

4. **PLAZA BRIDGE REHABILITATION ENGINEERING AND
MONITORING SERVICES**

COMMITTEE RECOMMENDATIONS

That Council approve:

- 1. The next phase for engineering services, during construction of the Plaza Bridge Rehabilitation Project to McNeely Engineering Consultants Limited, Kanata, in the amount of \$780,000, bringing the revised contract total to \$2,130,000;**
- 2. The next phase for engineering services, during construction of the Plaza Bridge Watermain Replacement to McNeely Engineering Consultants Limited, Orléans, in the amount of \$60,000, bringing the revised contract total to \$165,900;**
- 3. The appointment of Public Works and Government Services Canada, Nepean, to provide engineering services for the Plaza Bridge monitoring, in the amount of \$350,000.**

DOCUMENTATION:

- 1. Environment and Transportation Commissioner's report dated 19 Jan 98 is immediately attached.**

REGIONAL MUNICIPALITY OF OTTAWA CARLETON
MUNICIPALITÉ RÉGIONALE D'OTTAWA CARLETON

REPORT
RAPPORT

Our File/N/Réf. **25 RS 241-29**
Your File/V/Réf.

DATE 19 January 1998

TO/DEST. Co-ordinator
Corporate Services and Economic Development Committee

FROM/EXP. Environment and Transportation Commissioner

SUBJECT/OBJET **PLAZA BRIDGE REHABILITATION**
ENGINEERING AND MONITORING SERVICES

DEPARTMENTAL RECOMMENDATIONS

That the Corporate Services and Economic Development Committee and Council approve:

- 1. The next phase for engineering services, during construction of the Plaza Bridge Rehabilitation Project to McNeely Engineering Consultants Limited, Kanata, in the amount of \$780,000, bringing the revised contract total to \$2,130,000;**
- 2. The next phase for engineering services, during construction of the Plaza Bridge Watermain Replacement to McNeely Engineering Consultants Limited, Orléans, in the amount of \$60,000, bringing the revised contract total to \$165,900;**
- 3. The appointment of Public Works and Government Services Canada, Nepean, to provide engineering services for the Plaza Bridge monitoring, in the amount of \$350,000.**

BACKGROUND

1. Plaza Bridge Rehabilitation

On 11 September 1996, Regional Council approved the appointment of McNeely Engineering Consultants Limited, Kanata, to provide professional engineering and related services to consider the feasibility of rehabilitation of the existing structure and replacement alternatives for the Plaza Bridge, connecting Wellington Street to Rideau Street across the Rideau Canal for a total

contract provision of \$300,000. This study was undertaken on behalf of Public Works and Government Services Canada (PWGSC).

On 24 March 1997, a Contribution Agreement was signed by PWGSC and the Regional Municipality of Ottawa-Carleton. This resulted in the transfer of \$20,000,000 from PWGSC to the Regional Municipality to provide funds for the rehabilitation of the bridge, bridge maintenance and for the liability and risk management of assuming the bridge. The Agreement was signed on the condition that the Regional Municipality enter into a Divestiture Agreement which has since being signed by the Region. The negotiated sum of \$20,000,000 included amounts for long term bridge maintenance and for ownership liability and risk.

On 09 April 1997, Regional Council approved an extension of the assignment with McNeely Engineering Consultants Limited, Kanata, to provide professional engineering services for the detailed design and contract preparation, in the amount of \$1,050,000 for a revised contract total of \$1,350,000.

During the construction, specialist engineering services will be necessary to review detailed procedures and construction processes, as well as to install monitoring devices such as strain gauges and thermocouples in the interior of the bridge. The estimated cost for engineering services to be provided to complete the construction work is \$780,000, including GST.

2. Plaza Bridge Watermain Replacement

Concurrent with the bridge assignment, on 25 June 1997, Regional Council approved the appointment of McNeely Engineering Consultants Limited, Orleans, to provide professional engineering and bridge services for the 600 mm diameter Plaza Bridge Watermain Replacement, in the amount of \$105,900. The next phase of the engineering assignment is to undertake specialist engineering services during construction of the Plaza Bridge Watermain Replacement. The watermain project also includes the replacement of several small diameter watermains within the contract limits. The estimated cost for this phase of engineering services is \$60,000, including GST.

3. Plaza Bridge Monitoring

Authority is requested to appoint PWGSC, Technology and Environmental Services, to provide professional engineering services for the design, installation and operation of an intelligent monitoring system, including automated data collection and analysis processes, for the performance monitoring of the Plaza Bridge for a total contract provision of \$350,000.

This work will be carried out in conjunction with Carleton University and will have similar engineering equipment to that being used on the Confederation Bridge which links Prince Edward Island and New Brunswick. That work was also carried out by Public Works and Government Services Canada in association with Carleton University. The Department is taking advantage of the technology that has been developed for this latter project. PWGSC will also be contributing, an estimated 25% of the total cost.

The overall work will consist of the placement of in excess of 200 thermocouples (devices that measure temperature change) and vibrating wire strain gauges, triaxle accelerometer units (devices for earthquake analysis) along with connecting cables, two data loggers as well as signal conditioners and amplifiers. Along with this monitoring equipment it is necessary to develop software pertinent to this particular site and to calibrate the instruments. The assignment also includes training for Regional staff in the system operation.

The benefits of this monitoring will be that the Department will be able to objectively determine the stresses in the bridge during a period of some ten years. This will enable the Department to verify design assumptions for the renovated structure as well as to determine the complicated stress patterns due to thermal loads which are large for this type of structure. Discrete data gathered will enable the Department to react to future anomalies and to respond to any deficiencies in a timely manner to ensure the functionality of the bridge.

As well as specific applications for this bridge, the technology, experience and training of staff for this project will enable the Department to use 'state of the art' technology for all bridges of the future. Direct benefits will be attributable to the operation and maintenance to other arch structures such as Cummings and Bank Street Bridges which are presently and have recently been rehabilitated. The percentage of these monitoring costs in assuring the serviceability of these three major arch structures is approximately 1% of the rehabilitation project cost. Also, the use of this technology will assist in the protection of all of our Regional bridge structure assets which have a replacement cost in excess of \$750,000,000.

CONSULTATION

Extensive stakeholder consultation was undertaken during the feasibility and design stages of the project, with the formation of both a Technical Advisory Committee (TAC) and Public Advisory Committee (PAC). A public information session was held on 17 April 1997.

During the construction phase of the project a Co-ordinating Committee has been formed, with participation from immediate stakeholders and businesses affected by the construction. This Committee meets bi-weekly to ensure communication with the stakeholders during the construction work.

These works must also be co-ordinated with the Wellington Street Reconstruction (Phase III) and other projects, immediately adjacent to the bridge which may be undertaken in the same timeframe.

EXPENDITURE JUSTIFICATION

The Plaza Bridge is a key link in the Regional transportation and transit networks and the most critical one for users of the Wellington Street core area and it requires major rehabilitation. Continued serviceability of the structure is critical to the transportation network and transit

facilities using this bridge and to assure safety of the facilities and users under the bridge. Major tourist facilities are also located under and in the vicinity of the bridge.

The monitoring costs are a small percentage of the amount allocated for ownership liability and risk during the Divestiture Agreement negotiations. Without this expenditure there will not be any objective method to monitor the bridge behaviour and hence ensure the functionality of the bridge. As well, to confirm the design parameters and intent, and to assess the future deterioration and hence fiscal management of the structure, it is necessary to implement the monitoring system.

FINANCIAL STATEMENT

	<u>912-31060</u>	<u>922-41926</u>
	\$	\$
Approved Budget to Date	26,000,000	1,248,000
Total Paid & Committed	<u>(20,780,142)</u>	<u>(1,159,755)</u>
Balance Available	5,219,858	88,245
THIS REQUEST	<u>(1,130,000)</u>	<u>(60,000)</u>
Balance Remaining	<u>4,089,858</u>	<u>28,245</u>

Funds have been provided in the 1997 Capital Budget, Account No. 912-31060, Plaza Bridge (Reference page 97) and Account No. 922-41926, Plaza Bridge Watermain Replacement.

CA9236 - McNeely, Kanata
 CA9352 - McNeely, Orleans
 CA9459 - PWGSC

Approved by
M.J.E. Sheflin, P.Eng.

JBE/cpv

FINANCE DEPARTMENT COMMENT

Funds are available as indicated.

Approved by C. Colaiacovo
 on behalf of the Finance Commissioner