January 5, 2015

To: **Mayor Bemrich and City Council**

From: **David Fierke, City Manager**

Subject: **N. 1st St. Bridge (Over Soldier Creek) - Approve Offer of City Bridge Funding from IDOT**

ACTION: **For Vote Monday, January 12, 2015**

Brief History

Every year select bridges are inspected in Fort Dodge. The N. 1st Street bridge crosses over Soldier Creek and is approximately 800' north of Central Avenue. The bridge was built in 1920. The 2014 Bridge Inspection Report gave this bridge a Sufficiency Rating of 31 out of 100 and an estimated remaining life of 2 years. Numerous condition deficiencies were noted in the Report. Because of the condition, Weight Limits were posted at each end of the bridge in the fall of 2014.

Analysis of Issue

The Iowa Department of Transportation (IDOT) reviews the bridge inspection ratings annually and determines which bridges throughout the State are eligible for City Bridge Rehabilitation / Replacement funding. The bridge in question has met that criteria this year. The IDOT has offered the City of Fort Dodge 80% funding of the cost of the rehabilitation/replacement costs of this bridge, up to a limit of $1,000,000.

Calhoun-Burns & Associates completed a Feasibility Analysis of this bridge in October, 2014. The Feasibility Analysis looked at 3 alternatives for the replacement of this bridge: a single span concrete bridge, a three-span concrete bridge, and a multi-cell box culvert. The conclusion of the Analysis recommended the single span bridge with a total cost opinion of $1,110,000.

Notice must be given to the IDOT by January 19, 2015 of the City's intention to accept or decline the Offer of Funding. If accepted, the City must sign a project agreement with the IDOT within 90 days and the City will need to develop the project for a letting date within 3 years of the signing of the Project Agreement.

Budget Impact

This remaining money necessary to match the 80% funding from the IDOT will be paid from the Local Option Sales Tax (LOST) fund. In the Capital Improvement Plan presented in October, 2014, $225,000 of LOST funding was programmed in FY 2018.

Strategic Plan Impact

Policy D.4.2 Advanced planning for all infrastructure facilities shall be supported and routinely updated. Facilities benefited by advanced planning shall include, at minimum, schools, health care, residential areas, roads, water sewer, storm water management, parks, recreation, and greenways.

Impact on Existing Plans

N/A

Subcommittee or Commission Review / Recommendation

N/A

Staff Conclusions / Recommendations

The Engineering Department recommends accepting the Offer of City Bridge Funding from the Iowa Department of Transportation for the bridge located on N. 1st Street.

Alternatives

Council could choose to reject the Offer of Funding at this time. This bridge may be eligible for funding at a later date, but no guarantees are given by the IDOT.

Implementation and Accountability

The Engineering Department takes responsibility for this Offer.

Signed

Chad W. Schaeffer, P.E.
City Engineer

Approved

David Fierke
City Manager

IOWA DOT
SMARTER I SIMPLER I CUSTOMER DRIVEN
www.iowadot.gov

Office of Local Systems
800 Lincoln Way I Ames, IA 50010
Phone: 515.239.1291 I Email: John.Dostart@dot.Iowa.gov

December 12, 2014

Re: Offer of City Bridge Funding

City of Fort Dodge
Chad Schaeffer, P.E.
819 1st Ave. S.
Fort Dodge, IA 50501-4739

Dear Mr. Schaeffer:

I am pleased to inform you that the following bridges:

FHWA#	City Street	Feature Crossed	Qualified For
005020	Highland Park Ave.	Union Pacific Railroad	Replacement
500160	N 1st St.	Soldier Creek	Replacement

in your city are ranked high enough on the city bridge candidate list to receive funding for replacement or rehabilitation. Each year, the Iowa Department of Transportation (Iowa DOT) uses the City Bridge Candidate List to offer either Federal or State funds for replacement or rehabilitation of city bridges. The Iowa DOT makes final determination of whether a project will receive Federal or State funds.

Federally funded projects can receive 80 percent reimbursement of all eligible and properly documented project costs, up to a limit of $1,000,000 in Federal-aid funds. State funded projects can receive 80 percent reimbursement of all eligible and properly documented project costs, up to the limit specified in the funding agreement. The remaining 20 percent of eligible project costs, as well as any ineligible project costs, are paid by the city. Eligible project costs may include the following: engineering services, bridge construction, a limited amount of roadway approach construction (as determined by the Iowa DOT), right-of-way acquisition, and in certain cases, utility relocations. Replacement or rehabilitation funding is limited to one bridge per city per year.

If the city accepts this offer of funding, the city must sign the project agreement with the DOT within 90 days of receipt. The city must also develop the project to a successful contract letting within three years of signing the project agreement. These funds are offered in anticipation of a letting date after October 1, 2015.

If the city decides to accept funding for this project, please send a letter confirming the city's acceptance, indicating the one bridge to apply funding to, by **January 19, 2015**. Complete the attached

sheet and include it with the cities letter of acceptance. If the timing of your city council meetings will not allow a response by this date, please contact me in advance. If the city decides not to accept funding at this time, I would appreciate if you would inform me of your rejection by the same date. The bridge will remain on the Candidate List and may be offered funding in the future. However, each year new bridges are added to the Candidate List, and bridges already on the list continue to deteriorate, thereby changing the priority point calculations. These factors, combined with variations in funding levels, make it impossible to predict with certainty when this bridge may rank high enough to be offered funding again. If you have any questions about this program, please contact me.

Sincerely,

John Dostart, P. E.
Urban Engineer
Office of Local Systems
John.Dostart@dot.iowa.gov

cc: Gregg Durbin, P.E.; Iowa DOT District 1 Local Systems Engineer
Mike Clayton, Iowa DOT District 1 Planner

Attachment

Attachment to Offer of City Bridge Funding

City Name: _____

Accept: _____ Decline: _____

FHWA Bridge Number: _____

Who will be administering the project? City: _____ County: _____

Type of Project: Reconstruction: _____ Replacement: _____

Name of the contact person: _____

Title of contact: _____

Phone number of contact: _____

Address of contact: _____

_____

Are there any apparent reasons this project cannot be let within 3 years of signing the agreement?

No: _____ Yes: _____, explanation: _____

_____

Current estimated preliminary engineering (P.E.) costs $ _____

Current estimated right-of-way (ROW) costs $ _____

Current estimated construction engineering (C.E.) costs $ _____

Current estimated construction costs $ _____

Total estimated project cost $ _____

CALHOUN-BURNS AND ASSOCIATES, INC.
BRIDGES ♦ STRUCTURES ♦ TRANSPORTATION

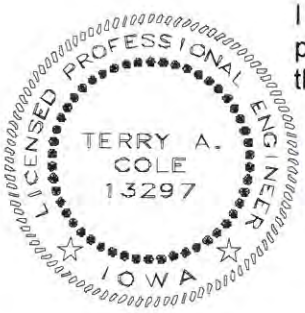
ENGINEERING DEPARTMENT
CITY OF FORT DODGE




FEASIBILITY ANALYSIS
NORTH 1ST STREET BRIDGE
OVER SOLDIER CREEK
FHWA NO. 500160
OCTOBER 10, 2014

CITY OF FORT DODGE

FEASIBILITY ANALYSIS
NORTH 1ST STREET BRIDGE
OVER SOLDIER CREEK
FHWA NO. 500160



I hereby certify that this plan, specifications, or report 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 _____ OCT 10 _____, 2014
Date

My Registration expires December 31, 2014

CALHOUN-BURNS AND ASSOCIATES, INC.
WEST DES MOINES, IOWA

CALHOUN-BURNS AND ASSOCIATES, INC.
BRIDGES ◆ STRUCTURES ◆ TRANSPORTATION

October 10, 2014

Chad Schaeffer, P.E.
Director of Engineering,
Business Affairs
& Community Growth
819 1st Avenue, South
Fort Dodge, IA 50501

RE: REPLACEMENT FEASIBILITY
FHWA NO. 500160
CB&A NO. 2014179

Dear Mr. Schaeffer:

Calhoun-Burns and Associates, Inc. were asked by the City of Fort Dodge to perform feasibility analysis/cost estimate work on three alternates for the North 1st Street Bridge over Soldier Creek, FHWA No. 500160. You have asked us to provide you a letter report summarizing our work on this assignment. It includes a description of our field and office analysis, alternates considered, and cost estimates. Finally, our conclusion and recommendations are presented for your review and evaluation.

GENERAL

The existing structure is a 26'x 31' concrete girder bridge with a reinforced concrete deck. The bridge carries a bike path along the West side of the curb and gutter roadway. Substructures consist of high reinforced concrete abutments. This bridge was built in 1920. The 2003 traffic count for this bridge is 1,350 VPD.

REVIEW

During our routine scheduled field inspection of this bridge on April 22, 2014, our inspector noted severe spalling and failed reinforcing of the deck and concrete girders. The high concrete abutments are aged and cracking with spalling at several utility penetrations. Due to this severe deterioration, we recently recommended a load posting of "415,520,625". We have provided a copy of our completed SI&A sheet near the end of this report.

ALTERNATES CONSIDERED

For this feasibility study, three alternates have been considered which will provide for an upgraded crossing of Soldier Creek at this site. The three alternates are as follows:

Alternate No. 1 includes replacement of the existing bridge with a new single span pretensioned prestressed concrete beam (PPCB) bridge with a 10' trail. Reinforced concrete approach sections complete the project.

1500 30th Street ◆ West Des Moines, IA 50266
WATS 877/241-8003 ◆ Phone 515/224-4344 ◆ FAX 515-224-1385 ◆ email: email@calhounburns.com

Alternate No. 2 includes replacement of the existing bridge with a new three span continuous concrete slab (CCS) bridge with a 10' trail. Reinforced concrete approach sections complete the project.

Alternate No. 3 includes replacement of the existing bridge with a new multi-cell reinforced concrete box culvert. The culvert would accommodate a 32' wide curb and gutter pavement utilizing doubly reinforced pavement along with the 10' trail.

When considering a reinforced concrete box culvert at this site, we made the following observations:

1. The design discharge at this site would require a very large multi-cell box culvert to meet Iowa DNR backwater requirements.
2. It appears Soldier Creek carries significant drift and debris, which tends to get hung up at culvert inlet walls and impact hydraulic performance.
3. The proximity of the Des Moines River suggests the probability of rock very near streambed, an issue for culvert construction.

For these reasons, it is our opinion a new reinforced concrete box culvert at this site is not in the City's best interest and will no longer be considered.

The major items of work for alternates No. 1 and No. 2 are shown at the end of this report.

COSTS

Opinions of probable costs were developed for alternates No. 1 and No. 2. Tabulations of these costs for each alternate are included at the end of this report. Costs for individual items of the work were developed. The total individual item costs are indicated as the "Total Opinion of Probable Construction Costs" figure. To this total, an allowance for design engineering and contingencies was added to generate the "Total Opinion of Probable Project Costs". While these opinions of costs are not a guarantee of the bids that will be received from bridge contractors, they were similarly developed using the same unit costs and can be used for comparison, project planning, and budgeting. However, the figures should be adjusted to reflect inflation from now to the year of construction.

The opinion of total project cost for Alternate No. 1, a new PPCB bridge is at $1,110,000.

The opinion of total project cost for Alternate No. 2, a new CCS bridge is at $1,080,000.

CONCLUSIONS AND RECOMMENDATIONS

During the performance of the feasibility analysis, we reached the following conclusions:

1. The existing structure is in very poor condition which requires a load embargo and should be replaced.
2. This site is near the mouth to the Des Moines River and likely has bedrock near streambed.
3. Soldier Creek appears to carry significant drift and debris.

4. A three-span CCS would likely require expensive rock coring for construction of the piers. Location of the piers within the channel may catch drift and debris.
5. This site appears to have adequate head room to install the deeper superstructure of a single span PPCB bridge, eliminating the piers.
6. While initial cost opinions suggest the single span PPCB bridge is slightly more expensive than the three-span CCS, the single span design eliminates potential rock issues at piers as well as the future maintenance of drift removal.

After consideration of the conclusions developed, we offer the following recommendations:

1. Select Alternate No. 1; construct new single span 85'x 32' PPCB bridge with a 10' trail and approach paving.

2. Authorize your structural consultant, Calhoun-Burns and Associates, Inc., to perform the project design and detailing to accomplish the selected alternate.

This completes our investigation and recommendations to date. If you have any questions or comments, please give us a call.

Sincerely,

Terry A. Cole
Project Manager

TAC/jac
Enclosures

IOWADOT

Structure Inventory and Appraisal

Bridge ID: FORT DODGE-500160
FHWA No.: 500160

Official	SR: 31.1	SD/FO: Structurally Deficient
Unofficial	SR: 31.1	SD/FO: Structurally Deficient

IDENTIFICATION

7 Facility Carried:	N 1ST ST
5B Rte. Signing Prefix:	5
5C Level of Service:	1 - MAINLINE
5D Inventory Route:	00000
City:	FORT DODGE
3 County:	094 - Webster
9 Location:	000000000
5E Directional Suffix:	0 - NOT APPLICABLE
6 Feature Intersected:	SOLDIER CREEK
2 District:	0
Garage:	000
98 Border Bridge Code:	
% Responsibility:	0
99 Border Bridge No.:	

STRUCTURE TYPE AND MATERIALS

43A Main Span	1 - Concrete
43B Main Span Design:	02 - Stringer/Multi-beam or Girder
45 No. Spans Main Unit:	1
44A Appr. Span	000 - NA
44B Appr. Span Design:	000 - NA
46 No. of Appr. Spans:	Near 0 Far 0
107 Deck Type:	1 - Concrete Cast-in-Place
108A Wearing Surface:	1 - Monolithic Concrete (concurrently placed with structural deck)
108B Membrane:	0 - None
108C Deck Protection:	0 - None

GEOMETRIC DATA

48 Length Max Span:	26 ft.
49 Structure Length:	26 ft.
34 Skew:	0°
Deck Area:	930.8 sq. ft.
50B Curb/Sdwk Width R:	0 ft.
50A Curb/Sdwk Width L:	0 ft.
51 Width Curb to Curb:	31.2 ft.
52 Width Out to Out:	35.8 ft.
32 Appr. Roadway width (w/ Shoulders):	30 ft.
33 Median:	0 - No median
35 Structure Flared:	00 - No flare
10 Vertical Clearance:	99'99"
47 Horiz. Clearance:	31'04"
53 Min. Vert. Clearance Over:	99'99"
54B Min. Vert. Underclearance:	00'00"
55 Min. Lat. Underclearance R:	00'00"
56 Min. Lat. Underclearance L:	00'00"

NAVIGATION DATA

38 Navigation Control:
0 - No navigation control on waterway (bridge permit not required)
111 Pier Protection:
39 Vertical Clearance: 00'00"
40 Horiz. Clearance: 000'00"

16 Latitude: 42.50567773 17 Longitude: -94 19894226

FRA No. (if RR Bridge):
Mile Post:

INSPECTION

90 Inspection Date:	**04/23/2014**	Inspection Type:	N/A
Next Routine Insp Date:	04/23/2015	91 Frequency:	12
		Next Insp Type:	Regular
Inspection Agency:	5 - Consultant	Inspection Group:	Calhoun-Burns and Assoc., Inc
93A FC Inspection Date:			
92A FC Frequency:	0	Next FC Insp.:	NA
93B UW Inspection Date:			
92B UW Frequency:	0	Next UW Insp.:	NA
93C SI Date:	04/23/2014		
92C SI Frequency:	12	Next Spec. Insp.:	04/23/2015
Other Non-NBI Date:			
Other Non-NBI Freq.:		Next Other Insp.:	NA

CONDITION

58 Deck:	3 - Serious Condition (primary structure affected)
59 Super:	3 - Serious Condition (primary structure affected)
60 Sub:	5 - Fair Condition (minor section loss)
61 Channel/Channel Prot:	6 - Bank slump, widespread minor damage
62 Culvert:	N - Not Applicable

APPRAISAL

67 Str. Evaluation:	2 - Intolerable - high priority of replacement
68 Deck Geometry:	5 - Somewhat better than minimum adequacy
69 Underclear Vert & Horiz:	N - Not applicable
71 Waterway Adequacy:	6 - Occasional Overtopping of Approaches
72 Approach Alignment:	4 - Meets minimum tolerable limits
36A Bridge Rail:	0 - DOES NOT MEET CURRENT SAFETY STANDARDS, OR IS NOT THERE AND IS NEEDED
36B Transition:	0 - DOES NOT MEET CURRENT SAFETY STANDARDS, OR IS NOT THERE AND IS NEEDED
36C Approach Rail:	0 - DOES NOT MEET CURRENT SAFETY STANDARDS, OR IS NOT THERE AND IS NEEDED
36D Approach Rail Ends:	0 - DOES NOT MEET CURRENT SAFETY STANDARDS, OR IS NOT THERE AND IS NEEDED
113 Scour Critical:	8 - Stable - Excellent Condition

LOAD RATING AND POSTING

31 Design Load:	0 - Unknown
63 Rating Method:	1 - Load Factor (LF) reported in english tons using HS-20 loading.
64 Operating Rating:	20.0 Tons
65 Rating Method:	1 - Load Factor (LF) reported in english tons using HS-20 loading.
66 Inventory Rating:	10.0 Tons
70 Posting:	0 - More than 39.9% below legal loads
41 Posting Status:	B - Open, Posting Required

AGE AND SERVICE

27 Year Built:	1920	Design No.:	0
106 Year Reconstructed:	0		
42A Type of Service on:	4 - Highway-railroad		
42B Type of Service Under:	5 - Waterway		
28A Lanes on:	2	28B Lanes under:	0
29 ADT:	1350	30 Year of ADT:	2003
109 Truck ADT:	0 %	Speed Limit:	25
19 Detour Length:	1 mi.		

CLASSIFICATION

112 NBIS Length:	Y
26 Functional Class:	17 - Urban - Collector
100 STRAHNET:	0 - Not a defense highway
101 Parallel Structure:	N - No parallel structure
102 Direction of Traffic:	2 - 2-way traffic
22 Owner:	04 - City or Municipal Highway Agency
21 Custodian:	04 - City or Municipal Highway Agency
37 Historical Significance:	5 - Not eligible
75A Type of Work Proposed:	31 - Replacement - Load/Geometry
75B Work Done by:	1 - Work to be done by contract

OPINION OF PROBABLE COSTS
BRIDGE 500160
N 1ST STREET OVER SOLDIER CREEK
CITY OF FORT DODGE
October 10, 2014

BRIDGE REPLACEMENT WITH A SINGLE SPAN 85' x 32' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE WITH A 10' TRAIL.

ALTERNATE NO. 1

ITEM NO.	DESCRIPTION	OPINION OF PROBABLE COST
1.	Removal of Existing Bridge	$ 40,000
2.	Removal of Approach Pavement	10,000
3.	Bridge Construction	530,000
4.	Approach P.C.C. Paving	71,000
5.	Revetment and Erosion Control	35,000
6.	Utility Reconstruction	150,000
7.	Traffic Control and Site Clean-up	9,000
8.	Mobilization	80,000
	Opinion of Probable Construction Cost:	$ 925,000
	Opinion of Design Engineering and Contingencies:	$ 185,000
	Total Opinion of Probable Project Cost:	$ 1,110,000

Engineer's opinions of probable Construction Cost are made on the basis of Engineer's experience and qualifications and represent Engineer's best judgment as an experienced and qualified professional generally familiar with the construction industry. However, since Engineer has no control over the cost of labor, materials, equipment, or services furnished by others, or over contractors' methods of determining prices, or over competitive bidding or market conditions, Engineer cannot and does not guarantee that proposals, bids, or actual Construction Cost will not vary from opinions of probable Construction Cost prepared by Engineer. Costs do not include field survey, bridge aesthetics, engineering services during construction, right-of-way, legal, administrative, environmental or wetland mitigation, utility relocations, and landscaping. The figures shown above should be adjusted to reflect changes in project concept, inflation from now to the year of construction, and/or changes in the currently acceptable bridge and/or grading design standards.

OPINION OF PROBABLE COSTS
BRIDGE 500160
N 1ST STREET OVER SOLDIER CREEK
CITY OF FORT DODGE
October 10, 2014

BRIDGE REPLACEMENT WITH A THREE SPAN 90' x 32' CONTINUOUS CONCRETE SLAB BRIDGE WITH A 10' TRAIL.

ALTERNATE NO. 2

ITEM NO.	DESCRIPTION	OPINION OF PROBABLE COST
1.	Removal of Existing Bridge	$ 40,000
2.	Removal of Approach Pavement	10,000
3.	Bridge Construction	490,000
4.	Approach P.C.C. Paving	71,000
5.	Revetment and Erosion Control	35,000
6.	Utility Reconstruction	170,000
7.	Traffic Control and Site Clean-up	9,000
8.	Mobilization	75,000
	Opinion of Probable Construction Cost:	$ 900,000
	Opinion of Design Engineering and Contingencies:	$ 180,000
	Total Opinion of Probable Project Cost:	$ 1,080,000

Engineer's opinions of probable Construction Cost are made on the basis of Engineer's experience and qualifications and represent Engineer's best judgment as an experienced and qualified professional generally familiar with the construction industry. However, since Engineer has no control over the cost of labor, materials, equipment, or services furnished by others, or over contractors' methods of determining prices, or over competitive bidding or market conditions, Engineer cannot and does not guarantee that proposals, bids, or actual Construction Cost will not vary from opinions of probable Construction Cost prepared by Engineer. Costs do not include field survey, bridge aesthetics, engineering services during construction, right-of-way, legal, administrative, environmental or wetland mitigation, utility relocations, and landscaping. The figures shown above should be adjusted to reflect changes in project concept, inflation from now to the year of construction, and/or changes in the currently acceptable bridge and/or grading design standards.