LETTING DATE
Dec. 15, 2026

Reconstruction - Bridge Deck Replacement
IMX-029-4(138)76--02-43
Harrison COUNTY

Index of Sheets	
No.	Description
Sheets	Bridge Plan
A.1	Title Sheet
A.2	Location Map Sheet
V.1	Estimated Quantities - Design No. 527
V.1 - V.36	Design No. 527
Road Sheets	Road Plan
A.3 - J.8	Road Plans
C.2-C.3	Estimated Quantities - Road
C.4	Standard Plans - Road

IOWA DOT

Revisions

TOTAL
86
PROJECT IDENTIFICATION NUMBER
22-43-029-080
PROJECT NUMBER
IMX-029-4(138)76--02-43
R.O.W. PROJECT NUMBER
PROJECT DIRECTORY NUMBER
4302908022

PLANS OF PROPOSED IMPROVEMENT ON THE

INTERSTATE ROAD SYSTEM

Harrison COUNTY

Reconstruction - Bridge Deck Replacement

I-29 over US 30 at the US 30 Interchange (SB)

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.

Standard Road Plans

Standard Road Plans are listed on Sheet Number C.4

Design Data US 30

2024 AADT	8,500 V.P.D.
TRUCKS	13 %
Total 20-yr ESALs	1,600,000

Design Data I-29

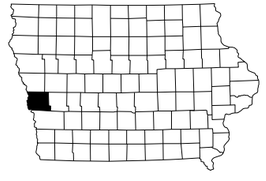
2024 AADT	17,300 V.P.D.
TRUCKS	30 %
Total 20-yr ESALs	10,000,000

AADT includes traffic in both directions.

Iowa DOT Bridges and Structures
Consultant Coordinator Contact:
Zahrah Alghalibi

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	Ryan G. Vashaw	Structural Design
A.3	Brian J. Birkland	Roadway Design

Structural Design

LICENSED PROFESSIONAL ENGINEER
Ryan G. Vashaw
28128
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.

Ryan Vashaw — 9-23-26
Signature — Date

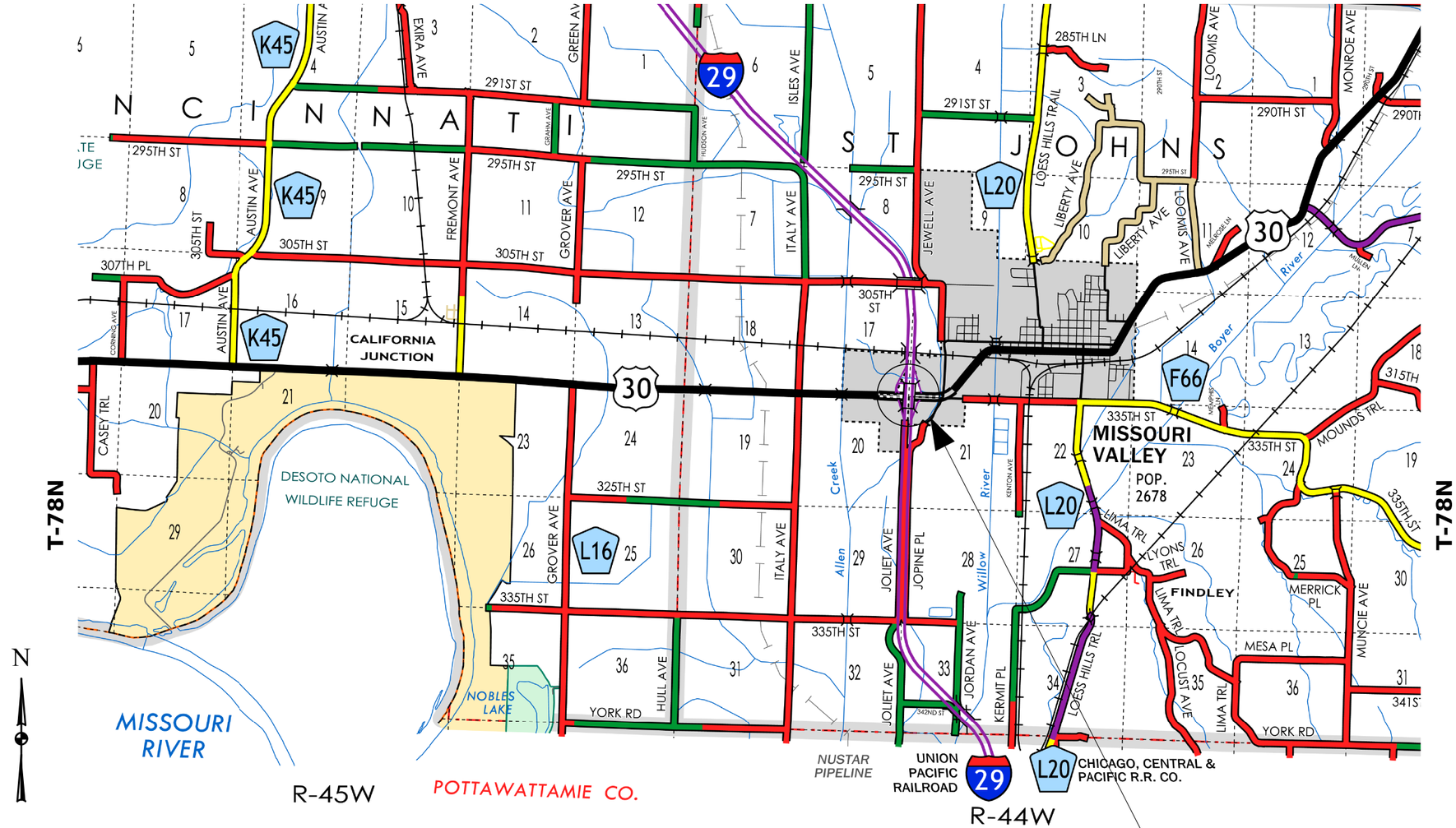
Ryan G. Vashaw
Printed or Typed Name

My license renewal date is December 31, 2026

Pages or sheets covered by this seal: A.1 thru A.2 and V.1 thru V.36

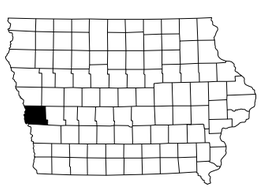
FILE NO. 32385	ENGLISH	DESIGN TEAM WHKS & Co.	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER A.1

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Harrison County Location Map

Not To Scale



Design No. 527
FHWA No. 28110

FILE NO. 32385	ENGLISH	DESIGN TEAM WHKS & Co.	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER A.2

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ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	ITEM DESCRIPTION
1	2401-6750001	REMOVALS, AS PER PLAN Includes all work for removal and off-site disposal of existing bridge deck, curbs, deck drains, barrier rails, abutment backwalls, and abutment diaphragms. 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)
2	2402-2720000	EXCAVATION, CLASS 20 Includes cost for all material, equipment, and labor necessary to furnish and place the compacted granular backfill between existing wings as shown on the Abutment Backfill Detail.
3	2403-0100000	STRUCTURAL CONCRETE (MISCELLANEOUS) Includes abutment backwall concrete. 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 wings.
4	2403-1000005	FIBER REINFORCEMENT FOR STRUCTURAL CONCRETE Polypropylene fibers shall be included in the bridge deck and abutment diaphragms. Refer to "Developmental Specifications for Fiber Reinforcement for Structural Concrete" for additional information.
5	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.
6	2403-7000210	HIGH PERFORMANCE STRUCTURAL CONCRETE Includes deck and abutment diaphragm concrete. Includes 1.1 CY for light pole bases. Includes all resilient joint filler required. Refer to "Developmental Specifications for High Performance Concrete for Structures" for additional information.
7	2404-7775005	REINFORCING STEEL, EPOXY COATED Includes 396 lb. for light pole bases. Includes 113 lbs. for rail conduit support bars.
8	2404-7775009	REINFORCING STEEL, STAINLESS STEEL - -
9	2408-7800000	STRUCTURAL STEEL All costs of bearing anchor bar replacement including removals, preparation, and field welding will be included in the contract unit price. Number of bearing anchor bar assemblies required = 24.
10	2414-6424038	CONCRETE BARRIER RAIL, 3'-8" Includes material and labor associated with providing and installing the rigid steel conduit, junction boxes and fittings. Includes 300 LF of 2" diameter and 85 LF of 1" diameter rigid steel conduit. If placement of concrete is done by the slip forming 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.
11	2426-6772010	BEAM REPAIR, AS PER PLAN Item is for repair of damaged PPC beams over EB and WB US 30 lanes. Item will be paid for as Lump Sum and includes all costs of removal of spalled and hollow areas, concrete patching, epoxy injection of cracks, FRP laminate, and installation as shown in these plans. Refer to Beam FRP Repair Details & Notes and "Developmental Specifications for Fiber Reinforced Polymer Repair for Concrete Containment of Collision Damaged Pretensioned Prestressed Concrete Beams" for additional information.
12	2426-6772013	REPAIR BEAM ENDS Item will be measured by count by the Engineer for each beam end repaired. Payment will be the contract unit price for each beam end repaired. Payment is full compensation for removals and all equipment and materials required to repair deteriorated beam ends as detailed in these plans.
13	2426-6772016	CONCRETE REPAIR - -
14	2499-2300001	DECK DRAINS Includes 4 deck drains. See Situation Plan and Deck Drain Details. Measurement will be Lump Sum for all deck drains required as detailed in the plans. Payment is full compensation for fabricating and installing the drains as per plan.
15	2501-8400172	TEMPORARY SHORING Shoring location is behind abutments adjacent to active traffic lane for reconstruction of abutment backwalls and placement of backfill. See Situation Plan and General Notes. Temporary shoring will be paid for as a lump sum including all cost for designing, furnishing, installing and removal.
16	2508-0970000	CONTAINMENT - -
17	2508-0991000	PAINTING OF STRUCTURAL STEEL Includes cleaning and painting of all abutment bearing sole plates, anchor bars, and masonry plates. Painting shall occur after anchor bar replacement.
18	2523-6765009	REMOVE AND REINSTALL LIGHT POLE AND LUMINAIRE Item is for removing and reinstalling two existing bridge-mounted light poles on the west side. Item will be measured by count for each pole removed and reinstalled. Light poles may be stored off-site or on-site if outside of clear zone. Use blocking to keep light poles off the ground. Payment will be the contract unit price for each pole removed and reinstalled. Payment is full compensation for all labor, equipment, and materials necessary, including cost of lighting conductor and connections.
19	2526-8285040	CONSTRUCTION SURVEY, LOCATION SURVEY - -
20	2533-4980005	MOBILIZATION - -
21	2536-6745045	REMOVAL OF ASBESTOS Includes removal of remnants of tar sealant on face of abutments at top of berm slope.
22	2599-9999008	('POUNDS' ITEM) Reinforcing Steel, Epoxy Coated, 80 ksi Refer to Section 2404 of the Standard Specifications for materials, construction, method of measurement, and basis of payment.

ESTIMATED BRIDGE REPAIR QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL
1	2401-6750001	REMOVALS, AS PER PLAN	LS	1
2	2402-2720000	EXCAVATION, CLASS 20	CY	42.9
3	2403-0100000	STRUCTURAL CONCRETE (MISCELLANEOUS)	CY	6.1
4	2403-1000005	FIBER REINFORCEMENT FOR STRUCTURAL CONCRETE	CY	374.2
5	2403-1000010	TRIAL BATCH AND TEST PLACEMENT (FIBER REINFORCED CONCRETE)	LS	1
6	2403-7000210	HIGH PERFORMANCE STRUCTURAL CONCRETE	CY	374.2
7	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	107,169
8	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB	5,098
9	2408-7800000	STRUCTURAL STEEL	LB	696
10	2414-6424038	CONCRETE BARRIER RAIL, 3'-8"	LF	443.5
11	2426-6772010	BEAM REPAIR, AS PER PLAN	LS	1
12	2426-6772013	REPAIR BEAM ENDS	EACH	24
13	2426-6772016	CONCRETE REPAIR	SF	28
14	2499-2300001	DECK DRAINS	LS	1
15	2501-8400172	TEMPORARY SHORING	LS	1
16	2508-0970000	CONTAINMENT	LS	1
17	2508-0991000	PAINTING OF STRUCTURAL STEEL	LS	1
18	2523-6765009	REMOVE AND REINSTALL LIGHT POLE AND LUMINAIRE	EACH	2
19	2526-8285040	CONSTRUCTION SURVEY, LOCATION SURVEY	LS	1
20	2533-4980005	MOBILIZATION	LS	1
21	2536-6745045	REMOVAL OF ASBESTOS	LS	1
22	2599-9999008	('POUNDS' ITEM) Reinforcing Steel, Epoxy Coated, 80 ksi	LB	14,501

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Roadway quantities shown elsewhere in these plans.

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

Estimated Bridge Repair Quantities

STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 Design Sheet No. 1 of 36 FHWA No. 28110

FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.1	

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General Notes:

This design is for repairs to the existing 219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge (SB) on I-29 over US 30 in Harrison County. Electronic copies of original design plans and repair plans are available to the Contractor as part of the e-Files supplied with the contract documents.

Dimensions shown on these plans are based on design plans (original Design No. 465).

See Situation Plan on Design Sheet 4 for list of repair items.

The City and Utility Companies whose facilities are shown on the plans or known to be within the construction limits shall be notified by the Contractor of the construction starting date.

Faint lines on plans indicate the existing portions of the bridge.

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.

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

The roadway will be open to thru traffic. Refer to the traffic control plan note on this sheet.

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

These bridge plans label all reinforcing steel with English notation (5a1 is ⅝ inch diameter bar). English reinforcing steel received in the field may display the following "bar designation" . The "bar designation" is the stamped impression on the reinforcing bars, and is equivalent to the bar diameter in millimeters.

English Size	3	4	5	6	7	8	9	10	11
Bar Designation	10	13	16	19	22	25	29	32	36

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

The lump sum bid for "Removal, as per Plan" shall include all costs associated with removing the existing bridge deck, curbs, deck drains, barrier rails, abutment backwalls and abutment diaphragms. 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.

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 reconstruct 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 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).

All reinforcing bars and bars noted as dowels supplied for this structure shall be deformed reinforcement unless otherwise noted or shown.

Kewyay 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.

Temporary shoring (sheet pile or other) shall be required as necessary to prevent the earth under the traffic lane from sloughing in during construction.

The Contractor shall submit a temporary shoring plan for review. The temporary shoring plan shall be designed and certified by a Professional Engineer licensed in the state of Iowa. When determining slope stability to support structures such as bridges, culverts and retaining walls, a global stability analysis shall be included in the design of the temporary shoring in accordance with Chapter 200F-1 in the Design Manual of the Iowa DOT, Design Bureau. The Contractor shall not proceed with installation of the temporary shoring without notice to proceed from the Engineer.

The temporary shoring submittal shall include:
- Design Calculations (Including a Global Stability Analysis)
- Soil Properties
- Shoring Material Properties
- Shoring Plan Layout (Showing Location of Traffic)
- Shoring Details

Temporary shoring shall be paid for as a lump sum including all cost for designing, furnishing, installing and removal. All material used for shoring shall remain the property of the Contractor. Shoring is to be removed only after backfilling has been completed. In addition to the requirements noted above, Article 1107.07 of the Standard Specifications still applies.

Abutment bearings (sole plates and masonry plates) are to be cleaned and painted. Cleaning by vacuum blasting or by a non-blasting method is required. Surface to be painted shall be prepared in accordance with Steel Structures Painting Council (SSPC) SP3. Surfaces of the abutment bearings are to be given one coat of both a rust inhibitor type primer and final coat as approved by the Engineer. The color of the dry paint should approximate the color of concrete. This work shall be measured and paid for at the contract unit price per lump sum for the bid item, "Painting of Structural Steel".

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 unit price bid for the "Containment" item.

A scrape sample was taken to get an indication of the existence of and level of total lead and total chromium. See below table. These analyses show the existence of these two toxic constituents. Level 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.

County	Route	Maint. No.	FHWA No.	Date	Location	Pb (ppm)	Cr (ppm)	TCLP Pb (ppm)
Harrison	029	4375.7L029	028110	12/18/2017	Abutment Bearing	1400	200	
Harrison	029	4375.7L029	028110	2/8/2000	Expansion Device	8150	< 50	1.5

The Contractor shall be responsible for ensuring stability of prestressed concrete beams during construction up through the bridge deck reaching its full 28-day strength. The Contractor shall provide sufficient temporary anchor bracing at beam ends and temporary intermediate bracing as needed to ensure prestressed beam stability. Partially or fully installed permanent bracing as shown in these or existing design plans shall not be assumed sufficient to brace prestressed beams during construction. Temporary bracing shall not be welded to prestressed beam stirrups.

The tops of the abutment backwalls as shown shall be constructed using structural concrete Class C. Promptly after the concrete has been placed and vibrated as provided in Articles 2403.03, C, and 2403.03, D, of the Standard Specifications, it shall be hand finished to provide a smooth surface with the proper crown. The Contractor may elect to use formwork which is marked or trimmed to the correct elevation and crown to provide the limits for the hand finishing.

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	- Tar sealant at abutment faces and curbs of macadam stone slope protection (5% chrysotile asbestos)
FHWA Number (Existing)	- Information provided elsewhere in plan
Road/Route (City)	- Information provided elsewhere in plan
County	- Information provided elsewhere in plan
Direction to Bridge	- Information provided elsewhere in plan
Bridge Size	- Information provided elsewhere in plan
Number of Decks	- 1 (Typ.)
Asbestos Inspector/Amounts	- Brad Azeltine - 515-239-1938

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.

Specifications:

Design: AASHTO LRFD 10th Ed. Series of 2024, except as noted in the current Iowa Bridge Design Manual.

Construction: Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, 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 Reinforcing for Structural Concrete.

Developmental Specifications for High Performance Concrete for Structures.

Developmental Specifications for Fiber Reinforced Polymer Repair for Concrete Containment of Collision Damaged Pretensioned Prestressed Concrete Beams.

Developmental Specifications for Electronic Ticketing.

Design Stresses:

Design stresses for the following materials are in accordance with the AASHTO LRFD Bridge Design Specifications, 10th Ed. Series of 2024, except as noted in the current Iowa Bride Design Manual.

Reinforcing steel in accordance with AASHTO LRFD Section 5, Grade 60 for epoxy coated and non-coated except ASTM A615 Grade 80 or ASTM A706 Grade 80 for epoxy coated 6j1 deck bars, and Grade 60 or 75 stainless reinforcing steel.

Concrete in accordance with AASHTO LRFD Section 5, f'c = 4.0 ksi.

Structural steel in accordance with AASHTO LRFD Section 6. ASTM A709 Grade 36, Grade 50, and Grade 50W (AASHTO M270 Grade 36, Grade 50 and Grade 50W)

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Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

General Notes

STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 Design Sheet No. 2 of 36 FHWA No. 28110

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	(138)_Harrison_Design527_DeckDrains.pdf	No
2	Deck Demolition Plan	(138)_Harrison_Design527_DeckDemolitionPlan.pdf	No
3	Temporary Shoring Plan	(138)_Harrison_Design527_TempShoringPlan.pdf	Yes
X			
X			

Bridge Deck Dimension Table

No.	Item	Unit	Quantity
1	Deck Length	L.F.	221.75
2	Minimum Deck Width	L.F.	54.86
3	Maximum Deck Width	L.F.	60.4
4	Deck Area	S.F.	12,779.5

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

Traffic Control Plan

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

Design History at this Site

(Includes this Design)

Des. No.	Type of Work
465	Original Design
1393	Overlay, Retrofit Rail (SB)
527	Bridge Deck Replacement

Design For 1°13’30” Skew RA

219’-7” x Var. Pretensioned Prestressed Concrete Beam Bridge

38’-11½” & 43’-1½” End Spans 2-68’-9” Interior Span

General Notes - Misc.

STA. 1088+28.60 (I-29)

Turn-in Date: Sept, 1, 2026

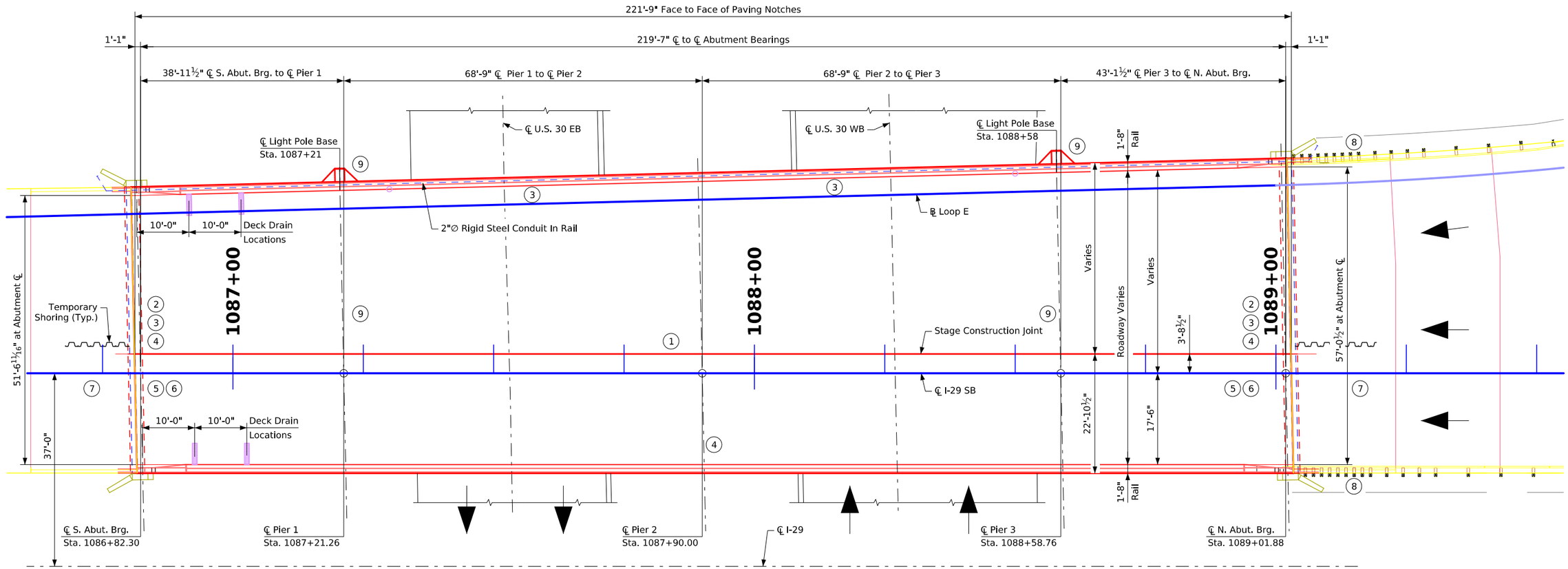
Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 Design Sheet No. 3 of 36 FHWA No. 28110

whks engineers + planners + land surveyors

Control Point: Bench Mark # 91-A Cut "X" in NW Wing Post Base. Sta. 1089+02± SBL. Elev. 1024.76



Situation Plan

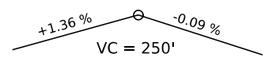
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Repairs Shall Consist Of:

1. Remove and reconstruct the deck and rails. Install new deck drains along outside gutter line.
2. Remove and reconstruct both abutment backwalls with semi integral conversion.
3. Perform beam repairs and install FRP wrap at damaged areas.
4. Perform concrete repairs to the existing abutment footings and piers.
5. Clean and paint abutment bearings.
6. Install new anchor bars into backwall.
7. Remove and replace the bridge approaches.
8. Remove and replace the existing guardrail.
9. Remove and re-install light poles. Reconnect underdeck lighting.

Notes:
All plan dimensions are horizontal unless noted otherwise.
All dimensions in feet unless noted otherwise.
For crown ordinates, see Design Sheet No. 11.

PI Sta. = 1088+20
Elev. = 1025.70



Profile Grade
Southbound I-29

Note: Profile Grade differs from Original Plan

Traffic Data (S.B. Bridge)

2024 AADT	8,650 V.P.D.
TRUCKS	30 %

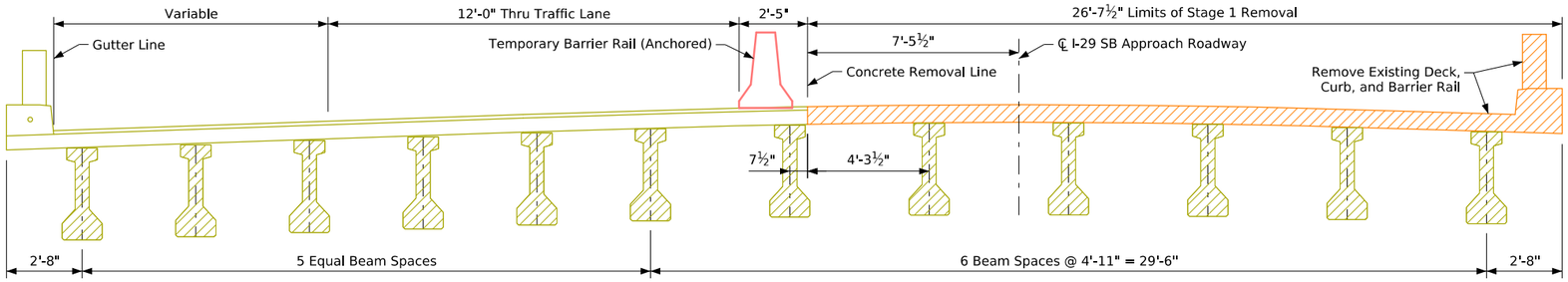
Location:
On I-29 (SB) over US 30
T-78N R-44W
Sections 16, 17, 20, 21
St. Johns Township
Harrison County
Maint. No. 4375.7L029
FHWA No. 028110
Latitude: 41.550210
Longitude: -95.917625

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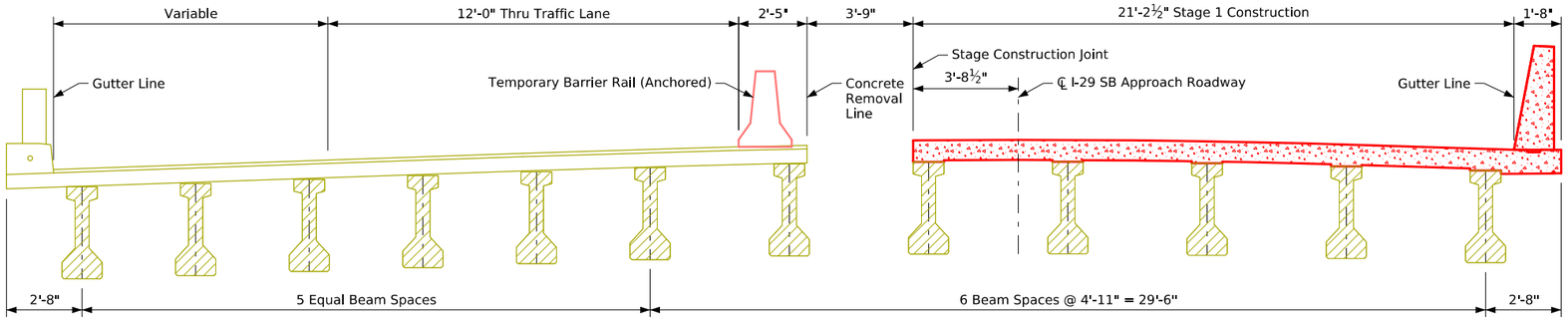
Design For 1°13'30" Skew RA
219'-7" x Var. Pretensioned
Prestressed Concrete Beam Bridge
38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span
Situation Plan
STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026
Harrison County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 527 Design Sheet No. 4 of 36 FHWA No. 28110

FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.4	

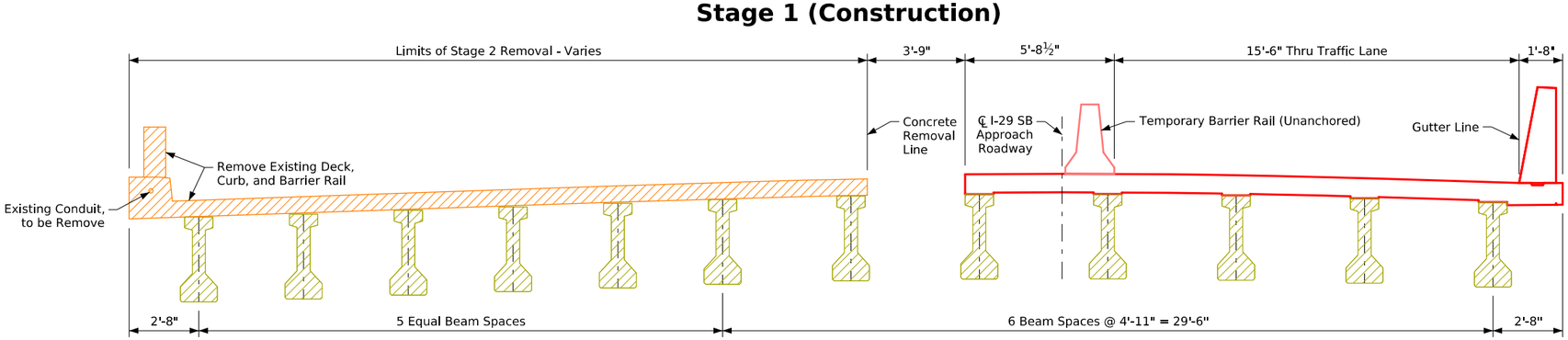
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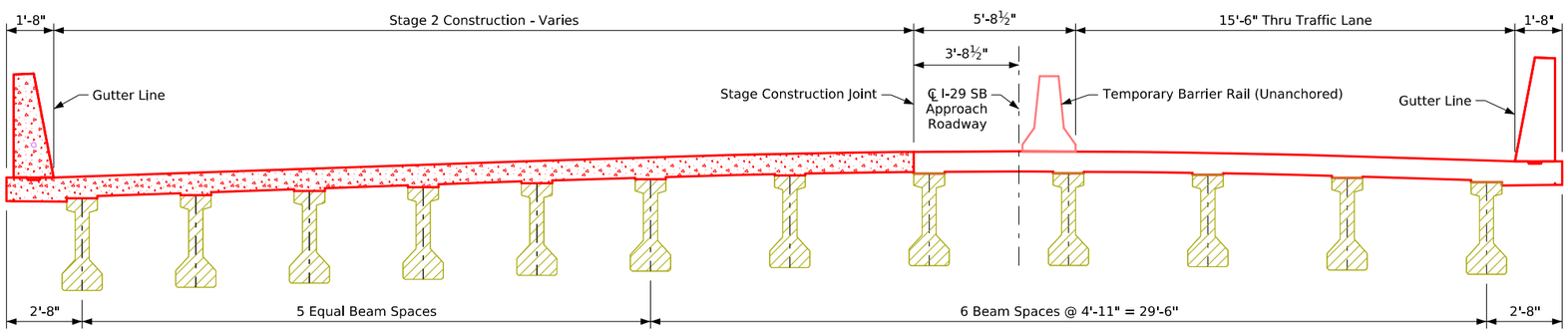
Stage 1 (Removal)



Stage 1 (Construction)



Stage 2 (Removal)



Stage 2 (Construction)

Southbound I-29 on-ramp (Loop E) will be closed for Stage 1 and Stage 2 construction

Note:
The plans show a layout for TBR for 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 upstation. (North)

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

Staging Details

STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026

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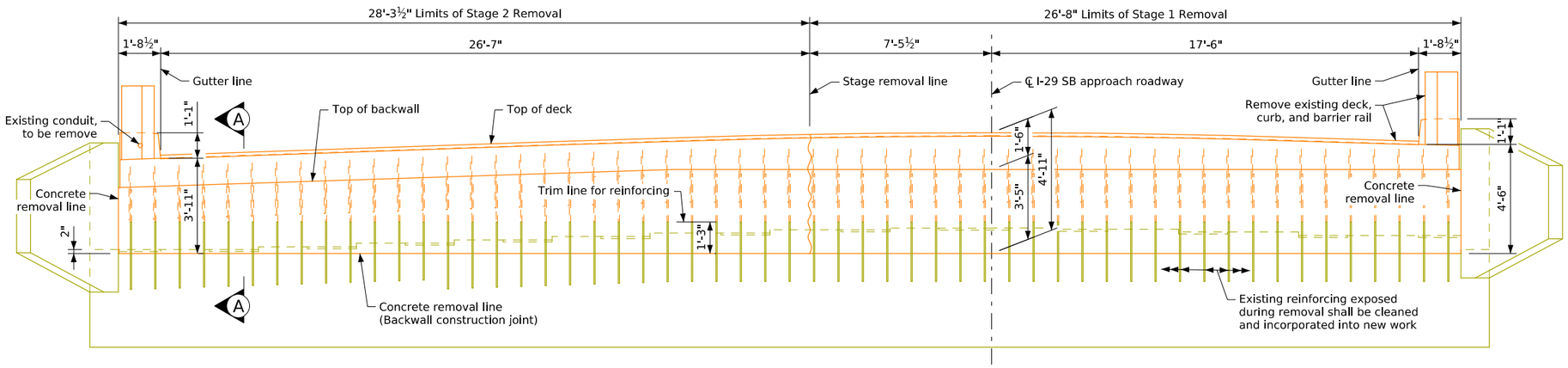
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Design No. 527 Design Sheet No. 5 of 36 FHWA No. 28110

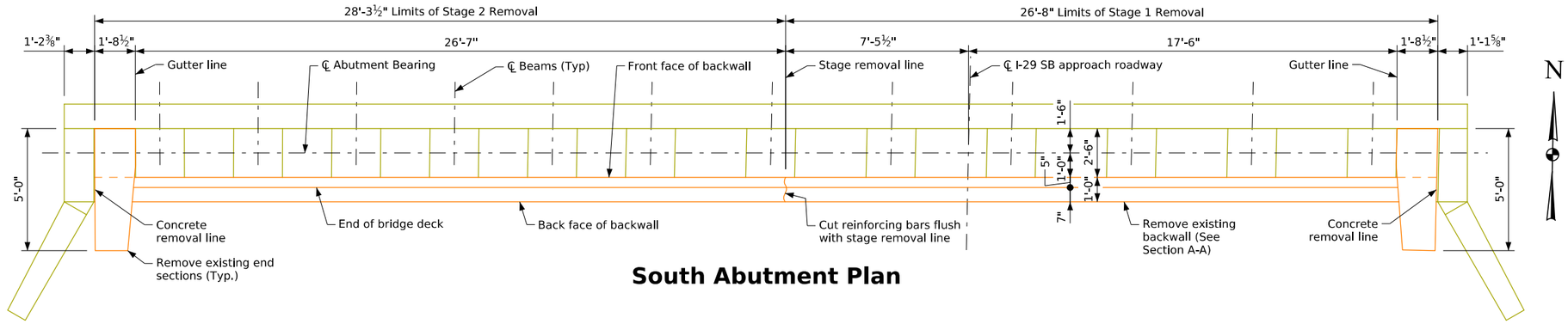
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FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.5	

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Rear Elevation



South Abutment Plan

Removal Notes:

These plans show details of the superstructure removal on the existing bridge. All partial removals shall be performed in accordance with Section 2401 of the Standard Specifications. All such removals shall be made with neat saw cuts to provide clean, straight surfaces at the interfaces between new concrete and remaining concrete. Concrete removal shall be initiated with a 3/4" saw cut wherever possible. The removal work shall be conducted in a manner that prevents any damage to the portions of the existing structure that will 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 designated to be "saved" and exposed during removal operations shall be carefully protected, cleaned, and incorporated into the new construction unless otherwise noted.

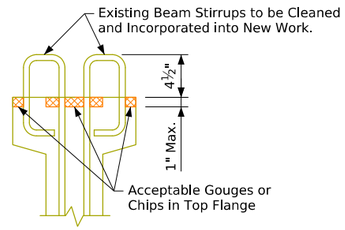
The Bridge Contractor is to use extreme care when removing the deck concrete at the beam locations to avoid damaging the top flange and ½" diameter hoop bars of the beam. Prior to commencing any deck removal work, the Contractor shall submit a demolition plan to the Engineer for approval. The Contractor 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 beam is removed, the top surface of the beam along the entire span shall be cleaned by sandblasting or another approved methods to provide a suitable bond between the beam and concrete deck in accordance with Article 2403.03, I, of the Standard Specifications.

The existing ½" diameter hoop bars are an integral part of the existing beam top flange. All damage sustained to the top flange and/or ½" diameter hoop bars shall be identified and repaired as directed by the Engineer.

If one or more of the existing beams or hoop bars are damaged during removals, the Contractor shall repair or replace the damaged beam or beams. Bearings shall also be replaced. The Engineer will determine what repairs and/or replacements are required.

All material, equipment, traffic control, and labor associated with removal of the deck and repair of any damage or beam and bearing replacement shall be considered incidental to the bid item "Removals, as per plan". Any damaged beams which are not to be re-used are to become the property of the Contractor.



Typical Allowable Damage Detail for Existing Prestressed Beams

Note: See Design Sheet 7 for Section A-A.

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans — 2-68'-9" Interior Span

Removal Detail

STA. 1088+28.60 (I-29) — Turn-in Date: Sept, 1, 2026

Harrison County

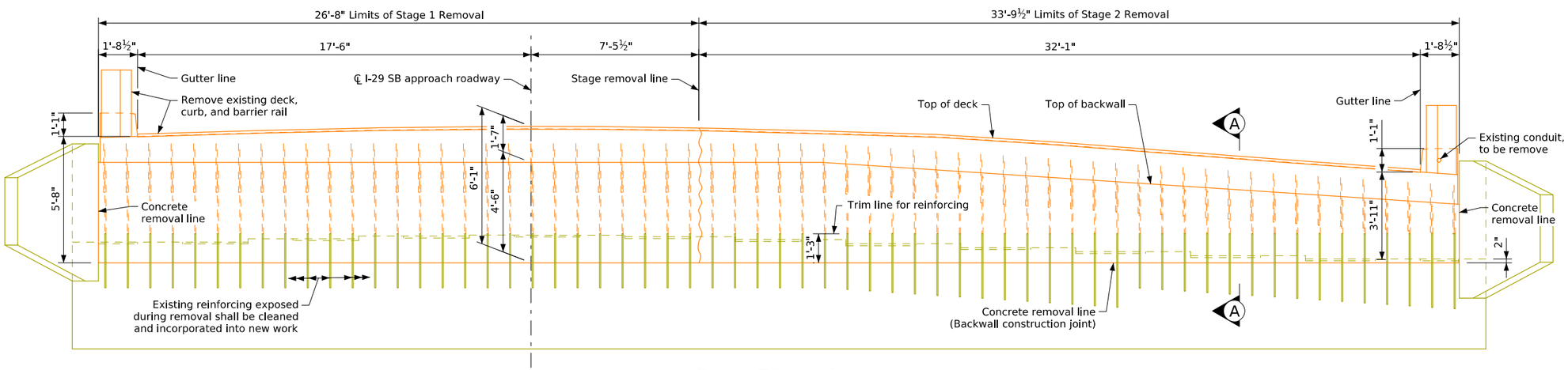
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Design No. 527 — Design Sheet No. 6 of 36 — FHWA No. 28110

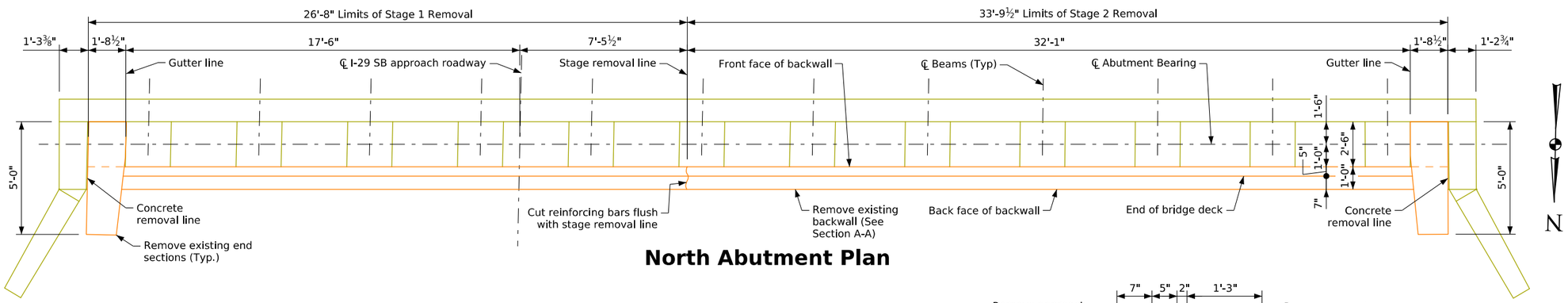
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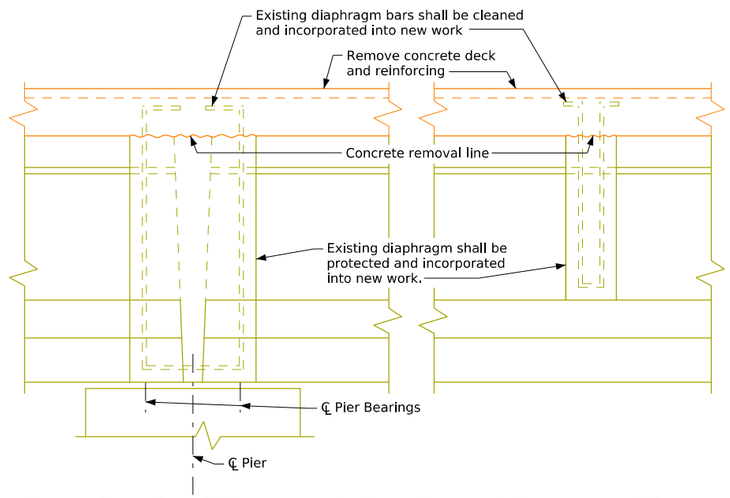
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Rear Elevation

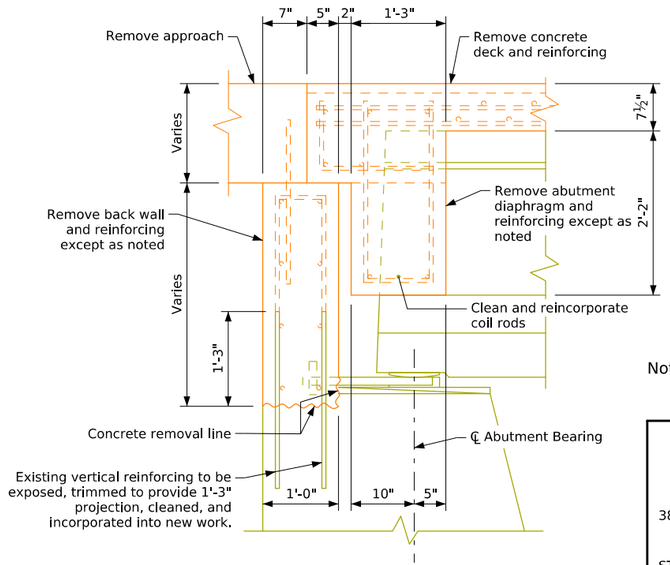


North Abutment Plan



Part Longitudinal Removal Section of Deck at Diaphragms

(Deck reinforcing and curb/barrier rail not shown for clarity.)



Section A-A

Note: See Design Sheet 6 for Section A-A cut.

Note: See Design Sheet 6 for Removal Notes.

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Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans — 2-68'-9" Interior Span

Removal Detail

STA. 1088+28.60 (I-29) — Turn-in Date: Sept, 1, 2026

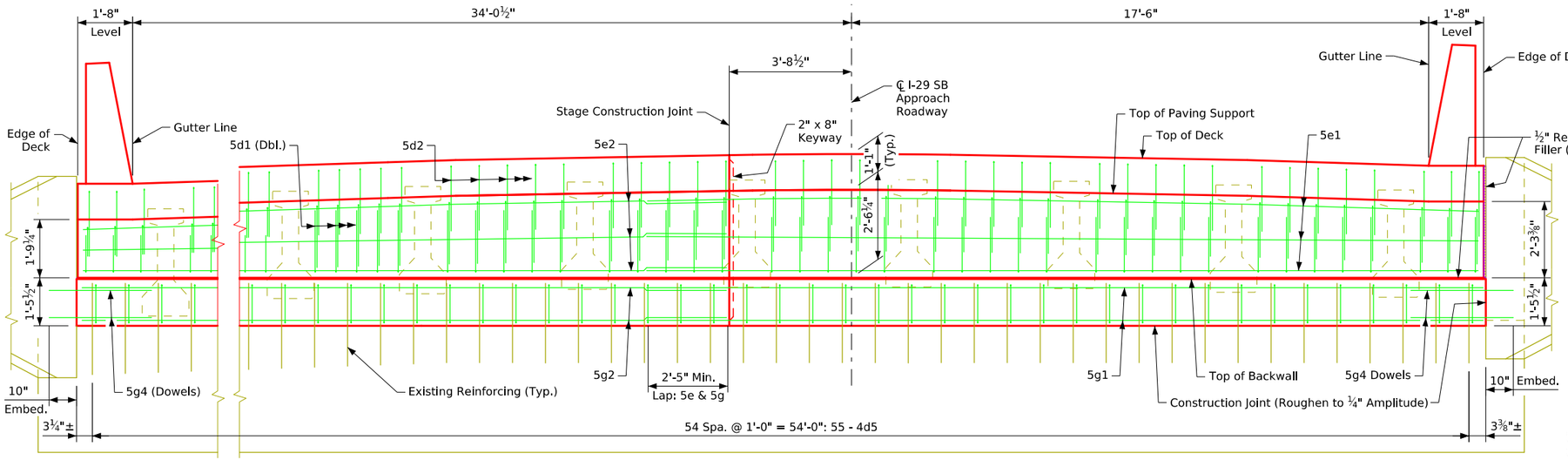
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Design No. 527 — Design Sheet No. 7 of 36 — FHWA No. 28110

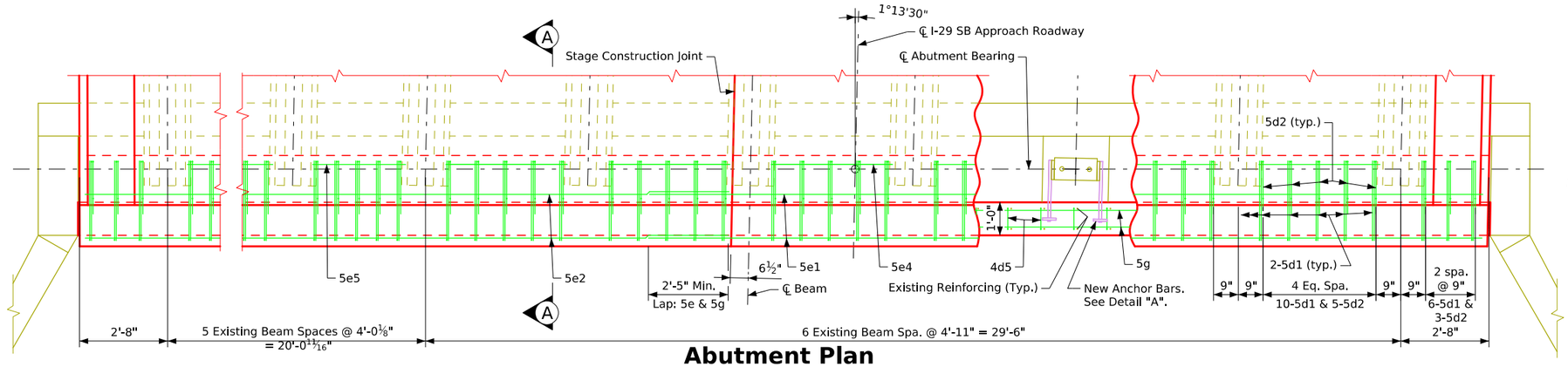
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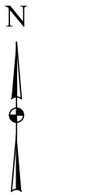
Abutment Rear Elevation

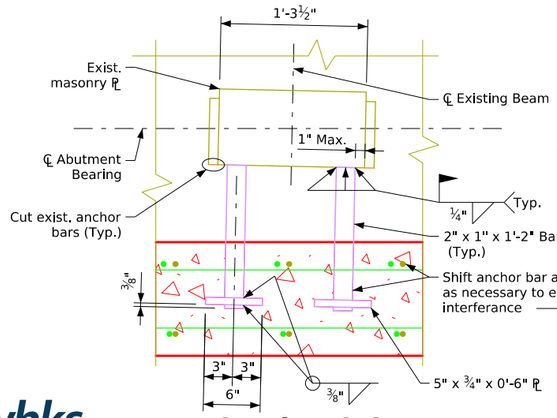
(Deck reinforcing not shown for clarity)



Abutment Plan

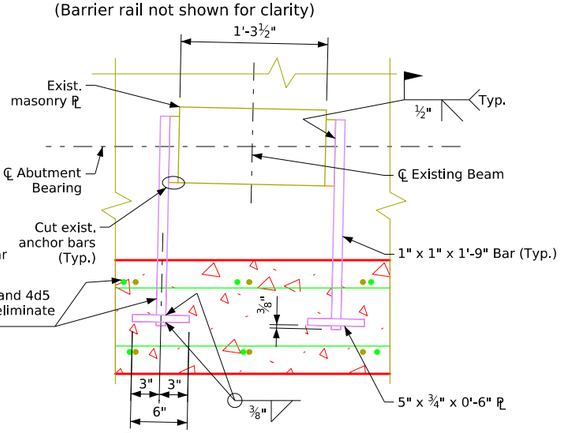
(Barrier rail not shown for clarity)





Section C-C

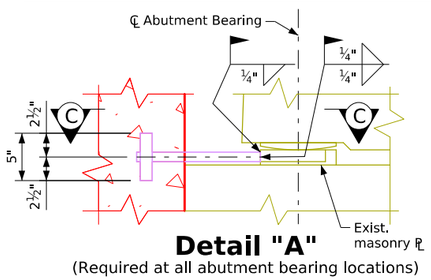
Wt. One Detail "A" = 29 lbs.



Alternate Section C-C

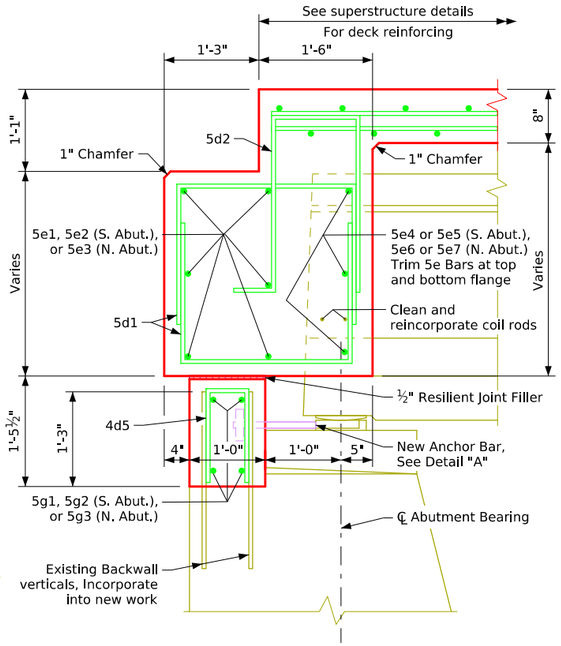
Wt. One Alternate Detail "A" = 25 lbs.

Note:
New anchor bars shall be welded following cleaning and blasting of existing steel bearings and prior to painting. Cleaning and blasting of existing steel bearings prior to painting is incidental to the price bid for "Containment".



Detail "A"

(Required at all abutment bearing locations)



Section A-A

Note: See Design Sheet 9 for section location at north abutment.
South Abutment Shown, North Abutment Similar

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Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans — 2-68'-9" Interior Span

South Abutment Repair Details

STA. 1088+28.60 (I-29) — Turn-in Date: Sept, 1, 2026

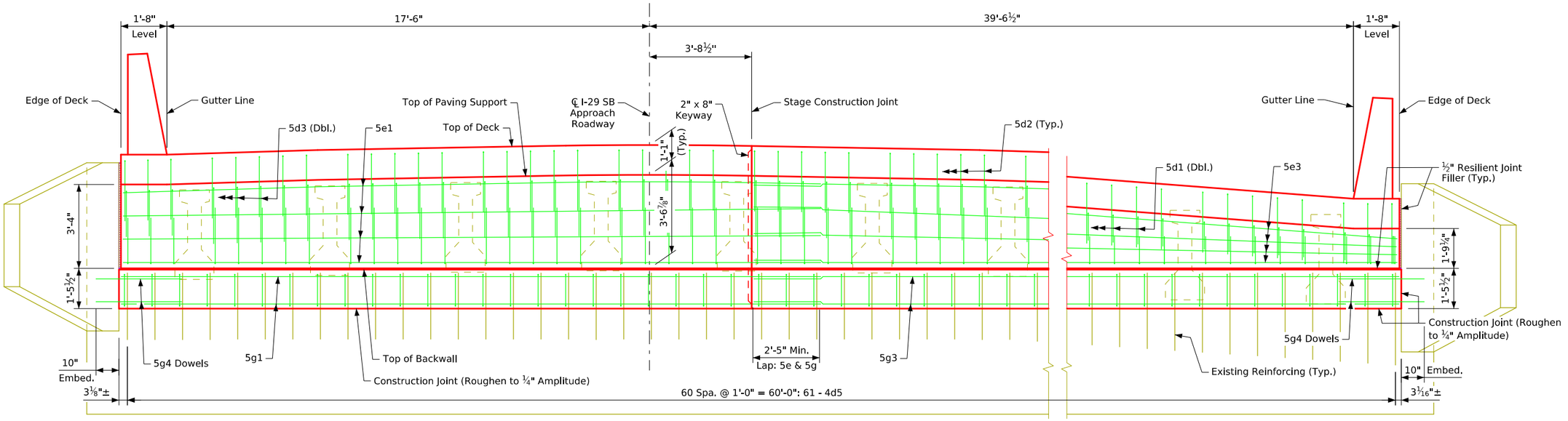
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Design No. 527 — Design Sheet No. 8 of 36 — FHWA No. 28110

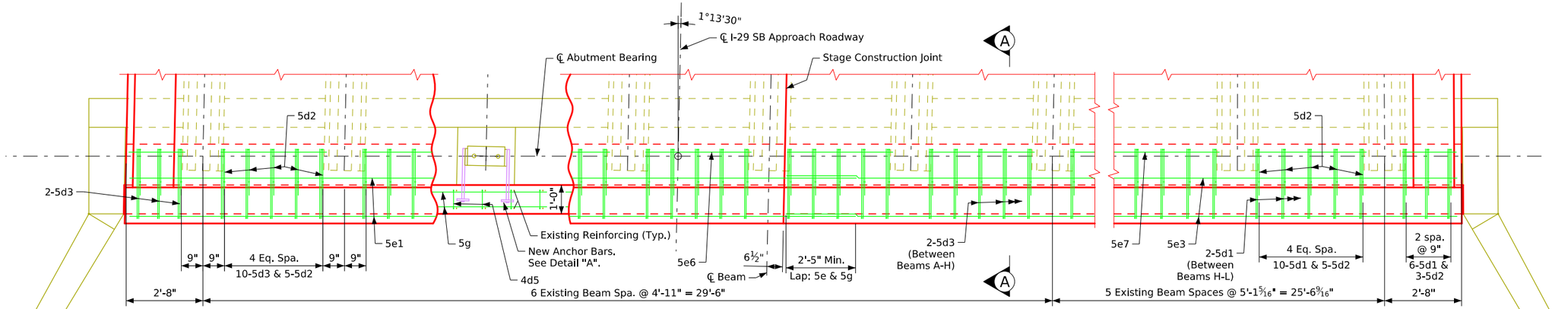
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Abutment Rear Elevation

(Deck reinforcing not shown for clarity)



Abutment Plan

(Barrier rail not shown for clarity)

N

Notes:
See Design Sheet 8 for Section A-A.
See Design Sheet 8 for bearing repair notes and details.

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Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans — 2-68'-9" Interior Span

North Abutment Repair Details

STA. 1088+28.60 (I-29) — Turn-in Date: Sept, 1, 2026

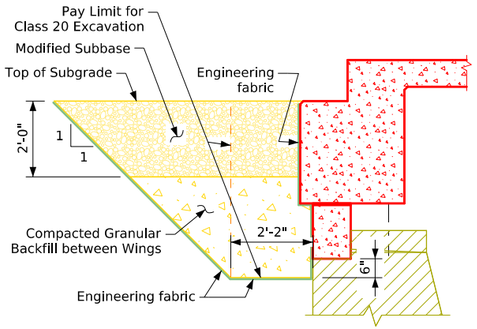
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Design No. 527 — Design Sheet No. 9 of 36 — FHWA No. 28110

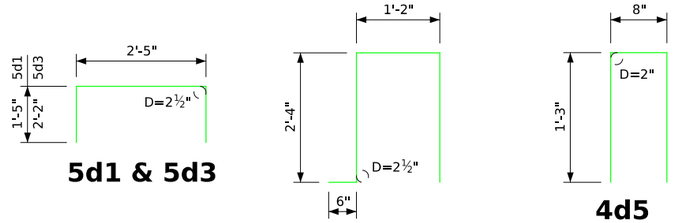
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Abutment Backfill Details

Bent Bar Details



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

Reinforcing Bar List - Both Abutments

Epoxy Coated Reinforcing

Bar	Location	Shape	No.	Length	Weight
5d1	Paving Notch, Hairpin		168	5'-3"	920
5d2	Paving Notch and Diaphragm, Hoop		122	6'-4"	806
5d3	Paving Notch, Hairpin, North Abutment Btwn. Beams A-H		76	6'-9"	535
4d5	Backwall, Vertical		116	3'-2"	245
5e1	Paving Notch, Transverse, Stage 1		13	25'-3"	342
5e2	Paving Notch, Transverse, Stage 2, South Abutment		6	31'-8"	198
5e3	Paving Notch, Transverse, Stage 2, North Abutment		7	37'-2"	271
5e4	Diaphragm Between Beams, South Abutment		18	3'-7"	67
5e5	Diaphragm Between Beams, South Abutment		15	2'-8"	42
5e6	Diaphragm Between Beams, North Abutment		24	3'-7"	90
5e7	Diaphragm Between Beams, North Abutment		20	3'-9"	78
5g1	Backwall Transverse, Stage 1		8	25'-3"	211
5g2	Backwall Transverse, Stage 2, South Abutment		4	31'-8"	132
5g3	Backwall Transverse, Stage 2, North Abutment		4	37'-2"	155
5g4	Backwall to Wing Dowels		16	3'-5"	57
	Reinforcing Steel - Epoxy Coated - Total (lbs.)				4,149

Concrete Placement Summary - Both Abutments

Location	Quantity
South Abutment Stage 1	1.2
South Abutment Stage 2	1.7
North Abutment Stage 1	1.2
North Abutment Stage 2	2.0
Abutment diaphragm concrete included in Superstructure Quantities.	
Total Structural Concrete (Misc.) (CY)	6.1

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 costs of setting bars as dowels in the abutment footings and wings.

Dowel Setting Note:

The 5g4 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 in accordance with Article 2301.03, E, of the Standard Specifications.

B. Hydraulic cement grout systems. Drilled holes are to be 2 1/2 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.

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Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

Abutment Repair Details

STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026

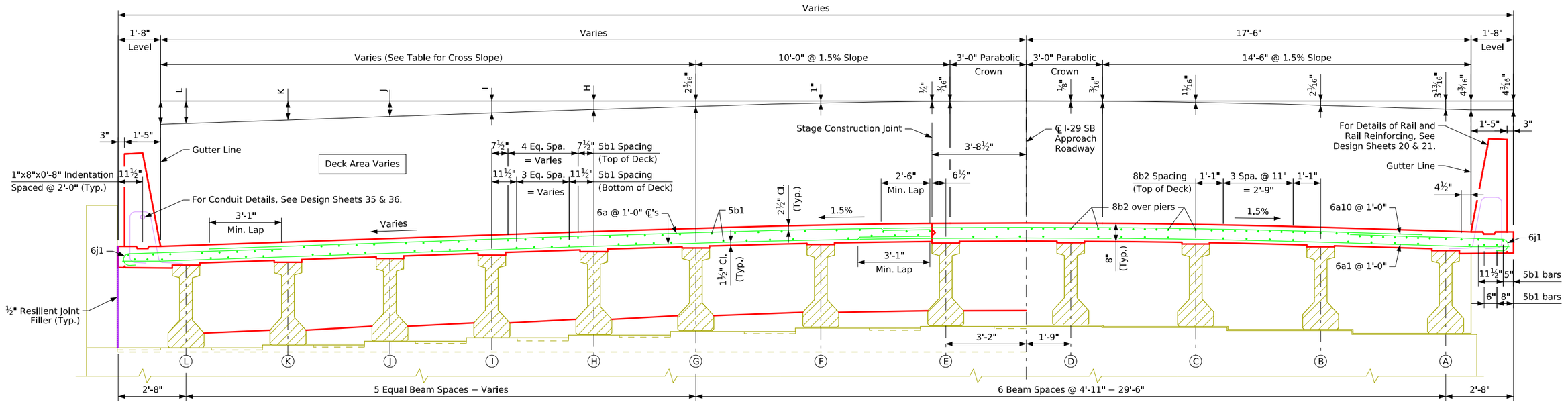
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Design No. 527 Design Sheet No. 10 of 36 FHWA No. 28110

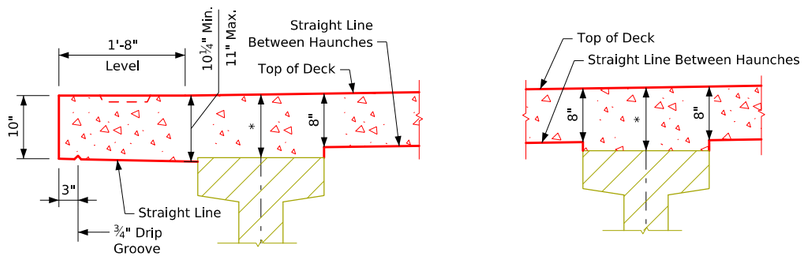
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Half Section at Abutment
Looking North

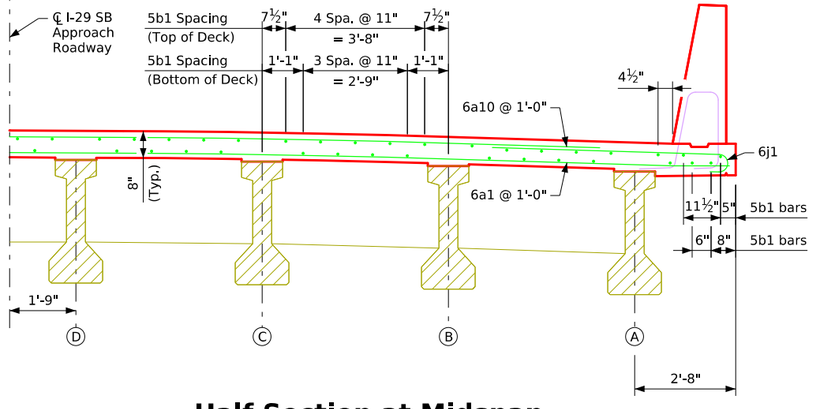
Half Section Near Pier
Looking North



Exterior Beams

Interior Beams

Typical Deck and Haunch Detail
* For Deck Thickness Over Beams, See "Deck Thickness at Existing Beams" on Design Sheet 18.



Half Section at Midspan
Looking North

Table of Cross Slopes and Crown Ordinates

Location	Cross Slope Gutterline to Beam H	Cross Slope Beam G to Beam H	H	I	J	K	L	Gutterline
South Abut.	2.92%	2.00%	3 5/16	4 11/16	6 1/8	7 1/2	8 15/16	9 1/4
Pier 1	3.60%	2.35%	3 1/2	5 3/8	7 3/16	9	10 13/16	11 1/4
Pier 2	4.90%	2.98%	3 15/16	6 5/8	9 5/16	1'-0	1'-2 11/16	1'-3 1/4
Pier 3	6.02%	3.60%	4 7/16	8	11 1/2	1'-3 1/16	1'-6 5/8	1'-7 5/16
North Abut.	6.64%	4.00%	4 13/16	8 7/8	1'-0 15/16	1'-5	1'-9 1/16	1'-9 7/8

Notes:
See Design Sheet 14 for Superstructure Notes.

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

Bridge Deck Cross Section

STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026

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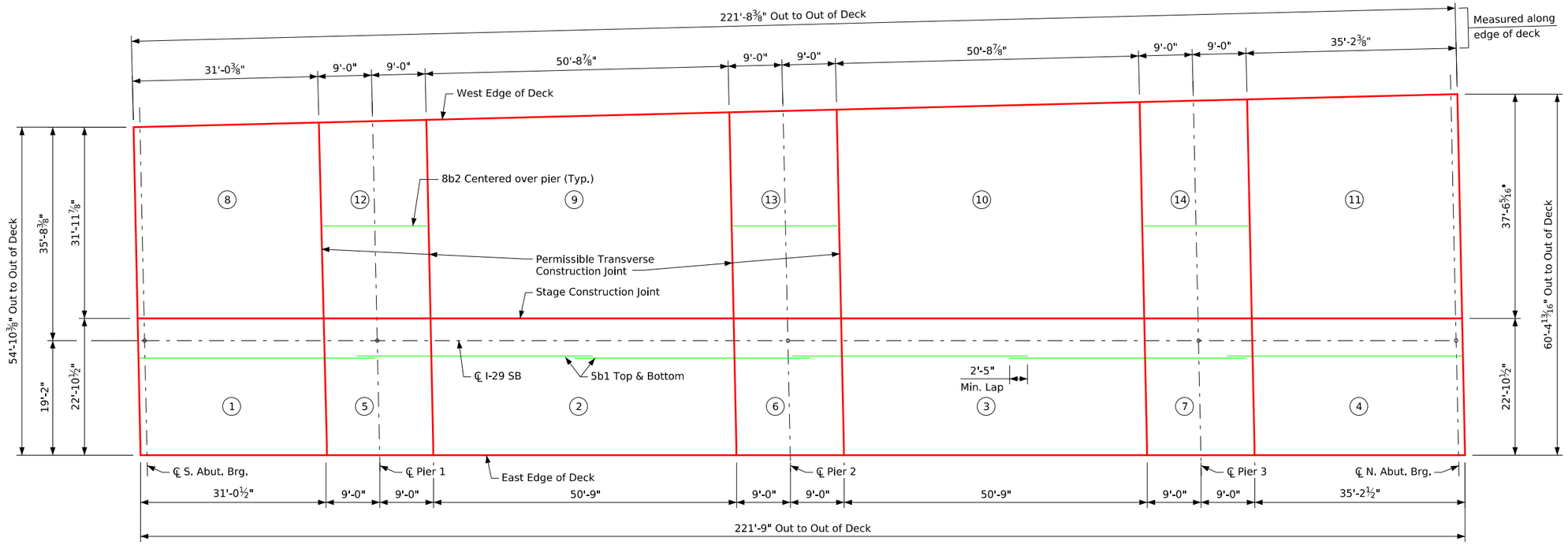
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Design No. 527 Design Sheet No. 11 of 36 FHWA No. 28110

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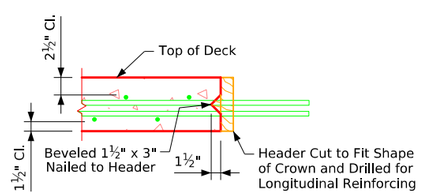
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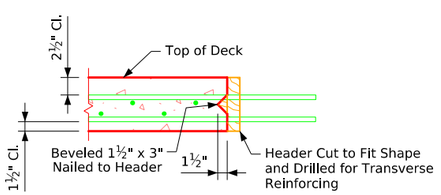
Concrete Placement Diagram & Longitudinal Deck Reinforcing

Concrete deck shall be placed in sections and sequences indicated. An approved alternate procedure is to place the concrete deck in one continuous pour 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.



Permissible Transverse Deck Construction Joint



Longitudinal Deck Construction Joint

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Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

Deck Reinforcing Layout

STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026

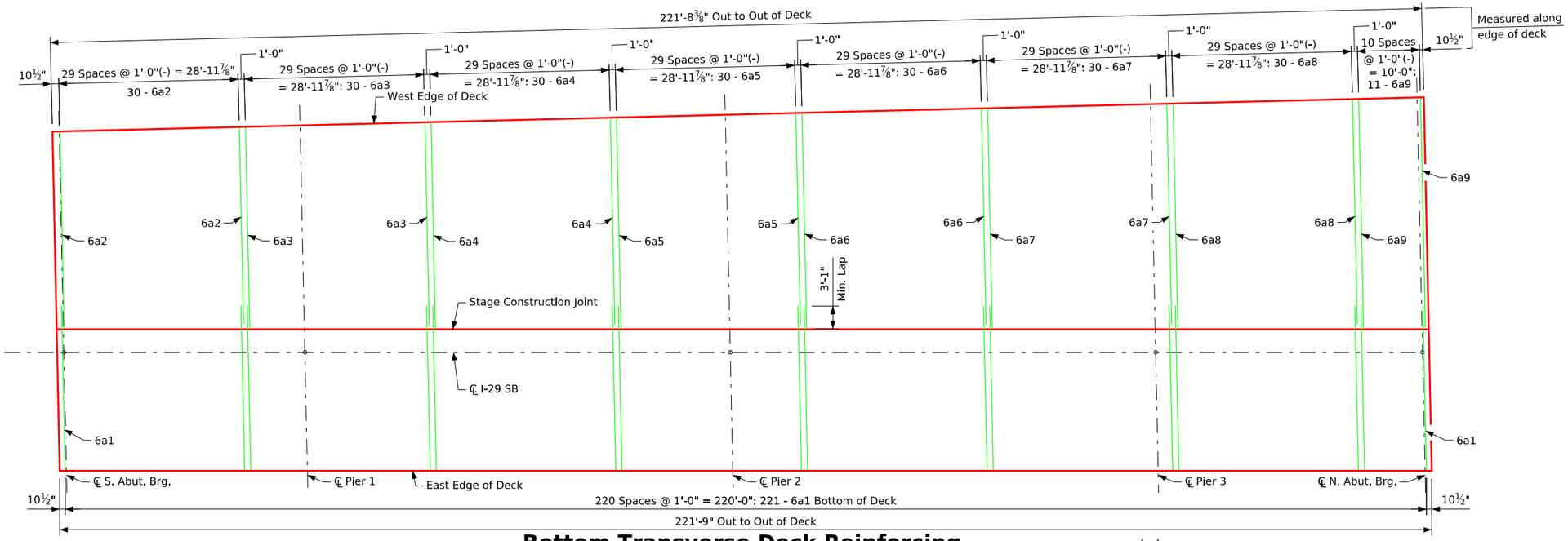
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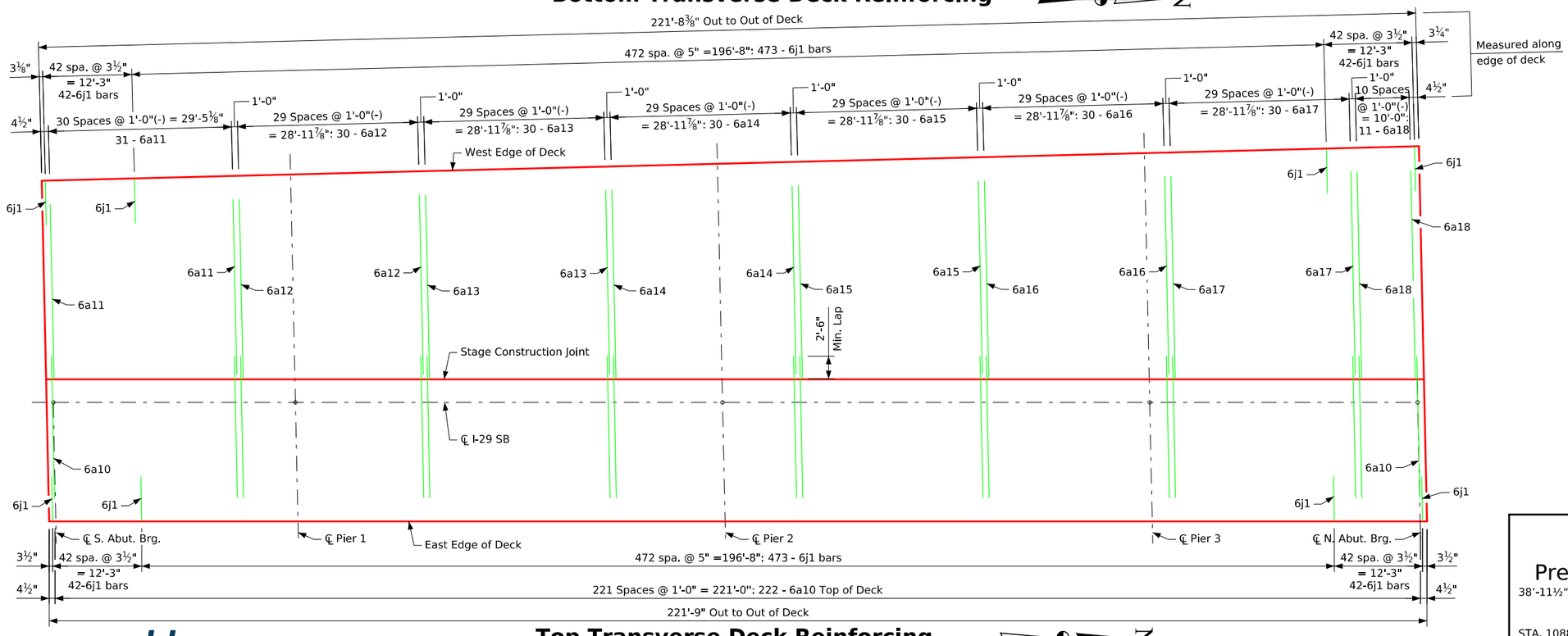
Design No. 527 Design Sheet No. 12 of 36 FHWA No. 28110

FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.12

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Bottom Transverse Deck Reinforcing



Top Transverse Deck Reinforcing

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engineers + planners + land surveyors

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans — 2-68'-9" Interior Span

Deck Reinforcing Layout

STA. 1088+28.60 (I-29) — Turn-in Date: Sept, 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 — Design Sheet No. 13 of 36 — FHWA No. 28110

FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.13	

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Superstructure Notes:

The bridge deck as shown includes ½" Intergral wearing surface.

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

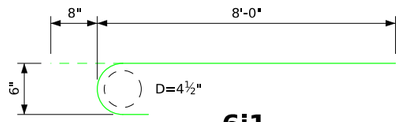
Forms for the deck and barrier rail are to be supported by the prestressed concrete beams.

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

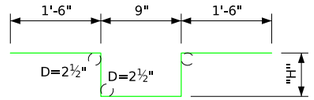
All deck and diaphragm reinforcing is to be wired in place and adequately supported before concrete is placed.

Top transverse reinforcing steel is to be parallel to and 2½" clear below top of deck. Bottom transverse reinforcing steel is to be parallel to and 1½" clear above bottom of the 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, bar high chairs, and deck bolsters.

Bent Bar Details



6j1



5m1 & 5m2

Bar	"H"
5m1	4½"
5m2	6"

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

Epoxy Coated Reinforcing

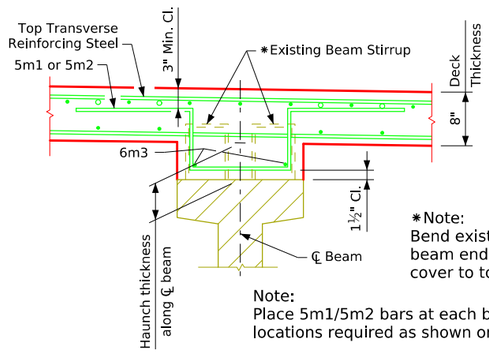
Bar	Location	Shape	No.		Weight
6a1	Deck, Transverse, Bottom Stage 1		221	26'-3"	8,713
6a2	Deck, Transverse, Bottom Stage 2		30	31'-9"	1,431
6a3	Deck, Transverse, Bottom Stage 2		30	32'-6"	1,464
6a4	Deck, Transverse, Bottom Stage 2		30	33'-3"	1,498
6a5	Deck, Transverse, Bottom Stage 2		30	34'-0"	1,532
6a6	Deck, Transverse, Bottom Stage 2		30	34'-9"	1,566
6a7	Deck, Transverse, Bottom Stage 2		30	35'-6"	1,600
6a8	Deck, Transverse, Bottom Stage 2		30	36'-3"	1,633
6a9	Deck, Transverse, Bottom Stage 2		11	37'-0"	611
6a10	Deck, Transverse, Top, Stage 1		222	22'-5"	7,475
6a11	Deck, Transverse, Top, Stage 2		31	28'-1"	1,308
6a12	Deck, Transverse, Top, Stage 2		30	28'-11"	1,303
6a13	Deck, Transverse, Top, Stage 2		30	29'-8"	1,337
6a14	Deck, Transverse, Top, Stage 2		30	30'-5"	1,371
6a15	Deck, Transverse, Top, Stage 2		30	31'-2"	1,404
6a16	Deck, Transverse, Top, Stage 2		30	31'-11"	1,438
6a17	Deck, Transverse, Top, Stage 2		30	32'-8"	1,472
6a18	Deck, Transverse, Top, Stage 2		11	33'-5"	552
5b1	Deck, Longitudinal		666	39'-0"	27,091
8b2	Deck, Longitudinal, over Piers		168	17'-8"	7,925
5m1	Haunch, Vertical		1,223	4'-6"	5,740
5m2	Haunch, Vertical		341	4'-9"	1,689
6m3	Haunch, Longitudinal		100	40'-0"	6,008
5u1	Deck Drains		16	3'-0"	50
				Reinforcing Steel - Epoxy Coated - Total (lbs.)	86,211

Epoxy Coated Reinforcing - Grade 80

Bar	Location	Shape	No.	Length	Weight
6j1	Deck, Overhang, Top		1,114	8'-8"	14,501
				Grade 80 Reinforcing Steel - Epoxy Coated - Total (lbs.)	14,501

Concrete Placement Summary

Location	Quantity
Pour 1 - Span 1 & Abutment Diaphragm, Stage 1	24.0
Pour 2 - Span 2, Stage 1	31.1
Pour 3 - Span 3, Stage 1	31.6
Pour 4 - Span 4 & Abutment Diaphragm, Stage 1	29.3
Pour 5 - Pier 1, Stage 1	10.8
Pour 6 - Pier 2, Stage 1	11.2
Pour 7 - Pier 3, Stage 1	11.1
Pour 8 - Span 1 & Abutment Diaphragm, Stage 2	33.4
Pour 9 - Span 2, Stage 2	46.3
Pour 10 - Span 3, Stage 2	49.3
Pour 11 - Span 4 & Abutment Diaphragm, Stage 2	44.5
Pour 12 - Pier 1, Stage 2	15.7
Pour 13 - Pier 2, Stage 2	17.1
Pour 14 - Pier 3, Stage 2	17.7
Total High Performance Concrete (CY)	373.1



*Note:
Bend existing beam stirrups if needed near beam ends to acheive minimum 3" clear cover to top of deck.

Note:
Place 5m1/5m2 bars at each beam stirrup at locations required as shown on Design Sheet 16.

6m3 bars shall have a 2'-5" minimum splice length.

Haunch Reinforcing Detail

(Interior Beam Shown, Exterior Similar)

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38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

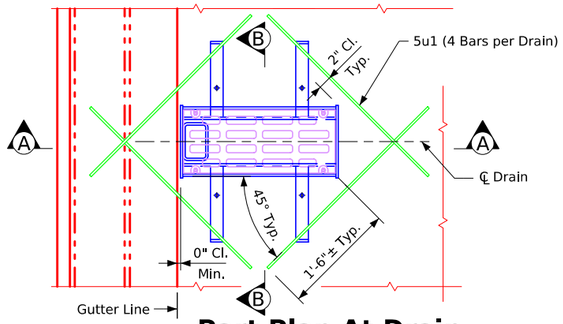
Superstructure Details

STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026

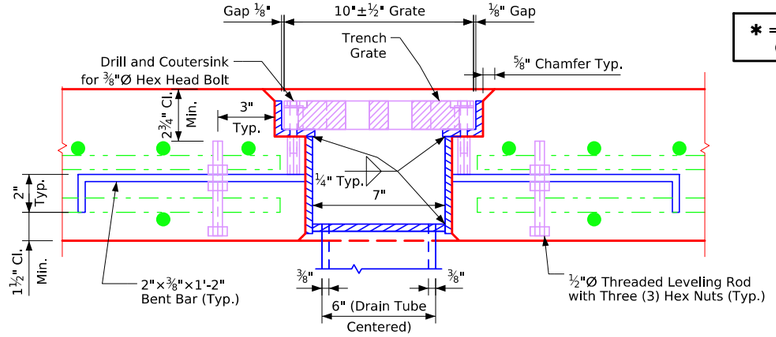
Harrison County

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Design No. 527 Design Sheet No. 14 of 36 FHWA No. 28110

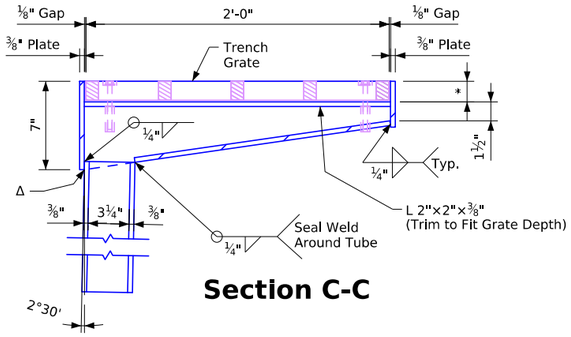


Part Plan At Drain
(Detail B Shown)

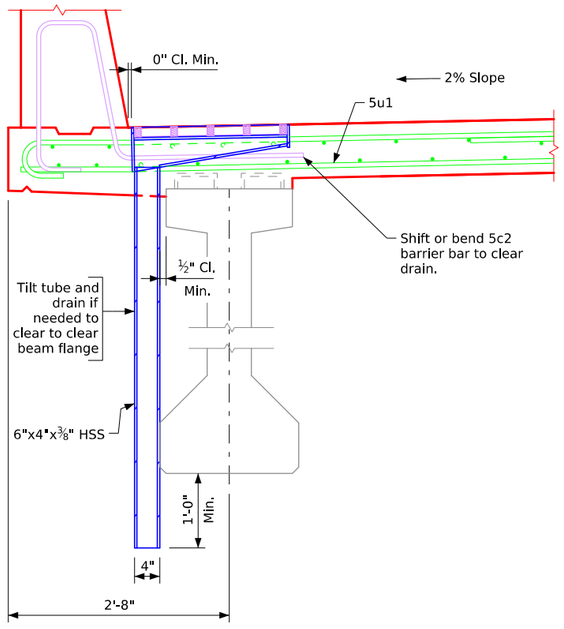


Part Section B-B - Showing Detail B Option
Detail is Shown Using 10" Wide Grate

✱ = Depth Based on Trench Grate Manufacturer.



Section C-C



Part Section A-A

Drain Notes

The drains shall be ⅜" thick steel. The drain assemblies shall be galvanized after fabrication. The bid item "Deck Drain, Lump Sum" shall include all costs associated with fabricating and installing the deck drains as per plan.

The trench grates shall be ferrous castings. Metal used in the manufacture of castings shall conform to ASTM A48-83 Class 35B or better gray iron castings in accordance with current Iowa D.O.T. Standard Specifications. Finish of castings shall be smooth and free of defects. Trench grates shall be capable of carrying AASHTO HL-93 loading. Galvanizing of the trench grates is not required.

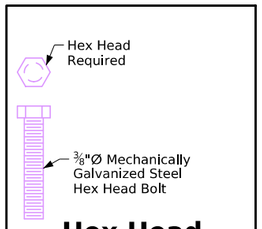
Drains shall be centered over the nearest bottom transverse deck reinforcing bar from the location designated on Design Sheet 4. The bottom transverse deck reinforcing bar shall be cut off to provide 1" clearance from the drain. The top transverse deck reinforcing bars on each side of the drain, shall be spaced as necessary to provide 1" clearance from the drain. Longitudinal deck reinforcing bars that conflict with the drain shall be cut off to provide 2" clearance from the drain. All cut ends of bars shall be coated with epoxy patching material supplied by the Manufacturer of the epoxy coating. Longitudinal deck reinforcing bars shall be shifted as necessary to accommodate anchor bars.

Materials

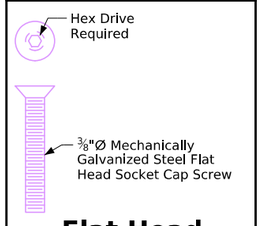
Plates, bars, threaded rods and angles shall meet the requirements ASTM A709 Grade 36. The tube steel shall meet the requirements ASTM A500 Grade B.

⅜"Ø mechanically galvanized steel hex head bolt and hex nut shall meet the requirements of ASTM B695-04 (2009) and ASTM A307-12 Grade A.

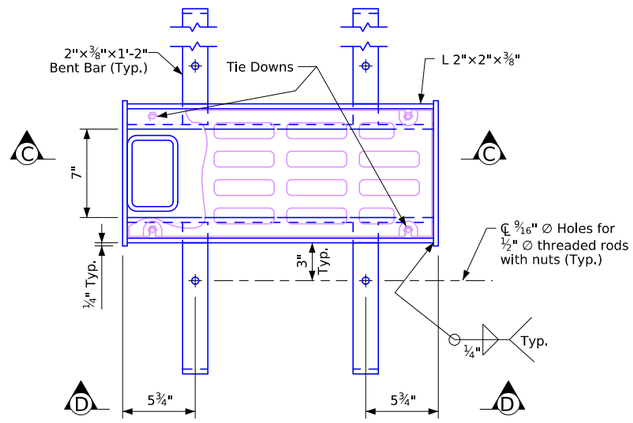
⅜"Ø mechanically galvanized steel flat head screw shall meet the requirements of ASTM B695-04 (2009) and ASTM ASTM F835-12.



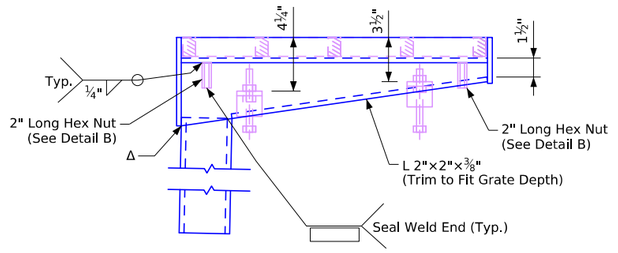
Hex Head Bolt Detail
Used for Detail B



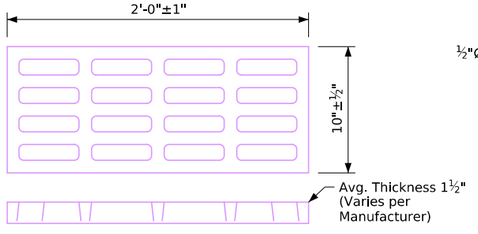
Flat Head Screw Detail
Used for Detail A



Plan View of Drain Trench
(Grate Tie Downs Show Detail B)

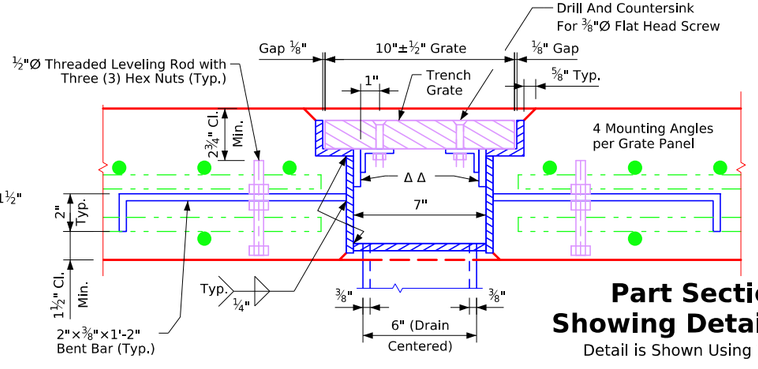


Side View D-D



Drain Trench Grate Details
(1 Grate Required Per Drain)

Note: Pattern and direction of grate openings shall be similar to the pattern shown.



Part Section B-B Showing Detail A Option
Detail is Shown Using 10" Wide Grate

Δ = Grind vertical plate flush with angled drain tube prior to welding.

Note: 4 Drains required.

Δ Δ = Adjust shim plate according to width of grate.

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans — 2-68'-9" Interior Span

Deck Drain Details

STA. 1088+28.60 (I-29) — Turn-in Date: Sept, 1, 2026

Harrison County

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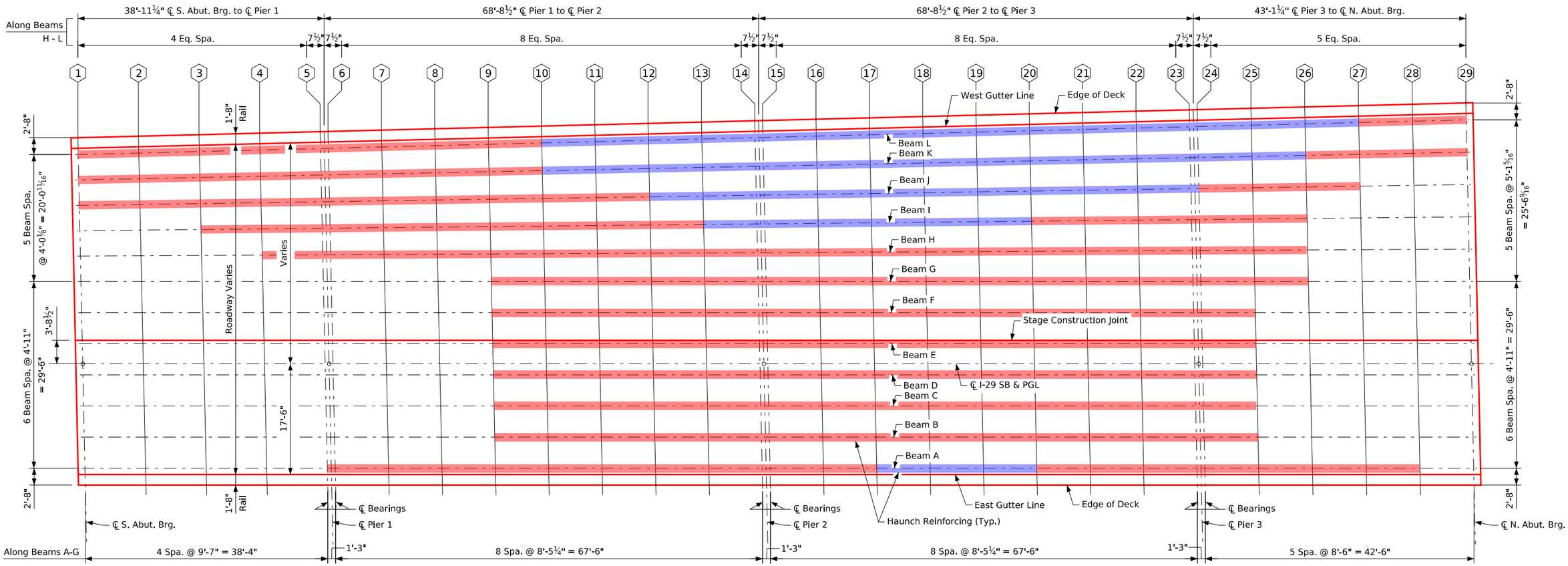
Design No. 527 — Design Sheet No. 15 of 36 — FHWA No. 28110

FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Trench Deck Drain Details	Standard Sheet 1054A (Modified)	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.15	

MiscellaneousBridges.dgn - 1054A - This Sheet Issued 06-2025.

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Control Point: Bench Mark # 91-A Cut "X" in NW Wing Post Base. Sta. 1089+02± SBL. Elev. 1024.76

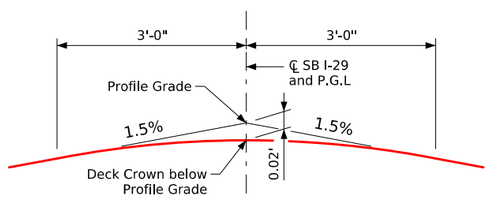


Deck Elevation Layout & Haunch Reinforcing

Haunch Reinforcing Bars
- 5m1
- 5m2

Note:
Haunch reinforcement is required at location where the field haunch is 1½" or greater. Estimated locations are shown on the diagram above. Estimated reinforcement quantity is shown in the Deck Reinforcement Table on Design Sheet 14.

Beam line labels correspond to original plans.



Crown Template
No Scale

Note:
Hexagonal numbers on this sheet correspond to the line numbers shown on the "Top of Deck Elevations Table", next sheet.

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

Top of Deck Elevations

STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026

Harrison County

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Design No. 527 Design Sheet No. 16 of 36 FHWA No. 28110

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FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.16

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Control Point: Bench Mark # 91-A Cut "X" in NW Wing Post Base. Sta. 1089+02± SBL. Elev. 1024.76

Table of Top of Deck Elevations

Location	℄ S. Abut. Brg.				℄ Pier 1 Bearings									℄ Pier 2 Bearings									℄ Pier 3 Bearings							℄ N. 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	Line 22	Line 23	Line 24	Line 25	Line 26	Line 27	Line 28	Line 29
West Gutterline	1023.05	1023.13	1023.22	1023.31	1023.38	1023.40	1023.46	1023.51	1023.56	1023.61	1023.65	1023.69	1023.72	1023.75	1023.76	1023.78	1023.80	1023.82	1023.83	1023.84	1023.84	1023.84	1023.83	1023.84	1023.83	1023.81	1023.80	1023.77	1023.75
Beam Line L	1023.07	1023.17	1023.26	1023.34	1023.42	1023.44	1023.50	1023.55	1023.60	1023.65	1023.69	1023.73	1023.77	1023.80	1023.81	1023.83	1023.85	1023.87	1023.88	1023.89	1023.90	1023.90	1023.89	1023.90	1023.89	1023.88	1023.86	1023.84	1023.82
Beam Line K	1023.19	1023.29	1023.39	1023.48	1023.57	1023.59	1023.66	1023.72	1023.78	1023.84	1023.89	1023.94	1023.98	1024.02	1024.03	1024.06	1024.09	1024.12	1024.14	1024.16	1024.17	1024.18	1024.19	1024.19	1024.19	1024.19	1024.18	1024.17	1024.15
Beam Line J	1023.31	1023.42	1023.53	1023.63	1023.73	1023.74	1023.82	1023.89	1023.96	1024.03	1024.09	1024.14	1024.20	1024.24	1024.25	1024.30	1024.34	1024.37	1024.40	1024.43	1024.45	1024.47	1024.48	1024.49	1024.50	1024.50	1024.50	1024.50	1024.49
Beam Line I	1023.43	1023.55	1023.66	1023.77	1023.88	1023.89	1023.98	1024.06	1024.14	1024.21	1024.28	1024.35	1024.41	1024.47	1024.48	1024.53	1024.58	1024.62	1024.66	1024.70	1024.73	1024.76	1024.78	1024.78	1024.80	1024.82	1024.83	1024.83	1024.83
Beam Line H	1023.55	1023.67	1023.80	1023.92	1024.03	1024.05	1024.14	1024.23	1024.32	1024.40	1024.48	1024.56	1024.63	1024.69	1024.70	1024.76	1024.82	1024.87	1024.92	1024.97	1025.01	1025.04	1025.07	1025.08	1025.11	1025.13	1025.15	1025.16	1025.17
Beam Line G	1023.63	1023.76	1023.89	1024.01	1024.13	1024.15	1024.25	1024.34	1024.43	1024.52	1024.60	1024.68	1024.76	1024.83	1024.84	1024.90	1024.97	1025.02	1025.08	1025.13	1025.17	1025.21	1025.25	1025.26	1025.29	1025.32	1025.34	1025.36	1025.38
Beam Line F	1023.70	1023.83	1023.96	1024.09	1024.21	1024.22	1024.32	1024.42	1024.51	1024.60	1024.68	1024.76	1024.83	1024.90	1024.91	1024.98	1025.04	1025.10	1025.15	1025.20	1025.25	1025.29	1025.32	1025.33	1025.36	1025.39	1025.42	1025.44	1025.45
Stage Constr. Joint	1023.77	1023.90	1024.03	1024.15	1024.27	1024.29	1024.39	1024.48	1024.57	1024.66	1024.74	1024.82	1024.90	1024.97	1024.98	1025.05	1025.11	1025.16	1025.22	1025.27	1025.31	1025.35	1025.39	1025.40	1025.43	1025.46	1025.48	1025.50	1025.52
Beam Line E	1023.78	1023.91	1024.04	1024.16	1024.28	1024.30	1024.40	1024.49	1024.58	1024.67	1024.75	1024.83	1024.91	1024.98	1024.99	1025.05	1025.12	1025.17	1025.23	1025.28	1025.32	1025.36	1025.40	1025.40	1025.44	1025.47	1025.49	1025.51	1025.52
℄ I-29 Southbound	1023.80	1023.94	1024.06	1024.19	1024.31	1024.32	1024.42	1024.52	1024.61	1024.70	1024.78	1024.86	1024.93	1025.00	1025.01	1025.08	1025.14	1025.20	1025.25	1025.30	1025.35	1025.39	1025.42	1025.43	1025.46	1025.49	1025.51	1025.53	1025.55
Beam Line D	1023.81	1023.94	1024.07	1024.20	1024.31	1024.33	1024.43	1024.52	1024.62	1024.70	1024.79	1024.86	1024.94	1025.01	1025.02	1025.09	1025.15	1025.21	1025.26	1025.31	1025.35	1025.39	1025.43	1025.44	1025.47	1025.50	1025.52	1025.54	1025.56
Beam Line C	1023.73	1023.86	1023.99	1024.11	1024.23	1024.25	1024.35	1024.44	1024.53	1024.62	1024.70	1024.78	1024.86	1024.93	1024.94	1025.00	1025.06	1025.12	1025.18	1025.22	1025.27	1025.31	1025.35	1025.35	1025.38	1025.41	1025.44	1025.46	1025.47
Beam Line B	1023.66	1023.79	1023.92	1024.04	1024.16	1024.17	1024.27	1024.37	1024.46	1024.55	1024.63	1024.71	1024.78	1024.85	1024.86	1024.93	1024.99	1025.05	1025.10	1025.15	1025.20	1025.24	1025.27	1025.28	1025.31	1025.34	1025.36	1025.38	1025.40
Beam Line A	1023.58	1023.71	1023.84	1023.97	1024.09	1024.10	1024.20	1024.30	1024.39	1024.47	1024.56	1024.64	1024.71	1024.78	1024.79	1024.86	1024.92	1024.98	1025.03	1025.08	1025.12	1025.16	1025.20	1025.21	1025.24	1025.27	1025.29	1025.31	1025.33
East Gutterline	1023.57	1023.70	1023.83	1023.95	1024.07	1024.09	1024.19	1024.28	1024.37	1024.46	1024.54	1024.62	1024.70	1024.77	1024.78	1024.84	1024.90	1024.96	1025.01	1025.06	1025.11	1025.15	1025.19	1025.19	1025.22	1025.25	1025.28	1025.29	1025.31

Note:
Hexagonal numbers on the previous "Top of Deck Elevations" sheet correspond to the line numbers shown on this sheet.

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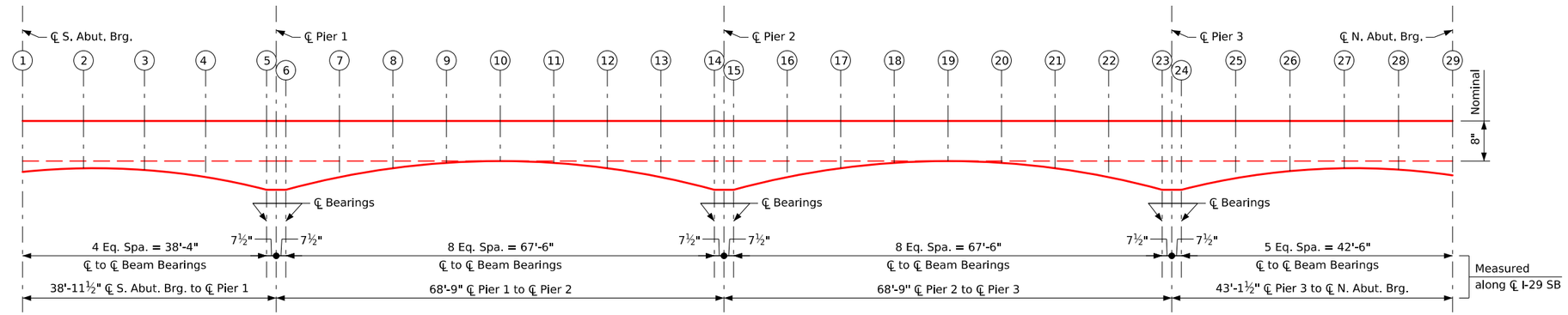
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Top of Deck Elevations Table
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Harrison County
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Design No. 527 Design Sheet No. 17 of 36 FHWA No. 28110

FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.17	

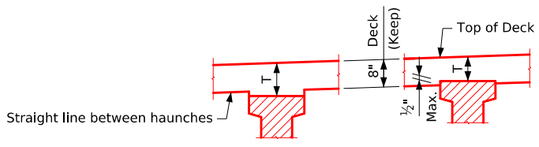
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Deck Thickness At Beams (T)

Beam Line	℄ S. Abut. Brg.				℄ Pier 1 Bearings									℄ Pier 2 Bearings									℄ Pier 3 Bearings						℄ N. 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	Line 22	Line 23	Line 24	Line 25	Line 26	Line 27	Line 28	Line 29
L	9 3/4	9 3/4	9 7/8	9 7/8	9 7/8	10 1/8	10 1/4	10 5/8	10 7/8	11 1/8	11 1/4	11 3/8	11 1/2	11 3/4	11 7/8	1'-0	1'-0 1/8	1'-0 1/4	1'-0 3/8	1'-0 3/8	1'-0 1/4	1'-0 1/4	1'-0 1/4	1'-0 1/4	11 7/8	11 1/2	11 1/8	10 3/4	10 3/8
K	9 5/8	9 3/4	9 3/4	9 7/8	9 7/8	10 1/8	10 1/4	10 1/2	10 3/4	11	11 1/8	11 1/4	11 3/8	11 1/2	11 5/8	11 3/4	11 7/8	11 7/8	1'-0	11 7/8	11 7/8	11 3/4	11 5/8	11 3/4	11 3/8	11	10 1/2	10 1/8	9 5/8
J	9 1/2	9 1/2	9 5/8	9 3/4	9 3/4	9 7/8	10 1/8	10 3/8	10 5/8	10 7/8	11	11 1/8	11 1/4	11 3/8	11 1/2	11 1/2	11 1/2	11 5/8	11 1/2	11 1/2	11 1/4	11 1/8	11	11 1/8	10 3/4	10 1/4	9 7/8	9 1/2	9
I	9 3/8	9 1/2	9 5/8	9 5/8	9 3/4	10	10 1/8	10 3/8	10 5/8	10 3/4	10 7/8	11	11	11 1/8	11 1/4	11 1/4	11 1/4	11 1/4	11 1/8	11	10 7/8	10 5/8	10 1/2	10 1/2	10 1/8	9 5/8	9 1/4	8 3/4	8 1/4
H	9 1/8	9 1/4	9 3/8	9 1/2	9 5/8	9 7/8	10	10 1/4	10 3/8	10 1/2	10 5/8	10 3/4	10 3/4	10 7/8	11	11	11	11	10 7/8	10 7/8	10 5/8	10 1/2	10 1/4	10 3/8	10	9 1/2	9 1/8	8 5/8	8 1/8
G	8 1/4	8 3/8	8 5/8	8 3/4	8 3/4	9	9 1/4	9 1/2	9 3/4	9 7/8	10	10 1/8	10 1/8	10 1/8	10 1/4	10 3/8	10 1/2	10 1/2	10 1/2	10 1/2	10 3/8	10 1/4	10 1/8	10 1/8	9 7/8	9 5/8	9 1/4	8 7/8	8 1/2
F	7 3/4	7 7/8	8	8 1/8	8 1/4	8 1/2	8 5/8	9	9 1/4	9 3/8	9 1/2	9 1/2	9 5/8	9 5/8	9 3/4	9 3/4	9 7/8	10	10	9 7/8	9 3/4	9 1/2	9 3/8	9 1/2	9 1/4	9	8 5/8	8 3/8	8
E	7 5/8	7 7/8	8	8 1/8	8 1/4	8 3/8	8 5/8	8 7/8	9 1/8	9 3/8	9 1/2	9 1/2	9 1/2	9 5/8	9 3/4	9 3/4	9 7/8	10	10	9 7/8	9 3/4	9 5/8	9 1/2	9 5/8	9 1/4	9	8 5/8	8 1/4	8
D	8 1/8	8 1/4	8 3/8	8 1/2	8 5/8	8 3/4	9	9 1/4	9 1/2	9 3/4	9 7/8	9 7/8	9 7/8	10	10 1/8	10 1/8	10 1/4	10 3/8	10 3/8	10 1/4	10 1/8	10	9 7/8	10	9 5/8	9 3/8	9	8 3/4	8 3/8
C	7 3/4	7 7/8	8	8 1/8	8 1/4	8 3/8	8 5/8	8 7/8	9 1/8	9 3/8	9 1/2	9 1/2	9 1/2	9 1/2	9 5/8	9 3/4	9 3/4	9 7/8	9 7/8	9 3/4	9 5/8	9 1/2	9 3/8	9 1/2	9 1/8	8 7/8	8 5/8	8 1/4	8
B	8 1/8	8 1/4	8 1/2	8 5/8	8 3/4	8 7/8	9 1/8	9 3/8	9 5/8	9 3/4	9 7/8	10	10	10	10 1/8	10 1/4	10 1/4	10 3/8	10 3/8	10 1/4	10 1/8	9 7/8	9 3/4	9 7/8	9 1/2	9 1/4	9	8 3/4	8 3/8
A	9	9 1/8	9 1/4	9 3/8	9 1/2	9 3/4	9 7/8	10 1/8	10 3/8	10 5/8	10 3/4	10 3/4	10 3/4	10 3/4	10 7/8	11	11 1/8	11 1/8	11 1/8	11 1/8	11	10 3/4	10 3/4	10 3/4	10 1/2	10 1/8	9 7/8	9 1/2	9 1/4



Deck Thickness at Existing Beams (T)



Deck Thickness Details

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 guaranteed for construction.

Note:
Haunch locations are at the same location as the encircled letters and numbers shown on deck elevations sheet.

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans — 2-68'-9" Interior Span

Deck Thickness Details

STA. 1088+28.60 (I-29) — Turn-in Date: Sept, 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 — Design Sheet No. 18 of 36 — FHWA No. 28110

whks engineers + planners + land surveyors

FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.18	

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Control Point: Bench Mark # 91-A Cut "X" in NW Wing Post Base. Sta. 1089+02± SBL. Elev. 1024.76

Table of Beam Line Deck Haunch Elevations

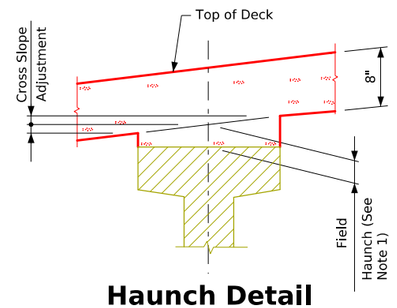
Beam Line	℄ S. Abut. Brg.				℄ Pier 1 Bearings									℄ Pier 2 Bearings								℄ Pier 3 Bearings						℄ N. Abut. Brg.
	Line 1	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line 8	Line 9	Line 10	Line 11	Line 12	Line 13	Line 14	Line 15	Line 16	Line 17	Line 18	Line 19	Line 20	Line 21	Line 22	Line 23	Line 24	Line 25	Line 26	Line 27	Line 28	Line 29
L	1022.41	1022.51	1022.60	1022,68	1022.75	1022.77	1022.87	1022,96	1023.03	1023.09	1023,12	1023.14	1023.14	1023.13	1023,14	1023.21	1023,27	1023,31	1023.33	1023.33	1023.31	1023.27	1023,23	1023.23	1023.23	1023.23	1023,21	1023.18	1023.15
K	1022,53	1022.63	1022,74	1022,83	1022,91	1022,92	1023.03	1023,13	1023.21	1023.28	1023.32	1023.34	1023,35	1023,35	1023,36	1023,44	1023,51	1023,56	1023,59	1023,60	1023,59	1023,56	1023,52	1023,53	1023,54	1023,54	1023,53	1023,52	1023,49
J	1022,64	1022,76	1022,87	1022,97	1023,06	1023,07	1023,19	1023,30	1023,39	1023,46	1023,52	1023,55	1023,57	1023,58	1023,59	1023,67	1023,75	1023,81	1023,85	1023,87	1023,86	1023,85	1023,82	1023,82	1023,84	1023,86	1023,86	1023,85	1023,83
I	1022,76	1022,89	1023,01	1023,11	1023,21	1023,23	1023,35	1023,47	1023,57	1023,65	1023,71	1023,76	1023,78	1023,80	1023,81	1023,91	1023,99	1024,06	1024,11	1024,13	1024,14	1024,13	1024,11	1024,12	1024,15	1024,17	1024,18	1024,18	1024,17
H	1022.88	1023.01	1023.14	1023.26	1023.36	1023.38	1023.52	1023.64	1023.75	1023.84	1023.91	1023.96	1024.00	1024.03	1024.04	1024.14	1024.23	1024.31	1024.37	1024.40	1024.42	1024.42	1024.41	1024.41	1024.45	1024.48	1024.50	1024.51	1024.51
G	1022.96	1023.10	1023.24	1023.36	1023.46	1023.48	1023.62	1023.76	1023.88	1023.97	1024.05	1024.10	1024.14	1024.16	1024.17	1024.28	1024.38	1024.47	1024.53	1024.57	1024.59	1024.59	1024.58	1024.59	1024.63	1024.67	1024.69	1024.71	1024.71
F	1023.04	1023.18	1023.31	1023.43	1023.54	1023.55	1023.70	1023.83	1023.95	1024.05	1024.12	1024.17	1024.21	1024.24	1024.25	1024.36	1024.46	1024.54	1024.60	1024.64	1024.66	1024.67	1024.66	1024.66	1024.71	1024.74	1024.77	1024.78	1024.78
E	1023.11	1023.25	1023.39	1023.51	1023.61	1023.63	1023.77	1023.91	1024.02	1024.12	1024.19	1024.25	1024.29	1024.31	1024.32	1024.43	1024.53	1024.61	1024.68	1024.72	1024.74	1024.74	1024.73	1024.74	1024.78	1024.82	1024.84	1024.85	1024.86
D	1023.15	1023.29	1023.42	1023.54	1023.65	1023.66	1023.81	1023.94	1024.06	1024.15	1024.23	1024.28	1024.32	1024.34	1024.35	1024.47	1024.57	1024.65	1024.71	1024.75	1024.77	1024.77	1024.77	1024.77	1024.81	1024.85	1024.87	1024.89	1024.89
C	1023.06	1023.20	1023.34	1023.46	1023.56	1023.58	1023.72	1023.86	1023.97	1024.07	1024.14	1024.20	1024.23	1024.26	1024.27	1024.38	1024.48	1024.56	1024.63	1024.67	1024.69	1024.69	1024.68	1024.69	1024.73	1024.76	1024.79	1024.80	1024.81
B	1022.99	1023.13	1023.26	1023.38	1023.49	1023.51	1023.65	1023.79	1023.90	1024.00	1024.07	1024.13	1024.16	1024.19	1024.20	1024.31	1024.41	1024.49	1024.55	1024.59	1024.61	1024.62	1024.61	1024.61	1024.66	1024.69	1024.72	1024.73	1024.73
A	1022.92	1023.06	1023.19	1023.31	1023.42	1023.43	1023.58	1023.71	1023.83	1023.92	1024.00	1024.05	1024.09	1024.11	1024.12	1024.24	1024.34	1024.42	1024.48	1024.52	1024.54	1024.54	1024.53	1024.54	1024.58	1024.62	1024.64	1024.65	1024.66

Miscellaneous Data Table

	Beam Line		℄ S. Abut. Brg.				℄ Pier 1 Bearings									℄ Pier 2 Bearings			
			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
Anticipated Deflection Due To Deck (in.)	Beam Lines H-L		0	1/8	1/8	1/8	0	0	1/2	7/8	1 3/16	1 1/4	1 3/16	7/8	1/2	0	0	1/2	15/16
	Beam Lines A-G		0	1/8	3/16	1/8	0	0	9/16	1	1 5/16	1 7/16	1 5/16	1	9/16	0	0	9/16	1
Cross Slope Adjustments (in.)	Beam Lines I-L		3/16	3/16	3/16	1/4	1/4	1/4	1/4	1/4	1/4	1/4	5/16	5/16	5/16	5/16	5/16	5/16	5/16
	Beam Line H		1/8	1/8	1/8	1/8	1/8	1/8	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16
	Beam Lines A-G		1/8																
Allowable Field Haunch (in. & ft.)	Max.	Beam Lines I-L	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	4 1/2 (0.375)	4 1/2 (0.375)	4 1/2 (0.375)	4 1/2 (0.375)	4 1/2 (0.375)	4 1/2 (0.375)	4 1/2 (0.375)	4 1/2 (0.375)
		Beam Lines H	1 1/2 (0.125)	1 1/2 (0.125)	1 1/2 (0.125)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)
		Beam Line B-G	1 1/2 (0.125)	1 1/2 (0.125)	1 1/2 (0.125)	1 1/2 (0.125)	1 1/2 (0.125)	1 1/2 (0.125)	1 1/2 (0.125)	1 1/2 (0.125)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)
		Beam Line A	1 1/2 (0.125)	1 1/2 (0.125)	1 1/2 (0.125)	1 1/2 (0.125)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	4 1/2 (0.375)
	Min.	Beam Lines I-L	- 5/16 (-0.026)	- 5/16 (-0.025)	- 5/16 (-0.024)	- 1/4 (-0.023)	- 1/4 (-0.022)	- 1/4 (-0.022)	- 1/4 (-0.021)	- 1/4 (-0.02)	- 1/4 (-0.02)	- 1/4 (-0.019)	- 3/16 (-0.018)	- 3/16 (-0.017)	- 3/16 (-0.016)	- 3/16 (-0.015)	- 3/16 (-0.015)	- 3/16 (-0.014)	- 3/16 (-0.014)
		Beam Lines H	- 3/8 (-0.031)	- 3/8 (-0.03)	- 3/8 (-0.03)	- 3/8 (-0.029)	- 3/8 (-0.029)	- 3/8 (-0.029)	- 5/16 (-0.029)	- 5/16 (-0.028)	- 5/16 (-0.028)	- 5/16 (-0.027)	- 5/16 (-0.027)	- 5/16 (-0.026)	- 5/16 (-0.026)	- 5/16 (-0.026)	- 5/16 (-0.026)	- 5/16 (-0.025)	- 5/16 (-0.025)
		Beam Line A-G	- 3/8 (-0.034)																

Miscellaneous Data Table

	Beam Line						℄ Pier 3 Bearings					℄ N. Abut. Brg.
			Line 18	Line 19	Line 20	Line 21	Line 22	Line 23	Line 24	Line 25	Line 26	Line 27	Line 28	Line 29
Anticipated Deflection Due To Deck (in.)	Beam Lines H-L		1 1/4	1 3/8	1 1/4	15/16	1/2	0	0	1/8	1/4	1/4	1/8	0
	Beam Lines A-G		1 5/16	1 7/16	1 5/16	1	9/16	0	0	1/8	3/16	3/16	1/8	0
Cross Slope Adjustments (in.)	Beam Lines I-L		3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	7/16	7/16	7/16	7/16
	Beam Line H		3/16	3/16	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
	Beam Lines A-G		1/8											
Allowable Field Haunch (in. & ft.)	Max.	Beam Lines I-L	4 1/2 (0.375)	4 1/2 (0.375)	4 1/2 (0.375)	4 1/2 (0.375)	4 1/2 (0.375)	4 1/2 (0.375)	4 1/2 (0.375)	4 1/2 (0.375)	4 1/2 (0.375)	4 1/2 (0.375)	3 (0.25)	3 (0.25)
		Beam Lines H	3 (0,25)	3 (0,25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0,25)	1 1/2 (0.125)	1 1/2 (0.125)	1 1/2 (0.125)
		Beam Line B-G	3 (0,25)	3 (0,25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	1 1/2 (0,125)	1 1/2 (0.125)	1 1/2 (0.125)	1 1/2 (0.125)
		Beam Line A	4 1/2 (0,375)	4 1/2 (0.375)	4 1/2 (0.375)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	3 (0.25)	1 1/2 (0.125)
	Min.	Beam Lines I-L	- 1/8 (-0.013)	- 1/8 (-0.012)	- 1/8 (-0.011)	- 1/8 (-0.011)	- 1/8 (-0.01)	- 1/8 (-0.009)	- 1/8 (-0.009)	- 1/8 (-0.008)	- 1/16 (-0.008)	- 1/16 (-0.007)	- 1/16 (-0.006)	- 1/16 (-0.006)
		Beam Lines H	- 5/16 (-0.024)	- 5/16 (-0.024)	- 1/4 (-0.023)	- 1/4 (-0.023)	- 1/4 (-0.023)	- 1/4 (-0.022)	- 1/4 (-0.022)	- 1/4 (-0.022)	- 1/4 (-0.021)	- 1/4 (-0.021)	- 1/4 (-0.02)	- 1/4 (-0.02)
		Beam Line A-G	- 3/8 (-0.034)											



Haunch Detail

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.

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Note 1:
To calculate field haunch required at each location, survey the beam tops consistent with the spacings shown on the "Deck Elevations 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.

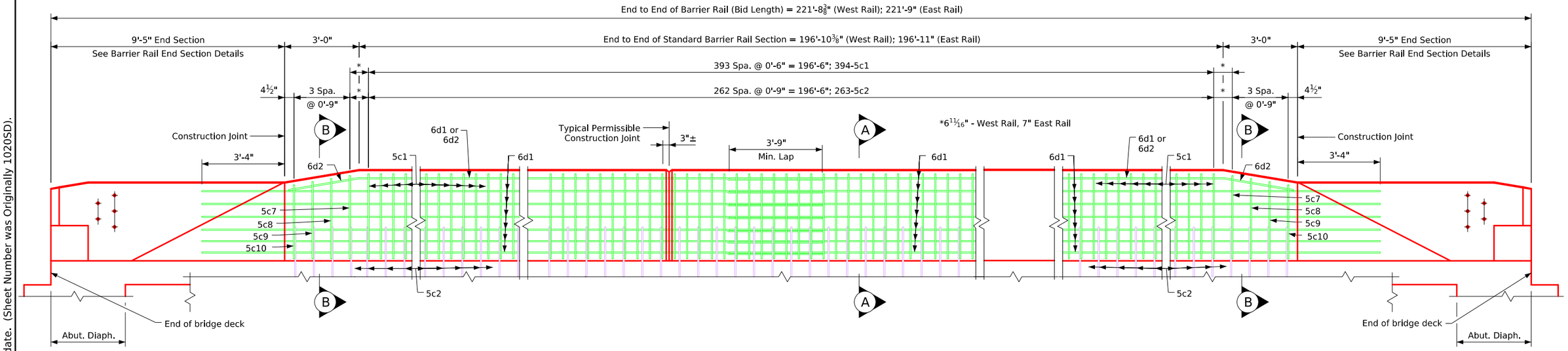
Note:
Haunch locations are at the same location as the encircled letters and numbers shown on deck elevations sheet.

Note: See Design Sheet 14 for haunch reinforcing details.

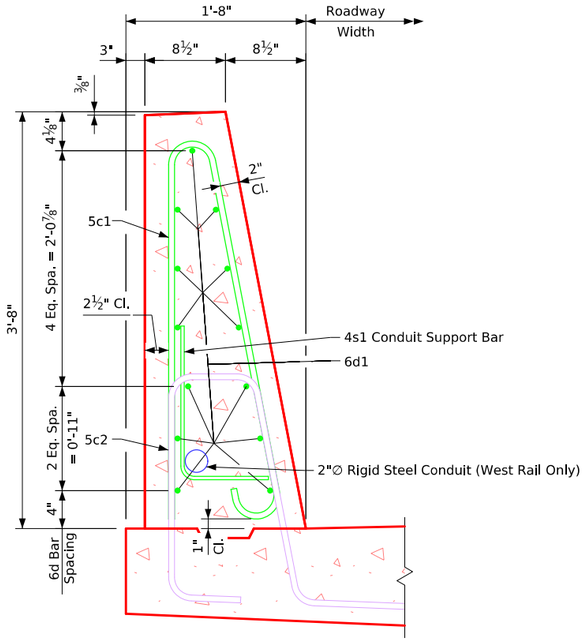
Design For 1°13'30" Skew RA
219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge
38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span
Deck Haunch Data Details
STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026
Harrison County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 527 Design Sheet No. 19 of 36 FHWA No. 28110

FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.19	

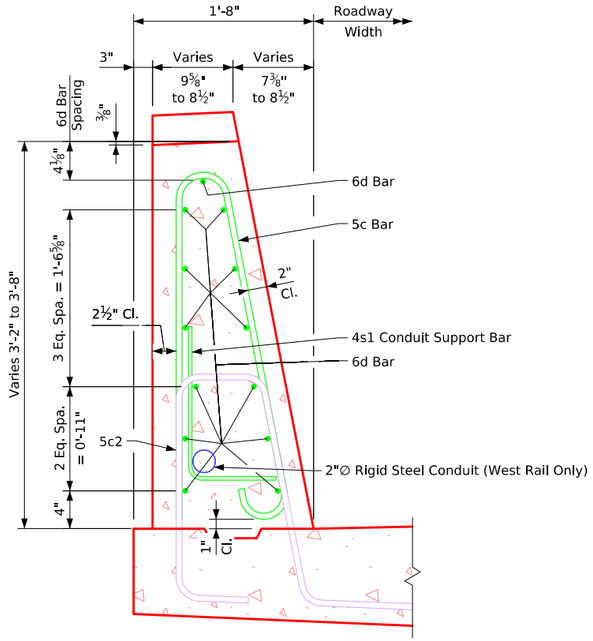
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Elevation of Barrier Rail



Part Section A-A



Part Section B-B

Note:
See Design Sheet 36 for additional details of conduit and conduit support reinforcing steel quantities.

See Barrier Rail Details on Design Sheet 21 for notes, reinforcing steel details, and quantities.

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans — 2-68'-9" Interior Span

Barrier Rail (TL-5)(Stainless) Details

STA. 1088+28.60 (I-29) — Turn-in Date: Sept, 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 — Design Sheet No. 20 of 36 — FHWA No. 28110

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. 32385	ENGLISH	DESIGN TEAM JO\LG	Barrier Rail (TSS TL-5) (Stainless) - Integral Abut. (1 of 2)	Standard Sheet 1020SD-1 (Modified)	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.20	

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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.

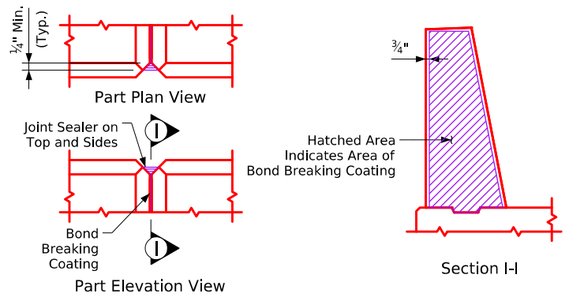
The concrete barrier rail is to be bid on a lineal foot basis. The number of linear feet of barrier rail installed will be paid for at the contract price per lineal foot based on plan quantities. Price bid for concrete barrier railing shall be full compensation for furnishing all material, excluding 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

Epoxy Coated Reinf. Steel - Two Rails

Section	Bar	Location	Shape	No.	Length	Weight
Standard Sections	5c1	Rail, Vertical		788	7'-6"	6,164
	5c7	Rail, Vertical, Sloped Ends		4	7'-4"	31
	5c8	Rail, Vertical, Sloped Ends		4	7'-1"	30
	5c9	Rail, Vertical, Sloped Ends		4	6'-10"	29
	5c10	Rail, Vertical, Sloped Ends		4	6'-7"	27
	6d1	Rail, Longitudinal		152	38'-1"	8,695
	6d2	Rail, Longitudinal, Top		4	34'-8"	208
					Epoxy Reinf. Total Weight (lbs.)	15,184

Stainless Steel Reinf. Steel - Two Rails

Section	Bar	Location	Shape	No.	Length	Weight
Standard Sections	5c2	Rail, Vertical		542	7'-8"	4,334
					Stainless Steel Reinf. Total Weight (lbs.)	4,334

Concrete Placement Summary

Section	Total
Δ Standard Section East Rail 202'-11" at 0.144 cu. Yd. per ft.	29.2
Δ Standard Section West Rail 202'-10⅜" at 0.144 cu. Yd. per ft.	29.2
Total (cu. yd.)	58.4
Note: Δ Deduct 0.021 cu. yd. for one sloped end.	

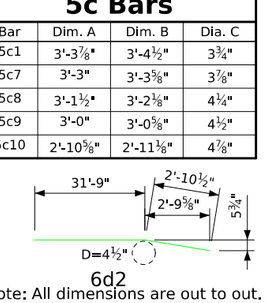
Concrete Barrier Rail Quantities

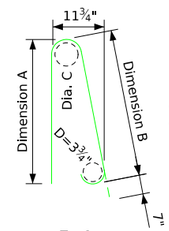
Item	Unit	Quantity
Concrete Barrier Railing, 3'-8"	L.F.	443.5

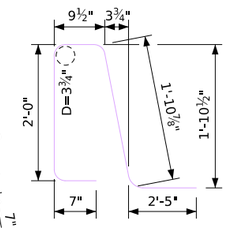
Bent Bar Details

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.

See Barrier Rail Details on Design Sheet 20 for details and sections.

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

Barrier Rail (TL-5)(Stainless) Details

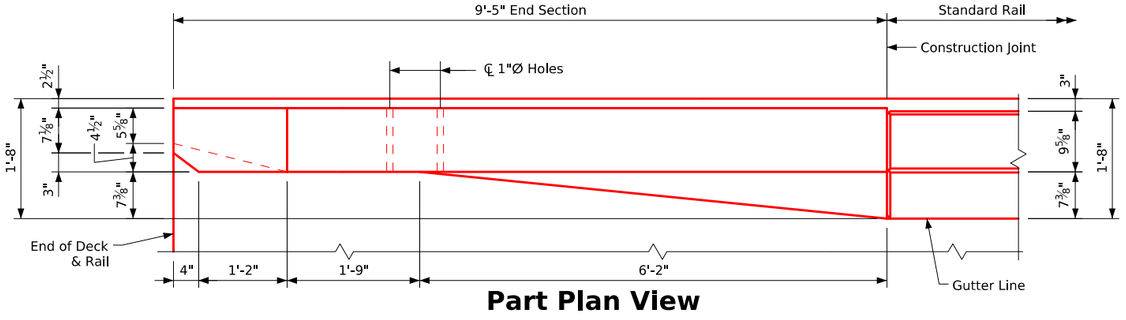
STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026

Harrison County

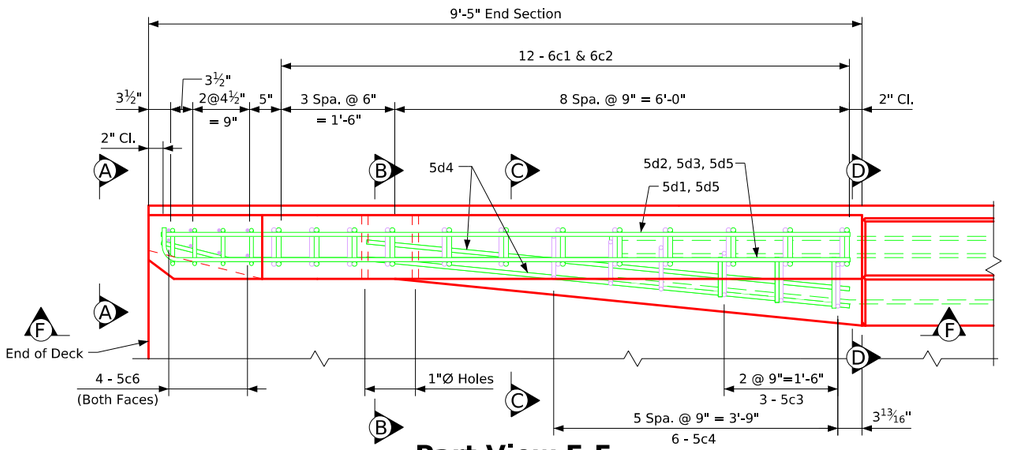
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 Design Sheet No. 21 of 36 FHWA No. 28110

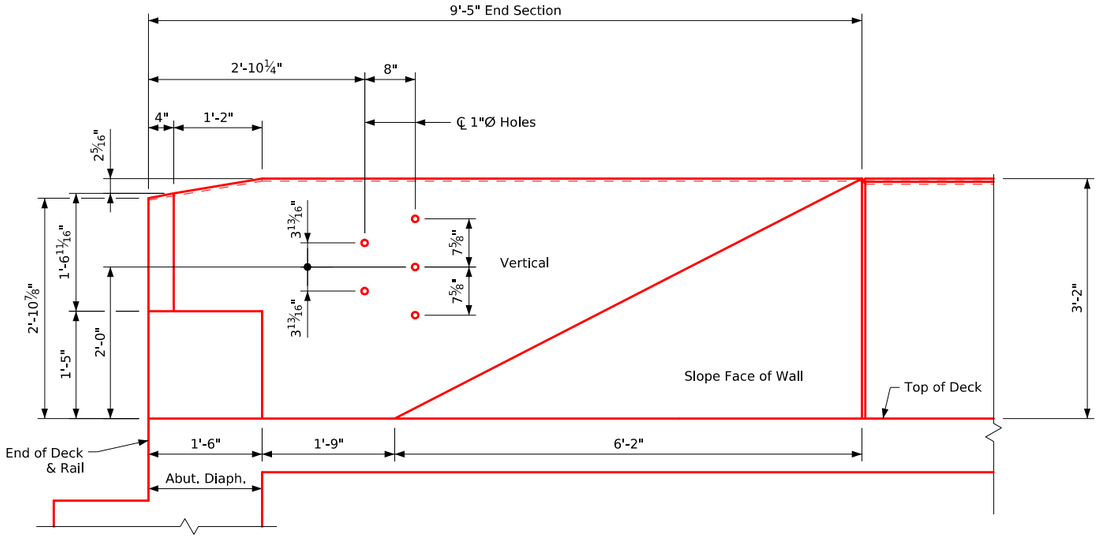
Deckrailbridges.dgn - 1020SD-2 -This Sheet Issued 05-2024. Additional Sheet For Clarity. (Sheet Number Was Originally 1020SD).



Part Plan View

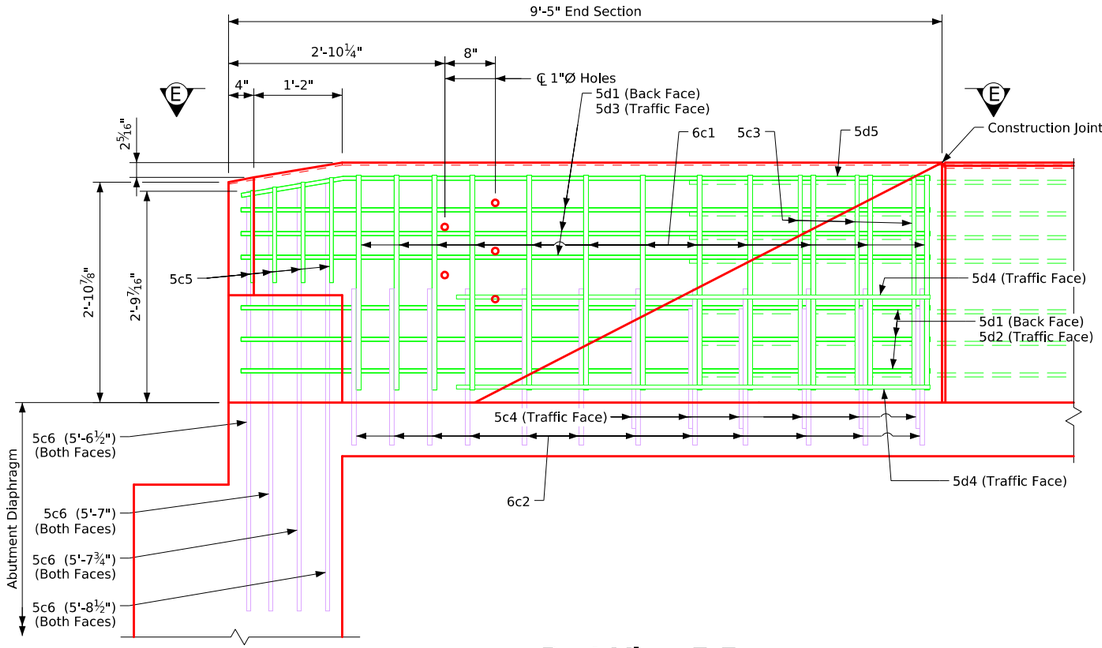


Part View E-E



Part Elevation View

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



Part View F-F

Notes:
Construction joint between top of deck with barrier rail is roughened concrete.
The 5c6 bars are to be placed with the abutment. The details for placement are shown on the Abutment Wing Sheet and Abutment Wing Extension Sheet.
For Bar List, Bent Bar Details, View A-A, Sections B-B, C-C, and D-D see Design Sheet No. 23.

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans — 2-68'-9" Interior Span

Barrier Rail End Section (Stainless) Dtls.

STA. 1088+28.60 (I-29) — Turn-in Date: Sept, 1, 2026

Harrison County

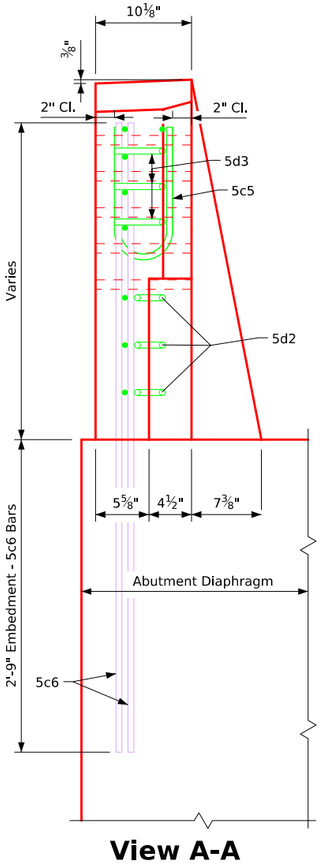
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 — Design Sheet No. 22 of 36 — FHWA No. 28110

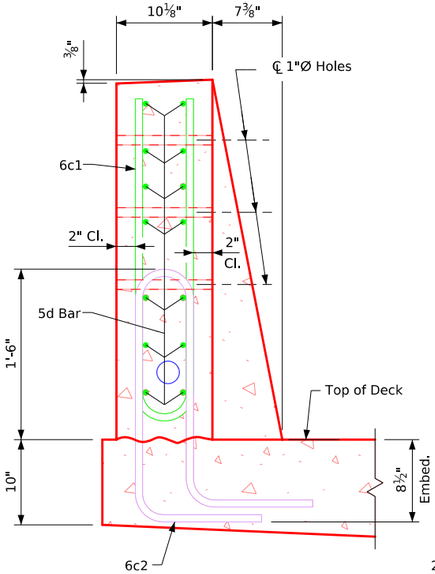
Issued 04-14. Added Stainless Steel Reinforcing Bar List and Changed 6c3, 6c4 & 5c5-10 Bars to Stainless Steel.
DeckRailBridges.dgn - 1017 S-1 - This Sheet Re-Issued 05-2024. Sheet Format Update. (Sheet Number was Originally 1017S).

FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Barrier Rail End Section (Stainless) - (1 of 2)	Standard Sheet 1017S-1 (Modified)	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.22	

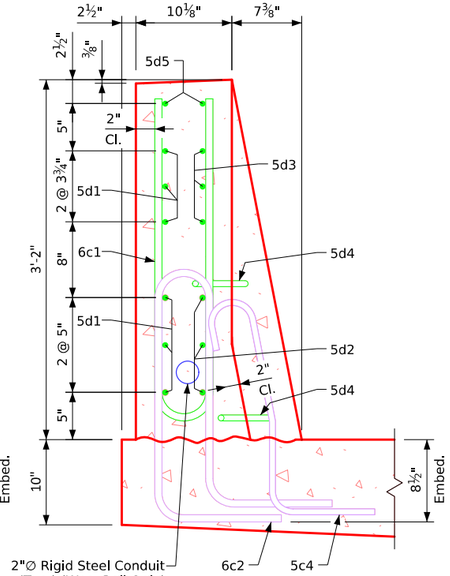
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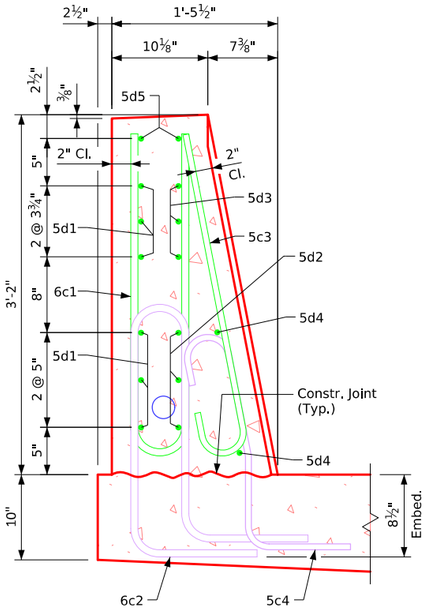
View A-A



Section B-B



Section C-C



Section D-D

Abutment and deck bars in View A-A and deck bars in Sections B-B, C-C & D-D 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
			Epoxy Reinforcing Total Weight (lbs.)		279

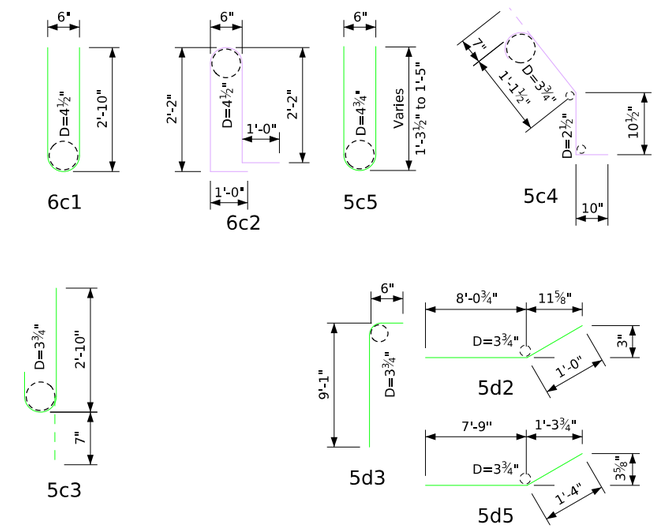
Stainless Steel Reinforcing Steel - One End Section

Bar	Location	Shape	No.	Length	Weight
6c2	Rail, Vertical		12	6'-10"	123
5c4	Rail, Vertical (Traffic Face)		6	3'-5"	21
5c6	Rail, Vertical (End)		8	Varies	47
			Stainless Steel Reinforcing Total Weight (lbs.)		191

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

Notes:
Construction joint between top deck and barrier rail is roughened concrete.
For Plan and Elevation see Design Sheet 22.

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans — 2-68'-9" Interior Span

Barrier Rail End Section (Stainless) Dtls.

STA. 1088+28.60 (I-29) — Turn-in Date: Sept, 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 — Design Sheet No. 23 of 36 — FHWA No. 28110

Beam End Repair Notes:

It is estimated that (12 beam ends at each abutment) will be repaired. The final quantity and limits of beam end areas shall be determined by the Engineer.

The Contractor shall notify the Engineer when concrete removals are complete by each location to allow inspection by the Engineer prior to placement of concrete or repair mortar.

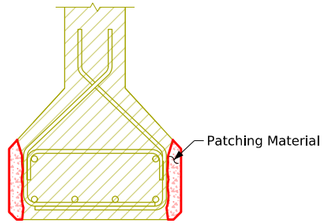
The Contractor shall report tendon or reinforcing bar section loss, exposed during removal work, to the Engineer prior to performing any repair work. The Engineer shall be given adequate time (7 days max.) to determine whether beam reinforcing is required. The Contractor shall incorporate this time into the construction schedule with work in other areas of the project in order to not delay the project.

Removal tools shall be limited to 15 lb chipping hammers and to hand tools without power.

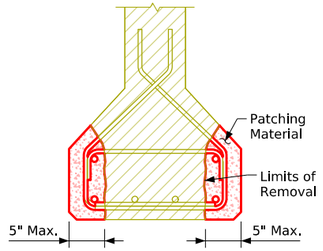
The Contractor shall perform the concrete repair work in accordance with the following procedures and/or as directed by the Engineer:

1. Initiate removal of unsound concrete with ½" saw cuts at perimeter. Do not cross cut at corners. Stop saw cuts short of corners and remove concrete by hand. Adjust depth of saw cut as required to prevent cutting of existing reinforcing steel or strands. Extreme care shall be exercised during concrete removal so that exposed strands and reinforcing bars are not damaged. Any damage done to the strands or bars by the Contractor shall be repaired by the Contractor at no additional cost to the State.
2. Remove deteriorated areas to sound concrete and chip square. Boundaries to be square with no feathered edges. Sandblast concrete surfaces in the repair area and the exposed steel to bare metal. Remove all dust and debris resulting from chipping and blasting by using clean compressed air.
3. If concrete removal results in more than half the diameter of any reinforcing bar or prestressing strand being exposed, then removal shall continue to a minimum of ¾" behind the first interior strand. If removals could exceed the 5" maximum horizontal depth, contact the Engineer prior to removal.
4. Report to the Engineer, prior to repair, section loss of tendons or reinforcing steel exposed during removals.
5. Apply two coats of protective coating/bonding agent (products are listed in the table on this sheet) to exposed prestressing strands and reinforcing bars according to manufacturer's recommendations.
6. Apply patching material. Type of material and application of material depends upon the extent of concrete removal and the two types of repair are to be as follows:
   A. Shallow repair: Shallow repair areas are those where concrete removal did not result in reinforcing bars or prestressing strands being exposed for more than half their diameters. Patching material shall be as listed in the table on this sheet. Patching materials contain corrosion inhibitors. Apply patching material to match original beam surface. Patch need not be formed. Follow manufacturer's instructions and recommendations for mixing, placing and curing.
   B. Regular repair: Regular repair areas are those where concrete removal extended behind the reinforcing bars and/or prestressing strands. These areas are to be placed using forms to match the original beam surface. Patching material shall be one of the grouts as listed in the table on this sheet. Patching materials contain corrosion inhibitors. Follow manufacturer's instructions and recommendations for mixing, placing and curing. Forms are to remain in place for seven days.
7. Sandblast 6'-0" of the ends of the repaired beams as shown on this sheet. The sandblasting shall be a light blast just enough to expose the fine aggregates. Do not sandblast patching material. All costs associated with sandblasting are to be included in the price bid for "Repair Beam Ends".
8. Apply concrete sealer to sandblasted portions of beams ends. Do not seal patching material.

All costs include equipment and materials required to repair deteriorated beam ends as detailed in these plans. These details shall be included in the price bid for "Repair Beam Ends". The Engineer will count each end of each beam properly repaired, and the Contractor will be paid the contract unit price per each repair.

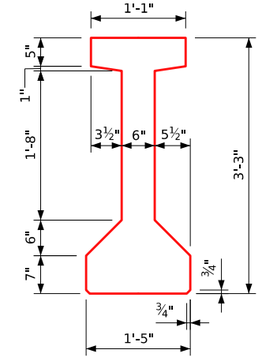


Shallow Repair Areas

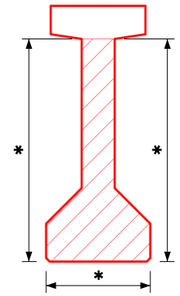


Regular Repair Areas

Note: The repair areas shown are schematic only. The actual area to be repaired will be determined by the Engineer. For location of beam ends to be repaired see beam layout below.

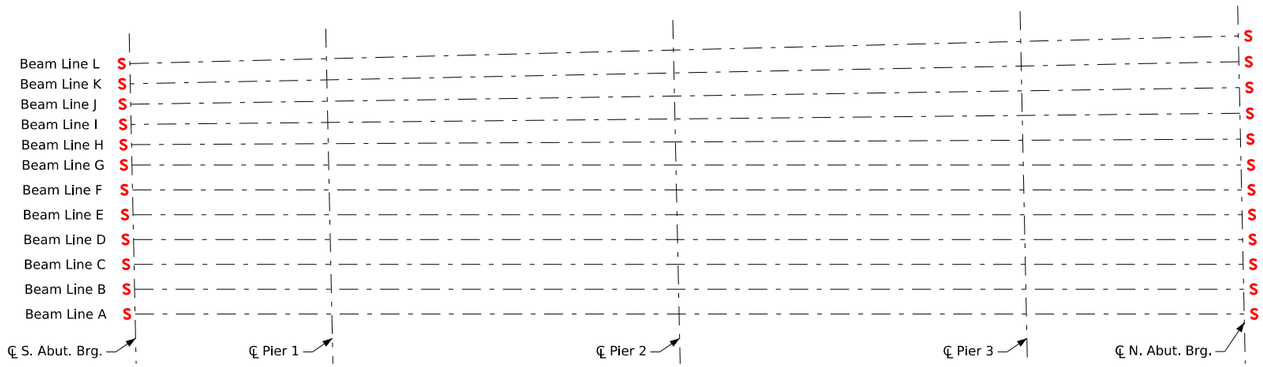


Beam Section



Limits of Sandblasting

✱ Sandblast the surfaces of the bottom flange and web within the limits shown to 6 feet of the beam ends.



Beam Layout

N

● - Regular Beam End Repair Locations

S - Shallow Beam End Repair Locations

Table of Manufacturers

Manufacturer	Bonding Agent	Shallow Repair	Regular Repair
BASF	Mastermaco P 124	Masteremaco N 350 CI	Masteremaco S 477CI
Euclid	Duralprep A.C.	Verticoat Supreme	Eucorepair
Sika	Sika Armatec 110 Epocem	Sikatop 123 Plus	Sikatop 111 Plus

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

Beam End Repair Details & Notes

STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 Design Sheet No. 24 of 36 FHWA No. 28110

FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Concrete Beam Repair Details	Standard Sheet 1055	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.24	

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RepairRetroftBridges.dgn - 1055 - This Sheet Issued 03-01-2017.
RepairRetroftBridges.dgn - 1055 - This Sheet Re-Issued 07-2023.

Beam Repair Notes:

Refer to Article 2426 of the Standard Specifications for materials and construction methods that are adequate for structural concrete repair of the damaged beams. Bonding grout will not be required.

Refer to Article 2426.03, B of the Standard Specifications for surface preparation requirements when the reinforcing steel has been exposed as a result of concrete spalling or removal of loose and unsound concrete.

Prepare the surface of the old concrete by removing all loose, disintegrated or unsound concrete from the beam as shown on these plans and as designated by the Engineer. All concrete removals shall be complete before commencing placement of new concrete. Edge of repair area shall be sawcut ¾" deep.

When surface preparation and cleaning is complete the necessary forms are to be installed. Forms shall be positively held in the proper position to restore beam to original dimensions.

Beam repairs shall be completed during Stage 2 while traffic is shifted away from the beams.

All concrete shall be Class "O" Structural Concrete.

The coarse aggregate shall be as described in Article 4115.05 of the Standard Specifications (½" maximum size).

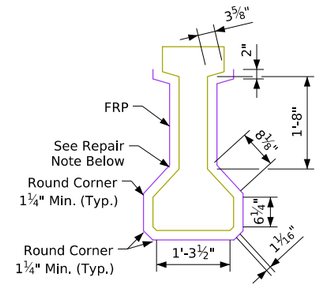
The repaired surfaces shall be cured by leaving the forms in place and any exposed concrete covered with wet burlap for at least 7 days.

Specifications for fiber reinforced polymer (FRP) repair of beams are included in the Developmental Specifications for "Fiber Reinforced Polymer Repair for Concrete Containment of Collision Damaged Pretensioned Prestressed Concrete Beams". The manufacturer of FRP laminates should be present to advise the Bridge Contractor on application and placement of FRP laminates.

All costs associated with the following shall be included in the price bid for "Beam Repair, As Per Plan":

- Removal of unsound or loose concrete, preparing, and cleaning repair areas.
- Epoxy inject cracks in beams.
- Restoring beam to its original cross sectional dimensions with concrete as noted and shown in the plans.
- Application of fiber reinforced polymer laminates to the beam as shown in the plans and Developmental Specifications for "Fiber Reinforced Polymer Repair for Concrete Containment of Collision Damaged Pretensioned Prestressed Concrete Beams."

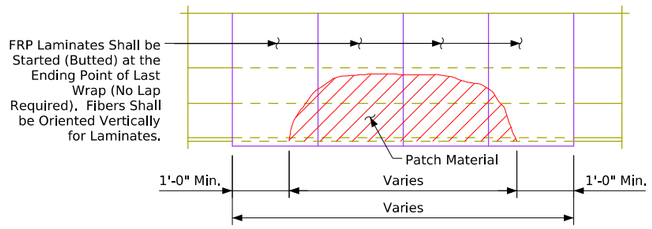
Contractor shall epoxy inject beam cracks after the concrete patch has cured and before the application of FRP laminates. The epoxy resin shall be in accordance with Materials IM 491.19 Appendix A.



Typical Section Thru Wrapped Beam

Repair Note: All interior corners shall be ground smooth to ensure proper adhesion between the FRP laminate and concrete surface.

The cure time for the repairs shall follow what is recommended by the FRP Manufacturer.



Impact Area Repair Detail

(Typical)

FRP = Fiber Reinforced Polymer

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

Beam FRP Repair Details & Notes

STA. 1088+28.60 (I-29)

Turn-in Date: Sept, 1, 2026

Harrison County

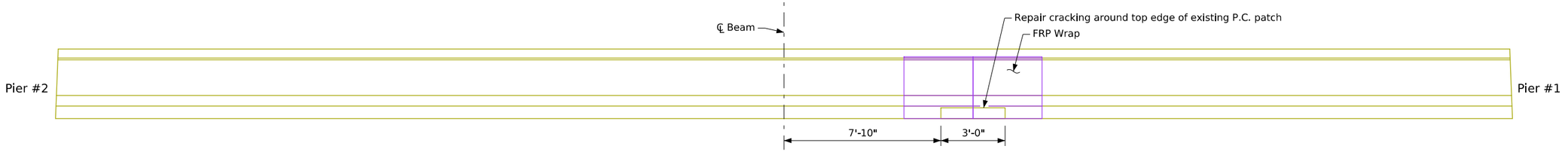
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 Design Sheet No. 25 of 36 FHWA No. 28110

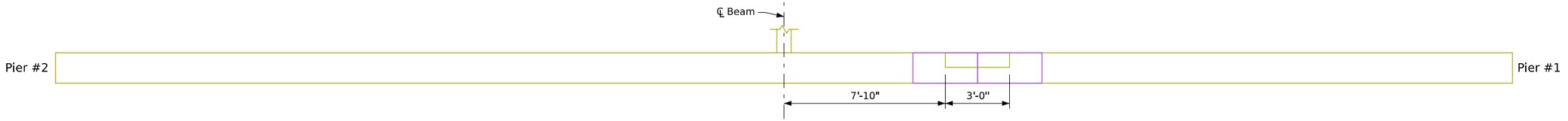
FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Concrete Beam Fiber Reinforced Polymer (FRP) Repair Details	Standard Sheet 1057s1 (Modified)	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.25	

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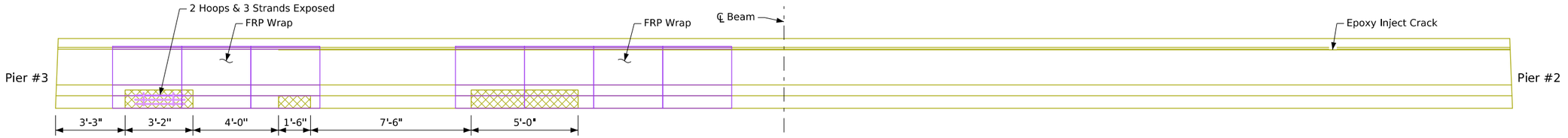
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RepairRetrofitBridges.dgn - 1057s1 - This Sheet Re-Issued 07-2023.



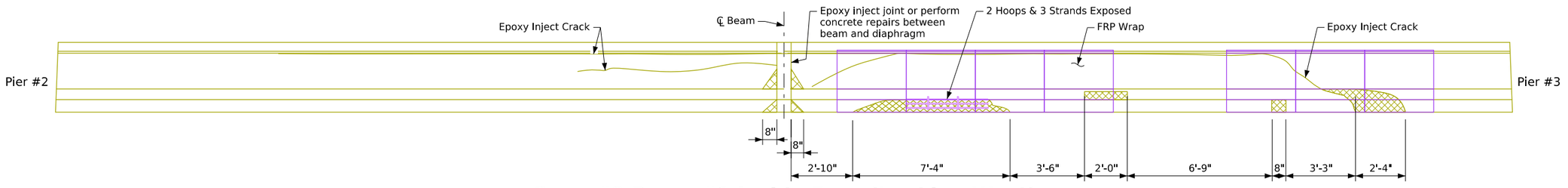
Span #2 Beam #1 Outside Face (Looking East)



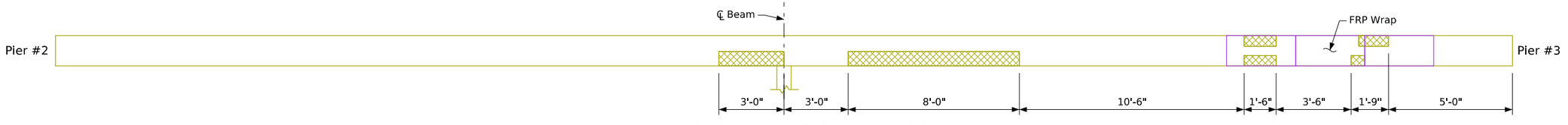
Span #2 Beam #1 Bottom Plan



Span #3 Beam #1 Outside Face (Looking East)



Span #3 Beam #1 Inside Face (Looking West)



Span #3 Beam #1 Bottom Plan

Previous P.C. Patch
Hollow Concrete
Spalled Concrete

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans — 2-68'-9" Interior Span

FRP Repair Details

STA. 1088+28.60 (I-29) — Turn-in Date: Sept, 1, 2026

Harrison County

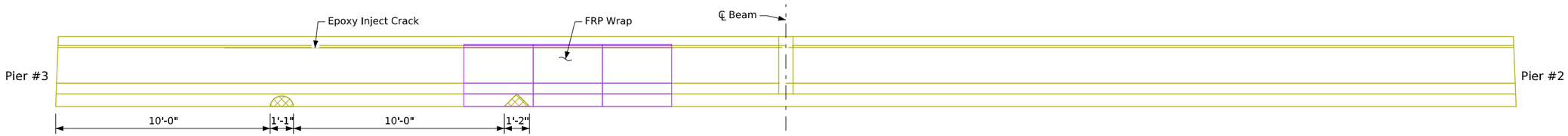
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 — Design Sheet No. 26 of 36 — FHWA No. 28110

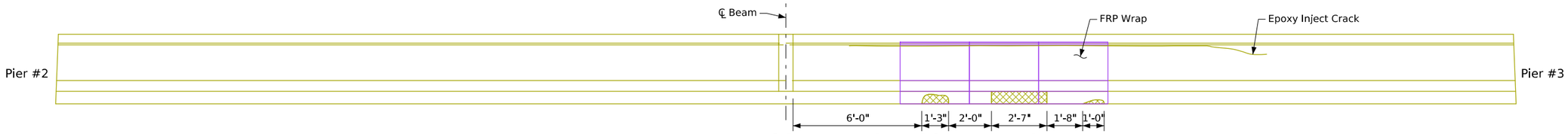
whks engineers + planners + land surveyors

FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.26

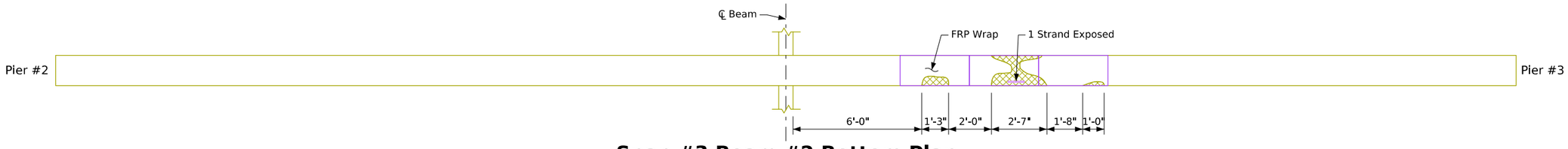
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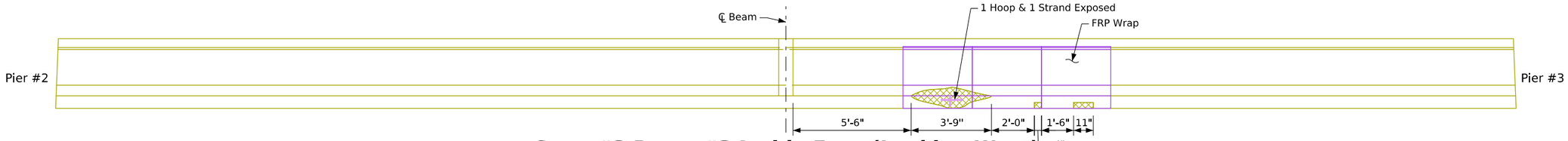
Span #3 Beam #2 Outside Face (Looking East)



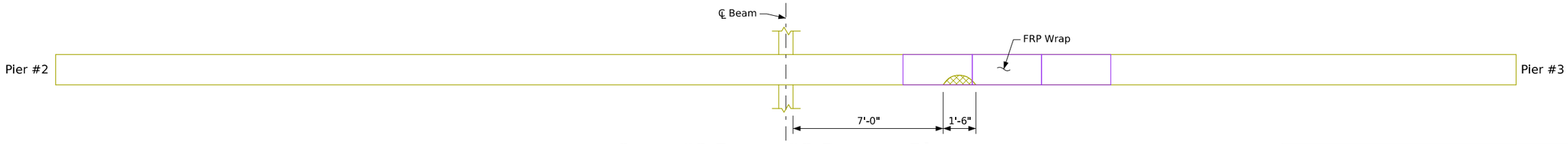
Span #3 Beam #2 Inside Face (Looking West)



Span #3 Beam #2 Bottom Plan



Span #3 Beam #3 Inside Face (Looking West)



Span #3 Beam #3 Bottom Plan

Previous P.C. Patch
Hollow Concrete
Spalled Concrete

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Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

FRP Repair Details

STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026

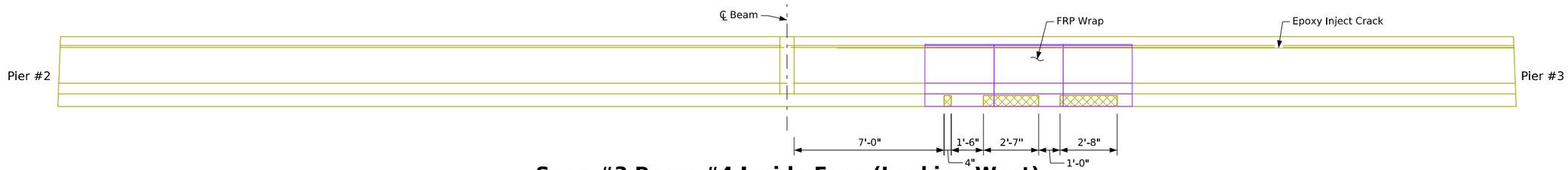
Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

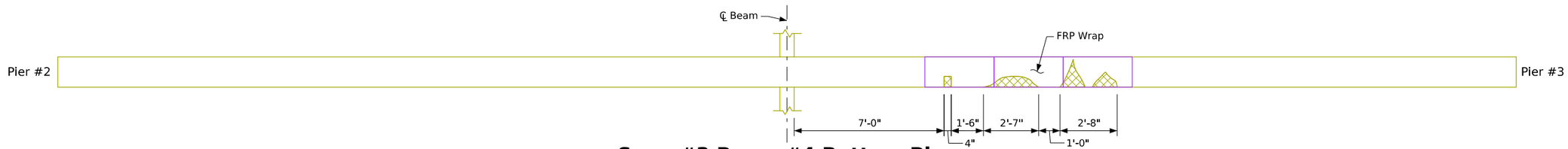
Design No. 527 Design Sheet No. 27 of 36 FHWA No. 28110

FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.27	

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Span #3 Beam #4 Inside Face (Looking West)



Span #3 Beam #4 Bottom Plan

Previous P.C. Patch
Hollow Concrete
Spalled Concrete

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

FRP Repair Details

STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026

Harrison County

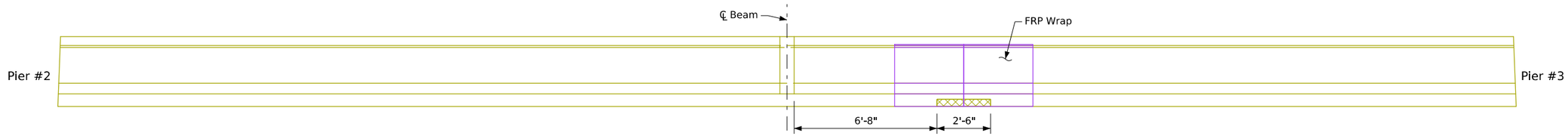
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 Design Sheet No. 28 of 36 FHWA No. 28110

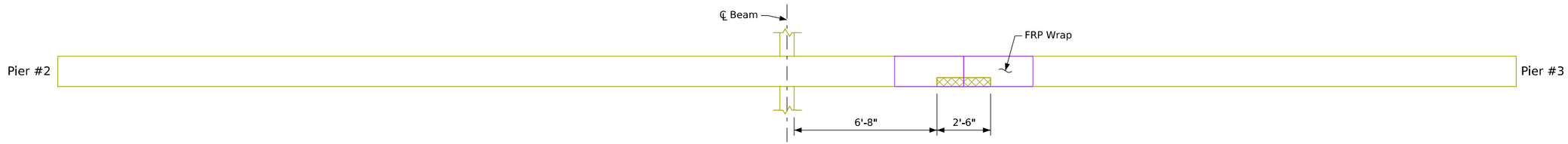
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FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.28	

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Span #3 Beam #6 Inside Face (Looking West)



Span #3 Beam #6 Bottom Plan

Previous P.C. Patch
Hollow Concrete
Spalled Concrete

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

FRP Repair Details

STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026

Harrison County

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Design No. 527 Design Sheet No. 29 of 36 FHWA No. 28110

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FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.29	

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North Abutment Repairs

Looking North

Note:
The dimensions and hatched area 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 determine by the Engineer.

Note:
See Design Sheet 34 for notes and details for concrete repairs.

Legend

- Indicated Shallow Repair
- Indicated Regular Repair

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans — 2-68'-9" Interior Span

Concrete Repair Details - N. Abutment

STA. 1088+28.60 (I-29)

Turn-in Date: Sept, 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 | Design Sheet No. 30 of 36 | FHWA No. 28110





South Abutment Repairs

Looking South

Note:
The dimensions and hatched area 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 determine by the Engineer.

Note:
See Design Sheet 34 for notes and details for concrete repairs.

Legend

- Indicated Shallow Repair
- Indicated Regular Repair

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned
Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans — 2-68'-9" Interior Span

Concrete Repair Details - S. Abutment

STA. 1088+28.60 (I-29) — Turn-in Date: Sept, 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 — Design Sheet No. 31 of 36 — FHWA No. 28110



Pier 2 Repairs
Looking Southwest

Note:
The dimensions and hatched area 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 determine by the Engineer.

Note:
See Design Sheet 34 for notes and details for concrete repairs.

Legend

- Indicated Shallow Repair
- Indicated Regular Repair

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans — 2-68'-9" Interior Span

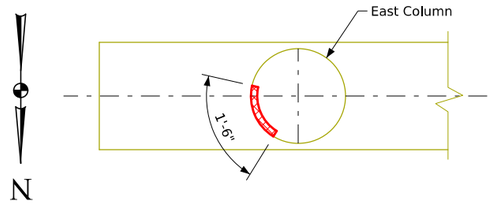
Repair Details - Pier 2

STA. 1088+28.60 (I-29) — Turn-in Date: Sept, 1, 2026

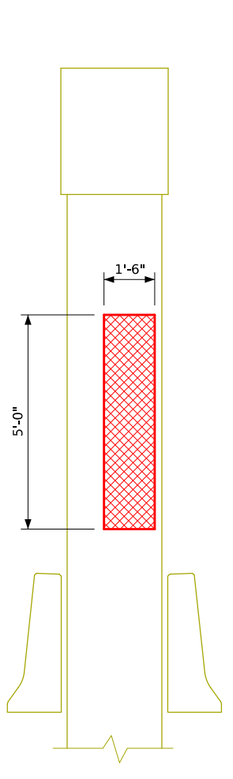
Harrison County

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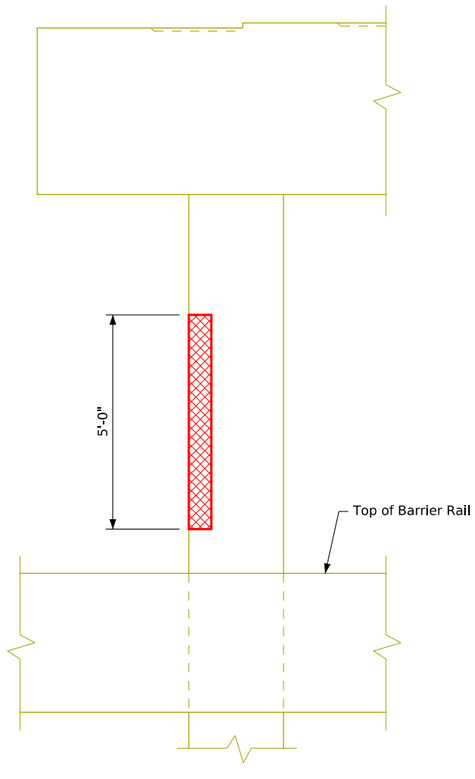
Design No. 527 — Design Sheet No. 32 of 36 — FHWA No. 28110



Part Pier 2 Plan



Pier 2 East End View
Looking West



Part Pier 2 Elevation
Looking South

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 area to be repaired shall be determined by the engineer.

Note:
See Design Sheet 34 for notes and details for concrete repairs.

Legend

- Indicated Shallow Repair
- Indicated Regular Repair

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Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans — 2-68'-9" Interior Span

Repair Details - Pier 2

STA. 1088+28.60 (I-29) — Turn-in Date: Sept, 1, 2026

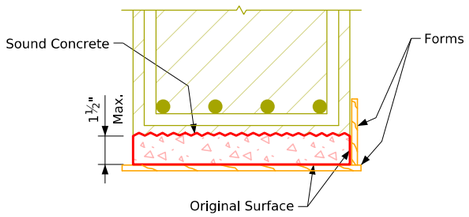
Harrison County

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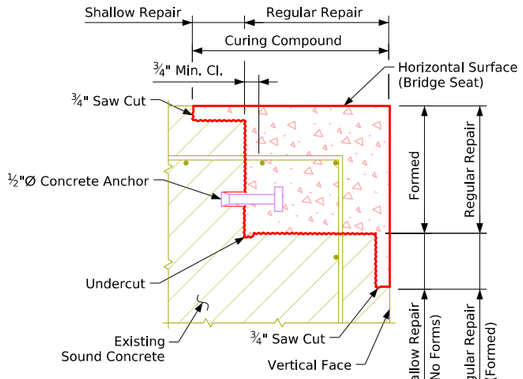
Design No. 527 — Design Sheet No. 33 of 36 — FHWA No. 28110

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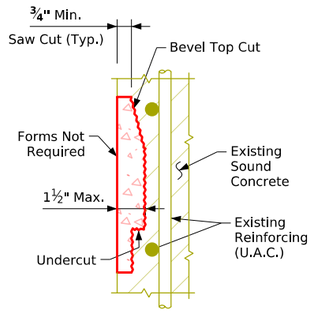
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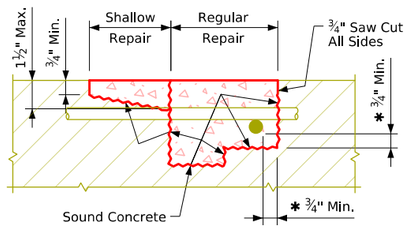
Shallow Repair Bottom Surface



Corner Repair

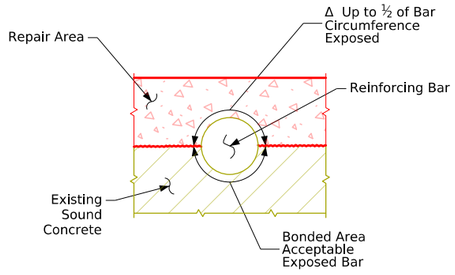


Shallow Repair Vertical Face

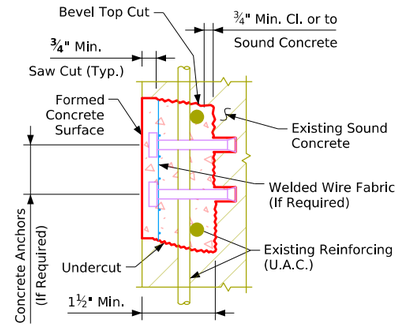


Repair Definition

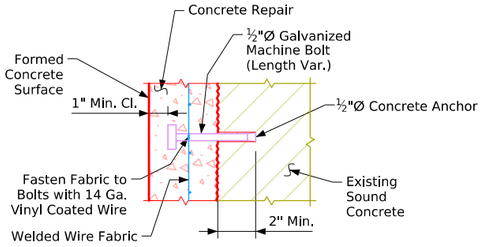
✱ Indicates Clearance for an Un-Bonded Rebar.



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

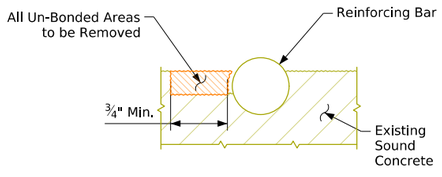


Regular Repair Vertical Face



Anchor Detail

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



Concrete Removal Adjacent to Reinforcing

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 square inch 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 square feet or larger. For this condition ½"∅ concrete anchors and welded wire fabric shall be installed at the rate of one concrete anchor with WWF per each 1.5 square feet 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.	28.0
		Total (Sq. Ft.)	28.0

Estimated Concrete Repair Quantities

Description	Units	Amount
Concrete Repair	Sq. Ft.	28.0

Note:
For estimated repair areas and locations, see Design Sheets 30-33.

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

Concrete Repair Details

STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 Design Sheet No. 34 of 36 FHWA No. 28110

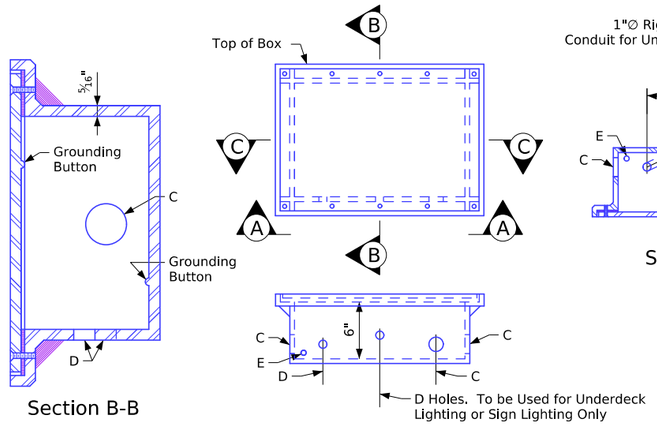
Revised 10-2014 - Deleted All References to Grout. Section 2426 Covers this Requirement and Doesn't Need to be Stated on the Plans.
RepairRetrofitBridges.dgn - 1045 - This Sheet Redrawn 09-27-1990.
RepairRetrofitBridges.dgn - 1045 - This Sheet Re-Issued 07-2023.

FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Concrete Repairs	Standard Sheet 1045	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.34	

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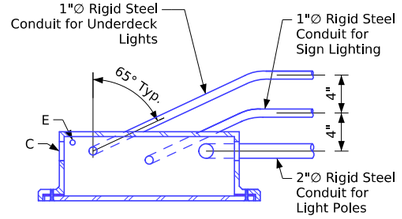
Bossed For	Hole	For Conduit Size
5 Threads	C	2" Ø Rigid Steel
None	D	1" Ø Rigid Steel
None	E	½" Ø Rigid Steel

Note: The grounding buttons are to be blind drilled and tapped for ⅜"Ø x 0'-0¾" bolts.



Section B-B

View A-A



Section C-C

LI-104 Junction Box

Watertight, Cast Iron - Flush Mount

Lighting Notes:

See LI-104 Standard Road Plan for additional information on junction boxes.

Construction shall conform to the current Iowa D.O.T. Standard and Supplemental Specifications and Special Provisions.

Conduit installation shall be in accordance with Article 2523.03, N, of the Standard Specifications.

All "C" entrance holes in junction boxes shall be drilled and tapped for the specified conduit size. All other holes shall have a concrete - tight slip fit. Conduit ends shall not protrude into junction box more than ¼". Drain pipe end shall be flush with inside surface of box. Grounding buttons shall be located approximately 3" from the inside surface of the box wall, and not closer than 3" to the edge of any hole in the box floor. Holes for drain pipe shall be placed in the low corner of the box, with a minimum clearance of 1" between the edge of the hole and the inside surface of the box wall. Typical details are shown on this sheet.

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.

All anchor bolt material shall comply with the requirements of Iowa DOT Construction and Materials I.M. 453.08 and Standard Specifications 4185.02,B,2.

Welding of anchor bolts shall not be allowed. The Contractor shall obtain a template from the Manufacturer / Fabricator for proper placement of the anchor bolts.

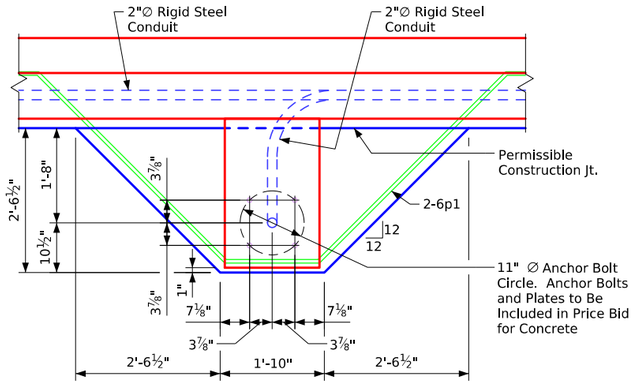
All reinforcing steel is to be epoxy coated and grade 60.

Stainless-steel reinforcement shall not be allowed to be in contact with the uncoated reinforcement, bare metal forming hardware, or to galvanized attachments or galvanized conduit.

Note:

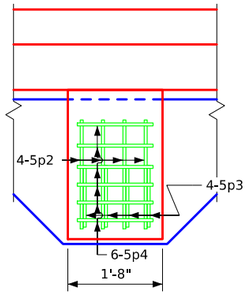
Existing light poles and luminaires are to be removed and reinstalled. Provide new 1" dia. galvanized leveling nut, anchor nut, and jam nut for each anchor bolt meeting the requirements of ASTM A563. Provide one galvanized hardened washer for each anchor bolt meeting the requirements of ASTM F436.

Costs for anchor bolts, nuts, and washers are incidental to the unit price for Concrete Barrier Rail.

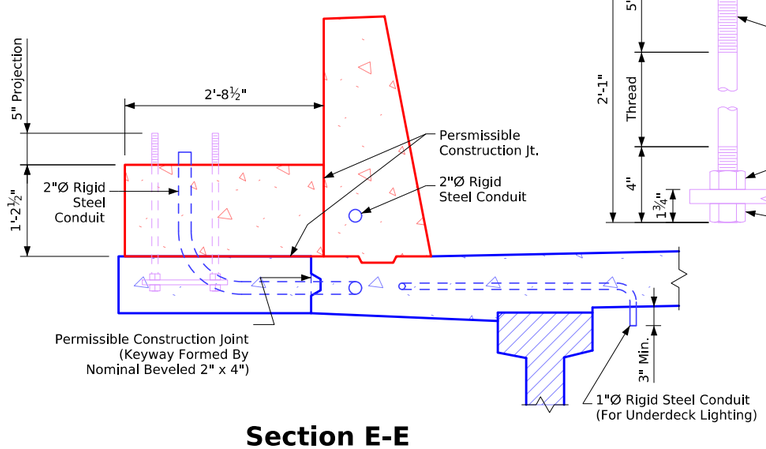


Plan of Pole Base

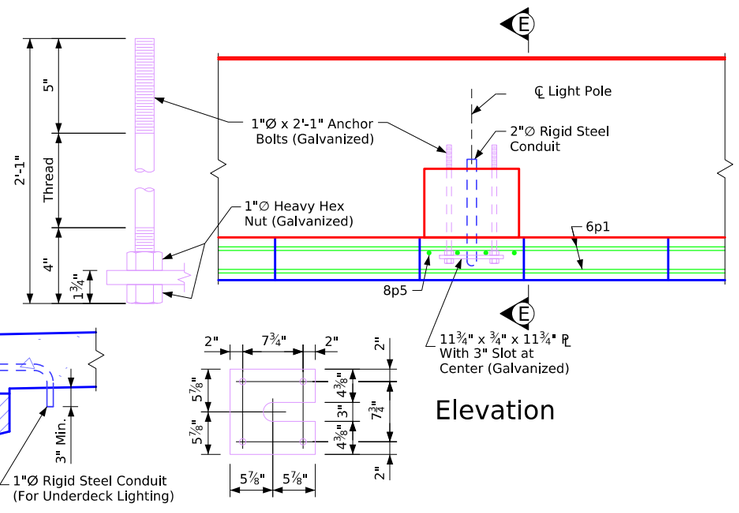
Base Reinforcing Bars Not Shown



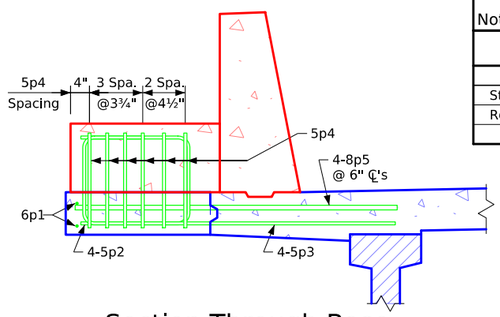
Plan of Pole Base Reinforcing



Section E-E



Elevation

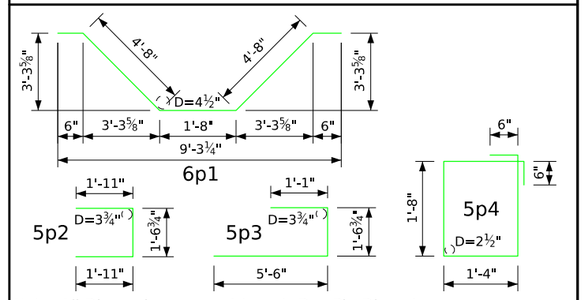


Section Through Base Showing Reinforcing

Epoxy Coated Reinf. Steel - One Base

Bar	Location	Shape	No.	Length	Weight
6p1	Deck Anchors		2	12'-0"	36
5p2	Pole Base to Deck		4	5'-5"	23
5p3	Pole Base to Deck		4	8'-2"	34
5p4	Pole Base Hoop		6	7'-0"	44
8p5	Deck Transverse		4	5'-8"	61
				Epoxy Reinforcing Total Weight (lbs.)	198

Bent Bar Details



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

Lighting Quantities

Section	Total
Structural Concrete (Bridge)	1.1 cu. yd.
Reinforcing Steel - Epoxy Coated	396 lbs.

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

Lighting Details

STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026

Harrison County

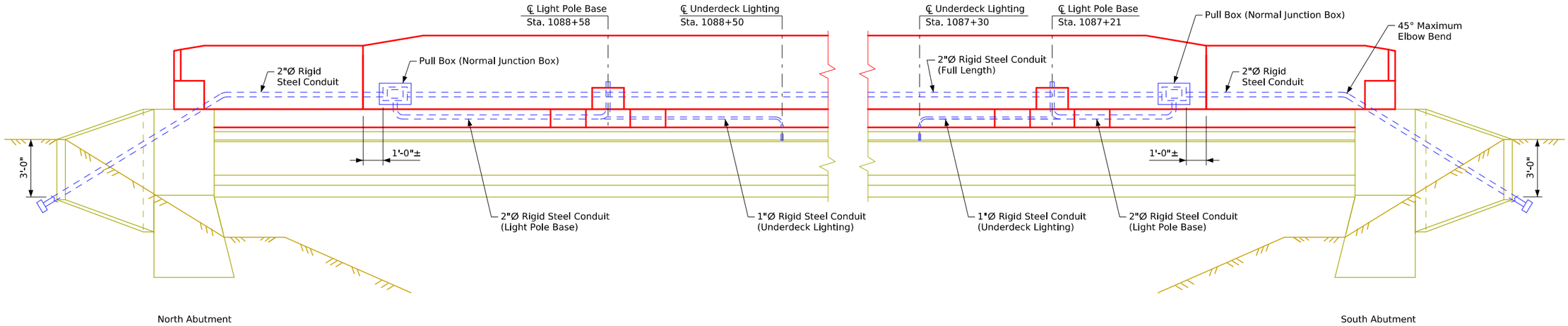
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 Design Sheet No. 35 of 36 FHWA No. 28110

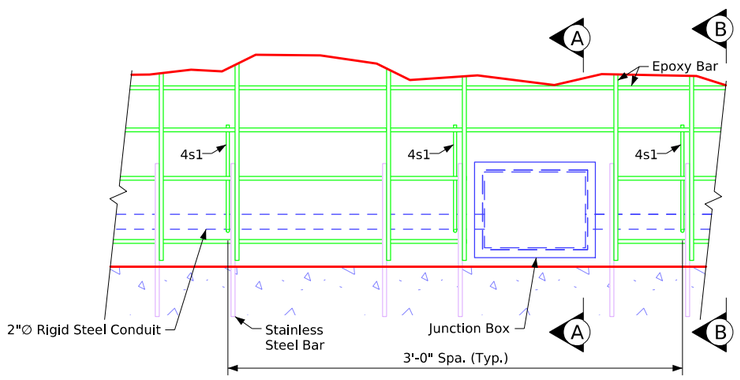
FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Lighting Details (1 of 2)	Standard Sheet 1030As1 (Modified)	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.35	

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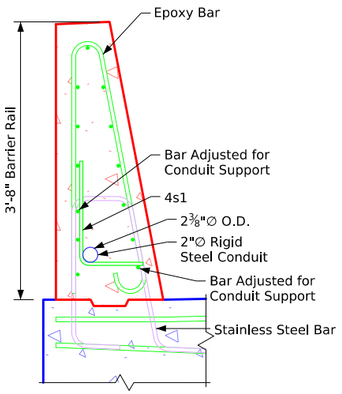
Revised 09-16: Added Standard Specifications 4185.02,B,2 in Lighting Notes. Changed Bar Mark from "x" to "p".
Redrawn 09-08-88.
DeckRailBridges.dgn - 1030As1 -This Sheet Re-Issued 05-2024. Sheet Format Update.



Exterior Elevation - West Barrier Rail - Looking East



Conduit Support - Rail Elev. Detail



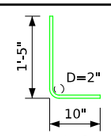
Section B-B - Conduit Support

Only used in rail with conduit, use 3'-0" spacing. Galvanized conduit shall not come into contact with the stainless steel reinforcing. lower conduit can only be 2" diameter.

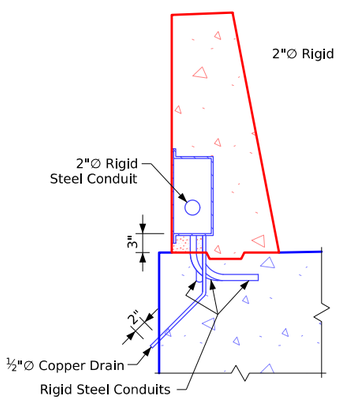
Epoxy Coated Reinf. Steel - One Rail

Bar	Location	Shape	No.	Length	Weight
4s1	Rail Conduit	⌟	75	2'-3"	113
	Epoxy Reinforcing Total Weight (lbs.)				113

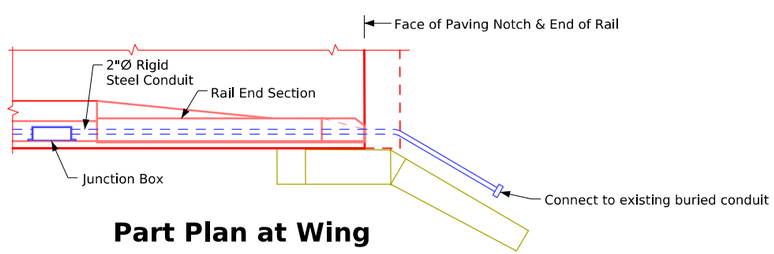
Bent Bar Details



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



Section A-A
Thru Junction Box



Part Plan at Wing

Design For 1°13'30" Skew RA

219'-7" x Var. Pretensioned Prestressed Concrete Beam Bridge

38'-11½" & 43'-1½" End Spans 2-68'-9" Interior Span

Lighting Details

STA. 1088+28.60 (I-29) Turn-in Date: Sept, 1, 2026

Harrison County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 527 Design Sheet No. 36 of 36 FHWA No. 28110

Revised 09-16: Added Conduit Support Rail Detail to Keep Conduit Isolated from the Stainless Steel Reinforcing.
Issued 09-03.
DeckRailBridges.dgn - 1030As2 -This Sheet Re-Issued 05-2024. Sheet Format Update.

FILE NO. 32385	ENGLISH	DESIGN TEAM JO\LG	Lighting Details (2 of 2)	Standard Sheet 1030As2 (Modified)	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER V.36	

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No.	DESCRIPTION
A Sheets	**Title Sheets**
A.3	Roadway Title Sheet
B Sheets	**Typical Cross Sections and Details**
B.1 - 5	Typical Cross Sections and Details
C Sheets	**Quantities and General Information**
C.1	Project Description
C.2 - 3	Estimated Roadway Quantities & Reference Information
C.4	Standard Road Plans
C.5	Index of Tabulations
C.6	Standard Notes
C.7 - 27	Tabulations
D Sheets	**Mainline Plan and Profile Sheets**
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	I-29 SB
E Sheets	**Side Road Plan and Profile Sheets**
* E.1	Loop E
F Sheets	**Detour or Temporary Pavement Sheets**
* F.1	Detour Plan Sheet
G Sheets	**Survey Sheets**
G.1 - 3	Horizontal Control Tab. & Super for all Alignments
J Sheets	**Traffic Control and Staging Sheets**
* J.1	Traffic Control Plan
* J.2	511 Travel Restrictions
* J.3	Staging Notes Stage
* J.4	Coordinated Operations
* J.5	Traffic Control & Staging Legend & Symbol Info. Sheet
* J.6	Staging Typical Sections
* J.7 - 8	Staging and Traffic Control Sheets
	* Color Plan Sheets

ROADWAY DESIGN

LICENSED PROFESSIONAL ENGINEER
BRIAN J. BIRKLAND 17375
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.

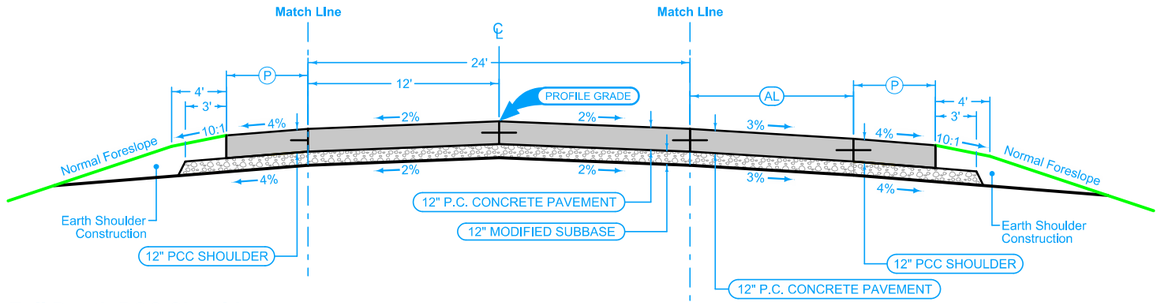
Signature 8-6-2026 Date

Brian J. Birkland
Printed or Typed Name

My license renewal date is December 31, 2026

Pages or sheets covered by this seal: A.3, B.1-B.5, C.1-C.27, D.1-D.2, E.1, F.1, G.1-G.3,J.1-J.8

I-29 SOUTHBOUND



Full Depth PCC Shoulder

Shoulder Jointing:
Longitudinal joint: BT-2, or L-2
Transverse joints: C at 17' spacing

2_P_FullPCC_ 04-15-25		
STATION TO STATION		(P) Feet
1085+40.00	1086+11.43	6.0
1089+73.18	1090+50.00	6.0

Mainline Jointing:
Transverse joints: CD at 17' spacing (max.)
Longitudinal joint: L-2

2P_ 04-21-20	
STATION TO STATION	
1085+40.00	1086+11.43
1089+73.18	1090+50.00

Auxiliary Lane

Transverse joint: CD at 17' spacing (max.)
Longitudinal joint: L or BT

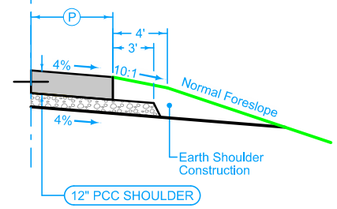
2_AuxLane_PCC_ 04-15-25		
STATION TO STATION		(AL) Feet
1085+40.00	1086+11.43	15.76 - 16.78

Full Depth PCC Shoulder

Shoulder Jointing:
Longitudinal joint: BT-2, or L-2
Transverse joints: C at 17' spacing

2_P_FullPCC_ 04-15-25		
STATION TO STATION		(P) Feet
1085+40.00	1086+11.43	6.0

View is in the direction of travel.



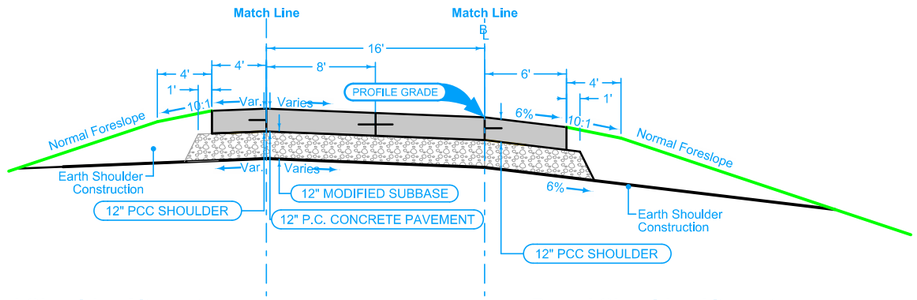
Full Depth PCC Shoulder

Shoulder Jointing:
Longitudinal joint: BT-2, or L-2
Transverse joints: C at 17' spacing

2_P_FullPCC_ 04-15-25		
STATION TO STATION		(P) Feet
1089+73.18	1090+10.96	11.22 - 16.70
1090+10.96	1090+50.00	8.0

See Tab 100-24 for pavement quantities.
See Tab 112-9 for shoulder quantities.
Refer to Sheets D.2 and E.1 for joint layouts.

LOOP E



Paved Shoulder Alternates

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at 15' spacing
HMA Shoulder Jointing:
Longitudinal joint: B

1L_P_ALT_ 10-18-22	
BEGIN STATION	END STATION
5589+71.29	5590+18.00

Section shown in the direction of traffic.

Ramp Jointing:
Transverse joints: CD at 15' spacing.
Longitudinal joints: L-2

1RP_ 04-20-21	
BEGIN STATION	END STATION
5589+71.29	5590+18.00

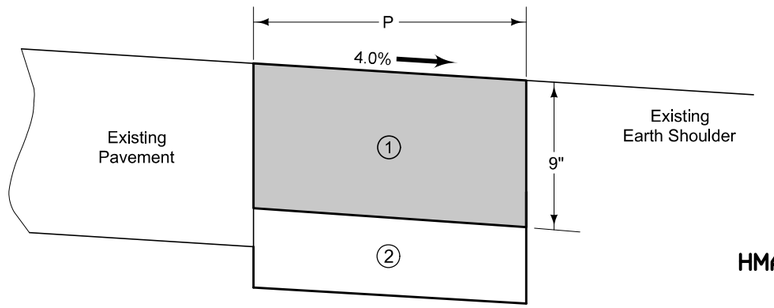
Paved Shoulder Alternates

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at 15' spacing
HMA Shoulder Jointing:
Longitudinal joint: B

1L_P_ALT_ 10-18-22	
BEGIN STATION	END STATION
5589+71.29	5590+18.00

See Tab 100-24 for pavement quantities.
See Tab 112-9 for shoulder quantities.
See Tab 101-18 for superelevation details.
Refer to Sheet E.1 for joint layout.

PS-1

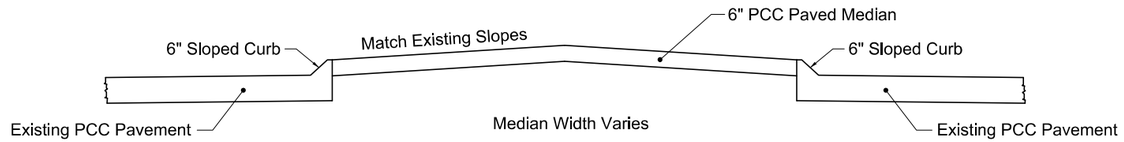


1. HMA Paved Shoulder, 9 in. Refer to Tab. 112-9.
2. Special Backfill, 6 in.

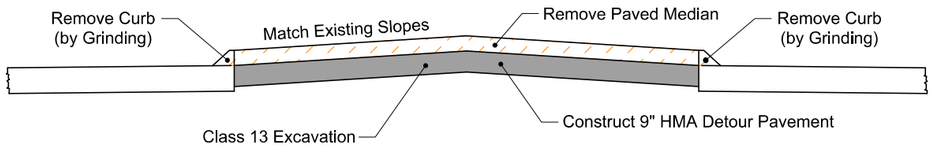
HMA PAVED SHOULDER

DET-1

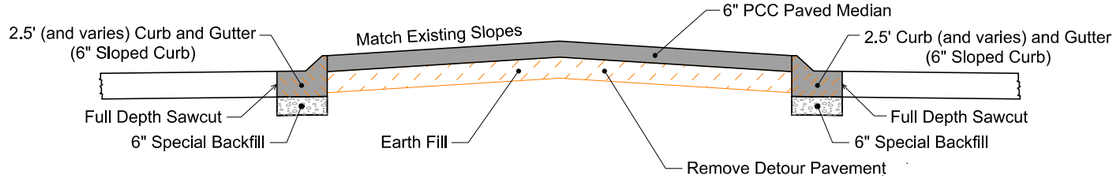
Existing Median



HMA Paved Detour



Final Paved Median

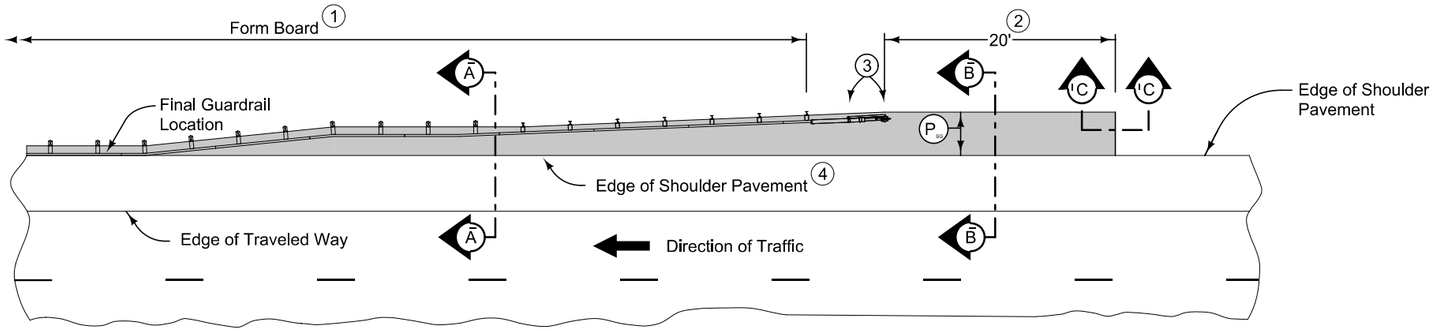


Refer to Sheet F.1 for final paved median.

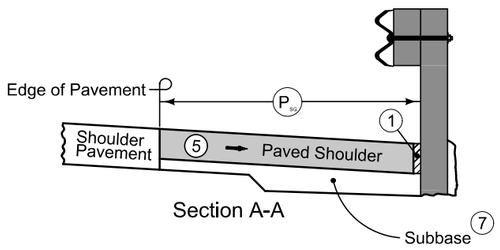
US 30 Median Detour Typicals

FILE NO. 32385	ENGLISH	DESIGN TEAM WHKS & Co.	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER B.3

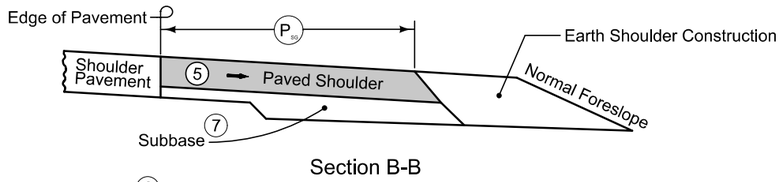
10:36:59 AM 8/6/2026 KirkRomsey pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302908022\Bridge\(138)_Reconstruction - Bridge Deck Replacement\WHKS\Roadway\CADD_Files\43029138_Z06_B1.dgn



PLAN VIEW

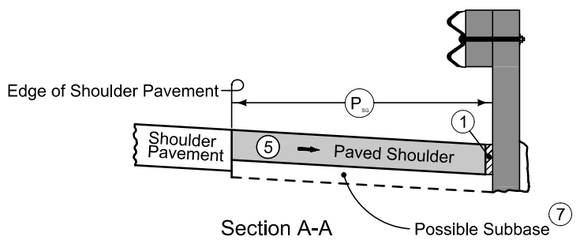


Section A-A

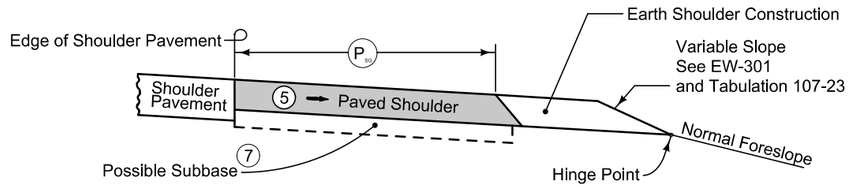


Section B-B

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:

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.

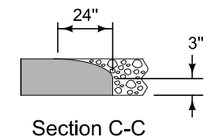
(3) Shoulder may be notched for first 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.

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

(5) Match shoulder slope.

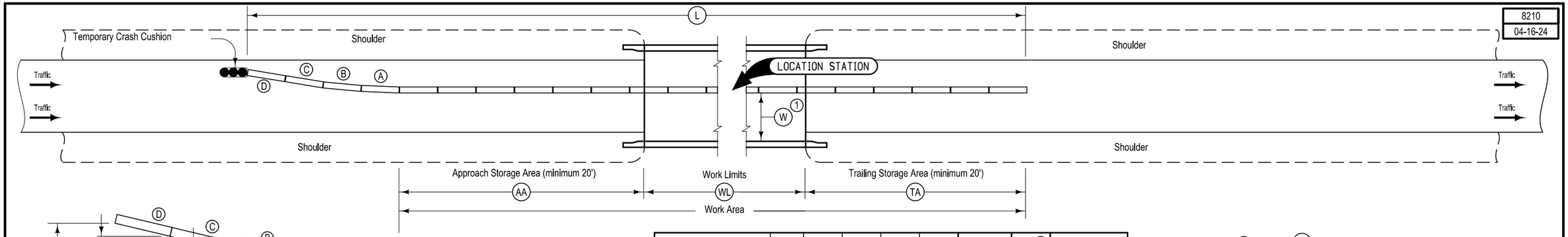
(6) The Contractor has the option to pave the paved shoulder at guardrail and the full width paved shoulder as one operation.

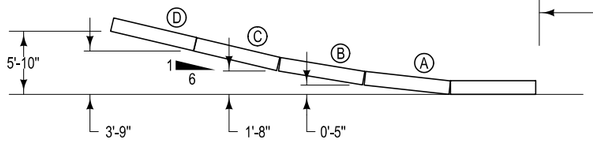
(7) Refer to other details in the plan.



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

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





BARRIER OFFSETS FOR FLARE SECTIONS

Station	Side	AA	WL	TA	L	Anchored	W (1)	Remarks
		Feet	Feet	Feet	Feet	X	Ft-Inches	
1088+28.60	Left	20.1	510.0	20.1	601.2	X	24 - 1	Stage 1
1088+28.60	Right	20.1	510.0	20.1	601.2		14 - 6	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

100_01D
8/15/22

PROJECT DESCRIPTION

This project is for deck replacement for the I-29 Southbound over US 30 in Harrison County. It also includes bridge approach replacement and guardrail replacement.

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	364.774	Refer to Tabs. 100_24 and 112_09, and Typicals PS-1 and DET-1 on Sheet B.3.
2	2102-2625000	EMBANKMENT-IN-PLACE	CY	20	Provide borrow material according to Section 2102 of the Standard Specifications. Refer to Tab. 107-23. Material shall be provided by the Contractor. Suitable material from Excavation, Class 13, may be used upon approval of the Engineer. Cross Sections not provided.
3	2115-0100000	MODIFIED SUBBASE	CY	315.31	Refer to Tabs. 100_24 and 112_09 and Typicals on Sheets B.1 and B.2.
4	2122-5190012	PAVED SHOULDER, P.C. CONCRETE, 12 IN.	SY	1,198.5	Refer to Tab. 112_09 and Sheets B.1-B.2.
5	2122-5500090	PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 9 IN.	SY	104.6	Refer to Tab. 112_09, Typical PS-1 on Sheet B.3, and Detail 7158 on Sheet B.4.
6	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	16.33	Refer to Tab. 112_09 and Typicals on Sheets B.1 and B.2, and Detail 7158 on Sheet B.4. Requires a minimum of 4 inches of topsoil. Place according to Article 2105.03,B of the Standard Specifications.
7	2213-2713300	EXCAVATION, CLASS 13, FOR WIDENING	CY	251.5	Refer to Tab. 112_09.
8	2301-0690203	BRIDGE APPROACH, BR-203	SY	906.2	Refer to Tab. 112_06.
9	2301-1033090	STANDARD OR SLIP FORM PORTLAND CEMENT CONCRETE PAVEMENT, CLASS C, CLASS 3 DURABILITY, 9 IN.	SY	86.3	Refer to Tab. 100_24 and Detail DET-1 on Sheet B.3.
10	2301-1033120	STANDARD OR SLIP FORM PORTLAND CEMENT CONCRETE PAVEMENT, CLASS C, CLASS 3 DURABILITY, 12 IN.	SY	680.2	Refer to Typicals on Sheets B.1 and B.2 and Tab. 100_24.
11	2301-4875006	MEDIAN, P.C. CONCRETE, 6 IN.	SY	398.1	Refer to Tab. 100_24.
12	2304-0100000	DETOUR PAVEMENT	SY	398.1	Refer to Typical DET-1 on Sheet B.3 and Tab. 100_24.
13	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE, BRIDGE DECK AND/OR APPROACHES	SY	1,985.8	Refer to Tab. 100-28.
14	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	250	Refer to Tabs. 110_07A and 110_13.
15	2505-4008300	STEEL BEAM GUARDRAIL	LF	212.5	Refer to Tab. 108_08A.
16	2505-4008410	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION, BA-201	EACH	2	
17	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED	EACH	2	
18	2505-4021720	STEEL BEAM GUARDRAIL TANGENT END TERMINAL, BA-205	EACH	2	

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadway Items	
19	2510-6745850	REMOVAL OF PAVEMENT	SY	3,431.2	Refer to Tabs. 110_01 and 102_05.
20	2514-0000200	REMOVAL OF CURB	STA	2.44	Refer to Tab. 110_04. Curb removal to be completed by grinding.
21	2527-9263137	PAINTED SYMBOLS AND LEGENDS, WATERBORNE OR SOLVENT-BASED	EACH	8	Refer to Tab. 108_29.
22	2527-9263181	PAVEMENT MARKINGS REMOVED	STA	61.37	Refer to Tab. 108_22.
23	2527-9263190	SYMBOLS AND LEGENDS REMOVED	EACH	8	Refer to Tab. 108_29.
24	2527-9263209	PAINTED PAVEMENT MARKINGS, WATERBORNE OR SOLVENT-BASED	STA	42.38	Refer to Tab. 108_22.
25	2527-9263216	PAINTED PAVEMENT MARKINGS, MULTI-COMPONENT LIQUID	STA	32.44	
26	2527-9263231	REMOVABLE TAPE MARKINGS, WET RETROREFLECTIVE	STA	53.48	
27	2527-9270112	GROOVES CUT FOR PAVEMENT MARKINGS	STA	32.44	
28	2528-2518000	SAFETY CLOSURE	EACH	2	Refer to Tab. 108-13A.
29	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE	LF	1,202.4	Refer to Tab. 108_33, Detail 8210 on Sheet B.5, and J Sheets. All temporary barrier rail shall be nominal 12'-6 long concrete units.
30	2528-8445110	TRAFFIC CONTROL	LS	1	Refer to Traffic Control Plan on Sheet J.1.
31	2548-0000100	MILLED SHOULDER RUMBLE STRIPS, HMA SURFACE	STA	9.57	Refer to Tab. 112_10.
32	2548-0000110	ASPHALT EMULSION FOR FOG SEAL (SHOULDER RUMBLE STRIPS)	GAL	10.4	
33	2548-0000200	MILLED SHOULDER RUMBLE STRIPS, PCC SURFACE	STA	2.38	
34	2551-0000110	TEMP CRASH CUSHION	EACH	2	Refer to Tab. 108_30.
35	2557-0000100	LONGITUDINAL GROOVING IN CONCRETE, PAVEMENT	SY	581	Refer to Tab. 100-28.
36	2602-0000320	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 20 IN. DIA.	LF	1,090	Refer to Tab. 100_19. The tabulation includes estimated locations for placement of "Perimeter and Slope Sediment Control Device, 20 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.
37	2602-0000370	DITCH CHECK SEDIMENT CONTROL DEVICE, 20 IN. DIA.	LF	25	Refer to Tab. 100_19. The tabulation includes estimated locations for placement of "Ditch Check Sediment Control Device, 20 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.

STANDARDS

The following Standards apply to construction work on this project.

Number	Date	Title
BA-200	10-20-26	Steel Beam Guardrail Components
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-250	10-20-26	Steel Beam Guardrail Installation at Concrete Barrier or Bridge End Post (MASH TL-3)
BA-401	04-20-21	Temporary Barrier Rail (Precast Concrete)
BA-500	04-20-21	Temporary Crash Cushions Sand Barrel
BR-203	10-20-26	Double Reinforced 12in Approach
BR-211	04-21-26	Bridge Approach (Abutting PCC or Composite Pavement)
BR-213	10-19-21	Bridge Approach (Abutting Pavement)
DR-306	10-17-23	Precast Concrete Headwall for Subdrain Outlets
EC-204	10-19-21	Perimeter, Slope and Ditch Check Sediment Control Devices
EW-301	10-20-26	Guardrail Grading
LI-104	10-21-14	Junction box (cast Iron)
PM-110	10-15-24	Line Types
PM-111	04-21-20	Symbols and Legends
PM-115	10-20-26	Grooving for Line Types
PM-310	04-15-25	Entrance and Exit Ramps
PM-320	04-15-25	Entrance and Exit Ramps (Interstate)
PV-12	10-20-26	Milled Shoulder Rumble Strips
PV-101	10-20-26	Joints
PV-102	10-21-25	PCC Curb Details
PV-104	10-21-25	Ramped Median Nose
SI-881	10-20-26	Special Signs for Workzones
SI-882	10-18-16	Special Signs for Restricted Width Traffic Control Zones
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-402	04-18-23	Work Within 15 ft of Traveled Way
TC-417	04-21-20	Ramp Closure
TC-418	04-18-23	Lane Closure on Divided Highway
TC-421	10-21-25	Lane Closure with TBR
TC-432	10-17-17	Shoulder Rumble Strip Operations
TC-433	10-17-17	Pavement Marking Operations

INDEX OF TABULATIONS

Tabulation	Tabulation Title	Sheet No.
100_01D	PROJECT DESCRIPTION	C.1
	ESTIMATED ROADWAY QUANTITIES & REFERENCE INFORMATION	C.2-C.3
105_04	STANDARD ROAD PLANS	C.4
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	STANDARD NOTES	C.6
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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_03
9/28/22

ROAD WEATHER INFORMATION SYSTEM

A Road Weather Information System (RWIS) installation is located within this project's construction limits. Notify the Iowa DOT's Maintenance Office (telephone number 515-239-1971) a minimum of 7 days prior to working near the RWIS installation. Maintenance personnel will locate and mark the RWIS one time. Treat this RWIS similar to other public utilities. The Contractor is responsible for paying for unapproved damage they have caused to the RWIS.

262_06
9/28/22

UTILITIES (NOT A POINT 25 PROJECT)

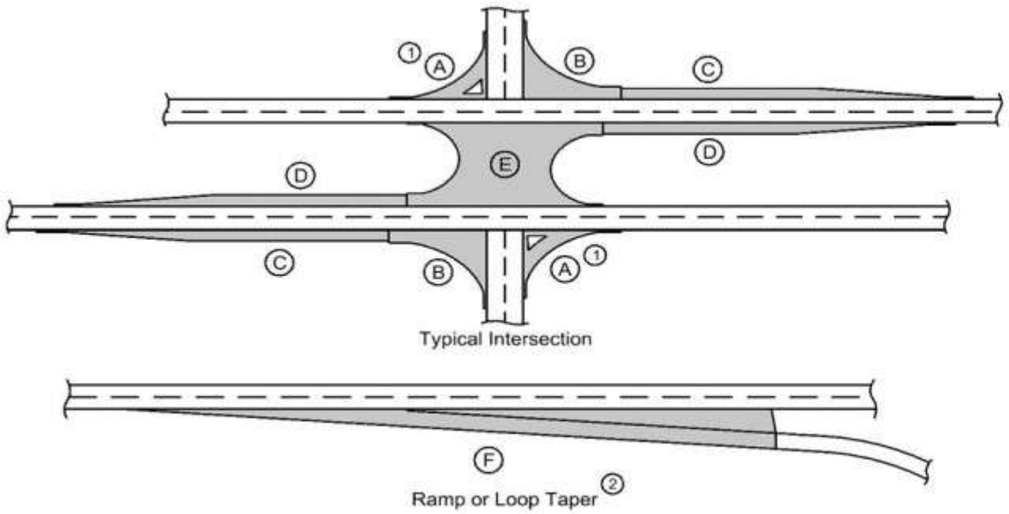
This is NOT a POINT 25 project and is not subject to the provisions of IAC 761-115.25.

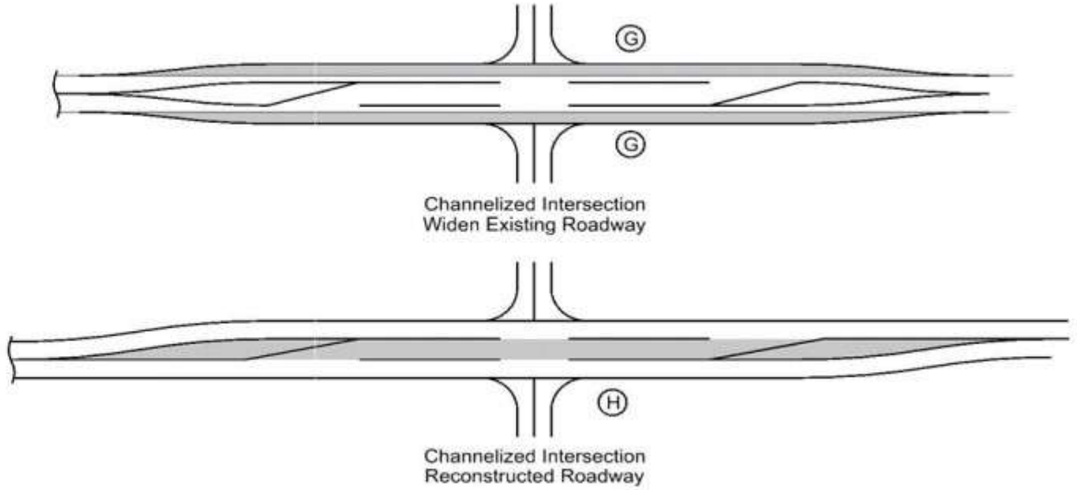
PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE

Possible Standards: EC-204

Station From	Station To	Side	Sediment Control Device Type	Diameter Size	Length (LF)	Remarks
1085+65.00	1086+90.00	Median	Perimeter and Slope	20 inch	130.00	
1088+95.00	1093+60.00	Median	Perimeter and Slope	20 inch	470.00	
1085+65.00	1086+85.00	Left	Perimeter and Slope	20 inch	120.00	
1090+55.00	1090+55.00	Left	Ditch Check	20 inch	20.00	
5588+95.00	5590+40.00	Left	Perimeter and Slope	20 inch	150.00	
			Perimeter and Slope	20 inch	220.00	+25% for Perimeter and Slope Replacements
			Ditch Check	20 inch	5.00	+25% for Ditch Check Replacements
						1090 Total LF for Perimeter and Slope Devices
						25 Total LF for Ditch Check Devices
Total:					**1115**	

PCC PAVEMENT

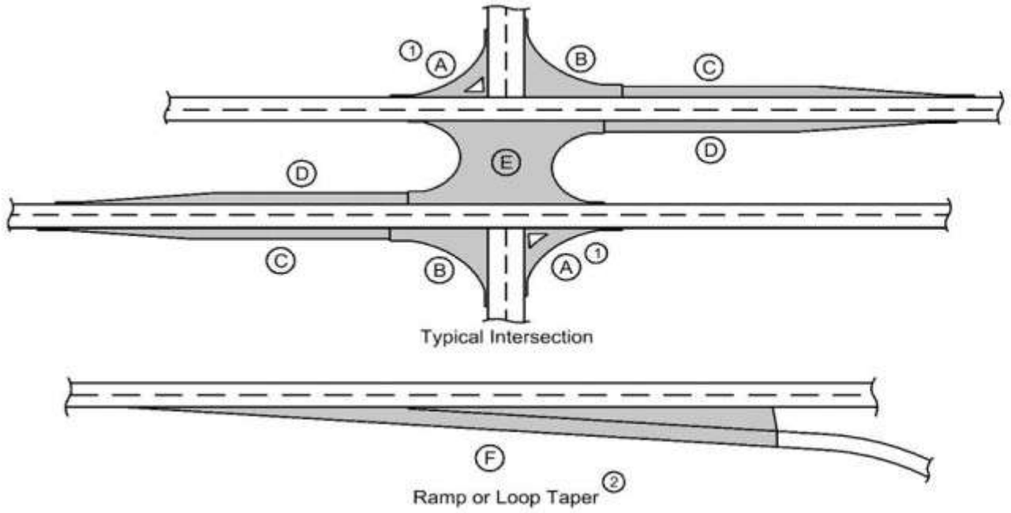




(1) Does not include raised island area or curb. Refer to tabulation 112-4 for quantities.
(2) Refer to PV-410, PV-411, PV-412, and PV-414.
(3) Quantity includes Pavement Header.

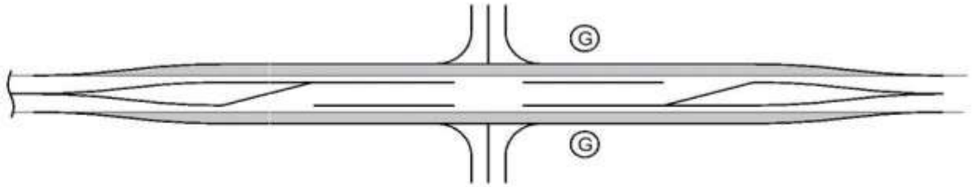
Road Identification	Direction of Travel	Station From	Station To	Width (FT)	Length (FT)	Area (SY)	Area A(1) (SY)(3)	Area B (SY)(3)	Area C (SY)(3)	Area D (SY)(3)	Area E (SY)(3)	Area F(2) (SY)(3)	Area G (SY)(3)	Area H (SY)(3)	Area by Thickness - Thickness(IN)	Area by Thickness - Area (SY)	Polymer Grid (SY)	Special Backfill (TON)	Modified Subbase (CY)	Granular Subbase (SY)	Remarks
I-29	SB	1085+40.00	1086+11.21	39.9	71.21	315.70									12.0	315.7			105.23		
I-29	SB	1089+72.96	1090+50.00	26.0	77.04	222.56									12.0	222.6			74.19		
Loop	SB	5589+71.29	5590+18.00	16.0	46.71	83.04									12.0	83.0			27.68		
I-29	SB	1089+72.96	1090+10.96		38.00	58.90									12.0	58.9			19.56		Between SB I-29 & Loop
US 30	Both	1087+65.00	1088+02.00		37.00	86.30									9.0	86.3		27.200			Final - 9" "Curb & Gutter
US 30	Both	1087+65.00	1088+02.00		37.00	398.07									6.0	398.1					Final - 6" Paved Median
																					Total 680.20 Sq. Yd. 12" Pavement
																					Total 86.3 Sq. Yd. 9" Pavement
																					Total 398.07 Sq. Yd. 6" Pavement
Total:						**1164.57**												**27.2**	**226.66**		

HMA PAVEMENT

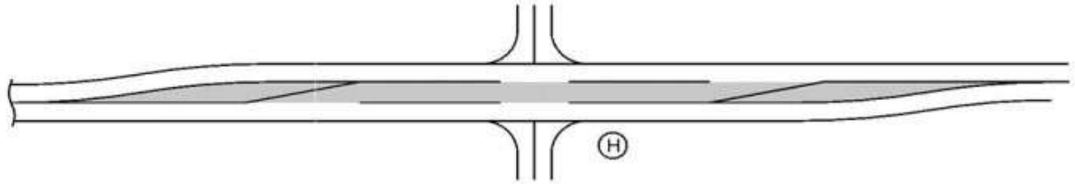


Typical Intersection

Ramp or Loop Taper (2)



Channelized Intersection
Widen Existing Roadway



Channelized Intersection
Reconstructed Roadway

(1) Does not include raised island area or curb. Refer to tabulation 112-4 for quantities.
(2) Refer to PV-410, PV-411, PV-412, and PV-414.
(3) Quantity includes Pavement Header.

Line No.	Road Identification	Direction of Travel	Station From	Station To	Width (FT)	Length (FT)	Area (SY)	Area A(1) (SY)(3)	Area B (SY)(3)	Area C (SY)(3)	Area D (SY)(3)	Area E(2) (SY)(3)	HMA Pavement Surface (TONS)	HMA Pavement Surface (SY)	HMA Pavement Intermediate (TONS)	HMA Pavement Intermediate (SY)	HMA Pavement Base (TONS)	HMA Pavement Base (SY)	Binder Surface (TONS)	Binder Intermediate (TONS)	Binder Base (TONS)	Polymer Grid (SY)	Special Backfill (TONS)	Modified Subbase (CY)	Granular Subbase (SY)	Pavement Scarification (SY)	Hot In-Place Recycling (SY)	Asphalt Rejuvenating Agent @ 0.175 GAL/SY/IN	Remarks
1.0	US 30	Both	1087+65.00	1088+02.00		37.00						398.10	43.293	398.10	151.527	398.10		398.10	2.598	9.092									US 30 Median Detour
Total:																													

LONGITUDINAL GROOVING

Location	Total (SY)	Remarks
1088+28.60	332.2	On South Bridge Approach
1088+28.60	1257.8	On Bridge
1088+28.60	395.8	On North Bridge Approach
1085+40.00	91.0	On Pavement
1085+40.00	91.0	On Pavement
1085+40.00	121.8	On Pavement
1089+72.96	98.4	On Pavement
1089+72.96	98.4	On Pavement
5589+71.29	80.4	On Pavement
1088+28.60		1985.8 Sq. Yd. Total on Bridge and Approaches
1088+28.60		581.0 Sq. Yd. Total on Pavement
Total	2566.8	

EXISTING PAVEMENT

County	Route	Direction of Travel	Begin Ref. Location Sign	End Ref. Location Sign	Year	Type	Project Number	Surface Type	Surface Depth (IN)	Base Type	Base Depth (IN)	Subbase Type	Subbase Depth (IN)	Removal Type	Removal Depth (IN)	Coarse Aggregate Source	Coarse Aggregate Type	Course Aggregate Durability Class	Reinforcement Type	Remarks
Harrison	I-29	SB	76.54	90.85	1995		IM-29-3(52)41--13-43	HMA	4.0											
Harrison	I-29	SB	76.54	90.85	1968		I-IG-29-5(17)78--04-43	PCC	8.0	GSB	4.0								Continuous	

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	SB	1089+03.34	Median	6:1	52.3	5.0	89.7	7.8	231.3	7.8	287.3	9.7	55.9		10.0	Stage 1
2.0	SB		Left	3:1											10.0	Stage 2

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.

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
SB	Median	1089+03.37	5.8	BA-201	1	BA-205	1	53.125	37.50	150.00	47.70			3			1		D	1		200.0	Stage 1
SB	Left	5589+02.22	3.9	BA-201	1	BA-205	1	53.125			47.70							1	D	1		12.5	
Total:					**2**		**2**													**2**		**212.5**	

108_13A
3/27/25

SAFETY CLOSURES

Refer to Section 2528 of the Standard Specifications

Station	Road Closure Qty.	Hazard Closure Qty.	Remarks
	1		Loop Entrance
5591+00.00		1	On Loop Prior to Work Area

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)	BLW4 Factored (STA)	BLW6 Factored (STA)	CHW8 Factored (STA)	CHW10 Factored (STA)	CHY8 Factored (STA)	CHY10 Factored (STA)	ELW4 Factored (STA)	ELW6 Factored (STA)	ELY4 Factored (STA)	ELY6 Factored (STA)	RLW6 Factored (STA)	RLY6 Factored (STA)	Remarks
1.0	I-29 SB	1081+00.00	1085+40.00	Both	Removal of Paint		X		No		0.75												Stage 1
2.0	I-29 SB	1090+50.00	1116+65.00	Both	Removal of Paint		X		No		4.45												Stage 1
3.0	I-29 SB	1088+40.00	1089+84.00	Left	Removal of Paint	X			No				1.92										Stage 1
4.0	Loop E	5588+40.00	5589+52.00		Removal of Paint	X			No				1.49										Stage 1
5.0	I-29 SB	1089+84.00	1095+05.00	Left	Removal of Paint	X			No								3.49						Stage 1
5.5	I-29 SB	1090+50.00	1109+15.00	Right	Removal of Paint			X	No										12.50				Stage 1
5.7	I-29 SB	1081+00.00	1081+70.00	Both	Waterborne/Solvent Paint	X			No							1.17							Stage 1
6.0	I-29 SB	1081+70.00	1085+20.00	Both	Wet Retroreflective Removable Tape	X	X		No						4.66								Stage 1
7.0	I-29 SB	1081+70.00	1085+20.00	Both	Wet Retroreflective Removable Tape	X			No				4.66										Stage 1
7.5	I-29 SB	1085+20.00	1091+55.00	Left	Waterborne/Solvent Paint	X			No					10.60									Stage 1
8.0	I-29 SB	1090+70.00	1091+55.00	Left	Waterborne/Solvent Paint				No							1.42							Stage 1
9.0	I-29 SB	1091+55.00	1095+05.00	Left	Wet Retroreflective Removable Tape	X			No				4.66										Stage 1
10.0	I-29 SB	1091+55.00	1095+05.00	Both	Wet Retroreflective Removable Tape	X	X		No						4.66								Stage 1
11.0	I-29 SB	1095+05.00	1100+05.00	Both	Waterborne/Solvent Paint		X		No						6.65								Stage 1
12.0	I-29	1100+05.00	1109+15.00	Right	Wet Retroreflective Removable Tape		X	X	No						12.10								Stage 1
12.5	I-29 SB	1081+00.00	1081+70.00	Both	Removal of Paint	X			No							1.17							Stage 2
13.0	I-29 SB	1081+97.00	1085+47.00	Both	Removal of Removable Tape	X	X		No						4.66								Stage 2
14.0	I-29 SB	1081+12.00	1081+97.00	Both	Removal of Paint	X			No						1.13								Stage 2
15.0	I-29 SB	1081+97.00	1085+47.00	Both	Removal of Removable Tape	X			No				4.66										Stage 2
16.0	I-29 SB	1085+47.00	1085+70.00	Left	Removal of Paint				No				0.31										Stage 2
17.0	I-29 SB	1090+50.00	1091+57.00	Left	Removal of Paint				No				1.42										Stage 2
18.0	I-29 SB	1091+57.00	1095+07.00	Left	Removal of Removable Tape	X			No				4.66										Stage 2
19.0	I-29 SB	1091+57.00	1095+07.00	Both	Removal of Removable Tape	X	X		No						4.66								Stage 2
20.0	I-29 SB	1095+07.00	1100+07.00	Both	Removal of Paint		X		No						6.65								Stage 2
21.0	I-29	1100+07.00	1109+17.00	Right	Removal of Removable Tape		X	X	No						12.10								Stage 2
22.0	I-29 SB	1081+70.00	1083+20.00	Center	Multi-Component Liquid Material		X		Yes	0.38		0.38											Stage 2 (Final too)
23.0	I-29 SB	1083+47.00	1085+70.00	Right	Removal of Paint			X	No										1.49				Stage 2
24.0	I-29 SB	1090+50.00	1093+57.00	Right	Removal of Paint			X	No										2.06				Stage 2
25.0	I-29 SB	1083+47.00	1085+47.00	Both	Wet Retroreflective Removable Tape		X	X	No				2.66										Stage 2
26.0	I-29 SB	1083+47.00	1085+47.00	Both	Wet Retroreflective Removable Tape			X	No						2.66								Stage 2
27.0	I-29 SB	1085+47.00	1091+57.00	Right	Waterborne/Solvent Paint			X	No						8.11								Stage 2
28.0	I-29 SB	1091+57.00	1093+57.00	Right	Wet Retroreflective Removable Tape			X	No						2.66								Stage 2
29.0	I-29 SB	1090+72.00	1091+57.00	Both	Waterborne/Solvent Paint			X	No				1.13										Stage 2
30.0	I-29 SB	1091+57.00	1093+57.00	Both	Wet Retroreflective Removable Tape		X	X	No				2.66										Stage 2
31.0	I-29 SB	1093+57.00	1098+57.00	Center	Waterborne/Solvent Paint		X		No				6.65										Stage 2
32.0	I-29 SB	1115+17.00	1116+67.00	Center	Multi-Component Liquid Material		X		Yes	0.38		0.38											Stage 2 (Final too)
32.5	I-29 SB	1093+57.00	1098+57.00	Both	Waterborne/Solvent Paint		X		No				6.65										Stage 2
33.0	I-29 SB	1093+57.00	1102+67.00	Left	Wet Retroreflective Removable Tape	X	X		No				12.10										Stage 2
34.0	I-29 SB	1083+47.00	1085+47.00	Both	Removal of Removable Tape		X	X	No				2.66										Final
35.0	I-29 SB	1083+47.00	1085+47.00	Both	Removal of Removable Tape			X	No						2.66								Final
36.0	I-29 SB	1085+47.00	1091+57.00	Right	Removal of Paint			X	No						8.11								Final
37.0	I-29 SB	1091+57.00	1093+57.00	Right	Removal of Removable Tape			X	No						2.66								Final
38.0	I-29 SB	1090+72.00	1091+57.00	Both	Removal of Paint			X	No				1.13										Final

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)	BLW4 Factored (STA)	BLW6 Factored (STA)	CHW8 Factored (STA)	CHW10 Factored (STA)	CHY8 Factored (STA)	CHY10 Factored (STA)	ELW4 Factored (STA)	ELW6 Factored (STA)	ELY4 Factored (STA)	ELY6 Factored (STA)	RLW6 Factored (STA)	RLY6 Factored (STA)	Remarks
39.0	I-29 SB	1091+57.00	1093+57.00	Both	Removal of Removable Tape		X	X	No				2.66										Final
40.0	I-29 SB	1093+57.00	1098+57.00	Center	Removal of Paint		X		No				6.65										Final
40.5	I-29 SB	1093+57.00	1098+57.00	Both	Removal of Paint		X		No				6.65										Final
41.0	I-29 SB	1093+57.00	1102+67.00	Left	Removal of Removable Tape	X	X		No				12.10										Final
42.0	I-29 SB	1085+20.00	1093+55.00	Right	Multi-Component Liquid Material			X	Yes	8.35										8.35			Final
43.0	I-29 SB	1081+00.00	1115+17.00	Both	Multi-Component Liquid Material		X		Yes	8.54		8.54											Final
44.0	I-29 SB	1088+40.00	1089+80.00	Left	Multi-Component Liquid Material	X			Yes	2.34				2.34									Final
45.0	I-29 SB	1089+80.00	1095+07.00	Left	Multi-Component Liquid Material	X			Yes	5.27								5.27					Final
46.0	Loop E	5588+40.00	5589+77.00	Right	Multi-Component Liquid Material			X	Yes	2.29				2.29									Final
47.0	Loop E	5589+77.00	5590+18.00	Right	Multi-Component Liquid Material			X	Yes	0.41												0.41	Final
48.0	Loop E	5585+70.00	5590+18.00	Left	Multi-Component Liquid Material	X			Yes	4.48											4.48		Final
Total:										**32.44**	**5.2**	**9.3**	**87.48**	**15.23**	**84.13**	**3.76**	**3.49**	**5.27**	**16.05**	**8.35**	**4.48**	**0.41**	

A separate worksheet sorted by line type was used for calculating quantities and will be provided with the e-Files.

PAVEMENT MARKING SYMBOLS AND LEGENDS

Refer to PM-111

Roadway Identification	Station	Side	Pavement Symbol	Quantity (EA)	Groove Marking Needed?	Remarks
I-29 SB	1119+82.00	Right	LLRW	1	No	Stage 1
I-29 SB	1120+82.00	Right	LLRW	1	No	Stage 1
I-29 SB	1129+82.00	Right	LLRW	1	No	Stage 1
I-29 SB	1130+82.00	Right	LLRW	1	No	Stage 1
I-29 SB	1118+32.00	Left	RLRW	1	No	Stage 2
I-29 SB	1119+32.00	Left	RLRW	1	No	Stage 2
I-29 SB	1128+32.00	Left	RLRW	1	No	Stage 2
I-29 SB	1129+32.00	Left	RLRW	1	No	Stage 2
Total:				**8**		

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.

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
SB	1091+21.09	Median	1.9	Temporary	1								TBR	Stage 1
SB	1091+21.09	Left	1.9	Temporary	1								TBR	Stage 2
Total:					**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.

No.	Station From	Station To	Length (FT)	Barrier Rail Type	Anchored*	Modular Glare Screen System	Remarks
1	1085+19.91	1091+21.09	601.2	Concrete BA-401	Yes	No	Stage 1
2	1085+19.91	1091+21.09	601.2	Concrete BA-401	No	No	Stage 2
Total:			**1202.4**				

REMOVAL OF PAVEMENT

Refer to Tabulation 102-5.

* Not a bid item.

Station From	Station To	Side	Pavement Type	Area (SY)	Saw Cut* (LF)	Remarks
1089+84.00	1094+93.77	Left	HMA	453.1	518.0	Before Stage 1
1083+47.47	1086+81.62	Right	HMA	222.8	229.0	Stage 1
1089+03.37	1093+56.86	Right	HMA	302.3	312.9	Stage 1
1085+40.00	1086+10.00	Right	PCC	152.3	90.7	Stage 1
1086+10.00	1086+81.00	Right	HMA/PCC	158.6	71.0	Stage 1
1089+03.24	1090+50.00	Right	PCC	318.0	166.7	Stage 1
1085+40.00	1086+10.00	Left	PCC	159.4	19.5	Stage 2
1086+10.00	1086+81.00	Right	HMA/PCC	172.1		Stage 2
1085+40.00	1086+80.50	Left	HMA	75.7	6.5	Stage 2
1089+02.80	1089+83.87	Left	PCC	282.0		Stage 2
5589+02.40	5589+82.05	Left	HMA	45.6	5.4	Stage 2
1089+83.87	1089+93.95	Left	HMA	15.3		Stage 2
1089+83.87	1090+50.00	Left	PCC	47.9	6.6	Stage 2
1089+93.95	1090+50.00	Left	HMA	63.7	10.0	Stage 2
5589+91.27	5590+17.86	Right	HMA	16.2	4.6	Stage 2
5589+82.05	5590+17.86	Right	HMA	63.7	16.0	Stage 2
1087+65.00	1088+02.00	Both	PCC Median	398.1	35.7	US 30 Median from 300' west of SB to crossover
1087+65.00	1088+02.00	Both	Detour + Curb & Gutt	484.4	300.7	US 30 Median from 300' west of SB to crossover
Total				3431.2	1793.3	

CURB REMOVAL

Station From	Station To	Side	Length (STA)	Remarks
1087+65.00	1088+02.00	Median	2.44	US 30 Median from 300' west of SB to crossover
Total:			**2.44**	

REMOVAL OF STEEL BEAM GUARDRAIL

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

No.	Direction of Traffic (1)	Station From	Station To	Side	Removal of Guardrail (2) (LF)
1	SB	1089+02.40	1090+98.20	Median	193.7
2	SB	1089+01.30	1089+59.80	Left	56.3
Total:					**250**

DELIVERY AND STOCKPILING

Item Description	Quantity	Quantity Units	Delivery Location	Contact Name	Contact Number	Remarks
Guardrail	250	Lin. Ft.	2308 US30 Missouri Valley	Rick Fink	402-680-7188	

CONCRETE MEDIANS

* Bid item

Station From	Station To	Type	Area* (SY)	Modified Subbase (CY)	Special Backfill (CY)	Remarks
1087+65.58	1088+01.25	Median PCC 6"	398.1			
Total:			**398.1**			

BRIDGE APPROACH SECTION

Refer to the BR Series.

* Not a bid item

Bridge Station	End	Skew Ahead Left (Degrees)	Skew Ahead Right (Degrees)	(T) Thickness (IN)	Pay Length (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)	Class 'A' * Crushed Stone Backfill (CY)	Modified * Subbase (TON)	Polymer * Grid (SY)	Special * Backfill (TON)	Remarks
1088+28.60	S		1.2	12.0	70.0	180.3	120.9	120.4	BR-203	Movable	BR-211	67.0	1086+21.41	Left			402.090	463.4		
1088+28.60	N		1.2	12.0	70.0	212.8	136.7	135.1	BR-203	Movable	BR-211	78.0	5589+61.43	Left			462.060	522.9		
																				906.2 Sq. Yd. Total
Total						393.1	257.6	255.5												

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)	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)	Special Backfill HMA Alt. (3) (TON)	Special Backfill HMA Alt. (TON/STA)	Special Backfill PCC Alt. (3) (TON)	Special Backfill PCC Alt. (TON/STA)	Polymer Grid (SY)	Subbase (3) (8) (CY)	Earth Shoulder Const. Alt (3) (STA)	Earth Shoulder Const. Alt HMA (6) (CY)	Earth Shoulder Const. Alt PCC (6) (CY)	Remarks
I-29	SB	1089+83.85	1095+06.68	Left	10		522.83	96.8	284.289	54.375	17.057	580.9		182.990	35.000	205.864	39.375			5.23			9" HMA Paved Shoulder (Before Stage 1)
I-29	SB	1083+47.47	1085+70.38	Median	6.0		222.91	24.8	71.108	31.900	4.266	148.6		46.811	21.000	54.613	24.500			2.23			9" HMA Paved Shoulder
I-29	SB	1085+40.00	1086+11.21	Median	6.0		71.21	9.1				47.5							15.82	0.71			12" PCC Shoulder, Modified Subbase
I-29	SB	1089+72.96	1090+50.00	Median	6.0		77.04	17.1				51.4							17.10	0.77			12" PCC Shoulder, Modified Subbase
I-29	SB	1090+50.00	1093+56.86	Median	6.0		306.86	34.1	100.113	32.625	6.007	204.6		64.441	21.000	81.410	26.530			3.07			9" HMA Paved Shoulder
I-29	SB	1089+54.75	1089+72.96	Median		0.61	18.21		0.607	3.335	0.036		1.2						0.51	0.18			9" HMA Paved Shoulder, Modified Subbase
I-29	SB	1089+72.96	1089+93.02	Median		2.93	20.06	1.1	3.200	15.950	0.192		6.6	2.064	10.290	2.401	11.970			0.20			9" HMA Paved Shoulder
I-29	SB	1089+93.02	1090+50.00	Median		3.6	56.98	7.6	11.154	19.575	0.669		22.8	17.949	31.500	19.145	33.600			0.57			9" HMA Paved Shoulder
I-29	SB	1090+50.00	1091+43.02	Median		3.6	93.02	6.2	18.209	19.575	1.093		37.2	11.721	12.600	13.674	14.700			0.93			9" HMA Paved Shoulder
I-29	SB	1091+43.02	1091+90.71	Median		4.6	47.69	4.1	11.928	25.012	0.716		24.4	7.678	16.100	8.947	18.760			0.48			9" HMA Paved Shoulder
I-29	SB	1091+90.71	1092+10.71	Median		5.6	20.00	2.1	6.090	30.450	0.365		12.4	3.920	19.600	4.564	22.820			0.20			9" HMA Paved Shoulder
I-29	SB	1085+40.00	1086+11.21	Left	6.0		71.21	9.1				47.5							15.82	0.71			12" PCC Shoulder, Modified Subbase
I-29	SB	1089+72.96	1089+79.52	Left	11.47		6.56	2.8				8.5							2.80	0.07			12" PCC Shoulder, Modified Subbase
I-29	SB	1089+79.52	1090+50.00	Left	8.0		70.48	20.9				62.6							20.90	0.70			12" PCC Shoulder, Modified Subbase
Loop	SB	5589+77.26	5590+18.00	Right	4		40.74	6.0				18.1							6.00	0.41			12" PCC Shoulder, Modified Subbase
Loop	SB	5589+71.29	5590+18.00	Left	5.6		46.71	9.7				28.8							9.70	0.47			12" PCC Shoulder, Modified Subbase
																							264.4 Sq. Yd. 12" Paved Shoulder
																							922.5 Sq. Yd. 9" Paved Shoulder
Total								251.5				1198.5	104.6	337.574					88.65	16.93			

MILLED RUMBLE STRIPS

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

Road Identification	Station From	Station To	Shoulder Pavement 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
I-29 SB	1083+47.47	1085+40.00	HMA	Right Shoulder	Milled	Asphalt Emulsion	12"		1.93	2.1	32.2		6.0		
I-29 SB	1085+40.00	1086+21.21	PCC	Right Shoulder	Milled		12"	0.81				6.0			
I-29 SB	1089+62.96	1090+50.00	PCC	Right Shoulder	Milled		12"	0.87				6.0			
I-29 SB	1090+50.00	1093+56.86	HMA	Right Shoulder	Milled	Asphalt Emulsion	12"		3.07	3.3	51.2		6.0		
I-29 SB	1089+79.52	1090+50.00	PCC	Left Shoulder	Milled			0.70							
I-29 SB	1090+50.00	1095+07.02	HMA	Left Shoulder	Milled	Asphalt Emulsion	12"		4.57	5.0	76.2				
Total:								**2.38**	**9.57**	**10.4**					

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

(M40G) MIDAMER-GAS
Contact Name : David Fitch
Contact Phone: 7123665669
Contact Email: dlfitch@midamerican.com

(CTLIA01) CENTURYLINK
Contact Name : SADIE HULL
Contact Phone: 9185470147
Contact Email: sadie.hull@lumen.com

(LBIA04) LONG LINES BROADBAND
Contact Name : MILES PATTON
Contact Phone: 7122715550
Contact Email: MILES.PATTON@LONGLINES.BIZ

(M40E) MIDAMER-ELEC
Contact Name : David Fitch
Contact Phone: 7123665669
Contact Email: dlfitch@midamerican.com

(MVC) MISSOURI VALLEY, CITY OF
Contact Name : Rita Miller
Contact Phone: 7126423502
Contact Email: rmiller@ci.missouri-valley.ia.us

(PMV) PEOPLESERVICE MISSOURI VALLEY
Contact Name : OFFICE
Contact Phone: 8888611921
Contact Email: movalleylocates@peopleservice.com

(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

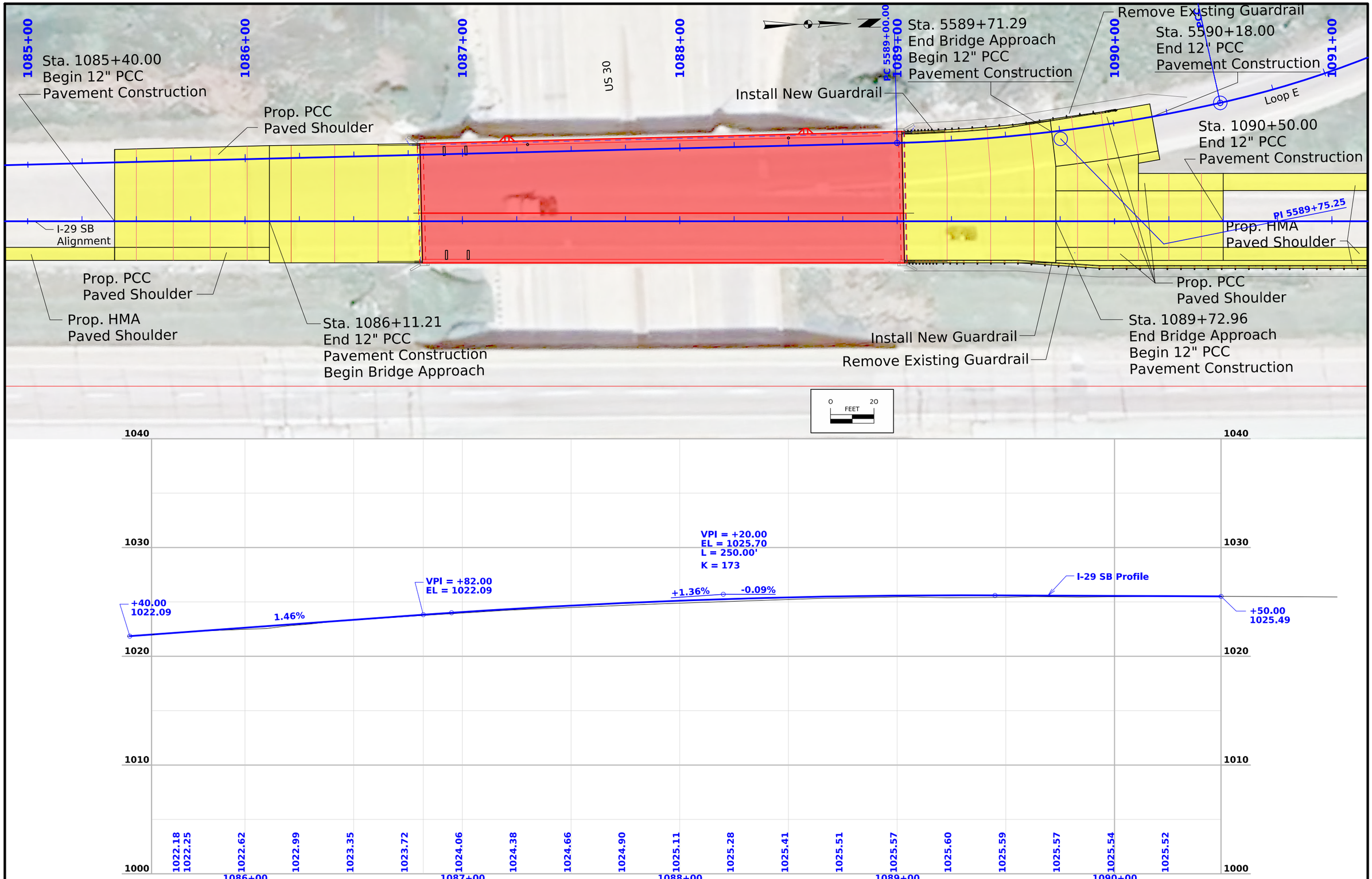
- Proposed Right-of-Way Symbol
- Proposed Right-of-Way Line
- Existing Right of Way
- Existing and Proposed Right-of-Way
- Easement and Existing Right-of-Way
- Easement (Temporary) Symbol
- Easement (Temporary) Line
- Easement
- C/A Access Control
- Property Line Symbol
- Property Line

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

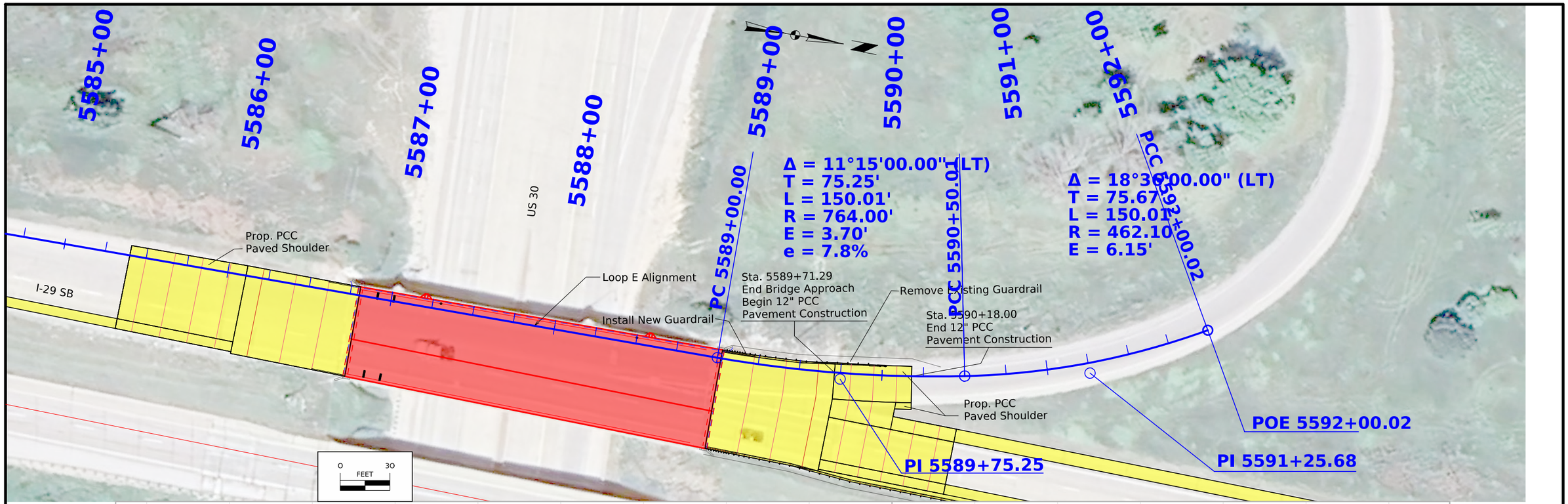
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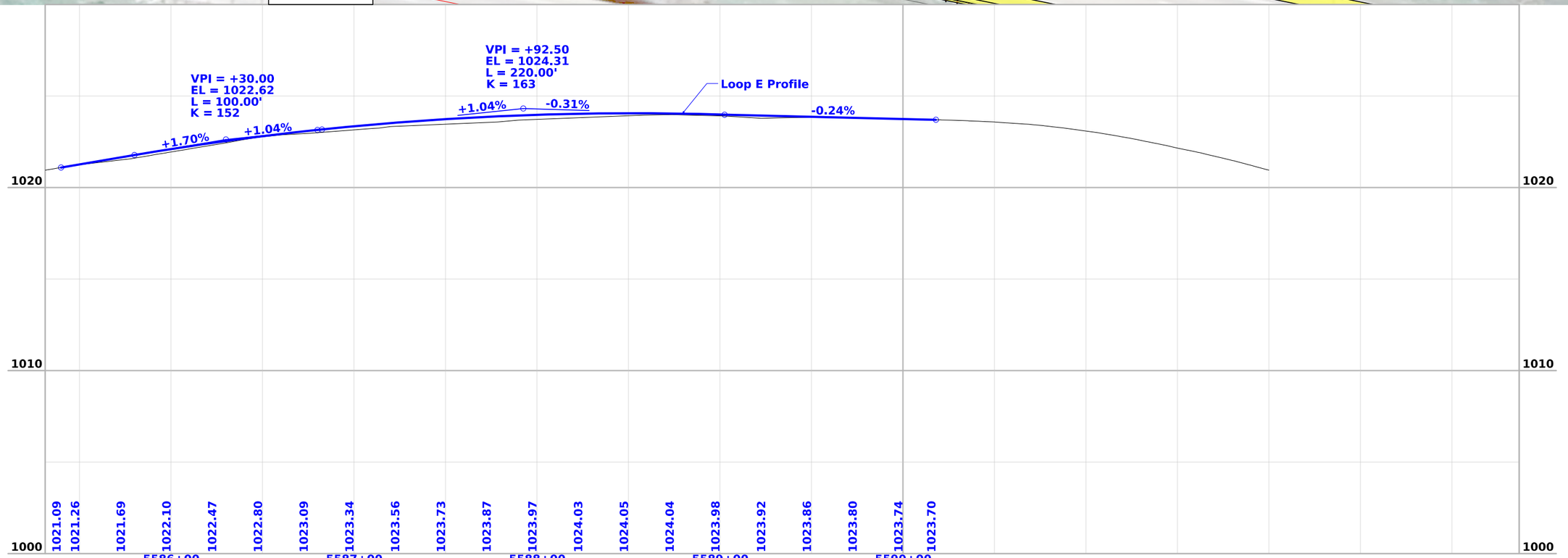
FILE NO. 32385	ENGLISH	DESIGN TEAM WHKS & Co.	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER D.1

2:10:54 PM 9/29/2025 kromsey pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302908022\Bridge\(138)_Reconstruction - Bridge Deck Replacement\WHKS\Roadway\CADD_Files\43029138_Z06_Legend.dgn



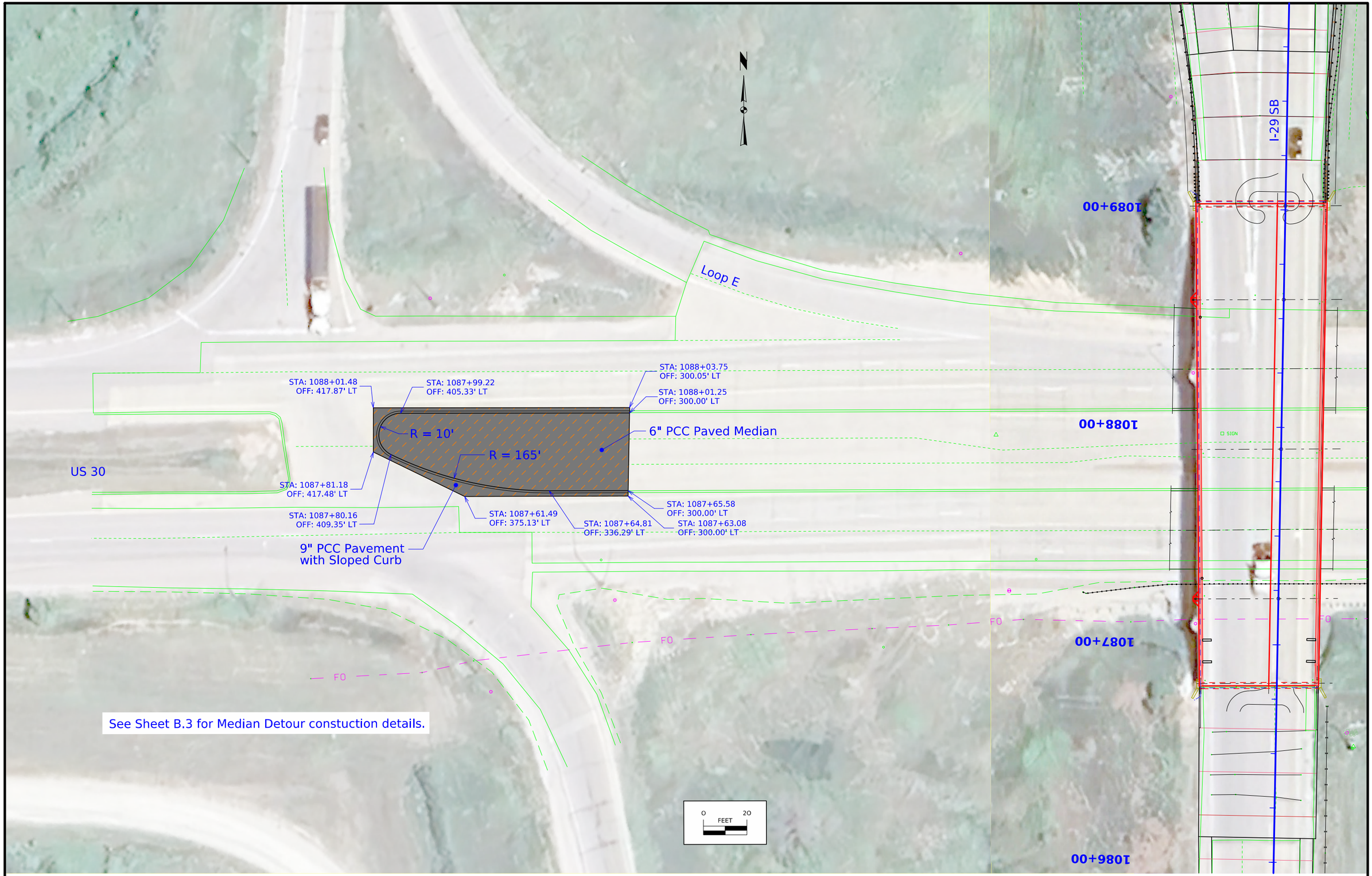
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FILE NO. 32385	ENGLISH	DESIGN TEAM WHKS & Co.	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER E.1

1:41:52 PM 8/6/2026 KirkRomsey pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302908022\Bridge\(138)_Reconstruction - Bridge Deck Replacement\WHKS\Roadway\CADD_Files\Sheet_Files\Named_Boundary_E1.dgn



FILE NO. 32385	ENGLISH	DESIGN TEAM WHKS & Co.	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER F.1	

1:52:16 PM 8/6/2026 KirkRomsey pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\4302908022\Bridge\(138)_Reconstruction - Bridge Deck Replacement\WHKS\Roadway\CADD_Files\Staging\43029138_Stage1.dgn

ALIGNMENT COORDINATES

Name	Location	Point on Tangent Station	Point on Tangent Y Northing	Point on Tangent X Easting	Begin Spiral Station	Begin Spiral Y Northing	Begin Spiral X Easting	Begin Curve Station	Begin Curve Y Northing	Begin Curve X Easting	Simple Curve PI or Master PI Station	Simple Curve PI or Master PI Y Northing	Simple Curve PI or Master PI X Easting	End Curve Station	End Curve Y Northing	End Curve X Easting	End Spiral Station	End Spiral Y Northing	End Spiral X Easting
I29SB-Alignment	I-29 SB	1080+00.00	7072925.624	16449554.336															
LoopBaseline	WB US 30 to SB	5579+39.70	7072865.851	16449541.252				5589+00.00	7073826.126	16449534.631	5589+75.25	7073901.371	16449534.112	5590+50.01	7073975.070	16449518.924			
	I-29 Loop							5590+50.01	7073975.070	16449518.924	5591+25.68	7074049.184	16449503.650	5592+00.02	7074114.555	16449465.534			

SPIRAL OR CIRCULAR CURVE DATA

Name	Location	SCS	S	Ls	Ts	Es	Xc	Yc	L.T.	S.T.	C	T	L	R	E	Remarks
I-29 Loop	1st Curve										149.770	75.247	150.011	764.000	3.697	
I-29 Loop	2nd Curve										149.354	75.672	150.012	462.1	6.155	

SUPERELEVATION DATA

See PV-300 Series

Line No.	Road Identification	Circular Curve or Spiral Curve Name	Radius (FT)	e (%)	L (FT)	x (FT)	Standard Road Plan	Section A-A	Section A'-A'	Section B-B	Section C'-C'	Section C-C	Section D-D	Case A	Case B	Case C	Case S	Case T	Case U	Remarks
1.0	I-29 SB Entrance Loop		764.0	7.8	**N/A**	**N/A**	PV-303	**N/A**		**N/A**		558901.12	558962.00		**X**		**N/A**	**N/A**	558962.00	C-C on Bridge, Case U Low Side Only

108_23A
8/15/22

TRAFFIC CONTROL PLAN

I-29 SB shall remain open to traffic at all times using Standard Road Plans listed on Tab. 105_4 and as shown on the J Sheets.

The entrance loop to I-29 SB shall be closed to traffic using Standard Road Plan TC-417.

108_26A
8/15/22

STAGING NOTES

Prior to Stage 1

Traffic: The west lane will be closed to traffic as per Standard Road Plans TC-418 and TC-420.
The inside lanes of US 30 will be closed as per Standard Road Plan TC-418.

Construction: Shoulder strengthening will be constructed on the west side to accommodate Stage 1 traffic.
Construct detour paving in the US 30 median for WB US 30 to SB I-29 traffic during stage construction.

Stage 1

Traffic: The east lane will be closed and traffic will be shifted to the west lane and shoulder and ramp pavement as per Standard Road Plans TC-420 and TC-421.
The entrance ramp loop will be closed as per Standard Road Plan TC-417.

Construction: The east portion of the bridge deck will be constructed.
The east portion of the bridge approaches will be constructed.
The east guardrail will be installed.
Shoulder strengthening will be constructed for Stage 2 traffic.

Stage 2

Traffic: The west lane will be closed and traffic will be shifted to the east lane and shoulder as per Standard Road Plans TC-421.
The entrance ramp loop will be closed as per Standard Road Plan TC-417.

Construction: The west portion of the bridge deck will be constructed.
The west portion of the bridge approaches will be constructed.
The west guardrail will be installed.

Stage 3

Traffic: The inside lanes of US 30 will be closed as per Standard Road Plan TC-418.

Construction: Construct curb and gutter and paved median in the US 30 median.

511 TRAVEL RESTRICTIONS

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
I-29	SB	Harrison	SB I-29 at US 30 Interchange	SB Bridge over US 30	Traffic Control Device	FHWA No. 28110	Horizontal	51.8	14.0	13.0	N/A	Stage 1
I-29	SB	Harrison	SB I-29 at US 30 Interchange	SB Bridge over US 30	Traffic Control Device	FHWA No. 28110	Horizontal	51.8	14.5	13.5	N/A	Stage 2

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-029-5(266)78--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
Orange	(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

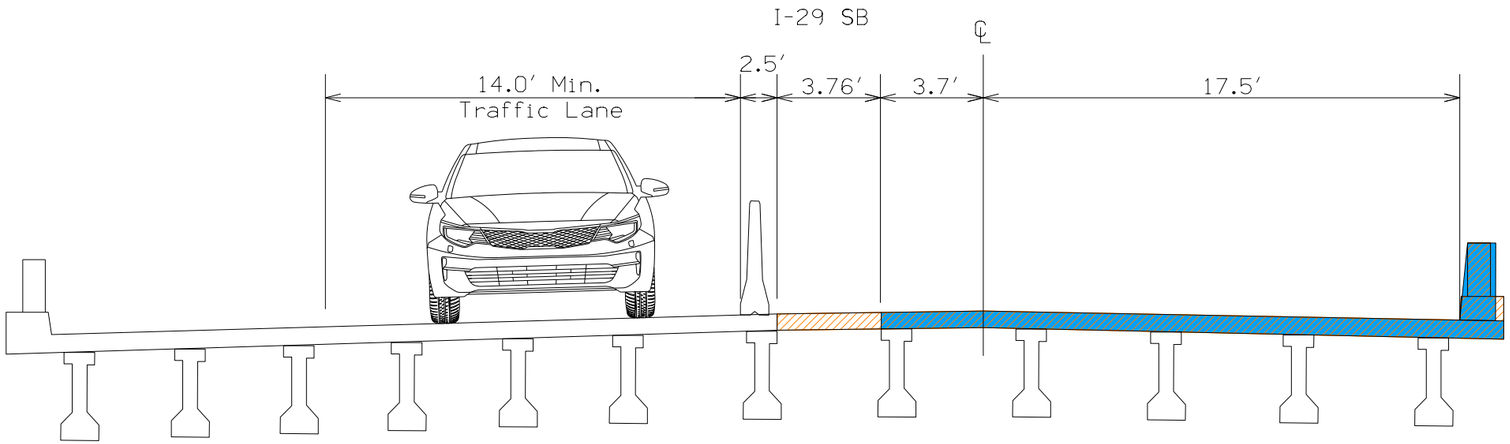
PLAN VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

●	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

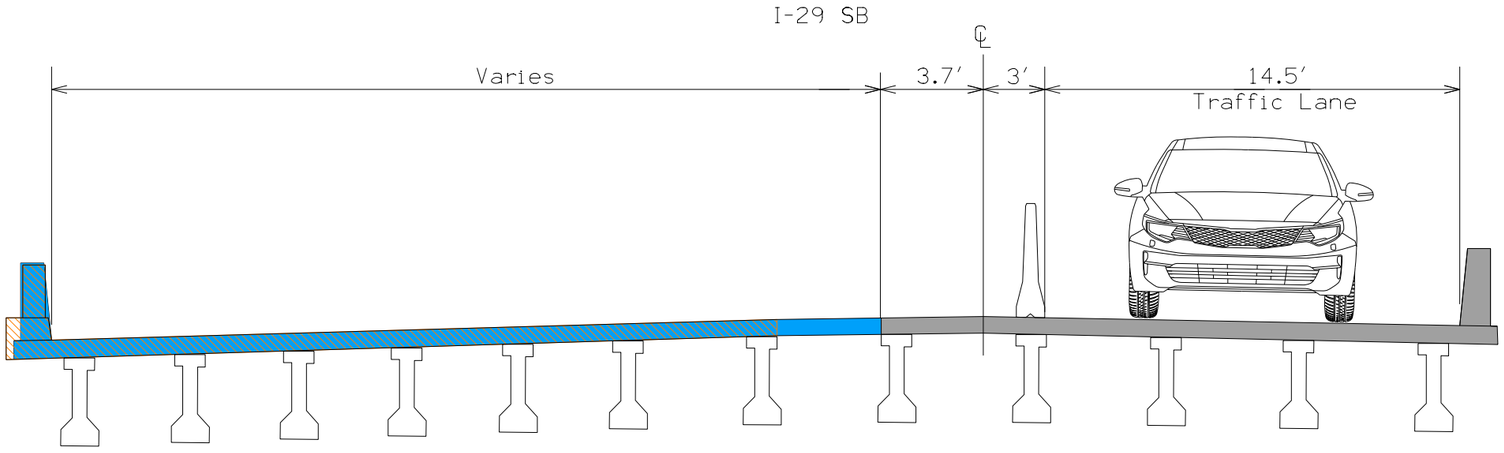
NOTE: Device spacing according to Standard Road Plans unless specifically dimensioned.

TRAFFIC CONTROL AND STAGING LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES J)



STAGE 1
(LOOKING AHEAD STATION)



STAGE 2
(LOOKING AHEAD STATION)

TYPICAL CONSTRUCTION SECTIONS

1081+00
1082+00
1083+00
1084+00
1085+00
1086+00
1087+00
US 30
1088+00
1089+00
1090+00

END
ROAD WORK

G20-2A
48" x 24"

I-29

0 30
FEET

1089+00
1090+00
1091+00
Loop E
1092+00
1093+00
1094+00
1095+00

Continue Traffic Control as per Standard Road Plan TC-421

I-29

POE 1095+00.00

0 30
FEET

Stage 1

FILE NO. 32385	ENGLISH	DESIGN TEAM WHKS & Co.	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER J.7	

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END
ROAD WORK

G20-2A
48" x 24"

1081+00
1082+00
1083+00
1084+00
1085+00
1086+00
1087+00
US 30
1088+00
1089+00

I-29

0 30
FEET

1089+00
1090+00
1091+00
Loop E
1092+00
1093+00
1094+00
1095+00

Continue Traffic Control as per Standard Road Plan TC-421

I-29

POE 1095+00.00

0 30
FEET

Stage 2

FILE NO. 32385	ENGLISH	DESIGN TEAM WHKS & Co.	Harrison COUNTY	PROJECT NUMBER IMX-029-4(138)76--02-43	SHEET NUMBER J.8	

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