : B.E. ATKINSON DATE : 10/17

PROJECT NO. I-5888A
BUNCOMBE COUNTY
BRIDGE NO. 24, 71, 156
164, 210, 215

DocuSigned by:
Byron E. Atkinson
241ED080A6C417...

NORTH CAROLINA PROFESSIONAL SEAL 24939 ENGINEER BYRON E. ATKINSON

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

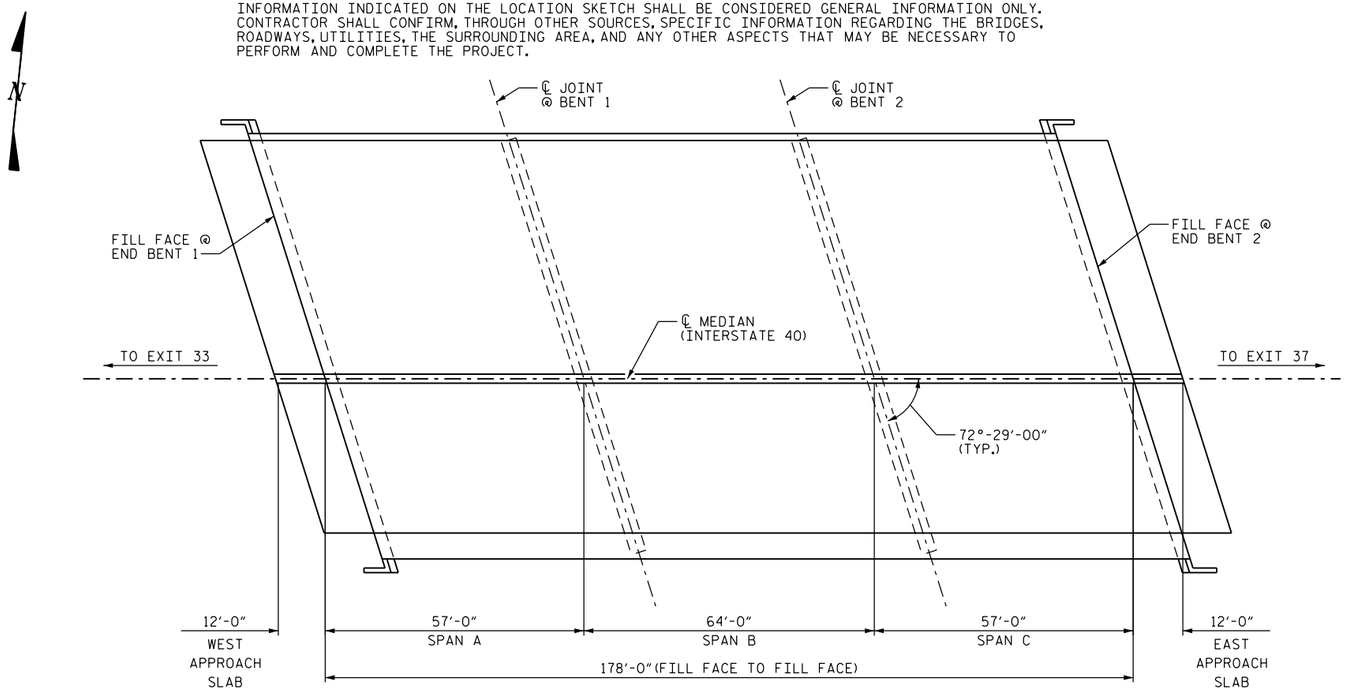
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TOTAL BILL OF MATERIAL

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

LOCATION SKETCH

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



PLAN

NOTES

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

IT IS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL STATE AND FEDERAL SAFETY REQUIREMENTS.

FOR CONTROL OF TRAFFIC AND LIMITS ON PHASING OF CONSTRUCTION, SEE TRANSPORTATION MANAGEMENT PLANS.

DURING CONSTRUCTION, BERMS OR APPROPRIATE MEASURES SHALL BE USED TO ENSURE HYDRO-DEMOLITION WATER DOES NOT FLOW OR MIGRATE INTO ACTIVE TRAVEL LANES.

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

FOR CLASS II SURFACE PREPARATION, SCARIFYING BRIDGE DECK AND HYDRO-DEMOLITION OF BRIDGE DECK, SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS.

THE CONTRACTOR MUST COLLECT, TREAT AND DISPOSE OF RUN-OFF WATER FROM THE HYDRO-DEMOLITION PROCESS, SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISION.

LONGITUDINAL CONSTRUCTION JOINTS OF OVERLAYS SHALL BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.

FOR BRIDGE JOINT DEMOLITION, SEE SPECIAL PROVISIONS.

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

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

FOR VOLUMETRIC MIXER, SEE SPECIAL PROVISIONS.

FOR CONCRETE FOR DECK REPAIRS, SEE SPECIAL PROVISIONS.

FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

SCOPE OF WORK

- PARTIALLY REMOVE BRIDGE DECK CONCRETE USING SCARIFICATION AND HYDRO-DEMOLITION METHODS.
- PERFORM CLASS II SURFACE PREPARATION AND REPAIR ON DECK SURFACES.
- OVERLAY PREPARED BRIDGE DECK WITH LATEX MODIFIED CONCRETE - VERY EARLY STRENGTH (LMC-VES).
- RECONSTRUCT BRIDGE DECK JOINT AND INSTALL JOINT SEALS.
- GROOVE LMC-VES BRIDGE DECK.

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

RESIDENT ENGINEER DATE

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 24

DocuSigned by:
Byron E. Atkinson
241BD080B3B6417...

NORTH CAROLINA PROFESSIONAL SEAL 030417 ENGINEER BYRON E. ATKINSON

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON I-40
OVER SR 1200
BETWEEN EXIT 37 AND EXIT 33

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

DRAWN BY : B.E. LANNING DATE : 10/17
CHECKED BY : B.E. ATKINSON DATE : 10/17
DESIGN ENGINEER OF RECORD : B.E. ATKINSON DATE : 10/17

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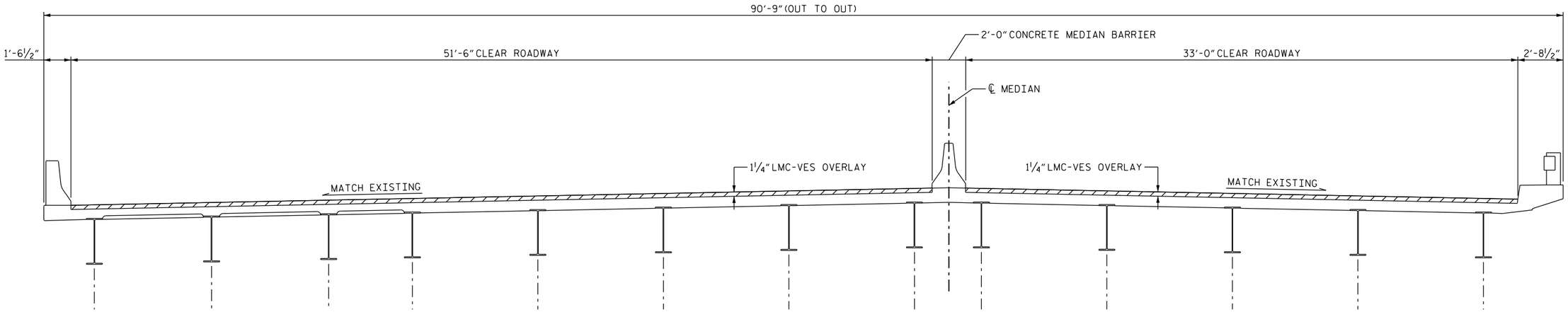
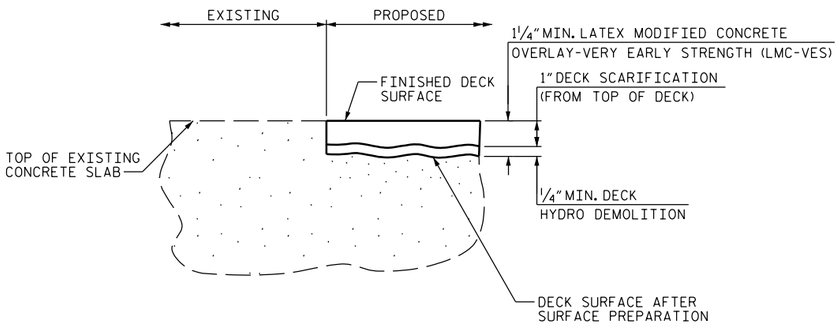
NOTE:

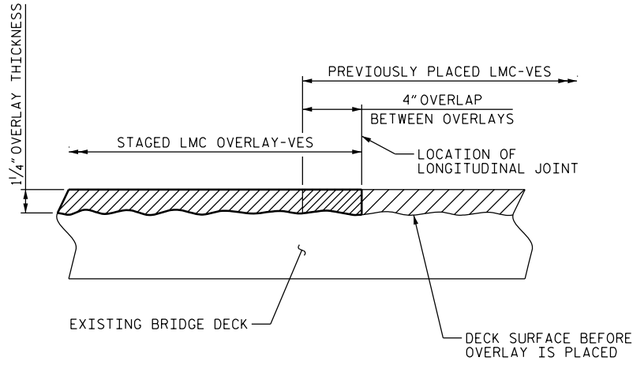
WHEN PREPARING THE SURFACE FOR LMC OVERLAY-VES ADJACENT TO A PREVIOUSLY PLACED LMC-VES STAGE, THE PREVIOUSLY PLACED LMC-VES SHALL BE REMOVED FOR A DISTANCE OF 4-INCHES FROM THE LMC-VES EDGE. THE SURFACE OF THE NEW STAGE AREA, ALONG WITH THE 4 INCH OVERLAY AREA, SHALL BE PREPARED AS PER THE OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS. NEW LMC-VES SHALL BE PLACED IN THE 4-INCH OVERLAP, AS PART OF NEW LMC-VES STAGE PLACEMENT.

FOR CONTROL OF TRAFFIC AND LIMITS OF PHASING OF CONSTRUCTION, SEE TRANSPORTATION MANAGEMENT PLANS.





DETAIL FOR LMC-VES OVERLAY



SECTION THRU DECK

STAGED LMC-VES OVERLAY JOINT

(AS NEEDED)

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 24

DocuSigned by:
Byron E. Atkinson
2418D0888B8C417...

NORTH CAROLINA PROFESSIONAL SEAL 24939 ENGINEER BYRON E. ATKINSON

11/15/2017

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MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION & LATEX MODIFIED CONCRETE - VES

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

DRAWN BY : B.E. LANNING DATE : 10/17
CHECKED BY : B.E. ATKINSON DATE : 10/17
DESIGN ENGINEER OF RECORD : B.E. ATKINSON DATE : 10/17

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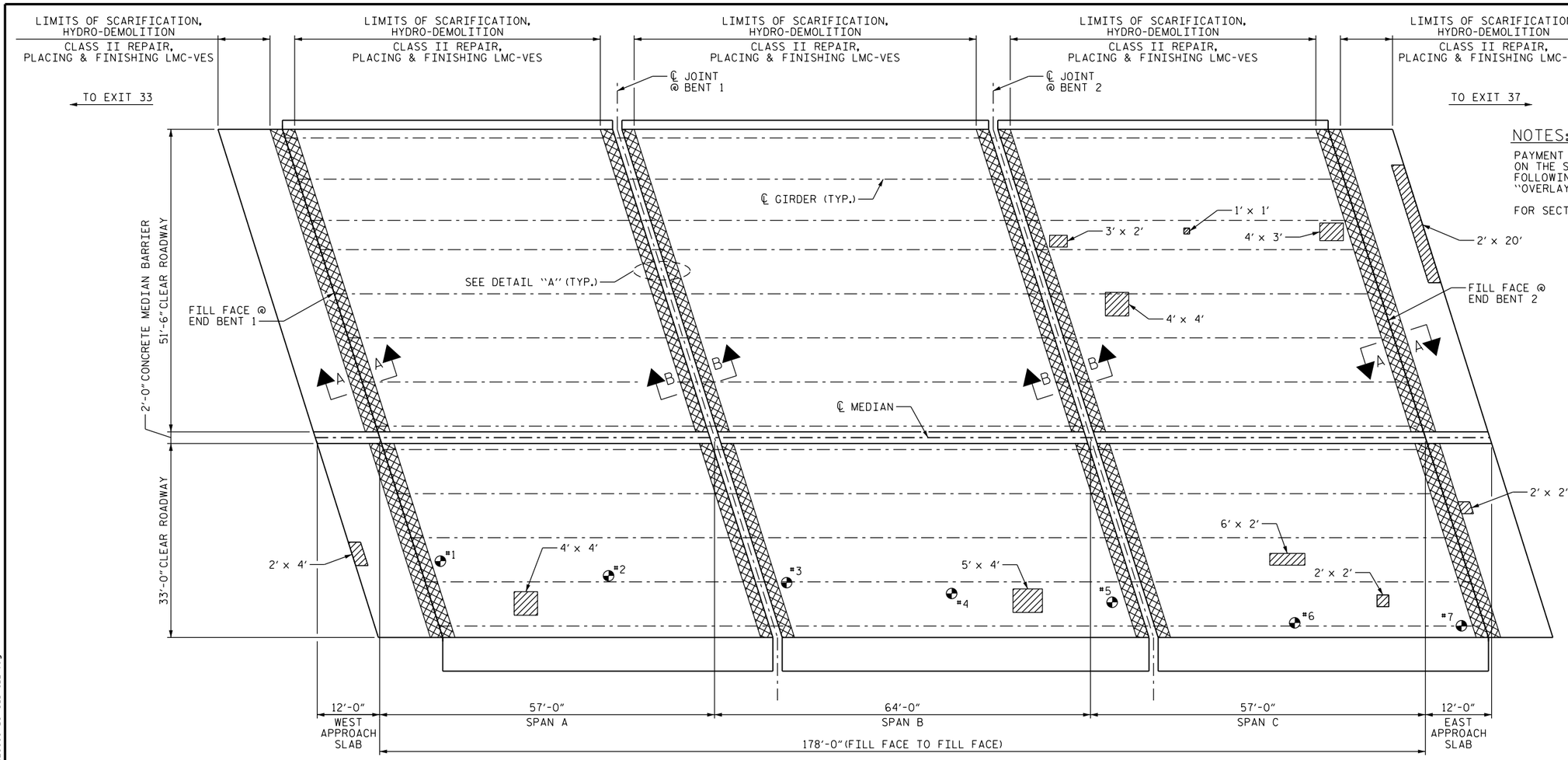


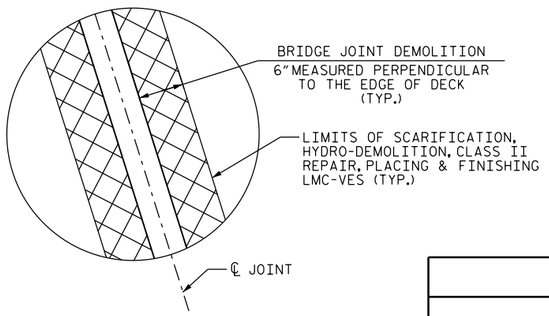
PLAN OF SPANS

BRIDGE JOINT DEMOLITION

CLASS II SURFACE PREPARATION

DECK SCARIFICATION, HYDRO-DEMOLITION AND LATEX MODIFIED CONCRETE OVERLAY-VES

#X TEST LOCATION



DETAIL "A"

NOTES:

PAYMENT FOR CLASS II SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING HYDRO-DEMOLITION OF THE BRIDGE DECK. SEE "OVERLAY SURFACE PREPARATION" SPECIAL PROVISIONS.

FOR SECTIONS A-A AND B-B, SEE "JOINT DETAILS" SHEET.

TEST LOCATION	*CONCRETE COVER	CONCRETE STRENGTH
	(INCH)	(PSI)
#1	2 7/8"	4700
#2	1 7/8"	4900
#3	1 7/8"	4900
#4	2 1/4"	4700
#5	2 3/8"	4700
#6	2 3/4"	4100
#7	2 3/4"	3700

INFORMATION IN CHART TAKEN FROM DECK EVALUATION DATED 08/08/17.

* CONCRETE COVER FOR TOP BARS IN THE DECK ARE BASED ON DECK EVALUATION DATED 08/08/17. EXISTING BRIDGE PLANS INDICATE 1 3/4" CONCRETE COVER.

SUMMARY OF QUANTITIES

	SCARIFYING BRIDGE DECK		HYDRO-DEMOLITION OF BRIDGE DECK		CLASS II SURFACE PREPARATION		BRIDGE JOINT DEMOLITION		CONCRETE FOR DECK REPAIR	
	SQ. YDS.		SQ. YDS.		SQ. YDS.		SQ. FT.		CU. FT.	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
WEST APPR. SLAB	108		108		0.9		45		2.1	
SPAN A	526		526		1.8		89		4.2	
SPAN B	591		591		2.3		89		5.3	
SPAN C	526		526		5.7		89		13.4	
EAST APPR. SLAB	108		108		4.9		45		11.6	
TOTAL	1,859		1,859		15.6		357		36.6	

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 24

DocuSigned by:
Byron E. Atkinson
24EBD0B0936C417...

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER BYRON E. ATKINSON

11/15/2017

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MI ENGINEERING
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RALEIGH, NC 27606
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FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SURFACE PREPARATION

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

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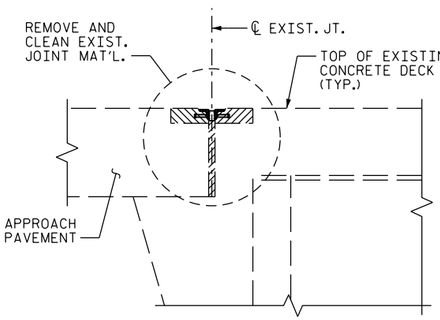
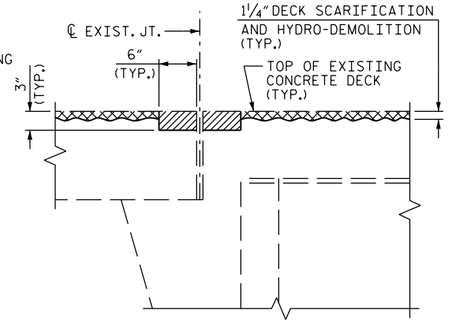
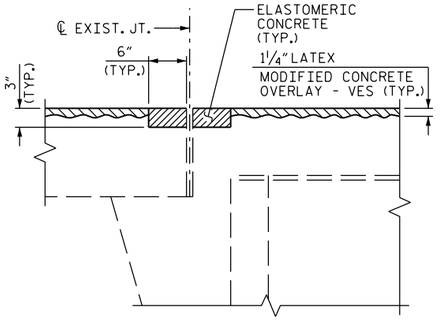


EXISTING JOINT AT END BENT

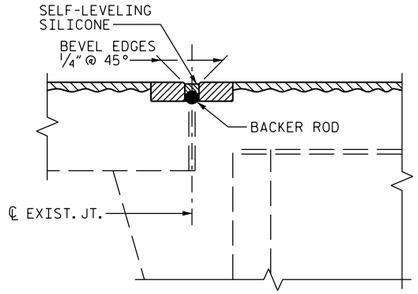
(END BENT 2 SHOWN, END BENT 1 SIMILAR)



MINIMUM EXISTING JOINT DEMOLITION AT END BENT



PROPOSED JOINT PRE-SAWED DIMENSIONS



PROPOSED JOINT

NOTES

CONTRACTOR SHALL FIELD VERIFY THE EXISTING FORMED OPENING PRIOR TO OBTAINING JOINT MATERIAL.

HYDRO-DEMOLITION OR EXCAVATION OF CONCRETE AT THE EXISTING JOINT SHALL RESULT IN THE BOTTOM OF THE EXCAVATION BEING REASONABLY FLAT AND LEVEL, TO PROVIDE SUFFICIENT SUBSTRATE FOR PLACEMENT AND SUPPORT OF ELASTOMERIC CONCRETE.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

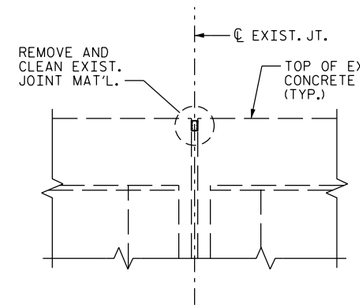
RETAIN ALL EXISTING REINFORCING STEEL. CLEAN AND REPAIR AS NEEDED.

THE WIDTH OF THE UNCOMPRESSED FOAM JOINT MATERIAL SHALL BE 2".

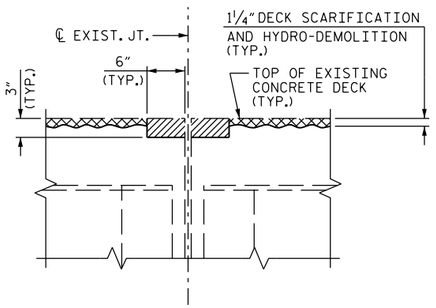
ELASTOMERIC CONCRETE		
END BENT 1	22.3	CU. FT.
BENT 1	22.3	CU. FT.
BENT 2	22.3	CU. FT.
END BENT 2	22.3	CU. FT.
* TOTAL	89.2	CU. FT.

*BASED ON MINIMUM BLOCKOUT SHOWN.

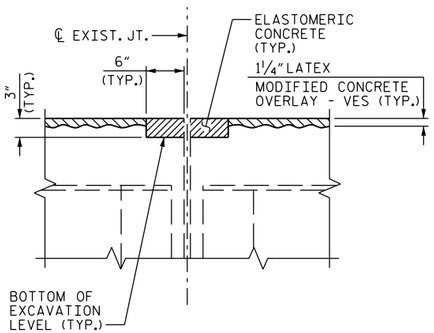
SECTION A-A



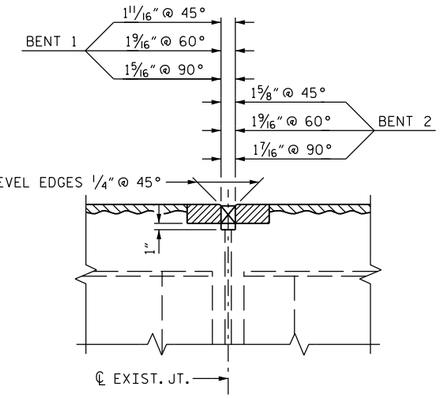
EXISTING JOINT



MINIMUM EXISTING JOINT DEMOLITION AT BENT

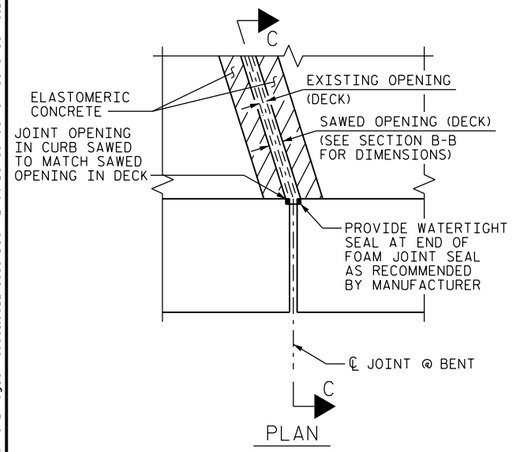


PROPOSED JOINT PRE-SAWED DIMENSIONS

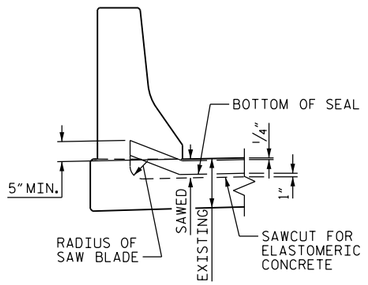


PROPOSED FOAM JOINT SEAL EXPANSION

SECTION B-B

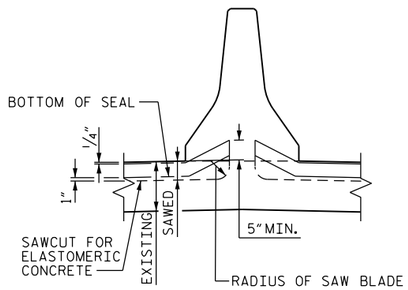


PLAN

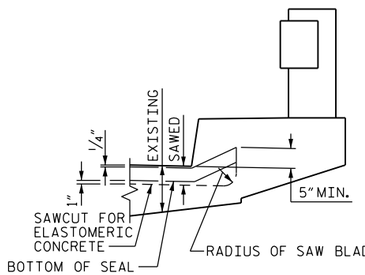


AT BARRIER RAIL

(SIMILAR BY ROTATION)



AT MEDIAN



AT CURB

SECTION C-C

JOINT DETAILS AT BARRIER RAIL AND CURB

DocuSigned by:
Byron E. Atkinson
241BD0A9536C417...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 43593 BYRON E. ATKINSON

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 24

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS

DRAWN BY : B.E. LANNING	DATE : 10/17
CHECKED BY : B.E. ATKINSON	DATE : 10/17
DESIGN ENGINEER OF RECORD : B.E. ATKINSON	DATE : 10/17

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			25

11/15/2017
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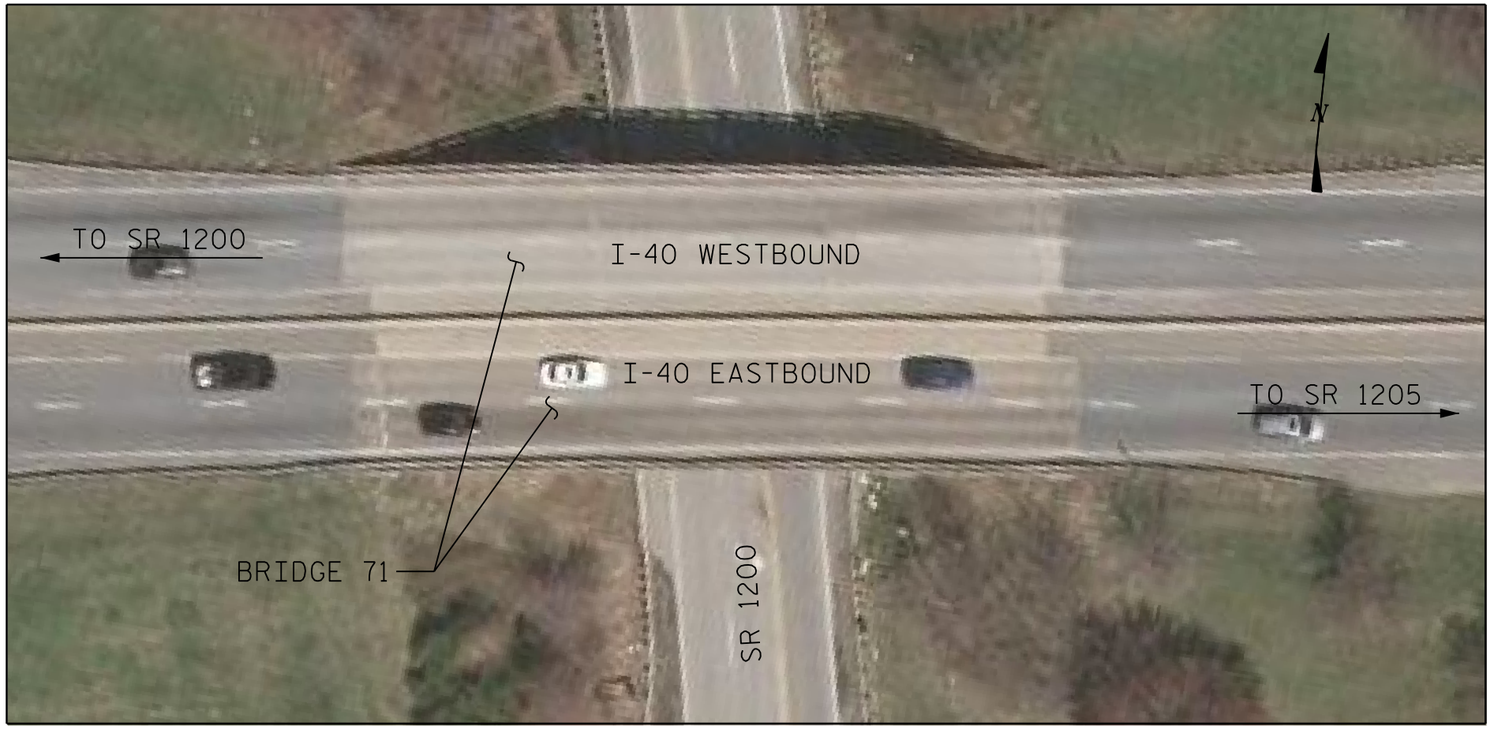
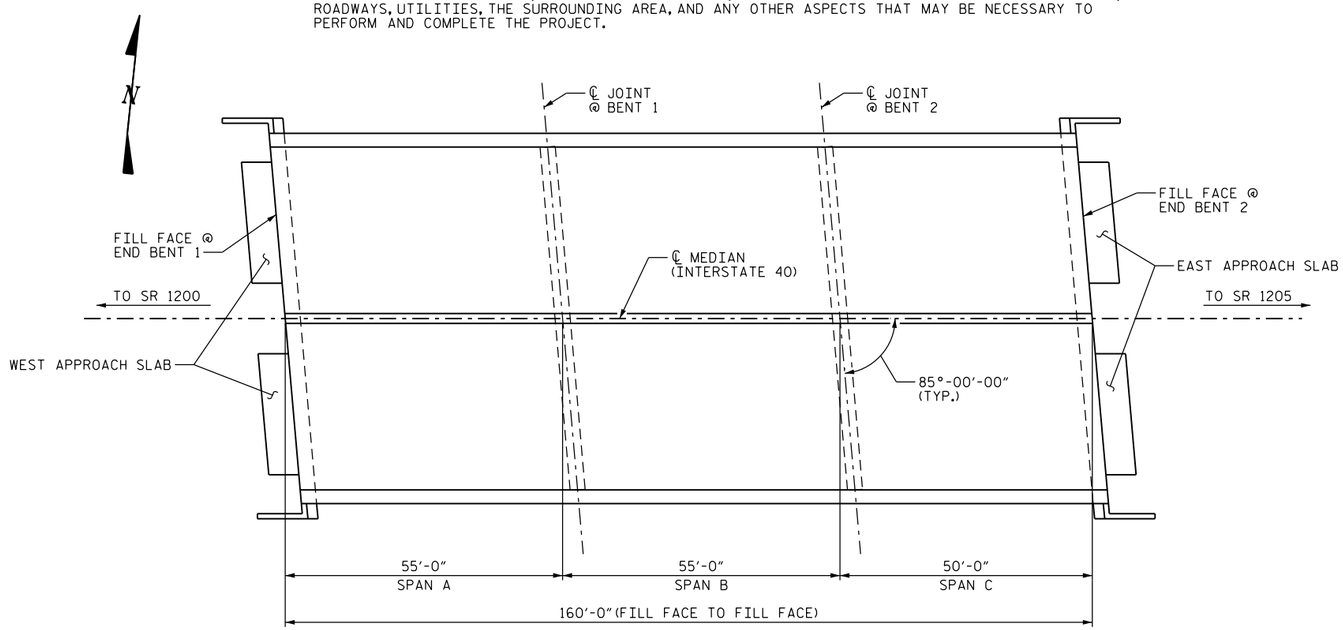


LOCATION SKETCH

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



PLAN

NOTES

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

IT IS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL STATE AND FEDERAL SAFETY REQUIREMENTS.

FOR CONTROL OF TRAFFIC AND LIMITS ON PHASING OF CONSTRUCTION, SEE TRANSPORTATION MANAGEMENT PLANS.

DURING CONSTRUCTION, BERMS OR APPROPRIATE MEASURES SHALL BE USED TO ENSURE HYDRO-DEMOLITION WATER DOES NOT FLOW OR MIGRATE INTO ACTIVE TRAVEL LANES.

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

FOR CLASS II SURFACE PREPARATION, SCARIFYING BRIDGE DECK AND HYDRO-DEMOLITION OF BRIDGE DECK, SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS.

THE CONTRACTOR MUST COLLECT, TREAT AND DISPOSE OF RUN-OFF WATER FROM THE HYDRO-DEMOLITION PROCESS, SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISION.

LONGITUDINAL CONSTRUCTION JOINTS OF OVERLAYS SHALL BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.

FOR BRIDGE JOINT DEMOLITION, SEE SPECIAL PROVISIONS.

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

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

FOR VOLUMETRIC MIXER, SEE SPECIAL PROVISIONS.

FOR CONCRETE FOR DECK REPAIRS, SEE SPECIAL PROVISIONS.

FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

SCOPE OF WORK

- PARTIALLY REMOVE BRIDGE DECK CONCRETE USING SCARIFICATION AND HYDRO-DEMOLITION METHODS.
- PERFORM CLASS II SURFACE PREPARATION AND REPAIR ON DECK SURFACES.
- OVERLAY PREPARED BRIDGE DECK WITH LATEX MODIFIED CONCRETE - VERY EARLY STRENGTH (LMC-VES).
- RECONSTRUCT BRIDGE DECK JOINT AND INSTALL JOINT SEALS.
- GROOVE LMC-VES BRIDGE DECK.

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

RESIDENT ENGINEER DATE

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 71

DocuSigned by:
Byron E. Atkinson
241BD08083BC417...

NORTH CAROLINA PROFESSIONAL SEAL 24939 ENGINEER BYRON E. ATKINSON

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON I-40
OVER SR 1200
BETWEEN SR 1200 AND SR 1205

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			25

DRAWN BY :	B.E. LANNING	DATE :	10/17
CHECKED BY :	B.E. ATKINSON	DATE :	10/17
DESIGN ENGINEER OF RECORD :	B.E. ATKINSON	DATE :	10/17

11/15/2017
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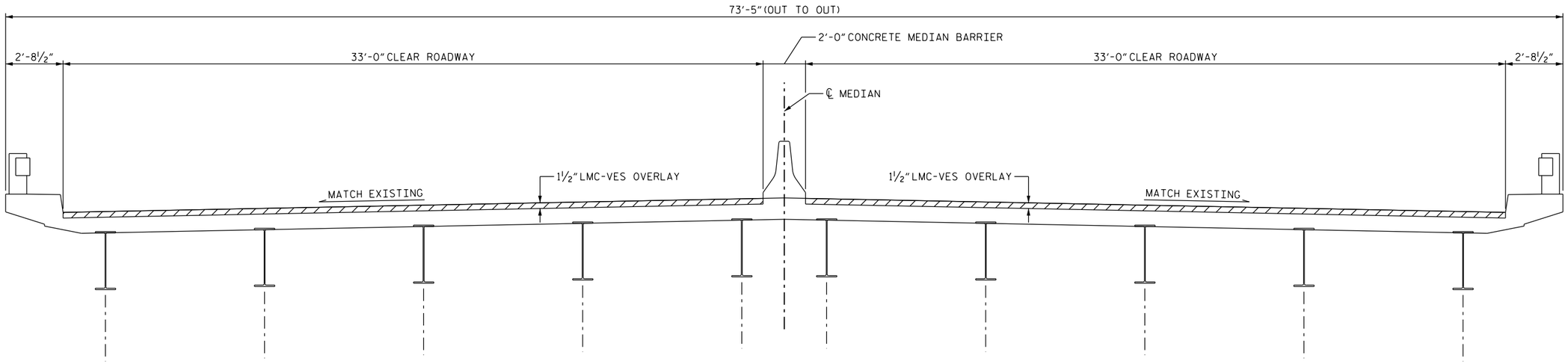
User: blanning
Filename: P:\NC Bridges\MI6001.30_I-5888 Deck Eval. (Buncombe)\Structures\401_015_I5888A_SMU_GD1_71.dgn

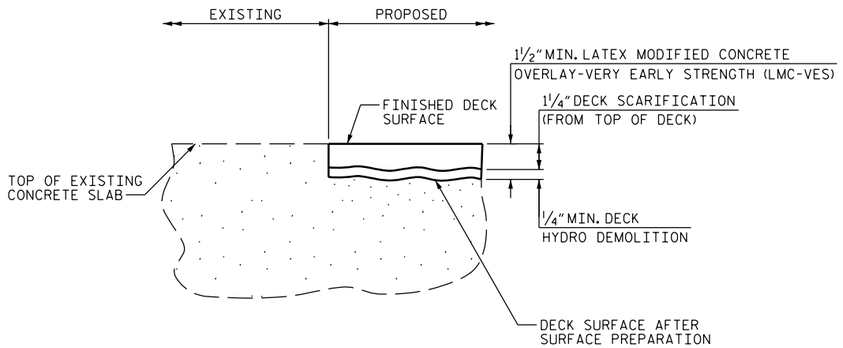
NOTE:

WHEN PREPARING THE SURFACE FOR LMC OVERLAY-VES ADJACENT TO A PREVIOUSLY PLACED LMC-VES STAGE, THE PREVIOUSLY PLACED LMC-VES SHALL BE REMOVED FOR A DISTANCE OF 4-INCHES FROM THE LMC-VES EDGE. THE SURFACE OF THE NEW STAGE AREA, ALONG WITH THE 4 INCH OVERLAY AREA, SHALL BE PREPARED AS PER THE OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS. NEW LMC-VES SHALL BE PLACED IN THE 4-INCH OVERLAP, AS PART OF NEW LMC-VES STAGE PLACEMENT.

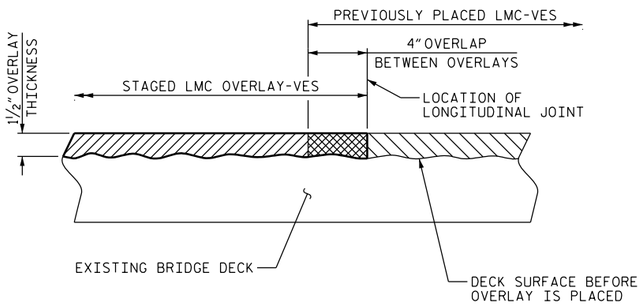
FOR CONTROL OF TRAFFIC AND LIMITS OF PHASING OF CONSTRUCTION, SEE TRANSPORTATION MANAGEMENT PLANS.



TYPICAL SECTION



DETAIL FOR LMC-VES OVERLAY



SECTION THRU DECK

STAGED LMC-VES OVERLAY JOINT

(AS NEEDED)

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 71

DocuSigned by:
Byron E. Atkinson
241BD0EM36C417...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24939 ENGINEER BYRON E. ATKINSON

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION & LATEX MODIFIED CONCRETE - VES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : B.E. LANNING DATE : 10/17
CHECKED BY : B.E. ATKINSON DATE : 10/17
DESIGN ENGINEER OF RECORD : B.E. ATKINSON DATE : 10/17

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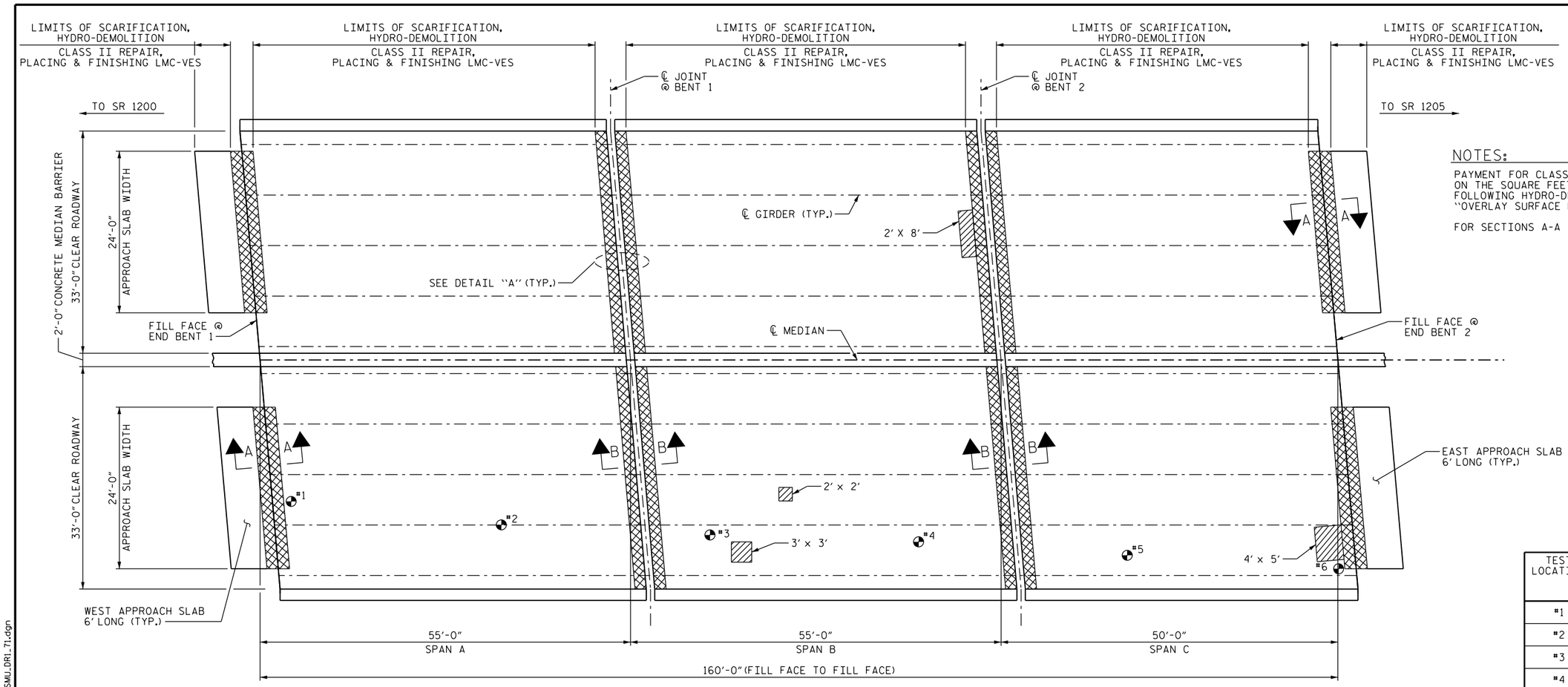


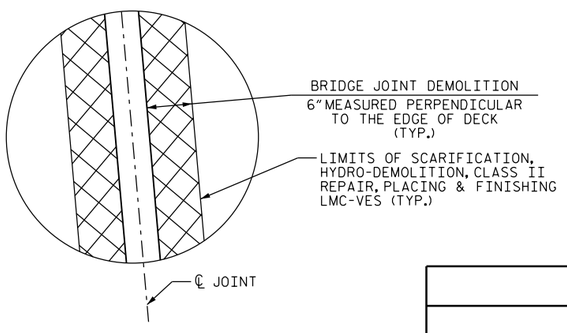
PLAN OF SPANS

BRIDGE JOINT DEMOLITION

CLASS II SURFACE PREPARATION

DECK SCARIFICATION, HYDRO-DEMOLITION AND LATEX MODIFIED CONCRETE OVERLAY-VES

#X TEST LOCATION



DETAIL "A"

NOTES:

PAYMENT FOR CLASS II SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING HYDRO-DEMOLITION OF THE BRIDGE DECK. SEE "OVERLAY SURFACE PREPARATION" SPECIAL PROVISIONS.

FOR SECTIONS A-A AND B-B, SEE "JOINT DETAILS" SHEET.

TEST LOCATION	CONCRETE COVER (INCH)	CONCRETE STRENGTH (PSI)
#1	2 1/4"	4100
#2	1 7/8"	4500
#3	2"	4100
#4	1 5/8"	4900
#5	2 3/8"	4700
#6	2 7/8"	3900

INFORMATION IN CHART TAKEN FROM DECK EVALUATION DATED 08/08/17.

SUMMARY OF QUANTITIES

	SCARIFYING BRIDGE DECK SQ. YDS.		HYDRO-DEMOLITION OF BRIDGE DECK SQ. YDS.		CLASS II SURFACE PREPARATION SQ. YDS.		BRIDGE JOINT DEMOLITION SQ. FT.		CONCRETE FOR DECK REPAIR CU. FT.	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
WEST APPR. SLAB	30		30		0.0		25		0.0	
SPAN A	396		396		0.0		67		0.0	
SPAN B	396		396		3.3		67		7.0	
SPAN C	360		360		2.3		67		4.9	
EAST APPR. SLAB	30		30		0.0		25		0.0	
TOTAL	1,212		1,212		5.6		251		11.9	

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 71

DocuSigned by: Byron E. Atkinson
2415D0684C6C417...

NORTH CAROLINA PROFESSIONAL SEAL 24939 ENGINEER BYRON E. ATKINSON

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SURFACE PREPARATION

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : B.E. LANNING DATE : 10/17
CHECKED BY : B.E. ATKINSON DATE : 10/17
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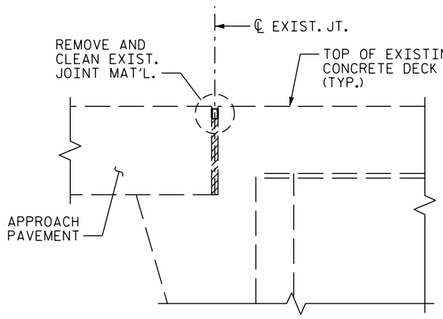
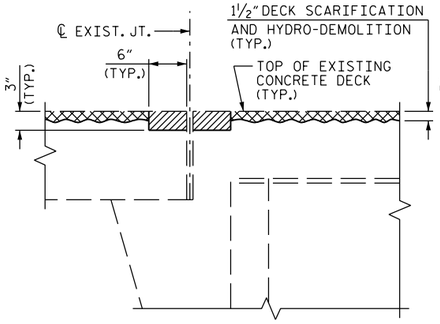
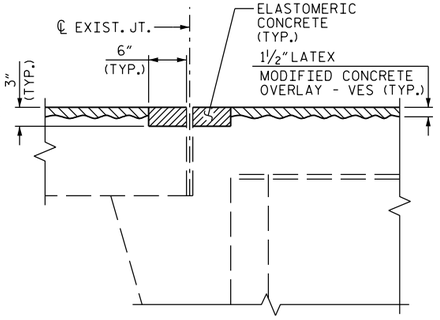


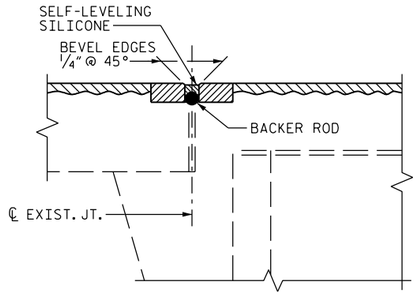
EXISTING JOINT AT END BENT



MINIMUM EXISTING JOINT DEMOLITION AT END BENT



PROPOSED JOINT PRE-SAWED DIMENSIONS



PROPOSED JOINT

NOTES

CONTRACTOR SHALL FIELD VERIFY THE EXISTING FORMED OPENING PRIOR TO OBTAINING JOINT MATERIAL.

HYDRO-DEMOLITION OR EXCAVATION OF CONCRETE AT THE EXISTING JOINT SHALL RESULT IN THE BOTTOM OF THE EXCAVATION BEING REASONABLY FLAT AND LEVEL, TO PROVIDE SUFFICIENT SUBSTRATE FOR PLACEMENT AND SUPPORT OF ELASTOMERIC CONCRETE.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

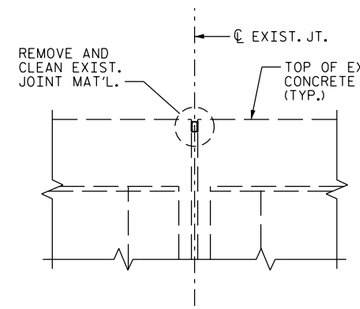
RETAIN ALL EXISTING REINFORCING STEEL. CLEAN AND REPAIR AS NEEDED.

THE WIDTH OF THE UNCOMPRESSED FOAM JOINT MATERIAL SHALL BE 2".

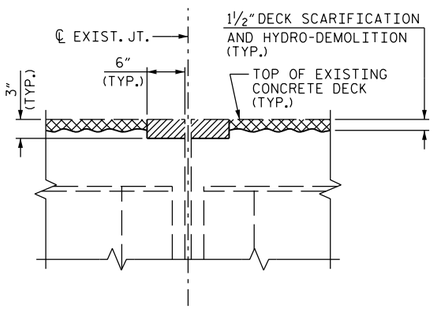
ELASTOMERIC CONCRETE		
END BENT 1	12.5	CU. FT.
BENT 1	16.8	CU. FT.
BENT 2	16.8	CU. FT.
END BENT 2	12.5	CU. FT.
* TOTAL	58.6	CU. FT.

*BASED ON MINIMUM BLOCKOUT SHOWN.

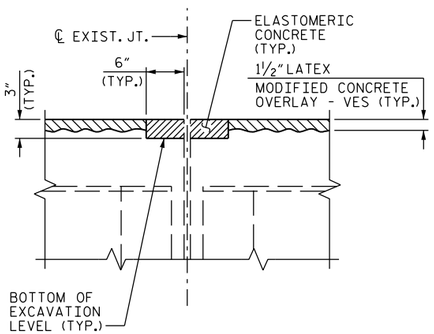
SECTION A-A



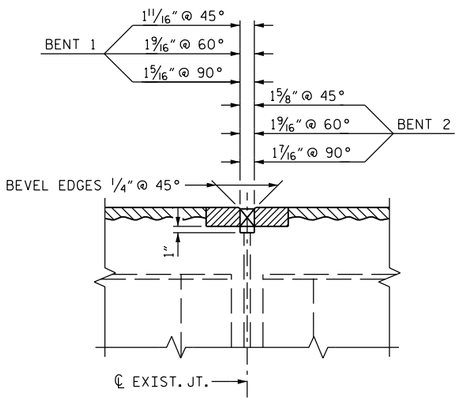
EXISTING JOINT



MINIMUM EXISTING JOINT DEMOLITION AT BENT

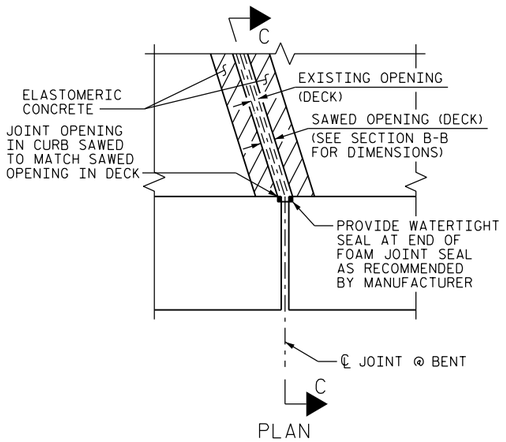


PROPOSED JOINT PRE-SAWED DIMENSIONS

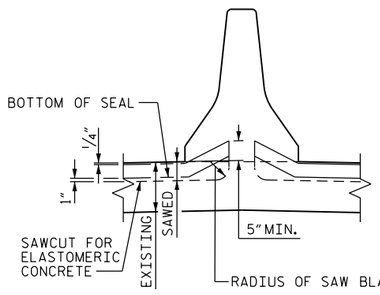


PROPOSED FOAM JOINT SEAL EXPANSION

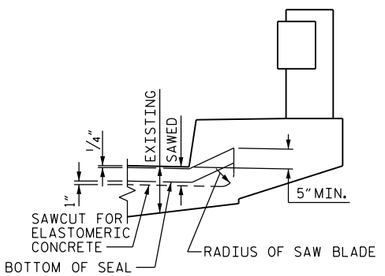
SECTION B-B



PLAN



AT MEDIAN



AT CURB

SECTION C-C

JOINT DETAILS AT BARRIER RAIL AND CURB

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 71

DocuSigned by:
Byron E. Atkinson
241BD08B36C417...

NORTH CAROLINA PROFESSIONAL SEAL 24938 ENGINEER BYRON E. ATKINSON

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			25

DRAWN BY :	B.E. LANNING	DATE : 10/17
CHECKED BY :	B.E. ATKINSON	DATE : 10/17
DESIGN ENGINEER OF RECORD :	B.E. ATKINSON	DATE : 10/17

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LOCATION SKETCH

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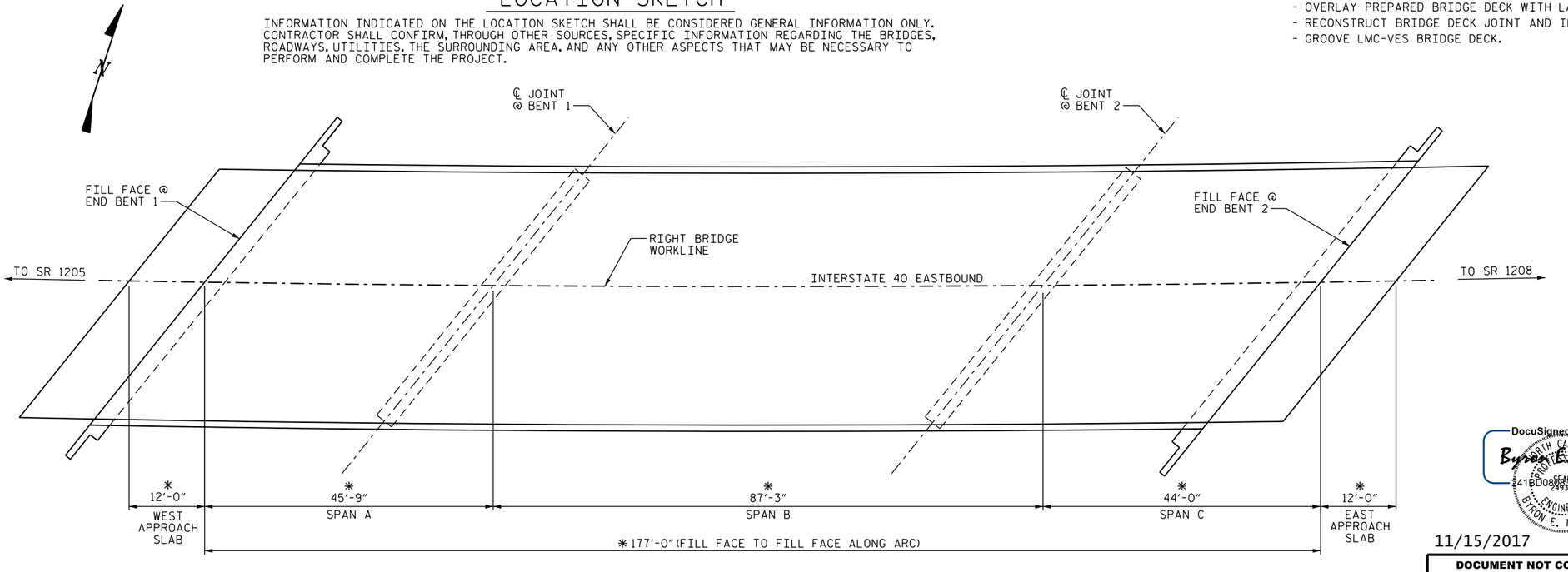

PLAN

*APPROX. ARC LENGTH ALONG RIGHT BRIDGE WORKLINE.

NOTES

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FOR BRIDGE JOINT DEMOLITION, SEE SPECIAL PROVISIONS.

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

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

FOR VOLUMETRIC MIXER, SEE SPECIAL PROVISIONS.

FOR CONCRETE FOR DECK REPAIRS, SEE SPECIAL PROVISIONS.

FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

SCOPE OF WORK

- PARTIALLY REMOVE BRIDGE DECK CONCRETE USING SCARIFICATION AND HYDRO-DEMOLITION METHODS.
- PERFORM CLASS II SURFACE PREPARATION AND REPAIR ON DECK SURFACES.
- OVERLAY PREPARED BRIDGE DECK WITH LATEX MODIFIED CONCRETE - VERY EARLY STRENGTH (LMC-VES).
- RECONSTRUCT BRIDGE DECK JOINT AND INSTALL JOINT SEALS.
- GROOVE LMC-VES BRIDGE DECK.

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

RESIDENT ENGINEER DATE

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 156

DocuSigned by:
Byron E. Atkinson
2415D08B86C417...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24939 BYRON E. ATKINSON

11/15/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON I-40 EASTBOUND
OVER SR 1141
BETWEEN SR 1205 AND SR 1208

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			25

DRAWN BY :	J.I. BREWER	DATE : 10/17
CHECKED BY :	B.E. ATKINSON	DATE : 10/17
DESIGN ENGINEER OF RECORD :	B.E. ATKINSON	DATE : 10/17

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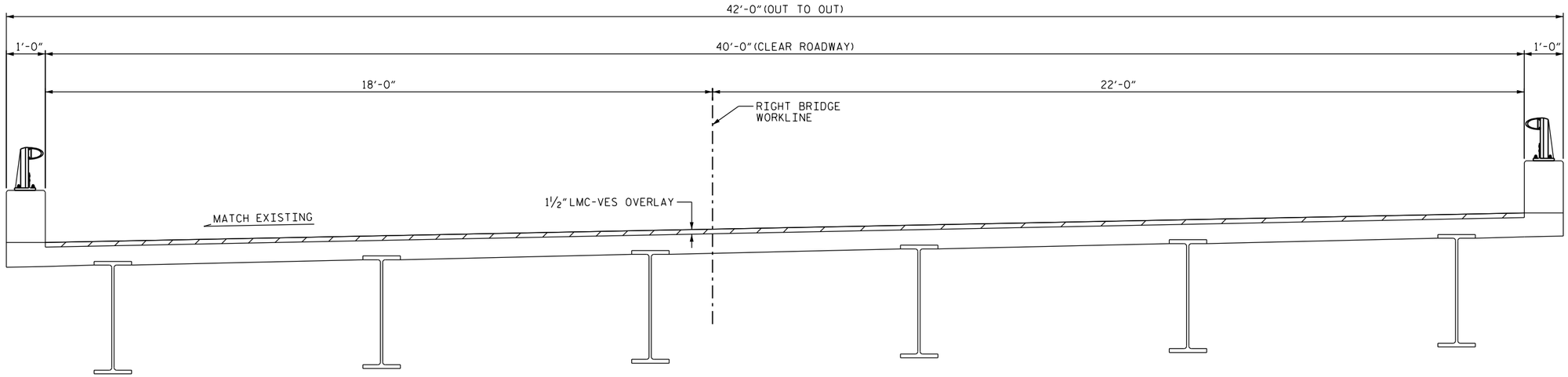
Filename: P:\NC Bridges\M16001.30_I-5888 Deck Eval.(Buncombe)\Structures\401_023_I5888A_SMU_GD1_156.dgn

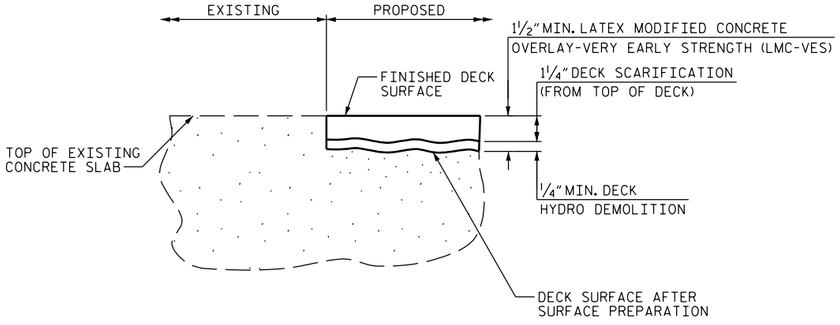
NOTE:

WHEN PREPARING THE SURFACE FOR LMC OVERLAY-VES ADJACENT TO A PREVIOUSLY PLACED LMC-VES STAGE, THE PREVIOUSLY PLACED LMC-VES SHALL BE REMOVED FOR A DISTANCE OF 4-INCHES FROM THE LMC-VES EDGE. THE SURFACE OF THE NEW STAGE AREA, ALONG WITH THE 4 INCH OVERLAY AREA, SHALL BE PREPARED AS PER THE OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS. NEW LMC-VES SHALL BE PLACED IN THE 4-INCH OVERLAP, AS PART OF NEW LMC-VES STAGE PLACEMENT.

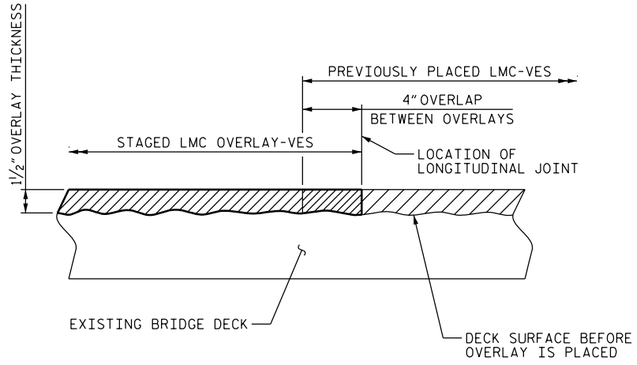
FOR CONTROL OF TRAFFIC AND LIMITS OF PHASING OF CONSTRUCTION, SEE TRANSPORTATION MANAGEMENT PLANS.



TYPICAL SECTION



DETAIL FOR LMC-VES OVERLAY



SECTION THRU DECK

STAGED LMC-VES OVERLAY JOINT

(AS NEEDED)

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 156

DocuSigned by:
Byron E. Atkinson
2418D0858B6C417...

NORTH CAROLINA PROFESSIONAL ENGINEER 24939 BYRON E. ATKINSON

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION & LATEX MODIFIED CONCRETE - VES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			25

DRAWN BY :	W. O. KEITH	DATE : 10/17
CHECKED BY :	B.E. ATKINSON	DATE : 10/17
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11/15/2017
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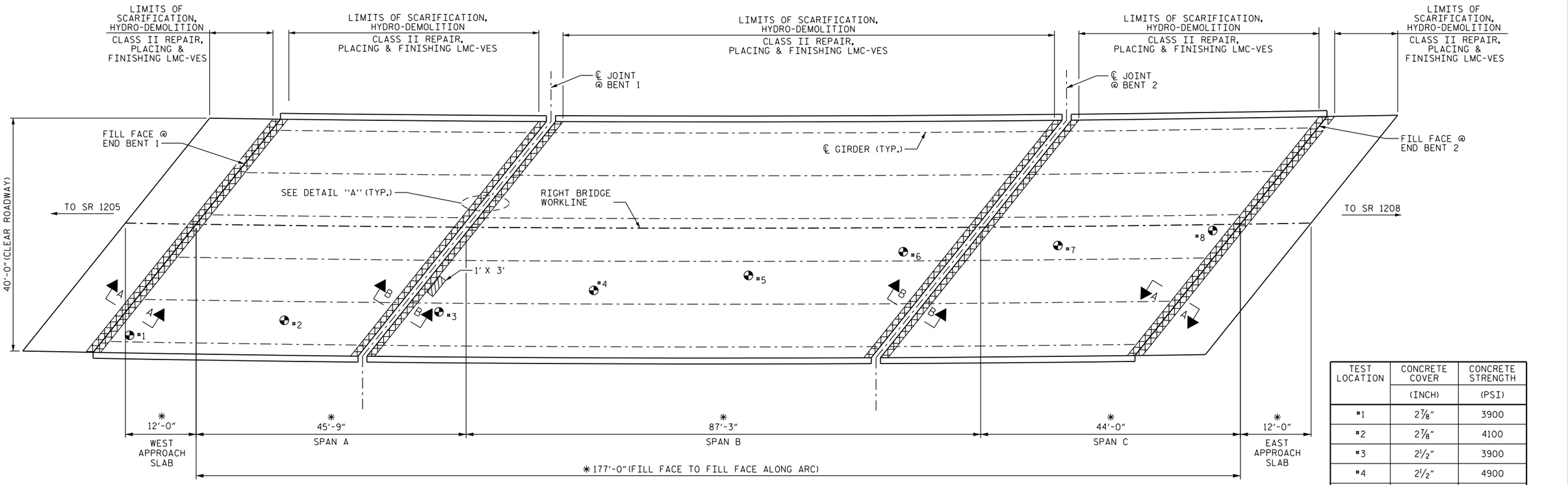
User: blanning
Filename: P:\NC Bridges\M16001.30_I-5888 Deck Eval.(Buncombe)\Structures\401_025_I5888A_SMU_TSI_156.dgn

NOTES:

PAYMENT FOR CLASS II SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING HYDRO-DEMOLITION OF THE BRIDGE DECK. SEE "OVERLAY SURFACE PREPARATION" SPECIAL PROVISIONS.

FOR SECTIONS A-A AND B-B, SEE "JOINT DETAILS" SHEET.



✳ APPROX. ARC LENGTH ALONG RIGHT BRIDGE WORKLINE.

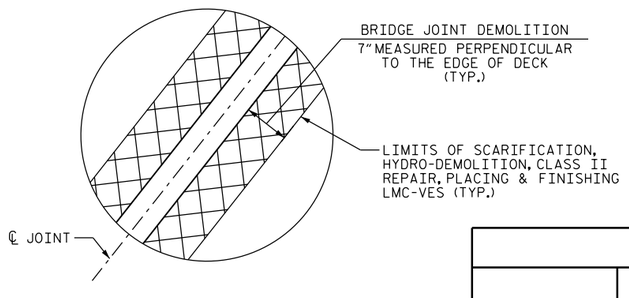
PLAN OF SPANS

BRIDGE JOINT DEMOLITION

CLASS II SURFACE PREPARATION

DECK SCARIFICATION, HYDRO-DEMOLITION AND LATEX MODIFIED CONCRETE OVERLAY-VES

✳X TEST LOCATION



DETAIL "A"

TEST LOCATION	CONCRETE COVER	CONCRETE STRENGTH
	(INCH)	(PSI)
#1	2 7/8"	3900
#2	2 7/8"	4100
#3	2 1/2"	3900
#4	2 1/2"	4900
#5	2 5/8"	4900
#6	2 3/8"	4100
#7	2 3/8"	5100
#8	2 1/4"	5700

INFORMATION IN CHART TAKEN FROM DECK EVALUATION DATED 08/09/17.

SUMMARY OF QUANTITIES

	SCARIFYING BRIDGE DECK		HYDRO-DEMOLITION OF BRIDGE DECK		CLASS II SURFACE PREPARATION		BRIDGE JOINT DEMOLITION		CONCRETE FOR DECK REPAIR	
	SQ. YDS.		SQ. YDS.		SQ. YDS.		SQ. FT.		CU. FT.	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
WEST APPR. SLAB	50		50		0.0		31		0.0	
SPAN A	197		197		0.0		61		0.0	
SPAN B	381		381		0.4		61		0.8	
SPAN C	189		189		0.0		61		0.0	
EAST APPR. SLAB	50		50		0.0		31		0.0	
TOTAL	867		867		0.4		245		0.8	

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 156

DocuSigned by: Byron E. Atkinson 241BDC8083864417...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24939 ENGINEER: BYRON E. ATKINSON

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
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RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SURFACE PREPARATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : W. O. KEITH DATE : 10/17
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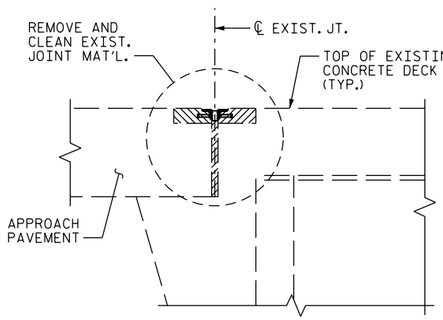
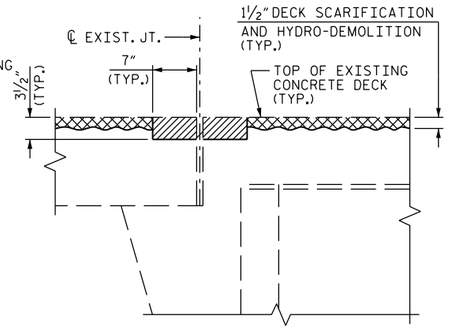
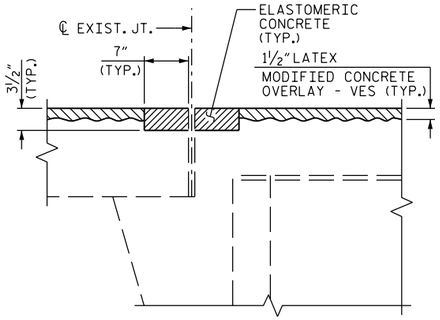


EXISTING JOINT AT END BENT

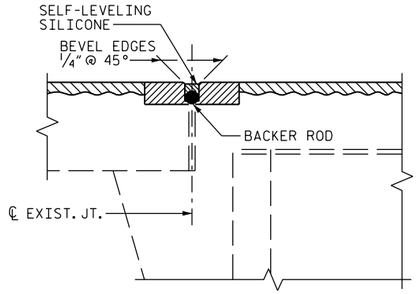
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



MINIMUM EXISTING JOINT DEMOLITION AT END BENT



PROPOSED JOINT PRE-SAWED DIMENSIONS



PROPOSED JOINT

NOTES

CONTRACTOR SHALL FIELD VERIFY THE EXISTING FORMED OPENING PRIOR TO OBTAINING JOINT MATERIAL.

HYDRO-DEMOLITION OR EXCAVATION OF CONCRETE AT THE EXISTING JOINT SHALL RESULT IN THE BOTTOM OF THE EXCAVATION BEING REASONABLY FLAT AND LEVEL, TO PROVIDE SUFFICIENT SUBSTRATE FOR PLACEMENT AND SUPPORT OF ELASTOMERIC CONCRETE.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

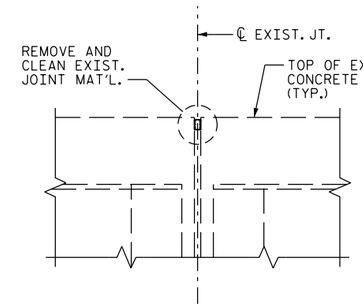
RETAIN ALL EXISTING REINFORCING STEEL. CLEAN AND REPAIR AS NEEDED.

THE WIDTH OF THE UNCOMPRESSED FOAM JOINT MATERIAL SHALL BE 2½" AT BENT 1 AND 2" AT BENT 2.

ELASTOMERIC CONCRETE		
END BENT 1	17.8	CU. FT.
BENT 1	17.8	CU. FT.
BENT 2	17.8	CU. FT.
END BENT 2	17.8	CU. FT.
* TOTAL	71.2	CU. FT.

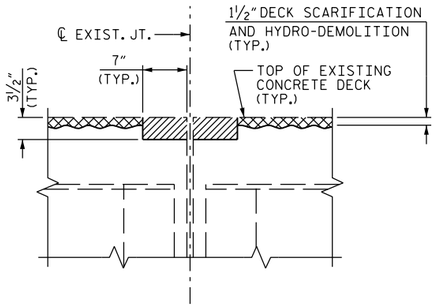
*BASED ON MINIMUM BLOCKOUT SHOWN.

SECTION A-A

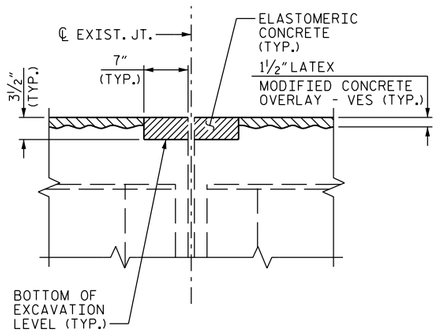


EXISTING JOINT

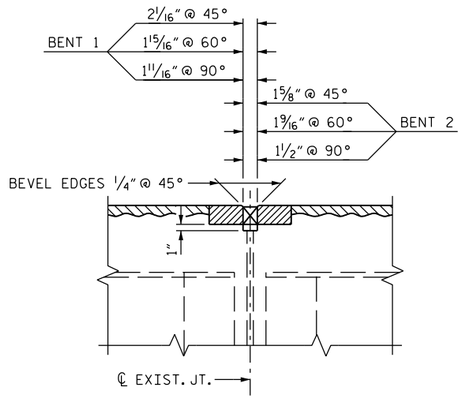
(BENT 1 SHOWN, BENT 2 SIMILAR)



MINIMUM EXISTING JOINT DEMOLITION AT BENT

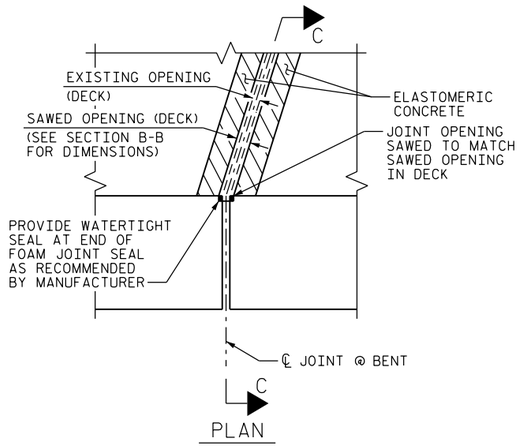


PROPOSED JOINT PRE-SAWED DIMENSIONS

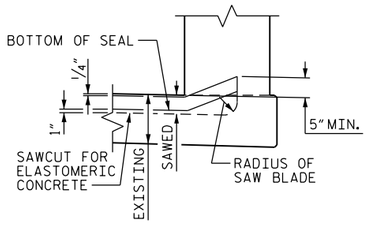


PROPOSED FOAM JOINT SEAL EXPANSION

SECTION B-B



PLAN



SECTION C-C

JOINT DETAILS AT PARAPET

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 156

DocuSigned by:
Byron E. Atkinson
241ED08C8A6C417...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24939 ENGINEER BYRON E. ATKINSON

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			25

DRAWN BY :	B.E. LANNING	DATE : 10/17
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User: blanning
Filename: P:\NC Bridges\M16001.30_I-5888 Deck Evol. (Buncombe)\Structures\401_029_I5888A_SMU_JT1_156.dgn

NOTES

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

IT IS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL STATE AND FEDERAL SAFETY REQUIREMENTS.

FOR CONTROL OF TRAFFIC AND LIMITS ON PHASING OF CONSTRUCTION, SEE TRANSPORTATION MANAGEMENT PLANS.

DURING CONSTRUCTION, BERMS OR APPROPRIATE MEASURES SHALL BE USED TO ENSURE HYDRO-DEMOLITION WATER DOES NOT FLOW OR MIGRATE INTO ACTIVE TRAVEL LANES.

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

FOR CLASS II SURFACE PREPARATION, SCARIFYING BRIDGE DECK AND HYDRO-DEMOLITION OF BRIDGE DECK, SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS.

THE CONTRACTOR MUST COLLECT, TREAT AND DISPOSE OF RUN-OFF WATER FROM THE HYDRO-DEMOLITION PROCESS, SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISION.

LONGITUDINAL CONSTRUCTION JOINTS OF OVERLAYS SHALL BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.

FOR BRIDGE JOINT DEMOLITION, SEE SPECIAL PROVISIONS.

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

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

FOR VOLUMETRIC MIXER, SEE SPECIAL PROVISIONS.

FOR CONCRETE FOR DECK REPAIRS, SEE SPECIAL PROVISIONS.

FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

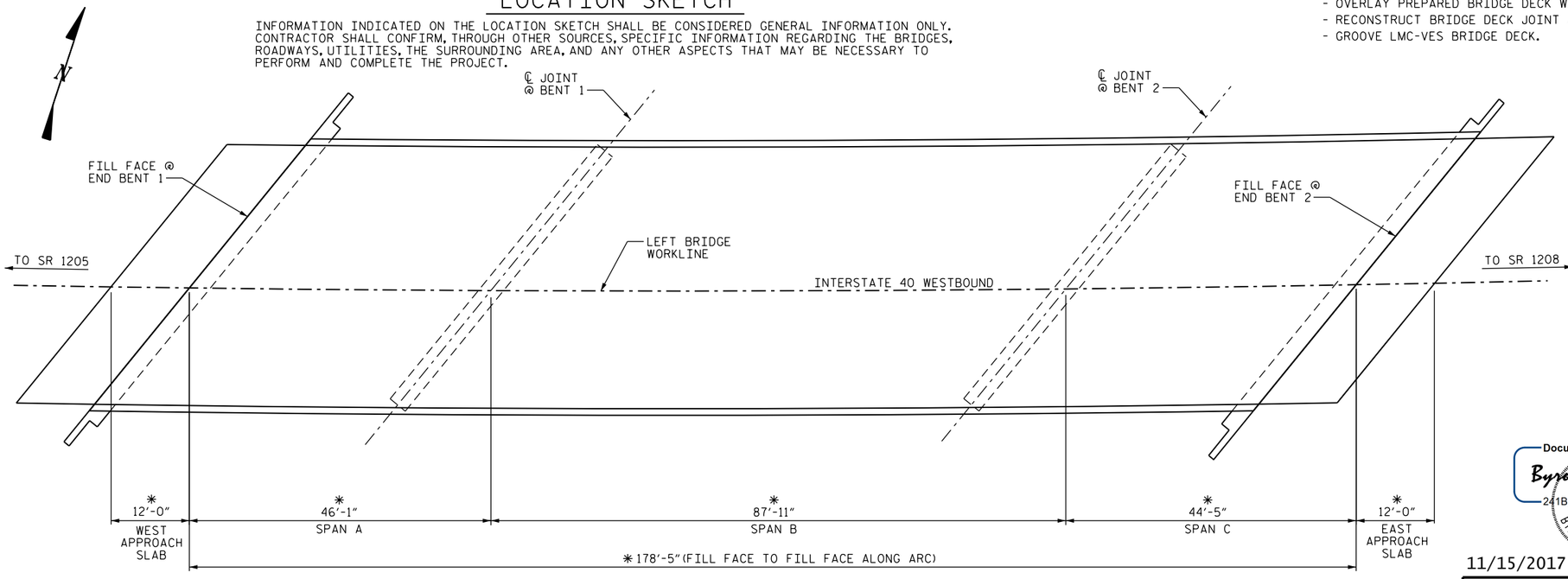
FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

SCOPE OF WORK

- PARTIALLY REMOVE BRIDGE DECK CONCRETE USING SCARIFICATION AND HYDRO-DEMOLITION METHODS.
- PERFORM CLASS II SURFACE PREPARATION AND REPAIR ON DECK SURFACES.
- OVERLAY PREPARED BRIDGE DECK WITH LATEX MODIFIED CONCRETE - VERY EARLY STRENGTH (LMC-VES).
- RECONSTRUCT BRIDGE DECK JOINT AND INSTALL JOINT SEALS.
- GROOVE LMC-VES BRIDGE DECK.

LOCATION SKETCH

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



PLAN

* APPROX. ARC LENGTH ALONG LEFT BRIDGE WORKLINE.

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

RESIDENT ENGINEER DATE

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 164

DocuSigned by:
Byron E. Atkinson
241BD0805FAC417...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24939 BYRON E. ATKINSON

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON I-40 WESTBOUND OVER SR 1141 BETWEEN SR 1205 AND SR 1208

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			25

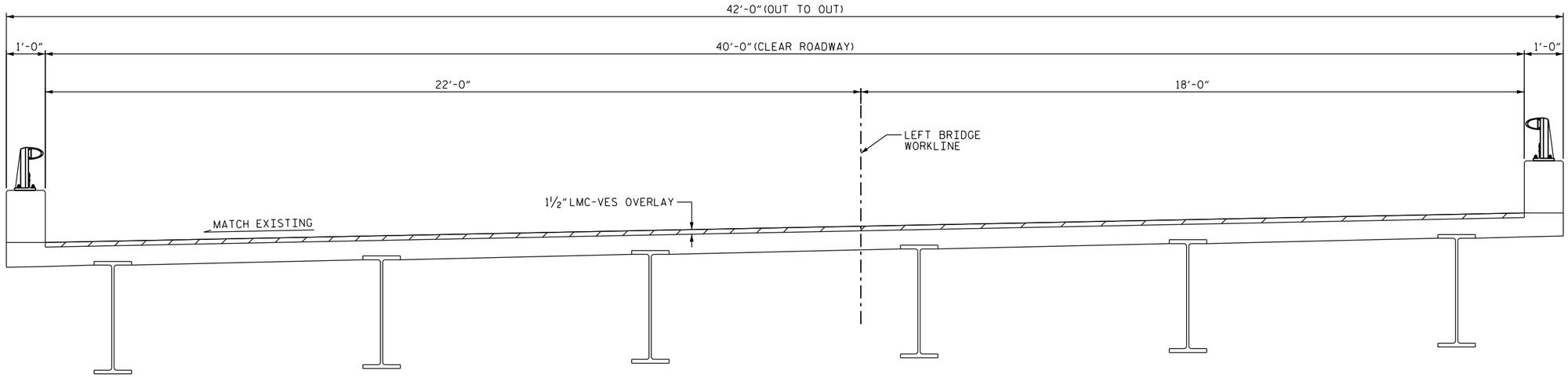
DRAWN BY : W. O. KEITH DATE : 10/17
CHECKED BY : B.E. ATKINSON DATE : 10/17
DESIGN ENGINEER OF RECORD : B.E. ATKINSON DATE : 10/17

11/15/2017 3:39:26 PM
User: blanning
Filename: P:\NC Bridges\MI6001.30_I-5888 Deck Eval (Buncombe)\Structures\401_031_I5888A_SMU_GDI_164.dgn

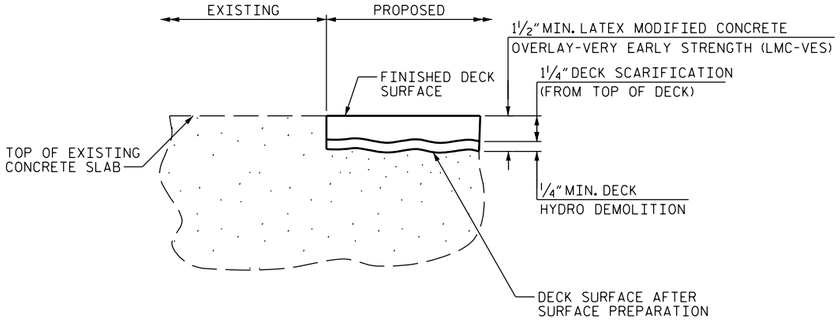
NOTE:

WHEN PREPARING THE SURFACE FOR LMC OVERLAY-VES ADJACENT TO A PREVIOUSLY PLACED LMC-VES STAGE, THE PREVIOUSLY PLACED LMC-VES SHALL BE REMOVED FOR A DISTANCE OF 4-INCHES FROM THE LMC-VES EDGE. THE SURFACE OF THE NEW STAGE AREA, ALONG WITH THE 4 INCH OVERLAY AREA, SHALL BE PREPARED AS PER THE OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS. NEW LMC-VES SHALL BE PLACED IN THE 4-INCH OVERLAP, AS PART OF NEW LMC-VES STAGE PLACEMENT.

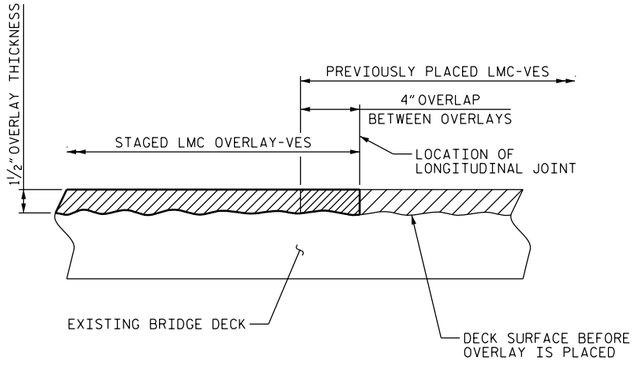
FOR CONTROL OF TRAFFIC AND LIMITS OF PHASING OF CONSTRUCTION, SEE TRANSPORTATION MANAGEMENT PLANS.



TYPICAL SECTION



DETAIL FOR LMC-VES OVERLAY



SECTION THRU DECK

STAGED LMC-VES OVERLAY JOINT

(AS NEEDED)

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 164

DocuSigned by:
Byron E. Atkinson
241B3080588C417...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24939 BYRON E. ATKINSON

11/15/2017

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MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION & LATEX MODIFIED CONCRETE - VES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			25

DRAWN BY :	W. O. KEITH	DATE : 10/17
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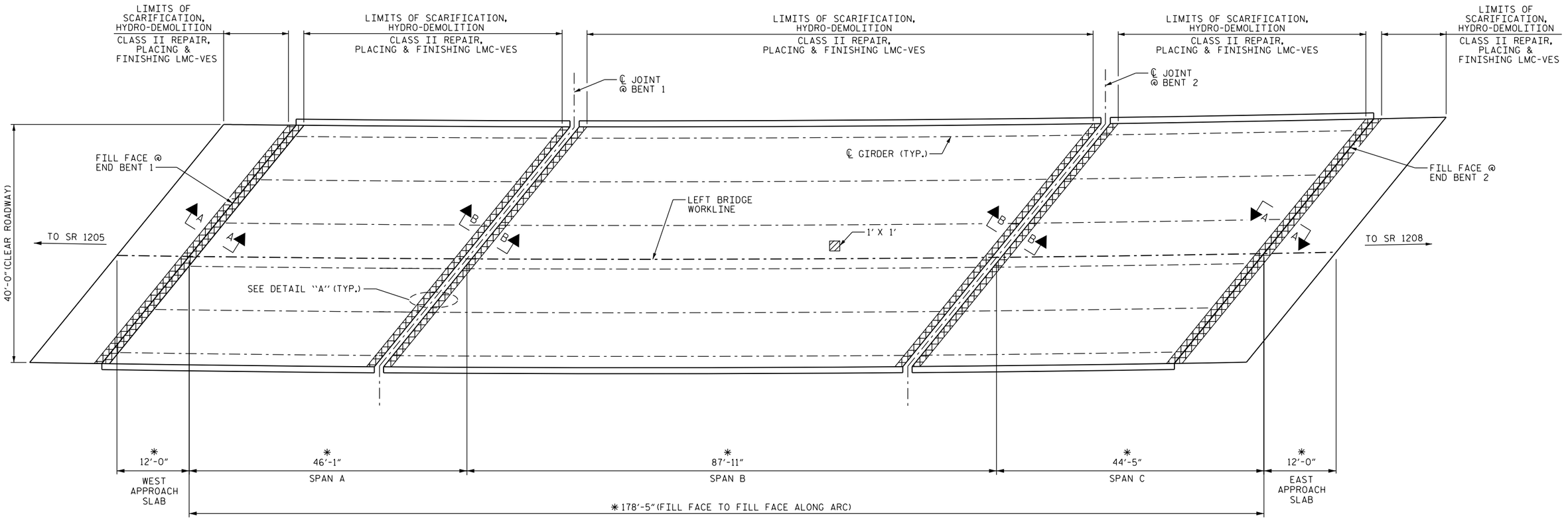
Filename: P:\NC Bridges\MI6001.30.1-5888 Deck Eval.(Buncombe)\Structures\401_033_I5888A_SMU_TSI_164.dgn

NOTES:

PAYMENT FOR CLASS II SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING HYDRO-DEMOLITION OF THE BRIDGE DECK. SEE "OVERLAY SURFACE PREPARATION" SPECIAL PROVISIONS.

FOR SECTIONS A-A AND B-B, SEE "JOINT DETAILS" SHEET.



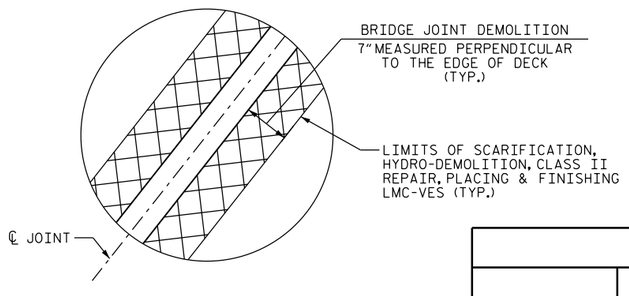
PLAN OF SPANS

* APPROX. ARC LENGTH ALONG LEFT BRIDGE WORKLINE.

BRIDGE JOINT DEMOLITION

CLASS II SURFACE PREPARATION

DECK SCARIFICATION, HYDRO-DEMOLITION AND LATEX MODIFIED CONCRETE OVERLAY-VES



DETAIL "A"

SUMMARY OF QUANTITIES

	SCARIFYING BRIDGE DECK		HYDRO-DEMOLITION OF BRIDGE DECK		CLASS II SURFACE PREPARATION		BRIDGE JOINT DEMOLITION		CONCRETE FOR DECK REPAIR	
	SQ. YDS.		SQ. YDS.		SQ. YDS.		SQ. FT.		CU. FT.	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
WEST APPR. SLAB	50		50		0.0		31		0.0	
SPAN A	199		199		0.0		61		0.0	
SPAN B	384		384		0.2		61		0.3	
SPAN C	191		191		0.0		61		0.0	
EAST APPR. SLAB	50		50		0.0		31		0.0	
TOTAL	874		874		0.2		245		0.3	

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 164

DocuSigned by: Byron E. Atkinson 241B90805AC417...

NORTH CAROLINA PROFESSIONAL SEAL 24939 ENGINEER BYRON E. ATKINSON

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SURFACE PREPARATION

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : W. O. KEITH DATE : 10/17
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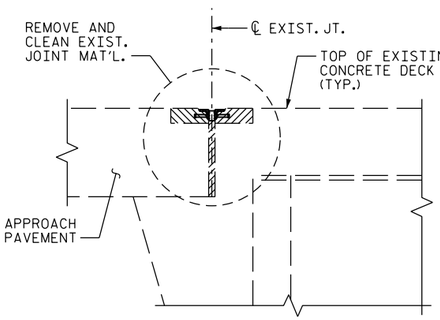
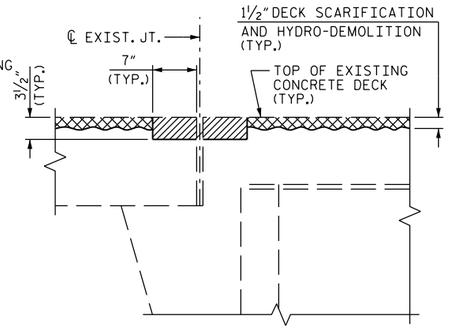
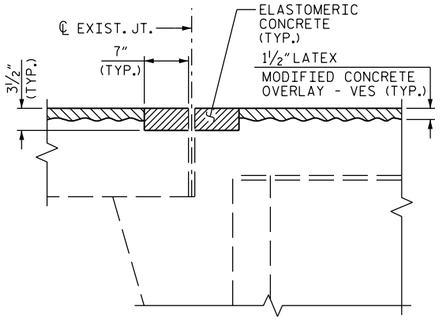


EXISTING JOINT AT END BENT

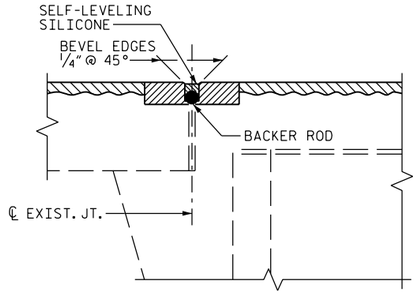
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



MINIMUM EXISTING JOINT DEMOLITION AT END BENT



PROPOSED JOINT PRE-SAWED DIMENSIONS



PROPOSED JOINT

NOTES

CONTRACTOR SHALL FIELD VERIFY THE EXISTING FORMED OPENING PRIOR TO OBTAINING JOINT MATERIAL.

HYDRO-DEMOLITION OR EXCAVATION OF CONCRETE AT THE EXISTING JOINT SHALL RESULT IN THE BOTTOM OF THE EXCAVATION BEING REASONABLY FLAT AND LEVEL, TO PROVIDE SUFFICIENT SUBSTRATE FOR PLACEMENT AND SUPPORT OF ELASTOMERIC CONCRETE.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

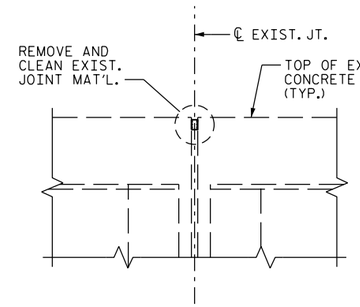
RETAIN ALL EXISTING REINFORCING STEEL. CLEAN AND REPAIR AS NEEDED.

THE WIDTH OF THE UNCOMPRESSED FOAM JOINT MATERIAL SHALL BE 2½" AT BENT 1 AND 2" AT BENT 2.

ELASTOMERIC CONCRETE		
END BENT 1	17.8	CU. FT.
BENT 1	17.8	CU. FT.
BENT 2	17.8	CU. FT.
END BENT 2	17.8	CU. FT.
* TOTAL	71.2	CU. FT.

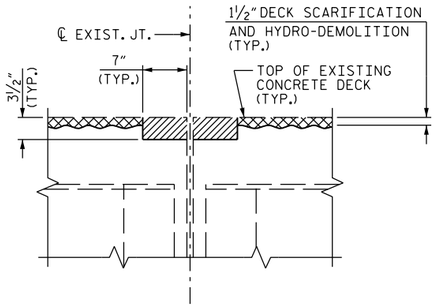
*BASED ON MINIMUM BLOCKOUT SHOWN.

SECTION A-A

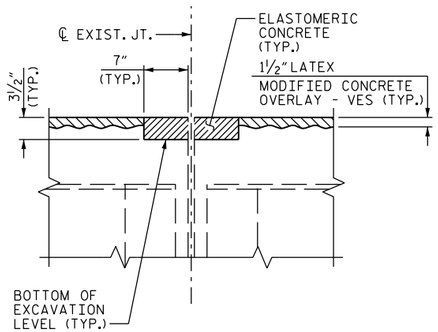


EXISTING JOINT

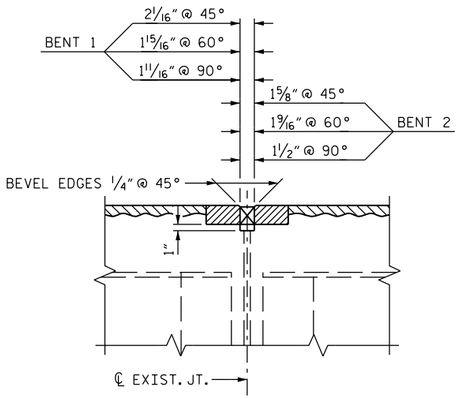
(BENT 1 SHOWN, BENT 2 SIMILAR)



MINIMUM EXISTING JOINT DEMOLITION AT BENT

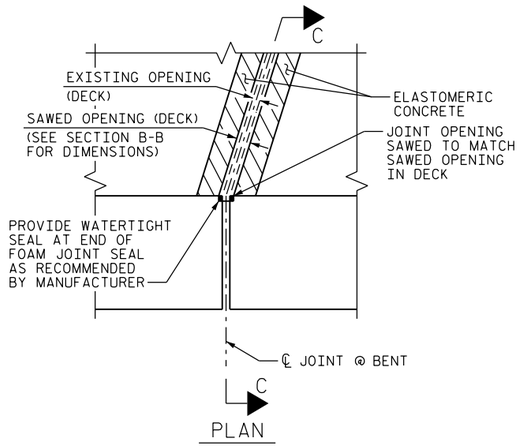


PROPOSED JOINT PRE-SAWED DIMENSIONS

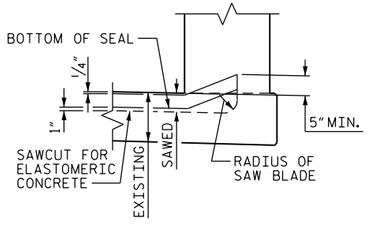


PROPOSED FOAM JOINT SEAL EXPANSION

SECTION B-B



PLAN



SECTION C-C

JOINT DETAILS AT PARAPET

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 164

DocuSigned by:
Byron E. Atkinson
24BBD3B0B5E4C417...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24939 ENGINEER BYRON E. ATKINSON

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			25

DRAWN BY :	B.E. LANNING	DATE :	10/17
CHECKED BY :	B.E. ATKINSON	DATE :	10/17
DESIGN ENGINEER OF RECORD :	B.E. ATKINSON	DATE :	10/17

11/15/2017
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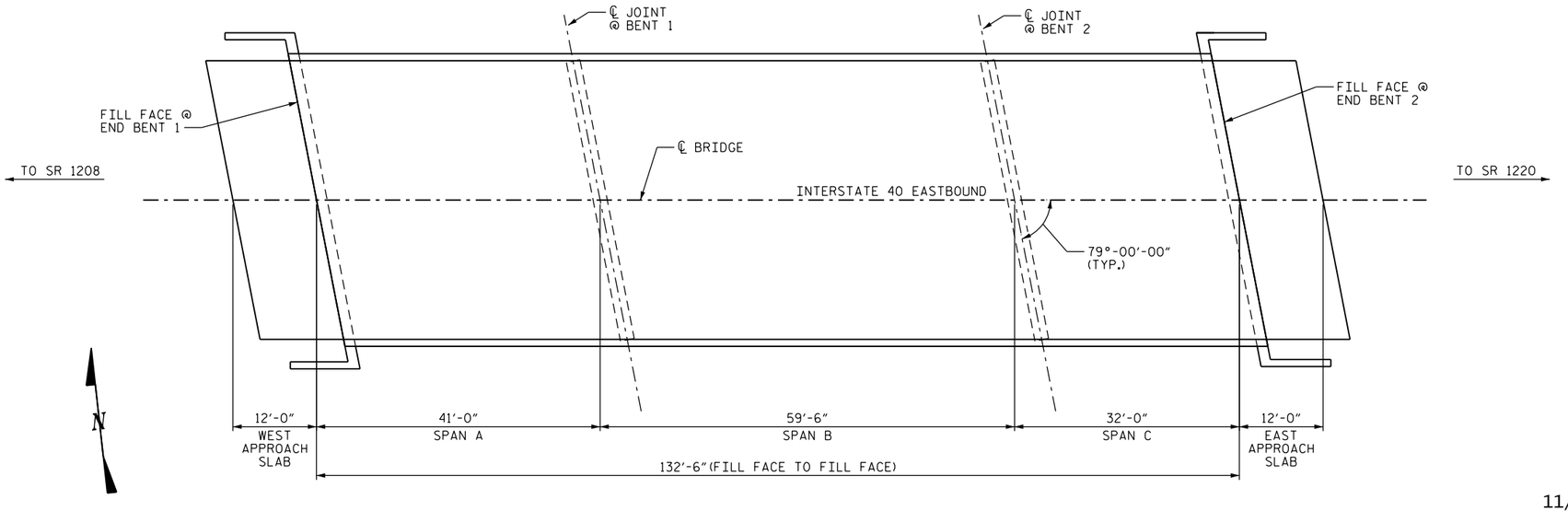
User: blanning
Filename: P:\NC Bridges\M16001.30_I-5888 Deck Evol. (Buncombe)\Structures\401_037_I5888A_SMU_JT1_164.dgn

LOCATION SKETCH

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



PLAN

NOTES

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

IT IS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL STATE AND FEDERAL SAFETY REQUIREMENTS.

FOR CONTROL OF TRAFFIC AND LIMITS ON PHASING OF CONSTRUCTION, SEE TRANSPORTATION MANAGEMENT PLANS.

DURING CONSTRUCTION, BERMS OR APPROPRIATE MEASURES SHALL BE USED TO ENSURE HYDRO-DEMOLITION WATER DOES NOT FLOW OR MIGRATE INTO ACTIVE TRAVEL LANES.

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

FOR CLASS II SURFACE PREPARATION, SCARIFYING BRIDGE DECK AND HYDRO-DEMOLITION OF BRIDGE DECK, SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS.

THE CONTRACTOR MUST COLLECT, TREAT AND DISPOSE OF RUN-OFF WATER FROM THE HYDRO-DEMOLITION PROCESS, SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISION.

LONGITUDINAL CONSTRUCTION JOINTS OF OVERLAYS SHALL BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.

FOR BRIDGE JOINT DEMOLITION, SEE SPECIAL PROVISIONS.

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

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

FOR VOLUMETRIC MIXER, SEE SPECIAL PROVISIONS.

FOR CONCRETE FOR DECK REPAIRS, SEE SPECIAL PROVISIONS.

FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

SCOPE OF WORK

- PARTIALLY REMOVE BRIDGE DECK CONCRETE USING SCARIFICATION AND HYDRO-DEMOLITION METHODS.
- PERFORM CLASS II SURFACE PREPARATION AND REPAIR ON DECK SURFACES.
- OVERLAY PREPARED BRIDGE DECK WITH LATEX MODIFIED CONCRETE - VERY EARLY STRENGTH (LMC-VES).
- RECONSTRUCT BRIDGE DECK JOINT AND INSTALL JOINT SEALS.
- GROOVE LMC-VES BRIDGE DECK.

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

RESIDENT ENGINEER DATE

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 210

DocuSigned by:
Byron E. Atkinson
241BD0802...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24939 BYRON E. ATKINSON

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON I-40 EASTBOUND
OVER SR 1210
BETWEEN SR 1208 AND SR 1220

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : W. O. KEITH DATE : 10/17
CHECKED BY : B.E. ATKINSON DATE : 10/17
DESIGN ENGINEER OF RECORD : B.E. ATKINSON DATE : 10/17

11/15/2017
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User: blanning
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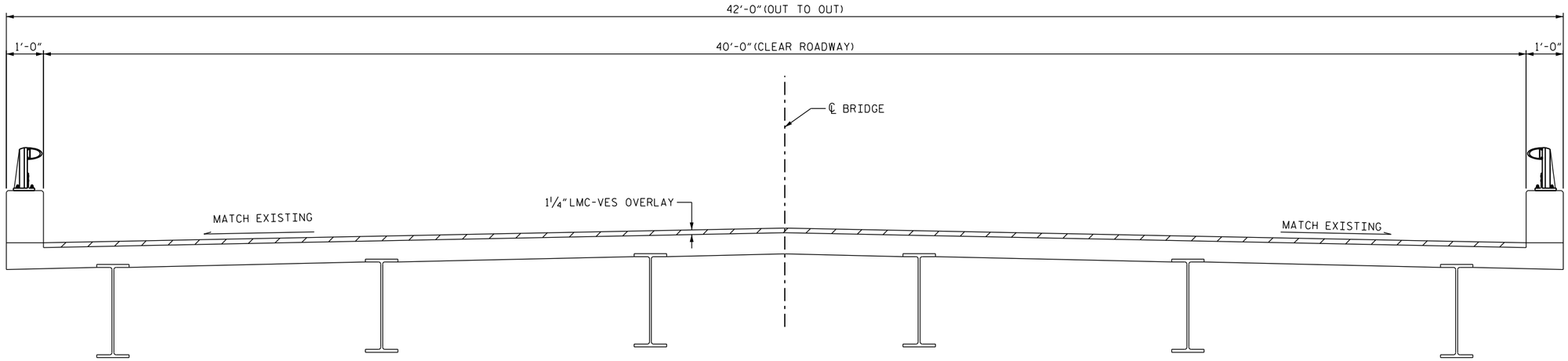
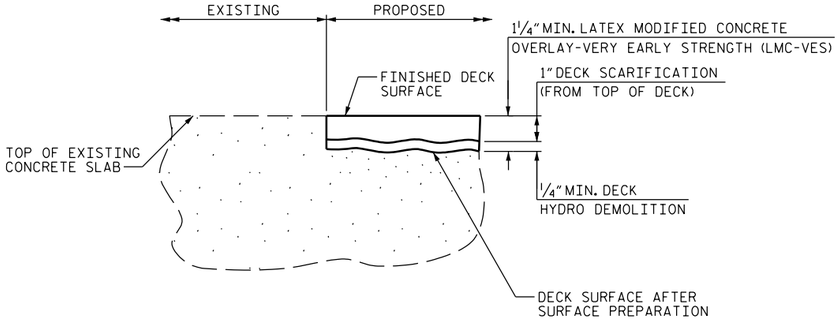
NOTE:

WHEN PREPARING THE SURFACE FOR LMC OVERLAY-VES ADJACENT TO A PREVIOUSLY PLACED LMC-VES STAGE, THE PREVIOUSLY PLACED LMC-VES SHALL BE REMOVED FOR A DISTANCE OF 4-INCHES FROM THE LMC-VES EDGE. THE SURFACE OF THE NEW STAGE AREA, ALONG WITH THE 4 INCH OVERLAY AREA, SHALL BE PREPARED AS PER THE OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS. NEW LMC-VES SHALL BE PLACED IN THE 4-INCH OVERLAP, AS PART OF NEW LMC-VES STAGE PLACEMENT.

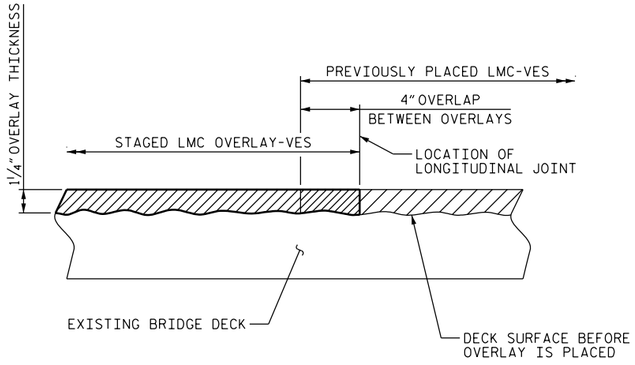
FOR CONTROL OF TRAFFIC AND LIMITS OF PHASING OF CONSTRUCTION, SEE TRANSPORTATION MANAGEMENT PLANS.



TYPICAL SECTION



DETAIL FOR LMC-VES OVERLAY



SECTION THRU DECK

STAGED LMC-VES OVERLAY JOINT

(AS NEEDED)

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 210

DocuSigned by:
Byron E. Atkinson
241BD0806A6C417...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24939 BYRON E. ATKINSON

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION & LATEX MODIFIED CONCRETE - VES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : W. O. KEITH DATE : 10/17
CHECKED BY : B.E. ATKINSON DATE : 10/17
DESIGN ENGINEER OF RECORD : B.E. ATKINSON DATE : 10/17

11/15/2017
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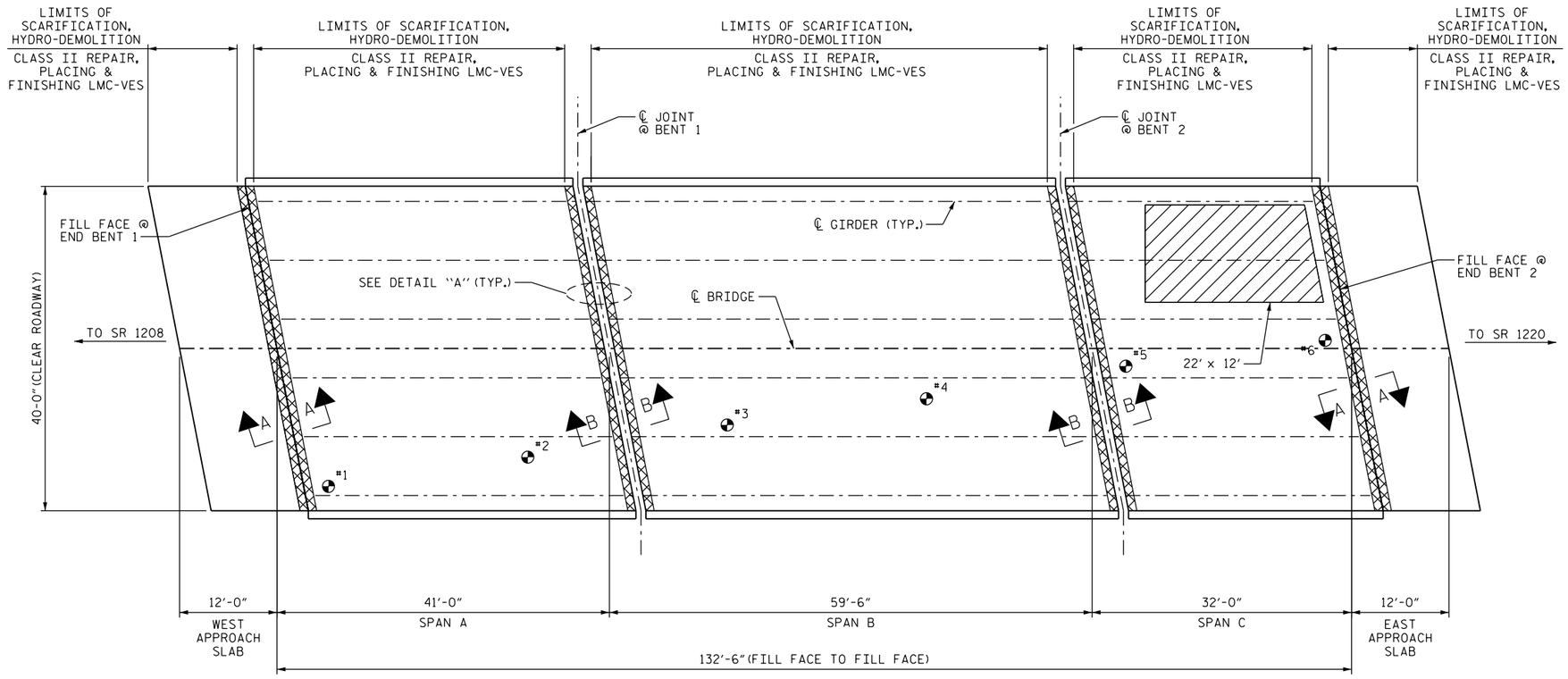
User: blanning
Filename: P:\NC Bridges\MI6001.30_I-5888 Deck Eval.(Buncombe)\Structures\401_041_I5888A_SMU_TSI_210.dgn

NOTES:

PAYMENT FOR CLASS II SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING HYDRO-DEMOLITION OF THE BRIDGE DECK. SEE "OVERLAY SURFACE PREPARATION" SPECIAL PROVISIONS.

FOR SECTIONS A-A AND B-B, SEE "JOINT DETAILS" SHEET.



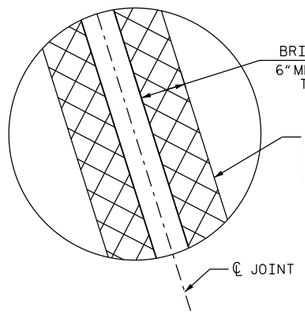
PLAN OF SPANS

BRIDGE JOINT DEMOLITION

CLASS II SURFACE PREPARATION

DECK SCARIFICATION, HYDRO-DEMOLITION AND LATEX MODIFIED CONCRETE OVERLAY-VES

#X TEST LOCATION



DETAIL "A"

TEST LOCATION	CONCRETE COVER (INCH)	CONCRETE STRENGTH (PSI)
#1	2 5/8"	3900
#2	2 5/8"	4300
#3	2 1/2"	4300
#4	2 3/8"	4500
#5	2 1/2"	4100
#6	2 3/8"	4300

INFORMATION IN CHART TAKEN FROM DECK EVALUATION DATED 08/09/17.

SUMMARY OF QUANTITIES

	SCARIFYING BRIDGE DECK SQ. YDS.		HYDRO-DEMOLITION OF BRIDGE DECK SQ. YDS.		CLASS II SURFACE PREPARATION SQ. YDS.		BRIDGE JOINT DEMOLITION SQ. FT.		CONCRETE FOR DECK REPAIR CU. FT.	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
WEST APPR. SLAB	51		51		0.0		21		0.0	
SPAN A	178		178		0.0		41		0.0	
SPAN B	260		260		0.0		41		0.0	
SPAN C	138		138		29.4		41		75.7	
EAST APPR. SLAB	51		51		0.0		21		0.0	
TOTAL	678		678		29.4		165		75.7	

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 210

DocuSigned by:
Byron E. Atkinson
24BBD1080B4C417...

NORTH CAROLINA PROFESSIONAL SEAL 24939 ENGINEER BYRON E. ATKINSON

11/15/2017

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SURFACE PREPARATION

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

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

SHEET NO. S-20

TOTAL SHEETS 25

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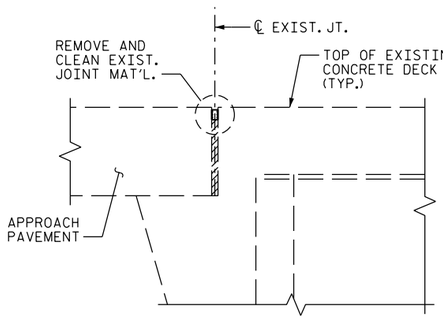
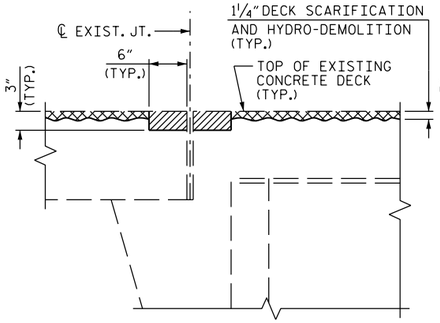
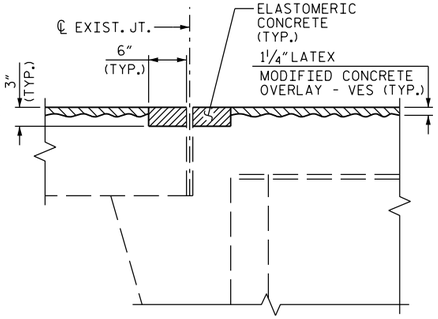


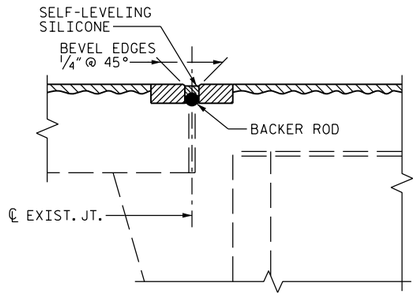
EXISTING JOINT AT END BENT



MINIMUM EXISTING JOINT DEMOLITION AT END BENT



PROPOSED JOINT PRE-SAWED DIMENSIONS



PROPOSED JOINT

NOTES

CONTRACTOR SHALL FIELD VERIFY THE EXISTING FORMED OPENING PRIOR TO OBTAINING JOINT MATERIAL.

HYDRO-DEMOLITION OR EXCAVATION OF CONCRETE AT THE EXISTING JOINT SHALL RESULT IN THE BOTTOM OF THE EXCAVATION BEING REASONABLY FLAT AND LEVEL, TO PROVIDE SUFFICIENT SUBSTRATE FOR PLACEMENT AND SUPPORT OF ELASTOMERIC CONCRETE.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

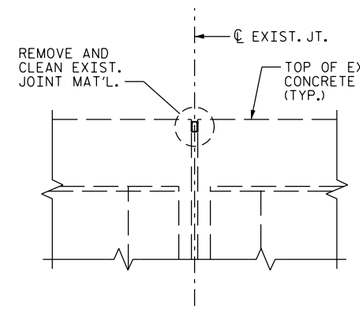
RETAIN ALL EXISTING REINFORCING STEEL. CLEAN AND REPAIR AS NEEDED.

THE WIDTH OF THE UNCOMPRESSED FOAM JOINT MATERIAL SHALL BE 2".

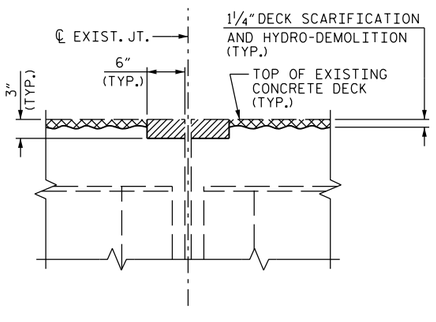
ELASTOMERIC CONCRETE		
END BENT 1	10.3	CU. FT.
BENT 1	10.3	CU. FT.
BENT 2	10.3	CU. FT.
END BENT 2	10.3	CU. FT.
* TOTAL	41.2	CU. FT.

*BASED ON MINIMUM BLOCKOUT SHOWN.

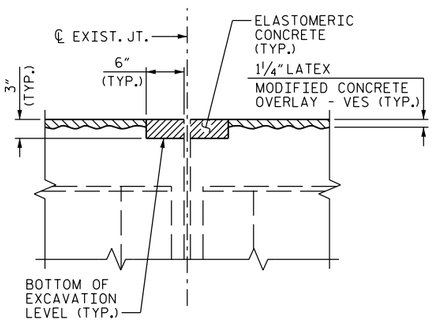
SECTION A-A



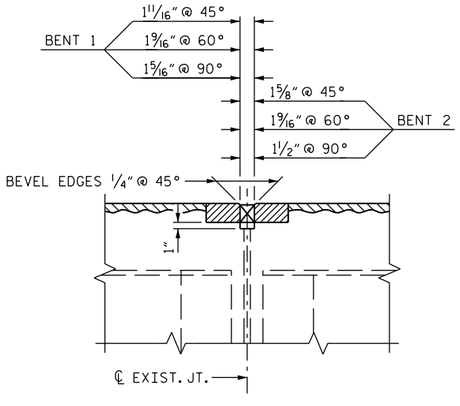
EXISTING JOINT



MINIMUM EXISTING JOINT DEMOLITION AT BENT

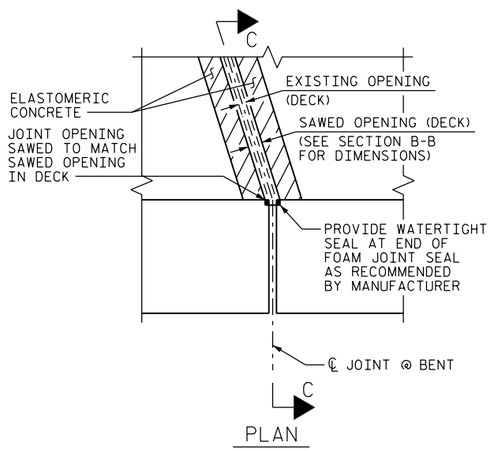


PROPOSED JOINT PRE-SAWED DIMENSIONS

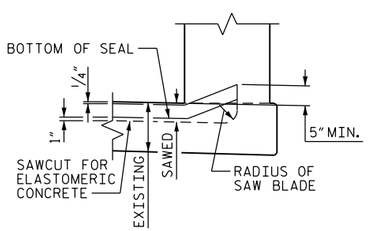


PROPOSED FOAM JOINT SEAL EXPANSION

SECTION B-B



PLAN



SECTION C-C

JOINT DETAILS AT PARAPET

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 210

DocuSigned by:
Byron E. Atkinson
281B0D80C84C412...

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS

DRAWN BY :	B.E. LANNING	DATE : 10/17
CHECKED BY :	B.E. ATKINSON	DATE : 10/17
DESIGN ENGINEER OF RECORD :	B.E. ATKINSON	DATE : 10/17

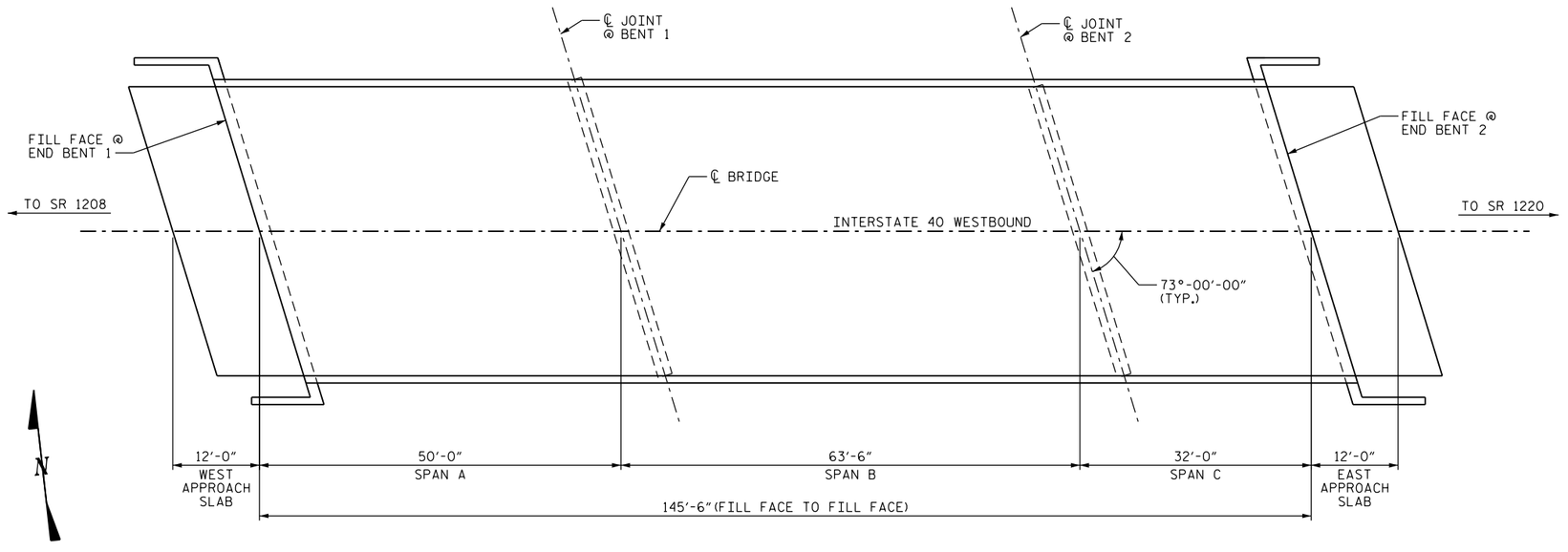
MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			25

11/15/2017 3:35:41 PM
User: blanning
Filename: P:\NC Bridges\MI6001.30_I-5888 Deck Eval. (Buncombe)\Structures\401_045_I5888A_SMU_JT1_210.dgn

LOCATION SKETCH

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



PLAN

NOTES

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

IT IS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL STATE AND FEDERAL SAFETY REQUIREMENTS.

FOR CONTROL OF TRAFFIC AND LIMITS ON PHASING OF CONSTRUCTION, SEE TRANSPORTATION MANAGEMENT PLANS.

DURING CONSTRUCTION, BERMS OR APPROPRIATE MEASURES SHALL BE USED TO ENSURE HYDRO-DEMOLITION WATER DOES NOT FLOW OR MIGRATE INTO ACTIVE TRAVEL LANES.

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

FOR CLASS II SURFACE PREPARATION, SCARIFYING BRIDGE DECK AND HYDRO-DEMOLITION OF BRIDGE DECK, SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS.

THE CONTRACTOR MUST COLLECT, TREAT AND DISPOSE OF RUN-OFF WATER FROM THE HYDRO-DEMOLITION PROCESS, SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISION.

LONGITUDINAL CONSTRUCTION JOINTS OF OVERLAYS SHALL BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.

FOR BRIDGE JOINT DEMOLITION, SEE SPECIAL PROVISIONS.

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

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

FOR VOLUMETRIC MIXER, SEE SPECIAL PROVISIONS.

FOR CONCRETE FOR DECK REPAIRS, SEE SPECIAL PROVISIONS.

FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

SCOPE OF WORK

- PARTIALLY REMOVE BRIDGE DECK CONCRETE USING SCARIFICATION AND HYDRO-DEMOLITION METHODS.
- PERFORM CLASS II SURFACE PREPARATION AND REPAIR ON DECK SURFACES.
- OVERLAY PREPARED BRIDGE DECK WITH LATEX MODIFIED CONCRETE - VERY EARLY STRENGTH (LMC-VES).
- RECONSTRUCT BRIDGE DECK JOINT AND INSTALL JOINT SEALS.
- GROOVE LMC-VES BRIDGE DECK.

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

RESIDENT ENGINEER DATE

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 215

DocuSigned by:
Byron E. Atkinson
24BD1080554C417...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24939 BYRON E. ATKINSON

11/15/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON I-40 WESTBOUND
OVER SR 1210
BETWEEN SR 1208 AND SR 1220

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			25

DRAWN BY :	W. O. KEITH	DATE : 10/17
CHECKED BY :	B.E. ATKINSON	DATE : 10/17
DESIGN ENGINEER OF RECORD :	B.E. ATKINSON	DATE : 10/17

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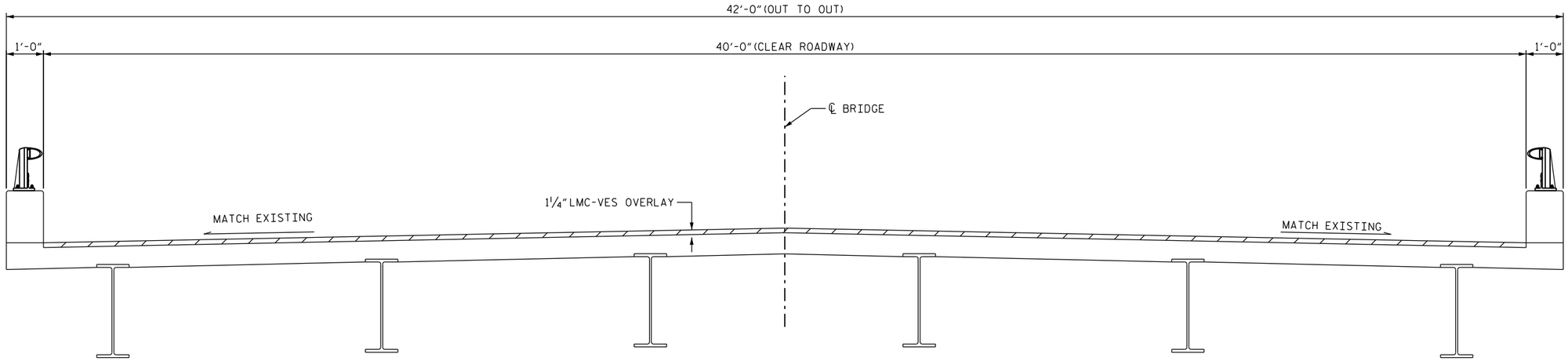
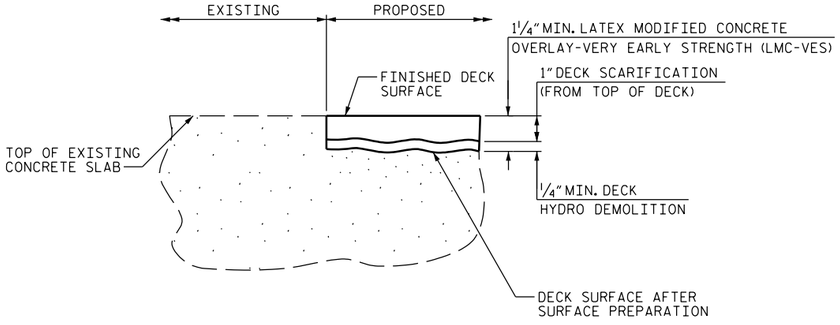
NOTE:

WHEN PREPARING THE SURFACE FOR LMC OVERLAY-VES ADJACENT TO A PREVIOUSLY PLACED LMC-VES STAGE, THE PREVIOUSLY PLACED LMC-VES SHALL BE REMOVED FOR A DISTANCE OF 4-INCHES FROM THE LMC-VES EDGE. THE SURFACE OF THE NEW STAGE AREA, ALONG WITH THE 4 INCH OVERLAY AREA, SHALL BE PREPARED AS PER THE OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS. NEW LMC-VES SHALL BE PLACED IN THE 4-INCH OVERLAP, AS PART OF NEW LMC-VES STAGE PLACEMENT.

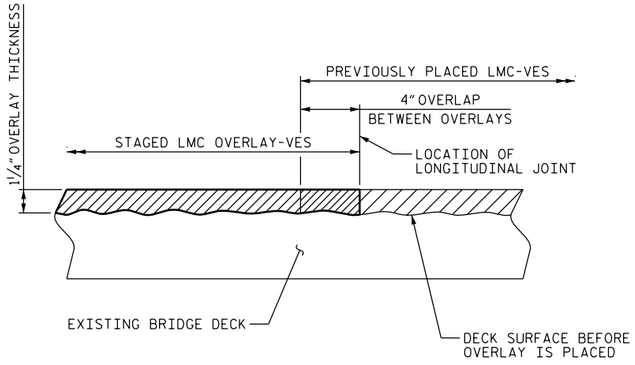
FOR CONTROL OF TRAFFIC AND LIMITS OF PHASING OF CONSTRUCTION, SEE TRANSPORTATION MANAGEMENT PLANS.



TYPICAL SECTION



DETAIL FOR LMC-VES OVERLAY



SECTION THRU DECK

STAGED LMC-VES OVERLAY JOINT

(AS NEEDED)

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 215

DocuSigned by:
Byron E. Atkinson
241B0080B8C417...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24939 BYRON E. ATKINSON

11/15/2017

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(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION & LATEX MODIFIED CONCRETE - VES

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1			3			TOTAL SHEETS
2			4			25

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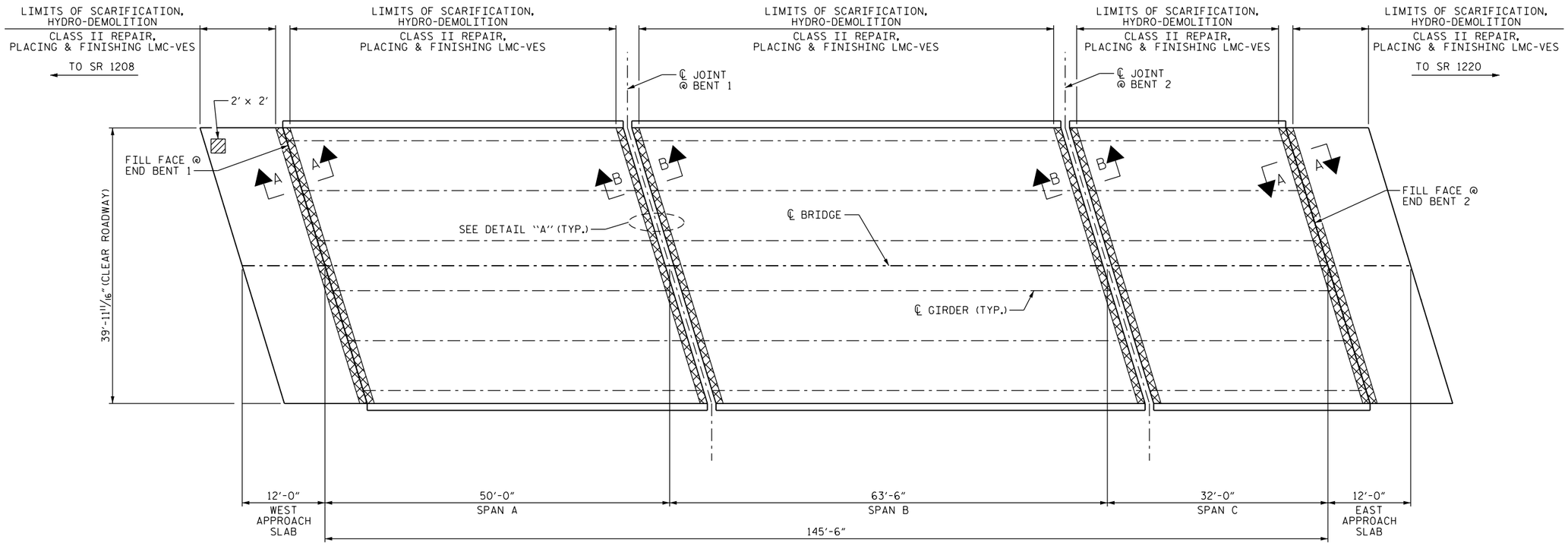
NOTES:

PAYMENT FOR CLASS II SURFACE PREPARATION IS BASED ON THE SQUARE FEET OF ADDITIONAL DEMOLITION REQUIRED FOLLOWING HYDRO-DEMOLITION OF THE BRIDGE DECK. SEE "OVERLAY SURFACE PREPARATION" SPECIAL PROVISIONS.

FOR SECTIONS A-A AND B-B, SEE "JOINT DETAILS" SHEET.

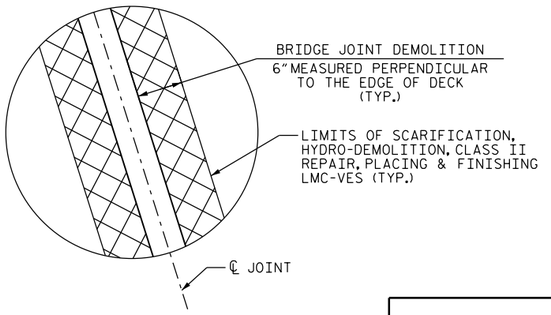


PLAN OF SPANS

BRIDGE JOINT DEMOLITION

CLASS II SURFACE PREPARATION

DECK SCARIFICATION, HYDRO-DEMOLITION AND LATEX MODIFIED CONCRETE OVERLAY-VES



DETAIL "A"

SUMMARY OF QUANTITIES

	SCARIFYING BRIDGE DECK		HYDRO-DEMOLITION OF BRIDGE DECK		CLASS II SURFACE PREPARATION		BRIDGE JOINT DEMOLITION		CONCRETE FOR DECK REPAIR	
	SQ. YDS.		SQ. YDS.		SQ. YDS.		SQ. FT.		CU. FT.	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
WEST APPR. SLAB	51		51		0.5		21		1.2	
SPAN A	218		218		0.0		42		0.0	
SPAN B	278		278		0.0		42		0.0	
SPAN C	138		138		0.0		42		0.0	
EAST APPR. SLAB	51		51		0.0		21		0.0	
TOTAL	736		736		0.5		168		1.2	

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 215

DocuSigned by:
Byron E. Atkinson
24BBD0B0864C417...

NORTH CAROLINA PROFESSIONAL ENGINEER 24939 BYRON E. ATKINSON

11/15/2017

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FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SURFACE PREPARATION

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1			3			TOTAL SHEETS
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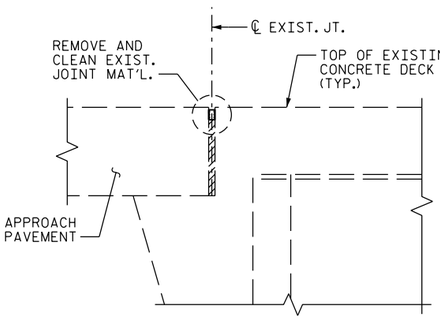
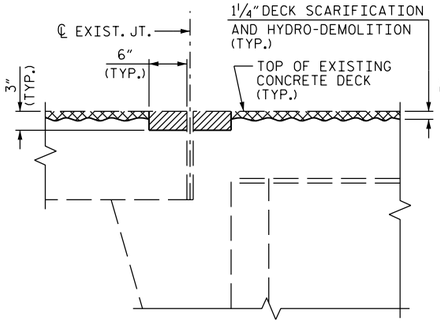
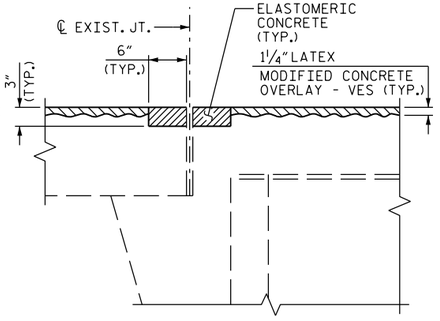


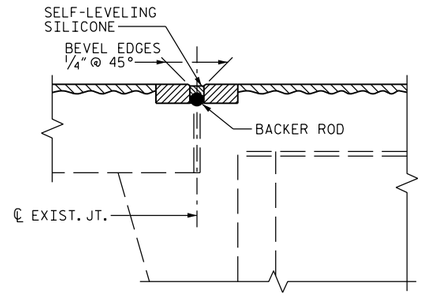
EXISTING JOINT AT END BENT



MINIMUM EXISTING JOINT DEMOLITION AT END BENT



PROPOSED JOINT PRE-SAWED DIMENSIONS



PROPOSED JOINT

NOTES

CONTRACTOR SHALL FIELD VERIFY THE EXISTING FORMED OPENING PRIOR TO OBTAINING JOINT MATERIAL.

HYDRO-DEMOLITION OR EXCAVATION OF CONCRETE AT THE EXISTING JOINT SHALL RESULT IN THE BOTTOM OF THE EXCAVATION BEING REASONABLY FLAT AND LEVEL, TO PROVIDE SUFFICIENT SUBSTRATE FOR PLACEMENT AND SUPPORT OF ELASTOMERIC CONCRETE.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

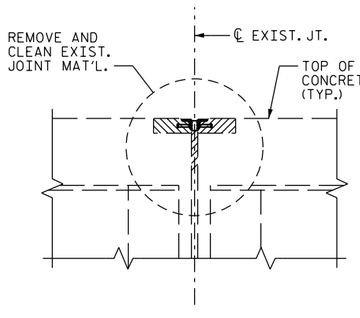
RETAIN ALL EXISTING REINFORCING STEEL. CLEAN AND REPAIR AS NEEDED.

THE WIDTH OF THE UNCOMPRESSED FOAM JOINT MATERIAL SHALL BE 2".

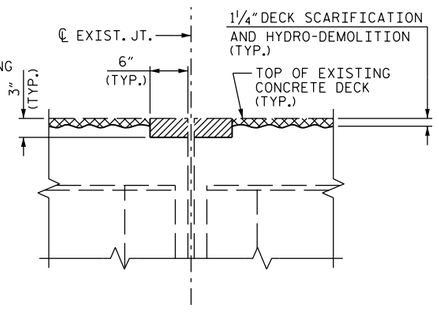
ELASTOMERIC CONCRETE		
END BENT 1	10.5	CU. FT.
BENT 1	10.5	CU. FT.
BENT 2	10.5	CU. FT.
END BENT 2	10.5	CU. FT.
* TOTAL	42.0	CU. FT.

*BASED ON MINIMUM BLOCKOUT SHOWN.

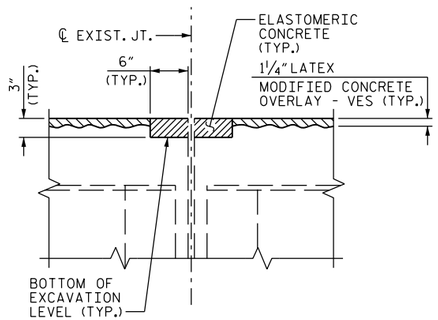
SECTION A-A



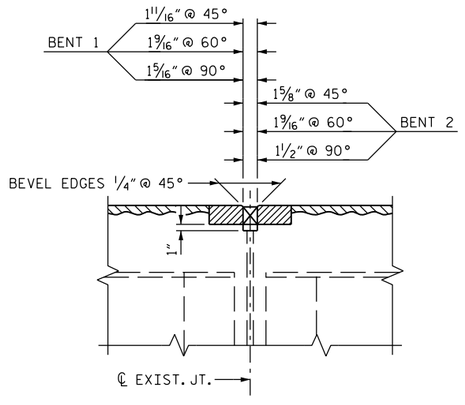
EXISTING JOINT



MINIMUM EXISTING JOINT DEMOLITION AT BENT

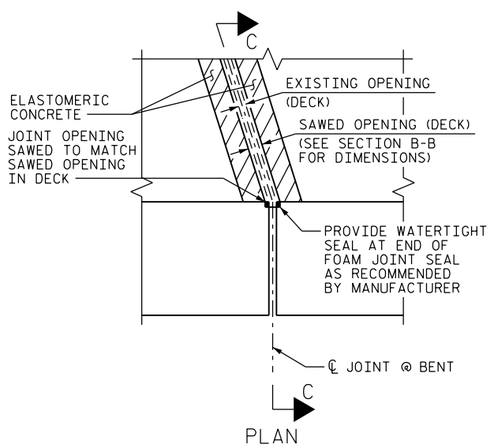


PROPOSED JOINT PRE-SAWED DIMENSIONS

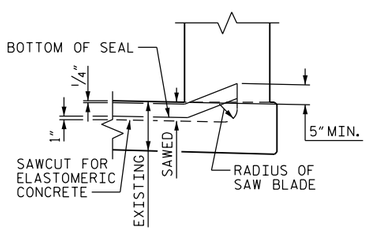


PROPOSED FOAM JOINT SEAL EXPANSION

SECTION B-B



PLAN



SECTION C-C

JOINT DETAILS AT PARAPET

PROJECT NO. I-5888A

BUNCOMBE COUNTY

BRIDGE NO. 215

DocuSigned by:
Byron E. Atkinson
241B5D8085AC417...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24939 BYRON E. ATKINSON

11/15/2017

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MI ENGINEERING
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RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS

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

DRAWN BY : B.E. LANNING DATE : 10/17
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STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 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.

REV. 6-16-95 EEM (W) RGW REV. 5-7-03 RWW (W) JTE REV. 10-1-11 MAA (W) GM
REV. 8-16-99 RWW (W) LES REV. 5-1-06 TLA (W) GM

ENGLISH

JANUARY, 1990

STD. NO. SN