To: **Honorable President George and Village Council**

From: **Jeff Campbell**

Date: **6/16/23**

RE: **Riverside Bridge Cost Estimate**

In the summer of 2021, Council approved a proposal for repair work on Riverside Bridge. At that time, the Administration was instructed to go out to bid for the work. For whatever reason, the proposal did not go out to bid. On several occasions over the last six months, Council expressed its desire to move forward with this work. Since a significant amount of time has passed since the previous proposal was approved, the current Village Manager requested that HRC review the previous proposal. HRC then submitted a subsequent proposal with estimates that reflect increases related to the cost of materials and labor associated with the repairs to Riverside Bridge. The current proposal is significantly higher than the previous proposal. HRC will be present to explain the increases in the total project cost.

The Administration also requested HRC outline the individualized cost for each separate repair to the Bridge if the Council wishes to spread the cost out over a longer period of time. For your review and discussion are the current proposal and previous proposal.

HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

555 Hulet Drive
Bloomfield Hills, MI 48302-0360

248-454-6300

www.hrcengr.com

June 16, 2023

Village of Beverly Hills
18500 W. 13 Mile Rd.
Beverly Hills, MI 48025

Attn: Jeffrey Campbell, Village Manager

Re: Updated Draft Proposal for Design Engineering Services: Riverside Bridge Rehabilitation Project — HRC Job No. 20230111

Dear Mr. Campbell:

In accordance with your request, Hubbell, Roth and Clark, Inc. (HRC) is pleased to submit this budgetary proposal estimate for design engineering services of the Riverside Bridge Rehabilitation Project crossing the Rouge River in the Village of Beverly Hills. The scope for this bridge rehabilitation project is based on our April 9, 2021 onsite deck investigation, preliminary discussions with the Village, and experience with similar bridge rehabilitation projects.

PROJECT UNDERSTANDING:

A. Based on our onsite April 9, 2021 deck evaluation, HRC recommended the following prioritized repairs and would become part of this project:

   1. The deck delaminations, especially in the northeast and northwest quadrants, would be removed and repaired with a cementitious material.
   2. Crack repairs and spalls along the deck and approach pavement joints would be completed.
   3. Much of the upstream deck sidewalk would be replaced. Replacement of the sidewalk would start at about six inches from the face of barrier to the gutter line, full span length.
   4. Partial replacement of the downstream deck sidewalk would occur. Replacement of the sidewalk would start at the gutter line and end about two feet further downstream, full span length.
   5. The top coping surface of both bridge barrier railings has spalls and delaminations. Repair of these areas would occur as well.
   6. The post-tensioning grout pockets along both fascias contain spalls and efflorescence. Removal and replacement of the grout would occur.
   7. Removal of efflorescence noted between the underside of adjacent box beams would occur.

B. The bridge barrier railings are inlaid with a grouted sandstone façade. Extensive deterioration of the sandstone façade has occurred due to weathering and winter salt moisture. Based on recent Village discussions, repairs to the inlaid façade would be implemented and would consist of replacing the inlaid sandstone with form lined concrete of a similar pattern and color.

C. We understand the Village would like these repairs completed this construction season.

SCOPE OF SERVICES:

HRC will provide the following design engineering rehabilitation services:

Task 1 On-site investigation to determine the limits of repairs for the contract documents.
Task 2 Prepare contract plans and specifications. We will prepare these documents based on repair priorities and assign individual pay items. This approach will provide the most flexibility for the Village meeting, not exceeding their construction budget.
Task 3 Communicate with Village personnel throughout the design process, including status meetings.
Task 4 Provide the Village with 60% and 90% Owners Review set of documents.
Task 5 Prepare, submit, and obtain all necessary permit applications.
Task 6 Assist the Village through the advertising and bidding process.
Task 7 Evaluate bids, prepare bid tabulations, and make recommendations for the contract award.

CONSTRUCTION COST COMPARISON: SINGLE PROJECT VERSUS SEPARATE STAND-ALONE PROJECTS:

The repairs for this bridge can be completed with a single project or separate stand-alone projects. Several advantages of combining all the repairs as a single project, versus separate stand-alone projects, are as follows; construction cost savings results, responsibility for construction is with one company, equipment mobilization time and costs are minimized, and the shortest overall construction duration results. Single project construction costs versus separate stand-alone prioritized project cost comparison is as follows:

Preliminary Construction Costs (2023 dollars)

Single Project:		$400,000
Separate Stand-Alone Projects: (prioritized)		
1. Deck Delaminations	$84,000	
2. Deck and Approach Joint Repairs	$23,000	
3. Upstream Deck Sidewalk Replacement	$162,000	
4. Downstream Deck Sidewalk Replacement	$86,000	
5. Railing Coping Repairs	$27,000	
6. Post Tension Grout Pocket Repairs	$6,000	
7. Efflorescence Removal, Box Beam Underside	$3,000	
8. Bridge Barrier Stone Fascade Replacement	$123,000	
Totals	$514,000	$400,000

The repairs in the list above is prioritized to address the bridge's integrity as well as any public health and safety concerns first. Please note the construction cost savings for completing the repairs in a single project is about 22% as compared to separate stand-alone projects.

FEE OF SERVICES:

As noted above, combining the bridge repairs (Part A) with bridge barrier railing repairs (Part B) as a single project, we would anticipate the total construction cost to be approximately $400,000. Our bridge rehabilitation design fees typically average about 9% of the construction cost. Therefore, we would propose a bridge rehabilitation design fee cost, not to exceed without prior Village authorization, of $36,000.

Construction engineering and administration fees would vary greatly depending on the scope of the project selected. Our office can provide a proposal under separate cover once a scope of work is determined to best estimate the level of effort and anticipated budget for construction engineering services.

Our bridge rehabilitation design team would consist of Daniel Mitchell, P.E., President will be the Principal In-Charge, Bradley Shepler as Project Manager, Richard B. Nacey, P.E. Structural Department Head, Krista Schoonveld, P.E. Staff Structural Engineer and Jack Nagle, P.E. Project Civil Engineer. We believe you are familiar with all of these individuals but can provide detailed resumes upon request.

Please note this proposal is for the development of contract documents through award of project and excludes construction engineering, construction support and contract administration.

Thank you again for the opportunity to submit this proposal. If you have any questions or require any additional information, please contact the undersigned.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.

Bradley Shepler, P.E.
Senior Associate

RBN/ bws

pc: Village of Beverly Hills; Neil Johnston
HRC; D. Mitchell, J. Nagle, K. Schoonveld, File

HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

MAILING: PO Box 824
Bloomfield Hills, MI 48303-0824

SHIPPING: 555 Hulet Drive
Bloomfield Hills, MI 48302-0360

PHONE: 248-454-6300
WEBSITE: hrcengr.com

Memorandum

To: Brad Shepler, P.E.

From: Krista Schoonveld, P.E. and Rich Nacey, P.E.

Date: May 14, 2021

Subject: Village of Beverly Hills
Riverside Bridge Deck Investigation

HRC Job No. 20200667

As requested, on April 9, 2021, Rich Nacey and Krista Schoonveld completed the site investigation regarding the deterioration observed in the deck and sidewalk of the Riverside Bridge crossing over the Rouge River, just east of Evergreen Road. This bridge consists of 36" wide x 33" deep reinforced concrete box beams and a 6" reinforced concrete deck.

Site observations include reflective longitudinal cracking in the deck full span length, diagonal and some random deck cracking in each quadrant, as well as several transverse cracks mostly along the east approach joint, spalling and delamination of the concrete deck in the northeast and northwest quadrants, and some minor efflorescence between the adjacent box beam joints on the underside of the deck. Majority of efflorescence noted on the underside was noted along the second joint from the upstream facia beam below the sidewalk, along with some minor longitudinal cracking in the beams at this joint. Efflorescence and cracking were noted in the post-tensioning grout pockets.

Observations of Significance:

- Cracking, deterioration, and delamination of the deck noted in the northeast and northwest quadrants.
  - Northeast quad approximately 70 square feet
  - Northwest quad approximately 45 square feet
- Cracking located along the deck and approach joint was noted.
- Significant deterioration and delaminations noted in the upstream sidewalk. Totaling approximately 328 square feet.
- Deterioration and delamination noted along the deck joint of the downstream sidewalk. Totaling approximately 82 square feet.
- Efflorescence along the box beam underside below the upstream sidewalk.
- Cracking and spalling along the top of the concrete railing.
  - Upstream rail approximately 26 linear feet.
  - Downstream rail approximately 16 linear feet.
- Overall good condition of the underside of all box beams.
- Efflorescence and cracking in post-tensioned grout pockets.

Evaluation:

It appears that water has migrated under the concrete sidewalk along the sidewalk/deck joint and due to freeze-thaw cycles

has caused the concrete sidewalk surface to deteriorate, scale and delaminate from the deck. It appears that water has migrated under the concrete deck along the approach joints and due to freeze thaw cycles, has cause the concrete deck surface to delaminate from the box beams. It is our opinion that the deterioration is likely limited to the concrete deck and sidewalk and does not extend into the top flange of the box beam. The efflorescence noted along the box beam joints indicates the water is likely pooling under the sidewalk and deck and migrating through the box beam joints. The box beams were noted to be in good condition but if the water migration is not addressed, further deterioration of the box beams is expected.

Prioritized Recommendations (Higher to lower):

1. Replace cracked and delaminated concrete deck in the northeast and northwest quadrant along the approach joint. During removal operations the box beam top flanges should be evaluated.
2. Replace cracked and delaminated concrete sidewalks.
3. Hot-pour seal the sidewalk/deck joint and each approach joint.
4. Apply a silane-based penetrating sealant to all exposed surfaces of the concrete deck, sidewalk, and railing to seal all cracks.
5. Replace cracked and spalled concrete along top of bridge railing.
6. Replace deteriorated grout in post-tensioned pockets.
7. Above noted repairs should be combined into a bridge maintenance project.

The estimated cost of construction for these recommendations would be approximately $186,000.

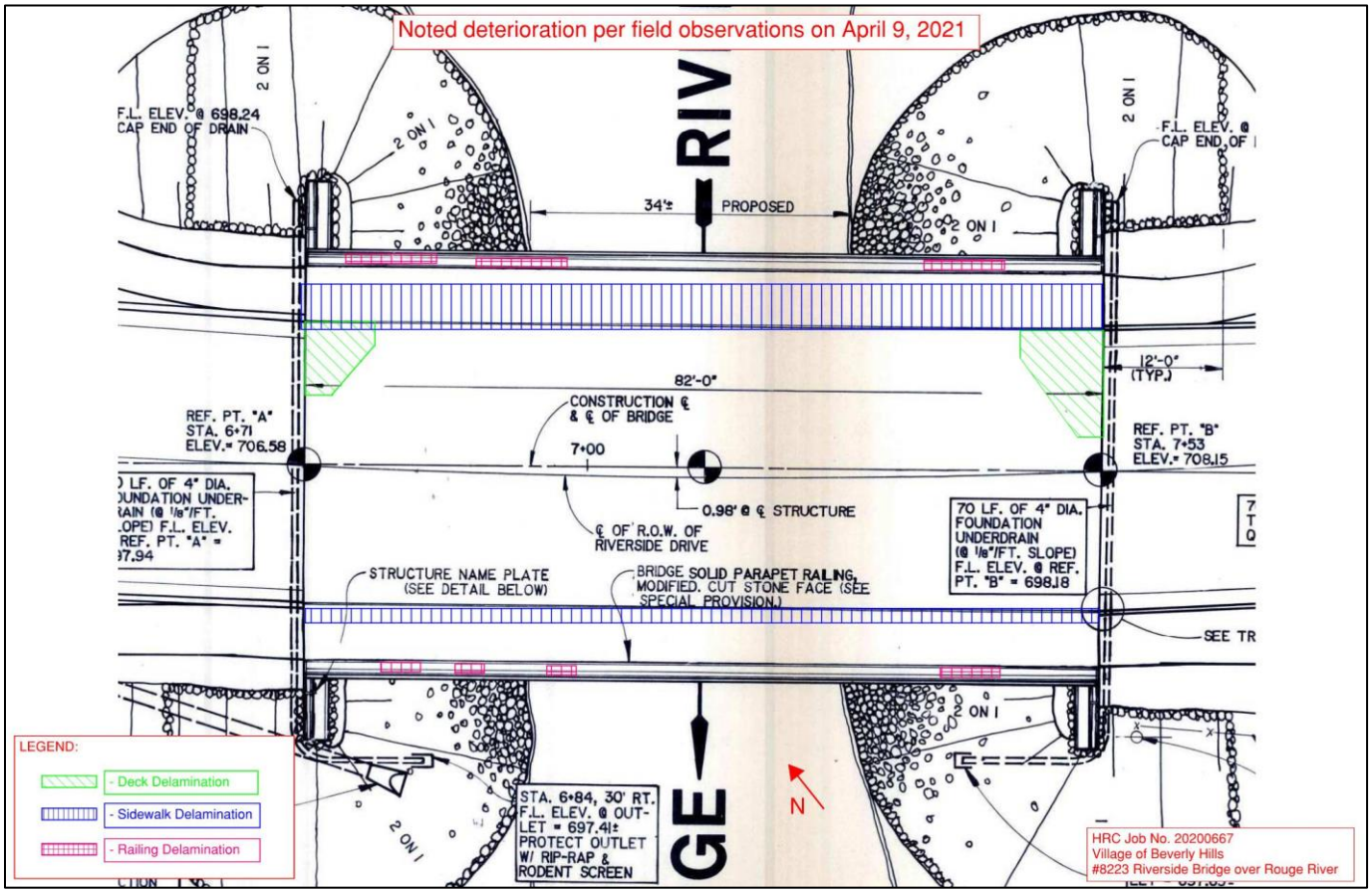

Figure 1: Locations of significant cracking and delamination of the deck, sidewalk and railing.

Photos of Significance:

Photo 1: Deck cracking, sidewalk deterioration, and railing spalls in Northwest quad.

Photo 2: Deck cracking and sidewalk deterioration in Northwest quad.

Photo 3: Sidewalk deterioration along deck joint.

Photo 4: Exposed reinforcement in sidewalk

Photo 5: Efflorescence and minor beam cracking 2nd joint from upstream fascia beam, below the sidewalk.

Photo 6: Efflorescence and cracking in post-tensioned grout pocket.

Hubbell, Roth Clark, Inc.
555 Hulet Drive, P.O. Box 824
Bloomfield Hills, Michigan 48303-0824
248.454.6300 | www.hrc-engr.com

HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

PURPOSE

Engineer's Preliminary Opinion of Probable Construction Cost

Owner:	City of Beverly Hills	Est. Date:	5/13/2021
Project:	2021 Routine Bridge Inspections	Project No.	2020667
Work:	8223 Riverside Bridge Repairs	Prepared By:	K. Schoonveld
		Checked By:	R. Nacey

Basis of Estimate:	Concept:	x	BOD:		Design:	
	Prelim:		Revised:		Final:	

Item No.	Prioritized Item			Quantity	Unit	Unit Price	Sub Total
1	Deck Delamination Repair			100	SF	$ 375.00	$ 37,500.00
2	Concrete Sidewalk Repair			410	SF	$ 175.00	$ 71,750.00
3	Hot Poured Joint Sealant			255	FT	$ 25.00	$ 6,375.00
5	Water Repellent Treatment, Penetrating			605	SY	$ 50.00	$ 30,250.00
4	Concrete Railing Repair			50	FT	$ 150.00	$ 7,500.00
6	Grout Pocket Repair			10	SF	$ 150.00	$ 1,500.00
					Construction Subtotal:		$ 154,875.00
	Mobilization	10%					$ 15,487.50
	Contingencies	10%					$ 15,487.50
						Subtotal:	$ 30,975.00
	Engineer's Preliminary Opinion of Probable Construction Cost:						$ 186,000.00

Engineer's Note: This estimate does not include design fees or project management fees. This estimate is for construction costs only. Estimate is based on 2021 dollars.