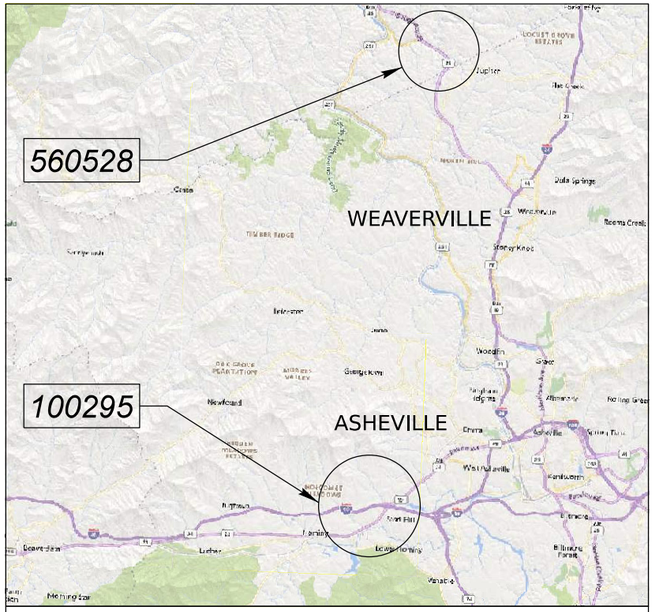
3/19/2025

CONTRACT: DM00464 PROJECT NUMBER: BP13–R050

STRUCTURES



VICINITY MAP N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

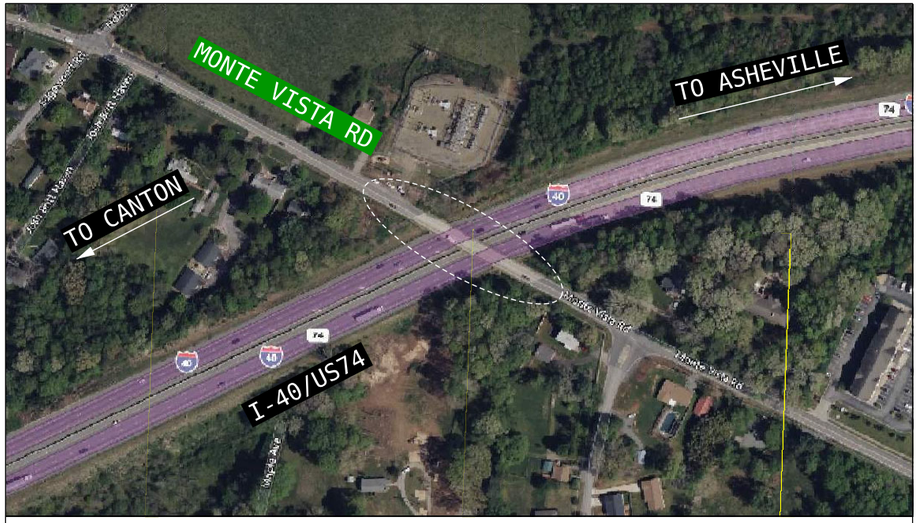
BUNCOMBE & MADISON COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13–R050	1	40

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP13.R050.1	–	P.E.
BP13.R050.2	–	UTL/ROW.
BP13.R050.3	–	CONST.

LOCATION: BRIDGE #100295 ON MONTE VISTA ROAD OVER I–40 AND #560528 ON US25/70 OVER IVY CREEK

TYPE OF WORK: CONCRETE SHOULDER REPAIR, APPROACH SLAB HEADER INSTALLATION, CONCRETE DECK REPAIRS, LATEX MODIFIED CONCRETE OVERLAY – VERY EARLY STRENGTH, JOINT REPLACEMENT, SUBSTRUCTURE CONCRETE REPAIRS, ZONE PAINTING OF EXISTING STEEL, CLEANING AND PAINTING EXISTING WEATHERING STEEL, CLEANING AND PAINTING BEARINGS WITH HRCSA, BOLTED BEAM REPAIRS, BRIDGE JACKING, EPOXY COAT CAPS, WEEP HOLE FILTERS, CAP UNDERMINING REPAIRS.



LOCATION MAP S1 – 100295

LOCATION MAP S2 – 560528

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

BRIDGE # 100295 ADT 2018 = 11,500

BRIDGE # 560528 ADT 2019 = 9,800

PROJECT LENGTH

BRIDGE # 100295 LENGTH = 0.057 MI.

BRIDGE # 560528 LENGTH = 0.066 MI.

LOCATION SKETCHES

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

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

2024 STANDARD SPECIFICATIONS

LETTING DATE :

07/16/2025

JACOB H. DUKE, PE, CBI
PROJECT ENGINEER

FIDEL L. FLORES, EI, CBI
PROJECT DESIGN ENGINEER

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13–R050	1A	40

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP13–R050.1	–	P.E.
BP13–R050.2	–	UTL/ROW.
BP13–R050.3	–	CONST.

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S1A	INDEX OF SHEETS
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S4	DECK REPAIR DETAILS
S5	CONCRETE RESTORATION DETAILS (SHEET 1 OF 2)
S6	CONCRETE RESTORATION DETAILS (SHEET 2 OF 2)
S7	BRIDGE JACKING DETAILS
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S1-5	PLAN OF SPANS (2 OF 2)
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S2-18	SUBSTRUCTURE REPAIRS - BENT 1
S2-19	SUBSTRUCTURE REPAIRS - BENT 2
S2-20	SUBSTRUCTURE REPAIRS - BENT 3
SN	STANDARD NOTES

DRAWN BY :	FIDEL L. FLORES	DATE :	05/2024
CHECKED BY :	CHANEY LOWE	DATE :	05/2024
DESIGN ENGINEER:	JACOB H. DUKE	DATE :	06/2024

9/11/2024
13BPR.SMU.IS.P1.dgn
jduke

TOTAL BILL OF MATERIAL

DESCRIPTION	UNCLASSIFIED EXCAVATION	AGGREGATE BASE COURSE (ABC)	FLOWABLE FILL	3'-5" CONCRETE CURB & GUTTER	ADJUSTMENT OF DROP INLETS	REMOVE AND RESET EXISTING GUARDRAIL	SEEDING & MULCHING	CONCRETE REPAIRS	SHOTCRETE REPAIRS	EPOXY RESIN INJECTION	GROOVING BRIDGE FLOORS	POLLUTION CONTROL	CLASS II, SURFACE PREPARATION	ZONE PAINTING OF EXISTING STRUCTURE	CLEANING AND REPAINTING EXISTING WEATHERING STEEL FOR BRIDGE *	PAINTING CONTAINMENT FOR ZONE PAINTING *	PAINTING CONTAINMENT FOR BRIDGE *
BRIDGE NO:	CU. YD.	TON	CY	LIN. FT	EA	LIN. FT	ACR	CU. FT.	CU. FT.	LIN. FT.	SQ. FT.	LUMP SUM	SQ. YD.	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM
100295	-	-	-	-	-	-	-	14.0	35.6	12.4	9029	LUMP SUM	117.4	LUMP SUM	-	LUMP SUM	-
560528	4	2	4	17	1	25	0.5	107.3	135.9	83.0	13510	LUMP SUM	172.1	-	LUMP SUM	-	LUMP SUM
TOTALS:	4	2	4	17	1	25	0.5	121.3	171.5	95.4	22539	LUMP SUM	289.5	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM

TOTAL BILL OF MATERIAL CONT.

DESCRIPTION	FOAM JOINT SEALS FOR PRESERVATION	LATEX MODIFIED CONCRETE OVERLAY-VERY EARLY STRENGTH	ELASTOMERIC CONCRETE FOR PRESERVATION	BOLTED BEAM REPAIR	BRIDGE JOINT DEMOLITION	EPOXY COATING	PLACING AND FINISHING OF LATEX MODIFIED CONCRETE OVERLAY - VERY EARLY STRENGTH	SCARIFYING BRIDGE DECK	HYDRO-DEMOLITION OF BRIDGE DECK	CLEANING AND PAINTING EXISTING BEARINGS WITH HIGH RATIO CALCIUM SULFONATE	WEEP HOLE FILTERS	DRAINPIPE REPAIRS	TYPE I BRIDGE JACKING BRIDGE *
BRIDGE NO:	LIN. FT.	CU. YD.	CU. FT.	LB.	SQ. FT.	SQ. FT.	SQ. YD.	SQ. YD.	SQ. YD.	EA	EA	EA	EA
100295	135	46.3	33.9	-	135	599	1113	1113	1113	35	-	-	3
560528	671	66.0	208.6	1668	783	1743	1601	1601	1601	68	26	13	2
TOTALS:	806	112.3	242.5	1668	918	2342	2714	2714	2714	103	26	13	5

NOTES:

AT THE TIME OF PREPARATION OF THESE PLANS, IT WAS NOT ANTICIPATED THAT THE ITEM(S) LISTED BELOW WOULD BE REQUIRED. HOWEVER, IT MAY BE DETERMINED IN THE FIELD THAT THE FOLLOWING ITEM(S) LISTED, OR OTHER WORK, WILL BE NECESSARY TO PROPERLY COMPLETE THE INTENDED BRIDGE PRESERVATION/REHABILITATION WORK. THE CONTRACTOR SHALL BE PREPARED TO PERFORM SUCH WORK IN A TIMELY MANNER, AS DETERMINED IN THE FIELD. SUCH WORK SHALL BE CONSIDERED EXTRA WORK AND SHALL BE ADDRESSED AS PER ARTICLE 104-7 OF THE STANDARD SPECIFICATIONS. PROJECT SPECIAL PROVISIONS THAT OUTLINE REQUIREMENTS FOR THESE POTENTIAL ADDITIONAL WORK ITEMS HAVE BEEN PROVIDED IN THE PROJECT DOCUMENTS, BUT NO QUANTITIES HAVE BEEN LISTED. ACTUAL PAY ITEMS, QUANTITIES, AND COSTS WILL BE ESTABLISHED, AS REQUIRED, IF EXTRA WORK IS ENCOUNTERED. UNANTICIPATED ITEMS:

CLASS III, SURFACE PREPARATION
VOLUMETRIC MIXER
CONCRETE FOR DECK REPAIR

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
13BPR_SMU_BOM_P1.dgn
jduke

Signed by: Jacob Duke 29530C8054E94D9...
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
9/12/2024

KCA KISINGER CAMPO & ASSOCIATES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

PROJECT NO. BP13-R050
MADISON & BUNCOMBE COUNTIES
BRIDGE NO. MULTIPLE
BRIDGES: 100295, 560528

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TOTAL BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2
1			3			TOTAL SHEETS
2			4			

GENERAL NOTES

ASSUMED LIVE LOAD FOR REPAIRS = HL93

GENERAL DRAWING(S) INFORMATION IS TAKEN FROM THE ORIGINAL PLANS AND THE MOST RECENT ROUTINE INSPECTION REPORTS.

ALL BRIDGE ORIENTATIONS DO NOT CONFORM TO THE EXISTING BRIDGE PLANS/ROUTINE INSPECTION REPORT.

PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL SUBMIT, FOR REVIEW AND APPROVAL, A COMPLETE SEQUENCE OF TASKS FOR EACH OPERATION AFFECTING THE BRIDGE(S) SURFACE AND/OR TRAFFIC.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT DUE TO THE NATURE OF PRESERVATION PROJECTS, THE EXTENT OF THE WORK CANNOT ALWAYS BE ACCURATELY DETERMINED PRIOR TO COMMENCEMENT OF WORK. REPAIR LOCATIONS AND ESTIMATES OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS, NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS.

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

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

THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON THE DIFFERENCES BETWEEN WHAT IS SHOWN IN THE PLANS AND THE ACTUAL CONDITIONS AT EACH PROJECT SITE.

WORK ON THE BRIDGES SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL BELOW, EXCEPT WHERE THE CONTRACTOR'S PLANS USE PLATFORMS, NETS, SCREENS OR OTHER PROTECTIVE DEVICES TO CATCH THE MATERIAL. THE CONTRACTOR SHALL SUBMIT PLANS FOR CONSTRUCTION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS AND THE PROJECT SPECIAL PROVISIONS.

THE CONTRACTOR SHALL PERFORM ALL WORK WITH CARE SO THAT THE EXISTING STRUCTURES WHICH ARE TO REMAIN IN PLACE WILL NOT BE DAMAGED. IF THE CONTRACTOR DAMAGES ANY PART OF THE EXISTING STRUCTURE, WHICH IS TO REMAIN IN PLACE, THE DAMAGED AREA SHALL BE REPAIRED AND REPLACED IN A MANNER SATISFACTORY TO THE ENGINEER AT NO ADDITIONAL COST TO THE DEPARTMENT.

ANY DAMAGE TO EXISTING REINFORCING STEEL DURING CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER AND PERFORMED AT NO ADDITIONAL COST TO THE DEPARTMENT.

FOR CONTROL OF TRAFFIC AND LIMITS ON PHASING OF CONSTRUCTION, SEE ELSEWHERE IN CONTRACT DOCUMENTS.

EXISTING JOINTS AND DECK DRAINS SHALL BE SEALED PRIOR TO BEGINNING SURFACE PREPARATIONS OF THE BRIDGE. THE CONTRACTOR SHALL TAKE CARE THAT ANY CONSTRUCTION DEBRIS THAT COLLECTS IN THE DRAINS IS CONTAINED AND REMOVED. DRAINS IN SHOULDERS OF ADJACENT TRAVEL LANES SHALL BE KEPT FREE AND CLEAR OF DEBRIS.

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

FOR EACH BRIDGE SCOPE OF WORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

ALL PAVEMENT MARKINGS WILL BE IN ACCORDANCE WITH THE PAVEMENT MARKING PLANS.

560528:
ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

100295:
ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND PAINTED IN ACCORDANCE WITH SYSTEM 1 OR SYSTEM 2 OF THE STRUCTURAL STEEL COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL STRUCTURAL STEEL SHALL BE CLEANED AND PAINTED UP TO THE LIMITS SHOWN ON THE PLANS.

THE CONTRACTOR SHALL SCHEDULE CLEANING AND PAINTING OPERATIONS SUCH THAT THE STEEL REPAIRS ARE PERFORMED AFTER THE STEEL HAS BEEN CLEANED AND PREPARED FOR PAINTING AND BEFORE PAINTING OPERATIONS. AFTER STEEL REPAIRS HAVE BEEN COMPLETED, THE REPAIRS SHALL BE BLAST-CLEAN ACCORDING TO THE STANDARD SPECIFICATIONS.

FOR PAINTING CONTAINMENT AND POLLUTION CONTROL, SEE PAINTING EXISTING STRUCTURE AND PAINTING EXISTING WEATHERING STEEL STRUCTURE SPECIAL PROVISIONS.

FOR LMC OVERLAY SURFACE PREPARATIONS, SEE SPECIAL PROVISIONS.

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

FOR CONCRETE FOR DECK REPAIR, SEE SPECIAL PROVISIONS.

FOR VOLUMETRIC MIXER, SEE SPECIAL PROVISIONS.

FOR BRIDGE JOINT DEMOLITION, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEALS FOR PRESERVATION, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE FOR PRESERVATION, SEE SPECIAL PROVISIONS.

FOR WEEP HOLE FILTERS, SEE SPECIAL PROVISIONS.

FOR EPOXY COATING AND DEBRIS REMOVAL, SEE SPECIAL PROVISIONS.

FOR ZONE PAINTING EXISTING STEEL, SEE SPECIAL PROVISIONS.

FOR PAINTING EXISTING WEATHERING STEEL STRUCTURE, SEE SPECIAL PROVISIONS.

FOR CLEANING AND PAINTING EXISTING BEARINGS WITH HRCSA, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

FOR BEAM BOLTED BEAM REPAIRS, SEE SPECIAL PROVISIONS.

FOR EXISTING DRAINPIPE REPAIRS, SEE SPECIAL PROVISIONS.

SAMPLE BAR REPLACEMENT	
SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

NOTE: SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND Fy = 60ksi.

BRIDGE COORDINATES

BRIDGE No.	LATITUDE	LONGITUDE
100295	35° 33' 30.89"	82° 38' 53.32"
560528	35° 46' 08.01"	82° 37' 06.86"

PROJECT NO. BP13-R050
MADISON & BUNCOMBE COUNTIES
BRIDGE NO. MULTIPLE
BRIDGES: 100295, 560528

Signed by: Jacob Duke
29530C8054E94D9...
CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
9/12/2024

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

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL NOTES

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

SHEET NO. S3
TOTAL SHEETS

DRAWN BY :	FIDEL L. FLORES	DATE :	05/2024
CHECKED BY :	CHANEY LOWE	DATE :	05/2024
DESIGN ENGINEER:	JACOB H. DUKE	DATE :	06/2024

9/12/2024
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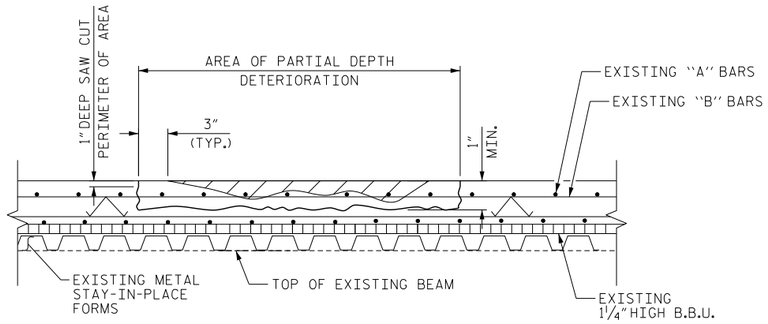
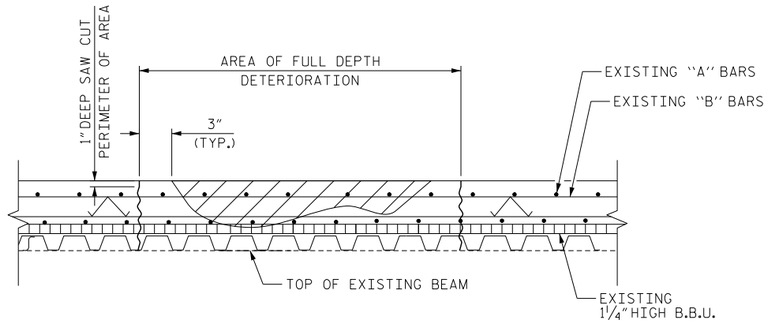
jduke



CLASS II (PARTIAL DEPTH) REPAIR



CLASS III (FULL DEPTH) REPAIR

NOTES

FOR AREAS TO BE REPAIRED, SEE PLAN OF SPAN SHEETS & DECK UNDERSIDE REPAIR SHEETS.

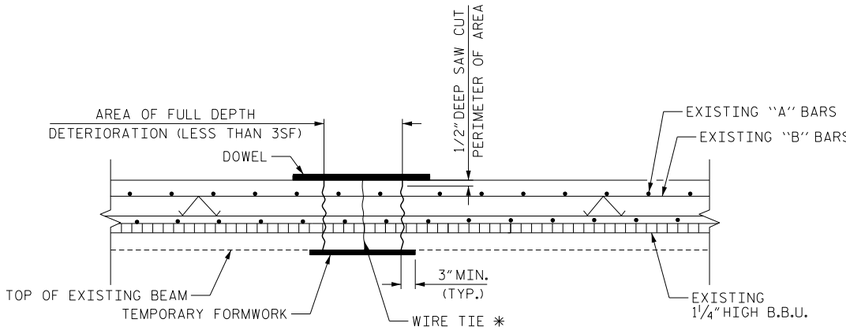
FOR CLASS II AND CLASS III SURFACE PREPARATION AND CLASS III REPAIRS, SEE LMC OVERLAY SURFACE PREPARATION SPECIAL PROVISION.

FOR SHOTCRETE REPAIR, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO STARTING WORK FOR TEMPORARY FORMWORK. FOR SUBMITTALS OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

UPON REMOVAL OF TEMPORARY FORMWORK, ALL VOIDS AND HONEYCOMBS ON THE UNDERSIDE OF DECK SURFACE SHALL BE FILLED WITH THE SAME MATERIAL AS USED FOR THE PATCH, AND FINISHED TO CONFORM TO THE SURROUNDING CONCRETE SURFACE.

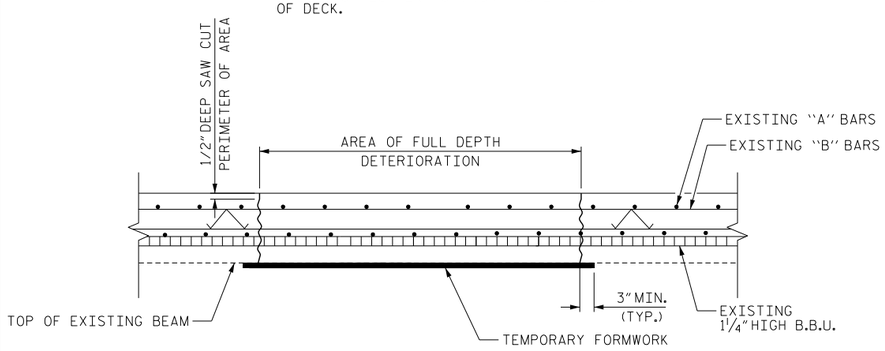
NO FORMWORK SHALL BE LEFT IN PLACE.



FULL DEPTH REPAIR WITH TEMPORARY FORMWORK

(FOR AREAS OF DETERIORATION EQUAL TO OR LESS THAN 3SF)

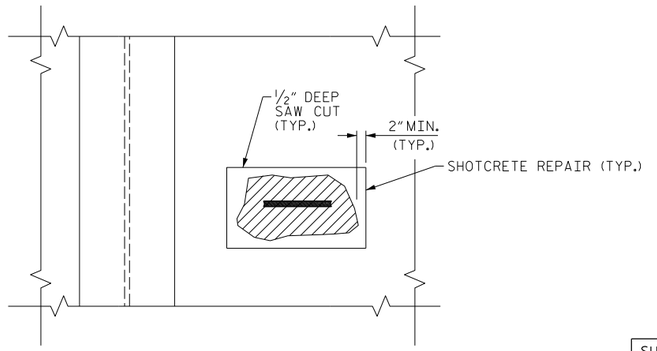
* WIRE TIE TO BE KNOTTED BELOW TEMPORARY FORMWORK AND ATTACHED TO DOWEL THAT IS WIDER THAN FORMED FULL DEPTH HOLE. ROTATE DOWEL TO TIGHTEN FORMWORK AGAINST BOTTOM OF DECK.



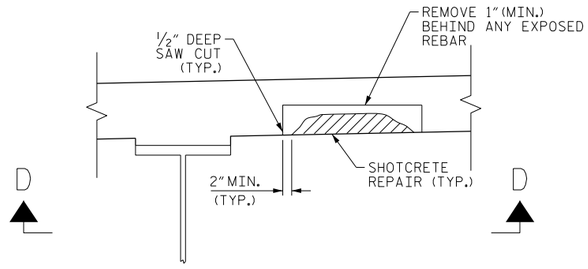
FULL DEPTH REPAIR WITH TEMPORARY FORMWORK

(FOR AREAS OF DETERIORATION GREATER THAN 3SF)

AREA OF DETERIORATION

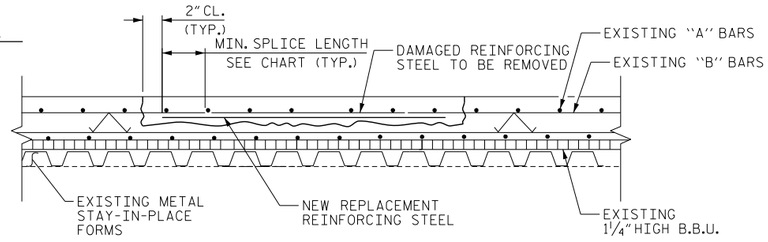


SECTION D-D



TYPICAL SECTION

UNDERSIDE OF DECK REPAIR



REINFORCING STEEL REPAIR

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

PROJECT NO. BP13-R050

MADISON & BUNCOMBE COUNTIES

BRIDGE NO. MULTIPLE

BRIDGES: 100295, 560528

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

DECK REPAIR DETAILS

Signed by: Jacob Duke 29530C8054E94D9...
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
9/12/2024

KCA KISINGER CAMPO & ASSOCIATES

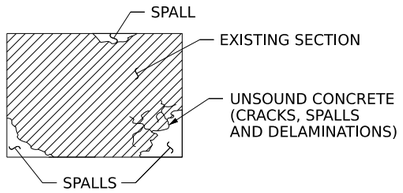
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

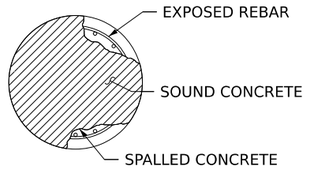
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4
1			3			TOTAL SHEETS
2			4			

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

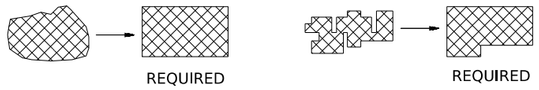
9/12/2024
13BPR.401.1_SMU_DRD01.dgn
jduke



TYPICAL
DELAMINATIONS AND SPALLS

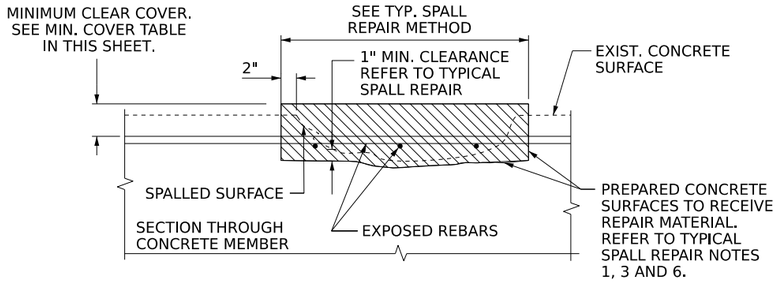


TYPICAL
SPALL WITH EXPOSED REBAR



SIMPLE PATCH CONFIGURATION

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



EXPOSING AND UNDERCUTTING REINFORCING STEEL

APPLICABLE TO HORIZONTAL, VERTICAL, AND OVERHEAD LOCATIONS

MIN. CONCRETE COVER TABLE

STRUCTURE ELEMENT	COVER	
	ALL OTHER SITES	CORROSIVE SITES
Bridge Deck to top of slab to bottom of slab	2½" (65mm) 1¼" (32mm)	2½" (65mm) 2½" (65mm)
Footings and Pile Caps to top face to all other faces	2" (50mm) 3" (75mm)	4" (100mm) 4" (100mm)
Bent Caps to bottom of cap to ends of cap to top of cap to sides of cap	3" (75mm) 2" (50mm) 2" (50mm) 2" (50mm)	4" (100mm) 3" (75mm) 3" (75mm) 3" (75mm)
Columns (spiral)	2" (50mm)	3" (75mm)
Drilled Piers (spiral)	5" (125mm)**	6" (150mm)**
Culverts to bottom of bootom slabs and footings to all other faces	3" (75mm) 2" (50mm)	3" (75mm) 2" (50mm)
Approach Slabs	2" (50mm)	2" (50mm)

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

TYPICAL SPALL REPAIR

1. FOR CONCRETE RESTORATION, REMOVE AND REPAIR UNSOUND CONCRETE FROM AREAS TO BE REPAIRED IN ACCORDANCE WITH THIS SHEET AND THE PROJECT SPECIAL PROVISIONS. AREAS WELL ADHERED TO EXISTING STRAND OR REINFORCEMENT SHALL REMAIN.
2. ALL UNSOUND CONCRETE MUST BE REMOVED. HOWEVER, PRESTRESSED STRANDS SHOULD NOT BE DISTURBED UNLESS ABSOLUTELY NECESSARY. USE EXTREME CARE TO NOT DAMAGE STRANDS.
3. ALL REPAIRS SHALL BE MARKED FOR APPROVAL OF APPROXIMATE PERIMETER PRIOR TO INITIATION OF WORK.
4. THE CONTRACTOR SHALL SUBMIT A PLAN FOR CONTROL AND DISPOSAL OF DEBRIS TO THE ENGINEER FOR APPROVAL.
5. ANY REINFORCEMENT WHICH IS LOOSE SHALL BE SECURED IN PLACE BY TYING TO OTHER SECURED BARS OR BY OTHER APPROVED METHODS. LAP SPLICES SHALL BE INSTALLED IN ACCORDANCE WITH THE TABLE BELOW.
6. CLEAN EXPOSED REBARS AND ANY LOOSE CONCRETE OR ABRASIVES BY SANDBLASTING OR APPROVED ALTERNATE. CLEANED STEEL SHALL NOT BE LEFT EXPOSED FOR MORE THAN 72 HOURS PRIOR TO ENCAPSULATION OF CONCRETE.
7. AN APPROVED BONDING AGENT SHALL BE USED ON ALL EXPOSED CONCRETE SURFACES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS BEFORE THE REPAIR MATERIAL IS APPLIED.
8. FILL VOIDS WITH REPAIR MATERIAL IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS AND NCDOT SPECIFICATIONS. NOTE THAT ANY REPAIR MATERIAL APPLIED TO OVERHEAD LOCATIONS SHALL BE SPECIFICALLY DESIGNATED FOR OVERHEAD USE BY THE MANUFACTURER'S SPECIFICATIONS.
9. FOR OVERHEAD SPALL REPAIRS, EXCAVATE CONCRETE TO A MINIMUM DEPTH OF 2 INCHES BEHIND FIRST MAT OF REINFORCING STEEL.

TYPICAL CRACK REPAIR

1. OBTAIN ENGINEER'S APPROVAL TO CARRY OUT CRACK REPAIR (IN LIEU OF SPALL REPAIR) FOR CASES WHERE ADJACENT CONCRETE IS OTHERWISE SOUND AND CRACKING IS NOT A RESULT OF CORRODING REINFORCEMENT.
2. ADDRESS CRACKS IN NEW CONSTRUCTION IN ACCORDANCE WITH PROJECT SPECIAL PROVISIONS. ADDRESS EXISTING CRACKS IN ACCORDANCE WITH THIS SHEET AND PROJECT SPECIAL PROVISIONS.
3. REMOVE UNSOUND CONCRETE FROM CRACK AREA.
4. THE CONTRACTOR SHALL SUBMIT A PLAN FOR CONTROL AND DISPOSAL OF DEBRIS TO THE ENGINEER FOR APPROVAL.
5. ENGINEER TO APPROVE CRACK AND CAP SEAL MATERIAL PRIOR TO BEGINNING OF CONSTRUCTION.
6. APPLY CLASS II FINISH AT COMPLETION OF CRACK REPAIR TO REMOVE FINS OR KNOBS.

DOWEL DETAILS & NOTES

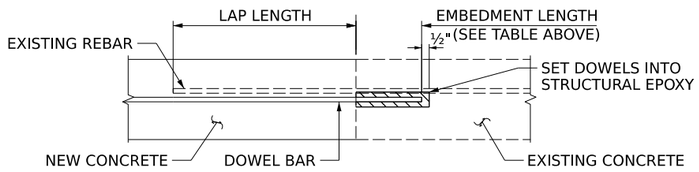
DOWEL DIMENSIONS (UNLESS OTHERWISE NOTED)			
DOWEL SIZE	HOLE DIAMETER	EMBEDMENT LENGTH	MIN LAP LENGTH
4	⅝"	8"	1'-9"
5	¾"	9"	2'-2"
6	⅞"	11"	2'-7"
8	1⅛"	1'-4"	4'-6"

NOTES:

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

NOTIFY THE ENGINEER OF ANY BROKEN BARS OR BARS WHICH ARE DETERMINED TO HAVE A SECTION LOSS OF 10% OR GREATER.

INSTALL DOWELS IN ACCORDANCE WITH NCDOT SPECIFICATIONS.



CONCRETE REPAIR NOTES

1. PERFORM A SOUNDING SURVEY IN THE PRESENCE OF THE ENGINEER TO IDENTIFY ALL LOCATIONS IN NEED OF CONCRETE REPAIR.
2. GAIN CONCURRENCE ON ALL REPAIR AREAS AT EACH LOCATION PRIOR TO COMMENCING WORK.
3. THE DETERIORATED AREAS SHOWN ON OTHER SHEETS ARE BASED ON THE BRIDGE INSPECTION REPORT, AND PARTIAL FIELD REVIEWS OF THE STRUCTURE. AS SUCH, THEY ARE FOR INFORMATIONAL PURPOSES, SUBJECT TO CHANGE BASED ON CONTINUING DETERIORATION.
4. EXTEND REPAIR AREAS A MINIMUM OF 2" INTO SOUND CONCRETE BEYOND EDGE OF SPALLS AND SQUARE OFF AREAS IN ACCORDANCE WITH DETAILS ON THIS SHEET.
5. THE METHOD USED TO DELINEATE THE AREAS OF UNSOUND CONCRETE TO BE REPAIRED SHALL NOT PERMANENTLY MARK THE CONCRETE, LEAVE ANY RESIDUE AFTER REMOVAL, OR REQUIRE HARSH CHEMICALS TO REMOVE.
6. THE CONTRACTOR SHALL REMOVE THE DETERIORATED CONCRETE IN ACCORDANCE WITH THE GUIDELINES SET IN THESE NOTES, IN THE PROJECT SPECIAL PROVISIONS, AND THE STANDARD SPECIFICATIONS.
7. REMOVE ALL UNSOUND CONCRETE AND SOUND CONCRETE TO THE EXTENT NECESSARY. MINIMUM OF 1" BEHIND REBAR AND MINIMUM OF 2" CLEARANCE TO SAWCUT.
8. REINFORCING STEEL, WHICH IS DETERMINED BY THE ENGINEER TO BE REPLACED, SHALL BE REMOVED TO A POINT WHERE IT IS SOUND. THE PATCH SHALL EXTEND A SUFFICIENT DISTANCE BEYOND THIS POINT TO DEVELOP A SPLICE LENGTH SPECIFIED IN THE TABLE ON THIS SHEET.
9. FOR REPAIRS OVER TRAFFIC AND SHALLOW REPAIRS THAT DO NOT ENGAGE REINFORCEMENT, ANCHOR PATCH MATERIAL USING ¼" GALVANIZED BOLTS, EPOXY ANCHORED WITH 2" EMBEDMENT. PLACE BOLTS IN A 6" GRID. USE A LATEX OR EPOXY PATCH MATERIAL FOR IMPROVED BOND. MASONRY ANCHORS ARE ACCEPTABLE ALSO, SUBMIT PLAN IF USING MASONRY ANCHORS.
10. CONCRETE COVER SHOWN IN THE PLANS DOES NOT INCLUDE PLACEMENT OR FABRICATION TOLERANCES UNLESS SHOWN AS "MINIMUM COVER". SEE NCDOT SPECIFICATIONS FOR ALLOWABLE REINFORCEMENT PLACEMENT TOLERANCES.
11. WHEN PROPOSED CONCRETE REPAIRS (OR DETERMINED LOCATIONS) ARE ADJACENT TO A CORNER, REPAIR ON THE ADJACENT EDGE SHOULD BE ANTICIPATED IN ADDITION TO THE AREA SHOWN ON SUBSTRUCTURE CONCRETE REPAIR SHEETS. THE CONTRACTOR IS RESPONSIBLE FOR THIS REPAIR AT ALL LOCATIONS REGARDLESS OF CALL-OUT(S) ON RESPECTIVE SHEET(S).
12. FINISH CONCRETE SURFACES IN ACCORDANCE WITH THE LATEST NCDOT SPECIFICATIONS. MATCH EXISTING FINISH ON ALL EXPOSED EDGES UNLESS OTHERWISE NOTED. A CLASS 5 FINISH COATING SHALL BE APPLIED TO THE BEAM ENDS WHERE CONCRETE REPAIRS HAVE BEEN PERFORMED, MATCHING THE COLOR OF SURROUNDING CONCRETE.
13. ALL REINFORCING STEEL SHALL BE ASTM A615-96, GRADE 60. REINFORCEMENT DETAIL DIMENSIONS ARE OUT-TO-OUT OF BARS. ALL DIMENSIONS PERTAINING TO LOCATION OF REINFORCEMENT ARE TO CENTERLINE OF BARS EXCEPT WHERE THE CLEAR DIMENSION IS SHOWN TO FACE OF CONCRETE. ANY DAMAGE TO EXISTING REINFORCING STEEL, DURING CONTRACTOR'S OPERATIONS, SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER AND PERFORMED AT NO ADDITIONAL COST TO THE DEPARTMENT.
14. FOR ADHESIVELY ANCHORED DOWELS OR ANCHOR BOLTS, SEE STANDARD SPECIFICATIONS.
15. FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.
16. FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.
17. FOR EPOXY RESIN INJECTION (ERI), SEE SPECIAL PROVISIONS.

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

PROJECT NO. BP13-R050

MADISON & BUNCOMBE COUNTIES

BRIDGE NO. MULTIPLE

BRIDGES: 100295, 560528

SHEET 1 OF 2

Signed by: Jacob Duke 2953OC8054E0409...

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE

9/12/2024

KCA KISINGER CAMPO & ASSOCIATES

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE RESTORATION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5
1			3			TOTAL SHEETS
2			4			

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
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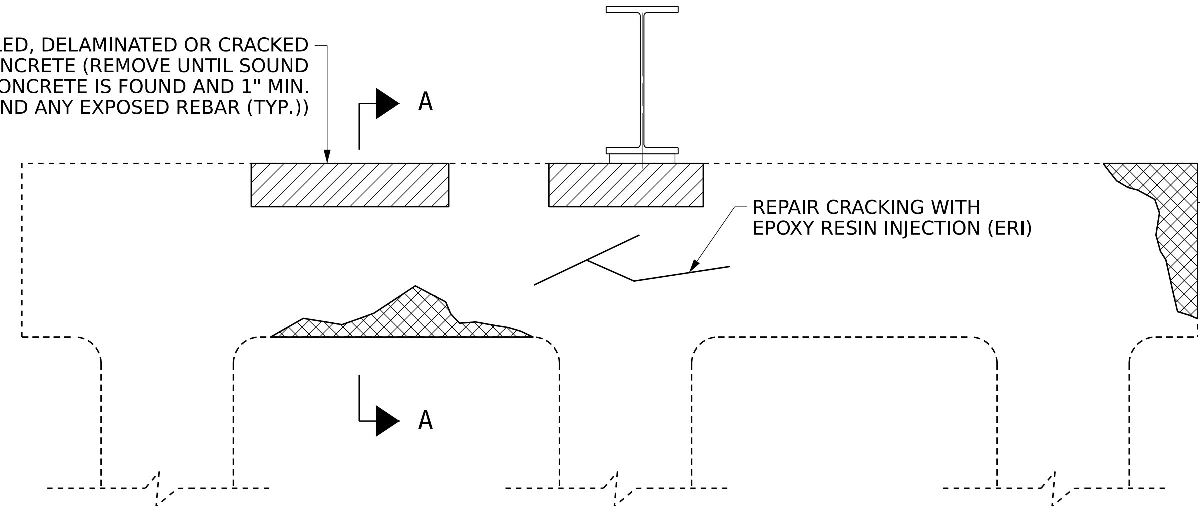
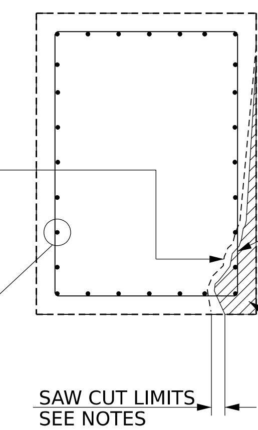
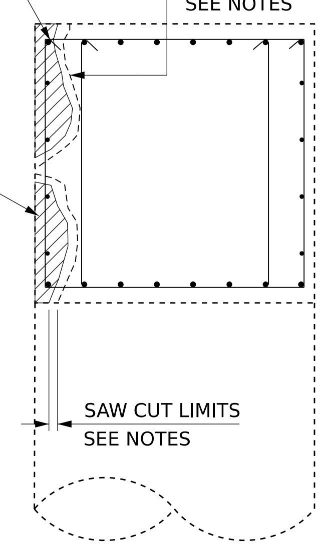
jduke



ELEVATION

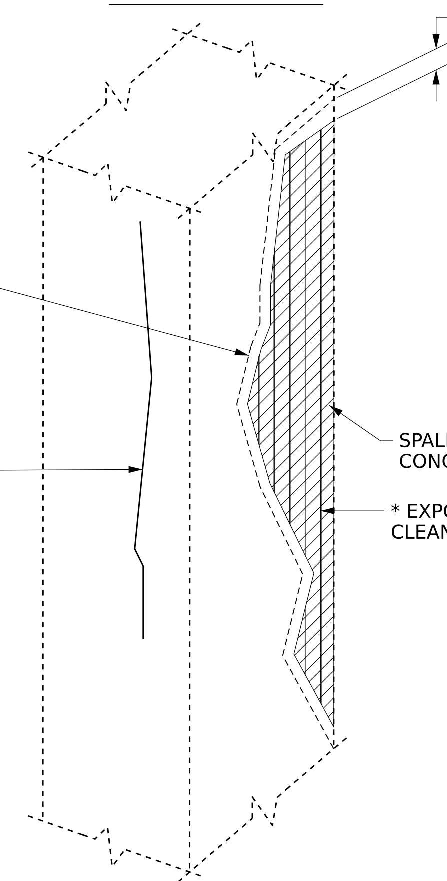


SECTION



SECTION A-A

BENT CAP REPAIRS



ELEVATION

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

COLUMN REPAIRS

SQUARE COLUMNS SHOWN, ROUND COLUMNS SIMILAR

NOTES:

1. WORK THIS SHEET WITH REPAIR METHODS AND CONCRETE REPAIR NOTES IN "CONCRETE RESTORATION DETAILS" SHEET 1 AND THE "BRIDGE JACKING DETAILS" SHEET.
2. TYPICAL BENT CAP REPAIRS ARE SHOWN IN THIS SHEET. REPAIR DETAILS SIMILAR FOR END BENT CAPS.
3. THE METHOD USED TO DELINEATE THE AREAS OF UNSOUND CONCRETE TO BE REPAIRED SHALL NOT PERMANENTLY MARK THE CONCRETE, LEAVE ANY RESIDUE AFTER REMOVAL, OR REQUIRE HARSH CHEMICALS TO REMOVE.
4. THE CONTRACTOR SHALL REMOVE THE DETERIORATED CONCRETE IN ACCORDANCE WITH THE GUIDELINES SET IN THESE NOTES, IN THE SPECIAL PROVISIONS, AND THE STANDARD SPECIFICATIONS.
5. REMOVE UNSOUND CONCRETE AND SOUND CONRETE TO THE EXTENT NECESSARY, A MINIMUM OF 1" BEHIND REBAR AND MINIMUM CLEARANCE OF 2" BEYOND SAWCUT.
6. REINFORCING STEEL WHICH IS DETERMINED BY THE ENGINEER TO BE REPLACED, SHALL BE REMOVED TO A POINT WHERE IT IS SOUND. THE PATCH SHALL EXTEND A SUFFICIENT DISTANCE BEYOND THIS POINT TO DEVELOP A SPLICE LENGTH SPECIFIED IN THE TABLE ON SHEET 1.
7. IF ANY AREA IS DETERMINED TO BE UNSTABLE DURING THE REPAIR PROCESS AS DETERMINED BY THE ENGINEER, STOP THE CURRENT REPAIR PROCEDURE, SHORE THE AREA AND PERFORM A "FORM AND POUR" CONCRETE REPAIR.
8. NO MORE THAN ⅓ OF THE CAP OR COLUMN/PILE CROSS SECTIONAL AREA SHALL BE REMOVED AT ONE TIME. SHOULD IT BECOME NECESSARY TO REMOVE MORE THAN 30% OF THE CROSS SECTIONAL AREA, NOTIFY THE ENGINEER PRIOR TO PROCEEDING.
9. SIMULTANEOUS REMOVAL OF UNSOUND CONCRETE MAY BE PERMITTED ON MORE THAN ONE FACE OF A CAP AND/OR COLUMN/PILE, BUT NO MORE THAN ⅓ OF THE CIRCUMFERENCE SHALL BE REMOVED AT A TIME. IF REMOVAL EXTENDS MORE THAN 1-½" BEHIND THE MAIN REINFORCING BARS. NOTIFY THE ENGINEER PRIOR TO PROCEEDING.
10. REPAIR TYPES SHOWN IN THIS SHEET ARE FOR ILLUSTRATION PURPOSES ONLY. FOR REPAIRS AT SPECIFIC LOCATIONS, SEE "SUBSTRUCTURE REPAIRS" SHEETS.
11. REPAIRS TO THE BENT CAPS MAY REQUIRE BRIDGE JACKING, FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

LEGEND

(hatch)	CONCRETE REPAIR AREA (CR)
(crosshatch)	SHOTCRETE REPAIR AREA (SCR)
(line)	EPOXY RESIN INJECTION (ERI)

PROJECT NO. BP13-R050
MADISON & BUNCOMBE COUNTIES
BRIDGE NO. MULTIPLE
BRIDGES: 100295, 560528
SHEET 2 OF 2

Signed by: Jacob Duke 29530C8054E94D6
CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H. DUKE
9/12/2024

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE RESTORATION DETAILS

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

REVISIONS

SHEET NO. S6
TOTAL SHEETS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
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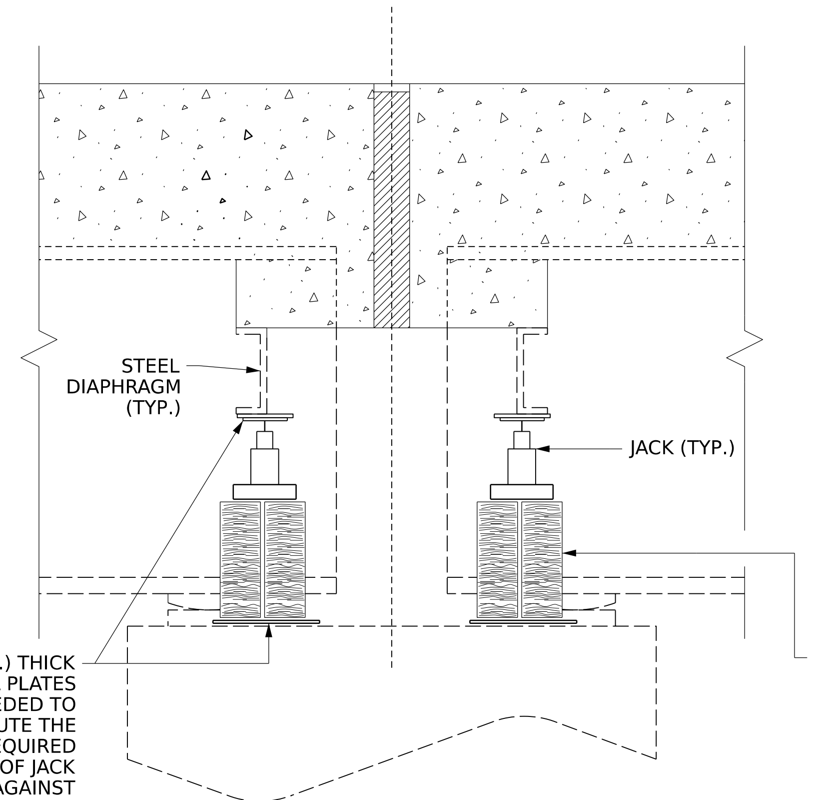

SECTION THRU DIAPHRAGM

NOTES:

THIS DETAIL IS A GENERIC EXAMPLE OF A JACKING SCHEME AND DOES NOT NECESSARILY REPRESENT SPECIFIC CONDITIONS AT A PARTICULAR BRIDGE. ACTUAL BRIDGE GEOMETRIES, DIMENSIONS, AND CONDITIONS MAY DIFFER FROM THIS DETAIL. PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL INVESTIGATE THE BRIDGES ON THE PROJECT AND DEVELOP A JACKING PLAN TO BE SUBMITTED FOR REVIEW AND APPROVAL. SEE BRIDGE JACKING SPECIAL PROVISION.

PRIOR TO BRIDGE JACKING OPERATIONS, THE ENGINEER AND CONTRACTOR SHALL INSPECT THE STRUCTURE FOR ANY NOTABLE DEFECTS TO THE PRIMARY AND SECONDARY STRUCTURAL MEMBERS. ALL NOTABLE DEFECTS SHALL BE DOCUMENTED AND REPORTED TO THE AREA BRIDGE MAINTENANCE ENGINEER PRIOR TO COMMENCEMENT OF ANY BRIDGE JACKING. THE CONTRACTOR SHALL PROVIDE SAFE AND SUFFICIENT ACCESS TO ALL STRUCTURAL MEMBERS FOR THE ENGINEER TO ESTABLISH PROPER DOCUMENTATION.

PRIOR TO JACKING, THE CONTRACTOR SHALL ENSURE THERE ARE NO OBSTACLES PREVENTING THE BEAM FROM BEING LIFTED.

THE BEAM SHALL BE LIFTED ENOUGH THAT THE BEAM CLEARS THE BEARINGS AND ALL LOAD IS SUPPORTED BY THE JACKS. AFTER JACKING IS COMPLETE, THE CONTRACTOR SHALL PROVIDE FOR A METHOD TO REMOVE THE JACKS AND SUPPORT THE BEAM FOR DEAD AND LIVE LOAD DURING THE REPAIR OPERATIONS. IF THE JACKS REMAIN IN PLACE DURING THE ENTIRE JACKING AND REPAIR OPERATION, THEY SHALL HAVE MECHANICAL LOCK OFF CAPABILITIES.

IF, DURING THE JACKING PROCESS, OR WHILE THE BEAM IS BEING SUPPORTED, THE BEAM SHIFTS FROM ITS ORIGINAL POSITION, ALL WORK SHALL CEASE AND THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.

BEARINGS ADJACENT TO THE BEAM BEING JACKED MAY BE LOOSENED TO DECREASE THE RESISTANCE OF THE DECK SLAB DURING JACKING. ALL BEARINGS LOOSENED SHALL BE TIGHTENED BACK AFTER REPAIR OPERATIONS ARE COMPLETED AND THE JACKS AND BLOCKING HAVE BEEN REMOVED.

THE MAXIMUM DIFFERENTIAL BETWEEN ADJACENT BEAMS THAT ARE BEING JACKED IS ⅛".

LOADS PROVIDED IN THE ``BRIDGE JACKING TABLE'' ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY, THE CONTRACTOR'S ENGINEER SHALL DETERMINE THE EXPECTED LOADS TO BE LIFTED DURING THE BRIDGE JACKING OPERATIONS.

THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS AND CALCULATIONS OF THE JACKING PROCEDURE(S) SEALED BY A PROFESSIONAL ENGINEER IN THE STATE OF NORTH CAROLINA TO THE ENGINEER FOR APPROVAL PRIOR TO BRIDGE JACKING OPERATIONS.

FOR TYPE I OR TYPE II BRIDGE JACKING, SEE SPECIAL PROVISIONS.

FOR WORKING DRAWING SUBMITTALS, SEE SPECIAL PROVISIONS.

ANY STEEL THAT HAS BEEN WELDED TO THE EXISTING STRUCTURE SHALL REMAIN IN PLACE.

TYPE II BRIDGE JACKING SHALL BE DONE WITH A HYDRAULIC JACKING SYSTEM THAT LIFTS EACH BEAM ALONG ENTIRE SPAN END WITH EQUAL FORCE AND AT AN EQUAL RATE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE CAUSED TO THE EXISTING STRUCTURE BY BRIDGE JACKING OPERATIONS AT NO ADDITIONAL COST TO THE DEPARTMENT.

NO BEAM SHALL BE JACKED AT EITHER END BENT.

BRIDGE JACKING TABLE
BRIDGE NO. 100295

SPAN	BEAM(S)	BRIDGE JACKING TYPE	DEAD LOAD (DC+DW) (KIPS)
1-4	INT./EXT.	TYPE I	52

BRIDGE JACKING TABLE
560528

SPAN	BEAM(S)	BRIDGE JACKING TYPE	DEAD LOAD (DC+DW) (KIPS)
1-8	INT./EXT.	TYPE I	50

PROJECT NO. BP13-R050
MADISON & BUNCOMBE COUNTIES
BRIDGE NO. MULTIPLE
BRIDGES: 100295, 560528

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE JACKING DETAILS

Signed by: Jacob Duke
29530C8054E94D0
CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE
9/12/2024

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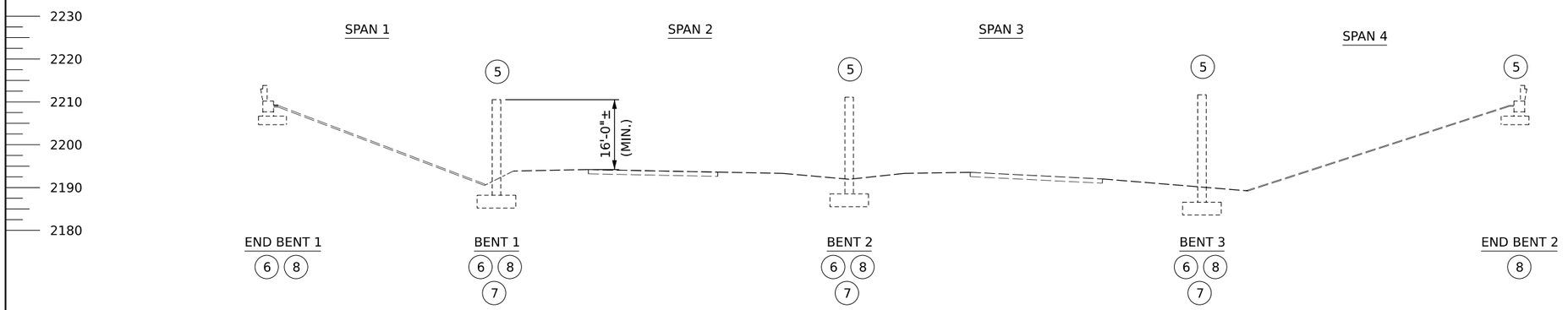
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S7
1			3			TOTAL SHEETS	
2			4				

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

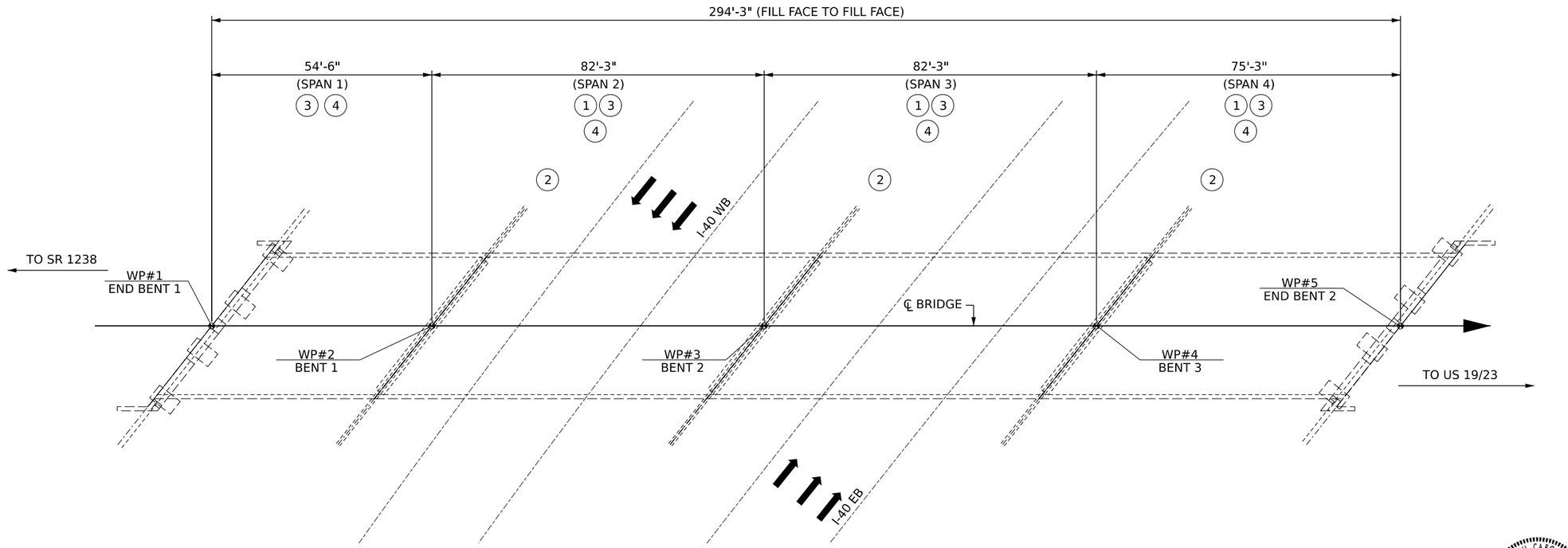
9/12/2024
13BPR_SMU_JK01.dgn
jduke

SCOPE LEGEND:

1. DECK REPAIRS
2. REPLACE JOINTS
3. LMC OVERLAY - VERY EARLY STRENGTH
4. ZONE PAINTING EXISTING STEEL
5. CLEANING AND PAINTING BEARINGS WITH HRCSA
6. SUBSTRUCTURE CONCRETE REPAIRS
7. BRIDGE JACKING (POTENTIAL)
8. EPOXY COAT CAPS



SECTION ALONG ROADWAY



PLAN VIEW

NOTES:

GENERAL DRAWING INFORMATION IS TAKEN FROM THE ORIGINAL PLANS AND THE ROUTINE INSPECTION REPORT DATED 10/17/2023.

BRIDGE ORIENTATION/SPAN CONFIGURATION DOES NOT CONFORM TO THE EXISTING ROUTINE INSPECTION REPORT. ORIENTATION/SPAN CONFIGURATION CONFORMS TO THE EXISTING BRIDGE PLANS.

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

RESIDENT ENGINEER DATE

PROJECT NO. BP13-R050

BUNCOMBE COUNTY

BRIDGE NO. 100295

Signed by: Jacob Duke 29530C8054E9409...

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

9/12/2024

KCA KISINGER CAMPO & ASSOCIATES

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

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER I-40
ON SR 1224 BETWEEN SR 1238
AND US 19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-1
1			3			TOTAL SHEETS
2			4			12

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : JACOB H. DUKE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
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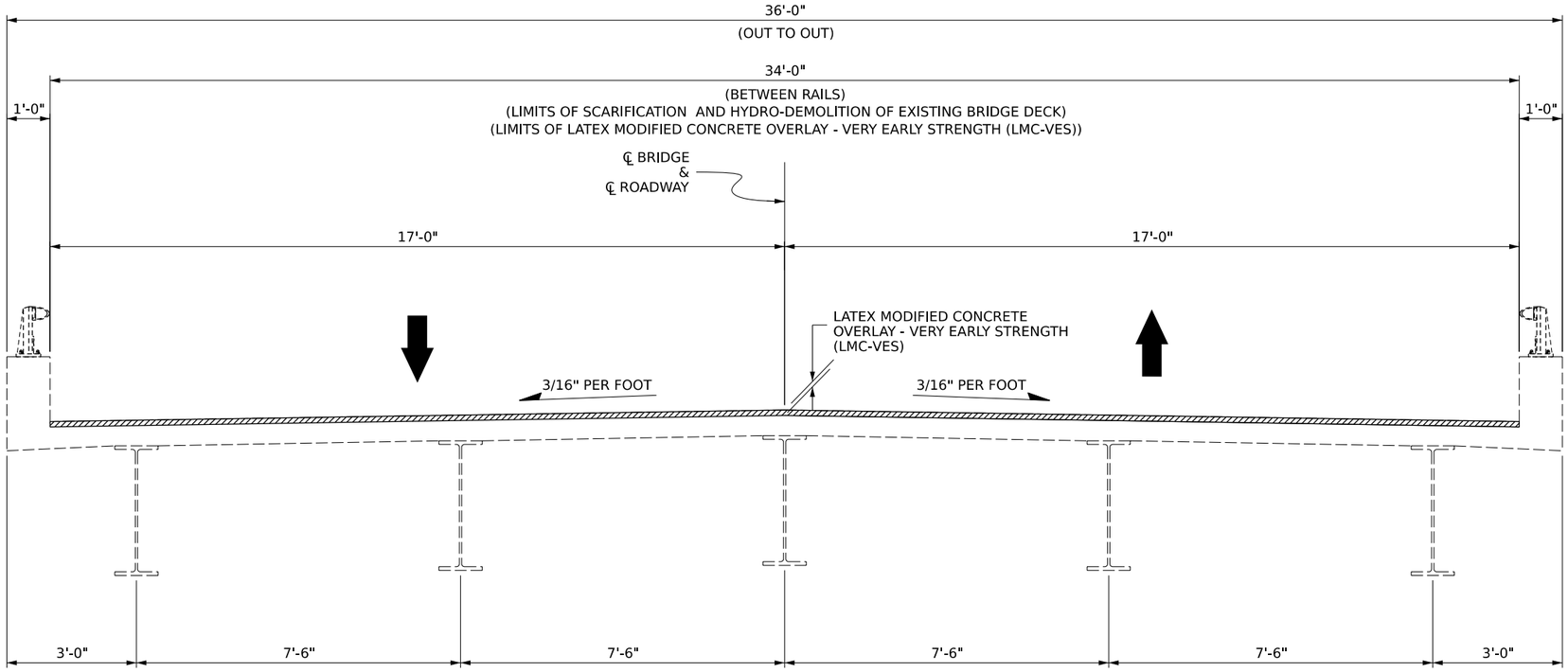
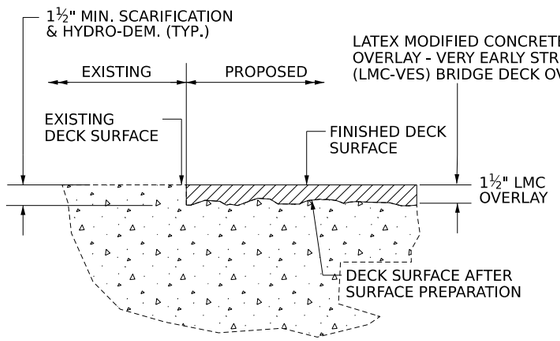
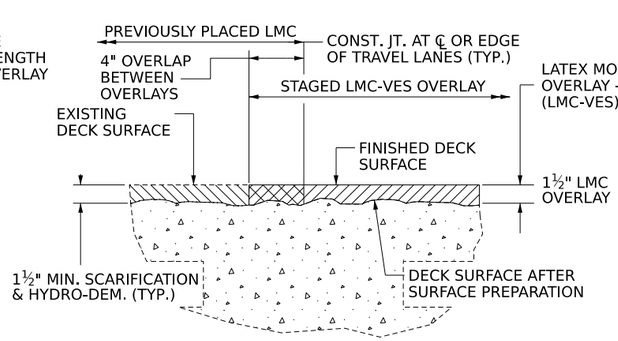
jduke



EXISTING TYPICAL SECTION



DETAIL FOR LMC OVERLAY



DETAIL FOR STAGED LMC OVERLAY

NOTES:

1. LONGITUDINAL CONSTRUCTION JOINTS OF OVERLAYS SHALL BE LOCATED ALONG THE CENTERLINE OR EDGE OF TRAVEL LANES.
2. FOR LANE WIDTHS, SEQUENCING, AND OTHER TRAFFIC CONTROL MEASURES FOR STAGING OF LATEX MODIFIED CONCRETE OVERLAY - (LMC-VES) SYSTEM AND SURFACE PREPARATION, SEE ELSEWHERE IN THE CONTRACT DOCUMENTS.

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
i3BPR_100295_SMU_TS01.dgn
jduke

PROJECT NO. BP13-R050
BUNCOMBE COUNTY
BRIDGE NO. 100295

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-2
1			3			TOTAL SHEETS
2			4			12

Signed by: Jacob Duke
29530C8054E94D9...
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE
9/12/2024

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

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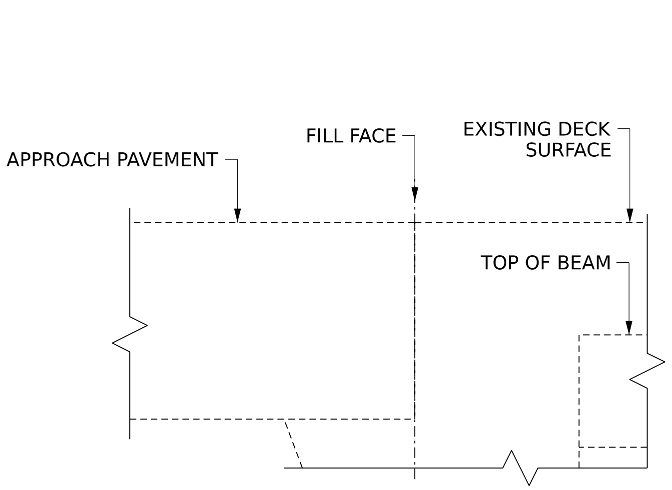
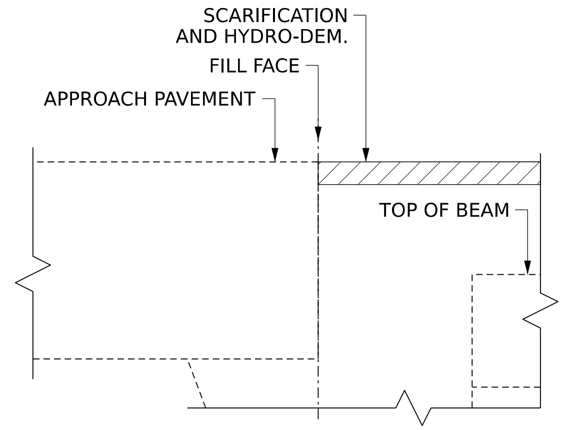
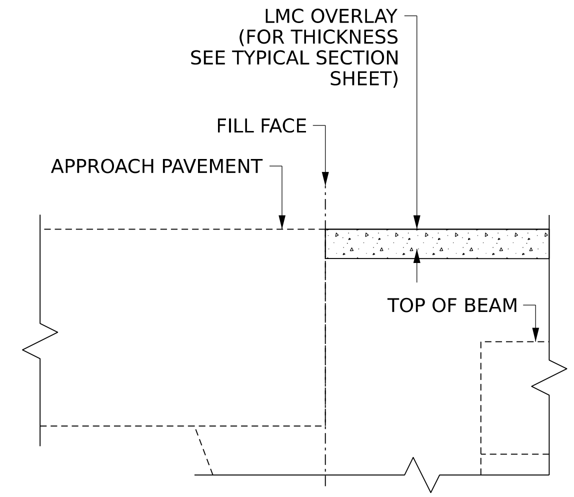


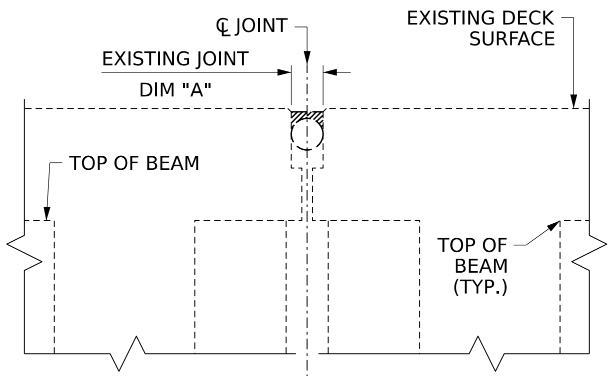
SECTION A-A
(EXISTING DETAIL, NO JOINT)



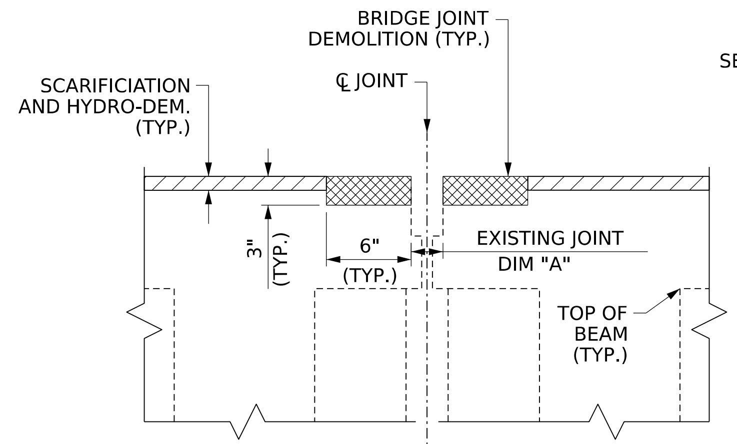
SECTION A-A
(MIN. EXIST. DECK DEMOLITION)



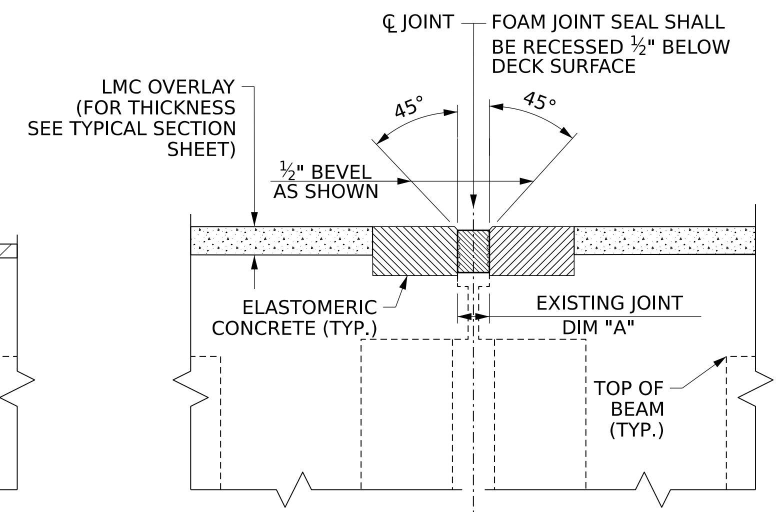
SECTION A-A
(PROPOSED DETAIL, NO JOINT)



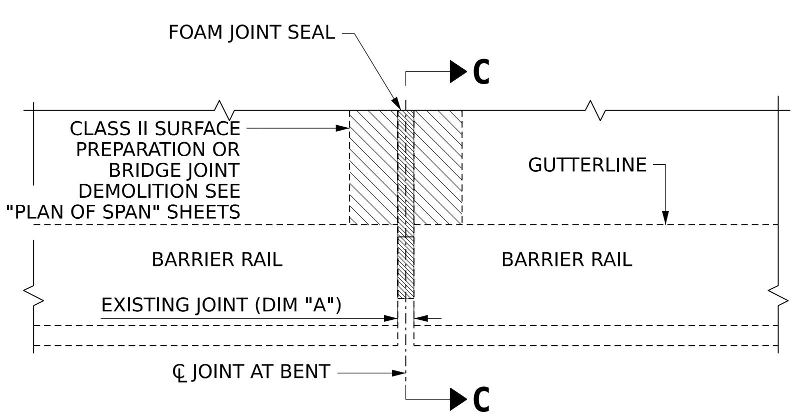
SECTION B-B
(EXISTING JOINT PRIOR TO LMC OVERLAY)



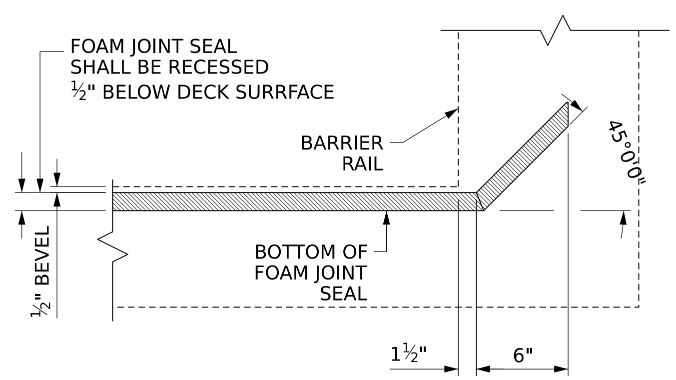
SECTION B-B
(SCARIFICATION AND HYDRO-DEMOLITION)



SECTION B-B
(PROPOSED FOAM JOINT SEAL)



PLAN OF BARRIER
(PROPOSED JOINT SEAL)



SECTION C-C
(PROPOSED JOINT SEAL)

TABLE 1				
TABLE DATE 04/08/24		DIM "A" JOINT MOVEMENTS		
BENT / JOINTS	DIM "A"*	45°	60°	90°
END BENT 1	N/A			
BENT 1	2"	2 3/16"	2"	1 15/16"
BENT 2	1½"	1 11/16"	1½"	1 7/16"
BENT 3	1½	1 11/16"	1½	1 7/16"
END BENT 2	N/A			

*ALL MEASUREMENTS TAKEN AT 68°

NOTES:

THE CONTRACTOR SHALL FIELD VERIFY THE EXISTING JOINT OPENING PRIOR TO ORDERING JOINT SEAL MATERIAL. IF THE ACTUAL OPENING VARIES FROM THE OPENING INDICATED IN THE DETAIL BY MORE THAN ¼", NOTIFY THE ENGINEER. REVISION OF THE JOINT SEAL SIZE MIGHT BE NECESSARY.

THE MANUFACTURER IS TO PROVIDE THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL FOR THE SIZE OF THE OPENING ON THE PLANS AND ACCOMODATE THE MINIMUM EXPANSION SHOWN ON THE PLANS.

FOAM JOINTS SHALL BE INSTALLED AS PER THE MANUFACTURER'S RECOMMENDATIONS.

THE CONTRACTOR SHALL TAKE CARE DURING JOINT REHAB OPERATIONS NOT TO DROP ANY MATERIAL THAT FALLS BELOW THE BRIDGE, WITHOUT PROTECTIVE DEVICES BELOW TO CATCH THE MATERIAL. ANY MATERIAL THAT FALLS BELOW THE BRDIGE SHALL BE CONTAINED, REMOVED AND DISPOSED OF BY THE CONTRATCTOR AT NO EXTRA COST TO THE DEPARTMENT. IF THE ENGINEER DETERMINES THAT THE PROTECTIVE DEVICES ARE NOT ADEQUATE OR NOT BEING EMPLOYED, THE WORK SHALL BE SUSPENDED UNTIL ADEQUATE PROTECTION IS PROVIDED.

THE CONTRACTOR WILL NOT BE PERMITTED TO FORM THE JOINTS IN LIEU OF SAWING THE JOINT.
THE INSTALLED FOAM JOINT SHALL BE WATER TIGHT.
QUANTITIES SHOWN IN THE ELASTOMERIC CONCRETE FOR PRESERVATION TABLE BASED ON THE MINIMUM JOINT DEMOLITION SHOWN.

FOR EXCAVATION BELOW THE BOTTOM OF THE PLANNED JOINT DECK DEMOLITION, CONCRETE FOR DECK REPAIRS SHALL BE PLACED IN THE EXCAVATED AREA TO THE ELEVATION AT BOTTOM OF THE PROPOSED ELASTOMERIC CONCRETE FOR RESERVATION HEADERS SHOWN.

FOR BRIDGE JOINT DEMOLITION, SEE SPECIAL PROVISIONS.
FOR FOAM JOINT SEALS FOR PRESERVATION, SEE SPECIAL PROVISIONS.
FOR ELASTOMERIC CONCRETE FOR PRESERVATION, SEE SPECIAL PROVISIONS.
FOR CONCRETE FOR DECK REPAIR, SEE SPECIAL PROVISIONS.

IF THE EMBEDDED PORTION OF THE EXISTING PLASTIC WATERSTOP IS EXPOSED DURING REMOVAL OF UNSOUND CONCRETE, OR IF UNSOUND CONCRETE IS REMOVED WITHIN 2" OF THE WATERSTOP, THE ENTIRE CONCRETE DEPTH TO THE WATERSTOPS SHALL BE REMOVED. IF SUCH EXCAVATION EXTENDS MORE THAN 2" BELOW THE BOTTOM OF THE PLANNED ELASTOMERIC CONCRETE HEADER, AS SHOWN, APPROVED REPAIR CONCRETE SHALL BE PLACED IN THE EXCAVATED AREA TO THE ELEVATION AT THE BOTTOM OF THE ELASTOMETIC CONCRETE.

DEMOLISH BRIDGE JOINT AREA SUCH THAT THE BOTTOM OF THE EXCAVATION SHALL BE REASONABLY FLAT AND LEVEL AND TO THE NECESSARY DEPTH, SUCH THAT ELASTOMERIC CONCRETE SHALL BE FOUNDED ON CONCRETE OR REPAIR CONCRETE SUBSTRATE.

ELASTOMERIC CONCRETE FOR PRESERVATION		
LOCATION	ESTIMATED (CU. FT.)	ACTUAL (CU.FT.)
END BENTS		
BENT 1	11.3	
BENT 2	11.3	
BENT 3	11.3	

BRIDGE JOINT DEMOLITION		
LOCATION	ESTIMATED (SF.FT.)	ACTUAL (SF.FT.)
END BENTS	N/A	
BENT 1	45	
BENT 2	45	
BENT 3	45	

PROPOSED JOINT QUANTITY		
	ESTIMATED (CU.FT.)	ACTUAL (CU.FT.)
FOAM JOINT SEALS FOR PRESERVATION	135.0	

PROJECT NO. BP13-R050
BUNCOMBE COUNTY
BRIDGE NO. 100295

Signed by: Jacob Duke
SEAL 043777 ENGINEER JACOB H. DUKE — NORTH CAROLINA PROFESSIONAL
9/12/2024

KINGSINGER CAMPO & ASSOCIATES
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS

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

SHEET NO. S1-3
TOTAL SHEETS 12

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DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
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jduke

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

	SPAN 1		SPAN 2	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	206 SY		311 SY	
HYDRO-DEMOLITION OF BRIDGE DECK	206 SY		311 SY	
CLASS II SURFACE PREPARATION	-- SY		15.5 SY	
CLASS III SURFACE PREPARATION	-- SY		-- SY	
LATEX OVERLAY - VERY EARLY STRENGTH (LMC-VES)	8.6 CY		12.9 CY	
PLACING AND FINISHING LMC OVERLAY	206 SY		311 SY	
GROOVING BRIDGE FLOORS	1674 SF		2519 SF	
SHOTCRETE REPAIRS (SCR)	--CF		--CF	

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 1⅞" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION, CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 0 TO 1½" BASED ON VISUAL INSPECTION.

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

THE LMC CONTRACTOR SHALL PROVIDE A METHOD OF HANDLING UNEXPECTED BLOW THROUGH OF THE DECK DURING HYDRO- DEMOLITION.

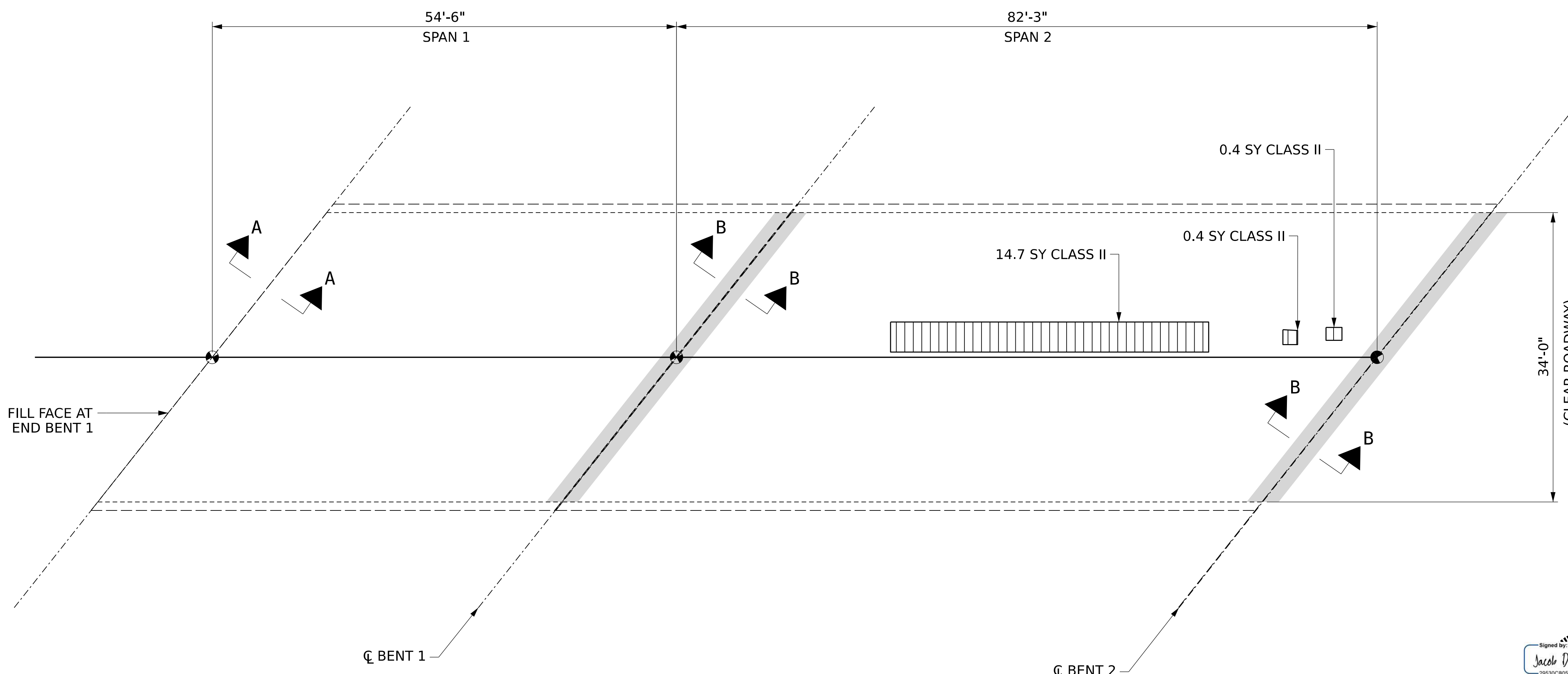
DURING CONSTRUCTION, BERMS OR APPROPRIATE COUNTERMEASURES SHALL BE USED TO ENSURE HYDRO-DEMOLITION WATER DOES NOT MIGRATE INTO ACTIVE TRAVEL LANES.

THE CONTRACTOR SHALL COLLECT, TREAT AND DISP0SE OF RUN-OFF WATER FROM HYDRO-DEMOLITION PROCESS, SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS.

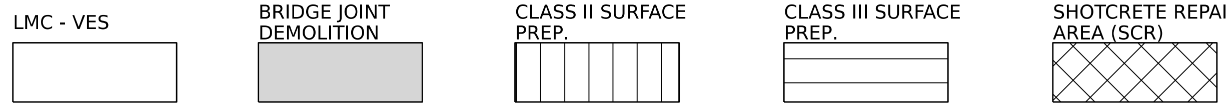
FOR CONCRETE FOR DECK REPAIR, SEE SPECIAL PROVISIONS.

FOR PLACING AND FINISHING LATEX MODIFIED CONCRETE OVERLAY-VERY EARLY STRENGTH (LMC-VES), SEE LATEX MODIFIED CONCRETE-VERY EARLY CONCRETE SPECIAL PROVISIONS.

WORK THIS SHEET WITH THE SHEETS FOR "TYPICAL SECTION", "DECK REPAIR DETAILS" AND "JOINT DETAILS".



PARTIAL PLAN



PROJECT NO. BP13-R050

BUNCOMBE COUNTY

BRIDGE NO. 100295

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
SPANS 1 - 2

Signed by: Jacob Duke
SEAL 043777 JACOB H. DUKE
9/12/2024

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

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

SHEET NO. S1-4
TOTAL SHEETS 12

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
13BPR_100295_SMU_DSR01.dgn
jduke

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

	SPAN 3		SPAN 4	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	311 SY		285 SY	
HYDRO-DEMOLITION OF BRIDGE DECK	311 SY		285 SY	
CLASS II SURFACE PREPARATION	99.3 SY		2.6 SY	
CLASS III SURFACE PREPARATION	-- SY		--SY	
LATEX OVERLAY - VERY EARLY STRENGTH (LMC-VES)	12.9 CY		11.9 CY	
PLACING AND FINISHING LMC OVERLAY	311 SY		285 SY	
GROOVING BRIDGE FLOORS	2519 SF		2317 SF	
SHOTCRETE REPAIRS (SCR)	-- CF		3.0 CF	

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

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FOR CONCRETE FOR DECK REPAIR, SEE SPECIAL PROVISIONS.

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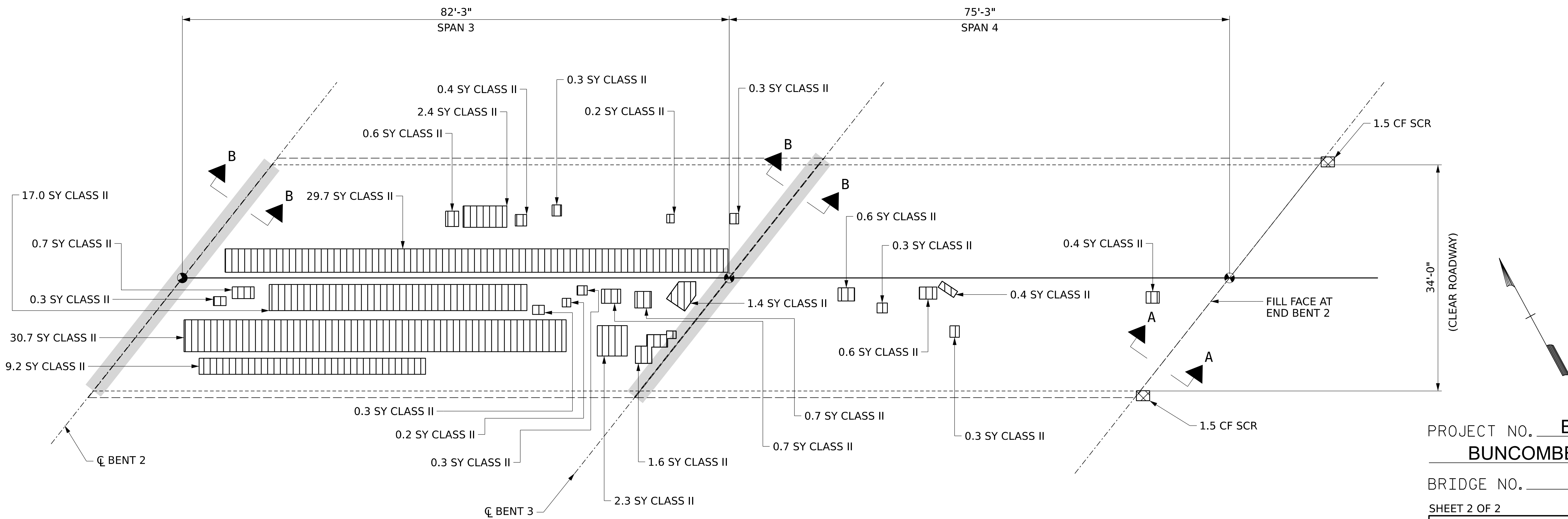
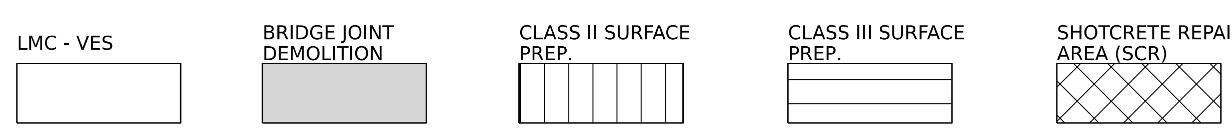


PARTIAL PLAN



PROJECT NO. BP13-R050

BUNCOMBE COUNTY

BRIDGE NO. 100295

SHEET 2 OF 2

SEAL 043777 JACOB H. DUKE ENGINEER — Signed by: Jacob Duke 9/12/2024

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NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
SPANS 3 - 4

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

SHEET NO. S1-5
TOTAL SHEETS 12

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DRAWN BY :	FIDEL L. FLORES	DATE :	05/2024
CHECKED BY :	CHANEY LOWE	DATE :	05/2024
DESIGN ENGINEER:	JACOB H. DUKE	DATE :	06/2024

9/12/2024
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jduke

AS-BUILT REPAIR QUANTITY TABLE

	DECK UNDERSIDE REPAIRS			
	SPAN 1		SPAN 2	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
CONCRETE REPAIRS (CR)	--CF		--CF	
SHOTCRETE REPAIRS (SCR)	--CF		--CF	
EPOXY RESIN INJECTION (ERI)	--LF		--LF	

LEGEND

(hatched)	CONCRETE REPAIR AREA (CR)
(cross-hatched)	SHOTCRETE REPAIR AREA (SCR)
(line)	EPOXY RESIN INJECTION (ERI)

NOTES:

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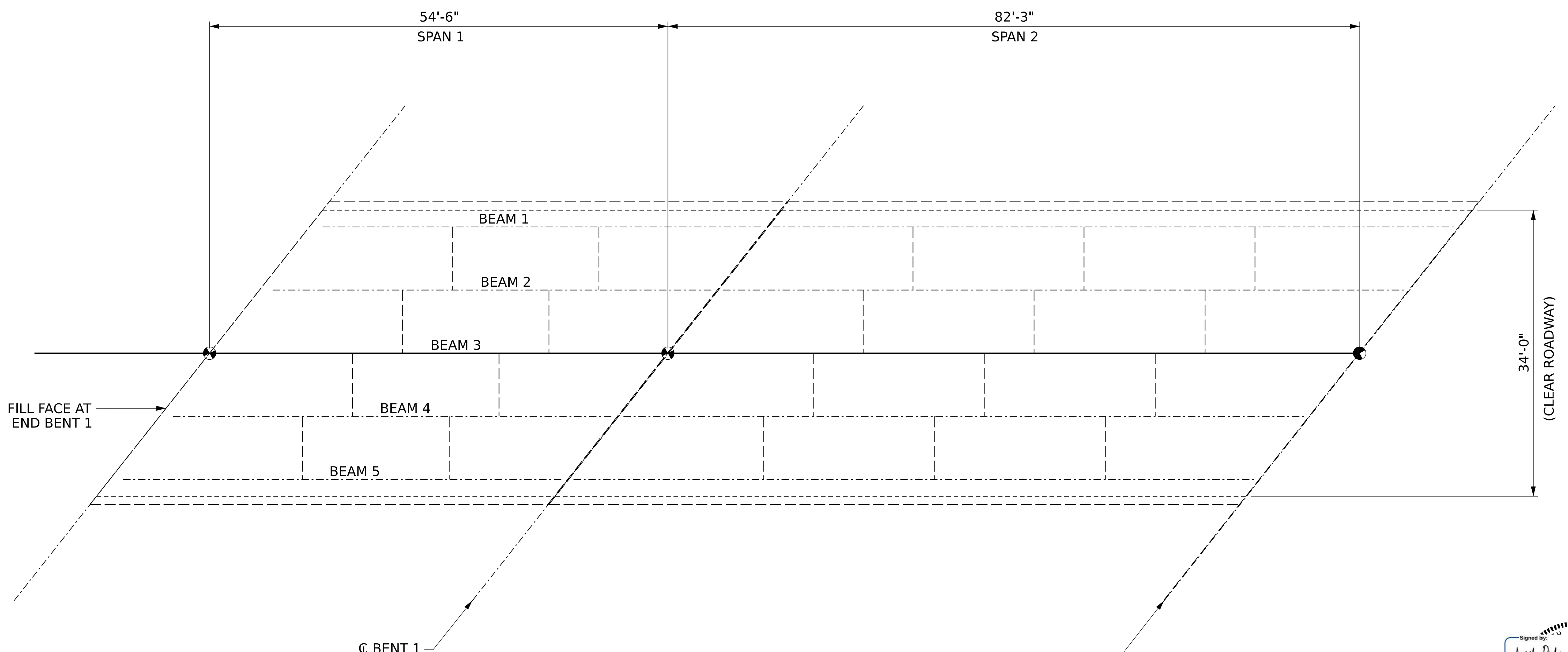
WORK THIS SHEET WITH "TYPICAL SECTION" SHEET.

WORK THIS SHEET WITH THE "DECK REPAIR DETAILS" SHEET.



PARTIAL PLAN

PROJECT NO. BP13-R050
BUNCOMBE COUNTY
BRIDGE NO. 100295
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK UNDERSIDE REPAIRS
SPANS 1 - 2

SEAL 043777 ENGINEER JACOB H. DUKE
Signed by: Jacob Duke
9/12/2024

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2			4		

SHEET NO. S1-6
TOTAL SHEETS 12

DRAWN BY :	FIDEL L. FLORES	DATE :	05/2024
CHECKED BY :	CHANEY LOWE	DATE :	05/2024
DESIGN ENGINEER:	JACOB H. DUKE	DATE :	06/2024

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jduke

AS-BUILT REPAIR QUANTITY TABLE

	DECK UNDERSIDE REPAIRS			
	SPAN 3		SPAN 4	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
CONCRETE REPAIRS (CR)	--CF		--CF	
SHOTCRETE REPAIRS (SCR)	--CF		3.0 CF	
EPOXY RESIN INJECTION (ERI)	--LF		--LF	

LEGEND

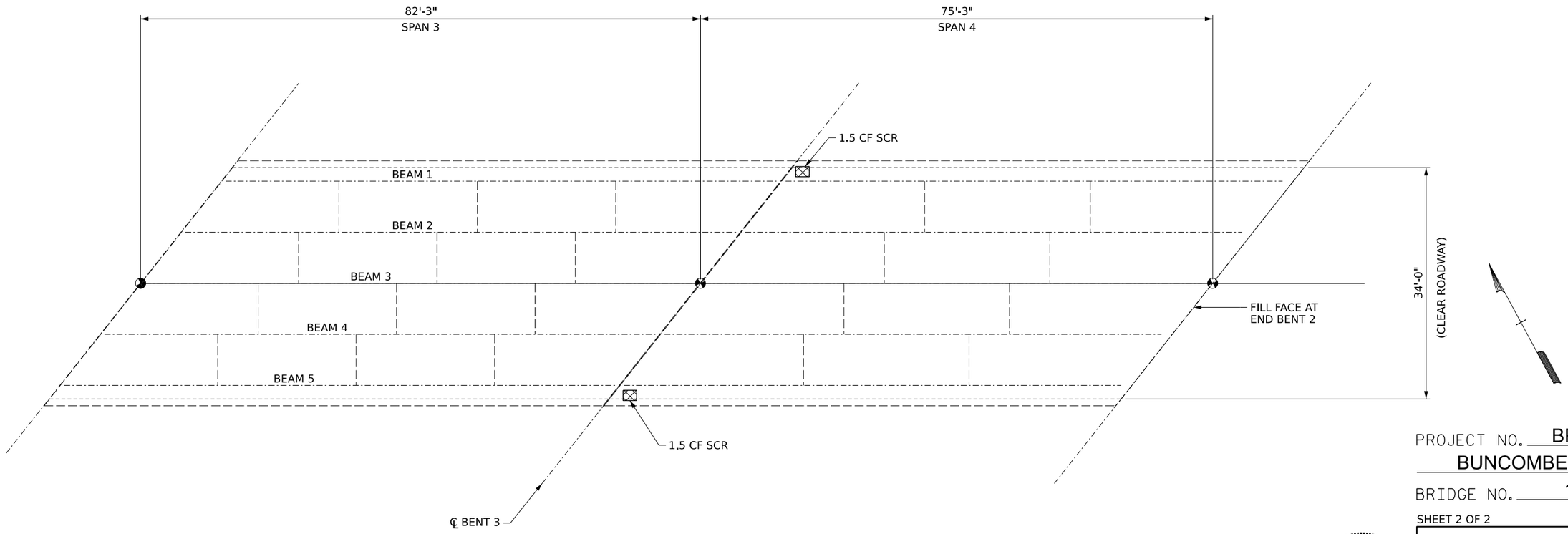
	CONCRETE REPAIR AREA (CR)
	SHOTCRETE REPAIR AREA (SCR)
	EPOXY RESIN INJECTION (ERI)

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN IN THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTIONS OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

WORK THIS SHEET WITH "TYPICAL SECTION" SHEET.

WORK THIS SHEET WITH THE "DECK REPAIR DETAILS" SHEET.



PARTIAL PLAN

PROJECT NO. BP13-R050

BUNCOMBE COUNTY

BRIDGE NO. 100295

SHEET 2 OF 2

Signed by: Jacob Duke 29530C8054E0402...
9/12/2024
SEAL 043777 NORTH CAROLINA PROFESSIONAL ENGINEER JACOB H. DUKE

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK UNDERSIDE REPAIRS
SPANS 3 - 4

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-7
1			3			TOTAL SHEETS
2			4			12

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
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AS-BUILT REPAIR QUANTITY TABLE

	ESTIMATE	ACTUAL
CLEANING & PAINTING EXISTING BEARING WITH HRCSA	35 EA	
TYPE I BRIDGE JACKING	3 EA	

(CPA) CLEAN AND PAINT ALL BEARINGS AT BENT

(JK) JACKING

NOTES:

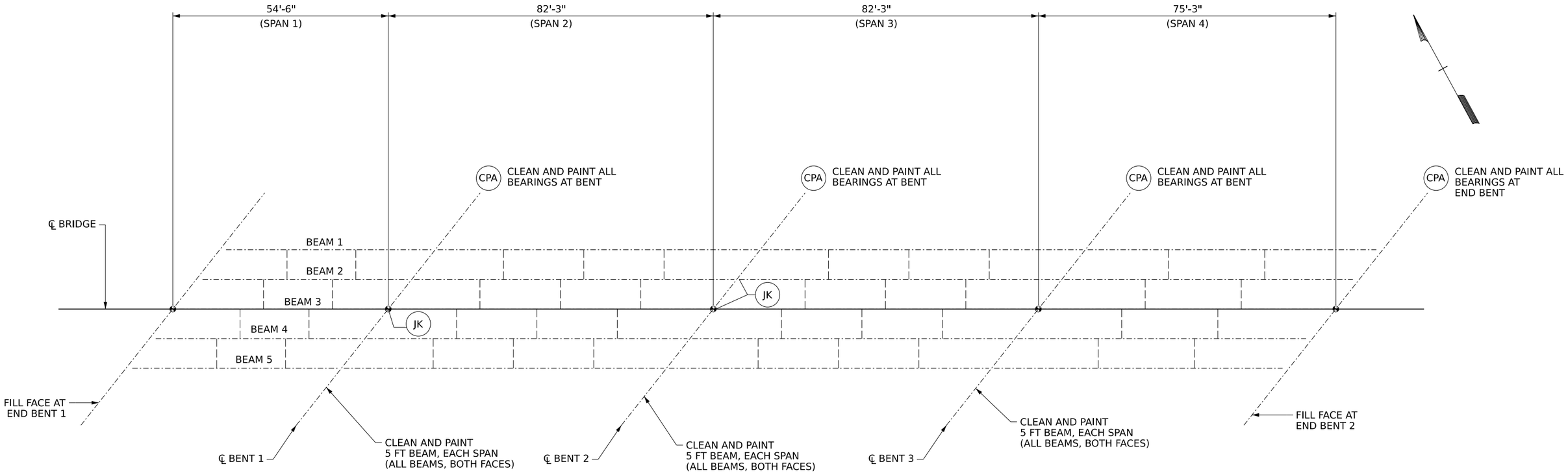
FOR CLEANING & PAINTING EXISTING BEARING WITH HRCSA, SEE SPECIAL PROVISIONS.

FOR ZONE PAINTING EXISTING STEEL, SEE SPECIAL PROVISIONS.

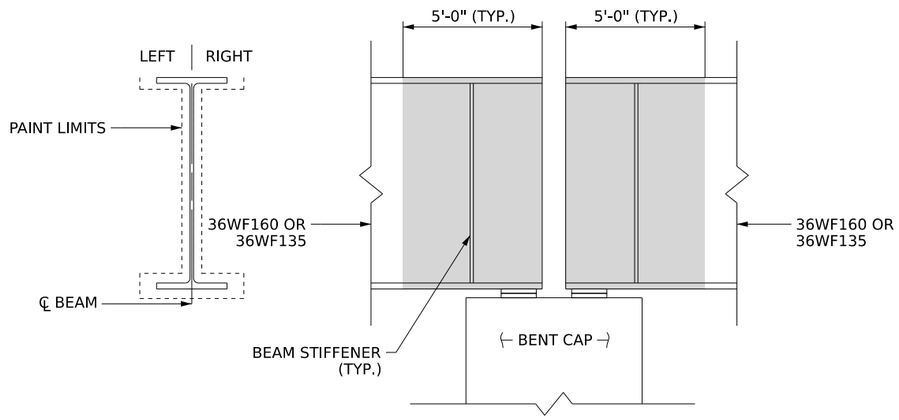
AREAS WHERE CLEANING AND PAINTING ARE CALLED OUT INCLUDE CLEANING AND PAINTING ALL STRUCTURAL STEEL COMPONENTS.

FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

THE ESTIMATED PAINTING QUANTITIES PROVIDED IN THE TABLE BELOW ARE BASED ON INFORMATION COLLECTED DURING SCOPING AND SUBJECT TO CHANGE BETWEEN PLAN DEVELOPMENT AND CONSTRUCTION.



PLAN



BEAM PAINT DETAILS

(DECK NOT SHOWN FOR CLARITY)
(ANCHOR RODS NOT SHOWN FOR CLARITY)

EST. CLEANING AND PAINTING QUANTITIES

	SPAN 1	SPAN 2	SPAN 3	SPAN 4
	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE
CLEAN AND PAINT STRUCTURAL STEEL	250 SF	500 SF	500 SF	250 SF

PROJECT NO. BP13-R050

BUNCOMBE COUNTY

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-8
1			3			TOTAL SHEETS
2			4			12

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
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RALEIGH, NC 27601 (919) 882-7839
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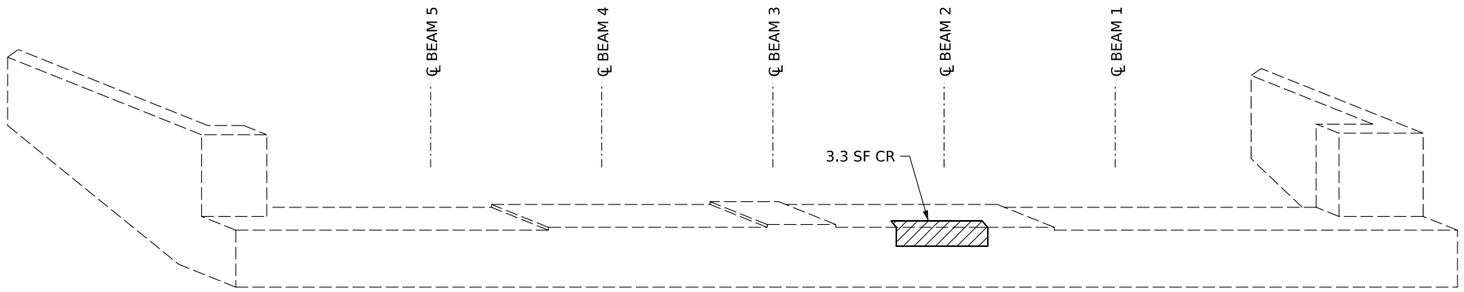
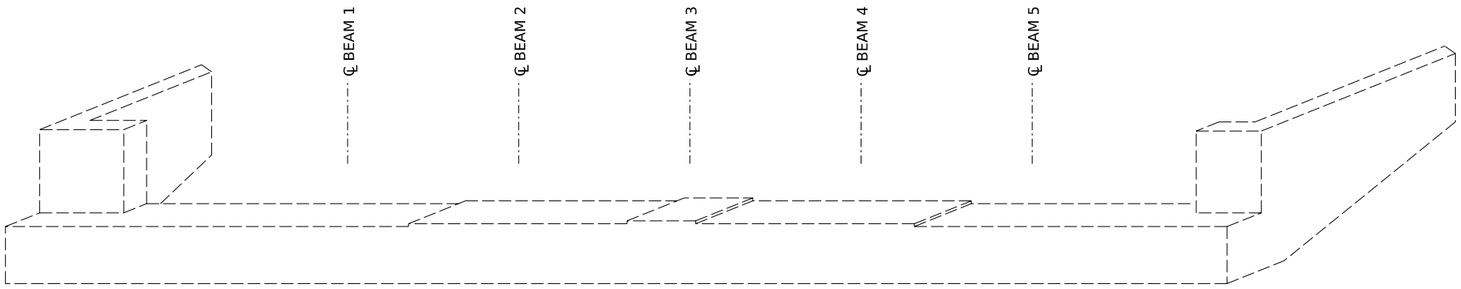
LEGEND	
	CONCRETE REPAIR AREA (CR)
	SHOTCRETE REPAIR AREA (SCR)
	EPOXY RESIN INJECTION (ERI)



END BENT 1

(LOOKING NORTH)



END BENT 2

(LOOKING SOUTH)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/BACKWALL	-	-		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	3.3	1.7		
COLUMN/PILE	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
COLUMN/PILE	-			
EPOXY COAT CAPS	AREA SQ. FT			
TOP OF CAPS	284			

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=$\frac{1}{16}$" AT EACH BENT AND END BENT AS DESCRIBED IN THE SPECIAL PROVISIONS.

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

REPAIRS TO THE CAPS MAY REQUIRE BRIDGE JACKING. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

PERFORM ALL CONCRETE REPAIRS PRIOR TO APPLYING THE EPOXY COATING.

TOP OF CAPS SHOULD BE CLEAN AND CLEAR OF DEBRIS PRIOR TO THE APPLICATOIN OF THE EPOXY COATING.

COAT ALL THE FREE SURFACE AREA ON THE TOP OF THE CAPS, INCLUDING CHAMFERS, WITH EPOXY COATINGS. DO NOT COAT UNDER BEARING AREAS.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS. AND STANDARD SPECIFICATIONS SECTION 420-18.

PROJECT NO. BP13-R050

BUNCOMBE COUNTY

BRIDGE NO. 100295

Signed by: Jacob Duke
29530C8054E9409...
9/12/2024

NORTH CAROLINA SEAL 043777 ENGINEER JACOB H DUKE

KCA KISINGER CAMPO & ASSOCIATES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

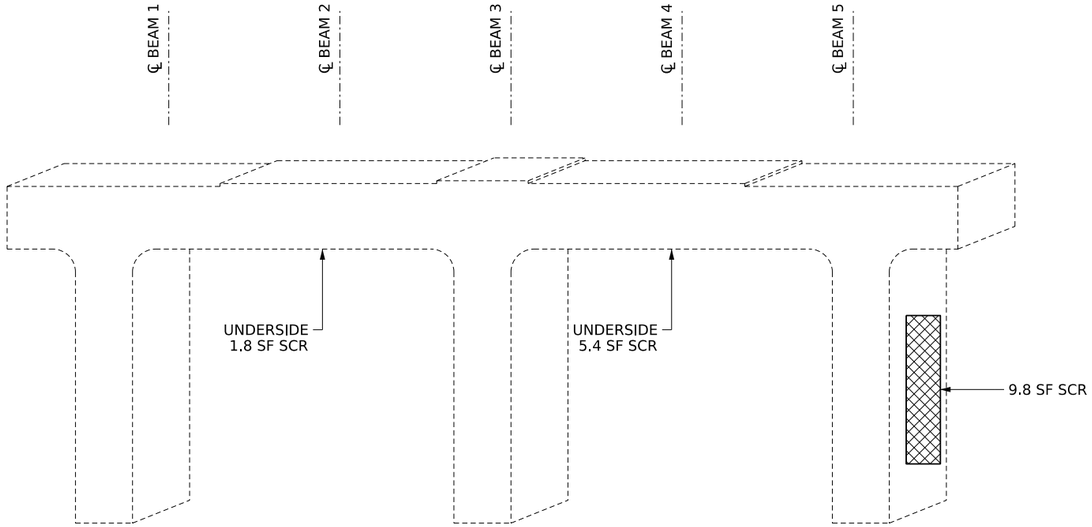
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIRS
END BENTS 1 & 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-9
1			3			TOTAL SHEETS
2			4			12

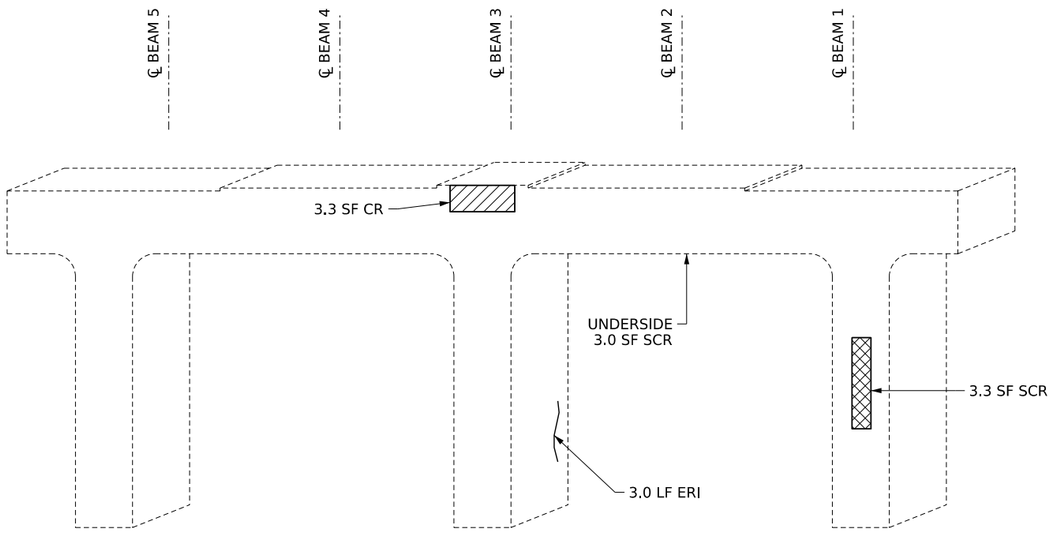
DRAWN BY : JASON M. DEBONE DATE : 05/2024
CHECKED BY : ALLEN J. MCSWAIN DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
13BPR_100295_SMU_B00.dgn
jduke



BENT 1

(LOOKING SOUTH)



BENT 1

(LOOKING NORTH)

LEGEND	
	CONCRETE REPAIR AREA (CR)
	SHOTCRETE REPAIR AREA (SCR)
	EPOXY RESIN INJECTION (ERI)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/BACKWALL	10.2	5.1		
COLUMN/PILE	13.1	6.6		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	3.3	1.7		
COLUMN/PILE	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
COLUMN/PILE	3.0			
EPOXY COAT CAPS	AREA SQ. FT			
TOP OF CAPS	105			

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=$\frac{1}{16}$" AT EACH BENT AND END BENT AS DESCRIBED IN THE SPECIAL PROVISIONS.

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FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

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FOR EPOXY COATING, SEE SPECIAL PROVISIONS. AND STANDARD SPECIFICATIONS SECTION 420-18.

PROJECT NO. BP13-R050

BUNCOMBE COUNTY

BRIDGE NO. 100295

Signed by: Jacob Duke
29530C8054E9409...
9/12/2024

NORTH CAROLINA SEAL 043777 ENGINEER JACOB H DUKE

KCA KISINGER CAMPO & ASSOCIATES

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

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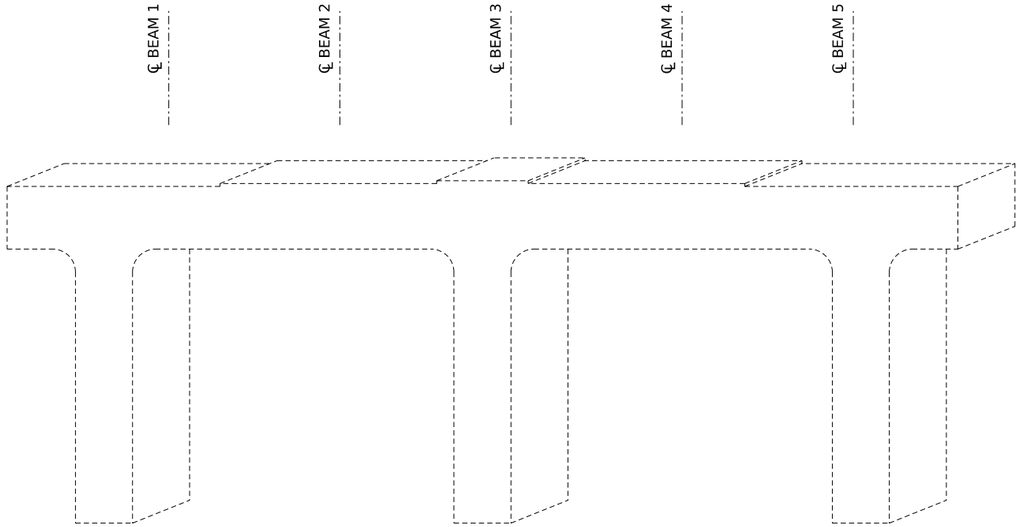
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIRS
BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-10
1			3			TOTAL SHEETS
2			4			12

DRAWN BY :	JASON M. DEBONE	DATE : 05/2024
CHECKED BY :	ALLEN J. MCSWAIN	DATE : 05/2024
DESIGN ENGINEER:	JACOB H. DUKE	DATE : 06/2024

9/12/2024
13BPR_100295_SMU_B01.dgn
jduke



BENT 2

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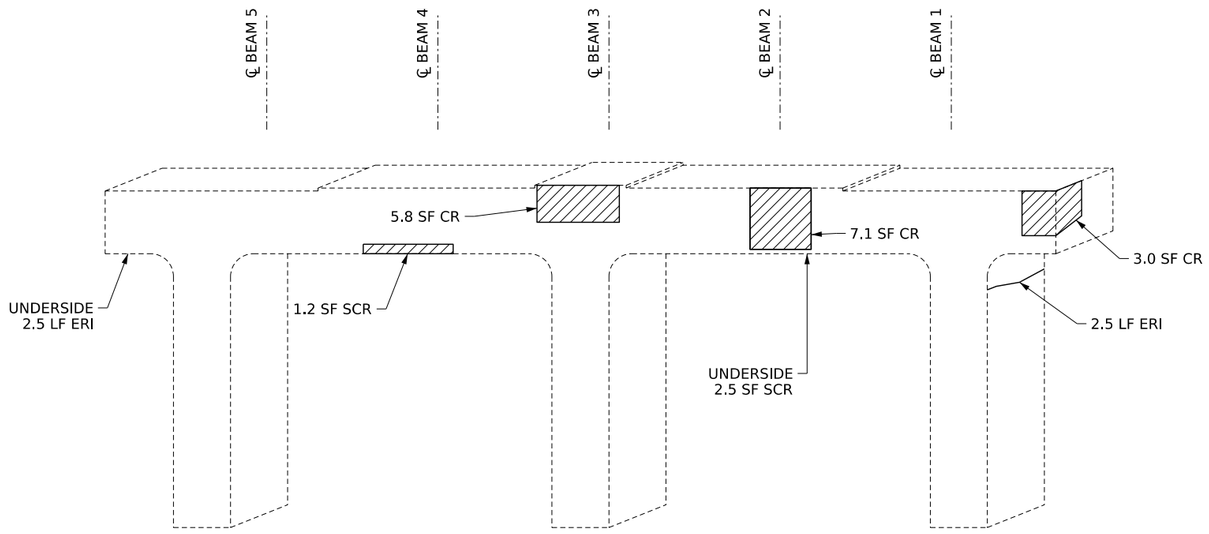

BENT 2

(LOOKING NORTH)

DRAWN BY :	JASON M. DEBONE	DATE :	05/2024
CHECKED BY :	ALLEN J. MCSWAIN	DATE :	05/2024
DESIGN ENGINEER:	JACOB H. DUKE	DATE :	06/2024

9/12/2024
13BPR_100295_SMU_B02.dgn
jduke

LEGEND

	CONCRETE REPAIR AREA (CR)
	SHOTCRETE REPAIR AREA (SCR)
	EPOXY RESIN INJECTION (ERI)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/BACKWALL	3.7	1.9		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	15.9	8.0		
COLUMN/PILE	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	2.5			
COLUMN/PILE	2.5			
EPOXY COAT CAPS	AREA SQ. FT			
TOP OF CAPS	105			

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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PROJECT NO. BP13-R050

BUNCOMBE COUNTY

BRIDGE NO. 100295

Signed by: Jacob Duke
29530C8054E9409...
9/12/2024

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

KCA KISINGER CAMPO & ASSOCIATES

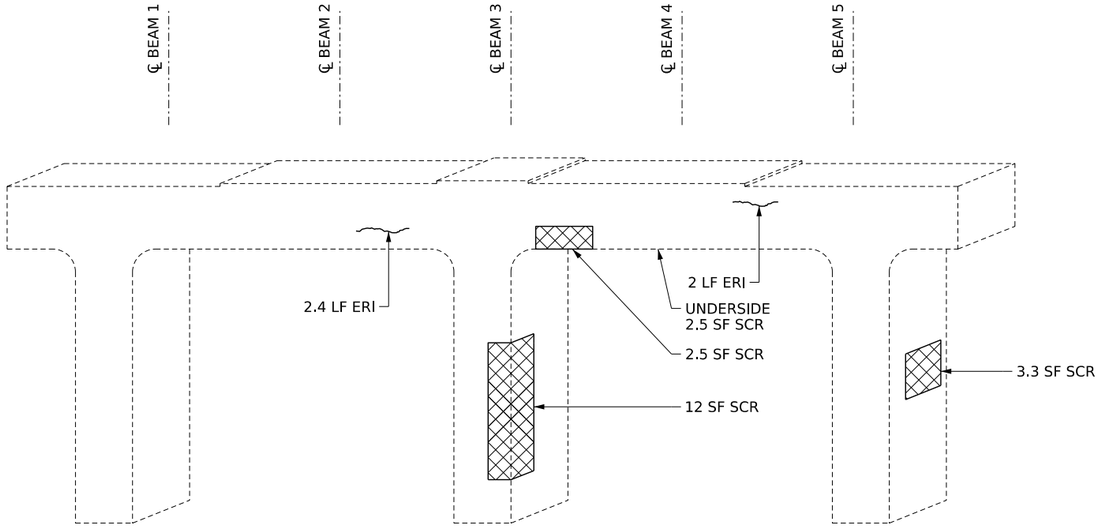
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIRS
BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-11
1			3			TOTAL SHEETS
2			4			12



BENT 3

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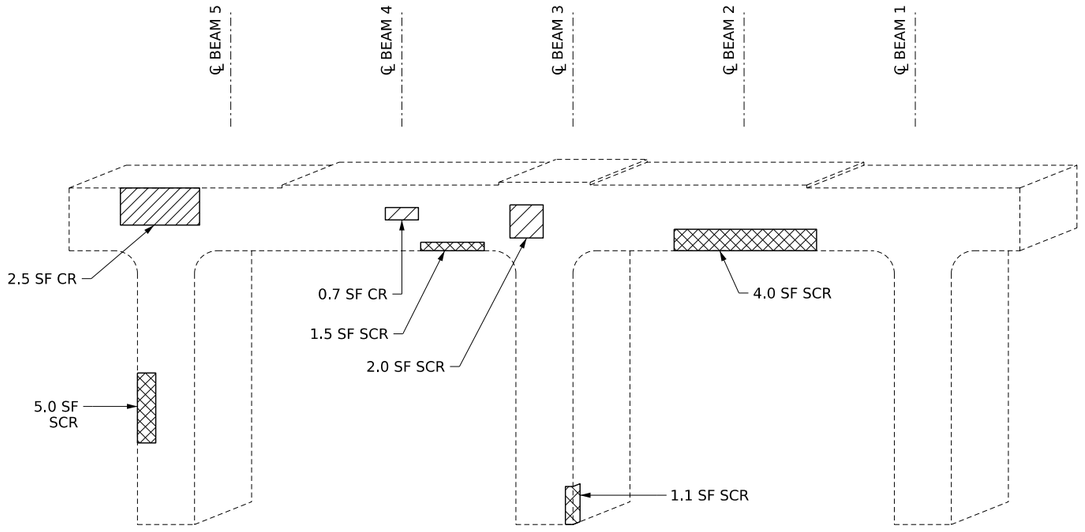

BENT 3

(LOOKING NORTH)

LEGEND	
	CONCRETE REPAIR AREA (CR)
	SHOTCRETE REPAIR AREA (SCR)
	EPOXY RESIN INJECTION (ERI)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/BACKWALL	10.5	5.3		
COLUMN/PILE	21.4	10.7		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	5.2	2.6		
COLUMN/PILE	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	4.4			
COLUMN/PILE	-			
EPOXY COAT CAPS	AREA SQ. FT			
TOP OF CAPS	105			

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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PROJECT NO. BP13-R050

BUNCOMBE COUNTY

BRIDGE NO. 100295

Signed by: Jacob Duke 29530C8054E9409...
9/12/2024

NORTH CAROLINA SEAL 043777 ENGINEER JACOB H DUKE

KCA KISINGER CAMPO & ASSOCIATES

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

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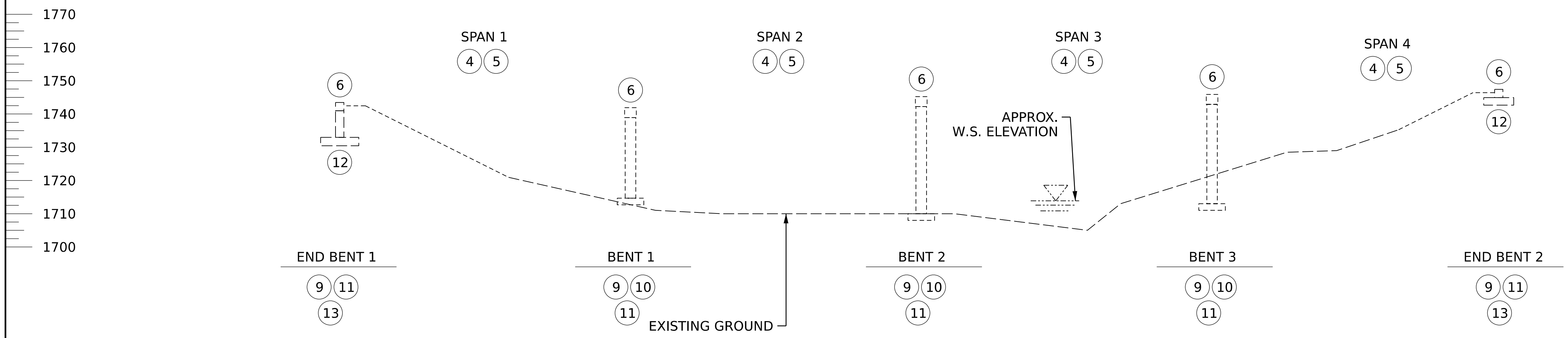
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE REPAIRS
BENT 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-12
1			3			TOTAL SHEETS
2			4			12

DRAWN BY : JASON M. DEBONE DATE : 05/2024
CHECKED BY : ALLEN J. MCSWAIN DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

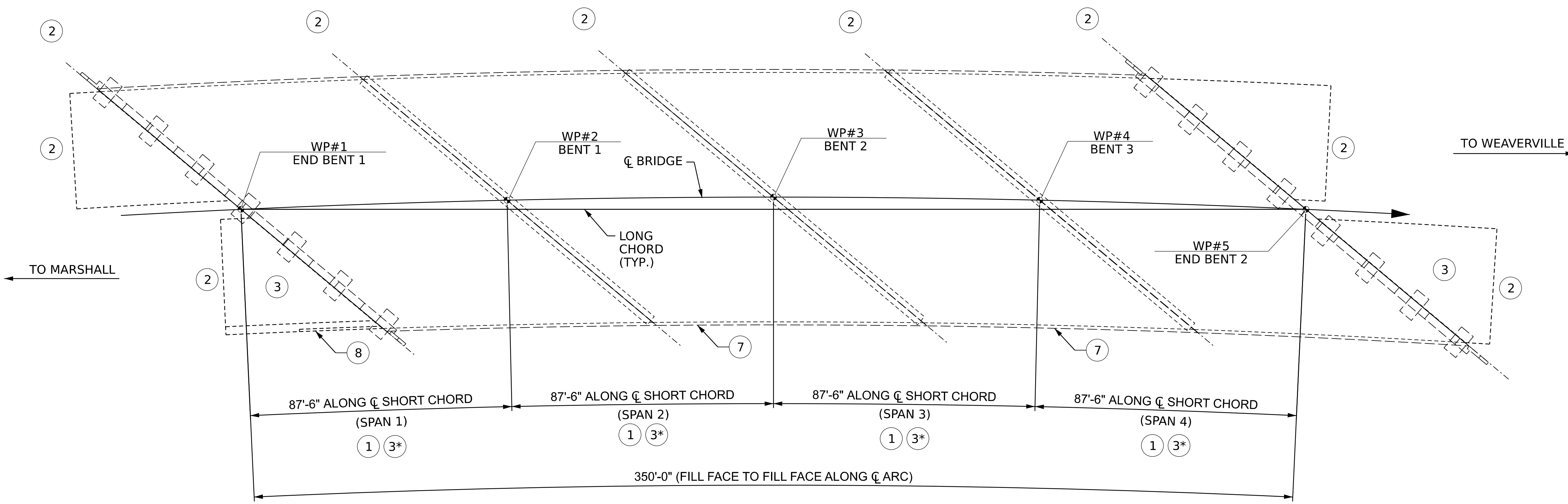
9/12/2024
13BPR_100295_SMU_B03.dgn
jduke



SECTION ALONG ROADWAY

SCOPE LEGEND:

1. DECK REPAIRS
2. REPLACE JOINTS
3. LMC OVERLAY - VERY EARLY STRENGTH (PARTIAL)
4. STRUCTURAL STEEL REPAIRS
5. CLEANING AND PAINTING WEATHERING STEEL
6. CLEANING AND PAINTING BEARING WITH HRCSA
7. DECK DRAIN REPAIRS
8. APPROACH SHOULDER REPAIRS
9. SUBSTRUCTURE CONCRETE REPAIRS
10. BRIDGE JACKING
11. EPOXY COAT CAPS
12. CAP UNDERMINING REPAIRS
13. INSTALL WEEP HOLE FILTERS



PLAN VIEW

* PARTIAL WIDTH
SEE TYPICAL SECTION
AND DECK SURFACE
REPAIR SHEETS

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

RESIDENT ENGINEER DATE

PROJECT NO. BP13-R050
MADISON COUNTY
BRIDGE NO. 560528

NOTES:

GENERAL DRAWING INFORMATION IS TAKEN FROM THE ORIGINAL PLANS AND THE ROUTINE INSPECTION REPORT DATED 10/17/2023.

BRIDGE ORIENTATION/SPAN CONFIGURATION DOES NOT CONFORM TO THE EXISTING ROUTINE INSPECTION REPORT. ORIENTATION/SPAN CONFIGURATION CONFORMS TO THE EXISTING BRIDGE PLANS.

Signed by: Jacob Duke
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043777 JACOB H. DUKE
9/12/2024

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

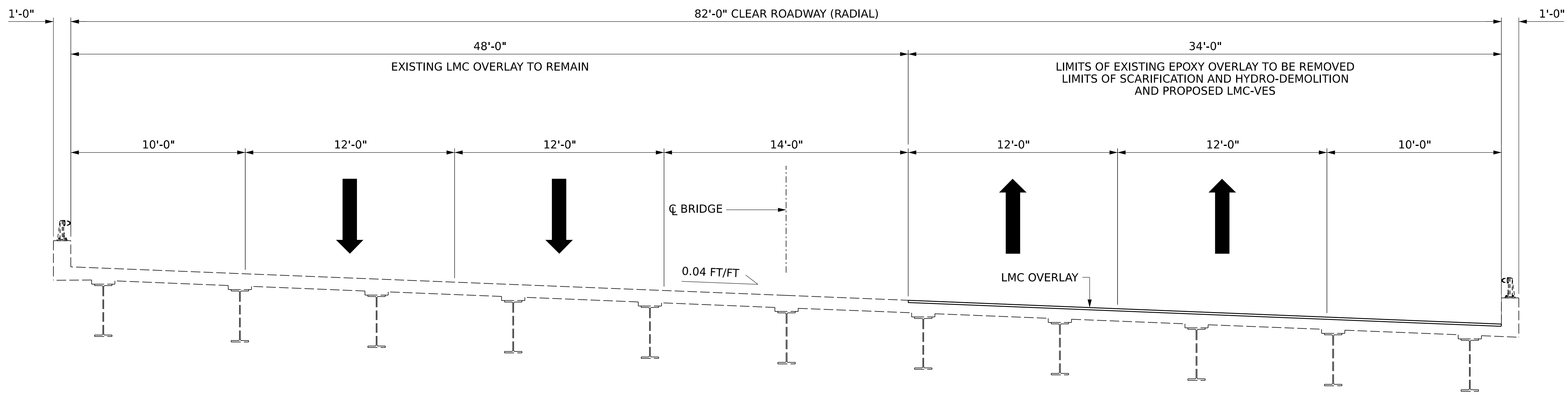
GENERAL DRAWING
FOR BRIDGE OVER IVY RIVER
ON US 25 BETWEEN
SR 1580 & SR 1586

DRAWN BY :	FIDEL L. FLORES	DATE :	05/2024
CHECKED BY :	CHANEY LOWE	DATE :	05/2024
DESIGN ENGINEER:	JACOB H. DUKE	DATE :	06/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

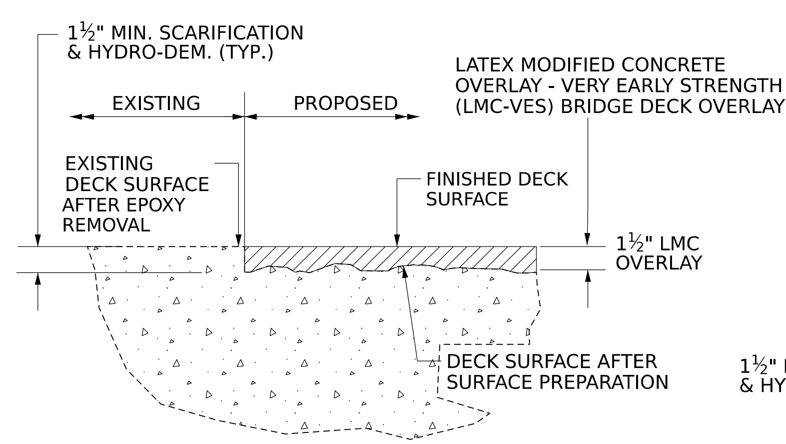
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-1
1			3			TOTAL SHEETS
2			4			20

9/12/2024
13BPR_560528_SMU_GD01.dgn
jduke

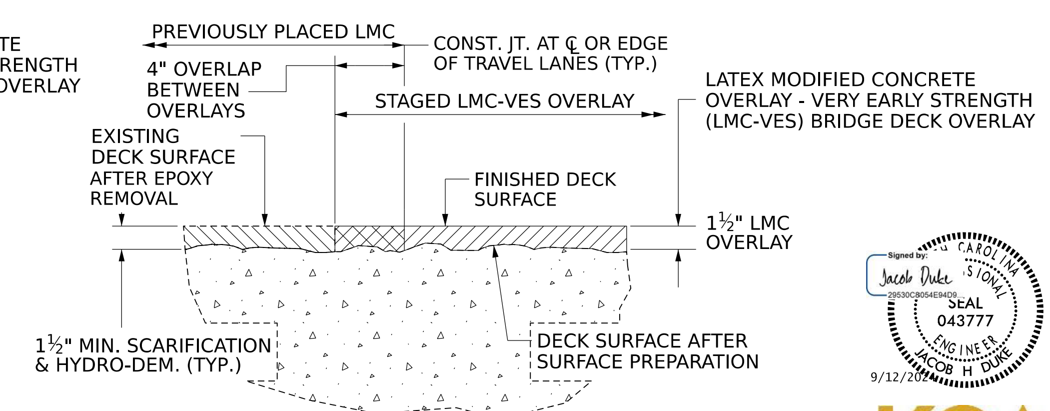


TYPICAL SECTION

DIAPHRAGMS NOT SHOWN FOR CLARITY



DETAIL FOR LMC OVERLAY



DETAIL FOR STAGED LMC OVERLAY

NOTES:

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

2. FOR LANE WIDTHS, SEQUENCING, AND OTHER TRAFFIC CONTROL MEASURES FOR STAGING OF LATEX MODIFIED CONCRETE OVERLAY - (LMC-VES) SYSTEM AND SURFACE PREPARATION, SEE ELSEWHERE IN THE CONTRACT DOCUMENTS.

PROJECT NO. BP13-R050
MADISON COUNTY
BRIDGE NO. 560528

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION

SEAL 043777
JACOB H. DUKE
9/12/2024

KCA KISINGER CAMPO & ASSOCIATES
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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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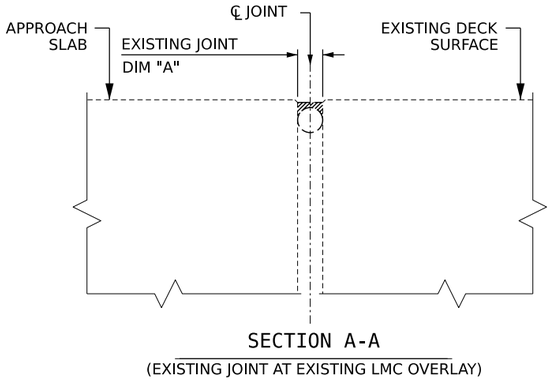
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S2-2
TOTAL SHEETS 20

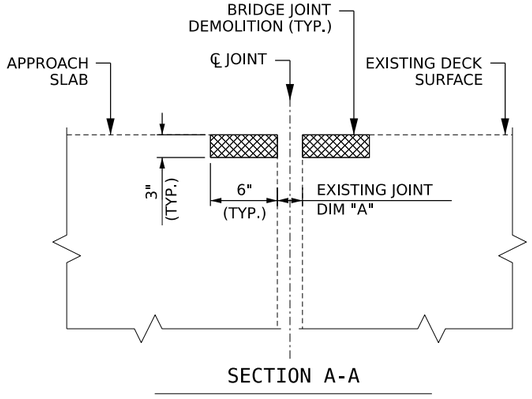
DRAWN BY :	FIDEL L. FLORES	DATE :	05/2024
CHECKED BY :	CHANEY LOWE	DATE :	05/2024
DESIGN ENGINEER:	JACOB H. DUKE	DATE :	06/2024

9/12/2024
13BPR_560528_SMU_TS01.dgn
jduke

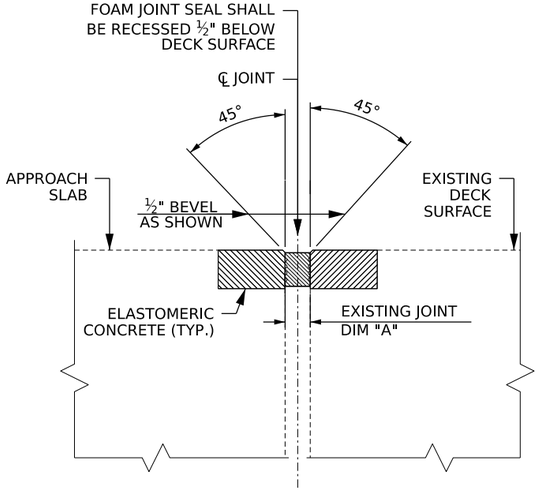


SECTION A-A

(EXISTING JOINT AT EXISTING LMC OVERLAY)

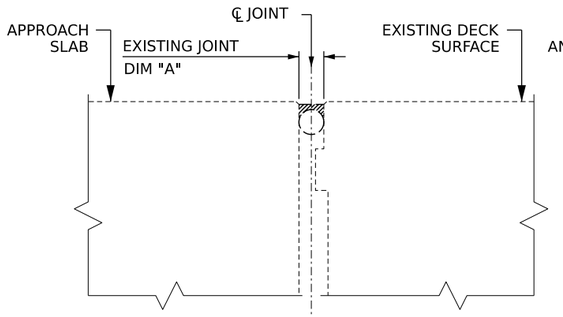


SECTION A-A



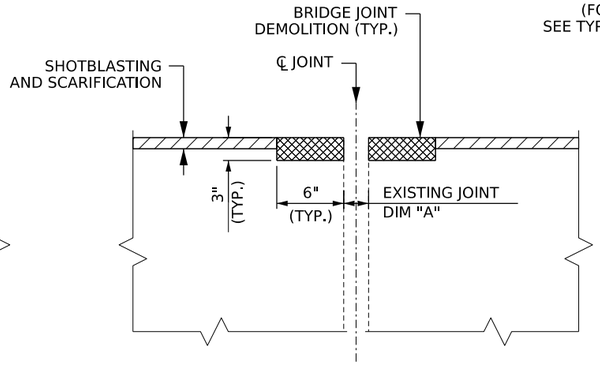
SECTION A-A

(PROPOSED FOAM JOINT SEAL)



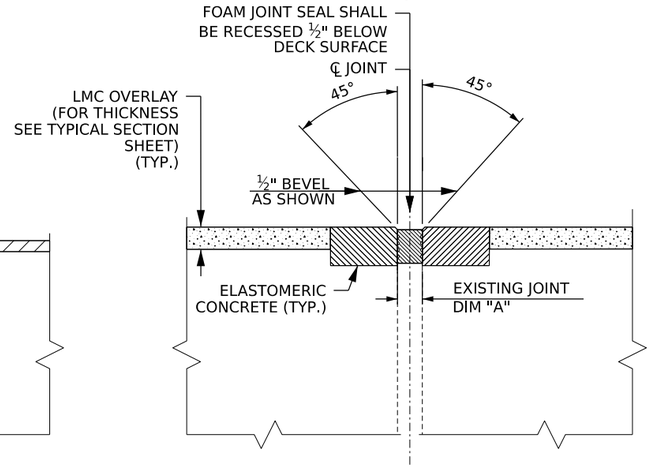
SECTION B-B

(EXISTING JOINT AT EXISTING EPOXY OVERLAY)



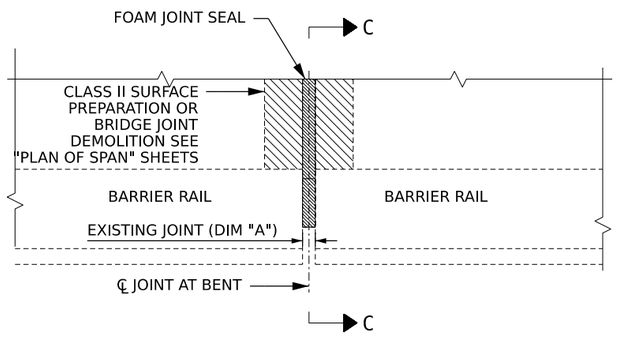
SECTION B-B

(SHOTBLASTING AND SCARIFICATION)



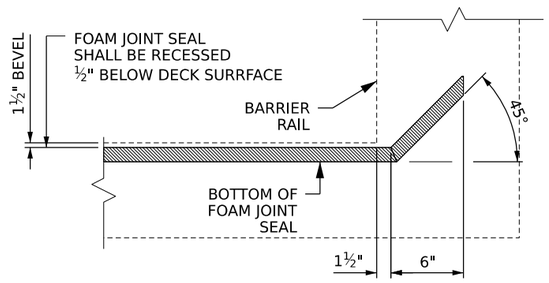
SECTION B-B

(PROPOSED FOAM JOINT SEAL)



PLAN OF BARRIER

(PROPOSED JOINT SEAL)



SECTION C-C

(PROPOSED JOINT SEAL)

NOTES:

FOR NOTES AND TABLE SHOWING DIM 'A', SEE SHEET 2.

PROJECT NO. BP13-R050

MADISON COUNTY

BRIDGE NO. 560528

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS

Signed by: Jacob Duke 29530C8054E0409...
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
9/12/2024

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

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-3
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
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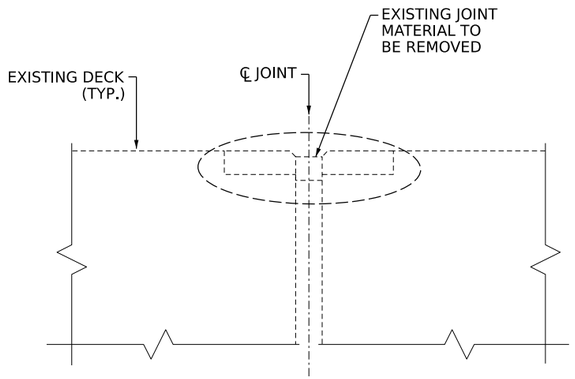
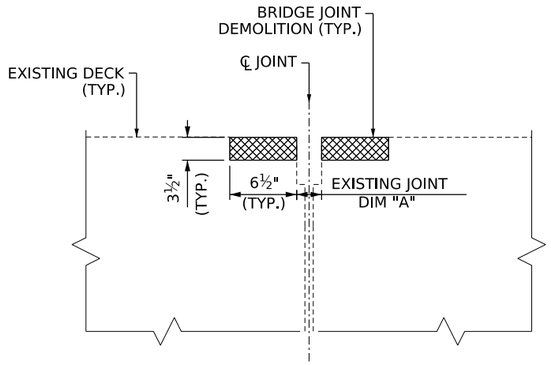
jduke



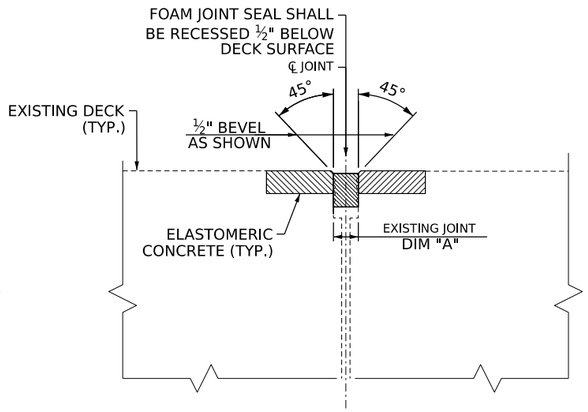
SECTION D-D

(EXISTING JOINT WITH EXISTING LMC OVERLAY)



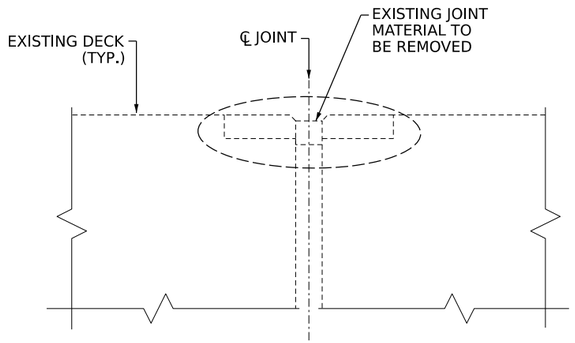
SECTION D-D

(DEMOLITION)



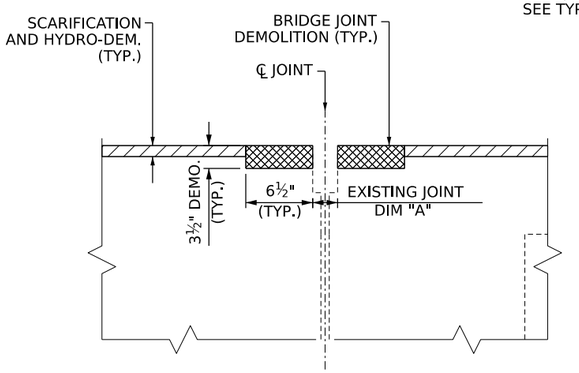
SECTION D-D

(PROPOSED FOAM JOINT SEAL)



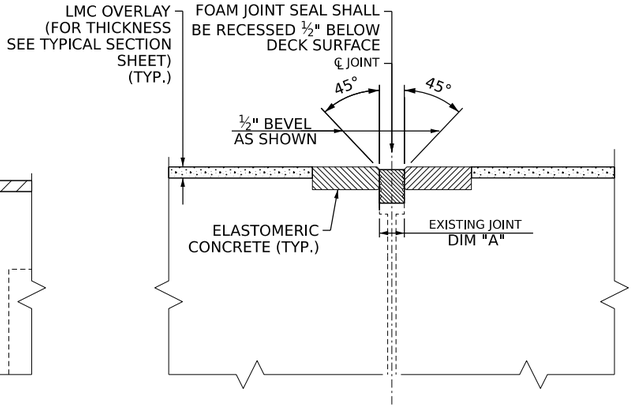
SECTION E-E

(EXISTING JOINT PRIOR TO LMC OVERLAY)



SECTION E-E

(SCARIFICATION AND SHOTBLASTING)



SECTION E-E

(PROPOSED FOAM JOINT SEAL)

NOTES:

THE CONTRACTOR SHALL FIELD VERIFY THE EXISTING JOINT OPENING PRIOR TO ORDERING JOINT SEAL MATERIAL. IF THE ACTUAL OPENING VARIES FROM THE OPENING INDICATED IN THE DETAIL BY MORE THAN ¼", NOTIFY THE ENGINEER. REVISION OF THE JOINT SEAL SIZE MIGHT BE NECESSARY.

THE MANUFACTURER IS TO PROVIDE THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL FOR THE SIZE OF THE OPENING ON THE PLANS AND ACCOMODATE THE MINIMUM EXPANSION SHOWN ON THE PLANS.

FOAM JOINTS SHALL BE INSTALLED AS PER THE MANUFACTURER'S RECOMMENDATIONS.

THE CONTRACTOR SHALL TAKE CARE DURING JOINT REHAB OPERATIONS NOT TO DROP ANY MATERIAL THAT FALLS BELOW THE BRIDGE, WITHOUT PROTECTIVE DEVICES BELOW TO CATCH THE MATERIAL. ANY MATERIAL THAT FALLS BELOW THE BRDIGE SHALL BE CONTAINED, REMOVED AND DISPOSED OF BY THE CONTRATCTOR AT NO EXTRA COST TO THE DEPARTMENT. IF THE ENGINEER DETERMINES THAT THE PROTECTIVE DEVICES ARE NOT ADEQUATE OR NOT BEING EMPLOYED, THE WORK SHALL BE SUSPENDED UNTIL ADEQUATE PROTECTION IS PROVIDED.

THE CONTRACTOR WILL NOT BE PERMITTED TO FORM THE JOINTS IN LIEU OF SAWING THE JOINT.

THE INSTALLED FOAM JOINT SHALL BE WATER TIGHT.

QUANTITIES SHOWN IN THE ELASTOMERIC CONCRETE FOR PRESERVATION TABLE BASED ON THE MINIMUM JOINT DEMOLITION SHOWN.

FOR EXCAVATION BELOW THE BOTTOM OF THE PLANNED JOINT DECK DEMOLITION, CONCRETE FOR DECK REPAIRS SHALL BE PLACED IN THE EXCAVATED AREA TO THE ELEVATION AT BOTTOM OF THE PROPOSED ELASTOMERIC CONCRETE FOR PRESERVATION HEADERS SHOWN.

FOR BRIDGE JOINT DEMOLITION, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEALS FOR PRESERVATION, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE FOR PRESERVATION, SEE SPECIAL PROVISIONS.

FOR CONCRETE FOR DECK REPAIR, SEE SPECIAL PROVISIONS.

IF THE EMBEDDED PORTION OF THE EXISTING PLASTIC WATERSTOP IS EXPOSED DURING REMOVAL OF UNSOUND CONCRETE, OR IF UNSOUND CONCRETE IS REMOVED WITHIN 2" OF THE WATERSTOP, THE ENTIRE CONCRETE DEPTH TO THE WATERSTOPS SHALL BE REMOVED. IF SUCH EXCAVATION EXTENDS MORE THAN 2" BELOW THE BOTTOM OF THE PLANNED ELASTOMERIC CONCRETE HEADER, AS SHOWN, APPROVED REPAIR CONCRETE SHALL BE PLACED IN THE EXCAVATED AREA TO THE ELEVATION AT THE BOTTOM OF THE ELASTOMETIC CONCRETE.

DEMOLISH BRIDGE JOINT AREA SUCH THAT THE BOTTOM OF THE EXCAVATION SHALL BE REASONABLY FLAT AND LEVEL AND TO THE NECESSARY DEPTH, SUCH THAT ELASTOMERIC CONCRETE SHALL BE FOUNDED ON CONCRETE OR REPAIR CONCRETE SUBSTRATE.

ELASTOMERIC CONCRETE FOR PRESERVATION		
LOCATION	ESTIMATED (CU.FT.)	ACTUAL (CU.FT.)
END BENTS	64.1	
BENT 1	39.4	
BENT 2	40.3	
BENT 3	41.4	

BRIDGE JOINT DEMOLITION		
LOCATION	ESTIMATED (SQ. FT.)	ACTUAL (SQ. FT.)
END BENTS	256	
BENT 1	135	
BENT 2	138	
BENT 3	142	

PROPOSED JOINT QUANTITY		
	ESTIMATED (LIN.FT.)	ACTUAL (LIN.FT.)
FOAM JOINT SEALS FOR PRESERVATION	646	

TABLE 1				
TABLE DATE 04/09/24 56° F		DIM "A" JOINT MOVEMENTS		
BENT / JOINTS	DIM "A"	45°	60°	90°
END BENT 1	2"	2"	2"	1 5/16"
BENT 1	1¼"	1 5/16"	1¼"	1⅛"
BENT 2	1¼"	1 5/16	1¼	1⅛"
BENT 3	1½"	1 9/16"	1½"	1⅜"
END BENT 2	2"	2"	2"	1 15/16"

PROJECT NO. BP13-R050

MADISON COUNTY

BRIDGE NO. 560528

SHEET 2 OF 3

Signed by: Jacob Duke 29530C8054E94D9...

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

9/12/2024

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NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-4
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
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jduke

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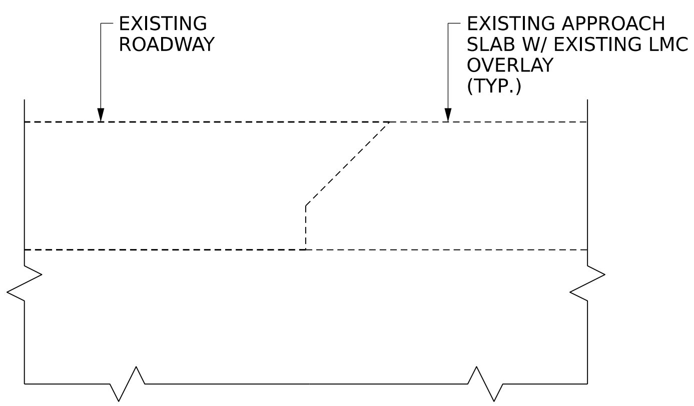
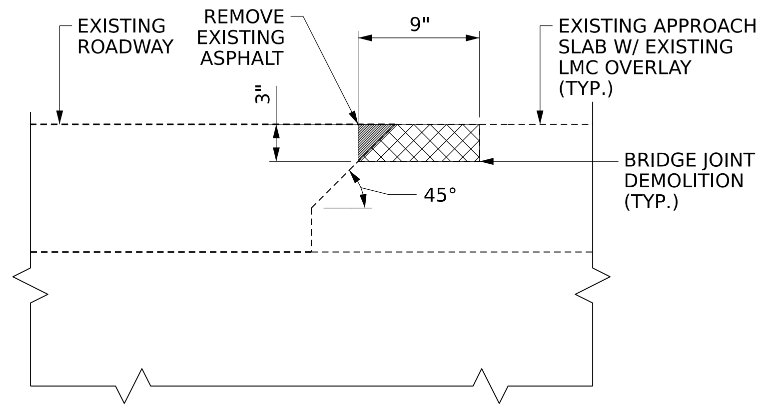
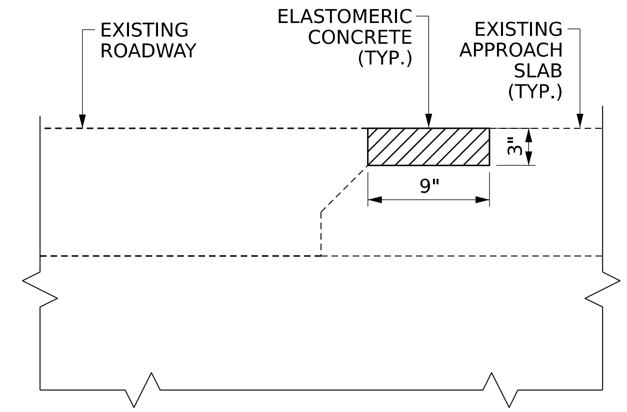


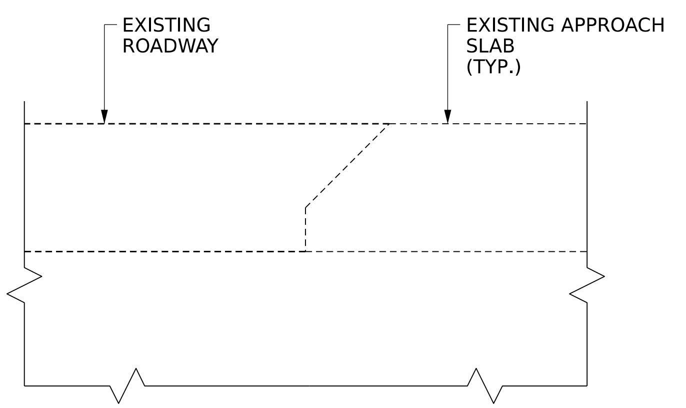
SECTION F-F
(EXISTING APPROACH EXISTING LMC)



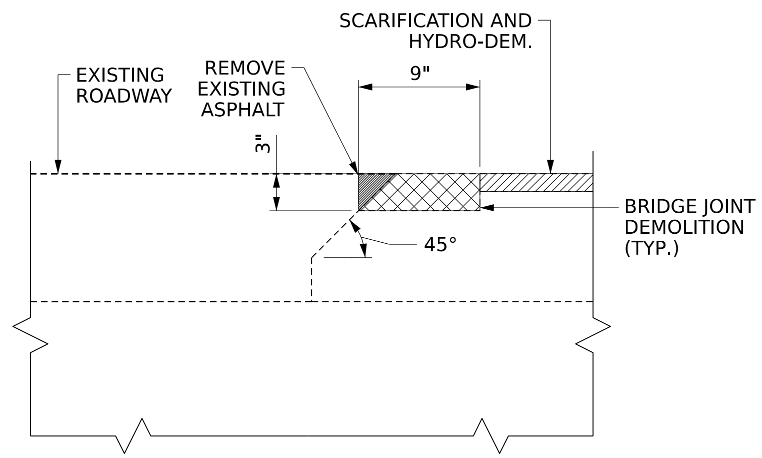
SECTION F-F
(DEMOLITION)



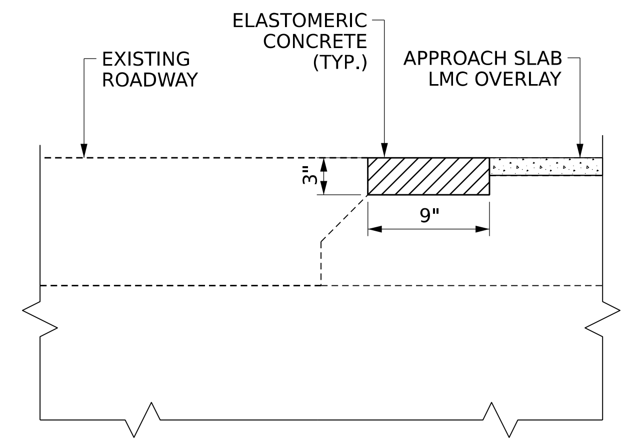
SECTION F-F
(PROPOSED APPROACH HEADER)



SECTION G-G
(EXISTING APPROACH)



SECTION G-G
(DEMOLITION)



SECTION G-G
(PROPOSED APPROACH HEADER)

NOTES:

FOR CLASS II SURFACE PREPARATION, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE FOR PRESERVATION, SEE SPECIAL PROVISIONS.

DEMOLISH APPROACH HEADER AREA SUCH THAT THE BOTTOM OF THE EXCAVATION SHALL BE REASONABLY FLAT AND LEVEL AND TO THE NECESSARY DEPTH, SUCH THAT THE REPAIR SHALL BE FOUNDED ON CONCRETE OR REPAIR CONCRETE SUBSTRATE.

TAKE CARE NOT TO DAMAGE ANY EXISTING APPROACH SLAB REINFORCING EXPOSED DURING CLASS II SURFACE PREPARATION. NOTIFY THE ENGINEER OF ANY APPROACH SLAB REINFORCING EXPOSED DURING CLASS II SURFACE PREPARATION.

EXISTING APPROACH SLAB REINFORCING IS NOT SHOWN IN THE SECTIONS PROVIDED ON THIS SHEET.

REMOVE EXISTING ASPHALT TO INSTALL PROPOSED HEADERS AS NEEDED. PAYMENT FOR ASPHALT REMOVAL SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE PROPOSED ELASTOMERIC HEADERS.

BRIDGE JOINT DEMOLITION

LOCATION	ESTIMATED (SQ. FT.)	ACTUAL (SQ. FT.)
BEGIN APPROACH	55	
END APPROACH	57	

ELASTOMERIC CONCRETE FOR PRESERVATION

LOCATION	ESTIMATED (CU. FT.)	ACTUAL (CU. FT.)
BEGIN APPROACH	11.5	
END APPROACH	11.9	

PROJECT NO. BP13-R050
MADISON COUNTY
BRIDGE NO. 560528
SHEET 3 OF 3

Signed by: Jacob Duke
29530C8054E94D0
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE
9/12/2024

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS
APPROACH SLAB HEADERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-5
1			3			TOTAL SHEETS
2			4			20

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CHECKED BY :	CHANEY LOWE	DATE :	05/2024
DESIGN ENGINEER:	JACOB H. DUKE	DATE :	06/2024

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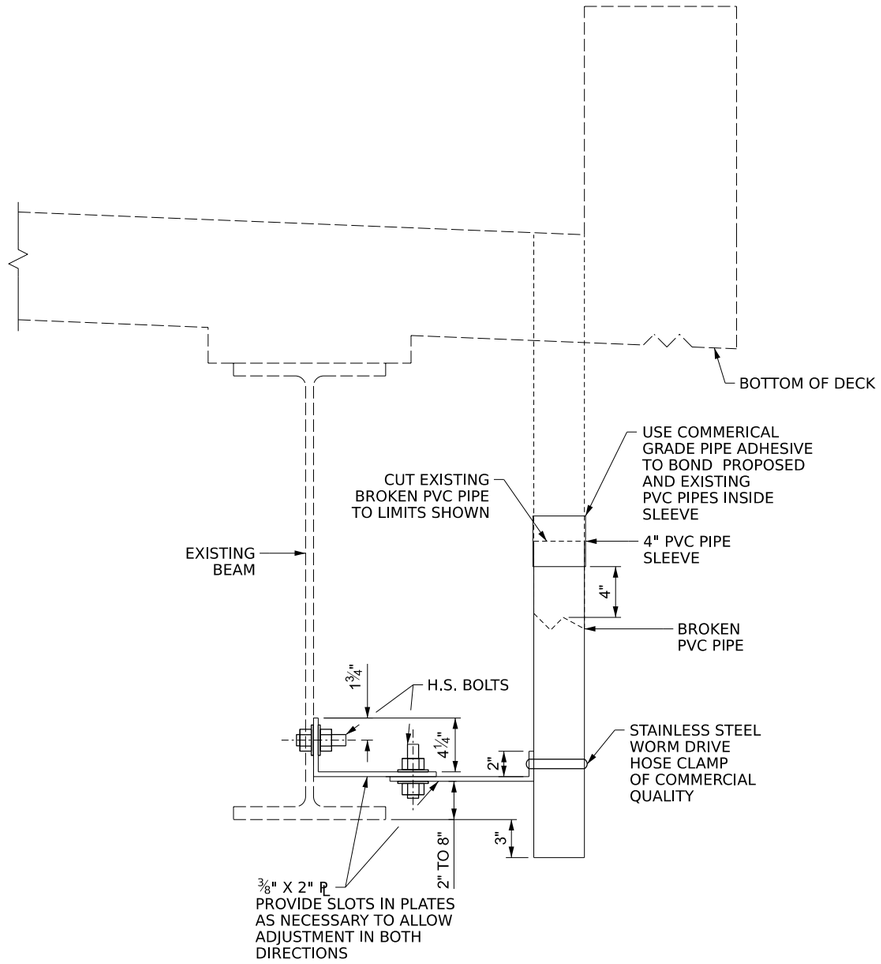
jduke



DRAIN REPAIR DETAIL

SPANS 2 AND 3
RIGHT OVERHANG
13 LOCATIONS TOTAL

NOTES:

CONTRACTOR IS RESPONSBILE TO ADEQUATELY SIZE CONNECTION PLATES.

FOR MATERIAL PROPERTIES, SEE STANDARD SPECIFICATIONS.

THE REMOVAL AND DISPOSAL OF ALL BROKEN HARDWARE SHALL BE CONSIDERED INCIDENTAL TO THE INSTALLATION OF THE PROPOSED DRAINPIPES.

FOR REPAIRS TO EXISTING DRAINPIPES, SEE SPECIAL PROVISIONS.

ALL PVC SHALL BE SCHEDULE 40 OR EQUIVALENT.

DRAINPIPE DETAILS ARE TAKEN FROM THE ORIGINAL PLANS. REPLACE BROKEN OR MISSING PLATES IN KIND AS SHOWN IN THESE DETAILS AND AS SHOWN ON THE ORIGINAL PLANS.

AS-BUILT REPAIR QUANTITY TABLE

	ESTIMATE	ACTUAL
DRAINPIPE REPAIRS	13 EA	

PROJECT NO. BP13-R050
MADISON COUNTY
BRIDGE NO. 560528

Signed by: Jacob Duke 29530C8054E0409...
9/12/2024
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK DRAIN REPAIRS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-6
1			3			TOTAL SHEETS
2			4			20

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CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
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jduke

AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS

	SPAN 1		SPAN 2		SPAN 3	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	334 SY		334 SY		334 SY	
HYDRO-DEMOLITION OF BRIDGE DECK	334 SY		334 SY		334 SY	
CLASS II SURFACE PREPARATION	4.5 SY		3.2 SY		1.7 SY	
CLASS III SURFACE PREPARATION	-- SY		-- SY		-- SY	
LATEX OVERLAY - VERY EARLY STRENGH (LMC-VES)	13.9 CY		13.9 CY		13.9 CY	
PLACING AND FINISHING LMC OVERLAY	334 SY		334 SY		334 SY	
GROOVING BRIDGE FLOORS	2812 SF		2812 SF		2812 SF	
EPOXY RESIN INJECTION (ERI)	27 LF		-		-	

	BEGIN APP. SLAB	
	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	115 SY	
HYDRO-DEMOLITION OF BRIDGE DECK	115 SY	
CLASS II SURFACE PREPARATION	-- SY	
CLASS III SURFACE PREPARATION	-- SY	
LATEX OVERLAY - VERY EARLY STRENGH (LMC-VES)	4.1 CY	
PLACING AND FINISHING LMC OVERLAY	115 SY	
GROOVING BRIDGE FLOORS	957 SF	
EPOXY RESIN INJECTION (ERI)	36 LF	

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION, CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 0 TO 1½" BASED ON VISUAL INSPECTION.

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

THE LMC CONTRACTOR SHALL PROVIDE A METHOD OF HANDLING UNEXPECTED BLOW THROUGH OF THE DECK DURING HYDRO- DEMOLITION.

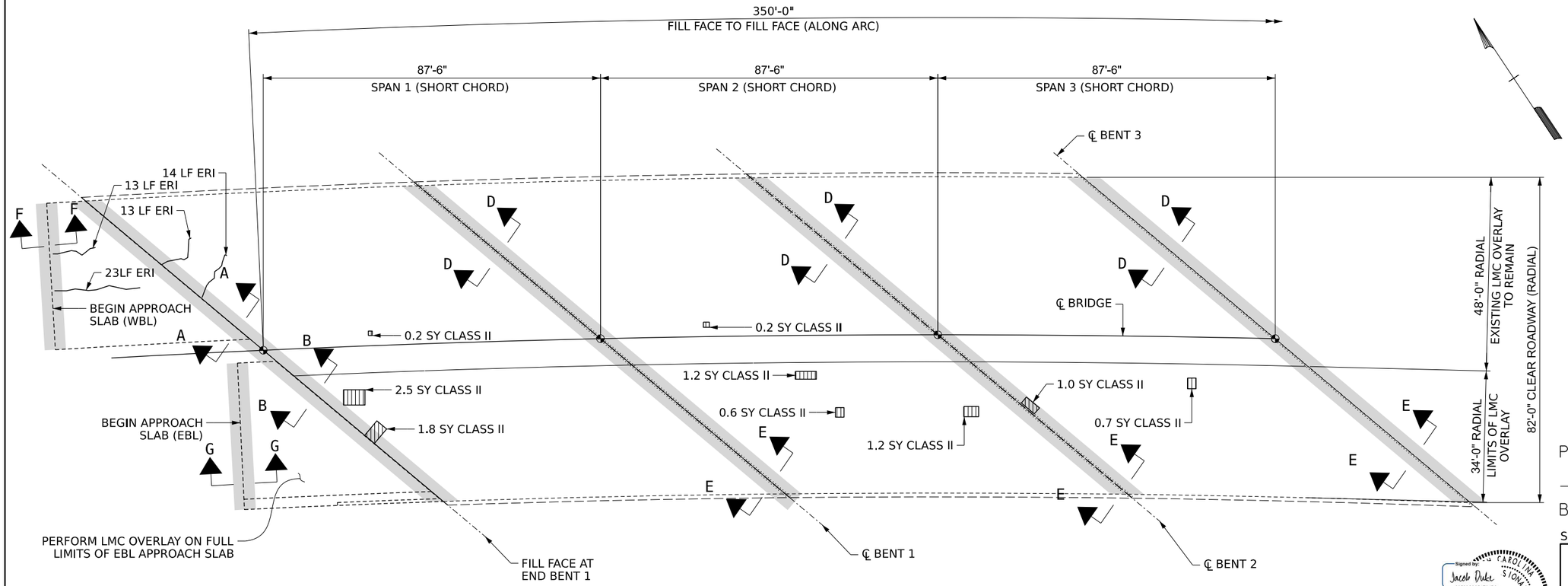
DURING CONSTRUCTION, BERMS OR APPROPRIATE COUNTERMEASURES SHALL BE USED TO ENSURE HYDRO-DEMOLITION WATER DOES NOT MIGRATE INTO ACTIVE TRAVEL LANES.

THE CONTRACTOR SHALL COLLECT, TREAT AND DISP0SE OF RUN-OFF WATER FROM HYDRO-DEMOLITION PROCESS, SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS.

FOR CONCRETE FOR DECK REPAIR, SEE SPECIAL PROVISIONS.

FOR PLACING AND FINISHING LATEX MODIFIED CONCRETE OVERLAY-VERY EARLY STRENGTH (LMC-VES), SEE LATEX MODIFIED CONCRETE-VERY EARLY CONCRETE SPECIAL PROVISIONS.

WORK THIS SHEET WITH THE SHEETS FOR "TYPICAL SECTION", "DECK REPAIR DETAILS" AND "JOINT DETAILS".



PARTIAL PLAN

BRIDGE JOINT DEMOLITION

CLASS II SURFACE PREP.

CLASS III SURFACE PREP.

SHOTCRETE REPAIR AREA (SCR)

EPOXY RESIN INJECTION (ERI)

PROJECT NO. BP13-R050

MADISON COUNTY

BRIDGE NO. 560528

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
SPANS 1 - 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-7
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

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jduke

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NORTH CAROLINA SEAL 043777 ENGINEER JACOB H. DUKE
9/12/2024

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AS-BUILT REPAIR QUANTITY TABLE

TOP OF DECK REPAIRS	SPAN 4		END APP. SLAB	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
SCARIFYING BRIDGE DECK	334 SY		150 SY	
HYDRO-DEMOLITION OF BRIDGE DECK	334 SY		150 SY	
CLASS II SURFACE PREPARATION	160.9 SY		1.8 SY	
CLASS III SURFACE PREPARATION	-- SY		-- SY	
LATEX OVERLAY - VERY EARLY STRENGH (LMC-VES)	13.9		6.3 CY	
PLACING AND FINISHING LMC OVERLAY	334 SY		150 SY	
GROOVING BRIDGE FLOORS	2812 SF		1305 SF	

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE AS-BUILT REPAIR QUANTITY TABLE.

CONCRETE COVER FOR TOP BARS IN THE DECK SLAB IS 2" PER THE EXISTING BRIDGE PLANS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING SCARIFICATION, CURRENT AVERAGE COVER IS EXPECTED TO BE FROM 0 TO 1½" BASED ON VISUAL INSPECTION.

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

THE LMC CONTRACTOR SHALL PROVIDE A METHOD OF HANDLING UNEXPECTED BLOW THROUGH OF THE DECK DURING HYDRO- DEMOLITION.

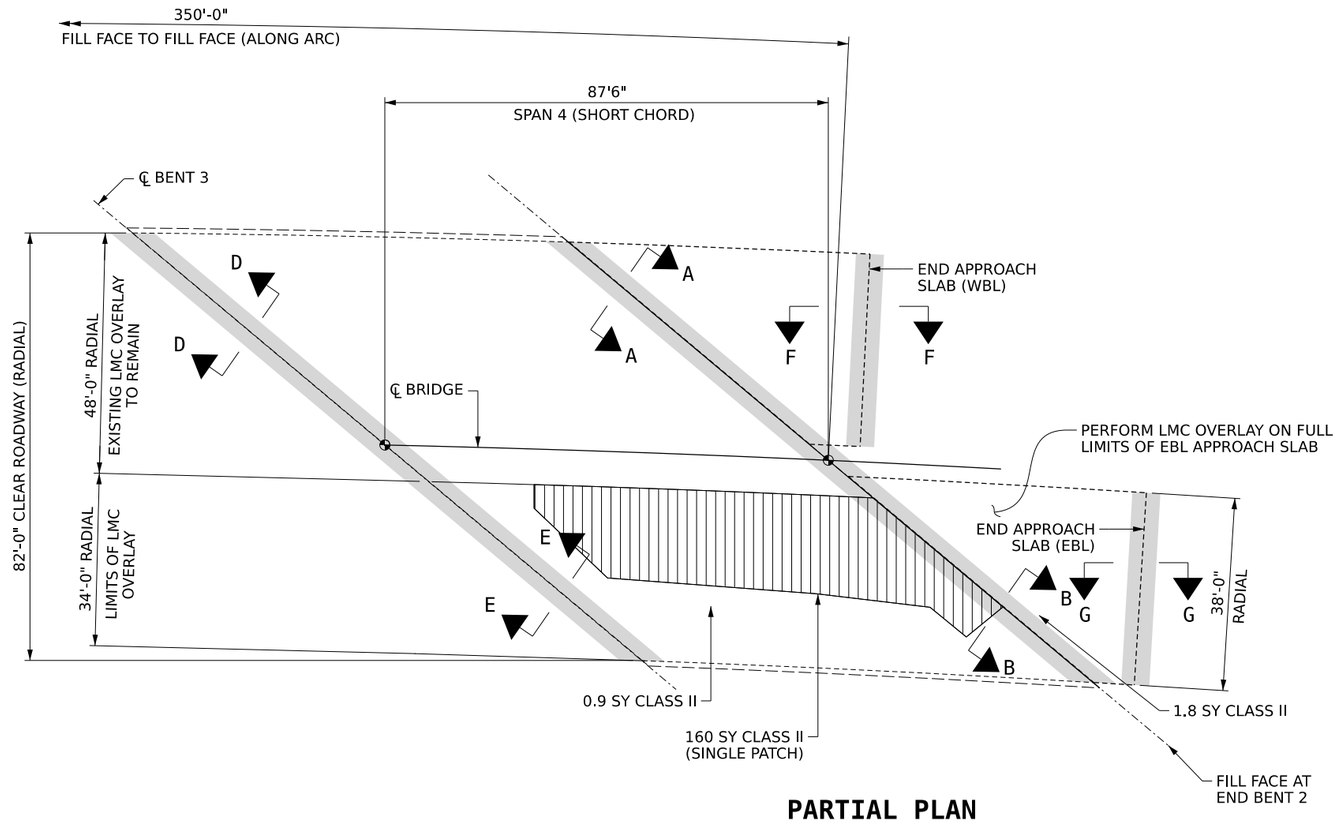
DURING CONSTRUCTION, BERMS OR APPROPRIATE COUNTERMEASURES SHALL BE USED TO ENSURE HYDRO-DEMOLITION WATER DOES NOT MIGRATE INTO ACTIVE TRAVEL LANES.

THE CONTRACTOR SHALL COLLECT, TREAT AND DISP0SE OF RUN-OFF WATER FROM HYDRO-DEMOLITION PROCESS, SEE OVERLAY SURFACE PREPARATION SPECIAL PROVISIONS.

FOR CONCRETE FOR DECK REPAIR, SEE SPECIAL PROVISIONS.

FOR PLACING AND FINISHING LATEX MODIFIED CONCRETE OVERLAY-VERY EARLY STRENGTH (LMC-VES), SEE LATEX MODIFIED CONCRETE-VERY EARLY CONCRETE SPECIAL PROVISIONS.

WORK THIS SHEET WITH THE SHEETS FOR "TYPICAL SECTION", "DECK REPAIR DETAILS" AND "JOINT DETAILS".



PARTIAL PLAN

BRIDGE JOINT DEMOLITION

CLASS II SURFACE PREP.

CLASS III SURFACE PREP.

SHOTCRETE REPAIR AREA (SCR)

EPOXY RESIN INJECTION (ERI)

PROJECT NO. BP13-R050

MADISON COUNTY

BRIDGE NO. 560528

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS
SPAN 4

NORTH CAROLINA SEAL 043777 ENGINEER JACOB H. DUKE
Signed by: Jacob Duke 29530C8054E94C9...
9/12/2024

KISINGER CAMPO & ASSOCIATES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-8
1			3			TOTAL SHEETS
2			4			20

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

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
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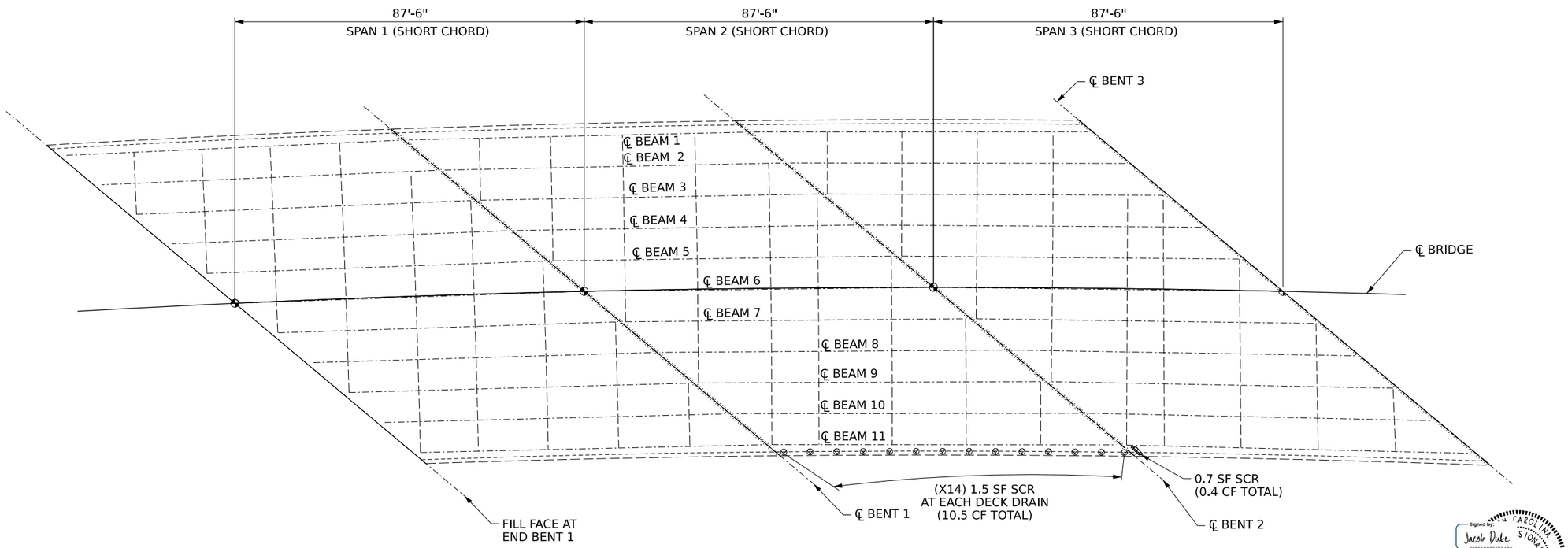
jduke

AS-BUILT REPAIR QUANTITY TABLE

	DECK UNDERSIDE REPAIRS					
	SPAN 1		SPAN 2		SPAN 3	
	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
CONCRETE REPAIRS (CR)	-- CF		-- CF		-- CF	
SHOTCRETE REPAIRS (SCR)	-- CF		10.5 CF		0.4 CF	
EPOXY RESIN INJECTION (ERI)	-- LF		-- LF		-- LF	

LEGEND

	CONCRETE REPAIR AREA (CR)
	SHOTCRETE REPAIR AREA (SCR)
	EPOXY RESIN INJECTION (ERI)



PARTIAL PLAN

PROJECT NO. BP13-R050

MADISON COUNTY

BRIDGE NO. 560528

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK UNDERSIDE REPAIRS
SPANS 1 - 3

Signed by: Jacob Duke
29530C8656E94D9...
NORTH CAROLINA SEAL 043777 ENGINEER JACOB H DUKE
9/12/2024

KISINGER CAMPO & ASSOCIATES
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1			3			TOTAL SHEETS
2			4			20

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

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AS-BUILT REPAIR QUANTITY TABLE

	DECK UNDERSIDE REPAIRS	
	SPAN 4	
	ESTIMATE	ACTUAL
CONCRETE REPAIRS (CR)	-- CF	
SHOTCRETE REPAIRS (SCR)	1.3 CF	
EPOXY RESIN INJECTION (ERI)	-- LF	

LEGEND

- CONCRETE REPAIR AREA (CR)
- SHOTCRETE REPAIR AREA (SCR)
- EPOXY RESIN INJECTION (ERI)

NOTES:

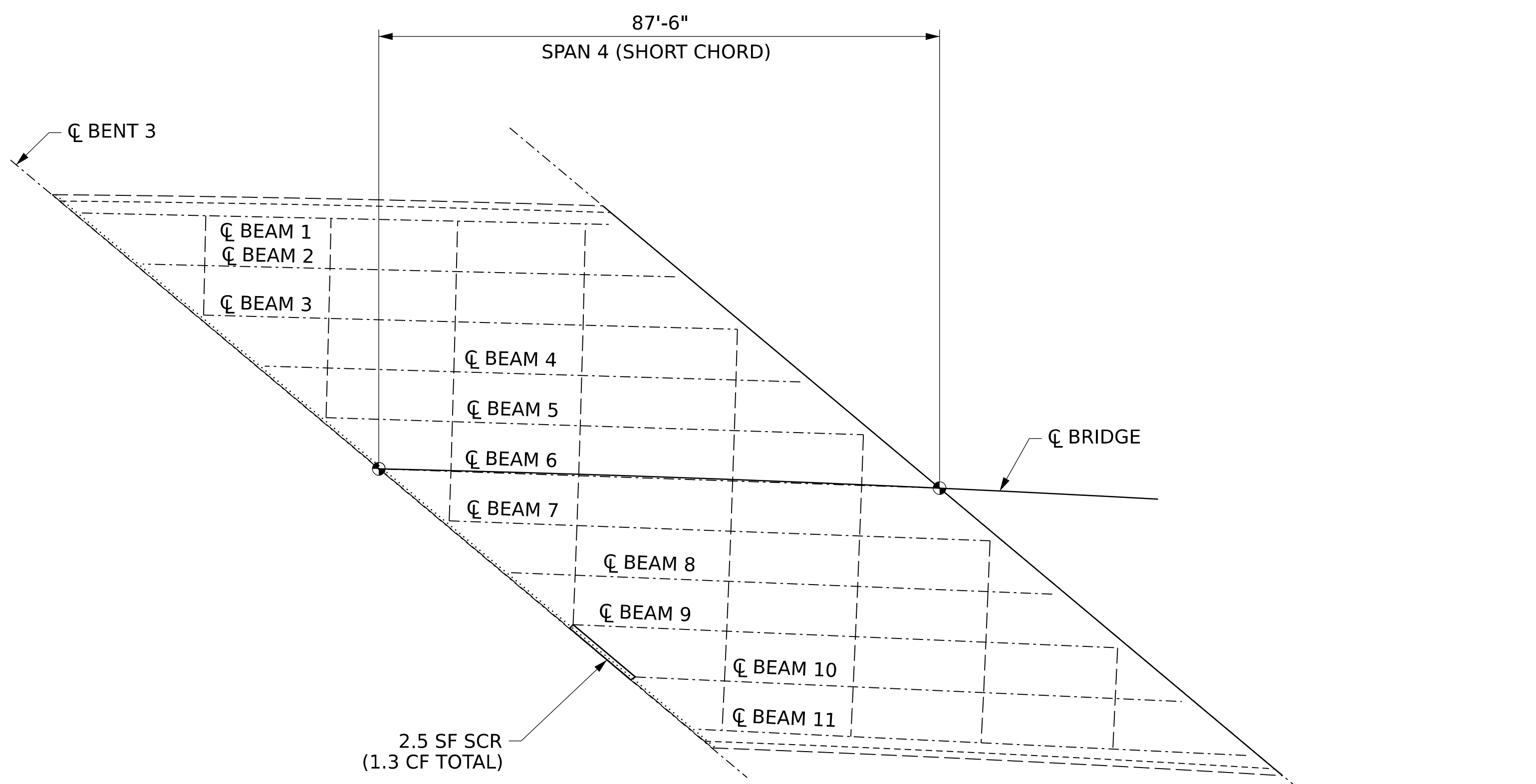
REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE BASED ON THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN IN THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTIONS OF THE REPAIRS AND ENTER THE ACTUAL QUANTITIES INTO THE AS-BUILT REPAIR QUANTITY TABLE.

WORK THIS SHEET WITH "TYPICAL SECTION" SHEET.

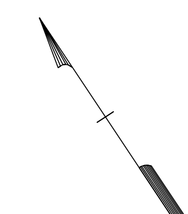
WORK THIS SHEET WITH THE "CONCRETE RESTORATION" DETAILS.

WORK THIS SHEET WITH THE "DECK REPAIRS DETAIL" SHEET.

WORK THIS SHEET WITH THE "DECK DRAIN REPAIRS" SHEET.



PARTIAL PLAN



PROJECT NO. BP13-R050

MADISON COUNTY

BRIDGE NO. 560528

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DECK UNDERSIDE REPAIRS
SPAN 4

SEAL 043777 — JACOB H. DUKE — ENGINEER — Signed by: Jacob Duke — 9/12/2024

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
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2			4		

SHEET NO. S2-10
TOTAL SHEETS 20

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
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DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
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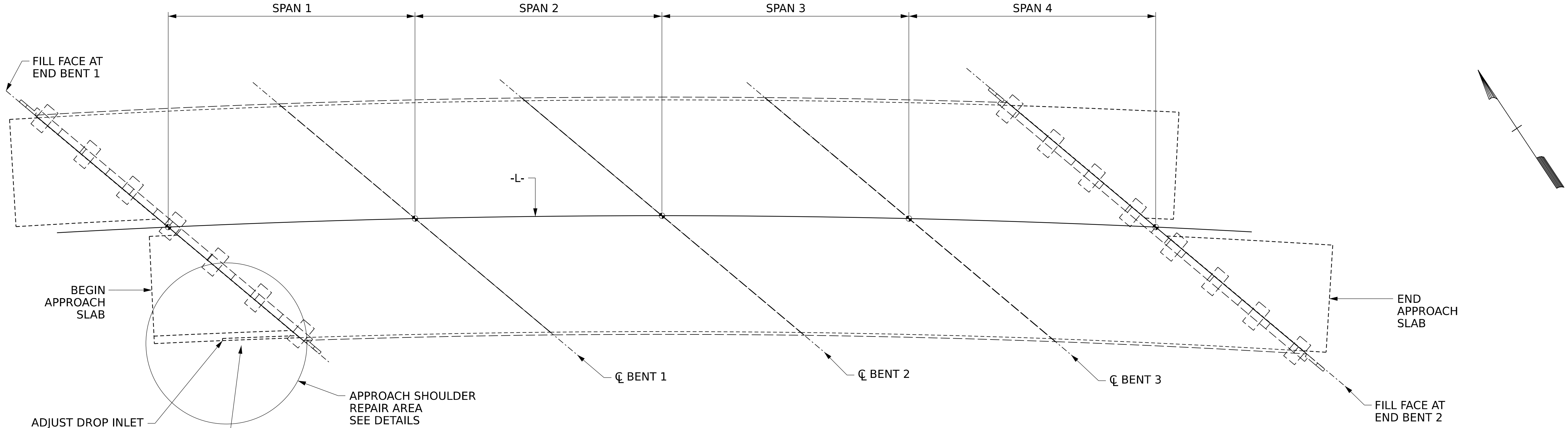
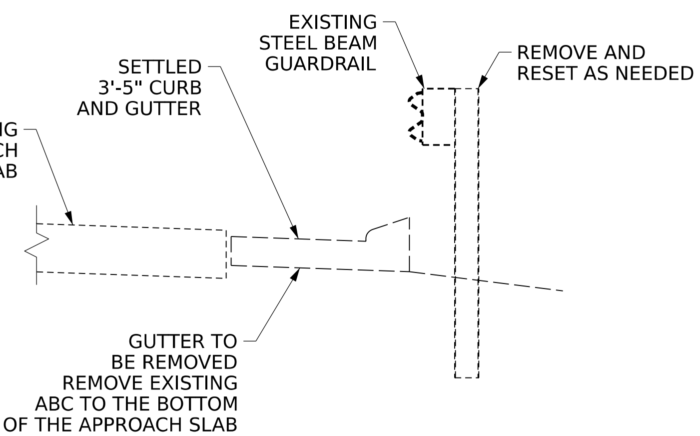
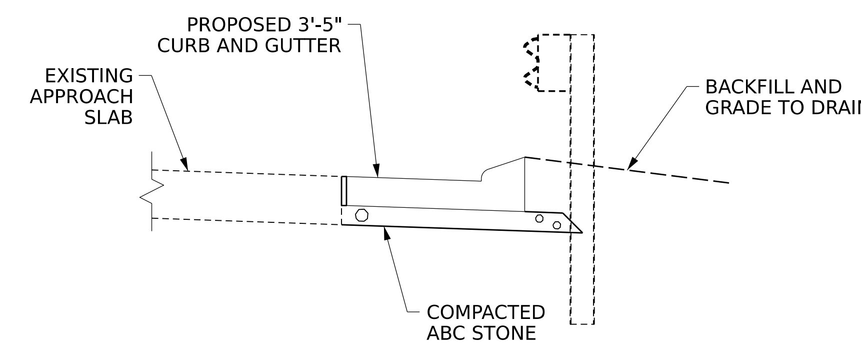
jduke





EXISTING SECTION



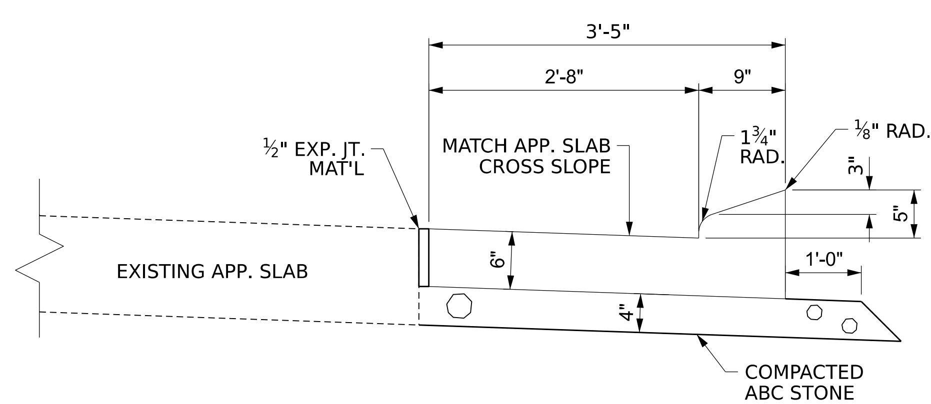
PROPOSED SECTION

NOTES:

1. REMOVAL AND DISPOSAL OF THE EXISTING CONCRETE SHOULDER SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE PROPOSED 3'-5" CURB AND GUTTER.
2. FOR PROPOSED 3'-5" CURB AND GUTTER, SEE PLAN DIMENSIONS, STANDARD DRAWINGS AND STANDARD SPECIFICATIONS.
3. REFER TO STANDARD DRAWINGS 846.01, 846.02 AND 846.04 FOR MORE DETAILS.
4. REMOVE AND RESET GUARDRAIL ANCHOR UNIT AS NEEDED.
5. GRADE AREA TO DRAIN BEHIND PROPOSED 3'-5" CURB AND GUTTER AND AROUND WING WALL.
6. COMPLETE THIS PROPOSED WORK PRIOR TO REPLACING JOINTS AT END BENTS.
7. REMOVE EXISTING ABC STONE UNDER EXISTING CONCRETE SHOULDER TO THE BOTTOM OF THE APPROACH SLAB. DO NOT REUSE REMOVED ABC STONE. REMOVAL AND DISPOSAL OF EXISTING ABC STONE SHALL BE INCIDENTAL TO THE VARIOUS PAY ITEMS OF THIS PROJECT.

AS-BUILT REPAIR QUANTITY TABLE

APPROACH ROADWAY		
	ESTIMATE	ACTUAL
AGGREGATE BASE COURSE (ABC)	2 TON	
3'-5" CURB & GUTTER	17 LF	
REMOVE AND RESET EXISTING GUARDRAIL	25 LF	
ADJUSTMENT OF DROP INLETS	1 EA	



PROPOSED 3'-5" GUTTER DETAILS

SOME FEATURES NOT SHOWN FOR CLARITY

PROJECT NO. BP13-R050
MADISON COUNTY
BRIDGE NO. 560528

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH SHOULDER REPAIRS

Signed by: Jacob Duke
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE
9/12/2024

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

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1			3			TOTAL SHEETS
2			4			20

DRAWN BY :	FIDEL L. FLORES	DATE :	05/2024
CHECKED BY :	CHANEY LOWE	DATE :	05/2024
DESIGN ENGINEER:	JACOB H. DUKE	DATE :	06/2024

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AS-BUILT REPAIR QUANTITY TABLE

	ESTIMATE	ACTUAL
CLEANING & PAINTING EXISTING BEARING WITH HRCSA	34 EA	
TYPE I BRIDGE JACKING	2 EA	

(CPB) CLEAN AND PAINT BEARING

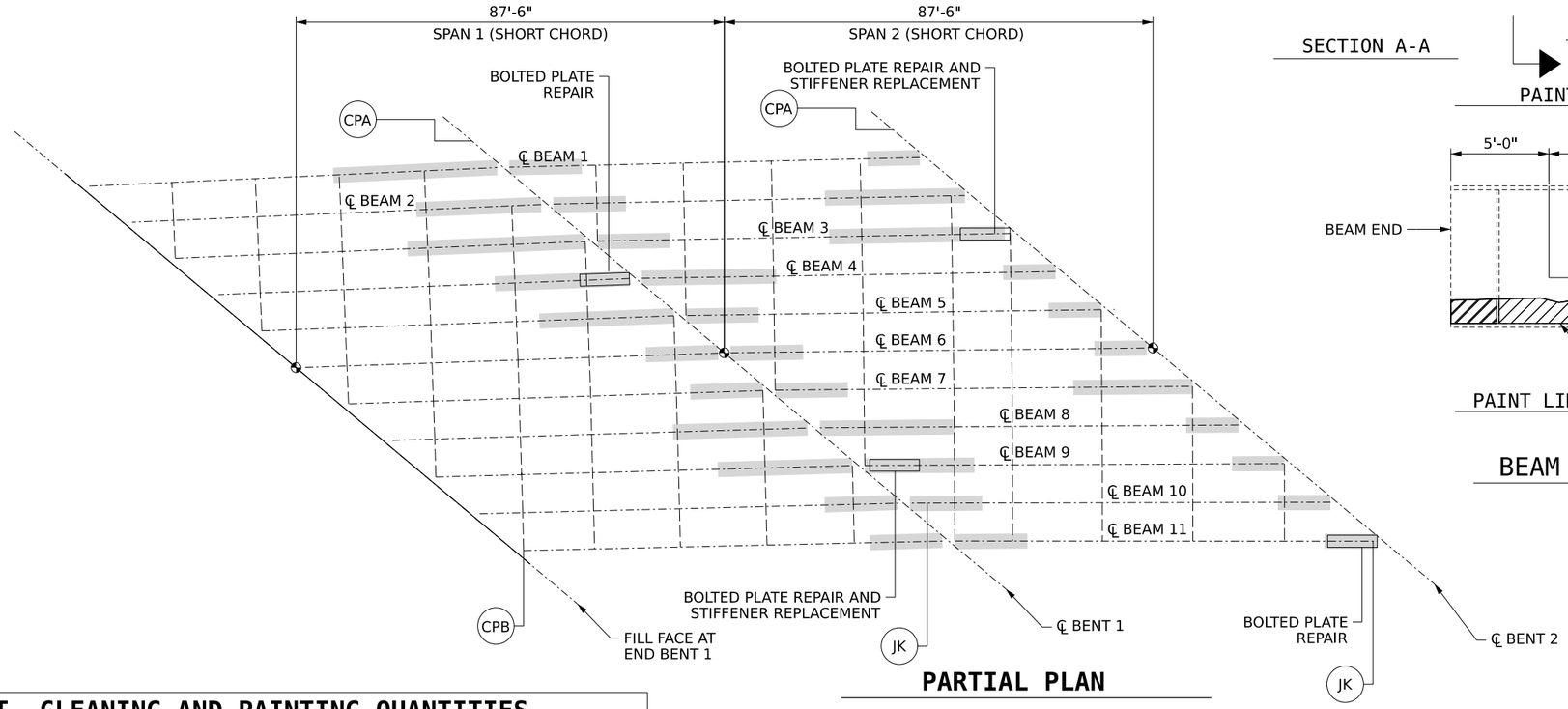
(CPA) CLEAN AND PAINT ALL BEARINGS AT BENT

(JK) JACKING

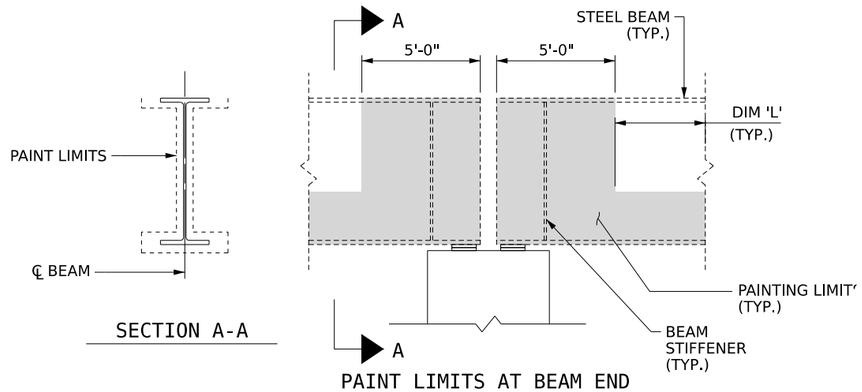
CLEAN AND PAINT BEAM

NOTES:

FOR NOTES AND DETAILS, SEE SHEET 2 AND 4.

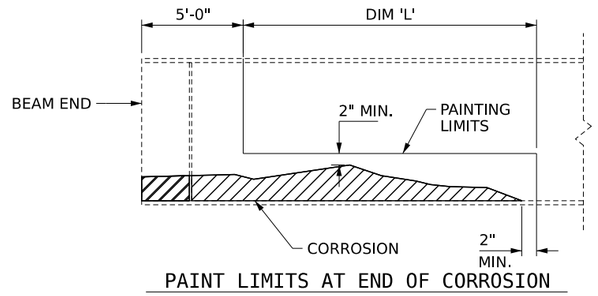


PARTIAL PLAN



SECTION A-A

PAINT LIMITS AT BEAM END



PAINT LIMITS AT END OF CORROSION

BEAM PAINTING DETAILS

EST. CLEANING AND PAINTING QUANTITIES

	SPAN 1			SPAN 2		
	BEAM END	DIM 'L'	TOTAL SQ. FT.	BEAM END	DIM 'L'	TOTAL SQ. FT.
BEAM 1	30 SF	-	30 SF	60 SF	-	60 SF
BEAM 2	30 SF	10 FT	100 SF	60 SF	15 FT	110 SF
BEAM 3	30 SF	30 FT	160 SF	60 SF	45 FT	200 SF
BEAM 4	30 SF	19 FT	130 SF	60 SF	-	60 SF
BEAM 5	30 SF	-	30 SF	60 SF	-	60 SF
BEAM 6	30 SF	-	30 SF	60 SF	-	60 SF
BEAM 7	30 SF	-	30 SF	60 SF	10 FT	100 SF
BEAM 8	30 SF	10 FT	100 SF	60 SF	-	100 SF
BEAM 9	30 SF	10 FT	100 SF	60 SF	-	100 SF
BEAM 10	30 SF	-	30 SF	60 SF	-	60 SF
BEAM 11	30 SF	-	30 SF	60 SF	-	60 SF

PROJECT NO. BP13-R050

MADISON COUNTY

BRIDGE NO. 560528

SHEET 1 OF 4

Signed by: Jacob Duke 29530C8054E94D9...
9/12/2024
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

KCA KISINGER CAMPO & ASSOCIATES

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS
SPANS 1 - 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-12
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

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AS-BUILT REPAIR QUANTITY TABLE

	ESTIMATE	ACTUAL
CLEANING & PAINTING EXISTING BEARING WITH HRCSA	34 EA	

(CPB) CLEAN AND PAINT BEARING

(CPA) CLEAN AND PAINT ALL BEARINGS AT BENT

(JK) JACKING

CLEAN AND PAINT BEAM

NOTES:

FOR BRIDGE JACKING, SEE "BRIDGE JACKING" SHEET AND SPECIAL PROVISIONS.

FOR BEAM REPAIR CUT-OUT AND BEAM REPAIR PLATING, SEE SUPERSTRUTURE REPAIR SHEET 3 AND SPECIAL PROVISIONS.

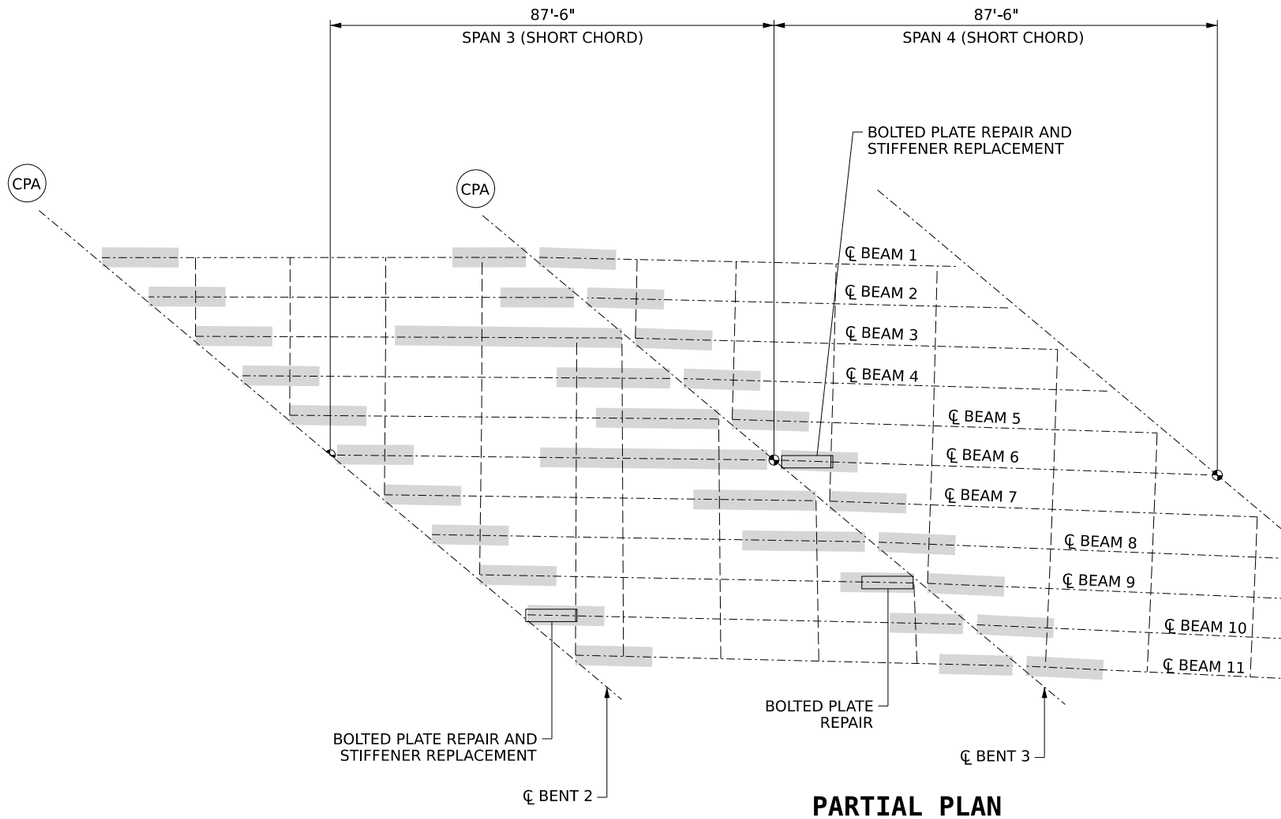
FOR CLEANING & PAINTING EXISTING BEARING WITH HRCSA, SEE SPECIAL PROVISIONS.

FOR CLEANING & PAINTING EXISTING WEATHERING STEEL, SEE SPECIAL PROVISIONS.

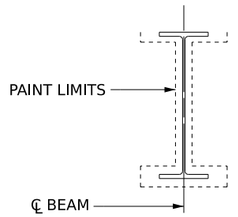
AREAS WHERE CLEANING AND PAINTED ARE CALLED OUT INCLUDE CLEANING AND PAINTING ALL STRUCTURAL STEEL COMPONENTS.

THE ESTIMATED PAINTING QUANTITIES PROVIDED IN THE TABLES ON THESE SHEETS ARE BASED ON INFORMATION COLLECTED DURING SCOPING AND ARE SUBJECT TO CHANGE BETWEEN PLAN DEVELOPMENT AND CONSTRUCTION.

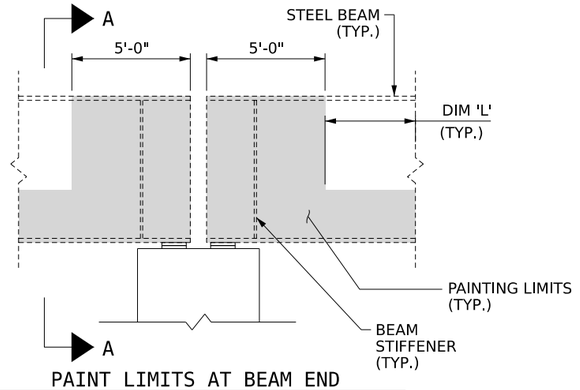
THE ENGINEER IS RESPONSIBLE FOR TO VERIFY DIM 'X' PRIOR TO CLEANING AND PAINTING.



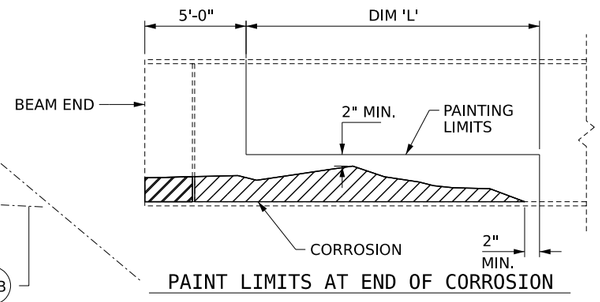
PARTIAL PLAN



SECTION A-A



PAINT LIMITS AT BEAM END



PAINT LIMITS AT END OF CORROSION

BEAM PAINTING DETAILS

EST. CLEANING AND PAINTING QUANTITIES

	SPAN 3			SPAN 4		
	BEAM END	DIM 'L'	TOTAL SQ. FT.	BEAM END	DIM 'L'	TOTAL SQ. FT.
BEAM 1	60 SF	-	60 SF	30 SF	3 FT	70 SF
BEAM 2	60 SF	-	60 SF	30 SF	-	30 SF
BEAM 3	60 SF	25 FT	150 SF	30 SF	3 FT	70 SF
BEAM 4	60 SF	5FT	80 SF	30 SF	-	30 SF
BEAM 5	60 SF	10 FT	100 SF	30 SF	3 FT	70 SF
BEAM 6	60 SF	45 FT	220 SF	30 SF	3 FT	70 SF
BEAM 7	60 SF	3 FT	70 SF	30 SF	3 FT	70 SF
BEAM 8	60 SF	10 FT	100 SF	30 SF	-	30 SF
BEAM 9	60 SF	3 FT	70 SF	30 SF	3 FT	70 SF
BEAM 10	60 SF	-	60 SF	30 SF	-	30 SF
BEAM 11	60 SF	-	60 SF	30 SF	-	30 SF

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

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PROJECT NO. BP13-R050
MADISON COUNTY
BRIDGE NO. 560528
SHEET 2 OF 4

NORTH CAROLINA SEAL 043777 ENGINEER JACOB H. DUKE
Signed by: Jacob Duke 29530C8054E04C9...
9/12/2024

KCA KISINGER CAMPO & ASSOCIATES

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS
SPANS 3 - 4

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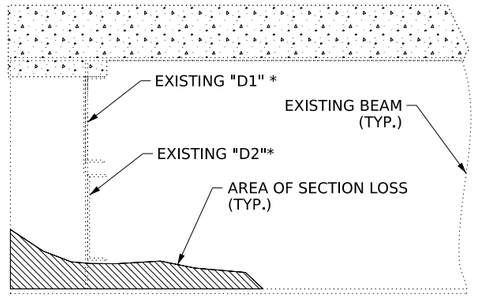
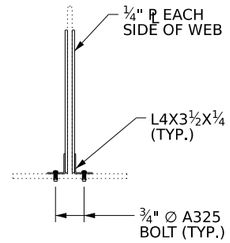
1			3		
2			4		

SHEET NO. S2-13
TOTAL SHEETS 20



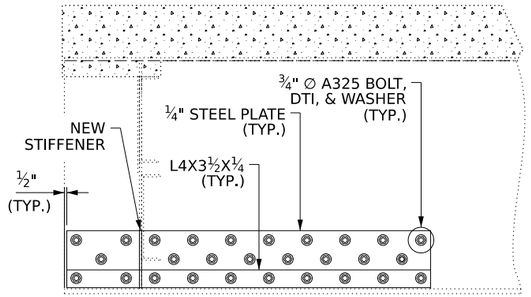
EXISTING BEAM WITH SECTION LOSS

* CORRESPONDS TO ORIGINAL PLANS LOCATION OF DIAPHRAGMS



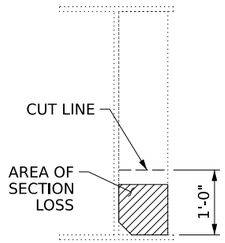
END ELEVATION

(WEB PLATE BOLTS NOT SHOWN FOR CLARITY)

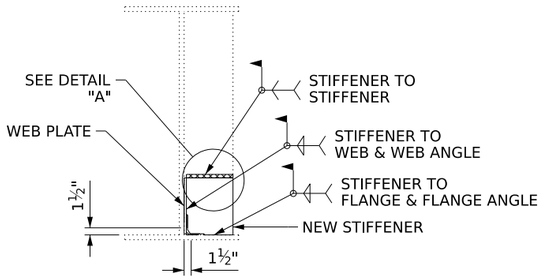


STEEL PLATING DETAIL

(TYPE "A")

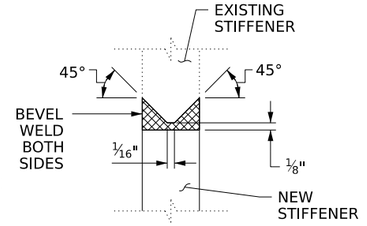


STIFFENER / CONN. ℄ SECTION LOSS

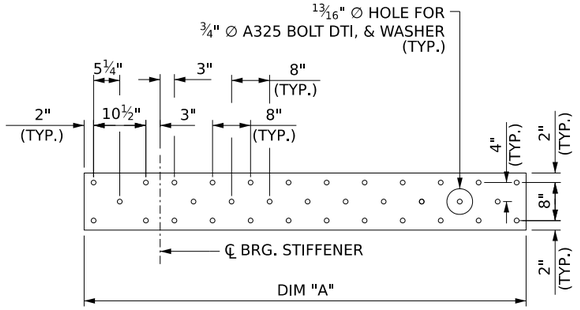


STIFFENER / CONN. ℄ SECTION LOSS

(FLANGE ANGLE NOT SHOWN FOR CLARITY)

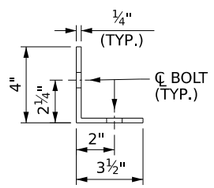


DETAIL "A"



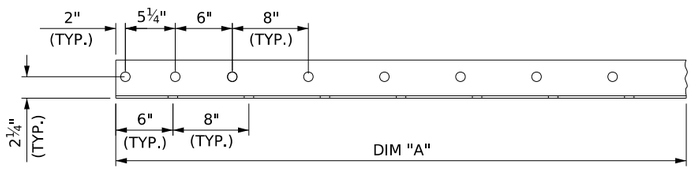
STEEL PLATE DETAIL

(TYPE "A")
(SEE SHEET 4 OF 4 FOR DIM "A")



STEEL ANGLE PROFILE

(BOLT AND FASTENER NOT SHOWN FOR CLARITY)



STEEL ANGLE DETAIL

(TYPE "A")

PROJECT NO. BP13-R050

MADISON COUNTY

BRIDGE NO. 560528

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

Signed by: Jacob Duke 29530C8054E94D9...
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE
9/12/2024

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
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SHEET NO. S2-14
TOTAL SHEETS 20

DRAWN BY : FIDEL L. FLORES DATE : 06/2024
CHECKED BY : CHANEY LOWE DATE : 06/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
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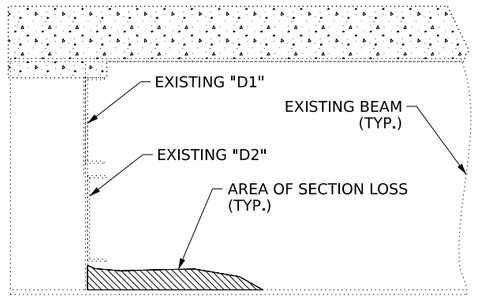
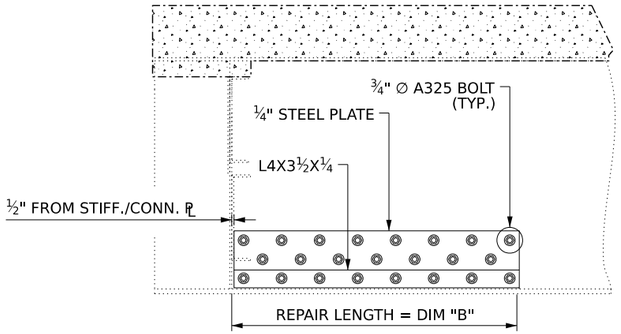
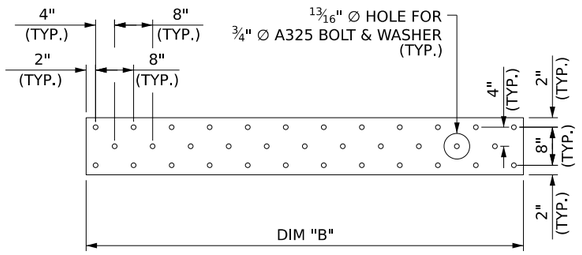
jduke



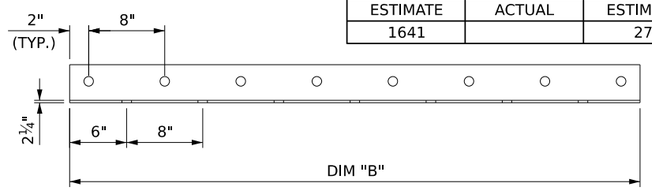
EXISTING BEAM WITH SECTION LOSS



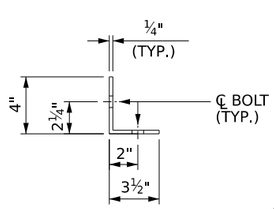
STEEL PLATING DETAIL
(TYPE "B")



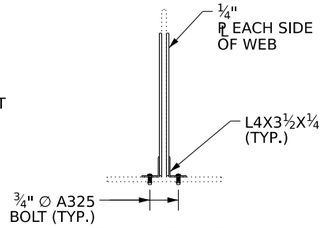
STEEL PLATE DETAIL
(TYPE "B")



STEEL ANGLE DETAIL
(TYPE "B")



STEEL ANGLE PROFILE



END ELEVATION

REPAIR TYPES:

TYPE A: INCLUDES THE REPLACEMENT OF BEARING STIFFENER.

TYPE B: DOES NOT INCLUDE THE REPLACEMENT OF THE BEARING STIFFENER.

NOTES:

FOR EACH BEAM BEING REPAIRED, CONTRACTOR SHALL FIELD VERIFY DIMENSIONS. THE CONTRACTOR SHALL VERIFY THE PLATE DIMENSIONS PRIOR TO ORDERING MATERIALS. THE DIMENSIONS SHOWN ON THE PLANS MAY BE ADJUSTED TO FIT IN THE PROVIDED SPACE. ALL MODIFICATIONS TO PLATE DIMENSIONS BASED ON FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEER.

THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL BOLT HOLE LOCATIONS PRIOR TO CUTTING HOLES. ALL MODIFICATIONS TO THE BOLT HOLE LOCATIONS BASED ON FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEER.

REPAIR PLATES SHALL BE NEW, AND SHALL MEET THE SAME GRADE OF THE EXISTING STEEL MEMBER OR BETTER.

PLATES SHALL BE SHOP PRIMED PRIOR TO DELIVERY.

FOR HARDWARE REQUIREMENTS, SEE SPECIAL PROVISIONS FOR BOLTED BEAM REPAIRS.

SEE SPECIAL PROVISIONS FOR BOLTED BEAM REPAIR.

BEAM REPAIR LOCATIONS

SPAN	BEAM	LOCATION	DIM "A"	DIM "B"	REPAIR TYPE
1	4	BENT 1	-	5'-0"	B
2	3	BENT 2	5'-0"	-	A
2	9	BENT 1	10'-0"	-	A
2	11	BENT 2	-	5'-0"	B
3	9	BENT 3	-	10'-0"	B
3	10	BENT 2	10'-0"	-	A
4	6	BENT 3	5'-0"	-	A

BEAM REPAIR QUANTITY TABLE

STEEL PLATES		STIFFENER	
LBS.		LBS.	
ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
1641		27	

REPAIR SEQUENCE:

REMOVE LIVE LOAD FROM REPAIR AREA BY EITHER CLOSING BRIDGE TO TRAFFIC OR SHIFTING TRAFFIC AWAY FROM REPAIR AREA.

COORDINATE WITH MATERIALS AND TEST UNIT AT LEAST 4 DAYS PRIOR TO ANTICIPATED WORK.

REPAIR PLATES SHALL BE NEW, AND SHALL BET THE SAME GRADE OF THE EXISTING STEEL MEMBER OR BETTER.

IF NECESSARY, REMOVE EXISTING STIFFENER TO INSTALL BOLTED PLATE REPAIR. REPLACE WITH A NEW STIFFENER PLATE OR SIMILAR SIZE.

IF PAINTING THE STEEL, CLEAN AND BLAST STEEL AS REQUIRED, PRIOR TO PERFORMING STEEL REPAIRS. OTHERWISE, MECHANICALLY CLEAN RUST, SCALE, AND EXISTING PAINT TO AT LEAST 3" BEYOND REPAIR AREA.

FULLY WELD ALONG TOP AND SIDES OF THE PLATES AS SHOWN.

ALL WELDING SHALL BE IN ACCORDANCE WITH CURRENT APPLICABLE AWS AND NCDOT STANDARD SPECIFICATIONS.

ALL WELDS SHALL BE INSPECTED AND TESTED BY THE NCDOT MATERIALS AND TEST UNIT IN ACCORDANCE WITH THE CURRENT AWS BRIDGE WELDING CODE AND STANDARD SPECIFICATIONS.

IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, AFTER REPAIR, GRIND ALL WELDS FLUSH, AND THOROUGHLY CLEAN AREA TO REMOVE DEBRIS AND OILS FROM THE REPAIR PROCESS.

THE EXISTING FILLET WELD BETWEEN THE BOTTOM OF WEB AND FLANGE MAY BE GRINDED AS NEEDED FOR THE PROPOSED ANGLES TO SIT FLUSH AGAINST THE BEAM.

STEEL DIAPHRAGM CHANNELS AND/OR STIFFENERS MAY BE TEMPORARILY REMOVED, IF NECESSARY, AND RESET AFTER BEAM REPAIR.

CLEANING AND PAINTING REPAIRED STRUCTURAL STEEL SHALL BE PERFORMED AS PART OF THE OVERALL CLEANING AND PAINTING CONTRACT.

FOR CLEANING AND PAINTING EXISTING WEATHERING STEEL, SEE PAINTING EXISTING STRUCTURE SPECIAL PROVISION.

DRAWN BY : FIDEL L. FLORES DATE : 06/2024
CHECKED BY : CHANEY LOWE DATE : 06/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
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jduke

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Signed by: Jacob Duke 20530C8054E94D9...
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE
9/12/2024

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

PROJECT NO. BP13-R050
MADISON COUNTY
BRIDGE NO. 560528
SHEET 4 OF 4

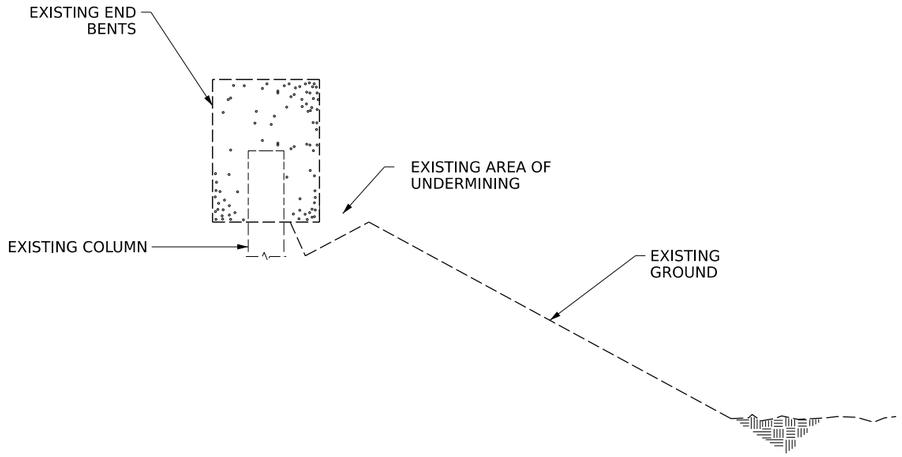
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE REPAIRS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-15
1			3			TOTAL SHEETS
2			4			20

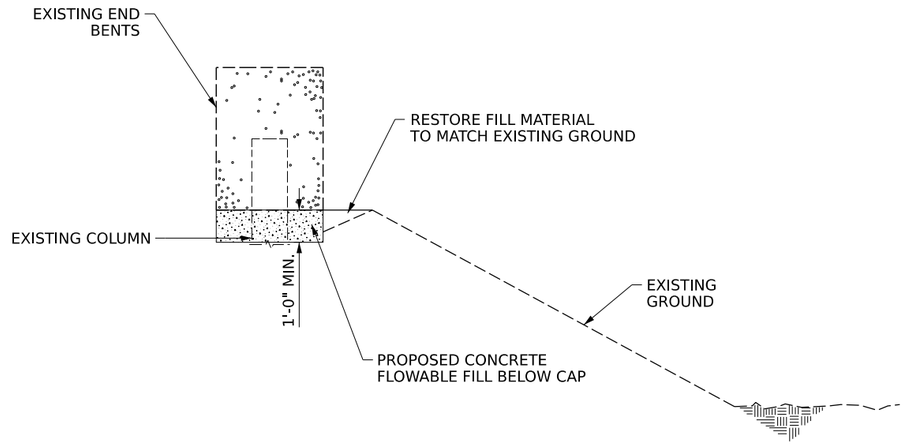
AS-BUILT REPAIR QUANTITY TABLE

CAP UNDERMINING	QUANTITIES	
	ESTIMATE	ACTUAL
FLOWABLE FILL	4 CY	
UNCLASSIFIED EXCAVATION	4 CY	



END BENT SECTION

(EXISTING CAP UNDERMINING)



END BENT SECTION

(PROPOSED UNDERMINING REPAIR)

NOTES:

EXCAVATE BELOW THE EXISTING CAP TO 1'-0" MINIMUM WHERE FEASIBLE.

PLACE FLOWABLE FILL FOR THE FULL WIDTH OF CAP, FULLY ENGAGING THE COLUMNS.

FOR FLOWABLE FILL, SEE ROADWAY SPECIAL PROVISIONS.

PROJECT NO. BP13-R050

MADISON COUNTY

BRIDGE NO. 560528

Signed by: Jacob Duke 29530C8054E94D9...
9/12/2024

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

KCA KISINGER CAMPO & ASSOCIATES

301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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SUBSTRUCTURE UNDERMINING REPAIRS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-16
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
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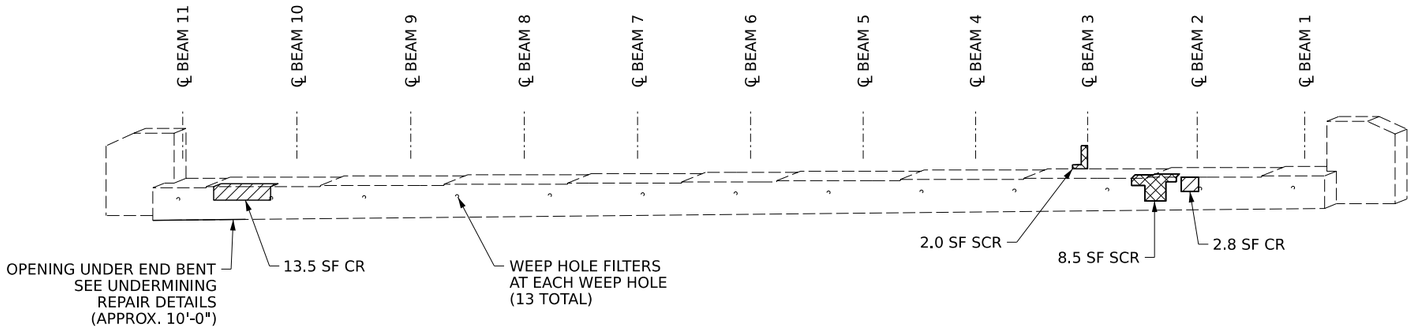
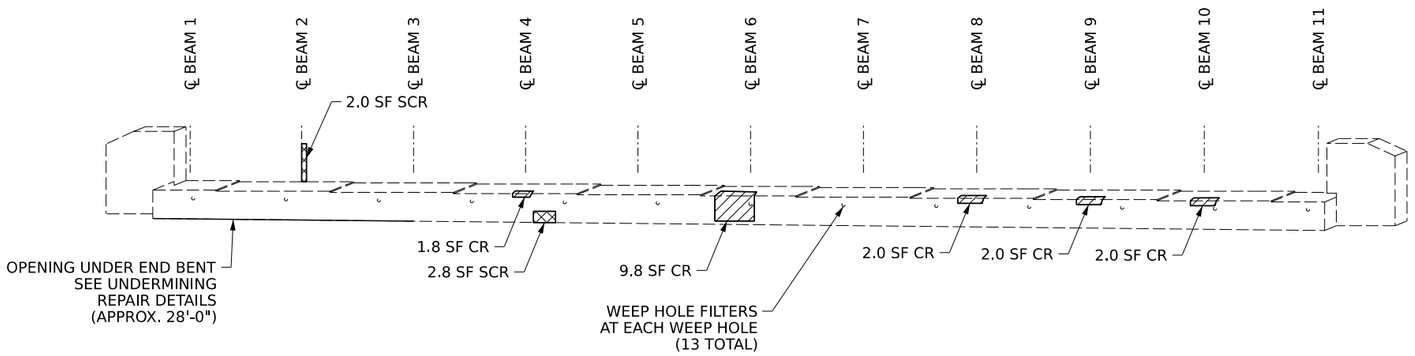
jduke

LEGEND	
	CONCRETE REPAIR AREA (CR)
	SHOTCRETE REPAIR AREA (SCR)
	EPOXY RESIN INJECTION (ERI)



END BENT 1

(LOOKING WEST)



END BENT 2

(LOOKING EAST)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/BACKWALL	15.3	7.7		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	33.9	17.0		
COLUMN/PILE	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
COLUMN/PILE	-			
EPOXY COAT CAPS	AREA SQ. FT			
TOP OF CAPS	413			
WEEP HOLE FILTERS	EACH			
CAPS	26			

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=$\frac{1}{16}$" AT EACH BENT AND END BENT AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED TO BE 2" ON THE CAP AND FROM 1½" TO 2" ON THE COLUMNS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING EXCAVATION/ DEMOLITION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO THE CAPS MAY REQUIRE BRIDGE JACKING. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

PERFORM ALL CONCRETE REPAIRS PRIOR TO APPLYING THE EPOXY COATING.

TOP OF CAPS SHOULD BE CLEAN AND CLEAR OF DEBRIS PRIOR TO THE APPLICATOIN OF THE EPOXY COATING.

COAT ALL THE FREE SURFACE AREA ON THE TOP OF THE CAPS, INCLUDING CHAMFERS, WITH EPOXY COATINGS. DO NOT COAT UNDER BEARING AREAS.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS. AND STANDARD SPECIFICATIONS SECTION 420-18.

PROJECT NO. BP13-R050

MADISON COUNTY

BRIDGE NO. 560528

Signed by: Jacob Duke 29530C8054E9409...
9/12/2024

NORTH CAROLINA SEAL 043777 ENGINEER JACOB H. DUKE

KCA KISINGER CAMPO & ASSOCIATES

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUTURE REPAIRS
END BENTS 1 & 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-17
1			3			TOTAL SHEETS
2			4			20

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DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

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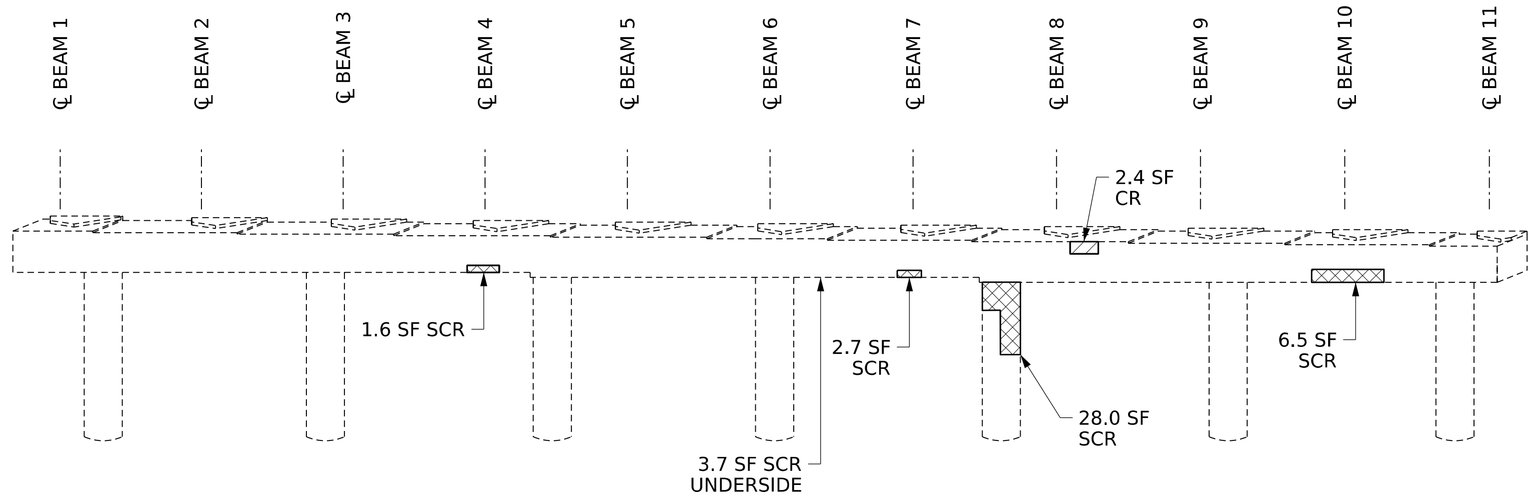
jduke



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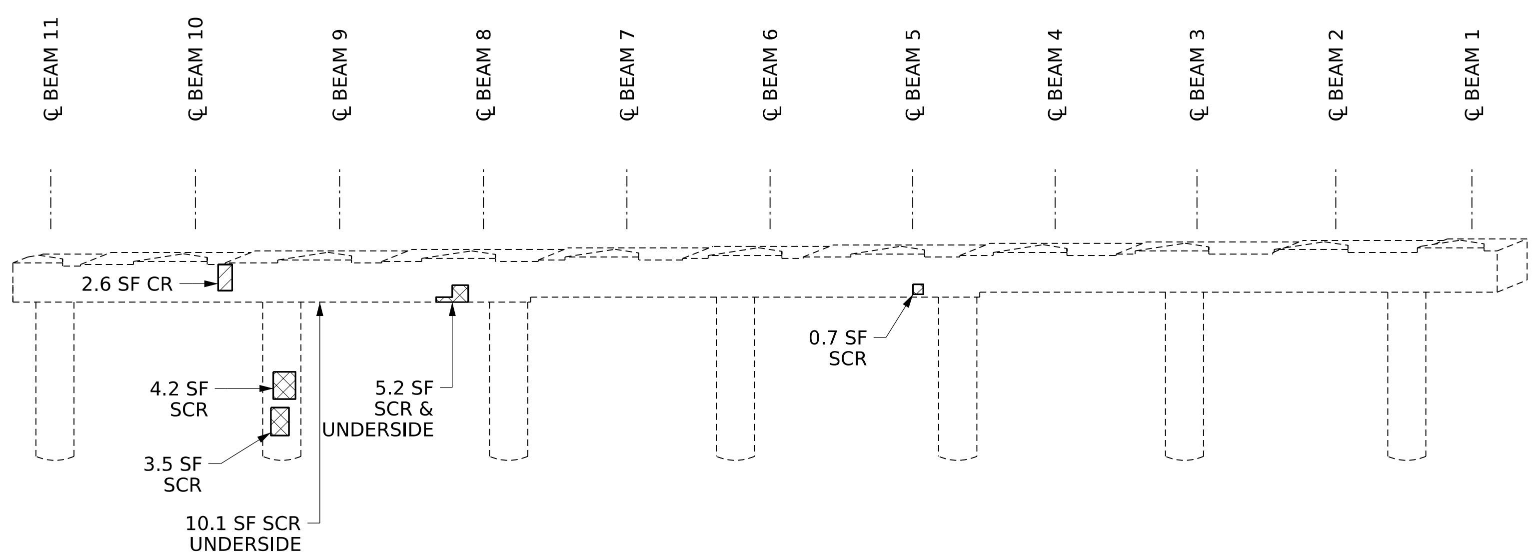
(LOOKING EAST)



BENT 1

(LOOKING WEST)

LEGEND

(hatch)	CONCRETE REPAIR AREA (CR)
(cross-hatch)	SHOTCRETE REPAIR AREA (SCR)
(line)	EPOXY RESIN INJECTION (ERI)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/BACKWALL	20.4	10.2		
COLUMN/PILE	35.7	17.9		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	5.0	2.5		
COLUMN/PILE	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
COLUMN/PILE	-			
EPOXY COAT CAPS	AREA SQ. FT			
TOP OF CAPS	432			

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

NOTES:

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FOR EPOXY COATING, SEE SPECIAL PROVISIONS. AND STANDARD SPECIFICATIONS SECTION 420-18.

PROJECT NO. BP13-R050

MADISON COUNTY

BRIDGE NO. 560528

Signed by: Jacob Duke
29530C8054E9406...
SEAL 043777
CAROLINA PROFESSIONAL ENGINEER JACOB H. DUKE
9/12/2024

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUTURE REPAIRS
BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-18
1			3			TOTAL SHEETS
2			4			20

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY :	FIDEL L. FLORES	DATE :	05/2024
CHECKED BY :	CHANEY LOWE	DATE :	05/2024
DESIGN ENGINEER:	JACOB H. DUKE	DATE :	06/2024

9/12/2024
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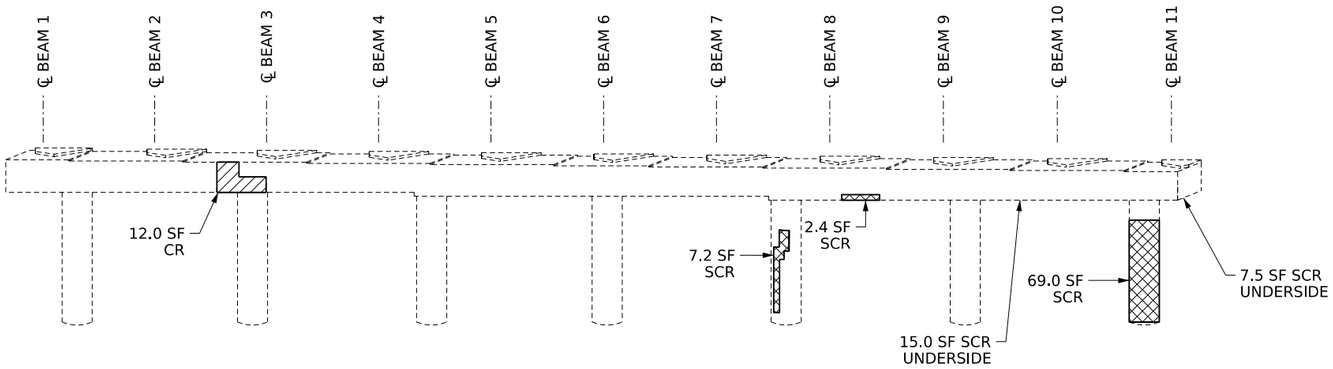
jduke

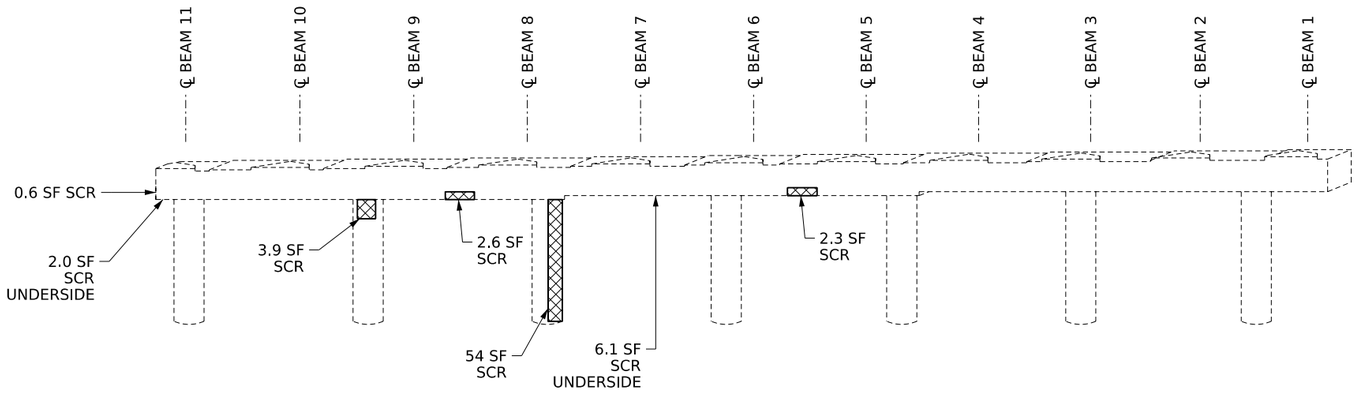
LEGEND

	CONCRETE REPAIR AREA (CR)
	SHOTCRETE REPAIR AREA (SCR)
	EPOXY RESIN INJECTION (ERI)



BENT 2

(LOOKING EAST)



BENT 2

(LOOKING WEST)

AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/BACKWALL	38.5	19.3		
COLUMN/PILE	134.1	67.1		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	12.0	6.0		
COLUMN/PILE	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	-			
COLUMN/PILE	-			
EPOXY COAT CAPS	AREA SQ. FT			
TOP OF CAPS	443			

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO THE CAPS MAY REQUIRE BRIDGE JACKING. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

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PROJECT NO. BP13-R050

MADISON COUNTY

BRIDGE NO. 560528

Signed by: Jacob Duke 29530C8054E9409...
9/12/2024

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

KCA KISINGER CAMPO & ASSOCIATES

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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUTURE REPAIRS
BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-19
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
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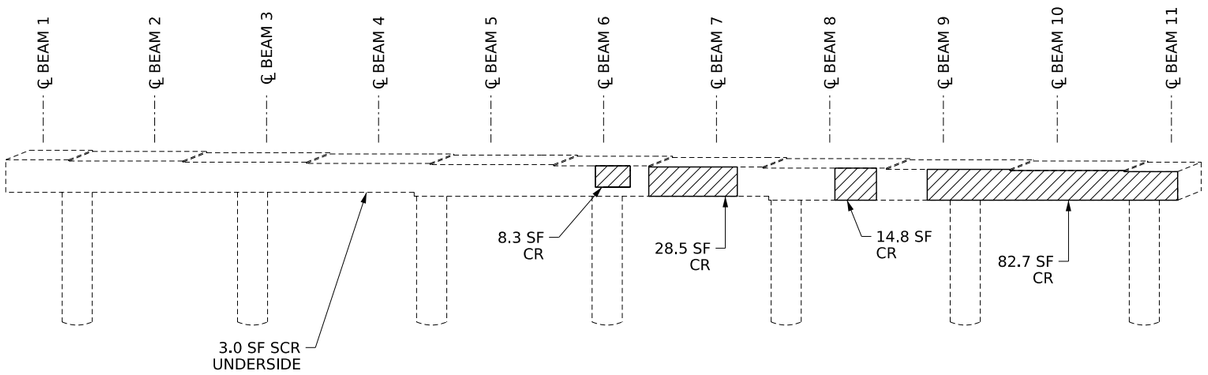
jduke

LEGEND

	CONCRETE REPAIR AREA (CR)
	SHOTCRETE REPAIR AREA (SCR)
	EPOXY RESIN INJECTION (ERI)

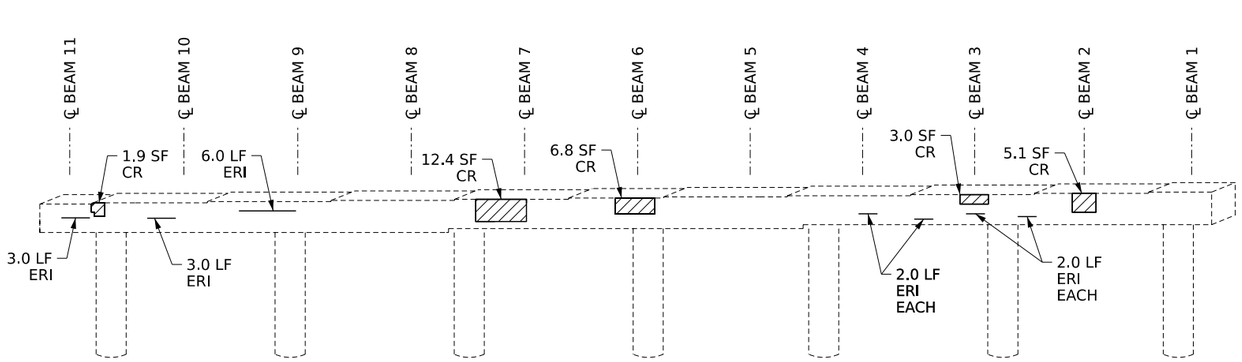
AS-BUILT REPAIR QUANTITY TABLE

	QUANTITIES			
	ESTIMATE		ACTUAL	
SHOTCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP/BACKWALL	3.0	1.5		
COLUMN/PILE	-	-		
CONCRETE REPAIRS	AREA SQ. FT.	VOLUME CU. FT.	AREA SQ. FT.	VOLUME CU. FT.
CAP	163.5	81.8		
COLUMN/PILE	-	-		
EPOXY RESIN INJECTION	LIN. FT.		LIN. FT.	
CAP	20.0			
COLUMN/PILE	-			
EPOXY COAT CAPS	AREA SQ. FT			
TOP OF CAPS	455			



BENT 3

(LOOKING EAST)



BENT 3

(LOOKING WEST)

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MINIMUM OF 1" BEHIND REBAR AND MINIMUM 2" CLEARANCE TO SAWCUT. FOR REPAIR DETAILS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

NOTES:

REPAIR LOCATIONS AND ESTIMATED QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE ENGINEER, THE ENGINEER WILL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATIONS AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE TABLE ABOVE.

CRACKING LOCATIONS AND QUANTITIES FOR LOCATIONS DESCRIBED AS "SCATTERED THROUGHOUT" IN THE INSPECTION REPORT ARE BASED ON THE BEST INFORMATION AVAILABLE. THE ENGINEER AND CONTRACTOR SHALL IDENTIFY AND REPAIR ALL CRACKS >=$\frac{1}{16}$" AT EACH BENT AND END BENT AS DESCRIBED IN THE SPECIAL PROVISIONS.

AVERAGE CONCRETE COVER IS EXPECTED TO BE 2" ON THE CAP AND FROM 1½" TO 2" ON THE COLUMNS. ACTUAL CONCRETE COVER SHALL BE DETERMINED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER PRIOR TO BEGINNING EXCAVATION/ DEMOLITION.

FOR CONCRETE AND SHOTCRETE REPAIRS, SEE "CONCRETE RESTORATION DETAILS" SHEETS.

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

REPAIRS TO THE CAPS MAY REQUIRE BRIDGE JACKING. FOR BRIDGE JACKING, SEE SPECIAL PROVISIONS.

PERFORM ALL CONCRETE REPAIRS PRIOR TO APPLYING THE EPOXY COATING.

TOP OF CAPS SHOULD BE CLEAN AND CLEAR OF DEBRIS PRIOR TO THE APPLICATOIN OF THE EPOXY COATING.

COAT ALL THE FREE SURFACE AREA ON THE TOP OF THE CAPS, INCLUDING CHAMFERS, WITH EPOXY COATINGS. DO NOT COAT UNDER BEARING AREAS.

FOR EPOXY COATING, SEE SPECIAL PROVISIONS. AND STANDARD SPECIFICATIONS SECTION 420-18.

PROJECT NO. BP13-R050

MADISON COUNTY

BRIDGE NO. 560528

Signed by: Jacob Duke 29530C8054E9409...
9/12/2024

NORTH CAROLINA SEAL 043777 ENGINEER JACOB H DUKE

KCA KISINGER CAMPO & ASSOCIATES

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUTURE REPAIRS
BENT 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-20
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : FIDEL L. FLORES DATE : 05/2024
CHECKED BY : CHANEY LOWE DATE : 05/2024
DESIGN ENGINEER: JACOB H. DUKE DATE : 06/2024

9/12/2024
13BPR.560528_SMU_B03.dgn
jduke

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	AASHTO (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE AASHTO
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 AASHTO
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 2024 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST $\frac{5}{16}$" 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 $\frac{1}{16}$" OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

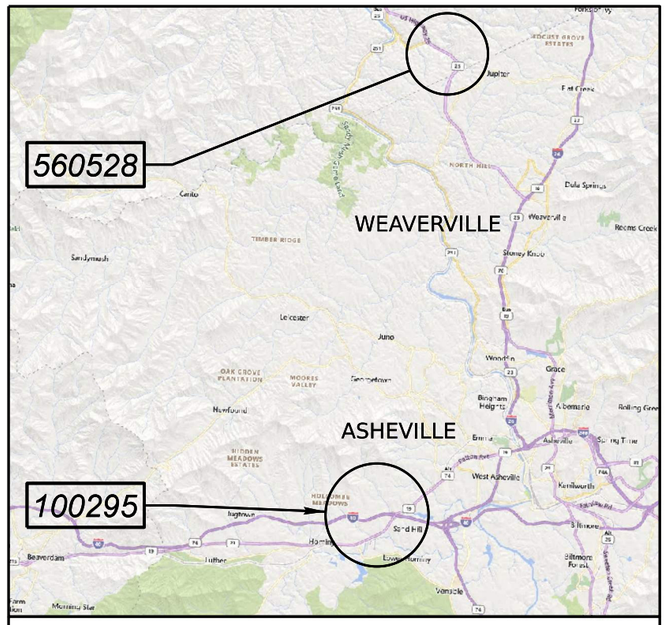
HANDRAILS AND POSTS:

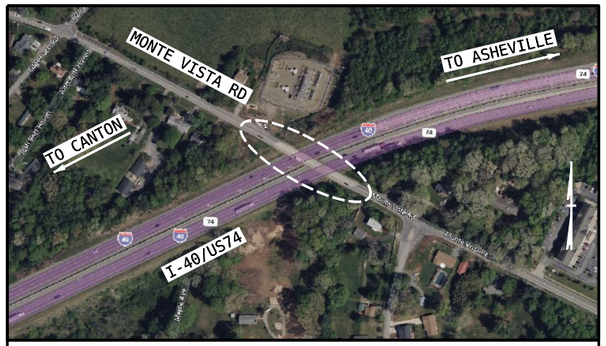
METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

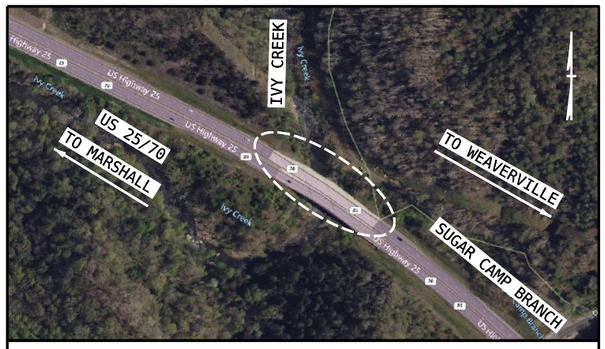
METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE 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.







STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

BUNCOMBE & MADISON COUNTIES

TYPE OF WORK: ***CONCRETE SHOULDER REPAIR, APPROACH SLAB HEADER INSTALLATION, CONCRETE DECK REPAIRS, LATEX MODIFIED CONCRETE OVERLAY – VERY EARLY STRENGTH, JOINT REPLACEMENT, SUBSTRUCTURE CONCRETE REPAIRS, CLEANING AND PAINTING EXISTING STEEL, CLEANING AND PAINTING EXISTING WEATHERING STEEL, CLEANING AND PAINTING BEARINGS WITH HRCSA, STEEL BEAM REPAIRS CUT-OUTS AND PLATING, BRIDGE JACKING, EPOXY COAT CAPS, WEEP HOLE FILTERS, CAP UNDERMINING REPAIRS.***

VICINITY MAP N.T.S.

LOCATION MAP S1 – 100295

LOCATION MAP S2 – 560528

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-1B THRU TMP-1C	GENERAL NOTES
TMP-1D	PHASING NOTES
TMP-2 THRU TMP-3	BRIDGE 100295 TOPSIDE WORK AREA LANE CLOSURE DETAILS
TMP-4 THRU TMP-5	BRIDGE 100295 UNDERSIDE WORK AREA OUTSIDE SHOULDER CLOSURE DETAILS
TMP-6	BRIDGE 100295 UNDERSIDE WORK AREA INSIDE LANE CLOSURE DETAILS
TMP-7 THRU TMP-9	BRIDGE 560528 WORK AREA NB LANE CLOSURE DETAILS
TMP-10 THRU TMP-12	BRIDGE 560528 WORK AREA SB LANE CLOSURE DETAILS

SHEET NO.
TMP-1

PROJECT: BP13-R050

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

PLANS PREPARED BY:

JACOB H. DUKE, P.E.
WZTC ENGINEER

ALLEN J. MCSWAIN
DESIGN ENGINEER

NCDOT CONTACTS:

ZACHARY CLARK, P.E.
PROJECT ENGINEER

SHEENA N. GREEN
PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS – WORK ZONE TRAFFIC CONTROL

KISINGER CAMPO & ASSOCIATES

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(919) 882-7839
NC Firm License No: C-1506

APPROVED: Signed by: Jacob Duke 29530C8054E94D9...

DATE: 9/12/2024

SEAL

SEAL 043777 JACOB H DUKE

PROJ. REFERENCE NO.	SHEET NO.
BP13-R050	TMP-1A

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NC FIRM LICENSE: C-1506

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 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
1101.06	WARNING SIGNS FOR BLASTING ZONES
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	DRUMS
1135.01	CONES
1145.01	BARRICADES - TYPE III
1150.01	FLAGGERS
1160.01	TEMPORARY CRASH CUSHION - REFLECTIVE END TREATMENT
1165.01	TRUCK MOUNTED ATTENUATOR
1170.01	PORTABLE CONCRETE BARRIER
1180.01	SKINNY DRUMS
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.03	PAVEMENT MARKINGS - EXIT AND ENTRANCE RAMPS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.06	PAVEMENT MARKINGS - LANE DROPS
1205.07	PAVEMENT MARKINGS - PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.10	PAVEMENT MARKINGS - SCHOOL AREAS
1205.11	PAVEMENT MARKINGS - RAILROAD CROSSINGS
1205.12	PAVEMENT MARKINGS - BRIDGES
1205.13	PAVEMENT MARKINGS - LANE REDUCTIONS
1205.14	PAVEMENT MARKINGS - ROUNDABOUTS
1205.15	PAVEMENT MARKINGS - REDUCED CONFLICT INTERSECTIONS
1205.16	BICYCLE FACILITIES
1205.17	PAVEMENT MARKINGS - SIDE-BY-SIDE/ADJACAENT ON/OFF RAMPS PVMT. MARKING LANE TREATMENT
1250.01	RAISED PAVEMENT MARKERS INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION
1264.01	OBJECT MARKERS - TYPES
1264.02	OBJECT MARKERS - INSTALLATION
1266.01	RAISED PAVEMENT MARKERS - TUBULAR MARKERS
1267.01	FLEXIBLE DELINEATORS - INSTALLATION
1267.02	FLEXIBLE DELINEATORS - SPACING TABLES
1267.03	FLEXIBLE DELINEATORS - INTERCHANGE PLACEMENT

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)
- WORK AREA
- REMOVAL

SIGNALS

EXISTING PROPOSED TEMPORARY

PAVEMENT MARKINGS

EXISTING LINES
TEMPORARY LINES

ABBREVIATIONS

SB - SOUTHBOUND
NB - NORTHBOUND
WB - WESTBOUND
EB - EASTBOUND

TEMPORARY PAINT MARKINGS

P1	WHITE EDGELINE (4",90 MIL)
P10	YELLOW EDGELINE (4",90 MIL)
P13	YELLOW DOUBLE CENTER (4",90 MIL)
C13	COLD APPLIED PLASTIC - YELLOW DOUBLE CENTER (4",90 MIL)

TRAFFIC CONTROL DEVICES

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

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

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

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

APPROVED: Signed by: Jacob Duke 29530C8054E9409... DATE: 9/12/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ROADWAY STANDARD DRAWINGS & LEGEND

9/12/2024
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User:jduke

GENERAL NOTES

PROJ. REFERENCE NO.	SHEET NO.
BP13-R050	TMP-1B

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NC FIRM LICENSE: C-1506

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. MODIFICATION 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 CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

TIME RESTRICTIONS

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

ROAD NAME	DAY AND TIME RESTRICTIONS
I-40	6:00 A.M. TO 9:00 P.M.
MONTE VISTA RD (SR 1224)	SEE ICT

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

ROAD NAME

I-40
MONTE VISTA RD (SR 1224)
US-25

HOLIDAY

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 6:00 A.M. DECEMBER 31st TO 9:00 P.M. JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 9:00 P.M. THE FOLLOWING TUESDAY.
3. FOR EASTER, BETWEEN THE HOURS OF 6:00 A.M. THURSDAY AND 9:00 P.M. MONDAY.
4. FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY TO 9:00 P.M. TUESDAY.
5. FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6:00 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 9:00 P.M. THE DAY AFTER INDEPENDENCE DAY.

   IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY OR MONDAY THEN BETWEEN THE HOURS OF 6:00 A.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 9:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.
6. FOR LABOR DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY AND 9:00 P.M. TUESDAY.
7. FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 6:00 A.M. TUESDAY TO 9:00 P.M. MONDAY.
8. FOR CHRISTMAS, BETWEEN THE HOURS OF 6:00 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 9:00 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

LANE AND SHOULDER CLOSURE REQUIREMENTS

C) 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.

D) 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.

E) 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 A 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.

F) 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.

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

H) DO NOT INSTALL MORE THAN 2 MILES OF LANE CLOSURE ON US 24 MEASURED FROM THE BEGINNING OF THE MERGE TAPER TO THE END OF THE LANE CLOSURE.

I) USE SEQUENTIAL FLASHING WARNING LIGHTS ON DRUMS USED FOR THE MERGING TAPERS OF NIGHTTIME LANE CLOSURES IN ACCORDANCE WITH SECTION 1140 IN THE STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

J) NOTIFY THE NCDOT STATEWIDE TRANSPORTATION OPERATIONS CENTER (STOC) AT 877-627-7862 APPROXIMATELY 30 MINUTES PRIOR TO INSTALLING AND WITHIN 15 MINUTES AFTER REMOVING LANE CLOSURES ON INTERSTATES, FREEWAYS, CONTROLLED ACCESS FACILITIES, AND US ROUTES.

PAVEMENT EDGE DROP OFF REQUIREMENTS

K) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED 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.

L) 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 EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

M) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

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

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

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

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

R) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 500FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES

S) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET 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 SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

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

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

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SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

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

GENERAL NOTES
(1 OF 2)

9/12/2024
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GENERAL NOTES CONT.

PROJ. REFERENCE NO.	SHEET NO.
BP13-R050	TMP-1C

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PAVEMENT MARKINGS AND MARKERS

V) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
US 25 (ASPHALT)	PAINT	NONE
US 25 (BRIDGE)	COLD APPLIED PLASTIC	NONE
MONTE VISTA RD (SR 1224)	PAINT	NONE
MONTE VISTA RD (SR 1224) (BRIDGE)	COLD APPLIED PLASTIC	NONE

W) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

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

Y) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

MISCELLANEOUS

Z) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) 350' RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

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GENERAL NOTES
(2 OF 2)

PHASING NOTES

PROJ. REFERENCE NO.	SHEET NO.
BP13-R050	TMP-1D

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PRIOR TO ANY CONSTRUCTION, INSTALL WORK ZONE ADVANCE WARNING SIGNS USING NCDOT RSD 1101.01 SHEETS 1 AND 3. CONTRACTOR MAY WORK ON MULTIPLE LOCATIONS SIMULTANEOUSLY IF APPROVED BY THE ENGINEER.

IT IS THE CONTRACTORS RESPONSIBILITY TO COORDINATE WORK WITH NCDOT TIP PROJECT B-5895.

NCDOT PROJECT MANAGER: DAVID STUTTS
EMAIL: DSTUTTS@NCDOT.GOV

STURCTURE 100295 - SEE ICT FOR DURATION OF DECK WORK.

STEP 1: USE TMP-4 THRU TMP-5 TO DENOTE WORK AREAS. USE TMP-4 THRU TMP-5, AND RSD 1101.04 SHEET 1 OF 2 TO CLOSE THE OUTSIDE SHOULDERS OF I40. PERFORM SUBSTRUCTURE CONCRETE REPAIRS PER STRUCTURES PLANS. PERFORM BRIDGE JACKING AS NEEDED TO COMPLETE THE SUBSTRUCTURE CONCRETE REPAIRS PER STRUCTURES PLANS. ONCE THE SUBSTRUCTURE CONCRETE REPAIRS ARE COMPLETE, PERFORM THE FOLLOWING:

- CLEANING AND PAINTING BEARINGS WITH HRCSA
- CLEANING AND PAINTING STRUCTURAL STEEL
- EPOXY COAT CAPS

PER STRUCTURES PLANS. AT THE END OF EACH WORK PERIOD REOPEN THE ROADWAY TO TRAFFIC. REPEAT STEP 1 UNTIL ALL WORK IS COMPLETE. ONCE ALL WORK IS COMPLETE REMOVE SIGNS AND DEVICES TO OPEN I40 TO TRAFFIC.

STEP 2: USE TMP-6 TO DENOTE WORK AREAS. USE TMP-6, AND RSD 1101.02 SHEET 3 OF 19 TO PLACE SIGNS AND DEVICES TO CLOSE THE INSIDE WESTBOUND AND EASTBOUND LANES OF I40. PERFORM SUBSTRUCTURE CONCRETE REPAIRS PER STRUCTURES PLANS. PERFORM BRIDGE JACKING AS NEEDED TO COMPLETE THE SUBSTRUCTURE CONCRETE REPAIRS PER STRUCTURES PLANS. ONCE THE SUBSTRUCTURE CONCRETE REPAIRS ARE COMPLETE, PERFORM THE FOLLOWING:

- CLEANING AND PAINTING BEARINGS WITH HRCSA
- CLEANING AND PAINTING STRUCTURAL STEEL
- EPOXY COAT CAPS

PER STRUCTURES PLANS. AT THE END OF EACH WORK PERIOD REOPEN THE ROADWAY TO TRAFFIC. REPEAT STEP 1 UNTIL ALL WORK IS COMPLETE. ONCE ALL WORK IS COMPLETE REMOVE SIGNS AND DEVICES TO OPEN I40 TO TRAFFIC.

STEP 3: USE TMP-2 THRU TMP-3 TO DENOTE WORK AREAS. USE TMP-2 THRU TMP-3 AND RSD 1101.02 SHEET 1 OF 19 TO PLACE SIGNS AND DEVICES TO CLOSE THE WESTBOUND AND EASTBOUND LANES OF MONTE VISTA RD (SR 1224) RESPECTIVELY. PERFORM THE FOLLOWING:

- DECK REPAIRS
- LMC OVERLAY - VERY EARLY STRENGTH
- REPLACE JOINTS

PER STRUCTURES PLANS. AT THE END OF EACH WORK PERIOD REOPEN THE ROADWAY TO TRAFFIC. REPEAT STEP 2 UNTIL ALL WORK IS COMPLETE.

STEP 4: USE RSD 1101.02 SHEET 1 OF 19 TO PLACE SIGNS AND DEVICES. PLACE FINAL PAVEMENT MARKINGS IN ACCORDANCE WITH RSD 1205.01, 1205.02, 1205.12, 1250.01, AND PAVEMENT MARKING PLANS (PMP-01). REMOVE ALL SIGNS AND DEVICES TO OPEN MONTE VISTA RD (SR 1224) TO TRAFFIC.

PRIOR TO ANY CONSTRUCTION, INSTALL WORK ZONE ADVANCE WARNING SIGNS USING NCDOT RSD 1101.01 SHEETS 1 AND 3. CONTRACTOR MAY WORK ON MULTIPLE LOCATIONS SIMULTANEOUSLY IF APPROVED BY THE ENGINEER.

STURCTURE 560528 - SEE ICT FOR DURATION OF CROSSOVERS

STEP 1: USE TMP-7 THRU TMP-9 TO DENOTE THE WORK AREA. PRIOR TO ANY STRUCTURE REPAIR WORK, REMOVE ANY CONFLICTING PAINT MARKINGS WITHIN PROJECT LIMITS SHOWN ON TMP-7 THRU TMP-9. PLACE TEMPORARY PAVEMENT MARKINGS PER TMP-7 THRU TMP-9. USE TMP-7 THRU TMP-9, AND RSD 1101.02 SHEET 3 OF 19 TO PLACE SIGNS AND DEVICES TO CLOSE THE WESTBOUND LANES OF US-25. PERFORM BRIDGE JACKING IN ORDER TO PERFORM SUBSTRUCTURE CONCRETE REPAIRS PER STRUCTURES PLANS. ONCE THE SUBSTRUCTURE CONCRETE REPAIRS ARE COMPLETE, PERFORM THE FOLLOWING:

- STRUCTURAL STEEL REPAIRS
- CLEANING AND PAINTING WEATHERING STEEL
- CLEANING AND PAINTING BEARING WITH HRCSA
- EPOXY COAT CAPS
- CAP UNDERMINING REPAIRS
- DECK REPAIRS
- DECK DRAIN REPAIRS
- APPROACH SHOULDER REPAIRS
- LMC OVERLAY - VERY EARLY STRENGTH
- REPLACE JOINTS

PER STRUCTURES PLANS. ONCE ALL WORK IS COMPLETE REMOVE SIGNS AND DEVICES TO OPEN US-25 TO TRAFFIC.

STEP 2: USE TMP-10 THRU TMP-12 TO DENOTE THE WORK AREA. PRIOR TO ANY STRUCTURE REPAIR WORK, REMOVE ANY CONFLICTING PAINT MARKINGS WITHIN PROJECT LIMITS SHOWN ON TMP-10 THRU TMP-12. PLACE TEMPORARY PAVEMENT MARKINGS PER TMP-10 THRU TMP-12. USE TMP-10 THRU TMP-12, AND RSD 1101.02 SHEET 3 OF 19 TO PLACE SIGNS AND DEVICES TO CLOSE THE WESTBOUND LANES OF US-25. PERFORM BRIDGE JACKING IN ORDER TO PERFORM SUBSTRUCTURE CONCRETE REPAIRS PER STRUCTURES PLANS. ONCE THE SUBSTRUCTURE CONCRETE REPAIRS ARE COMPLETE, PERFORM THE FOLLOWING:

- STRUCTURAL STEEL REPAIRS
- CLEANING AND PAINTING WEATHERING STEEL
- CLEANING AND PAINTING BEARING WITH HRCSA
- EPOXY COAT CAPS
- CAP UNDERMINING REPAIRS
- DECK REPAIRS
- DECK DRAIN REPAIRS
- APPROACH SHOULDER REPAIRS
- LMC OVERLAY - VERY EARLY STRENGTH
- REPLACE JOINTS

PER STRUCTURES PLANS. ONCE ALL WORK IS COMPLETE REMOVE SIGNS AND DEVICES TO OPEN US-25 TO TRAFFIC.

STEP 3: USE RSD 1101.02 SHEET 16 OF 19 TO PLACE SIGNS AND DEVICES. PLACE FINAL PAVEMENT MARKINGS IN ACCORDANCE WITH RSD 1205.01, 1205.02, 1205.04, 1205.08, 1205.09, 1205.12, 1250.01, AND PAVEMENT MARKING PLANS (PMP-02). REMOVE ALL SIGNS AND DEVICES TO OPEN US-25 TO TRAFFIC.

APPROVED: Signed by: Jacob Duke 29530C8054E94D9... DATE: 9/12/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

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PHASING NOTES

9/12/2024
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PROJ. REFERENCE NO.	SHEET NO.
BP13-R050	TMP-2

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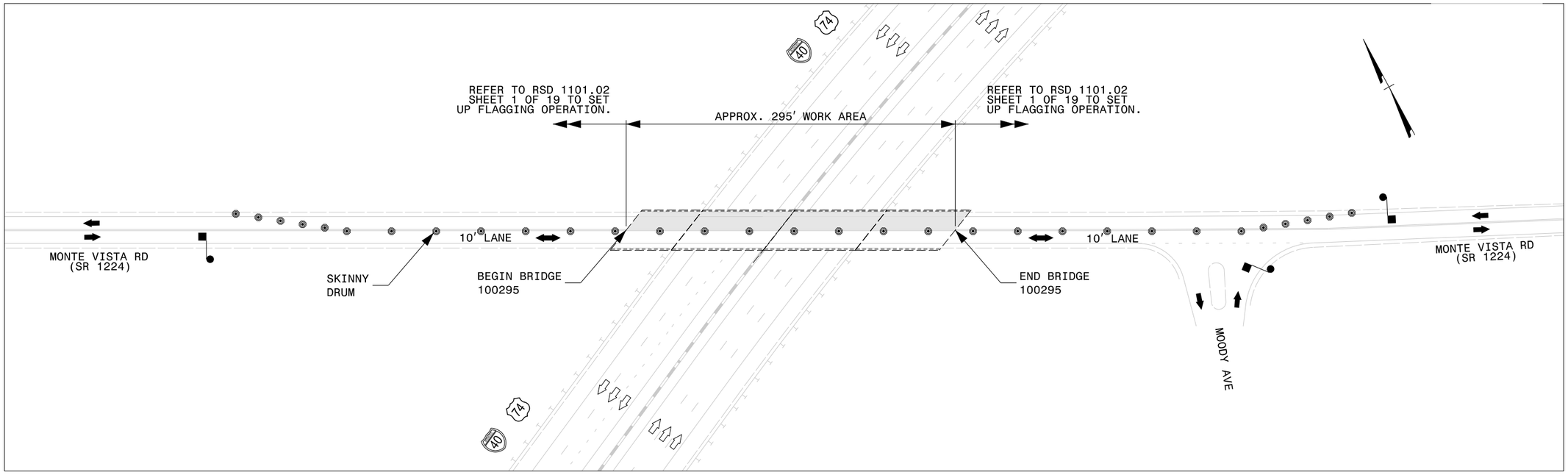

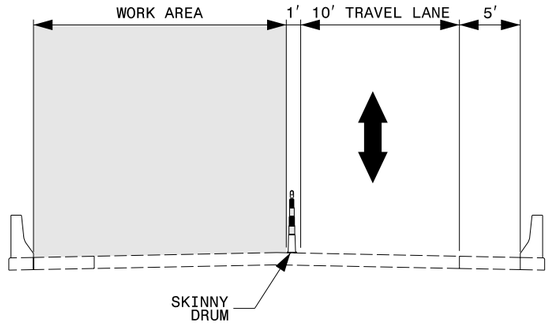

TYPICAL SECTION

NOTES:

1. USE THIS SHEET IN CONJUNCTION WITH RSD 1101.02 SHEET 1 OF 19.
2. PLACE DEVICES PER ENGINEER'S INSTRUCTIONS.
3. THE CONTRACTOR MUST MAINTAIN DRIVEWAY ACCESS THROUGHOUT THE LIFE OF THE PROJECT.
4. PLACE ADDITIONAL FLAGGERS AT DRIVEWAYS AS NEEDED.

APPROVED: Signed by: Jacob Duke 29530C8054E94D9...
DATE: 9/12/2024
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BRIDGE 100295
TOPSIDE WORK AREA
LANE CLOSURE DETAILS
(SHEET 1 OF 2)

9/12/2024
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PROJ. REFERENCE NO.	SHEET NO.
BP13-R050	TMP-3

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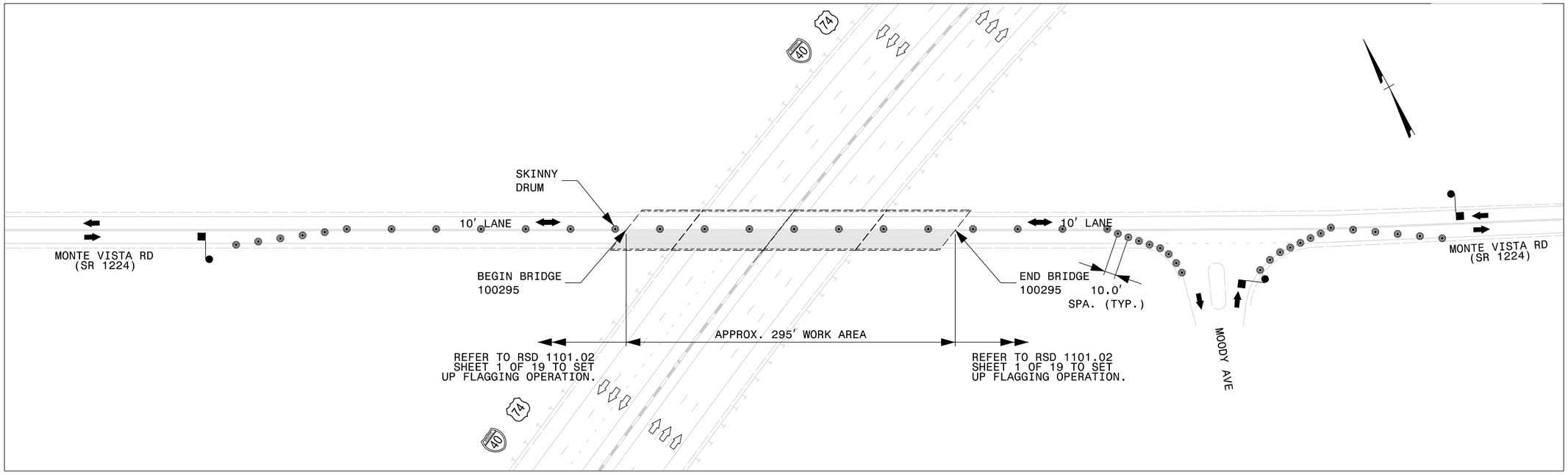

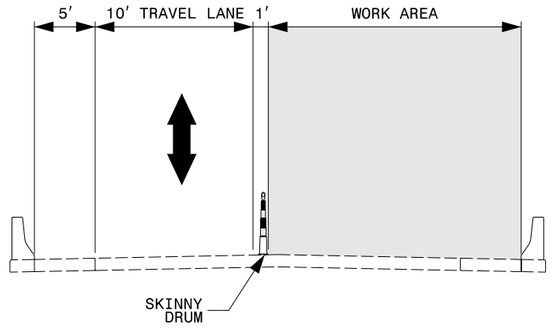

TYPICAL SECTION

NOTES:

1. USE THIS SHEET IN CONJUNCTION WITH RSD 1101.02 SHEET 1 OF 19.
2. PLACE DEVICES PER ENGINEER'S INSTRUCTIONS.
3. THE CONTRACTOR MUST MAINTAIN DRIVEWAY ACCESS THROUGHOUT THE LIFE OF THE PROJECT.
4. PLACE ADDITIONAL FLAGGERS AT DRIVEWAYS AS NEEDED.

APPROVED: Signed by: Jacob Duke 29530C8054E94D9...
DATE: 9/12/2024
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BRIDGE 100295
TOPSIDE WORK AREA
LANE CLOSURE DETAILS
(SHEET 2 OF 2)

9/12/2024
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PROJ. REFERENCE NO.	SHEET NO.
BP13-R050	TMP-4

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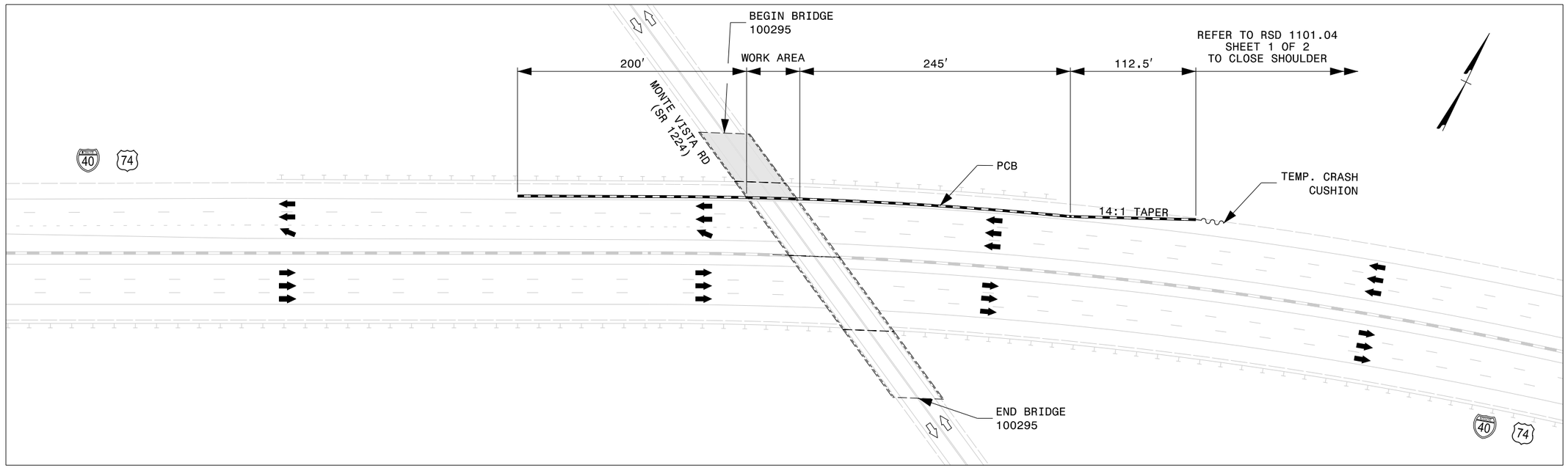

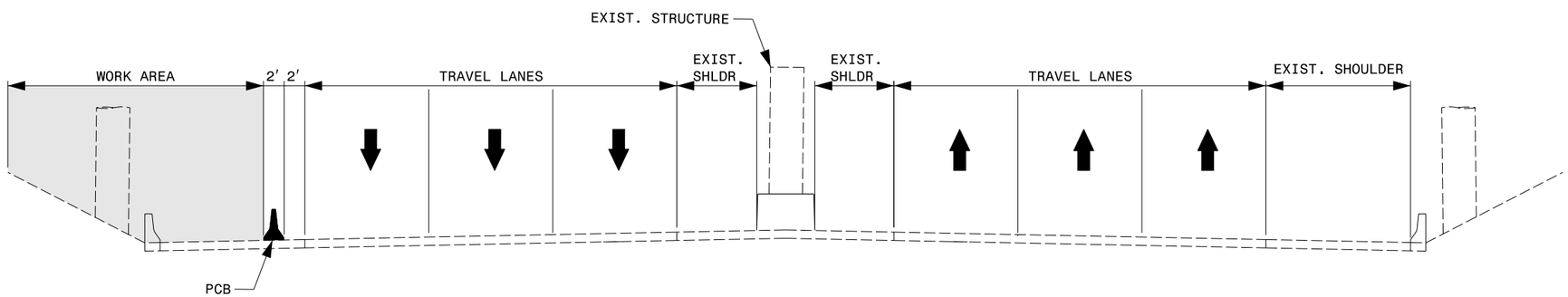

TYPICAL SECTION

NOTES:

1. USE THIS SHEET IN CONJUNCTION WITH RSD 1101.04 SHEET 1 OF 2.

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BRIDGE 100295
UNDERSIDE WORK AREA
WB OUTSIDE SHOULDER
CLOSURE DETAILS
SHEET 1 OF 2

9/12/2024
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PROJ. REFERENCE NO.	SHEET NO.
BP13-R050	TMP-5

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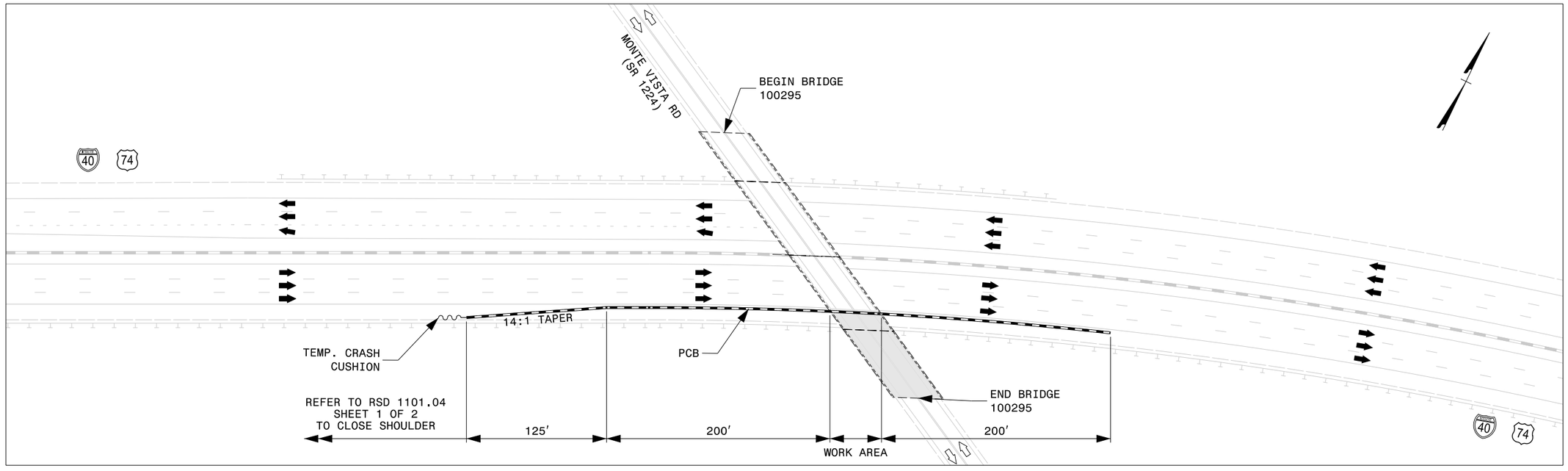

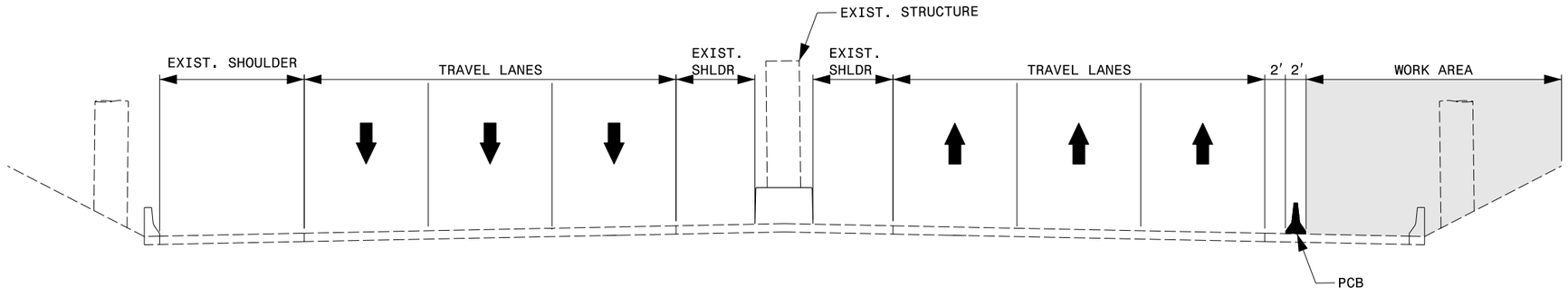

TYPICAL SECTION

NOTES:

1. USE THIS SHEET IN CONJUNCTION WITH RSD 1101.04 SHEET 1 OF 2.

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BRIDGE 100295
UNDERSIDE WORK AREA
EB OUTSIDE SHOULDER
CLOSURE DETAILS
SHEET 2 OF 2

9/12/2024
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PROJ. REFERENCE NO.	SHEET NO.
BP13-R050	TMP-6

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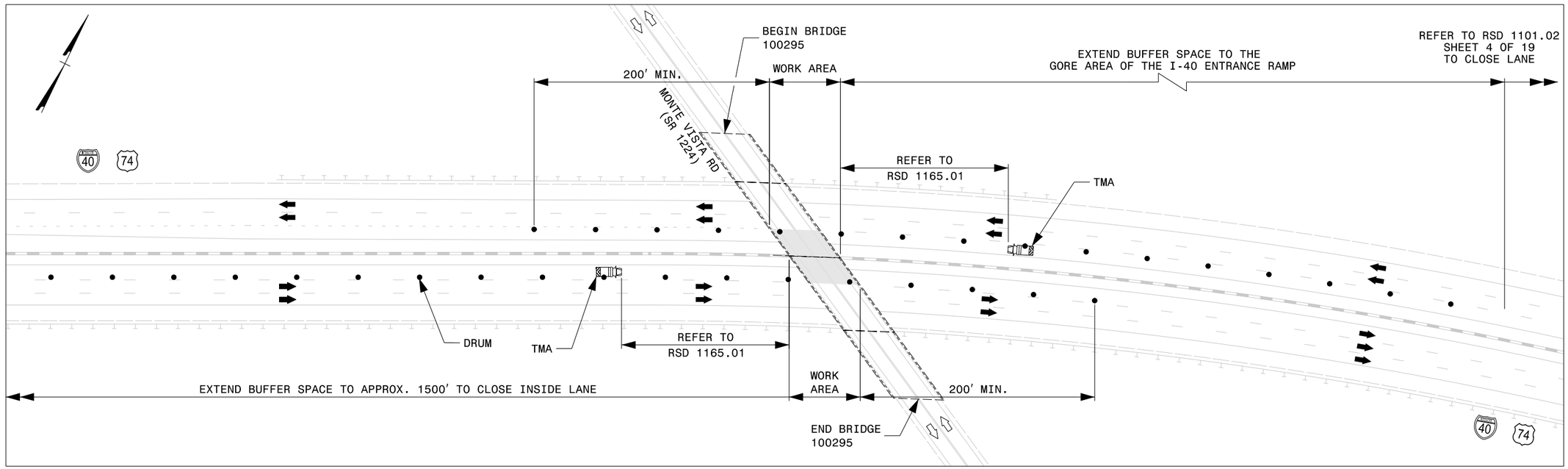

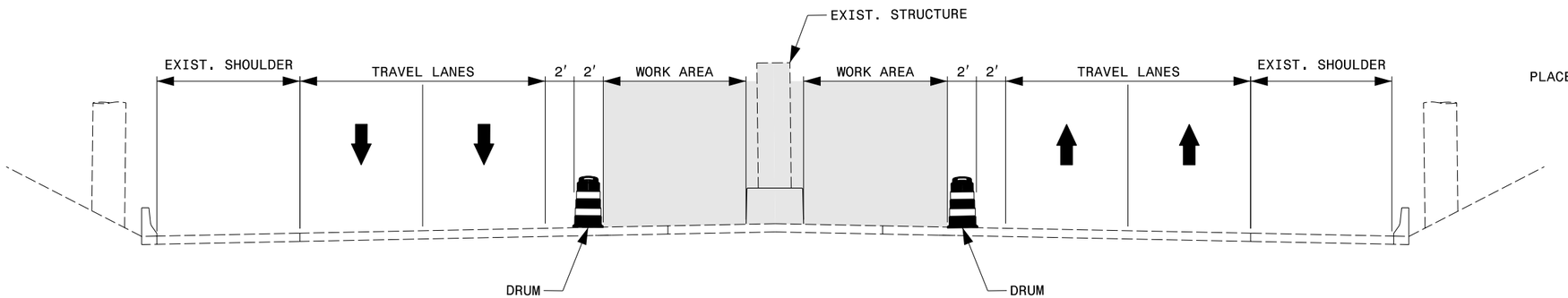

TYPICAL SECTION

PLACE SIGN ON US 74 ALT/US 19 ON-RAMP

NOTES:

1. USE THIS SHEET IN CONJUNCTION WITH RSD 1101.02 SHEET 4 OF 19.
2. USE THIS SHEET IN CONJUNCTION WITH RSD 1165.01 SHEET 1 OF 1 FOR TMA SPACE.

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DATE: 9/12/2024
SEAL

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BRIDGE 100295 UNDERSIDE WORK AREA INSIDE LANE CLOSURE DETAILS

9/12/2024
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PROJ. REFERENCE NO.	SHEET NO.
BP13-R050	TMP-7

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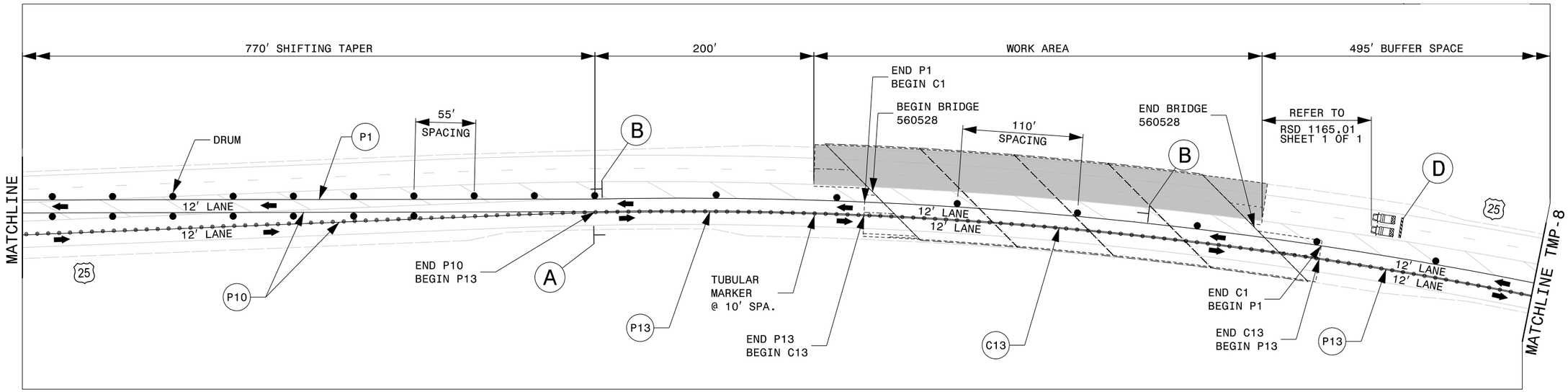
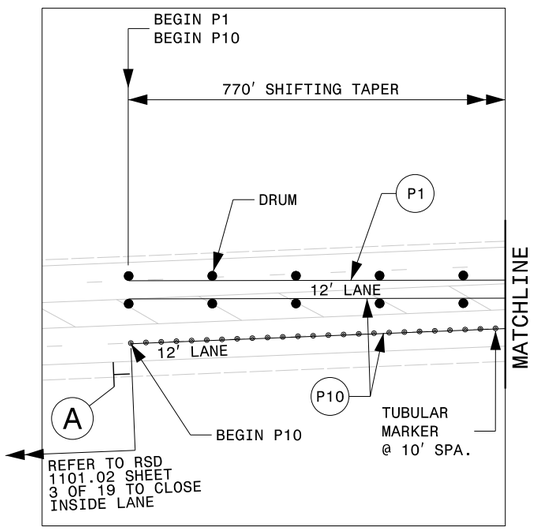
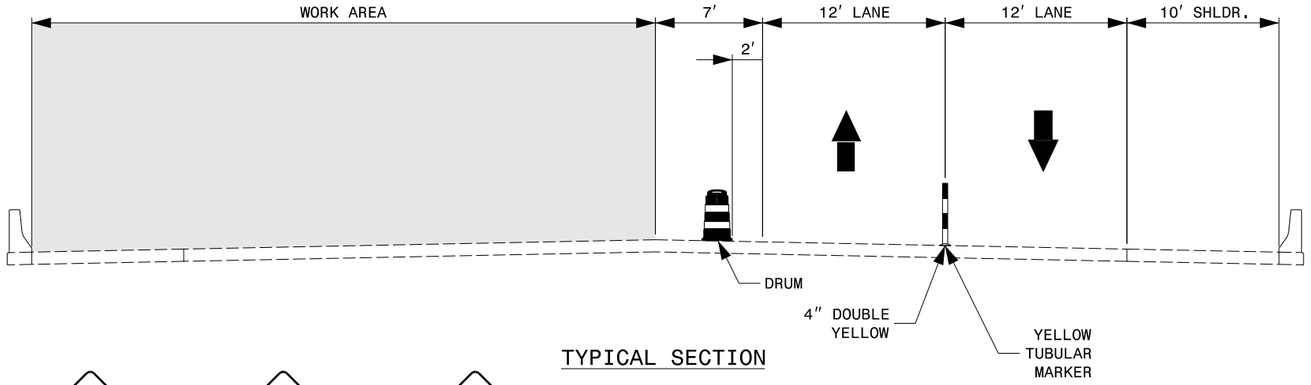
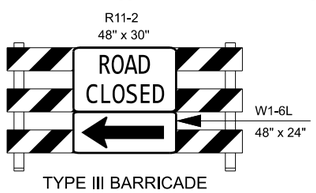






TYPICAL SECTION



NOTES:

1. USE THIS SHEET IN CONJUNCTION WITH RSD 1101.02 SHEET 3 OF 19 AND RSD 1101.03 SHEET 6 OF 9.
2. REMOVE EXISTING MARKINGS WHERE NEEDED TO INSTALL TEMPORARY MARKINGS ACCORDING TO PLAN.
3. IT IS THE CONTRACTORS RESPONSIBILITY TO TAKE NOTE OF THE EXISTING PAINT MARKINGS AND REPLACE WITH PERMANENT MARKINGS OF THE SAME MATERIAL LISTED IN THE PERMANENT MARKING PLANS ONCE ALL TEMPORARY PAINT IS REMOVED.
4. USE THIS SHEET IN CONJUNCTION WITH RSD 1266.01 SHEET 1 OF 1.

APPROVED: Signed by: Jacob Duke 29530C8054E94D9...
DATE: 9/12/2024
SEAL
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DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

BRIDGE 560528
TOPSIDE WORK AREA
NB LANE CLOSURE DETAILS
(SHEET 1 OF 3)

9/12/2024
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PROJ. REFERENCE NO.	SHEET NO.
BP13-R050	TMP-8

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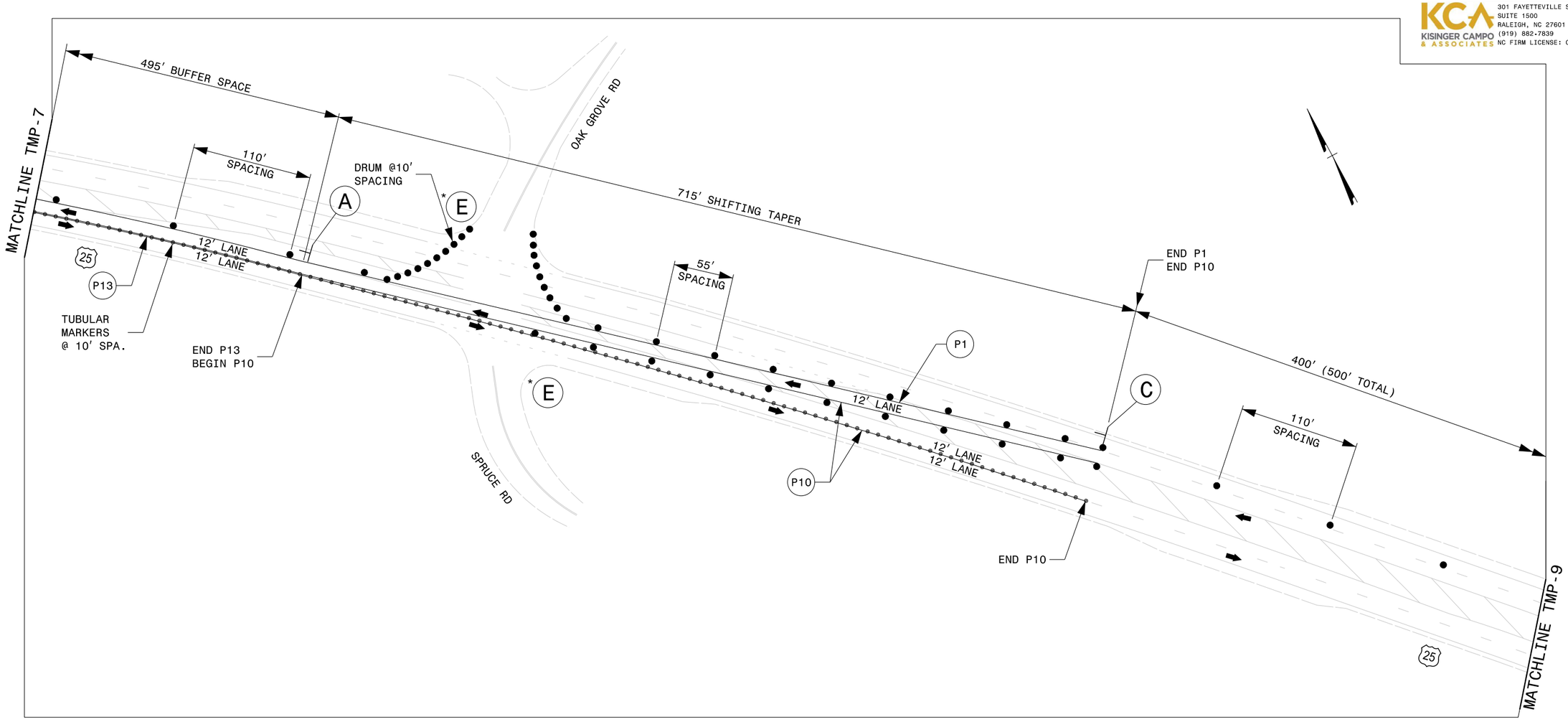
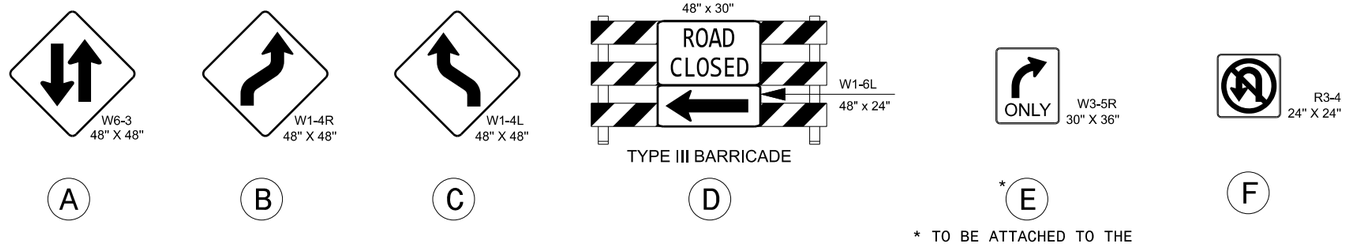




* TO BE ATTACHED TO THE EXISTING STOP SIGN

NOTES:

1. USE THIS SHEET IN CONJUNCTION WITH RSD 1101.02 SHEET 3 OF 19.
2. REMOVE EXISTING MARKINGS WHERE NEEDED TO INSTALL TEMPORARY MARKINGS ACCORDING TO PLAN.
3. IT IS THE CONTRACTORS RESPONSIBILITY TO TAKE NOTE OF THE EXISTING PAINT MARKINGS AND REPLACE WITH PERMANENT MARKINGS OF THE SAME MATERIAL LISTED IN THE PERMANENT MARKING PLANS ONCE ALL TEMPORARY PAINT IS REMOVED.
4. USE THIS SHEET IN CONJUNCTION WITH RSD 1266.01 SHEET 1 OF 1.

APPROVED: Signed by: Jacob Duke 29530C8054E94D9... DATE: 9/12/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

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

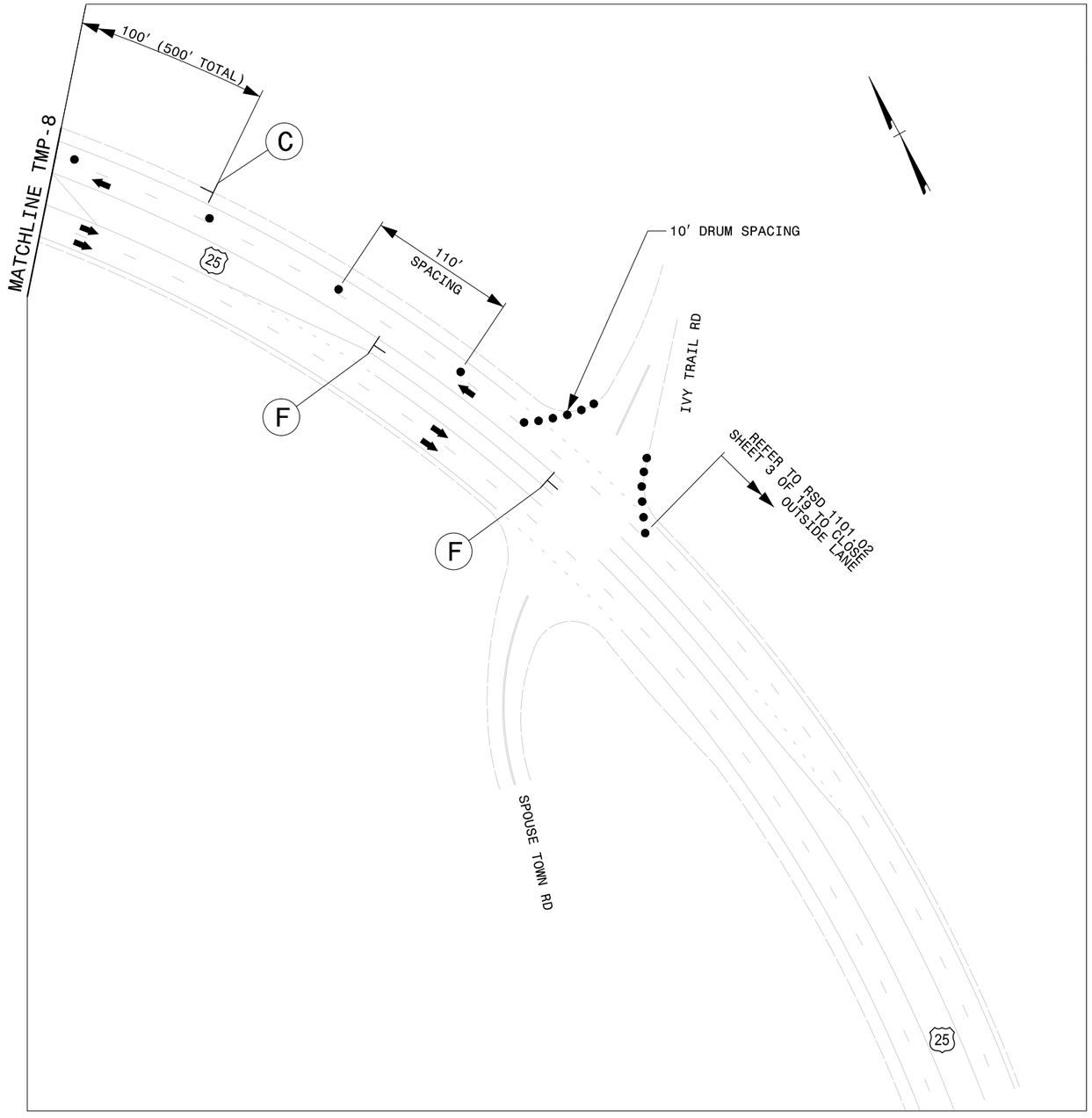
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BRIDGE 560528
TOPSIDE WORK AREA
NB LANE CLOSURE DETAILS
(SHEET 2 OF 3)

9/12/2024
13BP_TC_TMP_TOP.dgn
User:jduke

PROJ. REFERENCE NO.	SHEET NO.
BP13-R050	TMP-9

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



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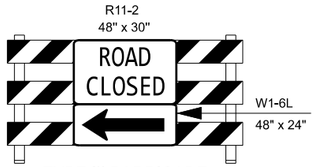

TYPE III BARRICADE

D

* E

* TO BE ATTACHED TO THE EXISTING STOP SIGN

F

NOTES:

1. USE THIS SHEET IN CONJUNCTION WITH RSD 1101.02 SHEET 3 OF 19.
2. REMOVE EXISTING MARKINGS WHERE NEEDED TO INSTALL TEMPORARY MARKINGS ACCORDING TO PLAN.
3. IT IS THE CONTRACTORS RESPONSIBILITY TO TAKE NOTE OF THE EXISTING PAINT MARKINGS AND REPLACE WITH PERMANENT MARKINGS OF THE SAME MATERIAL LISTED IN THE PERMANENT MARKING PLANS ONCE ALL TEMPORARY PAINT IS REMOVED.

APPROVED: Signed by: Jacob Duke 29530C8054E94D9...
DATE: 9/12/2024
SEAL

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BRIDGE 560528
TOPSIDE WORK AREA
NB LANE CLOSURE DETAILS
(SHEET 3 OF 3)

9/12/2024
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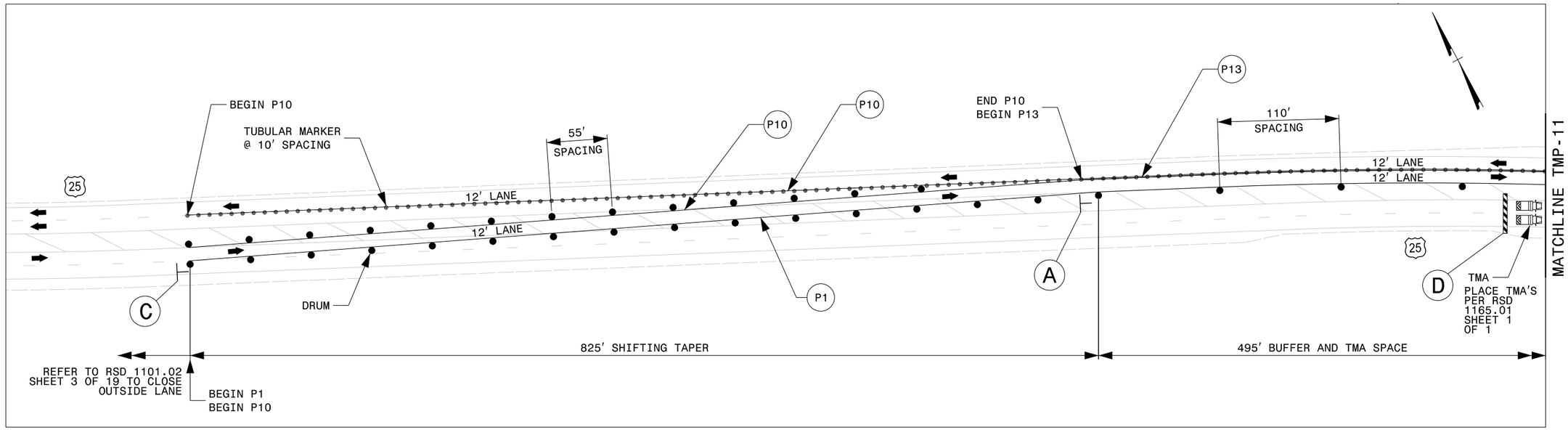
User:jduke

PROJ. REFERENCE NO.	SHEET NO.
BP13-R050	TMP-10

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
(919) 882-7839
NC FIRM LICENSE: C-1506



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TYPE III BARRICADE

D

* E

* TO BE ATTACHED TO THE EXISTING STOP SIGN

F

NOTES:

1. USE THIS SHEET IN CONJUNCTION WITH RSD 1101.02 SHEET 3 OF 19 AND RSD 1101.03 SHEET 6 OF 9.
2. REMOVE EXISTING MARKINGS WHERE NEEDED TO INSTALL TEMPORARY MARKINGS ACCORDING TO PLAN.
3. IT IS THE CONTRACTORS RESPONSIBILITY TO TAKE NOTE OF THE EXISTING PAINT MARKINGS AND REPLACE WITH PERMANENT MARKINGS OF THE SAME MATERIAL LISTED IN THE PERMANENT MARKING PLANS ONCE ALL TEMPORARY PAINT IS REMOVED.
4. USE THIS SHEET IN CONJUNCTION WITH RSD 1266.01 SHEET 1 OF 1.

APPROVED: Signed by: Jacob Duke 29530C8054E94D9...
DATE: 9/12/2024
SEAL

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BRIDGE 560528
TOPSIDE WORK AREA
SB LANE CLOSURE DETAILS
(SHEET 1 OF 3)

9/12/2024
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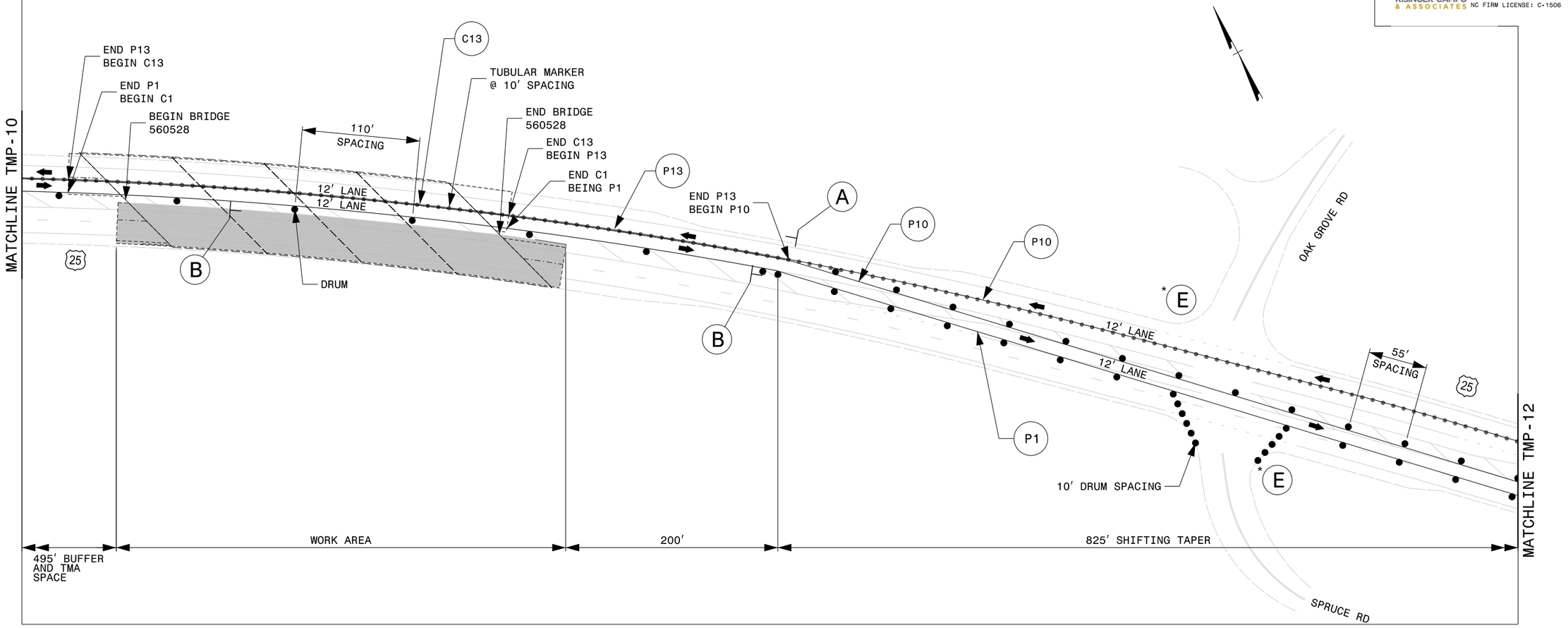
User:jduke

PROJ. REFERENCE NO.	SHEET NO.
BP13-R050	TMP-11

KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
(919) 882-7839
NC FIRM LICENSE: C-1506



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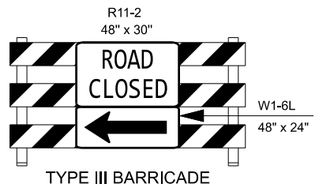

TYPE III BARRICADE

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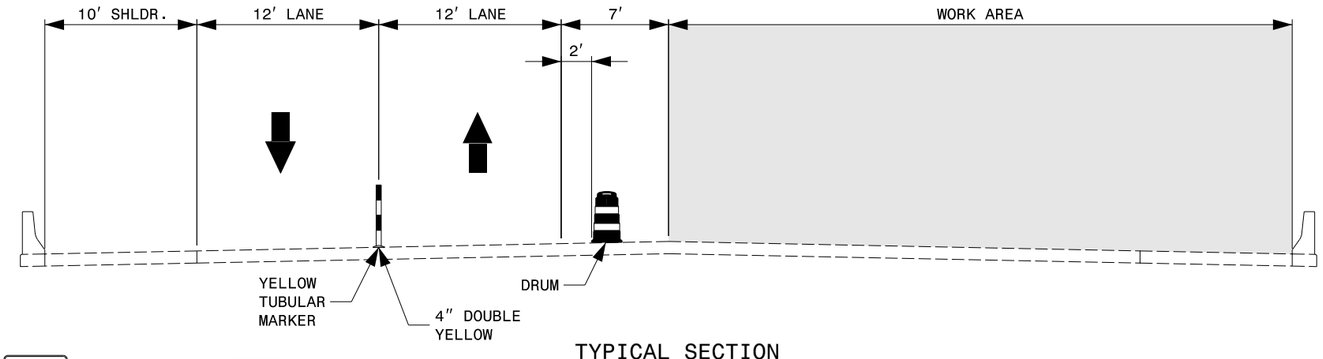

TYPICAL SECTION

NOTES:

1. USE THIS SHEET IN CONJUNCTION WITH RSD 1101.02 SHEET 3 OF 19 AND RSD 1101.03 SHEET 6 OF 9.
2. REMOVE EXISTING MARKINGS WHERE NEEDED TO INSTALL TEMPORARY MARKINGS ACCORDING TO PLAN.
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4. USE THIS SHEET IN CONJUNCTION WITH RSD 1266.01 SHEET 1 OF 1.

W3-5R
30" X 36"

R3-4
24" X 24"

*E

* TO BE ATTACHED TO THE EXISTING STOP SIGN

F

APPROVED: Signed by: Jacob Duke 29530C8054E94D9...
DATE: 9/12/2024
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

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

BRIDGE 560528
TOPSIDE WORK AREA
SB LANE CLOSURE DETAILS
(SHEET 2 OF 3)

9/12/2024
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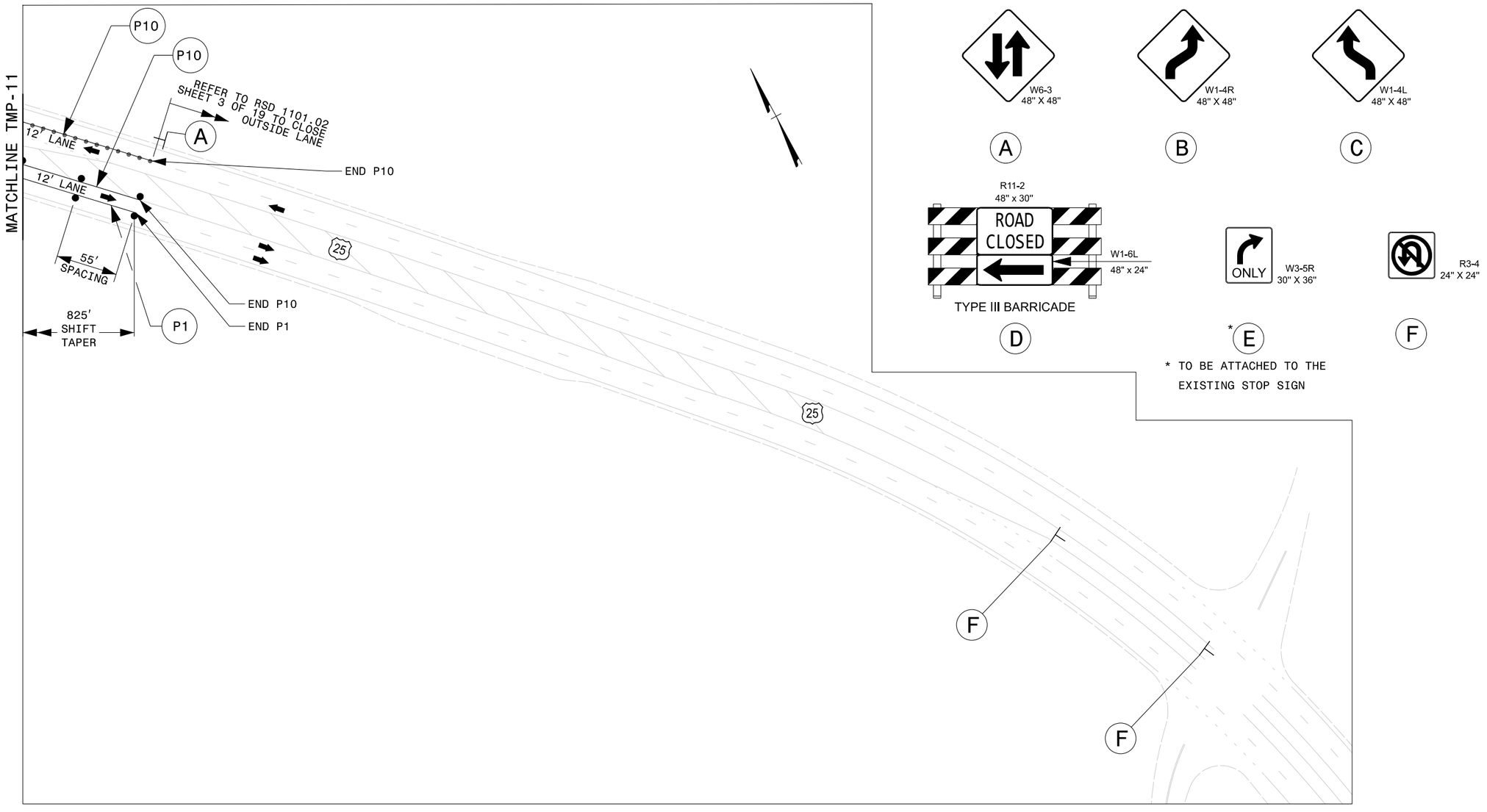
User:jduke

PROJ. REFERENCE NO.	SHEET NO.
BP13-R050	TMP-12

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



A

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TYPE III BARRICADE

D

*E

* TO BE ATTACHED TO THE EXISTING STOP SIGN

F

NOTES:

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APPROVED: Signed by: Jacob Duke 29530C8054E94D9...
DATE: 9/12/2024
SEAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BRIDGE 560528
TOPSIDE WORK AREA
SB LANE CLOSURE DETAILS
(SHEET 3 OF 3)

9/12/2024
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User:jduke

PROJECT NUMBER: BP13-R050

TIP NO.	SHEET NO.
BP13-R050	PMP-1

APPROVED: Jacob Duke
DATE: 9/12/2024

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H DUKE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
BUNCOMBE COUNTY
BRIDGE 100295

INDEX

SHT. NO.	TITLE
PMP-01	PAVEMENT MARKING PLAN - BRIDGE 100295
PMP-02 THRU PMP-03	PAVEMENT MARKING PLAN - BRIDGE 560528

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION	QUANTITY
POLUREA		
V1	WHITE EDGELINE (4", 20 MIL)	590 LF
V13	YELLOW DOUBLE CENTER (4", 20 MIL)	590 LF

GENERAL NOTES

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

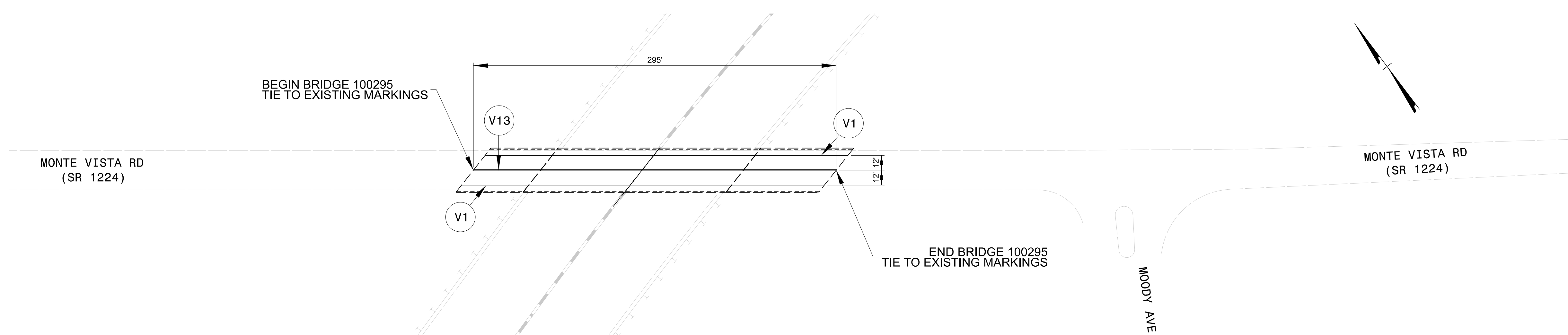
A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
MONTE VISTA RD (SR 1224)	POLYUREA	NONE

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

C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

D) REMOVE ALL RESIDUE AND SURFACE LAITANCE BY ACCEPTABLE METHODS ON CONCRETE BRIDGE DECKS PRIOR TO PLACING POLYUREA PAVEMENT MARKING MATERIAL.



PLAN SUBMITTED TO:

KELVIN L. JORDAN – SIGNING AND DELINEATION REGIONAL ENGINEER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY: KISINGER CAMPO & ASSOCIATES

JACOB H. DUKE, PE PROJECT ENGINEER
ALLEN J. MCSWAIN PROJECT DESIGNER

KCA KISINGER CAMPO & ASSOCIATES

NC FIRM LICENSE No: C-1506
301 Fayetteville St.,
Suite 1500
Raleigh, NC 27601
(919)882-7839

9/12/2024
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User:jduke

PROJECT NUMBER: BP13-R050

TIP NO.	SHEET NO.
BP13-R050	PMP-2

APPROVED: Signed by: Jacob Duke

DATE: 9/12/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN

MADISON COUNTY
BRIDGE 560528

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION	QUANTITY
POLUREA		
V1	WHITE EDGELINE (4", 20 MIL)	8163 LF
V2	WHITE SOLID LANE LINE (4", 20 MIL)	551 LF
V3	10 FT. WHITE SKIP (4", 20 MIL)	2149 LF
V4	3 FT. - 9 FT./SP WHITE MINISKIP (4", 20 MIL)	209 LF
V10	YELLOW EDGELINE (4", 20 MIL)	8371 LF
V42	YELLOW DIAGONALS (8", 20 MIL)	1737 LF
HEATED IN-PLACE THERMOPLASTIC		
T70	LEFT TURN ARROW (90 MIL)	4 EA
MARKERS		
MF	SNOWPLOWABLE (CRYSTAL & RED)	108 EA

GENERAL NOTES

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

A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
US 25	POLYUREA/THERMO	SNOWPLOWABLE

B) PLACE TWO APPLICATIONS OF PAINT PAVEMENT MARKINGS ON THE FINAL WEARING SURFACE. PLACE THE SECOND APPLICATION OF PAINT UPON SUFFICIENT DRYING TIME OF THE FIRST.

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

D) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

E) REMOVE ALL RESIDUE AND SURFACE LAITANCE BY ACCEPTABLE METHODS ON CONCRETE BRIDGE DECKS PRIOR TO PLACING POLYUREA PAVEMENT MARKING MATERIAL.

F) IT IS THE CONTRACTORS RESPONSIBILITY TO TAKE NOTE OF THE EXISTING PAINT MARKINGS OUTSIDE OF BRIDGE LIMITS AND REPLACE WITH PERMANENT MARKINGS OF THE MATERIAL LISTED IN THE PERMANENT MARKING PLANS ONCE ALL TEMPORARY PAINT IS REMOVED.

G) UNLESS OTHERWISE SPECIFIED, HEATED-IN-PLACE THERMOPLASTIC MAY BE USED IN LIEU OF EXTRUDED THERMOPLASTIC FOR STOP BARS, SYMBOLS, CHARACTERS AND DIAGONALS. IF HEATED-IN-PLACE IS USED, IT SHALL BE PAID FOR USING THE EXTRUDED THERMOPLASTIC PAY ITEM.

PLAN SUBMITTED TO:

KELVIN L. JORDAN - SIGNING AND DELINEATION REGIONAL ENGINEER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY: KISINGER CAMPO & ASSOCIATES

JACOB H. DUKE, PE — PROJECT ENGINEER

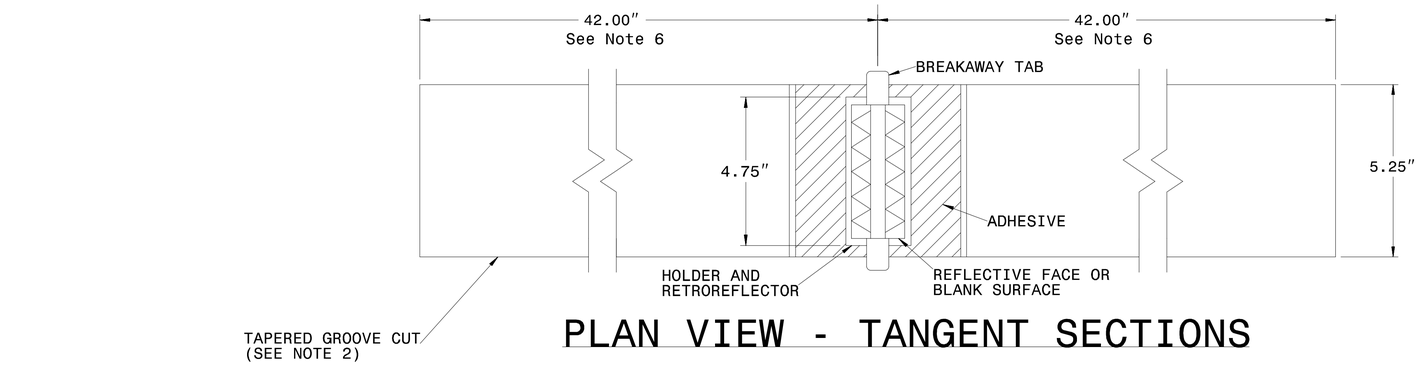
ALLEN J. MCSWAIN — PROJECT DESIGNER

KCA KISINGER CAMPO & ASSOCIATES

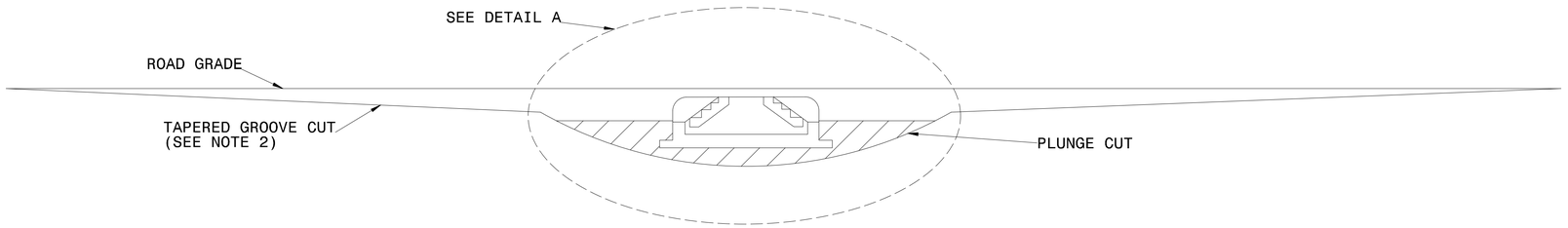
NC FIRM LICENSE No: C-1506
301 Fayetteville St.,
Suite 1500
Raleigh, NC 27601
(919)882-7839

9/12/2024
13BPR.3.5_SGN_PMP_560528.dgn
User:jduke

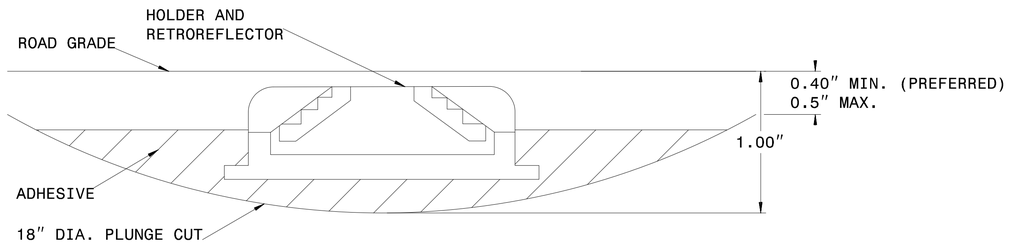
PROJECT REFERENCE NO.	SHEET NO.
BP13-R050	PMP-3



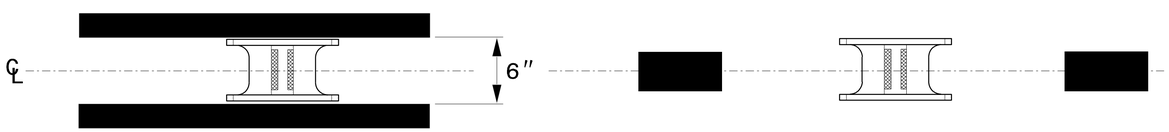
PLAN VIEW - TANGENT SECTIONS



PROFILE VIEW



DETAIL A



MARKER SPACING

NOTES:

1. ALL GROOVE EDGES SHALL BE AT LEAST 2 INCHES FROM ANY SEAM OR PAVEMENT JOINT
2. GROOVE CUTS MAY BE TAPERED OR BEVELED. TAPERED CUTS SHALL START AT ROAD LEVEL ON EACH END AND TAPER AT A FIXED RATE AS SHOWN ON THE PROFILE VIEW. BEVELED GROOVE CUTS SHALL BE 0.5″ MAXIMUM DEPTH (0.4″ PREFERRED), AND SHALL BE 0.4″ MINIMUM DEPTH AT BOTH ENDS OF THE PLUNGE CUT.
3. GROOVE AND PLUNGE CUT SHALL BE CLEAN AND DRY PRIOR TO PLACEMENT OF ADHESIVE.
4. THE EPOXY ADHESIVE SHALL BE THOROUGHLY MIXED UNTIL IT IS UNIFORM IN COLOR, AND APPLIED IN COLOR, AND APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
5. MARKER SHALL BE INSTALLED AS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS WITH THE BREAKWAY TABS RESTING ON THE PAVEMENT SURFACE. THE EPOXY SHALL BE FILLED TO THE LEVEL OF THE TOP OF THE MARKER HOLDER. EPOXY SHALL NOT TOUCH THE RETROREFELCTOR.
6. TOTAL GROOVE LENGTH MAY BE SHORTENED TO 54″ ON SHARP CURVES IF APPROVED BY THE ENGINEER. GROOVES SHALL NOT OVERLAP WITH LOOP DETECTOR WIRES.

NORTH CAROLINA PROFESSIONAL SEAL 042546 ENGINEER MATTHEW V. SPRINGER

DocuSigned by: Matthew V. Springer
BC60F6E8B584403...

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-8950 FAX 919-250-4119

DETAIL OF INLAID CRADLE MARKER

ORIGINAL BY: rgwatson DATE: 02-06-2024
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

TIP NO.	SHEET NO.
BP13-R050	PMP-4

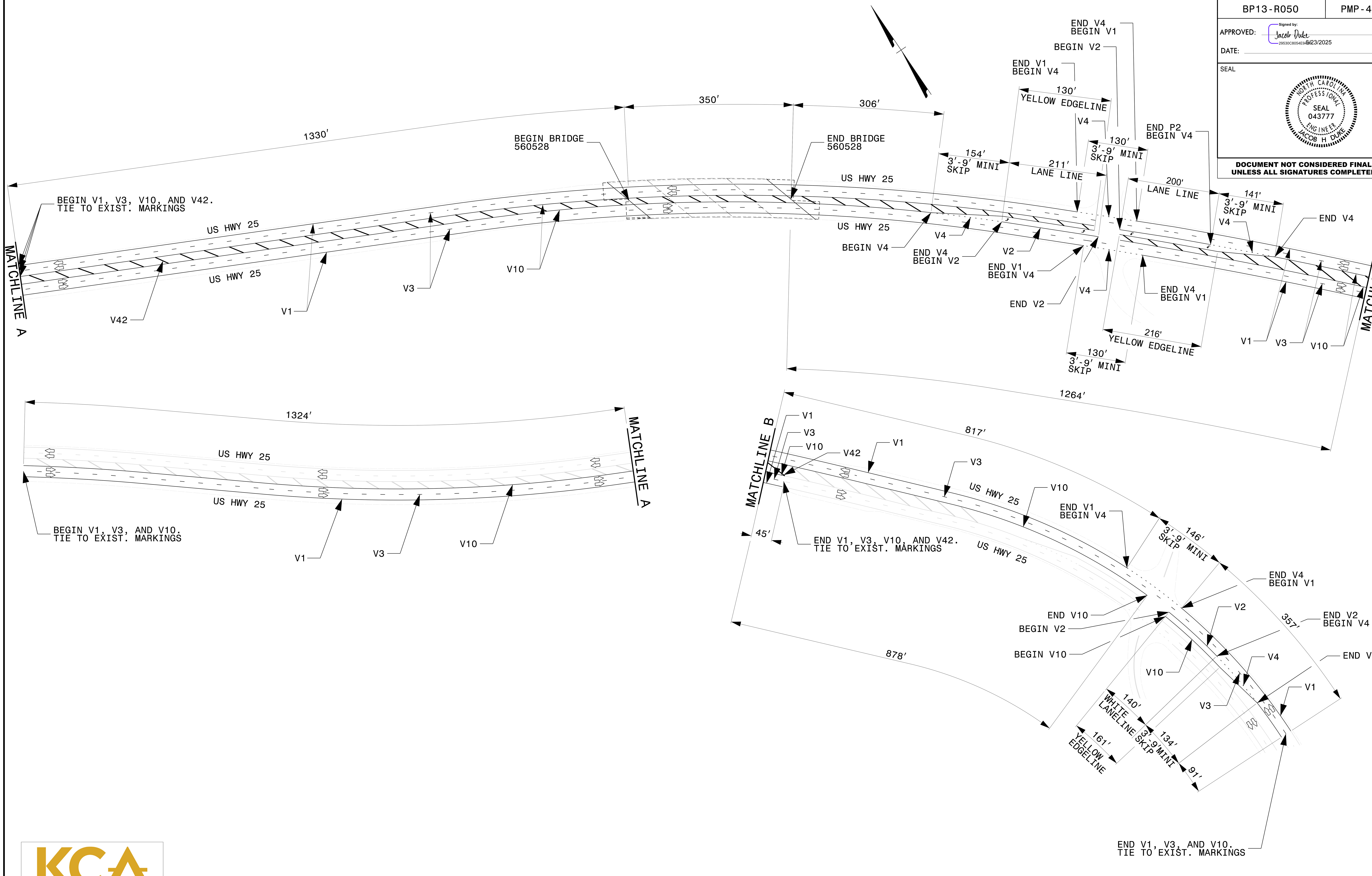
APPROVED: Signed by: Jacob Duke 6/23/2025

DATE:

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043777 ENGINEER JACOB H. DUKE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

PAVEMENT MARKING DETAIL