In the fall of 2012 CATT Board of Directors had a productive one-day retreat to look at CATT activities with respect to the previous five-year strategic plan and to set a new 2013 to 2018 strategic plan. Review of activities showed that CATT met and exceeded its strategic goals and objectives over the past five years, is financially self-sustainable, has a strong stable membership base which continues to grow, and is well recognized nationally and internationally as a leader in the trenchless industry. Some highlights over the past five years include increasing staff from one part-time employee to two full-time staff, training over 2500 industry professionals, increasing paying memberships by 150 percent, and growth of Trenchless Roadshow from 200 to over 400 attendees. The review of CATT activities showed that CATT continues to grow and is relevant to the industry and has established a strong foundation for growth. Excellence has no permanent address. Thus, excellence over the past five years will not ensure success over the next five years. CATT’s goal is be known nationally and internationally as Centre for Excellence in buried infrastructure research and education. To achieve this goal and to ensure that CATT continues to grow and develop as an industry relevant organization, the Board of Directors has developed an aggressive and ambitious 2013 to 2018 strategic plan. This plan includes: increasing membership by 150 percent; maintaining financial self-sustainability while increasing staff; and increasing research and contract testing by 50 percent. New initiatives include: an annual municipal trenchless survey to gather data on the state of Canada’s trenchless industry; the publication of a Canadian Buried Infrastructure Renewal Directory; increased marketing of CATT activities via LinkedIn and other social media; and continued research and promotion of buried infrastructure asset management. In April 2013 CATT launched a new course in partnership with OGRA—Asset Management of Buried Infrastructure. This course is part of OGRA new Academy program. CATT is a volunteer-based industry organization and we always need new volunteers. Please contact CATT if you want to become involved with CATT activities.

Mark Knight, Executive Director

Announcements

Trenchless Survey — The Centre for Advancement of Trenchless Technologies has launched the first Canadian Municipal Buried Infrastructure Survey. Fill out the survey to win prizes! For more information on the survey go to:www.catt.ca

Project Highlight: Ground Freezing Method for Excavation Stabilization - Sewer Replacement Project in City of Richmond, BC

Jim Young, P.Eng, and Michael Schwanke, City of Richmond

The City of Richmond in British Columbia is located at the mouth of the Fraser River. The City of 200000 people is between 0.6m and 2.5m above mean sea level which presents challenging underground constructability conditions, in particular, with deep excavations.

The City has completed CCTV inspections of its sanitary sewer system in 2011 to assess the condition and prioritize the repair and replacement of damaged or aging forcemain. The inspection program revealed the deteriorating condition of the Fibre Glass Reinforced (FRP) main fronting 9500 Van Horne Way that had been installed in 1970. As a result, a capital project was initiated to replace this forcemain with larger diameter pipe.

A geotechnical investigation revealed clayey silt to silt clay to depths up to 4m underlain interbedded silts and sands. The ground water table was approximately 2m below grade and with a high iron content.

Repair and Replacement Options

The City completed feasibility and cost assessments of several repair and replacement options based on trenchless and open-cut methodologies.

While dewatering has been the typical construction practice for deep excavations extending below the water table in Richmond, this site presented several challenges. Discharging the high volume of ground water to the sanitary sewer system would exceed the system’s capacity. Discharging the ground water into storm sewer would require significant treatment to meet the strict water quality requirements resulting in a substantial increase in cost.

Rehabilitation in-place using lining systems was not an option due to the requirement to increase the pipe diameter. Additionally, the excessive amount of deformation in the sewer would require a relatively thick liner design thereby reducing the pipe’s capacity.

Pipe bursting offered a means to increase the pipe size and utilize the existing running line, as well as, minimize the extent of dewatering. Based on the reduced construction footprint and cost saving, pipe bursting was selected as the preferred option.

The City awarded this project to PW Trenchless Construction Inc., and during the negotiation process, with the bidder, accepted the proposal to use ground freezing technology.
Artificial ground freezing can be accomplished using two different methods. Liquid nitrogen systems circulate liquid nitrogen through the system and vent the spent gas into the atmosphere; using liquid nitrogen freezes the ground quickly but is much more expensive than brine systems.

Brine systems circulate super cooled salt water through a closed-loop system. While this process takes longer to freeze the ground, brine systems typically cost less than liquid nitrogen systems. With the sanitary sewer bypass in place, timing was less of an issue in this project. As a result, the project team selected a brine system due to its lower cost.

**Entry and Exit Pit Configuration**

The freeze pits were excavated to just above the ground watertable to optimize the freezing and ensure that the freezing occur below the other nearby utilities. Installed at 1m separation, the pipes were angled towards the centre of the pit to ensure the freezing areas would overlap and create a barrier under the base of the excavation.

The entry (west) freeze pit, was 10m wide by 12m long. With sufficient space, the freeze pipes were installed along the perimeter of the pit. In the exit pit the excavation footprint was reduced by using 4 rows of nearly vertical pipes. Forty (40) pipes were installed in the west pit and sixty nine (69) pipes were installed in the east pit.

Determination of the number and location of freeze pipes is critical.
Feature Product - Tomahawk System

Envirologics Engineering Inc. located in Bracebridge, Ontario has developed an innovative solution for cleaning and rehabilitating deteriorated drinking-water distribution piping. The patent-pending Tomahawk System™ can quickly remove internal tuberculation and old bitumen or coal tar linings with no damage to the host pipe. The process is up to 50% faster than standard cleaning methods used today.

Envirologics technology uses crushed stones with a high volume of low pressure air to clean and prepare the host pipe for subsequent lining using spray-in-place pipe (SIPP) or cured-in-place pipe (CIPP) technologies. The Tomahawk System™ will meet or exceed the draft ASTM standard for SIPP coatings which will require a clean and prepared surface for bonding.

The system’s first pilot project was completed in Napanee, Ontario in July, 2012 and involved preparing 6-in. and 8-in. tuberculated and bitumen lined cast iron pipe for SIPP lining. The technology was initially requested as the SIPP lining crew could find no other method for cost-effectively removing the bitumen lining without damaging the host pipe or using chemicals. A significant advantage of the Tomahawk System™ is that the process is virtually waterless and is chemical free.

Additional pilot projects were completed in Peterborough and Cambridge and further demonstrated the Tomahawk’s capability to remove stubborn coal tar lining material from potable water pipes in a timely, cost-effective manner.

Independent, third-party bond strength testing of the Acuro SIPP liner after the coal tar was removed was completed by the Centre for Advancement of Trenchless Technologies (CATT) at the University of Waterloo. The documented results for liner bond strength exceeded expectations.

For more information on the Tomahawk System™, visit Envirologics at www.envirologics.ca or call (800) 267-9810.

Welcome New Members:
Gold Member: Munro Ltd.
Silver Members: Pure Technologies Ltd., Cole Engineering, RC. Spencer Associates, Envirologics Engineering Inc., Hatch Mott MacDonald
Visit www.catt.ca for details on membership and its benefits.