DECK JOINT REPAIR LETTING DATE 12-20-2022

MB-020-1(501)124--77-94

WEBSTER COUNTY

WEBSTER COUNTY - DESIGN 223

LEGEND

- INTERSTATE HIGHWAY
- PRIMARY HIGHWAY-DIVIDED
- PRIMARY HIGHWAY
- PORTLAND CEMENT CONCRETE ROAD
- ASPHALT ROAD
- BITUMINOUS ROAD
- GRAVEL ROAD
- EARTHEN ROAD
- INTERSTATE HIGHWAY (80)
- UNITED STATES HIGHWAY (65)
- STATE HIGHWAY (175)
- COUNTY HIGHWAY (S27)
- RAILROAD
- PIPELINE
- AIRPORT
- HYDROLOGY
- BRIDGE
- STATE BOUNDARY
- COUNTY BOUNDARY
- CORPORATE BOUNDARY
- TOWNSHIP LINE
- SECTION LINE
- ROAD NAMES — ABBEY ROAD
- UNINCORPORATED PLACE — ELWOOD

IOWA DOT

PLANS OF PROPOSED IMPROVEMENTS ON THE

PRIMARY ROAD SYSTEM

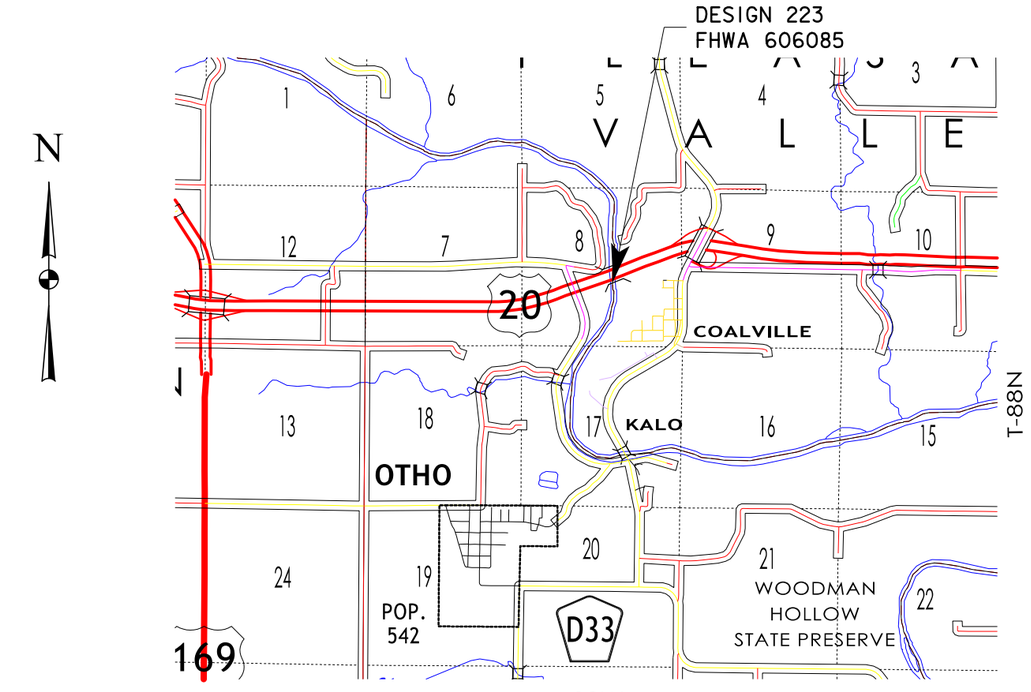
WEBSTER COUNTY

DECK JOINT REPAIR

US 20 (EB) OVER DES MOINES RIVER

2.6 MI. E. OF JCT. US 169

THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.



LOCATION MAP

PROJECT DIRECTORY NAME: 9402001021

ENGLISH STANDARD BRIDGE PLANS

STANDARD	ISSUED	REVISED

	TOTAL SHEETS
	24
PROJECT NUMBER	
MB-020-1(501)124--77-94	
R.O.W. PROJECT NUMBER	
PROJECT IDENTIFICATION NUMBER	
21-94-020-010	

INDEX OF SHEETS

REVISIONS

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

REVISIONS TO THIS DESIGN PLAN AND/OR PROJECT SPECIFICATIONS SHOULD BE SUBMITTED BY _____

STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED ON SHEET NUMBER C.1

DESIGN DATA RURAL

2019 AADT	4,400	V.P.D.
TRUCKS	26	%
2020 AADT	3,900	V.P.D.
TRUCKS	29	%

INDEX OF SEALS

SHEET NO.	NAME	TYPE
1	SAMANTHA L. MCKILLOP	STRUCTURAL DESIGN
B.1	CHERYL L. KELLY	ROADWAY DESIGN

PRELIMINARY
NOT FOR CONSTRUCTION

STRUCTURAL DESIGN

LICENSED PROFESSIONAL ENGINEER
Samantha L. McKillop
26065
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

CHECK PLANS XX-XX-2022

Signature Date

Samantha L. McKillop

Printed or Typed Name

My license renewal date is December 31, 2023

Pages or sheets covered by this seal: SHEETS 1 THRU 12 OF 24

DESIGN TEAM BURNS & MCDONNELL	ENGLISH	IOWA DOT * BRIDGES AND STRUCTURES BUREAU	FILE NO. 32114	WEBSTER COUNTY	PROJECT NUMBER MB-020-1(501)124--77-94	SHEET NUMBER

7/5/2022 1:50:18 PM TRN_Road pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\9402001021\Bridge\(501)_Deck Joint Repair\Burns and McDonnell\BRG_94020223 700323S000 11x17_pdf.pltcfg

GENERAL NOTES:

THIS DESIGN IS FOR REPAIRS TO THE EXISTING 671'-0x40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE ON E.B. US 20 OVER THE DES MOINES RIVER IN WEBSTER COUNTY.

ELECTRONIC COPIES OF ORIGINAL DESIGN PLANS WILL BE MADE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS. DIMENSIONS SHOWN ON THESE PLANS ARE BASED ON DESIGN PLANS (ORIGINAL DESIGN NO. 686).

SEE DESIGN SHEET 2 FOR LIST OF REPAIR ITEMS.

ALL ALIGNMENT, STATIONING, CONNECTING DIMENSIONS, AND ELEVATIONS USED IN THE NEW DETAILS IN THESE PLANS WERE DEVELOPED BASED ON THE EXISTING BRIDGE PLANS. THE BRIDGE CONTRACTOR SHALL FIELD VERIFY THESE DETAILS BEFORE STARTING CONSTRUCTION.

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE BRIDGE CONTRACTOR OF THE CONSTRUCTION STARTING DATE.

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5a1 is $\frac{5}{8}$ inch diameter bar). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

ENGLISH SIZE	3	4	5	6	7	8	9	10	11
BAR DESIGNATION	10	13	16	19	22	25	29	32	36

ALL REINFORCING BARS AND BARS NOTED AS DOWELS SUPPLIED FOR THIS STRUCTURE SHALL BE DEFORMED REINFORCEMENT UNLESS OTHERWISE NOTED OR SHOWN.

CONSTRUCTION SHALL BE DONE IN STAGES WITH AT LEAST ONE LANE TRAFFIC MAINTAINED AT ALL TIMES IN ACCORDANCE WITH "TRAFFIC CONTROL PLAN" NOTE.

CONSTRUCTION STAGES 1 & 2 AS DETAILED ON THESE PLANS MAY BE REVERSED AT THE CONTRACTOR'S OPTION SUBJECT TO THE ENGINEER'S APPROVAL.

KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. IN ADDITION, THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO A MAXIMUM OF 10 DEGREES FROM VERTICAL.

THE LUMP SUM BID FOR "REMOVALS, AS PER PLAN" SHALL INCLUDE ALL COSTS ASSOCIATED WITH REMOVING THE TOP OF EXISTING ABUTMENT BACKWALLS, PORTIONS OF THE BARRIER RAILS, PORTIONS OF THE DECK, CONCRETE ABUTMENT DIAPHRAGMS, AND THE EXPANSION JOINTS AT EACH END OF THE BRIDGE. REMOVAL OF SCHEDULED ITEMS SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE SPECIFICATIONS. ANY DAMAGE TO ANY STEEL OR CONCRETE NOT TO BE REMOVED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND REPAIRED AT NO EXTRA COST TO THE STATE.

NO TORCHWORK, CUTTING, GRINDING OR DRILLING OF HOLES ON THE EXISTING STRUCTURAL STEEL OF THE BRIDGE SHALL BE PERFORMED WHEN THE AIR TEMPERATURE AND STEEL TEMPERATURE ARE BELOW 40 DEGREES F.

THE TOPS OF THE ABUTMENT BACKWALLS AS SHOWN SHALL BE CONSTRUCTED USING STRUCTURAL CONCRETE CLASS C. PROMPTLY AFTER THE CONCRETE HAS BEEN PLACED AND VIBRATED AS PROVIDED IN ARTICLES 2403.03, C, AND 2403.03, D, OF THE STANDARD SPECIFICATIONS, IT SHALL BE HAND FINISHED TO PROVIDE A SMOOTH SURFACE WITH THE PROPER CROWN. THE CONTRACTOR MAY ELECT TO USE FORMWORK WHICH IS MARKED OR TRIMMED TO THE CORRECT ELEVATION AND CROWN TO PROVIDE THE LIMITS FOR THE HAND FINISHING.

THE BRIDGE CONTRACTOR IS TO PROVIDE A METHOD OF REMOVAL THAT WILL PREVENT FEATHER EDGING AT THE BOTTOM OF THE EXISTING SLAB. CARE SHALL BE TAKEN WHEN EXPOSING EXISTING REINFORCING SO THE BOND TO EXISTING CONCRETE IS NOT BROKEN AT THE CONCRETE BREAK LINES.

CONTRACTOR SHALL REPAIR ANY DAMAGE TO HMA OVERLAY OVER APPROACH SLAB AFTER COMPLETION OF REPLACEMENT OF EXPANSION JOINT.

IN ADDITION TO THE REQUIREMENTS OF ARTICLE 2413.03, G, OF THE STANDARD SPECIFICATIONS, THE EXPOSED BRIDGE SEATS AND WASH SURFACES AT THE ABUTMENTS SHALL HAVE AN APPLICATION OF CONCRETE SEALER IN ACCORDANCE WITH ARTICLE 2403.03, P, 3, OF THE STANDARD SPECIFICATIONS.

CONCRETE REMOVAL SHALL BE INITIATED WITH A $\frac{3}{4}$" SAW CUT WHEREVER POSSIBLE.

IT IS THE INTENT OF THESE PLANS TO REUSE THE EXISTING STEEL SHEAR STUDS ON TOP OF THE GIRDERS AND DIAPHRAGMS. THE CONTRACTOR SHALL EXERCISE CARE NOT TO DAMAGE THESE SHEAR STUDS DURING THE PARTIAL REMOVAL OF THE CONCRETE DECK OPERATION. ANY REPLACEMENT OF DAMAGED SHEAR STUDS WILL BE AS DIRECTED BY THE ENGINEER AT NO COST TO THE STATE.

SCRAPE SAMPLES WERE TAKEN FROM THE GIRDERS AND ABUTMENT BEARINGS ON THIS BRIDGE. ANALYSIS OF TOTAL LEAD ON THESE SAMPLES WERE 83 AND 370 PARTS PER MILLION (PPM), RESPECTIVELY. ANALYSIS OF TOTAL CHROMIUM ON THESE SAMPLES WERE 40 AND 31 PPM, RESPECTIVELY. THESE ANALYSES SHOW THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS. LEVELS INDICATED BY THESE TESTS COULD CREATE CONDITIONS ABOVE REGULATORY LIMITS FOR HEALTH AND SAFETY REQUIREMENTS. NO OTHER CONSTITUENTS WERE ANALYZED. THE BIDDER SHOULD NOT RELY ON THE IOWA DOT'S TESTING AND ANALYSIS FOR ANY PURPOSE OTHER THAN AS AN INDICATION OF THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS.

THE LUMP SUM BID FOR "PAINTING STRUCTURAL STEEL" SHALL INCLUDE THE COST OF PREPARING ALL THE EXISTING STRUCTURAL STEEL FOR PAINTING (INCLUDING BEARINGS) AND FIELD PAINTING EXISTING STRUCTURAL STEEL AS NOTED IN THESE PLANS. CLEANING AND PAINTING SHALL BE IN ACCORDANCE WITH SECTION 2508, OF THE STANDARD SPECIFICATIONS. AN EPOXY PAINT SYSTEM SHALL BE USED.

CONTAINMENT AND DISPOSAL OF WASTE SHALL BE IN ACCORDANCE WITH SECTION 2508, OF THE STANDARD SPECIFICATIONS. ALL COSTS ASSOCIATED WITH HAULING AND DEPOSITING OF WASTE AT THE DESIGNATED SITE/FACILITY SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND INCLUDED IN THE CONTRACT PRICE BID FOR THE "CONTAINMENT" ITEM.

BERM EROSION REPAIR NOTE:

THE CONTRACTOR SHALL REPAIR BERM EROSION AT THE NEAR AND FAR ABUTMENTS. THE CONTRACTOR SHALL RESHAPE BERMS AND INSTALL ENGINEERING FABRIC WITH A 2'-0 THICK LAYER OF EROSION STONE IN THE AREAS AS SHOWN ON THE SITUATION PLAN. ALL COSTS FOR LABOR AND MATERIAL REQUIRED TO REPAIR THE BERMS AS NOTED SHALL BE INCLUDED IN THE LUMP SUM UNIT PRICE BID FOR "BERM EROSION REPAIR". NO ADDITIONAL MEASUREMENT OR PAYMENT SHALL BE MADE. APPROXIMATELY 10.0 CY OF SUITABLE FILL, 834 SY OF ENGINEERING FABRIC AND 900 TONS OF EROSION STONE ARE REQUIRED TO REPAIR THE AREAS SHOWN ON THE SITUATION PLAN.

SPECIFICATIONS:

DESIGN: AASHTO SERIES OF 2002.

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2002.

REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 60.

CONCRETE IN ACCORDANCE WITH SECTION 8, f'c = 4.0 KSI.

STRUCTURAL STEEL IN ACCORDANCE WITH SECTION 10 ASTM A709 GRADE 36, GRADE 50, AND GRADE 50W (AASHTO M270 GRADE 36, GRADE 50, AND GRADE 50W)

ESTIMATED BRIDGE QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNITS	QUANTITY	AS BUILT QUANTITY
1	2401-6750001	REMOVALS, AS PER PLAN	LS	1.00	
2	2402-0425031	GRANULAR BACKFILL	TONS	10	
3	2403-0100000	STRUCTURAL CONCRETE (MISCELLANEOUS)	CY	13.7	
4	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	2206	
5	2413-1200000	STEEL EXTRUSION JOINT WITH NEOPRENE	LF	86.7	
6	2413-1200100	NEOPRENE GLAND INSTALLATION AND TESTING	LF	86.7	
7	2508-0970000	CONTAINMENT	LS	1.00	
8	2508-0991000	PAINTING OF STRUCTURAL STEEL	LS	1.00	
9	2533-4980005	MOBILIZATION	LS	1.00	
10	2599-9999010	BERM EROSION REPAIR	LS	1.00	

ESTIMATE REFERENCE INFORMATION

DATA LISTED BELOW IS FOR INFORMATIONAL PURPOSES ONLY AND SHALL NOT CONSTITUTE A BASIS FOR ANY EXTRA WORK ORDERS.

ITEM NO.	DESCRIPTION
1	REMOVAL OF SCHEDULED ITEMS SHALL BE IN ACCORDANCE WITH SECTION 2401, OF THE STANDARD SPECIFICATIONS. ANY DAMAGE TO MATERIAL NOT TO BE REMOVED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND REPAIRED AT NO EXTRA COST TO THE STATE.
2	PERCENT PASSING NO. 200 SIEVE NOT TO EXCEED 5%
3	INCLUDES ALL INSTALLATION COST FOR DOWELS. INCLUDES ALL RESILIENT JOINT FILLER REQUIRED. INCLUDES CLEANING ABUTMENTS AND FURNISHING AND APPLYING CONCRETE SEALER.
5	INCLUDES ALL NECESSARY HARDWARE AND ACCESSORIES INCLUDING THE ANCHORAGE SYSTEM, TEMPORARY ERECTION MATERIAL AND THE $\frac{3}{8}$" CURB PLATES WITH THEIR ANCHORAGE SYSTEM. EXCLUDES INSTALLATION OF NEOPRENE GLAND. EXPANSION CONDITIONS DO NOT ALLOW FOR THE USE OF DS BROWN JOINT FOR THIS INSTALLATION.
6	INCLUDES INSTALLATION OF NEOPRENE GLAND AND WATER TESTING OF JOINT.
8	INCLUDES COST OF CLEANING AND PAINTING ABUTMENT BEARINGS AND GIRDER ENDS.
10	INCLUDES ALL MATERIAL, EQUIPMENT, AND LABOR TO REPAIR BERM EROSION IN ACCORDANCE WITH THESE PLANS. METHOD OF MEASUREMENT AND BASIS OF PAYMENTS ARE LUMP SUM.

SHOP DRAWING SUBMITTALS

SHOP DRAWINGS SHALL BE SUBMITTED FOR THE FOLLOWING ITEMS SHOWN IN THE TABLE BELOW. (NOTE ADDITIONAL SHOP DRAWINGS MAY BE REQUIRED IN ACCORDANCE WITH ARTICLE 1105.03 OF THE STANDARD SPECIFICATIONS.)

SUBMITTAL REQUIREMENTS FOR SHOP DRAWINGS SHOULD BE IN ACCORDANCE WITH ARTICLE 1105.03, OF THE STANDARD SPECIFICATIONS, FOR HIGHWAY AND BRIDGE CONSTRUCTION OF THE IOWA DEPARTMENT OF TRANSPORTATION.

SHOP DRAWINGS SHALL BE SUBMITTED WITH THE FOLLOWING NAMING CONVENTION:
(Paren)_County_DesignNumber_SubmittalDescription.pdf
Example: (090)_BlackHawk_Design915_DeckDrains.pdf

1	STEEL EXTRUSION EXPANSION DEVICE
2	BARRIER PLATES

DESIGN HISTORY AT THIS SITE (INCLUDES THIS DESIGN)

DES. NO.	TYPE OF WORK
686	ORIGINAL DESIGN
532	GUARDRAIL REPAIR
403	TREE/BRUSH REMOVAL
412	EROSION REPAIR
223	DECK JOINT REPAIR

NOTE:
ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

TRAFFIC CONTROL PLAN:
THE ROADWAY WILL BE OPEN TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.

DESIGN FOR REPAIRS TO 20° SKEW L.A.

671'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

115'-0 END SPANS (3) 147'-0 INTERIOR SPANS

GENERAL NOTES & QUANTITIES

STA. 766+24.99 OCTOBER, 2022

WEBSTER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 1 OF 11 FILE NO. 32114 DESIGN NO. 223

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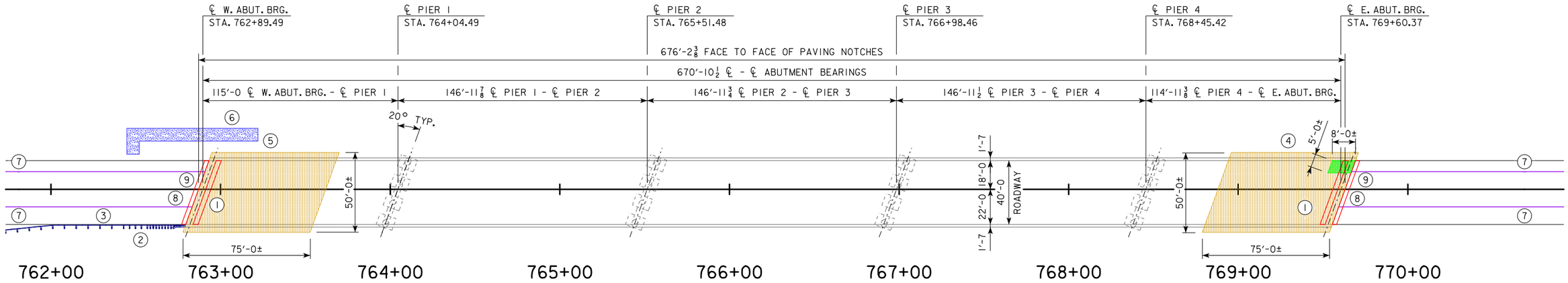
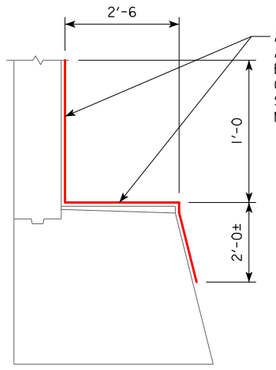


INDICATES APPROXIMATE AREA OF BERM EROSION REPAIR

INDICATES APPROXIMATE AREA OF GRANULAR BACKFILL

INDICATES APPROXIMATE AREA OF BRIDGE END DRAIN

SITUATION PLAN



APPLY CONCRETE SEALER TO FACE OF ABUTMENT BACKWALL, TOP AND SIDES OF BEAM SEAT PEDESTALS, AND TOP & FRONT OF ABUTMENT WASH SURFACE. SEALER SHALL MEET THE REQUIREMENTS OF MATERIALS I.M. 491.12 APPENDIX A OR B.

ABUTMENT CONCRETE SEALER DETAIL

N

REPAIRS SHALL CONSIST OF:

(1) REMOVE AND REPLACE EXPANSION JOINTS AT ABUTMENTS.

(2) UPDATE NEAR RIGHT GUARDRAIL.

(3) PAVE NEAR RIGHT SHOULDER OUT TO GUARDRAIL.

(4) REGRADE ERODED AREAS AT FAR ABUTMENT BERM. PLACE ENGINEERING FABRIC AND EROSION STONE. AND FILL IF NECESSARY. FILL AND COMPACT HOLE AT NORTH END OF ABUTMENT WITH GRANULAR BACKFILL.

(5) REGRADE ERODED AREAS AT NEAR ABUTMENT BERM. PLACE ENGINEERING FABRIC AND EROSION STONE. ADD FILL IF NECESSARY.

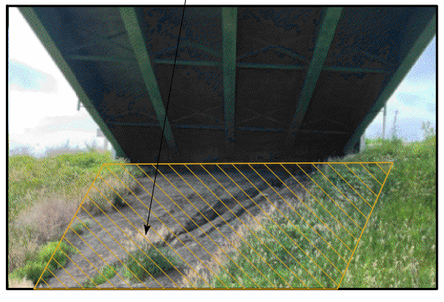
(6) INSTALL BRIDGE END DRAIN AT NEAR LEFT CORNER OF BRIDGE.

(7) SHOULDER STRENGTHENING FOR TRAFFIC SHIFTS DURING STAGED CONSTRUCTION.

(8) CLEAN AND SEAL ABUTMENT BACKWALL, SEATS AND FOOTING FRONT FACES.

(9) CLEAN AND REPAINT ABUTMENT BEARINGS AND GIRDER ENDS TO LENGTH REQUIRED TO CAPTURE CORRODED AREAS. (APPROX. 5'-0 AT WEST ABUTMENT AND TO APPROX. THE FIRST LINE OF CROSS-FRAMES AT EAST ABUTMENT)

COVER BERM WITH EROSION STONE OVER ENGINEERING FABRIC.

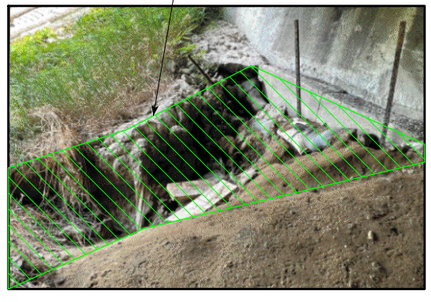


BERM EROSION AT WEST ABUTMENT

COVER BERM WITH EROSION STONE OVER ENGINEERING FABRIC.

BERM EROSION AT EAST ABUTMENT

FILL AND COMPACT HOLE WITH GRANULAR BACKFILL.



EROSION HOLE AT NORTH END OF EAST ABUT.

TRAFFIC ESTIMATE

2019 AADT	4,400	V.P.D.
TRUCKS	26	%
2020 AADT	3,900	V.P.D.
TRUCKS	29	%

LOCATION

E.B. US 20 OVER
DES MOINES RIVER
2.6 MI. E. OF JCT. US 169
T-88N, R-28W
SECTION 8
OTHO TWP.
WEBSTER COUNTY
MAINT. NO. 9424.IR020
FHWA NO. 606085
LATITUDE 42.447660°
LONGITUDE -94.136002°

DESIGN FOR REPAIRS TO 20° SKEW L.A.

671'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

115'-0 END SPANS (3) 147'-0 INTERIOR SPANS

SITUATION PLAN

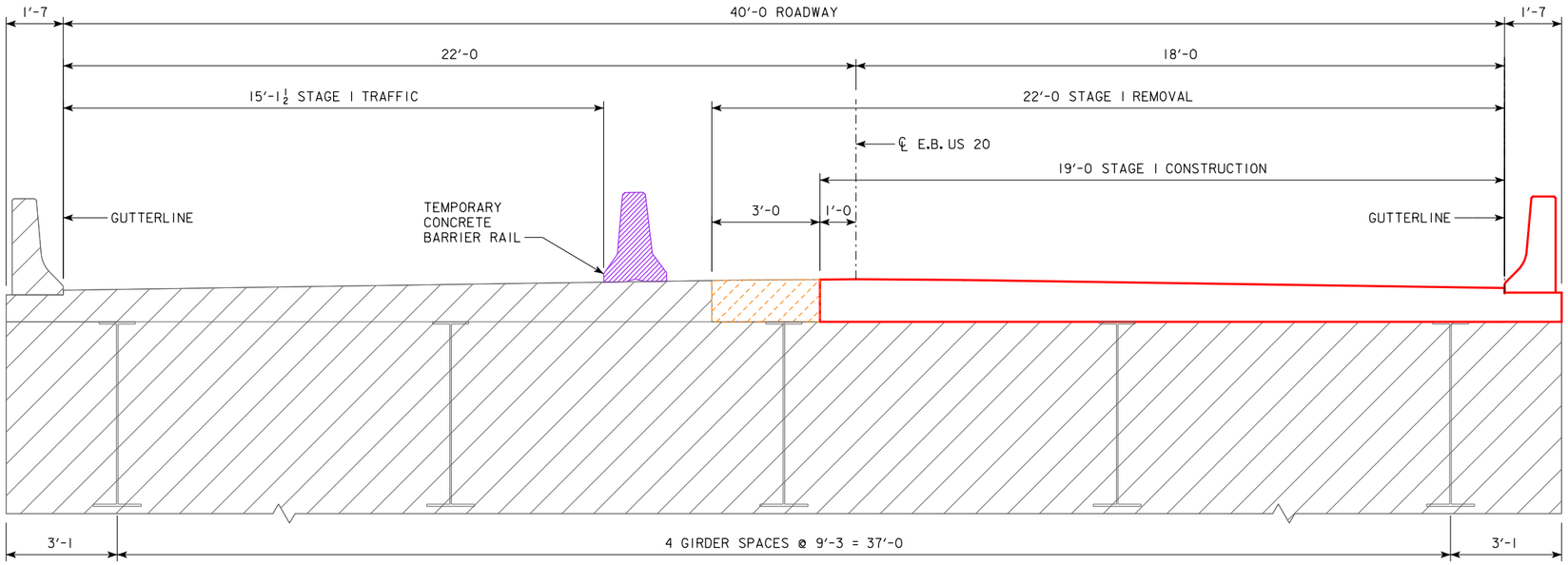
STA. 766+24.99 OCTOBER, 2022

WEBSTER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

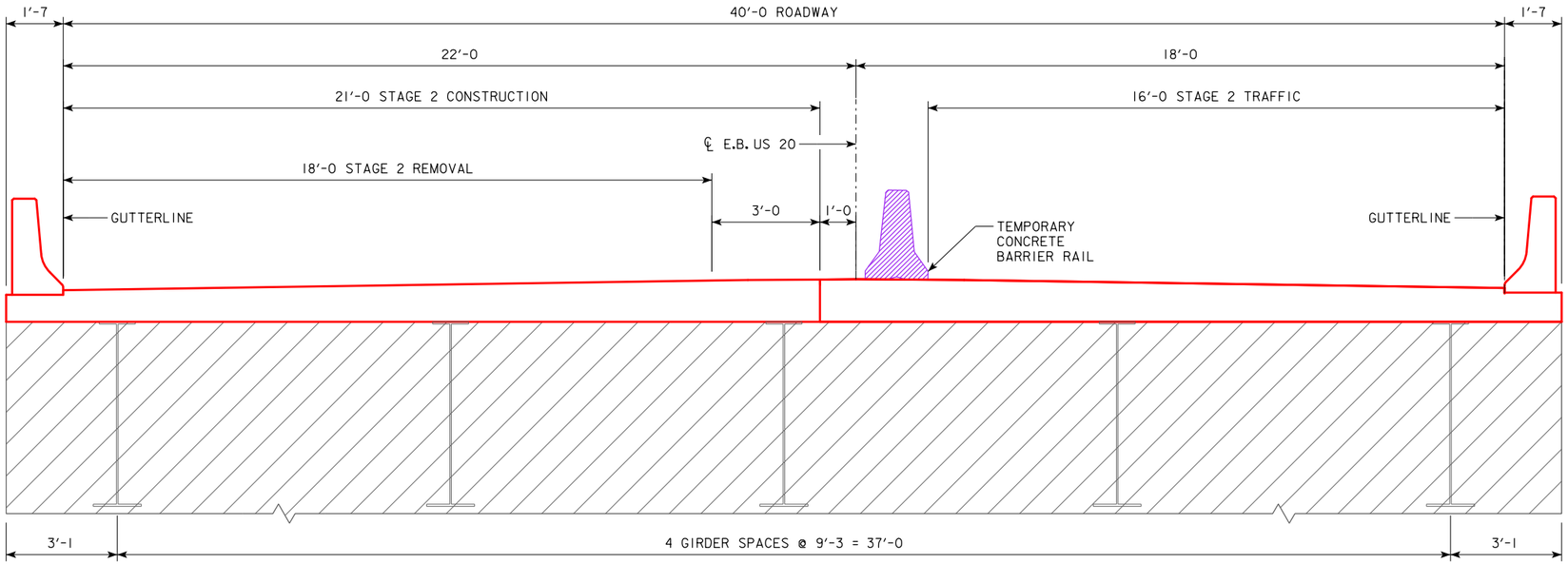
DESIGN SHEET NO. 2 OF 11 FILE NO. 32114 DESIGN NO. 223

DESIGN TEAM BURNS & MCDONNELL | WEBSTER COUNTY | PROJECT NUMBER MB-020-1(501)124--77-94 | SHEET NUMBER 3



TYPICAL SECTION STAGE I CONSTRUCTION AT ABUTMENT EXPANSION JOINT

(LOOKING WEST)



TYPICAL SECTION STAGE 2 CONSTRUCTION AT ABUTMENT EXPANSION JOINT

(LOOKING WEST)

DESIGN FOR REPAIRS TO 20° SKEW L.A.

671'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

115'-0 END SPANS (3) 147'-0 INTERIOR SPANS

STAGING DETAILS

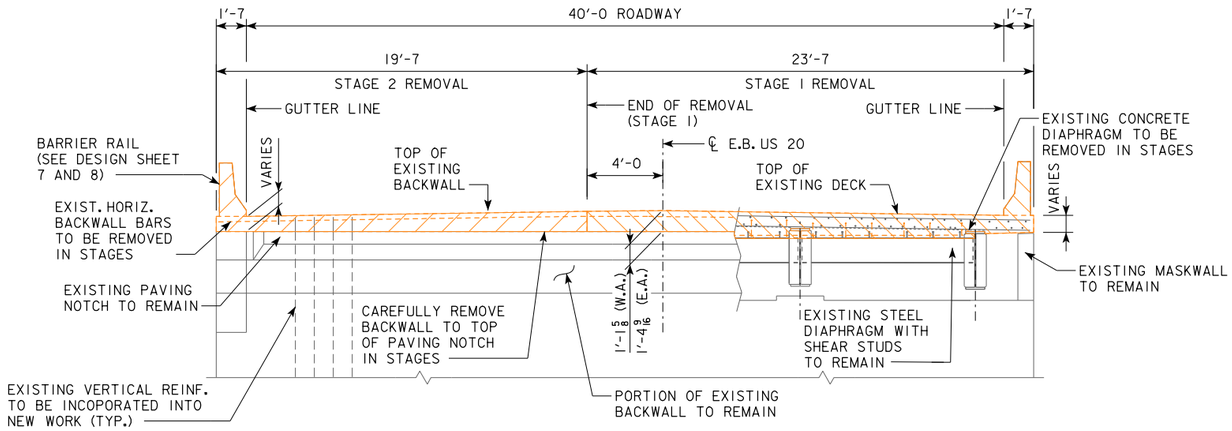
STA. 766+24.99 OCTOBER, 2022

WEBSTER COUNTY

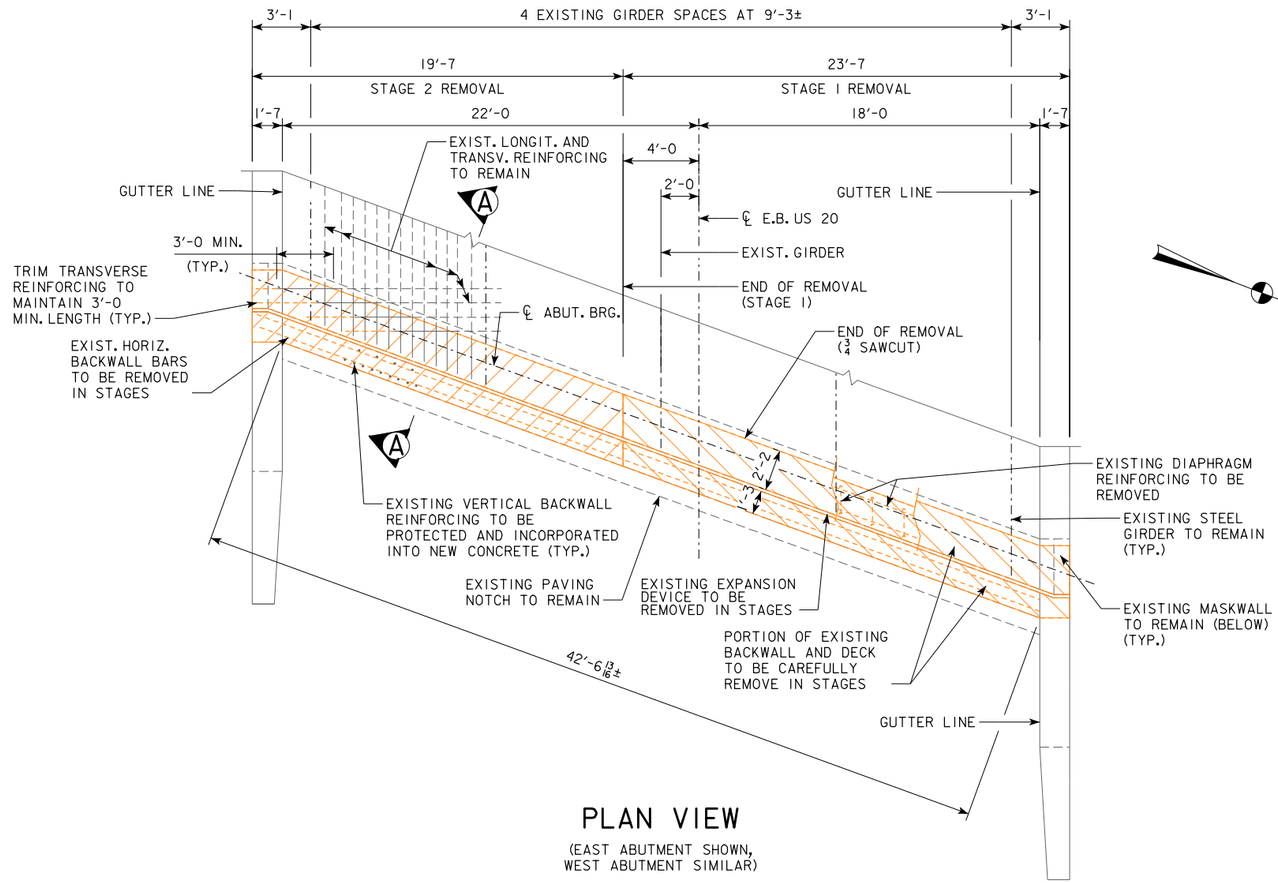
IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 3 OF 11 FILE NO. 32114 DESIGN NO. 223

DESIGN TEAM BURNS & MCDONNELL | WEBSTER COUNTY | PROJECT NUMBER MB-020-1(501)124--77-94 | SHEET NUMBER 4

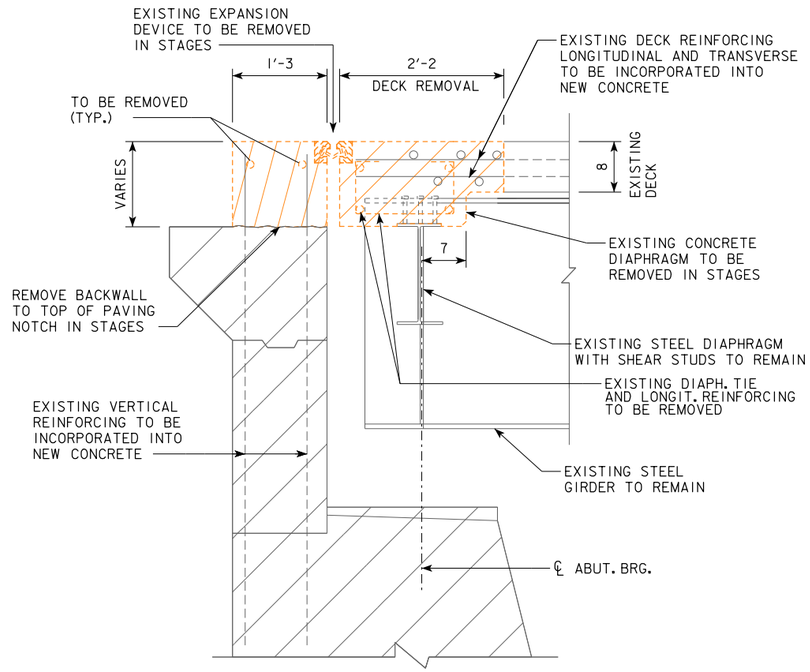


ABUTMENT REAR BACKWALL ELEVATION



PLAN VIEW

(EAST ABUTMENT SHOWN, WEST ABUTMENT SIMILAR)



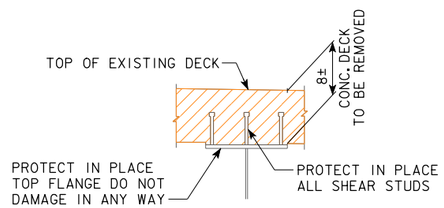
SECTION A-A

REMOVAL NOTES:

ORANGE HATCHED AREAS INDICATE CONCRETE REMOVALS.

THIS SHEET SHOWS DETAILS OF THE PARTIAL ABUTMENT AND SUPERSTRUCTURE REMOVAL ON THE EXIST. BRIDGE. ALL PARTIAL REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS. ALL SUCH REMOVALS SHALL BE TO NEAT SAW CUTS TO PROVIDE CLEAN STRAIGHT SURFACES AT INTERFACES BETWEEN NEW CONCRETE AND REMAINING CONCRETE. THE REMOVAL SHALL BE DONE IN A MANNER WHICH WILL PREVENT ANY DAMAGE TO THE EXISTING STRUCTURE TO REMAIN. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY DAMAGE CAUSED, AND SHALL REPAIR ANY DAMAGED AREA TO ITS ORIGINAL CONDITION, AS DIRECTED BY THE ENGINEER, AT THE CONTRACTOR'S EXPENSE. ANY EXISTING REINFORCING STEEL WHICH IS TO BE "SAVED" THAT IS EXPOSED DURING REMOVAL OPERATIONS IS TO BE CAREFULLY PROTECTED, CLEANED AND INCORPORATED INTO NEW CONSTRUCTION UNLESS NOTED OTHERWISE.

START ALL REMOVALS WITH 3/4" SAW CUT.



SHEAR STUD DETAIL

NOTE:
W.A. = WEST ABUTMENT
E.A. = EAST ABUTMENT

DESIGN FOR REPAIRS TO 20° SKEW L.A.

671'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

115'-0 END SPANS (3) 147'-0 INTERIOR SPANS

REMOVALS DETAILS

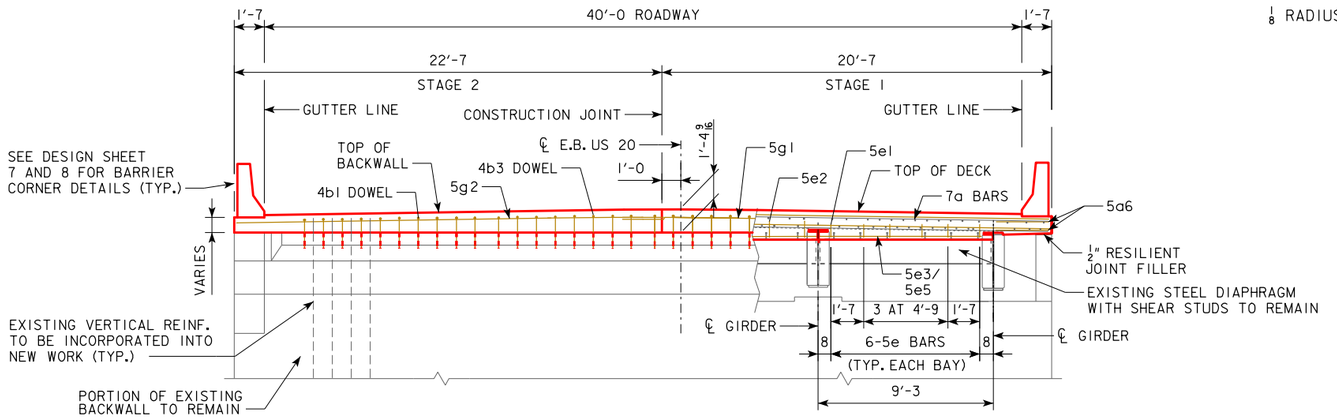
STA. 766+24.99 OCTOBER, 2022

WEBSTER COUNTY

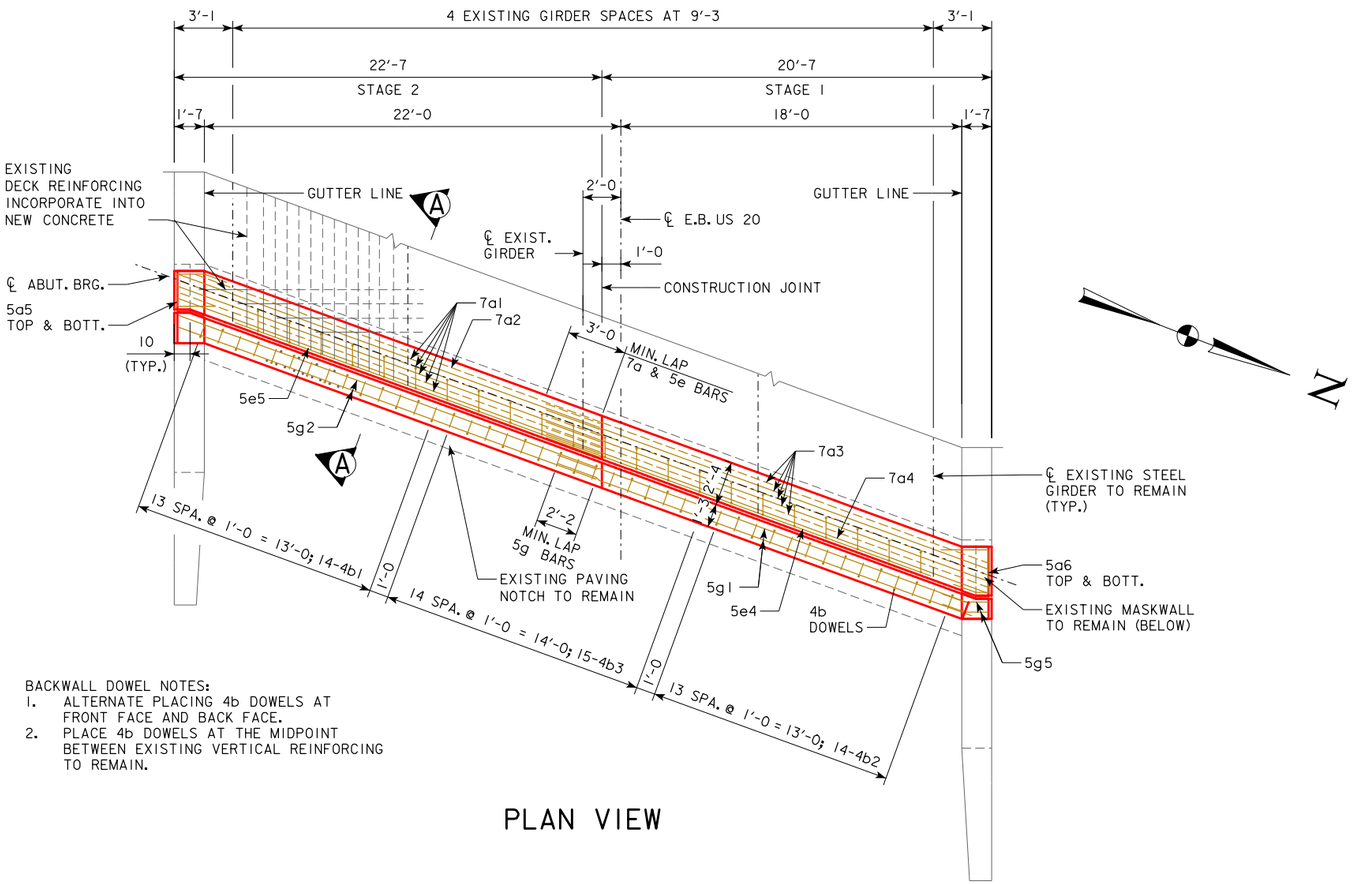
IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 4 OF 11 FILE NO. 32114 DESIGN NO. 223

DESIGN TEAM BURNS & MCDONNELL | WEBSTER COUNTY | PROJECT NUMBER MB-020-1(501)124--77-94 | SHEET NUMBER 5

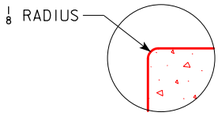


ABUTMENT REAR BACKWALL ELEVATION
(LOOKING WEST)

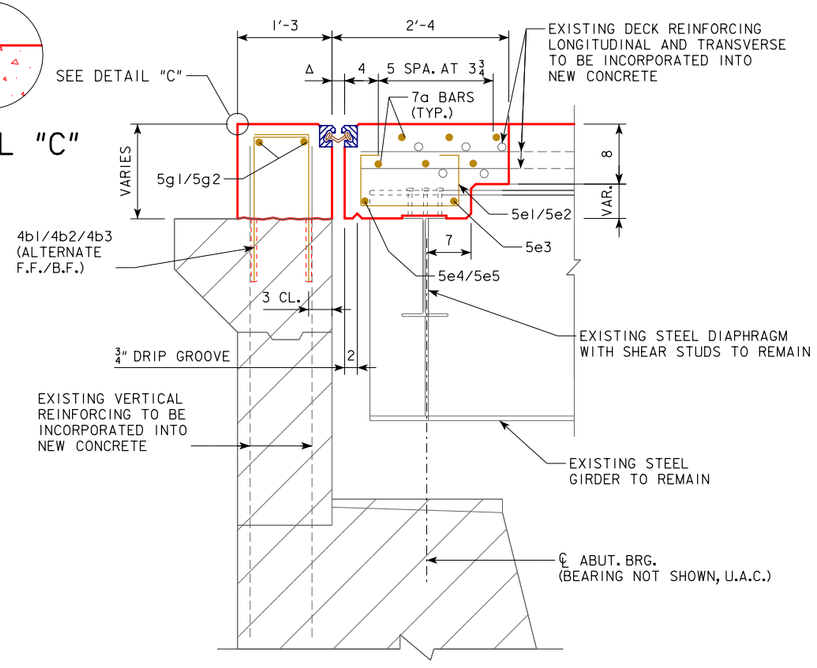


PLAN VIEW

BACKWALL DOWEL NOTES:
1. ALTERNATE PLACING 4b DOWELS AT FRONT FACE AND BACK FACE.
2. PLACE 4b DOWELS AT THE MIDPOINT BETWEEN EXISTING VERTICAL REINFORCING TO REMAIN.



DETAIL "C"



SECTION A-A

Δ ADJUST AS NEEDED TO SET EXPANSION JOINT

NOTES:
1. SEE DESIGN SHEETS 7 AND 8 FOR BARRIER RAIL DETAILS.
2. SEE DESIGN SHEET 11 FOR ABUTMENT NOTES, DOWEL SETTING NOTES, BENT BAR DETAILS, AND BAR LIST.
3. PLACE 5e BARS PARALLEL TO EXISTING LONGITUDINAL REINFORCING. CUT EXISTING BARS TO MAINTAIN 2" CLEAR COVER.
4. THE TOP OF EXISTING BACKWALL CONCRETE TO REMAIN SHALL BE INTENTIONALLY ROUGHENED.
5. CONTRACTOR SHALL REPAIR ANY DAMAGE TO HMA OVERLAY AFTER INSTALLATION OF NEW STRIP SEAL.

DESIGN FOR REPAIRS TO 20° SKEW L.A.

671'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

115'-0 END SPANS (3) 147'-0 INTERIOR SPANS

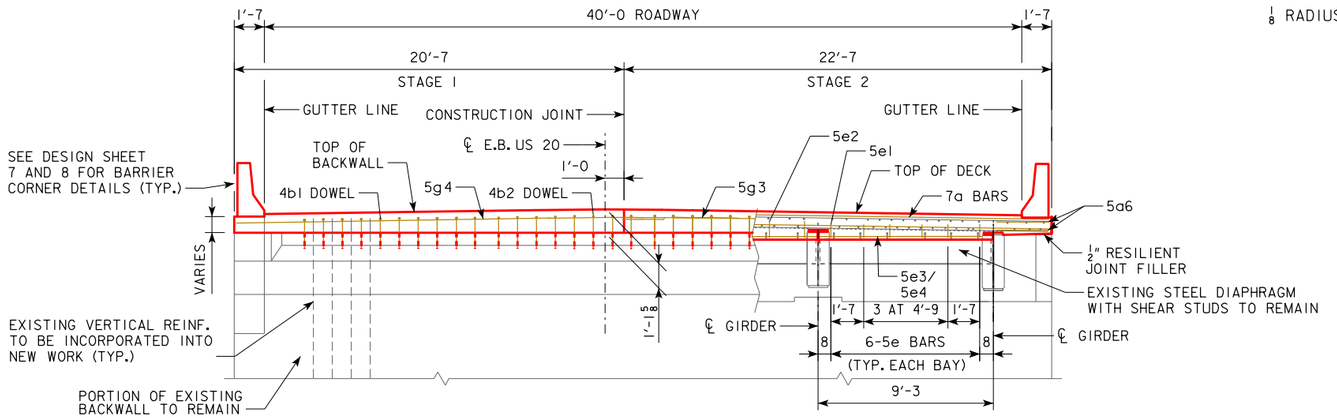
EAST ABUTMENT DETAILS

STA. 766+24.99 OCTOBER, 2022

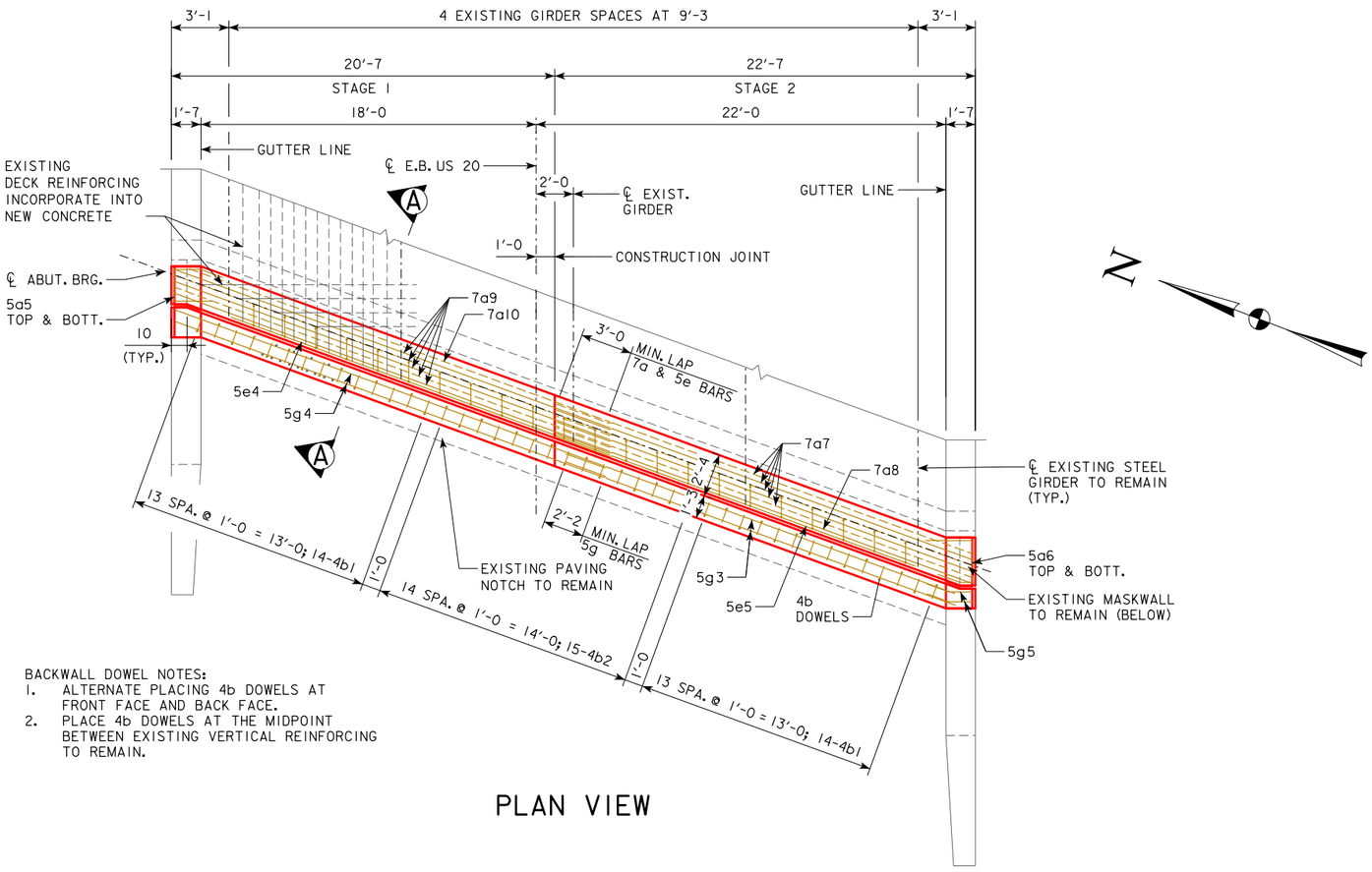
WEBSTER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 5 OF 11 FILE NO. 32114 DESIGN NO. 223

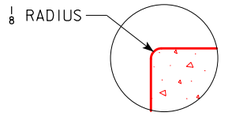


ABUTMENT REAR BACKWALL ELEVATION
(LOOKING EAST)

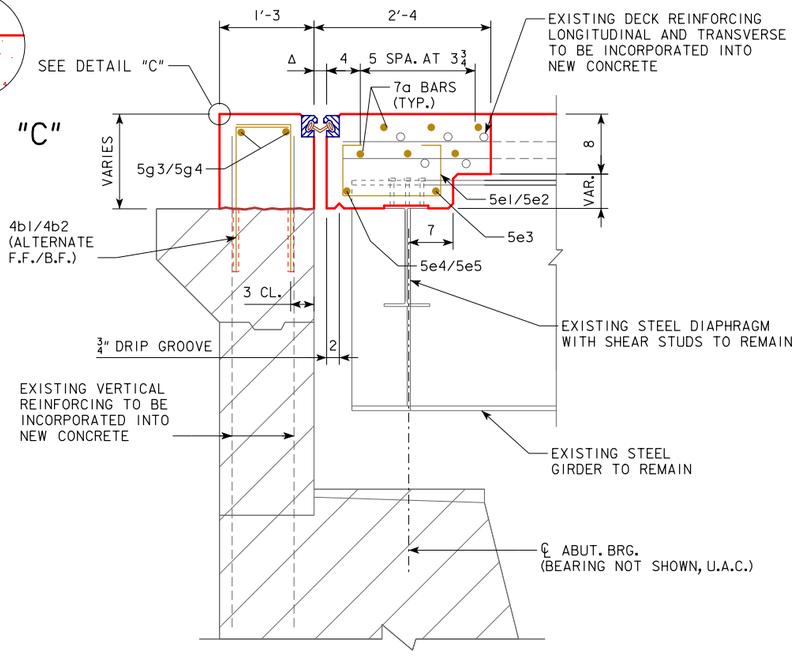


BACKWALL DOWEL NOTES:
1. ALTERNATE PLACING 4b DOWELS AT FRONT FACE AND BACK FACE.
2. PLACE 4b DOWELS AT THE MIDPOINT BETWEEN EXISTING VERTICAL REINFORCING TO REMAIN.

PLAN VIEW



DETAIL "C"



SECTION A-A

Δ ADJUST AS NEEDED TO SET EXPANSION JOINT

NOTES:
1. SEE DESIGN SHEETS 7 AND 8 FOR BARRIER RAIL DETAILS.
2. SEE DESIGN SHEET 11 FOR ABUTMENT NOTES, DOWEL SETTING NOTES, BENT BAR DETAILS, AND BAR LIST.
3. PLACE 5e BARS PARALLEL TO EXISTING LONGITUDINAL REINFORCING. CUT EXISTING BARS TO MAINTAIN 2" CLEAR COVER.
4. THE TOP OF EXISTING BACKWALL CONCRETE TO REMAIN SHALL BE INTENTIONALLY ROUGHENED.
5. CONTRACTOR SHALL REPAIR ANY DAMAGE TO HMA OVERLAY AFTER INSTALLATION OF NEW STRIP SEAL.

DESIGN FOR REPAIRS TO 20° SKEW L.A.

671'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

115'-0 END SPANS (3) 147'-0 INTERIOR SPANS

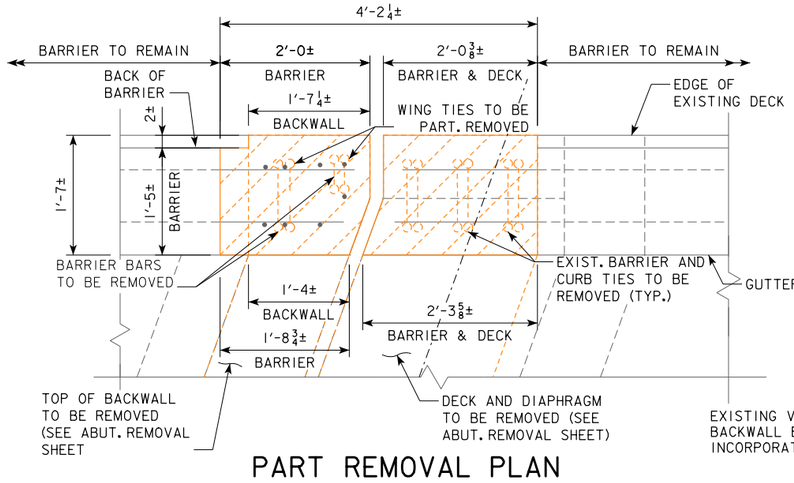
WEST ABUTMENT DETAILS

STA. 766+24.99 OCTOBER, 2022

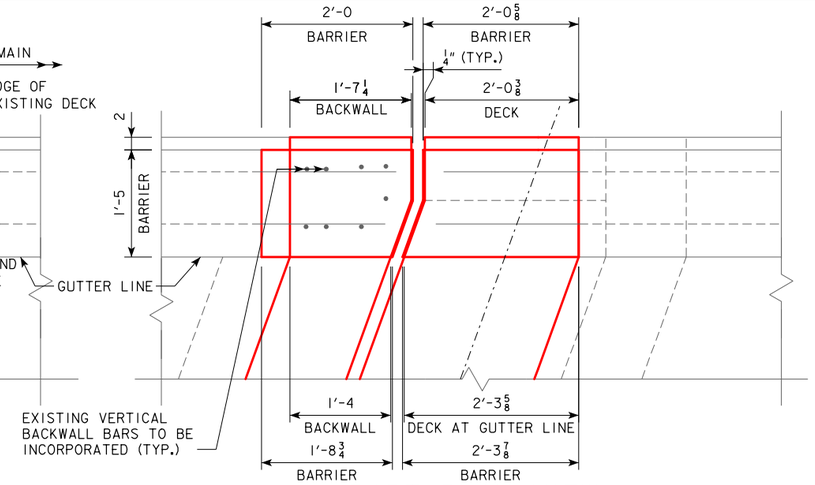
WEBSTER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

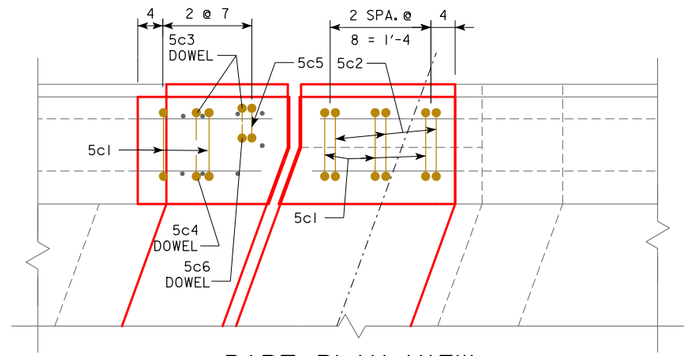
DESIGN SHEET NO. 6 OF 11 FILE NO. 32114 DESIGN NO. 223



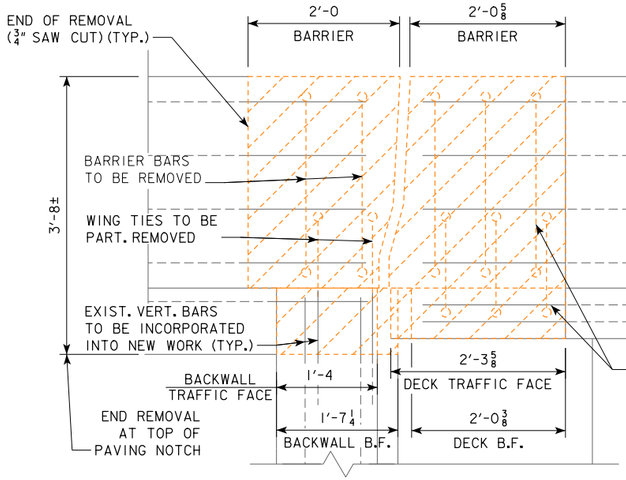
PART REMOVAL PLAN



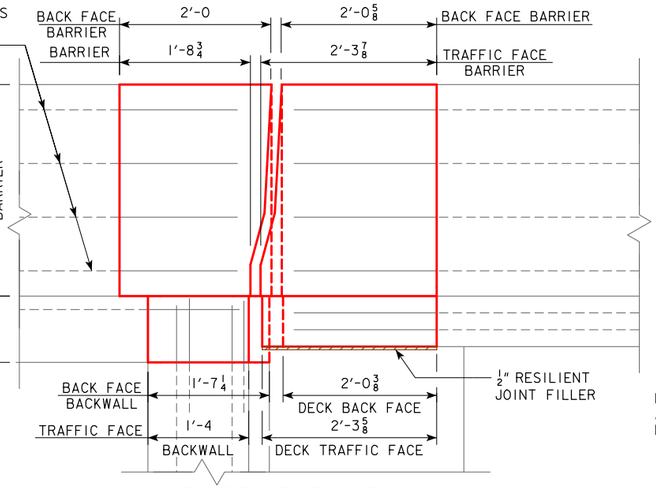
PART PLAN VIEW
(PROPOSED REINFORCING NOT SHOWN)



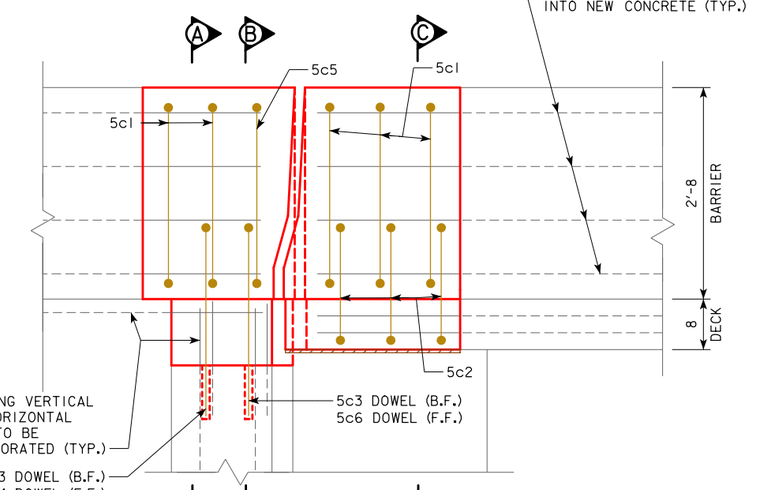
PART PLAN VIEW
(SHOWING BARRIER REINFORCING)



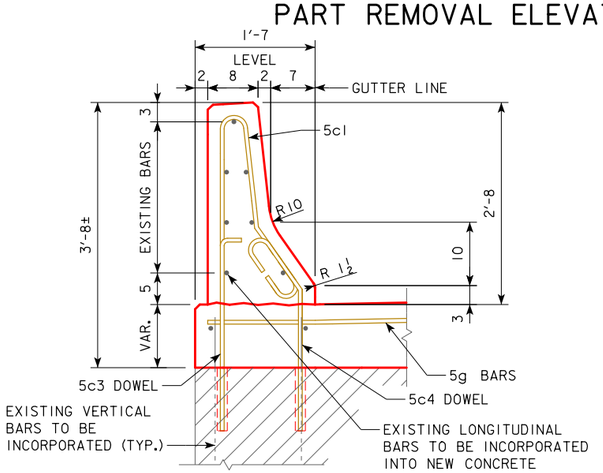
PART REMOVAL ELEVATION



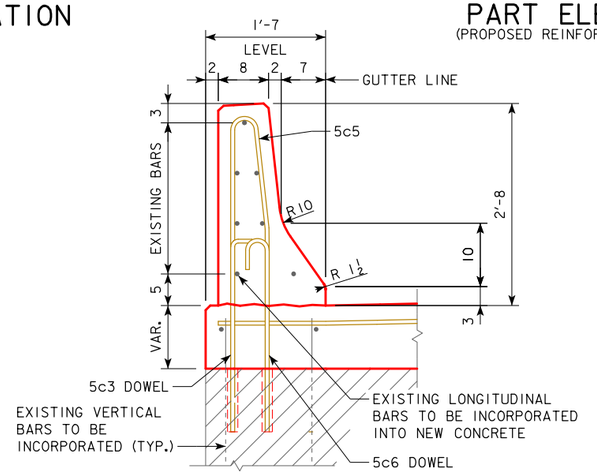
PART ELEVATION
(PROPOSED REINFORCING NOT SHOWN)



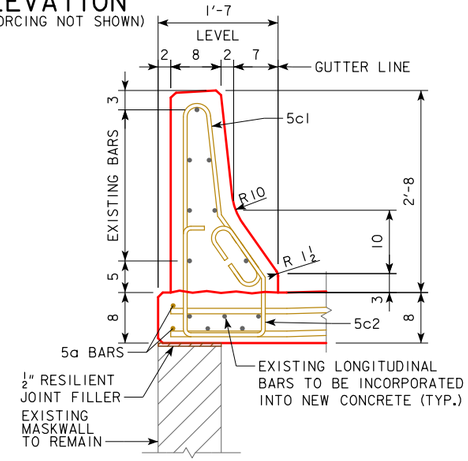
PART ELEVATION VIEW
(SHOWING BARRIER REINFORCING)



SECTION A-A



SECTION B-B



SECTION C-C

NOTES:
1. THIS SHEET IS FOR THE NORTH CORNER OF THE WEST ABUTMENT AND THE SOUTH CORNER OF THE EAST ABUTMENT. SEE DESIGN SHEET 8 FOR OTHER LOCATIONS.
2. INCORPORATE LONGITUDINAL REINFORCING INTO NEW WORK WHERE POSSIBLE. CUT EXISTING REINFORCING TO MAINTAIN 2" CLEAR COVER.
3. THE CONSTRUCTION JOINT UNDER THE BARRIER SHALL BE INTENTIONALLY ROUGHENED.
4. SEE DESIGN SHEET 11 FOR ABUTMENT NOTES, DOWEL SETTING NOTES, REINFORCING AND BENT BAR DETAILS.

DESIGN FOR REPAIRS TO 20° SKEW L.A.

671'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

115'-0 END SPANS (3) 147'-0 INTERIOR SPANS

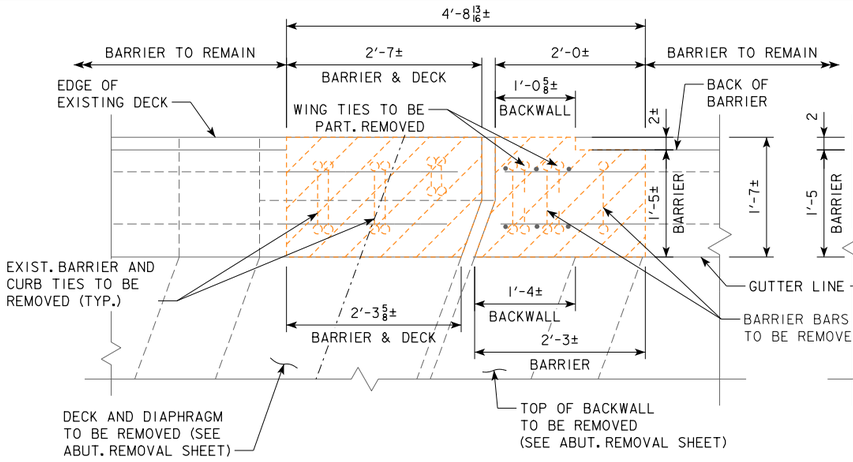
N.W. AND S.E. BARRIER DETAILS

STA. 766+24.99 OCTOBER, 2022

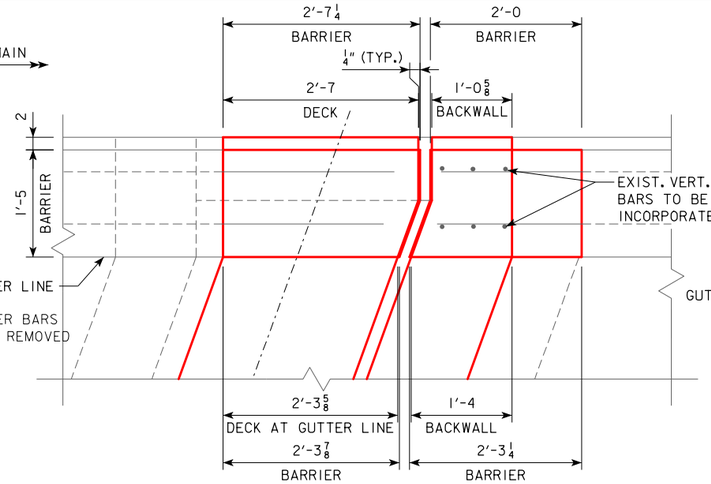
WEBSTER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

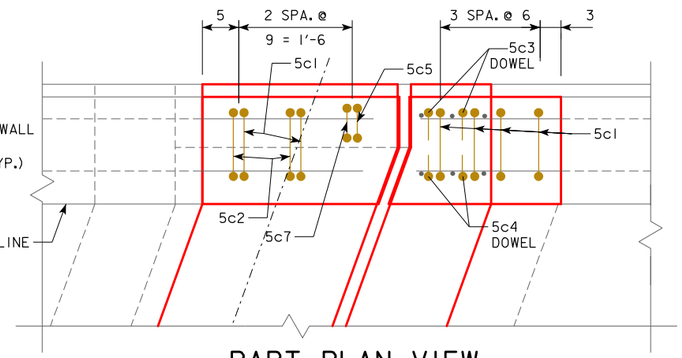
DESIGN SHEET NO. 7 OF 11 FILE NO. 32114 DESIGN NO. 223



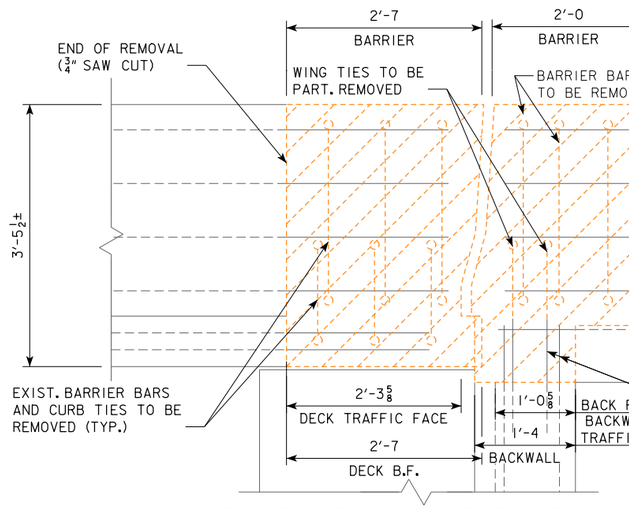
PART REMOVAL PLAN



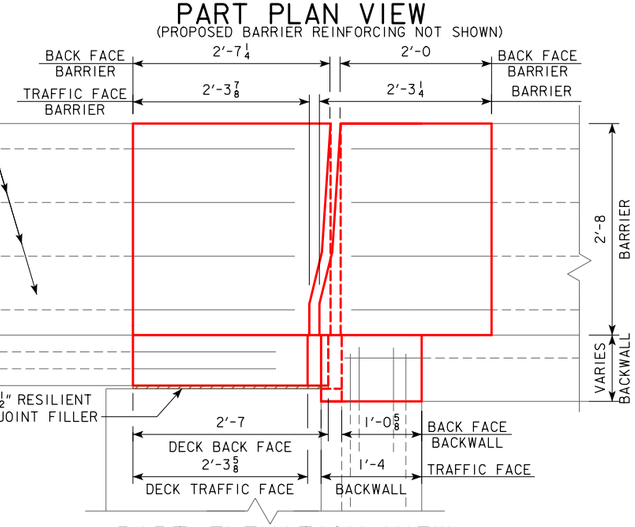
PART PLAN VIEW
(PROPOSED BARRIER REINFORCING NOT SHOWN)



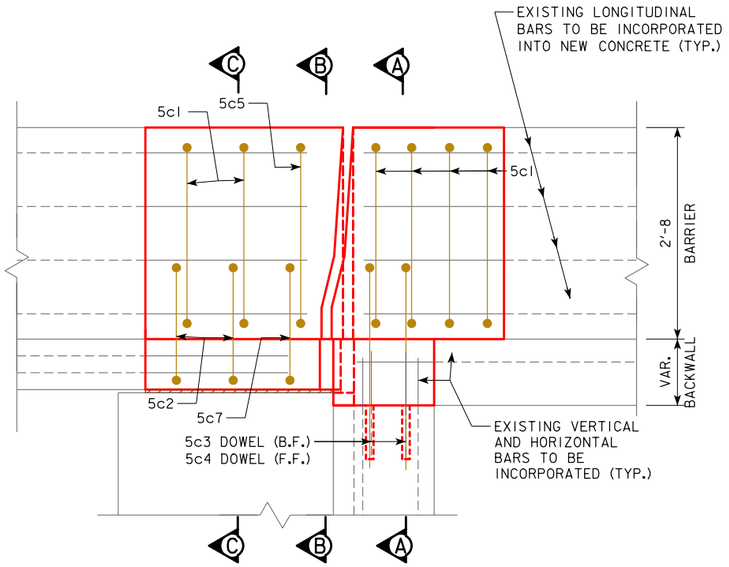
PART PLAN VIEW
(BARRIER REINFORCING SHOWN)



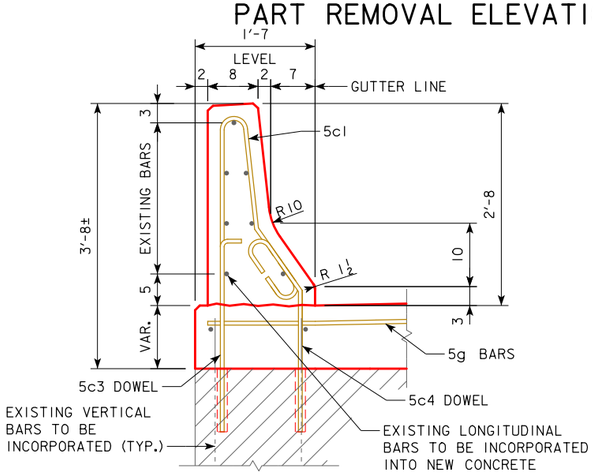
PART REMOVAL ELEVATION



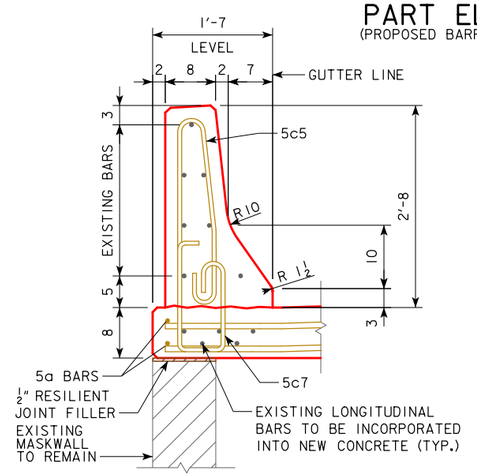
PART ELEVATION VIEW
(PROPOSED BARRIER REINFORCING NOT SHOWN)



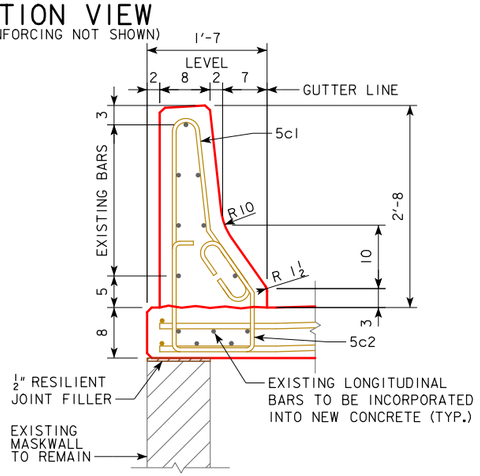
PART ELEVATION VIEW
(BARRIER REINFORCING SHOWN)



SECTION A-A



SECTION B-B



SECTION C-C

NOTES:
1. THIS SHEET IS FOR THE NORTH CORNER OF THE EAST ABUTMENT AND THE SOUTH CORNER OF THE WEST ABUTMENT. SEE DESIGN SHEET 7 FOR OTHER LOCATIONS.
2. INCORPORATE LONGITUDINAL REINFORCING INTO NEW WORK WHERE POSSIBLE. CUT EXISTING REINFORCING TO MAINTAIN 2" CLEAR COVER.
3. THE CONSTRUCTION JOINT UNDER THE BARRIER SHALL BE INTENTIONALLY ROUGHENED.
4. SEE DESIGN SHEET 11 FOR ABUTMENT NOTES, DOWEL SETTING NOTES, REINFORCING AND BENT BAR DETAIL.

DESIGN FOR REPAIRS TO 20° SKEW L.A.

671'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

115'-0 END SPANS (3) 147'-0 INTERIOR SPANS

S.W. AND N.E. BARRIER DETAILS

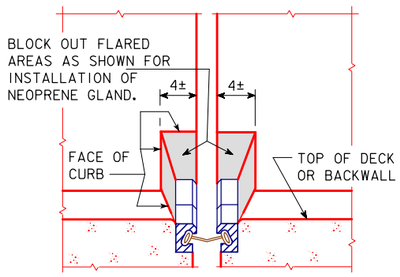
STA. 766+24.99 OCTOBER, 2022

WEBSTER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 8 OF 11 FILE NO. 32114 DESIGN NO. 223

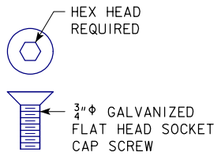
REVISION 08-13 - ADDED A CORRESPONDING MAXIMUM DECK TEMPERATURE COLUMN TO EXPANSION DEVICE TABLE. ADDED A SPLICE DETAIL TO THE PART PLAN VIEWS.
ENGLISHDECKRAILBRIDGES.DGN 1026 - THIS SHEET ISSUED 03-02.



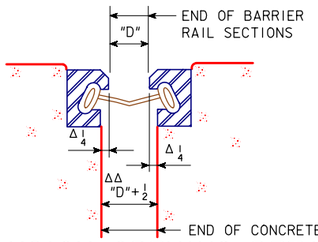
BLOCKOUT DETAIL

(DRAWN FOR 0° SKEW FOR ILLUSTRATIVE PURPOSES)

CONTRACTOR TO NOTE THAT THE CAP SCREW ANCHORAGE SYSTEM FOR THE $\frac{3}{8}$" BARRIER PLATES ARE ALWAYS TO BE PLACED ON THE ONCOMING TRAFFIC SIDE.



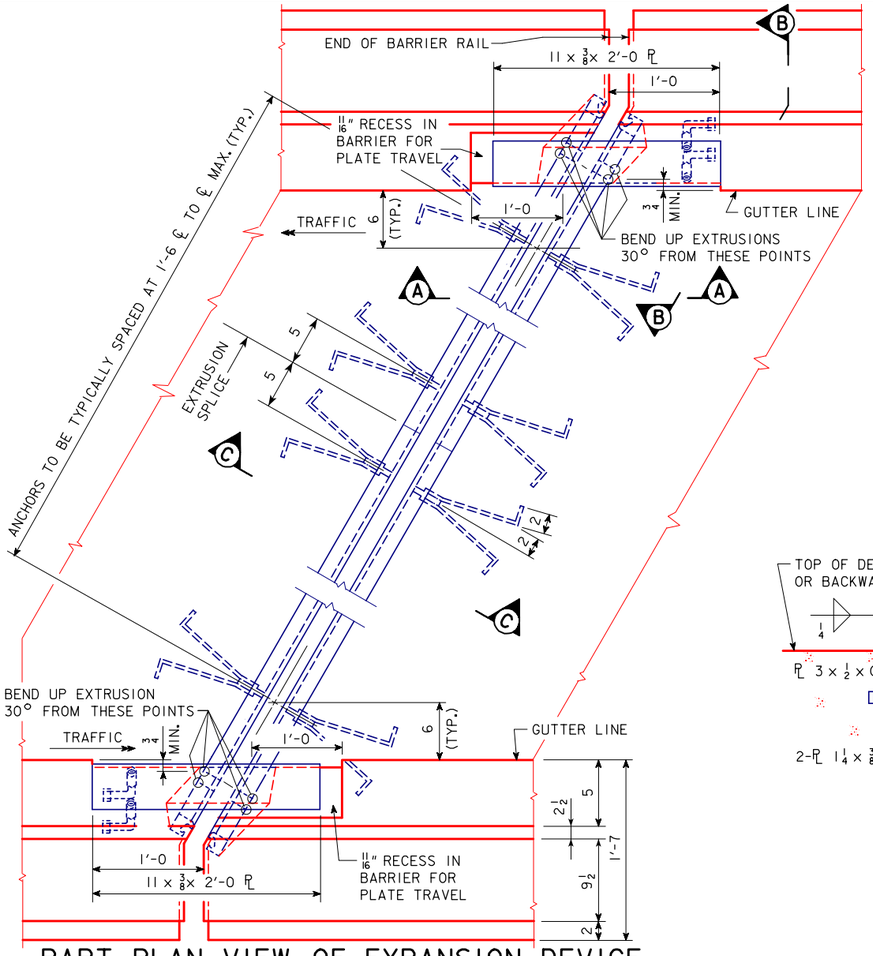
CAP SCREW DETAIL



EXPANSION OPENING DETAIL

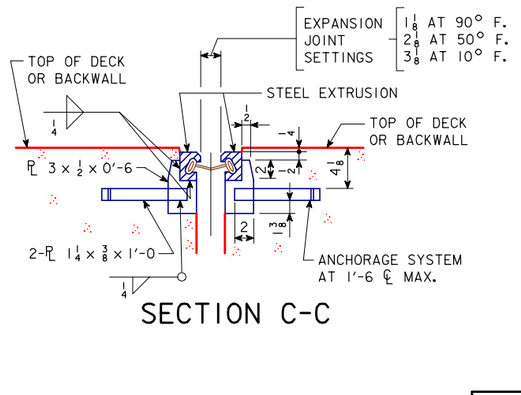
Δ THIS DIMENSION MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER FURNISHING THE JOINT.

ΔΔ USED FOR ALL OUT TO OUT DIMENSIONS OF SLAB. THE DIMENSION MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER FURNISHING THE JOINT.



PART PLAN VIEW OF EXPANSION DEVICE L.A. SKEW

NOTE: JOINT SETTINGS FOR OTHER TEMPERATURES ARE PROPORTIONAL. TEMPERATURES SHOWN ARE CONCRETE DECK TEMPERATURES ON THE UNDERSIDE OR SHADED PORTION OF THE DECK.



SECTION C-C

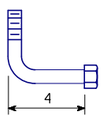
BARRIER PLATE NOTE:

THE MATERIAL USED FOR THE BARRIER PLATES IS TO BE ASTM A36 STEEL. THE BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A307. THE PLATES, BOLTS, NUTS AND CAP SCREWS ARE TO BE GALVANIZED IN ACCORDANCE WITH ARTICLE 4100.07 OF THE STANDARD SPECIFICATIONS.

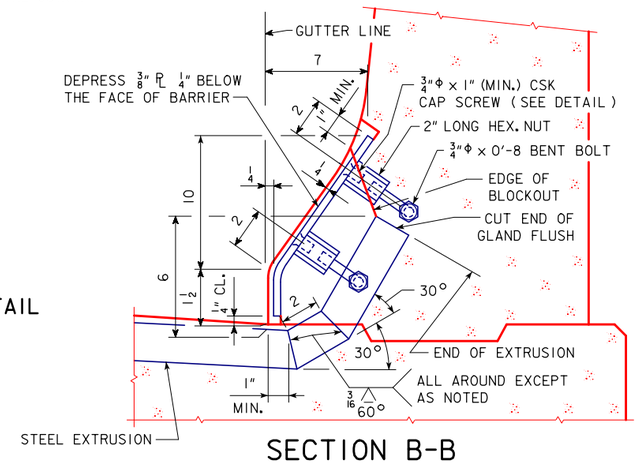
TABLE OF APPROVED EXPANSION DEVICES

MANUFACTURER	TYPE OF STEEL EXTRUSION	NEOPRENE GLAND	MINIMUM OPENING FOR GLAND INSTALLATION	CORRESPONDING MAXIMUM DECK TEMPERATURE
WATSON-BOWMAN & ACME CORP.	A	SE-400	1½"	75° F.
APPROVED EQUAL				

NOTE:
SEE DESIGN SHEET 10 FOR EXPANSION DEVICE NOTES CONTAINING THE STEEL EXTRUSION NOTES, NEOPRENE GLAND NOTES, AND WATERTIGHT INTEGRITY TESTING AND REPAIR NOTES.

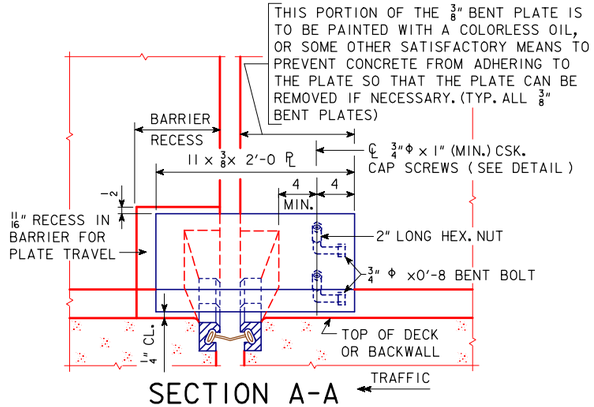


BENT BOLT DETAIL



SECTION B-B

NOTE: IT IS INTENDED THAT THE $\frac{11}{16}$ INCH RECESSED AREA BE FORMED SO THAT WHEN THE $\frac{3}{8}$" BENT PLATE IS INSTALLED THE PLATE WILL BE ABLE TO MOVE FREELY IN THIS RECESSED AREA.



SECTION A-A

(DRAWN FOR 0° SKEW FOR ILLUSTRATIVE PURPOSES)

DESIGN FOR REPAIRS TO 20° SKEW L.A.

671'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

115'-0 END SPANS (3) 147'-0 INTERIOR SPANS

EXPANSION DEVICE DETAILS

STA. 766+24.99 OCTOBER, 2022

WEBSTER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 9 OF 11 FILE NO. 32114 DESIGN NO. 223

DESIGN TEAM BURNS & MCDONNELL	F-SHAPE EXPANSION DEVICE DETAILS STEEL EXTRUSION WITH NEOPRENE GLAND (1 OF 2)	STANDARD SHEET 1026s1	WEBSTER COUNTY	PROJECT NUMBER MB-020-1(501)124--77-94	SHEET NUMBER 10

7/5/2022 1:51:29 PM TRN_Road pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\9402001021\Bridge\(501)_Deck Joint Repair\Burns and McDonnell\BRG_94020223 700323S009 11x17_pdf.pltcfg

STEEL EXTRUSION NOTES:

THE CONTRACTOR SHALL SUBMIT FOR APPROVAL SHOP DRAWINGS OF THE EXPANSION DEVICES SHOWING LAYOUT, MATERIAL TO BE USED, AND PROVISIONS FOR THE HOLDING DEVICE DURING PLACEMENT OF CONCRETE.

THE EXPANSION DEVICE SHALL BE GALVANIZED AFTER WELDING. ALL CURB PLATES INCLUDING THEIR ANCHORAGES SHALL BE GALVANIZED.

THE EXPANSION DEVICE IS TO BE PARALLEL TO GRADE.

CAP SCREWS SHALL BE COUNTERSUNK $\frac{1}{16}$" BELOW TOP OF THE PLATE. THE MINIMUM GRADE OF STRUCTURAL STEEL FOR THE EXPANSION DEVICE SHALL BE ASTM A36.

BLOCKOUT DETAILS MAY BE ALTERED FROM THOSE SHOWN PROVIDED THE GLAND MAY BE INSTALLED AND REMOVED IF NECESSARY AND THE CURB AREA REMAINS WATERTIGHT.

SHOP SPLICES OF THE STEEL EXTRUSION WILL BE PERMITTED. PRIOR TO MAKING SHOP SPLICES STEEL EXTRUSION PIECES SHALL HAVE A MINIMUM LENGTH OF 15 FEET. THE INDIVIDUAL LENGTH OF PIECES SHALL BE CHOSEN SO THAT A MINIMUM NUMBER OF SPLICES IS REQUIRED. ALL PIECES SHALL BE JOINED WITH A PREQUALIFIED PARTIAL PENETRATION SINGLE GROOVE WELD DETAILED ON THE SHOP DRAWING. ALL SURFACES NOT IN CONTACT WITH CONCRETE ARE TO BE GROUND FLUSH. NO WELD SHALL BE PERMITTED IN THE INTERNAL SECTION OF THE EXTRUSION WHERE THE NEOPRENE GLAND IS TO BE INSTALLED.

THE NUMBER OF FEET OF STEEL EXTRUSION INSTALLED SHALL BE PAID FOR AT THE CONTRACT PRICE PER FOOT BASED ON PLAN QUANTITIES. THE PRICE BID FOR "STEEL EXTRUSION JOINT W/NEOPRENE" SHALL INCLUDE THE COST OF FURNISHING BUT NOT THE COST OF INSTALLING THE NEOPRENE GLAND. THE CONTRACT PRICE BID FOR "STEEL EXTRUSION JOINT W/NEOPRENE" SHALL BE FULL COMPENSATION FOR FURNISHING AND INSTALLING STEEL EXTRUSIONS. THIS WORK WILL CONSIST OF FURNISHING ALL REQUIRED MATERIALS, (INCLUDING THE $\frac{3}{8}$" PLATES AT THE CURBS AND THEIR ANCHORAGE SYSTEMS), AND THE INSTALLATION AND ADJUSTMENT OF THE EXPANSION JOINTS IN ACCORDANCE WITH THE DETAILS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER. THE FURNISHING AND INSTALLATION OF ALL NECESSARY HARDWARE AND ACCESSORIES AS SUPPLIED BY THE EXPANSION JOINT MANUFACTURER ARE TO BE INCLUDED IN THIS WORK, INCLUDING THE ANCHORAGE SYSTEM AND ANY TEMPORARY ERECTION MATERIAL. ALL WORK AND MATERIALS FOR THE INSTALLATION OF THE EXPANSION JOINTS ARE TO COMPLY WITH THE WRITTEN RECOMMENDATIONS OF THE EXPANSION JOINT MANUFACTURER.

NEOPRENE GLAND NOTES:

THE NEOPRENE GLAND IS TO BE PLACED AS ONE CONTINUOUS PIECE FROM END TO END OF THE STEEL EXTRUSION.

THE NEOPRENE GLAND SHALL CONFORM TO ASTM-2628 MODIFIED TO EXCLUDE RECOVER TEST AND COMPRESSION SET.

THE CONTRACTOR SHALL INSTALL THE GLAND ABOVE THE MINIMUM TEMPERATURE OF 45° AND THE MINIMUM JOINT OPENING AND CORRESPONDING MAXIMUM DECK TEMPERATURE SHOWN IN THESE PLANS. THE DECK TEMPERATURE SHALL BE MEASURED BY RECORDING THE SURFACE TEMPERATURES ON THE UNDERSIDE OF THE DECK ADJACENT TO THE JOINTS. IF THE DECK TEMPERATURE DOES NOT FALL WITHIN THE SPECIFIED TEMPERATURE RANGE BEFORE THE CONTRACTOR HAS COMPLETED ALL OTHER REQUIRED WORK, IT WILL BE NECESSARY FOR THE CONTRACTOR TO RETURN TO THE PROJECT SITE TO COMPLETE INSTALLATION AND TESTING OF THE NEOPRENE GLAND. IF THE CONTRACTOR IS REQUIRED TO RETURN TO THE PROJECT SITE AFTER ALL OTHER REQUIRED WORK HAS BEEN COMPLETED, THE CONTRACTOR SHALL COMPLETE INSTALLATION AND TESTING OF NEOPRENE GLAND AT NO EXTRA CHARGE TO THE STATE.

THE NUMBER OF FEET OF NEOPRENE GLAND INSTALLED SHALL BE PAID FOR AT THE CONTRACT PRICE PER FOOT BASED ON PLAN QUANTITIES. THE PRICE FOR "NEOPRENE GLAND INSTALLATION AND TESTING" SHALL BE FULL COMPENSATION FOR INSTALLING AND TESTING OF THE NEW NEOPRENE GLAND. THIS WORK WILL CONSIST OF CLEANING THE EXTRUSION, INSTALLATION OF THE NEOPRENE GLAND AND WATER TIGHT TESTING OF THE EXPANSION JOINT SYSTEM. ALL WORK AND MATERIALS NECESSARY FOR THE INSTALLATION OF THE NEOPRENE GLAND SHALL COMPLY WITH THE RECOMMENDATIONS OF THE EXPANSION JOINT MANUFACTURER. THE PRICE BID FOR "NEOPRENE GLAND INSTALLATION AND TESTING" SHALL INCLUDE ALL WATERTIGHT INTEGRITY TESTING, LEAK REPAIRS AS DIRECTED BY THE ENGINEER, AND SUBSEQUENT WATERTIGHT TESTING UNTIL A LEAK FREE INSTALLATION IS ACHIEVED.

WATERTIGHT INTEGRITY TESTING AND REPAIR NOTES:

AFTER INSTALLATION OF EACH NEOPRENE GLAND, THE CONTRACTOR SHALL PERFORM WATERTIGHT INTEGRITY TESTS AT THE DECK LEVEL TO DETECT ANY LEAKAGE. THE TESTS ARE TO CHECK FOR LEAKAGE AT THE UPTURNED ENDS OF THE EXPANSION DEVICE AND FOR LEAKAGE ALONG THE EXPANSION DEVICE ACROSS THE DECK AND ANY MEDIANS OR SIDEWALKS. THE CONTRACTOR MAY CONDUCT A SINGLE TEST OF THE ENTIRE DEVICE INCLUDING UPTURNED ENDS OR MAY CONDUCT SEPARATE TESTS OF UPTURNED ENDS AND ONE OR MORE TESTS OF OVERLAPPING LENGTHS BETWEEN THE UPTURNED ENDS.

AT EACH UPTURNED END OF THE EXPANSION DEVICE, THE CONTRACTOR SHALL BLOCK OUT ON THE DECK AT LEAST 3 FEET OF THE EXPANSION DEVICE LEADING TO THE UPTURNED END AND FLOOD THE AREA. A MINIMUM WATER DEPTH OF 3" SHALL BE MAINTAINED AT THE GUTTERLINE FOR AT LEAST 30 MINUTES. DURING THE TEST, THE INSPECTOR SHALL OBSERVE FOR ANY OVERFLOW AT THE UPTURNED END. AT THE CONCLUSION OF THE TEST THE INSPECTOR WILL EXAMINE THE UNDERSIDE OF THE JOINT FOR LEAKAGE. THE EXPANSION DEVICE IS CONSIDERED WATERTIGHT IF THE INSPECTOR OBSERVES NO OVERFLOW DURING THE TEST AND IF NO DRIPPING WATER OR WATER DROPLETS ARE VISIBLE IN THE UNDERDECK AREAS NEAR THE UPTURNED END.

THE CONTRACTOR SHALL TEST THE EXPANSION DEVICE BETWEEN UPTURNED ENDS BY BLOCKING OUT AND COVERING THE DEVICE WITH PONDED OR FLOWING WATER TO A DEPTH OF AT LEAST 1" AT ALL POINTS, FOR AT LEAST 30 MINUTES. VERTICAL CURB SURFACES MAY BE TESTED WITH AN UNNOZZLED HOSE DELIVERING APPROXIMATELY ONE GALLON PER MINUTE DIRECTED TO FLOW OVER THE ENTIRE CURB HEIGHT FOR 30 MINUTES. AT THE CONCLUSION OF THE TEST, THE INSPECTOR WILL EXAMINE THE UNDERSIDE OF THE JOINT FOR LEAKAGE. THE EXPANSION DEVICE IS CONSIDERED WATERTIGHT IF NO DRIPPING WATER OR WATER DROPLETS ARE VISIBLE IN THE UNDERDECK AREAS ALONG THE FULL LENGTH OF THE EXPANSION JOINT. DAMP CONCRETE THAT DOES NOT SHOW DRIPPING WATER OR WATER DROPLETS IS NOT CONSIDERED A SIGN OF LEAKAGE.

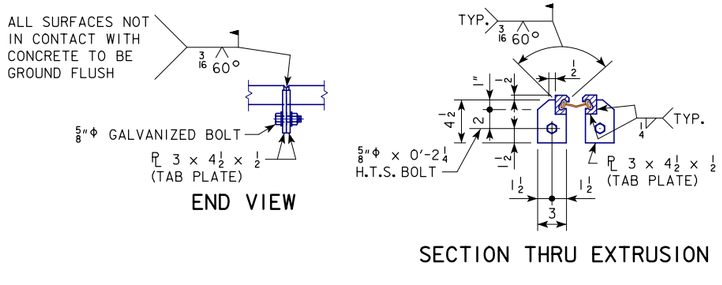
IF THE EXPANSION DEVICE LEAKS AT AN UPTURNED END OR ALONG ITS LENGTH, THE CONTRACTOR SHALL LOCATE THE LEAK(S) AND TAKE REPAIR MEASURES TO STOP THE LEAKAGE. THE REPAIR MEASURES SHALL BE AS RECOMMENDED BY THE MANUFACTURER AND APPROVED BY THE ENGINEER PRIOR TO BEGINNING CORRECTIVE WORK.

IF MEASURES TO ELIMINATE LEAKAGE ARE TAKEN, THE CONTRACTOR SHALL PERFORM SUBSEQUENT WATERTIGHT INTEGRITY TESTS SUBJECT TO THE SAME CONDITIONS AS THE ORIGINAL TEST.

FIELD CONSTRUCTION NOTES:

IF THE STEEL EXTRUSION IS SPLICED IN THE FIELD, THE SPLICE LOCATION SHALL BE DETAILED ON THE SHOP DRAWINGS. THE CONNECTION DETAILS SHALL INCLUDE TAB PLATES AND PREPARED ENDS TO ACCOMMODATE THE NECESSARY WELDING. SEE DETAILS IN THESE PLANS.

GALVANIZED COATING DAMAGE BY FIELD WELDING SHALL BE REPAIRED IN ACCORDANCE WITH MATERIALS I.M. 410.



END VIEW

SECTION THRU EXTRUSION

FIELD SPLICE DETAIL

DESIGN FOR REPAIRS TO 20° SKEW L.A.

671'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

115'-0 END SPANS (3) 147'-0 INTERIOR SPANS

EXPANSION DEVICE NOTES

STA. 766+24.99 OCTOBER, 2022

WEBSTER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 10 OF 11 FILE NO. 32114 DESIGN NO. 223

REVISION 08-13 - STEEL EXTRUSION NOTE WAS ADDED TO SHOW A WELD DETAIL ON THE SHOP DRAWINGS FOR SPLICES.
AN ADDITIONAL NEOPRENE GLAND NOTE ABOUT THE CORRESPONDING MAXIMUM DECK TEMPERATURE WAS ADDED.
ENGLISHDECKRAILBRIDGES.DGN - 1026s2 - THIS SHEET ISSUED 11-08.

DESIGN TEAM BURNS & MCDONNELL	F-SHAPE EXPANSION DEVICE DETAILS STEEL EXTRUSION WITH NEOPRENE GLAND (2 OF 2)	STANDARD SHEET 1026s2	WEBSTER COUNTY	PROJECT NUMBER MB-020-1(501)124--77-94	SHEET NUMBER 11

ABUTMENT NOTES:

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

CONCRETE SEALER SHALL BE APPLIED TO THE ABUTMENT BEARING SEAT IN ACCORDANCE WITH ARTICLE 2403.03, P, 3 OF THE STANDARD SPECIFICATIONS. IN ADDITION TO THE REQUIREMENTS OF ARTICLE 2403.03, P, 3, SEALER SHALL BE APPLIED TO THE WASH BETWEEN THE ABUTMENT SEAT STEPS AND AREAS NOTED ON DESIGN SHEET 2.

THE COST OF FURNISHING AND PLACING CONCRETE SEALER IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (MISCELLANEOUS)".

IF NECESSARY TO PREVENT DAMAGE TO THE END OF THE BRIDGE DECK AND BACKWALL FROM CONSTRUCTION EQUIPMENT, AN APPROPRIATE METHOD OF PROTECTION APPROVED BY THE ENGINEER SHALL BE PROVIDED BY THE BRIDGE CONTRACTOR AT NO EXTRA COST TO THE STATE.

DOWEL SETTING NOTES:

THE 4b, 5c3, 5c4, AND 5c6 BARS SHALL BE SET AS DOWELS IN DRILLED HOLES. HOLES ARE TO BE 10" DEEP. THE DOWELS SHALL BE INSTALLED IN ACCORDANCE WITH THE GROUT MANUFACTURER'S RECOMMENDATIONS. EITHER OF THE FOLLOWING SYSTEMS MAY BE USED AS A BONDING AGENT FOR VERTICAL DOWELS, BUT ONLY SYSTEM "A" MAY BE USED FOR HORIZONTAL DOWELS:

A. POLYMER GROUT SYSTEM IN ACCORDANCE WITH ARTICLE 2301.03, E, OF THE STANDARD SPECIFICATIONS.
B. HYDRAULIC CEMENT GROUT SYSTEMS. DRILLED HOLES ARE TO BE 2½ TIMES THE DOWEL DIAMETER AND ARE TO BE BLOWN CLEAN WITH COMPRESSED AIR IMMEDIATELY PRIOR TO PLACING GROUT. THE HYDRAULIC CEMENT GROUT SHALL BE ONE OF THOSE APPROVED IN MATERIALS I.M. 491.13 AND SHALL BE USED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

ALL REINFORCING BARS AND BARS NOTED AS DOWELS SUPPLIED FOR THIS STRUCTURE SHALL BE DEFORMED REINFORCEMENT UNLESS OTHERWISE NOTED OR SHOWN.

REINFORCING BAR LIST - EAST ABUTMENT AND ONE DECK END

EPOXY COATED BARS

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
7a1	DECK TRANSVERSE TOP & BOTTOM - STAGE 2		5	23'-8	242
7a2	DECK TRANSVERSE TOP - STAGE 2		1	22'-7	46
7a3	DECK TRANSVERSE TOP & BOTTOM - STAGE 1		5	24'-10	254
7a4	DECK TRANSVERSE BOTTOM - STAGE 1		1	24'-10	51
5a5	DECK - SOUTH END		2	6'-4	13
5a6	DECK - NORTH END		2	6'-8	14
4b1	ABUTMENT BACKWALL DOWEL - EXTERIOR		14	2'-4	22
4b2	ABUTMENT BACKWALL DOWEL - EXTERIOR		14	2'-7	24
4b3	ABUTMENT BACKWALL DOWEL - MIDDLE		15	2'-9	28
5c1	BARRIER VERTICAL		11	5'-5	62
5c2	BARRIER DECK HOOP		5	5'-3	27
5c3	BARRIER VERTICAL DOWEL		4	3'-0	13
5c4	BARRIER VERTICAL DOWEL		3	3'-10	12
5c5	BARRIER VERTICAL		2	5'-5	11
5c6	BARRIER VERTICAL DOWEL		1	2'-9	3
5c7	BARRIER DECK HOOP		1	4'-5	5
5e1	DECK DIAPHRAGM HOOP - EXTERIOR BAYS		12	3'-7	45
5e2	DECK DIAPHRAGM HOOP - INTERIOR BAYS		12	3'-11	49
5e3	DECK DIAPHRAGM TRANSVERSE - BETWEEN DIA.		4	9'-4	39
5e4	DECK DIAPHRAGM TRANSVERSE - STAGE 1		1	21'-5	22
5e5	DECK DIAPHRAGM TRANSVERSE - STAGE 2		1	20'-4	21
5g1	ABUTMENT BACKWALL LONGIT. - STAGE 1		2	23'-6	49
5g2	ABUTMENT BACKWALL LONGIT. - STAGE 2		2	23'-6	49
5g5	ABUTMENT BACKWALL CORNER - STAGE 1		2	2'-6	5
	REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)				1106

REINFORCING BAR LIST - WEST ABUTMENT AND ONE DECK END

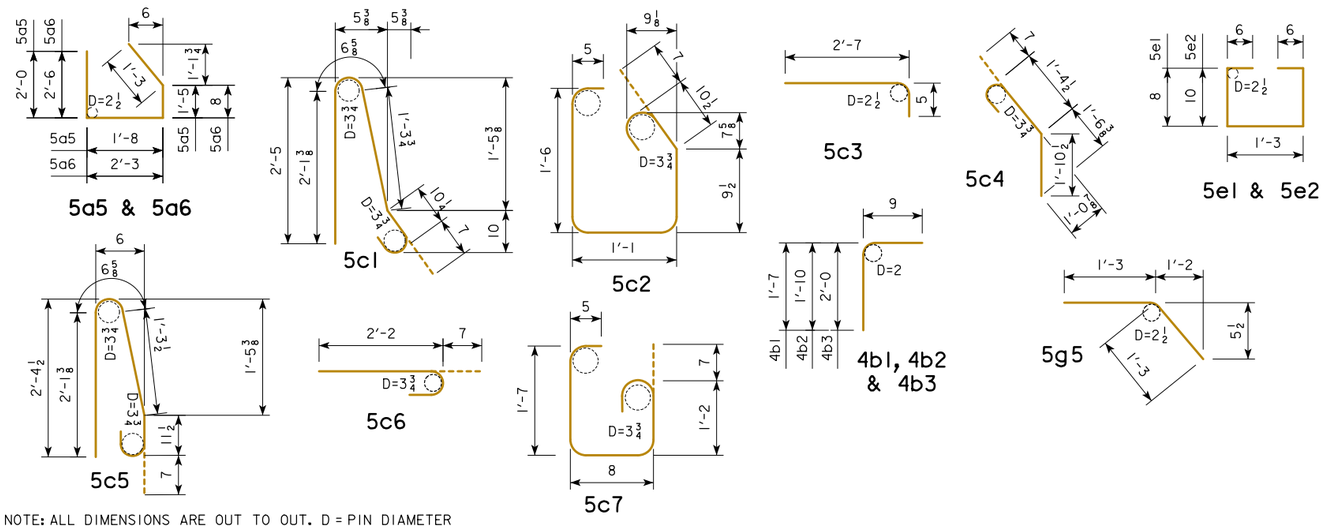
EPOXY COATED BARS

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
7a7	DECK TRANSVERSE TOP & BOTTOM - STAGE 2		5	23'-8	242
7a8	DECK TRANSVERSE BOTTOM - STAGE 2		1	23'-8	48
7a9	DECK TRANSVERSE TOP & BOTTOM - STAGE 1		5	24'-9	253
7a10	DECK TRANSVERSE TOP - STAGE 1		1	23'-8	48
5a5	DECK - NORTH END		2	6'-4	13
5a6	DECK - SOUTH END		2	6'-8	14
4b1	ABUTMENT BACKWALL DOWEL - EXTERIOR		28	2'-4	44
4b2	ABUTMENT BACKWALL DOWEL - MIDDLE		15	2'-7	26
5c1	BARRIER VERTICAL		11	5'-5	62
5c2	BARRIER DECK HOOP		5	5'-3	27
5c3	BARRIER VERTICAL DOWEL		4	3'-0	13
5c4	BARRIER VERTICAL DOWEL		3	3'-10	12
5c5	BARRIER VERTICAL		2	5'-5	11
5c6	BARRIER VERTICAL DOWEL		1	2'-9	3
5c7	BARRIER DECK HOOP		1	4'-5	5
5e1	DECK DIAPHRAGM HOOP - EXTERIOR BAYS		12	3'-7	45
5e2	DECK DIAPHRAGM HOOP - INTERIOR BAYS		12	3'-11	49
5e3	DECK DIAPHRAGM TRANSVERSE - BETWEEN DIA.		4	9'-4	39
5e4	DECK DIAPHRAGM TRANSVERSE - STAGE 1		1	21'-5	22
5e5	DECK DIAPHRAGM TRANSVERSE - STAGE 2		1	20'-4	21
5g3	ABUTMENT BACKWALL LONGIT. - STAGE 2		2	22'-6	47
5g4	ABUTMENT BACKWALL LONGIT. - STAGE 1		2	24'-6	51
5g5	ABUTMENT BACKWALL CORNER - STAGE 2		2	2'-6	5
	REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)				1100

CONCRETE PLACEMENT QUANTITIES

LOCATION	WEST ABUT.	EAST ABUT.
ABUTMENT BACKWALL	2.1	2.6
DECK END & ABUTMENT DIAPHRAGM	3.3	4.1
BARRIER RAILS & END SECTIONS	0.8	0.8
TOTAL (C.Y.)	6.2	7.5

BENT BAR DETAILS



NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER

DESIGN FOR REPAIRS TO 20° SKEW L.A.

671'-0 x 40'-0 CONTINUOUS WELDED PLATE GIRDER BRIDGE

115'-0 END SPANS (3) 147'-0 INTERIOR SPANS

SUPERSTRUCTURE DETAILS

STA. 766+24.99 OCTOBER, 2022

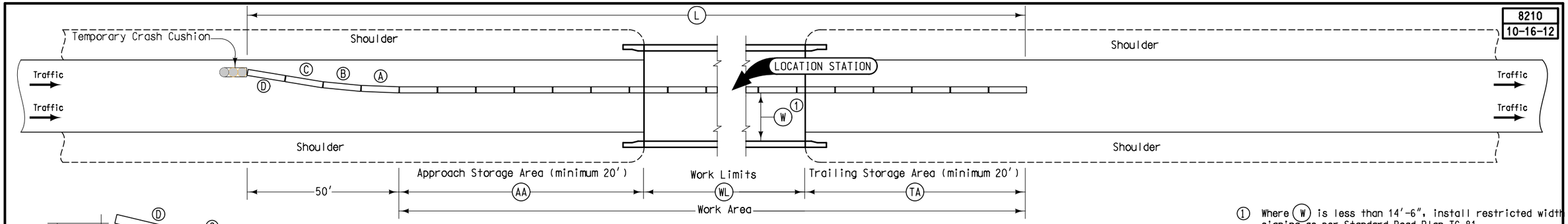
WEBSTER COUNTY

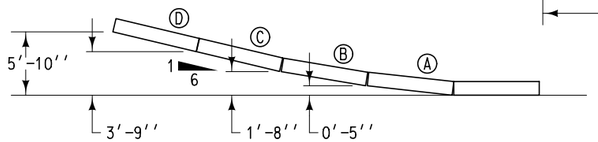
IOWA DEPARTMENT OF TRANSPORTATION

DESIGN SHEET NO. 11 OF 11 FILE NO. 32114 DESIGN NO. 223

DESIGN TEAM BURNS & MCDONNELL | WEBSTER COUNTY | PROJECT NUMBER MB-020-1(501)124--77-94 | SHEET NUMBER 12

8210
10-16-12





BARRIER OFFSETS FOR FLARE SECTIONS

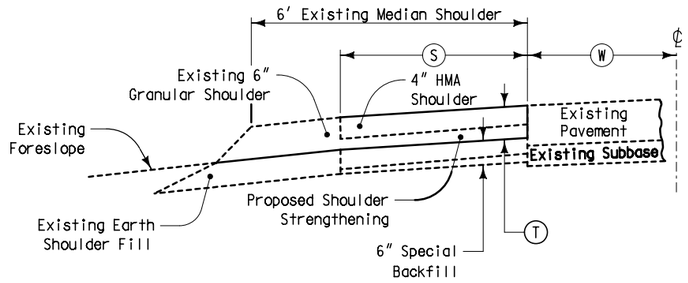
Station	Side	AA	WL	TA	L	② Anchored	① W	Remarks
		Feet	Feet	Feet	Feet	X	Ft-Inches	
766+24.99	EB LT	20.00	760.00	20.00	850.00	X	15'-1.5"	Stage 1
766+24.99	EB RT	20.00	760.00	20.00	850.00	X	16'-0"	Stage 2

① Where (W) is less than 14'-6", install restricted width signing as per Standard Road Plan TC-81.

② Barrier shall be anchored where dropoff is more than 3 inches. This is intended for both stages at each end of the Bridge. Refer to Tab 108-33.

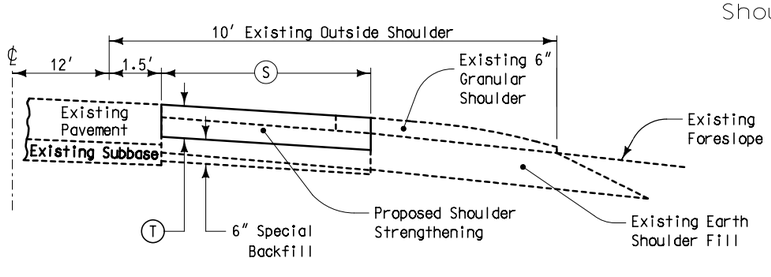
TEMPORARY CONCRETE BARRIER LAYOUT for One-Way Traffic

SHOULDER



Median Shoulders (Stage 2)

Note:
1) Use Longitudinal 'B' Joints for HMA.
2) Use Longitudinal 'BT-2' or 'BT-3' Joints for PCC. Use Tranverse 'C' Joints for PCC.



Outside Shoulders (Stage 1)

Note:
1) Use Longitudinal 'B' Joints for HMA.
2) Use Longitudinal 'BT-2' or 'BT-3' Joints for PCC. Use Tranverse 'C' Joints for PCC.

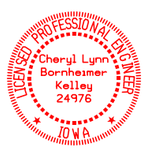
Shoulder Strengthening

9'' HMA Shoulder Jointing:
Longitudinal joint: B

8" PCC with the following jointing layout:
Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at W/2 from edge of mainline pavement when W is greater than 10' wide. Terminate longitudinal joint at transverse joint less than 10' in length.

STATION TO STATION		(S) Feet	Direction
759+20	760+39	6.0	EB LT
759+20	762+51	6.0	EB RT
769+86	771+25	6.0	EB LT
769+86	771+25	6.0	EB RT

SHOULDER (DETOUR PAVEMENT)



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

CHECK PLANS XX-XX-2022

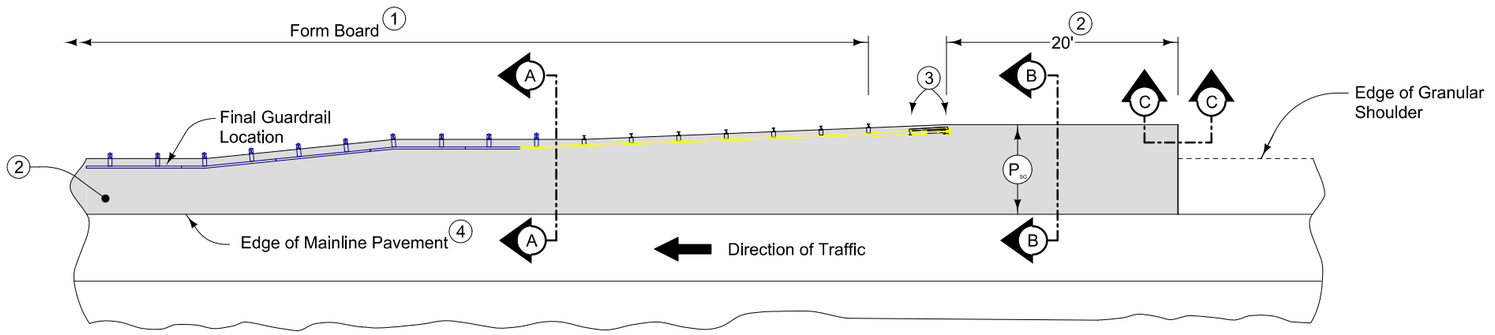
Signature Date

Cheryl Lynn Bornheimer Kelley

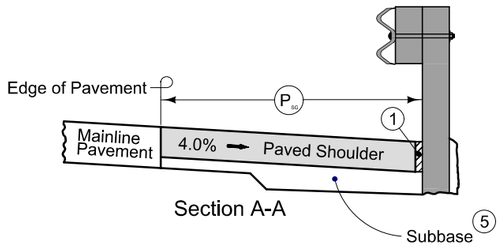
Printed or Typed Name

My license renewal date is December 31, 2023

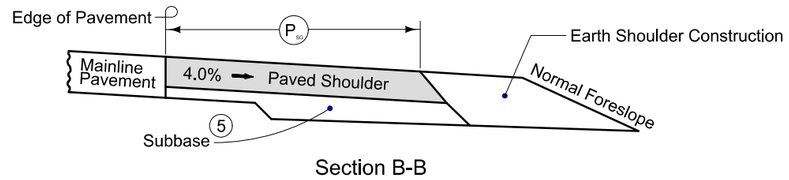
Pages or sheets covered by this seal: B.1, C.1-C.5, D.1, J.1-J.5



PLAN VIEW

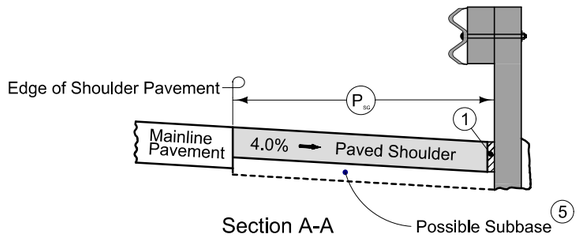


Section A-A

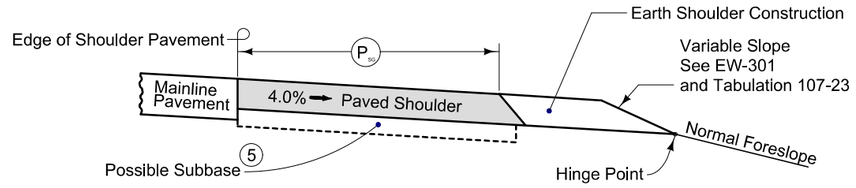


Section B-B

NEW CONSTRUCTION



Section A-A



Section B-B

EXISTING SHOULDER

DESIGNER INFO

7156
10-20-20

9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at P/2 from edge of mainline pavement when P is greater than 10' wide. Terminate longitudinal joint at transverse joint less than 10' in length.

Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal and reinstallation of guardrail will be allowed with no additional payment.

Refer to Tabulation 112-9 for shoulder quantities.

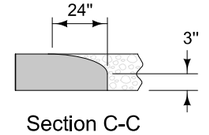
(1) PCC option only: When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown.

(2) Continue paved shoulder 20 feet beyond the center of the first post.

(3) Shoulder may be notched for first 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.

(4) 'KT-1 joint for PCC shoulder.
'B' joint for HMA shoulder.

(5) Refer to other details in the plan.



Section C-C
Roll down at granular shoulder or earth.

PAVED SHOULDER AT GUARDRAIL
(GRANULAR SHOULDER ADJACENT TO MAINLINE)

100-0A
10-28-97

ESTIMATED ROADWAY QUANTITIES
(1 DIVISION PROJECT)

Item No.	Item Code	Item	Unit	Total	As Built Qty.
1	2102-2625000	EMBANKMENT-IN-PLACE	CY	23	
2	2102-2713070	EXCAVATION, CLASS 13, ROADWAY & BORROW	CY	55.4	
3	2122-5500090	PAVED SHOULDER, HMA 9"	SY	180.6	
4	2122-7450080	SHOULDER STRENGTHENING, OPTIONAL HOT MIX ASPHALT MIXTURE OR PORTLAND	SY	498.3	
		CEMENT CONCRETE, 8 IN.			
5	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	9	
7	2503-0500402	BRIDGE END DRAIN, DR-402	EA	1	
8	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	68.8	
9	2505-4008300	STEEL BEAM GUARDRIAL	LF	62.5	
10	2505-4008410	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION, BA-201	EA	1	
11	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED	EA	1	
12	2505-4021720	STEEL BEAM GUARDRAIL, TANGENT TERMINAL, BA-205	EA	1	
13	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	21.2	
14	2527-9263131	WET RETROREFLECTIVE REMOVABLE TAPE MARKINGS	STA	37.6	
15	2527-9263137	PAINTED SYMBOLS AND LEGENDS, WATERBORNE OR SOLVENT-BASED	EA	8	
16	2527-9263180	PAVEMENT MARKINGS REMOVED	STA	21.2	
17	2527-9263190	SYMBOLS AND LEGENDS REMOVED	EA	8	
18	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE	LF	1700	
19	2528-8445110	TRAFFIC CONTROL	LS	1	
20	2528-9290050	PORTABLE DYNAMIC MESSAGE SIGN (PDMS)	CDAY	49	
21	2551-0000110	TEMP CRASH CUSHION	EACH	2	
22	2602-0000020	SILT FENCE	LF	1415	
23	2602-0000071	REMOVAL OF SILT FENCE	LF	1415	
24	2602-0000101	MAINTENANCE OF SILT FENCE	LF	1415	

100-4A
10-29-02

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
1	**2102-2625000**	**EMBANKMENT-IN-PLACE**
		Refer to Tab 107-23 on sheet C.3 for locations.
2	**2102-2713070**	**EXCAVATION, CLASS 13, ROADWAY & BORROW**
3	**2122-5500090**	**PAVED SHOULDER, HMA 9"**
4	**2122-7450080**	**SHOULDER STRENGTHENING, OPTIONAL HOT MIX ASPHALT MIXTURE OR PORTLAND**
		CEMENT CONCRETE, 8 IN.
5	**2123-7450000**	**SHOULDER CONSTRUCTION, EARTH**
		Refer to Tab 112-9 on sheet C.2 for locations.
6	**2435-0900000**	**BRIDGE END DRAIN, SW-538**
		Refer to Tab 104-8 on sheet C.2 for locations.
7	**2503-0500402**	**BRIDGE END DRAIN, DR-402**
		Refer to Tab 104-8A on sheet C.2 for locations.
8	**2505-4008120**	**REMOVAL OF STEEL BEAM GUARDRAIL**
		Refer to Tab 110-7A on sheet C.3 for locations.
9	**2505-4008300**	**STEEL BEAM GUARDRIAL**
10	**2505-4008410**	**STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION, BA-201**
11	**2505-4021010**	**STEEL BEAM GUARDRAIL END ANCHOR, BOLTED**
12	**2505-4021720**	**STEEL BEAM GUARDRAIL, FLARED END TERMINAL, BA-205**
		Refer to Tab 108-8A on sheet C.2 for locations.
13	**2527-9263109**	**PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED**
14	**2527-9263131**	**WET RETROREFLECTIVE REMOVABLE TAPE MARKINGS**
		Refer to Tab 108-22 on sheet C.4 for locations and details.
15	**2527-9263137**	**PAINTED SYMBOLS AND LEGENDS, WATERBORNE OR SOLVENT-BASED**
		Refer to Tab 108-29 on sheet C.4 for locations and details.
16	**2527-9263180**	**PAVEMENT MARKINGS REMOVED**
		Refer to Tab 108-22 on sheet C.4 for locations and details.
17	**2527-9263190**	**SYMBOLS AND LEGENDS REMOVED**
		Refer to Tab 108-29 on sheet C.4 for locations and details.
18	**2528-8400048**	**TEMPORARY BARRIER RAIL, CONCRETE**
		Refer to Tab 108-33 on sheet C.3 for locations and detail 8212 on sheet B.1 for additional information.
19	**2528-8445110**	**TRAFFIC CONTROL**
		Refer to J-sheets for additional information.
20	**2528-9290050**	**PORTABLE DYNAMIC MESSAGE SIGN (PDMS)**
		Refer to sheet J.1 for placement information.
		Item includes signs at (1) PDMS board locations.
		Item quantity assumes a sign duration of 7 weeks per sign, including 2 weeks in advance of construction.

100-4A
10-29-02

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
21	**2551-0000110**	**TEMP CRASH CUSHION**
		Refer to Tab 108-30 on sheet C.3 for locations.
22	**2602-0000020**	**SILT FENCE**
		Refer to Tab 100-17 on sheet C.3. The tabulation includes estimated locations for placement of Silt Fence to address possible erosion during ocnstruction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 25% additional quantity for field adjustments and replacements.
23	**2602-0000071**	**REMOVAL OF SILT FENCE**
		This item is included for silt fence, for replacement (replacement to be paid separately), or for areas that have achieved 70% permanent growth.
24	**2602-0000101**	**MAINTENANCE OF SILT FENCE**
		This item is included for cleanout and repair of the silt fence and silt fence for ditch checks during the project.

100-1D
10-18-05

PROJECT DESCRIPTION

This project is for bridge and roadway work along US 20 over the Des Moines River, 2.6 miles east of the junction with US 169.
This project includes guardrail improvements, addition of a bridge end drain, bridge erosion control, and shoulder strengthening.

105-4
10-18-11

STANDARD ROAD PLANS

The following Standard Road Plans apply to construction work on this project.

Number	Date	Title
BA-200	04-20-21	Steel Beam Guardrail Components
BA-201	04-19-22	Steel Beam Guardrail Barrier Transition Section (MASH TL-3)
BA-202	10-20-15	Steel Beam Guardrail Bolted End Anchor
BA-205	10-19-21	Steel Beam Guardrail Tangent End Terminal (MASH TL-3)
BA-250	04-20-21	Steel Beam Guardrail Installation at Concrete Barrier or Bridge End Post (MASH TL-3)
BA-401	04-20-21	Temporary Barrier Rail (Precast Concrete)
BA-500	04-20-21	Temporary Crash Cushions Sand Barrel
DR-402	04-19-22	Rock Flume for Bridge End Drain
EC-201	04-20-21	Silt Fence
EW-301	04-20-21	Guardrail Grading
PM-110	04-21-20	Line Types
PM-111	04-21-20	Symbols and Legends
SI-173	04-19-16	Object Markers
SI-211	10-18-16	Object Marker and Delineator Placement with Guardrail
SI-881	04-16-19	Special Signs for Workzones
SI-882	10-18-16	Special Signs for Restricted Width Traffic Control Zones
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-81	10-15-19	Restricted Width Signing (Less Than 14.5 Feet)
TC-418	04-19-22	Lane Closure on Divided Highway
TC-421	04-19-22	Lane Closure with TBR

111-25
10-18-11

INDEX OF TABULATIONS

102-5
04-18-17

EXISTING PAVEMENT

No.	Location					Year	Type	Project Number	Surface		Base		Subbase		Removal		Coarse Aggregate			Reinforcement	Remarks
	County	Route	Dir. of Travel	Begin Ref. Loc. Sign	End Ref. Loc. Sign				Type	Depth	Type	Depth	Type	Depth	Type	Depth	Source	Type	Durability Class	Type	
94	Webster	US 020	1	124.1	124.87	1990		F-520-3(28)--20-94	PCC	10	GSB	9					FT. DODGE MINE	C. LST.	I		

112-9
10-20-20

SHOULDERS

(1) Lane(s) to which the shoulder is adjacent.
(2) See Typ. 7156, 7157, or 7158.
(3) Bid Item.
(4) Applies only for Paved Shoulders constructed on project with existing granular shoulders.
(5) Bid Item. Typ. 7156, 7157, or 7158.
(6) Does not include shrink.

Calculations assume a HMA unit weight (lbs/cf) of 0, a Special Backfill unit weight (lbs/cf) of 140, and a Granular Shoulder unit weight (lbs/cf) of 140.

Location					Quantities																				
Road Identification	(1) Direction Of Traffic	Station to Station		Side	(P) Width	(P_{SG}) Width	(G) Width	(L) Length	Class 13 (4) Excavation	Hot Mix Asphalt		Binder	Paved Shoulder	9" Paved Shoulder at Guardrail	Reinforced Paved Shoulder	Special Backfill				_____ Subbase	Granular Shoulder		Earth Shoulder Construction Alternates			Remarks
																HMA Alternate		PCC Alternate					(3) STA	HMA	PCC	
					FT	FT (2)	FT	FT	CY (3)	TON	TON/STA	TONS	SY (3)	SY (5)	SY (3)	TON (3)	TON/STA	TON (3)	TON/STA	CY (3)	TON (3)	TON/STA		CY (6)	CY (6)	
US 20	EB	759+20.00	762+51.33	RT	6.0			331.3	24.5						220.9	69.579	21.000						3.3			
US 20	EB	759+20.00	760+58.18	LT	6.0			138.2	10.2						92.1	29.018	21.000						1.4			
US 20	EB	769+86.01	771+25.00	RT	6.0			139.0	10.3						92.7	29.188	21.000						1.4			
US 20	EB	769+86.01	771+25.00	LT	6.0			139.0	10.3						92.7	29.188	21.000						1.4			
US 20	EB	760+99.20	761+19.20	RT		13.0		20.0						28.9									0.2			
US 20	EB	761+19.20	761+74.32	RT		11 to 13		55.1						73.5									0.6			
US 20	EB	761+74.32	761+83.72	RT		11.0		9.4						11.5									0.1			
US 20	EB	761+83.72	762+08.59	RT		8.5 to 11		24.9						26.9									0.2			
US 20	EB	762+08.59	762+50.76	RT		8.5		42.2						39.8									0.4			
								Totals:	55.4					180.6	498.3	156.973							9.0			

108-8A
10-16-18

STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE RAIL END SECTION

Possible Standards: BA-200, BA-201, BA-202, BA-205, BA-206, BA-210, BA-211, BA-221, BA-225, BA-250, BA-260, LS-625, LS-626, LS-630, LS-635, SI-172, SI-173 and SI-211.

(1) Lane(s) to which the obstacle is adjacent.
(2) Not a bid item. Incidental to guardrail installation.

No.	Location				Layout Lengths				Long-Span System		Delineators and Object Markers (2)					Bid Items										Remarks
	(1) Direction of Traffic	Side O = Outside M = Median	Station	Offset	BA-250, BA-260, LS-630, or LS-635				BA-211		SI-211	Delineator SI-172	Object Marker SI-173			Bolted End Anchor	Post Adapter	Steel Beam Guardrail	BA-250 or LS-630					BA-260 or LS-635		
					VT1	VF	VT2	ET				Type 1	Type 2	Type 3					Barrier Transition Section	End Terminal				Barrier Transition Section	End Terminal	
																				Tangent	Flared	Tangent	Flared		Tangent	
				FT	LF	LF	LF	LF	STATION	TYPE	TYPE	White	OM2-2	OM3-L	OM3-R	TYPE	EACH	BA-210	BA-200	BA-201	BA-205	BA-206	LS-625	LS-626	BA-221	BA-225	
																BA-202			LF	EACH	EACH	EACH	EACH	EACH	EACH	EACH	
1	EB	O	762+73.66	22.0	65.625	25.00	12.50	47.7			3				1	C	1		62.5	1	1						
															1		1		62.5	1	1						TOTALS

104-8A
04-19-22

SCOUR PROTECTION OR ROCK FLUME FOR BRIDGE END DRAIN

Refer to Standard Road Plan DR-401 and DR-402

Location			Bid Items	Scour Protection (DR-401)			Rock Flume (DR-402)			Remarks
Bridge Station	Bridge Corner	Distance DI-1 or DI-2	Bridge End Drain	Special Ditch Control, Wood Excelsior Mat	Turf Reinforced Mat (TRM), Type 2	Transition Mat	Macadam Stone Base	Engineering Fabric	Erosion Stone	
				EC-101	EC-104	EC-105				
		FT	TYPE	SQ	SQ	SF	TONS	SY	TONS	
762+48.38	NW	44.2	DR-402				2.925	113.0	76.384	Goes 15' North, then 78' East
							2.925	113.0	76.384	TOTALS

107-23
10-18-11

GRADING FOR GUARDRAIL INSTALLATIONS

(1) Lane(s) to which the installation is adjacent. Refer to EW-301

Location					Dimensions (Feet)									Earthwork		Remarks
No.	(1) Direction of Traffic	Station	Side	Foreslope at Guardrail	X1	Y1	X2	Y2	X3	Y3	X4	Y4	Z	Excavation Class 10	Embankment In Place	
														CY	CY	
1	EB		RT	6:1	64.0	5.0	89.0	7.5	101.5	7.5	150.0	9.5	55.5		23.0	

108-30
04-16-13

CRASH CUSHIONS

* Bid Item
(1) Lane(s) to which the installation is adjacent.
(2) Complete this section when using the Temporary Crash Cushion bid item and Earthwork is needed for Sand Barrel placement. Refer to BA-500

No.	(1) Direction of Traffic	Location Station	Side	Obstacle Width	Crash Cushion (Select One)*					Sand Barrel Details (2)					Earthwork*		Spare Parts Kit (Select One)*		Obstacle Description	Remarks
					Temporary	Temporary Redirective	Temporary Severe Use	Permanent	Permanent Severe Use	V	W	X	Y	Z	Excavation Class 10	Embankment in Place	Permanent	Permanent Severe Use		
										Length	Length	Length	Length	Length						
				FT						FT	FT	FT	FT	FT	CY	CY	EACH	EACH		
1	EB	761+20.00	LT	2.00	1														Temporary Barrier Rail	Stage 1
2	EB	761+20.00	RT	2.00	1														Temporary Barrier Rail	Stage 2
					2														TOTALS	

108-33
10-15-19

TEMPORARY BARRIER RAIL

Possible Standard: BA-401 Possible Detail: 560-7

* Not a bid item. Anchorage requirements are based on TBR locations shown in the plans. TBR alignments that vary from what is shown in the plans may result in additional TBR sections requiring anchorage.

No.	Station to Station		Length	(Select One) Concrete	(Select One) Steel	Anchored*	Modular Glare Screen System	Remarks
			LF	BA-401	560-7	(Y/N)	(Y/N)	
1	761+50.00	770+00.00	850.0	X		Yes	No	Stage 1
2	761+50.00	770+00.00	850.0	X		Yes	No	Stage 2
			1700.0					TOTALS

110-7A
04-17-12

REMOVAL OF STEEL BEAM GUARDRAIL

(1) Lane(s) to which the installation is adjacent.
(2) Includes length of End Terminals and End Anchors.

Location					
No.	(1) Direction of Traffic	Station to Station		Side	Removal of Guardrail (2)
					LF
1	EB	762+12.04	762+74.34	RT	68.8
				TOTAL	68.8

232-3C
10-19-21

EROSION CONTROL
(NATIVE GRASS SEEDING)

Area to be seeded is estimated to be less than 1 acre. If the Contractor determines the area exceeds 2 acres, notify the Engineer. Approved quantity in excess of 2 acres will be paid for as extra work according to Article 1109.03,B of the Standard Specifications.

Following the completion of work in a disturbed area and according to the seeding dates in Section 2601 of the Standard Specifications, place seed and mulch on the disturbed area lying 8 feet or more beyond the shoulder as follows:

SEED MIX:
Big bluestem (Andropogon geradii) 6 lbs. PLS/Acre (7.0 kg/ha)
Indiangrass (Sorghastrum nutans) 6 lbs. PLS/Acre (7.0 kg/ha)
Little bluestem (Schizachyrium scoparium)
6 lbs. PLS/Acre (7.0 kg/ha)
Partridge Pea (Chamaecrista fasciculata)
4 lbs. PLS/Acre (4.5 kg/ha)
Sideoats grama (Bouteloua curtipendula)
4 lbs. PLS/Acre (4.5 kg/ha)
Canada wildrye (Elymus canadensis) 2 lbs. PLS/Acre (2.2 kg/ha)
Switchgrass (Panicum virgatum) 1 lbs. PLS/Acre (1.1 kg/ha)
Oats (Avena sativa) 32 lbs./Acre (36.0 kg/ha)

Furnish Big bluestem, Indiangrass, Canada wildrye and Little bluestem that is debearded or equal to facilitate the application of seed.

Furnish seed certified as Source Identified Class (Yellow Tag) Source G0-Iowa. Oats are excluded from this requirement.

Place seed according to the requirements of Article 4169.02 of the Standard Specifications.

Place mulch according to the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications.

Preparing the seedbed, furnishing and applying seed and mulch are incidental to mobilization and will not be paid for separately.

100-17
04-20-10

TABULATION OF SILT FENCES

Refer to EC-201

Location			Length	Remarks
Begin Station	End Station	Side	LF	
759+00.00	762+71.00	RT	371.0	
759+00.00	762+71.00	LT	371.0	
769+50.00	771+45.00	RT	195.0	
769+50.00	771+45.00	LT	195.0	
			1132.0	SUBTOTAL
			283.0	0.25
			1415.0	TOTAL

232-3B
10-19-21

EROSION CONTROL
(URBAN SEEDING)

Area to be seeded is estimated to be less than 1 acre. If the Contractor determines the area exceeds 2 acres, notify the Engineer. Approved quantity in excess of 2 acres will be paid for as extra work according to Article 1109.03,B of the Standard Specifications.

Following the completion of work in a disturbed area and according to the seeding dates in Section 2601 of the Standard Specifications, place seed, fertilizer, and mulch on the disturbed area as follows:

Place seed and fertilize according to the requirements of Article 2601.03,C,4 and Section 4169 of the Standard Specifications.

Place mulch according to the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications.

Preparing the seedbed, furnishing and applying seed, fertilizer, and mulch are incidental to mobilization and will not be paid for separately.

262-6
10-18-05

UTILITIES
(NOT A POINT 25 PROJECT)

This is NOT a POINT 25 project and is not subject to the provisions of IAC 761-115.25.

PAVEMENT MARKING LINE TYPES

See PM-110

*BCY4 - Place on the same side of the roadway to match existing markings near the project.
**NPY4 - For estimating purposes only. No Passing Zone Lines will be located in the field.
***MNY4 - Factor of 1.00 as value includes number of 4-inch passes to cover median nose area.

BCY4: Broken Centerline (Yellow) @ 0.25 DCY4: Double Centerline (Yellow) @ 2.00 NPY4: No Passing Zone Line (Yellow) @ 1.25 BLW4: Broken Lane Line (White) @ 0.25 ELW4: Edge Line Right (White) @ 1.00
ELY4: Edge Line Left (Yellow) @ 1.00

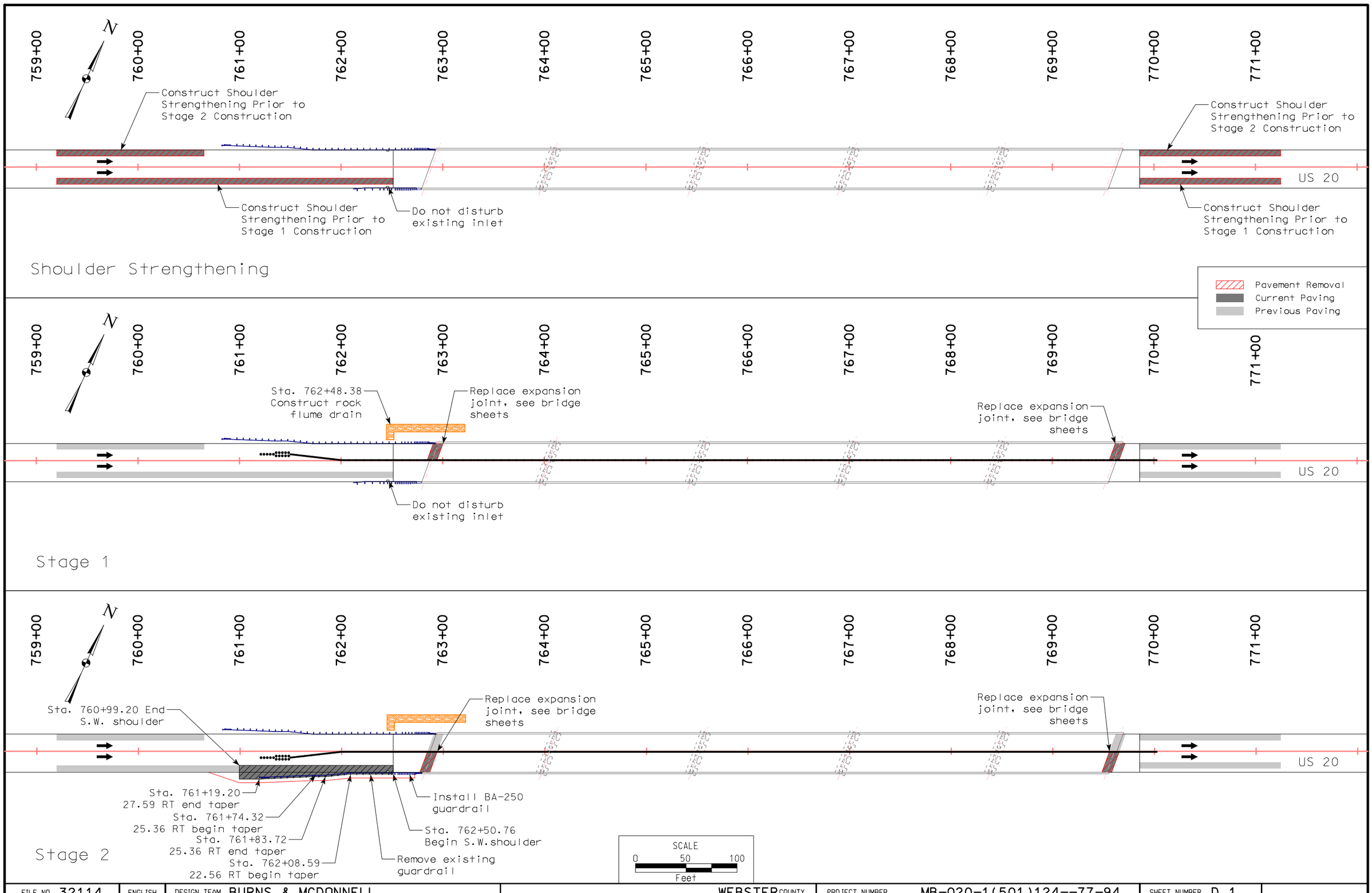
Location								Length by Line Type (Unfactored)														Remarks
Road ID	Station to Station		Dir. of Travel	Marking Type	Side			BCY4*	DCY4	NPY4**	BLW4	ELW4	ELY4									
					L	C	R	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	
US 20	753+34.00	762+74.00	EB	Removal of Paint	X								9.40									Stage 1
US 20	753+34.00	762+74.00	EB	Removal of Paint		X					9.40											Stage 1
US 20	753+34.00	762+74.00	EB	Removal of Paint			X					9.40										Stage 1
US 20	753+34.00	762+74.00	EB	Wet Retroreflective Removable Tape		X							9.40									Stage 1
US 20	753+34.00	762+74.00	EB	Wet Retroreflective Removable Tape			X					9.40										Stage 1
US 20	753+34.00	762+74.00	EB	Removal of Removable Tape		X							9.40									Stage 2
US 20	753+34.00	762+74.00	EB	Removal of Removable Tape			X					9.40										Stage 2
US 20	753+34.00	762+74.00	EB	Wet Retroreflective Removable Tape		X							9.40									Stage 2
US 20	753+34.00	762+74.00	EB	Wet Retroreflective Removable Tape	X								9.40									Stage 2
US 20	753+34.00	762+74.00	EB	Removal of Removable Tape		X						9.40										Final
US 20	753+34.00	762+74.00	EB	Removal of Removable Tape	X								9.40									Final
US 20	753+34.00	762+74.00	EB	Highbuild Waterborne Paint	X								9.40									Final
US 20	753+34.00	762+74.00	EB	Highbuild Waterborne Paint		X					9.40											Final
US 20	753+34.00	762+74.00	EB	Highbuild Waterborne Paint			X					9.40										Final
				Factored Total: Highbuild Waterborne Paint				-	-	-	2.35	9.40	9.40	-	-	-	-	-	-	-	-	
				Factored Total: Wet Retroreflective Removable Tape				-	-	-	-	18.80	18.80	-	-	-	-	-	-	-	-	
				Factored Total: Removal of Paint				-	-	-	2.35	9.40	9.40	-	-	-	-	-	-	-	-	
				Factored Total: Removal of Removable Tape				-	-	-	-	18.80	18.80	-	-	-	-	-	-	-	-	
				Bid Quantity: Painted Pavement Markings, Highbuild Waterborne							21.15											
				Bid Quantity: Wet Retroreflective Removable Tape Markings							37.60											
				Bid Quantity: Pavement Markings Removed							21.15											
				Incidental Removal of Removable Tape							37.60											

PAVEMENT MARKING SYMBOLS AND LEGENDS

Refer to PM-111

Road Identification	Location		STAW	RTAW	LTAW	CSRW	CSLW	CSTW	CRLW	FERW	LLRW	RLRW	RRCW	BLSW	WCSW	WPSB	SCHOOL	XING	STOP	AHEAD	ONLY	BIKE	LANE	EXIT	Groove Cuts	Remarks
	Station	Side																							EACH	
US 20	718+97.44										1															Stage 1
US 20	719+97.44										1															Stage 1
US 20	728+97.44										1															Stage 1
US 20	729+97.44										1															Stage 1
US 20	718+97.44											1														Stage 2
US 20	719+97.44											1														Stage 2
US 20	728+97.44											1														Stage 2
US 20	729+97.44											1														Stage 2
										TOTAL	8														

Shoulder Strengthening



FILE NO. 32114	ENGLISH	DESIGN TEAM BURNS & MCDONNELL	WEBSTER COUNTY	PROJECT NUMBER MB-020-1(501)124--77-94	SHEET NUMBER D.1

7/1/2022 4:24:58 PM STEMPATE TRN_Road pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\9402001021\Design\Burns & McDonnell\SHT_94020223_J02 77069503_J02 11x17_pdf.pltcfg

108-23A
08-01-08

TRAFFIC CONTROL PLAN

Maintain 1 lane of traffic along EB US-20 at all times utilizing Standard Road Plans listed in Tab. 105-4 on Sheet C.1 and J-sheets. Keep traffic open to Riverside Trail at all times.

108-25
10-21-14

511 TRAVEL RESTRICTIONS

Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
US 20	EB	Webster	2.6 mi E of Jct US 169	Des Moines River	Barrier	606085	Horizontal	40'	15'-1.5"	14'-1.5"	40'	Stage 1
US 20	EB	Webster	2.6 mi E of Jct US 169	Des Moines River	Barrier	606085	Horizontal	40'	16'-0"	N/A	40'	Stage 2

108-26A
08-01-08

STAGING NOTES

OUTSIDE SHOULDER STRENGTHENING:
Traffic Control:
Shift Eastbound US-20 traffic to inside lane utilizing Standard Road Plans listed in Tab. 105-4 on Sheet C.1.

Construction:
Remove and replace inside 6 feet of outside paved shoulder. Refer to Sheet D.1, SS-1 on Sheet B.1, and Sheet C.2 for more details. This shall be completed before beginning Stage 1.

MEDIAN SHOULDER STRENGTHENING:
Traffic Control:
Shift Eastbound US-20 traffic to outside lane utilizing Standard Road Plans listed in Tab. 105-4 on Sheet C.1.

Construction:
Remove and replace inside 6 feet of median paved shoulder. Refer to Sheet D.1, SS-1 on Sheet B.1, and Sheet C.2 for more details. This shall be completed before beginning Stage 2.

STAGE 1:
Traffic Control:
Shift Eastbound US-20 traffic to outside lane utilizing J-sheets, and Standard Road Plans TC-418 and TC-421. Place PDMS board as shown on Sheet J.4.

Construction:
Place bridge edge drain, rock flume, and replace bridge joint. Refer to Sheet D.1 for more details.

STAGE 2:
Traffic Control:
Shift Eastbound US-20 traffic to inside lane utilizing J-sheets, and Standard Road Plans TC-418 and TC-421.

Construction:
Remove and replace guardrail and replace bridge joint. Refer to Sheet D.1 for more details.

111-01
04-17-12

COORDINATED OPERATIONS

Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

Project	Type of Work
None provided.	

CROSS SECTION VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Med	(237)	Future Proposed Pavement Shading

CROSS SECTION VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

- Pavement Removal
- Proposed Granular Subbase
- Proposed Special Backfill
- Temporary Barrier Rail
- Proposed Granular Shoulder
- Temporary Shoulder
- Existing Shoulder Strengthening
- Permanent Barrier Rail
- Channelizing Device

PLAN VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Magenta	(5)	Pavement Marking Call Outs
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Yellow	(4)	Pavement Markings, Yellow
Off White	(254)	Pavement Markings, White
Violet	(15)	Temporary barrier rail, Unpinned
Flush Orange	(228)	Temporary barrier rail, Pinned

SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Proposed Granular Surface Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Light	(236)	Proposed Grading Limits Shading
Pink, Dark	(13)	Proposed MSE or CIP Wall Shading
Red	(3)	Proposed Bridge Shading and Sign Trusses
Black w/Gray, Light Fill	(0,48)	Previously Constructed Structure

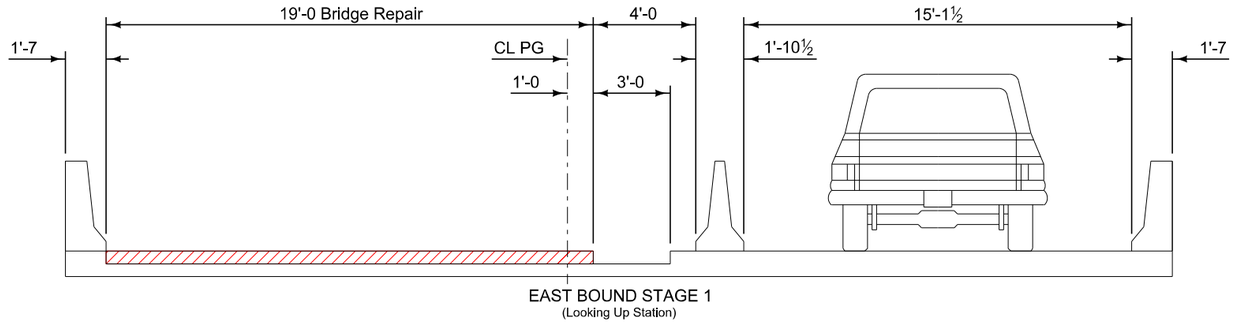
PLAN VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

- Channelizing Device
- Drum
- Temporary Lane Separator
- Tubular Marker
- Channelizer Marker
- Concrete Barrier Marker
- Delineator
- Temporary Barrier Rail
- Pavement Removal
- Sand Barrel Layout
- Crash Cushion (Temp or Perm)
- Traffic Signal
- Flagger
- Temporary Floodlighting
- Traffic Sign
- Type III Barricade
- Type A Warning Light
- Direction of Traffic
- Safety Closure
- Lane Identification

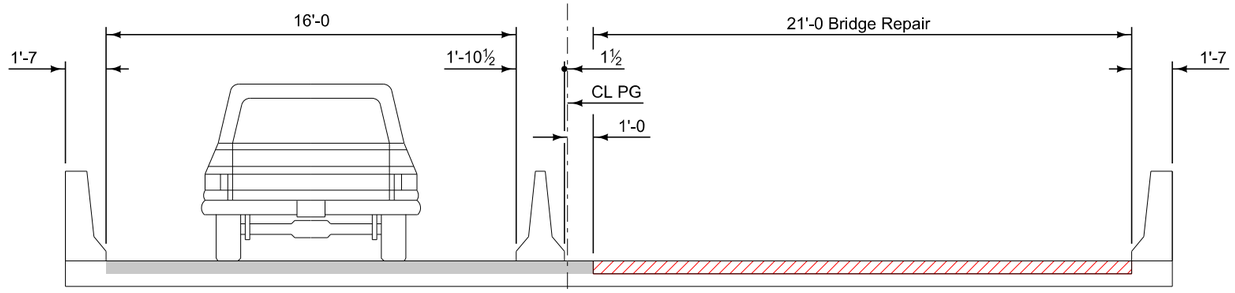
NOTE: Device spacing according to Standard Road Plans unless specifically dimensioned.

TRAFFIC CONTROL AND STAGING

(COVERS SHEET SERIES J)



EAST BOUND STAGE 1
(Looking Up Station)



EAST BOUND STAGE 2
(Looking Up Station)

N

NOT TO SCALE

ROAD WORK AHEAD

W20-1
48" x 48"

RIVERSIDE TRAIL

500'

SEE TC-418 FOR TRAFFIC CONTROL SETUP

770' TAPER
SPACING = 55'

350'

200'

400'

200'

85'

100'

500'

500'

US 20

500'

1000'

WIDE LOADS OVER 14' - 1.5" EXIT HERE

G20-53A
72" X 36"

LEFT LANE MUST TURN LEFT

R3-7L
36" x 36"

RIVERSIDE TRAIL

500'

ROAD WORK AHEAD

W20-1
48" x 48"

RESTRICTED WIDTH AHEAD
14' - 1.5"

G20-55A
60" X 30"

END ROADWORK

G20-2A
48" X 24"

SPEED LIMIT
65

R2-1
48" X 60"

SIGN		TRAFFIC FLOW	
DRUM		SPEED FEEDBACK SIGN	
PDMS		ARROW BOARD	
WORK AREA		CHANNELIZING DEVICE	

TRAFFIC CONTROL
STAGE 1

FILE NO. 32114	ENGLISH	DESIGN TEAM BURNS & MCDONNELL	WEBSTER COUNTY	PROJECT NUMBER MB-020-1(501)124--77-94	SHEET NUMBER J.4	

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N

NOT TO SCALE

ROAD WORK AHEAD

W20-1
48" x 48"

RIVERSIDE TRAIL

500'

SEE TC-418 AND TC-81 FOR TRAFFIC CONTROL SETUP

770' TAPER
SPACING = 55'

350'

400'

200'

85'

100'

500'

500'

US 20

500'

RIVERSIDE TRAIL

500'

ROAD WORK AHEAD

W20-1
48" x 48"

END ROADWORK

G20-2A
48" X 24"

SPEED LIMIT 65

R2-1
48" X 60"

SIGN		TRAFFIC FLOW	
DRUM		SPEED FEEDBACK SIGN	
PDMS		ARROW BOARD	
WORK AREA		CHANNELIZING DEVICE	

TRAFFIC CONTROL STAGE 2

FILE NO. 32114	ENGLISH	DESIGN TEAM BURNS & MCDONNELL	WEBSTER COUNTY	PROJECT NUMBER MB-020-1(501)124--77-94	SHEET NUMBER J.5	

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