TORONTO

REPORT FOR ACTION

Contract Award for the Construction of the Coxwell Bypass Tunnel from the Ashbridges Bay Treatment Plant to Coxwell Ravine Park, Tender Call 221-2017, Contract No. 17ECS-MI-04DC

Date: February 15, 2018
To: Public Works and Infrastructure Committee
From: Chief Engineer and Executive Director, Engineering and Construction Services
Chief Purchasing Officer
Acting Executive Director, Corporate Finance
Wards: 26, 27, 28, 29, 30, 32

SUMMARY

The purpose of this report is to advise of the results of Tender Call 221-2017 issued for Contract No. 17ECS-MI-04DC for the construction of the Coxwell Bypass Tunnel between the Ashbridges Bay Treatment Plant and Coxwell Ravine Park, and to request the authority to award this contract to North Tunnel Constructors ULC in the amount of $397,269,000 net of all applicable taxes and charges ($404,260,934 net of HST recoveries). This contract represents the first phase of the implementation of the Don River and Central Waterfront Project, and is aimed at improving water quality conditions in the Lower Don River and Inner Harbour, while providing security of operation of the Coxwell Sanitary Trunk Sewer.

Authority is also being requested to amend Purchase Order No. 6041404 with Marsh Canada Limited, for the procurement, maintenance and payment of insurance premiums associated with an Owner Controlled Insurance Program (OCIP) for the Coxwell Bypass Tunnel construction project by an amount of $6,000,000 net of all taxes ($6,480,000 including PST), revising the current value of the Purchase Order from $15,124,898 to $21,124,898 net of all taxes ($22,814,890 including PST).

RECOMMENDATIONS

The Chief Engineer and Executive Director, Engineering and Construction Services, the Chief Purchasing Officer, and Acting Executive Director, Corporate Finance recommend that:

1. The Public Works and Infrastructure Committee, in accordance with Section 195-8.4A of Toronto Municipal Code Chapter 195 (Purchasing By-Law), grant authority to award Contract 17ECS-MI-04DC, Tender Call 221-2017, for the construction of the Coxwell Bypass Tunnel to North Tunnel Constructors ULC in the amount of $ 397,269,000 net of all applicable taxes and charges ($ 404,260,934 net of HST recoveries) having submitted the lowest compliant bid and meeting the specifications in conformance with the Tender requirements. The awarded amount includes a contingency allowance of $62,509,000.

2. The Public Works and 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. 6041404 with Marsh Canada Limited, by an amount of $6,000,000 net of all taxes ($6,480,000 including PST), revising the current value from $15,124,898 to $21,124,898 net of all taxes ($22,814,890 including PST) to allow for the City to purchase an Owner Controlled Insurance Program specific to the Project.

FINANCIAL IMPACT

The total value of the construction contract award for Contract 17ECS-MI-04DC, Tender Call 221-2017, for the Coxwell Bypass Tunnel, including a contingency amount of $62,509,000, is $397,269,000 net of HST, and $448,913,970 including HST. The total cost to the City for the project is $404,260,934 including contingency and net of HST recoveries.

Funding is included in Toronto Water's 2018-2027 Approved Capital Budget and Plan under account CWW480-03 Don & Waterfront Trunk/CSO Construction - Phase 1, and the projected cash flow is summarized in the table below (all values are net of HST recoveries):

Table 1: Projected Cash Flow for the Coxwell Bypass Tunnel contract

WBS Element	2018	2019	2020	2021	2022	2023	2024	Total
CWW480-03	$14,800,000	$62,700,000	$75,000,000	$70,000,000	$75,000,000	$64,000,000	$42,760,934	$404,260,934

Note: Cash flow values include contingency allowance and are net of HST recovery

Amendment to Purchase Order No. 6041404 with Marsh Canada Limited, by an amount of $6,000,000 net of all taxes and charges ($6,480,000 including PST), revises the current Purchase Order value from $15,124,898 to $21,124,898 net of all taxes and charges, $22,814,890 including PST.

Funding is included in Toronto Water's 2018-2027 Approved Capital Budget and Plan under account CWW480-03 Don & Waterfront Trunk/CSO Construction - Phase 1, and the projected cash flow is summarized in the table below (all values include PST):

Table 2: Projected Cash Flow for the Owner Controlled Insurance Program (OCIP)

WBS Element	2018	2019	2020	2021	2022	2023	2024	Total
CWW480-03	$2,700,000	$3,780,000						$6,480,000

Note: Cash flow values include contingency allowance and include PST

The Acting Chief Financial Officer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

Coxwell Bypass Tunnel

At its meeting of January 19, 2018, Public Works and Infrastructure Committee granted authority to award a contract to Kenaidan Contracting Ltd. for a contract to complete site preparation work at the Ashbridges Bay Treatment Plant. This contract (referred to as Contract 1 of the Integrated Pumping Station (IPS)) would prepare the area to the north of the plant (on the south side of Lake Shore Boulevard) to allow for both the construction of the downstream shaft of the Coxwell Bypass Tunnel and the future IPS. The Public Works and Infrastructure Committee decision can be found at: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2018.PW26.2

At its meeting of March 4, 2014, Public Works and Infrastructure Committee granted authority to the Executive Director, Engineering and Construction Services, to negotiate and enter into agreements with Black and Veatch Canada Company, being the highest overall scoring proponent meeting the requirements of Request For Proposal No. 9117-13-7210, to provide contracted professional engineering services for the Design and Construction Administration of the Wet Weather Flow System to Control CSO Discharges to the Don River and Central Waterfront, in the amount of $57,018,913 net of HST. The Public Works and Infrastructure Committee decision can be found at: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2014.PW29.5

At its meeting of September 7, 2011, the Public Works and Infrastructure Committee requested that the General Manager, Toronto Water, finalize the Environmental Study Report for the Don River and Central Waterfront Class Environmental Assessment and submit it to the Ontario Ministry of the Environment (MOE) for the required 30 day public review period under the Municipal Class Environmental Assessment process. The Committee also directed that, subject to receiving approval of the Environmental Assessment from the Ontario MOE, the General Manager, Toronto Water, proceed to undertake the detailed design of the first phase of the Project, which represents the twinning of the Coxwell Sanitary Trunk Sewer and associated pumping station. The Public Works and Infrastructure Committee decision can be found at: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2011.PW7.6

Owner Controlled Insurance Program (OCIP)

Award to Marsh Canada Limited for Insurance Broker Services

At its meeting of December 14, 2017, Bid Award Panel granted authority to award the contract for Insurance Broker Services for the City of Toronto to Marsh Canada Limited, being the highest scoring Proponent meeting the requirements of Request for Proposal (RFP) No. 9105-17-7180. The services provided by the City's Broker include the procurement and maintenance of the City's annual corporate insurance policies, consulting on construction and surety matters, placement of non-routine insurance policies and insurance procurement for Division-specific purposes, such as the Coxwell Bypass Tunnel project. The scope of the Insurance Broker Services allows City Divisions to acquire insurance that is in addition to the City's usual suite of annual corporate insurance policies. Requests for project specific insurance coverage are reviewed by the City's Risk Management staff in consultation with the City's Insurance Broker on a case by case basis, and when additional coverage is warranted, the funding for the insurance premiums associated with the additional coverage are the responsibility of the City Division requiring the coverage. The Bid Award Panel decision can be found at:
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.BA55.1

Purchase Order No. 6041404 for Marsh Canada Limited for Insurance Premium and Broker Commission Fees

Purchase Order No. 6041404 was based on the 2015-2016 Insurance Program Renewal (insurance premiums) for the period from June 1, 2015 to May 31, 2016. City Council on May 5, 6 and 7, 2015 adopted on consent GM3.23, the March 18, 2015 report from the Deputy City Manager and Chief Financial Officer on the 2015-2018 Insurance Program Renewal. The Government Management Committee decision can be found at:
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.GM3.23

The report recommended that City Council delegate authority to the Deputy City Manager and Chief Financial Officer to renew the City's program of property and casualty insurance on an annual basis, throughout the duration of the current City Council term (June 1, 2016, June 1, 2017 and June 1, 2018) provided that the terms, conditions, limits and deductibles are, in the opinion of the Deputy City Manager and Chief Financial Officer, substantially the same as outlined in the report (March 18, 2015). Purchase Order No. 6041404 was originally created in the amount of $5,020,865 net of taxes and charges, and has subsequently been amended three times for separate insurance premiums required by City Divisions for specific projects as well as renewals of the City's corporate insurance program on each of June 1, 2016 and 2017. The Purchase Order to Marsh Canada Limited is currently valued at $15,124,898, net of all taxes.

It is appropriate that authority be requested from Public Works and Infrastructure Committee to approve an amendment to the City's Purchase Order with Marsh Canada Limited for the procurement of an Owner Controlled Insurance Program for the Coxwell Bypass Tunnel Project as it is a consequence of, and dependent on, the adoption of the

recommendation to authorize the contract award which is within the Committee's jurisdiction.

COMMENTS

BACKGROUND

In 1987, the International Joint Commission identified the City of Toronto's waterfront along Lake Ontario as one of 43 Areas of Concern in the Great Lakes Basin, largely because of impaired water quality conditions in the Don River and the Inner Harbour. The discharges from combined sewer overflows (CSOs) and storm sewers were identified as the principal sources of pollution.

In 2003, Toronto City Council approved the City-wide Wet Weather Flow Master Plan (WWFMP) to mitigate the impacts of stormwater runoff and combined sewer overflow (containing a mixture of untreated sewage and stormwater) discharges. The 25 year WWFMP identifies a series of projects that, upon implementation, are intended to achieve the ultimate goal of improving water quality conditions and ecosystem health in all six watersheds across the City and along the waterfront, thereby advancing the delisting of Toronto as an Area of Concern in the Great Lakes Basin.

In 2008, the Don River and Central Waterfront Municipal Class Environmental Assessment (EA) Project was initiated to provide a comprehensive systems integration approach, to incorporate:

i) The wet weather flow control projects identified in the WWFMP for combined sewer overflows and stormwater discharges to the Don River and the Central Waterfront;

ii) Infrastructure upgrades necessary to ensure operational security for the Coxwell Sanitary Trunk Sewer; and,

iii) Upgrades necessary to meet the longer term servicing needs within the Don Trunk and Waterfront Interceptor Sewer System to support the future growth projections in accordance with the City's Official Plan and Waterfront Revitalization Plan.

The Don River and Central Waterfront Municipal Class EA Environmental Study Report included a conceptual design of the preferred solution that would intercept CSO discharges from 50 outfalls, representing most of the remaining CSO discharge locations in the City. Now referred to as the Don River and Central Waterfront Project, the conceptual design in the Class EA Environmental Study Report represented an integrated system of tunnels and storage tanks which will intercept and control the discharge of CSOs to an average of one overflow per year. This is the highest level of control prescribed in the Ontario Ministry of the Environment and Climate Change's Procedure F-5-5 for combined sewer overflow discharges to recreational swimming beaches, even though there are no designated beach areas in the Lower Don River and Inner Harbour.

The cost for construction of the conceptual design as presented in the Environmental Study Report was estimated at $1.5 billion net of HST.

The Don River and Central Waterfront Project design elements consist of the following components.

a) Wet Weather Flow Collection and Storage System:

- Three interconnected storage tunnels connected to 12 vertical storage shafts which will collect and store combined sewer overflows and stormwater flows and convey these flows to a new high-rate wet weather flow treatment facility, through a new integrated wet and dry weather wastewater pumping station, to be constructed at the Ashbridges Bay Wastewater Treatment Plant.
- The three tunnels include the Coxwell Bypass Tunnel (10.5 km); Taylor-Massey Creek Tunnel (6.0 km); and Inner Harbour West Tunnel (5.6 km).
- Construction of three underground storage tanks to intercept flows from combined sewer overflows.
- Connection of the existing CSO and storm sewer outfalls, via diversion and drop structures to the three storage tunnels.
- Implementation of a computerized Real Time Control System for the waterfront interceptor system (Mid-Toronto Interceptor) to maximize storage of CSOs.

b) Sanitary Trunk Sewer System:

- The Coxwell Bypass Tunnel referenced in a) will also provide redundancy and security of operation for the existing Coxwell Sanitary Trunk Sewer, the City's most critical trunk sanitary sewer servicing about 30% of the City (approximately 750,000 residents). During periods of routine inspection and maintenance, the sewage flows from the existing Coxwell Sanitary Trunk Sewer would be redirected to the Coxwell Bypass Tunnel. Without this bypass tunnel, the City has no ability to reroute sewage flows from the Coxwell Sanitary Trunk Sewer.
- Construction of four sanitary sewage storage tanks to provide additional sanitary sewer capacity to service future urban growth within the Don Sanitary Trunk Sewer System by intercepting high flows during rainfall events, thereby reducing the risk of sanitary sewer overflows during wet weather flow conditions.

Preliminary Design of the Don River and Central Waterfront Project

An in depth assessment of the full system requirements was undertaken during the preliminary engineering design of the Don River and Central Waterfront Project, complete with detailed hydraulic modelling and assessment of various tunnel and vertical storage design options. Through this work, the preliminary engineering design concluded that a large diameter tunnel system could provide the same volume of storage and level of combined sewer overflow control, while providing several inherent advantages including a reduction in the:

- Number of vertical storage shafts from 23 to 12 thereby reducing overall, at-grade construction impacts, and property easement requirements;
- Overall maintenance requirements; and,

- Overall project cost.

Given the changes proposed to the original Class EA conceptual design, the preliminary design was reviewed by the Ontario Ministry of the Environment and Climate Change, and an Environmental Compliance Approval was subsequently issued for the Project.

Due to the large scale, scope, complexity and cost associated with the Don River and Central Waterfront Project, City staff incorporated several important design review processes during the preliminary engineering design phase. This included two Value Engineering sessions with tunnel design and construction experts. Value engineering is a systematic method to improve the "value" of the project through an examination of the overall design, constructability and functionality. The purpose in this formal process is to achieve the desired function (i.e. capture and conveyance of CSOs to the ABTP) at the lowest overall cost. The sessions were conducted at (1) the mid-point of the preliminary design and (2) the end of the preliminary design. The sessions confirmed the overall value for money of the design concept.

The Don River and Central Waterfront Project will be constructed in phases taking into consideration the large scale and complexity of the project, and the number of discrete locations where construction will take place. The Coxwell Bypass tunnel will be built first, due both to its importance as redundancy for the Coxwell Sanitary Trunk Sewer, and as the back-bone of the integrated wet weather tunnel system. It has to be in place to provide for the connection of both the Taylor Massey Tunnel and the Inner Harbour West Tunnel. All wet weather flows captured by the tunnel system will be treated at a dedicated high rate wet weather treatment facility to be constructed at the Ashbridges Bay Treatment Plant.

Attachment 1 presents a plan view showing the locations of the overall wet weather flow Project components. The overall system will be constructed in the following Stage sequence:

Stage 1. Coxwell Bypass Tunnel (shown as the red line in Attachment 1):

Consists of a 10.5 km in length, 6.3 metre diameter, concrete-lined rock tunnel, with 5 storage and tunnel access shafts that range in diameter from 20 to 22 metres at depths of 52 to 59 metres, and 12 small diameter connecting tunnels to drop shafts and tunnel air vents. This tunnel will initially serve as a bypass tunnel for the existing Coxwell Sanitary Trunk Sewer for inspection and maintenance purposes, and carry wastewater to the Ashbridges Bay Treatment Plant for treatment. Ultimately, when other components of the wet weather flow system and related infrastructure projects are constructed, including the high rate wet weather treatment facility, the Coxwell Bypass tunnel will principally be used for the interception and conveyance of stormwater and combined sewer overflows at 12 locations (consolidating overflows from 18 CSO outfalls) to a new integrated pumping station, where the flows will then be pumped to a new high rate wet weather flow treatment facility at the Ashbridges Bay Treatment Plant.

Stage 2. Taylor-Massey Creek Tunnel (shown as a green line in Attachment 1):

Will consist of a 6.0 km in length, 4.4 metre diameter, soft ground tunnel, which will be connected to the Coxwell Bypass Tunnel. The Taylor-Massey Creek Tunnel will include 4 vertical storage shafts, and will intercept the flows from 11 CSO outfalls.

Stage 3. Offline Storage Tanks:

Involves the construction of i) four underground dry weather flow storage facilities (identified as DWST in Attachment 1) to intercept and divert flows during rainfall events and to address the projected future growth needs within the Don Sanitary Trunk sewershed; and ii) three wet weather flow offline storage facilities (identified as ST in Attachment 1) to intercept flows from existing CSO outfalls. This will also involve the construction of connections and local pumping facilities to convey the stored wet weather flows to nearby sanitary trunk sewers. These storage tanks are required because the existing sewer outfalls are remotely located from the planned tunnel alignments.

Stage 4. Inner Harbour West Tunnel (shown as a blue line in Attachment 1):

Involves the construction of the Inner Harbour West Tunnel (5.6 km in length, 6.3 metre diameter, rock tunnel) and the associated 3 vertical storage shafts, at-grade diversion chambers, and connections to the tunnel from the existing 9 CSO outfalls. The Inner Harbour West Tunnel will connect to the Coxwell Bypass Tunnel east of the Don River at the Keating Railyard.

Stage 5. Coxwell Bypass CSO and Storm Outfall Connections (shown as "x" in Attachment 1):

Will be constructed from the existing 18 CSO outfalls along the Coxwell Bypass Tunnel alignment to the 12 drop shaft connections constructed in Stage 1, after the pumping and treatment works for wet weather flows at the ABTP are constructed and are operational.

It is noted that, separate staff reports will be submitted to the Public Works and Infrastructure Committee to affect the contract awards for the remaining four Stages.

In addition to the 5 Stages of construction listed above, the City is proceeding with other related projects. These include construction of:

- The Integrated Pumping Station, which will be constructed at the ABTP to replace the "M Building" and "T Building" sewage pumping stations and provide wet weather pumping capacity for the Don River and Central Waterfront Project. Dry weather sewage flows would continue to be directed to the ABTP, while the wet weather flows would be directed to a new high-rate wet weather flow treatment facility;
- A high rate treatment facility, as noted above, will be built on the ABTP site to treat the storm and combined sewage overflows captured by the Don River and Central Waterfront Project;
- A landform at the southwest corner of the water lot at the ABTP, to support the construction of the new high rate treatment facility; and,

- Installation of a Real Time Control (RTC) system for the Mid Toronto Interceptor (sanitary trunk sewer extending across the downtown core) to direct higher flows during wet weather to the Don River and Central Waterfront Project deep tunnel system, reducing high wet weather flows to the ABTP.

Refinement and Validation of Detailed Engineering Design of the Coxwell Bypass Tunnel

The detailed design of the Coxwell Bypass Tunnel focused on the refinement of the preliminary design, and included an extensive geotechnical investigation of the rock formations along the proposed alignment of the tunnel. The results of the investigation, documented in a Geotechnical Baseline Report, recommended the tunnel be constructed at a greater depth than originally proposed, such that the Coxwell Bypass Tunnel would be constructed entirely in the shale rock (no soft ground conditions). This resulted in cost savings to the City (by an estimated $30 million) and also reduced the risks associated with tunneling in more variable and challenging conditions frequently encountered in tunneling through soft ground (overburden).

Given the complexity of the system hydraulics, and long term maintenance considerations, computer simulation hydraulic models were used and complemented with the fabrication and testing of large scale physical models of the drop structures (structures through which the CSOs will flow to tunnel depth), to optimize the overall hydraulic design of the system. Figure 1 below is a photo of one of the models during testing. The use of these models allowed the design team to optimize the configuration of the drop structures to prevent damage to the structure by erosion or scouring as a result of high flow velocities, while also ensuring that the flows would be self-cleansing (i.e. to prevent the accumulation of solids and thereby reduce future maintenance requirements).

Figure 1 - Hydraulic Testing using a Physical Model of a Baffle Drop Shaft

Furthermore, a peer review panel of hydraulic engineering, tunnel design, tunnel construction and geotechnical engineering experts were assembled to review the preliminary design, and were engaged through the development of the detailed engineering design, when the design was 50 percent, and 70 percent complete. The peer review panel also reviewed the construction tender documents, technical specifications, and the Geotechnical Baseline Report.

Public Consultation Prior to Finalizing the Detailed Design

During the Don River and Central Waterfront Municipal Class Environmental Assessment (EA) process, extensive consultation with stakeholders and the community was undertaken. Site selection for the vertical storage shafts was largely based on locating them within City-owned property where possible, and minimizing impacts to the public both during and after construction. During the preliminary design phase for the Don River and Central Waterfront Project, the number of vertical storage shafts was reduced from 23 to 12, and the diameter of several storage shafts was reduced through increasing the diameter of the tunnel system. This refinement of the preliminary design had the benefit of further reducing the overall impacts of the project to the public during construction and the long term operation of the system.

Key stakeholders were consulted during the development of the preliminary and detailed engineering design for the Coxwell Bypass Tunnel, including the City's Parks, Forestry and Recreation Division, Toronto District School Board, local businesses and other affected property owners. Input was sought from the stakeholders and efforts were made by the City to minimize impacts to the public during construction and optimize the designs to further reduce operational impacts and overall maintenance requirements. Specific concerns related to the Coxwell Bypass Tunnel construction brought forward by the stakeholders were considered by the City and addressed within the Coxwell Bypass Tunnel tender documents, where possible.

In addition to the stakeholders noted above, coordination was undertaken with the groups representing the major capital projects to be constructed in the vicinity of the mouth of the Don River, given their proximity to the Coxwell Bypass Tunnel construction works at the LDS-3B shaft site (refer to Figure 2 below). This included the Toronto and Region Conservation Authority, City Planning, Waterfront Toronto, Waterfront Secretariat and the Engineering and Construction Services Gardiner Expressway Project Team.

A comprehensive Notification and Consultation Plan has been developed for the Don River and Central Waterfront Project which ensures continued efforts to notify and consult with key stakeholders and the public ahead of and during construction.

Coxwell Bypass Tunnel Construction

- The Coxwell Bypass Tunnel project, will be constructed over a six year period through to 2024. A plan view schematic of the major tunnel components is presented in Figure 2.

Figure 2. Photograph showing the alignment of the Coxwell Bypass Tunnel and Location of the Associated Wet Weather Flow Connections.

All of the major tunnel construction activities will be located at the tunnel entrance shaft site located on the northwest corner of the ABTP site, on the south side of Lakeshore Boulevard (shown as site IHES-2(B) in Figure 2 above, and the area highlighted in Figure 3 below). This is where the tunnel boring machine will be lowered and begin excavation, and where all excavated rock will be removed. This location was chosen because the majority of the excavated rock is expected to be utilized in the Ashbridges Bay landform project (referenced above) at the south west corner of the plant. Excavated material from the remaining four storage shafts will be removed and hauled off site. Excavated rock from these shafts is also expected to be used for the construction of the landform.

Figure 3. Aerial view showing existing M and T Building Pumping Stations, future Integrated Pumping Station, and the future Coxwell Bypass Tunnel shaft location north of the ABTP.

The Coxwell Bypass Tunnel entrance shaft will be located approximately 100 metres west of the site of the future Integrated Pumping Station (referenced above). A separate contract has been awarded for the site preparation work associated with both the Tunnel entrance shaft and the Integrated Pumping Station. Once the site is prepared, construction of the Coxwell Bypass Tunnel as well as the IPS can proceed.

Tendering for the Coxwell Bypass Tunnel

Once the detailed engineering design for the Coxwell Bypass Tunnel was completed, the construction tender was prepared and included the following unique requirements:

- Submission of Escrow Bid Documents by the contractors bidding on the Tender, where all the detailed financial information assembled by the contractor in the preparation of their bids was catalogued and placed in escrow with an escrow agent. This information was then available for review by the City and the contractor.

- The construction contract provides for a Dispute Review Board, a panel of independent experts with experience in tunneling projects, selected jointly by the City and the contractor. The use of a DRB is a common practice in the tunnelling industry. The DRB members will be kept abreast of project progress and will visit the project site and meet with the City and the contractor from time to time. The parties can bring certain disputes relating to underground work to the DRB and have the DRB issue advisory opinions on the dispute to assist in resolution. These opinions are non-binding on the parties and do not replace the existing dispute resolution process in the contract, but given the expected level of expertise of the DRB members, the opinion is likely to be persuasive. The intent is that by making this kind of expert opinion available, the parties will be able to resolve disputes quickly. The contract contemplates a maximum of $500,000 for the DRB, to be shared equally by the City and Contractor. The City's portion is carried as a $250,000 allowance in the construction contract and the contractor

will pay 100% of all DRB invoices (drawing from the allowance for the City's 50% share). In order to participate in the DRB process, the Chief Engineer and Executive Director of Engineering and Construction Services will enter into the required agreements with DRB members on behalf of the City.

- Procurement of an Owner Controlled Insurance Program (OCIP), whereby the City, as the Owner, will purchase a master insurance program to protect against the possibility of adverse financial impact due to accidental loss and damage as a result of the Coxwell Bypass Tunnel construction. The OCIP will provide coverage for all aspects associated with the Tunnel construction, including coverage for work undertaken by contractors, subcontractors, engineers, architects and consultants working on design and construction of the Project.

Owner Controlled Insurance Program (OCIP)

Consideration of the type of insurance coverage is a critical component in any construction contract in order to protect against the adverse financial impact of accidental loss and damage. Typically, the City requires that its Contractors and professional services providers purchase their own insurance policies, in accordance with the requirements specified by the City in the tender documents, and include the cost for the insurance as part of their bid price. This is referred to as a Contractor Controlled Insurance Program (CCIP).

For the Coxwell Bypass Tunnel contract, staff from the City's Corporate Finance, Insurance and Risk Management, have determined that purchasing an OCIP is more appropriate, given the scale, complexity, contract value, specialized equipment and requirements, and duration of the contract.

This determination was made in consideration of the numerous benefits of an OCIP when compared to the traditional construction project insurance approach when undertaking a large-scale construction project such as the Coxwell Bypass Tunnel. The benefits include:

Quality of coverage:

- An OCIP provides the Owner (City) with direct control over the terms and conditions of coverage, allowing the Owner to develop and impose the most appropriate and comprehensive clauses according to the specific contract.
- It eliminates gaps in coverage between what a contractor and their subcontractors might have under their own insurance policies (i.e., under the CCIP approach) and the insurance coverage needs of the City.
- All participants of the project are equally insured, thus apportioning project risk more equitably.

Financial stability:

- An OCIP allows the City to control the selection of insurance companies to meet specific financial strength ratings.

Contractor accountability:

- Contractors remain responsible for paying insurance policy deductible amounts on all claims incurred.

Claims procedure:

- The claims settlement process responds directly to the City rather than having the insurance companies report to the contractor. This allows the City direct communication with the insurers and greater control over the project timeline by reducing the likelihood of disruption due to insurance claims, and facilitates more effective and timely customer service in the event that any members of the public are affected by accidental damage resulting from the Coxwell Bypass Tunnel Project.
- An OCIP would reduce or eliminate cross claims and coverage disputes between different insurance companies providing coverage on the same project because all parties would be covered under the same blanket insurance policies.

The following insurance policies would be included within the OCIP for the Coxwell Bypass Tunnel Project:

- All Risk Builders' Risk: which will protect the City, contractor, subcontractors and consultants engaged in the Project against physical loss or property damage while the project is under construction, including loss of or damage to the Tunnel Boring Machine (TBM), due to an insured peril such as fire, flood, windstorm, earthquake and theft of materials.
- Commercial General Liability (Wrap-Up): this will protect the City, contractor, subcontractors and consultants engaged in the Project against liability arising from bodily injury and property damage to third parties during construction, including bodily injury and / or property damage that occurs after the Project is completed and up to the time when the Tunnel becomes operational.
- Single Project Contractors Pollution Liability: this will protect the City, contractor, subcontractors and consultants engaged in the Project against legal liability arising from either gradual or sudden and accidental pollution events that arise from the Project and that cause damage or injury to third parties.
- Project Specific Professional Liability: this will provide coverage to all consultants endorsed on the policy from negligent acts, errors or omissions in the performance of their professional services on the Project.

Through the City's Insurance Broker, quotations for the OCIP premiums were obtained from various insurers. City staff reviewed the quotations and determined that the value of an OCIP was competitive when compared to a CCIP, especially when considering the advantages noted above and that an OCIP would provide more comprehensive coverage for certain policies. As an example, under an OCIP, the Single Project Professional Liability insurance provides the City's consultants with increased coverage dedicated to the specific project, when compared to the required insurance under their professional engineering services contract with the City, which may be depleted by other claims.

Specific insurance policy terms and conditions for the OCIP, as well as a listing of the insurance companies approached for quotations and resultant responses, are on file at both Insurance and Risk Management and Engineering and Construction Services.

Prequalification of Contractors (RTP No. 3907-17-7007)

Given the scale and complexity of the Project, a contractor prequalification process was undertaken to ensure that the contractors invited to bid on the Tender had the necessary experience, expertise and equipment to successfully undertake the project within the prescribed timelines. The six firms/joint ventures that were prequalified were the only parties permitted to bid on the Coxwell Bypass Tunnel contract.

The prequalification criteria required that prospective bidders:

- Demonstrate that they had experience constructing similar projects. This experience included tunnels with values in excess of $100 million, rock tunnel excavation, tunnels constructed using precast segment lining, and the use of a shielded Tunnel Boring Machine.
- Contractor staff assigned to the Project had the necessary experience in constructing similar projects. This included the requirement that the project team had the following minimum years of experience: project manager (minimum of 10 years of experience including 3 in a project management position), project superintendents (with 15 years of tunneling experience of which at least 10 years in a supervisory role), safety coordinator (with 10 years of experience in heavy civil applications), and design staff (with preferably 10 years of tunnel and shaft design experience).
- Provide corporate information including organization structure (for joint ventures), health and safety policies and records, approaches to risk management and project management tools and approaches.

An invitation to prequalify was issued by the City's Purchasing and Material Management Division on February 20, 2017, and submissions were accepted until April 21, 2017. A total of six submissions were received (five from joint ventures and one from a single company). All were evaluated and all submissions met the prequalification evaluation criteria. The companies or joint ventures that were prequalified were as follows:

1) Barnard Canada Venture LP (a limited partnership of Barnard Construction Company, Inc. and SELI OVERSEAS USA, Inc.)
2) Technicore/Southland Mole of Canada Joint Venture (joint venture of Technicore Underground Inc. and Southland Mole of Canada)
3) East End Tunnel Constructors (joint venture of Aecon Constructors and Dragados Canada Inc.)
4) McNally-Shea Joint Venture (joint venture of McNally International Inc. and J. F. Shea Co. Inc.)
5) North Tunnel Constructors ULC (a Nova Scotia company jointly owned by Jay Dee Canada ULC, Michels Canada Company and C and M McNally Engineering Corp.)
6) STRABAG Inc.

Contract Award for Tender Call 221-2017

Tender Call 221-2017 for the Coxwell Bypass Tunnel Contract (comprising Stage 1 of the Don River and Central Waterfront Project), including construction of the tunnel, storage/access shafts, and drop shafts and tunnel connections for the future wet weather flow connections, was issued by the Purchasing and Materials Management Division to the six prequalified contractors, and was advertised on the City's Website on October 27, 2017. A mandatory site visit was held on November 8, 2017. Tenders were closed on January 19, 2018. Of the six prequalified firms or joint ventures, five attended at the mandatory site meeting.

The Purchasing and Materials Management Division, at its Public Opening held on January 19, 2018, opened the following five (5) Tender submissions:

Bidders	**Bid Price including HST**
North Tunnel Constructors ULC	$378,278,800
Strabag Inc.	$464,571,250
Technicore/Southland Mole Canada JV	$472,041,896
McNally/Shea Joint Venture	$522,822,750
East End Tunnel Constructors (JV)	$539,359,768
Barnard Canada Venture LP	Did not bid

The Tender documents submitted by the recommended and low bidder for Tender Call 221-2017, Contract No. 17ECS-MI-04DC for construction of the Coxwell Bypass Tunnel were reviewed and evaluated by staff from Purchasing and Materials Management Division and Engineering and Construction Services, and were found to be in conformance with the Tender requirements.

The City retained the services of a Fairness Monitor to ensure that the entire bidding process provided equal opportunities to all parties both during the prequalification process and throughout the tender process as well. The attestation reports for both the prequalification process and the tender process provided by the Fairness Monitor are included as Attachment 2.

Engineering and Construction Services staff compared the bids to the estimated cost and found the price of the recommended bidder of $378,278,800 including all taxes and charges, to be lower than the pre-tender engineering estimate of $498,836,704 including all taxes and charges.

The Fair Wage Office has reported that the recommended Bidder has indicated it has reviewed and understands the Fair Wage Policy and Labour Trades requirements and has agreed to comply fully.

The Tender submission from North Tunnel Constructors ULC for Tender Call 221-2017, Contract No. 17ECS-MI-04DC includes their agreement to complete the works within a time frame of 270 weeks from the date of the written Order to Commence. The planned completion date is December 29, 2023.

The Coxwell Bypass Tunnel involves tunnelling and construction of new facilities and tanks. Consistent with City practice, it is recommended that a contingency allowance for $62,509,000 on the base scope of work is included to cover contingencies and/or additional work or services under the construction contract to address any unforeseen conditions which may arise during construction, resulting in a total contract price of $448,913,970 including HST.

A single Purchase Order will be issued to North Tunnel Constructors ULC for Contract No. 17ECS-MI-04DC in the amount of $397,269,000 net of all taxes with funding from the Toronto Water 2018 Approved Capital Budget and 2019-2027 Approved Capital Plan for the part of the contract related to the Coxwell Bypass Construction.

Amendment to Purchase Order No. 6041404 for Marsh Canada Limited for Payment of OCIP Insurance Premium and Broker Commission Fees

An Owner Controlled Insurance Program (OCIP) is recommended by the City's Corporate Finance, Insurance and Risk Management, as the most advantageous arrangement for the Coxwell Bypass Tunnel contract.

Purchase Order No. 6041404, was issued to Marsh Canada Limited for Insurance Broker Services for the City of Toronto, following their selection through a competitive Request for Proposal (RFP). The services provided by the City's Broker include the procurement and maintenance of the City's annual corporate insurance policies, as well as consulting on construction and surety matters, and placement of non-routine insurance policies for Division-specific purposes. Although the terms of the contract with Marsh Canada Limited permits City Divisions to use the City Broker to place insurance policies outside of the City's usual roster of annual corporate insurance policies, it is necessary to seek authorization for the procurement of additional Divisional insurance policies and insurance premium expenditures.

This report recommends the Divisional insurance procurement of an OCIP for the Coxwell Bypass Tunnel contract and the subsequent amendment to the existing Purchase Order No. 6041404 with Marsh Canada Limited to process insurance premium and commission fee payments, which are not to exceed standard market commission rates and do not exceed the commission rates submitted by Marsh in response to the City's RFP No. 9105-17-7180 for Insurance Broker Services.

An amendment to Purchase Order No. 6041404 with Marsh Canada Limited, in the amount of $6,000,000 net of all taxes and charges ($6,480,000 including PST) is therefore required, revising the current Purchase Order value from $15,124,898 to $21,124,898 net of all taxes and charges, $22,814,890 including PST and all applicable charges. These funds represent an upset limit for the payment of insurance premiums and commission fees related to the OCIP for the Coxwell Bypass Tunnel contract.

It is the opinion of City staff that the costs for the Coxwell Bypass Tunnel contract OCIP insurance premiums, including commission rates, are fair, reasonable and consistent with the terms and conditions of RFP No. 9105-17-7180 for Insurance Broker Services.

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ATTACHMENTS

Attachment 1: Plan of Overall Don River and Central Waterfront Project Components
Attachment 2: Fairness Monitor Attestation Reports (2)