

2019 CANADIAN CONSULTING
ENGINEERING AWARDS

Whitby Rail Maintenance Facility

Formerly East Rail Maintenance Facility

Category A: Buildings



Whitby Rail Maintenance Facility (formerly East Rail Maintenance Facility)

GO Transit's only rail maintenance facility in Etobicoke, Ontario, had reached its capacity and a new facility was needed to expand their GO fleet to provide two-way, all-day service on all its corridors. The new LEED Gold-certified Whitby Rail Maintenance Facility provides mechanical maintenance, minor and major repair functions, daily inspections, cleaning and fueling. Its 500,000 ft² main building provides maintenance, repair, and additional storage for trains to support planned service expansions.



Project Highlights

Q.1 INNOVATION

GO Transit's new state-of-the-art facility, built to LEED Gold certification standards, provides the Greater Toronto and Hamilton Area with fast, convenient and integrated transit. The most unique innovative and sustainable feature of the Whitby Rail Maintenance Facility is its integrated rainwater harvesting and wash recycling system. Facilities of this nature use a lot of water to wash cars and locomotives. Stantec designed an efficient washing system working with our client, their contractors, and suppliers. In this system, wastewater is filtered, recycled, and recirculated. We're also reusing rainwater, with much of it being used to flush toilets and to top up the water for washing trains.

Daylighting is another notable feature of the facility. We've placed windows so that sunlight can provide internal lighting. This plays an integral part in the facility's energy savings. It's especially a unique decision to use daylighting for a maintenance facility due to the complexity of all the building and maintenance systems.

The programming, site planning, and concept design for this project had to be specifically functional as well. Our entire design approach was centered on developing a facility that was functional and designed specifically for Metrolinx's staff and users based upon their desired operating procedures.

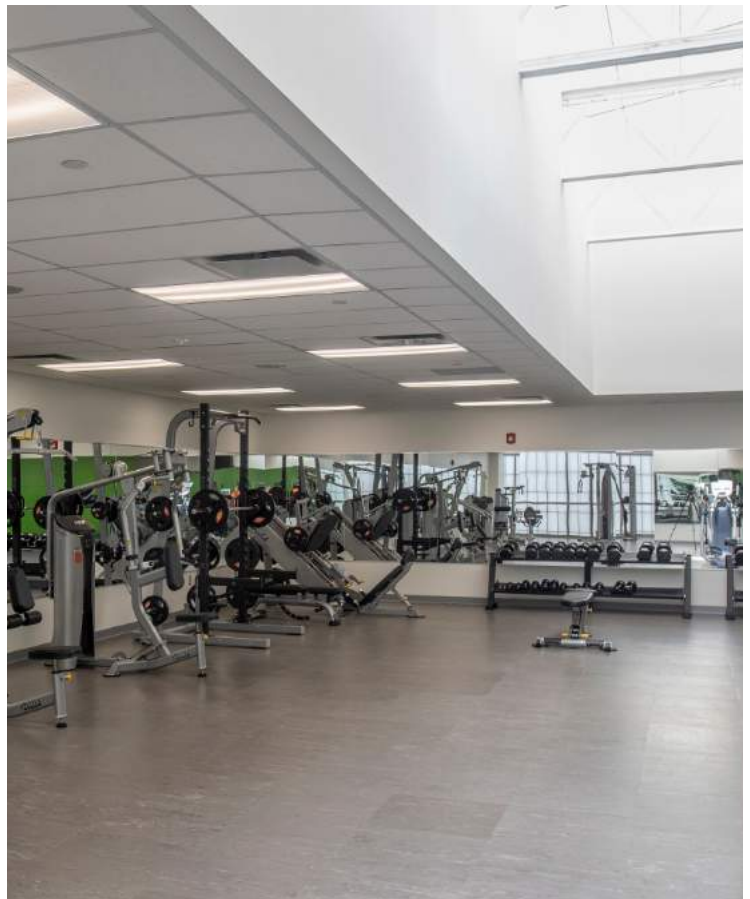




Q.2 COMPLEXITY

The Whitby Rail Maintenance Facility consists of approximately 500,000 ft² that includes not only building space but also fuel storage and tracks. A massive coordination of efforts was required to design and construct the large site which now comprises of multiple complex buildings, rail tracks, and electrical and process systems, all of which are intricately interconnected. All these systems work within very close physical proximity to each other. There was also incorporation of physical spaces such as pits and multi-level platforms, maintenance equipment such as drop tables and hoists, material movement using cranes and forklifts, and safety systems such as fall arrests and diesel exhaust capture. This was all done with efficiency and safety in mind. The incorporation of the cogeneration system on the second floor was complex as well.

The timing dictated that design and construction occur in parallel throughout the project. Coordination was required above and below ground due to the nature of locomotive maintenance and repair which requires all utilities and services to be very close in proximity to the rail structural system. In addition, working towards a goal of reduced energy usage with a facility that traditionally uses a large quantity of water and fresh air was also a challenge. Stantec was involved in obtaining all required development approvals from the Town of Whitby, Region of Durham, and Central Lake Ontario Conservation Authority. To walk through the new facility is beyond impressive. Every intricate detail in the massive machinery is in place with purpose.



Q.3 SOCIAL AND/OR ECONOMIC BENEFITS

When you picture a large, transit maintenance and operations facility, you might imagine a space that's dark, cold, and industrial—with poor indoor circulation and employee comfort. But our Facility is a revolutionary industrial building—one that puts people first. We have created a bright, spacious atmosphere that keeps workers safe while giving them a pleasant place to work.

In the Greater Toronto & Hamilton Area, moving commuters to their jobs and home again is essential and GO Transit does that effectively. Employee health and wellness on the job are important. The facility features an employee fitness area, modern locker rooms, and extensive lunchrooms where workers can enjoy their downtime. We also considered ergonomics, so rather than having workers carry heavy cables and hoses from cabinets

or storage areas, they are hung on the walls or on reels right in the areas where the workers use them. Likewise, workers throughout the facility can expect a well-ventilated, well-lit, comfortable workplace. Safety was also paramount to our design. We've consciously made the facility safe for the employees working in maintenance pits. We've brought in real-time air monitoring for contaminants, which minimizes the risk of fire hazards and issues related to indoor air quality. We haven't just focused on the facility's interior. We've also created an outdoor green space, so workers can lunch, meet, or just relax in a park-like area featuring a pond. Our design incorporates skylights, daylight harvesting, and clearstory windows to ensure consistent natural light inside the facility.



Q.4 ENVIRONMENTAL BENEFITS

This Facility is targeted as LEED Gold and was constructed on a 70 acre site in Whitby. Among the many green features, the Facility saves energy by allowing sunlight through windows where there normally wouldn't be. Occupancy sensors in the main building also detect if an area is empty and turn off the LED lighting. The integrated exhaust, heat recovery and supply systems continuously monitor the air to reduce outdoor air and heating/cooling requirements while maintaining a healthy working space. This will save a tangible amount of energy for this type and scale of facility, allowing for the LEED target to be met.

Outside, a green space doubles as the location of our retention pond, which holds storm water. Any runoff from the site ends up in the pond and doesn't flood the sewer system and municipality. The pond also functions as a wildlife refuge, providing a home for frogs, turtles, ducks, and fish. The facility strengthens the transit system in the Greater Toronto Area encouraging the use of public transport over personal vehicle use, which in turn will significantly reduce the region's carbon footprint. The washing system that uses recycled wastewater, described in an earlier section, conserves water as well and adds to the environmental benefits.



Q.5 MEETING CLIENT'S NEEDS

Part of Go Transit's efficiency lies in the careful management and maintenance of their fleet at sites like the Whitby Rail Maintenance Facility. Avoiding problems before they happen keeps commuters moving and our local economy on track. The Facility will be equipped to provide complete maintenance services to GO Transit's rolling stock, similar to GO's Willowbrook Rail Maintenance Facility. Stantec provided multi-disciplinary design services for this project as the prime consultant to Bird-Kiewit in a Joint Venture. Our services, delivered locally, include architecture, industrial, mechanical, electrical, process, track, and civil engineering, landscape architecture, interior design, and environmental services.

For this project we worked closely with Metrolinx, Infrastructure Ontario, the builder, and facility manager. We worked with the end users (rolling stock maintainers, train operators, and building maintainers) to ensure project requirements were effectively implemented and that specific maintenance activities and train dispatch could be performed efficiently and safely. We led an integrated architectural and engineering team to deliver an innovative, cost-effective design excellence solution over the life of the facility. The team worked closely with the Design Excellence panel at Metrolinx to develop a design that meets Metrolinx's goals for superior design at the facility.

