# STAFF REPORT TO COUNCIL

From: Geoff Goodall, Director of Infrastructure Services
Meeting Date: March 4, 2019
File No: 5400-02
**RE: 4Th Avenue, Rocky Creek – Culvert Option**

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**RECOMMENDATION:**

That Council:

1) Direct staff to tender a pipe arch culvert for the 4th Avenue, Rocky Creek crossing;
2) Direct staff not to include the acquisition of the pipe arch in the tender, and to purchase the pipe arch directly after obtaining a minimum of two competitive quotes; and
3) Waive the purchasing policy for item 2 above.

**PURPOSE:**

The purpose of this report is to seek Council authorization to tender the 4th Avenue, Rocky Creek crossing utilizing a pipe arch.

**PREVIOUS COUNCIL DIRECTION**

CS 2018-331
That Council:

1. Cancel tender 2018-IS-05 (4th Avenue Rocky Creek Culvert) due to insufficient budget and notify the three proponents;
2. Direct staff to revise and re-budget the Rocky Creek Culvert project in the 2019 - 2023 Financial Plan, with work to take place in 2019;
3. Direct staff to proceed with the interim measure of hardening the existing crossing (option 3 in the staff report from the Director of Infrastructure Services dated September 7, 2018) and constructing emergency access routes through Churchill Place and the forestry service road at the end of 4th Avenue;

**INTRODUCTION/BACKGROUND:**

In late winter/early spring the Town experienced two large storm events that resulted in creek flows that exceeded the capacity of the existing Culvert on Rocky Creek at 4th Avenue. As a result of these storms, portions of 4th Avenue were compromised and the travel surface was reduced to a single lane. Following the storms an assessment of the culvert was completed and it was found to be failing.

In 2018 Herold Engineering completed a review of three options to replace the crossing: a steel arch culvert, a concrete box culvert and a precast concrete bridge. Although the precast concrete bridge was considered the most expensive option, it provided a significant advantage at the time due to the short fish window for construction. Both other options would require significant periods of construction within the wetted perimeter of the stream, work that could only be completed during a fish window. The timing of construction put this work at risk as the fish window was very short. Based on this information and the technical advantages, the bridge was determined to be the most prudent choice.

The Town tendered the 4th Avenue Bridge at Rocky Creek and the tender closed on August 23, 2018. The Town received three tenders, the lowest of which was found to be non-compliant, which resulted in the lowest tender being for $1,257,615.45.

The lowest compliant bid was significantly more than the Town's budget and as a result Council elected to cancel the tender, harden the crossing and retender in 2019.

Construction of the new crossing in 2019 will have a longer construction and fish window as the project can be started earlier. This expanded construction window opens up additional options other than a precast bridge. With this in mind staff, requested that Herold Engineering review the options for the crossing.

Three options were considered in this review: a precast concrete box culvert, a cast-in-place box culvert and steel arch culverts.

- The precast box culvert was found to be impractical due to the limited size availability.

- The costing of the cast-in-place box culvert was approaching that of the bridge but provided lower technical performance; in addition the significant amount of concrete work in the stream channel increased the environmental risks. For these reasons this option was not studied further.

- The steel arch culvert was found to be feasible and considerably less expensive than a bridge. The main disadvantage of the arch culvert is that the arch shape impacts the hydraulic opening that is available to pass debris, decreasing as flow increases and thereby increasing the risk of debris accumulation and potential blocking of the culvert. The town currently has this type of structure on Rocky Creek above the 4$^{th}$ Avenue crossing and has not had any significant issues with debris. It is felt that staff can mitigate the increased risk with more monitoring.

Based on the potential significant cost savings and the experience with the existing arch culvert on Rocky Creek staff recommend that Council proceed to tender with a steel arch Culvert for the 4$^{th}$ Ave. at Rocky Creek crossing.

Due to the lead time required for the manufacture and delivery of these pipe arches, the Town's engineer has recommended that we purchase the pipe arch directly prior to issuing the construction tender. This approach will permit the project to be completed within the original timelines and in compliance with the fisheries window.

**ALTERNATIVES:**

1. Council can choose to go to tender with a precast concrete bridge. A bridge has technical advantages over the steel arch culvert; these advantages, however, come with a significant increase in cost. If Council chooses this option they will need to increase the budget for this project.
2. Council could consider going to tender with both a bridge and steel arch culvert and then compare the costs. This option will require the tender to clearly state that the lowest costing option would be the objective, which would likely result in no bridge tenders being submitted, as bidders will know that the bridge will be a more costly option. The preparation of tenders by contractors is expensive and unless they feel that their tender has a chance for success they would be unlikely to tender.

**FINANCIAL IMPLICATIONS;**

The current 2019 financial plan has a budget for this project of $750,000. Based on the current engineering estimates for the steel arch culvert this should be sufficient budget for this project, including engineer costs.

**LEGAL IMPLICATIONS;**

Staff has no knowledge of any legal implications.

**CITIZEN/PUBLIC RELATIONS IMPLICATIONS:**

N/A

**INTERDEPARTMENTAL INVOLVEMENT/IMPLICATIONS:**

Infrastructure Services oversees the project; Financial Services manages the budget, and Corporate Services is responsible for ensuring the tendering process is adhered to.

**ALIGNMENT WITH SUSTAINABILITY VISIONING REPORT:**

☐Complete Community Land Use
☐ Low Impact Transportation
☐Green Buildings
☐ Multi-Use Landscapes
☒Innovative Infrastructure
☐ Local Food Systems
☐Healthy Community
☐ Local, Diverse Economy
☐ Not Applicable

**ALIGNMENT WITH STRATEGIC PRIORITIES:**

☐Employment & Tax Diversity
☒ Natural & Built Infrastructure
☐Watershed Protection & Water Management
☐ Partnerships

☐Communications & Engagement ☐ Not Applicable

**SUMMARY:**

The culvert on Rocky Creek at 4th Avenue is failing. The project was tendered in 2018 utilizing a precast steel bridge. The tender was significantly over budget and was cancelled. Staff performed hardening procedures on the crossing to carry the crossing through the winter period. Since the construction window for this project will not be contrained by late tendering, it is possible to consider additional options for the crossing. Based on a Herold Engineering report it was found that a steel arch culvert is feasible and will provide significant cost saving to the project. Staff is recommending that Council tender a steel arch culvert for this crossing.

February 27, 2019

Geoff Goodall, Director of Infrastructure Services

I concur with the recommendation.

Guillermo Ferrero, City Manager