

# QUIET REVOLUTIONS

A NEW GROUND RUN-UP ENCLOSURE SHIELDS TORONTO'S CITY CENTRE FROM THE PRIMARY SOURCE OF AIRCRAFT NOISE COMPLAINTS.

CARROLL MCCORMICK REPORTS

**A**s part of being a good neighbour to Torontonians, the Billy Bishop Toronto City Airport has built a ground run-up enclosure (GRE) where maintenance crews can perform aircraft engine checks. It entered service on April 19 after seven months of construction work.

Located adjacent to Taxiway Echo, it is situated roughly 6,200ft (1,900m) – pretty much as far away as practical – from the city. The 210-acre (85ha) airport occupies Toronto Island, the nearest shore of which is around 500ft (150m) off the downtown's shoreline.

Although Billy Bishop Airport has several users of the GRE, its height, blast deflector and the pavement markings are all designed to serve the Bombardier regional turboprop Q400, as dictated by airport operator PortsToronto. The Q400 is the only aircraft operated by the airport's largest user, Porter Airlines. Larger-sized propeller aircraft have not been evaluated for the GRE, and jet aircraft are not allowed to use the airport.

"The facility is designed specifically for a Q400 aircraft to be safely

The ground run-up enclosure is custom-sized for the Bombardier Q400. (PortsToronto)



The Toronto skyline is visible through the partially constructed ground run-up enclosure. (PortsToronto)

powered into the facility, turned around and positioned for an engine run-up without the use of an aircraft tug. To date, the facility has been successfully used by operators of most of the aircraft that fly out of the airport, such as the Q400 and Dash-7," said Don Bergin, President of Reno, Nevada-based manufacturer, Blast Deflectors Inc (BDI).

Mississauga, Ontario-based Pave-Al Limited did the civil work, including the concrete foundations and paving.

Toronto-based WSP Canada was the project consultant. As the design-build subcontractor to Pave-Al, BDI created and installed the GRE. The C\$9 million project is part of the PortsToronto Airfield Rehabilitation Program.

Each GRE that BDI builds is custom-designed for the setting, and specifically takes into account the winds and area in which the noise reduction is most important. The objective is to meet the project

goals, which typically focus on aerodynamics, acoustics, aesthetics and budget, but without overbuilding the structure.

The Billy Bishop facility is 207.7ft (63.3m) wide and 216.5ft (66m) long, and is sized for powered in/out operations by the Q400. The open end faces roughly west – into the prevailing winds. "Ideally, the front of the facility (the open side) can be oriented into the prevailing winds, which, when combined with suitable aerodynamic features, addresses the challenges associated with running aircraft engines at high power settings while on the ground," Mr Bergin explained.

Bojan Drakul, Senior Project Manager, Aviation with WSP added: "The optimal location of the facility was determined by PortsToronto, while the optimal orientation within this location was determined by BDI based on maximising facility usability." The north wall, which faces downtown Toronto, is 45.9ft (14m) high. The southern one, which faces Lake Ontario, is 36.1ft (11m) high, as is the rear wall.

"The wall heights were optimised so the southern wall [facing the lake] is lower while that to the north was built higher to provide more protection due to taller buildings on the city side," explained Mr Drakul.

The GRE has aerodynamic features such as acoustically-treated vents on the side walls, rounded top edges and sloped leading edges. The interior walls are lined with over 1,700 special acoustic panels. "Our patented Noise



Installing special acoustic panels that block aircraft engine noise and prevent acoustic reflection. (PortsToronto)

Blotter panels are unique in that they block the transmission of aircraft engine noise and are highly absorbent in order to avoid acoustic reflection," Mr Bergin said.

Noise levels were measured before and after the installation of the GRE. The difference between these readings, which is measured in decibels, is referred to as 'insertion loss'. Live aircraft acoustic testing serves two main purposes: firstly, it allows the owner and facility users to verify that there are no aerodynamic issues that may cause propeller stress, engine stalls, etc. Secondly, it determines if the facility is doing its job.

"There was some concern voiced by members of the community prior to the GRE being built, primarily because no one knew what to expect or what the impact would

be. But now the structure is in place we are receiving comments from the community about the positive change it has made to noise associated with engine run-ups. We recognise that engine run-ups were one of the main irritants for the surrounding community and we are pleased we have implemented an approach that will mitigate the noise and demonstrate our commitment to being a good neighbour to assist the surrounding community," said the airport's Executive Vice President, Gene Cabral.

Based on the history of noise complaints, the GRE seems to have succeeded in soothing the nerves of its neighbours in Toronto.

The project has been complimented by Toronto's Deputy Mayor, Denzil Minnan-Wong who congratulated the airport on its noise management programme and applauded it for making the significant financial investment at no cost to the taxpayer.

