Message from the Board of Directors

….and once again we have made it through another Canadian winter. Spring brings with it the promise of longer days and warmth…and of course, CONSTRUCTION! Someone once mentioned to me that here in Canada we have only two seasons: winter and construction.

The CATT group has been busy over the past year. One committee that needs to be recognized is the Technical Committee and its contributions to the Ontario Provincial Standards. Virtually every OPS with a trenchless component has been put together or reviewed by this committee. A current undertaking is a much needed review of the OPSS 460 for CIPP, breaking it out into CIPP for gravity pipes, and CIPP for pressure pipes, two very different applications.

Our buried infrastructure does not look after itself, and aging takes its toll, both on the functionality of the systems and the economics of them. What this means for municipalities is that trenchless methodologies provide for a diversity of means to address deteriorating systems and save money. A big CATT activity that now occurs every year, alternating between western Canada and Ontario, is the Trenchless Roadshow, a joint undertaking by CATT (Conferences Committee) and Benjamin Media, the publisher of Trenchless Technology magazine. This year’s show will take place May 16, 17 in London, Ontario at the London Convention Centre. The show will be preceded by a day of workshops on May 15: TT 101, Pressure Pipe Lining, and Subsurface Utility Engineering (SUE). The show itself is shaping up to be an excellent one with the exhibit hall almost sold out, outdoor demonstrations, eleven tracks of sessions/topics, networking opportunities and reception. Something new this year will be two forums with panel discussions on the second day; one highlighting Successful Pipeline Renovation Projects and a second on Successful HDD and Tunnelling Projects. Special thanks must go out to all who contribute to the show’s success: those who present papers, exhibitors, suppliers, and of course, attendees. This event is the largest of its kind in Canada and helps to bring into focus new developments, innovative technologies and products, and of course, case studies that highlight projects that become stepping stones for advancing the trenchless world. Put the dates in your calendar and plan to be there….register! http://catttrenchlessroadshow.ca/online-registration/

Jonathan Pearce, Conferences Chair

Granite Acquires LiquiForce Services

Granite Construction Incorporated (NYSE:GVA) announced today that it has acquired LiquiForce, a privately-owned company which serves public and private sector water and wastewater customers in both Canada and the U.S. Today, LiquiForce provides a variety of underground contracting services including lateral liner rehabilitation, mainline Cured-in-Place Pipe (CIPP), project management, manhole rehabilitation, and mainline point repairs. In addition, they are recognized as a leader for their patented LiquiForce Junction Lateral Liner.

Richard (Dick) Kryzs

CATT lost a dear friend Richard (Dick) Kryzs the brother of Bernie Kryzs of Benjamin Media. Dick was a great supporter of CATT and a key part of the CATT Benjamin Trenchless Roadshows. Dick also help save the NASTT NoDig show by coming in when NASTT was in financial trouble and the show was losing sponsors, exhibitors and attendees. Dick efforts saved NASTT and turned around the NODIG show. Dick always wore a wonder smile and loved to tell goofy jokes.
Background and Motivations

Government of Canada has participated in international actions on climate change such as Kyoto Protocol, Paris Agreement, and Copenhagen Accord. These strategic agreements has trickled down to federal plans, provincial regulations, and programs to reduce Greenhouse Gas (GHG) emissions. Ontario regulation 452/09 required reporting from facilities that annually emit more than 25000 tonnes of GHGs. Over 300 municipalities in Canada have joined the Partner for Climate Program (PCP) to take local action plans to reduce the GHG emissions from their operation and services, including water and wastewater infrastructure.

The Southern Ontario Water Consortium (SOWC) has been awarded provincial funding to work with a water industry representative group to capture and enable water technologies’ potential solutions for GHG emission reduction. One of the major challenges is the availability of a user friendly online tool/calculator for water technology companies to quantify their GHG emission reduction resulting from new technological developments. A tool with transparent and streamlined methodology is needed for validating and achieving tangible improvements in reducing GHG emission from new technologies in wastewater treatment plant systems.

SOWC collaborated with Dr. Mark Knight at the Centre for Advancement of Trenchless Technologies (CATT) to develop this tool - CATT developed similar tools for other aspects of water and wastewater systems mainly focused on trenchless applications. Hamed Fardi, Dr. Knight’s PhD student, have conducted research studies for emission reduction potentials in water distribution and sewage collection network systems. Dr. Kim Youngy and his Student, Shurui Sun, from Mc Master University were reached out to calculate the fugitive emissions at the treatment plants.

Project Objectives

The main objective of the project is to develop a web based GHG emission calculator for wastewater technology developers to estimate GHG emissions for a typical wastewater treatment plant in Ontario and to estimate GHG reductions for innovative technology and process changes implemented in a wastewater treatment plant.

The second objective of this project is to establish a baseline for GHG emissions from wastewater treatment processes in Ontario. The information can be updated with new case studies and field measurement data to represent Canadian specific GHG emission data. It also provides a platform for water and wastewater treatment industry stakeholders to develop innovative technologies to reduce GHG emissions.

Project Scope and Methodology

Each treatment plant consists of specific unit processes, and operates based on defined regulations and standards. The main measured GHG sources are CO2, CH4, and N2O emissions from various unit processes, energy use and chemicals consumed at the sewage treatment plant.

Figure 1: Processes included in the GHG emissions tool
The first stage of this project includes three sources of GHG emission from a typical sewage treatment plant in Ontario:

1. The GHG emissions resulting from wastewater treatment processes, in particular, the activated sludge and anaerobic digestion processes.
2. The electricity used by electromechanical equipment at each unit processes such as pumps, aerators, and mixers which are estimated to calculate the offsite GHG emissions from electricity production and transmission systems in Ontario.
3. The life cycle GHG emissions from chemicals’ production used at the sewage treatment plant systems.

**Subsurface utility engineering and utility locating: what’s the difference?**

Ophir Wainer, Lawrence Arcand, and Blain Hunt, T2 Utility Engineers

Subsurface utility engineering (SUE) and utility locating may appear to be similar but each serve a different purpose. In reality, both may utilize electro-magnetic (EM) locating equipment to identify the location of underground utilities, but the similarities generally end there.

The practice of subsurface utility engineering was formalized with the creation of ASCE 38-02 — the Standard Guideline for Collection and Depiction of Existing Subsurface Utility Data in 2002. It promotes the use of field investigations and records search to determine the accurate location of underground infrastructure. Most importantly, the ASCE 38-02 provides a process to identify the quality of the results, and allow users to determine the degree of certainty of the information depicted. The standard was created to provide reliable information to engineers to aid in the design process, plan for utility relocations, reduce overall projects costs and aid in improving project safety during construction.

Utility locating has been around since infrastructure has been buried. The utility locates or layout was once a survey function and did not have a great deal to do with infrastructure protection, rather for layout of ongoing infrastructure projects. A large push to have utilities buried occurred and utility locating for damage prevention as an industry took shape. Third-party contract locating began in the late 1980s when employees at a local gas distribution company went on strike and the contracted locate service provider (LSP) industry was born. Private locates were brought to the forefront in the late 1990s when utility providers stopped assuming liability of their plant past the demarcation points and the private locate industry evolved for damage prevention on private utilities. In most regions of North America, one-call services are a government-mandated requirement prior to any excavation and are governed by municipal bylaws.

The EM locator is a go-to tool in both industries, but its application and end results are very different. When used in the damage prevention industry it is called locating, but when used in the SUE industry it is referred to as designating (as defined in ASCE 38-02). The EM locator determines the location of magnetic fields either naturally present on conductors or through induction with the use of transmitters. The location of the buried conductive plant is marked on the surface of the ground. The utility locator will place marks on the ground using color-coded paint specific to each utility. The marks for a SUE investigation are placed using pink paint (temporary markings) to avoid confusion with locating markings. The interpretation of the signals and an understanding of the geophysical properties of the earth and conductive elements is key to producing reliable data in both industries.

The SUE investigation will use EM locators as well as a variety of other geophysical technologies to determine the location of known utilities and unknown conductive signals during the designation phase. For a SUE investigation, the information collected in the field is surveyed, and integrated using CAD software onto a utility mapping drawing. Other site investigations and field observations related to the utility infrastructure that may be present are collected from the site. The SUE investigation includes a review of the record information (construction drawings, for example) and resolves discrepancies that may be found. The SUE utility-mapping drawing includes all utilities either
identified in the field or identified on records, even if they could not be designated in the field. In many projects the construction methods and sequencing may be reviewed to better understand the presence of abandoned or removed utilities. The engineer responsible for the investigation reviews all information and makes a professional judgement as to the quality of the information and how to depict it on the drawing. The distinction between how utilities are identified is made using quality levels according to ASCE 38-02. To make this distinction the Engineer confirms the validity of the designating marks and the methods used, the survey data, compares record drawings and checks the probability of the alignment based on known installation practices. The engineer will also provide a SUE report which outlines the methodology used for the investigation (including geophysical equipment used), the findings of the investigation and how they may impact the project. Often, there will also be recommendations for any additional investigations suggested to further identify the location of utilities in critical locations. The focus of additional investigations is specific to the project. Once construction begins, the results of the SUE investigation may help the contractors understand the risks associated with the buried utilities prior to excavation. Private locates would still be required prior to any physical excavation.

Utility locating (one-call or private locating) is primarily focused on public safety and damage prevention during construction. Utility locating allows excavators to understand the location of the known underground utilities in the field, which is a necessity for safe excavation. In one-call or private locating, the EM locator is used to verify alignments of known utilities shown on the utility company records. In many jurisdictions, they are performed by third-party contract locate companies. The utility locator places marks on the ground using color-coded paint to indicate the horizontal alignment of the known utility and creates a no-dig zone, stating that a utility lies beneath the marked area. In the damage prevention industry, the information is most commonly conveyed on a locate sheet with a sketch showing the specific utility in the target area. If a locator is responsible for multiple utilities, multiple utilities may be shown on the same sketch. Sketches are commonly provided onsite or can be transmitted via email. Typically, once a locate is completed, there is no independent technical or practical review of the sketch produced prior to providing it to the end user, which is the contractor.

Although their purposes and executions are different, both subsurface utility engineering and one-call or private utility locating provide important valuable information for their end users. One call and/or private locate are commonly mandatory and even legislated in some jurisdictions. They are required and necessary even when a SUE investigation is completed. SUE is recognized as a best practice in the Canadian Common Ground Alliance Best Practices Manual, the Transportation Association of Canada’s Guideline for the Coordination of Utility Relocations and other key documents. SUE is a valuable tool for any engineer to manage utility risks on their project.

Together SUE and one-call or private utility locating are an effective one-two punch that can be used to ensure your project’s overall success.
Upcoming Events

Trenchless Technology Road Show, London, Ontario

Don’t miss this chance to attend one of the best Trenchless Technology Road Shows in London, Ontario. For more information visit http://catttrenchlessroadshow.ca/

2018 Workshops and Courses

June 25-28: Horizontal Directional Drilling Fundamentals: Design to Construction
September 12: Reducing the Costs of I & I using Trenchless Approaches
October 11: Annual General Meeting
October 16: The Impact of the updated ASCE 38 on innovations in trenchless and inspection technologies
November 1: Integrating Trenchless Technologies and Traditional Open Cut Construction
November 21: Trenchless Water and Sewer Rehabilitation with Sprayed In Place Pipe (SIPP) Applications

Asset Management of Buried Infrastructure Nov. 20-24, 2018

The Centre for Advancement of Trenchless Technologies is pleased to partner with the Ontario Good Roads Association to offer the hands-on asset management of buried infrastructure course. The course will present the fundamentals of asset management with particular emphasis on urban water distribution and wastewater collection pipelines. The course will provide an in-depth knowledge and practical examples of the essential processes and techniques to establish an effective asset management program for water and wastewater utilities. The course will also highlight the new developments and future trends in the asset management field. For registration, please visit the OGRA course website https://www.ogra.org/courses-and-events/courses/event-details.html/Ogra/event-info/details/id/28227
Potable water pipes that were installed prior to 1980 will soon reach the end of their predicted service life. While some are still in good shape, many ductile iron pipes—which may or may not have been cement mortar lined—are beginning to corrode and will soon require repair solutions. Though the pipes may be in relatively good condition, they will require re-lining to prevent further corrosion and extend their service lives for additional years of continuous use.

GeoSpray 61 is an optimal solution for in-situ potable water pipe rehabilitation as it is a high-performance geopolymer mortar that is specifically designed for corrosion prevention and structural enhancement of potable water pipes. Its high-strength and ultra-low porosity design combine physical properties associated with cement mortars with a chemistry similar to an engineered stone. Additionally, the use of GeoSpray 61 as a factory-applied mortar to the interior surfaces of steel pipes can increase the effective life of the pipe and reduce maintenance costs.

GeoSpray 61 mortar is a new entrant to the market, but meets the requirements of NSF/ANSI 61-5 and 372 for use in drinking water system components and BS6920:2014. It can be used in potable water pipes and structures in pipes greater than 30” in diameter. GeoSpray 61 linings of pressurized potable water piping would be considered AWWA Class I, II or III, depending on the pressure and applied thickness.

GeoSpray 61 geopolymer mortar creates a barrier that protects the internal pipe surface from damage and corrosion while the pipe maintains peak hydraulic performance. It does not require the pipe to be totally dry and conforms to normal pipe-flushing protocols, but this mortar requires the outer pipe to hold the pressure.

To learn more about the benefits of choosing GeoSpray 61 mortar, visit our website, infrastructure.milliken.com.