Gall Zeidler Consultants
Geotechnics | Tunnel Design | Engineering

Advance Tunnel for Scarborough Subway Extension
Metrolinx and Infrastructure Ontario

Location: Toronto, Canada

Date: 2020

Structure: Emergency Exit Buildings and Station Headwalls and Support for Tunnel Design

Length: 4.8 miles (7.8km)

Cross-Section: 35ft (10.7m)

Geology: The Quaternary deposits of Toronto Region consists predominantly of glacial till, glaciolacustrine sand, silt, and clay deposits, and shallow post glacial lacustrine sediments which overlie the Ordovician bedrock of the Georgian Bay Formation consisting of shale with interbeds of limestone and siltstone.

Client: AECOM

Owner: Metrolinx and Infrastructure Ontario

Tender Design Services:

The Scarborough Subway Extension (SSE) project will replace the Scarborough Rapid Transit and will extend the Bloor-Danforth Subway (Line 2) east from Kennedy Station northeast to Sheppard Avenue East, following Eglinton Avenue East, Danforth Road and McCowan Road and crossing beneath Highway 401 along the way. The SSE will include three new stations (Lawrence East Station, Scarborough Centre Station and Sheppard East Station) and eight emergency exit buildings (EEB-1 to EEB-8). The project is planned to consist of a bored tunnel with an approximate 10.7m internal diameter.

Gall Zeidler Consultants (GZ) was contracted to develop the Tender Design of headwalls for 7 emergency egress buildings, 3 new stations as well as one cross over as part of the Advanced Tunnel Contract pursuit. The head walls are designed as secant piles and GZ proposed use of Glass Fiber Reinforced Polymer (GFRP) bars for secant piles reinforcement. GZ also provided design of safe havens at the headwalls for routine TBM Maintenance during tunnel excavation.

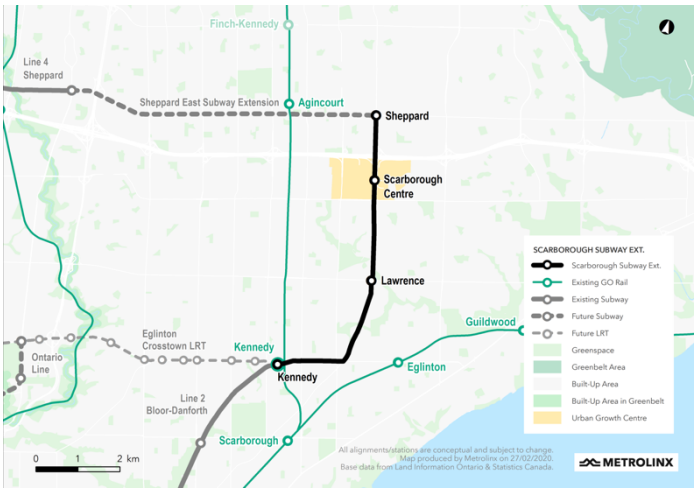

Figure 1. Scarbrough Subway Extension Alignment (Courtesy of Metrolinx).

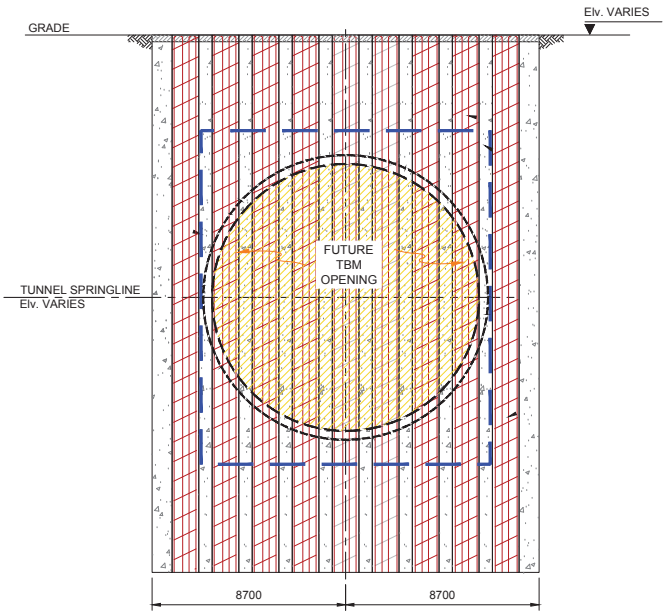

Figure 2. Headwall Cross Section indicating TBM break-in zone with alternate reinforcement.