Municipality of Chatham-Kent

Infrastructure and Engineering Services

Engineering and Transportation Division

To: Mayor and Members of Council

From: Eric Gerrard, P.Eng.
Engineering Technologist

Date: August 31, 2022

Subject: Tender Award: Contract T22-294 – McLarty Line over Fields Creek Drain Culvert Replacement, Community of Howard

---

Recommendations

It is recommended that:

1. The tender in the amount of $242,950.00 (including HST) for the work associated with Contract T22-294 – McLarty Line over Fields Creek Drain Culvert Replacement, Community of Howard, be awarded to Clarke Construction Inc. from Blenheim, Ontario.

2. The Mayor and Clerk be authorized to enter into the recommended agreements.

Background

The McLarty Line culvert over the Fields Creek Drain was built in 1965, has a west-east orientation, and is located on McLarty Line approximately 1.3 km east of Victoria Road in the Community of Howard. This concrete culvert carries 2 granular surfaced lanes of predominantly vehicular traffic across the Fields Creek Drain with an existing span of 1.8 m and a total length of 10.1 m. The roadway has a travel width of 6.6 m. Although records state this culvert was estimated to be constructed in 1965, it is likely that this structure is older than indicated.

With an Average Annual Daily Traffic volume (AADT) of approximately 200, the crossing is lightly used with truck volumes accounting for approximately 10 percent of the total traffic. The posted speed limit at the culvert location is 80 km/hr.

Bi-annual inspections are required on structures with spans exceeding 3.0 m and are conducted by the Municipality of Chatham-Kent (as legislated under the *Public Transportation and Highway Improvement Act*) to continually monitor the condition of the structures and to ensure public safety. Regardless of the span length being less than 3.0 m, this structure is included in the inspection program to monitor its condition.

The McLarty Line structure was identified through the 20-year bridge asset management plan as a candidate for potential repairs based on the observed condition.

In June 2020, the McLarty Line structure was initially inspected by Chatham-Kent Engineering staff and was noted as having the following issues:

- Isolated severe to very severe delamination of the underside of concrete deck, most likely resulting is loss of strength. Also causes an overhead safety concern.
- Isolated severe to very severe spalling on the interior surfaces of the culvert barrel.
- Severe to very severe corrosion of exposed reinforcing steel.
- Severe to very severe movement cracking of the culvert end walls and fascia, potentially resulting in loss of strength.
- Severe deterioration and settlement of the retaining walls, consisting of non-standard “concrete bag” configuration.
- Combination of cracking throughout the structure.
- Severe concrete scaling throughout the structure.
- Efflorescence and wet areas that will likely develop into further deterioration of the culvert ends interior barrel surfaces.
- Exposed concrete footings.
- Moisture penetration and leakage.
- Unprotected drop-off in close proximity to road edge.

Additional subsequent inspections have been performed to monitor the condition prior to construction to utilize the remaining lifecycle of the structure and prioritize with other construction projects.

Figure 1. McLarty Line over Fields Creek Drain – South Culvert End, showing structural movement cracking on culvert end wall and fascia, and deteriorated state on “concrete bag” retaining walls

Figure 2. McLarty Line over Fields Creek Drain – North Culvert End, showing structural movement cracking on culvert end wall and fascia, and settlement “concrete bag” retaining walls.

Figure 3. McLarty Line over Fields Creek Drain – Interior Culvert Surfaces, showing severe delamination and spalling with exposed corroded rebar, as well as an observed Barn Swallow nest

Comments

This contract consists of the following work:

- Installation of bird netting and Species at Risk (SAR) Barn Swallow nesting structure prior to construction.
- Installation of site isolation and drain bypass.
- Excavation and removal of the existing concrete culvert including footings.
- Supply and installation of new 2.7 m diameter polymer coated corrugated steel pipe culvert.
- Supply, installation, and compaction of new granular backfill and road base.
- Supply and installation of new rip-rap slope protection at each culvert end.

Bell Canada has existing utilities at this site that are located within the shoulder of the road and pass over the existing structure, and require relocation onto new utility poles adjacent to the site. The installation of the utility poles, and the relocation of the Bell utilities, will be completed prior to construction and are not included in this contract.

This structure replacement will provide approximately 50 to 75 years of service.

Innovation

Multiple structure type options were considered for the replacement structure, including steel and concrete options. Quotes were obtained for both precast concrete box culvert sections, as well as polymer coated corrugated steel pipe (CSP) options. Due to the fact that the costs for the precast concrete box culvert exceeded the costs of the steel pipe, the relatively low AADT, and the site has sufficient cover over the culvert to allow the installation of a CSP, the CSP pipe option was chosen.

CSP’s are offered with three main protective material properties (galvanized, aluminized, polymer coated). Of the three steel pipe options, the polymer coating provides the best protection against corrosion of the steel, which is typically the main source of deterioration in CSP culverts. The polymer coated CSP was selected due to the added durability and increased lifespan that is recognized in the industry.

The overall length of the CSP replacement is longer/wider than the existing concrete culvert in order to provide additional road width, and eliminate the need for guiderails to be installed. According to the Roadside Safety Manual, if adequate width is provided, often referred to as the clear zone, then the need for guiderails can be eliminated. The elimination of guiderails provides immediate and future lifecycle cost savings, and provides more functionality to the surrounding farming community.

In order to save on consulting engineering costs, this project was designed and managed internally by Chatham-Kent Engineering staff. As part of the design process, it was determined that the Bell utilities were in conflict with the CSP replacement, and relocation is required. The relocation is being completed in advance of construction to avoid additional construction costs, mitigate delays, and expedite the construction schedule.

As part of the environmental review requirements, Chatham-Kent Engineering staff performed a site assessment and desktop study to determine any potential species that may be adversely affected by the scope of the project. Species at Risk (SAR) Eastern Foxsnake have potential habitat within the site, and a SAR Barn Swallow nest was present in the existing concrete culvert. Proper mitigation measures have been incorporated into the contract to accommodate for SAR Eastern Foxsnake and SAR Barn Swallows.

This tender allows the bidders to choose their preferred construction schedule within a two (2) year window. This method has been implemented to allow the contractor additional flexibility when scheduling the work. Due to this flexibility, Chatham-Kent receives a larger number of bidders and more competitive prices. However, once mobilized to site the Contractor must complete the contract within the allocated working days.

The Tender was published on July 27, 2022, and the Purchasing Officer received the digitally submitted tenders for the work on August 31, 2022. The following table summarizes the bids received.

The tender bid results are as follows:

Bidder	**Location**	**Bid (including HST)**
Clarke Construction Inc.	**Blenheim, ON**	**$ 242,950.00**
South Shore Contracting of Essex County Inc.	Amherstburg, ON	$ 275,844.30
Murray Mills Excavating & Trucking (Sarnia) Ltd.	Sarnia, ON	$ 280,177.29
Henry Heyink Construction Ltd.	Chatham, ON	$ 284,765.65
Birnam Excavating Ltd.	Arkona, ON	$ 288,793.76
2220742 Ontario Ltd o/a Bronte Construction	Burlington, ON	$ 422,755.60

Per the terms of the tender, work may commence after tender award with a total completion date of November 29, 2024. The road will be closed for the duration of construction and a detour will be in place.

The lowest tender bid submitted by Clarke Construction Inc. was within the budget estimate.

Areas of Strategic Focus and Critical Success Factors

The recommendations in this report support the following areas of strategic focus:

☐ Economic Prosperity:
Chatham-Kent is an innovative and thriving community with a diversified economy

☐ A Healthy and Safe Community:
Chatham-Kent is a healthy and safe community with sustainable population growth

☐ People and Culture:
Chatham-Kent is recognized as a culturally vibrant, dynamic, and creative community

☐ Environmental Sustainability:
Chatham-Kent is a community that is environmentally sustainable and promotes stewardship of our natural resources

The recommendations in this report support the following critical success factors:

☐ Financial Sustainability:
The Corporation of the Municipality of Chatham-Kent is financially sustainable

☐ Open, Transparent and Effective Governance:

The Corporation of the Municipality of Chatham-Kent is open, transparent and effectively governed with efficient and bold, visionary leadership

☐ Has the potential to support all areas of strategic focus & critical success factors

☐ Neutral issues (does not support negatively or positively)

Consultation

The Tenders were opened by the Purchasing Officer and reviewed by Chatham-Kent's Engineering and Transportation Division.

Financial Implications

Project fees associated with this contract will be funded as summarized in the following table:

Financial Implications
McLarty Line over Fields Creek Drain Culvert Replacement
Project Costs

Recommended Tender [A] (Including HST)	$ 242,950.00
Less HST Rebate 11.24%	- $ 24,166.00
Total Current Project Costs	**$ 218,784.00**
Total Current Project Funding	**$ 218,784.00**

Note A: A species at risk mitigation work allowance is carried in this contract as a total of $3,000. A material testing allowance is carried in this contract as a total of $7,500. Contingency is carried in this contract as a total of $50,000. These amounts are accounted for in the recommended tender.

- The species at risk mitigation allowance may or may not be expended and is recommended to cover the expenses required to identify, protect, and relocate any species at risk encountered during the course of the project.

- Contingency allowance may or may not be expended and is recommended to address any unforeseen issues which present during the course of the project and are not covered by the contract specifications.

- Materials Testing and Inspection allowance may or may not be fully expended and is recommended to test and inspect construction materials for compliance with the contract specifications during the course of the project.

All engineering development, including design and project management, was completed internally by Chatham-Kent Engineering staff. No external consulting engineering fees were required for the design of this project.

The total current project costs listed above will be funded from the Minor Culverts Lifecycle Reserve, which includes funds under the Association of Municipalities of Ontario (AMO) Federal Transfers of Canada Community-Building Fund (CCBF).

Prepared by:

Eric Gerrard P.Eng. Engineering Technologist, Engineering and Transportation

Reviewed by:

Brendan Falkner P.Eng. Manager, Engineering, Engineering and Transportation

Chris Thibert P.Eng. Director, Engineering, Engineering and Transportation

Ryan Brown P.Eng. Acting General Manager, Infrastructure and Engineering Services

Consulted and confirmed the content of the consultation section of the report by:

Jennifer Scherle, Manager, Purchasing and Accounts Payable

Attachment(s):

No attachments included