



Port Lands Flood Protection

Toronto, Ontario, Canada

At the mouth of the Don River lies the Toronto Port Lands, a large, underdeveloped stretch of the downtown waterfront, created by infilling one of the largest wetlands in Ontario.



The project

For years, this area was undeveloped due to its vulnerability to flooding from extreme weather events and was used as an industrial zone. With over 715 acres of land available, the City of Toronto and other stakeholders developed a solution to use this property to generate economic opportunities in the area. The new development will include parks, green spaces, public amenities, affordable housing, and restored wetlands to support native species. Necessary flood protection will be provided by creating a naturalized mouth of the river, requiring support of excavation, dam, and permanent water cut-off wall. Ground conditions consisted of sand, silts, soft clay, and bedrock, with groundwater encountered 3 ft (1 m) below the working grade.

The challenge

Due to the previous industrial use of the area, soils were contaminated, and remediation procedures were necessary. In addition, crews had to work through extreme winter weather and the Covid-19 pandemic.

The solution

The final design consisted of a diaphragm wall to provide temporary excavation support and a permanent water cut-off for the river channel. Diaphragm walls offer several benefits over traditional secant piling, including fewer construction joints and less overall deflection during excavation. Keller installed wall panels up to 144 ft (44 m) deep. Panels were installed to meet lateral strength, verticality tolerances, and water resistance.

Working with the general contractor, contaminated soils were identified using specialized gas monitoring. Contaminated spoils were relocated to a containment area, treated to remove contaminants, and then reintroduced for future landscape projects.

Keller completed the project within all design requirements, reducing the overall construction schedule and cost for the client, allowing the project to continue to the next phase.

Project facts

Owner(s)

Waterfront Toronto

Keller business unit(s)

Keller

Main contractor(s)

Ellis Don

Engineer(s)

Keller

Solutions

Support of excavation

Groundwater control and dewatering

Markets

Commercial

Techniques

Diaphragm walls

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