

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: June 29, 2020

Subject: Tender Award: Contract T19-407 Union Line over Pollock Drain
and Pioneer Line over Forsyth Drain Culvert Rehabilitations,
Community of Chatham Township

Recommendations

It is recommended that:

1. The tender in the amount of \$448,610.00 (including HST) for the work associated with contract T19-407; the rehabilitation of Union Line over Pollock Drain and Pioneer Line over Forsyth Drain culverts in the Community of Chatham Township, be awarded to Clarke Construction Inc. of Blenheim, Ontario.
2. The Mayor and Clerk be authorized to enter into the recommended agreements.

Background

The Union Line culvert was built in 1960, has an east-west orientation, and is located on Union Line 1.3 km east of St. Clair Road. This concrete culvert carries two lanes of predominantly vehicular traffic across the Pollock Drain, with a span length of 1.8 m and a maximum clearance of approximately 1.8 m. The road has a travelled width of 6.7 m and an overall structure length of 17.5 m.

Union Line has an Average Annual Daily Traffic volume (AADT) of 400 and the speed limit at this location is 80 km/hr.

The Pioneer Line culvert was built in 1961, has an east-west orientation, and is located on Pioneer Line 1.5 km west of Centre Side Road. This concrete culvert carries two lanes of predominantly vehicular traffic across the Forsyth Drain, with a span length of 3.6m and a maximum clearance of approximately 1.7 m. The road has a travelled width of 6.5 m and an overall structure length of 14.5 m.

Pioneer Line has an Average Annual Daily Traffic volume (AADT) of 300 and the speed limit at this location is 60 km/hr.

Bi-annual inspections have been 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. All structures form part of the comprehensive 20 Year Plan managed by the Engineering and Transportation Division.

As per the July 2018 inspection completed by Chatham-Kent Engineering staff, the Union Line culvert over the Pollock Drain was documented as having:

- Severe spalling with exposed rebar, and deterioration of the concrete culvert ends. The south end of the culvert has deteriorated and has encroached on the south edge of the road.
- Cracking and moisture penetration through the concrete deck slab.
- Erosion at each end of the structure.



Figure 1. Union Line over Pollock Drain – South Culvert End



Figure 2. Union Line over Pollock Drain – South Culvert End Deterioration with Exposed Rebar

As per the July 2018 inspection completed by Chatham-Kent Engineering staff, the Pioneer Line culvert over the Forsyth Drain was documented as having:

- Severe spalling with exposed rebar, and deterioration of the concrete culvert ends. The north end is exhibiting worse deterioration than the south end.
- Cracking with efflorescence noted on the exterior surface of the south retaining wall at the corners of the culvert.
- Isolated delamination of the underside of deck with heavy efflorescence.
- Cracking and moisture penetration through the concrete deck slab.
- Erosion at each end of the structure.



Figure 3. Pioneer Line over Forsyth Drain – North Culvert End Concrete Deterioration



Figure 4. Pioneer Line over Forsyth Drain – South Retaining Wall with Cracking and Efflorescence

Comments

This contract consists of the following work at the Union Line over Pollock Drain site:

- Removal of the existing concrete culvert ends.
- Supply and installation of new precast concrete culvert ends, including new footings.
- Supply, installation, and compaction of new granular backfill and road base.
- Supply and installation of new waterproofing membranes
- Supply and placement of new asphalt road surface.
- Supply and installation of new roadside drainage pipes.
- Supply and installation of new rip-rap slope protection at each culvert end.

This rehabilitation will provide approximately 40 years of service.

This contract consists of the following work at the Pioneer Line over Forsyth Drain site:

- Removal of the existing north concrete culvert end.
- Supply and installation of new precast concrete culvert end, including new footings.
- Shallow depth concrete removal and patch repairs of the culvert and retaining walls.
- Supply and install new concrete curb extension to existing south retaining wall.
- Supply and installation of new waterproofing membranes
- Supply, installation, and compaction of new granular backfill and road surface.
- Supply and installation of new rip-rap slope protection at each culvert end.

This rehabilitation will provide approximately 40 years of service.

Innovation

These two (2) culverts were combined into a single tender in order to gain additional savings in mobilization, demobilization, and better pricing due to a larger volume of items. The location and scope of rehabilitation for each of these culverts was similar, therefore, a combined contract was favourable.

Allowing a two (2) year window to complete the work remains to be a valuable, innovative tool that continues to provide competitively priced bids.

The replacement design for the culverts in the tender allowed for either a precast concrete structure or a cast-in-place concrete structure. This option allows contractors the option to source the precast components and do the installation; or supply and install the formwork and reinforcing steel and cast the concrete in place. This flexibility will leverage the most economical option with the same long-term durability.

A Corrugated Steel Pipe (CSP) solution was not considered as the majority of the existing concrete culvert is still in good condition, and did not warrant a full replacement. Furthermore, use of CSP at these locations would have required demolition works, additional fill over the structure for support that in turn would have led to road modifications and additional costs. Therefore, the recommended rehabilitation is the most competitive solution.

This tender was let on June 5, 2020 and the Purchasing Officer received the digitally submitted tenders on June 25, 2020.

The tender results for are as follows:

<u>Bidder</u>	<u>Location</u>	<u>Bid (including HST)</u>
Clarke Construction Inc.	Blenheim, ON	\$448,610.00
Nevan Construction Inc.	Kingsville, ON	\$495,115.15
Sterling Ridge Infrastructure Inc.	LaSalle, ON	\$547,937.00

Per the terms of the tendered contract, work may commence any time after Council Award with a total contract completion date of November 26, 2021.

The low tender bid is approximately 10% lower than the engineer's market estimate due to synergies gained by bundling of work and allowing for the flexibility to complete the work over a two year period.

The roadway at each of these culverts will be closed to traffic for the duration of the respective culvert rehabilitations, estimated to be approximately 5 weeks for each site. A detour will be provided for the duration of the Union Line culvert rehabilitation comprising of: St. Clair Road, Cedar Hedge Line, and Prince Albert Road. A detour will be provided for the duration of the Pioneer Line culvert rehabilitation comprising of: Caledonia Road, Gregory Line, and Centre Side Road.

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 received by the Purchasing Officer and reviewed by the Engineering and Transportation Division.

Financial Implications

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

Financial Implications
Union Line over Pollock Drain and Pioneer Line over Forsyth Drain Culvert Rehabilitations
Project Costs

Total Recommended Tender (A + B)	\$ 448,610.00
Minor Culverts Lifecycle	
(A) 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
Bridge Lifecycle	
(B) Recommended Tender ^A (Including HST)	\$ 205,660.00
Less HST Rebate 11.24%	- \$ 20,456.80
Total Current Project Costs	\$ 185,203.20
Total Current Project Funding	\$ 185,203.20

Note A: A species at risk mitigation work allowance is carried in this contract as a total of \$10,000 for each site. A material testing allowance is carried in this contract as a total of \$7,500 for each site. Contingency is carried in this contract as a total of \$45,000 (\$25,000 for the Union Line site; \$20,000 for the Pioneer Line site). 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 expended and is recommended to test and inspect construction materials for compliance with the contract specifications during the course of the project.

The total current project costs listed above will be funded from both the Bridge Lifecycle Reserve and the Minor Culverts Lifecycle Reserve. The project costs for Union Line will be funded from the Minor Culverts Lifecycle. The project costs for Pioneer Line will be funded from the Bridge Lifecycle. The Bridge Lifecycle Reserve includes funds under the Association of Municipalities of Ontario (AMO) Federal Transfers of Federal Gas Tax Funding Agreement.

Prepared by:

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

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Attachments: None

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