TORONTO

STAFF REPORT
ACTION REQUIRED

Amendment to Purchase Order No. 6038978 Professional Engineering Services During Construction and Post Construction for North Toronto Wastewater Treatment Plant CSO Tank

Date:	March 29, 2016
To:	Public Works & Infrastructure Committee
From:	Executive Director, Engineering & Construction Services Director, Purchasing & Materials Management Division
Wards:	Ward 26 – (Don Valley West)
Reference Number:	P:\2016\Cluster B\TEC\PW16012 (AFS# 22812)

SUMMARY

The purpose of this report is to request the authority to amend Purchase Order No. 6038978 issued to CH2M Hill Canada Limited for professional services associated with contract administration and site supervision services during the construction of the North Toronto Wastewater Treatment Plant Combined Sewer Overflow (CSO) Tank – Implementation of Hydraulic Improvement and High Rate Treatment. An amendment to the Purchase Order is required due to the increased duration of the project resulting from the contractor's longer than expected construction schedule, and compounded by additional on-site requirements imposed by the Ministry of Environment and Climate Change; a temporary work stoppage due to extreme weather; and, the need to remove a significant amount of over-poured concrete and old construction shoring along the footing of the existing CSO tank. The total Purchase Order Amendment being requested is $499,726 net of all taxes ($508,521 net of HST recoveries), revising the current contract value from $1,010,350 to $1,510,076 net of all taxes ($1,536,653 net of HST recoveries).

RECOMMENDATIONS

The Executive Director of Engineering & Construction Services and the Director of Purchasing & Materials Managements recommend that:

1. The Public Works & Infrastructure Committee, in accordance with Section 71-11.1.C of the City of Toronto Municipal Code Chapter 71 (Financial Control By-law), grant authority to amend Purchase Order No. 6038978 with CH2M Hill Canada Limited for the provision of professional services associated with contract administration and site supervision services during the construction of the North Toronto Wastewater Treatment Plant CSO Tank - Implementation of Hydraulic Improvement and High Rate Treatment in the amount of $499,726 net of all taxes ($508,521 net of HST recoveries) revising the current contract value from $1,010,350 to $1,510,076 net of all taxes ($1,536,653 net of HST recoveries).

Financial Impact

The amendment of Purchase Order No. 6038978 for an additional amount of $499,726 net of all taxes ($508,521 net of HST recoveries) will increase the current contract value from $1,010,350 to $1,510,076 net of all taxes ($1,536,653 net of HST recoveries).

The delivery date for completion of the professional services covered by Purchase Order No. 6038978 was originally December 31, 2015. The amendment includes a revision to the purchase order completion date to December 31, 2016.

Funding is available in the Toronto Water 2016 Approved Capital Budget in WBS element CWW447-06-02 (WWFMP IMPLEMENTATION – DESIGN) summarized below (net of HST recoveries):

Account	Description	2016
CWW447-06-02	(WWFMP MPLEMENTATION – DESIGN)	$508,521

The Deputy City Manager & Chief Financial Officer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

At its meeting on April 11, 2007, Bid Committee granted authority to enter into an agreement with CH2M Hill Canada Limited (CH2M), being the highest overall scoring proponent meeting the requirements for Request for Proposal (RFP) 9117-06-7403, to provide contracted professional services for the North Toronto Wastewater Treatment Plant CSO Tank – Implementation of Hydraulic Improvement and High Rate Treatment, in an amount not to exceed $688,721 net of taxes ($700,843 net of HST recoveries). The agreement amount also included a provisional allowance of $15,000 net of taxes for designated substances and asbestos survey and electrical classification and pre-start health and safety reviews, and a contingency allowance of $89,833 net of taxes for additional services, if necessary and authorized by the Executive Director, Technical Services. The Bid Committee Report can be found at:
http://www.toronto.ca/legdocs/2007/agendas/committees/bd/bd070411/bddd.pdf

At its meeting on July 9, 2014, Bid Committee granted authority to enter into an agreement with A Plus General Contractor Corporation for Tender Call 341-2013, Contract No. 13FS-31WP, for the construction of the North Toronto Treatment Plant – CSO Tank Improvement, being the lowest bidder meeting specifications. The Bid Committee Report can be found at:
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2014.BD188.8

ISSUE BACKGROUND

The purpose of Contract 13FS-31WP is to upgrade the existing combined sewer overflow (CSO) and stormwater storage tanks at the North Toronto Wastewater Treatment Plant (NTTP) with high-rate treatment and hydraulic improvements to increase wet weather flow treatment capacity as identified in a joint study completed by the City of Toronto, the Ontario Ministry of the Environment and Climate Change, and Environment Canada's National Water Research Institute. This project will safely increase the flow rate through the existing CSO Tank and, with a polymer flocculant dosage system and increased retention time, is expected to provide a 60 to 70 percent increase in process efficiency and treatment capacity, without changing the footprint of the tank. This will reduce the discharge of untreated CSOs and provide an improvement in the quality of the effluent discharged to the Don River. This work is in support of the City of Toronto's Wet Weather Flow Master Plan which is being implemented to address the impact of wet weather flow on the City's receiving waters.

In 2007, Purchase Order No. 6024114 was issued to CH2M Hill Canada Limited (CH2M) pursuant to the Bid Committee award for RFP No. 9117-06-7403, in the amount of $356,161 for the detailed design of the NTTP CSO Tank upgrades.

CH2M completed the design work in early 2009, however, the construction of the upgrades to the tanks was put on hold by Toronto Water until the completion of the Coxwell Sanitary Trunk Sewer emergency repair by-pass tunnel. This was necessary, as the tanks would be used to provide temporary storage and treatment of sewage in the event that flows were diverted from the Coxwell Sanitary Trunk Sewer, in an emergency, as part of the contingency plan developed to support the emergency repair of the Trunk Sewer.

Following the successful diversion of flows from the Coxwell Sanitary Trunk Sewer to the new by-pass tunnel in 2013, CH2M was requested by Engineering & Construction Services (ECS) staff to update the design for the upgrades to the CSO Tank to the new regulatory agency requirements, expand the design to include new electrical upgrades, and to obtain new permits and approvals. They were also requested to update the tender documents for issuance in late 2013. To cover the cost of these updates, P.O. No. 6024114 was amended on January 25, 2013 to increase the value by $321,629 excluding HST and applicable charges for a combined total value of $677,790 excluding HST and applicable charges. The details of this increase are as follows:

- Review and revise the 2009 contract documents to reflect new regulatory agency requirements, technology advances, and new operational requirements: $117,660;
- Incorporate additional electrical and instrumentation into the design to permit the monitoring and operation of the CSO Tank from the Ashbridges Bay Wastewater Treatment Plant Control Centre: $60,620;
- Prepare applications and associated technical information to obtain new permits/approvals from the Toronto Region Conservation Authority, the Ministry of Natural Resources, the Ministry of the Environment and Climate Change, and Toronto Buildings: $75,743; and,
- A contingency allowance of $67,620 for additional services which may be required, and as approved by the Executive Director, Engineering and Construction Services.

CH2M completed the design update and the construction Tender Call 314-2013, Contract No. 13FS-31WP was issued on January 31, 2014.

In preparation for the start of construction, on March 11, 2014 ECS staff issued P.O. No. 6038978 to CH2M, in the amount of $332,560 net of all taxes. This P.O. was required to cover the construction administration and site supervision services as awarded under RFP No. 9117-06-7403. As well, it was intended to use this P.O. to provide support through the tender process to respond to requests from potential bidders as all of the funds under the design assignment had been expended. However, no such support was ultimately required.

The value of P.O. No. 6038978 was based on the 26-week construction duration estimated at the time of issuance of the RFP – in advance of detailed design and construction contract award. It was recognized that the construction duration would not be known until the completion of detailed design and submission of a final construction schedule by the bidders at the time of tendering.

Contract 13FS-31WP was awarded by Bid Committee, for the construction of the CSO Tank upgrades to A-Plus General Contractor Corporation on July 9, 2014. The tender submitted by A-Plus indicated 90 weeks duration for construction. Furthermore, a number of unforeseen events occurred once construction began which further extended the construction duration, summarized as follows:

- The Ministry of Environment and Climate Change (MOECC) required the installation of flow monitoring equipment prior to the start of construction, which was not known at the time of tendering and effectively delayed the start of construction by 42 working days. A significant effort was required by CH2M to develop a monitoring plan in consultation with MOECC and for their approval;
- Flooding of the site during an extreme storm event caused a work stoppage for 10 working days;
- Following the flooding event, the MOECC required the development of a Wet Weather Management Plan for the project for their review and approval, prior to construction restarting, which delayed the re-start of construction by 10 working days;

- During excavation the contractor encountered a previous over-pour of a significant amount of concrete along the footing of the existing CSO Tank, the removal of which required an additional 5 working days; and,
- Also during excavation, the contractor encountered the old construction shoring system which was left in place along the footing when the existing CSO Tank was constructed, cutting and removal of which required an additional 5 working days.

In total, these unforeseen events added 14 extra weeks to the construction duration, extending the contractor's expected construction completion date from May 2016 to August 2016. These factors, coupled with the contractor's construction schedule, effectively increased the need for CH2M's contract administration and site supervision services by an additional 78 weeks, above the 26 weeks stipulated within their current contract requirements.

In addition to CH2M's services, two additional sub-consulting services were required based on the design requirements and discovery of an impacted tree species-of-significance, as follows:

1. Amec Foster Wheeler Environment & Infrastructure (Amec) was required to perform the inspection and witnessing of tension load tests on the rock anchors required for the foundation of the upgraded CSO Tank. The cost for this work is $33,000; and
2. LGL Limited was required to provide arborist services to perform stress assessments during construction on a Butternut tree located close to the construction zone. This is a species of significance in Ontario and this monitoring was required by Toronto Parks, Forestry and Recreation. The cost of this work is $4,211.

CH2M's contract included a provision for a weekly rate of $7,115 for additional construction services should the 26 weeks included in their contract be insufficient. However, the start of the project was significantly delayed, from 2007 to 2014, and the weekly rate in the Agreement was based on 2007 billing rates. Since the delay was caused by the City, ECS staff negotiated a rate escalation of 2.5% per year to CH2M's fees, based on a comparison to billing rates on more recent projects awarded to CH2M, and recent rates of inflation.

Taking this into consideration, the additional 78 weeks of construction services would have resulted in an additional $652,090 for CH2M to provide services to the end of construction. ECS staff believed that an alternative approach could be developed that would reduce this additional cost to the City.

COMMENTS

ECS staff undertook a review and evaluation of alternative approaches to provide construction services to complete the project while minimizing costs. These alternatives included: using CH2M's services as originally planned; issuing a new RFP for

competitive bidding to complete CH2M's work; performing all construction services with in-house staff; and hybrid options thereof.

The end result of this process was a decision to provide a full-time City inspector on site, in addition to a representative from CH2M who would attend the site on a part-time basis to provide direction on technical issues and ensure full compliance with the design drawings. The main reasons for selecting this approach were as follows:

- Complexity of the work: The project involves civil, mechanical, electrical and process components which requires expertise not available in-house. Most of these components are proceeding in parallel and CH2M would need to be present to provide the required specialized expertise. Therefore, there is no opportunity to phase the tasks associated with each component of the project such that in-house staff could assume contract administration services during phases of the construction, when available in-house expertise would be required.

- Design compliance and modifications during construction: The treatment process system being constructed is complicated, involving chemical dosing and feedback data to treat CSO flows before discharging to the Don River. Ideally the designer of the system, CH2M, should monitor the construction closely to ensure that the design is properly implemented. Should design modifications be required during construction, having CH2M providing services during construction would permit a quicker response and minimize the impact on construction. Also, CH2M could be held responsible for design errors at no cost to the City, whereas a new consulting firm could not.

- Lost time: Construction is underway and any delays incurred to retain a new consultant could result in delay claims from the contractor, as well as delays in completing the project.

- Cost: Issuing a new RFP would require the new consultant to spend extra time familiarizing themselves with the project design and construction completed to date. Maintaining CH2M on the project would be less costly, and their total fees could be reduced by an estimated $208,400 by supplementing their services with the City's in-house staff.

Based on this analysis, ECS staff have developed an approach involving a City inspector working with CH2M to reduce the additional engineering consultant costs while maintaining adequate contractor supervision. The additional services required from CH2M and the associated costs are as follows:

- Contract administration and site supervision services on a part-time basis through construction completion in the amount of $400,515;
- Disbursements in the amount of $6,000;
- Engineering services by sub-consultants (Amec and LGL) for rock anchors inspection and arborist services in the amount of $37,211; and,

- A contingency allowance of $56,000 for additional services which may be required beyond August 31, 2016, and as approved by the Executive Director, Engineering and Construction Services.

The total fee increase required for CH2M to provide these services is $499,726 excluding all taxes ($508,521 net of HST recoveries). Staff have reviewed this request and consider it to be reasonable based on the work effort required.

The initial contract award to CH2M was for a total amount of $688,721 excluding all taxes, through the issuance of Purchase Order Nos. 6024114 and 6038978. Purchase Order No. 6024114 was previously amended in the amount of $321,629 net of all taxes. It is now requested that Purchase Order No. 6038978 be amended for an additional $499,726 net of all taxes. This will revise the total contract value from $1,010,350 to $1,510,076 net of all taxes ($1,536,653 net of HST recoveries).

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