ENVIRONMENT
- City environmental initiatives
- Energy retrofits
- Brownfields
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- Waste Diversion Team
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- Smog alerts

What's the City doing to shrink its footprint?

Detailed information on energy-efficient technologies and equipment in City of Toronto arena facilities.

Lighting systems

The City of Toronto is taking a comprehensive approach to the lighting retrofits, resulting in greater standardization of lighting systems across the City.

Lighting system improvements include:

- Installing dimming systems and occupancy sensors to control the light levels and energy use depending on building occupancy.
- Replacement of old lamps and electro-magnetic ballasts with next-generation, reduced wattage T8 lamps and electronic ballasts.
- Replacing and retrofitting exit signs to LED technology.
- Recycling all the lamps and ballasts.
- Converting mercury vapour or HID metal halide lamps in gymnasiums to T5 luminaries with occupancy sensor controls. The new fluorescent lighting systems illuminate fully and provide light immediately, without the HID start-up or restrike time.
- Redesigning the entire lighting system within a space with new luminaries.
- Installation of occupancy sensors in washrooms, change rooms, offices and zamboni rooms.

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Advanced building automation systems (BAS)

A digital control system commonly referred to as a Building Automation System (BAS) will be installed to operate facilities more efficiently. The BAS will enable building operators and facility managers to control building functions from a remote location through a modem. Inside the building, an operator workstation will be installed that will include controls graphics, operation schedules, and set point modification capabilities.

The BAS system will affect the following equipment in the arenas:

- The entire refrigeration plant will be controlled and include new infrared temperature sensors to cycle the brine pump and reset the ice temperature based on occupancy and activity requirements.
- The BAS will take over control of the arena dehumidifiers, where possible, for more efficient operation. This will better reduce their runtime, which results in lower operation and maintenance costs.
- The spectator radiant heating systems will also be controlled with preset run-time timers installed so that the units will not be left on.
- The BAS will control the Zamboni room heater. A garage door end switch will be installed to disable the unit heater while the garage doors are open.
- The BAS will control the existing heating hot water boiler to reset the temperature based on sensing coldest zones, not outdoor air temperature.
- Roof top units that run constantly will be controlled to allow scheduling, setback, and better space temperature control.
- Existing radiation unit thermostats in the change rooms will be controlled to allow scheduling, setback, and better temperature control.
- Existing change room exhaust fans will be scheduled so that they do not operate during unoccupied periods.

Additional controls will be installed at the outdoor ice rinks:

- Unit Heater and Exhaust Fans will be controlled through a space temperature sensor in each zone and the space temperature will be monitored through the BAS system. The exhaust fan will be cycled on/off to maintain a setback space temperature in the compressor room in the summer.
- The domestic hot water tank will be disabled by a control relay after the ice season through the BAS system.
- The interlock control of the brine pumps from the compressor control circuit will be modified so that the brine pumps will be controlled by the BAS system in series with the existing control. By installing a reliable outdoor air temperature sensor, the brine pump will be shut down when outdoor temperature is below -7 degrees Celsius. In order to prevent the freezing of the brine solution in the system, the brine pump will be re-activated when the outdoor temperature is below -15 degrees Celsius and will run continuously.

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Building envelope
Reducing drafts and leaks through installation of weather stripping around doors, improved sealing of overhead doors, and caulking roof to wall joints.

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Pipe insulation
Uninsulated heating pipes will be insulated to reduce heat loss.

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Brine header insulation
Brine headers feed refrigerant to maintain the ice surface. The brine system used in each arena is classified as a "two-pipe header and distribution system". A secondary refrigerant – ethylene glycol brine – is pumped underneath the ice surface via pipes located in a trench at one end of the ice surface.

At less than 20 degrees Fahrenheit, the brine causes moisture in the air to condense and freeze on the uninsulated header pipe. This creates an unnecessary load on the refrigeration plant.

This project insulates the pipe and eliminates heat gain, provides a water-proof barrier, and prevents ice build-up on the pipes. Insulation of the brine header will also reduce further corrosion and eliminate the annual maintenance associated with painting the pipes.

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Solar water heating systems
Solar heating devices will be installed on the roofs of Agincourt Recreation Complex and Centennial Recreation Centre.

- Pool water will be circulated through the collectors, and warmed naturally, saving a significant amount of natural gas. At Agincourt, it's estimated that the solar collectors will save 15,041 cubic metres of natural gas. At Centennial, they will save approximately 13,722 cubic metres.
- The system will be operational from April through November, and drained during the winter to prevent freezing.

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Zamboni fill nozzle
When filling the Zamboni (ice-surfacing machine) with heated water, it isn't unusual for the operator to allow some spillage. This wastes water and the energy used to heat the water.

To reduce the chances of this happening, heavy-duty water fill nozzles with automatic shut-off features will be installed. The fill nozzles work just like those used at gas stations to prevent over-filling; they will automatically shut off the water when the Zamboni tank is full, preventing water spillage.

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