

**Presentation to the Audit Committee
on June 28, 2019 Agenda Item AU3.15**

**AUDITOR
GENERAL**

TORONTO

Engineering and Construction Services

Phase Two: Construction Contract Change Management

Controls Should be Strengthened

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Presentation Overview

A. Audit Objective and Scope

B. Background

C. What We Found

D. Examples

E. Recommendations

A. Audit Objective

To assess ECS Division's contract management processes and controls over capital construction work.

The audit assessed whether:

- ECS could provide reasonable assurance that **change orders were justified and reasonably priced**
- ECS policies and procedures for **change order approval were followed** by staff

Scope

- Review of construction contracts between 2013 and 2017
- Audit reviewed 10 completed contracts valued at \$3M to \$30M, with change orders cost of 5% to 15% per contract
- Sampled 90 change orders representing \$9.6M in change order costs

B. Background

Between 2013 and 2017, ECS spent:

- \$2.3 billion in construction and consulting costs
- \$222M (or 10%) in change order cost

What is a Change Order?

A change order is an agreement between the contractor and the owner to modify the scope of the original contract, and establish any necessary terms and conditions affecting cost, time and scope of work.

Common Reasons for a Change Order

- Unforeseen site conditions
- Errors and omissions in drawings, designs and contract documents
- Poor quantity estimates
- Contractor claims
- Scope changes requested by client divisions
- Discovery of toxic substances requiring proper disposal
- Utility conflicts

C. Three Key Issues

1. ECS has good guidelines to support the change order process.

However:

- staff did not always adhere to these guidelines. Controls over change order approvals and compliance needs strengthening.

2. Documentation was either missing or needs improving for:

- price negotiations, liability assessment for errors and omissions, verification of work completed, and change order support

3. There are also opportunities to:

- minimize design errors and omissions
- pursue recovery for design errors and omissions (where appropriate)

Summary of Issues Noted in 90 Change Orders

Issue	# of instances	% of change orders with issues
Design error & omission	46	51%
Approval after work commenced or completed	32	36%
Price negotiation & reasonability check not documented	21	23%
Delegation of signing authority not followed	9	10%
Work verification not available	9	10%
Scope change resulting in Change Order	7	8%
Change Order splitting	6	7%
Invoices not obtained to verify third-party costs	3	3%
Pricing disputes due to not finalizing pricing prior to commencing work	4	4%
Work completed without authorization	3	3%
Other issues	25	28%
Total Instances Noted	165	

Improve Efforts to Recover Costs and Damages from Consultants where feasible

- ECS's current change order process does not include a robust evaluation of potential design errors and omissions caused by consultants
- No follow up on 14 of 90 change orders where ECS staff determined that consultants had partial or full liability

Systematically Track and Analyze Change Orders

- ECS does not track and analyze the reasons for change orders (e.g. design errors, unknown factors, contractor damage etc.) on an ECS-wide basis
- Tracking change order reasons may help in:
 - ❑ assigning accountability and making process improvements
 - ❑ Identifying the most frequent change types which have high risk and high dollar impact on projects

Cost of Engineering Should be Tracked

- ECS does not track engineering costs for construction work on a contract-by-contract basis
- Between 2013 and 2017, ECS spent:
 - ❑ \$1.95B on construction projects, plus
 - ❑ \$527M on engineering costs (27%)
 - ❑ 65% (\$341M) of the engineering cost was incurred on external consultants and the remaining 35% (\$186M) was ECS's internal staffing cost.

Change Order Rates Needs Monitoring

- From 2013 to 2017, ECS change order rate was 10% of total construction and consulting costs:
 - ❑ Construction contracts: 9%
 - ❑ Consulting contracts: 13%

- Analyzing change order costs can help ECS perform trend analysis of costs by project type, contract type, type of change order work, ECS staff, contractor, and consultant

Example A: Major Roads Contract

The contract had 15 change orders totalling \$594,375 (contract value \$3.76M)

- Sidewalk design errors by ECS staff resulting in unnecessary change order for \$271,876
- Project lead insisted on continuing work 'as per design' even though the errors were pointed out by site staff
- New sidewalk had to be removed and replaced
- Resulted in delay of 3 to 4 months
 - ECS is taking actions to address these issues

Example B : Basement Flooding Contract

- Unauthorized change work costing \$658,941 without senior management's approval
- Purchase order limit likely to exceed by \$495,000
- Change order work not recorded in Project Tracking Portal (PTP) and City's financial records
- In mid-2018, ECS initiated a review of these changes. This contract is still being investigated by ECS management and the Auditor General

Four Recommendations

- Four recommendations to improve the controls over oversight of construction contract
- The recommendations focus on the need for better planning of contract work to:
 1. minimize design errors and omissions
 2. improve controls related to proper authorization of change order work
 3. assess change order costs and pricing; and
 4. have better oversight of contractors' and consultants' work
- ECS has piloted professional service performance evaluation and is working with Legal Services and PMMD to hopefully implement later this year....

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