Replacing existing inefficient lights with new LED luminaires

Expected savings of around 35,000 kWh and $5,500 per annum

“The project was implemented not only to save energy and replace equipment that was at the end of its life, but also eliminate some lighting problems.”

– Jean Paul Rozon, Section Manager, Building Engineering and Energy Management
INTRODUCTION

The Carleton Lodge is a non-profit long-term care facility owned and operated by the City of Ottawa. It was built in 1960 as the first municipal home for the elderly in the Ottawa-Carleton region\(^2\). The site was later expanded with the construction of a new facility that opened its doors in the spring of 1989\(^2\).

Today, the Lodge is a 161-bed facility located on a beautiful 12-hectare waterfront property by the Rideau River in South Ottawa\(^2\). The facility consists of 136 private rooms, 12 double rooms, and plenty of amenities providing quality service to its residents\(^3\).

Carleton Lodge is equipped with various exterior lighting systems that can be divided into two categories: building-mounted lights and pole-mounted lights. The building-mounted lights include a mix of metal halide (MH) and high pressure sodium (HPS) wallpacks as well as 60W incandescent security luminaires, while the pole-mounted lights include MH bullhorn-mounted flood lights and a mix of post top-mounted luminaires\(^3\). Some of the existing lights can be seen in Figure 1.

While most of the existing lights are still operational, they are very old and consume a lot of energy.

PROJECT DETAILS

Energy Ottawa reviewed the existing equipment and conditions at the Lodge and recommended several upgrades that were carried out by the end of 2017. The project saw the replacement of the 175W MH and 150W HPS wallpacks with new 38W light emitting diode (LED) wallpacks, while the 70W HPS wallpacks were replaced with 18W LED wallpacks from the same product family\(^3\). The 60W incandescent security luminaires were also replaced with similar 20W LED security luminaires\(^3\).

As for the pole-mounted lighting, the 250W MH bullhorn-mounted (resembling a bull’s horn) flood lights were replaced with new 85W LED flood luminaires that were adjusted to increase light levels in the adjacent parking area\(^3\). The newly installed luminaires can be seen in Figure 2.

For the remaining pole-mounted lights, Energy Ottawa evaluated four different product family options with respect to lighting level performance, price and other factors. The evaluation narrowed the proposal to two options, which can be seen in Figure 3.

The first option offered the lowest cost option that maintained desirable light levels. Conversely, the second option offered excellent performance of the luminaires, albeit at a higher cost.

Ultimately, option 1 was chosen since the difference in cost savings was small compared to the project cost. This option included the installation of 40W luminaires along the pathways and in the courtyards, and a mix of 79W and 120W for parking areas\(^3\).

The project cost $45,100 to implement. It is also expected to receive $2,100 in incentives provided by Energy Ottawa through the saveONenergy program\(^3\). The City’s Building Engineering and Energy Management (BEEM) unit assumed around $30,000 of project cost to stay consistent with the BEEM unit’s 5.5 year payback period mandate, whereas Carleton Lodge paid for the remainder of the cost\(^3\).
Energy results: The project is expected to reduce electricity consumption by approximately 35,000 kWh and save $5,500 in utility costs per year[3].

GHG reduction: While the objective of the project was not to reduce greenhouse gas emissions, the retrofit will prevent 26 tonnes of carbon dioxide equivalent (t\(\text{CO}_2\)e) from being released into the atmosphere per year.

Carleton Lodge is one of the oldest long-term care homes in Ottawa; however, lighting retrofits such as this are considered as “low hanging fruit” that will help renew the facility’s overall energy infrastructure, while reducing operating costs and making sure that even the oldest buildings can benefit from new technologies.

Providing excellent care for their residents is of utmost importance to the Carleton Lodge, and with the help of the City’s BEEM unit and incentives from Energy Ottawa, the Lodge can undergo periodic energy retrofits that focus on reducing the facility’s energy use intensity.

REFERENCES


Figure 3: Recommended post top-mounted Luminares: Option 1 - RAB RAL (left), Option 2 - Cooper MESSA (right)[3]