TO:	**CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON AUGUST 29, 2017**
FROM:	**KELLY SCHERR, P. ENG, MBA, FEC MANAGING DIRECTOR, ENVIRONMENTAL & ENGINEERING SERVICES AND CITY ENGINEER**
SUBJECT:	**CONTRACT AWARD: TENDER NO. 17-72 BLACKFRIARS BRIDGE REHABILITATION**

RECOMMENDATION

That on the recommendation of the Managing Director, Environmental & Engineering Services and City Engineer the following actions **BE TAKEN** with respect to the award of a contract for the Blackfriars Bridge Rehabilitation:

(a) the bid submitted by McLean Taylor Construction Limited at its submitted tendered price of $7,924,152.27 (excluding HST), for the said project **BE ACCEPTED**; it being noted that the bid submitted by McLean Taylor Construction Limited was the lowest of two (2) bids received and meets the City's specifications and requirements in all areas;

(b) Dillon Consulting Limited, **BE AUTHORIZED** to carry out the resident inspection and contract administration of the said project in the amount of $569,772.50 (excluding HST), in accordance with Section 15.2 (g) of the Procurement of Goods and Services Policy;

(c) the financing for this project **BE APPROVED** as set out in the Sources of Financing Report attached hereto as Appendix A;

(d) the Civic Administration **BE AUTHORIZED** to undertake all the administrative acts that are necessary in connection with this project;

(e) the approval given herein **BE CONDITIONAL** upon the Corporation entering into a formal contract for the material to be supplied and the work to be done relating to this project (Tender 17-72); and,

(f) the Mayor and City Clerk **BE AUTHORIZED** to execute any contract or other documents, if required, to give effect to these recommendations.

PREVIOUS REPORTS PERTINENT TO THIS MATTER

- Civic Works Committee – June 7, 2017 – Blackfriars Bridge Project Status Update
- London Advisory Committee on Heritage (LACH) – May 10, 2017 – Heritage Alteration Permit Application at Blackfriars Bridge (2 Blackfriars Street)
- Civic Works Committee – April 25, 2016 – Blackfriars Bridge – Detailed Design & Tendering Appointment of Consulting Engineer
- Civic Works Committee – February 2, 2016 – Blackfriars Bridge - Environmental Study Report

- Civic Works Committee – May 26, 2014 – Appointment of Consulting Engineers, Blackfriars Bridge Environmental Assessment
- Civic Works Committee - September 9, 2013 – Blackfriars Bridge – Structural Repairs and Temporary Closure
- Civic Works Committee - March 18, 2013 – Blackfriars Bridge Detailed Structural Inspection
- Environment and Transportation Committee – April 26, 2010 – Appointment of Consulting Engineers - Traffic Study - Blackfriars Bridge Risk Assessment
- Environment and Transportation Committee – February 8, 2010 – Appointment of Consulting Engineers – Bridge Rehabilitation Program and Traffic Studies, Meadowlily Bridge Evaluation and Blackfriars Bridge Risk Assessment
- Environment and Transportation Committee – July 9, 2007 – Blackfriars Street Community Concerns

2015-19 STRATEGIC PLAN

The following report supports the Strategic Plan through the strategic focus area of Building a Sustainable City. Heritage conservation is an integral part of this focus area and includes managing and upgrading transportation heritage bridges through the Heritage Bridge Preservation Strategy and protecting and celebrating London's heritage for current and future generations.

BACKGROUND

Purpose

This report recommends the award of a construction tender to a contractor and the continuation of engineering consulting services for the contract administration of the Blackfriars Bridge Rehabilitation project.

Context

Blackfriars Bridge spans the north branch of the Thames River, connecting Blackfriars Street to Ridout Street North. Originally constructed in 1875, Blackfriars Bridge was individually designated under Part IV of the *Ontario Heritage Act* in 1992 by By-law No. L.S.P.-3140-106. The bridge is also included in the Blackfriars/Petersville Heritage Conservation District which was designated under Part V the *Ontario Heritage Act* in 2015 and adjacent to the Downtown Heritage Conservation District which was designated under Part V of the *Ontario Heritage Act* in 2013.

Blackfriars Bridge cannot remain in its current condition for much longer. The temporary emergency repairs completed in 2013 where short term in nature for 3 to 5 years.

In 2014, a Schedule 'C' Class Environmental Assessment (EA) was initiated that in May 2016 recommended the Blackfriars Bridge be rehabilitated, and re-opened to two-directional pedestrian and cyclist traffic and eastbound motor vehicle traffic. The EA received approval in April 2017.

While this structure is an important cultural asset to the City (existing since 1875), it has only had two rehabilitations done in 1956 and 1986. In order to preserve this bridge for

future generations to enjoy in any capacity, a major rehabilitation of this structure is now required.

DISCUSSION

Background

Repairs to existing bridges/structures are governed under the Public Transportation and Highway Improvement Act (R.S.O. 1990, Chapter P.50) which includes O. Reg. 104/97, “Standards for Bridges” and subsequent amendments, the latest being O. Reg. 472/10. This legislation invokes the Canadian Highway Bridge Design Code (CHBDC, CSA-S6.) and exceptions as governing the parameters for the design, evaluation and structural rehabilitation design for highway bridges in Canada.

The Canadian Highway Bridge Design Code (CHBDC) mandates that when rehabilitating an existing structure the proposed works bring the existing structure up to current bridge design codes, recognizing the advancements for safety requirements. This requirement becomes a challenge when dealing with a heritage structure and alterations or “sympathetic designs” may be required to meet this criteria. There is provision within the Code that allows for some acceptance of deficiencies in place if unaltered on an existing structure which allows some flexibility when dealing with a heritage structure.

Contract Design and Preparation

In 2013, a detailed structural inspection was completed which provided an initial understanding of the condition of the bridge at that time. Based on this understanding, the preferred solution from the EA anticipated that the rehabilitation of the bridge would occur in-situ, with a level of care appropriate for that process. The anticipated work would accept some deficiencies in place and would provide an expected additional service life of 25 years for the bridge. The EA preliminary project cost estimate based on this approach was $4.6 M.

During the detailed design phase, further investigations were completed that helped inform the rehabilitation. Investigations in the fall of 2016 discovered that one of the bearings had cracked, and there were new perforations through the arch ribs at all four corners of the structure that were not evident in previous inspections. The results of the continued deterioration now make it unsafe to complete the rehabilitation of the bridge in place. The bridge cannot support the weight of the temporary measures, equipment and workers required to complete the work.

This ongoing deterioration forced a reconsideration of the repair strategy. The ability to lift the bridge, move it off site and complete the work in a shop over winter was explored, and deemed to be possible while providing many advantages. This process does come with associated risks but it is offset by the greatly reduced risk of a work place accident during construction and of the public trying to cross the bridge while it is under construction. It also improves the quality of fabrication and takes advantage of the winter season for the ‘in-shop’ repairs. However, with the revised methodology for repairs on the Blackfriars Bridge (lifting the bridge off to a location where access is improved), the City is obligated under the CHBDC to address deficiencies that were previously anticipated to have been accepted in place. This triggers a more rigorous rehabilitation than anticipated during the EA. The more thorough rehabilitation triples the projected service life of the bridge from 25 years to 75 years.

The design team has taken a responsible and thoughtful approach to bring this iconic heritage structure into compliance with the current CHBDC while recognizing and retaining as much of the heritage attributes of Blackfriars Bridge as possible in the rehabilitation. On the bridge itself, the planned works will complete the following:

- Replacement of cover plates on top chord arches;
- Strengthening of top chord riveted connections;
- Modification to top chord hangers and diagonal connection details;
- Strengthening of vertical and diagonal truss members (approximately 15% of original members require replacement);
- Replacement of longitudinal stringers (from 1986 rehabilitation);
- Replacement of transverse floor beams (original 1875 construction);
- Modification to lower panel point connections (below the deck);
- Replacement of bottom lateral bracing (from 1986 rehabilitation);
- Repairs to top lateral bracing system;
- Repairs to pedestrian railing at sidewalk;
- Rehabilitation of bridge bearings and top portion of the abutments;
- Repainting of the bridge to match the existing green colour;
- Replacement of the timber deck with a more durable material in the vehicle lanes and wood on the pedestrian walkway;
- Modification to the existing hand rail and posts, with re-instatement of the original lattices panels on the pedestrian walkway;
- Repair of all primary members of the bridge by bolt or riveting rather than welding (due to impurities in the material, welding of wrought iron could result in the failure of the welds by brittle fractures after a number of stress cycles);
- Replication and installation of “Wrought Iron Bridge Company of Canton, Ohio” signs reusing salvaged wrought iron material; and,
- Illumination of the bridge structure and its approaches.

Approach works on the west side of the Thames River includes the introduction of a clearance beam to protect Blackfriars Bridge, and a speed table to slow traffic down as they proceed across the bridge. Landscaping is being kept to a minimum on this side, as the West London Dykes (WLD) project has planned works in this area in the near future and anything that was planted may be disturbed by construction related to the WLD project.

Approach works on the east side of the Thames River include the introduction of a turn-around facility so that west bound vehicles can no longer access the bridge, but have a safe way to turn around, a pedestrian crossover at the Thames Valley Parkway crossing of Ridout Street North, the creation of a viewing plaza, bridge artefact and enhanced landscaping.

With proper future maintenance, these planned works are expected to provide the following benefits:

- A service life estimated at 75 years;
- Increased load-carrying capacity;
- Upgraded abutment and wingwall caps (drainage and stability);
- New, low maintenance bearings;
- Safer construction approach for both workers and the public;
- Improved fabrication and coating quality (work in shop);
- Ability to shop rivet authentic to heritage;
- Improved corrosion resistance, removing more rusted members;
- Improved safety of pedestrian railing;

- Improved sidewalk width and AODA compliance on approach works;
- Improved public safety and less construction noise due to reduced construction activity on site;
- Improved appearance overall, removing some 1950's work that obscures view of 1875 details; and,
- Retention of pedestrian railing posts and lattice infill pieces from 1875.

Blackfriars Bridge is the oldest metal bridge on the Ontario Heritage Bridge list and is recognized nationally and internationally as a unique feature in the identity of the City of London. Its preservation over the years is a strong symbol of the City's good management and innovative approach to both preserving the past while adding value long into the future. This project retains the character and key elements of the original and restores the appearance closer to its historical configuration (with elements of the accumulated heritage incorporated) and provides greater value to the City with the longer 75 year service life.

Heritage/Archaeology

City staff, including the Heritage Planner and Dillon have worked closely to achieve the best possible design solutions for the proposed work, maintaining heritage elements where possible, and creating sympathetic design solutions were required. Council approved a heritage alteration permit on May 30, 2017.

All areas affected by the construction, including the turn-around area to the east and the contractor's lay down areas on the west side of the river have undergone a Stage 2 Archeological Investigation. No elements of interest were found.

Upper Thames River Conservation Authority

While no in-water works are planned for this project, ongoing consultation with the Upper Thames River Conservation Authority (UTRCA) has been an important element throughout this project. An UTRCA Permit has been applied for, and is expected to be issued by the end of August 2017.

The open space land between the existing right of way for Ridout Street North and the Thames River is currently owned by the UTRCA. The creation of the turn around and the reconfiguration of the roadworks at the north limit of Ridout Street North will expand the requirements for right-of-way. The City of London and UTRCA are in the process of establishing the required land transfer limits and working through the required process to effect this land transfer.

Construction Considerations

<u>Pre-qualification of Contractors</u>

Recognizing the unique and challenging elements that this structure presents, a public Request for Pre-Qualification of Contractors was issued in December 2016. Six contractors submitted a package of information and responses to specific questions relating to the project. An evaluation committee of City and Dillon staff reviewed and assessed the submission packages. Four contractors were short-listed, and these Contractors were invited to submit a tender for the actual project.

<u>Lifting of bridge</u>

The rehabilitation is planned to occur off-site. This involves lifting the bridge off its

abutments, disassembling, making repairs and modifications in a controlled shop environment, reassembling and lifting the bridge back into place onto rehabilitated abutments. A large laydown area near the northwest corner of the bridge provides adequate space to place the bridge while it is being dismantled and reassembled. While the bridge lifts introduce a unique risk, off-site rehabilitation will create an overall safer work environment, ensure better quality control, reduce the need for environmental protection measures and take advantage of the winter months to complete much of the work.

Schedule

Construction is anticipated to commence September 2017, and is expected to be substantially completed by November 2018.

Pedestrian / Cyclist Detours

No temporary crossing is proposed for this location. Upon the start of construction, Blackfriars Bridge will be closed to all users until the bridge is re-installed and all the tie in work is completed in late 2018. Pedestrians and cyclists will be required to cross the Thames River at either Oxford Street or Riverside Drive.

Tender Summary

Tenders for Blackfriars Bridge Rehabilitation were opened on Tuesday, June 27, 2017. Two (2) contractors submitted tender prices as listed below (excluding HST).

	CONTRACTOR	TENDER PRICE SUBMITTED ($)	CORRECTED TENDER PRICE ($)
1.	McLean Taylor Construction Limited	7,924,152.27	----
3.	FACCA	10,635,020.00	----

All tenders have been checked by the Environmental and Engineering Services Department and Dillon Consulting Limited. The tender estimate prior to tender opening was $5,936,400 (excluding HST). Funds adequate for this award of this tender are identified in the previously anticipated capital accounts including PTIF funding and supplemented by the Major Bridge Upgrades account.

The revised methodology for the repair obligates the City to complete a more rigorous rehabilitation resulting in additional costs not previously anticipated during the EA phase. There are unique elements to this project that made the pre-tender estimating challenging. Additionally, a recent escalation in structural tender costs has also been observed due to the quantum of work required by the industry in the current and coming years.

The award of this tender exceeds the EA goals by providing a longer future life span than previously anticipated. The revised approach to the construction reduces construction risk and may help minimize the expenditure of contingency funds that are $700,000 of the tender cost. The award at this time also mobilizes the $1.5 M Public Transit Infrastructure Funding (PTIF) project within funding deadlines. The PTIF funding was approved for the active transportation improvements enabled by the bridge rehabilitation.

Consulting Services

In 2014, Dillon was initially selected to complete the EA by a thorough, competitive consultant acquisition two stage process in accordance with the Procurement of Goods and Services Policy. The process, which included a publicly advertised Request for Qualifications (RFQ) and a Request for Proposal (RFP), identified the selected consultant from a list of seven engineering consultants. In May 2016, Dillon Consulting Limited was awarded the detailed design and tendering phase of the project in accordance with Section 15.2 (g) of the Procurement of Goods and Services Policy.

Blackfriars Bridge is a unique and complex heritage structure. The level of complexity required for the design is higher than on any other recent bridge project undertaken by the City. Due to the consultant's specific knowledge and positive performance with this project, Dillon Consulting Limited was requested to submit a proposal to carry out the contract administration and resident supervision for this project. Staff have reviewed the fee submission in detail, considering the hourly rates provided by each of the Consultant's staff members. City staff have confirmed that hourly rates are consistent with those submitted through competitive processes.

In accordance with Section 15.2 (g) of the Procurement of Goods and Services Policy, Civic Administration is recommending Dillon Consulting Ltd. be authorized to carry out the remainder of engineering services for this project. This involves the contract administration at an upset fee estimate of $569,772.50 (excluding HST). The City's requirement for the creation of record drawings following construction necessitates the reviewing engineer seal them on the basis of field verification and ongoing involvement. Consequently, the continued use of Dillon who created and sealed the rehabilitation design is required to not violate the City practice of Professional Engineers sealing record drawings. The continued use of Dillon Consulting Limited on this project is also of financial advantage to the City due to the fact that they have specific knowledge of the project, and they have undertaken work for which duplication would be required if another firm were to be selected. These fees are associated with the inspection services necessary to ensure the City receives the construction product specified and value for the investment. The approval of this work will bring the value of the overall consulting assignment to $1,381,181.

CONCLUSION

The rehabilitation of this iconic heritage bridge is a complex undertaking. Progressive deterioration necessitated a need to revise the rehabilitation strategy to include a bridge lift and more intense rehabilitation off-site. While this does increase costs, it does enable a much more extensive rehabilitation, a longer bridge life and reduced risk during the construction phase. The reduced risk may provide opportunities to manage costs better and return more committed funds to the accounts.

Civic Administration has reviewed the tender bids and recommends McLean Taylor Construction Limited be awarded the construction contract for the Blackfriars Bridge Rehabilitation project.

Dillon Consulting Limited has demonstrated an understanding of the City requirements for this project and it is recommended that this firm continue as the consulting engineer for the purpose of contract administration and inspection services as it is in the best financial and technical interests of the City.

There are no additional operating costs as a result of the award of this tender. This complete rehabilitation will reduce the need for non-routine and emergency maintenance that has been required in recent years.

Acknowledgements

This report was prepared with assistance from Jane Fullick, C.E.T., Senior Technologist of the Transportation Planning and Design Division.

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Attach: Appendix A: Sources of Financing

c. Dillon Consulting Limited
McLean Taylor Construction Limited