

Canada



Name: Tunnelling Association of Canada

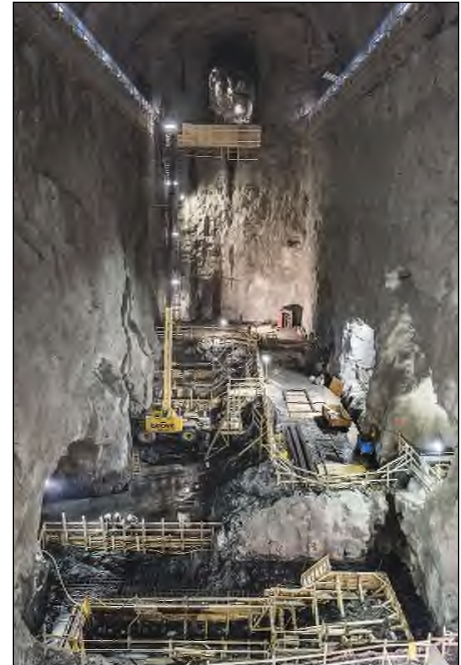
Type of structure: Federally incorporated non-for-profit society

Number of members: 378 (272 full, 51 corporate, 11 retired, 44 student)

Board of Directors:

Officers: Erik Eberhardt - President, Rick Lovat - Immediate Past President, Bruce Downing - Vice President West, Steve Skelhorn - Vice President East, Michelle Richards - Treasurer, Derek Zoldy - Secretary

Directors: Serge Moalli (Stephanie Robillard) - BC Region, Heinrich Heinz - Alberta and Prairies, Jason Mann - Manitoba and Prairies, Walter Trisi - Ontario, André Rancourt - Québec and Maritimes, Nichole Boulton, Jean Habimana, Boro Lukajic, Lara Reggin (Connor Langford), Seamus Tynan



John Hart Generating Station Replacement Project, British Columbia

ASSOCIATION ACTIVITIES IN 2017

TAC 2017 Workshop – Tunnelling and Underground Spaces: The Urban Challenge

100 tunnelling industry professionals met October 12 and 13 in Montreal to hear from international practitioners on: Practical Implementation of Risk Management in Tunnel Projects; Ground Stabilization; NATM; and the New ASCE Guidelines on Trenchless Technologies. The program also included a presentation by Han Admiraal and Antonia Cornaro representing ITACUS on Rethinking Design and Construction of Tunnels and Underground Spaces in the Urban Environment. The workshop concluded with a site visit to the Atwater Tunnel Project.

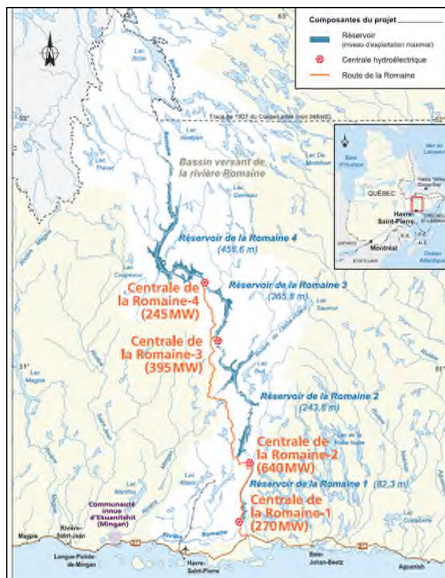
TAC 2017 Awards Dinner

2017 was the sixth year that the Tunnelling Association of Canada presented achievement awards to recognize deserving individuals and projects in the Canadian tunnelling industry. TAC's Canadian Lifetime Achievement Award was presented to long-time TAC member and former TAC President, Boro Lukajic. The Eisenstein Scholarship (value of \$6,000 CAD) was presented to Tim Packulak of Queen's University. Full 2017 TAC Achievement Awards details are posted on the TAC website at http://www.tunnelcanada.ca/achievement_awards.html.

Chapter Activities

TAC's Ontario and British Columbia

chapters continue to be very active running up to eight meetings (each) annually and featuring presentations on Canadian and international tunnelling projects. The Ontario Chapter closes the year with December social, attended by 85 members and non-members in 2017. The BC Chapter always opens the year in January with a combined meeting with the Vancouver Geotechnical Society.



La Romaine 4 Hydro Power Project (Quebec)

TAC Young Members

TAC continues to reach out to young members holding two dedicated YM meetings in the Greater Toronto Area and participating in one lecture Queen's and Ryerson Universities. The YM Group is also participating in the tunnelling course at Ryerson University

CURRENT TUNNELLING ACTIVITIES

The Canadian market is steady, especially in Ontario and British Columbia, with increased activity in Quebec, Alberta and Saskatchewan. There are a number of projects currently underway, some in the prequalification stages and others in the tender stage, and there seems to be a good outlook for projects to come on the horizon. Examples of current projects include:

- **Mid-Halton Outfall and Zone 1 Interconnect Tunnel, Oakville, Ontario:** The project is well underway with shafts and tunnelling complete. Pipe installation, marine work and restoration is still ongoing.
- **Ottawa Combined Sewage Storage Tunnel (CSST), Ottawa, Ontario:** The project consists of 6km of 3m diameter through rock with segments. General construction has commenced; the project is scheduled for completion in late 2019.
- **Trafalgar & Derry Rd Feedermain, Halton Region, Ontario:** There are multiple shafts and tunnels to be constructed for this project. Tunnelling will be in mixed ground conditions, utilizing various TBMs of differing sizes. A main portion of the work is to be performed with an EPB TBM that installs 3m ID prefabricated concrete segments.
- **West Whitby Trunk Sanitary Sewer, West Whitby, Ontario:** Drive utilizing a rock TBM. Currently constructing the shafts and tunnelling will begin shortly.
- **Washburn Second Feedermain, Halton Region, Ontario:** The project should be awarded shortly and consists of multiple tunnel drives in along the Guelph line and Prospect Street, which will be in bedrock of the Queenston shale formation that may contain interbedded layers of siltstone.
- **Romaine-4, Quebec:** The final 245MW site to be constructed as part of the total 1550MW on the river. Work has begun on the diversion tunnel awarded to EBC.
- **Cockburn and Calrossie Sewer Relief Project, Winnipeg, Manitoba:** Installation of 1.3 km of 1.2m diameter and 525m of 2.7m diameter sewer by microtunnelling.
- **Valley Line LRT, Edmonton, Alberta:** Construction of two 500m long soft ground NATM tunnels as part of a \$1.8bn P3 project awarded to TransEd Partners.
- **John Hart Generating Station Replacement Hydro Project, British Columbia:** Underground works have just completed, and the project is now transitioning from the tunnelling and heavy civil works to the mechanical and electrical works to commission the new generating station.
- **BluEarth Renewable's Narrow Inlet Hydro Project, British Columbia:** 1.2km

conveyance tunnel. Excavation works have commenced on both with the former expected to continue throughout 2018 while the latter is expected to be completed in 2018.

- **Second Narrows Water Supply tunnel, Vancouver, British Columbia:** 1.1km tunnel with 6m diameter to connect the suburbs of North Vancouver and Burnaby below the Burrard Inlet. This will involve pressures exceeding 6 bar. Tunnelling to commence in 2018 and be completed in 2022.

FUTURE TUNNELLING ACTIVITIES

The outlook for Canadian tunnelling continues to look promising. There are numerous projects under design and scheduled to be let for tender in future.

In Ontario, these include: Toronto's Coxwell By-pass Tunnel, Don River & Central Waterfront (10.6km of 6.3m diameter), York's West Vaughan Sewage System Project (14km of 3m diameter), CP Rail Tunnel from Windsor to Detroit (2km); and Ontario Power Generation's Deep Geologic Repository tunnels for nuclear waste.

In Quebec, these include: Montreal's Metro Blue Line east extension adding five new stations to the line to reach Anjou, Lavigne retention pool to manage storm water (3

In British Columbia, Vancouver's Annacis Main No. 5 Water Supply Tunnel beneath the Fraser River connecting the suburbs of New Westminster and Surrey is in the planning stages with construction anticipated to begin in 2020. The Annacis Outfall Sewer Tunnel is similarly in the final stages prior to issuance of RFQ's. Conceptual designs for the Coquitlam Reservoir Intake No. 2 tunnel are underway, which include a 6km long tunnel to tap water up the East side of Coquitlam Lake. Design of Greater Vancouver's Capilano Main No. 5 Stanley Park Section project has recently completed with construction expected to commence in 2018. Future projects also include Translink's 5km long Millennium Line Broadway Extension project, with planning and design work underway and construction expected to begin in 2019 with final commissioning expected 4 to 6 years later.

Other upcoming projects of note in the mining sector include Seabridge Gold's KSM project. Overall, the current Seabridge conceptual design shows more than 100km of tunnels including twin 23km-long ore conveyance and access tunnels as well as numerous other drainage tunnels and galleries. Some major pipeline projects in British Columbia also have tunnels planned along their alignment. Kinder Morgan's Transmountain Pipeline project is planned to go through a 3.8m diameter, 2km long tunnel



tunnels of 2m diameter with total length of 2.1km), and the recently approved \$6.3bn REM light rail train project, which includes a new 2km downtown tunnel, 3km airport tunnel, and major refurbishing of the existing 5km Mont-Royal tunnel to meet NFPA 130 standards for fire safety. The REM will be the fourth largest automated transportation system in the world after Singapore, Dubai and Vancouver.

In the prairies, planned investments in buried infrastructure continue to generate interest from tunnelling companies across North America. Winnipeg have approved Contract 5 for the Cockburn and Calrossie Sewer Relief Project, which will include 1.3km of trenchless tunnelling with piping up to 2.4m diameter. Calgary has approved the \$4.5bn Green Line LRT, which includes over 3km of tunnel in the city's downtown.

under Burnaby Mountain.

STATISTICS

1. Length or volume excavated - % mechanized / % conventional during 2017: Data not available.
2. Amount (USD or EUR) of tunnelling/ underground space facilities awarded in 2017: Data not available.
3. List of tunnels completed: Notable tunnelling projects recently completed include the: \$9.1bn Eglinton Crosstown LRT in Toronto; \$2.1bn Confederation Line in Ottawa; and 107MW Upper Lillooet Hydroelectric Project in British Columbia.
4. List of tunnels under construction: See above.