Marine structures

Billy Bishop Toronto City Airport

East Dock Wall Rehabilitation

CANADA

Combi-wall construction on Toronto Island for the East Dock Wall Rehabilitation

Owner
The Toronto Port Authority

Engineer
AECOM Canada Inc.

General contractor
Soletanche Bachy Canada

Dates of work
2025/07 2025/12

Main figures

Sheet piles/combi walls
140 m

Permanent anchors
30 EA.

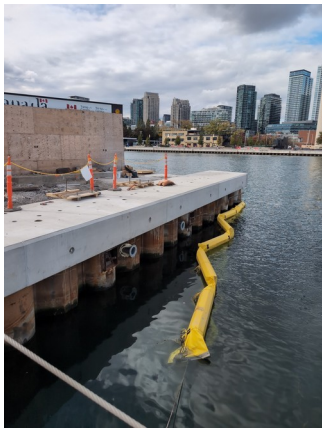
Demolition works
378 m³

Earthworks
2,530,000 kg

Reinforced Concrete
468 m³

Marine works
140 m

Hanging Lead System to install the pipe piles for the combi-wall



Completed dock wall with precast concrete coping

Description

Soletanche Bachy Canada was the General Contractor responsible for rehabilitating 140 m of the East Dock Wall at Billy Bishop Toronto City Airport that was reaching the end of its service life. This included all work required to install a combination wall (pipe piles and sheet piles), demolition of the existing concrete coping, installation of rock anchors and new precast concrete coping, excavation and backfill, environmental protection and monitoring of existing structures, reinstatement of the ferry power station and installation of new asphalt paving. The main challenge of the project was linked to its location on Toronto Island, which necessitated all deliveries to be completed by barges, and working in the perimeter of an operating airport with limited space on land. This project demonstrates SB Canada's ability to manage the entire scope for complex, marine infrastructure projects.

Ground conditions

Lakebed consisted of fine grained Sand and Silts with traces of clay with Shale Bedrock, interbedded with Siltstone and Limestone (Georgian Bay Formation)

Solution

The combi-wall was constructed via barges/marine plant utilizing a HC165 Terex Crawler Crane with a in-house, custom designed Hanging Lead System and Engineered Template to ensure proper alignment of the new wall. SB Canada provided a value engineered rock anchor solution which minimized interference with airport operations and property encroachment while mitigating potential dewatering risks associated with the original concrete anchor block deadman design. The rock anchors were installed utilizing a Commachio MC20 small diameter drill rig from a barge/marine plant. The installation of the precast concrete coping units, with each unit weighing 20T and secured with flowable concrete, was installed utilizing a volumetric concrete mixer and crane setup on a barge/marine plant, which eliminated concrete waste and potential quality issues.

Sustainable development

SB Canada was able to successfully reduce CO2 emissions by 36% or 105,000kg for the various concrete scopes compared to the original baseline targets for the project. SB Canada provided a value engineered solution which replaced tie-rods and concrete anchor blocks with rock anchors, effectively eliminating 23,000kg of CO2 emissions. SB Canada elected to use a volumetric concrete mixing truck to optimize the installation of flowable concrete. By implementing this methodology, SB Canada reduced the CO2 emissions by 49% for this scope or effectively eliminated 77,500kg of CO2 emissions.