



THE CORPORATION OF THE TOWN OF AMHERSTBURG

OFFICE OF ENGINEERING AND PUBLIC WORKS

MISSION STATEMENT: Committed to delivering cost-effective and efficient services for the residents of the Town of Amherstburg with a view to improve and enhance their quality of life.

Table with 2 columns: Author's Name, Report Date, Author's Phone, Date to Council, Author's E-mail, Resolution #.

To: Mayor and Members of Town Council

Subject: Bridge 3008 – Project Update - Additional Funding Required

1. RECOMMENDATION:

It is recommended that:

- 1. An over-expenditure not to exceed \$410,897, including a \$125,000 contingency allowance and net HST, for Bridge 3008 - Long Marsh Drain at Concession 2 North for a total project cost not to exceed \$1,593,497 including net HST, BE APPROVED; and,
2. The Treasurer BE AUTHORIZED to transfer up to \$410,897 from the Reserve Fund - General to fund the project over-expenditure.

2. BACKGROUND:

On September 25, 2017 Council authorized an agreement with Front Construction to replace Bridge 3008 on the 2nd Concession over the Long Marsh Drain based on a Design/ Build methodology. Based on the Cultural Heritage Evaluation report the bridge was constructed in 1938.

3. DISCUSSION:

Since the agreement with Front Construction (the Contractor) was approved by Council in 2017 this project has experienced a number of hurdles that have caused delays to the project. Immediately after award, Administration was required by the Ministry of Heritage, Sport, Tourism and Culture (MTCS) to complete a number of heritage reports. This included the required Cultural Heritage Evaluation Report and subsequent Heritage Documentation Report. Once the project was cleared to do so by the MTCS it moved forward with the next step being environmental clearances.

This project required extensive consultation with many governmental agencies such as Department of Fisheries and Oceans (DFO), Ministry of Natural Resources and Forestry (MNR) and ERCA for environmental approvals. The project required the following permits:

- Species at Risk Permit (MNR)
- Permit of Species Protection and Recovery – Fish Salvage (MNR)
- ERCA Permit
- Species at Risk Permit (DFO)

The permits with respect to aquatic species at risk restrict when ‘in water’ work can be completed. No work can be completed between March 15 and July 15 that would potentially have a negative impact on fish habitats and spawning.

The ability to obtain these permits, especially the permit from the DFO continued to delay the start of the project. Once all the permits were obtained in 2019 it was too late in the year to commence the project. It was agreed that the contractor would close the bridge in early February 2020 to complete demolition. Their schedule had them completing the demolition and sheetpiling (in water work) before the March 15 deadline, allowing for the bridge construction to continue during the restricted time of March 15 - July 15. The first process of demolition was to remove the asphalt pavement. The additional delays that resulted from the demolition are described below. At around the same time that the project ran into the demolition issue the project also ran into an issue with existing underground utilities. This is also detailed further in the report.

### **Demolition Issues**

The Contractor commenced demolition of the bridge structure in early February 2020. The first step in the process of bridge demolition was to remove the asphalt surface to expose the concrete deck. Once the deck was exposed it became apparent that the bridge structure was extremely compromised. There were several areas where portions of the concrete bridge deck peeled up with the asphalt, exposing rebar which indicates the top portion of the concrete was completely removed.



The asphalt removal also left sizable holes in the bridge deck. Considering this would have been a 225mm concrete slab the fact that a hole this large was present indicates the level of deterioration that was present.



On January 2, 2017 Stantec completed a structural review of the structure that recommended load restrictions as well as structural review every 6 months to ensure no further deterioration. This bridge had not received any documented rehabilitation in its lifetime and had been allowed to deteriorate to the point where the engineer was not confident it could support its own weight. The photo below shows the dilapidated condition the bridge was in prior to demolition starting, including the visible deterioration of arches and rails. Stantec's report was not included with the RFP issued in March 2017; however it did not identify the extensive level of deterioration later found after asphalt removal and through more invasive investigation that followed.



The severe deterioration of the bridge deck and beams affected the method the Contractor used to demolish the entire bridge. The Contractor's engineer has advised that the process for demolition of the bridge anticipated in their proposal was to strip the asphalt surface then remove the deck in large pieces using an excavator. Once the deck was removed the contractor would cut and remove the beams and finally lift the arches in one piece to be demolished on the ground.

Once it was known that the deck was severely compromised the Contractor's engineer (Haddad Morgan) requested that small holes be cut in the deck so that the beams could be seen. The beams displayed longitudinal cracking indicative of reinforcement rusting and bond failure. At this time the engineer recommended that no equipment be placed on the bridge (see attached letter from Haddad Morgan). The potential for complete collapse was very possible based on the condition of the deck and supporting beams. The engineer recommended that two steel trusses be built and clamps installed to support the beams during demolition for the safety of the workers and to avoid environmental impacts that would have resulted if portions of the bridge fell into the Long Marsh Drain.



Unable to use their excavator to remove the pieces due to the equipment restriction, the Contractor used a crane to remove all of the bridge pieces, adding significant unforeseen crane rental costs. The pieces of the deck and beams that were removed also needed to be cut significantly smaller than originally planned to ensure their integrity. The need for smaller pieces increased the costs related to crane rental time as well as concrete cutting both in labour hours as well as consumables (blades / fuel etc.). Even the large arches had to be sawcut and removed in pieces due to their condition. This added approximately 4 days of additional cost for the sawcutting, crane rental and labour.



As noted above, the extent of deterioration of the bridge deck and beam was revealed via asphalt removal, which rendered the bridge unusable and impacted the demolition methodology and costs of the Contractor. The additional costs related to the demolition are \$181,056.20 plus applicable taxes. The main costs related to this are the additional sawcutting, crane rental, steel truss manufacturing and installation as well as additional time for the Contractor to secure the structure for demolition.

### **Bridge Redesign Due to Utilities**

The Contractor's original bridge design was completed based on locates that were obtained via the Ontario One Call system. In early 2020 the contractor used hydro-excavation to determine the exact location of the Enbridge gas line and municipal sanitary forcemain. The gas line is located on the west side of the bridge and when it was located it was found to be further east than originally shown. With the sanitary forcemain being located on the east side of the bridge there was no opportunity to shift the bridge easterly. Any shifting of the bridge alignment would also have resulted in increased costs to relocate the road to suit the new horizontal alignment. At that time it was agreed between the Contractor and Administration that the best course of action to move forward would be to adjust the size of the bridge structure to suit the conflicting utilities. The bridge would be slightly narrower but would still be able to maintain width required for safe vehicle and bicycle traffic. This decision was made based on the assumption that the reduced size would lead to some potential cost savings with the goal of being cost neutral and the potential to receive a credit. What Administration did not anticipate was that the concrete girder supplier would take the opportunity to increase the price of his supply by 35% even though the order size was reduced by 11%. After some discussion and negotiation, they would go no lower than a 25% increase which Administration felt was unjust. At that time Administration worked with Front Construction to cost out other options, including utilizing steel beams in lieu of concrete girders. Although the pricing for this is still higher than the original costs it is lower than the other cost option when compared directly and can be completed in 2020. This design change will result in an additional cost of \$79,441 plus applicable taxes.

### **Contract Language**

Both of the additional costs noted above are not within the Contractor's design-build proposal. The following agreement between the Town and the Contractor for this project includes the following provisions to address unknown conditions:

#### *Section GC 6.4 – Concealed or Unknown Conditions*

- 6.4.1 If the Owner or the Design-Builder discovers conditions at the Place of the Work which are:
- .1 subsurface or otherwise concealed physical conditions which existed before the commencement of the Contract and which differ materially from those indicated in the Contract Documents; or
  - .2 physical conditions, other than conditions due to weather, that are of a nature which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents,
- then the observing party shall give Notice in Writing to the other party of such conditions before they are disturbed and in no event later than 5 Working Days after first observance of the conditions.

- 6.4.2 The Owner will promptly investigate such conditions. If the conditions differ materially from the Contract Documents and this would cause an increase or decrease in the Design-Builder's cost or time to perform the Design Services or the Work, the Owner will issue appropriate instructions for a change in the Contract as provided in GC 6.2 – CHANGE ORDER or GC 6.3 – CHANGE DIRECTIVE.
- 6.4.3 If the Owner is of the opinion that the conditions at the Place of the Work are not materially different or that no change in the Contract Price or the Contract Time is justified, the Owner will advise the Design-Builder in writing of the grounds on which this opinion is based.
- 6.4.4 The Design-Builder shall not be entitled to an adjustment in the Contract Price or the Contract Time if such conditions were reasonably apparent during the request for proposal period or bidding period and prior to proposal closing or bid closing.

Both situations documented above would fall under this section. Administration concurs that the conditions differ materially from the Contract documents and are eligible for an increase in costs for the Contractor.

#### 4. **RISK ANALYSIS:**

Not approving the additional funding for this project will result in the project not being completed and the bridge remaining closed. There is also a potential for legal action from the contractor for lost profit based on the signed agreement with the Town.

#### 5. **FINANCIAL MATTERS:**

Based on the additional cost considerations outlined above, the estimated financial impact of this project is as follows:

Capital Project: Bridge 3008 Replacement	Budget	Actual (incl. net HST)	Variance (over)/under
<b>Project Cost:</b>			
Engineering – Peer Review	\$ 20,000	\$ 20,352	
Construction – Tender Pricing	1,162,600	1,183,062	
<b>Subtotal - Project Cost (1)</b>	<b>\$1,182,600</b>	<b>\$1,203,414</b>	<b>(\$ 20,814)</b>
<b>Additional Costs:</b>			
Demolition		\$ 184,243	
Structure Redesign		80,840	
Contingency (2)		125,000	
<b>Subtotal - Additional Cost</b>	<b>\$ -</b>	<b>\$ 390,083</b>	<b>(\$ 390,083)</b>
<b>Total Project Cost</b>	<b>\$1,182,600</b>	<b>\$1,593,497</b>	<b>(\$ 410,897)</b>
<b>Project Funding:</b>			
Grant Revenue (OCIF)	\$ 882,600	\$ 882,600	\$ -
Federal Gas Tax	100,000	100,000	-
Transfer from Reserve Fund(General) (3)	200,000	610,897	(\$410,897)
<b>Total Project Funding</b>	<b>\$1,182,600</b>	<b>\$1,593,497</b>	<b>(\$ 410,897)</b>

Notes:

1. Council authorized an agreement with Front Construction on September 25, 2017 for \$1,162,600 plus applicable taxes. The 2020 Budget request included project cost including construction and consulting (engineering peer review), but did not include the non-recoverable taxes on that cost, in error, resulting in a shortfall of \$20,814.
2. The Design-build contract with the Contractor does not include a contingency allowance. Administration recommends that the Town provide for a contingency allowance to fund any further unforeseen costs that the Town would be obligated to pay for under the agreement with the Contractor. A contingency allowance of \$125,000 including net taxes is recommended.
3. The 2020 Budget includes Reserve Fund - General allocations for Culvert No. 59 replacement (\$310,000) and design engineering for Bridge 3012 (\$400,000). The Culvert No. 59 project has been deferred as it required significant design changes after the 2020 budget was formulated, resulting in tender submissions at costs much higher than the 2020 Budget estimate. The Bridge 3012 project has recently been approved for grant funding, which has reduced the funding obligations of the Town, and the later project start has reduced the estimated cost to be incurred in 2020. An increased transfer of \$67,808 from Reserve Fund – General for Culvert No. 3 was approved at the September 14, 2020 Council meeting and the balance leaves sufficient funds to accommodate an additional transfer to fund the over-expenditures of up to \$410,897 for the Bridge 3008 project in 2020. However, it is important to note that use of the reserve for this purpose will require that additional funds be levied for the Culvert No. 59 and Bridge 3012 projects in future budgets.

6. **CONSULTATIONS:**

Front Construction was consulted with respect to the values of the additional works.

The CAO, Director of Corporate Services and Treasurer were consulted on this report.

7. **CONCLUSION:**

Administration is recommending that Council approve the additional funding for Bridge 3008.



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Todd Hewitt

**Manager of Engineering**

## Report Approval Details

Document Title:	2020 09 28 - Bridge 3008 - Project Update and Additional Funding Request.docx
Attachments:	- Letter from Haddad Morgan - Demolition Protocol Modification.pdf - Signed 2nd Conc Agreement w CCDC.pdf
Final Approval Date:	Sep 23, 2020

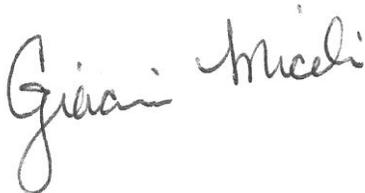
This report and all of its attachments were approved and signed as outlined below:



Antonietta Giofu



Cheryl Horrobin



John Miceli



Task assigned to Paula Parker was completed by assistant Tammy Fowkes