

Micropile Retrofit and Construction at Mass Transit Facility – Toronto, ON July 2009

The Problem:

- Existing cast in place retaining wall to be used as a foundation wall for a pedestrian bridge at a subway station upgrade
- Wall required lateral tiebacks to reinforce wall as a result of increased loads based on new use
- Limited access available between existing wall and subway track required compact equipment
- Additional vertical foundation support for subway station also required
- Soil strata was 2 to 2.5 meters (6-8 ft) of fill material to bedrock
- Helical piers could not be used due to bedrock embedment requirement



Installing retaining wall anchors



Micropile anchors installed along wall

The Solution:

- Micropiles were chosen for the project based on several reasons:
 - Bedrock embedment required
 - More cost effective solution than other technologies
- EBS equipment able to work within narrow construction envelope without interfering with subway traffic

Product Used: (9) Dywidag® Micropiles for lateral support of retaining wall
(12) groups of (3) Dywidag® Micropiles to support new subway station

Length: Minimum embedment of 7.5 meters (24 ft) into bedrock

Loads: Retaining Wall Anchors - 270 KN (60 kips) SLS
New Building - 650 KN (145 kips) ULS per group of (3) vertical loads
- 105 KN (23.5 kips) ULS per group of (3) horizontal loads

Structural Engineer: Halsall Associates Limited
Geotechnical Engineer: Golder Associates
Micropile Installer: EBS Engineering and Construction Limited



Termination at retaining wall



Installed micropile groups for new structure