LETTING DATE
Dec. 15, 2026

Bridge Deck Replacement
IMX-029-5(266)78--02-43

HARRISONCOUNTY

Index of Sheets

No.	Description
Sheets	Bridge Plan
A.1	Title Sheet
A.2	Location Map Sheet
V.1	Estimated Quantities - Design 327
V.2 - V.25	Design 327
V.26	Estimated Quantities - Design 427
V.27 - V.31	Design 427
Road Sheets	Road Plan
A.3 - J.11	Road Plans
C.1 - C.3	Estimated Quantities - Road
C.5	Standard Plans - Road

IOWA DOT

PLANS OF PROPOSED IMPROVEMENT ON THE

INTERSTATE ROAD SYSTEM
HARRISON COUNTY
Bridge Deck Replacement

On I-29 over Allen Creek,
1.9 Mi. N of US 30

Refer to the Plan Sheets for list of applicable specifications.

Value Engineering Saves. Refer to Article 1105.13 of the Specifications.

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

Revisions

	TOTAL
	74
PROJECT IDENTIFICATION NUMBER	
22-43-029-070	
PROJECT NUMBER	
IMX-029-5(266)78--02-43	
R.O.W. PROJECT NUMBER	
PROJECT DIRECTORY NUMBER	
4302907022	

Iowa DOT Bridges and Structures
Consultant Coordinator Contact:
Zahrah Alghalibi

Standard Road Plans

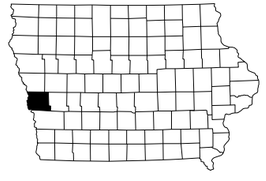
Standard Road Plans are listed on Sheet No. C.5

Design Data Rural

Refer to individual Situation Plans for Traffic Data information.

Scan the QR code or click the link below to leave plan quality feedback and help us improve future projects.

Design QR Feedback Link



Index of Seals

Sheet No.	Name	Type
A.1	Joshua J. Opheim	Structural Design
A.3	Lucas D. Fatka	Roadway Design

Structural Design

LICENSED PROFESSIONAL ENGINEER
Joshua J. Opheim
20567
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.

Joshua J Opheim 9-22-2026
Signature Date

Joshua J. Opheim
Printed or Typed Name

My license renewal date is December 31, 2026

Pages or sheets covered by this seal: Sheets A.1-A.2, V.1-V.31

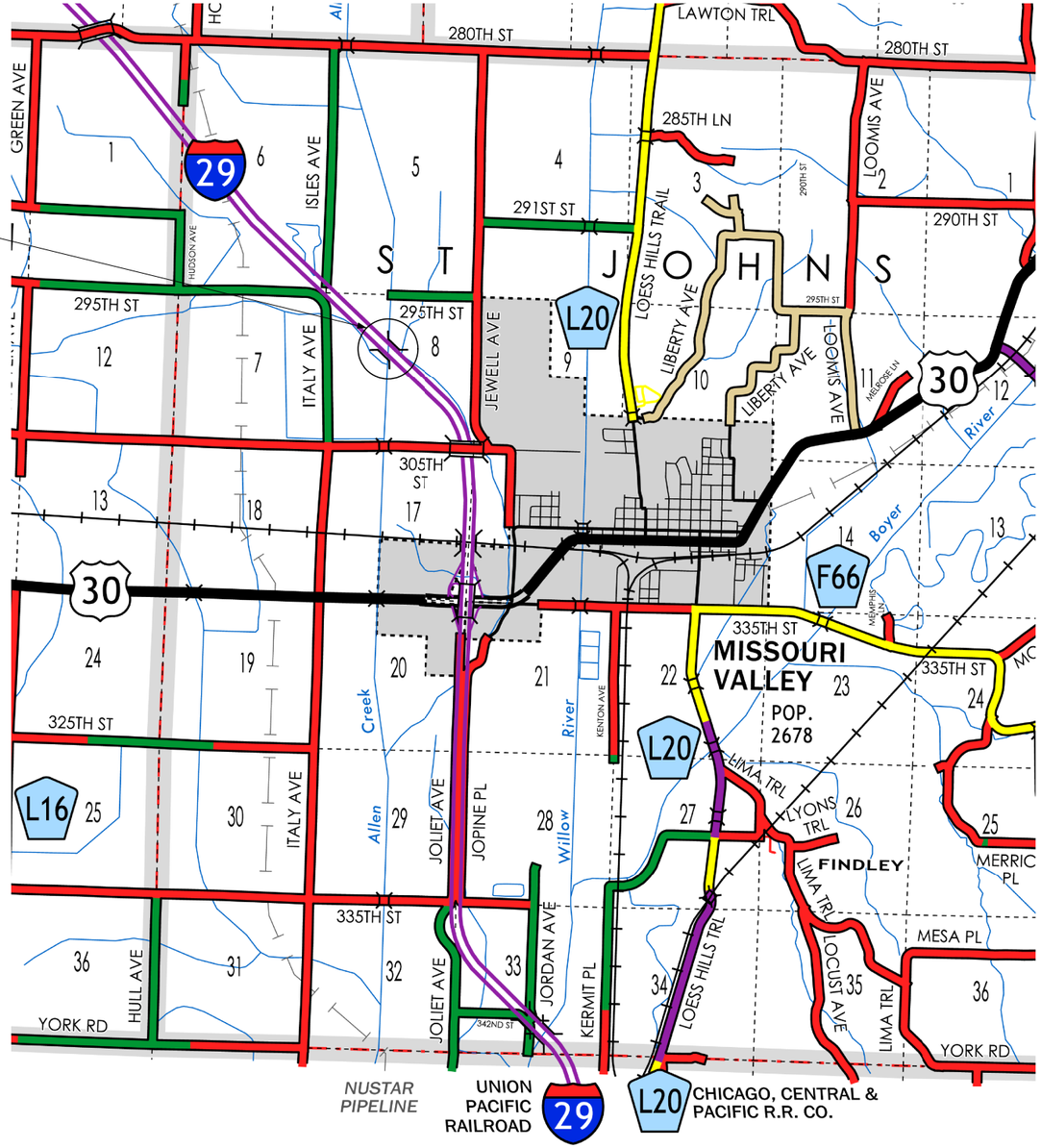
FILE NO. 32384	ENGLISH	DESIGN TEAM WHKS & CO.	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER A.1	

4:14:07 PM 9/22/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn

Design No. 327 (NB)
FHWA No. 28150

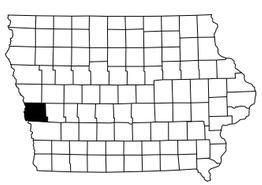
Design No. 427 (SB)
FHWA No. 28160

T-78N



R-44W

N



Harrison 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. 32384	ENGLISH	DESIGN TEAM WHKS & CO.	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER A.2

4:50:48 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn

ESTIMATED BRIDGE REPAIR QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	
1	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	340	
2	2401-6750001	REMOVALS, AS PER PLAN	LS	1	
3	2402-2720000	EXCAVATION, CLASS 20	CY	32	
4	2403-0100000	STRUCTURAL CONCRETE (MISCELLANEOUS)	CY	4.9	
5	2403-1000005	FIBER REINFORCEMENT FOR STRUCTURAL CONCRETE	CY	208.2	
6	2403-1000010	TRIAL BATCH AND TEST PLACEMENT (FIBER REINFORCED CONCRETE)	LS	1	
7	2403-7000210	HIGH PERFORMANCE STRUCTURAL CONCRETE	CY	208.2	
8	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	95,526	
9	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB	4,226	
10	2408-7800000	STRUCTURAL STEEL	LB	1,380	
11	2414-6424038	CONCRETE BARRIER RAIL, 3'-8"	LF	328.6	
12	2426-6772016	CONCRETE REPAIR	SF	15	
13	2506-4984000	FLOWABLE MORTAR	CY	6	
14	2507-3250005	ENGINEERING FABRIC	SY	594	
15	2507-6799000	BANK SHAPING	LS	1	
16	2507-6800061	REVETMENT, CLASS E	TON	510	
17	2508-0970000	CONTAINMENT	LS	1	
18	2508-0991000	PAINTING OF STRUCTURAL STEEL	LS	1	
19	2526-8285040	CONSTRUCTION SURVEY, LOCATION SURVEY	LS	1	
20	2533-4980005	MOBILIZATION	LS	1	
21	2536-6745045	REMOVAL OF ASBESTOS	LS	1	

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	ITEM DESCRIPTION
1	2104-2710020	EXCAVATION, CLASS 10, CHANNEL For excavation involved in placing embedded revetment at both stream banks within the limits shown on Design Sheet 3, estimated to be 170 cu yds. per bank. Dispose of excess material according to Article 1106.07 of the current specifications.
2	2401-6750001	REMOVALS, AS PER PLAN See General Notes for list of removal items. 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. Contractor to add the following information when submitting the Iowa DNR "Notification of Bridge Demolition and Renovation" form: Name of Asbestos Inspector: Brad Azeltine Date Inspected: 5/3/2022 IA License Number: IA DOT Inspector Phone: 515-239-1938 Procedure used to detect the presence of asbestos materials: Polarized Light Microscopy (PLM)
3	2402-2720000	EXCAVATION, CLASS 20 Includes cost of furnishing and placing subdrain (including excavation), porous backfill, and subdrain outlet as detailed in these plans. See Subdrain Details sheet for limits of excavation.
4	2403-0100000	STRUCTURAL CONCRETE (MISCELLANEOUS) This item includes concrete to construct abutment backwalls. Item may be deleted and quantity added to High Performance Structural Concrete at no additional cost to the State. Includes the cost of setting bars as dowels in the existing footing and maskwalls.
5	2403-1000005	FIBER REINFORCEMENT FOR STRUCTURAL CONCRETE Polypropylene fibers shall be included in the bridge deck and abutment diaphgrams. Refer to "Developmental Specifications for Fiber Reinforcement for Structural Concrete".
6	2403-1000010	TRIAL BATCH AND TEST PLACEMENT (FIBER REINFORCED CONCRETE) Includes all work and materials necessary for trial batch and test placement of fiber reinforced concrete. Refer to "Developmental Specifications for Fiber Reinforcement for Structural Concrete" for additional information.
7	2403-7000210	HIGH PERFORMANCE STRUCTURAL CONCRETE This bid item includes the concrete for the slab, abutment diaphragms, and end section footings. Includes all resilient joint filler required. Includes furnishing and placing fabric reinforced neoprene sheets, steel plates, and concrete anchors behind abutment diaphragms. Includes cost of installing additional shear studs on top of beams as shown on Design Sheet 17. Refer to the "Developmental Specification for High Performance Concrete for Structures for additional information".
8	2404-7775005	REINFORCING STEEL, EPOXY COATED Includes mechanical splicers in the abutment diaphragm.
9	2404-7775009	REINFORCING STEEL, STAINLESS STEEL - -

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	ITEM DESCRIPTION
10	2408-7800000	STRUCTURAL STEEL Includes 10 drains at 98 lbs each and 10 abutment bearing anchor bar replacement assemblies at 40 lbs each.
11	2414-6424038	CONCRETE BARRIER RAIL, 3'-8" If placement of concrete is done by the slipforming method, Class BR concrete is required. Cast-in-place barrier rails shall use Class C mix. Price bid for this item shall include the cost of cast-in-place forms if required for placement of the concrete.
12	2426-6772016	CONCRETE REPAIR - -
13	2506-4984000	FLOWABLE MORTAR Includes estimated quantity for filling low and undermined areas at the west abutment. See notes and details on Design Sheet 8.
14	2507-3250005	ENGINEERING FABRIC Engineering fabric shall be material as specified for embankment erosion control in accordance with Article 4196.01,B,3, of the Standard Specifications. Material shall be measured in sq. yard of actual area covered. Refer to details on Design Sheet 3.
15	2507-6799000	BANK SHAPING Item is for shaping and smoothing of the stream banks prior to placing engineering fabric and revetment. See notes and details on Design Sheets 2 and 3.
16	2507-6800061	REVETMENT, CLASS E Item is for placement of channel lining along east and west banks. See details on Design Sheet 3. Estimated at 1.5 ton/cu yd. Class E revetment shall meet requirements of Article 4130.
17	2508-0970000	CONTAINMENT - -
18	2508-0991000	PAINTING OF STRUCTURAL STEEL Includes cleaning, blasting, and painting existing structural steel (including diaphragms, stiffeners, and bearings) end of the beams within 5 ft. of each abutment. See detail on Design Sheet 15.
19	2526-8285040	CONSTRUCTION SURVEY, LOCATION SURVEY - -
20	2533-4980005	MOBILIZATION - -
21	2536-6745045	REMOVAL OF ASBESTOS Includes removal and disposal of regulated asbestos containing material. See notes on Design Sheet 2.

whks
engineers + planners + land surveyors

Note:
Roadway quantities shown elsewhere in these plans.

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans 60'-6" Interior Span

Estimated Bridge Quantities

STA. 1187+12.50 (℄ I-29) Turn-in Date: September 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 Design Sheet No. 1 of 25 FHWA No. 28150

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.1	

4:51:57 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn

General Notes:

This design is for repairs to the existing 155'-0" x 39'-0" Continuous Steel I-Beam bridge located on NB I-29 over Allen Creek in Harrison County. Dimensions on these plans are based on original design plans. Electronic copies of original design plans will be made available to the contractor as part of the e-files supplied with the contract documents. Shop drawings will be available to the contractor by contacting the Contracts & Specifications Bureau - Highway Division - Iowa DOT - Ames. Dimensions on these plans are based on original design plans (Design No. 565).

See Design Sheet No. 3 for list of repair items.

Faint lines on plans indicate the existing structure.

All alignment, stationing, connecting dimensions, and elevations used in the new details in these plans were developed based on the existing bridge plans and field survey. The Bridge Contractor shall field verify these details before starting construction.

Utillity 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.

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 $\frac{5}{8}$" 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.

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 existing bridge deck, bridge deck drains, curbs and barrier rails, end section footings, abutment backwalls, bearing anchor bars, and sliding plate joint. Removal of scheduled items shall be in accordance with Section 2401 of the Standard 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.

Construction shall be done in stages with at least one lane traffic maintained at all times in accordance with "Traffic Control Plan" note.

The tops of the abutment backwalls 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 to provide limits for hand finishing.

The Contractor shall provide temporary shoring (sheet pile or other) to prevent the earth under the traffic lane, from sloughing in during construction. All cost of shoring, will be considered incidental to construction and no direct payment will be made. All material used for shoring shall remain the property of the Contractor. Shoring is to be removed only after backfilling has been completed. The Contractor shall submit shoring plans for review. in addition to the requirements noted above, Article 1107.07 of the Standard Specifications still applies.

New bridge deck is designed for HL-93 loading, plus 20 lbs. per square foot of roadway for future wearing surface.

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°F.

The Contractor is responsible to provide sufficient temporary bracing to minimize lateral deflection and rotation of exterior steel beams during deck placement. Lateral deflection and rotation of exterior beams may result in thin decks and an upwards shift in bar mats which can decrease concrete cover. Partially or fully installed permanent bracing as shown in these design plans shall not be assumed sufficient to minimize lateral deflection and rotation of exterior beams during deck placement. Temporary bracing shall not be welded to the steel beams or its attachments including the studs.

It shall be the Bridge Contractor's responsibility to provide sites for excess excavated material. No payment for overhaul will be allowed for material hauled to these sites.

The bridge contractor shall dress up the slopes around the wings which are disturbed during construction. This work shall be considered incidental and no extra payment will be made.

Concrete barrier rails placed using the slipform method will require the use of a class BR concrete in accordance with Article 2513.03, A, 2, of the Standard Specifications. Cast-in-place barrier rails shall use class C mix. Class D concrete is not permitted for concrete barrier rails (cast in-place or slipformed method).

whks
engineers + planners + land surveyors

Scrape samples were taken on this bridge to get an indication of the existence of and level of total lead and total chromium. 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.

Scrape Sample Results

Date Sampled	Sampled Item	Total Pb	Total Cr	TCLP Pb	TLCP Cr
9/25/2014	Abutment Bearing	2,500	1,200	----	----
2/14/2000	Beam	1,525	1,625	----	----
9/25/2014	Beam	3,800	1,700	----	----
9/25/2014	Expansion Plate	130	49	----	----

Bridge deck finishing machine screed rails shall not be placed on previously poured stages of the deck or on the decks of existing structures. Screed rails shall ordinarily be placed on beam overhang formwork or, when necessary due to space limitations, directly over a beam. The Contractor is responsible for the structural adequacy and functionality of the support system for the screed rail and finishing machine.

The lump sum bid for "Painting Structural Steel" shall include the cost of preparing 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 "Containment".

Laboratory analysis has identified asbestos at this site. Asbestos shall be removed prior to bridge demolition operations. Removal, transport, and disposal shall be in accordance with Section 2536, of the Standard Specifications.

Required DNR information includes:

Year Constructed	-	1967
Asbestos Location	-	Joint filler between outside corners of West Abut. and deck
FHWA Number (Existing)	-	28150
Road/Route (City)	-	NB I-29 over Allen Creek
County	-	Harrison
Direction to Bridge	-	1.9 Mi. N of US 30
Number of Decks	-	1 (Typ.)
Asbestos Inspector/Amounts	-	Brad Azeltine / 3% chrysotile asbestos

Deck Removal Notes:

The bridge Contractor is to use extreme care when removing the deck concrete at the girder locations to avoid damaging the top flange and shear connectors of the girder. Prior to commencing any deck removal work, the Contractor shall submit a demolition plan to the Engineer for approval. The Contractor shall notify the Engineer of the start date for deck removal work in order to demonstrate the removal procedure on a small portion of the deck while the inspector is present. Damage may require the Contractor to modify the removal process prior to approval to proceed.

Once the deck concrete over the girder is removed, all remaining debris shall be cleaned from the girders to provide a suitable bond to the concrete deck.

The existing shear connectors are an integral part of the existing girder top flange. All damage sustained to the top flange and/or shear connectors shall be identified and repaired. In addition to being repaired, any damage located in a negative moment region shall undergo magnetic particle testing for cracks.

Acceptable repair methods:

Girder top flange:
- Gouges – grind out on a 10:1 taper
- Bends or tears – to be evaluated by the Engineer

Angle and bar shear lugs:
- Minor gouges – grind smooth
- Bends and gouges to angle – grind sharp corners and, if in a negative moment region, magnetic particle test angle to flange weld. Any crack detected will necessitate the removal of the angle as noted below.
- Tears to angle – if in a negative moment region, remove angle by mechanically cutting to just above the top of flange, grind surface of flange smooth and perform magnetic particle testing on repair area. If in a positive moment region, remove angle by mechanically cutting to location of tear and grind sharp edges smooth.
- Bend or tear to bar – remove bar and grind top of angle smooth.

Magnetic particle testing is to be done at the Contractor's expense by an approved third party. Any cracks identified shall be repaired or the section of damaged girder replaced at the Engineer's direction at no additional cost to the State.

Existing shear connectors are considered for future structural capacity. Any damaged angle and bar shear lugs shall be replaced at the Contractor's expense with 2 rows of 3 - 7/8" diameter shear studs. Refer to Deck Haunch Details sheet for dimensions and details.

The Contractor shall repair or replace any steel beams or diaphragms damaged during deck removal at no additional cost to the State. All material, labor, equipment, and traffic control required for the removal and replacement of damaged members shall be considered incidental to the Lump Sum bid item "Removals, As Per Plan". Any damaged members which are not to be re-used shall become the property of the Contractor.

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	Deck Drains	(266)_Harrison_Design327_DeckDrains.pdf	No
2	Deck Demolition Plan	(266)_Harrison_Design327_DeckDemolitionPlan.pdf	No
3	Temporary Shoring Plan	(266)_Harrison_Design327_TempShoringPlan.pdf	No

Specifications:

Design: AASHTO Series 2002.

Construction: Iowa Department of Transportation Standard Specifications for Highway and Bridge Construtions, Series 2023, plus applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions shall apply to construction work on this project.

Developmental Specifications for Fiber Reinforcement for Structural Concrete.

Developmental Specifications for High Performance Concrete for Structures.

Developmental Specifications for Electronic Ticketing.

Design Stresses:

Design stresses for the following materials are in accordance with the AASHTO Standard Specifications for Highway Bridges, Series 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 or Grade 50.

Bank Shaping Notes:

The Contractor shall smooth and shape the channel banks prior to placing engineering fabric and revetment as detailed in these plans. Actual areas of bank shaping shall be determined by the engineer in the field. Includes excavation for placement of revetment and off-site disposal of waste material if necessary. All costs for material, equipment, and labor required to repair the bank shall be included in the lump sum unit price for "Bank Shaping". No additional measurement or payment shall be made.

Design History at this Site

(Includes this Design)

Des. No.	Type of Work
565	Original Design
290	Overlay & Retrofit Rail
327	Bridge Deck Replacement

Traffic Control Plan:

I-29 will be open to thru traffic. Refer to traffic control plans shown elsewhere in these plans.

Bridge Deck Dimension Table

No.	Item	Unit	Quantity
1	Deck Length	L.F.	158.6
2	Deck Width	L.F.	42.2
3	Deck Area	S.F.	6,688

1. Deck length is measured from face-to-face of paving notches along the centerline of the roadway.
2. Deck widths are measured from out-to-out of deck perpendicular to the centerline of roadway.
3. Deck area is to be based on the face-to-face paving notch distance and out-to-out deck dimensions.

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans 60'-6" Interior Span

General Notes

STA. 1187+12.50 (℄ I-29) Turn-in Date: September 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

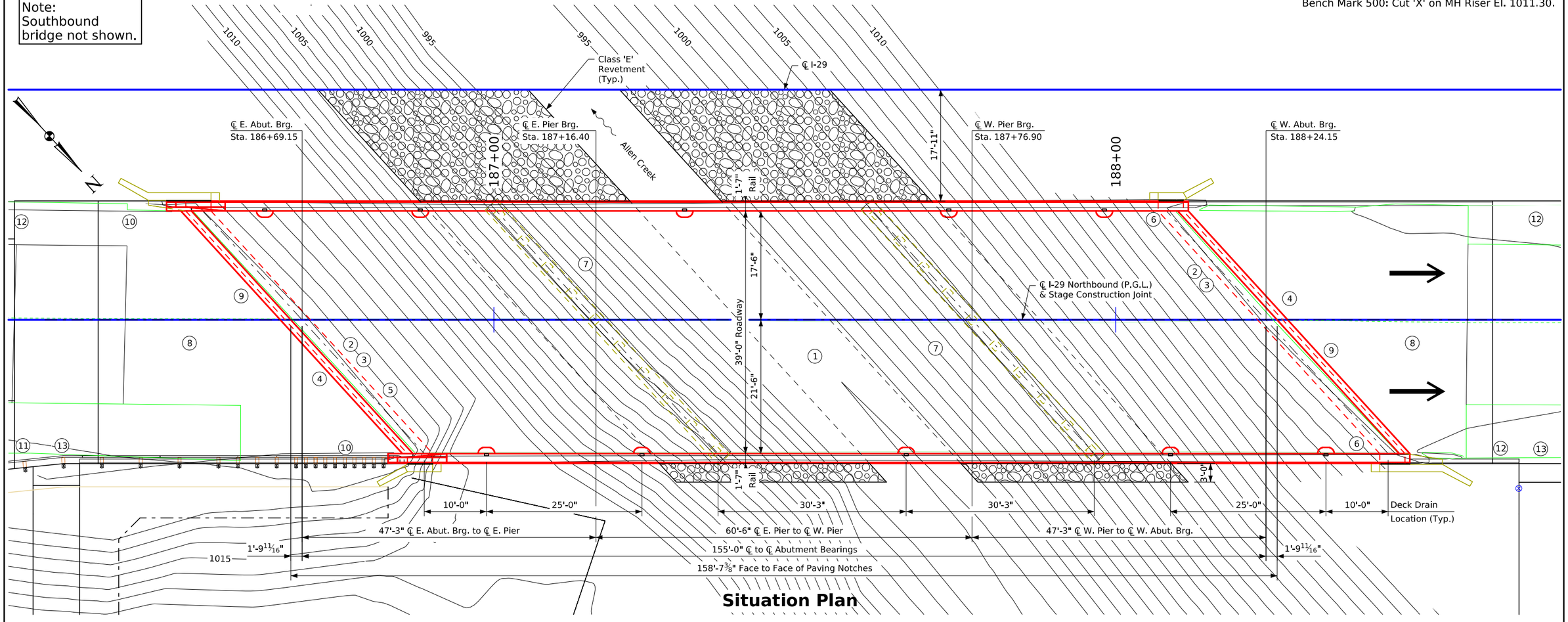
Design No. 327 Design Sheet No. 2 of 25 FHWA No. 28150

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.2	

4:51:59 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn

Note:
Southbound bridge not shown.

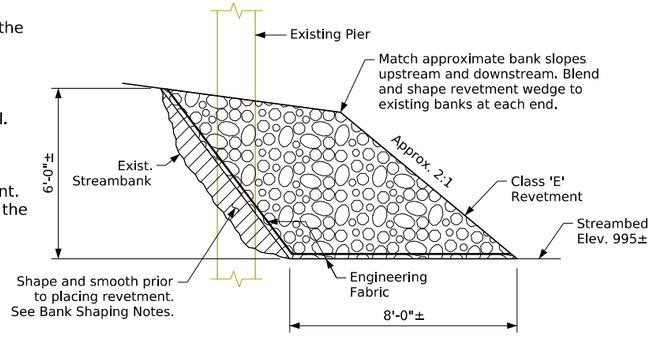
Bench Mark 500: Cut 'X' on MH Riser El. 1011.30.



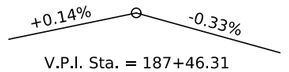
Situation Plan

Repairs Shall Consist of:

1. Remove and replace the bridge deck. Replace existing curb/rails with new TL-5 railing on the bridge.
2. Encase beam ends with semi-integral diaphragms.
3. Clean and paint beams, diaphragms, and bearings within 5' of the beam ends at each abutment.
4. Replace abutment backwalls and install new galvanized bearing anchor bars into backwall.
5. Perform concrete repairs to deteriorated areas of the east abutment.
6. Fill undermining at west abutment with flowable mortar and install new subdrain behind abutments.
7. Perform bank shaping and place berm armoring and channel lining using Class E revetment.
8. Replace the first two sections of bridge approach at each end, then UAC the remainder of the bridge approaches.
9. Install new "BE" joints with new bridge deck and approaches.
10. Replace the existing outside guardrail. Remove and reinstall inside guardrail.
11. Add HMA paved shoulder in front of new guardrail.
12. Construct shoulder strengthening to handle staged traffic.
13. Install a bridge end drains.



Typical Channel Lining Detail



V.P.I. Sta. = 187+46.31
V.P.I. Elev. = 1020.00
VC = 157.70'

Proposed Profile Grade NB I-29

Note:
Bridge stationing does not match original plans due to the new office alignment along ℄ I-29 Northbound roadway.

Location

I-29 (NB) over Allen Creek
T-78N R-44W
Section 8
St. Johns Township
Harrison County
FHWA No. 28150
Bridge Maint. No. 4377.6R029
Latitude 41.574025°
Longitude -95.928086°

Traffic Estimate

2024 AADT	8,250 V.P.D.
TRUCKS	31 %

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans — 60'-6" Interior Span

Situation Plan

STA. 1187+12.50 (℄ I-29)

Turn-in Date: September 1, 2026

Harrison County

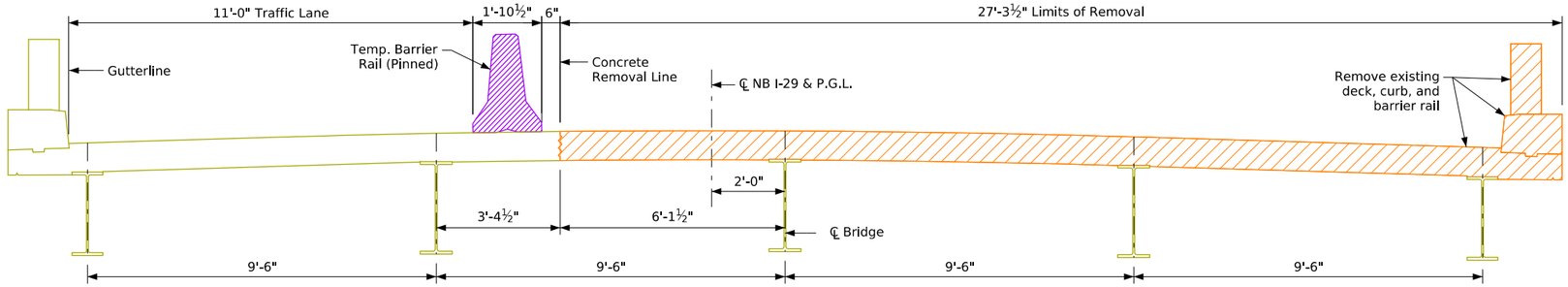
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 | Design Sheet No. 3 of 25 | FHWA No. 28150

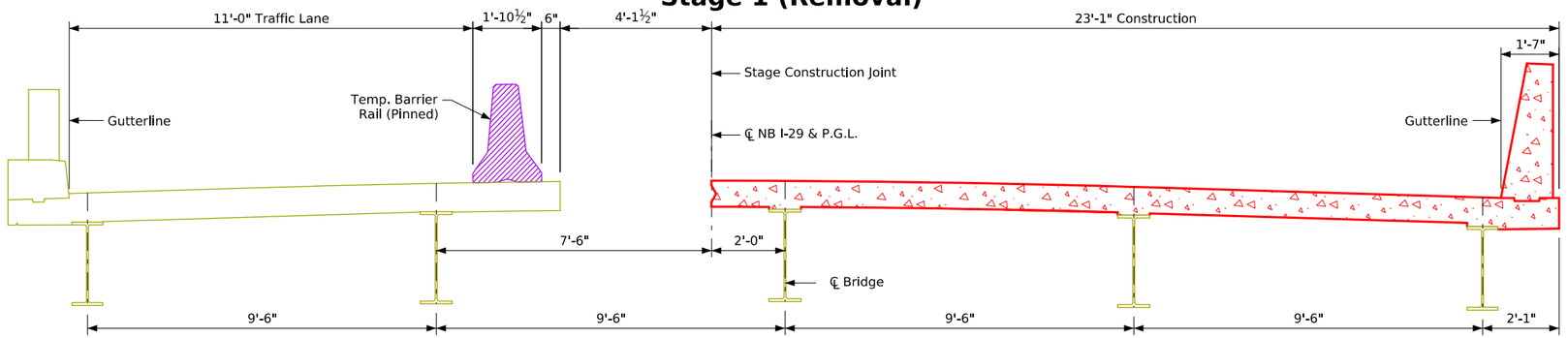
whks engineers + planners + land surveyors

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.3

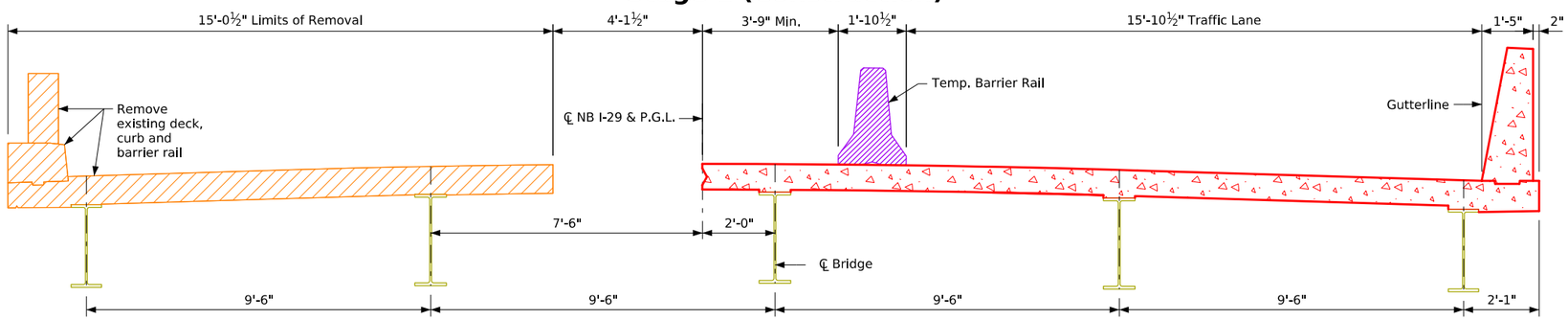
4:52:02 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn



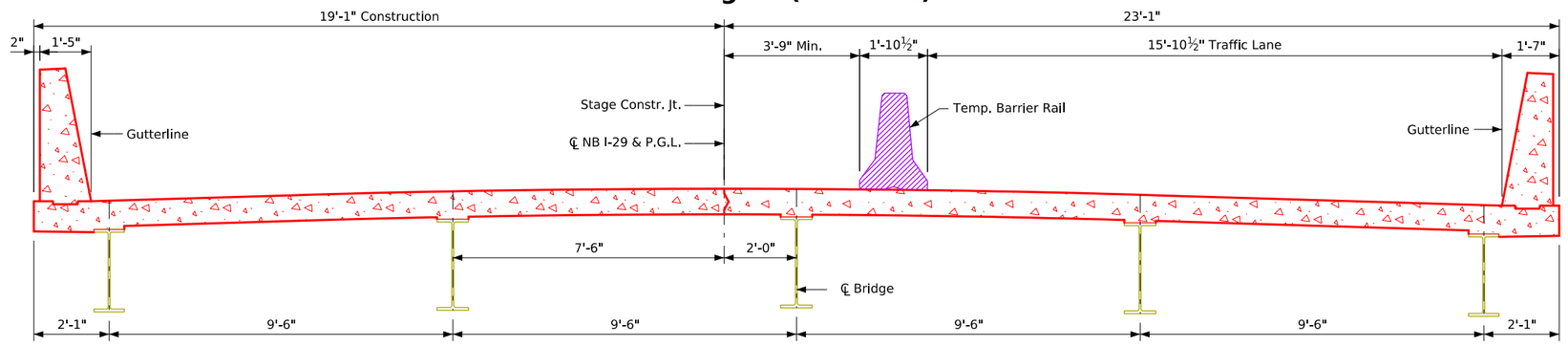
Stage 1 (Removal)



Stage 1 (Construction)



Stage 2 (Removal)



Stage 2 (Construction)

Note:
The plans show a layout for TBR for both Stage 1 and Stage 2 construction. The temporary barrier rail sections adjacent to the traffic lane for Stage 1 traffic are to remain in place until traffic is shifted to the Stage 2 traffic lane. The temporary barrier rail sections adjacent to the traffic lane for Stage 2 traffic are to be in place prior to shifting traffic to the Stage 2 traffic lane.

Note:
All views looking west (upstation).

whks
engineers + planners + land surveyors

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans — 60'-6" Interior Span

Staging Details

STA. 1187+12.50 (℄ I-29)

Turn-in Date: September 1, 2026

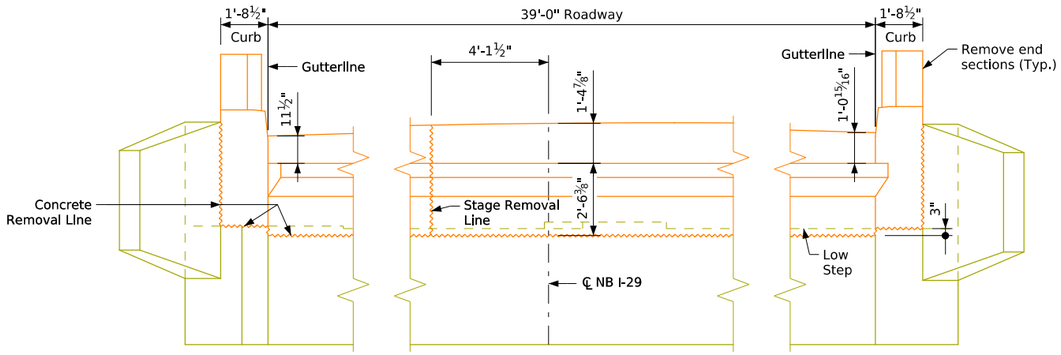
Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 — Design Sheet No. 4 of 25 — FHWA No. 28150

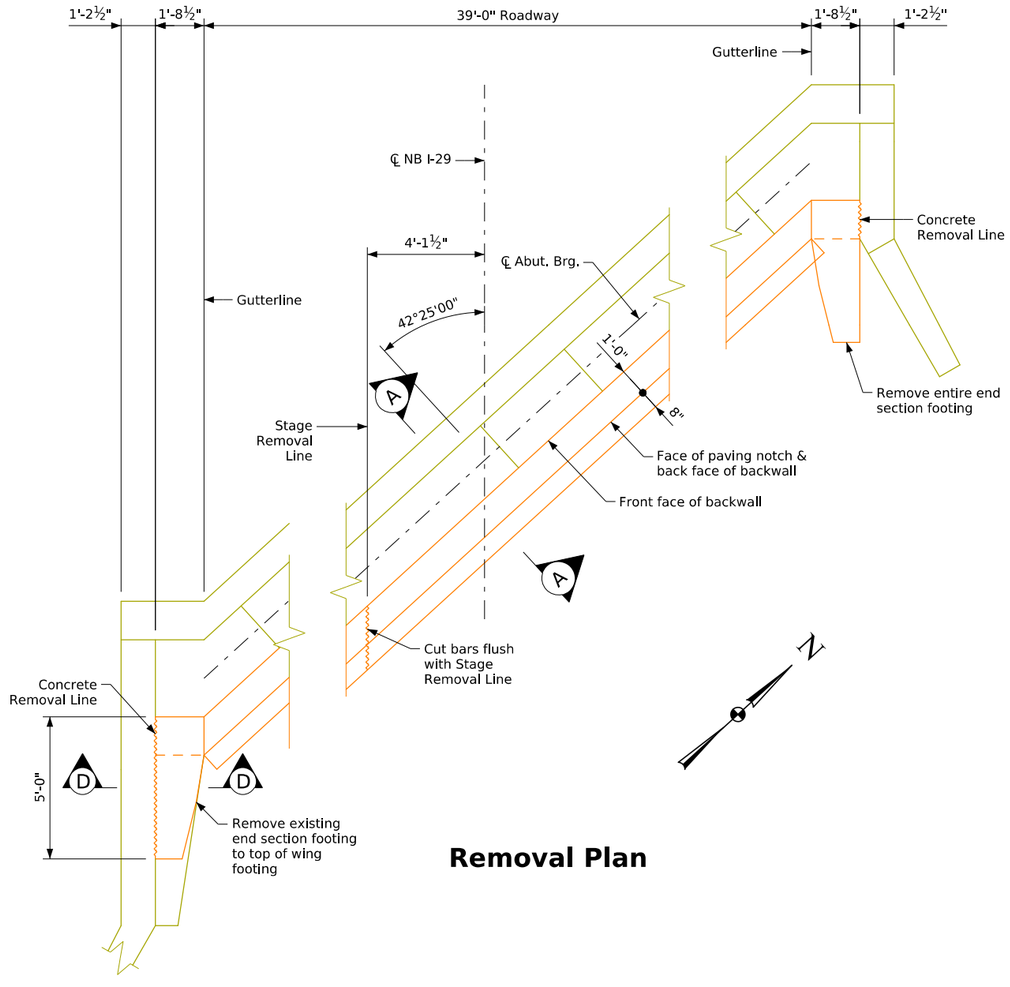
FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.4	

4:52:05 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn

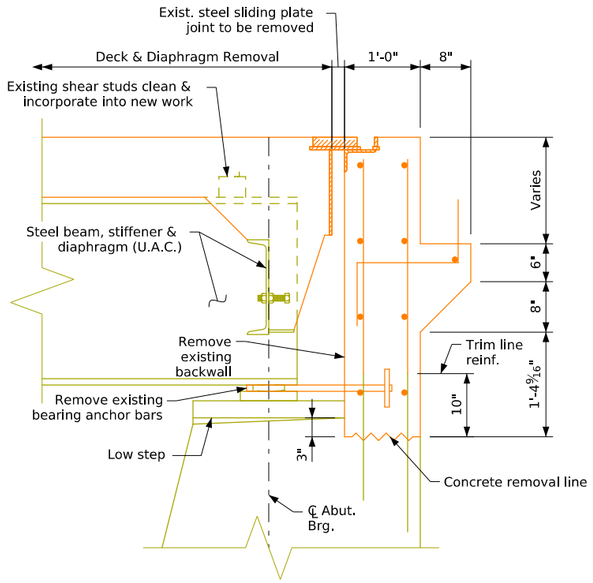


Rear Elevation

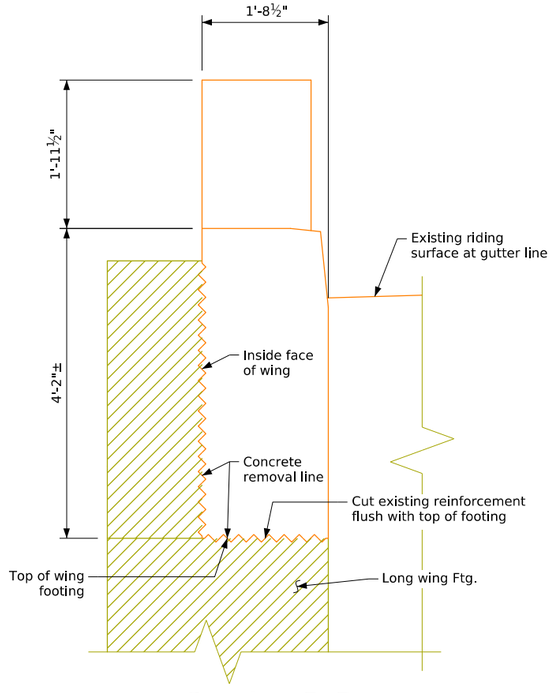
Looking Perpendicular to ℄ Roadway



Removal Plan



Section A-A



Section D-D

Removal Notes:

All partial removals (e.g.-at abutment backwalls) 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 "preserved" that is exposed during removal operations is to be carefully protected, cleaned and incorporated into new construction unless noted otherwise.

Existing vertical bars in the backwall shall be cleaned and incorporated into new work. The bars shall be cut off 10" above the concrete removal line.

All other existing backwall bars are to be removed. Any reinforcing exposed during removals that does not extend into new concrete shall be cut off flush with the removal line and given two coats of zinc-rich paint.

whks
engineers + planners + land surveyors

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans 60'-6" Interior Span

East Abutment Removal Details

STA. 1187+12.50 (℄ I-29) Turn-in Date: September 1, 2026

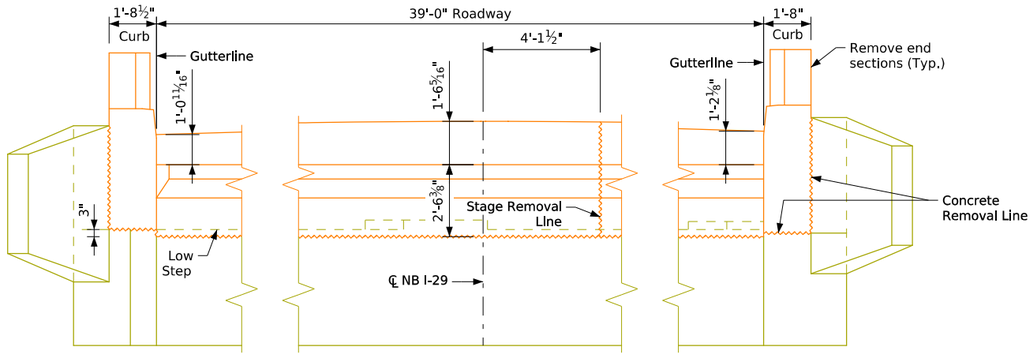
Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 Design Sheet No. 5 of 25 FHWA No. 28150

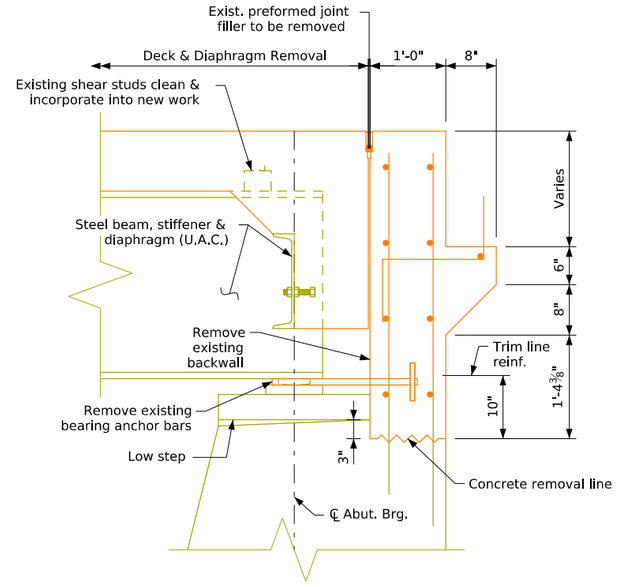
FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.5	

4:52:07 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn

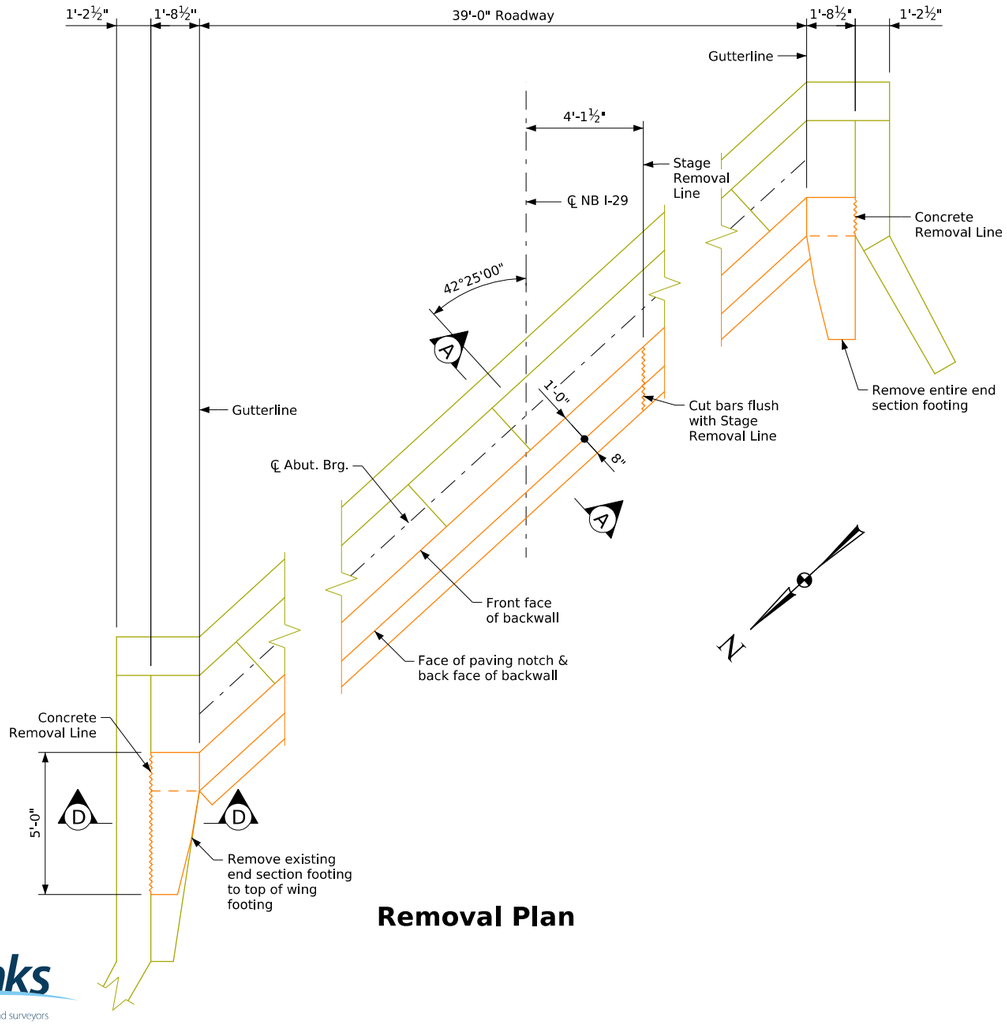


Rear Elevation

Looking Perpendicular to ℄ Roadway



Section A-A



Removal Plan

Note:
See Design Sheet 5 for Removal Notes.

See Design Sheet 5 for Section D-D.

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans — 60'-6" Interior Span

West Abutment Removal Details

STA. 1187+12.50 (℄ I-29) — Turn-in Date: September 1, 2026

Harrison County

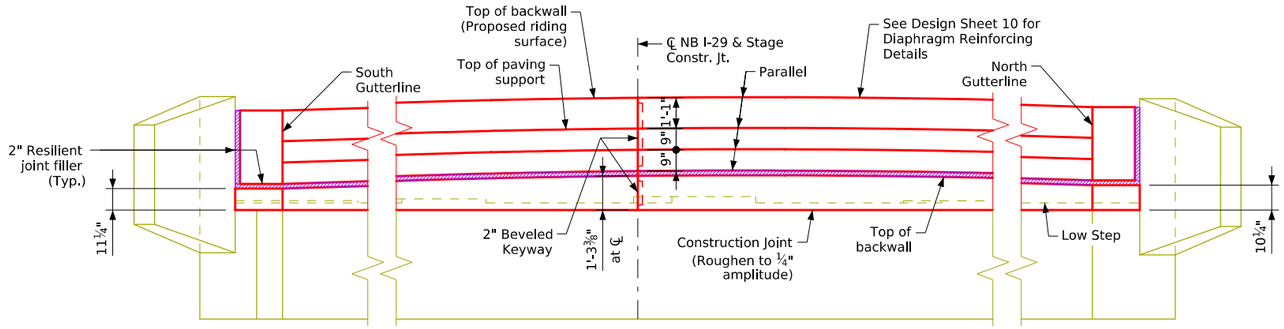
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 — Design Sheet No. 6 of 25 — FHWA No. 28150

whks
engineers + planners + land surveyors

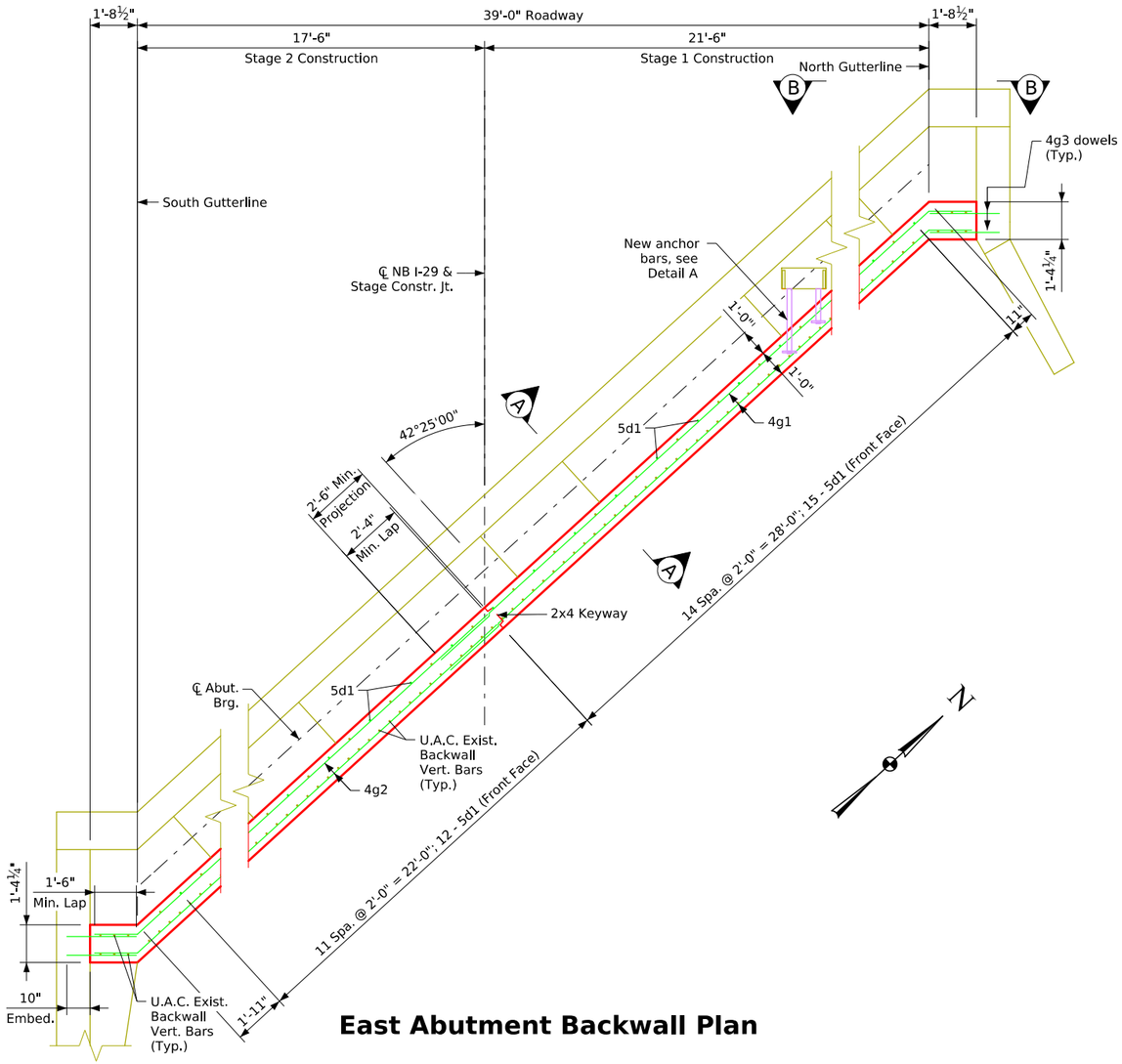
FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.6	

4:52:09 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn

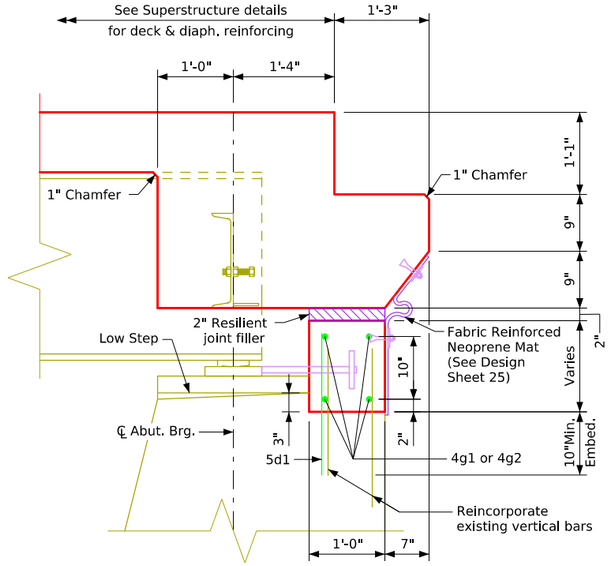


Rear Elevation

Looking Perpendicular to ℄ Roadway



East Abutment Backwall Plan



Section A-A

See Design Sheet 10 for details of slab and diaphragm reinforcing.

Notes:

Barrier rails not shown in details.

See Design Sheet 9 for Abutment Notes.

See Design Sheet 8 for Section B-B.

See Design Sheet 9 for Detail A.

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans 60'-6" Interior Span

East Abutment Details

STA. 1187+12.50 (℄ I-29) Turn-in Date: September 1, 2026

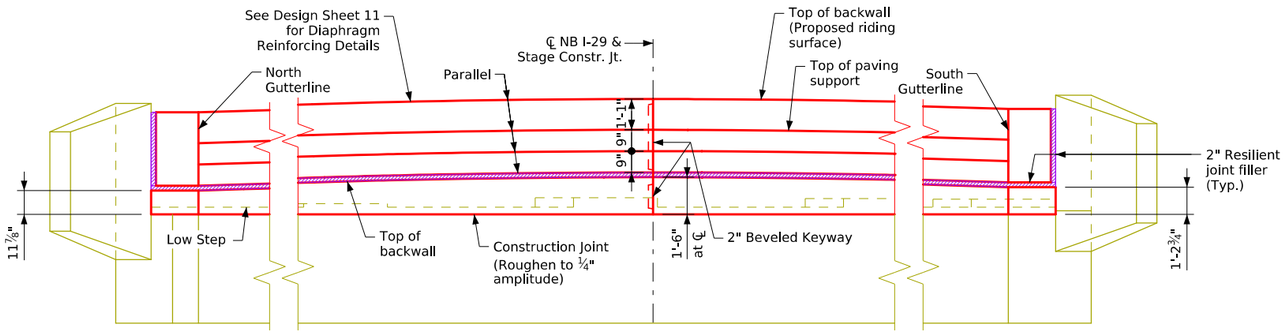
Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 Design Sheet No. 7 of 25 FHWA No. 28150

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.7

4:52:11 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn



Rear Elevation

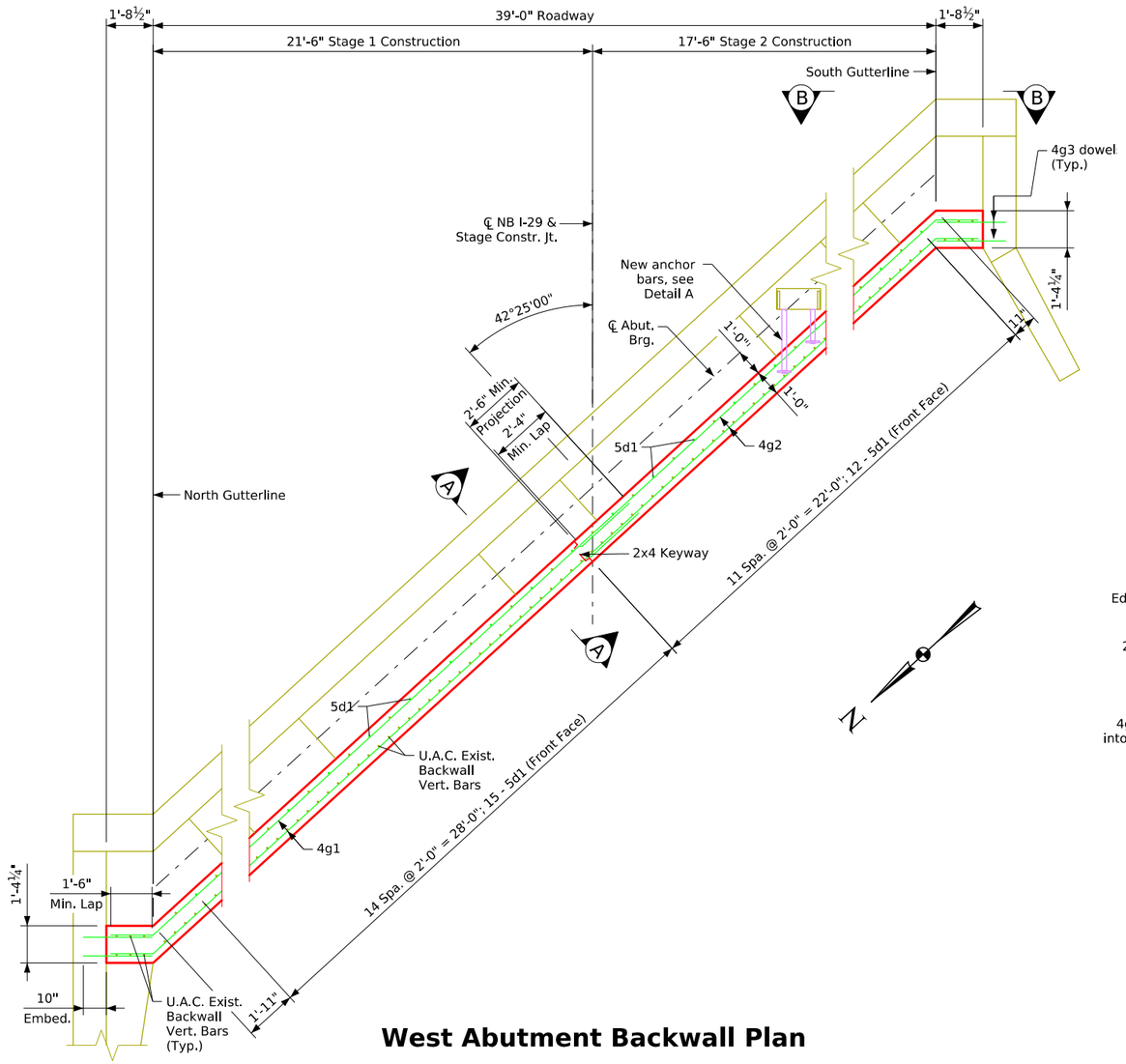
Looking Perpendicular to ℄ Roadway



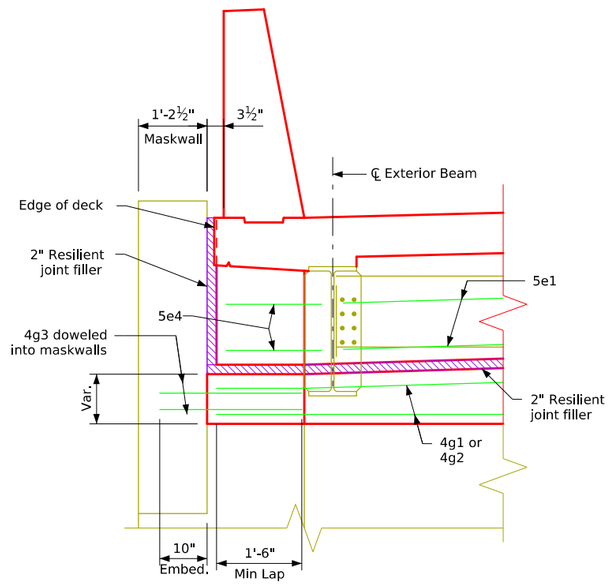
Elevation of West Abutment Showing Undermining

Looking West

Note: Flowable mortar to be placed under the West Abutment to repair and encase piles that are currently exposed. The area to be filled is assumed to be 25'-0" long, has a maximum height of 1'-6", and a maximum depth of 4'-0". The length and depth dimensions were estimated from apparent erosion visible at the base of the abutment footing. Inspection underneath the abutment footing was not performed. The quantity has been rounded to the nearest 1 Cu. Yd. for estimating purposes. Payment will be based on the actual volume furnished and placed at the contract price per cubic yard.



West Abutment Backwall Plan



Section B-B

(Deck and barrier rail reinforcing not shown)

Notes:

Barrier rails not shown in details.

See Design Sheet 9 for Abutment Notes.

See Design Sheet 7 for Section A-A.

See Design Sheet 9 for Detail A.

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans — 60'-6" Interior Span

West Abutment Details

STA. 1187+12.50 (℄ I-29) — Turn-in Date: September 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 — Design Sheet No. 8 of 25 — FHWA No. 28150

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.8

4:52:14 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn

Dowel Setting Note:

The 5d1 and 4g3 bars shall be set as dowels in drilled holes. Holes are to be 10" deep. The dowels shall be installed in accordance with the 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 shall be 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.

Abutment Notes:

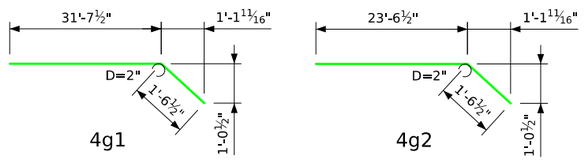
Minimum clear distance from face of concrete to near reinforcing bar is to be 2" unless otherwise noted or shown.

The price bid for "Structural Concrete (Misc.)" shall include the cost of setting bars as dowels in the existing footing & maskwalls.

See Design Sheet 25 for Subdrain and Excavation and Backfill Details.

Construction joint keyways are to be formed with beveled 2x4's, except as noted.

Bent Bar Details



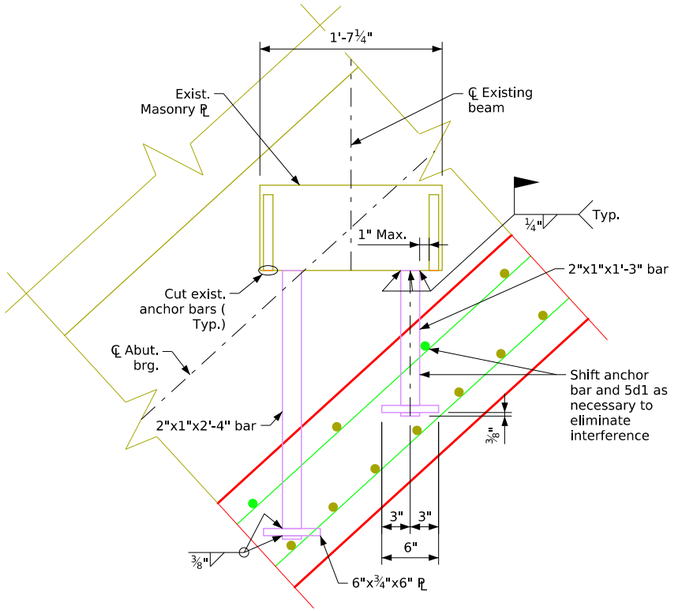
Note: All dimensions are out to out. D=Pin Diameter.

Epoxy Coated Reinforcing Steel Bar List – Both Abutments

Bar	Location	Shape	No.	Length	Weight
5d1*	Backwall Vertical, FF, Dowel		54	2'-2"	122
4g1	Backwall Horizontal, Stage 1		8	33'-2"	177
4g2	Backwall Horizontal, Stage 2		8	25'-1"	134
4g3	Backwall to Maskwall, Horizontal, Dowel		16	2'-4"	25
	*Trim or bend excess length for variable height backwall				
	Epoxy Coated Reinforcing Steel – Total Weight (lbs.)				458

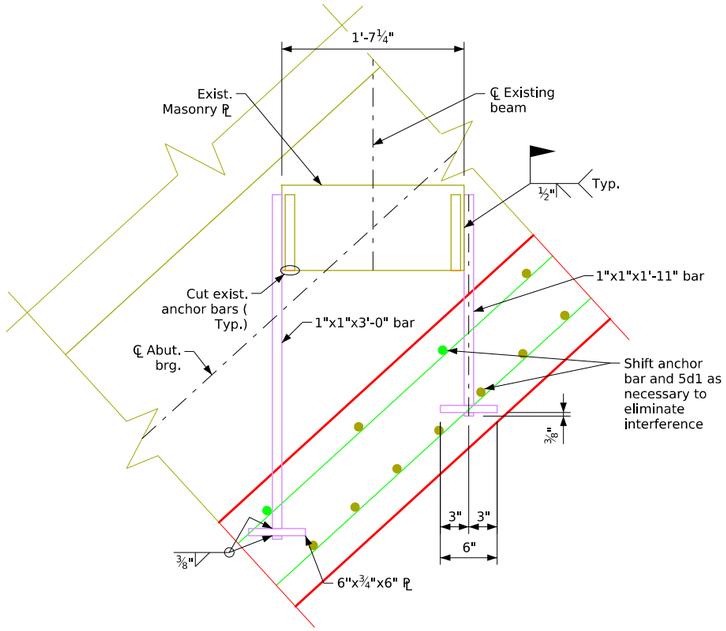
Concrete Placement Quantites

Location	Quantity
East Abutment - Backwall Stage 1	1.2
East Abutment - Backwall Stage 2	1.0
West Abutment - Backwall Stage 1	1.4
West Abutment - Backwall Stage 2	1.3
Total (cu. yds.)	4.9



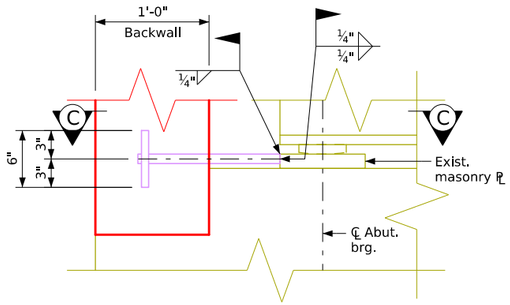
Detail A

Wt. One Detail A = 40 Lbs.



Alternate Detail A

Wt. One Alternate Detail A = 32 Lbs.



Detail A

(Required at all abutment bearing locations)

Note: All costs of bearing anchor bar replacement (including removals, preparation, and field welding) will be included in the unit cost for bid item "Structural Steel". Weight for measurement of quantity is based on "Detail A". Number of bearing anchor bar assemblies required = 10.

whks engineers + planners + land surveyors

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans 60'-6" Interior Span

Abutment Details & Quantities

STA. 1187+12.50 (℄ I-29) Turn-in Date: September 1, 2026

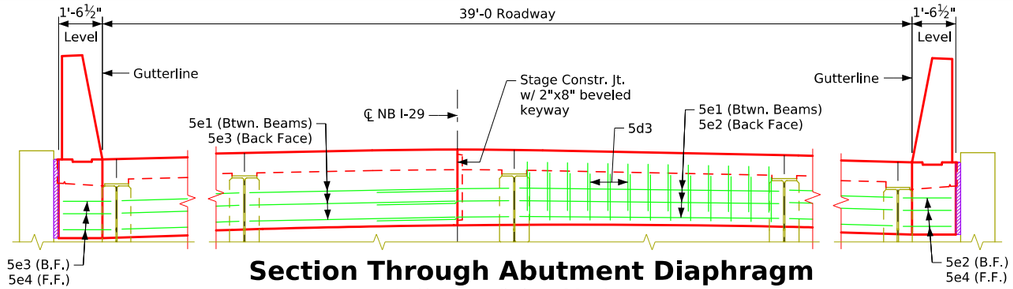
Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 Design Sheet No. 9 of 25 FHWA No. 28150

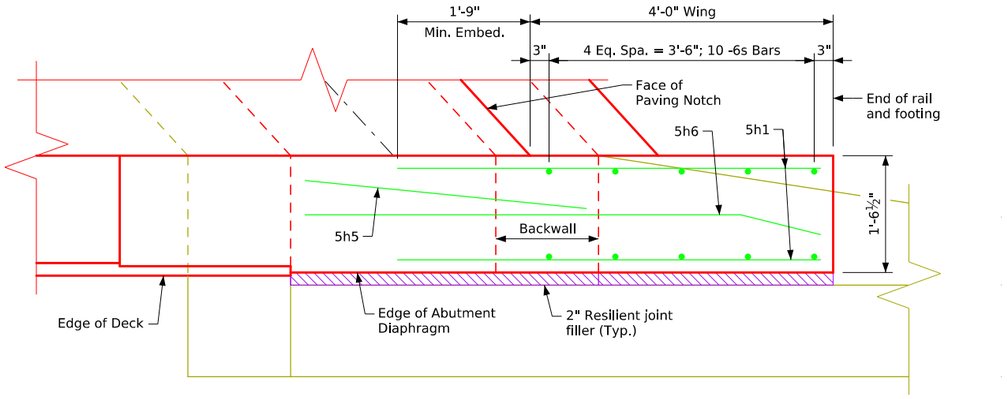
FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.9

4:52:16 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn



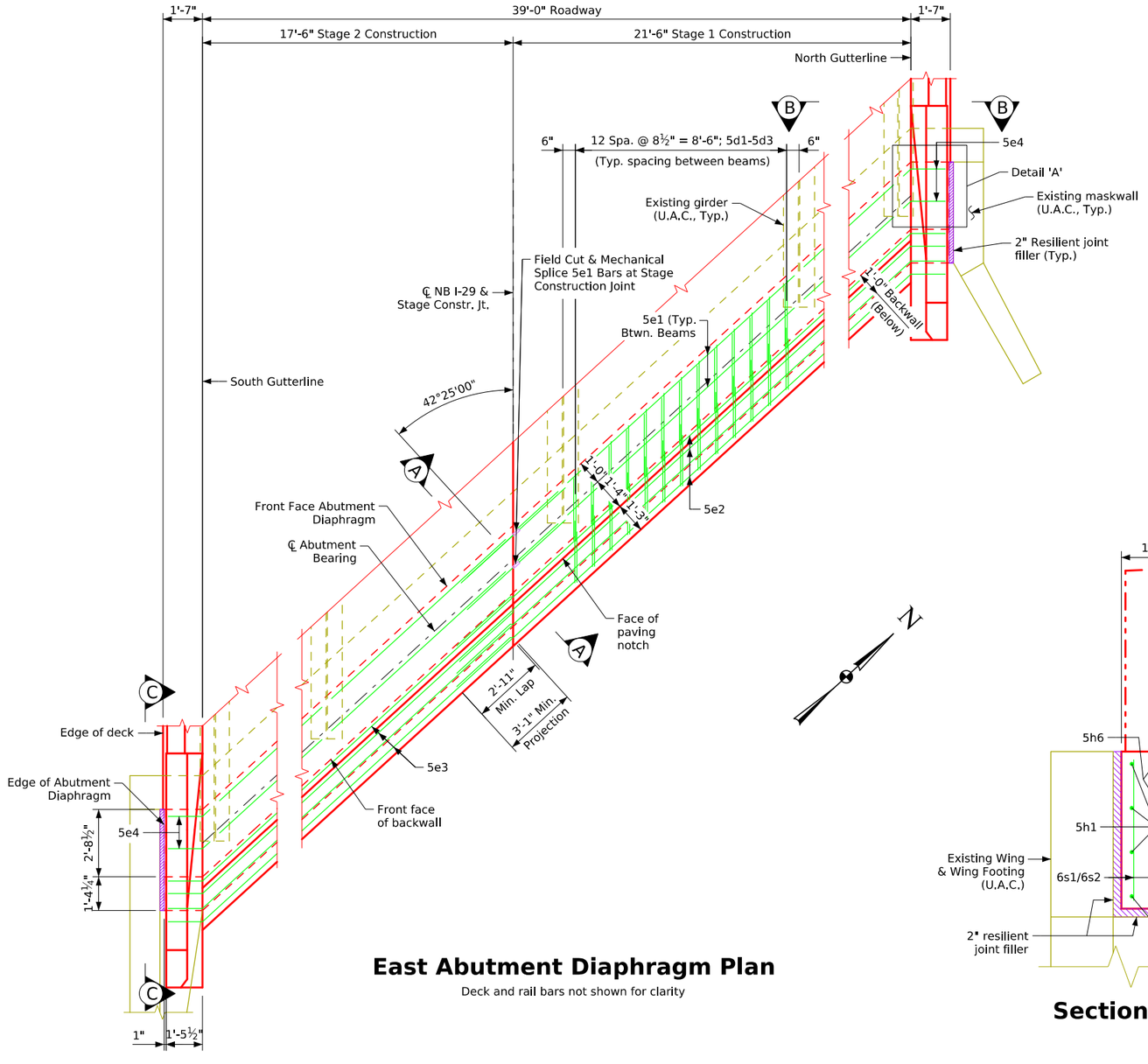
Section Through Abutment Diaphragm

Looking Perpendicular to ℄ Roadway



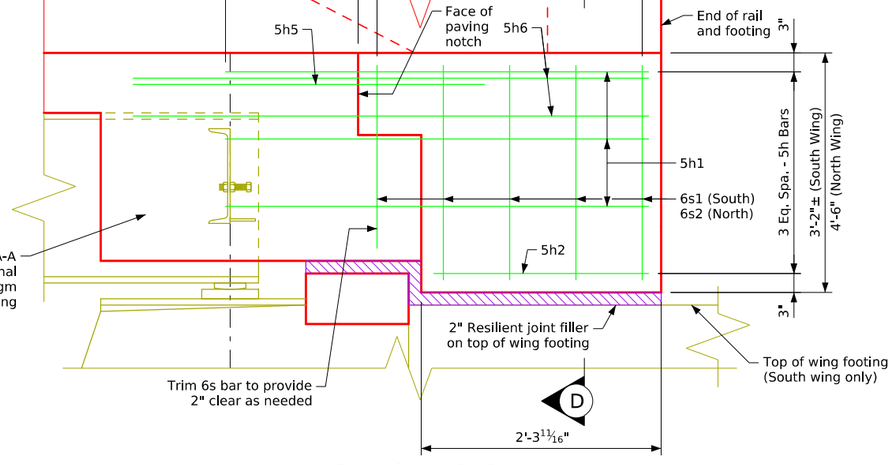
Part Plan at Barrier End Section Footing

Southeast Wing Shown - Northeast Wing Similar



East Abutment Diaphragm Plan

Deck and rail bars not shown for clarity



Section C-C

Section D-D

Note:

See Design Sheet 8 for Section B-B.

See Design Sheet 11 for Section A-A and Detail 'A'.

For mechanical splice assemblies details and notes see design sheet No. 15.

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans — 60'-6" Interior Span

East Abutment Superstructure Details

STA. 1187+12.50 (℄ I-29) — Turn-in Date: September 1, 2026

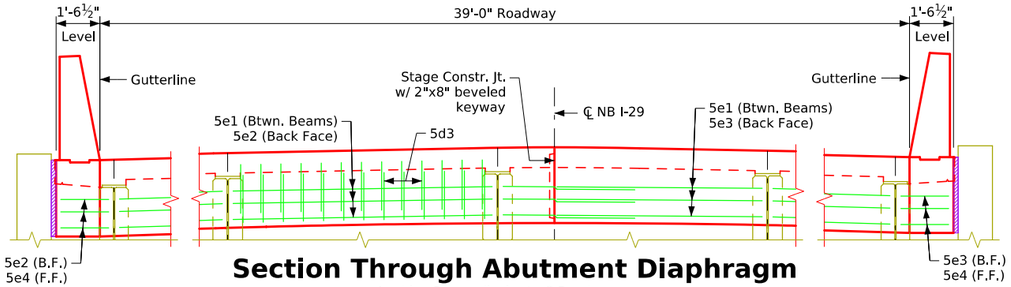
Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 — Design Sheet No. 10 of 25 — FHWA No. 28150

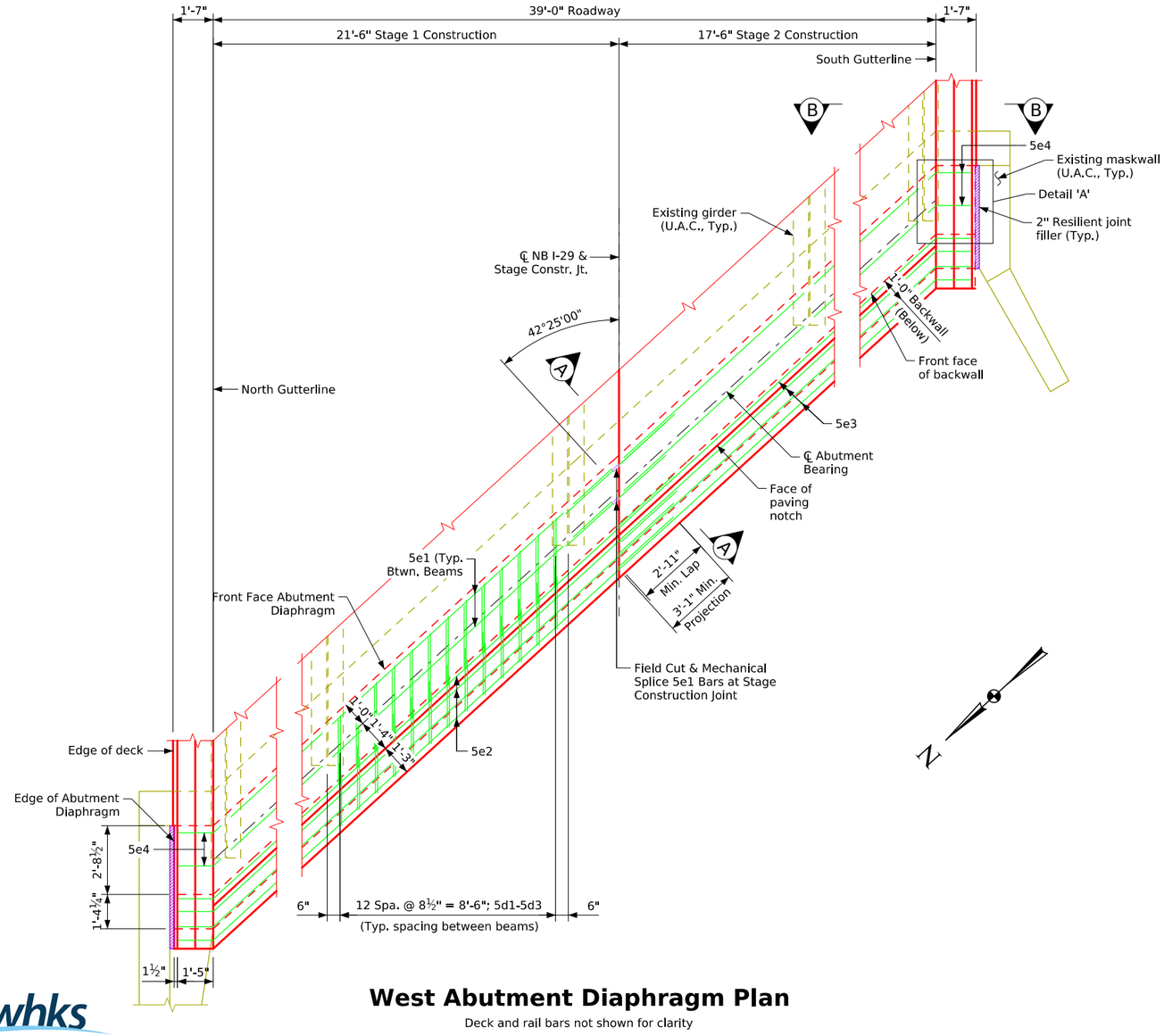
FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.10

4:52:19 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn



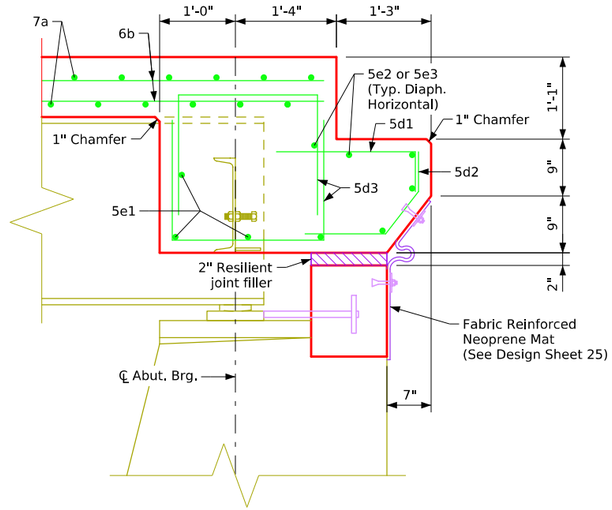
Section Through Abutment Diaphragm

Looking Perpendicular to ℄ Roadway



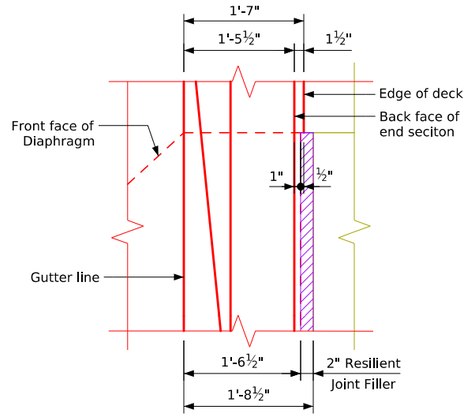
West Abutment Diaphragm Plan

Deck and rail bars not shown for clarity



Section A-A

Backwall reinforcing not shown.



Detail 'A'

Note:

See Design Sheet 8 for Section B-B.

For mechanical splice assemblies details and notes see Design Sheet No. 15.

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans 60'-6" Interior Span

West Abutment Superstructure Details

STA. 1187+12.50 (℄ I-29) Turn-in Date: September 1, 2026

Harrison County

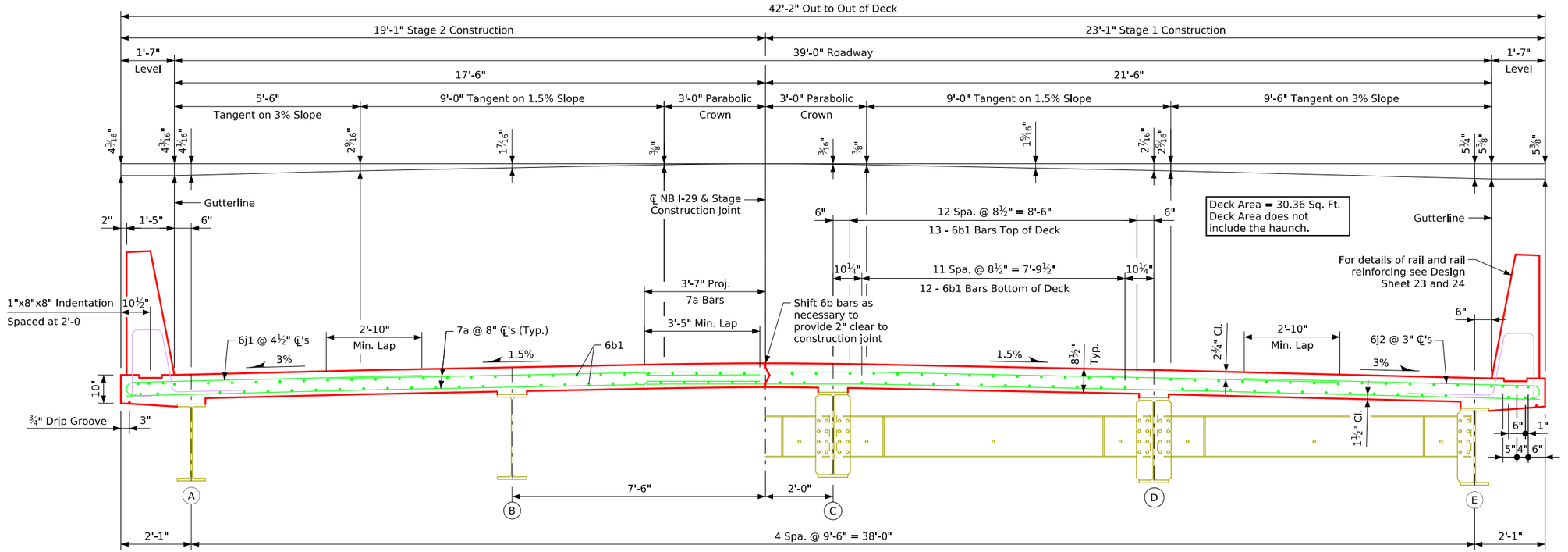
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 Design Sheet No. 11 of 25 FHWA No. 28150

whks engineers + planners + land surveyors

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.11

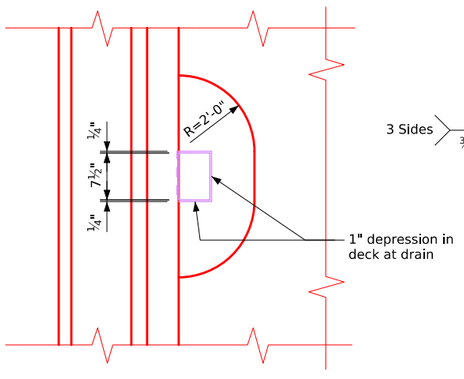
4:52:21 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn



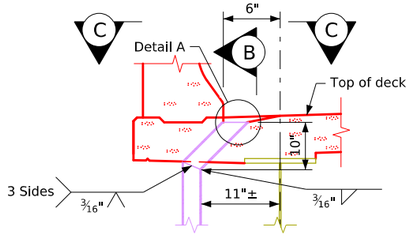
Half Section at Midspan

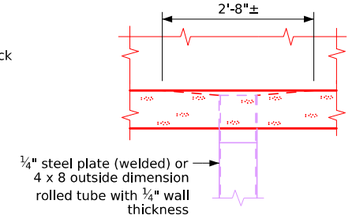
Half Section at Abutment

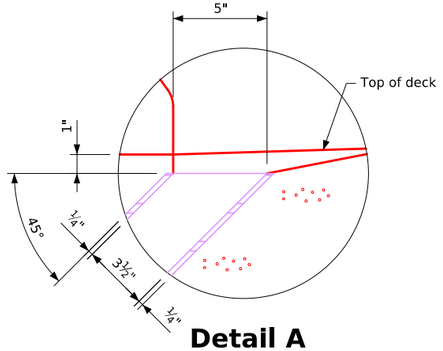
Note: All views looking West (Upstation)



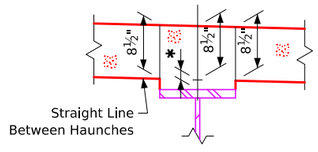
View C-C







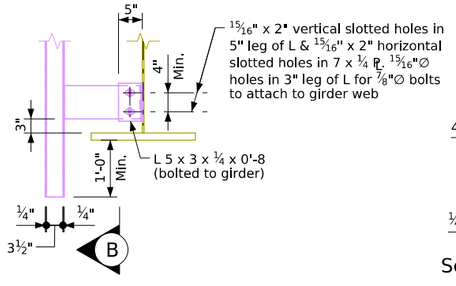
Detail A



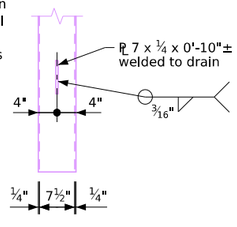
Typ. Deck & Haunch Detail

✱ Concrete haunch dimension measured between bottom of deck and top of top flange plate. Refer to haunch details shown elsewhere in these plans.

The maximum embedment of the edge of the top flange in the deck shall be ½". Shear studs are to have a minimum penetration of 2" into the deck and be at least 2½" clear of the top of the deck. These requirements were used in setting the maximum and minimum allowable field haunch values shown in the "Miscellaneous Data Table" shown elsewhere on these plans.



Drain Details



Section B-B

Note:
Deck drains including plates welded to the drain for drain support are to be Grade 36 Steel.

Drains are to be galvanized according to Section 2509 of the Standard Specifications. 10 drains are required. See "Situation Plan" sheet for location. Weight of one drain = 98 Lbs. Weight of drains is based on rolled tube. Weight of drain includes angle and plate. Drain weights are included in the Structural Steel quantity.

See superstructure notes on Design Sheet 15.

whks
engineers + planners + land surveyors

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans — 60'-6" Interior Span

Transverse Section

STA. 1187+12.50 (℄ I-29) — Turn-in Date: September 1, 2026

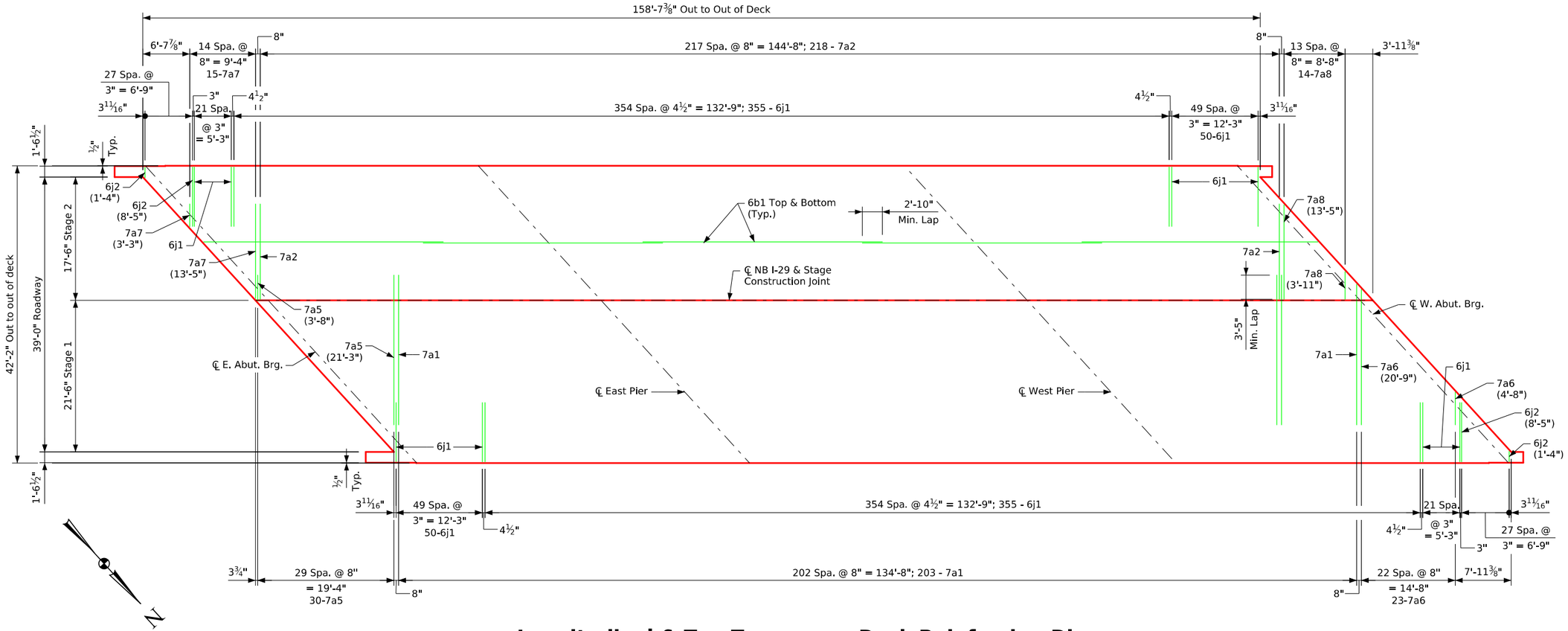
Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 — Design Sheet No. 12 of 25 — FHWA No. 28150

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.12

4:52:24 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn



Longitudinal & Top Transverse Deck Reinforcing Diagram

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans — 60'-6" Interior Span

Deck Reinforcing Layout

STA. 1187+12.50 (℄ I-29) — Turn-in Date: September 1, 2026

Harrison County

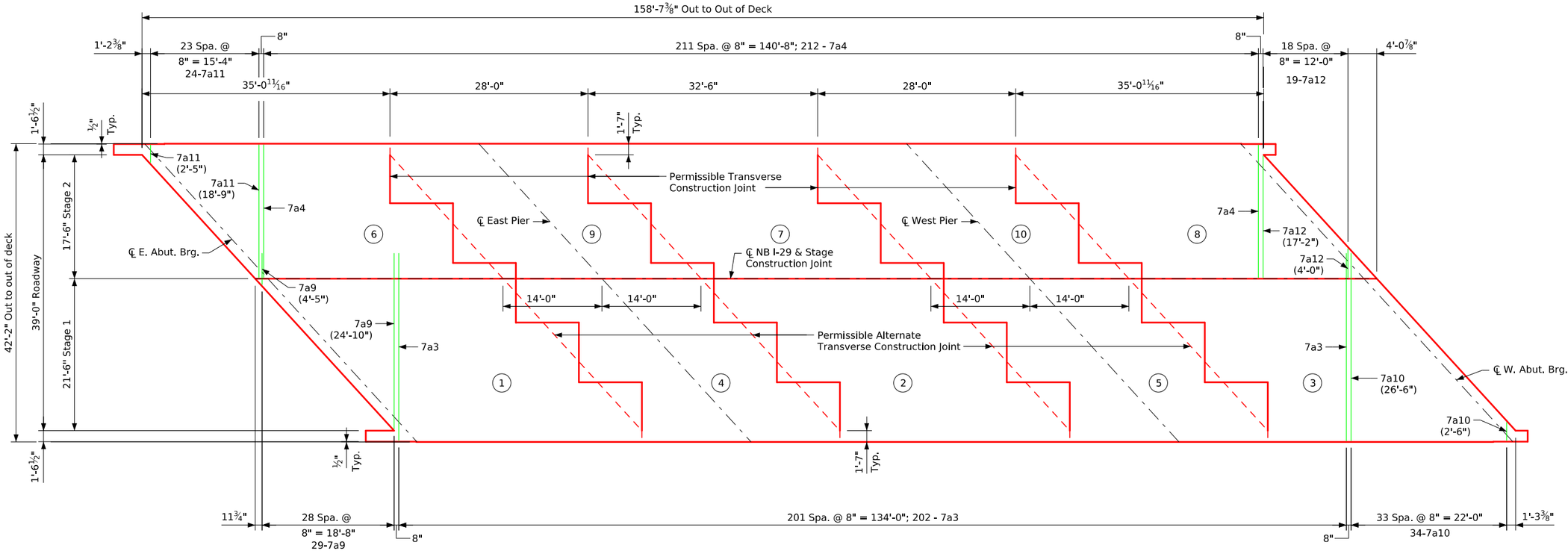
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 — Design Sheet No. 13 of 25 — FHWA No. 28150

whks engineers + planners + land surveyors

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.13	

4:52:26 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn



Bottom Transverse Deck Reinforcing & Concrete Placement Diagram

Note:
Concrete deck shall be placed in sections and sequences indicated. An approved alternate procedure is to place the concrete deck in one continuous pour per stage beginning at one end of the bridge. Alternate procedures for placing deck concrete may be submitted for approval together with a statement of the proposed method and evidence that the Contractor possesses the necessary equipment and facilities to accomplish the required results. The bridge Engineer shall review any alternate procedures. The cost of any additional analysis and plan modifications shall be paid for by the Contractor. The Engineer shall determine if a retarding admixture is required to maintain plasticity of the concrete deck during placement.

Deck Concrete sections shall cure for a minimum of 48 hours and shall achieve a minimum strength of 75% of the 28 day deck concrete strength prior to removing deck headers and beginning an adjacent pour.

whks
engineers + planners + land surveyors

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans — 60'-6" Interior Span

Deck Reinforcing Layout

STA. 1187+12.50 (℄ I-29) — Turn-in Date: September 1, 2026

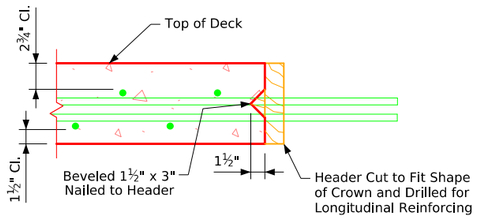
Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

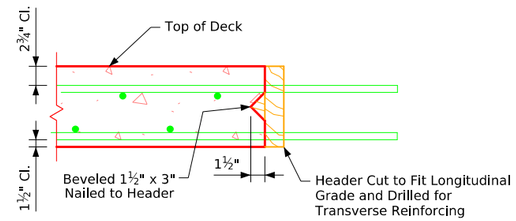
Design No. 327 — Design Sheet No. 14 of 25 — FHWA No. 28150

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.14	

4:52:26 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn



Permissible Transverse Deck Construction Joint



Longitudinal Deck Construction Joint

Superstructure Notes:

The bridge deck as shown includes ¾" integral wearing surface.

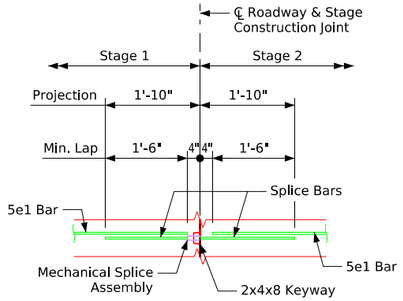
Forms for the bridge deck and barrier rail are to be supported by the girders.

Clear distance from face of concrete to near reinforcing bar shall be 2 inches unless otherwise noted or shown.

Top transverse reinforcing steel is to be parallel to and 2¾" clear below top of deck. Bottom transverse reinforcing steel is to be parallel to and 1 ½" clear above bottom of deck. Top and bottom reinforcing steel is to be supported by individual bar chairs spaced at not more than 3'-0" centers longitudinally and transversely, or by continuous rows of bar high chairs or deck bolsters spaced 4'-0" apart. I.M. 451.01 requirements shall apply for bar chairs, high bar chairs, and deck bolsters.

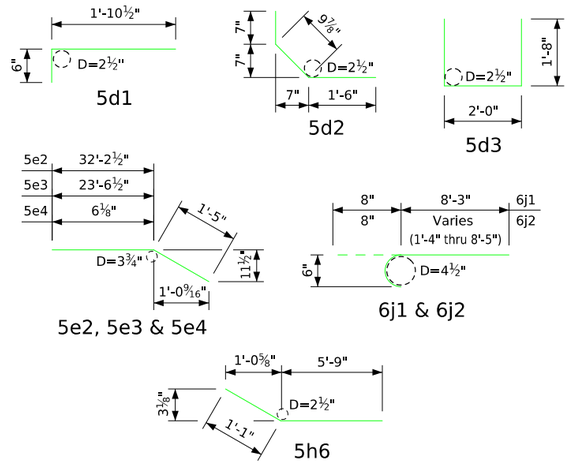
All deck and diaphragm reinforcing is to be wired in place and adequately supported before concrete is placed.

Cost of all resilient joint filler is to be included in the price bid for "High Performance Structural Concrete".



Mechanical Splice Detail

Bent Bar Details



Note: All dimensions are out to out. D= Pin diameter

Mechanical Splice Assemblies:

The 5e1 bars in the abutment diaphragms shall be spliced at the locations shown using mechanical splice assemblies. Mechanical splice assemblies consist of mechanical splicers and reinforcing splice bars as required to facilitate the use of the mechanical splicer. The mechanical splice assembly used shall meet the requirements of Materials I.M. 451 Appendix E. Reinforcing splice bars shall be a minimum of ⅝ inch dia.

All mechanical splice assemblies to be used in splicing 5e1 bars in the abutment diaphragms shall be epoxy coated.

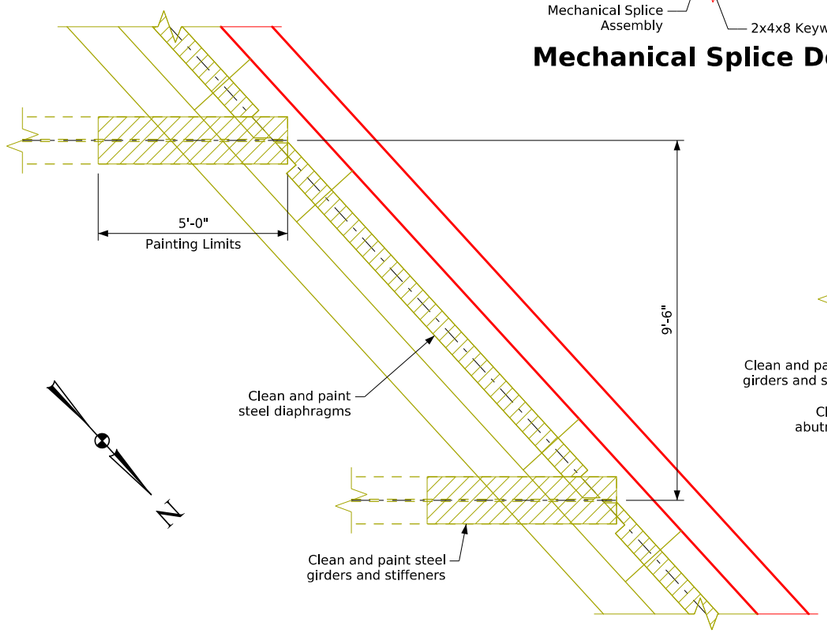
The cost of all splice assemblies is to be included in the price bid for "Reinforcing Steel Epoxy Coated" and no separate payment will be made. The weight of mechanical splice assemblies is not included in the quantity shown for "Reinforcing Steel Epoxy Coated". A total of 6 epoxy coated splice assemblies will be required.

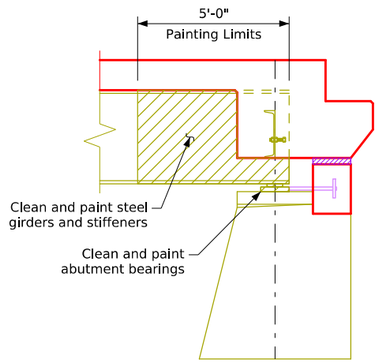
Epoxy Coated Reinforcing Steel Bar List – Superstructure

Bar	Location	Shape	No.	Length	Weight
7a1	DECK TRANSVERSE, TOP - STAGE 1	—	203	21'-3"	8,817
7a2	DECK TRANSVERSE, TOP - STAGE 2	—	218	13'-8"	6,090
7a3	DECK TRANSVERSE, BOTTOM - STAGE 1	—	202	26'-6"	10,942
7a4	DECK TRANSVERSE, BOTTOM - STAGE 2	—	212	18'-9"	8,125
7a5	DECK TRANSVERSE, TOP, EAST END - STAGE 1	—	30	VARIES	764
7a6	DECK TRANSVERSE, TOP, WEST END - STAGE 1	—	23	VARIES	597
7a7	DECK TRANSVERSE, TOP, EAST END - STAGE 2	—	15	VARIES	256
7a8	DECK TRANSVERSE, TOP, WEST END - STAGE 2	—	14	VARIES	248
7a9	DECK TRANSVERSE, BOTTOM, EAST END - STAGE 1	—	29	VARIES	867
7a10	DECK TRANSVERSE, BOTTOM, WEST END - STAGE 1	—	34	VARIES	1,008
7a11	DECK TRANSVERSE, BOTTOM, EAST END - STAGE 2	—	24	VARIES	519
7a12	DECK TRANSVERSE, BOTTOM, WEST END - STAGE 2	—	19	VARIES	411
6b1	DECK LONGITUDINAL, TOP & BOTTOM	—	560	34'-0"	28,598
5d1	PAVING NOTCH	⌐	104	2'-5"	262
5d2	PAVING NOTCH	◟	104	2'-11"	316
5d3	DIAPHRAGM HOOP	⌴	208	5'-4"	1,157
5e1	ABUT. DIAPHRAGM, BETWEEN BEAMS	—	24	12'-7"	315
5e2	ABUT. DIAPHRAGM, LONGITUDINAL - STAGE 1	⌒	12	33'-8"	421
5e3	ABUT. DIAPHRAGM, LONGITUDINAL - STAGE 2	⌒	12	25'-0"	313
5e4	ABUT. DIAPHRAGM, BETWEEN BEAMS, ENDS	⌒	12	2'-0"	25
5h1	EAST ABUT. WING, HORIZONTAL	—	12	5'-7"	70
5h2	EAST ABUT. WING, HORIZONTAL	—	4	1'-11"	8
5h5	EAST ABUT. WING, HORIZONTAL	—	2	4'-0"	8
5h6	EAST ABUT. WING, HORIZONTAL	⌒	4	6'-10"	29
6s1	EAST ABUT. WING, VERTICAL, SOUTH	—	10	2'-10"	43
6s2	EAST ABUT. WING, VERTICAL, NORTH	—	10	4'-2"	63
6j1	DECK TRANSVERSE, TOP - AT RAIL	⌒	854	8'-11"	11,437
6j2	DECK TRANSVERSE, TOP ENDS - AT RAIL	⌒	56	VARIES	466
	Epoxy Coated Reinforcing Steel – Total Weight (lbs.)				82,175

Concrete Placement Quantites

Location	Quantity
SECTION 1, DECK & ABUT. DIAPH - STAGE 1	29.9
SECTION 2, DECK - STAGE 1	20.4
SECTION 3, DECK & ABUT. DIAPH - STAGE 1	29.6
SECTION 4, DECK - STAGE 1	17.5
SECTION 5, DECK - STAGE 1	17.5
SECTION 6, DECK & ABUT. DIAPH. - STAGE 2	23.9
SECTION 7, DECK - STAGE 2	16.8
SECTION 8, DECK & ABUT. DIAPH. - STAGE 2	23.8
SECTION 9, DECK - STAGE 2	14.4
SECTION 10, DECK - STAGE 2	14.4
Total - High Performance Structural Concrete (HPC) (cu. yds.)	208.2





Paint Limit Details

(West abutment shown; East abutment similar)

whks
engineers + planners + land surveyors

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans 60'-6" Interior Span

Superstructure Details

STA. 1187+12.50 (℄ I-29) Turn-in Date: September 1, 2026

Harrison County

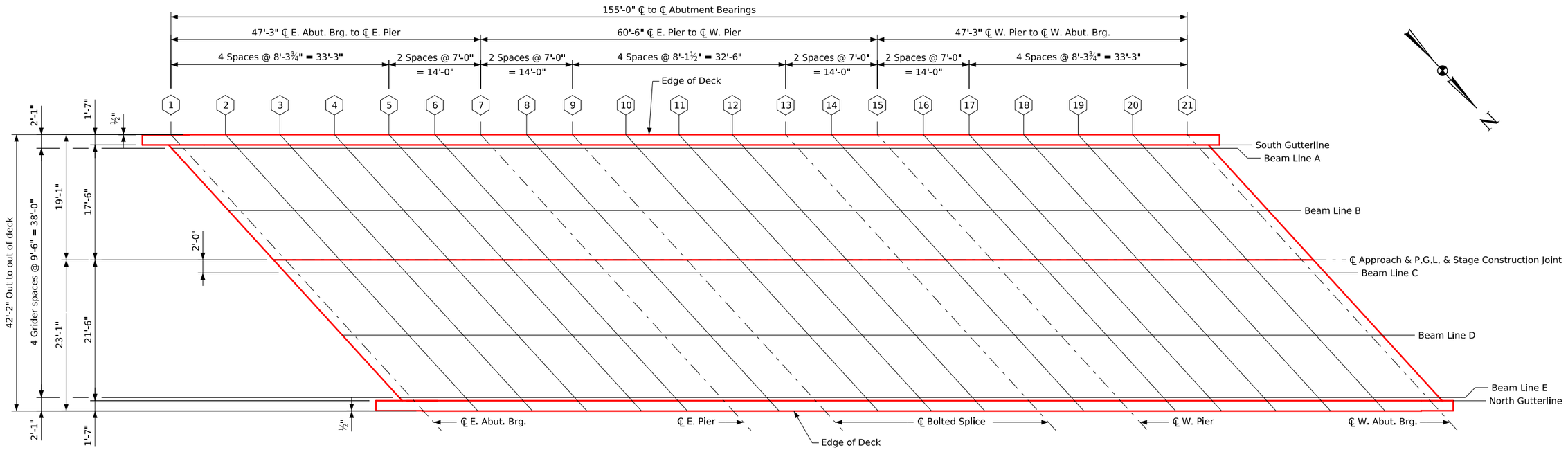
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 Design Sheet No. 15 of 25 FHWA No. 28150

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.15	

4:52:27 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn

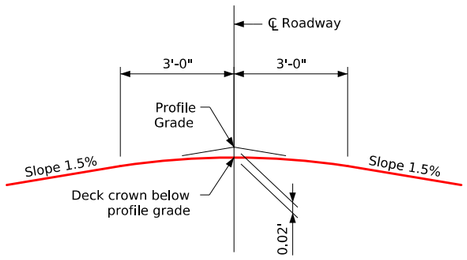
Bench Mark 500: Cut 'X' on MH Riser El. 1011.30.



Top of Deck Elevation Plan

TOP OF DECK ELEVATIONS

LOCATION	℄ E. ABUT. BRG.				℄ BOLTED SPLICE		℄ E. PIER		℄ BOLTED SPLICE				℄ BOLTED SPLICE		℄ W. PIER		℄ BOLTED SPLICE				℄ W. ABUT. BRG.
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21
SOUTH GUTTER LINE	1019.53	1019.54	1019.55	1019.56	1019.57	1019.57	1019.58	1019.58	1019.58	1019.58	1019.57	1019.57	1019.56	1019.56	1019.55	1019.54	1019.52	1019.51	1019.49	1019.47	1019.45
BEAM LINE A	1019.54	1019.55	1019.56	1019.57	1019.58	1019.59	1019.59	1019.59	1019.59	1019.59	1019.59	1019.58	1019.58	1019.57	1019.56	1019.55	1019.54	1019.52	1019.50	1019.48	1019.46
BEAM LINE B	1019.77	1019.78	1019.79	1019.80	1019.81	1019.81	1019.81	1019.81	1019.81	1019.81	1019.80	1019.79	1019.79	1019.78	1019.76	1019.75	1019.74	1019.72	1019.70	1019.68	1019.65
CROWN LINE & STAGE CONSTR. JT.	1019.87	1019.88	1019.89	1019.89	1019.90	1019.90	1019.90	1019.90	1019.90	1019.89	1019.89	1019.88	1019.87	1019.86	1019.84	1019.83	1019.81	1019.79	1019.77	1019.75	1019.72
BEAM LINE C	1019.86	1019.87	1019.88	1019.89	1019.89	1019.89	1019.89	1019.89	1019.89	1019.88	1019.87	1019.86	1019.85	1019.84	1019.83	1019.82	1019.80	1019.78	1019.76	1019.73	1019.71
BEAM LINE D	1019.73	1019.74	1019.75	1019.75	1019.75	1019.75	1019.75	1019.75	1019.74	1019.73	1019.72	1019.71	1019.70	1019.69	1019.67	1019.66	1019.64	1019.62	1019.59	1019.56	1019.54
BEAM LINE E	1019.46	1019.47	1019.47	1019.47	1019.47	1019.47	1019.47	1019.46	1019.46	1019.45	1019.43	1019.42	1019.41	1019.39	1019.37	1019.36	1019.34	1019.31	1019.29	1019.26	1019.23
NORTH GUTTER LINE	1019.45	1019.45	1019.46	1019.46	1019.46	1019.46	1019.45	1019.45	1019.44	1019.43	1019.42	1019.40	1019.39	1019.37	1019.36	1019.34	1019.32	1019.30	1019.27	1019.24	1019.21



Crown Template

No Scale

whks
engineers + planners + land surveyors

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans — 60'-6" Interior Span

Top of Deck Elevations

STA. 1187+12.50 (℄ I-29) — Turn-in Date: September 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

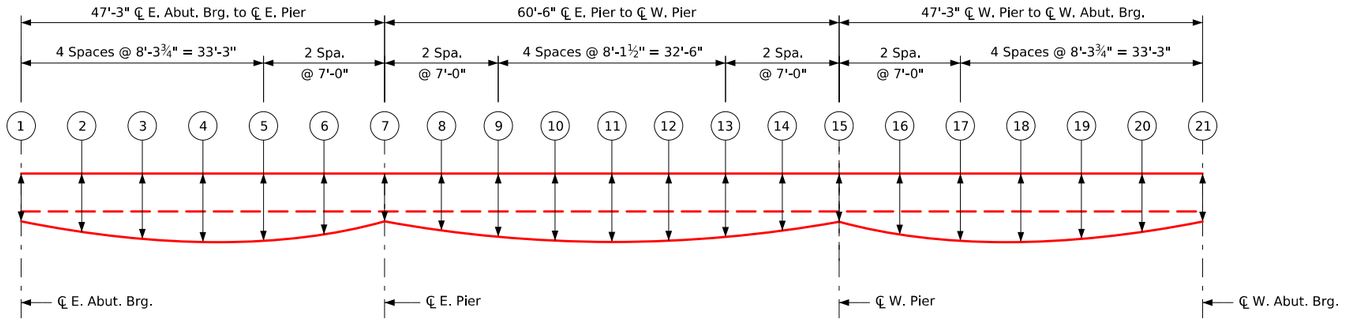
Design No. 327 — Design Sheet No. 16 of 25 — FHWA No. 28150

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.16

4:52:28 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn

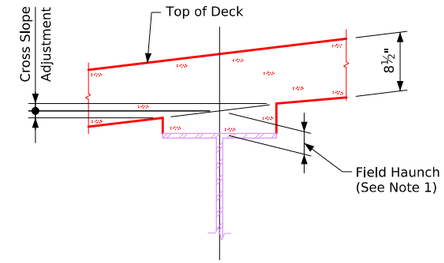
Deck Thickness At Beams (T)

Beam Line	℄ E. Abut. Brg.						℄ E. Pier		℄ Bolted Splice				℄ Bolted Splice		℄ W. Pier						℄ W. Abut. Brg.
	Line 1	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line 8	Line 9	Line 10	Line 11	Line 12	Line 13	Line 14	Line 15	Line 16	Line 17	Line 18	Line 19	Line 20	Line 21
A	10 5/16	10 3/8	10 5/16	10 1/16	9 13/16	9 9/16	9 5/16	9 1/2	9 11/16	10 3/16	10 5/16	10 3/16	9 5/8	9 1/2	9 1/4	9 7/16	9 5/8	9 13/16	9 15/16	9 15/16	9 13/16
B	9 3/8	9 7/16	9 3/8	9 3/16	8 15/16	8 11/16	8 7/16	8 5/8	8 13/16	9 3/8	9 7/16	9 5/16	8 3/4	8 9/16	8 3/8	8 9/16	8 13/16	9	9 3/16	9 1/4	9 1/8
C	9 1/2	9 5/8	9 9/16	9 3/8	9 3/16	8 15/16	8 11/16	8 7/8	9 1/16	9 5/8	9 11/16	9 5/8	9 1/16	8 7/8	8 11/16	8 7/8	9 1/16	9 5/16	9 1/2	9 1/2	9 3/8
D	9 3/4	9 7/8	9 13/16	9 5/8	9 3/8	9 1/8	8 15/16	9 1/8	9 5/16	9 7/8	10	9 15/16	9 3/8	9 1/4	9 1/16	9 1/4	9 7/16	9 11/16	9 13/16	9 7/8	9 3/4
E	10 3/8	10 1/2	10 7/16	10 1/4	10 1/16	9 13/16	9 5/8	9 13/16	10	10 9/16	10 5/8	10 9/16	10 1/16	9 7/8	9 11/16	9 7/8	10 1/8	10 5/16	10 1/2	10 9/16	10 1/2

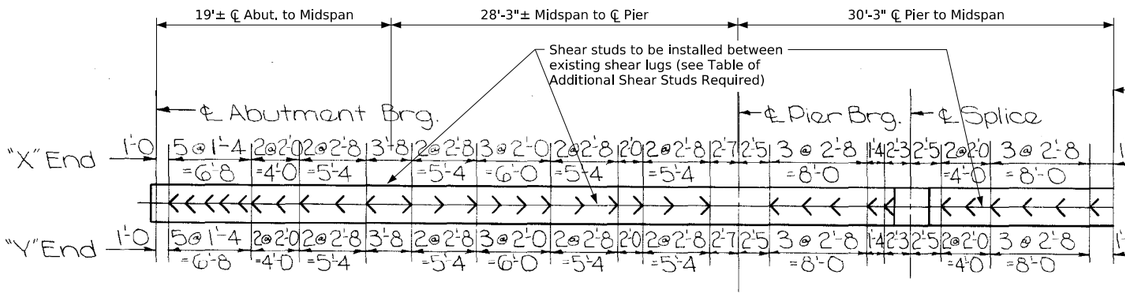


Deck Thickness at Existing Beams (T)

Note:
Haunch Locations are at the same location as the encircled letters and numbers shown on Top of Deck Elevations Sheet.

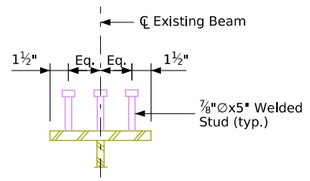


Haunch Detail



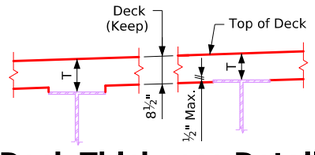
TYPICAL BEAM SHEAR LUG SPACING

Note: Detail from existing plans shown for information only.



Shear Stud Detail

This detail is to be used for installation of additional shear studs as shown on this sheet as well as replacement of damaged angle and bar shear lugs, as described in the Deck Removal Notes on Design Sheet 2. Shear studs shall be an approved type listed in Materials I.M 453.10, Appendix A.



Deck Thickness Details

Table of Additional Shear Studs Required

	End Spans	Center Span	
	℄ Abut. to Midspan	Mid Span to ℄ Pier	℄ Pier to Midspan
Exterior Beams			
Total Studs	12	21	3
Add'l Rows	4	7	1
Interior Beams			
Total Studs	15	30	12
Add'l Rows	5	10	4

Note:
Additional rows is equal to total studs divided by 3 studs per row. Contractor is allowed to determine final spacing and location to meet the minimum number of studs/rows required as shown in the table. Do not exceed 24 inches between rows of studs nor place rows closer than 4 inches center to center.

Note:
Survey and original plan data were used to determine existing top of beam elevations. Theoretical camber and beam deflections are based on existing plan data. The proposed top of deck elevations will provide a theoretical beam haunch within design parameters. Field haunches are determined using surveyed top of beam elevations and "Beam Line Haunch Elevation" data. Allowable maximum and minimum "Field Haunch" values are given in inches and decimals of feet in the "Miscellaneous Data" table. "Cross Slope Adjustment" values will aid the Contractor in determining actual formed haunch dimensions at the edges of the top flange.

Note 1:
To calculate field haunch required at each location, survey the beam tops consistent with the spacings shown on the "Top of Deck Elevation Plan". Subtract the surveyed beam shot from the "Beam Line Haunch Elevation". This value will be the haunch needed (see "Field Haunch" in haunch detail.) The "Beam Line Haunch Elevation" includes adjustments for deck thicknesses and anticipated deflections. No additional calculations are required. If the field haunch exceeds the maximums and minimums shown in inches and decimals of feet in the Miscellaneous Data Table, adjustments to the grade or additional haunch reinforcement will be required.

Note:
The deck thickness (T) at beams is estimated based on proposed top of deck elevations and anticipated beam camber and deflection data from existing plans. These deck haunch thickness values are estimates and not a guaranteed for construction.

whks
engineers + planners + land surveyors

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans — 60'-6" Interior Span

Deck Haunch Data Details

STA. 1187+12.50 (℄ I-29) — Turn-in Date: September 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 — Design Sheet No. 17 of 25 — FHWA No. 28150

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.17

4:52:29 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn

Bench Mark 500: Cut 'X' on MH Riser El. 1011.30.

BEAM LINE HAUNCH ELEVATIONS

LOCATION	℄ E. ABUT. BRG.				℄ BOLTED SPLICE		℄ E. PIER		℄ BOLTED SPLICE				℄ BOLTED SPLICE		℄ W. PIER		℄ BOLTED SPLICE				℄ W. ABUT. BRG.
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21
BEAM LINE A	1018.83	1018.86	1018.87	1018.88	1018.88	1018.88	1018.88	1018.90	1018.90	1018.91	1018.91	1018.90	1018.89	1018.87	1018.85	1018.84	1018.84	1018.83	1018.81	1018.79	1018.75
BEAM LINE B	1019.06	1019.09	1019.10	1019.11	1019.11	1019.10	1019.10	1019.11	1019.12	1019.13	1019.13	1019.11	1019.09	1019.08	1019.06	1019.04	1019.04	1019.03	1019.01	1018.98	1018.94
BEAM LINE C	1019.15	1019.18	1019.19	1019.19	1019.19	1019.18	1019.18	1019.19	1019.19	1019.20	1019.20	1019.18	1019.16	1019.14	1019.12	1019.11	1019.10	1019.09	1019.07	1019.03	1019.00
BEAM LINE D	1019.02	1019.04	1019.05	1019.06	1019.05	1019.04	1019.04	1019.05	1019.05	1019.05	1019.05	1019.03	1019.01	1018.99	1018.96	1018.95	1018.94	1018.92	1018.90	1018.87	1018.83
BEAM LINE E	1018.76	1018.77	1018.78	1018.78	1018.78	1018.76	1018.76	1018.76	1018.76	1018.76	1018.76	1018.74	1018.71	1018.69	1018.67	1018.65	1018.64	1018.62	1018.59	1018.56	1018.52

Miscellaneous Data Table

Location	Beam Line		℄ E. Abut. Brg.						℄ E. Pier		℄ Bolted Splice		
			Line 1	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line 8	Line 9	Line 10	Line 11
Anticipated Deflection Due to Deck (In.)	All		0	1/8	3/16	3/16	1/8	0	0	1/8	3/16	5/16	3/8
Cross Slope Adjustment (In.)	A,E		3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	1/8	1/8
Cross Slope Adjustment (In.)	B,C,D		1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/16	1/16
Allowable Field Haunch (In. & Ft.)	A,E	Max.	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)
		Min.	- 5/16 (-0.024)	- 5/16 (-0.024)	- 5/16 (-0.024)	- 5/16 (-0.024)	- 5/16 (-0.024)	- 5/16 (-0.024)	- 5/16 (-0.024)	- 5/16 (-0.024)	- 5/16 (-0.024)	- 3/8 (-0.029)	- 3/8 (-0.029)
	B,C,D	Max.	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)
		Min.	- 3/8 (-0.032)	- 3/8 (-0.032)	- 3/8 (-0.032)	- 3/8 (-0.032)	- 3/8 (-0.032)	- 3/8 (-0.032)	- 3/8 (-0.032)	- 3/8 (-0.032)	- 3/8 (-0.032)	- 7/16 (-0.035)	- 7/16 (-0.035)

Miscellaneous Data Table (Cont'd.)

Location	Beam Line			℄ Bolted Splice		℄ W. Pier							℄ W. Abut. Brg.
			Line 12	Line 13	Line 14	Line 15	Line 16	Line 17	Line 18	Line 19	Line 20	Line 21
Anticipated Deflection Due to Deck (In.)	All		5/16	3/16	1/8	0	0	1/8	3/16	3/16	1/8	0
Cross Slope Adjustment (In.)	A,E		1/8	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16
Cross Slope Adjustment (In.)	B,C,D		1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
Allowable Field Haunch (In. & Ft.)	A,E	Max.	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)
		Min.	- 3/8 (-0.029)	- 5/16 (-0.024)	- 5/16 (-0.024)	- 5/16 (-0.024)	- 5/16 (-0.024)	- 5/16 (-0.024)	- 5/16 (-0.024)	- 5/16 (-0.024)	- 5/16 (-0.024)	- 5/16 (-0.024)
	B,C,D	Max.	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)
		Min.	- 7/16 (-0.035)	- 3/8 (-0.032)	- 3/8 (-0.032)	- 3/8 (-0.032)	- 3/8 (-0.032)	- 3/8 (-0.032)	- 3/8 (-0.032)	- 3/8 (-0.032)	- 3/8 (-0.032)	- 3/8 (-0.032)

Note:
Haunch Locations are at the same location as the encircled letters and numbers shown on Top of Deck Elevations Sheet.

Note:
The maximum embedment of the edge of the top flange in the deck shall be ½ inch. Shear connectors are to have a minimum penetration of 2 inches into the deck and be at least 2½ inches clear of the top of the deck. These requirements were used in setting the maximum and minimum allowable field haunch values shown in the "Miscellaneous Data Table".

whks
engineers + planners + land surveyors

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans 60'-6" Interior Span

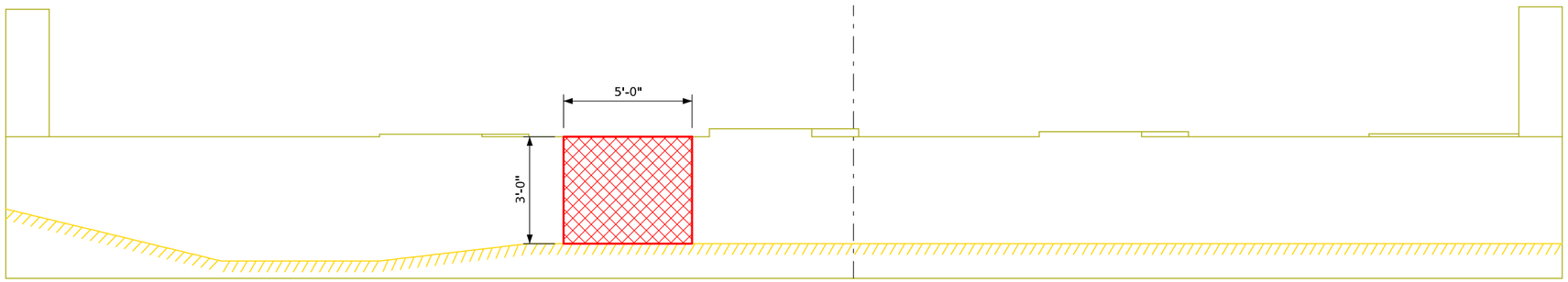
Deck Haunch Data Details

STA. 1187+12.50 (℄ I-29) Turn-in Date: September 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 Design Sheet No. 18 of 25 FHWA No. 28150



East Abutment

(Looking East)

Legend

Indicates Shallow Repair

Indicates Regular Repair

Note:
The dimensions and hatched areas shown on this sheet indicating concrete repairs are based on recent bridge inspection sketches and are for information only. The actual areas to be repaired shall be determined by the Engineer.

Note: See design sheet No. 20 for notes and details for concrete repair.

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans 60'-6" Interior Span

Concrete Repair Details

STA. 1187+12.50 (℄ I-29) Turn-in Date: September 1, 2026

Harrison County

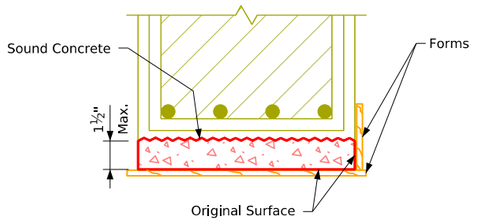
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 Design Sheet No. 19 of 25 FHWA No. 28150

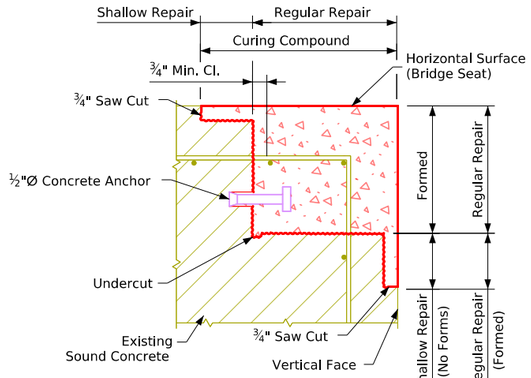
whks engineers + planners + land surveyors

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.19	

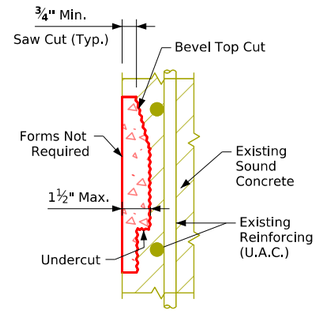
4:52:30 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn



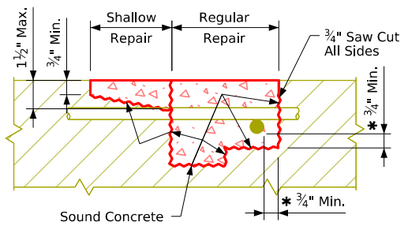
Shallow Repair Bottom Surface



Corner Repair

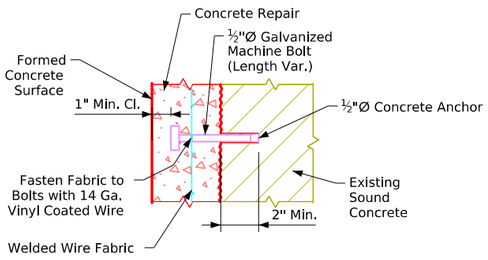


Shallow Repair Vertical Face



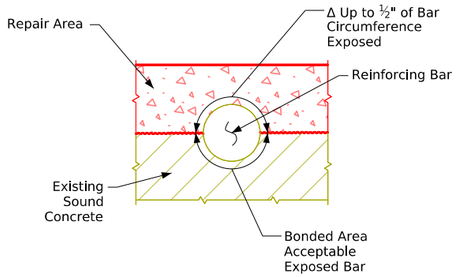
Repair Definition

✱ Indicates Clearance for an Un-Bonded Rebar.

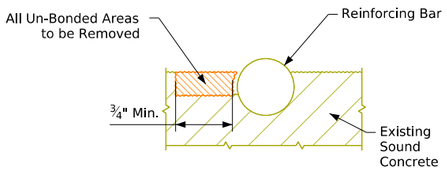


Anchor Detail

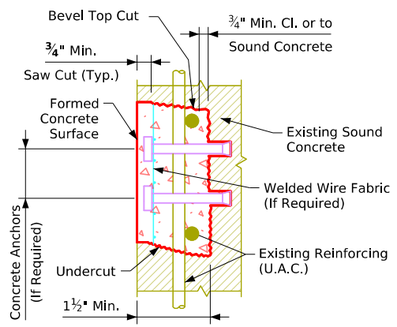
For Spacing and Use of Concrete Anchors and WWF See the Repair Notes.



Δ If more than ½ of the rebar is exposed it shall be treated as an un-bonded rebar.



Concrete Removal Adjacent to Reinforcing



Regular Repair Vertical Face

Repair Notes:

The spalled and hollow areas of this bridge as noted and shown in these plans shall be repaired as follows:

- All the costs of equipment and materials required to repair the spalled and hollow areas of this bridge shall be included in the price bid for "Concrete Repair".
- The price bid for "Concrete Repair" shall include the cost of all concrete anchors and welded wire fabric required by the plans.
- The Engineer shall determine and outline by visual and audible inspection the actual areas of the concrete repairs. The Contractor shall be paid for the actual amount of repairs made on a square foot basis based on the price bid per square foot.
- All existing reinforcing bars that are exposed by the concrete removal shall be cleaned and carefully incorporated into the new work, except badly deteriorated existing reinforcing which shall be replaced as directed by the Engineer.
- The concrete anchors required shall have a minimum pull out of 5,000 lbs based on 4,000 psi concrete. An anchor meeting the requirements of Iowa D.O.T. Materials I.M. 453.09 and the pull out load above is required. The anchors shall be galvanized and shall be installed according to recommendations of the Manufacturer. The cost of furnishing and installing the concrete anchors shall be included in the price bid for "Concrete Repair".
- The welded wire fabric shall be ASTM A185 and galvanized as per ASTM A-641. The WWF wires shall be spaced 3x3 or 4x4 and the wires shall have a nominal area of 0.014 to 0.029 sq in inclusive, example "WWF 3x3 - W1.4xW2.9".

Where reinforcement has been exposed and clearance around the periphery of the existing bar is provided, no supplemental reinforcing is required, except where existing reinforcement density and pattern are such that individual open spaces between bars are of 1.5 sq ft or larger. For this condition ½"Ø concrete anchors and welded wire fabric shall be installed at the rate of one concrete anchor with WWF per each 1.5 sq ft of area within each open space.

Repairing the structural concrete shall be in accordance with Section 2426, of the Standard Specifications.

Concrete Placement Quantities

Mark	Type	Units	Quantity
①	Shallow repair	Sq. Ft.	0
②	Regular repair	Sq. Ft.	15
		Total (Sq. Ft.)	15

Estimated Concrete Repair Quantities

Description	Units	Amount
Concrete Repair	Sq. Ft.	15

Note: For estimated repair areas and locations see design sheet 19.

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans 60'-6" Interior Span

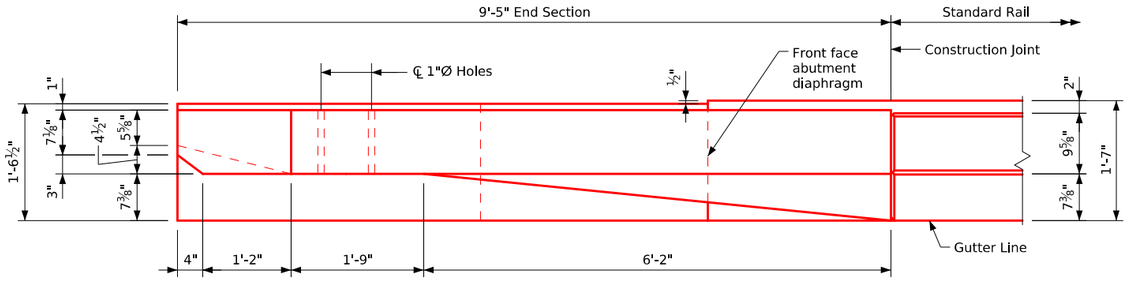
Concrete Repair Details

STA. 1187+12.50 (℄ I-29) Turn-in Date: September 1, 2026

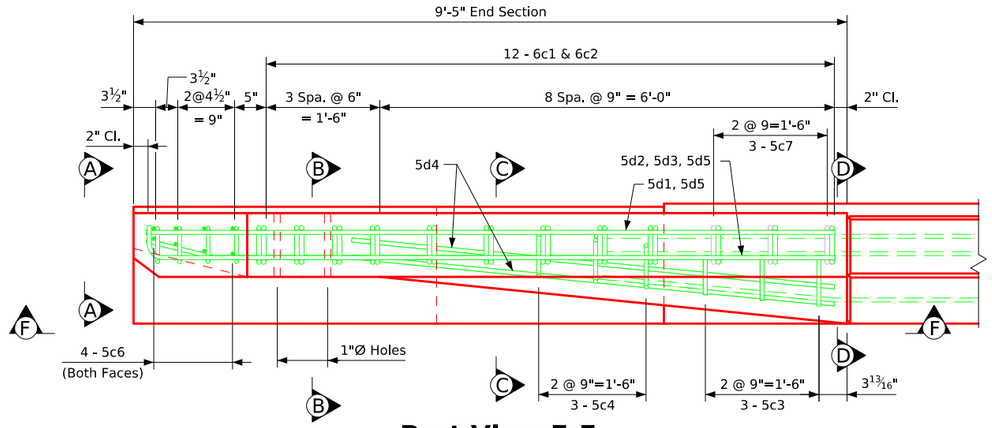
Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

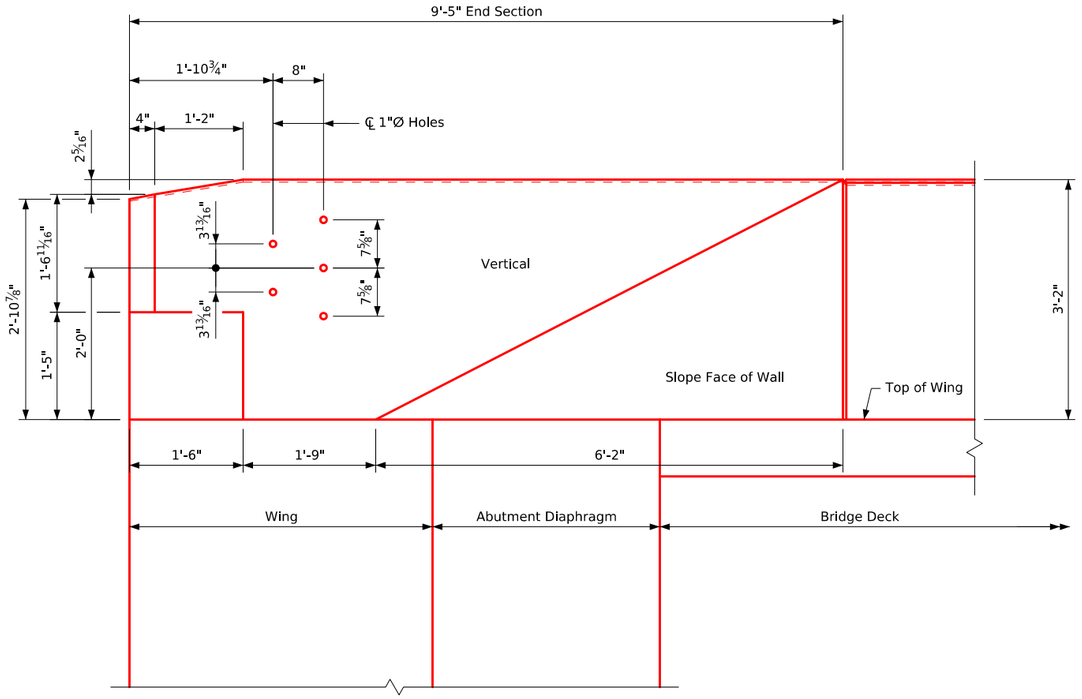
Design No. 327 Design Sheet No. 20 of 25 FHWA No. 28150



Part Plan View

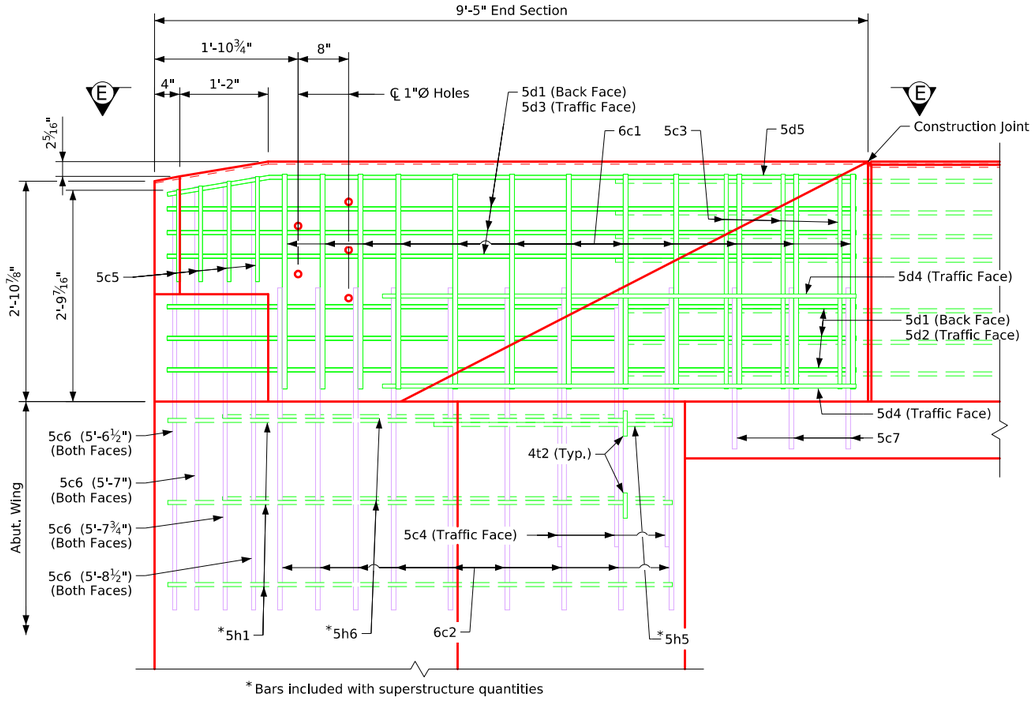


Part View E-E



Part Elevation View

Provide 5 holes formed with 1"Ø plastic conduit.
Cost to be included in price of bid for Concrete Barrier Railing.



* Bars included with superstructure quantities

Part View F-F

Notes: 4t2 placement - 3 bars each at top two rows of 5h1 bars in abutment wing and abutment diaphragm.

Construction joint between top of abutment wing and abutment wing extension with barrier rail is roughened concrete.

The 6c2, 5c4, 5c6, and 4t2 bars are to be placed with the abutment wing and abutment diaphragm.

Dashed lines below the top of wing are the abutment wing reinforcing steel. See Design Sheet 10 for details.

For Bar List, Bent Bar Details, View A-A, Sections B-B, C-C, and D-D see Design Sheet No. 22.

Note: Barrier rail end section details applicable at the east end only.

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans — 60'-6" Interior Span

Barrier Rail End Section Details

STA. 1187+12.50 (℄ I-29) — Turn-in Date: September 1, 2026

Harrison County

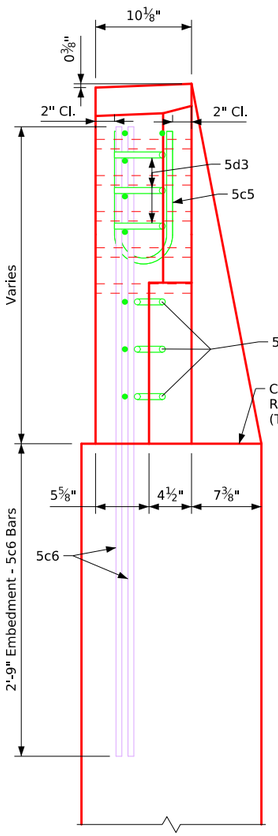
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 — Design Sheet No. 21 of 25 — FHWA No. 28150

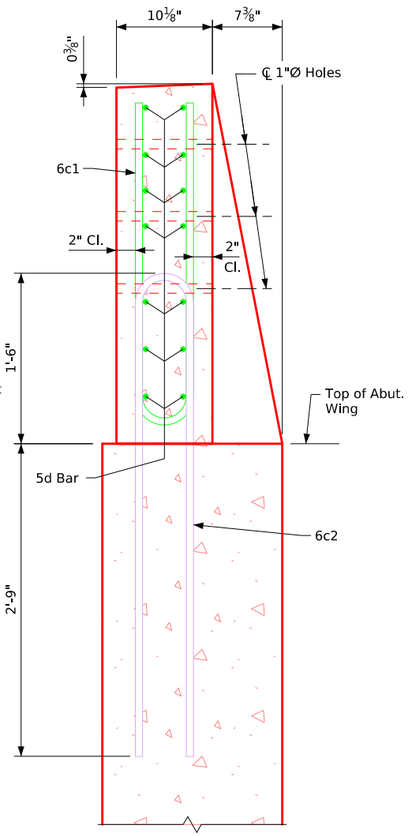
FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	Barrier Rail End Section (Stainless) - (1 of 2)	Standard Sheet 1017S-1 (Modified)	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.21	

4:52:31 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn

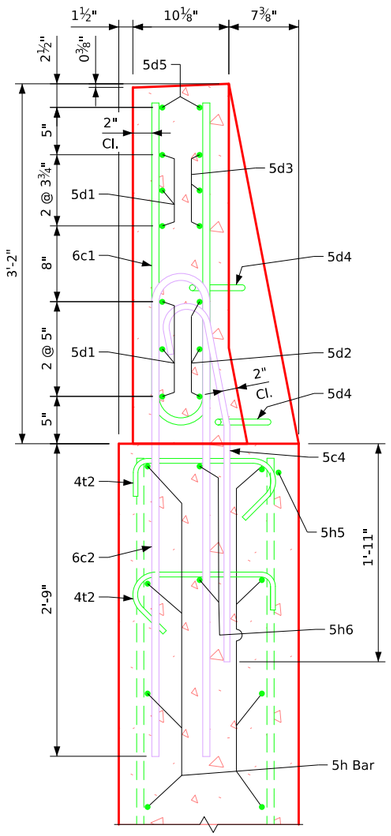
Issued 04-14. Added Stainless Steel Reinforcing Bar List and Changed 6c3, 6c4 & 5c5-10 Bars to Stainless Steel. DeckRailBridges.dgn - 1017 S-1 - This Sheet Re-Issued 05-2024. Sheet Format Update. (Sheet Number was Originally 1017S).



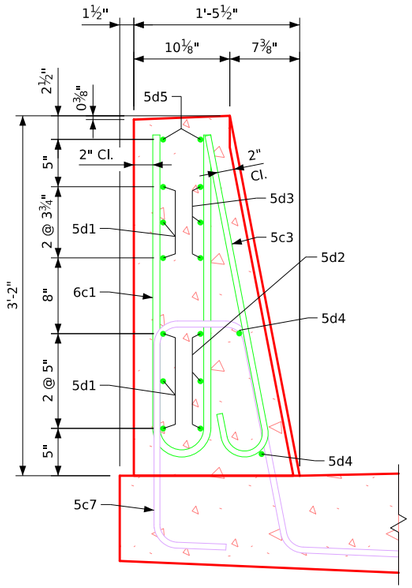
View A-A



Section B-B



Section C-C



Section D-D

Abutment wing bars in View A-A and Sections B-B & C-C are not shown for clarity.

Epoxy Coated Reinforcing Steel - One End Section

Bar	Location	Shape	No.	Length	Weight
6c1	Rail, Vertical		12	5'-11"	107
5c3	Rail, Vertical (Traffic Face)		3	3'-5"	11
5c5	Rail, Vertical (End)		4	Varies	14
5d1	Rail, Horizontal (Back Face)		6	9'-1"	57
5d2	Rail, Horizontal (Traffic Face)		3	9'-1"	28
5d3	Rail, Horizontal (Traffic Face)		3	9'-7"	30
5d4	Rail, Horizontal (Traffic Face)		2	6'-3"	13
5d5	Rail, Horizontal (Top)		2	9'-1"	19
4t2	Rail, Abutment Wing Tie Bars		6	2'-0"	8
				Epoxy Reinforcing Total Weight (lbs.)	287

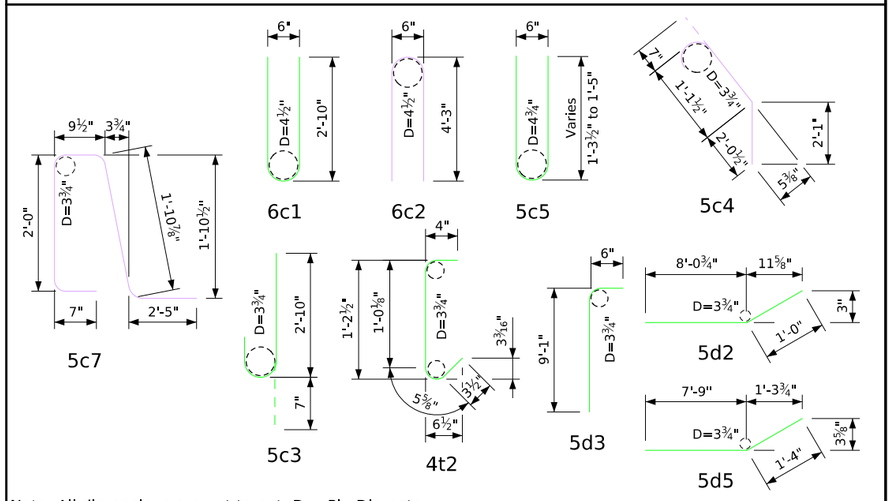
Stainless Steel Reinforcing Steel - One End Section

Bar	Location	Shape	No.	Length	Weight
6c2	Rail, Vertical		9	8'-9"	118
5c4	Rail, Vertical (Traffic Face)		3	3'-10"	12
5c6	Rail, Vertical (End)		8	Varies	47
5c7	Rail, Vertical (At Deck)		3	7'-8"	24
				Stainless Steel Reinforcing Total Weight (lbs.)	201

Concrete Placement Summary

Section	Total
Barrier Rail, One End Section	1.0 cu. yd.

Bent Bar Details



Note: All dimensions are out to out. D = Pin Diameter

Note: Reinforcing steel quantities are included on the Summary Quantities Sheet.

Notes: 4t2 placement - 3 bars each at top two rows of 5h1 bars in abutment wing and abutment diaphragm.

Construction joint between top of abutment wing and abutment wing extension with barrier rail is roughened concrete.

The 6c2, 5c4, 5c6, and 4t2 bars are to be placed with the abutment wing and abutment diaphragm.

Dashed lines below the top of wing are the abutment wing reinforcing steel. See Design Sheet 10 for details.

For Plan and Elevation see Design Sheet No. 21.

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans — 60'-6" Interior Span

Barrier Rail End Section Details

STA. 1187+12.50 (℄ I-29) — Turn-in Date: September 1, 2026

Harrison County

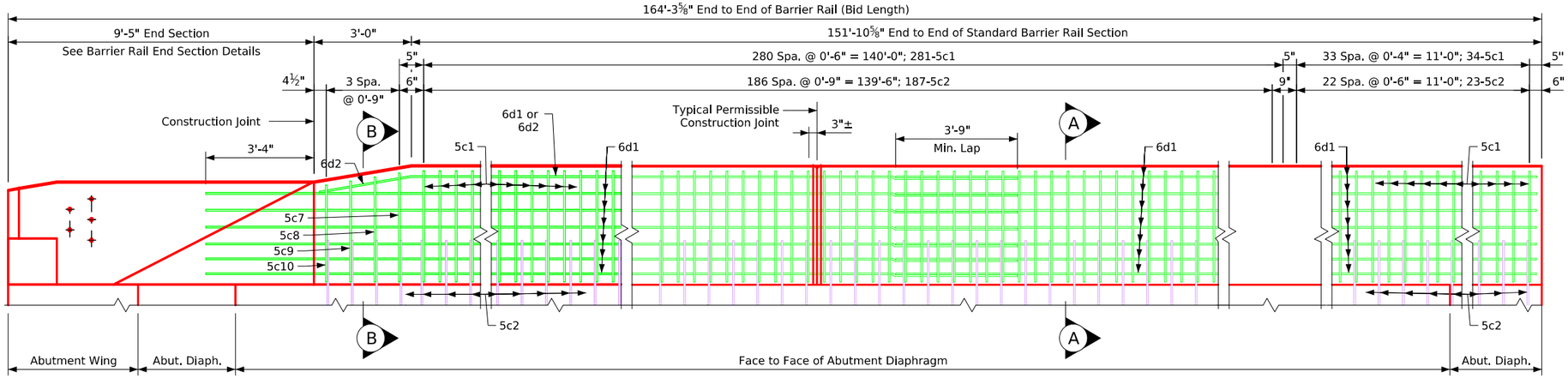
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 — Design Sheet No. 22 of 25 — FHWA No. 28150

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	Barrier Rail End Section (Stainless) - (2 of 2)	Standard Sheet 1017S-2 (Modified)	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.22	

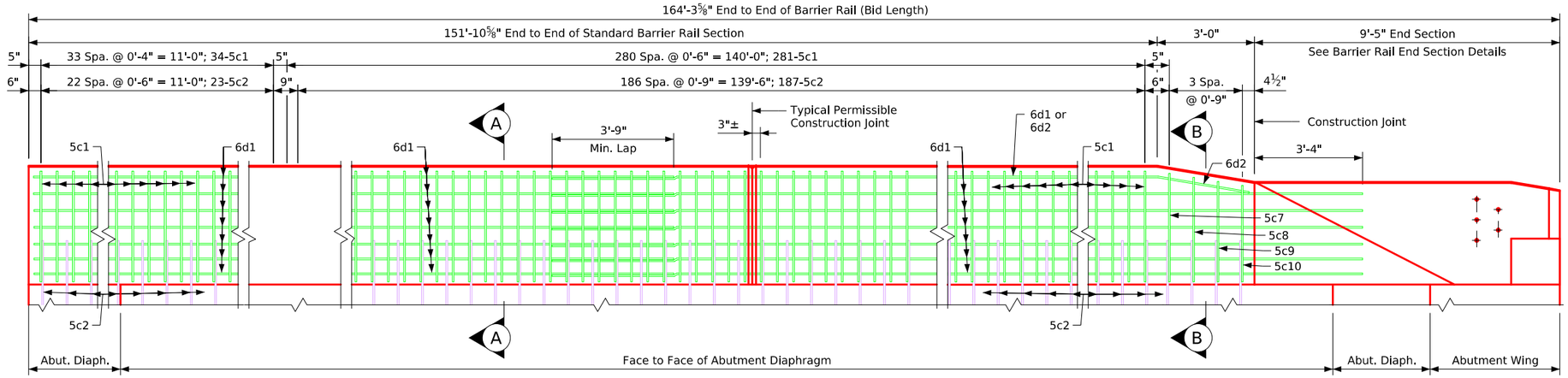
4:52:32 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn

DeckRailBridges.dgn - 1017S-2 - This Sheet Issued 05-2024. Revised to Single Slope Barrier Shape. Additional Sheet for Clarity. (Sheet Number was Originally 1017S).



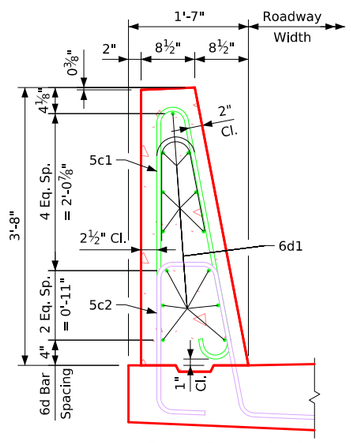
Elevation of Barrier Rail

(South Rail Looking South)

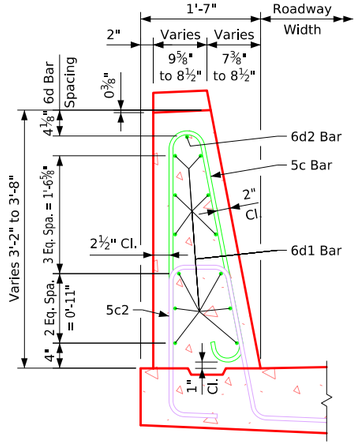


Elevation of Barrier Rail

(North Rail Looking North)



Part Section A-A



Part Section B-B

See Barrier Rail Details on Design Sheet 24 for notes, reinforcing steel details, and quantities.

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans — 60'-6" Interior Span

Barrier Rail Details

STA. 1187+12.50 (℄ I-29)

Turn-in Date: September 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 — Design Sheet No. 23 of 25 — FHWA No. 28150

Correction 04-14: Added Stainless Steel Reinforcing Bar List and Changed 5c2 Bars to Stainless Steel.
Issued 11-07.
DeckRailBridges.dgn - 1020SD-1 -This Sheet Re-Issued 05-2024. Revised to Single Slope Barrier Shape. Sheet Format Update. (Sheet Number was Originally 1020SD).

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	Barrier Rail (TSS TL-5) (Stainless) - Integral Abut. (1 of 2)	Standard Sheet 1020SD-1 (Modified)	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.23	

4:52:32 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn

Barrier Rail Notes:

Minimum clear distance from face of concrete to near reinforcing bar is to be 2" unless otherwise noted or shown.

The permissible construction joints are to be placed between vertical bars at a minimum spacing of 20 feet. Construction joint contact surfaces are to be coated with an approved bond breaker.

Cost of the joint sealer and bond breaker shall be considered incidental to other construction.

All barrier rail reinforcing steel is to be either epoxy coated or stainless steel as shown. The stainless steel reinforcing steel shall be deformed bar grade 60 meeting the requirements of Construction and Materials I.M. 452.

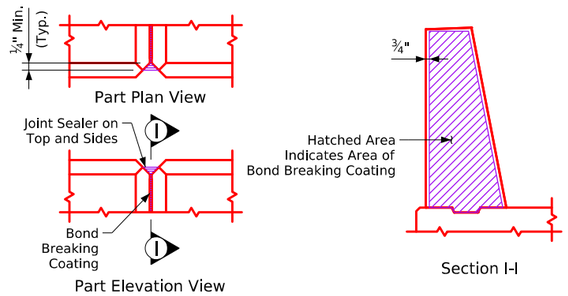
The concrete barrier rail is to be bid on a lineal foot basis. The number of linear feet of barrier rail installed will be paid for at the contract price per lineal foot based on plan quantities. Price bid for concrete barrier railing shall be full compensation for furnishing all material, excluding reinforcing steel, and all of the equipment and labor required to erect the rail in accordance with these plans and current specifications. If conduit is required in this plan the rigid steel conduit, junction boxes and fittings including labor and any additional work to do the installation is considered incidental to the cost of the railing.

The joint sealer shall be light gray nonsag latex caulking sealer marketed for outdoor use. No testing or certification is required.

Top of the barrier rail is to be parallel to the theoretical ℄ grade.

All exposed corners on the top of the barrier and all other corners 90° or sharper to be filleted with a ¾" dressed and beveled strip.

Cross sectional area of the Standard Sections of the barrier rail = 3.90 square feet, except the 3'-0" sloped ends at the end sections.

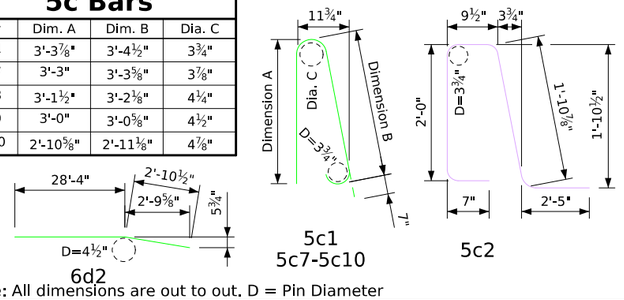


Barrier Rail Joint Details

Bent Bar Details

5c Bars

Bar	Dim. A	Dim. B	Dia. C
5c1	3'-3⅞"	3'-4½"	3¾"
5c7	3'-3"	3'-3⅝"	3⅞"
5c8	3'-1½"	3'-2⅛"	4¼"
5c9	3'-0"	3'-0⅝"	4½"
5c10	2'-10⅝"	2'-11⅛"	4⅞"



Note: All dimensions are out to out. D = Pin Diameter

Note: Reinforcing steel quantities are included on the Summary Quantities Sheet.

Epoxy Coated Reinforcing Steel – Two Rails

Bar	Location	Shape	No.	Length	Weight
5c1	Rail, Vertical		630	7'-6"	4,928
5c7	Rail, Vertical, Sloped Ends		2	7'-4"	15
5c8	Rail, Vertical, Sloped Ends		2	7'-1"	15
5c9	Rail, Vertical, Sloped Ends		2	6'-10"	14
5c10	Rail, Vertical, Sloped Ends		2	6'-7"	14
6d1	Rail, Longitudinal		128	34'-8"	6,665
6d2	Rail, Longitudinal (Top)		2	31'-3"	94
				Epoxy Coated Reinforcing Steel – Total Weight (lbs.)	11,745

Stainless Steel Reinforcing Steel – Two Rails

Bar	Location	Shape	No.	Length	Weight
5c2	Rail, Vertical		428	7'-8"	3,422
				Stainless Steel Reinforcing Steel – Total Weight (lbs.)	3,422

Concrete Placement Quantites

	Location	Quantity
Δ	Standard Section 309'-9 at 0.144 cu. Yd. per ft.	44.6
	Total (cu. yds.)	44.6

Δ Note: Deduct 0.021 cu. yd. for one sloped end

Concrete Barrier Rail Quantities

Item	Unit	Quantity
Concrete Barrier Rail, 3'-8"	L.F.	328.6

See Barrier Rail Details on Design Sheet No. 23 for details and sections.

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans 60'-6" Interior Span

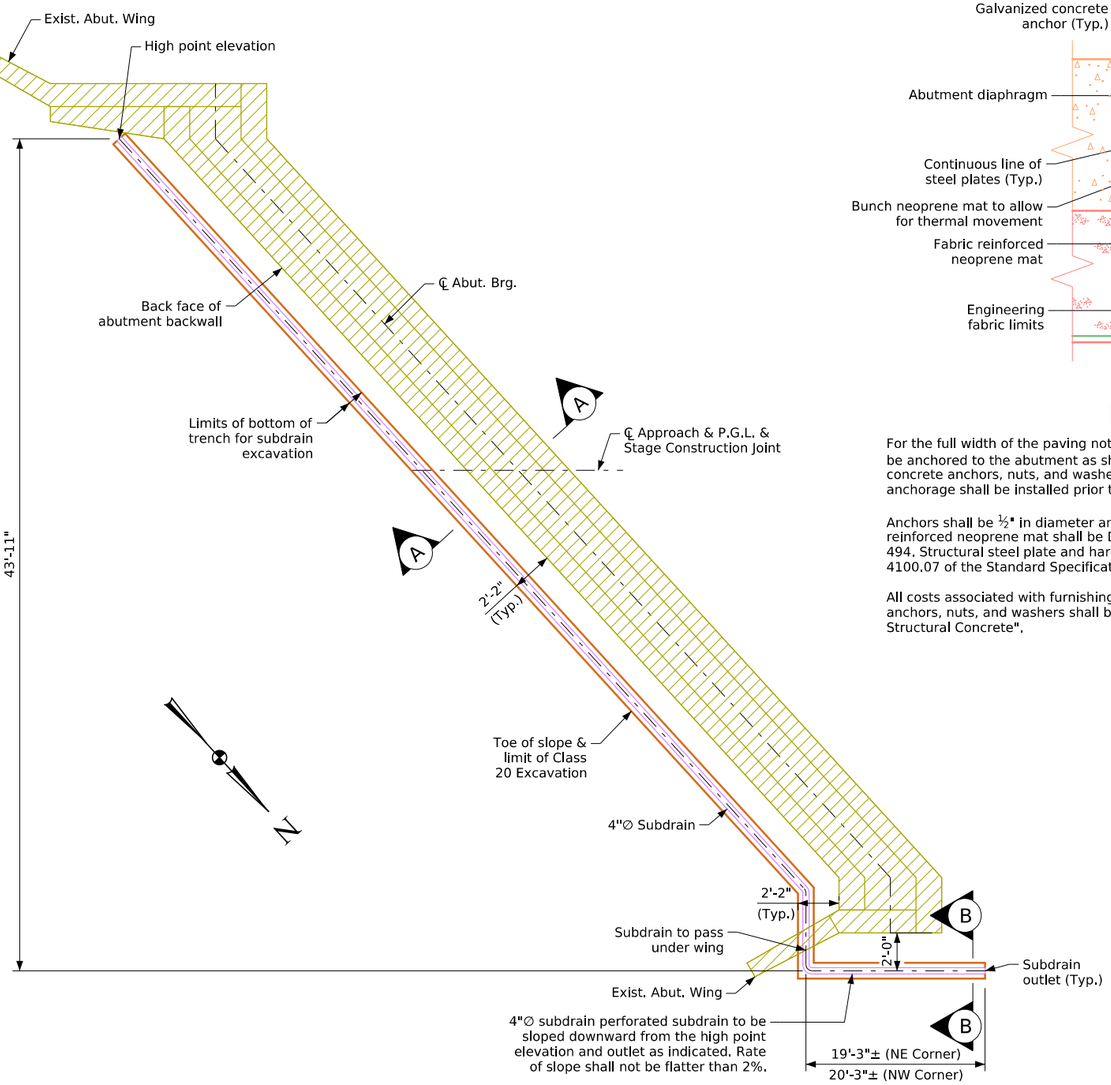
Barrier Rail Details

STA. 1187+12.50 (℄ I-29) Turn-in Date: September 1, 2026

Harrison County

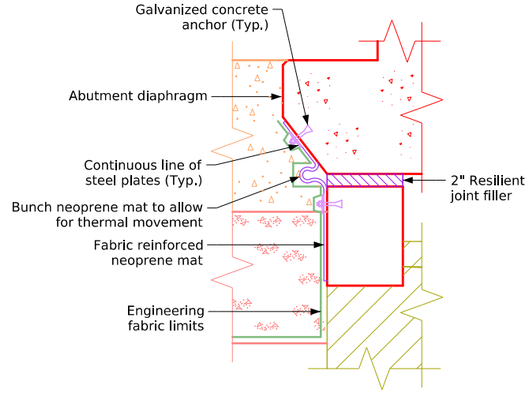
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 Design Sheet No. 24 of 25 FHWA No. 28150



Abutment Subdrain Plan

East abutment shown, West abutment similar)



Detail A

For the full width of the paving notch, a 2'-0"x¼" fabric reinforced neoprene mat shall be anchored to the abutment as shown with a continuous line of 5"x⅜" steel plates and concrete anchors, nuts, and washers spaced at 1'-0" maximum. Neoprene mat and anchorage shall be installed prior to engineering fabric.

Anchors shall be ½" in diameter and in accordance with Materials IM 453.09. Fabric reinforced neoprene mat shall be Durometer 50 and in accordance with Materials IM 494. Structural steel plate and hardware shall be galvanized in accordance with Article 4100.07 of the Standard Specifications.

All costs associated with furnishing and installing neoprene mat, steel plates, concrete anchors, nuts, and washers shall be included in the price bid for "High Performance Structural Concrete".

Subdrain Notes:

This plan sheet shows details for placing all subdrains and subdrain outlets required for this structure.

The subdrains shall be 4"Ø and shall be in accordance with Article 4143.01, B, of the Standard Specifications.

The subdrain outlet shall consist of a length of pipe with a removable rodent guard as detailed on this sheet. The length of the outlet pipe shall be determined by the revetment and it's placement location. The Contractor is to insure the outlet pipe is adequately strong enough and will not be damaged when revetment is placed. A check will be made at the subdrain outlet to insure that the subdrain is not damaged and is draining properly during the backfill flooding process. If a metal outlet pipe is used, it shall be 6"Ø and coupled to the 4"Ø subdrain in one of the two following ways.

-Use an inside fit reducer coupler (coupler must be inserted a minimum of 1'-0" into the metal outlet pipe).

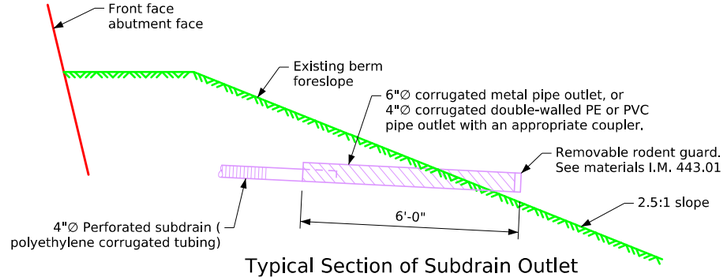
-Insert 1'-0" of the 4"Ø subdrain into the 6"Ø metal outlet pipe, then fully seal the entire opening with grout.

The cost of furnishing and placing subdrain (including excavation), granular backfill, porous backfill, and subdrain outlet is to be included in the price bid for "Excavation, Class 20". No extra payment will be made.

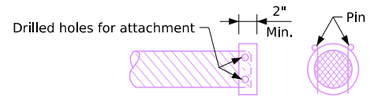
The dimensions shown for the proposed subdrains are based on the proposed grading layout of bridge berms. The dimensions shown are for estimating only. Required lengths and general locations of subdrains are subject to change due to field adjustments of the grading layout.

Subdrain Outlet Elevations

Location	Elevation
East Abutment	1011.60
West Abutment	1011.21

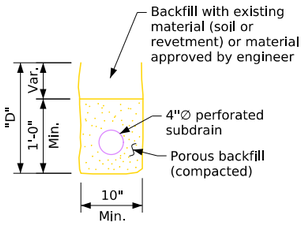


Typical Section of Subdrain Outlet



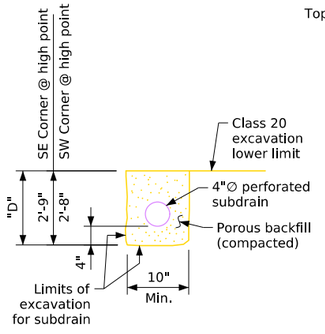
Removable Rodent Guard Details

Outlet Details



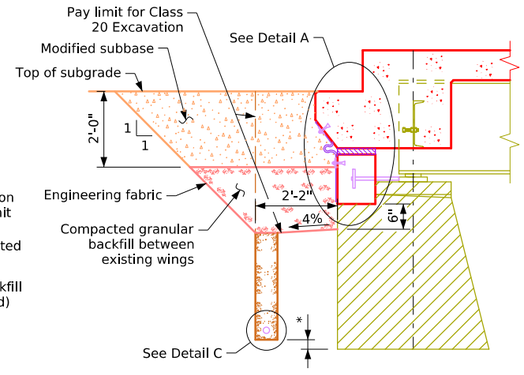
Section B-B

"D" = Depth required to provide proper flow line for subdrain.



Detail C

"D" = Depth required to provide proper flow line for subdrain.



Section A-A

* Bottom of subdrain shall be 1" minimum above bottom of footing where subdrain passes under wing.

whks
engineers + planners + land surveyors

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans — 60'-6" Interior Span

Subdrain Details

STA. 1187+12.50 (℄ I-29)

Turn-in Date: September 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 327 — Design Sheet No. 25 of 25 — FHWA No. 28150

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.25

4:52:37 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_327_28150_Z06.dgn

ESTIMATED BRIDGE REPAIR QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	
1	2413-0698074	DECK REPAIR, CLASS A	SY	139	
2	2426-6772016	CONCRETE REPAIR	SF	18	
3	2506-4984000	FLOWABLE MORTAR	CY	1	
4	2507-3250005	ENGINEERING FABRIC	SY	348	
5	2507-6799000	BANK SHAPING	LS	1	
6	2507-6800061	REVETMENT, CLASS E	TON	300	
7	2510-6745640	REMOVAL OF EXISTING P.C. OVERLAY	SY	695	
8	2533-4980005	MOBILIZATION	LS	1	
		Design No. 0427-Harrison Alternate AA Option 1			
9	2413-0698066	DECK OVERLAY (CLASS O PCC)	SY	695.1	
		Design No. 0427-Harrison Alternate AA Option 2			
10	2403-1000010	TRIAL BATCH AND TEST PLACEMENT (FIBER REINFORCED CONCRETE)	LS	1	
11	2413-0698067	DECK OVERLAY (CLASS HPC-O PCC)	SY	695.1	
12	2413-1000005	FIBER REINFORCEMENT FOR CONCRETE REPAIR/OVERLAY	SY	695.1	

ESTIMATE REFERENCE INFORMATION

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	ITEM DESCRIPTION
1	2413-0698074	DECK REPAIR, CLASS A Quantity for Class A repair is estimated as 20% of the deck area due to the presence of an existing deck overlay.
2	2426-6772016	CONCRETE REPAIR - -
3	2506-4984000	FLOWABLE MORTAR Includes estimated quantity for filling low and undermined areas at the west abutment. See notes and details on Design Sheet 2.
4	2507-3250005	ENGINEERING FABRIC Engineering fabric shall be material as specified for embankment erosion control in accordance with Article 4196.01,B,3, of the Standard Specifications. Material shall be measured in sq. yard of actual area covered. Refer to details on Design Sheet 3.
5	2507-6799000	BANK SHAPING Item is for shaping and smoothing of the stream banks prior to placing engineering fabric and revetment. See notes and details on Design Sheets 2 and 3.
6	2507-6800061	REVETMENT, CLASS E Item is for placement of channel lining along east and west banks. See details on Design Sheet 3. Estimated at 1.5 ton/cu yd. Class E revetment shall meet requirements of Article 4130.
7	2510-6745640	REMOVAL OF EXISTING P.C. OVERLAY For method of measurement and basis of payment, see notes on Design Sheet 2.
8	2533-4980005	MOBILIZATION - -
9	2413-0698066	DECK OVERLAY (CLASS O PCC) Includes furnishing and applying concrete sealer to the bridge rails. Includes installing new "BE" joints at each abutment and all associated labor/materials including removal and preparation of concrete surfaces.
10	2403-1000010	TRIAL BATCH AND TEST PLACEMENT (FIBER REINFORCED CONCRETE) Includes all work and materials necessary for trial batch and test placement of fiber reinforced concrete. Refer to "Developmental Specifications for Fiber Reinforcement for Structural Concrete" for additional information.
11	2413-0698067	DECK OVERLAY (CLASS HPC-O PCC) Includes furnishing and applying concrete sealer to the bridge rails. Includes installing new "BE" joints at each abutment and all associated labor/materials including removal and preparation of concrete surfaces.
12	2413-1000005	FIBER REINFORCEMENT FOR CONCRETE REPAIR/OVERLAY See Developmental Specifications for Fiber Reinforcement for Structural Concrete. Polypropylene fibers shall be included in the bridge deck overlay.

whks
engineers + planners + land surveyors

Note:
Roadway quantities shown elsewhere in these plans.

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous
I-Beam Bridge

47'-3" End Spans 60'-6" Interior Span

Estimated Bridge Quantities

STA. 1187+12.50 (℄ I-29) Turn-in Date: September 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 427 Design Sheet No. 1 of 6 FHWA No. 28160

General Notes:

This design is for repairs to the existing 155′-0″ x 39′-0″ Continuous Steel I-Beam bridge located on SB I-29 over Allen Creek in Harrison County. Dimensions on these plans are based on original design plans. Electronic copies of original design plans will be made available to the contractor as part of the e-files supplied with the contract documents.

See Design Sheet No. 3 for list of repair items.

Faint lines on plans indicate the existing structure.

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

Present deck thickness is about 9½ inches, including existing overlay. The Contractor shall exercise care in removing concrete in order to prevent unnecessary unbonding of reinforcing steel.

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.

Minimum clear distance from face of concrete to near reinforcing bar is to be 2″ unless otherwise noted or shown.

No preliminary deck survey is shown. The plan quantity for "Class A Bridge Deck Repair" is estimated as 20% of the total deck area. The actual quantity is determined by the Engineer after the PCC overlay has been removed. Actual spalled and hollow areas as determined by the Engineer shall be repaired.

Construction shall be done in stages with at least one lane traffic maintained at all times in accordance with "Traffic Control Plan" note.

Ready mix trucks are not allowed on the prepared portion of the bridge deck.

The bridge deck is covered with a 1¾ inch thick Portland cement concrete overlay. The contractor shall note the redefining of the classification line (Boundary between repair and overlay) for this project due to the existing 1¾ inch overlay. The classification line will be defined as 2 inches below the top of existing overlay. This will necessitate the removal of the existing bridge deck overlay before placing the proposed new bridge deck overlay.

The bridge deck may have been epoxy-injected. The Contractor shall remove all exposed epoxy. Removal of epoxy is incidental to "Removal of Existing P.C.C. Overlay" and "Deck Repair, Class A" as appropriate.

All costs associated with the removal of the existing overlay shall be included in the bid item "Removal of Existing P.C.C. Overlay". Removal of existing overlay shall be computed in square yards from the measurement of areas removed. The contractor will be paid the contract price per square yard for furnishing all equipment and labor necessary to remove the concrete to within ¼ inch above the classification line. All costs, including furnishing equipment and labor, associated with removal of the next ¼ inch of concrete (to the classification line) shall be included in the bid item "Deck Overlay".

Upon completion of the removal of concrete down to the classification line, the Engineer shall determine the areas of bridge deck to be repaired as "Deck Repair, Class A". Actual hollow areas, as determined by the Engineer, shall be repaired.

Surface preparation shall be according to Article 2413.03, B and C of the Standard Specifications. The Contractor shall ensure the vertical edge of the stage 1 overlay is prepared for placement of the new concrete for stage 2 by sandblasting or shot blasting, followed by an air blast. Ensure this cleaning removes all dirt, oil, and other foreign material. Ensure it removes all unsound concrete, laitance, or loose material from the surface and edges against which the surface mixture is to be placed. The cleaning should roughen the surface in order to provide a satisfactory bond with the surfacing mixture.

The top and interior faces of the existing concrete railing are to be cleaned and sealed in accordance with Article 2403.03, P, of the Standard Specifications. All costs associated with cleaning and sealing of the concrete rails shall be included in the unit price bid item "Deck Overlay".

Specifications:

Design: AASHTO Series 2002.

Construction: Iowa Department of Transportation Standard Specifications for Highway and Bridge Constrution, Series 2023, plus applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions shall apply to construction work on this project.

Developmental Specification for Fiber Reinforcement for Structural Concrete.

Design Stresses:

Design stresses for the following materials are in accordance with the AASHTO Standard Specifications for Highway Bridges, Series 2002.

Reinforcing steel in accordance with Section 8, grade 60.

Concrete in accordance with Section 8, f'c = 4.0 ksi.

Bank Shaping Notes:

The Contractor shall smooth and shape the channel banks prior to placing engineering fabric and revetment as detailed in these plans. Actual areas of bank shaping shall be determined by the engineer in the field. Includes excavation for placement of revetment and off-site disposal of waste material if necessary. All costs for material, equipment, and labor required to repair the bank shall be included in the lump sum unit price for "Bank Shaping". No additional measurement or payment shall be made.

The Bridge Contractor shall dress up the slopes around the wings which are disturbed during construction. This work shall be considered incidental and no extra payment will be made.



Detail of West Abutment Undermining

At South Edge Looking West

Note: Flowable mortar to be placed under the West Abutment to repair and encase piles that are currently exposed. The area to be filled is approximately 5'-6" long, has a maximum height of 9", and a maximum depth of 2'-0". The quantity has been rounded to the nearest 1 Cu. Yd. for estimating purposes. Payment will be based on the actual volume furnished and placed at the contract price per cubic yard.

Traffic Control Plan:

I-29 will be open to thru traffic. Refer to traffic control plans shown elsewhere in these plans.

Design History at this Site

(Includes this Design)

Des. No.	Type of Work
565	Original Design
590	Overlay & Retrofit Rail
215	Rehabilitation
427	Re-Overlay

whks
engineers + planners + land surveyors

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans 60'-6" Interior Span

General Notes

STA. 1187+12.50 (℄ I-29) Turn-in Date: September 1, 2026

Harrison County

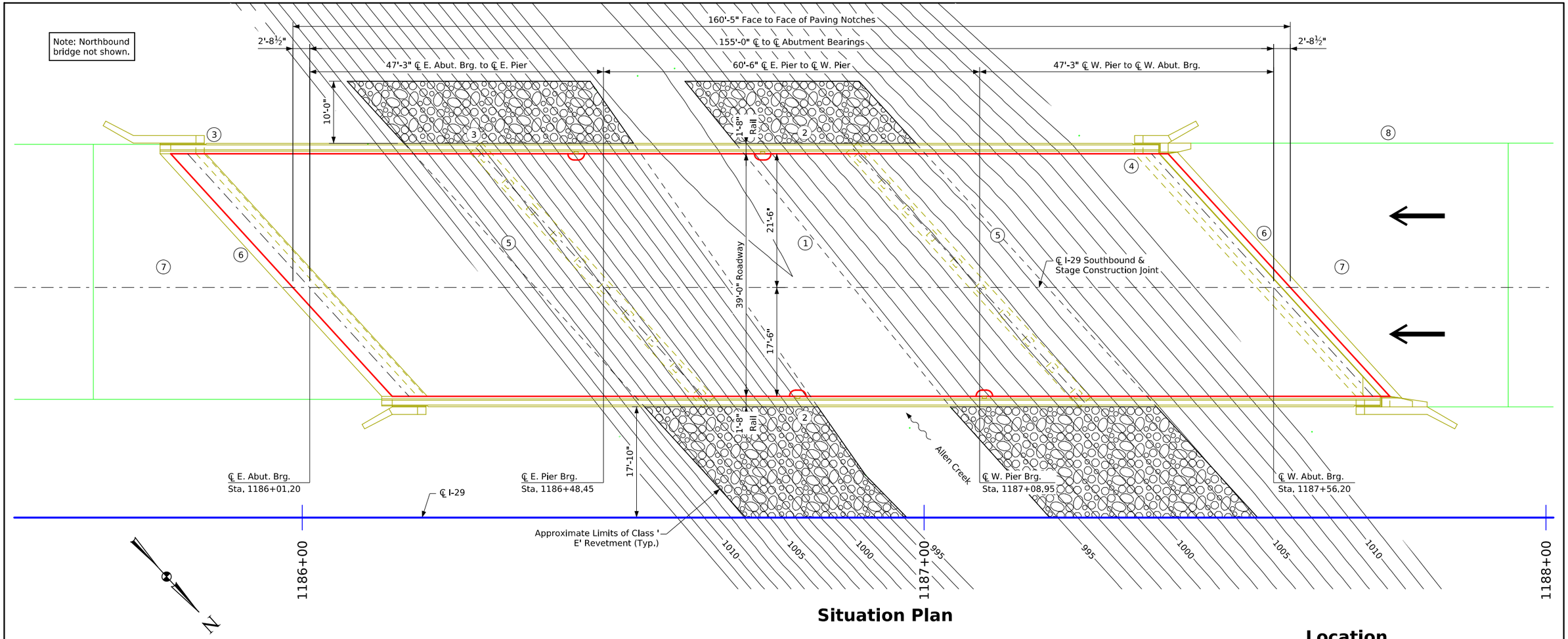
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 427 Design Sheet No. 2 of 6 FHWA No. 28160

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.27

4:52:48 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_427_28160_Z06.dgn

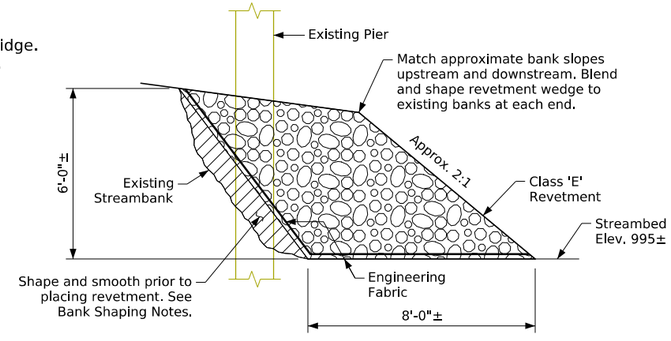
Note: Northbound bridge not shown.



Situation Plan

Repairs Shall Consist of:

1. Remove the existing overlay, perform Class A repairs as needed, and re-overlay the bridge.
2. UAC existing bridge rail and end sections. Apply concrete sealer to face of barrier rails.
3. Perform concrete repairs to east abutment maskwall and east pier face.
4. Fill undermining at west abutment with flowable mortar.
5. Perform bank shaping and place channel lining using Class E revetment.
6. Replace joints between bridge deck and approach with a BE joint.
7. UAC bridge approaches and guardrail.
8. Construct a bridge end drain at the southwest corner of the bridge.



Typical Channel Lining Detail

Location

I-29 (SB) over Allen Creek
T-78N R-44W
Section 8
St. Johns Township
Harrison County
FHWA No. 28160
Bridge Maint. No. 4337.6L029
Latitude 41.574035°
Longitude -95.928523°

Traffic Estimate

2023 AADT	7,900 V.P.D.
TRUCKS	31 %

whks
engineers + planners + land surveyors

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans — 60'-6" Interior Span

Situation Plan

STA. 1187+12.50 (℄ I-29) — Turn-in Date: September 1, 2026

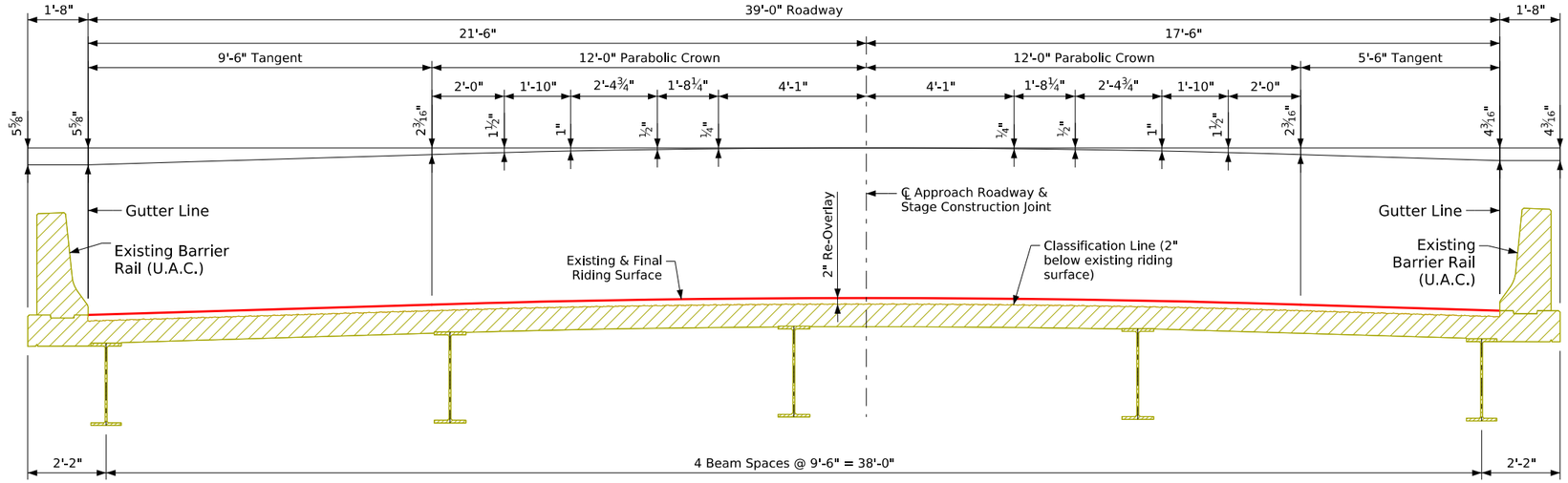
Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 427 — Design Sheet No. 3 of 6 — FHWA No. 28160

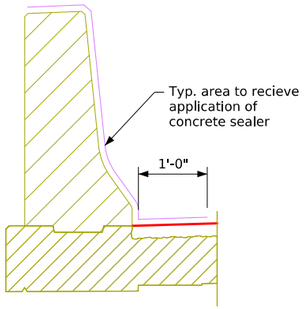
FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.28

4:52:50 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_427_28160_Z06.dgn



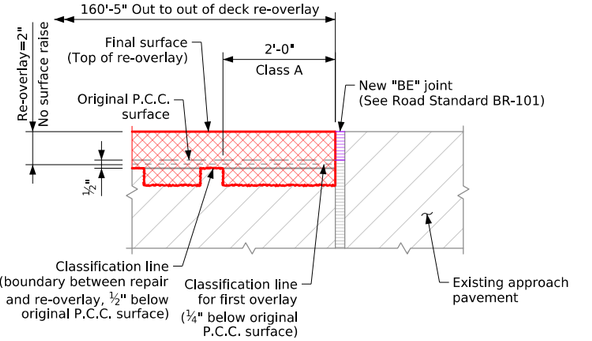
Transverse Section

(Looking West)



Detail Of Concrete Sealer Area

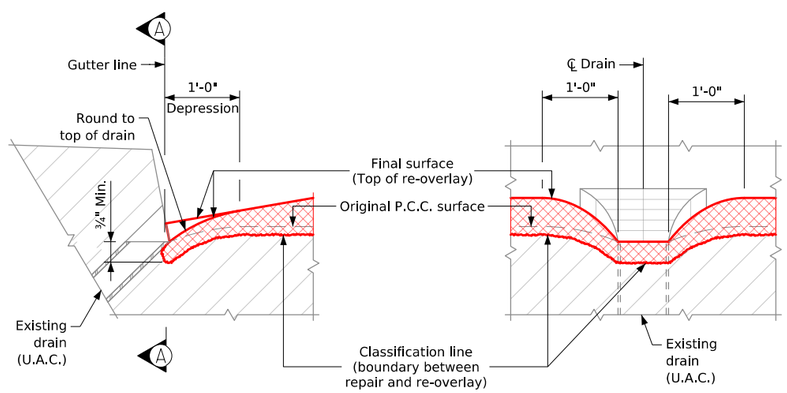
Note:
The 2'-0" Class "A" repair area shown at the joint shall be removed to a minimum depth 1" below the existing top mat of reinforcing. The existing bridge deck reinforcing bars shall be carefully exposed and incorporated into the new construction work.



Part Longitudinal Section Along Roadway

Each Abutment

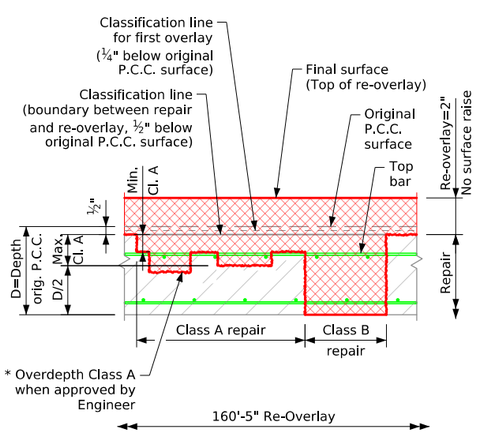
* Per IDOT Std. Spec. 2413.03.C.3.b, limited areas of Class A removal may exceed 50% of the floor thickness at the Engineer's direction. These limited areas of excess depth (overdepth) will be measured as Class A deck repair.



Section A-A

Deck Repair Detail at Drain

(Required at 4 Locations)



Repair and Re-Overlay Definition

whks
engineers + planners + land surveyors

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans — 60'-6" Interior Span

Deck Repair Details

STA. 1187+12.50 (℄ I-29) — Turn-in Date: September 1, 2026

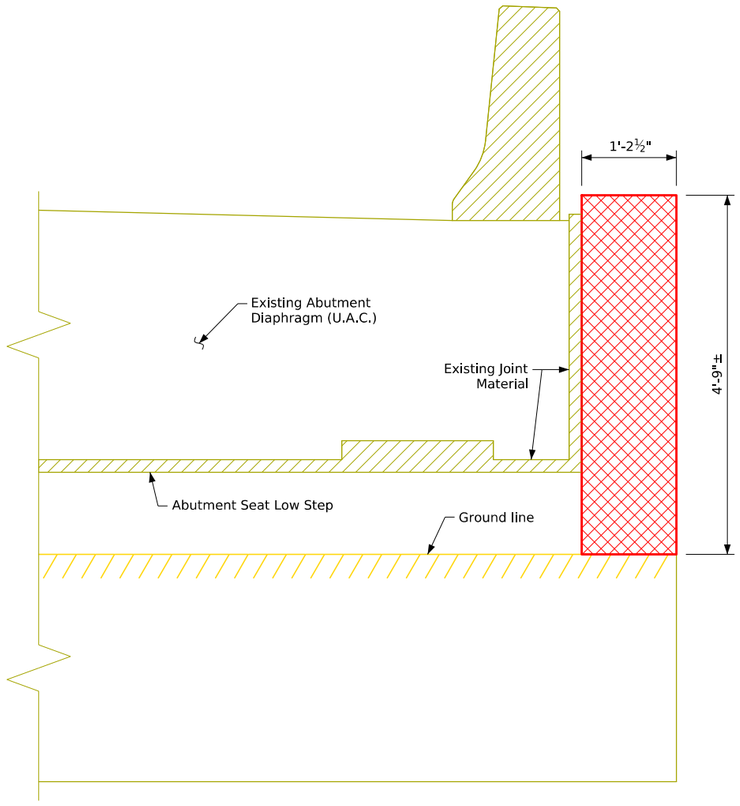
Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 427 — Design Sheet No. 4 of 6 — FHWA No. 28160

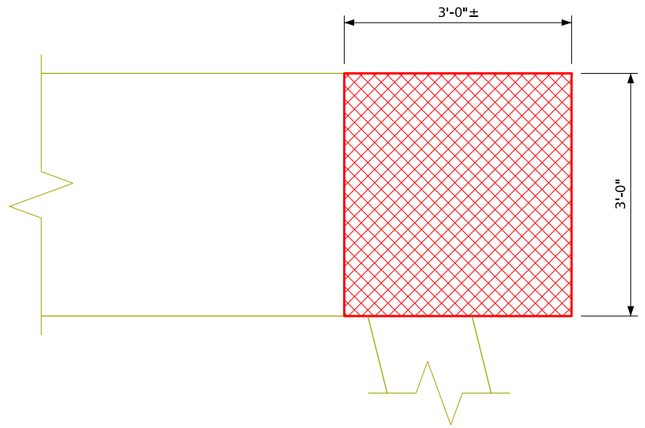
FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.29

4:52:51 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_427_28160_Z06.dgn



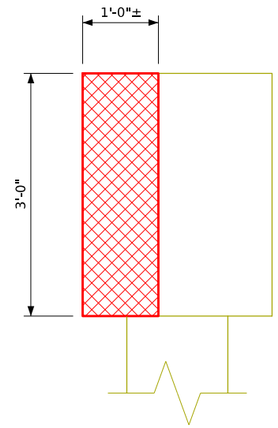
Front Elevation - East Abutment

(Looking East)



East Pier - West Face

(Looking East)



East Pier - South Cap Face

(Looking North)

Legend

Indicates Shallow Repair

Indicates Regular Repair

Note:
The dimensions and hatched areas shown on this sheet indicating concrete repairs are based on recent bridge inspection sketches and are for information only. The actual areas to be repaired shall be determined by the Engineer.

Note: See design sheet No. 6 for notes and details for concrete repair.

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans 60'-6" Interior Span

Concrete Repair

STA. 1187+12.50 (℄ I-29) Turn-in Date: September 1, 2026

Harrison County

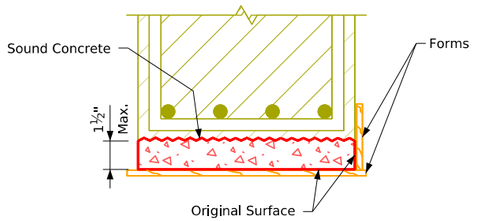
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 427 Design Sheet No. 5 of 6 FHWA No. 28160

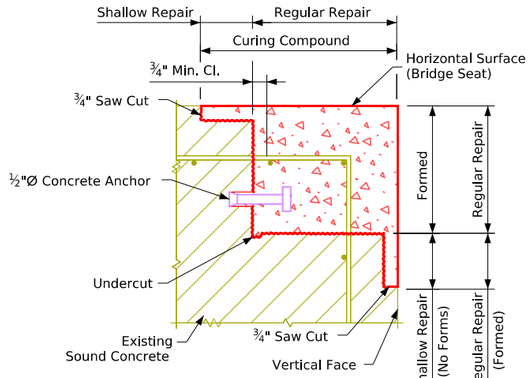
whks engineers + planners + land surveyors

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.30	

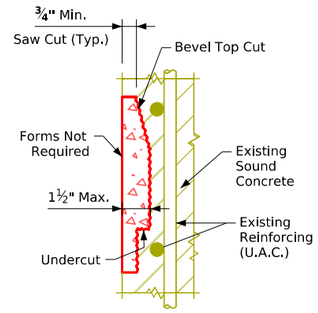
4:52:52 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_427_28160_Z06.dgn



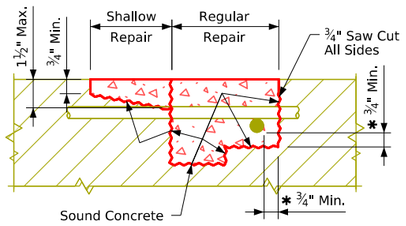
Shallow Repair Bottom Surface



Corner Repair

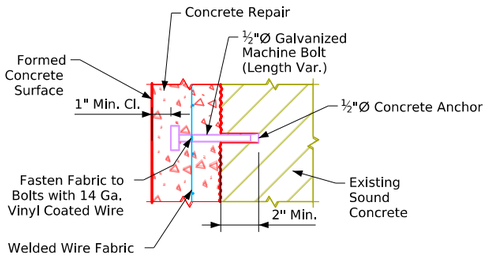


Shallow Repair Vertical Face



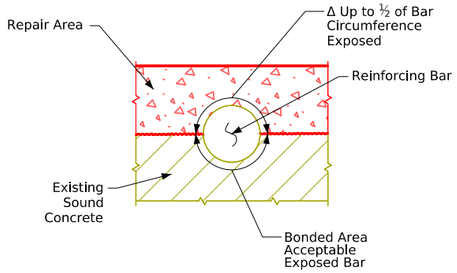
Repair Definition

* Indicates Clearance for an Un-Bonded Rebar.

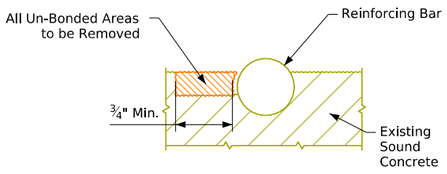


Anchor Detail

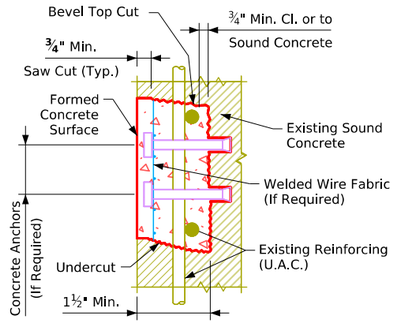
For Spacing and Use of Concrete Anchors and WWF See the Repair Notes.



Δ If more than ½ of the rebar is exposed it shall be treated as an un-bonded rebar.



Concrete Removal Adjacent to Reinforcing



Regular Repair Vertical Face

Repair Notes:

The spalled and hollow areas of this bridge as noted and shown in these plans shall be repaired as follows:

- All the costs of equipment and materials required to repair the spalled and hollow areas of this bridge shall be included in the price bid for "Concrete Repair".
- The price bid for "Concrete Repair" shall include the cost of all concrete anchors and welded wire fabric required by the plans.
- The Engineer shall determine and outline by visual and audible inspection the actual areas of the concrete repairs. The Contractor shall be paid for the actual amount of repairs made on a square foot basis based on the price bid per square foot.
- All existing reinforcing bars that are exposed by the concrete removal shall be cleaned and carefully incorporated into the new work, except badly deteriorated existing reinforcing which shall be replaced as directed by the Engineer.
- The concrete anchors required shall have a minimum pull out of 5,000 lbs based on 4,000 psi concrete. An anchor meeting the requirements of Iowa D.O.T. Materials I.M. 453.09 and the pull out load above is required. The anchors shall be galvanized and shall be installed according to recommendations of the Manufacturer. The cost of furnishing and installing the concrete anchors shall be included in the price bid for "Concrete Repair".
- The welded wire fabric shall be ASTM A185 and galvanized as per ASTM A-641. The WWF wires shall be spaced 3x3 or 4x4 and the wires shall have a nominal area of 0.014 to 0.029 sq in inclusive, example "WWF 3x3 - W1.4xW2.9".

Where reinforcement has been exposed and clearance around the periphery of the existing bar is provided, no supplemental reinforcing is required, except where existing reinforcement density and pattern are such that individual open spaces between bars are of 1.5 sq ft or larger. For this condition ½"Ø concrete anchors and welded wire fabric shall be installed at the rate of one concrete anchor with WWF per each 1.5 sq ft of area within each open space.

Repairing the structural concrete shall be in accordance with Section 2426, of the Standard Specifications.

Concrete Placement Quantities

Mark	Type	Units	Quantity
①	Shallow repair	Sq. Ft.	0
②	Regular repair	Sq. Ft.	18
		Total (Sq. Ft.)	18

Estimated Concrete Repair Quantities

Description	Units	Amount
Concrete Repair	Sq. Ft.	18

Note: For estimated repair areas and locations see design sheet 5.

whks
engineers + planners + land surveyors

Design For Repairs to a 42°25' Skew R.A.

155'-0" x 39'-0" Continuous I-Beam Bridge

47'-3" End Spans 60'-6" Interior Span

Concrete Repair

STA. 1187+12.50 (℄ I-29) Turn-in Date: September 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 427 Design Sheet No. 6 of 6 FHWA No. 28160

FILE NO. 32384	ENGLISH	DESIGN TEAM JJO\JRS\WDB	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER V.31

4:52:52 PM 8/11/2026 bbarker pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\SHT_43029266_WHKS_427_28160_Z06.dgn

INDEX OF SHEETS

No.	DESCRIPTION
A Sheets	**Title Sheets**
* A.3	Title Sheet (B&W Plans Only)
B Sheets	**Typical Cross Sections and Details**
B.1	Typical Cross Sections and Details
C Sheets	**Quantities and General Information**
* C.1 - 3	Estimated Project Quantities
* C.1 - 3	Estimate Reference Information
C.4	Project Description
C.5	Standard Road Plans
C.6 - 22	Tabulations
C.23	Index of Tabulations
C.24	Standard Notes
D Sheets	**Mainline Plan Sheets**
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2 - 3	ML029NB Plan & Profile
G Sheets	**Survey Sheets**
G.1	Survey Details
J Sheets	**Traffic Control and Staging Sheets**
J.1	Traffic Control Plan
J.2	Staging Notes
J.3	511 Travel Restrictions
J.4	Coordinated Operations
* J.5	Traffic Control Legend and Symbol Information Sheet
* J.6	Staging & Traffic Control Cross Section Sheet
* J.7 - 9	Northbound Staging & Traffic Control Sheets
* J.10 - 11	Southbound Staging & Traffic Control Sheets
	*Color Plan Sheets

LICENSED PROFESSIONAL ENGINEER
Lucas D. Fatka
23466
IOWA

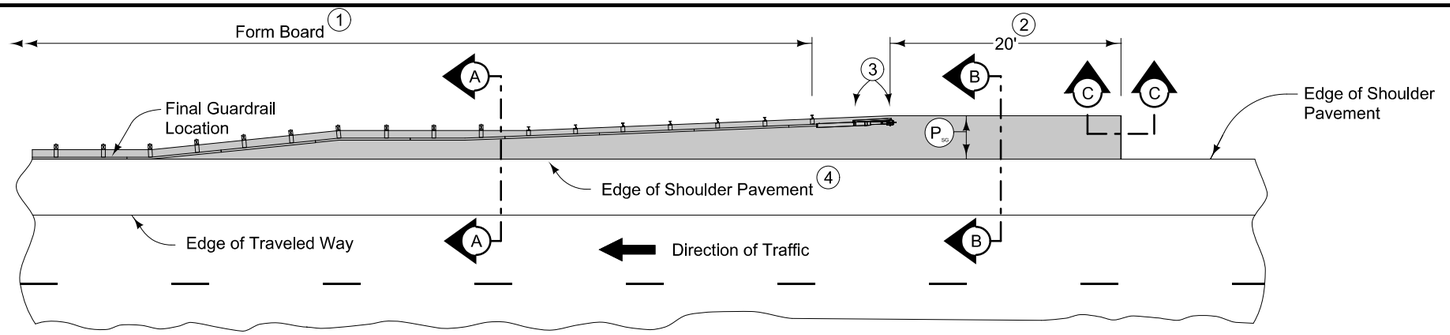
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature 8/11/2026 Date

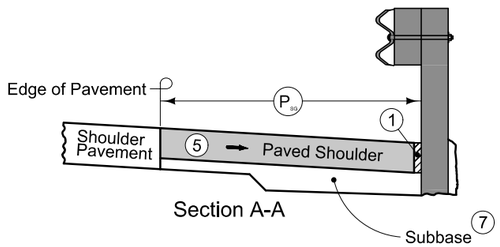
Lucas D. Fatka
Printed or Typed Name

My license renewal date is December 31, 2027

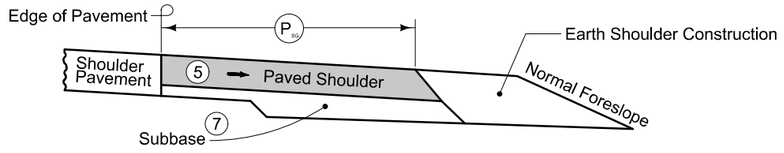
Pages or sheets covered by this seal:
A.3, B.1, C.1-C.24, D.1-D.3, G.1, & J.1-J.11



PLAN VIEW

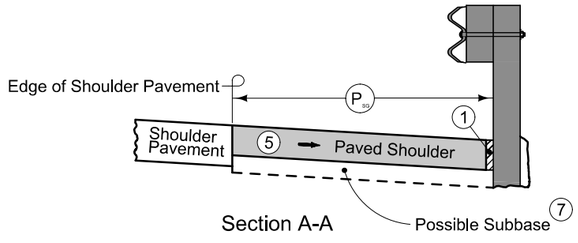


Section A-A

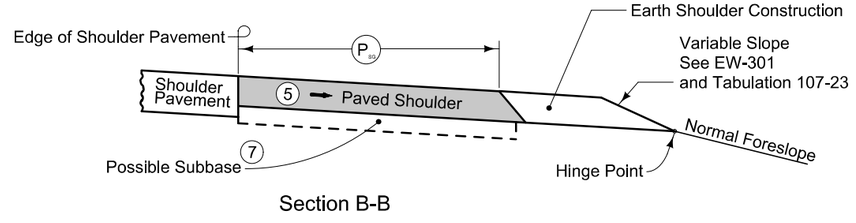


Section B-B

NEW CONSTRUCTION 6



Section A-A



Section B-B

EXISTING SHOULDER

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

7158
04-19-22

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.

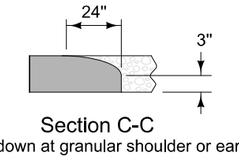
(3) Shoulder may be notched for first 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.

(4) 'KT' (per PV-101) joint for PCC shoulder.
'B' (per PV-101) joint for HMA shoulder.

(5) Match shoulder slope.

(6) The Contractor has the option to pave the paved shoulder at guardrail and the full width paved shoulder as one operation.

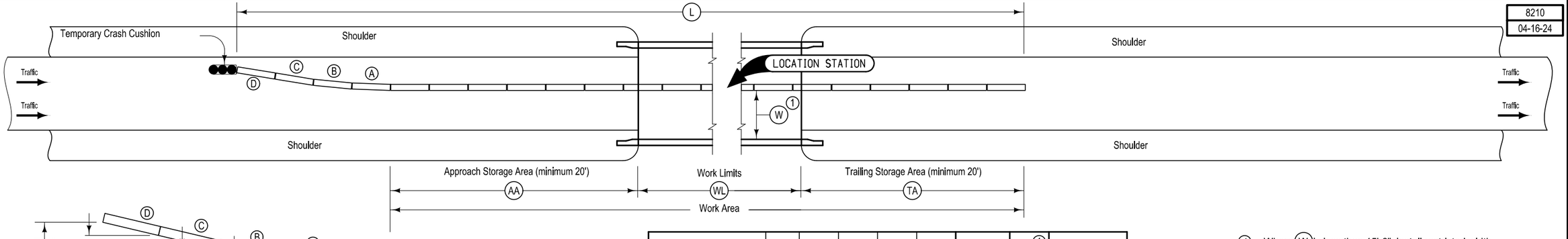
(7) Refer to other details in the plan.

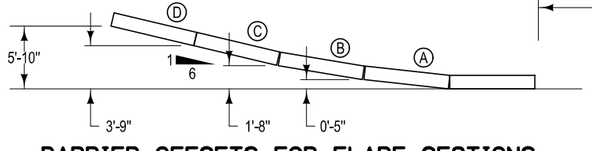


Section C-C
Roll down at granular shoulder or earth.

PAVED SHOULDER AT GUARDRAIL
(ADJACENT TO FULL WIDTH PAVED SHOULDER)

8210
04-16-24





BARRIER OFFSETS FOR FLARE SECTIONS

Station	Side	AA	WL	TA	L	Anchored	W (1)	Remarks
		Feet	Feet	Feet	Feet	X	Ft-Inches	
187+46.31	Rt.	20	247.5	20	337.5	X	11 - 0	NB Stage 2
187+46.31	Lt.	20	247.5	20	337.5		15 - 10.5	NB Stage 3
187+46.31	Rt.	20	197.5	20	287.5		11 - 0	SB Stage 1
187+46.31	Lt.	20	197.5	20	287.5		15 - 10.5	SB Stage 2

(1) Where (W) is less than 15'-6", install restricted width signing as per Standard Road Plan TC-81.

TEMPORARY CONCRETE BARRIER LAYOUT
for One-Way Traffic

FILE NO. 32384	ENGLISH	DESIGN TEAM WHKS & CO.	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER B.1

8:27:09 AM 9/23/2025 jfeldmann pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\WHKS\Roadway\CADD_Files\Sheet_Files\SHT_43029266Z06_b01

ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Item no.	Item Code	Item	Unit	Quantities Estimated Roadway Items	Estimate Reference Notes
1	2102-0425070	SPECIAL BACKFILL	TON	742.557	Refer to Tabs. 112-09 and 106-05. Includes 651.555 tons for base widening and 91.002 tons for shoulder construction. Refer to Typical 7158.
2	2102-2625000	EMBANKMENT-IN-PLACE	CY	370	Provide borrow material according to Section 2102 of the Standard Specifications. Refer to Tab. 107-23. Material shall be provided by the Contractor.
3	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	178	Refer to Tab. 103-10. Strip 6 inches of topsoil within the limits of grading, and place topsoil to a depth of 6 inches after grading the embankment. Seed the disturbed topsoil stockpile area as per section 2601.05 of the standard specifications. Seeding of the stockpile areas shall be considered incidental to this bid item.
4	2122-5500090	PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 9 IN.	SY	288.7	Refer to Tab. 112-9. Item is for construction of the paved shoulder adjacent to guardrail.
5	2122-7450080	SHOULDER STRENGTHENING, OPTIONAL HOT MIX ASPHALT MIXTURE OR PORTLAND CEMENT CONCRETE, 8 IN.	SY	1,973.3	Refer to Tab. 106-05.
6	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	1.85	Requires a minimum of 4 inches of topsoil. Place according to Article 2105.03,B of the Standard Specifications. Refer to Tab. 112-09.
7	2213-2713300	EXCAVATION, CLASS 13, FOR WIDENING	CY	685.7	Refer to Tab. 106-05.
8	2301-0690203	BRIDGE APPROACH, BR-203	SY	445	Refer to Tab. 112-06. Construct double reinforced and single reinforced bridge approach sections only. U.A.C. existing non reinforced bridge approach. Match existing joint between proposed reinforced section and existing non-reinforced bridge approach pavement.
9	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE, BRIDGE DECK AND/OR APPROACHES	SY	1,821.6	Refer to Tab. 100-28.
10	2503-0500402	BRIDGE END DRAIN, DR-402	EACH	3	Refer to Tab. 104-08A.
11	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	58	Refer to Tab. 110-07A.
12	2505-4008300	STEEL BEAM GUARDRAIL	LF	137.5	Refer to Tab. 108-08A.
13	2505-4008410	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION, BA-201	EACH	1	
14	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED	EACH	1	

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadway Items	
15	2505-4021720	STEEL BEAM GUARDRAIL TANGENT END TERMINAL, BA-205	EACH	1	
16	2505-6765006	REMOVE AND REINSTALL FORMED STEEL BEAM GUARDRAIL	LF	272	The intent of this work is to remove and reinstall only the steel beam guardrail for placement of pavement. Carefully remove and stockpile steel beam guardrail for reinstallation. The Contractor has the option to leave the posts in place, or to remove and reinstall the posts at no additional cost to the Contracting Authority. Replace steel beam rail and posts damaged by the Contractor's operations at no additional cost to the Contracting Authority. Posts, delineators, and object markers are to remain in place. Replace posts, delineators, and object markers damaged by the Contractors operations at no additional cost to the Contracting Authority. Ensure that all posts are firm and plum prior to reinstalling the guardrail. Restore the area disturbed by removal and reinstallation operations to an acceptable condition. Method of Measurement: Measurement will be in linear feet, measured along the front of the rail, of steel beam guardrail (includes W-beam and Thrie-beam guardrail) removed and reinstalled. Basis of Payment: Payment will be at the contract unit price per linear foot of steel beam guardrail removed and reinstalled. Payment includes all labor, equipment, and materials required to remove and reinstall the steel beam guardrail.
17	2510-6745850	REMOVAL OF PAVEMENT	SY	1,245.5	Refer to Tab. 110-1.
18	2527-9263137	PAINTED SYMBOLS AND LEGENDS, WATERBORNE OR SOLVENT-BASED	EACH	16	Refer to Tab. 108-29.
19	2527-9263181	PAVEMENT MARKINGS REMOVED	STA	67.77	Refer to Tab 108-22.
20	2527-9263190	SYMBOLS AND LEGENDS REMOVED	EACH	16	
21	2527-9263209	PAINTED PAVEMENT MARKINGS, WATERBORNE OR SOLVENT-BASED	STA	78.7	
22	2527-9263231	REMOVABLE TAPE MARKINGS, WET RETROREFLECTIVE	STA	92.72	
23	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE	LF	1,250	Refer to the J Sheets and Tab. 108-33. All temporary barrier rail shall be nominal 12'-6 long concrete units.
24	2528-8445110	TRAFFIC CONTROL	LS	1	Refer to Traffic Control Plans on the J Sheets.
25	2548-0000100	MILLED SHOULDER RUMBLE STRIPS, HMA SURFACE	STA	7.46	Refer to Tab. 112-10.
26	2548-0000110	ASPHALT EMULSION FOR FOG SEAL (SHOULDER RUMBLE STRIPS)	GAL	8.1	
27	2548-0000200	MILLED SHOULDER RUMBLE STRIPS, PCC SURFACE	STA	15.68	
28	2551-0000110	TEMP CRASH CUSHION	EACH	4	Refer to Tab. 108-30. Winterize sand filled or water filled crash cushions according to the manufacturer's recommendations if they are to remain in place during winter months.

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadway Items	
29	2602-0000312	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 12 IN. DIA.	LF	362.5	Refer to Tab. 100-19. The tabulation includes estimated locations for placement of "Perimeter and Slope Sediment Control Device, 12 in. dia." to address erosion to be encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 25% additional quantity for field adjustments and replacements.
30	2602-0000351	REMOVAL OF PERIMETER AND SLOPE OR DITCH CHECK SEDIMENT CONTROL DEVICE	LF	362.5	Refer to Tab. 100-19. The tabulation includes estimated locations for placement of "Perimeter and Slope Sediment Control Device, 12 in. dia." to address erosion to be encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 25% additional quantity for field adjustments and replacements.

100_01D
8/15/22

PROJECT DESCRIPTION

Work includes double reinforced bridge approach replacement, steel beam guardrail, pavement base widening, paved shoulders, and bridge end drains.

STANDARDS

The following Standards apply to construction work on this project.

Number	Date	Title
BA-201	10-18-22	Steel Beam Guardrail Barrier Transition Section (MASH TL-3)
BA-202	10-20-26	Steel Beam Guardrail Bolted End Anchor
BA-205	10-17-23	Steel Beam Guardrail Tangent End Terminal (MASH TL-3)
BA-401	04-20-21	Temporary Barrier Rail (Precast Concrete)
BR-203	10-20-26	Double Reinforced 12in Approach
DR-401	04-16-24	Scour Protection for Bridge End Drain
DR-402	04-16-24	Rock Flume for Bridge End Drain
EC-204	10-19-21	Perimeter, Slope and Ditch Check Sediment Control Devices
EW-301	10-20-26	Guardrail Grading
PM-111	04-21-20	Symbols and Legends
PM-110	10-15-24	Line Types
PR-202	10-21-14	Notches for Resurfacing (with or without Runout)
PV-12	10-20-26	Milled Shoulder Rumble Strips
PV-101	10-20-26	Joints
SI-211	10-18-22	Object Marker and Delineator Placement with Guardrail
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-202	04-18-23	Work Within 15 ft of Traveled Way
TC-421	10-21-25	Lane Closure with TBR

PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE

Possible Standards: EC-204

Line No.	Station From	Station To	Side	Sediment Control Device Type	Diameter Size	Length (LF)	Remarks
1.0	183+94.08	186+82.65	Right	Perimeter and Slope	12 inch	290.00	Toe of Slope
2.0	183+94.08	186+82.65	Right	Perimeter and Slope	12 inch	72.50	+25% Additional

LONGITUDINAL GROOVING

Line No.	Location	Total (SY)	Remarks
1.0	186+22.58	208.7	NB Approach
2.0	187+46.31	687.3	NB Bridge
3.0	188+25.62	238.3	NB Approach
4.0	287+46.31	687.3	SB Bridge

TOPSOIL STRIPPING AND PLACEMENT

Line No.	Road Identification	Dir. of Traffic	Station From	Station To	Topsoil Stripping Thickness (IN)	Topsoil Placement Thickness (IN)	Remarks
1.0	I-29	NB	183+94.08	186+82.65	6	6	Guardrail Blister

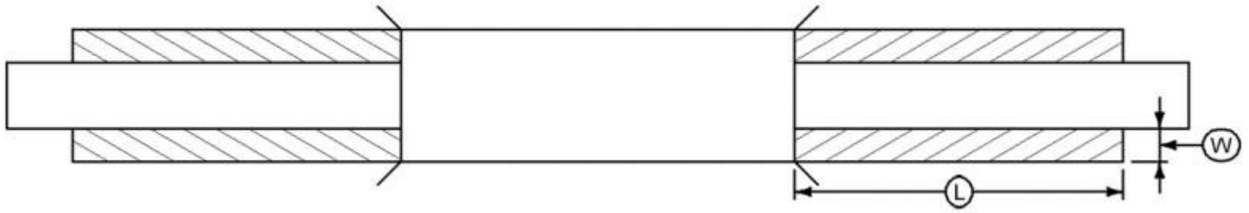
104_08A
8/15/22

SCOUR PROTECTION OR ROCK FLUME FOR BRIDGE END DRAIN

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

Line No.	Bridge Station	Bridge Corner	Distance DI-1 or DI-2 (FT)	Bridge End Drain Type	Special Ditch Control, Wood Excelsior Mat EC-101 (SQ)	Turf Reinforced Mat (TRM) Type 2 EC-104 (SQ)	Transition Mat EC-105 (SF)	Macadam Stone Base (TONS)	Engineering Fabric (SY)	Erosion Stone (TON)	Remarks
1.0	187+46.31	NE	55.3	DR-402				1.100	10.1	27.270	NB
2.0	187+46.31	NW	21.3	DR-402				1.100	10.1	27.270	NB
3.0	187+46.31	SW	61.0	DR-402				1.100	10.1	27.270	SB

AREAS FOR PAVEMENT OR BASE WIDENING



(1) Bid Item
(2) Estimated for two applications to achieve lifts and one application of 0.10 Gal/SY adjacent to existing pavement. Priming of subgrade or finished base is not required.

Line No.	Station From	Station To	Side	Pavement Type	Length (LF)	Width (LF)	Thickness (IN)	HMA Unit Wt. (lbs/cf)	HMA Base Widening (1) (TONS)	HMA Base Widening (1) (SY)	PCC Base Widening (1) (SY)	PCC Pavement Widening (1) (SY)	Tack Coat Unit Wt. (gal/sy)	Tack Coat Lifts (GAL)	Tack Coat Vertical Edge (GAL)	Tack Coat (2) (GAL)	Asphalt Binder (1) (TON)	Class 13 Excavation Widening (1) (CY)	Special Backfill Unit Weight (lbs-cf)	Special Backfill (1) (TONS)	Remarks
1.0	183+16.19	186+22.58	Median	PCC	306.39	6.0	9.0				204.3							51.1	140	64.342	
2.0	183+16.19	186+22.58	Right	HMA	306.39	8.0	9.0	145		272.3			0.05	27.23	2.55	29.78		68.1	140	85.789	
3.0	188+76.27	190+96.50	Median	HMA	220.23	6.0	9.0	145		146.8			0.05	14.68	1.84	16.52		36.7	140	46.248	
4.0	188+76.27	190+96.50	Right	HMA	220.23	8.0	9.0	145		195.8			0.05	19.58	1.84	21.42		48.9	140	61.664	
5.0	282+04.56	285+16.40	Left	PCC	311.84	10.0	9.0				346.5							144.4	140	109.144	
6.0	283+54.56	285+16.40	Median	PCC	161.84	6.0	9.0				107.9							45.0	140	33.986	
7.0	288+38.95	292+32.49	Left	PCC	393.54	10.0	9.0				437.3							182.2	140	137.739	
8.0	288+38.95	292+32.49	Median	PCC	393.54	6.0	9.0				262.4							109.3	140	82.643	

GRADING FOR GUARDRAIL INSTALLATIONS

Refer to EW-301.

(1) Lane(s) to which the installation is adjacent.

Line No.	Direction of Traffic (1)	Station	Side	Foreslope at Guardrail	X1 (FT)	Y1 (FT)	X2 (FT)	Y2 (FT)	X3 (FT)	Y3 (FT)	X4 (FT)	Y4 (FT)	Z (FT)	Excavation Class 10 (CY)	Embankment-in-Place (CY)	Remarks
1.0	NB	186+82.65	Right	3:1	52.0	13.8	89.4	17.6	173.9	17.6	225.0	19.6	93.4		370.0	

STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE RAIL END SECTION

Possible Standards: BA-200, BA-201, BA-202, BA-205, BA-206, BA-209, 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.

Line No.	Direction of Travel (1)	Side	Station	Offset (FT)	Barrier Transition Section	Barrier Transition Section (EA)	End Terminal	End Terminal Count (EA)	VT1 (LF)	VF (LF)	VT2 (LF)	ET (LF)	BA-211 Station	BA-211 (Type)	SI-211 (Type) (2)	Delineator SI-172 Type 1 (EA) (2)	Object Marker Type 2 (EA) (2)	Object Marker Type 3 Lt (EA)(2)	Object Marker Type 3 Rt (EA)(2)	Bolted End Anchor BA-202 (Type)	Bolted End Anchor BA-202 (EA)	Post Adapter BA-210 (EA)	Steel Beam Guardrail BA-200 (LF)	Remarks
1.0	NB	Right	186+83.82	22.1	BA-201	1	BA-205	1	53.125	37.50	84.38	47.70			2		6	1	1	D	1		137.5	

PAVEMENT MARKING LINE TYPES

Line factors based on 6-inch wide continuous line.
*BCY4 - Place on the same side of the roadway to match existing markings near the project.
**NPY4 - Estimating purposes only. No Passing Zone Lines will be located in the field.
***MNY6 - Factor of 1.00 includes number of 6-inch passes to cover median nose area.

BCY4: Broken Centerline (Yellow) @ 0.17 | BCY6: Broken Centerline (Yellow) @ 0.25 | BLC6: Broken Line Contrast (White/Black) @ 0.50 | BLW4: Broken Lane Line (White) @ 0.17 | BLW6: Broken Lane Line (White) @ 0.25
CBW6: Crosswalk Bar (White) @ 10.00 | CHW8: Channelizing Line (White) @ 1.33 | CHW10: Channelizing Line (White) @ 1.67 | CHY8: Channelizing Line (Yellow) @ 1.33 | CHY10: Channelizing Line (Yellow) @ 1.67
CLW6: Crosswalk Line (White) @ 2.00 | DCY4: Double Centerline (Yellow) @ 1.34 | DCY6: Double Centerline (Yellow) @ 2.00 | DDY4: Double Dotted Line (Yellow) @ 0.44 | DDY6: Double Dotted Line (Yellow) @ 0.67
DLW4: Dotted Line (White) @ 0.22 | DLW6: Dotted Line (White) @ 0.33 | DLY4: Dotted Line (Yellow) @ 0.22 | DLY6: Dotted Line (Yellow) @ 0.33 | ELW4: Edge Line Right (White) @ 0.67
ELW6: Edge Line Right (White) @ 1.00 | ELY4: Edge Line Left (Yellow) @ 0.67 | ELY6: Edge Line Left (Yellow) @ 1.00 | LDW8: Lane Drop (White) @ 0.33 | LDW10: Lane Drop (White) @ 0.42
MNY6: Median Nose (Yellow) @ 1.00 | NPY4: No Passing Zone Line (Yellow) @ 0.84 | NPY6: No Passing Zone Line (Yellow) @ 1.25 | RLW4: Ramp Edge Line Right (White) @ 0.67 | RLW6: Ramp Edge Line Right (White) @ 1.00
RLY4: Ramp Edge Line Left (Yellow) @ 0.67 | RLY6: Ramp Edge Line Left (Yellow) @ 1.00 | SLW2: Stop Line (White) @ 4.00 | SLW4: Solid Lane Line (White) @ 0.67 | SLW6: Solid Lane Line (White) @ 1.00
SPW4: Sloped Curb 4" (White) @ 2.16 | SPW6: Sloped Curb 6" (White) @ 2.28 | SPY4: Sloped Curb 4" (Yellow) @ 2.16 | SPY6: Sloped Curb 6" (Yellow) @ 2.28 | STW6: Standard Curb 6" (Yellow) @ 2.03
STY6: Standard Curb 6" (Yellow) @ 2.03 | YLW2: Yield Line (White) @ 1.15

Line No.	Road ID	Station From	Station To	Lane	Marking Type	Left	Center	Right	Groove Marking Needed?	Groove Qty. (STA)	BCY4* (STA)	BCY4* Factored (STA)	BLW4 (STA)	BLW4 Factored (STA)	CHW8 (STA)	CHW8 Factored (STA)	CHY8 (STA)	CHY8 Factored (STA)	ELW4 (STA)	ELW4 Factored (STA)	ELY4 (STA)	ELY4 Factored (STA)	Remarks
1.0	I-29	161+57.35	186+02.35	All	Removal of Paint		X		No				24.45	4.16									NB Stage 2
2.0	I-29	169+07.35	186+02.35	All	Removal of Paint			X	No										16.95	11.36			NB Stage 2
3.0	I-29	183+17.35	189+96.38	All	Removal of Paint	X			No												6.79	4.55	NB Stage 2
4.0	I-29	169+07.35	178+17.35	All	Wet Retroreflective Removable Tape			X	No						9.10	12.10							NB Stage 2
5.0	I-29	178+17.35	183+17.35	All	Waterborne/Solvent Paint			X	No										5.00	3.35			NB Stage 2
6.0	I-29	183+17.35	186+02.35	All	Wet Retroreflective Removable Tape			X	No						2.85	3.79							NB Stage 2
7.0	I-29	183+17.35	189+96.38	All	Wet Retroreflective Removable Tape	X			No								6.79	9.03					NB Stage 2
8.0	I-29	169+07.35	178+17.35	All	Removal of Removable Tape			X	No						9.10	12.10							NB Stage 2
9.0	I-29	178+17.35	183+17.35	All	Removal of Paint			X	No										5.00	3.35			NB Stage 2
10.0	I-29	183+17.35	186+02.35	All	Removal of Removable Tape			X	No						2.85	3.79							NB Stage 2
11.0	I-29	169+07.35	178+17.35	All	Wet Retroreflective Removable Tape	X			No								9.10	12.10					NB Stage 3
12.0	I-29	178+17.35	183+17.35	All	Waterborne/Solvent Paint	X			No										5.00	3.35			NB Stage 3
13.0	I-29	183+17.35	186+02.35	All	Wet Retroreflective Removable Tape	X			No						2.85	3.79							NB Stage 3
14.0	I-29	183+17.35	189+96.38	All	Wet Retroreflective Removable Tape			X	No						6.79	9.03							NB Stage 3
15.0	I-29	169+07.35	178+17.35	All	Removal of Removable Tape	X			No								9.10	12.10					NB Stage 3
16.0	I-29	178+17.35	183+17.35	All	Removal of Paint	X			No												5.00	3.35	NB Stage 3
17.0	I-29	183+17.35	186+02.35	All	Removal of Removable Tape	X			No								2.85	3.79					NB Stage 3
18.0	I-29	183+17.35	189+96.38	All	Removal of Removable Tape			X	No						6.79	9.03							NB Stage 3
19.0	I-29	161+57.35	188+76.27	All	Waterborne/Solvent Paint		X		No				27.19	4.62									NB Permanent
20.0	I-29	169+07.35	188+76.27	All	Waterborne/Solvent Paint			X	No										19.69	13.19			NB Permanent
21.0	I-29	169+07.35	188+76.27	All	Waterborne/Solvent Paint	X			No												19.69	13.19	NB Permanent
22.0	I-29	283+54.56	292+32.49	All	Removal of Paint			X	No												8.78	5.88	SB Stage 1
23.0	I-29	287+58.91	313+92.49	All	Removal of Paint		X		No				26.34	4.48									SB Stage 1
24.0	I-29	287+74.90	313+92.49	All	Removal of Paint	X			No										26.18	17.54			SB Stage 1
25.0	I-29	283+54.56	285+54.56	All	Wet Retroreflective Removable Tape			X	No								2.00	2.66					SB Stage 1
26.0	I-29	285+54.56	290+32.49	All	Waterborne/Solvent Paint			X	No												4.78	3.20	SB Stage 1
27.0	I-29	290+32.49	292+32.49	All	Wet Retroreflective Removable Tape			X	No								2.00	2.66					SB Stage 1
28.0	I-29	289+30.34	292+32.49	All	Wet Retroreflective Removable Tape	X			No						3.02	4.02							SB Stage 1
29.0	I-29	292+32.49	297+32.49	All	Waterborne/Solvent Paint	X			No										5.00	3.35			SB Stage 1
30.0	I-29	297+32.49	306+42.49	All	Wet Retroreflective Removable Tape	X			No						9.10	12.10							SB Stage 1
31.0	I-29	283+54.56	285+54.56	All	Removal of Removable Tape			X	No								2.00	2.66					SB Stage 1
32.0	I-29	285+54.56	290+32.49	All	Removal of Paint			X	No												4.78	3.20	SB Stage 1
33.0	I-29	290+32.49	292+32.49	All	Removal of Removable Tape			X	No								2.00	2.66					SB Stage 1
34.0	I-29	289+30.34	292+32.49	All	Removal of Removable Tape	X			No						3.02	4.02							SB Stage 1
35.0	I-29	292+32.49	297+32.49	All	Removal of Paint	X			No										5.00	3.35			SB Stage 1
36.0	I-29	297+32.49	306+42.49	All	Removal of Removable Tape	X			No						9.10	12.10							SB Stage 1
37.0	I-29	283+54.56	285+54.56	All	Wet Retroreflective Removable Tape	X			No								2.00	2.66					SB Stage 2
38.0	I-29	285+54.56	290+32.49	All	Waterborne/Solvent Paint	X			No												4.78	3.20	SB Stage 2
39.0	I-29	290+32.49	292+32.49	All	Wet Retroreflective Removable Tape	X			No								2.00	2.66					SB Stage 2

PAVEMENT MARKING LINE TYPES

Line factors based on 6-inch wide continuous line.
*BCY4 - Place on the same side of the roadway to match existing markings near the project.
**NPY4 - Estimating purposes only. No Passing Zone Lines will be located in the field.
***MNY6 - Factor of 1.00 includes number of 6-inch passes to cover median nose area.

BCY4: Broken Centerline (Yellow) @ 0.17 | BCY6: Broken Centerline (Yellow) @ 0.25 | BLC6: Broken Line Contrast (White/Black) @ 0.50 | BLW4: Broken Lane Line (White) @ 0.17 | BLW6: Broken Lane Line (White) @ 0.25
CBW6: Crosswalk Bar (White) @ 10.00 | CHW8: Channelizing Line (White) @ 1.33 | CHW10: Channelizing Line (White) @ 1.67 | CHY8: Channelizing Line (Yellow) @ 1.33 | CHY10: Channelizing Line (Yellow) @ 1.67
CLW6: Crosswalk Line (White) @ 2.00 | DCY4: Double Centerline (Yellow) @ 1.34 | DCY6: Double Centerline (Yellow) @ 2.00 | DDY4: Double Dotted Line (Yellow) @ 0.44 | DDY6: Double Dotted Line (Yellow) @ 0.67
DLW4: Dotted Line (White) @ 0.22 | DLW6: Dotted Line (White) @ 0.33 | DLY4: Dotted Line (Yellow) @ 0.22 | DLY6: Dotted Line (Yellow) @ 0.33 | ELW4: Edge Line Right (White) @ 0.67
ELW6: Edge Line Right (White) @ 1.00 | ELY4: Edge Line Left (Yellow) @ 0.67 | ELY6: Edge Line Left (Yellow) @ 1.00 | LDW8: Lane Drop (White) @ 0.33 | LDW10: Lane Drop (White) @ 0.42
MNY6: Median Nose (Yellow) @ 1.00 | NPY4: No Passing Zone Line (Yellow) @ 0.84 | NPY6: No Passing Zone Line (Yellow) @ 1.25 | RLW4: Ramp Edge Line Right (White) @ 0.67 | RLW6: Ramp Edge Line Right (White) @ 1.00
RLY4: Ramp Edge Line Left (Yellow) @ 0.67 | RLY6: Ramp Edge Line Left (Yellow) @ 1.00 | SLW2: Stop Line (White) @ 4.00 | SLW4: Solid Lane Line (White) @ 0.67 | SLW6: Solid Lane Line (White) @ 1.00
SPW4: Sloped Curb 4" (White) @ 2.16 | SPW6: Sloped Curb 6" (White) @ 2.28 | SPY4: Sloped Curb 4" (Yellow) @ 2.16 | SPY6: Sloped Curb 6" (Yellow) @ 2.28 | STW6: Standard Curb 6" (Yellow) @ 2.03
STY6: Standard Curb 6" (Yellow) @ 2.03 | YLW2: Yield Line (White) @ 1.15

Line No.	Road ID	Station From	Station To	Lane	Marking Type	Left	Center	Right	Groove Marking Needed?	Groove Qty. (STA)	BCY4* (STA)	BCY4* Factored (STA)	BLW4 (STA)	BLW4 Factored (STA)	CHW8 (STA)	CHW8 Factored (STA)	CHY8 (STA)	CHY8 Factored (STA)	ELW4 (STA)	ELW4 Factored (STA)	ELY4 (STA)	ELY4 Factored (STA)	Remarks
40.0	I-29	289+30.34	292+32.49	All	Wet Retroreflective Removable Tape			X	No						3.02	4.02							SB Stage 2
41.0	I-29	292+32.49	297+32.49	All	Waterborne/Solvent Paint			X	No										5.00	3.35			SB Stage 2
42.0	I-29	297+32.49	306+42.49	All	Wet Retroreflective Removable Tape			X	No						9.10	12.10							SB Stage 2
43.0	I-29	283+54.56	285+54.56	All	Removal of Removable Tape	X			No								2.00	2.66					SB Stage 2
44.0	I-29	285+54.56	290+32.49	All	Removal of Paint	X			No												4.78	3.20	SB Stage 2
45.0	I-29	290+32.49	292+32.49	All	Removal of Removable Tape	X			No								2.00	2.66					SB Stage 2
46.0	I-29	289+30.34	292+32.49	All	Removal of Removable Tape			X	No						3.02	4.02							SB Stage 2
47.0	I-29	292+32.49	297+32.49	All	Removal of Paint			X	No										5.00	3.35			SB Stage 2
48.0	I-29	297+32.49	306+42.49	All	Removal of Removable Tape			X	No						9.10	12.10							SB Stage 2
49.0	I-29	283+54.56	292+32.49	All	Waterborne/Solvent Paint			X	No												8.78	5.88	SB Permanent
50.0	I-29	287+58.91	313+92.49	All	Waterborne/Solvent Paint		X		No				26.34	4.48									SB Permanent
51.0	I-29	287+74.90	313+92.49	All	Waterborne/Solvent Paint	X			No										26.18	17.54			SB Permanent

PAVEMENT MARKING SYMBOLS AND LEGENDS

Refer to PM-111

Line No.	Roadway Identification	Station	Side	Pavement Symbol	Quantity (EA)	Groove Marking Needed?	Remarks
1.0	I-29	146+57.35	Right	RLRW	1	No	NB Stage 2
2.0	I-29	147+57.35	Right	RLRW	1	No	NB Stage 2
3.0	I-29	157+57.35	Right	RLRW	1	No	NB Stage 2
4.0	I-29	158+57.35	Right	RLRW	1	No	NB Stage 2
5.0	I-29	146+57.35	Left	LLRW	1	No	NB Stage 3
6.0	I-29	147+57.35	Left	LLRW	1	No	NB Stage 3
7.0	I-29	157+57.35	Left	LLRW	1	No	NB Stage 3
8.0	I-29	158+57.35	Left	LLRW	1	No	NB Stage 3
9.0	I-29	371+92.49	Right	RLRW	1	No	SB Stage 1
10.0	I-29	318+92.49	Right	RLRW	1	No	SB Stage 1
11.0	I-29	327+92.49	Right	RLRW	1	No	SB Stage 1
12.0	I-29	328+92.49	Right	RLRW	1	No	SB Stage 1
13.0	I-29	371+92.49	Left	LLRW	1	No	SB Stage 2
14.0	I-29	318+92.49	Left	LLRW	1	No	SB Stage 2
15.0	I-29	327+92.49	Left	LLRW	1	No	SB Stage 2
16.0	I-29	328+92.49	Left	LLRW	1	No	SB Stage 2

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.

Line No.	Lane	Station	Side	Obstacle Width (FT)	Crash Cushion Type	Crash Cushion Quantity	V (FT) (2)	W (FT) (2)	X (FT) (2)	Y (FT) (2)	Z (FT) (2)	Excavation Class 10* (CY)	Embankment in Place* (CY)	Obstacle Description	Remarks
1.0	NB	185+51.20	Right	2.0	Temporary	1								TBR	NB Stage 2
2.0	NB	185+51.20	Left	2.0	Temporary	1								TBR	NB Stage 3
3.0	SB	288+48.64	Right	2.0	Temporary	1								TBR	SB Stage 1
4.0	SB	288+48.64	Left	2.0	Temporary	1								TBT	SB Stage 2

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.

Line No.	No.	Station From	Station To	Length (FT)	Barrier Rail Type	Anchored*	Modular Glare Screen System	Remarks
1.0		185+51.20	188+96.50	337.5	Concrete BA-401	Yes	No	NB Stage 2
2.0		185+51.20	188+96.50	337.5	Concrete BA-401	No	No	NB Stage 3
3.0		285+54.56	288+48.64	287.5	Concrete BA-401	No	No	SB Stage 1
4.0		285+54.56	288+48.64	287.5	Concrete BA-401	No	No	SB Stage 2

110_01
4/5/24

REMOVAL OF PAVEMENT

Refer to Tabulation 102-5.

* Not a bid item.

Line No.	Station From	Station To	Side	Pavement Type	Area (SY)	Saw Cut* (LF)	Remarks
1.0	183+16.19	186+59.25	Right	HMA	304.9	360.0	Shoulder
2.0	183+16.19	186+22.58	Left	PCC	204.3	320.0	Shoulder
3.0	186+22.58	186+86.65	Both	PCC	175.2	26.0	Bridge Approach
4.0	188+56.64	190+96.50	Right	HMA	213.2	256.0	Shoulder
5.0	188+56.64	190+96.50	Left	HMA	159.9	252.0	Shoulder
6.0	188+09.63	188+76.27	Both	PCC	188.0	26.0	Bridge Approach
7.0	282+04.56	285+16.40	Left	PCC	346.5	331.8	Shoulder
8.0	283+54.56	285+16.40	Right	PCC	107.9	173.8	Shoulder
9.0	288+38.95	292+32.49	Left	PCC	437.3	413.5	Shoulder
10.0	288+38.95	292+32.49	Right	PCC	262.4	413.5	Shoulder

BRIDGE APPROACH SECTION

Refer to the BR Series.

* Not a bid item
** Verify layout of bridge approach does not conflict with guardrail posts.

Line No.	Bridge Station	End	Skew Ahead Left (Degrees)	Skew Ahead Right (Degrees)	(T) Thickness (IN)	Pay Length (FT)	Right Edge Offset (FT) **	Left Edge Offset (FT) **	Non-Reinf. Area (SY)	Single-Reinf. Area (SY)	Double-Reinf. Area (SY)	SRP Approach	SRP Abutment Type	SRP Abutting Pavement	Perforated * 4" Subdrain (LF)	Subdrain * Outlet (STA)	Subdrain * Outlet Side	Porous * Backfill (CY)	Modified * Subbase (TON)	Polymer * Grid (SY)	Special * Backfill (TON)	Remarks
1.0	187+46.49	S		42.4	12.0	44.4	23.1	19.1		63.4	153.1	BR-203	Movable	BR-211					296.500	235.3		Double and single reinforced sections only
2.0	187+46.49	N		42.4	12.0	50.7	23.1	19.1		75.1	153.4	BR-203	Movable	BR-211					314.300	249.4		Double and single reinforced sections only

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.
(7) Paved shoulder thickness specified in Remarks.
(8) Subbase type specified in Remarks.

Roadway Identification	Direction of Travel (1)	Station From	Station To	Side	P Width (FT)	P SG Width (2) (FT)	G Width (FT)	L Length (FT)	Class 13 Excavation (CY)(3)(4)	HMA (TON)	HMA (TON/STA)	Binder (TONS)	Paved Shoulder (3) (SY)	Paved Shoulder at Grdrail (5)(7) (SY)	Reinforced Paved Shoulder(3) (SY)	Special Backfill HMA Alt. (3) (TON)	Special Backfill HMA Alt. (TON/STA)	Special Backfill PCC Alt. (3) (TON)	Special Backfill PCC Alt. (TON/STA)	Pavement Scarification (SY)	Polymer Grid (SY)	Subbase (3) (8) (CY)	Granular Shoulder (3) (TON)	Granular Shoulder (TON/STA)	Earth Shoulder Const. Alt (3) (STA)	Earth Shoulder Const. Alt HMA (6) (CY)	Earth Shoulder Const. Alt PCC (6) (CY)	Remarks
I-29	NB	184+37.53	184+57.53	Right	8	7.6		20.00		16.936	84.680	1.016	17.8	16.9		10.906	54.530	10.906	54.530						0.20	4.08	3.63	
I-29	NB	184+57.53	185+00.29	Right	8	6.8		42.76		34.411	80.475	2.065	38.0	32.1		22.150	51.800	22.150	51.800						0.43	8.73	7.76	
I-29	NB	185+00.29	185+93.10	Right	8	5.9		92.81		69.979	75.400	4.199	82.5	60.8		45.152	48.650	45.152	48.650						0.93	18.94	16.84	
I-29	NB	185+93.10	186+22.58	Right	8	4.4		29.48		19.877	67.425	1.193	26.2	14.4		12.794	43.400	12.794	43.400						0.29	6.02	5.35	

RUMBLE STRIPS

* Calculated at 18" width for Shoulder.
** For use with penetrating Engineered Fog Seal. Calculated at 2" wider than rumble strips.

Line No.	Road Identification	Station From	Station To	Surface Type	Rumble Strip Lane	Rumble Strip Type	Fog Seal Type	L (IN)	PCC Length (STA)	HMA Length (STA)	Fog Seal* Shoulder (GAL)	Fog Seal (SY)**	Effective Shoulder Width PCC (FT)	Effective Shoulder Width HMA (FT)	Effective Shoulder Width Granular\Earth (FT)	Remarks
1.0	I-29	183+16.19	186+22.58	PCC	Left Shoulder	Diamond Ground Shoulder Rumble Strips		12"	3.06				6.0			
2.0	I-29	183+16.19	186+22.58	HMA	Right Shoulder	Milled Shoulder Rumble Strips	Asphalt Emulsion	12"		3.06	3.3	51.0		8.0		
3.0	I-29	188+76.27	190+96.50	HMA	Left Shoulder	Milled Shoulder Rumble Strips	Asphalt Emulsion	12"		2.20	2.4	36.7		6.0		
4.0	I-29	188+76.27	190+96.50	HMA	Right Shoulder	Milled Shoulder Rumble Strips	Asphalt Emulsion	12"		2.20	2.4	36.7		8.0		
5.0	I-29	282+04.56	285+16.40	PCC	Left Shoulder	Diamond Ground Shoulder Rumble Strips		12"	3.12				10.0			
6.0	I-29	283+54.56	285+16.40	PCC	Right Shoulder	Diamond Ground Shoulder Rumble Strips		12"	1.62				6.0			
7.0	I-29	288+38.95	292+32.49	PCC	Left Shoulder	Diamond Ground Centerline Rumble Strips		12"	3.94				10.0			
8.0	I-29	288+38.95	292+32.49	PCC	Right Shoulder	Diamond Ground Shoulder Rumble Strips		12"	3.94				6.0			

REMOVAL OF STEEL BEAM GUARDRAIL

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

Line No.	No.	Direction of Traffic (1)	Station From	Station To	Side	Removal of Guardrail (2) (LF)
1.0		NB	186+26.57	186+83.93	Right	58.0

111_25
4/30/25

INDEX OF TABULATIONS

Line No.	Tabulation	Tabulation Title	Sheet No.
1.0	100_01D	PROJECT DESCRIPTION	C.4
2.0	111_25	INDEX OF TABULATIONS	C.23
3.0	105_04	STANDARD ROAD PLANS	C.5
4.0	100_19	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE	C.6
5.0	100_28	LONGITUDINAL GROOVING	C.7
6.0	103_10	TOPSOIL STRIPPING AND PLACEMENT	C.8
7.0	104_08A	SCOUR PROTECTION OR ROCK FLUME FOR BRIDGE END DRAIN	C.9
8.0	106_05	AREAS FOR PAVEMENT OR BASE WIDENING	C.10
9.0	107_23	GRADING FOR GUARDRAIL INSTALLATIONS	C.11
10.0	108_08A	STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE RAIL END SECTION	C.12
11.0	108_22	PAVEMENT MARKING LINE TYPES	C.13-C.14
12.0	108_29	PAVEMENT MARKING SYMBOLS AND LEGENDS	C.15
13.0	108_30	CRASH CUSHIONS	C.16
14.0	108_33	TEMPORARY BARRIER RAIL	C.17
15.0	110_01	REMOVAL OF PAVEMENT	C.18
16.0	112_06	BRIDGE APPROACH SECTION	C.19
17.0	112_09	SHOULDERS	C.20
18.0	112_10	MILLED RUMBLE STRIPS	C.21
19.0	110_07A	REMOVAL OF STEEL BEAM GUARDRAIL	C.22
20.0	232_03A	EROSION CONTROL (RURAL SEEDING)	C.24
23.0	232_03C	EROSION CONTROL (NATIVE GRASS SEEDING)	C.24
24.0	232_11	EROSION CONTROL (STABILIZING CROP SEEDING)	C.24
25.0	262_06	UTILITIES (NOT A POINT 25 PROJECT)	C.24
26.0	108_23A	TRAFFIC CONTROL PLAN	J.1
27.0	108_26A	STAGING NOTES	J.2
28.0	108_25	511 TRAVEL RESTRICTIONS	J.3
30.0	111_01	COORDINATED OPERATIONS	J.4

232_03A
9/28/22

EROSION CONTROL (RURAL 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 lying 8 feet adjacent to shoulder and median as follows:

Place seed and fertilize according to the requirements of Article 2601.03,C,3 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 all incidental to mobilization and will not be paid for separately.

232_03C
8/28/24

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.

232_11
6/21/23

EROSION CONTROL (STABILIZING CROP 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.

If outside of permanent seeding dates in Section 2601 of the Standard Specifications, or if required by a storm water permit, place stabilizing crop, fertilizer, and mulch on the disturbed area as follows:

Place seed and fertilize according to the requirements of Article 2601.03,C,1 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 will not be paid for separately.

262_06
9/28/22

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.

SURVEY SYMBOLS

- Interstate Highway Symbol
- U.S. Highway Symbol
- Iowa Highway Symbol
- County Road Highway Symbol
- Evergreen Tree
- Deciduous Tree
- Fruit Tree
- Shrub (Bushes)
- Timber
- Hedge
- Stump
- Swamp
- Rock Outcrop
- Broken Concrete
- Revetment (Rip Rap)
- Cemetery
- Grave
- Cave
- Sink Hole
- Board Fence
- Chain Link or Security Fence
- Wire Fence
- Terrace
- Earth Dam or Dike (Existing)
- Tile Outlet
- Edge of Water
- Existing Drainage
- Right of Way Rail or Lot Corner
- Concrete Monument
- Well
- Windmill
- Beehive Intake
- Existing Intake
- Existing Utility Access (Manhole)
- Fire Hydrant
- WH Water Hydrant (Rural)
- ST Septic Tank
- C Cistern
- LP L.P. Gas Tank (No Footing)
- UST Underground Storage Tank
- Latrine
- Satellite TV Dish
- WHU Water Hook Up
- RT Radio Tower
- TA Tower Anchor
- Guardrail (Beam or Cable)
- GP Guard Post (one or two)
- Guard Post (over two)
- FP Filler Pipe
- GV Gas Valve
- WV Water Valve
- SL Speed Limit Sign
- MM Mile Marker Post
- SIGN Sign
- TCB Traffic Signal Control Box
- RRB Rail Road Signal Control Box
- TSB Telephone Switch Box
- EB Electric Box

UTILITY LEGEND

(S10) IOWA DOT
Contact Name : Tony Arrick
Contact Phone: 7126422178
Contact Email: todd.frank@iowadot.us

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities

SHADING	Design Color No.		Transparency
Pink, Dark	(13)	Temporary Pavement Shading	50%
Yellow	(4)	Proposed Pavement Shading	50%
Orange	(6)	Proposed Granular Shading	50%
Orange	(70)	Proposed Shoulder Granular Shading	50%
Yellow	(68)	Proposed Shoulder Paved Full Depth Shading	50%
Yellow	(132)	Proposed Shoulder Paved Partial Depth Shading	50%
Brown, Light	(236)	Grading Shading	50%
Orange, Light	(134)	Proposed Granular Entrance Shading	50%
Yellow	(220)	Proposed Paved Entrance Shading	50%
Tan	(8)	Proposed Sidewalk Shading	50%
Blue, Light	(230)	Proposed Sidewalk Landing Shading	50%
Pink	(11)	Proposed Sidewalk Ramp Shading	50%
Red	(3)	Proposed Structure Shading	50%
Red	(3)	Delineates Restricted Areas	0%

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(10)	Existing Ground Line Profile
Blue	(1)	Proposed Profile and Annotation
Magenta	(5)	Existing Utilities
Blue, Light	(230)	Proposed Ditch Grades, Left
Black	(0)	Proposed Ditch Grades, Median
Rust	(14)	Proposed Ditch Grades, Right

- Reference Point / Station — Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

RIGHT-OF-WAY LEGEND

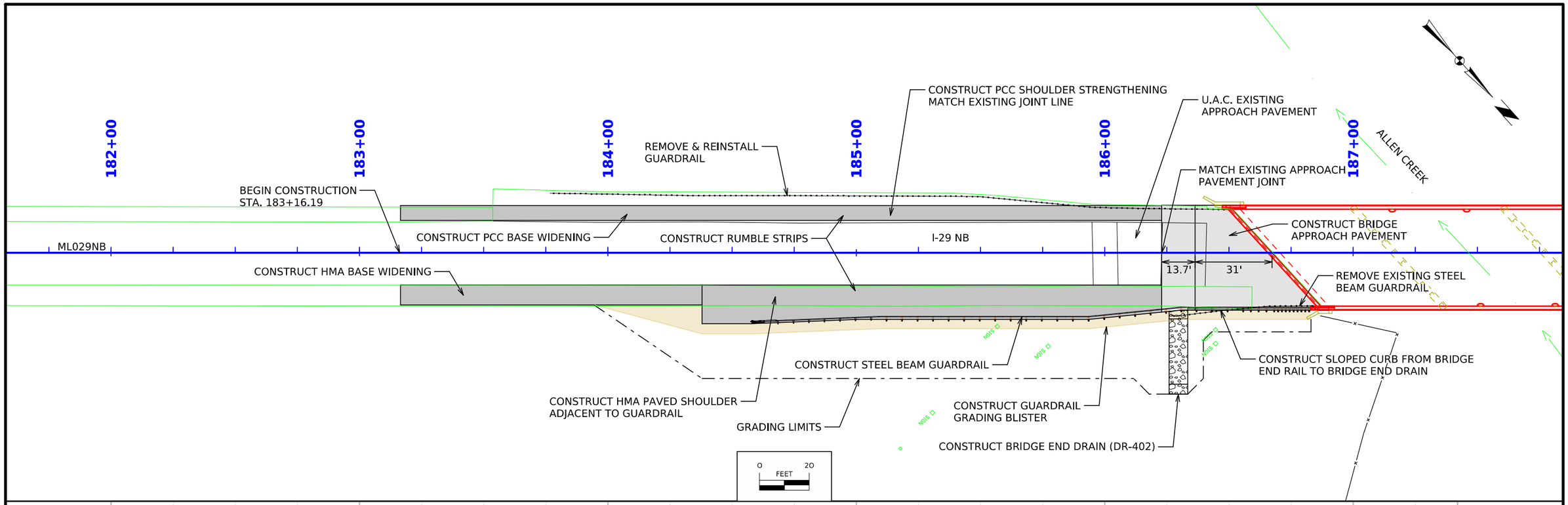
- Proposed Right-of-Way Symbol
- Proposed Right-of-Way Line
- Existing Right of Way
- Existing and Proposed Right-of-Way
- Easement and Existing Right-of-Way
- Easement (Temporary) Symbol
- Easement (Temporary) Line
- Easement
- C/A Access Control
- Property Line Symbol
- Property Line

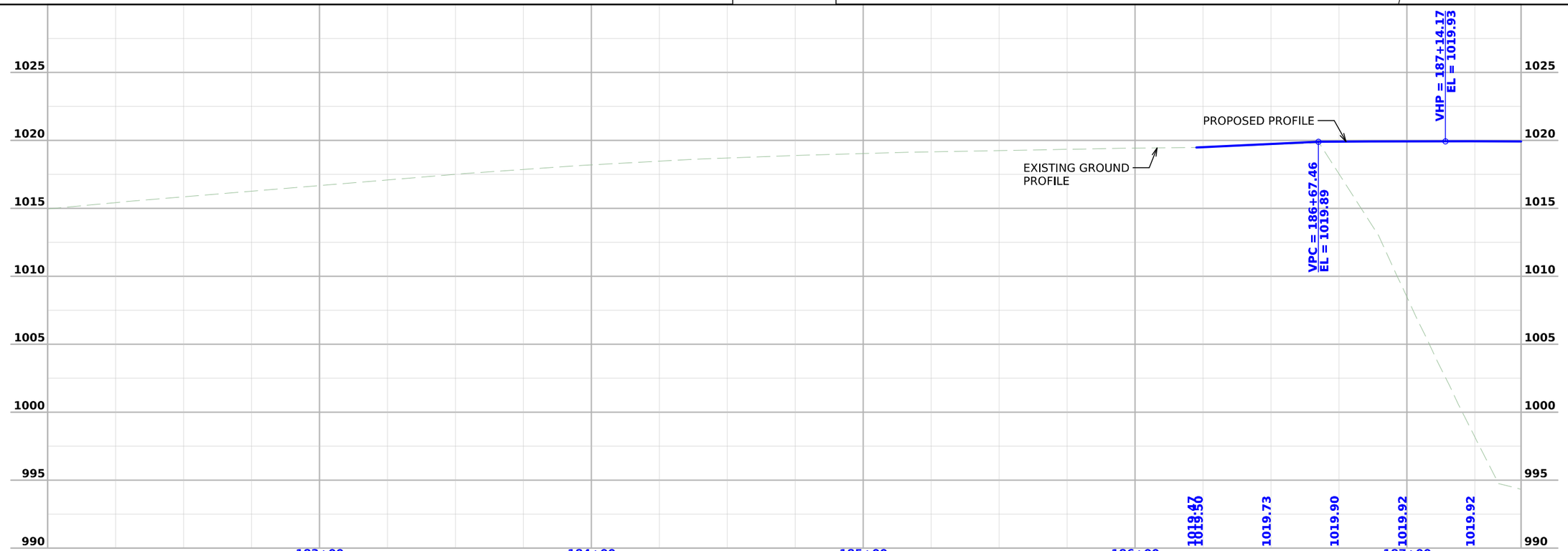
PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES D)

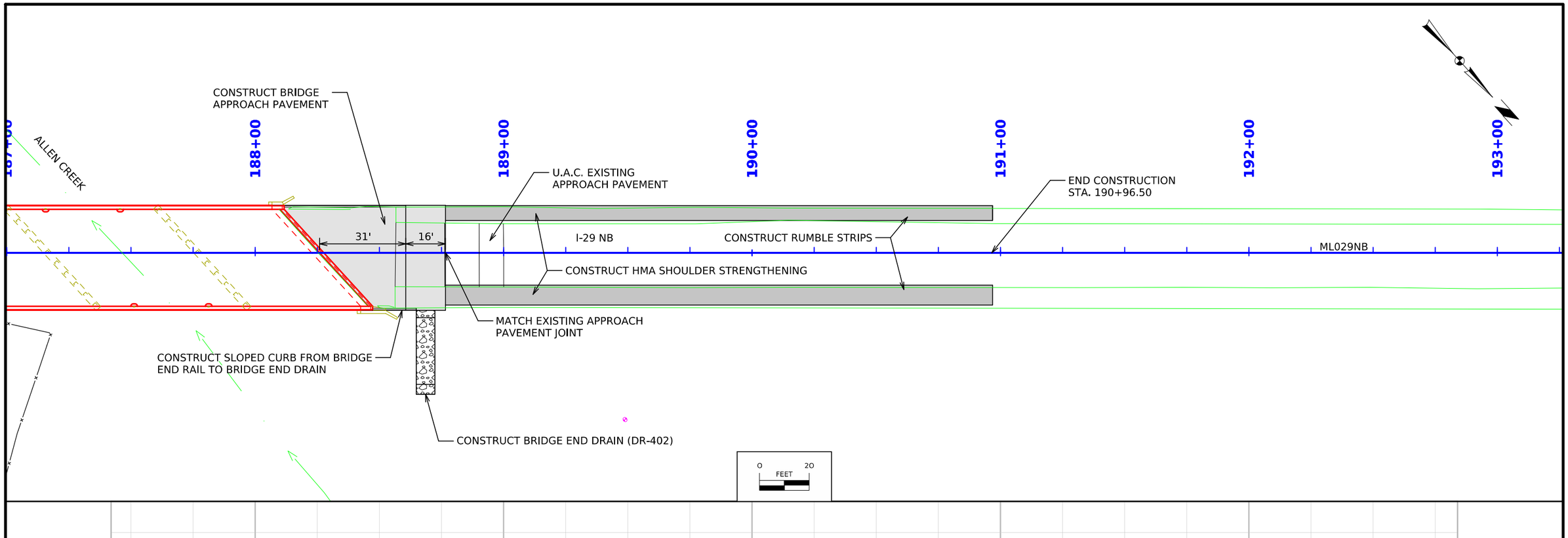
FILE NO. 32384	ENGLISH	DESIGN TEAM WHKS & CO.	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER D.1

4:16:26 PM 6/12/2025 bbogaard pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\WHKS\Roadway\CADD_Files\Sheet_Files\LegendSheet.dgn





FILE NO. 32384	ENGLISH	DESIGN TEAM WHKS & CO.	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER D.2



FILE NO. 32384	ENGLISH	DESIGN TEAM WHKS & CO.	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER D.3

11:32:00 AM 9/15/2025 bbogaard pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\WHKS\Roadway\CADD_Files\Sheet_Files\D Sheets\D03_ML029NB - Plan 2.dgn

ALIGNMENT COORDINATES

101-16
10-20-09

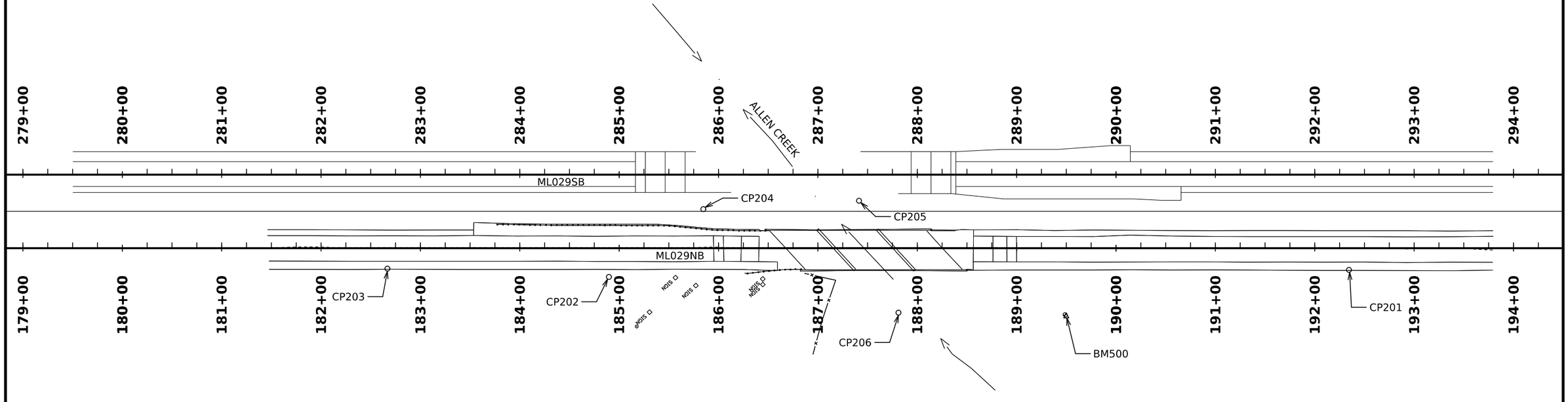
Name	Location	Point on Tangent			Begin Spiral			Begin Curve			Simple Curve PI or Master PI of SCS			End Curve			End Spiral		
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
ML029NB																			
PT		178+00.00	7,081,918.952	16,447,351.249															
PT		195+00.00	7,083,059.790	16,446,090.896															
ML029SB																			
PT		278+00.00	7,081,864.090	16,447,301.589															
PT		295+00.00	7,083,004.928	16,446,041.236															

CONTROL POINTS

NO.	DESCRIPTION	STATION	OFFSET	Y (NORTHING)	X (EASTING)
CP201	SET MAG NAIL	192+34.38	21.86' RT	7,082,897.742	16,446,302.490
CP202	SET 1/2" REBAR	184+89.72	28.94' RT	7,082,403.265	16,446,859.320
CP203	SET MAG NAIL	182+66.84	20.67' RT	7,082,247.566	16,447,019.010
CP204	SET 60D SPIKE	185+84.74	39.24' LT	7,082,416.484	16,446,743.120
CP205	SET 60D SPIKE	187+41.42	47.66' LT	7,082,515.391	16,446,621.310
CP206	SET 60D SPIKE	187+81.15	64.97' RT	7,082,625.548	16,446,667.440

BENCHMARKS

NO.	DESCRIPTION	ELEAVTION
BM500	CUT 'X' ON MH RISER	1,011.30



SURVEY DETAILS

FILE NO. 32384	ENGLISH	DESIGN TEAM WHKS & CO.	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER G.1

4:29:19 PM 6/12/2025 bbogaard pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\WHKS\Roadway\CADD_Files\Sheet_Files\SHT_43029266Z06_g01

108_23A
8/15/22

TRAFFIC CONTROL PLAN

1. Maintain at least one lane of traffic at all times.

2. Contractor shall furnish, install, maintain, and remove all traffic control devices.

3. All traffic control devices shall be in accordance with current IDOT Standard Specifications and current MUTCD specifications.

4. Refer to the J Sheets for staging details.

STAGING NOTES

NB STAGE 1
Construction:
- Shoulder strengthening to prepare for traffic shift.

Traffic Control:
- Close NB inside lane. Shift traffic to outside lane/shoulder in accordance with TC-418.

NB STAGE 2
Construction:
- Bridge approach pavement.
- HMA Shoulder strengthening.
- HMA paved shoulder adjacent to guardrail.
- Steel beam guardrail and guardrail grading.
- Bridge end drains.

Traffic Control
- Close NB outside lane. Shift traffic to inside lane/shoulder with TBR in accordance with TC-421.

NB STAGE 3
Construction:
- Bridge approach pavement.
- Remove and reinstall steel beam guardrail.

Traffic Control:
- Close NB inside lane. Shift traffic to outside lane/shoulder with TBR in accordance with TC-421.

SB STAGE 1
Construction:
- Bridge end drain.
- Bridge deck overlay and repair.

Traffic Control:
- Close SB outside lane, shift traffic to inside lane/shoulder with TBR in accordance with TC-421.

SB STAGE 2
Construction:
- Bridge deck overlay and repair.

Traffic Control
- Close SB inside lane, shift traffic to outside lane/shoulder with TBR in accordance with TC-421.

511 TRAVEL RESTRICTIONS

Line No.	Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No. or Structure ID or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
1.0	I-29	NB	Harrison		Allen Creek	Traffic Control Device	FHWA No. 28150	Horizontal	21'-6"	11'-0"	10'-0"	21'-6"	NB Stage 2
2.0	I-29	SB	Harrison		Allen Creek	Traffic Control Device	FHWA No. 28160	Horizontal	21'-6"	11'-0"	10'-0"	21'-6"	SB Stage 1

111_01

10/14/22

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
IMX-029-4(138)76--02-43	Bridge Deck Replacement
IMX-029-5(275)86--02-43	Bridge Replacement-CCS

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	(6)	Proposed Granular Surface Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Pink, Dark	(13)	Temporary Pavement Shading
Brown, Light	(236)	Proposed Grading Limits Shading
Cyan	(7)	Proposed MSE or CIP Wall Shading
Red	(3)	Proposed Bridge Shading and Sign Trusses
Black w/Gray, Light Fill	(0,48)	Previously Constructed Structure

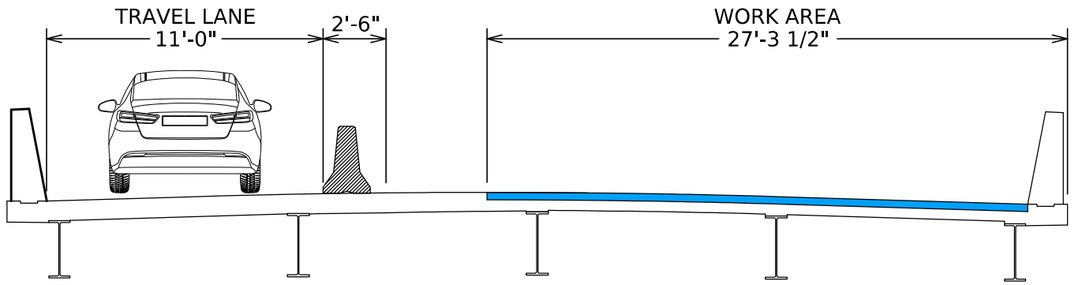
PLAN VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

●	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

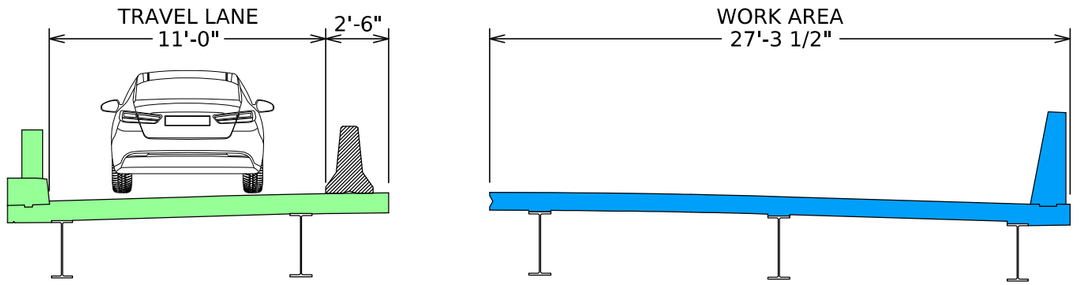
NOTE: Device spacing according to Standard Road Plans unless specifically dimensioned.

TRAFFIC CONTROL AND STAGING LEGEND AND SYMBOL INFORMATION SHEET

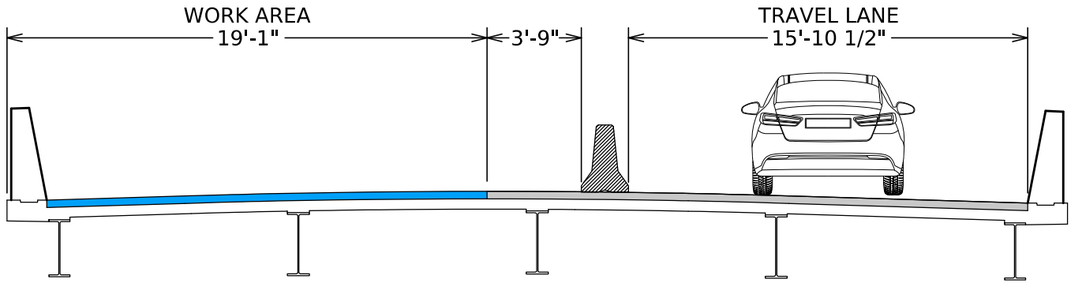
(COVERS SHEET SERIES J)



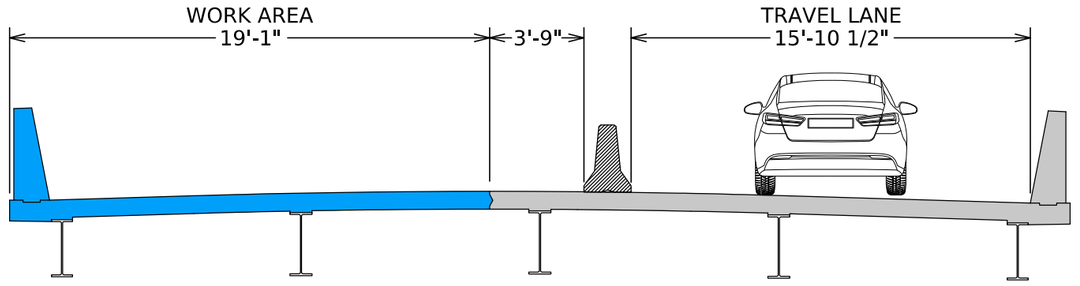
STAGE 1 SB



STAGE 2 NB



STAGE 2 SB

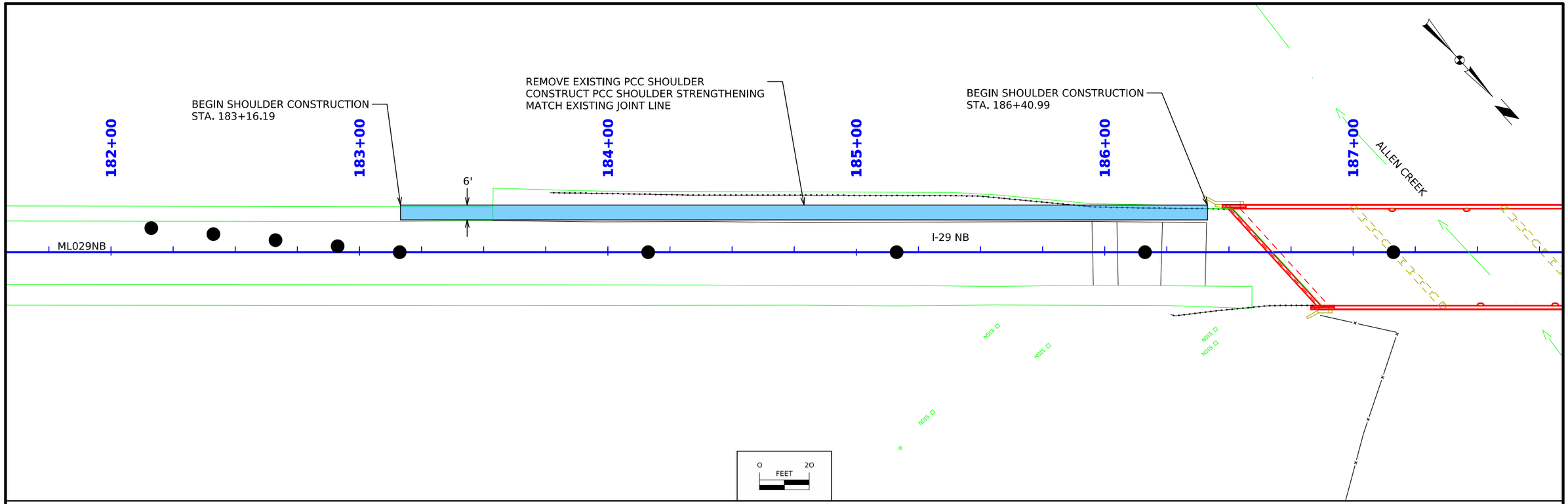


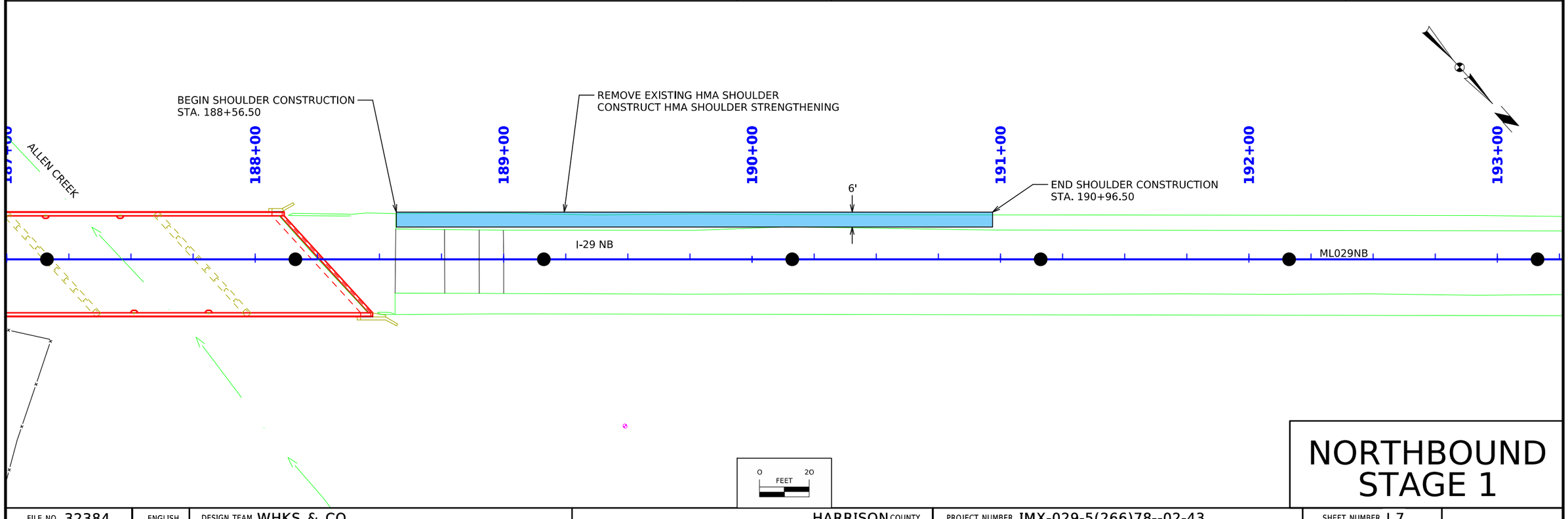
STAGE 3 NB

STAGING CROSS SECTION

FILE NO. 32384	ENGLISH	DESIGN TEAM WHKS & CO.	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER J.6

12:11:38 PM 9/23/2025 jfeldmann pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\WHKS\Roadway\CADD_Files\Sheet_Files\J Sheets\J05_ML029NB





NORTHBOUND STAGE 1

FILE NO. 32384	ENGLISH	DESIGN TEAM WHKS & CO.	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER J.7

11:51:25 AM 9/15/2025 bbogaard pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\WHKS\Roadway\CADD_Files\Sheet_Files\J Sheets\J06_ML029NB

182+00
183+00
184+00
185+00
186+00
187+00
ALLEN CREEK
EXISTING GUARDRAIL TO BE USED
AS CONSTRUCTED DURING STAGE 2
ML029NB
BEGIN CONSTRUCTION
STA. 183+16.19
I-29 NB
11'
REMOVE EXISTING STEEL
BEAM GUARDRAIL
8'
CONSTRUCT HMA SHOULDER STRENGTHENING
CONSTRUCT HMA PAVED SHOULDER
ADJACENT TO GUARDRAIL
CONSTRUCT STEEL BEAM GUARDRAIL
CONSTRUCT GUARDRAIL
GRADING BLISTER
CONSTRUCT BRIDGE END DRAIN (DR-402)
CONSTRUCT SLOPED CURB FROM BRIDGE
END RAIL TO BRIDGE END DRAIN
0 20
FEET

187+00
ALLEN CREEK
188+00
189+00
190+00
191+00
192+00
193+00
11'
I-29 NB
ML029NB
END SHOULDER CONSTRUCTION
STA. 190+96.50
8'
CONSTRUCT BRIDGE
APPROACH PAVEMENT
MATCH EXISTING APPROACH
PAVEMENT JOINT
CONSTRUCT HMA SHOULDER STRENGTHENING
CONSTRUCT SLOPED CURB FROM BRIDGE
END RAIL TO BRIDGE END DRAIN
CONSTRUCT BRIDGE END DRAIN (DR-402)
0 20
FEET

NORTHBOUND
STAGE 2

FILE NO. 32384	ENGLISH	DESIGN TEAM WHKS & CO.	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER J.8

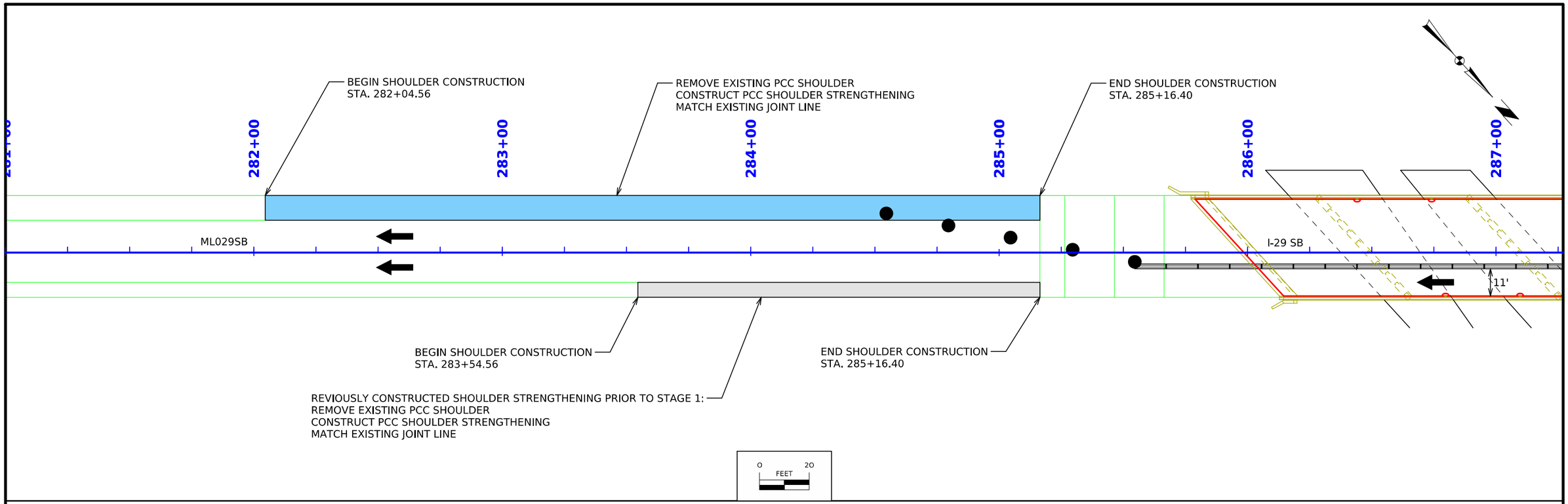
10:38:17 AM 9/23/2025 jfeldmann pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\WHKS\Roadway\CADD_Files\Sheet_Files\J Sheets\J07_ML029NB

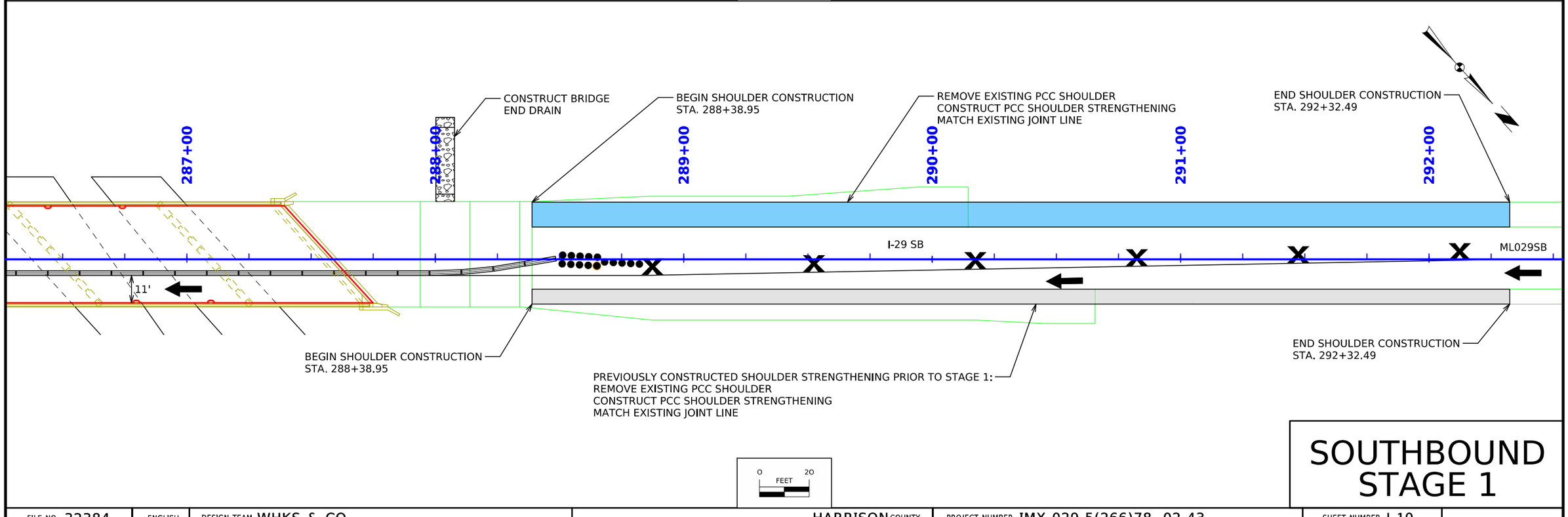
182+00
183+00
184+00
185+00
186+00
187+00
REMOVE AND REINSTALL GUARDRAIL
CONSTRUCT BRIDGE APPROACH PAVEMENT
ML029NB
I-29 NB
MATCH EXISTING JOINT
15' - 10 1/2"
0 20 FEET
187+00
188+00
189+00
190+00
191+00
192+00
193+00
CONSTRUCT BRIDGE APPROACH PAVEMENT
MATCH EXISTING JOINT
I-29 NB
ML029NB
15' - 10 1/2"
0 20 FEET

NORTHBOUND STAGE 3

FILE NO. 32384	ENGLISH	DESIGN TEAM WHKS & CO.	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER J.9

10:41:59 AM 9/23/2025 jfeldmann pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\WHKS\Roadway\CADD_Files\Sheet_Files\J Sheets\J08_ML029NB

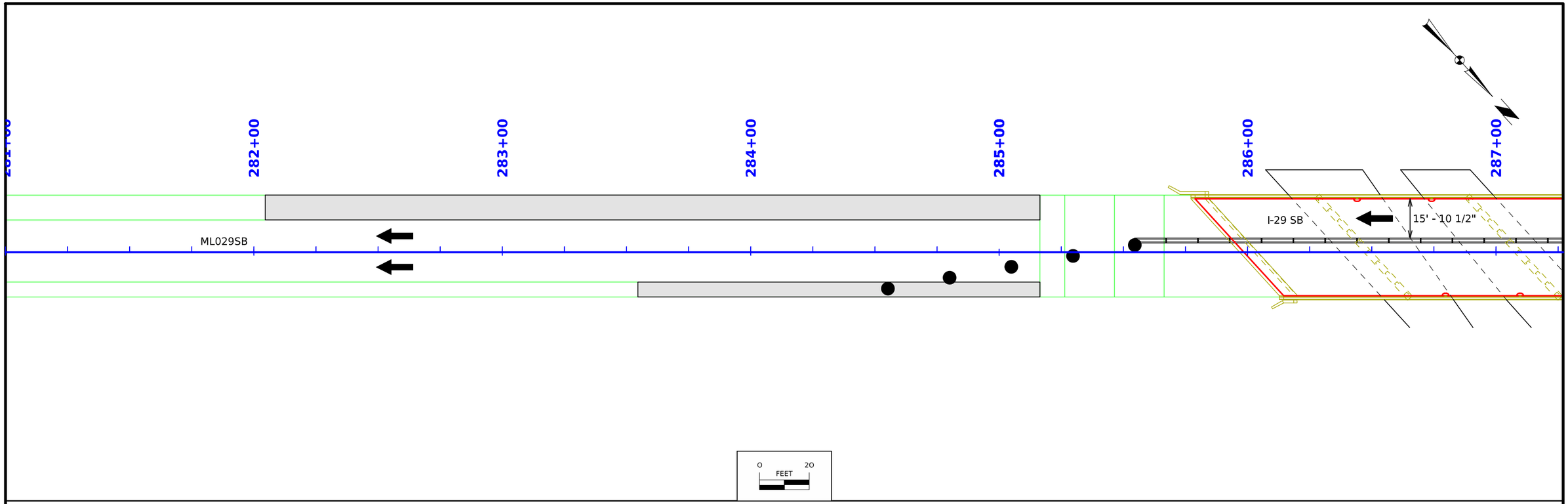


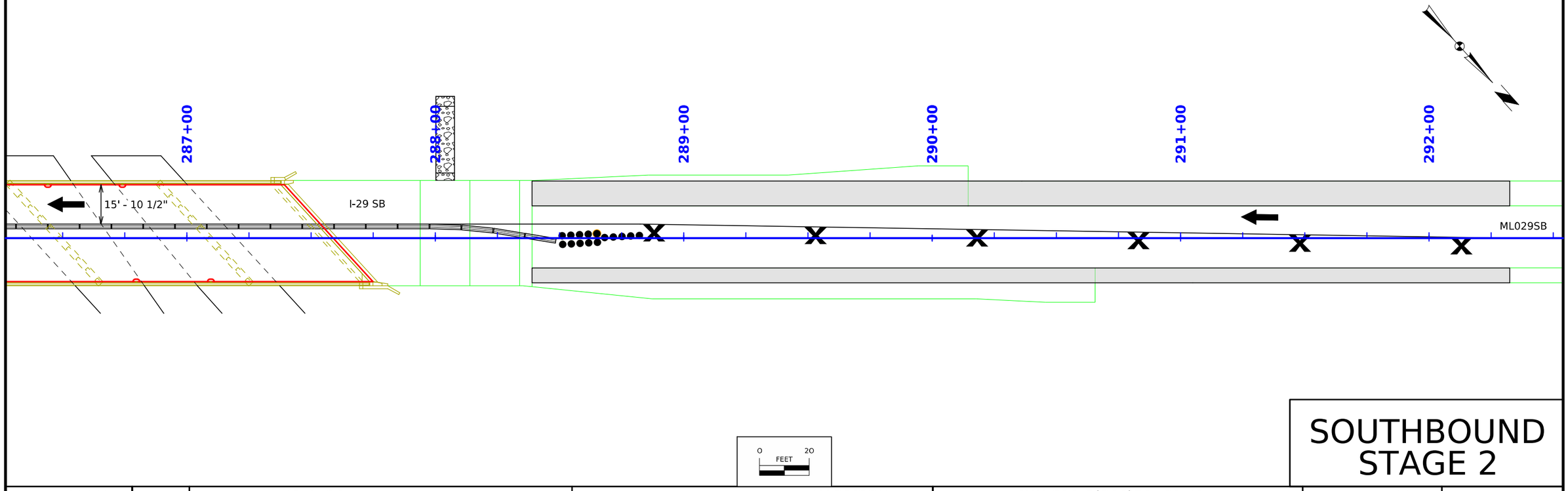


SOUTHBOUND STAGE 1

FILE NO. 32384	ENGLISH	DESIGN TEAM WHKS & CO.	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER J.10

11:28:54 AM 8/11/2026 lfatka pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\WHKS\Roadway\CADD_Files\Sheet_Files\J Sheets\J10_ML029SB





SOUTHBOUND STAGE 2

FILE NO. 32384	ENGLISH	DESIGN TEAM WHKS & CO.	HARRISON COUNTY	PROJECT NUMBER IMX-029-5(266)78--02-43	SHEET NUMBER J.11

11:32:28 AM 8/11/2026 lfatka pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302907022\Bridge\(266)_Reconstruction - Bridge Deck Replacement\WHKS\Roadway\CADD_Files\Sheet_Files\J Sheets\J11_ML029SB