

Background

The City of Toronto contracted Optimira Energy to implement energy efficiency measures at the City of Toronto's Emergency Services Headquarters at 4330 Dufferin Road.



The project is part of the Energy Retrofit Program that was approved by Toronto City Council in 2004. The Program was created to reduce building operating costs and deliver environmental benefits. The improvements include installation of a building automation system, variable speed drives, energy efficient motors, lighting retrofits, power factor correction and control of vending machines.



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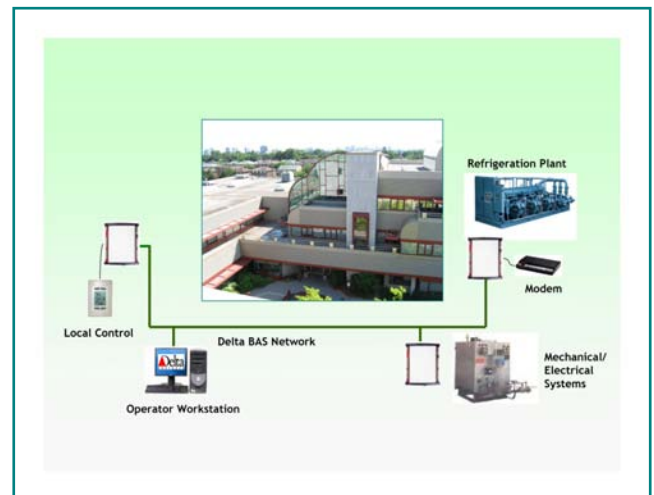
Project Summary			
Building Types:	Emergency services administration building, garage and emergency call center.	Annual Energy Savings:	\$112,745 1,057,634 kWh 25,131 m ³ of natural gas 321 tonnes of CO ₂ per year
Total Area:	14,000 m ²	Total Project Cost:	\$595,791
Start Date:	September 2009	Completion Date:	May 2010

Description of the Work Implemented

Building Automation System

The existing building automation system (BAS) was partially disabled and obsolete. The system was not capable of scheduling any functions within the building. A BAS was installed to replace the existing system. The new BAS will control all major building functions.

Strategies implemented include ventilation control using air quality sensors, garage ventilation control using CO sensors, boiler outdoor air temperature reset control, optimum start stop of ventilation fan systems, BACnet interface with variable speed drives and alarm pager communication system.



Variable Speed Drives and Energy Efficient Motors

Variable speed drives were installed on motors to control their speed based on measured conditions. Motors being controlled were replaced with energy efficient units.

Applications included:

- Replacement of existing fan system variable inlet vane control
- Domestic water booster pump speed control based on pressure
- Vehicle bay exhaust air flow control based on pressure and CO measurement.



Lighting Retrofits

Passive infrared and ultrasonic motion ceiling mounted occupancy sensors were installed in meeting rooms, conference rooms, office spaces, staff change rooms, warehouse and public washrooms. Daylighting sensors were installed to control vehicle service garage lighting under skylight locations.

Incandescent fixtures were replaced with new compact fluorescent lamps.

Lighting was re-designed and replaced in staff change rooms, repair garage and parking garage facility.



Power Factor Correction

The building power factor varied between 86-89%. The electrical utility charges a penalty for any power factor less than 100%. Power factor correction capacitors were installed at the electrical service entry to reduce this penalty.

Vending Machine Control

Drink vending machines controls were installed to reduce machine lighting and compressor use based on occupancy.

