IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE:	District 5	**DATE:**	March 11, 2013
ATTENTION:	James V. Armstrong	**PROJECT:**	Warren County BRF-065-3(66)--38-91
FROM:	Kevin K. Patel		PIN: 11-91-065-020
OFFICE:	Design		
SUBJECT:	Project Concept Statement; (Final Approval, D0)		

This project involves the replacement of the U.S. 65 bridge (Maint. No 9156.7S065) over the South River, 2.0 miles south of IA 92.

A concept review was held on November 15, 2012. Those present included Mark Van Dyke, Jeff Owen, and Todd Netley from the District 5 Office; Dave Mulholland from the Office of Bridges and Structures; Colin Greenan from the Office of Location and Environment; and Kevin Patel and Gary Kretlow from the Office of Design.

The three alternatives considered were:
1. Replace the bridge with an off-site detour. $3,219,600
2. Replace the bridge utilizing Accelerated Bridge Construction (ABC). $4,409,900
3. Replace the bridge by stage construction. $4,337,000

Alternative 2 is the preferred alternative as it minimizes the disruption to U.S. 65 to 30 days. This project received a first stage ABC rating score of 52 which indicates the project should be further evaluated as an ABC candidate. The second stage analytic hierarchy process received a score of 0.68 for accelerated bridge construction versus 0.32 for conventional methods of construction, further indicating this project would be a strong candidate for ABC. The District 5 Office has recommended this be an ABC project. Additional right of way/right of entry will be required. Traffic will be maintained by off-site detour.

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved by Friday, March 8, 2013. Comments received during the review period have been considered and resolved.

This project is recommended for construction in FY 2016. The Office of Design will coordinate plan preparation with assistance from the Office of Bridges and Structures.

KKP:glk:mk
Attach.

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D. L. Maifield
B. R. Smith
G. A. Novey
B. C. Worrel
T. D. Crouch
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S. C. Marler
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FINAL PROJECT CONCEPT STATEMENT

U.S. 65 Bridge over the South River 2 miles South of IA 92

Warren County
BRF-065-3(66)--38-91
PIN: 11-91-065-020
Maint. No. 9156.7S065
FHWA No. 50890

Highway Division
Office of Design

Kevin K. Patel, P.E.
515-239-1540

March 11, 2013

I. STUDY AREA

A. Project Description

This project involves the replacement of the U.S. 65 bridge (Maint. No 9156.7S065) over the South River, 2.0 miles south of IA 92.

The three alternatives considered were:
1. Replace the bridge with an off-site detour.
2. Replace the bridge utilizing Accelerated Bridge Construction (ABC)
3. Replace the bridge by stage construction.

Alternative 2 is the preferred alternative as it minimizes the disruption to U.S. 65 to 30 days. This project received a first stage ABC rating score of 52 which indicates the project should be further evaluated as an ABC candidate. The second stage analytic hierarchy process received a score of 0.68 for accelerated bridge construction versus 0.32 for conventional methods of construction, further indicating this project would be a strong candidate for ABC. The District Office has recommended this be an ABC project.

B. Need for Project

This is a 213’ long by 30’ wide steel girder bridge which was built in 1948 and overlaid in 1985 and is near the end of its useful life. The bottom of the deck has several hollow areas and leaching transverse cracks. The bridge was designed for live loads below current standards. This type of superstructure is vulnerable to fatigue cracking in the vicinity of the welded cover plates; therefore this bridge should be replaced.

Looking North

Looking South

C. Present Facility

The existing structure is a 210’ x 30’ continuous I-beam bridge constructed in 1948.

U.S. 65 in the project area is 26’ wide PCC pavement with 6’ wide granular shoulders and 2:1 foreslopes, constructed in 1948. HMA resurfacing was accomplished in 1985 and 2012.

D. Traffic Estimates

The 2012 and 2032 average daily traffic estimates are 5,900 ADT with 7% trucks and 7,400 ADT with 8% trucks, respectively.

E. Sufficiency Ratings

U.S. 65 is classified as an area development route and is a maintenance service level “C”. The federal bridge sufficiency rating is 53.

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2007 through December 31, 2011, there were 11 crashes including, 0 fatal crashes, 1 personal injury crash, and 10 personal property crashes. One accident occurred on the bridge and 6 of the accidents involved turning movements at the intersection with McGregor Street.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 – Bridge Replacement -Off Site Detour

Replace the existing 210’ x 30’ continuous I-beam bridge with a three span 243’ x 60’ pretensioned prestressed concrete beam bridge. In addition to replacing the bridge, approximately 1700 ft. of U.S. 65 will be replaced in order to develop a left turn lane that will serve McGregor Street. A minor right turn lane for McGregor Street is also warranted.

The typical cross section adjacent to the bridge will consist of a 16 ft. wide left turn lane, two adjacent 14’ wide lanes, and 8 ft. wide shoulders (2 ft. paved and 6 ft. granular) with 6:1/3.5:1 foreslopes.

The alignment for the proposed northbound lane will remain in their current location with the widening for the left turn lane and the relocated southbound lane taking place on the west side of U.S. 65.

A grade raise will not be required as approximately 3.33 ft. of freeboard is provided under the proposed bridge. A minimum of 3 ft. is desired for the 50 year storm event. The bottom of the new beams will be approximately 1.5 ft. below the bottom of the existing bridge beams. Typically the bottom of the proposed beams are set at an elevation equal to or higher than the existing beams; as an additional 0.33 ft. of freeboard is provided, this is considered acceptable.

New guardrail will be installed. The guardrail on the southeast quadrant of the bridge will conflict with McGregor Street, thus requiring the McGregor Street intersection to be relocated approximately 170 ft. to the south. The relocation of McGregor Street will impact a pond which may require mitigation. The typical cross section for McGregor Street will be a 30’ top with 3:1 foreslopes. The section of pond under the new footprint of McGregor Street will be drained, have 2’ of silt removed, and place a 1’ granular blanket before placing class 10 roadway embankment.

Construct new bridge approaches. Class 10 will be necessary to construct the wider template, flatten the existing foreslopes and construct new guardrail blisters. Place class E revetment for slope protection under the bridge. Construct 2 bridge end drains on each end of the bridge.

A wing dike is proposed at the northwest quadrant of the bridge to aid in the conveyance of high flows.

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

Right of way will be required for this project.

U.S. 65 will be closed to traffic and will be routed to an off-site detour. The intersection of U.S. 65 and McGregor Street will also be closed to traffic requiring traffic to exit the residential development via the east entrance off of 140th Avenue.

Bridge Items	Estimated Costs
New Bridge	$ 1,243,800
Bridge Removal	51,900
Revetment	120,000
Wing Dike	9,000
Mobilization - 10%	142,500
M & C - 15%	235,000
Bridge Costs	**$ 1,802,200**
Roadway Items	
Bridge Approaches	$105,300
Removal of Pavement	38,300
PCC Pavement	451,200
Modified Subbase	100,500
Granular Shoulder	12,700
Class 10 Roadway and Borrow	27,800
Excavation Class 13 Waste	8,400
Guardrail (Includes Removal)	22,700
Paved Shoulders for Guardrail	17,800
Class 10 for Guardrail Blisters	14,200
Bridge End Drains	11,600
Clearing and Grubbing	2,600
Seeding and Fertilizing	11,500
Erosion Control	5,000
Right of Way	80,000
Wetland Mitigation	50,000
Granular Surface for Roadway (McGregor St.)	35,200
Topsoil-Strip, Salvage, & Spread	6,800
Compaction w/Moisture Control	1,800
Granular Material for Core-Out	13,300
Longitudinal Subdrain & Outlets	17,500
Roadway Pipe for McGregor St.	2,600
Traffic Control - 5%	47,600
Mobilization - 5%	47,600
M & C - 30%	285,400
Roadway costs	**$ 1,417,400**
Project Total	**$3,219,600**

Alternative #2 - Replace with a bridge-Utilize ABC method of construction

This option is similar to alternative 1; however, in lieu of using standard construction practices, accelerated bridge construction (ABC) techniques will be utilized. Accelerated Bridge Construction will require the roadway be closed a maximum 30 calendar days. This will also require the closure of the intersection of U.S. 65 and McGregor Street. Traffic will be detoured as shown in the detour analysis.

Bridge Items	Estimated Costs
New Bridge	$ 1,865,700
Bridge Removal	51,900
Revetment	120,000
Wing Dike	9,000
Mobilization - 10%	204,700
M & C - 15%	337,700
Bridge Costs	**$ 2,589,000**

Roadway Items	
Bridge Approaches	$105,300
Removal of Pavement	38,300
PCC Pavement	451,200
Modified Subbase	113,800
Granular Shoulder	56,700
Class 10 Roadway and Borrow	52,200
Excavation Class 13 Waste	8,400
Guardrail (Includes Removal)	22,700
Paved Shoulders for Guardrail	17,800
Class 10 for Guardrail Blisters	14,200
Bridge End Drains	11,600
Clearing and Grubbing	2,600
Seeding and Fertilizing	11,500
Erosion Control	5,000
Right of Way	80,000
Wetland Mitigation	50,000
Granular Surface for Roadway (McGregor St.)	35,200
Topsoil-Strip, Salvage, & Spread	6,800
Compaction w/Moisture Control	1,800
Granular Material for Core-Out	13,300
Longitudinal Subdrain & Outlets	17,500
Roadway Pipe for McGregor St.	2,600
Traffic Control - 5%	46,400
Mobilization - 5%	46,400
Accelerated Roadway Construction – 25%	279,600
M & C - 30%	330,000
Roadway costs	**$ 1,820,900**

Project Total	**$4,409,900**

Alternative #3 - Replace Bridge-Stage Construction

This alternative will replace the existing bridge utilizing staged construction and maintaining one lane of traffic in each direction. The existing 210' x 30' continuous I-beam bridge will be replaced with a three span 243' x 70' pretensioned prestressed concrete beam bridge. The bridge width will be increased 10' from 60' as shown in alternatives 1 and 2 to 70', in order to maintain two 10.5' wide lanes for traffic in both stage 1 and stage 2.

The typical cross section adjacent to the bridge will consist of a 16 foot wide left turn lane, two adjacent 14 foot wide lanes, 13 foot wide shoulders, with 6:1/3:1 foreslopes. The additional 10' required to stage construct the bridge will be distributed evenly, resulting in 13' wide outside shoulders. The southbound outside shoulder will be paved 13' wide in order to accommodate traffic during stage 1. The 13' wide northbound shoulder will be comprised of 2' of pavement and 11' of granular surfacing.

No off site detour will be required.

This alternative will be similar to alternative 1 with the exception of the items discussed above.

Bridge Items	Estimated Costs
New Bridge	$ 1,440,600
Bridge Stage Construction- 10%	153,000
Bridge Removal	51,900
Revetment	120,000
Wing Dike	9,000
Steel Sheet Pile	60,000
Cofferdams for new piers	100,000
Mobilization - 10%	193,500
M & C - 15%	319,200
Bridge Costs	**$ 2,447,200**

Bridge Approaches	$105,300
Removal of Pavement	38,300
PCC Pavement	451,200
Modified Subbase	100,500
Granular Shoulder	12,700
Class 10 Roadway and Borrow	27,800
Excavation Class 13 Waste	8,400
Guardrail (Includes Removal)	22,700
Paved Shoulders for Guardrail	17,800
Class 10 for Guardrail Blisters	14,200
Bridge End Drains	11,600
Clearing and Grubbing	2,600

Seeding and Fertilizing	11,500
Erosion Control	5,000
Right of Way	80,000
Wetland Mitigation	50,000
Granular Surface for Roadway (McGregor St.)	35,200
Topsoil-Strip, Salvage, & Spread	10,300
Compaction w/Moisture Control	2,300
Granular Material for Core-Out	13,300
Longitudinal Subdrain & Outlets	17,500
Roadway Pipe for McGregor St.	2,600
Traffic Control - 5%	52,700
Mobilization - 5%	52,700
Staging – 30%	371,800
M & C - 30%	371,800
Roadway Costs	**$ 1,889,800**
Project Total	**$4,337,000**

B. Detour Analysis

For alternative #1 and alternative #2, U.S. 65 will be closed and an offsite detour will be utilized. It is anticipated the detour will be in place for approximately 150 days for Alternative #1 and 30 days for Alternative #2. The detour would follow County Road G-76 west at the south junction with U.S. 65 to Interstate 35, then north on Interstate 35 to Iowa 92 then east to the junction of U.S. 65/69 in Indianola. Out of distance travel is 27 miles. The total distance user cost is anticipated to be $5,229,850 for Alternative #1 and $1,050,200 for Alternative #2. The cost for county road maintenance will be $112,250 for alternative #1 and $18,700 for alternative #2 as calculated by the Gas Tax Method. Detour signing costs will be $10,000.

There will be no off-site detour for Alternative #3. Traffic will be maintained via staged construction by using the existing structure for stage 1 and using the new bridge during stage 2 while the existing bridge is replaced. Two lanes of traffic will be maintained at all times.

C. Recommendations

It is recommended that the present structure be replaced, as described in Alternative No. 2.

D. Construction Sequence

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

E. ADA Accommodation

There are no bike paths or sidewalks adjacent to U.S. 65; therefore, no ADA accommodations are planned in conjunction with this project.

E. Special Considerations

As part of the selecting a project for Accelerated Bridge Construction (ABC), an Analytical Hierarchy Process is performed. For this bridge, the score was 0.681 for ABC and 0.319 for conventional methods of construction.

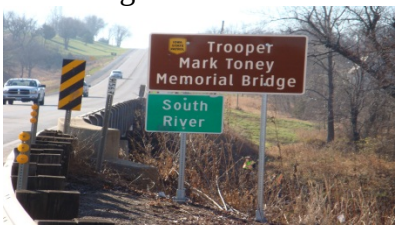
Currently McGregor Street is a gravel road. Warren County may be interested in contributing the additional funds in order to upgrade this to a paved roadway.

Right of Way will be required for this project.

The Office of Location and Environment has reviewed this project and based on preliminary desktop observations, has determined that a Section 404 Permit will be required. It is expected that the work will be covered by Nationwide Permit 14. Wetland mitigation will be required for impacts to the pond/wetland complex that is located south of McGregor Street. Wetland impacts are expected to be <0.5 acre.

Construction of this project will have to be coordinated with a proposed bridge replacement project at the I-35 and G-76 interchange. This interchange will be part of the proposed detour route.

This bridge is also known as the Trooper Mark Toney Memorial Bridge.



F. Program Status

Site data has been developed by the Office of Design. This project is listed in the 2013-2017 Iowa Transportation Improvement Program, with $15,000 programmed for right of way in FY 2016, and $1,482,000 for replacement in FY 2016. $2,716,300 will be paid for by bridge reserve funds and $1,693,600 will be paid for by program dollars. A schedule of events will be developed following approval of the Project Concept.

KKP: glk

Existing Bridge
210′ x 30′ Continuous I-Beam
Proposed Bridge
243′ x 60′ PPCBB

Existing Erosion Stone Shoulder Fillet

U.S. 65

410 415 420 425

0+00 5+00 10+00 15+00 20+00

McGregor Street Proposed

McGregor Street Existing

South River

- Proposed Pavement
- Proposed Granular Surfacing
- Proposed Painted Median
- Proposed Bridge
- Existing Structure
- Proposed Shoulder
- X Obliterate

ENGLISH	IOWA DOT	DESIGN TEAM **Pre-Design**	**WARREN** COUNTY	PROJECT NUMBER	SHEET NUMBER **1**

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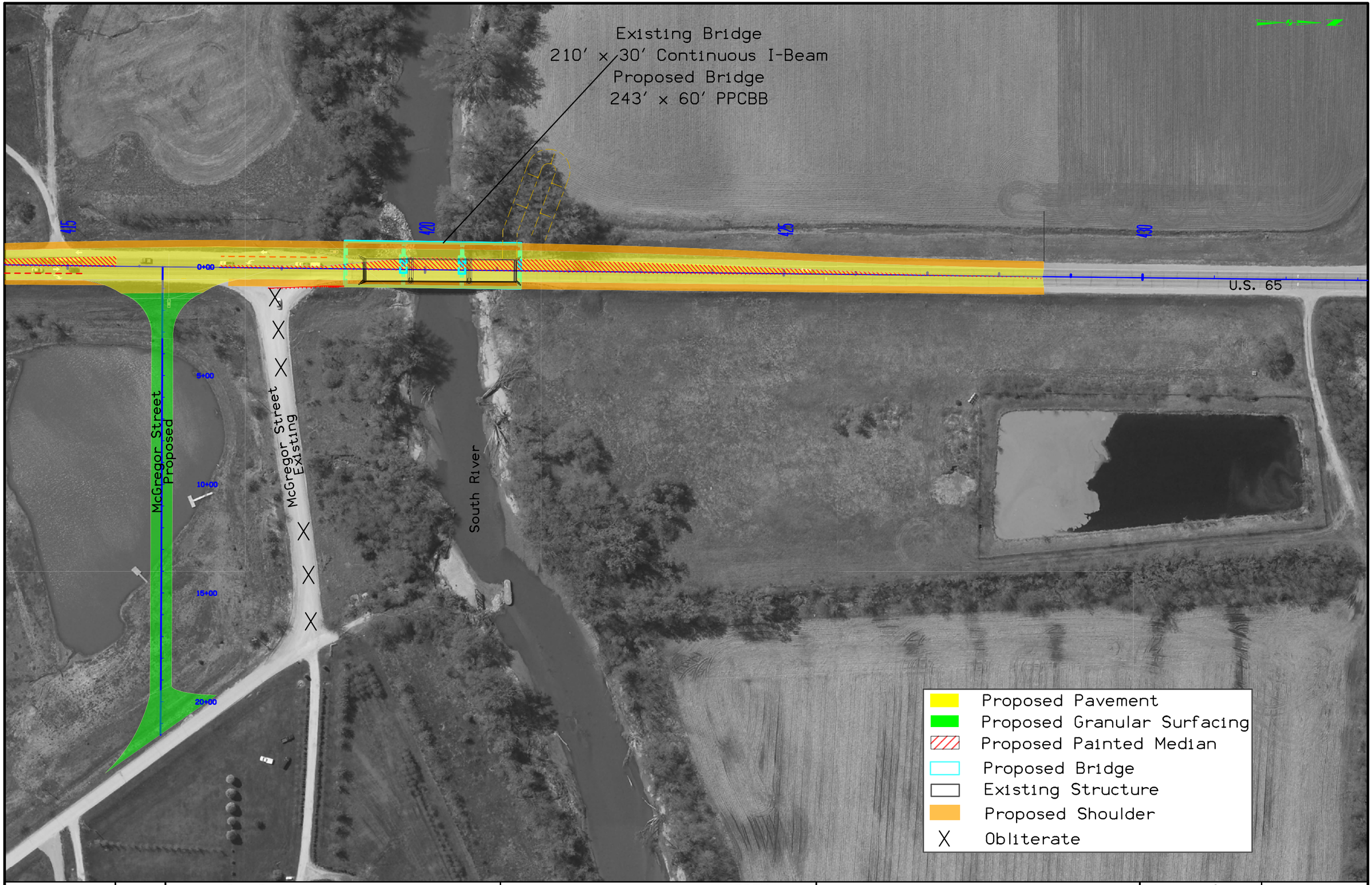

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Existing Bridge
210' x 30' Continuous I-Beam
Proposed Bridge
243' x 70' PPCBB

Existing Erosion Stone
Shoulder Fillet

U.S. 65

410 415 420 425

0+00 5+00 10+00 15+00 20+00

McGregor Street
Proposed

McGregor Street
Existing

South River

- Proposed Pavement
- Proposed Granular Surfacing
- Proposed Painted Median
- Proposed Bridge
- Existing Structure
- Proposed Shoulder
- X Obliterate

ENGLISH	IOWA DOT	DESIGN TEAM **Pre-Design**	**WARREN** COUNTY	PROJECT NUMBER	SHEET NUMBER **3**

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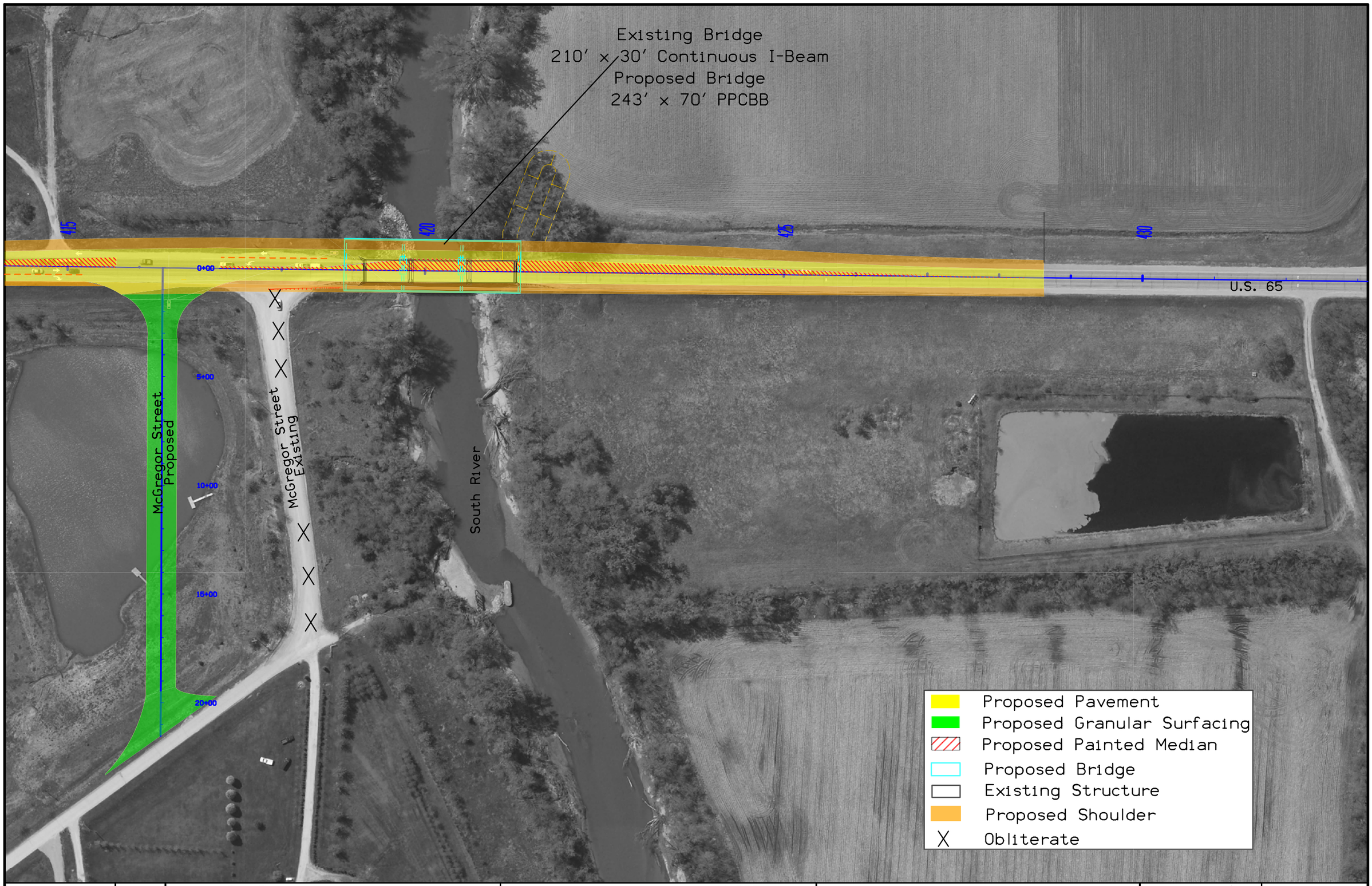

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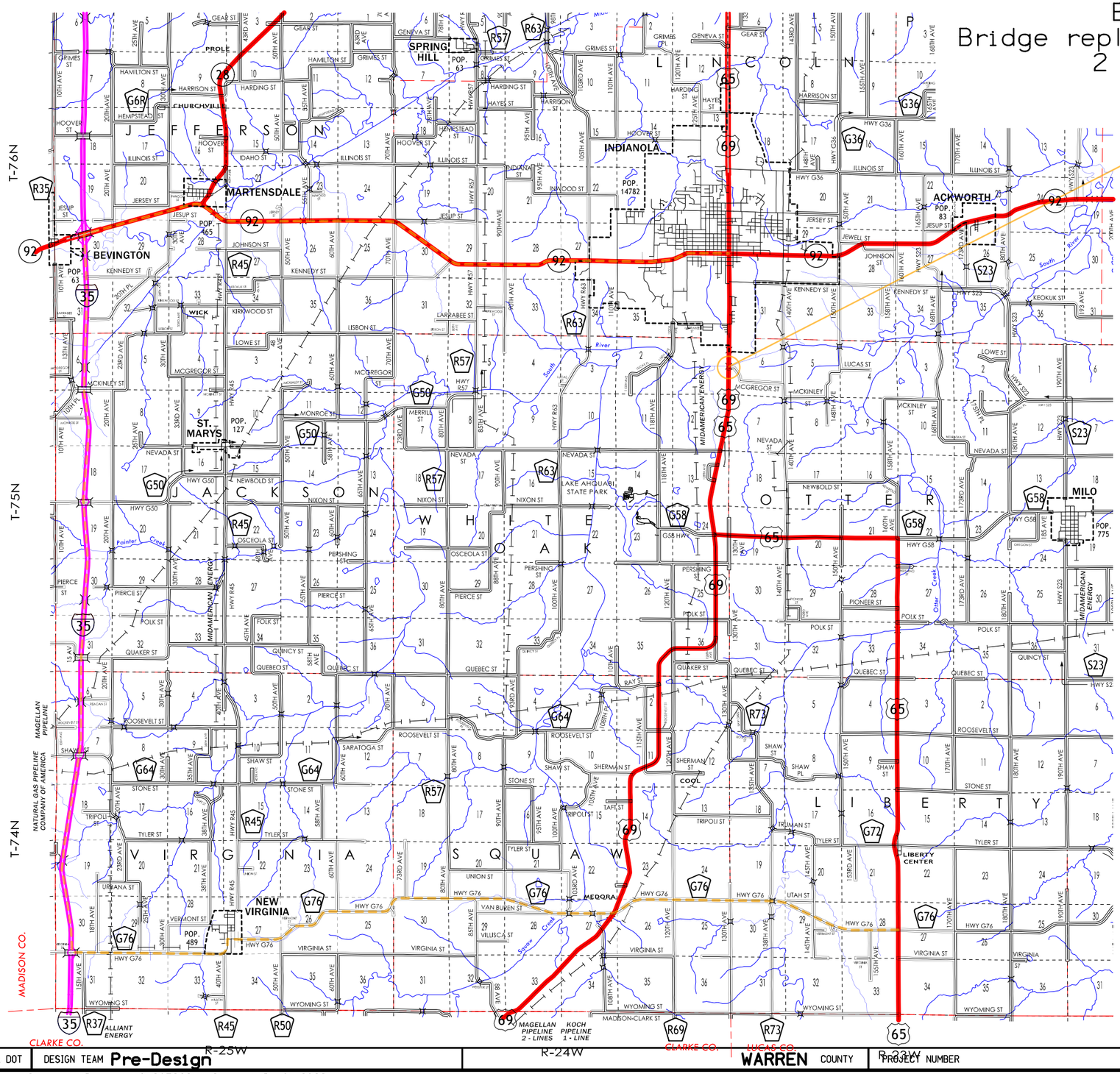
Warren County
U.S. 65
BRF-065-3(66)--38-91
Bridge replacement over the South River
2 miles South of IA 92



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