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ENGINEERING SERVICES, WESTON ROAD, TESTON ROAD AND HIGHWAY 400 INTERCHANGE – PURCHASE ORDER REVISION CITY OF VAUGHAN, PROJECTS 81820 AND 98610

The Transportation and Works Committee recommends the adoption of the recommendation contained in the following report, December 18, 2007, from the General Manager, Roads:

1. RECOMMENDATION

It is recommended that approval be given to increase McCormick Rankin Corporation fees for providing professional engineering services during the detailed design and construction phases of the Weston Road (Y.R. 56), Teston Road (Y.R. 49) and the Highway 400 Interchange project by \$241,842 from \$1,402,905 to \$1,644,747 excluding GST.

2. PURPOSE

This report is to obtain Council approval to increase the purchase order amount for the previously retained engineering consulting firm.

3. BACKGROUND

The Council of the Regional Municipality of York at its meeting on October 16, 2003, adopted, without amendment, Clause No. 10 contained in Report No. 9 of the Transportation and Works Committee recommending award of Request for Proposal (RFP) P-03-55 to McCormick Rankin Corporation (MRC).

3.1 Scope of the Original Assignment

MRC's work under the original engineering services agreement included detail design and contract preparation for widening of Weston Road from Retreat Boulevard (500 metres north of Major Mackenzie Drive) to Teston Road and Teston Road from Weston Road to 800 metres west of Jane Street, including the new interchange at Highway 400.

3.2 Cost of the Original Assignment

MRC's fees for their work performed under the original engineering services agreement was \$995,300.

3.3 Previously Approved Purchase Order Revisions

The project team identified additional requirements during work on original assignment. This included, but was not limited to:

- Planning and design for new commuter parking lot (recoverable from MTO).
- Additional foundation investigation, design and structural engineering for the Cold Creek culvert replacements.
- Phase 1 environmental site assessment for lands to be acquired.
- Detail design and contract preparation for the culvert replacement on Teston Road approximately 300 m east of Pine Valley Drive.

Staff revised the original purchase order to address these additional project requirements and changes in conditions. The aggregate amount of the purchase order revisions to date is \$407,605 (41% of original purchase order), which includes \$199,060 (20% of original purchase order) for Scope Changes, \$149,295 (15% of original purchase order) for Contingencies and \$59,250 (6% of original purchase order) for work recoverable from a third party. The total revised upset limit for the purchase order is \$1,402,905. In accordance with the Purchasing By-law, staff can increase a purchase order for work recoverable from a third party exclusive of the Scope Change and Contingency provisions.

3.4 Project Status

This project is currently in the construction phase. Construction is approximately 50% complete. All work should be fully complete by the end of 2008 and the new interchange at Highway 400 and Teston Road open to traffic.

4. ANALYSIS AND OPTIONS

The Region retained MRC to provide professional engineering services for the detailed design of Weston Road from Retreat Boulevard to Teston Road, Weston Road to 800 metres west of Jane Street, including the new interchange at Highway 400.

In response to new project requirements, changes in field conditions and liaison during construction, which was not anticipated at the time of the proposal, additional scope is required.

4.1 Scope of Additional Engineering Requirements

Prior to tender, the project team identified additional tasks and activities necessary to complete the engineering and prepare the contract package. These changes were initiated predominantly by the Ministry of Transportation and work affecting the new Highway 400 interchange. Time was of the essence during this period and completing the design and tendering a contract for construction had to proceed forthwith. The additional work included:

Stage 2 archaeological investigation for the entire contract limits.

- Design changes to the watermain and sanitary forcemain servicing the Highway 400 southbound service centre.
- Update contract documents and specifications to reflect changes in MTO specifications.

During the initial detailed design stage for the structure replacement on Teston Road east of Pine Valley Drive, which was included in the work under purchase order revision 3, the Toronto and Region Conservation Authority (TRCA) suggested a longer span structure is required at this location to protect the valley corridor and enhance channel geomorphology. The project team reviewed this suggestion and concluded a bridge structure is more economical than a culvert with significant fill and retaining walls. The additional work for this design change includes:

- Expanded Stage 2 archaeological investigation.
- Design of bridge structure instead of concrete culvert.
- Preliminary designs, review and analysis, including detailed cost estimates for both the original culvert alternative and new bridge alternative.
- Additional field investigations, including structure foundations.

During construction, it is anticipated that effort from the engineering consultant and the geotechnical/foundation engineer will be required to assist the Region in reviewing shop drawings, responding to questions from the contractor on alternate means and methods of undertaking the work and other activities.

4.2 Cost of Additional Engineering Requirements

The additional engineering requirements, including costs, are summarized in Table 1.

Table 1
Additional Engineering Requirements Summary

Item	Total
Additional Engineering Prior to Contract Tender	\$43,140
Additional Engineering for the Culvert Replacement East of Pine Valley Drive	66,702
Liaison and Shop Drawing Review During Construction	132,000
TOTAL	\$241,842.00

Staff have reviewed the extra costs and concur they are reasonable. In further support of the reasonableness, the total fee for this assignment, staff have compared the ratio for the total design fee to the construction tender value on several recent projects. This analysis showed the minimum ratio being 2.6% and the maximum ratio being 8.7%, with an average of 5.4%. For this assignment, the ratio for the total design fee to construction tender value is 5.7%. This is comparable with the average.

Sufficient funds are available in the 2007 budget and proposed 2008 budget.

5. FINANCIAL IMPLICATIONS

MRC's assignment was to undertake the detailed design for the road reconstruction and widening to Weston Road from Retreat Boulevard (500 metres north of Major Mackenzie Drive) to Teston Road, Teston Road from Weston Road to 800 metres west of Jane Street, including the new interchange at Highway 400 at an upset limit fee of \$995,300.00. Given the various changes to the scope of work and the significant additional work that has been added to the assignment, including the detailed design of the culvert replacement and associated roadwork on Teston Road east of Pine Valley Drive, it is recommended that authorization be given to increase the purchase order by \$241,842 for MRC and their team to complete work to a total cost of \$1,644,747.00 excluding GST.

6. LOCAL MUNICIPAL IMPACT

The local municipality will benefit significantly from the works presently under construction in the Weston Road, Teston Road and Highway 400 area of the City of Vaughan. The road improvements will provide additional capacity within the Regional corridors and the new interchange at Highway 400 and Teston Road will enhance connectivity between the arterial road system and the Provincial freeway network.

7. CONCLUSION

MRC is required to assist Regional staff in completing the construction phase of this project and to complete the detailed design of the culvert replacement and associated roadwork on Teston Road east of Pine Valley Drive. In order to accomplish this, an increase is required to the current purchase order to reflect changes in the work and additional requirements to the original purchase order and approved revisions.

For more information on this report contact Dino Basso, Director, Capital Delivery, Roads Branch at extension 5902 in the Transportation Services Department.

The Senior Management Group has reviewed this report.