



City of Richmond

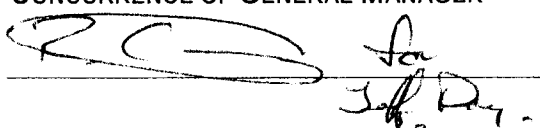
Report to Council

To: Public Works & Transportation Committee *To Public Works + Transp - Sept 21, 2005*
From: Robert Gonzalez, P.Eng.
Director, Engineering **Date:** September 16, 2005
Re: **Emergency Repairs to the Interior and Exterior Piping
for the Geothermal System at Thompson Community Centre** **File:** 2052-20-TCC/Vol 1

Staff Recommendation

1. That emergency repairs to the interior and exterior piping of the geothermal system at Thompson Community Centre proceed immediately; and
2. That funding in the amount of \$115,500 for the repairs be sourced from the Capital Equipment account 4225-10-615-00000-0000.

Robert Gonzalez, P.Eng.
Director, Engineering

FOR ORIGINATING DIVISION USE ONLY			
ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER	
Budgets	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>		
Recreation & Cultural Services	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>		
		REVIEWED BY CAO	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>

Staff Report

Origin

During the 2005 calendar year, Facility Management staff have experienced above normal levels of major maintenance issues with the geothermal system at Thompson Community Centre.

Issues with the geothermal field were suspected shortly after the facility opened. The geothermal field has been the source of several leaks, all of which were repaired from Facility Management maintenance budgets.

In 1999 poor heat dissipation in the field loop resulted in a major flushing and recharging of the system. This action revealed that the lines contained air locks and were contaminated with gravel and debris. The work improved overall performance of the system however, when compared to other similar geothermal systems it still did not deliver comparable efficiencies.

In January 2005 Facility Management staff identified severe corrosion of the inside circulation piping. Work to repair several system failures due to leaks since January has been frustrating, resulting in year to date repair costs in excess of \$54,000. Accessing the failed piping has resulted in damage to the building estimated at \$5,000 and this damage has yet to be repaired.

A recent system audit by our contracted maintenance vendor, Airon Heating and Air Conditioning Ltd. and Earth Source, a geothermal systems consultant, has revealed additional problems with field circulation causing the compressors to operate at a very high head pressure. Failure to correct this problem will eventually result in premature failure of the mechanical system. (Photos attached).

Analysis

Interior Piping System Facility Management staff have been experiencing on-going problems with the interior geothermal piping system since the beginning of this year. Year to date there have been eleven emergency calls to repair leaking pipes. Water leaks in the building have caused drywall damage and in several locations drywall had to be removed to access the failed piping.

In August, Airon and Earth Source facilitated an audit of the geothermal system. Information received from this audit identified the need to replace additional internal piping as well as flow and heat transfer issues with the external geothermal field. This condition is putting additional load and strain on the mechanical equipment not allowing it to function as designed. Failure to take action will result in premature failure of equipment. In addition the plant is not running efficiently resulting in much higher energy costs than should be expected from typical geothermal systems.

Staff met with the contractor to investigate the situation and review available options and action plans.

Option #1

Take a wait and see approach and respond to emergencies as and when they occur.

Pros: Possible minimal immediate budget impact.

Cons: The interior piping will continue to fail again and again. Should the piping fail during off hours the facility could sustain additional building damage, which in turn could impact programming and public use of the facility. Premature equipment failure is a reality and most likely would require temporary shutdown of critical areas if not the entire building. In addition, a review of the consultants schedule would only allow him to facilitate the work this month. Given his pre-commitments and the existing construction market not doing the work now may result in having to pay premium or overtime labor costs and could result in extended disruption to the facility users and programming.

Option #2

Facilitate the repairs immediately as recommended.

Pros/Cons: The repairs would be planned and facilitated within the next three to four weeks. We have quoted prices and the work will be done with minimal impact and interruption to the users and facility.

Financial Impact

The vendor quoted price for the emergency repairs to the internal and external geothermal system is \$83,460.00 plus GST. A quote for internal resources to repair the damaged walls and ceilings in the building is \$5,000.00. We recommend a contingency of \$21,200.00 to allow for identified needs that accurate pricing cannot be provide for at this time.


Source	Description	Funding Required
Airon Heating and Air Conditioning Ltd.	Internal and external work to geothermal system	\$89,300.00 GST included
Internal Resources	Drywall and framing repairs to ceilings and walls	\$ 5,000.00
Contingency	Safety fencing unforeseen pipe damage during excavation, landscape repairs and interior painting.	\$ 21,200.00
Total Funding Requested		\$115,500.00

Finance has identified funding for these repairs available from account 4225-10-615-00000-0000.

Staff have discussed sharing the cost of these emergency repairs equally with the Thompson Community Association. A letter requesting this financial assistance and outlining the project details and costs has been sent to their president, Mr. Gerry Galasso for discussion with the members at their Board Meeting on September 19, 2005. Funding from the Thompson Community Centre Association will be redirected to account 4225-10-615-00000-0000 when received.

Conclusion

We recommend approval funding in the amount of \$115,500 for the equipment emergency repairs to the geothermal system at Thompson Community Centre and the repairs as outlined begin immediately. Facility Management staff will assign resources to fast track this project to minimize loss of revenue and user disruption.



Philip James Hogg
Manager, Facilities Operations and Maintenance

PJH:cmm

