

CANADA

ACTIVITY REPORT 2014

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The Tunnelling Association of Canada (TAC) was established in 1980. Key objectives of TAC are:

- Promote the development and use of underground space to decision makers and the public;
- Exchange and inform the use of Canadian underground excavation and construction technologies;
- Facilitate the exchange of information on related activities and technical developments;
- Represent the interests of the tunnelling and underground excavation community in matters of technical and public concerns;
- Act as an intermediary body between ITA and those individuals and organizations in Canada who are interested in tunnels and underground excavations;
- Disseminate throughout Canada the news of the activities of ITA and the technical information available as a result of those activities;
- Support and promote the TAC Young Members division;
- Organize the annual Canadian Tunnelling Awards; and
- Provide student scholarships

TAC is a national association supported by several regions: British Columbia, Alberta & and the Prairies, Ontario, Quebec and the Maritimes.



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Eastern Canada:

In Ontario, Tunnelling for the Spadina Subway is essentially complete and the TTC is moving ahead with the stations and track work. This project involved four EPB TBMs and also saw some innovative construction techniques including SEM and compensation grouting to pass below some sensitive structures.

Tunnelling on the Billy Bishop Airport Link has recently been completed making way for easier access to the Billy Bishop Airport. The Project saw the first use of interlocking stacked drifts as a primary support in Canada.

In the York Region, the South East Collector project consisted of twinning the existing trunk sewer from York to Durham in order to provide future capacity for expansion. Four EPB TBMs were used on this project.

Other Ontario projects currently under construction include:

- RR#25, Halton Region;
- Hanlan Feedermain, Contract 1 and Contract 3
- Eglinton Scarborough Crosstown Light Rail project – construction has commenced, with tunnelling underway on the western contract and tunnelling due to start in the New Year on the eastern portion; and
- Ottawa Light Rail Project – construction underway.

There is also a very active micro tunnelling market in Ontario with projects from Kingston to Guelph with many other large micro tunnel projects to hit the streets soon.

Upcoming Ontario projects include the following:

- Twinning of the West Trunk Sewer, Contract#2, City of Mississauga, Region of Peel - project is scheduled to tender this year;
- Upper Centennial Parkway, City of Hamilton - design is complete and project should be out to tender in third to fourth quarter of this year;

- City of Toronto – twinning of the Coxwell Sewer and combined lakeshore storage tunnels; and
- Ashbridges Bay Outfall – Will involve a variety of tunnelling methods including micro tunnelling as well as a significant marine portion of work.

Upcoming National events taking place in Ontario include the following:

- 2015 TAC Workshop and AGM: Kingston, Ontario – scheduled for October, 2015. Focus on innovations on tunnelling and looking to the future; and
- 2016 TAC National Conference: Ottawa, Ontario – scheduled for October, 2016. Theme to be determined.

In Quebec, the Romaine-3 Hydro-electrical complex (395 MW) includes four drill and blast work contracts:

The river diversion tunnel, the powerhouse, the spillway-intake dams and the pressure tunnel. The diversion tunnel is now complete and in operation. Excavations for the surface powerhouse, the spillway and the intake are ongoing and almost completed. The pressure tunnel is a D-shaped excavation and the work is just beginning with the starting portal excavation advanced of 20 m.

A new utility tunnel associated with hospital operations at McGill University's downtown Montreal campus is currently underway using drill and blast. Careful planning and execution is required to minimize disruption to the University operations that house sensitive medical and research equipment as well as patients.

In Montreal, a 4 km long, 3.0 m diameter, water main tunnel in limestone is being excavated to connect to the existing Rosemont. A Robbins main beam TBM is being used for the job and the tunnel is planned for completion early next year with the project due on line in 2016.

The Quebec market is still looking strong in tunnelling with the following projects on the horizon:

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- Metro extension – Blue Line (Agence Metropolitaine de Transport, AMT) adding five new stations to the line towards the east to reach Anjou;
- City of Montreal Lavigne retention pool – 3 tunnels of 2 m diameter to be excavated for a total length of 2.1 km to manage storm water;
- Ministry of Transport of Quebec Melocheville Tunnel – Road tunnel maintenance project; and
- Hydro-Canyon project – 800 m long pressure tunnel near Quebec City, 4.8 m wide D-shaped D/B tunnel section, Axor Group, ±10MW.

Western Canada:

Alberta tunnellers have been active during this past year, thanks to an ever-growing population in Calgary and Edmonton.

The City of Calgary is studying the feasibility of a 5 km long, 10 m diameter flood bypass tunnel from the Glenmore Reservoir to the Bow River. The tunnel would mitigate the impact of future floods like the one in June 2013. The city is also investigating several 2-3 m diameter sewer and water tunnels up to 1.8 km long, which are part of the Nose Creek sanitary upgrades and relocations associated with the upcoming construction of the Southwest Ring Road. The trenchless crossing of the Bow River has been tendered and involves 200 m long twin tunnels anticipated to be constructed using slurry micro tunnelling.

In Edmonton, the \$1.8 Billion, 13 km long LRT Valley Line is proceeding as a P3 project, and will include construction of twin 400 m long tunnels on the north side of the North Saskatchewan River. Five teams responded to the City's RFQ released in April, 2014 and three have been shortlisted to submit a bid to design, build, operate, maintain and partially finance the project. The shortlisted teams are TransEd Partners (incl. Bechtel, EllisDon, and Bombardier), Moving YEG (incl. ACS Infrastructure, Hochtief, and Stantec) and

River City Transit (incl. SNC-Lavalin, Kiewit, and Alstom). Final proposals are expected in the fall of 2015 with the successful team selected by the end of 2015. Major construction is expected to begin in 2016.

In B.C., the tunnelling industry is active with a number of planned, ongoing and completed projects in Greater Vancouver and other regions of the province.

Metro Vancouver's Seymour-Capilano Twin Tunnels Completion Project is nearing completion. These 7.1km long, 3.8 m diameter twin tunnels have been constructed through a joint venture of Aecon, JF Shea and Frontier Kemper, who were awarded a contract in April 2009 to complete the tunnels. Both tunnels were complete by November 2010 and the 2 shaft excavations (By raise bore) were completed in April 2011. Final shotcrete lining and steel liner installation is 100%complete as of August, 2014.

Tunnelling on Metro Vancouver's Port Mann Water Supply Tunnel Project is currently in progress. The project consists of two slurry wall shafts, each approximately 60 m deep and located on either side of the Fraser River, connected with a 1 km long, 3.5 m diameter tunnel. Excavation of the tunnel is being carried out using a CAT EPB TBM; construction is being undertaken by the McNally-Aecon Joint Venture.

Preliminary design is currently underway on Metro Vancouver's proposed Second Narrows Water Supply Tunnel Project. The 1.1 km long, 5.7 m diameter tunnel would connect the suburbs of North Vancouver and Burnaby. The tunnel will be driven through variable soils and bedrock beneath Burrard Inlet. Construction is planned to commence in 2017.

The Annacis Main No. 5 Water Tunnel is a proposed water supply tunnel beneath the Fraser River connecting the Greater Vancouver suburbs of New Westminster and Surrey. Conceptual design is currently underway for the project. Construction is planned to commence in 2018.

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The Evergreen Line Rapid Transit Project will be an 11 km extension to Greater Vancouver's rapid transit system. The project includes a 2 km long, 10 m diameter bored tunnel. The design-build-finance contract was awarded to EGRT Construction and the tunnelling work is being conducted by SNC-SELI Joint Venture.

The tunnel is being excavated with a CAT EPB TBM and is expected to be completed in early 2015.

B.C. is also currently experiencing an increase in activity in hydroelectric project development.

- AltaGas has completed their 195 MW Forrest Kerr Hydro Project in northern B.C. The project included over 5000 m of access, tailrace and power tunnels. Tunnel construction was carried out by Procon. The project is now in service.
- AltaGas is also constructing the 66 MW McLymont Creek Hydro Project downstream of Forrest Kerr.

This project includes an intake, surface powerhouse and a 2.7 km long power tunnel. Tunnel excavation commenced in Q2 2013, with tunnel excavation being carried out by Procon Mining and Tunnelling. The project is scheduled for completion in mid-2015.

- The principal contract for BC Hydro's \$1B John Hart Generating Station Replacement Project, located near Campbell River on Vancouver Island, was awarded earlier this year to inPower BC (SNC-Lavalin). The project includes a 2.1 km long tunnel, underground powerhouse, and associated shafts and access tunnels. Underground construction is scheduled to start in fall 2014.
- Innergex Renewable Energy is constructing the Upper Lillooet Hydroelectric Project, 70 km northwest of Pemberton. The project includes two facilities: Upper Lillooet and Boulder Creek. The 81.4 MW Upper Lillooet HEF includes a 2500 m power tunnel being constructed by drill and blast by CRTEBC

(S.E.N.C.) of Quebec. Work began in August, with overall completion scheduled for mid-2016. The 25.2 MW Boulder Creek HEF includes a 2900 m long drill and blast tunnel, also being constructed by CRTEBC. Tunnelling began in June, with completion also intended for mid-2016.

- Innergex is also constructing the Big Silver HEP, located approximately 40km north of Harrison Hot Springs. This includes an 1800 m long, 5.5 x 6 m tunnel scheduled to begin in late 2014 with the equipment and crews from Boulder Creek mobilizing during their winter shut down period.