LETTING DATE

Bridge Repair

NHSN-002-1(151)--2R-36

FREMONT COUNTY

Index of Sheets

No.	Description
Sheets	Bridge Plan
A.1	Title Sheet
A.2	Location Map Sheet
V.1	Estimated Quantities - Design 724
V.1 - V.5	Design 724
V.6	Estimated Quantities - Design 824
V.6-V.10	Design 824
Road Sheets	Road Plan
C.1	Estimated Quantities - Road
C.2	Standard Plans - Road
C.1 - C.4	Quantities and General Information
J.1 - J.7	Traffic Control and Staging Sheets

IOWA DOT

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

FREMONT COUNTY

Bridge Repair

IA 2 over Missouri River Overflow
0.5 mi E of the Missouri River (EB/WB)

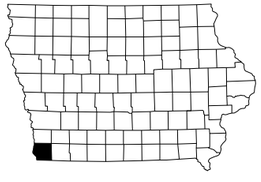
Refer to the Plan Sheets for list of applicable specifications.

Value Engineering Saves. Refer to Article 1105.14 of the Specifications.

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

Revisions

	TOTAL
	23
PROJECT IDENTIFICATION NUMBER	
24-36-002-010	
CONTRACT ID NUMBER	
36-0021-151	
PROJECT NUMBER	
NHSN-002-1(151)--2R-36	
R.O.W. PROJECT NUMBER	
PROJECT DIRECTORY NUMBER	
3600201024	



Standard Road Plans

Standard Road Plans are listed on Sheet Number C.2.

Design Data Rural

Refer to individual Situation Plans for Traffic Data information.

Index Of Seals

Sheet No.	Name	Type
A.1	Casey V. Faber	Structural Design
A.1	Steven Scott Sweet	Roadway Design

Roadway Design

LICENSED PROFESSIONAL ENGINEER
Steven S. Sweet
12558
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.

Signature 7/31/2023 Date

Steven Scott Sweet
Printed or Typed Name

My license renewal date is December 31, 2024

Pages or sheets covered by this seal: Sheets C.1-C.4, J.1-J.7

Structural Design

LICENSED PROFESSIONAL ENGINEER
Casey V. Faber
22283
IOWA

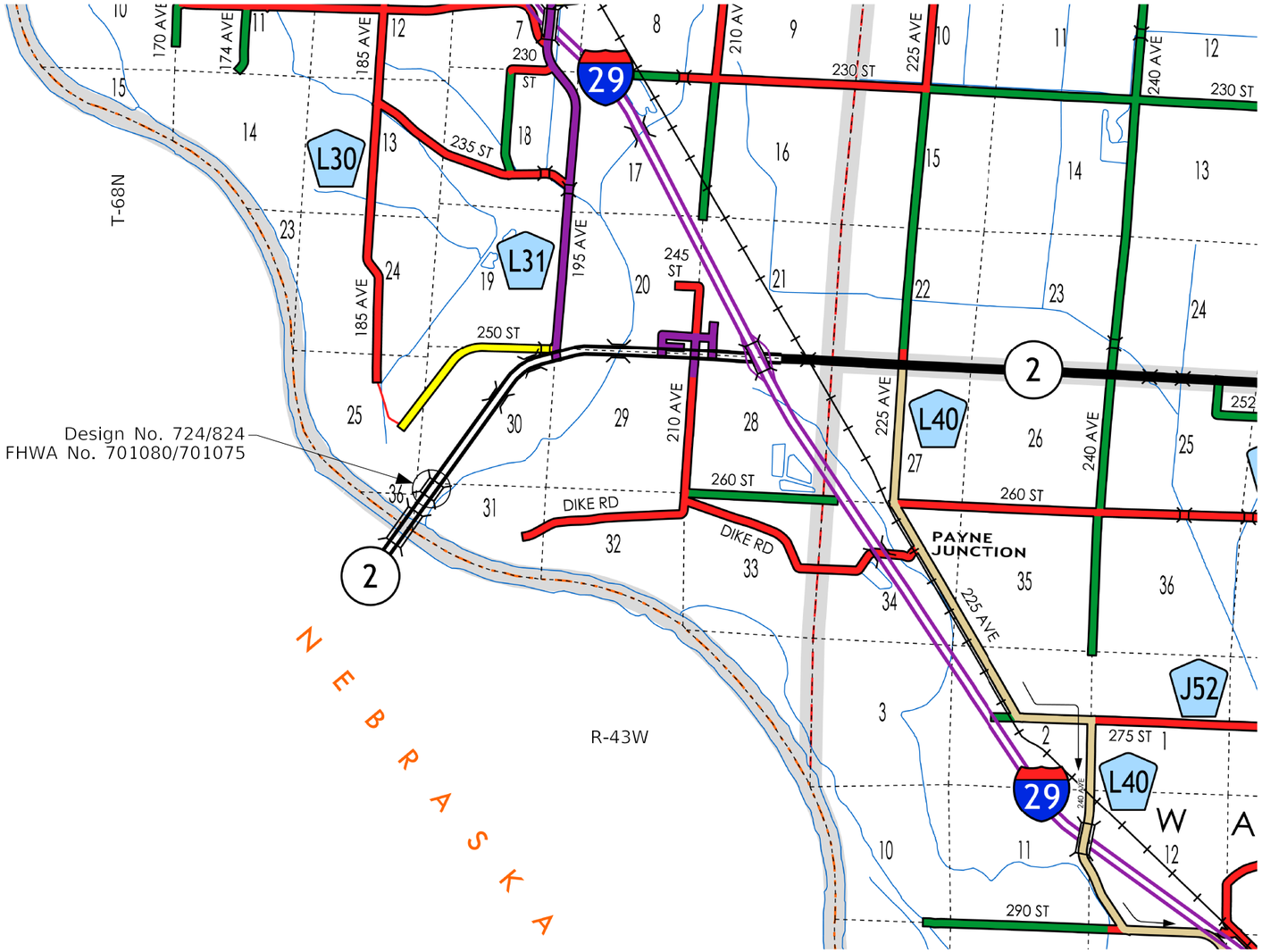
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature 7.31.2023 Date

Casey V. Faber
Printed or Typed Name

My license renewal date is December 31, 2023

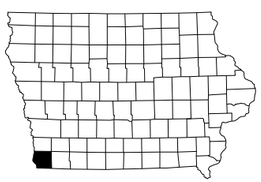
Pages or sheets covered by this seal: Sheets A.1-A.2, V.1-V.10



N

Fremont County Location Map

Not To Scale



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 (237)
- 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)
- STATE PARKS
- STATE INSTITUTIONS
- FEDERAL LAND

FILE NO. 32448	ENGLISH	DESIGN TEAM WHKS	FREMONT COUNTY	PROJECT NUMBER NHSN-002-1(151)--2R-36	SHEET NUMBER A.2

9:11:05 AM 7/31/2023 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\3600201024\Bridge\(151)_Bridge Repair\BRG_36002151_WHKS_724_701080_Z06.dgn

ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Item no.	Item Code	Item	Unit	Quantities Estimated Design No. 0724-FREMONT	Estimate Reference Notes
1	2401-6750001	REMOVALS, AS PER PLAN	LS	1	Includes all work for removal and off-site disposal of the abutment bearing assemblies as noted and shown in these plans. 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	2408-7800000	STRUCTURAL STEEL	LB	6,600	Includes abutment bearing material for 12 bearing assemblies as detailed in these plans. Includes allowance for bronze plates. Includes 1/8 inch neoprene sheets. Includes material, equipment, and labor associated with providing and installing anchor bolts as noted and shown in these plans.
3	2499-0700070	BRIDGE RAISING	LS	1	Includes all costs to raise the bridge end as a single unit using a sufficient number of hydraulic jacks and provide adequate vertical and lateral support to facilitate bearing replacement as noted and shown in these plans. This lump sum bid item also includes all costs for submitting for approval detailed plans and design calculations showing the proposed method of raising and supporting the bridge end. The plans and calculations for bridge raising and support shall be prepared and sealed by a professional civil or structural engineer licensed to practice in the State of Iowa.
4	2533-4980005	MOBILIZATION	LS	1	Includes material, equipment, and labor required to remove and reinstall the barrier plates as noted and shown in these plans. Includes material, equipment, and labor required to cut and repair the conduit in the outside rails at the joint as noted and shown in these plans. See Design Sheet 5 for additional information.

Note:
Roadway quantities shown elsewhere in these plans.

whks
engineers + planners + land surveyors

Design For 0° Skew
1097'-0" x 40'-0" Pretensioned
Prestressed Concrete Beam W.B. Bridge
156'-0" End Spans (5) - 157'-0" Interior Spans
Estimated Bridge Repair Quantities
STA. 400+85.00, LT. 32.00' (IA 2) Turn-in Date: July 2023
Fremont County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 724 Design Sheet No. 1 of 5 FHWA No. 701080

General Notes:

This design is for repairs to the existing 1097' x 40' pretensioned prestressed concrete beam bridge on IA 2 WB over the Missouri River overflow. Electronic copies of original design plans and bearing shop drawings will be made available to the Contractor as part of the E-files supplied with the contract documents. Repairs shall consist of:

1. Removing and replacing the bearings at both abutments (6 each abutment).

All dimensions and details shown on these plans pertinent to new construction shall be verified in the field by the Contractor before starting construction.

Faint lines on plans indicate existing portions of the bridge.

The road will be closed to traffic during construction. See traffic control plan note on this sheet.

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 starting date.

The lump sum bid for "Removals, as Per Plan" shall include all costs associated with removing the abutment bearing assemblies as noted and shown in these plans. 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.

The Bridge Contractor shall dress up any areas used to access the abutments which are disturbed during construction. This work shall be considered incidental and no extra payment will be made.

Design 824 (EB IA 2) shall be completed prior to Design 724 (WB IA 2) to provide time for additional bearing assemblies to be fabricated should they be found necessary based on the orientation of the bronze sliding plates at the west abutment of the eastbound bridge.

Bridge Raising Notes:

The Contractor shall raise the bridge ends with hydraulic jacks to facilitate bearing replacement at the abutments as indicated in the General Notes. It is anticipated that the bearings can be replaced by raising the bridge no more than ¾ inch.

Simultaneous jacking of the beams is required. No more than ¼ inch elevation difference between adjacent beams is allowed.

The bridge end shall be raised using jacks below the beam (in front of the bearing) and/or below the abutment diaphragm adjacent to the beam. A sufficient number of hydraulic jacks shall be used and distributed along the abutment to lift the full weight of the tributary superstructure dead load and any anticipated construction loads. Bridge raising shall be performed under closure to traffic and live loads are not anticipated.

The beam ends shall be supported during raising operations and throughout the duration of bearing replacement work (in the raised condition). In addition to the superstructure weight as noted above, longitudinal and lateral support of the superstructure shall be provided to prevent horizontal movement of the superstructure.

Support of the superstructure shall consist of hydraulic jacks and/or temporary support blocking. The Contractor shall submit for approval detailed plans and design calculations showing the proposed method of raising and supporting the superstructure. Raising operations and support shall be provided in a manner which prevents the overstressing of any bridge member. The plans and calculations shall be prepared by a Professional Engineer licensed to practice in the State of Iowa.

All costs associated with jacking and supporting the superstructure shall be included in the lump sum price bid for "Bridge Raising". This price shall include all labor, materials, equipment, submittals, and design associated with the jacking and temporary supports.

Bearing Anchor Notes:

Prior to drilling holes in the abutment for the anchor bolts, the Contractor shall locate the 5b1, 5m1, 5n1, and 8a1 bars near the proposed bearing assembly replacement location. Slotted holes have been provided in the masonry plate to allow shifting of the anchor bolts in the direction of the centerline of the abument bearing to avoid conflict with existing reinforcing.

Measurements were taken to aid in properly setting the bearing assembly in the direction of the beam centerline as noted below (distance from backwall to centerline of abutment bearing):

West abutment = 1'-10"
East abutment = 1'-11½"

Prior to drilling holes for anchor bolts, the Contractor shall verify the location of the centerline of bearing based on this equation:

Distance from backwall to centerline of abutment bearing = distance measured from backwall to centerline of beam sole plate + (temperature of underside of deck - 50°F) x 0.04, see Detail A.

If the results of this equation differ from the dimensions shown above contact the Engineer.

The centerline of anchor bolts shall be set 1'-2⅝" toward the backwall from the centerline of abutment bearings.

Specifications:

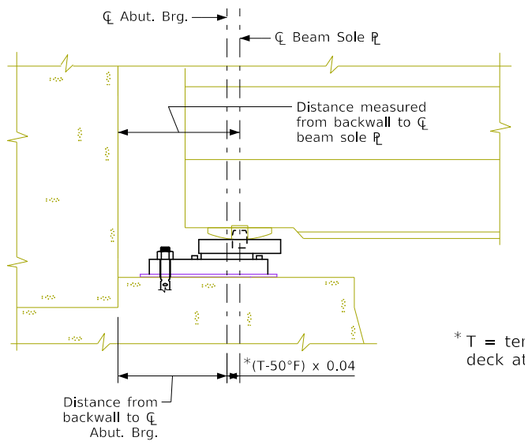
Design: AASHTO LRFD 8th Ed, Series of 2017, except as noted in the current Iowa Bridge Design Manual.

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 LRFD Bridge Design Spedifications, 8th Ed, Searies of 2017, except as noted in the current Iowa Bridge Design Manual.

Structural steel in accordance with AASHTO LRFD Section 6. ASTM A709 Grade 36 (AASHTO M270 Grade 36).



Detail A

* T = temperature of underside of deck at time of measurement

Note:
The situation shown above is for temperatures less than 50°F. The equation provided in the Bearing Anchor Notes does not need to be adjusted for temperatures above 50°F, but the ℄ beam sole ℙ will be on the opposite side of the ℄ abutment bearing as shown in the detail.

Working Drawing and Calculation Submittals

Working drawings and calculations shall be submitted for the following items shown in the table below. (Note additional working drawings and calculations may be required in accordance with Article 1105.03 of the Standard Specifications.)

Submittal requirements for working drawings and calculations shall be in accordance with 1105.03 of the Standard Specifications for Highway and Bridge Construction of the Iowa Department of Transportation. The absence of a certification requirement for a submittal does not relieve the Contractor of the responsibility to attain certification.

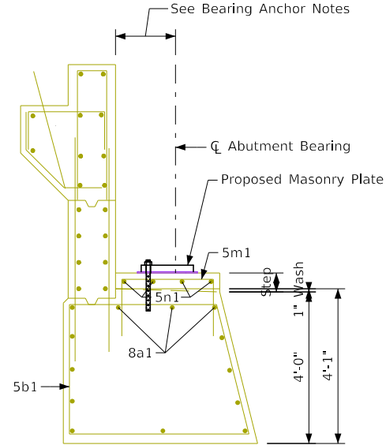
Calculation submittals in this table which are associated with working drawing submittals shall be submitted on the same day. Review time for calculation submittals shall be of the same duration as and run concurrently with review time for associated working drawings. The calculation submittals listed in the table are not meant to be an exhaustive list and do not relieve the Contractor from providing additional calculation submittals if requested by the Engineer.

No.	Working Drawing Description	Working Drawing File Name Convention For Submittal	Certified by Iowa P.E. (Yes/No)
1	Bridge Raising and Support Plan	(151)_Fremont_724_BridgeRaisingandSupportPlan.pdf	Yes
2	Abutment Bearings and Anchors	(151)_Fremont_724_AbutmentBearingsandAnchors.pdf	No
No.	Calculation Description	Calculation File Name Convention For Submittal	Certified by Iowa P.E. (Yes/No)
1	Bridge Raising and Support Calcs	(151)_Fremont_724_BridgeRaisingandSupportCalcs.pdf	Yes

Design History at this Site
(Includes this Design)

Des. No.	Type of Work
219	Original design
N/A	Emergency Bearing Repair
724	Bridge Repair

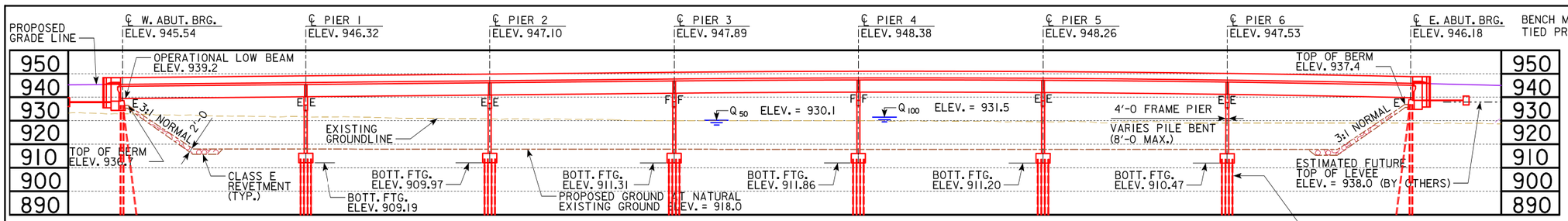
Traffic Control Plan
The roadway will be closed to thru traffic. Refer to the Traffic Control Plan shown elsewhere in these plans.



Part Section Through Abutment

Design For 0° Skew
1097'-0" x 40'-0" Pretensioned Prestressed Concrete Beam W.B. Bridge
156'-0" End Spans (5) - 157'-0" Interior Spans
General Notes
STA. 400+85.00, LT. 32.00' (IA 2) Turn-in Date: July 2023
Fremont County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 724 Design Sheet No. 2 of 5 FHWA No. 701080

whks engineers + planners + land surveyors

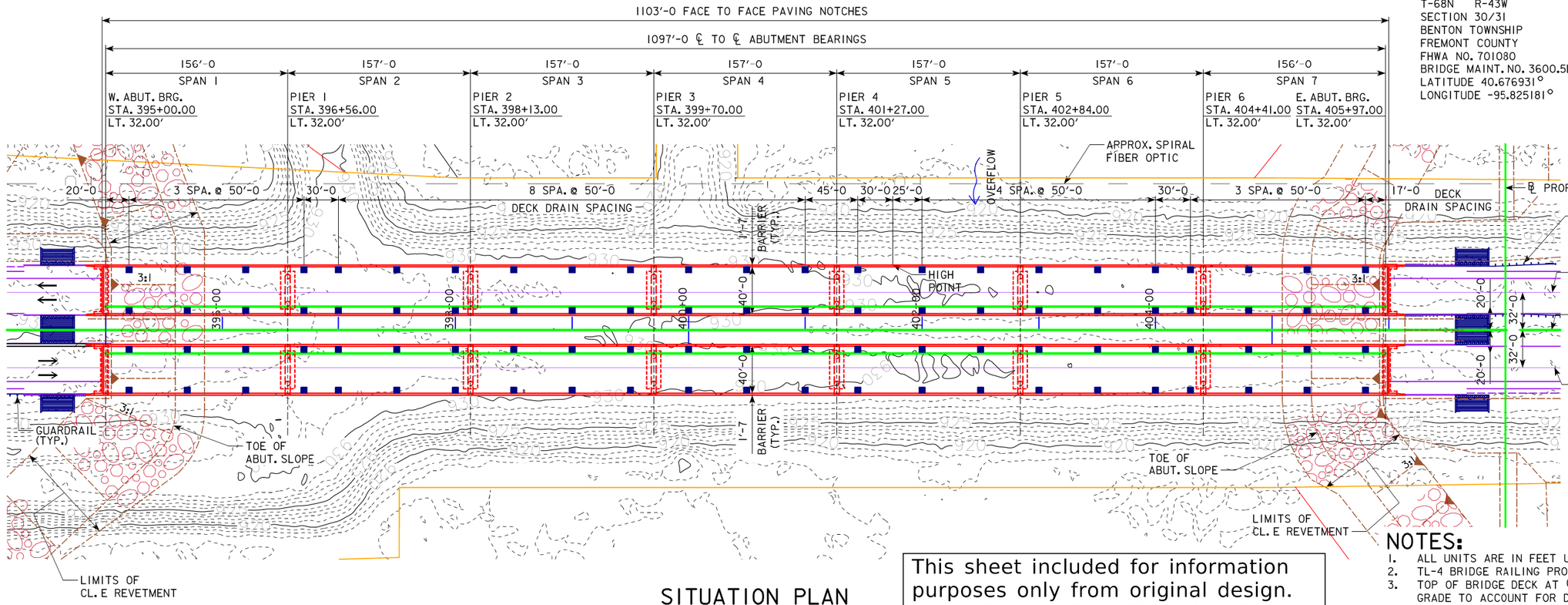


LONGITUDINAL SECTION ALONG ℄ W.B. BRIDGE

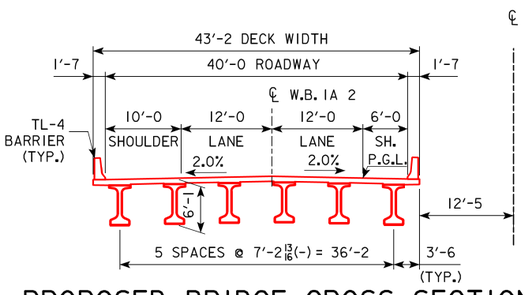
(VERTICAL SCALE 2:1)
(FRAME PIER OPTION SHOWN)

PERMITTING NOTES:

1. AS THIS PROJECT REQUIRES A SOVEREIGN LANDS PERMIT, BID ITEM REFERENCE NOTES SHALL RESTRICT BROKEN CONCRETE AS A SUBSTITUTE FOR REVETMENT.
2. AN IOWA DNR FLOOD PLAIN CONSTRUCTION PERMIT IS REQUIRED.
3. AN IOWA DNR SOVEREIGN LANDS PERMIT IS REQUIRED.



SITUATION PLAN



PROPOSED BRIDGE CROSS SECTION

HYDRAULIC DESIGN

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.

LICENSED PROFESSIONAL ENGINEER — Mark D. Werner 15418 — IOWA

Mark D Werner — 7/2/2019
Signature — Date

MARK D. WERNER
Printed or Typed Name

My license renewal date is December 31, 2019

Pages or sheets covered by this seal: _____

HYDRAULIC DATA

DRAINAGE AREA = 410,000 SQ. MI.
STREAM SLOPE = 0.9 FT./MI.
AVG. LOW WATER STAGE = 914.2

Q_{25} = 189,900 CFS
STAGE = 929.3

Q_{50} = 206,400 CFS
STAGE = 930.1
REGULATORY LOW BEAM = N/A
BACKWATER = -0.9 FT.

Q_{100} = 236,700 CFS
STAGE = 931.5
OPERATIONAL LOW BEAM = 939.4
BACKWATER = -1.1 FT.
AVG. BRIDGE VELOCITY = 3.9 FPS

Q_{200} = 275,900 CFS
STAGE = LEVEE OVERTOPS*
CALCULATED DESIGN SCOUR = 894.9 (FRAME PIER)
890.6 (PILE BENT)

Q_{500} = 345,400 CFS
STAGE = LEVEE OVERTOPS*
CALCULATED CHECK SCOUR = 886.7 (FRAME PIER)
881.9 (PILE BENT)

* LEVEE OVERTOPS LESS THAN Q_{200} PER USACE STUDY. ASSUME STAGE 1' ABOVE TOP OF LEVEE.

DISCHARGES FROM USACE, UPPER MISSISSIPPI RIVER SYSTEM FLOW FREQUENCY STUDY, DATED NOVEMBER 2003.

VERTICAL DATUM = NAVD 88

This sheet included for information purposes only from original design.
Current Traffic Estimate: 2021 AADT = 4,150 VPD, 23% Trucks.

LOCATION

W.B. IA 2 OVERFLOW
T-68N R-43W
SECTION 30/31
BENTON TOWNSHIP
FREMONT COUNTY
FHWA NO. 701080
BRIDGE MAINT. NO. 3600.5L002
LATITUDE 40.676931°
LONGITUDE -95.825181°

-3.200% +0.500% -2.000%

VPI STA. = 389+75
VPI ELEV. = 942.70
VC = 500'

VPI STA. = 404+75
VPI ELEV. = 950.20
VC = 1,000'

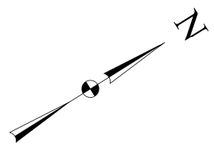
PROPOSED PROFILE GRADE IA 2

TRAFFIC ESTIMATE

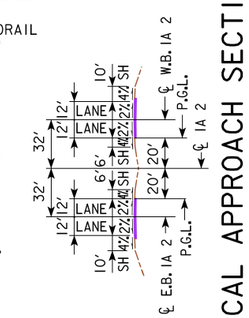
2016 AADT	8,200	V.P.D.
TRUCKS	20	%
Total Design ESALs	8,200	V.P.D.

UTILITIES LEGEND:

— FO — SPIRAL FIBER OPTIC



TYPICAL APPROACH SECTION



NOTES:

1. ALL UNITS ARE IN FEET UNLESS OTHERWISE NOTED.
2. TL-4 BRIDGE RAILING PROPOSED.
3. TOP OF BRIDGE DECK AT ℄ W.B. IA 2 IS 0.21' ABOVE THE PROFILE GRADE TO ACCOUNT FOR DECK CROSS SLOPE AND PARABOLIC CROWN.
4. PIER TYPE - 2 COLUMN FRAME PIER OPTION SHOWN, PILE BENT OPTION SIMILAR.
5. BEAM TYPE - BTE BEAMS.
6. BOTH PIER OPTIONS SUPPORTED ON DRIVEN H-PILES.
7. CLASS E REVETMENT STONE IS EMBEDDED.
8. SEE 'SPS-SHEETS' FOR APPROXIMATE BORING LOCATIONS.

Design For 0° Skew

1097'-0" x 40'-0" Pretensioned Prestressed Concrete Beam W.B. Bridge

156'-0" End Spans (5) - 157'-0" Interior Spans

Situation Plan

STA. 400+85.00, LT. 32.00' (IA 2)

Turn-in Date: July 2023

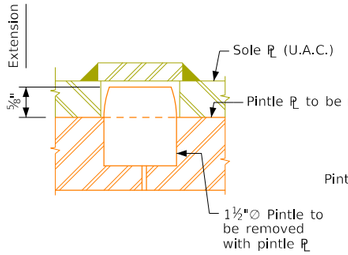
Fremont County

IOWA DEPARTMENT OF TRANSPORTATION

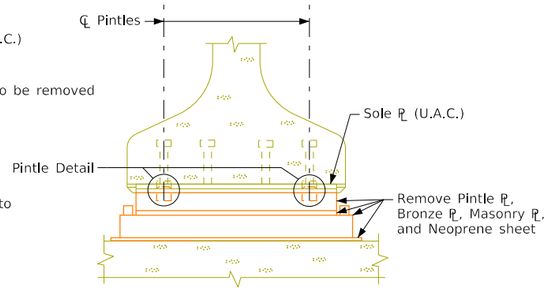
Design No. 724 | Design Sheet No. 3 of 5 | FHWA No. 701080

FILE NO. 32448	ENGLISH	DESIGN TEAM CVF\RCM\WDB	Fremont COUNTY	PROJECT NUMBER NHSN-002-1(151)--2R-36	SHEET NUMBER V.3

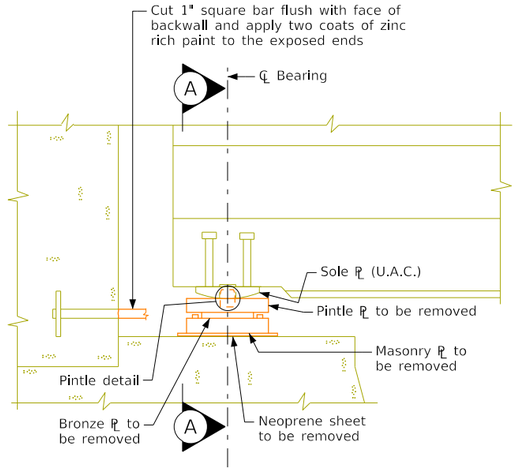
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Pintle Detail

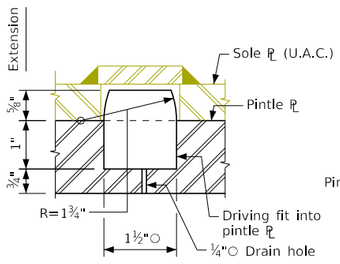


Section A-A

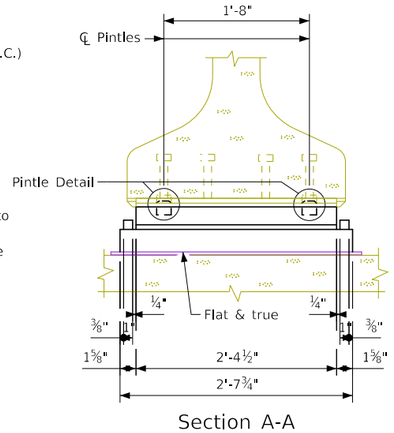


Part Elevation

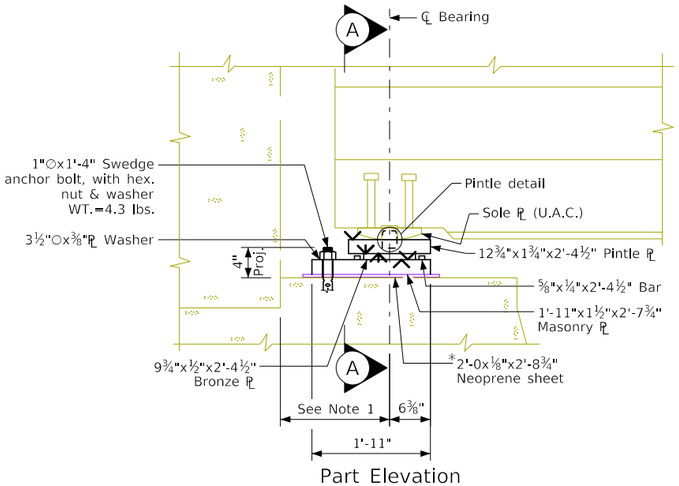
Removal Details



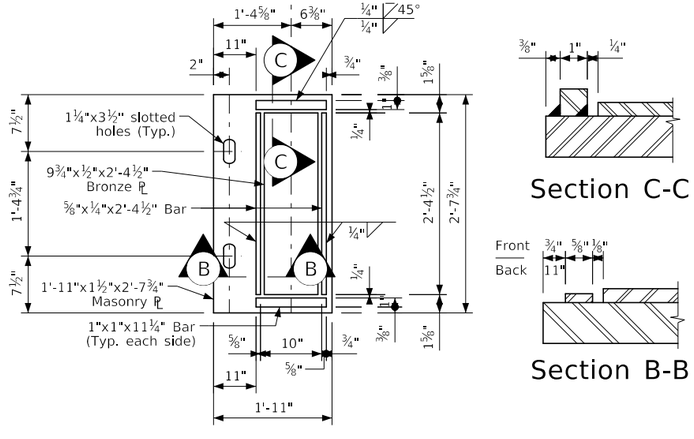
Pintle Detail



Section A-A



Part Elevation

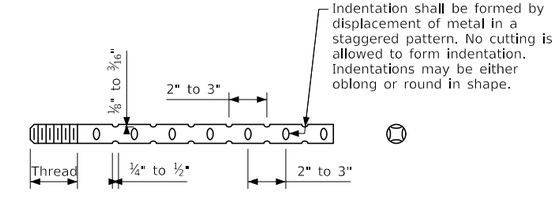


Plan of Masonry ℄ and Bronze ℄

* The ⅛ inch neoprene sheets are to be 50, 60, or 70 durometer hardness and shall be 1 inch greater in length and width than the bottom surface of the masonry plates.

Masonry ℄ / Bronze Bearing Assembly

Note 1:
See "Bearing Anchor Notes" on Design Sheet 2 for information on setting the anchor bars and masonry plate.



Anchor Bolt Swedge Detail

Note:
Emergency repairs were performed to prevent shifting of certain abutment bearings with compromised anchor bars. The repair consisted of installing a shim plate between the backwall and masonry plate, see E-Files for additional information. These plates shall be removed in accordance with Section 2401 of the Specifications. This work shall be considered incidental to the Removals bid item.

Abutment Bearing Notes:

The sliding surface of the bronze ℄ shall be lubricated in accordance with Article 4190.03, of the Standard Specifications, and the bronze metal shall be cast bronze in accordance with Article 4190.03, of the Standard Specifications. Top edges of bronze ℄ shall be beveled ⅛".

Surfaces mark "V" shall be finished ANSI 250 and surfaces marked "⩛" shall be finished ANSI 125.

Masonry plates are to be set on a ⅛" neoprene sheet.

Pintle plates, masonry plates, and lubricated bronze plates are included with the structural steel quantity. Unit price bid for structural steel shall include allowance for cost of bronze plates. Cost of neoprene sheets shall be considered incidental to the structural steel bid item.

The pintle plate and the masonry plate shall be galvanized. Swedge anchor bolts, nuts, and washers shall be galvanized. Galvanizing shall be in accordance with Article 4100.07, of the Standard Specifications. The masonry plate shall be fitted up and welded prior to galvanizing. The surface of pintle plate in contact with bronze bearing plate shall be smooth and free of projections due to galvanizing.

Anchor bolts shall be set in accordance with Article 2405.03, H, of the Standard Specifications. Material, equipment, and labor required to install the anchor bolts shall be considered incidental to the structural steel bid item.

After masonry plates are in correct location, fill slotted holes around anchor bolts with a hydraulic cement or polymer grout in accordance with Article 2405.03, H, of the Standard Specifications.

Plate washers shall be ASTM A709 Grade 36 (AASHTO M270 Grade) Steel.

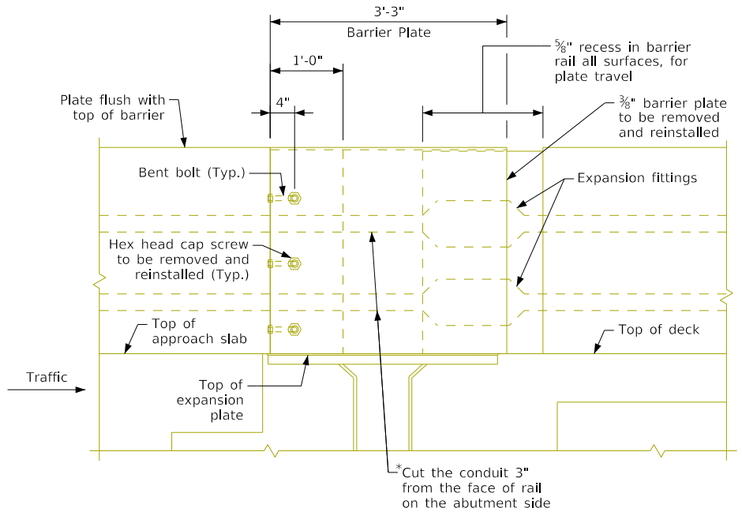
Weight of anchor bolts, nuts, and washers is included with the structural steel quantity.

whks
engineers + planners + land surveyors

Design For 0° Skew
1097'-0" x 40'-0" Pretensioned Prestressed Concrete Beam W.B. Bridge
156'-0" End Spans (5) - 157'-0" Interior Spans
Bearing Details
STA. 400+85.00, LT. 32.00' (IA 2) Turn-in Date: July 2023
Fremont County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 724 Design Sheet No. 4 of 5 FHWA No. 701080

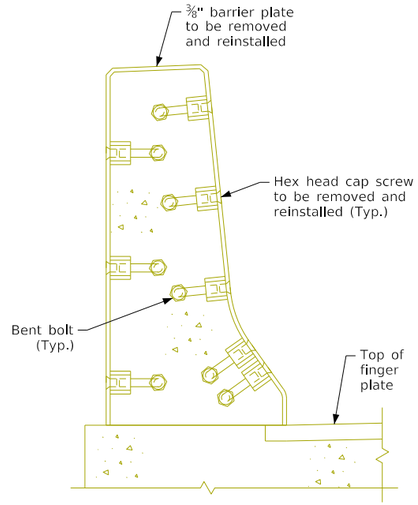
FILE NO. 32448	ENGLISH	DESIGN TEAM CVF\RCM\WDB	Fremont COUNTY	PROJECT NUMBER NHSN-002-1(151)--2R-36	SHEET NUMBER V.4

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Part Front Elevation of Rail at Joint

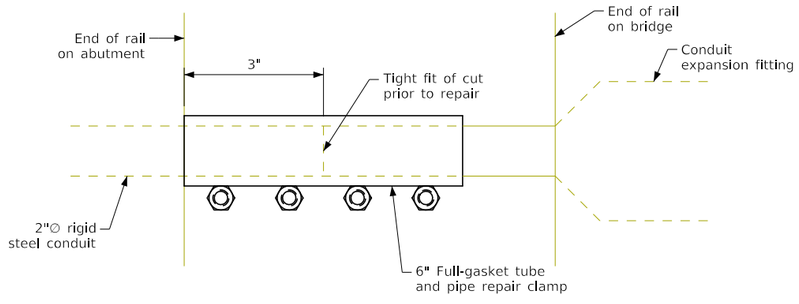
Looking at traffic face at outside rail corner with conduit, median rail similar except conduit



Section Through Rail at Joint

Conduit not shown for clarity

*Note:
The conduit shall be cut 3" from the end of rail opposite of the expansion fittings. Based on original plans this is assumed to be the abutment side but should be verified by the Contractor prior to cutting.



Conduit Repair Detail

Barrier Sliding Plate Notes:

Prior to raising the bridge, the Contractor shall remove the cap screws from the ⅜" barrier plates at locations where the plate anchor bolts are attached to the abutment side of the rail.

At the outside rail locations the ⅜" barrier plates shall be removed to provide access to the conduit in the rails.

The Contractor shall safely store the ⅜" barrier plates and cap screws during bridge raising operations. The plates and screws shall be reinstalled at the end of other work prior to opening the bridge to traffic.

Materials, equipment, and labor required to remove and reinstall the ⅜" barrier plates as noted and detailed in these plans shall be considered incidental to the Mobilization bid item, no additional measurement or payment will be made.

Conduit Notes:

The Contractor's attention is drawn to the presence of two 2"∅ rigid steel conduits located in the outside rail of the bridge.

Prior to raising the bridge, the Contractor shall remove the barrier plates at the joints of the outside rails in accordance with the notes and details in these plans. The Contractor shall then cut the conduit 3" from the end of rail opposite of the expansion fittings (abutment side assumed based on existing plans). The cuts shall be made with equipment that minimizes damage to the conduit such as bending, tearing, or leaving rough edges or projections.

The conduit shall be pushed into the expansion fitting on the bridge side of the joint and the Contractor shall remove any rough edges or projections from the inside of the conduit and remove any material, such as metal shavings, left from cutting.

After the bridge has been lowered into final position, the conduit shall be pulled from the expansion fitting tight against the conduit projecting from the other side. The Contractor shall repair the conduit by installing a 6" full-gasket tube and pipe repair clamp. The fasteners of the repair clamp shall be installed at the bottom. If the repair clamp is stainless steel, the gasket shall prevent contact between stainless steel and galvanized surfaces, otherwise the Contractor shall take measures approved by the Engineer prior to installing the clamp to prevent contact of these surfaces. The repair clamp shall be of a size recommended by the manufacturer for the diameter of the conduit.

All materials, equipment, and labor to cut and repair the conduit as noted and detailed in these plans shall be considered incidental to the Mobilization bid item, no additional measurement of payment will be made.

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Design For 0° Skew
1097'-0" x 40'-0" Pretensioned Prestressed Concrete Beam W.B. Bridge
156'-0" End Spans (5) - 157'-0" Interior Spans
Rail Conduit Details
STA. 400+85.00, LT. 32.00' (IA 2) Turn-in Date: July 2023
Fremont County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 724 Design Sheet No. 5 of 5 FHWA No. 701080

ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Item no.	Item Code	Item	Unit	Quantities Estimated Design No. 0824-FREMONT	Estimate Reference Notes
1	2401-6750001	REMOVALS, AS PER PLAN	LS	1	Includes all work for removal and off-site disposal of the abutment bearing assemblies as noted and shown in these plans. 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	2408-7800000	STRUCTURAL STEEL	LB	3,300	Includes abutment bearing material for 6 bearing assemblies as detailed in these plans. Includes allowance for bronze plates. Includes 1/8 inch neoprene sheets. Includes material, equipment, and labor associated with providing and installing anchor bolts as noted and shown in these plans. If additional bearing assemblies are required based on the orientation of the bronze sliding plates at the west abutment bearings, the quantity shall be extended at the contract unit price.
3	2499-0700070	BRIDGE RAISING	LS	1	Includes all costs to raise the bridge end as a single unit using a sufficient number of hydraulic jacks and provide adequate vertical and lateral support to facilitate abutment bearing orientation confirmation and/or replacement as noted and shown in these plans. This lump sum bid item also includes all costs for submitting for approval detailed plans and design calculations showing the proposed method of raising and supporting the bridge end. The plans and calculations for bridge raising and support shall be prepared and sealed by a professional civil or structural engineer licensed to practice in the State of Iowa.
4	2533-4980005	MOBILIZATION	LS	1	Includes material, equipment, and labor required to remove and reinstall the barrier plates as noted and shown in these plans. Includes material, equipment, and labor required to cut and repair the conduit in the outside rails at the joint as noted and shown in these plans. See Design Sheet 5 for additional information.

Note:
Roadway quantities shown elsewhere in these plans.

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Design For 0° Skew
1097'-0" x 40'-0" Pretensioned
Prestressed Concrete Beam E.B. Bridge
156'-0" End Spans (5) - 157'-0" Interior Spans
Estimated Bridge Repair Quantities
STA. 400+85.00, RT. 32.00' (IA 2) Turn-in Date: July 2023
Fremont County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 824 Design Sheet No. 1 of 5 FHWA No. 701075

General Notes:

This design is for repairs to the existing 1097' x 40' pretensioned prestressed concrete beam bridge on IA 2 EB over the Missouri River overflow. Electronic copies of original design plans and bearing shop drawings will be made available to the Contractor as part of the E-files supplied with the contract documents. Repairs shall consist of:

1. Raising the bridge at the west abutment to confirm the orientation of the existing bronze sliding plates. Bearings shall be removed and replaced in accordance with the notes and details in these plans if the orientation of the existing bronze sliding plate is determined to be installed incorrectly. If they were installed incorrectly, additional bearing assemblies as detailed in these plans will be required to complete work at the west abutment.

2. Removing and replacing the bearings at the East abutment (6 total).

All dimensions and details shown on these plans pertinent to new construction shall be verified in the field by the Contractor before starting construction.

Faint lines on plans indicate existing portions of the bridge.

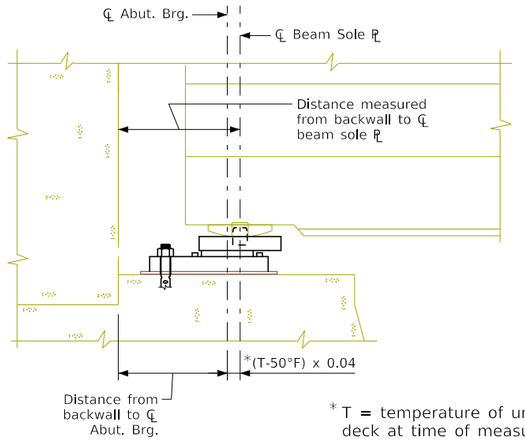
The road will be closed to traffic during construction. See traffic control plan note on this sheet.

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 starting date.

The lump sum bid for "Removals, as Per Plan" shall include all costs associated with removing the abutment bearing assemblies as noted and shown in these plans. 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.

The Bridge Contractor shall dress up any areas used to access the abutments which are disturbed during construction. This work shall be considered incidental and no extra payment will be made.

Design 824 (EB IA 2) shall be completed prior to Design 724 (WB IA 2) to provide time for additional bearing assemblies to be fabricated should they be found necessary based on the orientation of the bronze sliding plates at the west abutment of the eastbound bridge.



* T = temperature of underside of deck at time of measurement

Detail A

Note:
The situation shown above is for temperatures less than 50°F. The equation provided in the Bearing Anchor Notes does not need to be adjusted for temperatures above 50°F, but the ℄ beam sole ℙ will be on the opposite side of the ℄ abutment bearing as shown in the detail.

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engineers + planners + land surveyors

Bridge Raising Notes:

The Contractor shall raise the bridge ends with hydraulic jacks to facilitate bearing replacement at the abutments as indicated in the General Notes. It is anticipated that the bearings can be replaced by raising the bridge no more than ¾ inch.

Simultaneous jacking of the beams is required. No more than ¼ inch elevation difference between adjacent beams is allowed.

The bridge end shall be raised using jacks below the beam (in front of the bearing) and/or below the abutment diaphragm adjacent to the beam. A sufficient number of hydraulic jacks shall be used and distributed along the abutment to lift the full weight of the tributary superstructure dead load and any anticipated construction loads. Bridge raising shall be performed under closure to traffic and live loads are not anticipated.

The beam ends shall be supported during raising operations and throughout the duration of bearing replacement work (in the raised condition). In addition to the superstructure weight as noted above, longitudinal and lateral support of the superstructure shall be provided to prevent horizontal movement of the superstructure.

Support of the superstructure shall consist of hydraulic jacks and/or temporary support blocking. The Contractor shall submit for approval detailed plans and design calculations showing the proposed method of raising and supporting the superstructure. Raising operations and support shall be provided in a manner which prevents the overstressing of any bridge member. The plans and calculations shall be prepared by a Professional Engineer licensed to practice in the State of Iowa.

All costs associated with jacking and supporting the superstructure shall be included in the lump sum price bid for "Bridge Raising". This price shall include all labor, materials, equipment, submittals, and design associated with the jacking and temporary supports.

Bearing Anchor Notes:

Prior to drilling holes in the abutment for the anchor bolts, the Contractor shall locate the 5b1, 5m1, 5n1, and 8a1 bars near the proposed bearing assembly replacement location. Slotted holes have been provided in the masonry plate to allow shifting of the anchor bolts in the direction of the centerline of the abument bearing to avoid conflict with existing reinforcing.

Measurements were taken to aid in properly setting the bearing assembly in the direction of the beam centerline as noted below (distance from backwall to centerline of abutment bearing):

West abutment = 1'-10¾"
East abutment = 1'-10"

Prior to drilling holes for anchor bolts, the contractor shall verify the location of the centerline of bearing based on this equation:

Distance from backwall to centerline of abutment bearing = distance measured from backwall to centerline of beam sole plate + (temperature of underside of deck - 50°F) x 0.04, see Detail A.

If the results of this equation differ from the dimensions shown above contact the Engineer.

The centerline of anchor bolts shall be set 1'-2⅝" toward the backwall from the centerline of abutment bearings.

Specifications:

Design: AASHTO LRFD 8th Ed, Series of 2017, except as noted in the current Iowa Bridge Design Manual.

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 LRFD Bridge Design Spedifications, 8th Ed, Searies of 2017, except as noted in the current Iowa Bridge Design Manual.

Structural steel in accordance with AASHTO LRFD Section 6. ASTM A709 Grade 36 (AASHTO M270 Grade 36).

Working Drawing and Calculation Submittals

Working drawings and calculations shall be submitted for the following items shown in the table below. (Note additional working drawings and calculations may be required in accordance with Article 1105.03 of the Standard Specifications.)

Submittal requirements for working drawings and calculations shall be in accordance with 1105.03 of the Standard Specifications for Highway and Bridge Construction of the Iowa Department of Transportation. The absence of a certification requirement for a submittal does not relieve the Contractor of the responsibility to attain certification.

Calculation submittals in this table which are associated with working drawing submittals shall be submitted on the same day. Review time for calculation submittals shall be of the same duration as and run concurrently with review time for associated working drawings. The calculation submittals listed in the table are not meant to be an exhaustive list and do not relieve the Contractor from providing additional calculation submittals if requested by the Engineer.

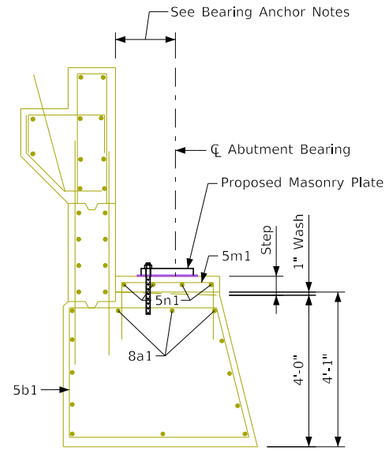
No.	Working Drawing Description	Working Drawing File Name Convention For Submittal	Certified by Iowa P.E. (Yes/No)
1	Bridge Raising and Support Plan	(151)_Fremont_824_BridgeRaisingandSupportPlan.pdf	Yes
2	Abutment Bearings and Anchors	(151)_Fremont_824_AbutmentBearingsandAnchors.pdf	No
No.	Calculation Description	Calculation File Name Convention For Submittal	Certified by Iowa P.E. (Yes/No)
1	Bridge Raising and Support Calcs	(151)_Fremont_824_BridgeRaisingandSupportCalcs.pdf	Yes

Design History at this Site
(Includes this Design)

Des. No.	Type of Work
119	Original design
N/A	Emergency Bearing Repair
824	Bridge Repair

Traffic Control Plan

The roadway will be closed to thru traffic. Refer to the Traffic Control Plan shown elsewhere in these plans.



Part Section Through Abutment

Design For 0° Skew

1097'-0" x 40'-0" Pretensioned Prestressed Concrete Beam E.B. Bridge

156'-0" End Spans (5) - 157'-0" Interior Spans

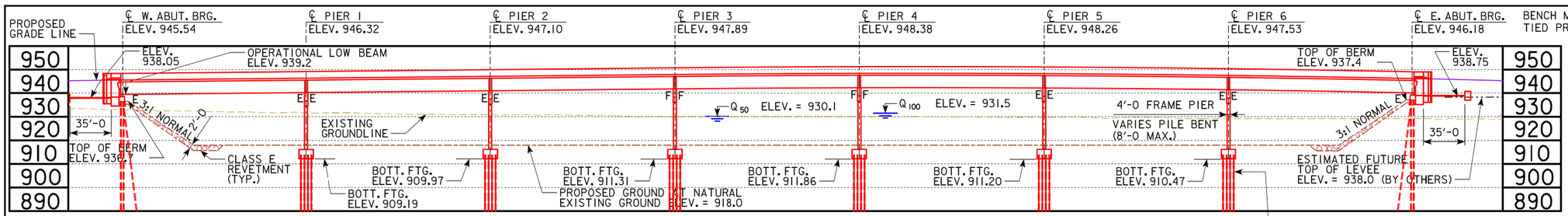
General Notes

STA. 400+85.00, RT. 32.00' (IA 2) Turn-in Date: July 2023

Fremont County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 824 Design Sheet No. 2 of 5 FHWA No. 701075



LONGITUDINAL SECTION ALONG ℄ E.B. BRIDGE

(VERTICAL SCALE 2:1)
(FRAME PIER OPTION SHOWN)

This sheet included for information purposes only from original design.
Current Traffic Estimate: 2021 AADT = 4,150 VPD, 23% Trucks.

-3.200% +0.500% -2.000%

VPI STA. = 389+75 VPI ELEV. = 942.70 VC = 500'
VPI STA. = 404+75 VPI ELEV. = 950.20 VC = 1,000'

PROPOSED PROFILE GRADE IA 2

TRAFFIC ESTIMATE

2016 AADT	8,200	V.P.D.
TRUCKS	20	%
Total Design ESALs	47,900,000	

HYDRAULIC DESIGN

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.

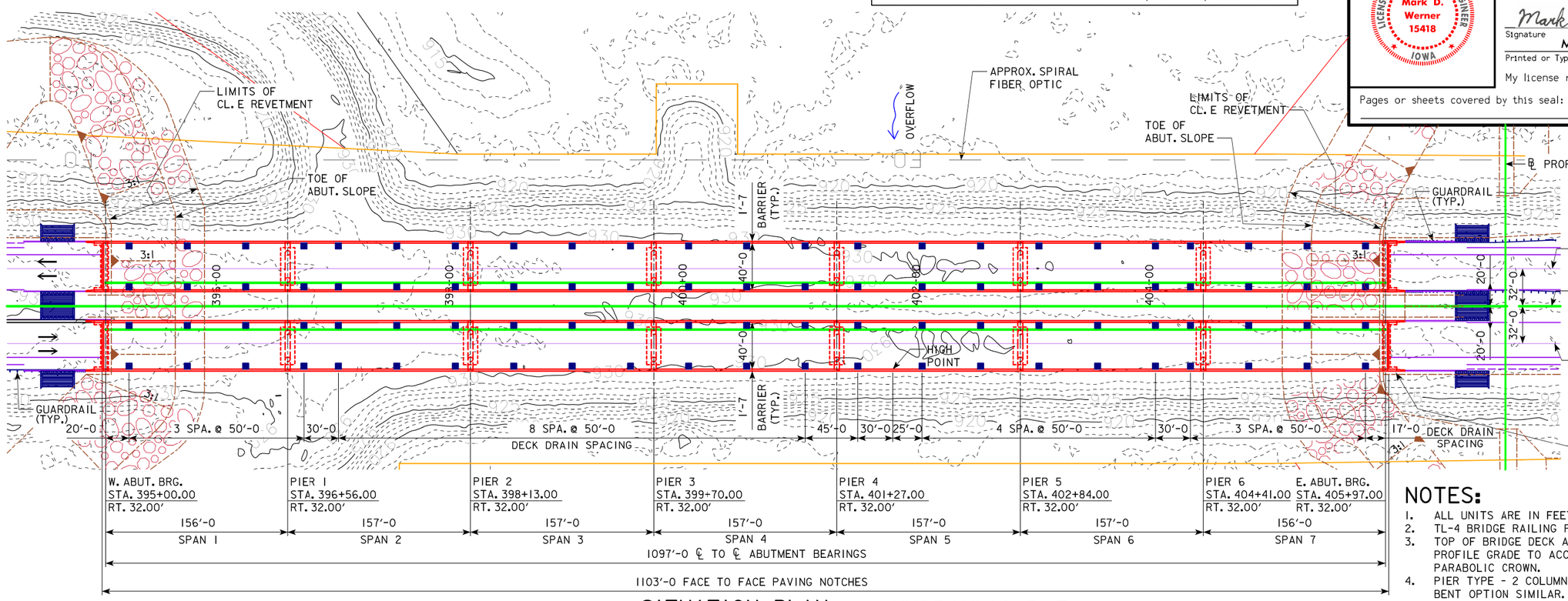
LICENSED PROFESSIONAL ENGINEER — Mark D. Werner 15418 — IOWA

Mark D Werner — 7/2/2019
Signature — Date

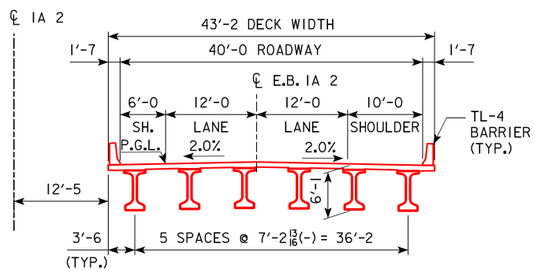
MARK D. WERNER
Printed or Typed Name

My license renewal date is December 31, 2019

Pages or sheets covered by this seal:



SITUATION PLAN



PROPOSED BRIDGE CROSS SECTION

LOCATION

E.B. IA 2 OVERFLOW
T-68N R-43W
SECTION 30/31
BENTON TOWNSHIP
FREMONT COUNTY
FHWA NO. 701075
BRIDGE MAINT. NO. 3600.5R002
LATITUDE 40.676833°
LONGITUDE -95.824989°

UTILITIES LEGEND:

— FO — SPIRAL FIBER OPTIC

PERMITTING NOTES:

1. AS THIS PROJECT REQUIRES A SOVEREIGN LANDS PERMIT, BID ITEM REFERENCE NOTES SHALL RESTRICT BROKEN CONCRETE AS A SUBSTITUTE FOR REVETMENT.
2. AN IOWA DNR FLOOD PLAIN CONSTRUCTION PERMIT IS REQUIRED.
3. AN IOWA SOVEREIGN LANDS PERMIT IS REQUIRED.

HYDRAULIC DATA

DRAINAGE AREA = 410,000 SQ. MI.
STREAM SLOPE = 0.9 FT./MI.
AVG. LOW WATER STAGE = 914.2

Q_{25} = 189,900 CFS
STAGE = 929.3

Q_{50} = 206,400 CFS
STAGE = 930.1
REGULATORY LOW BEAM = N/A
BACKWATER = -0.9 FT.

Q_{100} = 236,700 CFS
STAGE = 931.5
OPERATIONAL LOW BEAM = 939.2
BACKWATER = -1.1 FT.
AVG. BRIDGE VELOCITY = 3.9 FPS

Q_{200} = 275,900 CFS
STAGE = LEVEE OVERTOPS*
CALCULATED DESIGN SCOUR = 894.9 (FRAME PIER)
890.6 (PILE BENT)

Q_{500} = 345,400 CFS
STAGE = LEVEE OVERTOPS*
CALCULATED CHECK SCOUR = 886.7 (FRAME PIER)
881.9 (PILE BENT)

* LEVEE OVERTOPS LESS THAN Q_{200} PER USACE STUDY. ASSUME STAGE 1' ABOVE TOP OF LEVEE.

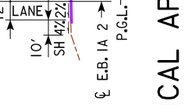
DISCHARGES FROM USACE, UPPER MISSISSIPPI RIVER SYSTEM FLOW FREQUENCY STUDY, DATED NOVEMBER 2003.

VERTICAL DATUM = NAVD 88

NOTES:

1. ALL UNITS ARE IN FEET UNLESS OTHERWISE NOTED.
2. TL-4 BRIDGE RAILING PROPOSED.
3. TOP OF BRIDGE DECK AT ℄ E.B. IA 2 IS 0.21' ABOVE THE PROFILE GRADE TO ACCOUNT FOR DECK CROSS SLOPE AND PARABOLIC CROWN.
4. PIER TYPE - 2 COLUMN FRAME PIER OPTION SHOWN, PILE BENT OPTION SIMILAR.
5. BEAM TYPE - BTE BEAMS.
6. BOTH PIER TYPE OPTIONS SUPPORTED BY DRIVEN H-PILES.
7. CLASS E REVETMENT STONE IS EMBEDDED.
8. SEE 'SPS-SHEETS' FOR APPROXIMATE BORING LOCATIONS.

TYPICAL APPROACH SECTION



Design For 0° Skew

1097'-0" x 40'-0" Pretensioned Prestressed Concrete Beam E.B. Bridge

156'-0" End Spans (5) - 157'-0" Interior Spans

Situation Plan

STA. 400+85.00, RT. 32.00' (IA 2) Turn-In Date: July 2023

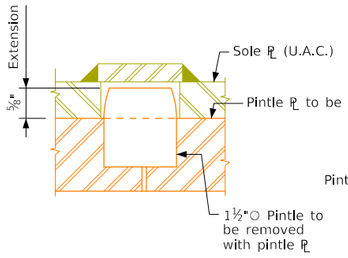
Fremont County

IOWA DEPARTMENT OF TRANSPORTATION

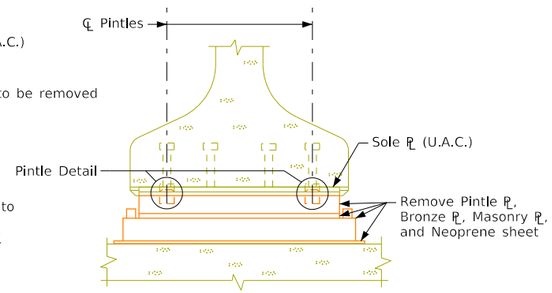
Design No. 824 Design Sheet No. 3 of 5 FHWA No. 701075

FILE NO. 32448	ENGLISH	DESIGN TEAM CVF\RCM\WDB	Fremont COUNTY	PROJECT NUMBER NHSN-002-1(151)--2R-36	SHEET NUMBER V.8

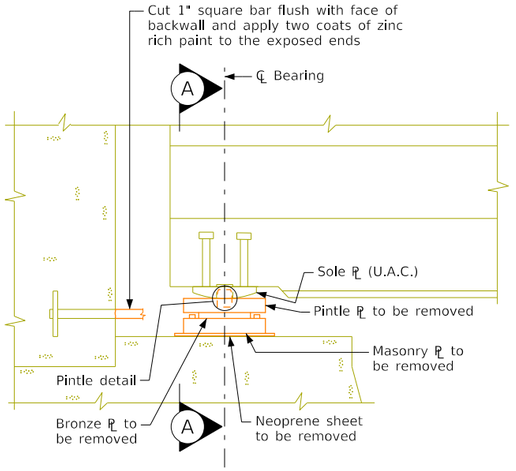
9:12:30 AM 7/31/2023 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\3600201024\Bridge\(151)_Bridge Repair\BRG_360021S1_WHKS_824_701075_Z06.dgn



Pintle Detail

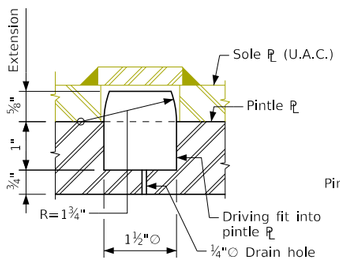


Section A-A

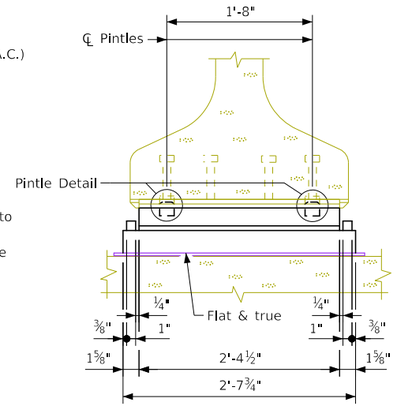


Part Elevation

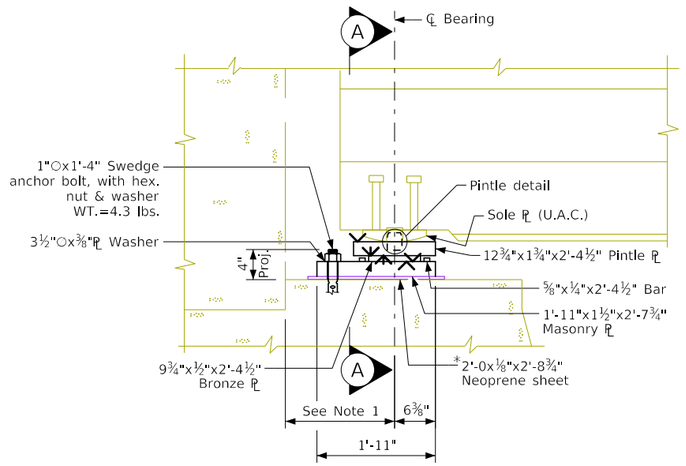
Removal Details



Pintle Detail



Section A-A



Part Elevation

* The ⅛ inch neoprene sheets are to be 50, 60, or 70 durometer hardness and shall be 1 inch greater in length and width than the bottom surface of the masonry plates or steel bearings.

Masonry ℄ / Bronze Bearing Assembly

Note 1:
See "Bearing Anchor Notes" on Design Sheet 2 for information on setting the anchor bars and masonry plate.

Abutment Bearing Notes:

The sliding surface of the bronze ℄ shall be lubricated in accordance with Article 4190.03, of the Standard Specifications, and the bronze metal shall be cast bronze in accordance with Article 4190.03, of the Standard Specifications. Top edges of bronze ℄ shall be beveled ⅛".

Surfaces mark "V" shall be finished ANSI 250 and surfaces marked "⩛" shall be finished ANSI 125.

Masonry plates are to be set on a ⅛" neoprene sheet.

Pintle plates, masonry plates, and lubricated bronze plates are included with the structural steel quantity. Unit price bid for structural steel shall include allowance for cost of bronze plates. Cost of neoprene sheets shall be considered incidental to the structural steel bid item.

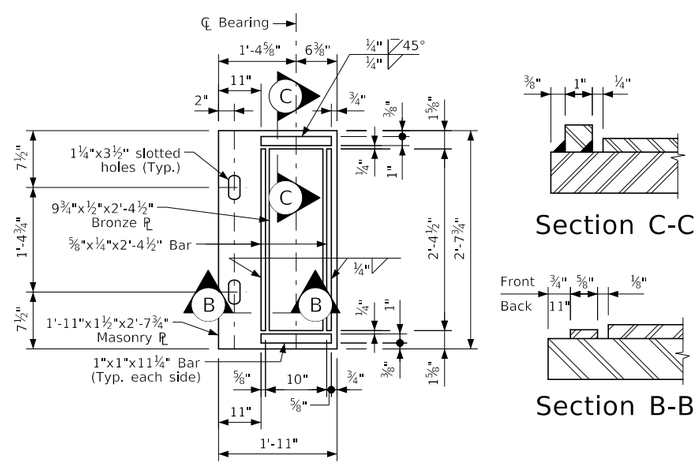
The pintle plate and the masonry plate shall be galvanized. Swedge anchor bolts, nuts, and washers shall be galvanized. Galvanizing shall be in accordance with Article 4100.07, of the Standard Specifications. The masonry plate shall be fitted up and welded prior to galvanizing. The surface of pintle plate in contact with bronze bearing plate shall be smooth and free of projections due to galvanizing.

Anchor bolts shall be set in accordance with Article 2405.03, H, of the Standard Specifications. Material, equipment, and labor required to install the anchor bolts shall be considered incidental to the structural steel bid item.

After masonry plates are in correct location, fill slotted holes around anchor bolts with a hydraulic cement or polymer grout in accordance with Article 2405.03, H, of the Standard Specifications.

Plate washers shall be ASTM A709 Grade 36 (AASHTO M270 Grade) Steel.

Weight of anchor bolts, nuts, and washers is included with the structural steel quantity.



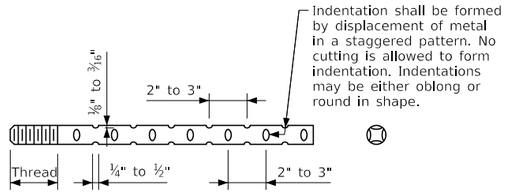
Plan of Masonry ℄ and Bronze ℄

Section C-C

Section B-B

Note:
At certain bearing assemblies, anchor bolt(s) were installed in front of or behind the masonry plate during construction. The original design plans do not include these anchor bolts. Where bearings are replaced, the Contractor shall cut these anchor bolts flush with the top of the bridge seat and apply two coats of zinc rich paint to the exposed end prior to installing the new bearing assembly. Removal of the anchor bolts shall be in accordance with Section 2401 of the Specifications. This work shall be considered incidental to the Removals bid item.

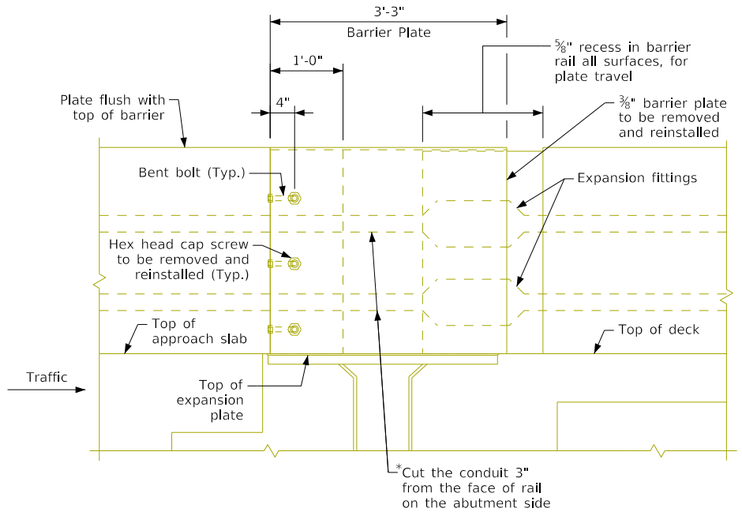
Note:
Emergency repairs were performed to prevent shifting of certain abutment bearings with compromised anchor bars. The repair consisted of installing a shim plate between the backwall and masonry plate, see E-Files for additional information. These plates shall be removed in accordance with Section 2401 of the Specifications. This work shall be considered incidental to the Removals bid item.



Anchor Bolt Swedge Detail

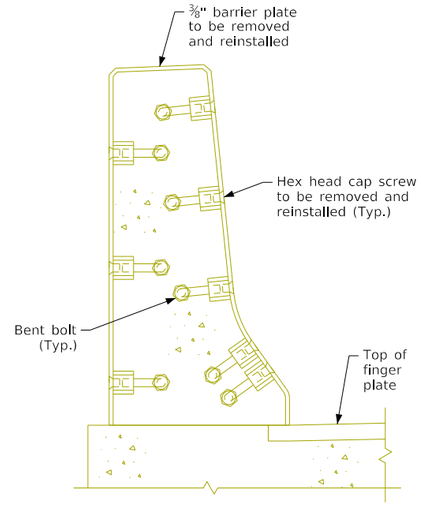
whks
engineers + planners + land surveyors

Design For 0° Skew
1097'-0" x 40'-0" Pretensioned Prestressed Concrete Beam E.B. Bridge
156'-0" End Spans (5) - 157'-0" Interior Spans
Bearing Details
STA. 400+85.00, RT. 32.00' (IA 2) Turn-in Date: July 2023
Fremont County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 824 Design Sheet No. 4 of 5 FHWA No. 701075



Part Front Elevation of Rail at Joint

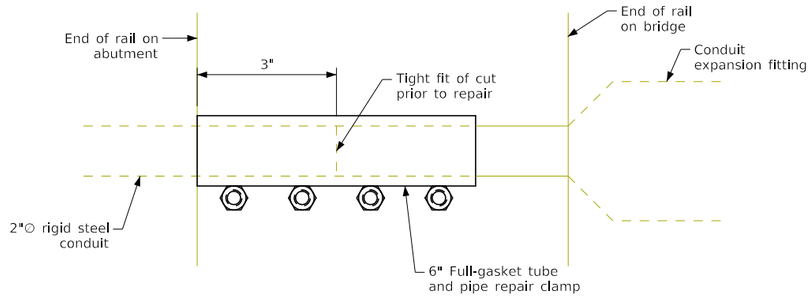
Looking at traffic face at outside rail corner with conduit, median rail similar except conduit



Section Through Rail at Joint

Conduit not shown for clarity

*Note:
The conduit shall be cut 3" from the end of rail opposite of the expansion fittings. Based on original plans this is assumed to be the abutment side but should be verified by the Contractor prior to cutting.



Conduit Repair Detail

Barrier Sliding Plate Notes:

Prior to raising the bridge, the Contractor shall remove the cap screws from the ⅜" barrier plates at locations where the plate anchor bolts are attached to the abutment side of the rail.

At the outside rail locations the ⅜" barrier plates shall be removed to provide access to the conduit in the rails.

The Contractor shall safely store the ⅜" barrier plates and cap screws during bridge raising operations. The plates and screws shall be reinstalled at the end of other work prior to opening the bridge to traffic.

Materials, equipment, and labor required to remove and reinstall the ⅜" barrier plates as noted and detailed in these plans shall be considered incidental to the Mobilization bid item, no additional measurement or payment will be made.

Conduit Notes:

The Contractor's attention is drawn to the presence of two 2"∅ rigid steel conduits located in the outside rail of the bridge.

Prior to raising the bridge, the Contractor shall remove the barrier plates at the joints of the outside rails in accordance with the notes and details in these plans. The Contractor shall then cut the conduit 3" from the end of rail opposite of the expansion fittings (abutment side assumed based on existing plans). The cuts shall be made with equipment that minimizes damage to the conduit such as bending, tearing, or leaving rough edges or projections.

The conduit shall be pushed into the expansion fitting on the bridge side of the joint and the Contractor shall remove any rough edges or projections from the inside of the conduit and remove any material, such as metal shavings, left from cutting.

After the bridge has been lowered into final position, the conduit shall be pulled from the expansion fitting tight against the conduit projecting from the other side. The Contractor shall repair the conduit by installing a 6" full-gasket tube and pipe repair clamp. The fasteners of the repair clamp shall be installed at the bottom. If the repair clamp is stainless steel, the gasket shall prevent contact between stainless steel and galvanized surfaces, otherwise the Contractor shall take measures approved by the Engineer prior to installing the clamp to prevent contact of these surfaces. The repair clamp shall be of a size recommended by the manufacturer for the diameter of the conduit.

All materials, equipment, and labor to cut and repair the conduit as noted and detailed in these plans shall be considered incidental to the Mobilization bid item, no additional measurement of payment will be made.

whks
engineers + planners + land surveyors

Design For 0° Skew
1097'-0" x 40'-0" Pretensioned Prestressed Concrete Beam E.B. Bridge
156'-0" End Spans (5) - 157'-0" Interior Spans
Rail Conduit Details
STA. 400+85.00, RT. 32.00' (IA 2) Turn-in Date: July 2023
Fremont County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 824 Design Sheet No. 5 of 5 FHWA No. 701075

ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadway Items	
1	2514-0000200	REMOVAL OF CURB	STA	0.4	Refer to Tab. 110-4. Removal is to facilitate placement of crash cushions.
2	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	599.45	Refer to Tab. 108-22.
3	2527-9263131	WET RETROREFLECTIVE REMOVABLE TAPE MARKINGS	STA	127.2	
4	2527-9263137	PAINTED SYMBOLS AND LEGENDS, WATERBORNE OR SOLVENT-BASED	EACH	16	Refer to Tab. 108-29.
5	2527-9263180	PAVEMENT MARKINGS REMOVED	STA	599.45	Refer to Tab. 108-22.
6	2527-9263190	SYMBOLS AND LEGENDS REMOVED	EACH	16	Refer to Tab. 108-29.
7	2528-2518000	SAFETY CLOSURE	EACH	8	Refer to Tab. 108-13A.
8	2528-8400157	TEMPORARY FLOODLIGHTING LUMINAIRE	EACH	8	Refer to Tab. 108-27.
9	2528-9109020	TEMPORARY LANE SEPARATOR SYSTEM	LF	2,400	Refer to Tab. 108-35, Standard Road Plan TC-61. and J Sheets.
10	2551-0000130	TEMP CRASH CUSHION, SEVERE USE (SU)	EACH	2	Refer to Tab. 108-30.

105-4
10-18-11

STANDARD ROAD PLANS

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

Number	Date	Title
BA-500	04-20-21	Temporary Crash Cushions Sand Barrel
PM-110	04-21-20	Line Types
PM-111	04-21-20	Symbols and Legends
SI-881	04-16-19	Special Signs for Workzones
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-61	04-19-22	Two-Lane, Two-way Operation
TC-252	04-21-20	Routes Closed to Traffic
TC-402	04-18-23	Work Within 15 ft of Traveled Way
TC-418	04-18-23	Lane Closure on Divided Highway
TC-433	10-17-17	Pavement Marking Operations

111-25
10-18-11

INDEX OF TABULATIONS

Tabulation	Tabulation Title	Sheet No.
C Sheets		
105-4	STANDARD ROAD PLANS	C.2
108-13A	SAFETY CLOSURES	C.2
108-22	PAVEMENT MARKING LINE TYPES	C.4
108-27	TEMPORARY FLOODLIGHTING LUMINAIRES	C.2
108-29	PAVEMENT MARKING SYMBOLS AND LEGENDS	C.3
108-30	CRASH CUSHIONS	C.2
108-35	TEMPORARY LANE SEPARATOR SYSTEM	C.2
110-4	CURB REMOVAL	C.2
111-25	INDEX OF TABULATIONS	C.2

108-35
04-17-12

TEMPORARY LANE SEPARATOR SYSTEM

See TC-61

Station to Station	Length LF	Remarks
Stage 1		
East Crossover	350	as directed by Engineer
Valmont Drive	500	as directed by Engineer
West Crossover	350	as directed by Engineer
Stage 2		
East Crossover	350	as directed by Engineer
Valmont Drive	500	as directed by Engineer
West Crossover	350	as directed by Engineer
Total:	2400	

108-13A
10-18-22

SAFETY CLOSURES

Refer to Section 2528 of the Standard Specifications

Station	Closure Type		Remarks
	Road Qty.	Hazard Qty.	
EB IA2 at West X-over	1		Stage 1
EB IA2 at Valmont Dr.	2		Stage 1
EB IA2 at East X-over	1		Stage 1
WB IA2 at West X-over	1		Stage 2
WB IA2 at Valmont Dr.	2		Stage 2
WB IA2 at East X-over	1		Stage 2
Total:	8		

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.

108-27
10-17-17

TEMPORARY FLOODLIGHTING LUMINAIRES

Possible Standard: LI-130

No.	Location Station	Offset	Number Lumin.	Remarks
	Stage 1			
1	East Crossover		2	as directed by Engineer
2	West Crossover		2	as directed by Engineer
	Stage 2			
3	East Crossover		2	as directed by Engineer
4	West Crossover		2	as directed by Engineer
		Total:	8	

110-4
08-01-08

CURB REMOVAL

Begin Station	End Station	Side	Length STA	Remarks
at SW corner of WB bridge			0.2	Stage 1
at NE corner of EB bridge			0.2	Stage 2

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.	Direction of Traffic (1)	Location Station	Side	Obstacle Width FT	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 Length FT	W Length FT	X Length FT	Y Length FT	Z Length FT	Excavation Class 10 CY	Embankment in Place CY	Permanent EACH	Permanent Severe Use EACH		
1	EB	SW Corner of the WB Bridge	Rt.	2.00			1												SW Endpost of the WB Bridge	Stage 1
2	WB	NE Corner of the EB Bridge	Lt.	2.00			1												NE Endpost of the EB Bridge	Stage 2

PAVEMENT MARKING SYMBOLS AND LEGENDS

Refer to PM-111

Road Identification	Location																						Groove Cuts	Remarks
	Station	Side	STAW	RTAW	LTAW	CSRW	CSLW	CSTW	CRLW	FERW	LLRW	RLRW	RRCW	BLSW	WCSW	WPSB	SCLW	XNGW	STPW	AHDW	ONLW	BIKW	LANW	XITW	EACH	
Stage 1																										
IA 2	East X-Over											4														as directed by the Engineer
IA 2	West X-Over										4															as directed by the Engineer
Stage 2																										
IA 2	East X-Over										4															as directed by the Engineer
IA 2	West X-Over											4														as directed by the Engineer
Subtotal:											8	8														
Painted Symbols and Legends Removed:																										
Stage 2																										
IA 2	East X-Over											4														
IA 2	West X-Over										4															
after Stage 2																										
IA 2	East X-Over										4															
IA 2	West X-Over											4														
Subtotal:											8	8														
Bid Items:																										
Painted Symbols and Legends:			16	Each																						
Painted Symbols and Legends Removed:			16	Each																						

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 | CHY8: Channelizing Line (Yellow) @ 2.00 | CHW8: Channelizing Line (White) @ 2.00

Location							Length by Line Type (Unfactored)															Remarks
Road ID	Station to Station	Dir. of Travel	Marking Type	Side			BCY4*	DCY4	NPY4**	BLW4	ELW4	ELY4	CHY8	CHW8								
				L	C	R	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	
IA 2																						
Stage 1	West X-over to East X-over	WB	Removal of Paint	X	X					89.30		82.80										
	West X-over	EB	Removal of Paint		X	X				28.30		3.00										
	East X-over	EB	Removal of Paint	X	X					3.00		3.00										
	West X-over to East X-over	BOTH	Waterborne/Solvent Paint		X			58.00			58.00											
	West X-over	WB	Waterborne/Solvent Paint									4.00										
	West X-over	WB	Wet Retroreflective Removable Tape										6.00	6.00								
	West X-over	EB	Waterborne/Solvent Paint								10.00											
	West X-over	EB	Wet Retroreflective Removable Tape								7.80											
	East X-over	EB	Wet Retroreflective Removable Tape		X	X							6.00	6.00								
	East X-over	WB	Waterborne/Solvent Paint		X							13.00										
	East X-over	WB	Wet Retroreflective Removable Tape		X	X						7.80										
Stage 2																						
	West X-over to East X-over	BOTH	Removal of Paint		X			58.00			58.00											
	West X-over	WB	Removal of Paint									4.00										
	West X-over	WB	Removal of Removable Tape										6.00	6.00								
	West X-over	EB	Removal of Paint								10.00											
	West X-over	EB	Removal of Removable Tape								7.80											
	East X-over	EB	Removal of Removable Tape		X	X							6.00	6.00								
	East X-over	WB	Removal of Paint		X							13.00										
	East X-over	WB	Removal of Removable Tape		X	X						7.80										
	West X-over to East X-over	EB	Removal of Paint	X	X					58.00		64.00										
	West X-over	EB	Wet Retroreflective Removable Tape	X	X							7.80										
	West X-over	EB	Waterborne/Solvent Paint		X							13.00										
	West X-over	WB	Wet Retroreflective Removable Tape		X	X							6.00	6.00								
	West X-over to East X-over	BOTH	Waterborne/Solvent Paint					58.00			58.00											
	East X-over	WB	Wet Retroreflective Removable Tape	X	X								6.00	6.00								
	East X-over	WB	Waterborne/Solvent Paint		X						10.00											
	East X-over	WB	Wet Retroreflective Removable Tape								7.80											
	East X-over	EB	Waterborne/Solvent Paint	X	X						4.00											
Final																						
	West X-over	EB	Removal of Removable Tape	X	X							7.80										
	West X-over	EB	Removal of Paint		X							13.00										
	West X-over	WB	Removal of Removable Tape		X	X							6.00	6.00								
	West X-over to East X-over	BOTH	Removal of Paint					58.00			58.00											
	East X-over	WB	Removal of Removable Tape	X	X								6.00	6.00								
	East X-over	WB	Removal of Paint		X						10.00											
	East X-over	WB	Removal of Removable Tape								7.80											
	East X-over	EB	Removal of Paint	X	X						4.00											
	West X-over to East X-over	EB	Waterborne/Solvent Paint		X					89.30		70.00										
	West X-over to East X-over	WB	Waterborne/Solvent Paint	X	X					89.30		82.80										
				X																		
			Factored Total: Waterborne/Solvent Paint				-	232.00	-	44.65	140.00	182.80	-	-	-	-	-	-	-	-	-	
			Factored Total: Wet Retroreflective Removable Tape				-	-	-	-	15.60	15.60	48.00	48.00	-	-	-	-	-	-	-	
			Factored Total: Removal of Paint				-	232.00	-	44.65	140.00	182.80	-	-	-	-	-	-	-	-	-	
			Factored Total: Removal of Removable Tape				-	-	-	-	15.60	15.60	48.00	48.00	-	-	-	-	-	-	-	
			Bid Quantity: Painted Pavement Markings, Waterborne or Solvent-Based							599.45												
			Bid Quantity: Wet Retroreflective Removable Tape Markings							127.20												
			Bid Quantity: Pavement Markings Removed							599.45												
			Incidental Removal of Removable Tape							127.20												

108-23A
08-01-08

TRAFFIC CONTROL PLAN

IA 2 shall remain open at all times using Standard Road Plans as listed on Tab. 104-5 and Sheets J.3-J.7.
Crossovers are located approximately 760 feet west of Valmont Drive in Nebraska and approximately 830 feet east of the bridge.

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 Providied.	

108-26A
08-01-08

STAGING NOTES

Stage 1

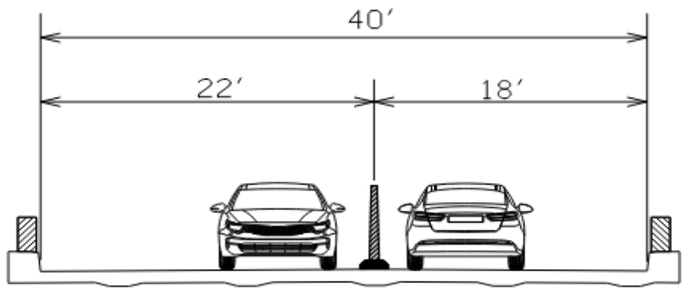
Traffic : Close EB lanes.
Place EB traffic in the inside WB lane.

Construction: Repair EB Bridge.

Stage 2

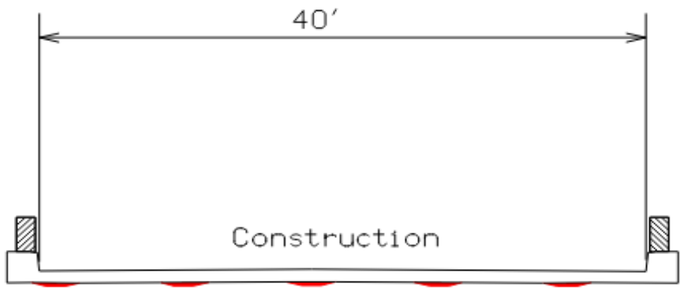
Traffic : Close WB lanes.
Place WB traffic in the inside EB lane.

Construction: Repair WB Bridge.

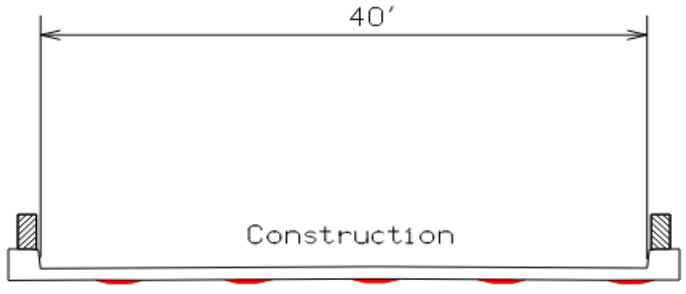


IA 2 WB

STAGE 1
(LOOKING AHEAD STATION)

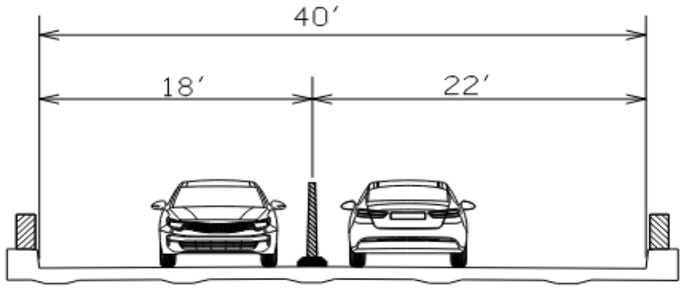


IA 2 EB



IA 2 WB

STAGE 2
(LOOKING AHEAD STATION)



IA 2 EB

TYPICAL CONSTRUCTION SECTIONS

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 Shoulder
	Proposed Granular Subbase		Temporary Shoulder
	Proposed Special Backfill		Existing Shoulder Strengthening
	Temporary Barrier Rail		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

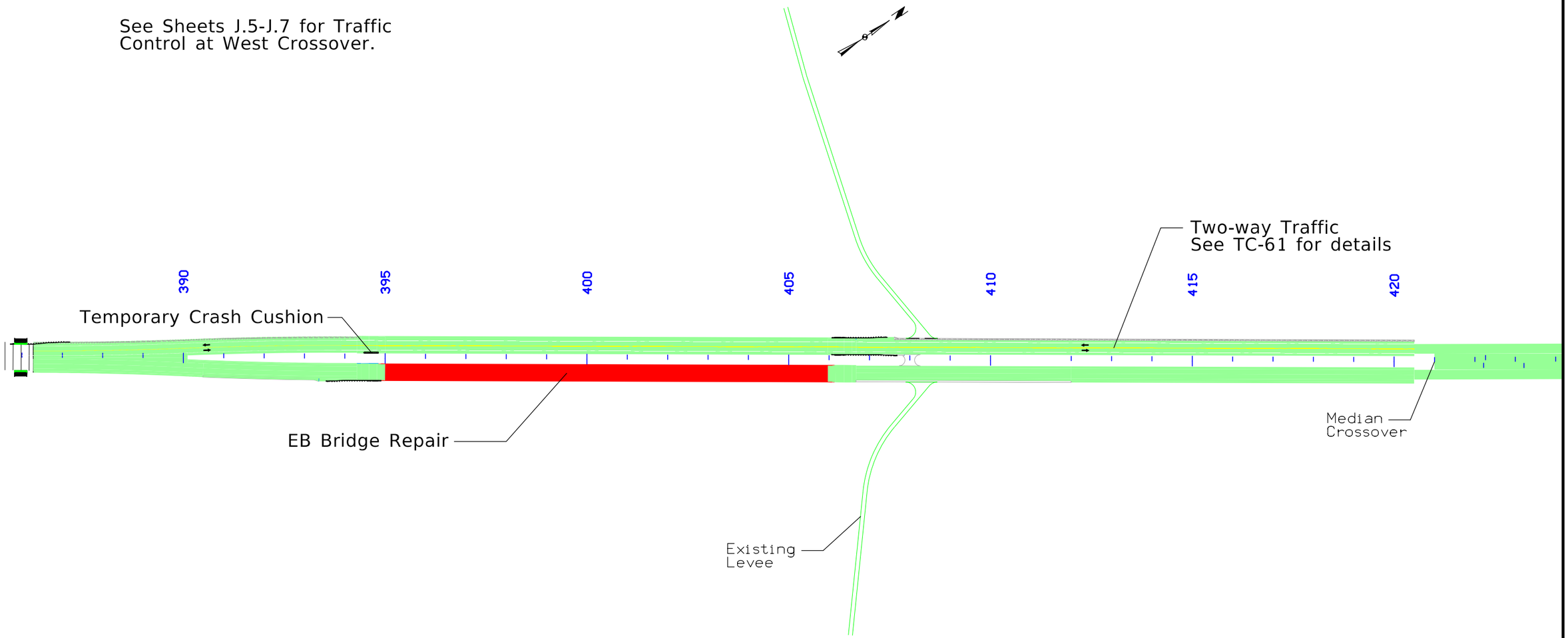
●	Channelizing Device		Crash Cushion (Temp or Perm)
✕	Drum		Traffic Signal
◘	Temporary Lane Separator		Flagger
◆	Tubular Marker		Temporary Floodlighting
♦	Channelizer Marker		Traffic Sign
△	Concrete Barrier Marker		Type III Barricade
⊰	Delineator		Type A Warning Light
	Temporary Barrier Rail		Direction of Traffic
	Pavement Removal		Safety Closure
	Sand Barrel Layout	1	Lane Identification

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

TRAFFIC CONTROL AND STAGING LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES J)

See Sheets J.5-J.7 for Traffic Control at West Crossover.



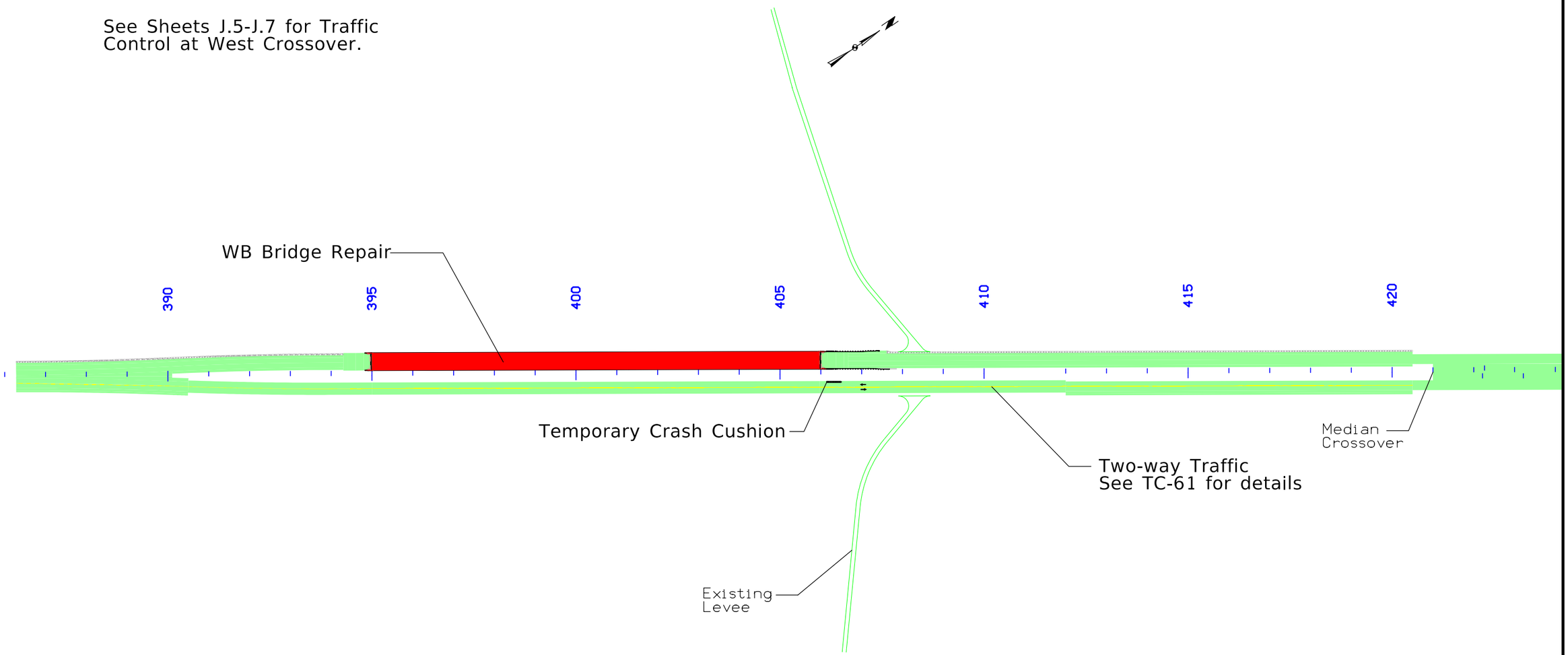
Not to Scale

STAGE 1

FILE NO. 32448	ENGLISH	DESIGN TEAM WHKS	FREMONT COUNTY	PROJECT NUMBER NHSN-002-1(151)--2R-36	SHEET NUMBER J.3	

9:49:59 AM 7/31/2023 kromsey pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\3600201024\Bridge\(151)_Bridge Repair\36002151_J02.dgn

See Sheets J.5-J.7 for Traffic Control at West Crossover.

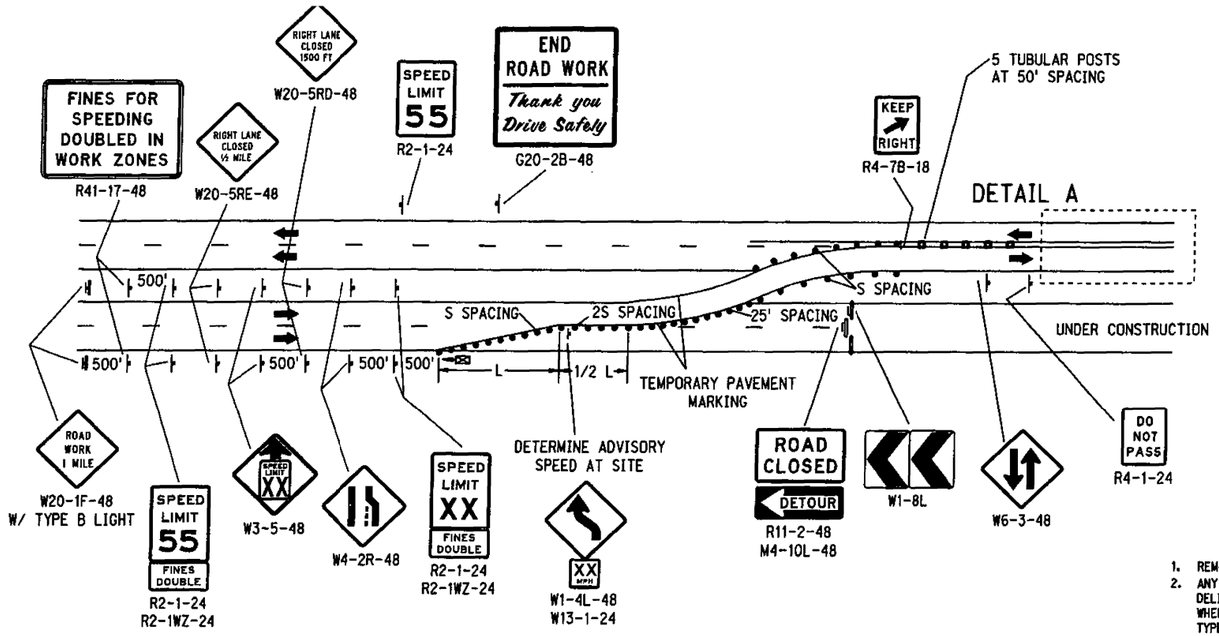


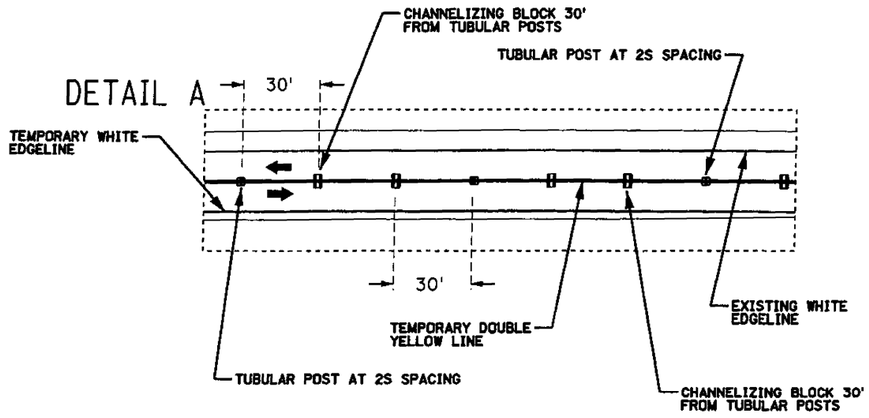
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STAGE 2

FILE NO. 32448	ENGLISH	DESIGN TEAM WHKS	FREMONT COUNTY	PROJECT NUMBER NHSN-002-1(151)--2R-36	SHEET NUMBER J.4

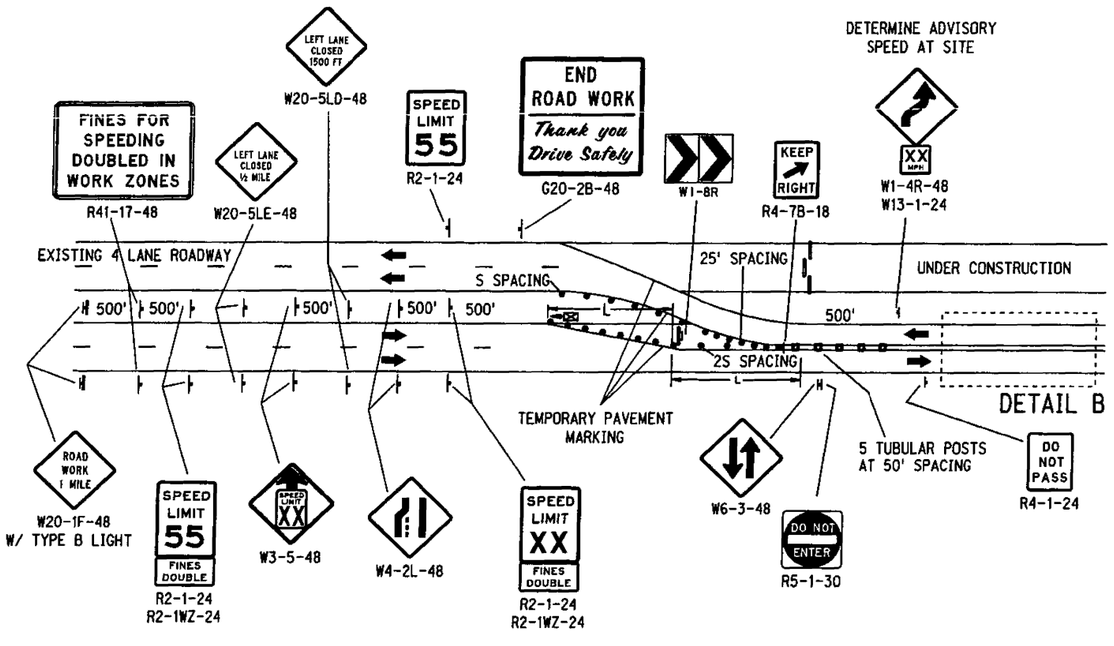
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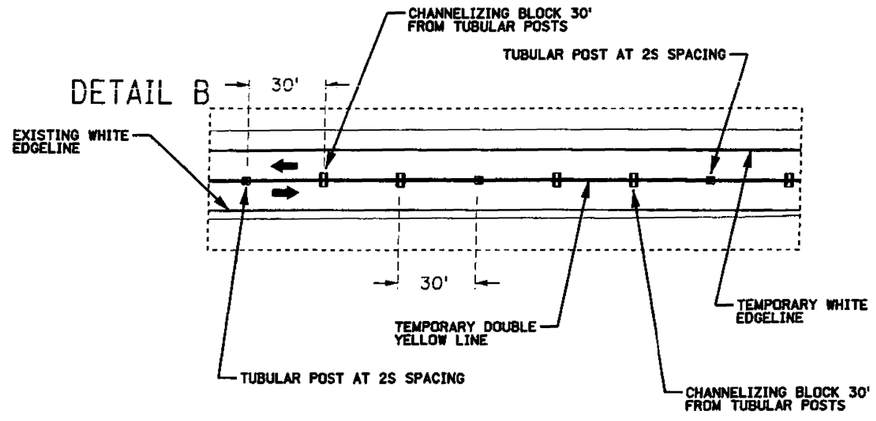




GENERAL NOTES

1. REMOVE ALL CONFLICTING PAVEMENT MARKINGS.
2. ANY DROP-OFF ADJACENT TO THE TRAVEL LANE WHICH EXCEEDS 2" SHALL BE DELINEATED WITH TYPE II BARRICADES OR PLASTIC DRUMS AT 2S TO 4S SPACING. WHERE LATERAL SPACE IS LIMITED, VERTICAL PANELS MAY BE USED IN LIEU OF TYPE II BARRICADES OR DRUMS WITH THE APPROVAL OF THE ENGINEER.
3. DESIGNATION OF SPEED SHOWN ON ADVISORY SPEED SIGNS SHALL BE DETERMINED BY THE ENGINEER IN ACCORDANCE WITH THE MUTCD. THE SPEED DESIGNATION SHALL BE AS HIGH AS PRACTICAL AND FEASIBLE.
4. WHEN MESSAGE IS NOT PERTINENT, SIGNS SHALL BE TAKEN DOWN, COVERED OR FOLDED. TAPE WILL NOT BE PERMITTED ON THE FACE OF THE SIGN.
5. WORK ZONE SPEED LIMITS SHOWN ARE TYPICAL APPLICATIONS ONLY, AND MAY NOT BE THE SAME AS THE SPEED LIMITS FOR THE ROADWAY OR THE PROJECT. SPEED LIMIT AND DOUBLE FINE SIGNS SHALL BE INSTALLED EVERY MILE THROUGH THE WORK AREA WHEN THE SPEED LIMIT IS REDUCED.
6. FLAGS MAY BE USED TO CALL ATTENTION TO THE ADVANCE WARNING SIGNS.
7. ALL BARRICADE AND SIGN LOCATIONS ON THIS PLAN ARE APPROXIMATE, AND MAY BE ADJUSTED TO FIT FIELD CONDITIONS. THE SIGNS SHALL BE INSTALLED SO AS NOT TO OBSCURE THE VIEW OF OTHER TRAFFIC CONTROL DEVICES.
8. FOR HORIZONTAL CURVES THE SPACING OF PLASTIC DRUMS AND BARRICADES USED FOR CHANNELIZATION MAY BE REDUCED AS DIRECTED BY THE ENGINEER.
9. THE FLASHING ARROW PANEL SHOULD BE VISIVBLE FOR AT LEAST 1/2 MILE AND IF NECESSARY SHOULD BE RELOCATED TO PROVIDE THE MAXIMUM VISIBILITY.
10. TEMPORARY PAVEMENT MARKINGS WILL BE REMOVED AS REQUIRED.





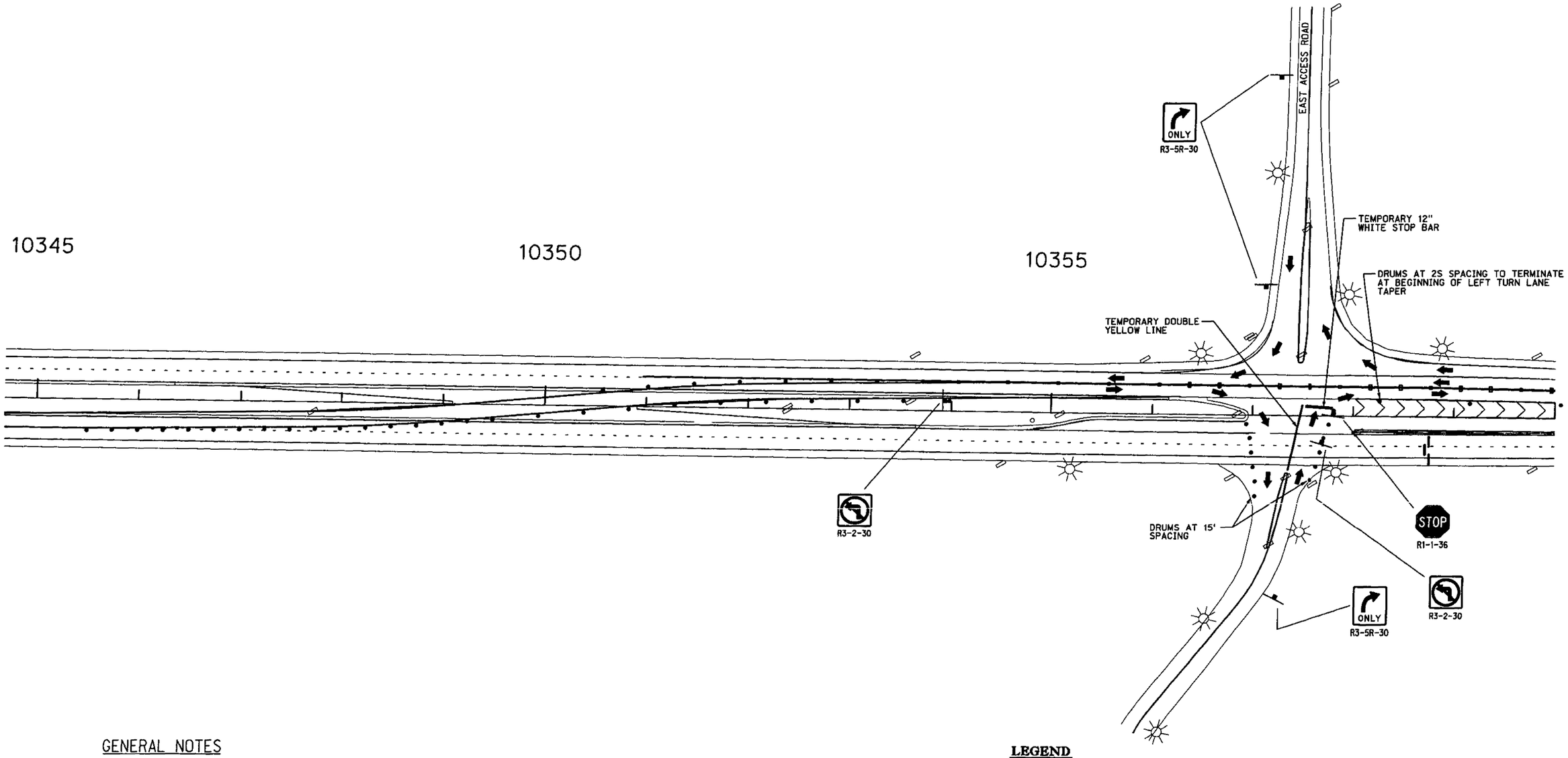
LEGEND

- FLASHING ARROW PANEL
- TYPE III BARRICADE
- REFLECTORIZED PLASTIC DRUM
- SIGN
- TUBULAR POST
- CHANNELIZING BLOCK

TRAFFIC CONTROL DETAILS FOR NEBRASKA CROSSOVER (Sheet 1 of 3)

FILE NO.	ENGLISH	DESIGN TEAM	COUNTY	PROJECT NUMBER	SHEET NUMBER J.5

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GENERAL NOTES

THIS SHEET INTENDED TO BE USED IN COMBINATION WITH TEMPORARY TRAFFIC CONTROL PLAN SHEET 1 OF 3 "4 LANE CROSSOVER".

WHEN MESSAGE IS NOT PERTINENT, SIGNS SHALL BE TAKEN DOWN, COVERED OR FOLDED. TAPE WILL NOT BE PERMITTED ON THE FACE OF THE SIGN.

FLAGS MAY BE USED TO CALL ATTENTION TO THE ADVANCE REGULATORY SIGNS.

ALL BARRICADE AND SIGN LOCATIONS ON THIS PLAN ARE APPROXIMATE, AND MAY BE ADJUSTED TO FIT FIELD CONDITIONS. THE SIGNS SHALL BE INSTALLED SO AS NOT TO OBSCURE THE VIEW OF OTHER TRAFFIC CONTROL DEVICES.

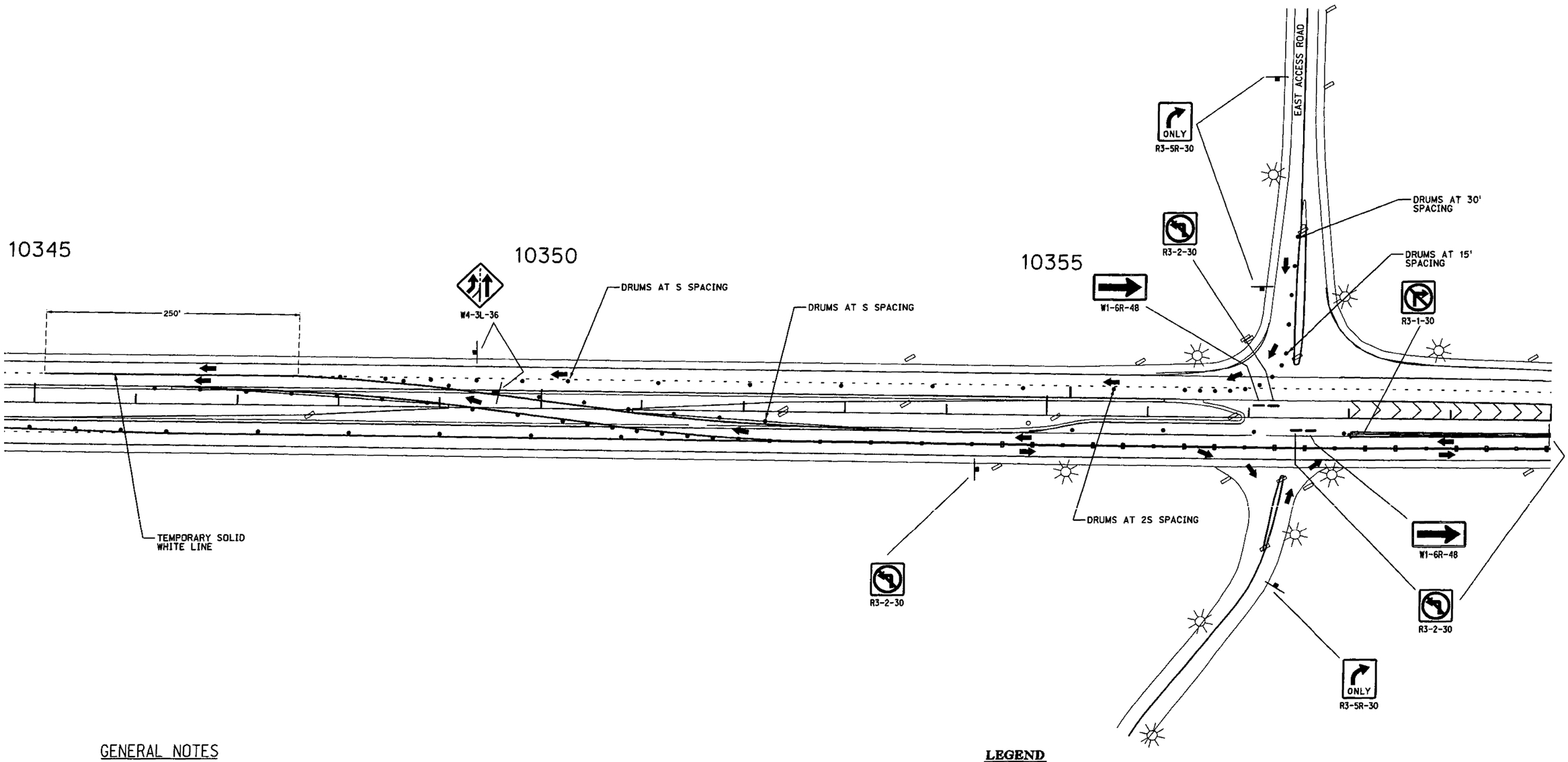
LEGEND

- FLASHING ARROW PANEL
- TYPE III BARRICADE
- REFLECTORIZED PLASTIC DRUM
- SIGN
- TUBULAR POST
- CHANNELIZING BLOCK

TRAFFIC CONTROL DETAILS FOR NEBRASKA CROSSOVER (Sheet 2 of 3)

FILE NO.	ENGLISH	DESIGN TEAM	COUNTY	PROJECT NUMBER	SHEET NUMBER J.6

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GENERAL NOTES

THIS SHEET INTENDED TO BE USED IN COMBINATION WITH TEMPORARY TRAFFIC CONTROL PLAN SHEET 1 OF 3 "4 LANE CROSSOVER".

WHEN MESSAGE IS NOT PERTINENT, SIGNS SHALL BE TAKEN DOWN, COVERED OR FOLDED. TAPE WILL NOT BE PERMITTED ON THE FACE OF THE SIGN.

FLAGS MAY BE USED TO CALL ATTENTION TO THE ADVANCE REGULATORY SIGNS.

ALL BARRICADE AND SIGN LOCATIONS ON THIS PLAN ARE APPROXIMATE, AND MAY BE ADJUSTED TO FIT FIELD CONDITIONS. THE SIGNS SHALL BE INSTALLED SO AS NOT TO OBSCURE THE VIEW OF OTHER TRAFFIC CONTROL DEVICES.

LEGEND

- FLASHING ARROW PANEL
- TYPE III BARRICADE
- REFLECTORIZED PLASTIC DRUM
- SIGN
- TUBULAR POST.
- CHANNELIZING BLOCK

TRAFFIC CONTROL DETAILS FOR NEBRASKA CROSSOVER (Sheet 3 of 3)

FILE NO.	ENGLISH	DESIGN TEAM	COUNTY	PROJECT NUMBER	SHEET NUMBER J.7

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