



A REQUEST FOR PROPOSAL (RFP) FOR:

Powell Avenue Bridge Deck Rehabilitation

Hovde Bridge

State Project No: 7994-00-52

Bridge ID: P-55-0148

Issued by:

CITY OF RIVER FALLS

Engineering Department

Proposals must be submitted no later than 4:30 PM Central Standard Time March 11, 2021

For further information regarding this RFP, contact: Crystal Raleigh, City Engineer at [craleigh@rfcity.org](mailto:craleigh@rfcity.org)  
or 715.426.3412

LATE PROPOSALS WILL BE REJECTED

Issued: February 11, 2021

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## GENERAL INFORMATION

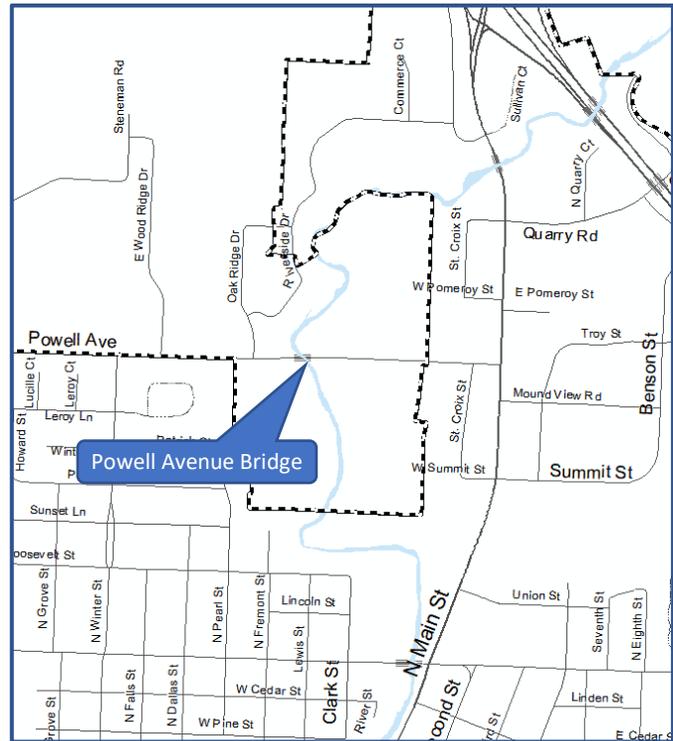
### Introduction

The purpose of this document is to provide interested parties with information to enable them to prepare and submit a proposal for Powell Avenue Bridge Deck Rehabilitation.

The City of River Falls is seeking engineering services consisting of design, environmental reporting, right of way plat, plans, specifications and estimates for bridge deck rehabilitation for Powell Avenue Bridge over the Kinnickinnic River. Construction funding will be through the WisDOT Local Bridge Program.

### Procuring and Contracting Agency

This RFP is issued by the City of River Falls. The person responsible for managing the procurement process is Crystal Raleigh, City Engineer. The consulting contract resulting from this RFP will be administered by the City of River Falls.



### Definitions

The following definitions are used throughout the RFP:

**City** means City of River Falls

**DOT** means Department of Transportation

**FDM** means Facilities Development Manual

**MUTCD** means Manual on Uniform Traffic Control Devices

**NBI** means National Bridge Inspection

**Proposer/vendor** means a firm submitting a proposal in response to this RFP

**RFMU** means River Falls Municipal Utilities

**State** means State of Wisconsin

### Clarification of the Specifications and Requirements

Any questions concerning this RFP should be submitted to: Crystal Raleigh, City Engineer at [craleigh@rfcity.org](mailto:craleigh@rfcity.org) or 715.426.3412

### Site Visit of Project Location

It is the proposer's responsibility to inspect the premises completely prior to submitting a proposal to determine all requirements associated with the contract. Failure to do so will in no way relieve the consultant from the necessity of providing, without additional cost to the City, all necessary services which may be required to carry out the intent of the resulting contract.

## PROJECT DESCRIPTION

### Existing Conditions

Powell Avenue, formerly CTH MM, is a minor arterial seeing approximately 2000 vehicles per day. In a jurisdictional transfer in 2018, the City of River Falls gained control of the roadway from St. Croix County. The Powell Avenue Bridge, also known as the Hovde Bridge, over the Kinnickinnic River is located approximately 1/3 mile west of N. Main Street. St. Croix County last inspected the bridge in Fall 2019 and the report is included in Appendix A.



In Spring 2020, a hole was discovered in the bridge deck and the City contracted with Ayres Associates to complete another inspection of the bridge. The results of that study are included in Appendix B.

The existing structure was constructed in 1973 as a three-span 36-inch prestressed concrete deck girder bridge. It is approximately 143-feet long and has a clear roadway width of 34-feet with a 5.5-foot wide raised sidewalk on the north side. In a 1993 maintenance project, a membrane was installed over the concrete prior to an asphalt overlay.

The hole in the east span of the deck has developed from the bottom where there are large areas of spalling. The spalling has caused the steel to be exposed in the bottom of the deck and it is showing significant section loss. There is another hole developing over the west abutment joint which is leaking excessively. The deck and abutment backwalls are deteriorating at the joints. The ends of the prestressed concrete beams are deteriorating at both abutments.

The 2020 Ayres study notes that the structure is in Serious to Satisfactory condition and that the deck should have a NBI Rating of 3, the superstructure a rating of 5, and the substructure a rating of 6. The study recommended a local posting of 10 Tons and the City has since implemented that posting.

In October 2020, City and DOT Bridge Maintenance staff collaborated to make temporary repairs to the underside of the bridge deck using timber bracing.



### Proposed Conditions

The City plans to retain a consultant for deck rehabilitation design, with an intent to submit for local bridge funding in late Summer 2021 for the 2022-2027 cycle. (The design project shall be 30% complete by July 15, 2021. The design contract award will be presented to the City Council, and presumably awarded, at its April 13 meeting.) All WisDOT submittal requirements shall be complete for a May 1, 2022, PS&E submittal. The City is hopeful for construction early in the 2022-2027 cycle.

The project involves design for a full deck replacement in compliance with the FDM. Additionally, the City wishes to eliminate the sidewalk and to include wider shoulders to accommodate bike traffic. The typical section shall be designed as two 12-foot lanes with a 6.5-foot paved shoulder. This rehabilitation will require a new railing and beam guard compliance with the FDM. This will likely trigger property acquisition and a transportation project plat. Minimal approach roadway work is anticipated.

The proposal and design shall be based on “road closed” construction. If, while in the design process, a staged construction project is desired, the City will negotiate with the consultant for an adjustment to their fee.

## PREPARING AND SUBMITTING A PROPOSAL

### General Instructions

Consultants wishing to propose on this project shall submit the proposal in two envelopes. The first envelope shall contain information related to the consulting firm, its project team, similar projects, design approach, and capacity to meet the project schedule. The second envelope shall contain the design fee as a lump sum proposal. Envelopes must be clearly marked to identify which envelope contains proposal pricing.

The evaluation of a consultant will be based on the information submitted in the proposal plus references. Proposers should respond clearly and completely to all requirements. Failure to respond completely may be the basis for rejecting a proposal.

### Communication and Inquiries

Direct all questions and inquiries to:

Crystal Raleigh  
City of River Falls, City Engineer  
222 Lewis Street  
River Falls, WI 54022  
Tel: 715-426-3412  
Email: [craleigh@rfcity.org](mailto:craleigh@rfcity.org)

Any questions or requests for clarifications should be submitted in writing via email by February 22, 2021. Responses will be posted by February 26, 2021.

### Incurring Costs

The State and the City are not liable for any cost incurred by proposers in responding to this RFP.

### Submitting the Proposal

Proposers must submit an original hard copy, three additional hard copies, and a digital copy of all materials required for acceptance of their proposal on or before March 11, 2021, to:

Name: Crystal Raleigh, City Engineer, City of River Falls  
Address: 222 Lewis Street, River Falls, WI 54022

Hard copy proposals must be received in the above office. Digital proposals may be emailed ([craleigh@rfcity.org](mailto:craleigh@rfcity.org)) or shared via ftp or cloud transfer.

## PROPOSAL SELECTION AND AWARD PROCESS

### Proposal Evaluation

Proposals will be reviewed by a Selection Committee chosen by the City Engineer. Proposers may not contact members of the evaluation team except at the City's request.

### Preliminary Evaluation

The first envelope of the proposals will be reviewed to determine if all requirements are met. Failure to meet all requirements may result in the proposal being rejected.

### Proposal Scoring

The first envelope of accepted proposals will be reviewed by the evaluation committee and scored against the stated criteria. The committee will review references. The evaluation committee’s scoring will be tabulated, and proposals ranked based on the numerical scores received.

The selection team will then open the second envelope, containing the fee, for the three highest scoring proposals. Scores for the fee will be added to the initial qualifications-based scores to produce a final ranking.

### Evaluation Criteria

The criteria to be used for evaluating the Request for Proposals are stated below.

**Envelope 1:**

Criterion	Points
Company Capability & Project Team	30
Similar Projects by Project Engineer	20
Design Approach	25
<u>Demonstrated Capacity to Meet Schedule</u>	<u>10</u>
<b>Total</b>	<b>85</b>

**Envelope 2:**

Criterion	Points
<u>Proposal Pricing</u>	<u>15</u>
<b>Total Points</b>	<b>100</b>

### Right to Reject Proposals and Negotiate Contract Terms

The City reserves the right to reject any and all proposals. The City reserves the right to negotiate the terms of the contract, including the award amount, with the selected proposer prior to entering into a contract. If contract negotiations cannot be concluded successfully with the highest scoring proposer, the City may negotiate a contract with the next highest scoring proposer.

## GENERAL PROPOSAL REQUIREMENTS

### Organization Capabilities

Describe the firm’s experience and capabilities in providing similar services. Be specific and identify projects, for whom and dates. Projects that demonstrate the proposing firm’s ability to work creatively to balance the needs of the DOT, the City, RFMU, and the affected property owners will be looked upon favorably. Projects that demonstrate experience with the Local Bridge program will be favorable.

### Staff Qualifications

Provide resumes describing the education and work experiences for each of the key staff who would be assigned to the project. Staff with strong qualifications in bridge deck rehabilitation projects will be favorable.

### Proposer References

Proposers must include in their RFPs a list of at least two organizations, including contact name, address, and telephone number, which can be used as references for work performed in the area of service required. Selected organizations may be contacted to determine the quality of work performed and personnel assigned to the project. The results of the reference check will be provided to evaluators and used in scoring the written proposal.

### Project Approach

Proposers must detail their approach to the project including the following:

- Public involvement
- Project Owner Engagement
- Preparation of Local Bridge application
- Right of way Plat
- Utility Coordination
- Design
- Plans, Specifications, and Estimates Development
- Permitting as required
- Proposed Schedule

## TECHNICAL REQUIREMENTS

### Standard Specification

Work under this project shall be performed in accordance with DOT's Facilities Development Manual, DOT Bridge Manual, MUTCD, and other applicable specifications.

## Appendix A

August 2019 Bridge Inspection Report by St. Croix County



STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

Inspection Report for  
P-55-148

MM over KINNICKINNIC RIVER  
Aug 21, 2019



Type	Prior	Team Leader	Frequency (mos)	Performed
Routine	11-06-18	Ohman, Rob (6526)	24	X
Reach All				X
SIA Review	11-01-16	Durkee, Jeffrey S (6514)	48	

Latitude	44°52'11.66"N	Owner	COUNTY
Longitude	92°37'42.74"W	Maintainer	COUNTY

**Time Log**

Hours	Minutes	Team members
1	30	Rob Ohman Derek Tuttle

Inspector	Name	Number	Signature	Signature Date
	Ohman, Rob	6526	<i>Rob Ohman</i>	08-27-19
			E-signed by Derek Tuttle(tutder)	

**BRIDGE INSPECTION REPORT**  
**Wisconsin Department of Transportation**  
**DT2007 2003 s.84.17 Wis. Stats.**

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**Identification & Location**

Feature On: MM	Section Town Range: S36 T28N R19W	Structure Number: <b>P-55-148</b>
Feature Under: KINNICKINNIC RIVER	County: ST. CROIX	
Location 0.3M W JCT STH 35	Municipality: TROY	Structure Name:

**Geometry**

measurements in feet, except where noted

Approach Roadway Width: 32	Bridge Roadway Width: 34.0	Total Length: 147.3
Approach Pavement Width: 22	Deck Width: 42.0	Deck Area (sq ft): 6186

**Traffic**

	Lanes	ADT	ADT year	Traffic Pattern
On	2	2700	2016	TWO WAY TRAFFIC

**Capacity**

**Load Rating**

Inventory rating: HS18	Overburden depth (in): 2.0	Last rating date: 05-12-10	Controlling: INTERIOR DECK GIRDER Shear
Operating rating: HS31	Deck surface material: BITUMINOUS	Re-rate for capacity (Y/N):	Control location: 0.1 SPAN 03, 4.1
Posting:	Re-rate notes:		

**Hydraulic**

**Classification**

Scour Critical Code(113): (8) STABLE-ABOVE TOP FOOTING	Q100 (ft3/sec): 0	
High water elevation (ft): 887.0	Velocity (ft/sec): 0.0	Sufficiency #: 93.7

**Span(s)**

Span #	Material	Configuration	Depth (in)	Length (ft)	Main
1	PREST CONCRETE	DECK GIRDER	36	47.5	
2	PREST CONCRETE	DECK GIRDER	36	48.0	Y
3	PREST CONCRETE	DECK GIRDER	36	47.5	

**Expansion joint(s)**

**Temperature:** File:  New:

**Clearance**

Item	File Measurement (ft)	File Date	New Measurement (ft)
Highway Min Vertical On Cardinal			
Horizontal On Cardinal			

**Construction History**

Year	Work Performed	FOS id
1993	OVERLAY - BITUMINOUS	
1973	NEW STRUCTURE	

**Maintenance Items History**

Item	Recommended by	Status	Status change	Year completed
<b>Superstructure - Patch Girders / Super</b>	Durkee, Jeffrey S (6514)	COMPLETE	11/09/18	2018
Clean rebar and patch concrete in SE corner.				

**BRIDGE INSPECTION REPORT**  
**Wisconsin Department of Transportation**  
**DT2007 2003 s.84.17 Wis. Stats.**

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Structure No.: **P-55-148**

**Elements**

Chk	Element	Defect	Description	UOM	Total	Quantity in Condition State			
						1	2	3	4
X	12		<b>Reinforced Concrete Deck-Black Steel Reinforcing</b>	SF	6,187	4,000	2,000	187	0
		1080	Delamination - Spall - Patched Area East end, spalled areas. Also large spall on the underside of the deck at the southeast quadrant. <b>Rebar still intact but placed with minimal cover. Structural review not required.</b> See photo.	SF		0	0	187	0
		1130	Cracking (RC) <b>Minor deck cracks</b> with leaching <b>throughout</b>	SF		0	2,000	0	0
		8512	AC Overlay w/ Membrane	SF	6,187	0	0	6,187	0
		3210	Debonding/Spall/Patched Area/Pothole Spray patched and crack filled but showing deterioration. Showing cracking of pavement over membrane throughout. <b>See photo.</b>	SF		0	0	6,187	0
X	109		<b>Prestressed Concrete Open Girder</b>	LF	841	679	78	39	45
		1080	Delamination - Spall - Patched Area Spalling South beam, East abutment. Also spalling on most ends of girders at the abutments. <b>Due to minimal bending moment at spall locations, structural review not needed.</b> See Photos	LF		679	78	39	45
X	210		<b>Reinforced Concrete Pier Wall</b>	LF	90	90	0	0	0
		1080	Delamination - Spall - Patched Area	LF		0	0	0	0
		1130	Cracking (RC)	LF		0	0	0	0
X	215		<b>Reinforced Concrete Abutment</b>	LF	87	0	77	10	0
		1080	Delamination - Spall - Patched Area Spalling East abutment, South end. <b>See photo.</b>	LF		0	33	10	0
		1130	Cracking (RC) Moderate cracking. See photo	LF		0	44	0	0
X	234		<b>Reinforced Concrete Cap</b>	LF	88	88	0	0	0
		1130	Cracking (RC)	LF		0	0	0	0
X	305		<b>Assembly Joint without Seal</b> Referred to as a steel expansion joint on plans, west side of bridge.	LF	52	0	40	0	12
		2360	Adjacent Deck or Header Damage Spalling of concrete from under metal angle irons used in expansion joint. West end. See photos <b>taken from underside. Due to location being at the end of deck, structural review not needed.</b>	LF		0	40	0	12
X	310		<b>Elastomeric Bearing</b>	EA	18	0	18	0	0
		2220	Alignment	EA		0	0	0	0
		2230	Bulging, Splitting or Tearing Some deterioration showing	EA		0	18	0	0

**BRIDGE INSPECTION REPORT**  
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Structure No.: **P-55-148**

X	311		<b>Moveable Bearing</b>	EA	6	0	0	6	0
		1000	Corrosion Significant rust <b>on the east end of structure</b> -See photos	EA		0	0	6	0
		2210	Movement Heavy rust	EA		0	0	0	0
		2220	Alignment	EA		0	0	0	0
X	331		<b>Reinforced Concrete Bridge Rail</b>	LF	298	0	298	0	0
		1080	Delamination - Spall - Patched Area Spall on North wall.	LF		0	20	0	0
		1130	Cracking (RC) Cracking throughout.	LF		0	278	0	0

**Assessments**

Chk	Element	Defect	Description	UOM	Total	Quantity in Condition State			
						1	2	3	4
X	9001		<b>Drainage - Ends of Structure</b> <b>Minor erosion on west end</b>	EA	4	2	2	0	0
			<b>Sidewalk</b> Cracking and popouts with age throughout. <b>See photo.</b>	EA	170	0	0	170	0
X	9011		<b>Utilities</b> Service box deteriorated. See Photo.	EA	3	0	0	3	0
X	9045		<b>Slope Protection- Riprap</b>	EA	2	2	0	0	0
X	9168		<b>Concrete Diaphragm</b>	EA	15	13	0	2	0
			Spalling-See photo						

**NBI Ratings**

	File	New
Deck	5	5
Superstructure	6	6
Substructure	6	6
Culvert	N	N
Channel	8	8
Waterway	8	8

**Structure Specific Notes**

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**Inspection Specific Notes**

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**BRIDGE INSPECTION REPORT**  
**Wisconsin Department of Transportation**  
**DT2007 2003 s.84.17 Wis. Stats.**

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Structure No.: **P-55-148**

**Inspector Site-Specific Safety Considerations**

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**Structure Inspection Procedures**

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**Special Requirements**

	Chk	Hours	Cost	Comments
UB60 Reach-All Unit	X			

**Underwater Probe Form  
P-55-148**

**General Site Conditions - Scour**

None

**General Site Conditions - Embankment Erosion/Conditions**

Good Condition

**Substructure Notes**

Chk	Unit	Max Water Depth(ft)	Mode	Notes
X	Cardinal	0.0	Dry	Good Condition
X	Pier 1	1.0	Wade	Good Condition
X	Pier 2	1.0	Wade	Good Condition
X	Non Cardinal	0.0	Dry	Good Condition

**Routine Document Comment/Description**

Concrete diaphragm at end of girder



**Linked Element(s)**  
Concrete Diaphragm

**Routine**  
**Document Comment/Description**

Roadway



Routine  
Document Comment/Description

Utilities



Routine  
Document Comment/Description

Bridge



**Routine**  
**Document Comment/Description**

Bearing on east end rusted



**Linked Element(s)**  
Moveable Bearing

**Routine**  
**Document Comment/Description**

Bearing on east end rusted and sitting on cracked abutment



**Linked Element(s)**  
Moveable Bearing

**Routine**  
**Document Comment/Description**

Bottom of Diaphragms at girder ends.



**Linked Element(s)**  
Concrete Diaphragm

**Routine**

**Document Comment/Description**

Spalling South beam, East abutment. Due to minimal bending moment at spall locations, structural review not needed



**Linked Element(s)**

Prestressed Concrete Open Girder

**Routine**

**Document Comment/Description**

East end, spalled areas. Also large spall on the underside of the deck at the southeast quadrant. Rebar still intact but placed with minimal cover. Structural review not required.



**Linked Element(s)**

Reinforced Concrete Deck-Black Steel Reinforcing

**Routine**  
**Document Comment/Description**

Spalling and cracking on east abutment



**Linked Element(s)**

Reinforced Concrete Abutment

**Routine**  
**Document Comment/Description**

Concrete under steel expansion plates that has spalled off, and is now sitting on abutment.



**Linked Element(s)**

Assembly Joint without Seal

**Routine Document Comment/Description**

Service box deterioration. Northwest end of structure.



**Routine**  
**Document Comment/Description**

Showing cracking of pavement over membrane throughout



**Linked Element(s)**

Reinforced Concrete Deck-Black Steel Reinforcing -> AC Overlay w/ Membrane

**Routine  
Document Comment/Description**

Typical spalling at abutments on girder ends.



**Linked Element(s)**

Prestressed Concrete Open Girder

**Routine Document Comment/Description**

Moderate cracking.



**Linked Element(s)**

Reinforced Concrete Abutment

**Routine**

**Document Comment/Description**

Concrete under steel expansion plates that has spalled off and left a gap at the joint, photo taken from underside of deck.



**Linked Element(s)**

Assembly Joint without Seal

**Routine Document Comment/Description**

Sidewalk cracking and popouts throughout



**Linked Element(s)**  
Sidewalk

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## Appendix B

April 2020 Bridge Evaluation by Ayres Associates

April 29, 2020

Crystal Raleigh, PE - City Engineer  
City of River Falls  
222 Lewis Street  
River Falls, WI 54022

Re: Structure Evaluation Study  
CTH MM Bridge (P-55-148) over the Kinnickinnic River  
City of River Falls  
St. Croix County

Dear Ms. Raleigh:

This letter report summarizes our findings and recommendations for the CTH MM Structure over the Kinnickinnic River in the City of River Falls, St. Croix County. This study was done in accordance with our contract dated April 15, 2020.

#### Existing Conditions

The existing structure is a three-span 36-Inch prestressed concrete deck girder bridge that is approximately 143-feet long that has a clear roadway width of 34-feet with a 5.5-foot wide raised sidewalk on the north side. The bridge was originally constructed in 1973. It had an asphalt overlay placed on the deck in 1993. The abutments are sill-type abutments. The east abutment is supported by steel piling and the west abutment is supported by a spread footing type foundation. The piers are concrete hammerhead piers. The structure is skewed approximately 25 degrees.

The bridge was last inspected on August 21, 2019. Since that inspection, a hole developed in the deck in the east span on the south side of the bridge. The south edge of the deck has had cones put in place to keep traffic off that edge of the deck.

During our site visit on April 17, 2020, the following items were observed:

- The asphaltic deck surface is in satisfactory to poor condition. There is a pothole in the center span and the surface is rough and cracking.
- The hole in the east span of the deck appears to be in the location of a previous patch. The previous patch looks like it was done by placing a roadway sign over a hole and then covering it with asphalt.
- There is a significant hole developing over the west abutment joint on the north side of the deck.
- Most of the east span is in poor condition. There are large areas of the bottom of the deck that are ready to fall off, which is a safety issue.
- The center span is dark and staining, indicating that the deck reinforcement is deteriorating within.
- The west span is not as bad as the east span, but it is worse than the center span.
- The exposed steel in the bottom of the deck is showing significant section loss.
- Both joints in the deck at the abutments have failed and are leaking excessively. The deck and abutment backwalls are deteriorating at the joints.
- The ends of the prestressed concrete beams are deteriorating at both abutments.
- The east end of the south exterior beam in the east span has been repaired in the past.

The existing structure is in Serious to Satisfactory condition. Based on our site visit, the Deck should have a National Bridge Inspection (NBI) Rating of 3 (Serious Condition). The superstructure should have an NBI Rating of 5 (Fair Condition). The substructures (Abutments & Piers) should have an NBI Rating of 6 (Satisfactory Condition).

We did an approximate load rating of the bridge deck based on the existing condition of the deck. (See the attached computations.) Assuming 50% section loss of the reinforcing steel and a 4,000-psi standard concrete deck, the capacity of the deck would be approximately 18-Tons. However, because of the age of the deck, the strength of the deck concrete is probably 3,500-psi or less. Based on unknown strength of the concrete and extent of deterioration, the recommended load posting of the bridge should be 10 Tons until the deck is replaced.

We also considered how to temporarily repair the deck. Because of the condition of the existing deck, a conventional concrete patch is not anticipated to work. It is anticipated that conventional patches would require replacing at least 25% of the deck, which would include approximately 50% of the east span.

We determined that a large steel plate placed over the holes in the deck could work as a temporary patch. The required steel plate thickness to span a 3-foot wide hole would be 1 5/8". The size of the steel plate should be approximately 6-feet by 6-feet. The plate would be installed as follows:

1. Remove the asphalt around the hole in the deck so that the 6-foot by 6-foot plate can be centered over the hole.
2. Place the 6-foot by 6-foot by 1 5/8" thick plate on the concrete deck centered over the hole.
3. Cover the plate with asphalt to hold the plate in place and provide a smooth driving surface.
4. Maintain the 10 Ton Load Posting and monitor the patch regularly to make sure it is performing properly.

### Alternatives

At this time, there are three alternatives that could be considered for the structure. The costs include mobilization, traffic control, approach roadway, construction engineering, and other contingency items.

These alternatives are as follows:

1. Do Nothing.  
If this option is selected, the south edge of the deck will need to have a more permanent barrier placed to protect traffic from the south edge of the deck. The loose concrete on the underside of the deck will also need to be removed so that it does not fall on anyone that may go under the bridge.  
The bridge will also need to be posted 10 Tons based on the condition of the deck.  
Significant maintenance will be required to keep the bridge open to traffic. It is anticipated that additional holes in the deck could develop, which will require steel plate patches as described above.  
The estimated life of the deck is 1 year. After that, the bridge will probably need to be closed to traffic until the deck is replaced.

2. Replace the Existing Deck.

The existing deck and abutment joints would be replaced. The new deck would match the existing width of the structure. The new abutment joints would be strip seals. The railings on the bridge would also be replaced. The ends of the beams at the abutments would also be repaired. The steel bearings at the west abutment could also be replaced. The bridge would no longer require a Load posting. Future maintenance for the new deck would consist of power washing the new strip seal joints every spring and fall to remove sand and debris that accumulates in the recess. After about 30 years, the bridge would require a concrete overlay. The estimated life of the structure with this alternative is 50 years providing that maintenance is done. The estimated cost is approximately \$750,000.

3. Construct a new 3-span 28-Inch Prestressed Concrete Girder Bridge.

A new 3-span 28-Inch prestressed concrete girder bridge would be constructed. The new bridge would be approximately 145-feet long. The bridge would be skewed 25 degrees. The new structure would require that the profile be approximately the same in order to maintain the existing clearances under the bridge. The piers would be in relatively the same location as the existing piers. The abutments would be sill-type abutments supported on piling with wings parallel to the road. The piers would be hammerhead piers on spread footings. A 32SS Single Slope Concrete Parapet would be used on the south side of the bridge. A 6-foot wide clear width sidewalk with a 4.5-foot high combination railing would be used on the north side of the bridge for pedestrians and bikes. The Inventory Rating would be greater than HS-20, the Operating Rating would be greater than HS-30 and the Standard Permit Vehicle Rating would be greater than 200 kips. After about 30 years, the bridge would require a concrete overlay. After about 50 years, the bridge would need to be re-decked. After about 80 years the bridge would need another concrete overlay. The estimated life of the structure with this alternative is 100 years providing that maintenance is done. The estimated cost is \$1,650,000.

Summary

A Life-Cycle Cost Analysis was performed to determine the most cost-effective alternative over time. The life-cycle cost was determined through an “Equivalent Uniform Annual Cost” (EUAC) Analysis. The EUAC method was used instead of the Present Worth method because the cost of each alternative is spread over different time frames. It was assumed that Alternatives 1 and 2 would be replaced with Alternative 3 after the end of their expected life. The interest rate was assumed to be 5%.

Alternative	Estimated Cost	Life (Years)	Equivalent Uniform Annual Cost
1	\$0	1	\$79,200
2	\$750,000	50	\$49,110
3	\$1,650,000	100	\$83,160

Based on the above analysis, Alternate 2 is the most economical option for the site.



Ms. Crystal Raleigh, PE – City Engineer  
City of River Falls  
April 29, 2020  
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### Recommendation

As a minimum, the south edge of the deck should have a more permanent barrier placed to protect traffic from the south edge of the deck until the hole is temporarily repaired. The loose concrete on the underside of the deck should also be removed so that it does not fall on anyone that may go under the bridge.

The bridge should be posted 10 Tons based on the condition of the deck.

The hole in the deck should be temporarily repaired with a steel plate as described above. The hole should be frequently monitored to make sure there are no issues with the patch.

Replacing the Bridge Deck (Alternative 2) is the recommended alternative at this site. This would repair the deterioration of the girders, replace the joints at the abutments, and provide a safe driving surface.

Until the deck is replaced, it will continue to develop holes and require maintenance throughout the year. It is not anticipated that the deck will make it through next winter based on its current condition.

If you have any questions about this report or the recommendations, please call me.

Sincerely,

Ayres Associates Inc



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CBM:jms

Enclosure

cc: Dan Sydow, PE – Ayres Associates





Looking West at Bridge



Looking East at Bridge



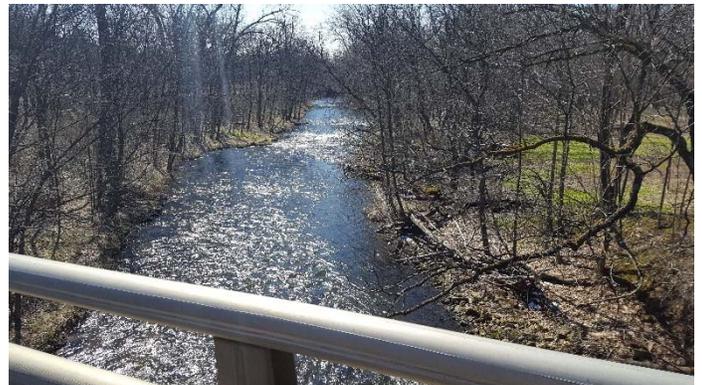
Looking Southwest at Upstream Face



Looking Northeast at Downstream Face



Looking Upstream



Looking Downstream



Looking Northwest at Deck



Looking Northeast at Sidewalk



Looking at Northwest Corner of Bridge



Looking East at Deck & Pothole in Overlay



Looking at Deck Surface at Center Span



Looking at Hole in Deck



Looking West at Sidewalk



Looking Southwest at Sidewalk and Deck



Looking at East Abutment Joint



Looking at West Abutment Joint (1)



Looking at West Abutment Joint (2)



Bottom of Deck in Southeast Corner (1)



Bottom of Deck in Southeast Corner (2)



Bottom of Deck at Hole in Deck



Bottom of Deck in Center of East Span



Bottom of Deck Northeast Corner



Bottom of Deck in East Span South Side at Pier



Bottom of Deck in East Span North Side at Pier



Bottom of Center Span Looking Southwest



Bottom of Center Span Looking Southeast



Bottom of Center Span Looking Northeast



Bottom of Deck in Center of West Span



Bottom of Deck in Northwest Corner



Bottom of Deck in West Span North Side at Pier



East Abutment



Typical Beam End at East Abutment



Typical Elastomeric Bearing at East Abutment



Typical Joint Deterioration at East Abutment



Previous Beam Repair in Southeast Corner



Expansion Notch at East Abutment



Looking East at West Pier



West Abutment



Looking South at West Abutment



Joint Deterioration Southwest End of West Abutment



Bottom of Hole at West Abutment Joint



Typical Steel Bearing at West Abutment



Name Plate in Southwest Wing



Bank Erosion in Southeast Quadrant