



Sustainable Municipal Pipelines

Centre for Advancement of Trenchless Technologies

Building Sustainable Buried Infrastructure for the Future

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Issue 2

March 2012

Message from CATT's Board of Directors

Uniting the Trenchless World in Niagara Falls, Ontario

In just a few months, international trenchless experts will converge on Niagara Falls, Ontario, to participate in the Underground Infrastructure Research International Conference & *Trenchless Technology* Road Show.

On June 5 & 6 CATT will welcome you to the Scotiabank Convention Centre, where the conference will be kicked off by keynote speaker Dr. John Gumbel, Ph.D., C.Eng., M.I.C.E, Director, JG Pipeline Consultancy Ltd in the United Kingdom and formerly Technical Director of *Insituform* Technologies. Dr Gumbel will share his unique insights on the need to UNITE the Trenchless World by bridging the gap between industry academic partnerships and the development of unified specifications between North America and Europe. Presenters from Austria, Canada, Holland, Iran, New Zealand, the United Kingdom, and the USA will share their experiences and research in eleven technical sessions. Over forty exhibitors will be on site to showcase the latest technologies, and live demonstrations will provide attendees an opportunity to see some of them in action. The networking reception will give you a chance to chat with colleagues, meet new people, and win some great prizes. Afterwards, enjoy all that Niagara Falls has to offer before retiring to the conference hotel. While you're at the show, spend some extra time with us and participate in the short courses. *Trenchless Technology 101* will be held on June 4th and *Asset Management – Strategies for Sustainable Urban Water and Wastewater Networks* will be held on June 7th.

Make sure to stop by www.catttrenchlessroadshow.ca to check out the session schedule and to register for this fantastic event. Come and participate in the largest trenchless technology event in Canada!

News Release — Survey Results Are In

Feedback to the survey carried out in January show that this newsletter has filled a gap in the industry. The survey, distributed to CATT members and non-members, was filled out by 28 readers. Over 80% of the readers found that the content of the newsletter was useful and over 90% rated the articles interesting. The majority of readers would like to see the newsletter at least 4 times a year, a recommendation under consideration. The editorial board would like to thank all those who took the time to fill out the questionnaire and invites additional comments from all those in the industry. Visit <http://www.surveymonkey.com/s/GBRZQT7>

Project Highlight - City of Kingston's First Pipe Burst Project a Huge Success

Louis-Philippe Dubé, Eng.



In the spring of 2011, Utilities Kingston successfully completed their very first pipe bursting project on Bath road in Kingston, Ontario. The scope of the project was to replace and upsize 720m of an existing 6" cast iron watermain that had been installed in the late 1950's. The existing pipe was showing a high failure rate and was no longer adequate to supply the volume and water pressures required in this area.

Since the existing water line was installed at the edge of the Ontario Ministry of Transportation road right-of-way, under what most residents would now consider "their" property; over the years, the residents had performed extensive landscaping over the water line which required that the installation method chosen to perform the replacement needed to keep disturbance to a minimum. Several replacement methods were looked at by the Operations Group of Utilities Kingston and Pipe Bursting was chosen, a first in the area, as it allowed to upsize the existing pipe while limiting the impact on the residents.

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The Utilities Kingston Operation Group examined different materials to perform the installation; they finally decided on 200mm DR14 cast iron outside diameter Fusible PVC as it was the only material that was both compatible with the other piping systems used by the utility, and received industry endorsement for use in a bursting/upsizing installation. IPEX Fusible Brute pipe also offered a fully restrained joint with a much smaller outside diameter than a mechanically restrained joint, allowing for an easier installation. Although the pressure rating of a DR18 (235 PSI) would have been more than sufficient for the system requirements; DR14 was selected for its thicker wall which increased the safety factor with regards to potential scratching and gouging from the shattered iron pipe resulting from the pipe bursting operation. As it turns out, the pipe showed very little signs of scratching upon examination after the installation. Chris Phippen, Project Manager at Utilities Kingston, commented, "Given the amount of rock in the backfill and the way the cast iron pipe burst into shards, as seen in the entry and exit pits, we were very pleasantly surprised with the apparent lack of damage to the exterior of the PVC pipe. We initially had some concerns about finding adequately smooth exterior wall to make up tight connections, but this proved not to be an issue."



The pipe bursting was performed in several sections that ran between strategically located access pits that would reduce the impact on the residents. The longest single section pulled was 130m in length. The contractor used a "static" burst head, which consisted of cutting wheels increasing in sizes mounted in front of an expansion head that splits the existing pipe while pushing the broken pieces out of the way of the new pipe. The pipe was fused prior to installation in strings that would accommodate the length of a given pull.

.After installation, the new Fusible PVC pipe was ready to be tied to the rest of the system and tested. Upon completion of the installation, limited excavation was required in order to connect the service lines to the new pipe.

One of the concerns regarding this pipe bursting installation was that the existing pipe had been installed at a shallow depth on rock, which meant that the bursting operation that increases the actual space taken by the existing pipe could displace the soil upward. Fortunately the soft soil conditions above the pipe were such that there was no heaving effect which could have disturbed the surface.

The project was completed within schedule and on budget offering the utility a brand new system that meets today's and tomorrow's requirements, with a very low impact on residents' properties. According to Chris Phippen, "We are extremely pleased with the success of this, our first foray into pipe bursting. We accomplished all of our goals with the project, and learned a great deal about the technology."

Louis-Philippe Dubé, Eng.

Market Development Manager, IPEX Inc.

"The project was completed within schedule and on budget offering the utility a brand new system that meets today's and tomorrow's requirements"

CATT Research

CATT is involved in a number of trans-disciplinary, industry-based research initiatives focusing on the sustainability of urban water and wastewater buried infrastructure. Some of the selected projects include: the development of optimal strategies for financially sustainable management of drinking-water and wastewater networks; the development and field validation of an innovative water pipelines rehabilitation technology; and testing of PVC piping products for trenchless applications. The funding for these prestigious projects is provided by the industry, Natural Sciences and Engineering Research Council of Canada, and the cities of Cambridge, Niagara Falls, and Waterloo. For further information about these projects, please visit www.catt.ca.

Education Program for Civil Infrastructure Professionals (www.epcip.ca)

A university-level diploma program for municipal buried infrastructure professionals jointly offered by University of Waterloo Centre for Extended Learning and CATT.

Core Courses

- Trenchless Rehabilitation
- Trenchless Construction
- Pipe Materials and Engineering Properties
- Data Management (GIS, Databases) and Analysis

Elective Courses

- Asset management and Life Cycle Costing
- Asset's Inventory and condition Assessment
- Design Methods
- Contract Administration and Construction Supervision



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Platinum Members



Gold Members



Feature Product - SpectraShield System

Chris Lewis, Liqui-Force Services.

Aurora, Ontario recently identified 26 deteriorating sanitary manhole, both brick and pre cast concrete. All of these manholes had missing bricks and mortar and had inflow and infiltration present. To rehabilitate these manholes, the Town of Aurora decided to use Liqui-Forces' SpectraShield Lining System. SpectraShield is a multi-layered liner system specifically designed for manhole, wetwell and WWTP structures.



Introduced in 1993, SpectraShield has been used to rehabilitate over 3.2 million square feet equaling 30,000 structures in Canada and the United States. The multi layering process eliminates ground water intrusion, restores a structures profile and provides a light reflecting, impervious barrier to environmental penetration. Installation is done by trenchless application thereby saving money and reducing the carbon footprint. The patented SpectraShield system is applied at a minimum thickness of 500 mils. Its flexibility allows it to move with the structure, such as in freeze/thaw climates, without cracking. The three layer "stress skin panel" effect provides structural integrity.

Installation to rehabilitate a standard manhole while keeping the sewer in service takes approximately 1 hour and is a 4- step process. First, the existing structures are prepared. Then the lining process begins with a barrier coat of silicone modified polyurea which will become the inside layer of a multi-layer system that will form a stress-skin panel when complete. Next, a surfacing coat of closed cell polyurethane foam is applied. The foam fills all of the voids, eroded areas, bug holes, and missing mortar joints while restoring the surface to its original emplacement. Finally a barrier coat of silicone modified polyurea provides the corrosion barrier as well as the third layer of the multi layer stress skin panel.



SpectraShield can be used in manholes, wet wells, head-works, grit chambers, clarifiers, aerations basins, chlorine contact chambers and large diameter pipes. Advantages of using SpectraShield include: eliminates infiltration, restores wall surfaces, prevents corrosion, environmentally friendly, trenchless applications and 100 year design life. Limitations include that the SpectraShield is only applicable to easily accessible areas and that it is difficult to apply to small diameter pipes.

For more information check out: www.spectrashield.com

Upcoming Events - Visit www.catt.ca for more details

Underground Infrastructure Research and Trenchless Technologies Road Show 2012 - June 5—6, 2012 - ScotiaBank Convention Centre at Niagara Falls, Ontario. www.catttrenchlessroadshow.ca