CIOWADOT

REVISIONS

PROJECT IDENTIFICATION NUMBER

24-97-141-020

PROJECT NUMBER

BRF-141-1(047)--38-97

R.O.W. PROJECT NUMBER

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM WOODBURY COUNTY

BRIDGE REPLACEMENT

IA 141 BRIDGE Over Smokey Hollow Creek 0.2 mi East of IA 31

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



	Index of Sheets		
No.	No. Description		
A Sheets	Title Sheets		
*A.1	Title Sheet		
*A,2	Location Map Sheet		
A.3	Field Review Notes		
*A.4 - A.10	D0 Project Concept Statement		
B Sheets	Typical Cross Sections and Details		
B.1 - B.2	Typical Section and Details		
D Sheets	Mainline Plan and Profile Sheets		
*D.1 *D.2	Plan & Profile Legend & Symbol Information Sheet IA 141 Plan and Profile		
J Sheets	Traffic Control and Staging Sheets		
J.1	Traffic Control Information		
*J.2	Detour Route Map		
V Sheets	Bridge and Culvert Situation Plans		
*V.1	Bridge Situation Plan		
*V.2	Bridge Construction Staging & Notes		
W Sheets	Mainline Cross Sections		
W.1 - W.8	Mainline Cross Sections		
	* Color Plan Sheets		

INDEX OF SEALS			
SHEET NO.	NAME	TYPE	BID QUANTITY SHEETS
A.1	X	Primary Signature Block	X
Х	X	X	X

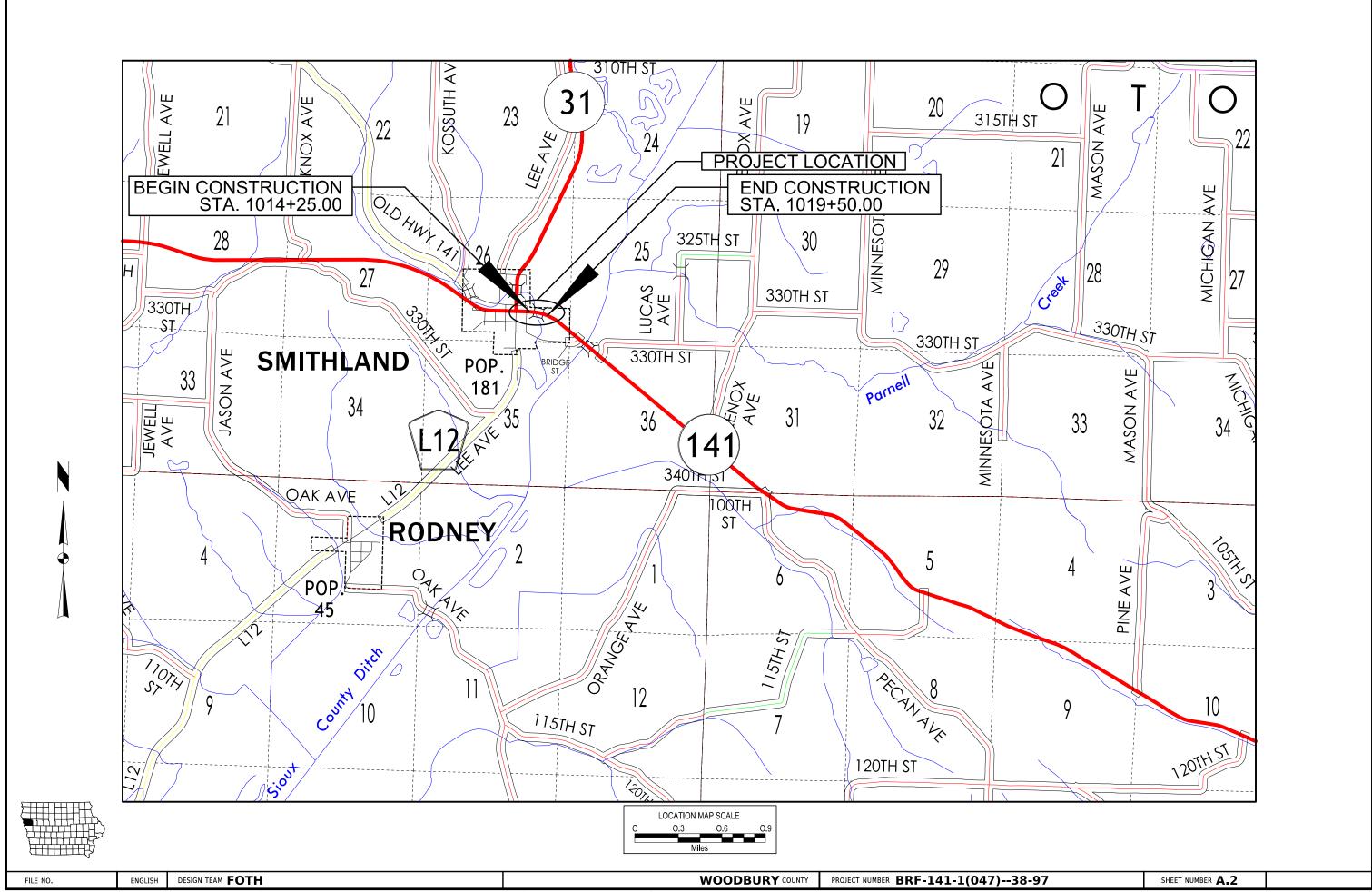


Subject to change by final design.

D2 PLAN - Date: AUGUST 20, 2025



FILE NO.	ENGLIS



FIELD REVIEW NOTES:	FIELD REVIEW NOTES:
FILE NO. ENGLISH DESIGN TEAM FOTH	WOODBURY COUNTY PROJECT NUMBER BRF-141-1(047)38-97 SHEET NUMBER A.3

IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District 3 **DATE:** May 19, 2025

ATTENTION: Jessica Felix **PROJECT:** Woodbury County

BRF-141-1(047)--38-97

FROM: J. Scott Ingersoll/Foth IE Project Code: 24-97-141-020

BUREAU: Design

SUBJECT: Project Concept Statement; (Final, D0)

This project involves the replacement of the IA 141 bridge (Maint No. 9716.7S141) over Smokey Hollow Creek located 0.2 mile east of IA 31.

A concept review was held on April 17, 2025. Those present included Todd Huju, Jason Klemme, Justin Pottorff, Dylan Pryor, Shane Tymkowicz and Bethany Waltersdorf from the District 3 Office; Austin Yates from the District 4 Office; Mohamad Dokmak, Jim Ellis, Christian Kennel and Tom Lovan from the Bridges and Structures Bureau; John Bartholomew and Jeremy Harris from the Design Bureau; Luka Arroyo from the Project Management Bureau and Scott Ingersoll, Dave Overman, Adam Schott, and Tim Sheets from Foth IE.

The two alternatives considered were:

- 1. Replacement with 100' x 45' continuous concrete slab bridge utilizing offsite detour (Estimated cost \$1,734,100)
- 2. Replacement with 100' x 69' continuous concrete slab bridge utilizing offsite detour (Estimated cost \$2,476,100)

Alternative 1 is the preferred alternative. Additional right of way/right of entry may be required. Traffic will be maintained by offsite detour.

The Draft Concept Statement was sent out for review and comment with concerns to be resolved by Friday, May 16, 2025. Comments received during the review period have been considered and resolved.

JSI:ADS Attach. cc:

J. S. Nelson K. D. Nicholson C. Brakke M. Nop J. Ellis S. Majors M. A. Swenson D. Stokes B. Hofer E. C. Wright W. A. Sorenson K. Brink C. C. Poole J. W. Laaser-Webb S. Anderson D. E. Sprengeler N. Cuva J. Bartholomew M. Dell R. Harris N. Pohlen B. Smith D. Ta M. Van Dyke D. Heeren G. Cagle D. Blue S. Cook B. Hucker B. Worrel R. Meyer A. Buss S. Tymkowicz J. Pottorff T. Huiu D. Prvor M. Thayer J. Klemme J. Becker C. Duncan M. Carlson S. Sturtz D. Newell C. Schwienebart A. Yates J. Hauber S. Sersland M. E. Khoda M. Gordy A. A. Welch J. Harris D. Johnson M. Todsen G. Karssen B. Dolan T. Lovan

PROJECT NUMBER BRF-141-1(047)--38-97

SHEET NUMBER A.4

FINAL PROJECT CONCEPT STATEMENT

IA 141 over Smokey Hollow Creek

Woodbury County BRF-141-1(047)--38-97 Project Code: 24-97-141-020 Maint. No. 9716.7S141 FHWA No. 53320

> **Highway Division** Design Bureau

Prepared by Foth Infrastructure and Environment for the Iowa Department of Transportation

May 19, 2025

I. STUDY AREA

A. Project Description

This project involves the replacement of the IA 141 bridge over Smokey Hollow Creek, located 0.2 miles east of IA 31.

The two alternatives considered were:

- 1. Replace current structure with a 100' x 45' continuous concrete slab bridge utilizing an off-site detour. The cost estimate for this alternative is \$1,734,100.
- 2. Replace current structure with a 100' x 69' continuous concrete slab bridge utilizing an off-site detour. The cost estimate for this alternative is \$2,476,100.

Alternative 1 is the preferred alternative since the relatively low traffic volume at this location does not require a bridge with four traffic lanes.

B. Need for Project

This is an 80' x 50' continuous concrete slab bridge that was built in 1959. The bridge was overlaid in 1970 and re-overlaid in 2013. Retrofit barrier rails were also added to the bridge curbs in 2013. The bridge has now reached the end of its service life. There are a few hollow areas on the top of the slab and numerous longitudinal leaching cracks on the bottom of the slab. Some hollow areas exist along the cracks on the underside and several hollow areas exist on each abutment and pier. Due to the condition of the bridge, a replacement is recommended.



Figure 1: With route n-f, 2024



Figure 3: Against route f-n, 2024



Figure 2: Left profile f-n, 2024



Figure 4: Waterway opening looking downstream,

C. Present Facility

The existing structure is a 80' x 50' continuous concrete slab bridge that was built in 1959. The rural section of IA 141 in the project area is 28' wide PCC pavement with 6' granular shoulders and 4:1 foreslopes. The roadway widens to a 4-lane, 44' wide PCC pavement urban section east of the bridge and continues west through the city of Smithland. See below for pavement history from the Mile Post Book:

M.P. 15.96 to M.P. 16.51

10" PCC Original Pavement: Year Constructed: 1958

Resurfaced (Type A Asphalt): 1993, resurfaced with 2" of surface course

Widened/Resurfaced: 2011, resurfaced with 1.5" of surface course

over 1.5" of base course

Coarse Aggregate Source: Dell Rapids, Quartz

FILE NO. **ENGLISH** WOODBURY COUNTY

PROJECT NUMBER BRF-141-1(047)--38-97

SHEET NUMBER A.5

Woodbury County BRF-141-1(047)--38-97 Project Code: 24-97-141-020

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Project:

STP-141-1(25)--2C-97

D. <u>Traffic Estimates</u>

The 2029 construction year and 2049 design year average daily traffic estimates are 1930 ADT with 21% trucks and 2350 ADT with 11% trucks, respectively.

E. Sufficiency Ratings

IA 141 is classified as a "Primary" route and is a maintenance service level "C" roadway. The Bridge Condition Index for the bridge is 59.3 and the Bridge Condition Rating is "Fair".

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2019 through December 31, 2023, there was 1 property damage only crash near the project vicinity. The Potential for Crash Reduction value for all crashes (KABCO) is -0.171 crash/mile/year and negligible for severe crashes (KAB).

H. Horizontal Curve Review

The existing bridge is located on a horizontal curve with a posted speed limit that changes from 35 to 45 mph at the west end of the bridge. Existing plans indicate the horizontal curve has a radius of 1,910 feet and superelevation rate of 3.5 percent. Using Table 1 from Section 2B-3 of the Iowa DOT Design Manual, shows that for a radius of 1,910 feet and superelevation rate of 3.5 percent, the design speed for this curve should be 40 mph.

Therefore, to limit the roadway reconstruction, it is recommended to move the existing speed limit signs east of the bridge near the start of the horizontal curve and allow for a design speed of 40 mph for the proposed bridge and match with the existing roadway cross-slope.

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WOODBURY COUNTY

II. PROJECT CONCEPT

A. <u>Feasible Alternatives</u>

Alternative #1 - Replace with new 100' x 45' continuous concrete slab bridge

The existing 80' x 50' continuous concrete slab bridge will be replaced with a 100' x 45' continuous concrete slab bridge utilizing an off-site detour.

The typical cross section adjacent to the bridge will consist of a 24' wide roadway with 6' paved and 4' granular outside shoulders. Foreslope grading beyond the shoulders will be comprised of 10:1 for 4' then 6:1 slopes to the clear zone and 3.5:1 to the ditch grade with 3:1 backslopes.

The bridge will be constructed on the existing horizontal alignment. New bridge approaches will be constructed. Additional reconstruction of roadway pavement is necessary beyond the bridge approaches in order to achieve minimum preferred grade and K-values for a 40-mph design speed on the vertical alignment. The superelevation of the roadway will be at 3.5% to match the existing superelevation rate. Pavement markings will be utilized on the west end of the bridge to taper the proposed 2-lane roadway to the existing 4-lane roadway section.

The existing guardrail will be replaced with new guardrail and the shoulders will be paved beyond the ends of the bridge approaches. Class 10 will be necessary to flatten the existing foreslopes and to construct the new guardrail blisters. Class E revetment will be placed under the bridge for slope protection.

Apply erosion control and rural seeding and fertilizing to all disturbed areas.

Right of way may be required for this project.

Bridge Items	Estimated Costs
New Bridge	\$ 705,000
Bridge Removal	92,000
Revetment	51,000
Mobilization - 10%	85,000
M & C -20%	<u>187,000</u>
Bridge Costs	\$ 1,120,000
Roadway Items	
Bridge Approaches	\$ 213,000
Removal of Pavement	40,500
PCC Pavement, 9.5"	60,500
Granular Shoulder	1,500

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Embankment-In-Place, Contractor Furnished	8,200
Removal of Steel Beam Guardrail	1,500
Steel Beam Guardrail	15,000
Paved Shoulders for Guardrail	19,000
Full-Depth Paved Shoulder	23,000
Bridge End Drains	7,500
Removal and Reinstallation of Chain Link Fence	5,000
Pavement Markings	4,000
Seeding and Fertilizing	1,200
Erosion Control	4,500
Right of Way	20,000
Wetland Mitigation	50,000
Traffic Control - 5%	23,720
Mobilization - 5%	23,720
M & C - 20%	94,880
Roadway costs	\$ 614,100
Project Total	\$ 1,734,100

Alternative #2 - Replace with new 100' x 69' continuous concrete slab bridge

The existing 80' x 50' continuous concrete slab bridge will be replaced with a 100' x 69' continuous concrete slab bridge utilizing an off-site detour.

The typical roadway cross section adjacent to the bridge will consist of a 48' wide roadway with 6' paved and 4' granular shoulders. Foreslope grading beyond the shoulders will be comprised of 10:1 for 4-ft. then 6:1 slopes to the clear zone and 3.5:1 to the ditch grade with 3:1 backslopes.

The bridge will be constructed on the existing horizontal alignment. New bridge approaches will be constructed. Additional reconstruction of roadway pavement is necessary beyond the bridge approaches in order to achieve minimum preferred grade and K-values for a 40-mph design speed on the vertical alignment. The superelevation of the roadway will be at 3.5% to match the existing superelevation rate.

The existing guardrail will be replaced with new guardrail and the shoulders will be paved beyond the ends of the bridge approaches. Class 10 will be necessary to flatten the existing foreslopes and to construct the new guardrail blisters. Class E revetment will be placed under the bridge for slope protection.

Apply erosion control and rural seeding and fertilizing to all disturbed areas.

It appears that right of way will be required for this project.

Woodbury County BRF-141-1(047)--38-97 Project Code: 24-97-141-020

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Bridge Items	Estimated Costs
New Bridge	\$ 1,056,000
Bridge Removal	92,000
Revetment	61,000
Mobilization - 10%	121,000
M & C -20%	<u>266,000</u>
Bridge Costs	\$ 1,596,000
Roadway Items	
Bridge Approaches	\$ 350,000
Removal of Pavement	40,500
PCC Pavement, 9.5"	115,000
Granular Shoulder	3,000
Embankment-In-Place, Contractor Furnished	12,500
Removal of Steel Beam Guardrail	1,500
Steel Beam Guardrail	14,000
Paved Shoulders for Guardrail	28,300
Bridge End Drains	7,500
Removal and Reinstallation of Chain Link Fence	5,000
Pavement Markings	4,000
Seeding and Fertilizing	1,200
Erosion Control	4,500
Right of Way	40,000
Wetland Mitigation	50,000
Traffic Control - 5%	33,850
Mobilization - 5%	33,850
M & C - 20%	135,400
Roadway costs	\$ 880,100
Project Total	\$ 2,476,100

B. Detour Analysis

WOODBURY COUNTY

IA 141 will be closed and an off-site detour will be utilized. It is anticipated the detour will be in place for 180 days. The detour would follow IA 31 north from the junction at IA 141, then east on County Road D54 to Danbury to the junction of IA 175, then finally southwest back to IA 141. Out-of-distance travel is 21.7 miles. The total distance user cost is anticipated to be \$2,007,000. The cost for the county road maintenance will be \$33,718 as calculated by the Gas Tax Method. The cost for the city road maintenance will be \$1,260 as calculated by the Gas Tax Method. Detour signing costs will be \$11,000.

Woodbury County BRF-141-1(047)--38-97 Project Code: 24-97-141-020

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C. Recommendations

It is recommended that the present structure be replaced as described in Alternative No. 1. The speed limit signs should be moved to east of the bridge, near the entrance to the Smithland City Park.

D. Construction Sequence

It is anticipated that all work on this project will be awarded to one prime contractor. The Bridges and Structures Bureau will coordinate the plan preparation with assistance from the Design Bureau.

E. ADA Accommodations

There are no bike paths or sidewalks adjacent to IA 141 and no future City plans for sidewalk or trail. Therefore, no ADA accommodations are planned in conjunction with this project.

F. Special Considerations

This will not be a traffic critical project.

The ABC Rating Score of 52 is more than the first stage filter threshold of 50, therefore additional consideration should be given to site conditions by the project delivery team to determine if there is support for an ABC approach.

The number of working days allowed for construction should be reduced to the practical limit for the scope of this project to minimize the duration of the offsite detour.

No bike path or sidewalk will be required as part of this project. The City of Smithland's improvement plans do not include a recreational trail along IA 141 at this location.

Right of Way may be required for this project.

The Location and Environment Bureau NEPA Section has reviewed this project and based on preliminary desktop observations, had determined two resources within 0.5 miles of the project:

• Fowler Forest Preserve

Woodbury County BRF-141-1(047)--38-97 Project Code: 24-97-141-020

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• Smithland City Park

PROJECT NUMBER BRF-141-1(047)--38-97

It is recommended to avoid or minimize impacts to these resources. The NEPA review process and clearance will be based on further developments in design and the results of additional Location and Environment Bureau desktop and field reviews.

Access to the two businesses in NW quadrant and drainage of the shoulder area in front of these businesses should be evaluated during preliminary design. Access rights to NE and SW quadrants should also be further evaluated.

G. Program Status

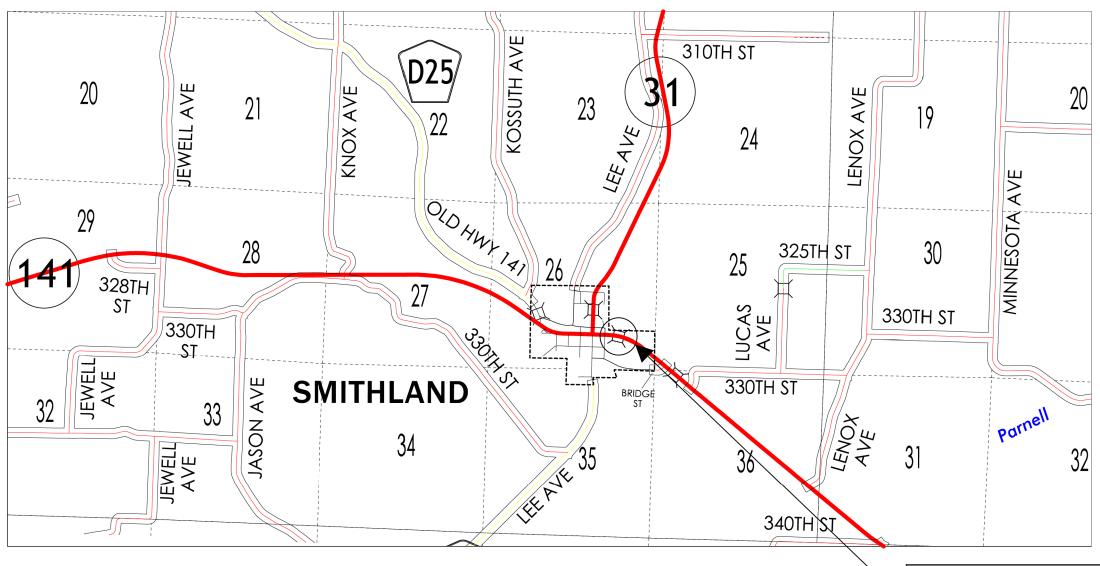
Site data has been developed by the Design Bureau. This project is listed in the 2025-2029 Iowa Transportation Improvement Program, with \$2,275,000 programmed for replacement in FY 2029. Costs for this project may be eligible for bridge replacement funds. A schedule of events will be developed following approval of the Project Concept.

SHEET NUMBER A.8

JSI:ADS

WOODBURY COUNTY





Project Location

IA 141 Over Smokey Hollow Creek 0.2 mi E of IA 31 BRF-141-1(047)--38-97

PIN: 24-97-141-020



FILE NO. ENGLISH DESIGN TEAM FOTH WOODBURY COUNTY PROJECT NUMBER BRF-141-1(047)--38-97 SHEET NUMBER A.9

Woodbury County IA 141 Over Smokey Hollow Creek 0.2 mi E of IA 31 BRF-141-1(047)--38-97

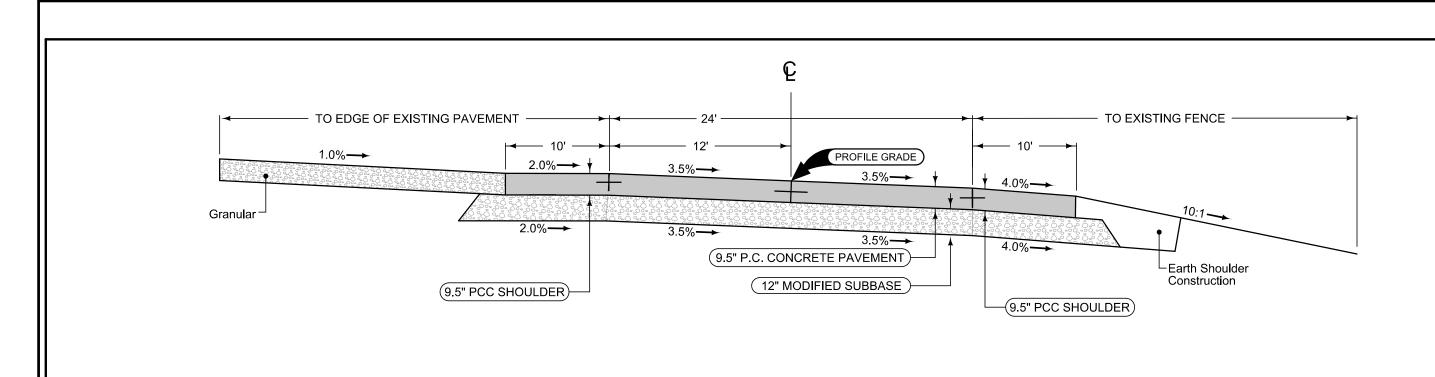
PIN: 24-97-141-020



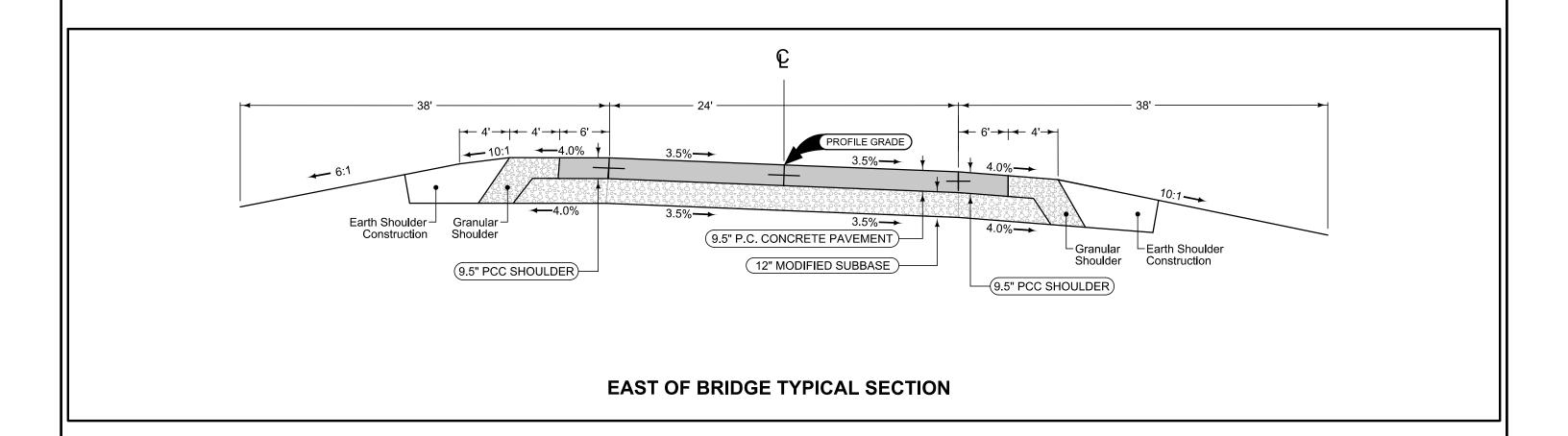
STA 1016+76.00 FHWA 53320 Maint. No.: 9716.7S141

FILE NO. ENGLISH DESIGN TEAM FOTH

WOODBURY COUNTY PROJECT NUMBER BRF-141-1(047)--38-97 SHEET NUMBER A.10



WEST OF BRIDGE TYPICAL SECTION



WOODBURY COUNTY

PROJECT NUMBER BRF-141-1(047)--38-97

SHEET NUMBER **B.1**

DESIGNER INFORMATION

7158 10-21-25

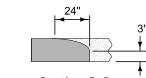
9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

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.

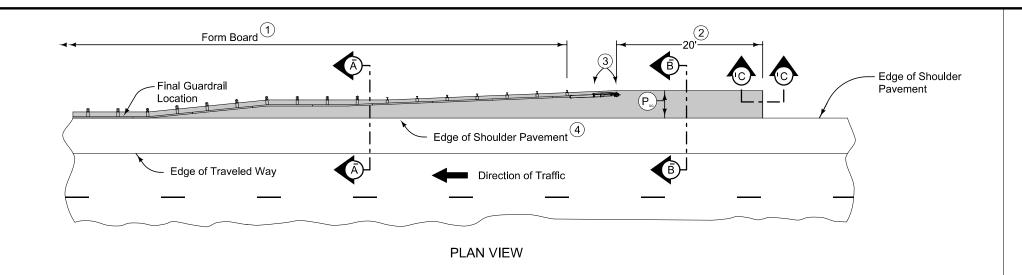
Refer to Tabulation 112-9 for shoulder quantities.

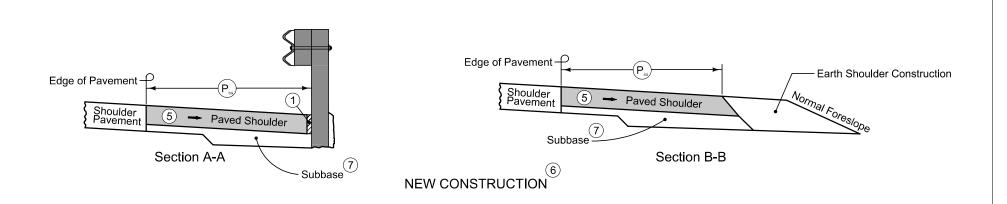
- (1) PCC option only: When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown.
- (2) Continue paved shoulder 20 feet beyond the center of the first post.
- (3) Shoulder may be notched for first 2 posts or post 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.

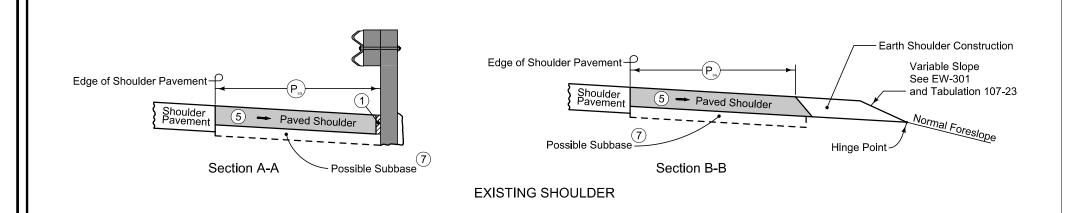


Section C-C
Roll down at granular shoulder or earth.

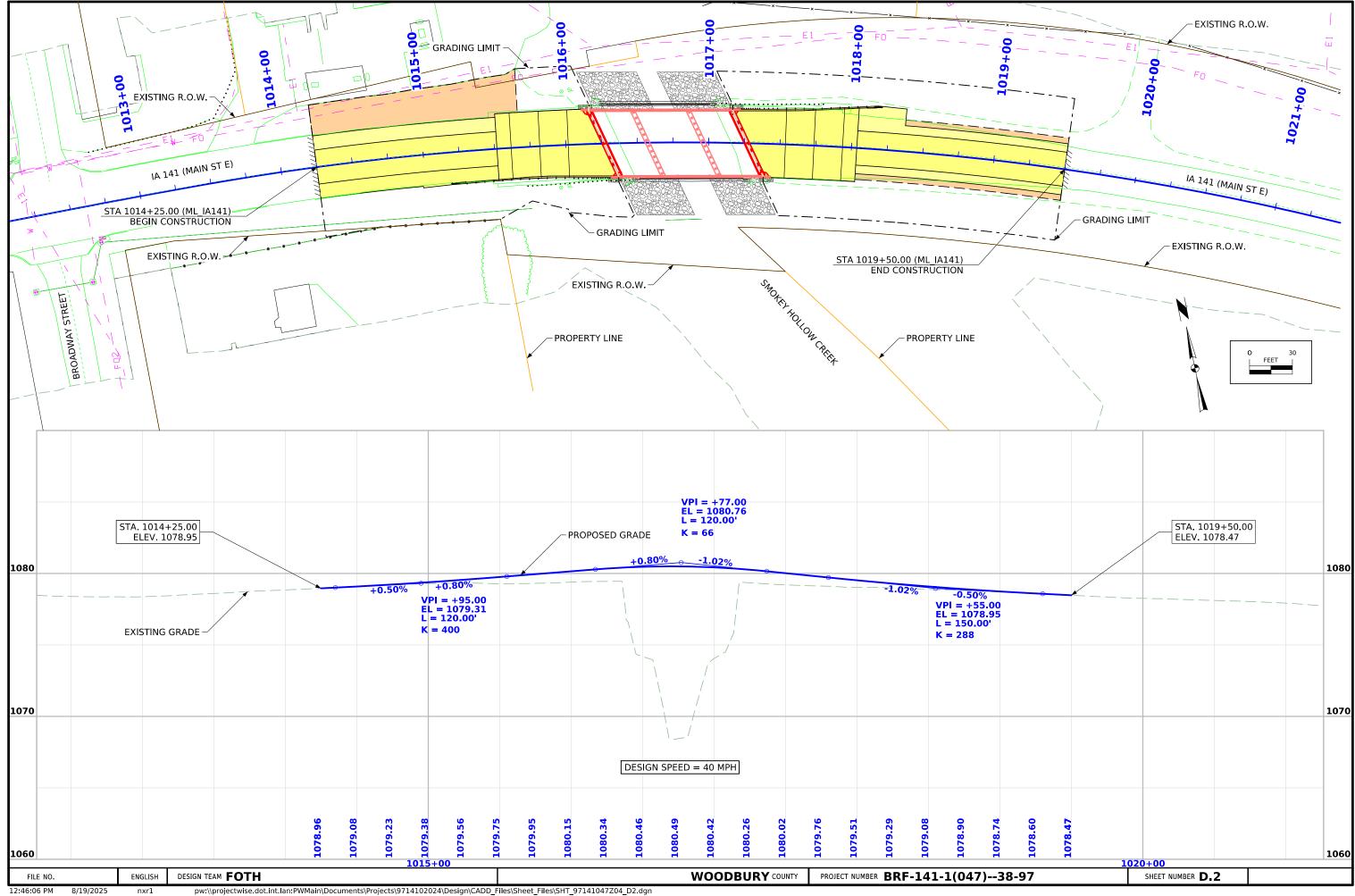
PAVED SHOULDER AT GUARDRAIL (ADJACENT TO FULL WIDTH PAVED SHOULDER)







UTILITY LEGEND PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS SURVEY SYMBOLS LINEWORK Design Color No. Septic Tank Interstate Highway Symbol (2) Existing Topographic Features and Labels Green U.S. Highway Symbol Cistern Blue Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation Magenta Existing Utilities (LP) Iowa Highway Symbol L.P. Gas Tank (No Footing) SHADING Design Color No. County Road Highway Symbol Underground Storage Tank Temporary Pavement Shading Lavender (9) Proposed Pavement Shading Yellow (4) Evergreen Tree Latrine (6) Proposed Granular Shading Orange Deciduous Tree Satellite TV Dish Proposed Shoulder Granular Shading Orange (70)Yellow Proposed Shoulder Paved Full Depth Shading Fruit Tree Water Hook Up Yellow (132)Proposed Shoulder Paved Partial Depth Shading Shrub (Bushes) □ RT Radio Tower Gray, Dark (112) Proposed Grade and Pave Shading "In conjunction with a paving project" Brown, Light (236)**Grading Shading** Timber Tower Anchor Orange, Light (134) Proposed Granular Entrance Shading Hedge Guardrail (Beam or Cable) Yellow (220) Proposed Paved Entrance Shading Proposed Sidewalk Shading Tan 2 Stump Guard Post (one or two) Blue, Light (230) Proposed Sidewalk Landing Shading Guard Post (over two) Pink Proposed Sidewalk Ramp Shading (11) Green, Light (225) Existing Pavement Shading Ш≣ Rock Outcrop Filler Pipe Red Proposed Structure Shading 0000 **Broken Concrete** Delineates Restricted Areas Gas Valve Red Revetment (Rip Rap) Water Valve PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS † Cemetery Speed Limit Sign Design Color No. ¦G] Grave MM Mile Marker Post Green (10) Existing Ground Line Profile Blue (1) Proposed Profile and Annotation (CV) Cave ☐ SIGN Sign Existing Utilities Magenta (5) (SH) Sink Hole □ TCB Traffic Signal Control Box Blue, Light (230) Proposed Ditch Grades, Left Black Proposed Ditch Grades, Median Board Fence □ RRB Rail Road Signal Control Box Rust (14) Proposed Ditch Grades, Right ----- # Chain Link or Security Fence □ TSB Telephone Switch Box **RIGHT-OF-WAY LEGEND** Reference Point Wire Fence □ EB Electric Box Survey Line Station Proposed Right-of-Way Terrace ---- Section Corner Existing Right of Way Earth Dam or Dike (Existing) Δ — - - — - - — Ground Line Intercept Existing and Proposed Right-of-Way Tile Outlet Saw Cut Easement and Existing Right-of-Way Edge of Water Guardrail Easement (Temporary) **Existing Drainage** Trench Drain Easement Right of Way Rail or Lot Corner C ∕ A Access Control HighTension Cable Concrete Monument → Property Line X Well Sheet Pile Windmill Clearing & Grubbing Area Pavement Removal Beehive Intake Existing Intake Existing Utility Access (Manhole) Fire Hydrant PLAN AND PROFILE LEGEND AND SYMBOL **INFORMATION SHEET** (COVERS SHEET SERIES D)



108_25 3/28/24 **511 TRAVEL RESTRICTIONS** Maint. Bridge No. Construction Projected As Existing Measurement Type of Construction Direction County Location Description Feature Crossed Object Type or Structure ID Measurement as Built Remarks Restriction Measurement or FHWA No. Signed Measurement NO TRAVEL RESTRICTION EXPECTED None

108_23A 8/15/22

TRAFFIC CONTROL PLAN

Construction activity in this area will disrupt traffic on IA 141 between IA 31 and IA 175. IA 141 will remain closed for the duration of the project, with traffic maintained via a designated detour route. Road Closures shall be in accordance with Standard Road Plan TC-252. Information regarding the detour route is provided on Sheet J.3.

Traffic control on this project shall be in accordance with the Standard Road Plans. For additional complementary information, refer to Part 6 of the Manual on Uniform Traffic Control Devices and the current Standard Specifications.

Contractor shall install and maintain all road closures and detour signs. Coordinate closures with Engineer.

There are no existing pedestrian facilities within this project area.

108_13A 3/27/25

SAFETY CLOSURES

		· 	
Station	Road Closure Qty.	Hazard Closure Qty.	Remarks
1012+75.00	1		
1014+25.00		1	
1019+50.00		1	
1026+20.00	1		

108_26A 8/15/22

STAGING NOTES

Contractor shall be responsible to establish and maintain detour route.

Contractor shall maintain access to properties at all times.

Stage 1

Close IA 141 to traffic. Coordinate road closures with Engineer.

Remove existing bridge and roadway pavement.

Stage 2

Complete construction of continuous concrete slab bridge and roadway reconstruction.

Coordinate the opening of IA 141 with Engineer.

FILE NO. ENGLISH DESIGN TEAM WOODBURY COUNTY PROJECT NUMBER BRF-141-1(047)--38-97 SHEET NUMBER J.1 FOTH

Route

