

Niagara Falls Tunnel, Ontario



• Tunnel entrance.



• Borehole drilling for extensometer and piezometer installation.



• Extensometer installation.



• Niagara falls.

In the summer of 2005, Ontario Power Generation (OPG) contracted the Strabag AG Company to build one of the largest tunnels in North America, using a 14.4 meter diameter open shield Robbins TMB.

The tunnel runs under the City of Niagara Falls from the upper Niagara River to the Sir Adam Beck Power Station at Queenston, which is 10.4 kilometers away.

In the fall of 2007, GKM Consultants undertook the instrumentation of one of the deepest sections (140 m depth). The instrumentation was deployed to confirm the designers' (Hatch Energy) hypotheses regarding the behavior of the geological conditions and to monitor the rate of change, stabilization and structural integrity during, and after, construction.

The project consisted of installing arrays of 8 Multi-position borehole extensometers, each with 6 anchors, and 6 vibrating wire piezometers. All cables are routed to the surface through a dewatering shaft and connected to a Micro-800 datalogger for automatic data acquisition.

The piezometers were installed in the annulus between the precast lining and bedrock, where 20 bar of concreting pressure is expected. As a precaution, protective sleeves were used to house the sensor cables to help protect them during and after installation.

The expected monitoring period of the instrumentation is for a minimum of 5 years. Construction of the tunnel is projected to be complete in 2011.

GKM Consultants
1430 Hocquart Street, Suite 100
St-Bruno (QC) J3V 6E1
Canada

phone: 1 • 450 • 441 • 5444 (x203)
fax: 1 • 450 • 441 • 0677
email: set@geokon.com
web: www.gkmconsultants.com

Geokon, Incorporated
48 Spencer Street
Lebanon, New Hampshire 03766
USA

phone: 1 • 603 • 448 • 1562
fax: 1 • 603 • 448 • 3216
email: info@geokon.com
web: www.geokon.com