

Staff Report 2023-0309

Meeting Date: May 9, 2023

Subject: Strawberry Hill Court Retaining Wall Replacement Project Update

Submitted By: Andrew Pearce, Director, Engineering Services
Ryan Grodecki, Manager, Engineering Capital Design and Construction, Engineering Services
Ben Pressman, Sr. Project Manager, Capital Infrastructure, Engineering Services

RECOMMENDATION

That additional funding for the reconstruction of the Strawberry Hill Court Retaining Wall (Capital Project 22-133) in the amount of \$2,500,000 with funding from the Tax Funded Capital Contingency Reserve, be approved; and

That staff be directed to continue to work with the Region of Peel to explore more cost-effective design alternatives for the portion of the existing and replacement retaining walls within the Regional sewer easement and related cost sharing arrangements.

REPORT HIGHLIGHTS

- As part of the 2022 Budget, Council approved \$2,600,000 to fund the reconstruction of the wall as Capital Project #22-133. In February 2022, Staff retain McIntosh Perry Consulting Engineers Ltd. to complete the detailed design.
- In March 2023, Dynex Construction Inc. submitted the lowest bid submitted through a competitive bidding process for the replacement of the Strawberry Hill Court Retaining Wall at a value of \$3,981,244.00 exclusive of HST. Additional funding is being recommended for approved for the reconstruction of the Strawberry Hill Court Retaining Wall (Capital Project 22-133) in the amount of \$2,500,000 with funding from the Tax Funded Capital Contingency Reserve.
- In accordance with the Town's Purchasing Bylaw, no contract award may be approved unless approved funding in an amount sufficient to cover the procurement value is available.
- At the request of the Region, additional design elements were incorporated into the retaining wall project to reduce the weight over the existing forcemains within the servicing easement, which have increased the complexity and cost of the project.

DISCUSSION

Background

In late 2020, the existing large gabion basket retaining wall located in the rear yards of 54, 56, 58 and 60 Strawberry Hill Court in Bolton was found to be in a failing condition. The retaining wall is approximately 70m long and ranges in height between 0.5 and over 4.5 metres, was built over 20 years ago. The Region of Peel owns an easement that crosses the retaining wall containing multiple wastewater forcemains.

Continuous monitoring of the existing gabion retaining wall is ongoing

In December 2021, monitoring of the existing gabion retaining wall commenced. Sensors placed on the existing retaining wall give a detailed account of the wall stability. Movement of the existing gabion wall has been detected, however, the leaning over vertical has not yet passed the threshold for emergency intervention. Contingency plans are in place should the immediate intervention be necessary.

Council approved the expenditure of capital funds for the replacement of the retaining wall

In conjunction with the 2022 capital budget, Council approved funding in the amount of \$2,600,000 to replace the existing retaining wall (Capital Project #22-133). Staff prioritized this project and retained McIntosh Perry Consulting Engineers Ltd. in February 2022 to complete the design. Staff provided a status update to Council on June 21, 2022. This Memorandum is attached at **Schedule "A"**. In June 2022, Staff anticipated construction of the replacement wall to commence in September 2022.

Forcemain deflections observed

In July 2022, the Region completed a condition assessment of two of the three forcemains located underneath and perpendicular to the existing gabion retaining wall. The condition assessment revealed localized deformation of the forcemains, one location was in proximity to the existing gabion retaining wall. The report recommended the forcemain be repaired.

Forcemain repairs planned to be completed in advance of retaining wall replacement construction

In August 2022, the Region retained a third-party consultant to analyze the condition of the existing forcemains under the existing retaining wall and recommend repair options. Options for forcemain renewal considered were open cut repairs and trenchless renewal methodologies. Open cut repairs would be difficult due to the deflection being near the existing gabion retaining wall. Structural lining of the forcemains was also considered as a potential trenchless renewal option.

Replacement retaining wall designed to be bridged over easement

At the request of the Region, the foundation of the new retaining wall was designed to bridge the full weight of the new retaining wall over the existing sewer easement, a span of 7.0 meters in length. This request was made to protect the existing underground forcemains. This substantial span requires the installation of helical piles to support a structural slab foundation for the replacement retaining wall.

Existing gabion wall weight designed to be removed from the easement

The original design of the replacement wall made provision for the majority of the existing gabion basket wall to remain in place to limit the construction impacts on the adjacent properties. The height of the existing gabion retaining wall over the easement is over four and one half (>4.5) meters. The bottom rows of the existing gabion retaining wall over the easement were to remain in place to reduce risk to nearby private structures, to reduce project costs, and to improve the constructability of the replacement wall. The limited distance between the gabion wall and the nearby residential foundations is a key variable in the design

of the required shoring depth and location. The more of the existing gabion wall that is removed, the more complex the shoring is required to facilitate safe excavation and removal of the existing gabion retaining wall as generally shown on **Schedule "B"**. The Region requested that all the existing segments of the gabion retaining wall within the easement be removed to reduce the point loads on the forcemains. This change to the design resulted in the need to introduce more shoring and excavation required to facilitate the full removal of the gabion wall segments and to retain the rear yards of the abutting properties. This additional shoring work has increased the risk profile, complexity, and cost of the project.

Town representatives are advised that the forcemain repair may no longer be required

In December 2022, Town staff were advised by the Region that the forcemain repair may no longer be required based on a) the weight of the existing gabion retaining wall will be removed from over the forcemains as part of Town's retaining wall replacement project thereby reducing the risk of forcemain failure, and b) the Region has plans to reroute the forcemains in the future.

Cost sharing discussion with Peel Region staff have been initiated

The cost of the project has increased as a result of accommodating the Region's design requirements related to the existing and proposed retaining wall within the easement. Accordingly, staff have initiated discussions with the Region regarding the recovery of the incremental cost associated with these design changes.

Three competitive bids were received from prequalified firms, Dynex Construction Inc. submitted the lowest bid of \$3,981,244.00 exclusive of HST.

In March 2023, the retaining wall replacement project tender (2023-04) was released to three pre-qualified firms, each of which had demonstrated proficiency working within sensitive areas with limited access, and with systems required to mechanically stabilize earth.

Three bids were received. Dynex Construction Inc. (Dynex) submitted the lowest bid at a value of \$3,981,244.00, excluding HST.

Capital Project #22-133 2022 sets a budget of \$2,600,000 for the retaining wall replacement. Based on the low bid, a budget increase of \$2,500,000 is required to move forward with the work. This budget increase is calculated as follows:

Construction Tender Price	\$ 3,981,244 (4,051,313.89 inclusive of non-recoverable HST)
Engineering and Insurance	\$ 650,000 (rounded)
Construction Contingencies (10%)	\$ 400,000
Total Project Cost	\$ 5,100,000 (rounded)
Approved Project Budget	\$ 2,600,000
Budget shortfall	\$ 2,500,000 (rounded)

Value of bid results were higher than anticipated

Pre-tender engineering estimates indicated additional funding would be required. However, bid results were higher than anticipated. Several factors contributed to the cost increase

including: 1) pre-existing failure conditions may result in a contractor risk price premium, 2) limited access and other site constraints including proximity to nearby residential structures, 3) increase in complexity with respect to the easement, and 4) inflationary factors.

Access constraints, easement complexity and pre-existing gabion wall failure increase contractors risk considerations. Pre-existing failure conditions tend to be more uncertain and can result in a price premium for protectionary shoring measures and for other potential risk assumption considerations.

Construction cost increases the highest on record. Statistics Canada noted that construction cost in Toronto increased [16.2%](#) in 2022 compared with 2021. This is the highest annual increase on record. This is partially the result of “a combination of increasing demand for construction and supply challenges due to labour shortages resulted in limited availability and higher prices for materials and labour in the construction industry in 2022”. Delays in tendering from 2022 to 2023 likely contributed an increase in price and is noted on several infrastructure projects in Southern Ontario and beyond.

Approval of Additional Funding Recommended Allowing for 2023 Construction

Staff recommend that Council authorize additional funding to allow for the award of the contract to Dynex Construction Inc.

Staff will continue work with the Region to explore design alternatives that would realize costs savings, including having partial gabion remain in-place over the easement. If an alternate design agreement is unable to be agreed upon in a timely fashion, construction will proceed as currently designed with all existing gabion being removed from the easement.

Staff will continue to seek a cost sharing arrangement with Region of Peel representatives for the incremental works required over the easement. It is anticipated that any cost sharing agreements may take time to be established. Staff recommend that cost recovery discussions continue in parallel with the commencement of construction of the replacement retaining wall.

FINANCIAL IMPLICATIONS

Staff are recommending that additional funding be approved for the reconstruction of the Strawberry Hill Court Retaining Wall (Capital Project 22-133) in the amount of \$2,500,000 with funding from the Tax Funded Capital Contingency Reserve (current balance \$3,371,103.98).

COUNCIL WORK PLAN

None.

ATTACHMENTS

Schedule A: Memorandum to Council dated June 21, 2022

Schedule B: Retaining Wall Cross Section