

CREATING A BEACON OF SUSTAINABILITY

INTENT ON ITS NEW HEADQUARTERS BECOMING A SHOWPLACE LOCATION FOR THE PROFESSION, PEO EMPHASIZED A HOST OF "GREEN" FACTORS IN RETROFITTING 40 SHEPPARD AVENUE WEST.

By Kristian Partington

PEO recently received a rebate totalling almost \$232,000 from the Building Owners and Managers Association (BOMA) Toronto for its extensive renovations, aimed to achieve Gold CI certification under the Leadership in Energy and Environmental Design (LEED) system.



In late 1997, global leaders brought the concept of climate change in relation to human activity to the minds of the global population when the Kyoto Protocol was adopted in Kyoto, Japan. The intent at the time was to realize the “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.”

In other words, the protocol brought to light the concept that the impact people have on the environment is real and must be reduced.

In the 14 years since Kyoto, the debate has swung back and forth among governments, policy-makers and industry leaders, but no matter where you sit in terms of why we must reduce our carbon footprint, there is no question that the “how” has evolved immensely during the course of the debate.

SUSTAINABLE DESIGN SERVES PUBLIC INTEREST

PEO has long recognized that reducing environmental impact in as many ways as possible makes sense from a moral point of view, just as it does from a business perspective. As the entity that governs 80,000 licence and certificate holders in the province and sets the standards that regulate the practice of professional engineering under the law, PEO’s mandate is to protect and serve the public interest where engineering is concerned.

And today, the public interest is focused on creating a greener world. The proliferation of hybrid vehicles, a growing demand for organic produce, massive uptake of government incentives to maximize energy efficiency in our homes, are all indications of the public’s desire to go green.

People are more aware than ever that undeveloped land is shrinking, landfills are quickly expanding, natural resources are

dwindling, and the world’s water and air quality requires immediate improvement. To answer the growing challenge, people are reading labels more closely, scrutinizing energy ratings, recycling more, considering how products are made and, generally speaking, making greener decisions.

In recognition of this reality, and knowing the means to achieve a more sustainable impact on the environment are within reach, PEO set out to make its new Toronto headquarters a landmark of sustainable design through minimal energy consumption using the highest of environmental standards.

As the decision was being made on whether the regulator should purchase its own building or continue to lease, former PEO president Walter Bilanski, PhD, P.Eng., FEC, asked the membership a few poignant questions in the January/February 2008 issue of *Engineering Dimensions* (p. 13): “Do you want space to publicly showcase our profession, to have the type of facilities that a modern corporation needs, to have control of our future accommodation needs?” he asked. “Do you want a place where we can show our environmental leadership?”

The answers came back affirmative.

In March 2009, PEO purchased its new headquarters at 40 Sheppard Ave. W. in Toronto, and in 2010 took the first steps to make the vision of environmental leadership a reality.

PEO engaged BLJC, Canada’s leading facility management services company, to help manage the massive retrofit to recreate PEO’s home base as a beacon of what’s possible in environmental sustainability.

“PEO’s vision for its new headquarters is to create a building that enshrines the profession,” says BLJC President Gord Hicks. “To achieve this vision, there will be a number of renovations over

the next several years to upgrade the mechanical and electrical equipment, and create venues within the building for PEO and its members to host events and meetings.”

The targeted retrofits underway aim to achieve Gold CI certification under the internationally recognized Leadership in Energy and Environmental Design (LEED) system. LEED represents third-party confirmation that a building is designed and built to the highest standards of minimal energy and water consumption, improved indoor environmental quality and reduced greenhouse gas emissions.

“It is exciting to see PEO ‘model the way’ as an organization with regard to their building and operations. By building out the interior to meet LEED CI standards, utilizing BOMA and registering the building for LEED Operations and Maintenance, PEO is leading the leaders,” says Michael Wymant, BLJC director, energy and sustainability.

Nearly half of the world’s greenhouse gas emissions are drawn from the lighting, heating and cooling of facilities, so PEO is committed to major retrofits of the building in these areas.

HVAC AND LIGHTING AUTOMATION

The overall design of the retrofit embraces the highest quality heating, ventilation and air conditioning (HVAC) system, a high-efficiency lighting system throughout the building, and state-of-the-art automation and communication technology to ensure energy is used only when necessary.

Natural light and fresh air have been utilized to their maximum potential, limiting the need for artificial systems and creating a bright, comfortable space for PEO staff, members and volunteers.

In replacing the 22-year-old building’s light system, new energy-efficient luminaires translated into an immediate saving of 12 watts a fixture, or roughly an 18 per cent saving. The new fixtures provide better light output, which coupled with the better use of natural light means fewer lights in the building are required. In addition, occupancy sensors ensure lights are on only when a space is in use, so the savings to be realized stretch well beyond the base 18 per cent.

As for heating and cooling, the previous system dated from the mid-1980s, had reached the end of its life cycle and the existing equipment efficiency was well below current available technology.

The original cooling tower, which removed heat from the heat pump water circuit via a shell-and-tube heat exchanger, was replaced with a new cooling tower and plate-and-frame heat exchangers. This heat rejection system upgrade was also reconfigured to accommodate a new variable speed chiller for higher energy efficiency for redeveloped areas to be served by chilled water. The new system in redeveloped areas of the building incorporates a variable air volume (VAV) cooling design served by chilled water for both compartment unit systems and a central station air-handling system. These were considered a well-proven and efficient combination that could be integrated within the building’s existing structure and other physical constraints.

To support this increased level of HVAC sophistication, the upgrade of the base-building mechanical also included a renewal of the building automation system (BAS). The new BAS improves efficiency in a number of ways but, essentially, like the enhanced

lighting system, it ensures the building’s central systems work within a tighter tolerance and the distributed systems manage heating and cooling with less conflict and operate in occupied locations through more effective automated scheduling.

Reducing water consumption has also been a major focus of the building overhaul, with the installation of low-flow toilets and urinals, along with automatic taps to ensure waste is kept to a minimum.

SETTING AN EXAMPLE REDUCES OPERATING COSTS

These major initiatives will greatly reduce energy consumption and the reality is: savings in energy consumption translate into economic savings. Despite the popular perception that energy-efficiency is costly, it has been clearly proven this is not the case.

“PEO’s firm commitment to these projects matches well with BLJC’s commitment to making a difference to the environment,” says BLJC Facility Manager John Cookson. “It allows me to control energy costs and reduce operating costs, as this new technology and equipment is less costly to maintain. All in all, this is a win-win situation for PEO and its ability to maintain current tenants as a landlord and attract new tenants in the future.”

An initial upfront investment is required to make the move toward low-impact energy efficiency, but the return on investment is seen almost instantly. The investment in integrated design and the materials and products needed to make that design a reality is balanced by reduced operating costs.

BLJC regularly sees this reality at play across the country. A recent upgrade from an oil heating system to an energy-efficient natural gas operation for a long-term client in Halifax, for example, will translate into energy savings of approximately \$200,000 a year on a \$300,000 investment, according to BLJC Nova Scotia Facility Manager Michael McCormick.

With the building considered a leader in efficiency under LEED certification, the prospect of attracting tenants that share the vision of a greener future is heightened because, simply put, people want to be in a space they know is attractive to occupants and visitors because of its environmental sensitivity.

Like driving a hybrid car or buying local produce, people want to lease or rent space in a “green” building, and PEO’s commitment will certainly make the upgraded headquarters a desirable Toronto address in this regard.

PEO and its new headquarters are examples on many fronts of environmental awareness and stewardship its members hold as core values. As the centre of Ontario’s engineering profession, the building reflects the perception and reality of a future that is as healthy and green as possible.

“The public has an expectation for engineers to operate at the highest level of professionalism, integrity and environmental stewardship,” says Kim Allen, P.Eng., FEC, PEO’s CEO/registrar, “and this is indeed what we are doing at 40 Sheppard Avenue West.”

While the debate on how governments, policy-makers and industries go about reducing carbon emissions and energy consumption continues, PEO is setting an example.

Its headquarters shows what is possible. **Σ**