



Report to: General Committee

Date Report Authored: August 9, 2011

SUBJECT: Implementation of Lightning Protection and Fire Alarm System at Markham Museum

PREPARED BY: Phoebe Fu, Senior Manager Facility Assets, ext.3010
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RECOMMENDATION:

- 1) That the report titled "Implementation of Lightning Protection and Fire Alarm System at Markham Museum" be received;
- 2) That staff be authorized to proceed with Phase I of implementation (replacement of fire alarm system) at the estimated cost of \$199,500 with funding from the Life Cycle Replacement & Capital Reserve;
- 3) That Phase II of the implementation (install lightning protection system) at the estimated cost of \$240,200 be included in the proposed 2012 Capital budget for consideration with funding from the Life Cycle Replacement & Capital Reserve;

And that Staff be authorized and directed to do all things necessary to give effect to this resolution.

EXECUTIVE SUMMARY:

Lightning strikes and problems with grounding of the existing alarm system at Markham Museum have been examined. The fire alarm systems were installed in a fragmented fashion over twenty five years and the infrastructure has deteriorated over time. A report by Crossey Engineering Ltd., recommends that the wiring for the security system be replaced and buried below the frost line and that surge protection devices be installed. The inadequacy of the fire alarm system is a safety concern and as a minimum Phase I (replacing the system) should be carried out immediately to minimize liability to the Town and provide a safe environment for both the public and staff.

PURPOSE:

The purpose of this report is to obtain approval from Council to replace existing fire alarm system and implement lightning protection at the Markham Museum.

BACKGROUND:

The Museum grounds have experienced an increasing number of lightning strikes which pose a risk to life safety issues. Staff retained a consultant to investigate the concern and identified that the existing fire alarm system requires replacement.

The Museum's existing fire alarm wiring is 25 years old and was installed only 6" to 12" below grade. The age and condition of the infrastructure (broken sections of conduits have been observed) combined with its shallow depth causes water infiltration into the wiring and conduit system. Water causes electrical conduits to experience low impedance paths, which is very attractive to lightning current. Good engineering practice would call for wiring and conduit systems to be installed at least 1 metre below grade.

OPTIONS/ DISCUSSION:

There is a safety concern to both people and assets arising from lightning and grounding issues that compromise the Museum's security systems; therefore the work should be carried out immediately to minimize liability to the Town and to provide a safe environment for both the public and staff.

Staff retained Crossey Engineering Ltd., an electrical consulting engineering firm, to review the existing fire alarm system. The consultant recommends replacing all existing fire alarm conduits and wiring that interconnect the buildings, installing fire alarm devices, surge protection devices (SPD) and a lightning protection system.

Staff recommends the implementation be completed in two phases:

- Phase 1 - replace all existing fire alarm conduits and wiring with new a wiring system that interconnects the buildings; install fire alarm devices and surge protection devices at an estimated cost of \$199,500. This should minimize potential outages of the security and fire alarm system caused by lightning current entering the underground wiring and conduit system.
- Phase 2 – install lightning protection system at an estimated cost of \$240,200. The system will be able to receive lightning strikes and provide a direct path to earth rather than diverting the discharge in many other directions. This will protect the structures and avoid potential for fire.

FINANCIAL CONSIDERATIONS AND TEMPLATE: (external link)

Due to the age and physical deterioration of the fire alarm system and the need for the repair, it is recommended that the implementation and associated consulting fees for phase I implementation in the amount of \$199,500 be funded from the Life Cycle Replacement & Capital Reserve. Phase II implementation in the amount of \$240,200 with funding from the Life Cycle Replacement & Capital Reserve be included in the proposed 2012 Capital Budget for consideration.

HUMAN RESOURCES CONSIDERATIONS

Not applicable.

ALIGNMENT WITH STRATEGIC PRIORITIES:

Growth Management: In order to maintain and grow capacity the Museum is required to upgrade basic infrastructure, of which site security is imperative.

Culture: Artifact safety is compromised with the current security system.

Public Safety: Public safety has been compromised on several occasions in 2011

BUSINESS UNITS CONSULTED AND AFFECTED:

The Finance Department has been consulted and has provided input into the report.

RECOMMENDED

BY:

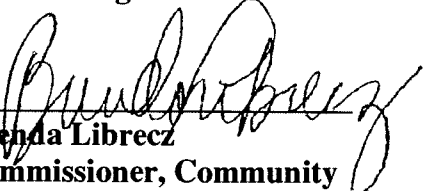


Gary Adamkowski, P. Eng
Director, Asset Management
Asset Management



John Ryerson
Director, Culture

BY:



Brenda Librecz
Commissioner, Community
And Fire Service

ATTACHMENTS:

Not applicable