

Engineering Department Capital Project Audit Report

Management Responses

November 22, 2010

Summary

- **Overview of Engineering Capital section**
- **E3 Initiative**
- **Issues/Challenges**
- **Highlights of Markham's Auditor General Report**
- **Staff's response to Auditor's Recommendations**

Engineering Capital Section Overview

- **Number of Current Active Projects Ranging From:**
 - 6 Environmental Assessment Studies
 - 14 Engineering Studies
 - 30 Design Projects
 - o (18 Engineering & 12 AM/Operations)
 - 39 Construction Projects
 - o (27 Engineering & 12 AM/Operations)

Engineering Capital Section Overview continued:

- **Projects relate to:**
 - Bridge construction (Birchmount Road under CN)
 - Road construction (Woodbine By-pass, Enterprise Drive, Main Street – Unionville)
 - Sewer construction (Hwy 7 Trunk Sanitary Sewer)
 - Water main construction
 - Erosion remediation
 - New sidewalk/pathway construction
 - New illumination installation
- **Total of 9 Staff consisting of Manager and 8 Staff**
- **All studies, designs, tenders and contract administration undertaken by external consultants**
- **Engineering Department provided an update to DSC in June 2010 on the 2010 Capital Program, the 5 Year Capital, Sidewalk and Illumination Programs**

E3 Initiative

- Under the E3 initiative an opportunity to increase efficiency and reduce costs by reorganizing based on like functions rather than funding source was recognized
- In the spring 2010 Engineering assumed responsibility for the construction of the larger repair/replacement of Asset Management/Operations Capital Program
- These 24 projects totalling ±\$15.0 million relates to;
 - Culvert Rehabilitation
 - Bridge Rehabilitation
 - Road reconstruction
 - Local Improvements
 - Stormwater Management pond cleanup
 - Watermain replacement
 - Streetlight replacement
- Two staff (Engineer and Technician) were transferred to Engineering from AM/Operations to manage these projects

Issues/Challenges

- **Staff Retention**
 - Professional engineers are in high demand in both the public and private sectors with much job mobility
 - High rate turnover of Capital Works staff in last two years
 - Manager position was recently filled after four (4) months of vacant position
- **Project Timelines**
 - Projects delayed due to staffing issues, approvals and property acquisition
- **Staffing Levels**
 - Asset Management/Operations projects transferred to Engineering has increased from 10 to 24, with an additional 13 Projects planned for 2011
 - The two staff members provided by Asset Management is insufficient to accommodate work load
 - Engineering resources temporarily reprioritized to accommodate Asset Management/Operations Capital Program
 - Two (2) new full time employees requested in 2011 Budget to accommodate existing and projected work program to be funded by Life Cycle, Water Rate and Tax Rate
 - Without adequate resources, the Asset Management / Operation Projects will have to be reduced

Issues/Challenges cont:

- **Revenue**

- Engineering staff to be self financed from fees generated by the Capital Program through Development Charges and Pre-DCA Reserve

(\$1.8million Budget vs. \$1.9million Projected revenue for 2010)

- Currently finalizing funding for Asset Management /Operation staff from life cycle and water rates

Auditor's Highlights

- **Auditor had an overall positive evaluation for the Engineering Capital Project management**
- **The Engineering department has adequate processes and controls in place to manage delivery of major infrastructure and capital projects**
- **Some improvement could be made in project reporting, change order process, project and issue closure and document management**
 - Project reporting should be further developed to ensure senior Town staff and Council are aware of outstanding project issues and risk mitigation activities in a timely fashion
 - Some improvement is needed to ensure availability of supporting documentation for change orders, and to ensure the Town formally approves and logs all change orders before the work is started
 - Project closure process should be tightened up
 - “Lessons Learned” exercise should be completed for larger projects to support continuous learning
 - Consultant contracts should be formalized to include the scope, expected activities, and mandatory documents.
 - Authorization of payments was excessive, with 4 staff members reviewing all invoices

Staff Responses to Auditor's Recommendations Finding 5.1

5.1- Project reporting framework is not sufficiently developed to ensure issues are appropriately escalated and risk mitigation is in place

Ref	Audit Recommendation	Town Response / Action plan (who, what, when)	Status Update as of November 2010
5.1	<p>Working with the newly implemented Project Management Office;</p> <ul style="list-style-type: none"> ○ Refine the project status reports to clearly identify issues, rate / assess their significance and any key deadlines, and include risk mitigation actions ○ Develop and adopt project reporting framework that includes reporting process to Council and senior Town staff, executive summary project dashboards that focus on project status as to time, cost, quality, issues, and ○ Develop / adopt issue tracking mechanism with an escalation process. 	<p>Engineering Senior Staff are currently involved in the Cross Commission Team which was setup to establish a Project Management Support Office</p> <ul style="list-style-type: none"> • The project status reporting is currently being reviewed by one of the sub-committees of the Cross Commission Team. Research and consultation for project status reporting is scheduled to be finalized in Q2 2010. Upon finalization of the status report, the information will be implemented by Engineering Senior Staff. • Engineering Department has recently adopted the new Town standard Eclipse program and required staff to use the program for managing the capital projects. The Eclipse program will have the ability to provide reporting tools (i.e. Dashboard) to Council and Senior Staff as discussed in the recent Cross Commission Team Meetings. • The issue tracking mechanisms are also being reviewed and will be finalized and implemented by the Cross Commission Team. 	<p>The Cross Commission Team is finalizing the project status reports regarding schedules and is scheduled to be completed by Q2/Q3 2011.</p> <p>Previous Capital Projects were managed using other Project Management Programs (i.e. Microsoft Project)</p> <p>The Capital section of the Engineering Department are now equipped with the Eclipse Program and is currently being implemented on <u>NEW</u> Capital projects. The project reporting framework is to be finalized by the Cross Commission Team and is scheduled to be completed by Q2/Q3 2011.</p> <p>The Cross Commission Team is finalizing the project tracking mechanism and is scheduled to be completed by Q2/Q3 2011.</p>

Staff Responses to Auditor's Recommendations Finding 5.2

- **5.2 - Project closure process not sufficient to ensure key documents are retrievable, and that project outcomes are assessed for continuous improvement.**

Ref	Audit Recommendation	Town Response / Action plan (who, what, when)	Status Update as of November 2010
5.2.1	<p>The close out process for projects should be documented, similar to the documentation maintained by the department for the other project phases.</p> <p>Project close out should include a "lessons learned" activity for continuous improvement.</p>	<p>Engineering will create a project close out form which will also include a section called "lessons learned" for continuous improvement. This form will be created by the end of 2010 and revised as required by the Manager, Infrastructure and Capital Projects.</p> <p>During the regular monthly Capital Works staff meetings, the lessons learned will be reviewed and discussed with the engineers.</p>	<p>A Project close out form has been created and is currently being utilized by staff. The Project close out form includes lessons learned.</p> <p>As a part of the monthly meetings, Capital works staff has been incorporating the "lessons learned" from other projects.</p>
5.2.2	<p>Engineering should adopt the use of the new Town standard project management software (Eclipse) to ensure key project documents are retrievable in the future. Develop a checklist of standard required documents in engineering projects.</p>	<p>Engineering will create a standard checklist of standard documents for engineering projects by the end of 2010. The implementation of Eclipse or other similar project management tool is estimated to be end of 2011 as this will require training and customized "dash board" to suit our needs. Engineering Senior staff will administer the implementation of this program.</p>	<p>The Capital works group has been setup to utilize Eclipse as the project management software. The program is being used for the more recent Capital Projects (i.e. Birchmount Road – Phase 2). The program still requires to be updated to incorporate the project management reporting tool being created by the PMSO office.</p>

Staff Responses to Auditor's Recommendations Finding 5.3

- **5.3 - Consultant contract for contract administration services was not always in place for some preferred suppliers**

Ref	Audit Recommendation	Town Response / Action plan (who, what, when)	Status Update as of November 2010
5.3.1	<p>Consultants hired as preferred suppliers should have a contract document created and executed to support the purchase of services. The contract document / consultant quote should at least include the scope, expected activities, mandatory documents, and performance measurements for the consultant.</p> <p>In selecting a preferred supplier for services, there is no required Town "Request for Quote" document. It is recommended that standard requirements for contract administration be developed to ensure all necessary services and documents have been included in the consultant quote.</p>	<p>Engineering will immediately require all "new" engagement of preferred suppliers to include detailed scope of work and sign a consultant service agreement. Implementation to be administered by Manager, Infrastructure and Capital Projects.</p> <p>Engineering Staff has recently obtained a copy of the Contract Supervision and Contract Administration Terms of Reference provided by the Contract Administrator for the Enterprise Phase II Project. A copy of this document is available for review in Engineering.</p> <p>Engineering will also develop detailed design and contract administration requirements, standard scope and activity documents by the end of July 2010. Prior to selecting a preferred supplier to perform consulting work, the consultant will be required to incorporate the newly developed documents into their quotes where applicable. Implementation to be administered by Manager, Infrastructure and Capital Projects.</p>	<p>All consultants that are hired on a "preferred supplier" basis are now required to issue the Town a proposal showing the scope of work, expected activities, expected documentations (i.e. inspection reports, etc.).</p> <p>To date, Capital Group have hired consultants for two (2) major projects (i.e. Woodbine By-pass Phase 1A and 3B and Birchmount Road Phase 2) on a preferred supplier basis using the standard "Request for Proposal / Quote" document. These consultants were chosen as they are the ones who completed the design for these projects.</p> <p>In addition, Capital staff has now implemented a "Project Initiation Meeting" with consultants, for major projects, prior to start of construction in order to identify the Town's requirements and expectations from the consultant (i.e. inspection reports, payment certificates, change orders, etc.).</p>

Staff Responses to Auditor's Recommendations Finding 5.3

- **5.3 - Consultant contract for contract administration services was not always in place for some preferred suppliers**

Ref	Audit Recommendation	Town Response / Action plan (who, what, when)	Status Update as of November 2010
5.3.2	Contract documents should be logged in the contract database as a project separate from the construction contract to ensure the agreement with the consultant is identified, properly executed and managed.	<p>Engineering will immediately log all new contract documents into the filing system. Implementation to be administered by Manager, Infrastructure and Capital Projects.</p> <p>The log will also be incorporated into the implementation of Eclipse or other similar project management tool. This process is estimated to be by the end of 2011 as this will require training and customized template form within Eclipse or other alternative software. Implementation to be administered by Manager, Infrastructure and Capital Projects.</p>	<p>All contract documents for current Capital Projects, for the consultants and contractors are now saved on the individual project folders, both hard copy and electronic file.</p> <p>Incorporation of the documents into the Eclipse program is being reviewed and will be implemented by 2011.</p>
5.3.3	Town project managers should have a copy of the consultant quote / agreement / contract to ensure that services are delivered as agreed to.	Some of the project managers already have a copy of the consultant quotes / agreements / contracts for their projects. For other projects that do not have these documents on file, Engineering will require that this be implemented immediately. Implementation to be administered by Manager, Infrastructure and Capital Projects.	All Capital Engineers are now required to keep a hard copy or electronic file of the consultant quote / agreement / contracts /etc..

Staff Responses to Auditor's Recommendations Finding 5.4

- **5.4 - Change order process could be strengthened to ensure cost control**

Ref	Audit Recommendation	Town Response / Action plan (who, what, when)	Status Update as of November 2010
5.4.1	Change orders should be logged at the time they are proposed and a copy of that log kept with town staff.	All new change orders will be logged immediately. Implementation to be administered by Engineering Senior Staff.	All Capital Engineers are required to log Change Orders at the time they are proposed. Capital Engineers have been tracking the change orders for current projects.
5.4.2	Town approval for the work request should be formalized outside of the site meeting minutes or emails.	Engineering will develop a change order update sheet by the end of June 2010, which will incorporate a status update function and the requirement to provide formal documentation. Implementation to be administered by Manager, Infrastructure and Capital Projects.	The change order form has been revised to formalize the issuance of approval for the change order. Capital Group has created a "Contemplated Change Order Form" which is required to be approved prior to start of the extra work. This form will be the formal approval for the Change Order to commence. A separate Change Order form is approved at the end of the work to identify the actual time and material that was used. The forms are now being utilized for all Capital Projects.
5.4.3	Change orders should be categorized as to the reason.	Engineering will develop a change order update sheet by the end June 2010, which will require the change orders to be categorized into scope change, unexpected circumstances and design related. Implementation to be administered by Manager, Infrastructure and Capital Projects.	The change order form has been revised to incorporate categories for the work order. The categories included in the change orders are: <ol style="list-style-type: none"> 1. Unexpected circumstances 2. Change in scope of work 3. Design change 4. Others

Staff Responses to Auditor's Recommendations Finding 5.4

- **5.4 - Change order process could be strengthened to ensure cost control**

Ref	Audit Recommendation	Town Response / Action plan (who, what, when)	Status Update as of November 2010
5.4.4	Proposed change orders that cannot be identified as valid, should be resolved prior to the contractor starting the work or else formal notification that the Town may not approve should be provided to the contractor.	<p>Engineering will implement immediately a requirement for the consultant to respond or reject extra claims within 2 weeks (whenever possible) after the contractor has initiated a formal claim.</p> <p>Otherwise, the consultant will advise the contractor to follow the dispute mechanism as described in the contract document and to continue with the required construction. At the same time, the consultant will keep track of all related time and material costs associated with the "outstanding" formal claim. Implementation to be administered by Manager, Infrastructure and Capital Projects.</p>	The consultants have been advised to formally respond within 2 weeks after the contractor has initiated a formal claim.