



# Ontario Line-Moss Park station

## Secant pile walls and bracing works

CANADA



Moss park station after stating of the Bracing

<b>Owner</b>	Metrolinx
<b>Engineer</b>	Sener
<b>General contractor</b>	Ontario Transit Group
<b>Dates of work</b>	2024/03 - 2024/12
<b>Turnover</b>	11,115,115.99 CAD

### Main figures

#### Geotechnical specialties

5,918 m Secant Pile and bracing works on Moss Park station

The project included a total of 408 piles, consisting of both filler piles and secondary structural piles. The filler piles had a combined length of 4,141 linear meters with a diameter of 1,180 mm. The structural piles comprised 1,315.38 meters of section W690x265 and 462 meters of section W690x217. Additionally, the project incorporated three levels of bracing work.



Drilling Operation done using BG36 and LB28

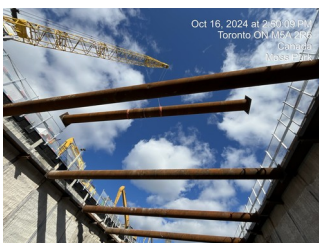
### Description

The Ontario Line is a 15.6-kilometer subway project designed to improve travel across Toronto. The line will run from Exhibition Place, through downtown, to Don Mills Road, and will introduce 15 new stations. Once operational, it will reduce travel time dramatically, cutting the trip from 70 minutes to under 30 minutes. This will be a significant benefit for commuters, as the line integrates with over 40 existing transit options, including connections to TTC's Line 1 and Line 2, three GO Transit rail lines, and the Eglinton Crosstown LRT, creating a more efficient and interconnected transit network for both residents and visitors.

At Moss Park station, a key part of the Ontario Line project, Soletanche Bachy, a global leader in soil and foundation engineering, is using its expertise in the construction of secant pile walls. The scope of their work includes construction of secant pile wall, installation of bracing systems across three levels, as well as testing and installing toe anchors for structural support. These efforts are crucial for soil retention and ensuring the stability of shafts and excavations, addressing the challenging ground conditions specific to Moss Park, and contributing to the success of this important infrastructure project.

### Ground conditions

The ground conditions at the Ontario Line Moss Park Station, located in downtown Toronto, reflect a typical urban subsurface environment characterized by a mix of natural and man-made materials. The uppermost layers often consist of fill material, including soil, gravel, and remnants of previous construction. Beneath the fill, native soils such as clayey silt, sandy silt, or silty sand are commonly encountered, varying in composition and thickness. Deeper layers typically comprise compact glacial till, which includes a mix of clay, silt, sand, gravel, and cobbles, presenting challenges for excavation. At greater depths, bedrock primarily composed of Georgian Bay Formation shale is found, generally at depths of 10-15 meters in the downtown area. Additionally, the groundwater table is relatively high due to the proximity to Lake Ontario and existing underground infrastructure, requiring dewatering to ensure construction stability and safety.



Struts being lifted in the pit using the crane

### Solution

To manage the challenging ground conditions at Moss Park Station, a variety of advanced construction methods are being employed to prioritize safety, efficiency, and minimal disruption to the surrounding area. To control noise levels and reduce disturbances, auger cleaners are used during drilling operations, which prevent excessive noise by cleaning the auger in a way that avoids high-impact processes. Water sprinklers are also placed throughout the site to suppress dust, ensuring better air quality and limiting the environmental impact on the nearby community.

For groundwater management and excavation stability, basic plastic sealing systems are utilized to prevent seepage and protect against structural complications during construction. Specialized drilling techniques are also used to navigate the difficult soil conditions, including glacial till and boulders. High-torque drilling rigs and



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precision excavation tools are employed to avoid damaging equipment while ensuring the work remains productive. In addition, continuous monitoring of groundwater levels, vibrations, and structural integrity takes place, allowing for real-time adjustments to construction strategies. This well-rounded approach guarantees that the project progresses smoothly and effectively. Additionally, spare equipment and drilling tools were kept on standby to mitigate any delays caused by potential damage during rock drilling operations.

### Sustainable development

Soletanche Bachy Canada utilizes energy-efficient technologies and sustainable building materials to reduce its carbon footprint. A site-specific environmental plan, along with continuous monitoring, ensures adherence to regulations and mitigates any potential environmental impacts. Additionally, the Ontario Line Southern Civil, Stations, and Tunnel project incorporates practices that further minimize waste and energy consumption, including the use of precast components and advanced tunneling methods. Measures like dust and noise suppression, responsible handling of excavated materials, and groundwater management protect local ecosystems. The project also uses low-emission machinery, recycled materials, and promotes green spaces to enhance urban aesthetics and livability. Designed with climate change resilience in mind, the project aims to provide a sustainable, long-term transit solution for Toronto