



The Regional
Municipality
of Durham

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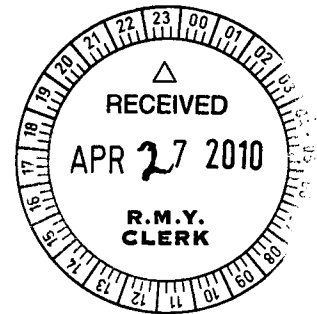
Pat M. Madill, A.M.C.T., CMM III
Regional Clerk

DEPARTMENT OF YORK
CLERK'S OFFICE

FILE No. - P07

April 22, 2010

Mr. Denis Kelly,
Regional Clerk
The Regional Municipality of York
17250 Yonge Street
Newmarket, ON L3Y 6Z1



**RE: ADDITIONAL FUNDING REQUIRED FOR THE EMERGENCY
REPLACEMENT OF TWO PRIMARY SLUDGE COLLECTION
BRIDGES AT THE DUFFIN CREEK WATER POLLUTION
CONTROL PLANT, IN THE CITY OF PICKERING (2010-W-39)
(Our File No.: 012)**

Please be advised the Works Committee of Regional Council considered the above matter and at a meeting held on April 21, 2010 Council adopted the following recommendations of the Committee:

- "a) THAT the Finance Department negotiate the purchase of two scum cross collector mechanisms and replacement water rails from EIMCO Water Technologies for inclusion in The Regional Municipality of Durham's specifications tender for the replacement of two primary sludge collection bridges at the Duffin Creek Water Pollution Control Plant, in the City of Pickering, at an estimated cost not to exceed \$525,000*;
- b) THAT the total original estimated project cost of \$3,000,000 be increased by \$825,000*, which includes both the purchase of the EIMCO equipment at an amount not to exceed \$525,000* plus \$300,000* for installation, for a total revised estimated project cost of \$3,825,000* (the Regional Municipality of Durham's share is \$765,000*);
- c) THAT financing for The Regional Municipality of Durham's share of the additional project cost in the amount of \$165,000* be provided for the replacement of the two primary sludge collection bridges through reallocating funds within the 2010 Sanitary Sewerage Capital Budget as follows:

City of Pickering Road Program
User Revenue

\$100,000



Allowance for unknown requirements in
conjunction with area municipal road programs
in various locations

User Revenue

65,000

Total Financing for Additional Project Costs \$165,000;

- d) THAT the Regional Chair and Clerk be authorized to execute the agreement with EIMCO Water Technologies; and
- e) THAT a copy of Report No. 2010-W-39 of the Commissioner of Works be forwarded to the Regional Municipality of York."
*(before applicable taxes)

As directed, please find enclosed a copy of Report No. 2010-W-39 of the Commissioner of Works.



P.M. Madill, AMCT, CMM III
Regional Clerk

PMM/cb

Encl.

c: C. Curtis, Commissioner of Works, Region of Durham



The Regional Municipality of Durham
To: The Works Committee
From: Commissioner of Works
Report: 2010-W-39
Date: April 7, 2010

SUBJECT:

Additional Funding Required for the Emergency Replacement of Two Primary Sludge Collection Bridges at the Duffin Creek Water Pollution Control Plant, in the City of Pickering

RECOMMENDATIONS:

THAT subject to the approval of the Finance and Administration Committee (recommendations a, b and c) the Works Committee recommends to Regional Council that:

- a) The Finance Department negotiate the purchase of two scum cross collector mechanisms and replacement wear rails from EIMCO Water Technologies for inclusion in the Regional Municipality of Durham's specifications tender for the replacement of two primary sludge collection bridges at the Duffin Creek Water Pollution Control Plant, in the City of Pickering, at an estimated cost not to exceed \$525,000*;
- b) The total original estimated project cost of \$3,000,000 be increased by \$825,000*, which includes both the purchase of the EIMCO equipment at an amount not to exceed \$525,000* plus \$300,000* for installation, for a total revised estimated project cost of \$3,825,000* (the Regional Municipality of Durham's share is \$765,000*);
- c) Financing for the Regional Municipality of Durham's share of the additional project cost in the amount of \$165,000* be provided for the replacement of the two primary sludge collection bridges through reallocating funds within the 2010 Sanitary Sewerage Capital Budget as follows:

City of Pickering Road Program	
User Revenue	\$100,000

Allowance for unknown requirements in conjunction with area municipal road programs in various locations	
User Revenue	<u>65,000</u>

Total Financing for Additional Project Costs	<u>\$165,000</u>
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- d) The Regional Chair and Clerk be authorized to execute the agreement with EIMCO Water Technologies; and
- e) That a copy of this report be forwarded to the Regional Municipality of York.

* (before applicable taxes)

REPORT:

Attachment No. 1: Joint Finance and Administration and Works Committee Report 2009-J-55

1. PURPOSE

The purpose of this report is to obtain authorization to include in the scope of equipment supplied by EIMCO Water Technologies (EIMCO) two replacement scum cross collectors and two sets of replacement wear rails for inclusion in the tender of two primary sludge collection bridges at the Duffin Creek Water Pollution Control Plant (WPCP).

2. BACKGROUND

The Duffin Creek WPCP commenced operation in 1979/1980 and consequently much of the large mechanical equipment is now in excess of 30 years of age. The original phase consisted of four liquid treatment trains, each with primary, aeration, and secondary treatment tanks, dedicated piping and pumping equipment, all connected through a common head works and final disinfection facilities. Much of the mechanical and electrical equipment is showing the signs of age and is nearing the end of its useful life. A planned program of rehabilitation will be required subsequent to the completion of the current Phase 3 expansion project and a future report will provide a work program for rehabilitation and replacement for the existing liquid process.

Over the past several years staff has inspected the primary sludge collection bridges closely as the material (aluminium) is age fatiguing and cracking in both the structural members at high load locations and at welded connections. In addition, major corrosion of the submerged equipment is present.

Approval for the emergency purchase of two replacement primary sludge collection bridges was obtained from the Joint Finance and Administration and Works Committee through Report 2009-J-55 (Attachment No. 1)

Staff had been concerned about the condition of these bridges for the past several years. Due to potential conflict with the major construction of the Phase 3 plant expansion and the impact to plant operation, their replacement had been postponed. However, structural failure of Bridge No. 8 has required the emergency replacement of both Bridge No. 8 and Bridge No. 5.

On February 17, 2010, EIMCO performed a site inspection on the drained primary tank no. 8 to evaluate the internal wear rails of the tank. The existing wear rails exhibited extensive corrosion and heavy scoring, consistent with over 30 years of service and the recent failure of the bridge causing the bridge shoes to excessively contact the wear rails. Plant staff further evaluated the existing scum cross collector at this time. The original collector mechanism is over 30 years old and numerous repairs have been conducted over time. However, the continued life expectancy of the existing scum cross collector is minimal. Discussions with EIMCO on continued supply of drive spare parts, etc. indicated that continued procurement of spare parts would become challenging and costly.

In order for the scum cross collectors and wearing rails to be available for installation along with the primary bridges, EIMCO requires the immediate release of a purchase order to begin fabrication of the equipment. Fabrication of the previously approved primary bridges is dependent on the wearing rail replacement in terms of fabrication tolerances.

If a primary tank is out of service, it substantially impairs the ability of the Duffin Creek WPCP to maintain treatment efficiency and ensure compliance with provincial regulations. Although the solids removal efficiency is reduced, the trains can continue to operate and produce a reasonable effluent under normal conditions. Should the cross collectors and internal wear rails not be replaced at this time, there is an increased probability that primary tanks No. 5 and 8, will again be removed from service for an extended duration while further repairs are conducted. This would include fabricating the equipment, along with subsequent installation.

Given the planned replacement program of Bridges No. 6 and 7 next year requiring two planned primary tank shutdowns and the potential for additional emergency primary tank shutdowns, the potential of impacting effluent quality is very high. Regulatory compliance requirements could not be met with more than one primary tank out of service. It is important that the Regional Municipality of Durham's (Region) regulatory compliance requirements under the Ministry of the Environment's Certificate of Approval be met in order to avoid non-compliance.

4. FINANCIAL IMPLICATIONS

The total estimated cost of the previously approved project budget of \$3,000,000* has been addressed in Joint Finance and Administration and Works Committee Report 2009-J-55 (Attachment No. 1). Durham's share of the additional costs of \$825,000* is \$165,000*. The additional \$165,000* can be financed as follows:

2010 Sanitary Sewerage Capital Budget:

Item No. 17A - City of Pickering Road Program
User Revenue

\$100,000

Item No. 17i – Allowance for unknown requirements
in conjunction with area municipal road programs
in various locations

User Revenue

65,000

Total Financing for Additional Project Costs

\$165,000

The total revised estimated project costs are identified below.

PROJECT COMPONENTS	ORIGINAL PROJECT ESTIMATE (\$)	REVISED PROJECT ESTIMATE (\$)
Contract Cost for the supply of two primary sludge collection bridges	\$1,550,000	\$1,550,000
Supply of (2) sets of wear rails and (2) scum cross collectors	0	\$525,000
Contract Cost for the installation of two primary sludge collection bridges	1,102,000	1,102,000
Contract cost for the installation of the (2) sets of wear rails and (2) scum cross collectors	0	300,000
Engineering – Consultant	50,000	83,840
Engineering – Contract Administration	50,000	91,160
Sundry Work by Region	10,000	10,000
Miscellaneous Project Costs	50,000	50,000
Contingencies	<u>188,000</u>	<u>113,000</u>
TOTAL PROJECT COST	<u>\$3,000,000*</u>	<u>\$3,825,000*</u>
DURHAM'S SHARE	<u>\$600,000*</u>	<u>\$765,000*</u>

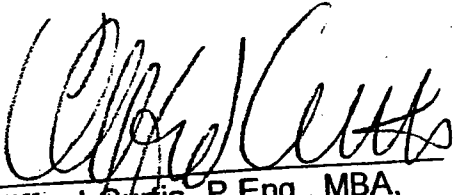
Note: Engineering requirements were presented in Works Committee Report 2010-W-13.

5. CONCLUSION

It is recommended that approval be granted to modify the existing tender with EIMCO Water Technologies from the currently approved \$1,550,000* to \$2,075,000* for the provision of needed replacement of wearing rails and scum cross collectors for primary tanks No. 5 and 8 at a cost of \$525,000*.

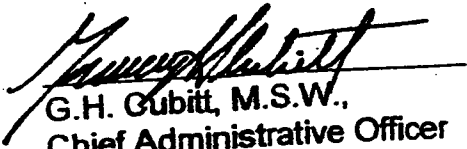
It is also recommended that the project cost of \$3,000,000 be increased by a further \$825,000* to permit the installation of the EIMCO Water Technologies' equipment, for a total revised estimated project cost of \$3,825,000*.

This report has been reviewed by the Finance Department and the Commissioner of Finance concurs with the financial recommendations.



Clifford Curtis, P.Eng., MBA,
Commissioner of Works

Recommended for Presentation to Committee



G.H. Gubitt, M.S.W.,
Chief Administrative Officer

PO2/em/dh



The Regional Municipality of Durham
To: The Joint Finance & Administration and Works
Committee
From: C. R. Curtis, Commissioner of Works
R. J. Clapp, Commissioner of Finance
Report: 2009-J-55
Date: December 8, 2009

SUBJECT:

Emergency Replacement of Two Primary Sludge Collection Bridges at the Duffin Creek Water Pollution Control Plant, in the City of Pickering

RECOMMENDATIONS:

THAT, contingent upon approval of financing by the Regional Municipality of York, the Joint Finance & Administration and Works Committee recommends to Regional Council that the following actions be confirmed for the emergency replacements:

- a) The Finance Department to negotiate and purchase two primary sludge collection bridges at the Duffin Creek Water Pollution Control Plant, in the City of Pickering, from EIMCO Water Technologies for inclusion in the Regional Municipality of Durham's specifications tender at an estimated total cost not to exceed \$1,550,000*, for a total project cost of \$3,000,000 (the Regional Municipality of Durham's share is \$600,000);
- b) The Purchasing By-Law be waived to allow the Regional Municipality of Durham to proceed with this project, including an invitational tender for the installation of the two primary sludge collection bridges at the Duffin Creek Water Pollution Control Plant;
- c) Financing for the Regional Municipality of Durham's share in the amount of \$600,000 will be provided for the replacement of the two primary sludge collection bridges from Durham's share of the York-Durham Reserve Fund;
- d) The Regional Chair and Clerk will be authorized to sign all related agreements.

* (before applicable taxes)

REPORT:

1. PURPOSE

The purpose of this report is to obtain authorization to negotiate the emergency purchase of two primary sludge collection bridges to replace existing primary sludge collection bridges at the Duffin Creek Water Pollution Control Plant (WPCP), and waive the Purchasing By-Law to allow for invitational bidding to tender for their installation.

2. BACKGROUND

The Duffin Creek WPCP commenced operation in 1979/1980 and consequently much of the large mechanical equipment is now in excess of 30 years of age. The original phase consisted of four liquid treatment trains, each with primary, aeration, and secondary treatment tanks, dedicated piping and pumping equipment, all connected through a common head works and final disinfection facilities.

When the Duffin Creek WPCP was first placed into service, all of the small sewage treatment plants which the YDSS system was designed to replace were not yet decommissioned and flow to the plant did not initially require operation of all treatment trains. The treatment train currently identified as No. 8 was the first to be put into operation and consequently the No.8 primary bridge is believed to have the most operational hours.

Over the past several years staff has inspected the bridges closely as the material (aluminium) is age fatiguing and cracking in both the structural members at high load locations and at welded connections. In addition, major corrosion of the submerged equipment is present.

Staff has been concerned about the condition of these bridges for the past several years. Due to potential conflict with the major construction of the Phase 3 plant expansion and the impact upon plant operation, their replacement has been postponed. Staff has been repairing the bridges with the hope that they would last until the Stage 3 plant expansion was commissioned, providing a window of opportunity to assess the condition of all mechanical equipment in the existing treatment trains, and begin replacement/rehabilitation in a scheduled manner.

Unfortunately, the Duffin Creek WPCP has experienced a failure of the No. 8 primary sludge collection bridge, putting the No. 8 primary clarifier out of operation and impacting the operation of the plant.

If a primary tank is out of service, it substantially impairs the ability of the WPCP to maintain treatment efficiency and ensure compliance with provincial regulations. Both the No.7 and No. 8 trains are currently being kept in operation by dividing the No. 7 primary effluent flows to both the No. 7 and No. 8 aeration tanks. Although the solids removal efficiency is reduced, the trains can continue to operate and produce a reasonable effluent under normal conditions. If bridge No. 7 were to fail, both process trains No.7 and No. 8 will become inoperable and 25 per cent of the Plant treatment capacity will be lost. Regulatory compliance requirements could not be met under this condition. Not meeting the Region's regulatory compliance requirements under the Ministry's Certificate of Approval could result in charges being laid against the Region.

3. **FAILURE OF BRIDGE NO. 8 AND CONDITION OF BRIDGES NO. 5, NO. 6 AND NO. 7**

Upon inspection, it was apparent that the structural components of the bridge had failed with several structural members completely detached through failure at the welded connections, detaching the vertical members from the top or bottom horizontal cords of the bridge truss. Without structural support, the entire bridge has bent both horizontally and vertically. Upon draining of the primary tank, no apparent cause for the failure was discovered and it is likely that fatigue and a cascading failure of the welded connections was responsible.

Inspection of primary bridge No.5 has revealed recent failure in the bottom cord at a high stress points. It is likely that complete failure is months rather than years away. Staff has realigned the failed beam and bolted a reinforcement plate across the damaged section to prevent imminent collapse.

Both bridges No. 6 and No. 7 were previously reinforced some years ago using steel plates. The plates on No. 7 bridge are now buckling.

4. **REPLACEMENT PROGRAM**

Staff contacted EIMCO Water Technologies, the supplier of the new bridges being installed as part of the Stage 3 expansion to obtain an appraisal of the situation with respect to repair of bridge No. 8. The appraisal of bridge No. 8 indicates that it is beyond repair. Lifting it out of the tank will likely result in extensive further damage due to structural instability. The aluminium structure has cracked and been previously welded numerous times. The material can no longer be relied upon to perform adequately.

It is necessary that the Regional Municipality of Durham (Region) in consultation with the Regional Municipality of York (York), co-owner, begin a replacement program for these bridges in order to avoid having to react to further emergency situations.

It is recommended that all the new bridges be of the same manufacture and preferable that they match the new bridges being installed as part of the Stage 3 expansion. This is important from an operations and maintenance point of view as it reduces the amount of spare parts kept on hand, the training required for both repair and operation, and improves the predictability of equipment performance and eventual wear as all the bridges would function and wear in a similar manner.

The EIMCO bridges recently selected for the Stage 3 expansion were obtained through an open tendering process, and the pricing currently obtained for the additional bridges is comparable. Purchased individually the price per bridge is approximately \$794,000*. Based on the quote of December 2nd, 2009 for a quantity of two, the unit price is \$775,000* each. A comparison to the 2006 quote for the bridges pre-purchased by York Region for the Stage 3 expansion indicates that the six bridges purchased cost roughly \$739,000* each.

Utilizing the existing bridge specification supplied by EIMCO as the successful bidder during the Stage 3 expansion project will allow the Region to competitively bid the installation portion of the project in a timely manner.

The replacement of the four primary bridges was discussed at the York/Durham Operations Committee meeting of November 20, 2009. As York Region is responsible for approximately 80% of the replacement cost based upon flow utilization, it is important that the replacement schedule for the four (4) bridges can be accommodated within York Region's Capital replacement budget. York Region staff have confirmed that a replacement program permitting the delivery and installation of two bridges per year is manageable within their program.

It is critical that bridge No. 5 and No. 8 be replaced immediately and be treated as an emergency, with bridge No. 6 and No. 7 to be completed in 2011

5. TENDERING SHORTLIST FOR INSTALLATION OF BRIDGE NO. 5 AND NO. 8

There are currently three qualified contractors on the Duffin Creek WPCP site performing various contracts. Current project management processes are in place to ensure time and space separation of existing contractors in order to ensure the Region does not become the Constructor as defined by the Ministry of Labour. If the Region were deemed to be the constructor, we would be responsible for managing the work and the safety of all staff on the project. The potential for becoming the constructor increases with additional contractors on site. In order to maintain this separation it is recommended that the Region only invite the three existing general contractors currently on site to bid on the installation of the two additional bridges.

It is intended that a purchase contract for the EIMCO bridges will be novated into the replacement installation contract specifications transferring the purchasing agreement to the successful contractor, removing liability for supplier/contractor conflicts from the Region. This is possible with the written consent of all parties to the novation.

6. **PROJECT COST**

The total estimated project cost for the supply and installation of two primary sludge collection bridges at the Duffin Creek WPCP is comprised of the following:

Contract Cost for the supply of two primary sludge collection bridges	\$1,550,000*
Contract Cost for the installation of two primary sludge collection bridges	1,102,000*
Engineering – Consultant	50,000*
Engineering – Contract Administration	50,000*
Sundry Work by Region	10,000*
Miscellaneous Project Costs	50,000*
Contingencies	<u>188,000*</u>
TOTAL PROJECT COST	<u>\$3,000,000*</u>

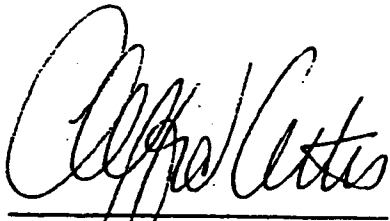
7. **FINANCIAL IMPLICATIONS**

The total cost of supply and installation of the two primary bridges is estimated at \$3,000,000* and Durham's share of \$600,000 will be financed from Durham's share of the York Durham Reserve Fund.

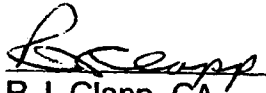
8. **CONCLUSION**

It is recommended that the Finance Department negotiate and purchase two primary sludge collection bridges at the Duffin Creek WPCP in the City of Pickering from EIMCO Water Technologies for inclusion in the Regional Municipality of Durham's specifications tender.

It is also recommended that the Purchasing By-law be waived to allow the project to proceed, including an invitational tender for the replacement of these bridges being offered to the general contractors currently working on contracts at the Duffin Creek Water Pollution Control Plant to avoid any change in the Region's status under the regulations set forth by the Ministry of Labour.

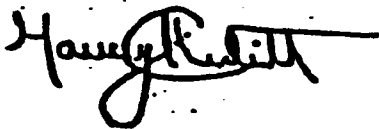


Clifford Curtis, P.Eng., MBA,
Commissioner of Works



R.J. Clapp, CA
Commissioner of Finance

Recommended for presentation to Committee



G. H. Cubitt, M.S.W.,
Chief Administrative Officer

PO1/tf/em