



Sustainable Municipal Pipelines

Centre for Advancement of Trenchless Technologies

Sustainable Buried Infrastructure for Livable Communities

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Sustainable Municipal Pipelines

Spring 2016 (revised)

Message from the Board of Directors

In May we will see the Trenchless Road Show return to Niagara Falls, and with that comes our opportunity and responsibility to showcase the products and services that make our industry unique!

Commodity Mentality. Fifteen years ago it was said by a municipal employee that cured-in-place lining was a commodity, and that everyone knew about it. Probably this individual made the statement due to the fact that he had used CIP methods, and lining had arrived in North America twenty-five years earlier. Fast forward to 2015. A major Canadian municipality had a huge need for pipe rehabilitation, and went through a major dig to replace the problematic sewer pipe. When the senior city official in charge of wastewater was asked, "did you consider that trenchless could have saved you millions?" he responded, "I have never heard of trenchless and question that it can even be done."

This is Our Problem. This is Our Opportunity. For the many members who belong to CATT, we all know and understand what needs to happen. GROWTH! Trenchless must continue to get bigger for each of us to survive and do well, no matter what we do with relation to the industry. CATT provides for us a foundation of credibility, training in relation to the various aspects of Trenchless, and forums such as the upcoming Road Show.

What Must WE Do? Membership strength is so key to our survival and expansion. Yes, our membership is growing, but never fast enough. We will be working aggressively to gain membership during the upcoming Road Show. Wouldn't it be nice to double our membership so that many more municipalities would be looking to Trenchless methods to stretch their tax dollars!

What Can You Do? Attend the show and invite someone to join you. Renew your membership, and ask others to become a member. Help us create a buzz that echoes through the halls of governments that we have key ingredients that can help municipalities become Sustainable! Together we can make a major difference.

Kim Lewis, Membership Chair

James Frederick Leppard (1951-2016): It is with deep sorrow that we announce that James Frederick Leppard (Jim Leppard) passed away March 30. Jim served on the CATT Board of Directors from 2008 to 2012. The CATT family wishes Jim's family heartfelt condolences.

Project Highlight: Southwest Water Supply Line, Fort McMurray, AB

Owen Mierke, Associated Engineering

The Regional Municipality of Wood Buffalo recently reached a major milestone on the South West Water Supply Line (SWSL) Phase 1- Contract 1 Project in Fort McMurray, AB. Over a 4-day period in late December, Direct Horizontal Drilling (Direct), the prime contractor, completed a 1400m long Horizontal Directional Drilling (HDD) pull back installation of a 750mm steel waterline that crossed the Athabasca River and snaked its way through subdivisions and a narrow public utility lot between two homes.

Associated Engineering, the design consultant, was tasked with designing a trenchless installation between the city's Water Treatment Plant and a residential neighborhood 1400m in distance away from the plant. The design traversed across the Athabasca River, and exited in the residential neighbourhood of Abasand. The elevation gain from entry at the WTP to exit in Abasand was 80m with the depth of crossing being an additional 35m under the Athabasca River bottom. Construction commenced in late September of 2015 with the construction of the HDD entry and exit pads. With the HDD exit location within close proximity (50m) to residential homes, a 32ft high temporary sound wall system was installed around the perimeter of the HDD exit pad for the duration of drilling operations to permit 24hr construction within a quiet residential area.

The area for pipe preparation was limited to 25m in width and 470m in length with residential homes on east and the Horse River top of bank setbacks to the west. To accommodate the complete 1400 m of product pipe, the pipe string was split into four pipe sections requiring three welds to be complete during pipe pull. Advancing the pipe from the pipe preparation area to the drill exit required advancing the pipe through a residential cul-da-sac and between two houses 6m apart. The pipe was supported with five side booms, four cranes, and two temporary A-frame support structures on either side of the houses. Emergency access and fall protection was provided with stacked sea-cans between two crane supports.

Geotechnical conditions supported HDD as a trenchless installation method of the Athabasca River. Geotechnical investigation completed by Thurber Engineering determined the 'no drill zones' within the unstable Athabasca River valley slopes. In addition, geotechnical test holes indicated bedrock was present at shallow depths at the entry location and at surface at the river bottom. As a result of the shallow bedrock, minimum casing was required at the entry point. Direct mobilized a drilling rig to both entry and exit locations and completed pilot hole within 7 days using the intercept method. Reaming was complete in 30" and 42" stages with an intermediate 18" ream only required through a short section of hard rock. Continuous in stream turbidity monitoring was completed throughout drilling operations to ensure immediate response if a hydrofracture did occur. Also included in the project is a cast in place PRV chamber near the HDD exit point, 400m of 750mm steel wa-

“Geotechnical conditions supported HDD as a trenchless installation method of the Athabasca River”



termain that extends from the HDD exit point to the Lower Townsite Reservoir, as well as 200m of 600mm PVC watermain from the HDD exit point across Alexander Crescent towards the Abasand Reservoir. Trenchless methods will be used to install pipe across Alexander Crescent, Athabasca Avenue and parallel to the Abasand Cemetery to minimize ground disturbance.

PRV chamber works are scheduled for January-May 2016 with the remainder of the open cut, auger crossings, and project restoration scheduled for May-September 2016. Upon project completion, the SWSL will supply potable water to the Lower Townsite, South Service Areas, and future connection to the South West Service Area, including the Horse and Hangingstone Developments.

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“Trenchless methods will be used to install pipe across Alexander Crescent ... to minimize ground disturbance”

Project Highlight: A Micro-Tunnelling Success in Southern Ontario: The Albion-Vaughan Sanitary Trunk Sewer

Bob Chisholm, Chisholm, Fleming and Associates

The Albion-Vaughan Sanitary Trunk Sewer—a 2.1 km length of 900 mm diameter sewer constructed through a combination of micro-tunnelling and open-cut excavation—was commissioned by the Region of Peel to accommodate future development in the Bolton area of the Town of Caledon and allow the Albion-Vaughan Pumping Station to be taken out of service. The sewer, which runs along Albion-Vaughan Road from Mayfield Road to the pumping station, diverts flows from the trunk system in the south part of the Bolton South Hill Subdivision. Chisholm, Fleming and Associates completed preliminary and detailed design, contract administration and resident inspection, post-construction services, and a SUE Level “A” investigation for the \$9,500,000 project. Construction was completed in only 14 months and under tight time constraints in order to provide the necessary outlet and sewer capacity for land development that was already undergoing approval within the area.



The native soil conditions consisted of silty clay till with deposits of cobbles and boulders. The groundwater table lay below the base of the sewer except in some areas where perched water was identified. Several alignment alternatives and construction methods were evaluated to address challenges of cost, scheduling, traffic, and property and environmental impacts.

The preferred construction solution was a combination of micro-tunnelling and open-trench construction, with micro-tunnelling used in deep sewer sections and to mitigate traffic impacts, and where underground and overhead utilities limited the use of construction equipment. High-voltage power lines run along both sides of Albion-Vaughan Road so for much of the sewer alignment, micro-tunnelling was the fastest, most cost-effective and safest construction method.

Approximately 1 km of 900 mm inside-diameter sanitary sewer was constructed in five separate micro-tunnelling drives, along with eight deep shafts up to 12 m in

“Several alignment alternatives and construction methods were evaluated to address challenges”

depth. The drives were 100 m to 260 m long and were completed with a Herrenknecht AVN 800 micro-tunnel boring machine. Sufficient surface work area had to be designated at the drive/entry shaft locations for set-up and operation of the micro-tunneling equipment that included the MTBM Control Centre, spoil management equipment, crane, loader, excavator etc. Circular concrete sections, 3 m in diameter, were used for retrieval/exit shafts and the shafts were later converted into maintenance holes. Intermediate pre-cast concrete maintenance holes were installed as per the design prior to micro-tunnelling. As work progressed, the MTBM bored directly through these maintenance holes with remarkable precision achieving the design sewer inverts elevations well within acceptable tolerances. The micro-tunnelling was carried out in winter, with continuous 24-hour operation to prevent lubricating slurry fluids from freezing and the ground from casing around the pipeline during non-active time, which would have caused high jacking forces and halted progress of the MTBM.

The tunnel sections crossed under several sub-surface utilities, Highway 50, and Canadian Pacific railway tracks so an extensive settlement monitoring program was put in place during the project. Virtually no settlements were observed during the tunneling operations. As well, traffic management strategies and construction staging were employed to minimize the disruption of traffic along Albion-Vaughan Road, which is travelled by approximately 11,300 commercial and commuter vehicles per day. A by-pass strategy of temporary pumping, piping, and isolation chambers maintained flows in the existing sewer and kept the pumping station in continuous operation during construction and before the new sewer was connected at both the downstream and upstream ends. Once the new sewer was operational, flows were redirected at upstream sewer chambers, the pumping station was decommissioned, and reusable equipment was salvaged for the Region. *Bob.Chisholm@chisholmfleming.com*

“The preferred construction solution was a combination of micro-tunnelling and open-trench construction”



Contractor Prequalification for third phase of the North Interceptor Sanitary Trunk

The City of St. Albert's third phase of the North Interceptor Sanitary Trunk sewer, consisting of a 1500 mm (5 ft) ID tunnel approximately 3000 m (10,000 ft) in length which is to be installed by microtunneling. The depth of the tunnel ranges from 3 m to 12 m (10 ft to 40 ft) with construction planned for the fall of 2016. The project has reached the prequalification stage for experienced general and tunneling contractors. For more information, contact: Jason Lueke, Ph.D., P.Eng. , at luekej@ae.ca.

News Release: On January 20, 2016, Pipeline Inspection Condition Analysis (PICA) Corporation was awarded Part 1 Professional Engineering Services for Condition Assessment of the Steel Segment of the 1500mm Beckett Sproule Feedermain in Peel Region (Ontario). This will be PICA's inaugural foray into the large diameter inspection market in Ontario; the inspection will be approximately 930m in length. The program includes: internal visual inspection, sounding (internal pipeline testing), electromagnetic survey, 3D mapping and Geographical Information System (GIS) recording. Tentative inspection date is late summer 2016.

Upcoming Events

2016 Trenchless Technology Road Show | Niagara Falls, ON | May 17-19, 2016

The technical program has been finalized and the exhibit hall is selling out fast. Please visit

www.catttrenchlessroadshow.ca/ to view sponsorship and exhibit opportunities.



May 17: *Watermain Condition Classification & Renewal*, Hilton Hotel and Suites, Niagara Falls

May 17: *Trenchless Technologies 101*, Hilton Hotel and Suites, Niagara Falls

September: *Construction Risk Mitigation*

October: *Condition Assessment Inspection Tools*

October 13: *CATT Annual General Meeting and Dinner*, Mississauga Grand

November 21-25: *Asset Management of Buried Infrastructure*, visit www.ogra.org

Infrastructure Education: Only through education can one learn of new materials, practices and applications. Although 'old ideas' are trusted by many underground infrastructure companies, it can often be shown that new and best practices, materials and applications can save time and money, often as much as 50% or more. CATT's Education Program for Civil Infrastructure Professionals (epCIP) will provide you with the knowledge to make an informed decision on which are the best choices for your next project, be it ease of installation, longevity of materials used or minimum disruption of the social environment. Topics and content of the epCIP have been carefully chosen and developed by both industry specialists and faculty from the University of Waterloo. epCIP courses are available on line, or in the classroom by University Faculty. So, update yourself with education from CATT. For more information visit: www.epcip.ca

John Green, Education Chair

On-site Training: In its continuing effort to meet the industry needs, CATT is now able to provide on-site training courses. These courses are tailored to fit your training needs and scheduled to fit your employees' availability.

Director-Approved CEUs can be granted, if required. Contact the CATT office for additional information: catt@uwaterloo.ca.



CATT Trenchless Directory
Comprehensive Source of the Canadian Trenchless Industry Information

List your company. It's free!

CATT is pleased to announce the online Canadian Trenchless Directory - a comprehensive source of information about the Canadian trenchless industry. Visit www.canadiantrenchlessdirectory.ca/.

Welcome New Members:

Corporate Platinum: HammerHead

Corporate Silver: Akkerman, HOBAS Pipe, Ontario Excavac Inc., Associated Engineering, Chisholm Fleming & Associates,

Municipal: City of Stratford



Gold Members



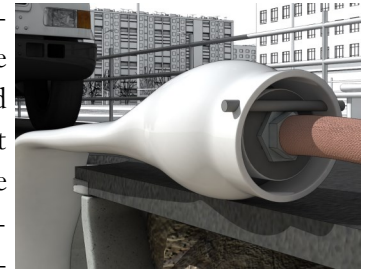
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Featured Products:

NovaForm PVC Liner - The Sewer and Culvert Rehabilitation Solution.

Aging sewer and water infrastructure has led to increasing maintenance costs for municipalities. The engineers at IPEX recognized this development and responded with NovaForm PVC Liner a product that brings the benefits of factory-made PVC pipe to the North American trenchless pipe rehabilitation industry. Non-corroding and installation friendly PVC piping systems have become the material of choice for potable water and sewer infrastructure across North America. The finished NovaForm PVC Liner product provides the same proven benefits of standard PVC pipe. Being made from PVC, NovaForm PVC Liner is highly-resistant to chemicals and offers excellent abrasion- and scratch – resistance properties. The smooth interior surface of PVC translates into improved hydraulic properties as well. Best of all PVC is a sustainable pipe material which means NovaForm provides an industry leading service life. Available in the sizes you need: 6” to 30” and industry standard dimension ratios DR 35 and DR 41. For more information visit ipexinc.com or call 1.866.473.9462.



Primus Line® - Pipe Repair with Primus Line Technology

Primus Line® is a rehabilitation technology for pressure pipelines for water, gas and oil. The process is based on a flexible high-pressure lining which is specially developed for the connection technique of the system. Due to its multi-layered structure and very small wall-thickness, the Primus Line lining provides both flexibility and ultra-high material strength. Primus Line® was originally developed for the high-pressure gas sector, but has now been optimized for drinking water, approved according to NSF / ANSI 61.



The lining is inserted into the host pipe from small insertion pits. Primus Line® is not attached to the host pipe and is self-supporting meaning that an annulus remains between Primus Line® and the host pipe. Primus Line® is produced in nominal diameters from 150mm to 500mm, and is delivered on a transport drum in one unbroken length up to 3000m depending on size. Depending on requirements, the Primus Line can be fitted either with a flange or welded ends. This way, it is also possible to join bends, tees or other fittings and fixtures (made of different materials).

Primus Line has installed and is operating over 270 kms of lining over the past 15 years for more than 200 clients with water, wastewater, gas and oil piping systems. Primus Line is pleased to announce that Ontario Excavac Inc. has become the Certified Solution Partner for Canada’s Central Provinces. For Further information visit our booth at TRS 2016 Niagara falls.