



CANADA

**Ontario line
Corktown Station**



Aerial photo of the north shaft of the station

Owner
Metrolinx

Engineer
Sener

General contractor
Ontario Transit Group

Dates of work
2024/05 2024/10

Main figures

Secant/contiguous piles

6,038 m Secant Pile Shaft for Corktown Station
A total of 462 secant piles were constructed for the North and South shafts. Of these, 406 piles had a diameter of 1180 mm, while 56 piles were 1000 mm in diameter. According to the design, every fourth pile is a structural pile incorporating an H-shaped steel profile. For the 1000 mm piles, every alternate pile was reinforced with rebar cages to meet structural requirements.



Proximity of a high-rise building to the drilling area.

Description

The Ontario Line is a 15.6-kilometer subway project designed to make travel within Toronto faster and more efficient. Stretching from Exhibition Place through downtown Toronto to the Eglinton Crosstown LRT at Don Mills Road, the line will introduce 15 new stations to the city. Once completed, the Ontario Line will significantly reduce travel time, enabling trips from one end to the other in under 30 minutes—a stark improvement compared to the current 70-minute journey using existing transit options.

The new line will also alleviate congestion throughout Toronto's transit network by integrating with over 40 other travel options. These include connections to the TTC's Line 1 and Line 2, three GO Transit rail lines, and the Eglinton Crosstown LRT, providing seamless and efficient transit solutions for residents and visitors.

In the Corktown area, a key component of the Ontario Line project, Soletanche Bachy is bringing its expertise as a global leader in soil and foundation engineering. Their scope of work includes constructing secant pile walls for structural support, ensuring soil retention, and maintaining the stability of shafts and excavations. These advanced foundation techniques are critical in addressing the complex ground conditions unique to Corktown, ensuring the successful execution of this transformative infrastructure project.

The Ontario Line will be a 15.6-kilometre subway line that will make it faster and easier to travel within Toronto and beyond.

The line will bring 15 new stations to the city and will run from Exhibition Place, through the heart of downtown, all the way to the Eglinton Crosstown LRT at Don Mills Road.

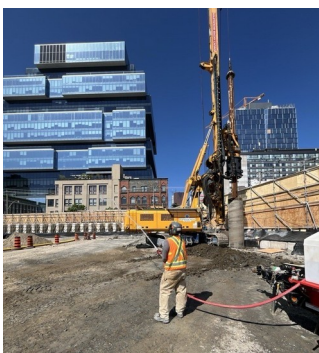
It will give people more time back in their days, with a trip from one end to the other taking less than 30 minutes compared to the 70 minutes it takes on transit today. There will also be significant relief from crowding throughout the existing transit network thanks to connections to more than 40 other travel options along the way, including the TTC's Line 1 and Line 2, three GO Transit rail lines, and the Eglinton Crosstown LRT.

As a global leader in soil and foundation technologies, Soletanche Bachy's scope of work on the Corktown project likely involves advanced foundation engineering and construction techniques. This includes constructing secant pile walls for structural support, addressing soil retention, and ensuring the stability of shafts and excavations.

Ground conditions

The ground conditions in the Corktown area, as part of the Ontario Line project, present complex challenges due to the site's urban and historical context. Corktown Station, situated between Parliament and Berkeley Streets and adjacent to Toronto's Distillery District, is located in an area that combines existing urban infrastructure with significant historical considerations, necessitating meticulous planning and execution.

Geotechnically, the station site poses challenges in preparing soil conditions for tunneling and station construction, as it will house a tunnel boring machine shaft. Proximity to Front Street further underscores its historical geography as part of Toronto's former waterfront expansion. Historically submerged, the area presents significant groundwater challenges due to its closeness to the previous Lake Ontario shoreline. The soil profile consists of saturated sands, silts, and clays, interspersed with glacial till and occasional boulders—remnants of the region's glacial history.



Drilling near an active street and suppressing dust with water.



Groundwater levels are notably high, necessitating efficient dewatering systems during excavation to manage seepage and maintain structural stability. The presence of boulders within the saturated soil complicates drilling, requiring advanced techniques to prevent disruptions and protect construction equipment. Furthermore, measures are taken to suppress dust during drilling activities to ensure a clean environment and minimize disruption to the surrounding neighborhood. Combined with the dense urban infrastructure, these factors demand precise engineering solutions and continuous monitoring to ensure the safe, successful development of Corktown Station.

Solution

To address the complex ground conditions at Corktown Station, several innovative measures and construction techniques are being implemented to ensure safety, efficiency, and minimal disruption to the surrounding urban environment. To manage noise levels and reduce disturbances, auger cleaners are being utilized during drilling operations. These devices help mitigate excessive noise by efficiently cleaning the auger without relying on high-impact processes. Additionally, water sprinklers are strategically deployed throughout the construction site to suppress dust, maintaining air quality and reducing environmental impact on the nearby community.

To mitigate groundwater challenges and ensure excavation stability, basic plastic sealing systems are employed. These systems effectively manage seepage and prevent structural issues during construction. Furthermore, specialized drilling techniques are employed to navigate through the glacial till and boulders embedded in the soil. For example, high-torque drilling rigs and precise excavation equipment help avoid damage to tools while maintaining productivity. Continuous monitoring of groundwater levels, vibrations, and structural conditions is also conducted, allowing for real-time adjustments to construction methods. This comprehensive approach ensures the project progresses safely while minimizing disruption to residents and preserving the historical significance of the area.

Sustainable development

The construction of Corktown Station, a pivotal component of the Ontario Line, is a testament to modern engineering and sustainable development. This ambitious project, situated in the heart of Toronto's historic Corktown neighborhood, involves the construction of a state-of-the-art underground station.

To minimize disruption to the bustling city center, innovative construction techniques are being employed by Soletanche Bachy Canada to reduce surface-level disturbances. Additionally, SB Canada implemented stringent noise and vibration mitigation measures to protect nearby residents and businesses.

The project is committed to environmental sustainability. By utilizing sustainable building materials and energy-efficient technologies, the station is designed to minimize its carbon footprint. SB Canada developed a site-specific environmental plan to ensure appropriate measures. Rigorous environmental monitoring is conducted throughout the project to ensure compliance with regulations and mitigate any potential impacts.