



STAFF REPORT ACTION REQUIRED

Capital Works Administrative Procedure Change to Support the Acceleration of the Basement Flooding Protection Program

Date:	July 29, 2014
To:	Public Works & Infrastructure Committee
From:	Executive Director, Engineering & Construction Services
Wards:	All
Reference Number:	P:\2014\Cluster B\TEC\PW14029 (AFS #19508)

SUMMARY

This report responds to the need to expand and accelerate the capital delivery of Toronto Water's Basement Flooding Protection Program (the "Program"). An expanded program management capital delivery model is being proposed, where engineering consultants, under contract to deliver this Program, would be granted authority to act as agents of the City to approve routine construction contract change orders, up to pre-defined limits, and thereby free up in-house professional engineering staff resources to provide the necessary oversight and management of the expanded Program.

RECOMMENDATIONS

The Executive Director, Engineering & Construction Services recommends that:

1. City Council authorize the Executive Director, Engineering & Construction Services, through Program Management Engineering Consulting Assignment agreements for the Basement Flooding Protection Program, to appoint professional engineering consultants as agents of the City for the purposes of approving, committing the City to and signing on behalf of the City, construction contract change orders, where the:
 - a) change order does not exceed \$25,000 and is within the contingency allowance of the contract;
 - b) change in scope of work, resulting in the change order request, was not foreseeable at the time of the engineering design; and,

- c) change order request is not attributed to an error or omission on the part of the engineering design consultant.

Financial Impact

There are no financial impacts resulting from the adoption of this report.

The Deputy City Manager and Chief Financial Officer has reviewed this report and agree with the financial impact statement.

DECISION HISTORY

At its meeting of December 16 to 18, 2013, City Council adopted Toronto Water's 2014 Budget and 2015-2023 Capital Plan. The 2014 Budget included \$61.3 million for the Basement Flooding Protection Program (BFPP); in combination with the 2015-2023 Capital Plan, Toronto Water expects to spend \$962.0 million on basement flooding relief over the period 2014-2023. The Council decision can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2013.EX36.17>

At the same meeting, City Council expanded the Basement Flooding Protection Program beyond the previously identified 34 study areas by an additional 7 study areas, to address the basement flooding impacts associated with the extreme storm event of July 8, 2013. In expanding the Program to 41 study areas, City Council requested the General Manager, Toronto Water, to report back on the schedule of future Basement Flooding Protection Program study areas, across the remainder of the City, as part of Toronto Water's 2015 Budget Submission. The staff report that provides background information about expanding the BFPP can be viewed at:

<http://www.toronto.ca/legdocs/mmis/2013/ex/bgrd/backgroundfile-63918.pdf>

At the same meeting, City Council considered, for future planning purposes, a water rate increase of 8% for the years, 2015, 2016 and 2017. Among the projects that were recommended to be added to the 2014 Capital Budget and 2015-2023 Capital Plan, to align with this increased funding scenario, was a \$326.0 million increase for the basement flooding relief over the period 2014-2023. The briefing note that outlines the scenarios can be viewed at:

<http://www.toronto.ca/legdocs/mmis/2013/ex/bgrd/backgroundfile-63905.pdf>

ISSUE BACKGROUND

The City's Basement Flooding Protection Program was originally approved by Council in 2006. This multi-year Program is directed at reducing the risk of basement and surface flooding during extreme storm events. To achieve this goal in identified chronic basement flooding study areas, Council has approved upgrading service level standards for sanitary sewers; and upgrades to storm drainage systems, akin to new development standards, where feasible, to provide for a 1 in 100 year storm.

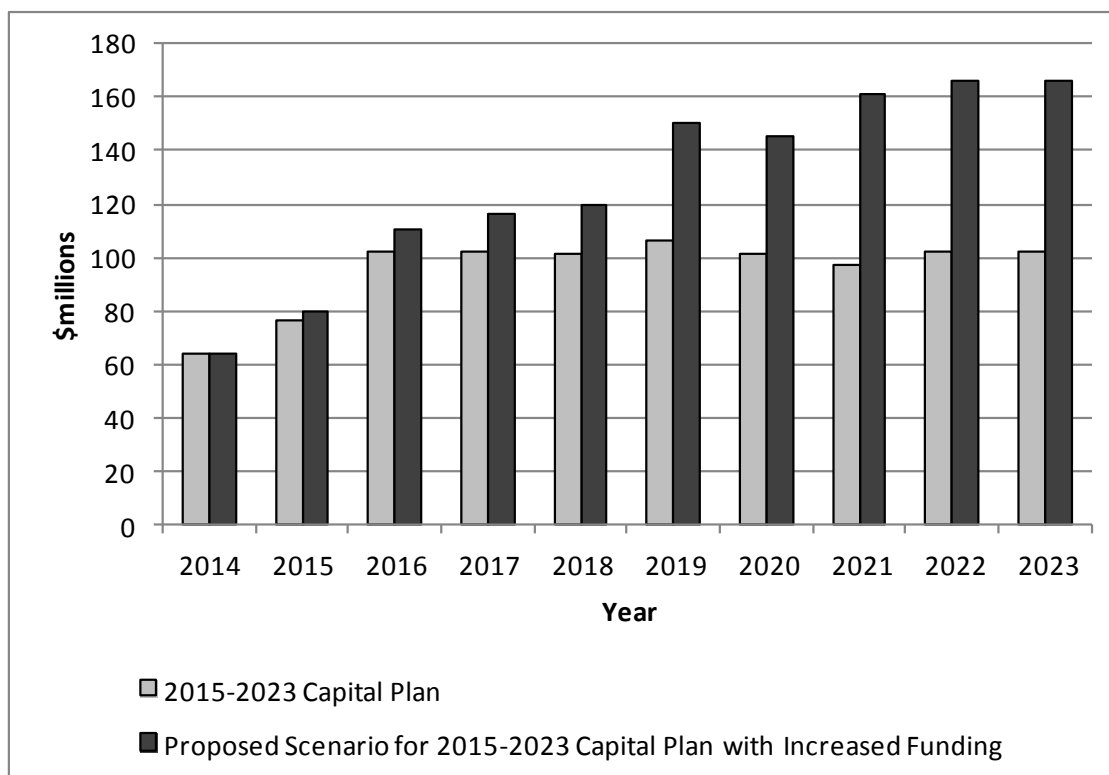
Expansion of the Basement Flooding Protection Program

When the Basement Flooding Protection Program was originally established, in 2006, the City identified 31 chronic basement flooding study areas. Subsequently, the program was expanded to include 34 priority study areas. Following the extreme storm event of July 8, 2013, Council approved a further expansion of the Program to 41 study areas and directed the General Manager, Toronto Water, to report back on the schedule of future Basement Flooding Protection Program study areas, across the remainder of the City, as part of Toronto Water's 2015 Budget Submission.

As shown in Figure 1, Toronto Water's approved 2014 Capital Budget has allocated \$61.3 million (net of HST recoveries). However, as shown in Figure 1, the Program expands by an estimated 72% to \$105.3 million (net of HST recoveries) in 2016, and this level of funding is expected to be generally sustained through to 2023 as per Toronto Water's 2015-2023 Capital Plan.

Further, as noted earlier, City Council has considered, for future planning purposes, a water rate increase of 8% for the years, 2015, 2016 and 2017. Among the projects that were recommended to be added to the 2014 Capital Budget and 2015-2023 Capital Plan, to align with this increased funding scenario, was a \$326.0 million (net of HST recoveries) increase for the Basement Flooding Protection Program over the current 10 year (2014-2023) funding of \$962 million (net of HST recoveries). The total Program funding over the 10 year period would, therefore, increase by an estimated 34% to \$1,288 million (net of HST recoveries).

**Figure 1 Basement Flooding Protection Program 2014-2023 Capital Plan:
a) current approved; and b) scenario based on increasing available funding**



Sources:

- a) Toronto Water Approved 2014-2023 Capital Plan
- b) 2014 Capital Budget Briefing Note: Scenario's for Increasing the Water Rate and Adding Projects to the 2014-2023 Capital Budget

COMMENTS

Delivery of the Basement Flooding Protection Program involves the following steps:

- i) Undertaking Class Environmental Assessment studies which include sewer condition assessments, detailed hydraulic analyses, computer simulation modelling, the development and assessment of options/strategies, and the selection of the preferred option/strategy, with input from the community, through a formalized public consultation process;
- ii) Once projects have been identified and cost estimates have been provided, Toronto Water, assesses these projects against predefined and Council approved criteria in regards to cost per benefitting property, and prioritizes the projects against all previously "completed" Basement Flooding Protection Program, Class Environmental Studies, across the City;
- iii) The projects are then assigned to the Engineering & Construction Services Division for delivery, which includes:
 - i. engineering design;

- ii. regulatory approvals (ie. typically Ontario Ministry of the Environment and Climate Change; and the Toronto and Region Conservation Authority);
- iii. capital coordination with other City Divisions and utilities;
- iv. preparation of contract tenders and procurement of construction services; and
- v. construction contract administration including construction inspection.

Engineering & Construction Services has successfully employed a program management approach to support the capital project delivery for the Basement Flooding Protection Program. Through this capital delivery model, the services of an engineering consulting firm are procured through a competitive process; and multi-year contract assignments are used to provide the specialized expertise necessary for the engineering design and construction contract administration services for a diverse, predefined list of projects. Engineering & Construction Services staff have overarching program management responsibility, providing oversight and direction to the engineering consultant teams, as well as oversight and management of the construction contract tendering process, contract awards and administration of progress payments; and the review and authorizations for payment for any changes to base scope (change orders) which may be encountered in the field.

This successful approach has provided us the ability to shorten the timelines for capital delivery, and significantly expand the volume of capital projects being delivered, to an estimated \$50 million annually. In a given year, this typically represents 20 projects in the design phase and approximately 12 to 15 concurrent construction contracts underway at any given time.

Accelerating Capital Delivery

While it can be expected that there will be some increase in the size of the construction projects with the expansion of the Program, any expansion of the Program will generally result in an increased number of projects and concurrent construction contracts in proportion to the increase in the value of the capital program. Based on the current forecasts and experience, the planned expansion of the Program by 2017 would result in an estimated increase of 9 to 12 construction projects, such that an estimated 21 to 27 projects would be delivered annually. If Toronto Water were to proceed with the expansion envisioned through the increased funding scenario, there could be as many as 26 to 32 construction projects underway annually, by 2023.

A significant expansion in the Program will result in an increase in the resources necessary to deliver the expanded program. Additional, in-house program management staff with specialized technical and program management expertise will be required, to manage larger multi-year professional engineering program management assignments. It is proposed that the successful program management approach used to deliver the Basement Flooding Protection Program, will continue to be employed to deliver the

expanded program. It is also proposed, that engineering consultants contracted through these assignments also undertake some of the routine contract administrative responsibilities, currently undertaken by staff, as agents of the City.

Benefits of appointing a Consultant as an agent of the City to approve Change

During construction, particularly of underground utilities, unexpected conditions and/or site constraints will be encountered. These are typically situations, where the conditions encountered were not shown on existing record drawings, and could not have been foreseen at the time of engineering design. The resolution of such changes requires significant effort on the part of staff managing the construction contracts. This typically involves reviewing all available information, including engineering drawings, site conditions, and documentation submitted to substantiate the change (typically to quantities originally stated in the tender documents). The process concludes with issuing a change order, where payment is drawn from the construction contract contingency allowance. The review, documentation and approval of such changes are necessary functions of construction management staff and are also some of the most time intensive tasks of construction management.

These tasks are defined in the Engineering & Construction Services Capital Works Projects Procurement & Administration Procedures Manual. City staff, who are senior engineers, and who are managing construction projects, can approve change orders that are recommended by the contract administrator, up to a maximum of \$25,000, as delegated by the manager or director.

It is proposed that, at the discretion of the Executive Director, Engineering & Construction Services, the engineering consultant, providing program management services in the delivery of the Basement Flooding Protection Program, would act as an agent of the City for the purpose of reviewing, approving and signing, on behalf of the City, some of the change orders associated with the delivery of the construction projects. The authority would be limited to situations where the:

- a) change order does not exceed \$25,000 and is within the contingency allowance of the contract;
- b) change in scope of work, resulting in the change order request, was not foreseeable at the time of the engineering design; and
- c) is not attributed to an error or omission on the part of the engineering design consultant.

Any change orders beyond the limits identified will be subject to the review and approval of City staff with the appropriate signing authority.

Presently, approximately 30% of the work load of City staff managing construction contracts is spent solely on the review and approval of change orders. Assigning this responsibility for the more routine, low risk, change orders to the engineering consultant, would free up valuable, senior staff resources, necessary to properly manage the complexities associated with an expanded Basement Flooding Protection Program.

Further, this would expedite the resolution of change order requests, and averting potential delay claims. However, a limit of \$25,000 is being proposed on the administration of change order requests by the engineering consultant. Based on recent experience with the Basement Flooding Protection Program, this represents approximately 70% of the change orders processed; and which are typically associated with the requirement for additional quantities of items that were priced competitively at the time of tender. Based on past experience with the Program a \$25,000 change order could represent:

- supply and installation of a 10 metre length of concrete storm sewer (1.8 metre diameter); or
- the full restoration (curb to curb) of 50 metre length of a typical two lane local road.

To ensure that risks to the City are minimized, the Program Management Consultant Agreement, used to engage the engineering consultant, will contain terms and conditions to ensure that the approval of change orders is per the criteria approved by Council. The Program Management Consultant will be expected to report on the management of these change orders on a monthly basis, including all the necessary assessments, trends and QA/QC reports. The contract will be structured so that there are no financial incentives for approving change orders, specifically payment will not be associated with any construction contract percentage fee that may be assigned. In addition, City staff will conduct on-going audits of change orders approved, to ensure that all required documentation is in place and properly reviewed. These audits will also include identification of any trends; and actions will be taken if there is any indication of violations of City's policies and procedures.

This report has been prepared in consultation with Toronto Water, Legal Services, Internal Audit and Purchasing and Materials Management Division.

CONTACT

Nancy Bonham, M.Eng., P.Eng.
Acting Director, Capital Works Delivery
Engineering & Construction Services
Tel: 416-338-2851
e-mail: nbonham@toronto.ca

SIGNATURE

Michael D'Andrea, M.E.Sc., P.Eng.
Executive Director
Engineering & Construction Service