



The Official Magazine of the North American Society for Trenchless Technology

NASTT's
Trenchless Today
Educate - Train - Research - Publish



Fall 2018
Volume 8 Issue No. 3

Municipalities & Utilities | Engineers | Contractors
Manufacturers | Service Providers | Academics | Hall of Famers

MEMBERSHIP HAS ITS REWARDS

GET ACCESS TO:

- Complimentary Resources
- Members-Only Discounts
- 2,000+ Technical Papers
- Continuing Education
- Industry Networking
- Career Advancement

2,000+
Members

25+
Years Representing
the Trenchless
Technology Industry

2018
Directory
Listings
Inside



nastt.org



nodigshow.com

**ANY SIZE. ANY LENGTH.
ANYWHERE.**



Calgary (403) 269.4998 **Edmonton** (780) 960.6037
www.directhorizontal.com

Trenchless solutions from the sharpest minds in the business!



DIRECT
HORIZONTAL DRILLING

contents

FALL 2018



NASTT OFFICERS

Chair & International Representative
Frank Firsching, B.Sc., MBA — President, Infrastructure Solutions, Aegion

Vice Chair
Craig Vandaele — General Manager, Michels Tunneling & Michels Corp.

Secretary
Joe Lane — General Manager, Aegion's Insituform Pacific Pty Ltd.

Treasurer
Michael Davison, P.Eng. — Product Director, Aqua-Pipe Division, Sanexen Environmental Services Inc.

Officer-at-Large
Matthew Wallin, P.E. — Partner & Senior Project Manager, Bennett Trenchless Engineers

Immediate Past Chair
Kimberlie Staheli, Ph.D., P.E. — President & Principal Engineer, Staheli Trenchless Consultants Inc.

2018 BOARD OF DIRECTORS

Erez Allouche, Ph.D., P.Eng. — Technology Leader, Tunneling and Trenchless Group, Stantec Consulting Ltd.

Lisa Arroyo, P.E. — Wastewater System Manager, Public Works, City of Santa Barbara

Maureen Carlin, Ph.D. — Strategic Marketing Manager, Laney Directional Drilling Co.

Alan Goodman — Global Sales Manager, HammerHead Trenchless

Tony Hranicka, P.E. — Owner, Tony Hranicka LLC

Larry Kiest, Jr. — President, LMK Technologies LLC

Gerard P. Lundquist, P.E. — Director of Gas Construction New York, National Grid

Michelle L. Macauley, P.E., LEG — Principal Engineer & Owner, Macauley Trenchless PLLC

Jeff Maier, P.E. — Director of Engineering, C&L Water Solutions Inc.

Babs Marquis, CCM — Construction Manager, McMillen Jacobs Associates

John C. Matthews, Ph.D. — Director of the Trenchless Technology Center & Associate Professor, Louisiana Tech University

Rick Melvin — National Product Specialist, TT Technologies Inc.

Charles Pullan, P.Eng. — Senior Project Engineer, Infrastructure Delivery, Water Resources Dept., City of Calgary

Dennis Walsh, P.E. — Senior Project Manager, Horizontal Directional Drilling, Public Service Electric & Gas Co. (PSE&G)

NASTT STAFF

Executive Director
Michael J. Willmets — mwillmets@nastt.org

Program Director
Michelle Hill — mhill@nastt.org

Marketing Manager
Jenna O. Hale — jhale@nastt.org

Membership Administrator
Renee Corea — rcorea@nastt.org

BENJAMIN MEDIA PUBLISHING TEAM

Publisher
Bernard P. Krzys

Editor
James W. Rush

Associate Editor
Andrew Farr

Graphic Designer
Deborah R. McManus

Advertising Account Manager / Brand Ambassador, Trenchless Technology
Dan Sisko

Events Manager
Brittany Cline

EDITORIAL AND ADVERTISING OFFICES



10050 Brecksville Rd.
Brecksville, OH 44141 USA
(330) 467-7588, Fax: (330) 468-2289
www.benjaminmedia.com
e-mail: info@benjaminmedia.com
Editorial: afarr@benjaminmedia.com
Advertising: bmaurer@benjaminmedia.com

Reprints
Wright's Media
Ph: (877) 652-5295
Fax: (281) 419-5712

MEMBERSHIP HAS ITS REWARDS

10 Q&A

By Andrew Farr

For our Fall Issue Q&A, NTT recently spoke with Jason Schiro, Product Manager for CIPP and Infrastructure Polymers with Interplastic Corp., to discuss his introduction to the construction industry and the current state of the trenchless relining market.

12 In the Trenches

By Mike Kezdi & Andrew Farr

In this month's In the Trenches, we profile Rory Ball of Mott MacDonald, Aaron Cohen of Arizona State University and Steve Donovan of SHN Consulting Engineers & Geologists to get their take on the trenchless industry, how they got their start and how owner acceptance of trenchless methods has broadened.

18 NASTT's 2018 Membership Directory

Compiled by NTT staff

Each year, countless resources and volunteer time are put into NASTT to make sure the Society is providing the essential resources for its members and professionals working in the trenchless technology field. NASTT's annual membership directory allows professionals to connect with contractors, manufacturers, service providers and municipal representatives who are NASTT members. When planning your next trenchless project, you may need it!

COLUMNS

- 4 Executive Director's Message
- 6 Chair Message
- 8 Education Update
- 40 Morty's Trenchless Academy

DEPARTMENTS

- 36 Eye on the Industry
- 38 Chapter News
- 41 Regional Chapter Info
- 42 Student Chapter Info
- 43 Technical Paper
- 47 Calendar/Ad Index

NASTT's Trenchless Today (ISSN 2160-8377) is published three times per year. Copyright 2018, Benjamin Media Inc. USA All rights reserved. No part of this publication may be reproduced or transmitted by any means without written permission from the publisher. One year subscription rates: complimentary in the United States and Canada. Single copy rate: \$10. Subscriptions and classified advertising should be addressed to the Brecksville office. POSTMASTER: send Changes of Address to *NASTT's Trenchless Today*, 10050 Brecksville Road, Brecksville, OH 44141 USA.

Canadian Subscriptions: Canada Post Agreement Number 40830553. Send change of address information and blocks of undeliverable copies to: KML Logistics Group Inc., 118 Herald Ave., Oakville, ON L6K 1S2 Canada



Success Requires Networking and Industry Support...

...AND OUR COMMUNITY IS DEDICATED TO ENRICHING YOUR TRENCHLESS CAREER

EVERY YEAR IN THE FALL ISSUE OF NASTT'S TRENCHLESS TODAY MAGAZINE we focus on the core of our organization – our membership! One of the best benefits of NASTT membership is the extensive opportunity for networking with your trenchless peers. Sharing ideas, innovations, challenges or just enjoying a laugh with a colleague who speaks your technical language is invaluable. This sharing of ideas is integral to the ongoing education of trenchless professionals and the growth of our industry.

Trenchless education is our focus and can be found in our mission and vision statements: To continuously improve infrastructure management through trenchless technology and to be the premier resource for knowledge and education in trenchless technology. Our members and volunteers make our educational programs so successful.

NASTT's 2019 No-Dig Show Program Committee recently met in Chicago to plan the technical program for the annual show. The committee is led by the 2019 Program Chair, Cindy Preuss of HydroScience Engineers and Vice Chair, Joe Lane of Aegion's Insituform Pacific Pipeline Rehabilitation Division. With this guidance, the committee of over 100 volunteers and industry experts, peer reviews each abstract that is submitted and uses their expertise and hands-on project knowledge to build the best possible technical program. Each and every attendee to NASTT's No-Dig Show will go away with more trenchless knowledge than they came with.

One of our recent initiatives I'm most proud of is our endeavor to develop trenchless method-based Centers of Excel-

lence within the organization. The first Center of Excellence is dedicated to the trenchless pipe bursting method and its full breadth of capabilities for potable water, gas, electrical and sewer applications. The Pipe Bursting Center of Excellence aims to provide leadership in education, standards, training and elevating the profile of the method throughout the construction industry. In addition, the group will work on the refinement of best practices and act as a resource and forum for utilities, contractors and manufacturers to share information and continue to move the pipe bursting method forward.

NASTT's Pipe Bursting Center of Excellence committee is led by Alan Ambler of AM Trenchless. Alan is passionate about the technology and ready to lead the Center in the coming months. The first major project that the Center is undertaking is authoring and updating NASTT's Pipe Bursting Good Practices Guidelines, Third Edition. This newest book in NASTT's technical library will be available at the 2019 Show in Chicago and promises to be a valuable addition to your trenchless toolbox.

We will continue planning for our 2019 conference in Chicago for the next several months, but we also have many regional events, training courses and webinars on tap for the rest of 2018. Visit our online calendar at nastt.org and see what's coming up in your area!



Michael J. Willmets
NASTT EXECUTIVE DIRECTOR

GOOD DECISIONS START

WITH GOOD INFORMATION



PICA helps Asset Managers who are serious about managing their pipeline assets proactively and fixing leaks before they can actually happen. With PICA's set of non-destructive testing tools, Asset Managers can know the real condition of their buried pipelines. Good information is powerful: pipelines can be surgically repaired, rehabilitated with liners, or partially replaced, thus extending their useful life while at the same time reducing risk of failure (and sleepless nights).

- Internal (ILI) Tools, such as See Snake, Chimera, RAFT and EMIT
- For pipe sizes 4" to 78" are used in raw water, drinking water, waste water, force mains and siphons to report high-resolution pipe-wall condition.
- Pipe wall thickness directly affects structural strength

PICA's new external Bracelet Probe can map internal H₂S damage and pits
Extensively field tested in 2017, now ready for general deployment



For more information on how PICA can help you keep on top of your critical pipeline assets, see www.picacorp.com or write info@picacorp.com.

Call us at 1-800-661-0127

 **PICA**
Pipeline Inspection and
Condition Analysis Corporation



■■■ CHAIR MESSAGE



Frank Firsching
NASTT CHAIR

ROOTED IN COMMUNITY:

Our Mission to Serve Our Members and the Trenchless Industry

THIS IS A VERY SPECIAL ISSUE OF NASTT'S TRENCHLESS TODAY MAGAZINE. That's because it is dedicated to our members and the support system that this industry community has built. Our trenchless organization exists because our members know that a vibrant trenchless association helps keep our industry strong. For that reason, it is important to us to recognize and thank our members for their support and trust.

This past July, NASTT embarked on its second strategic plan. Our first strategic plan, developed in 2014, has proven to be very enduring as an effective roadmap for the society. Many of the initiatives developed for the 2014 plan continue today and have been updated and expanded in scope. We exceeded our goals set four years ago for NASTT membership and attendance at the annual No-Dig Show and have set new, ambitious targets for both in the updated plan. The current Strategic Planning Committee met in Chicago to review our past efforts, as well as the findings of our recent member survey, and to discuss the future of our organization. The feedback from our member survey was invaluable to us in helping to formulate a plan and identify the key initiatives that will help this industry to continue to grow in numbers and strength. We thank the volunteer committee and NASTT Past Chair, Derek Potvin, for serving as the committee's facilitator.

The first step in identifying our future goals and initiatives is outlining our mission and vision. Our mission tells us why we exist and is an enduring statement of purpose and our reason for existence. Our vision tells us what we want to be. Our mission and vision complement each other. Taken together, they describe the purpose and goals of NASTT which are "to continuously improve infrastructure management through

trenchless technology" and "to be the premier resource for knowledge, education and training in trenchless technology." To support this mission and vision we adhere to our values, which include: integrity, excellence, objectivity, transparency, inclusiveness and passion. We know these values are also important to our membership and we will keep them top of mind as we plan for the future of this member-driven, not-for-profit society.

With education and training as our vision, and a mission to improve infrastructure management, it is crucial that we provide current information that is accessible to our community. One of the best ways we have found to do this is through our free webinar series. It was our seventh year in 2018 for offering complimentary technical webinars to the trenchless industry. This fall, we are excited to offer two webinars that will be great tools for those new to the industry, as well as for those who wish to expand their trenchless knowledge base beyond their current area of involvement. Join us on Wednesday, Oct. 24 for an Introduction to Trenchless Rehabilitation webinar and on Wednesday, Nov. 14 for an Introduction to Trenchless New Installations webinar. Visit nastt.org/training/events for details and registration. As always, our webinar series is free of charge and all of our previous webinars are available in our archive library for immediate download.

NASTT is committed to be the premier resource for trenchless education and networking for all of our members. For more information on member benefits, visit our website at nastt.org and please feel free to contact us at info@nastt.org.

Frank Firsching
NASTT CHAIR



TRENCHLESS INSTALLATION FOR YOUR **NEW AND AGING** **PRESSURE PIPELINES**

Fusible PVC[®] pipe
InsituMain[®] CIPP

Tite Liner[®] HDPE
Tyfo[®] FRP system

SEE AEGION.

CONTACT US NOW

844.619.2927

www.aegion.com/PressurePipe



Keeping the Focus on Trenchless

NO-DIG SHOW CLASSROOM ATTENDANCE STRONG
DESPITE TEMPING POOL CABANAS



I'LL ADMIT IT, when talks started five years ago about bringing NASTT's No-Dig Show to Palm Springs, California, I was the first to say it sounded like a perfect location. For those of you who don't know, I live in Cleveland, Ohio. While I love this city, winters are cold and dark. I, like most Midwesterners, jump at the chance to go to sunny California in March.

After I snapped out of my mid-century sunny daydream, I put on my association manager hat. This was not a decision to be taken lightly, or made just because of my need for sunshine. NASTT's No-Dig Show is the most important outreach initiative for this organization. We need to take every decision with planning this event seriously, starting with the location of the conference.

While there was concern over people being too tempted by the comfortable cabanas to show up to the classroom, we decided to give Palm Springs a shot. It's one of the better decisions I've helped to make in the seven years I've worked at NASTT.

First of all, let's talk about the overall attendance. For the fourth year in a row, we have had more than 2,000 attendees at the No-Dig Show. Of those attendees, nearly 30 percent of them had never attended our annual conference. That's a lot of new trenchless professionals.

What's even more impressive is that our attendees showed up in the classrooms despite the tempting, sparkling pool within steps of the sessions. This year we hosted 162 technical presentations and three forums. On average there were 79 professionals in each presentation eager to learn more about trenchless technology. 33 presentations had over 100 attendees, as well as two of our forums.

Many of you help shape our program by filling out our online survey. This information is invaluable when planning for future conferences. The feedback from this year's paper schedule was overwhelmingly positive, as 96 percent of reviewers highly agreed that our presenters were knowledgeable, 85 percent of the reviewers highly agreed that presenters explained their ideas clearly and 90 percent highly agreed that the content presented was useful and relevant.

There are many people to thank for these impressive stats from NASTT's 2018 No-Dig Show. It truly is a team effort. At the top of my list are Don Del Nero, Program Chair and Cindy Preuss, Vice Chair. They dedicated many hours to making this show a success. Next, I'd like to thank my loyal Session Leaders who are instrumental in working with the authors to keep our program at the highest quality. The Session Leaders are part of a 100-plus member Program Committee who review all of the submitted abstracts and help plan many of the details of the conference. Finally, I'd like to thank the authors who shared their knowledge and expertise with the rest of the industry. You are an integral part in NASTT fulfilling its mission.

After all this I'm sure you're wondering...did I ever make it to the pool? I was onsite for nine days and I spent two hours at the pool. Thanks to all of you, it was a glorious two hours with my team celebrating another successful No-Dig Show.



Michelle Hill
NASTT PROGRAM DIRECTOR

Congratulations to the following primary authors from NASTT's 2018 No-Dig Show who had more than 100 attendees in their sessions!

- Mark Hutchinson, Staheli Trenchless Consultants (CIPP)
- William Gibson, AECOM (HDD)
- Tim Marsh, Hampton Roads Sanitation District (HDD)
- Sibel Yildiz, King County (HDD)
- Charles Tripp, Kleinfelder (CIPP)
- Jeff Twardzik, Philadelphia Water Department (CIPP)
- Adam Braun, AECOM (Emerging Technologies)
- Christopher Garrett, Brown and Caldwell (Wastewater Rehabilitation)
- Andreas Fleischmann, RAEDLINGER (Water Main Rehabilitation)
- Martin Cherrington, HDD/HDB Consultant (HDD)
- Abdunnasser Almadhoun, NTH Consultants (HDD)
- Bradford Miller, Haley & Aldrich (Geotechnical Issues)
- Swirvine Nyirenda, City of Aurora (Condition Assessment)
- Matt Smith, Michels Corporation (Emerging Technologies)
- Jeff Maier, C&L Water Solutions (Wastewater Rehabilitation)
- Rory Ball, Mott MacDonald (HDD)
- Ladan Sahafi, Americore International (Wastewater Rehabilitation)
- Sclater Paterson, City of Calgary (CIPP)
- Nicholas Rystrom, City of Revere (CIPP)
- Shaurav Alam, Trenchless Technology Center (CIPP)
- Mathew Roder, Greeley and Hansen (Wastewater Rehabilitation)
- Michelle Macauley, Jacobs Engineering (Emerging Technologies)
- Michael Woodcock, Portland Utilities (Pipe Bursting)
- Haitao Lan, Queen's University (HDD)
- Ryan Benner, Las Vegas Valley Water District (Emerging Technologies)
- Kevin Bainbridge, Robinson Consultants (CIPP)
- Brendan Hedel, CH2M (Large Diameter Tunneling)
- Tara Sweet, East Bay Municipal Utility District (CIPP)
- David Landing, Jacobs Engineering (HDD)
- Christopher Macey, AECOM (Condition Assessment)
- Steven Hunt, CH2M (Microtunneling)
- James Anspach, Cardno (HDD)
- Daniel Buonadonna, CH2M (Condition Assessment)



**LOOKING FOR
SMART ANSWERS
ABOUT RELINE?**

**WITH OVER 15 RELINE
PRODUCTS, CONTECH WILL
HAVE THE BEST SOLUTION FOR
YOUR PROJECT NEEDS.**

RELINE DONE RIGHT[™]

With over 70 years of relining experience, Contech Engineered Solutions provides permanent, fully structural (the way structural and geotechnical engineers use the term) solutions based on time-proven design methods. Since we've been around the block a few times, we don't play games with the hydraulics or structural design. Knowing pipe assessment, structural design & hydraulic analysis is what we do. The result – the right solution for your project needs - done right, on time and under budget.

www.ContechES.com/reline | 800-338-1122

Q&A with Jason Schiro

NASTT's *Trenchless Today* sits down with Jason Schiro, Product Manager for CIPP and Infrastructure Polymers with Interplastic Corp., to discuss his introduction to the construction industry and the current state of the trenchless rehab market.



Schiro

What first piqued your interest in the construction engineering/manufacturing field?

My first exposure to the construction field was actually in concrete at the age of 14. I worked as a summer laborer for five years while finishing high school and entering college. Even at this early age, I always enjoyed seeing all that was involved in the project. From planning to the finished project, it was so interesting to see how the project would take place and evolve. When I finished college, I was hired by Interplastic Corporation. Initially, I worked as a chemist in the laboratory and was involved with many of the different applications and polymer lines we offered. I would often be given the opportunity to consult with our customer base to assist with improvements or modifications they required in their manufacturing process.

Tell us about your first introduction to trenchless technology.

When I was working in the laboratory in the late 1990s, the cured-in-place pipe (CIPP) market was rapidly evolving. It seemed like every day we had the opportunity to work with a new customer entering this market. At the same time, the resins we offered to support this line were becoming more numerous and complex. An opportunity arose for me to specialize in the design and use of CIPP resins for Interplastic, which I readily accepted. This was my first real exposure to the trenchless market.

What are your thoughts on the current state of the trenchless industry? What are the trends on the pipe rehabilitation side?

I think the trenchless industry is strong, and becoming even stronger. As municipalities continue to invest in their infrastructure, trenchless has an expanding role in their projects. On the pipe rehabilitation side, some of the most rapidly growing segments are for pressure pipe applications. We have seen multiple large force main projects completed in recent years. I think we will see this market continue to evolve

and have a larger footprint in other areas, such as potable water applications.

What is the biggest challenge facing the trenchless industry today? Has acceptance of the technology improved?

As with many industries, I think the biggest challenge facing the trenchless industry is finding and keeping a skilled workforce. It can be difficult to find skilled employees that are willing to spend a considerable time on the road away from family and friends for an extended period. We are also seeing many seasoned individuals enter into retirement. This group includes some real pioneers in our industry that were involved in the development or standards associated with many of these technologies. The good news is we see many dedicated and talented individuals, often mentored by the individuals entering retirement, willing to take on these roles.

Regarding acceptance of the technology, I would say the short answer is "yes." This is especially true for some of the real trenchless workhorses such as horizontal directional drilling (HDD) or CIPP. As more unique and complex projects are completed, the acceptance of these technologies continues to expand. However, it is still not uncommon to find individuals that have little knowledge or experience in this technology. It is certainly our role as an industry to help educate and promote this technology.

Briefly summarize your role and responsibilities at Interplastic Corp.

My current position at Interplastic is Product Manager for CIPP and Infrastructure Polymers. In this position I work closely with Interplastic's Business Manager for Remediation Polymers, Kaleel Rahaim. Together, we are responsible for all aspects of these product lines. This includes everything from working with our R&D Laboratories to identify new product needs and opportunities to supporting our customer base in the use of these products. What is unique about the position is it gives me the opportunity to interact

with a wide array of individuals in all different phases of a project. It is common for me to consult with design engineers, work with the crew wetting out a CIPP liner, and then the crew installing a liner, all on the same project. This position also gives me the opportunity to participate in a wide variety of trade shows, technical committees, and organizations that support and influence the trenchless market.

Do you see any particular needs in the way of education/training? Is the industry doing a good job of promoting the benefits of trenchless methods?

Education is so important to our industry, in all phases. It is important we educate the customers/municipalities on the technology currently available along with emerging technology. NASTT's Municipal and Public Utility Scholarship Program and Trenchless Technologies Center's (TTC) Municipal Forums are a couple ways that are specifically geared towards helping educate the Public Sector.

There are opportunities for those involved in the industry through organizations such as NASSCO and NASTT. Both offer training through webinars, forums, and in some cases, classroom type training, on many of the different trenchless methods. We are also seeing more Universities offering specialized training focusing on trenchless.

What do you enjoy most about working in the trenchless technology field?

The people. I think there are few, if any, markets that have more dedicated individuals. Even with the expanding role of today's trenchless market, it always surprises me how small it seems. It really is one of these markets where it feels like everyone knows each other. We see people involved in common goals to promote and improve the industry. It is common for individuals to volunteer their personal time to serve on various committees, training roles or task groups.

These Successful Trenchless Jobs have One Thing in Common



HORIZONTAL BORING



PIPE RAMMING



PIPE BURSTING



DIRECTIONAL DRILLING



STATIC BURSTING



www.tttechnologies.com

1-800-533-2078

In the Trenches

BY MIKE KEZDI & ANDREW FARR



Rory Ball

MOTT MACDONALD

When Rory Ball was finishing his master's degree in geotechnical and structural engineering, he began the process of interviewing at various firms both in consulting and contracting. After talking with senior professionals, he quickly

learned that geo-professionals often have the most project influence in tunneling compared to traditional foundation engineering.

"That steered me toward tunneling and trenchless," he says, noting it became the perfect fit for him as he began his engineering career. "Once I started in the industry, I promptly found that the market was gaining momentum

and new methods were continually being developed."

He also says he quickly found there was a need for more construction projects to ultimately tap into trenchless. "If you are willing to learn about new methods, and willing to travel and take on more responsibilities, there are a lot of opportunities in the market for a young engineer," he says.

Ball has taken advantage of many of those opportunities, establishing himself as a young leader in both trenchless design and industry development through organizations like NASTT. Ball is a graduate of the University of Illinois and now serves as a senior associate and tunnel design manager in the Cleveland, Ohio, office of Mott MacDonal. He now has more than 14 years of experience in the tunneling and trenchless technology industry on a variety of large-to-small diameter tunnels in four countries and more than a dozen states. Already in his young career, he lectures regularly at national tunneling conferences and training courses.

In 2016, he was a recipient of the Ralston Award for Young Trenchless Achievement at NASTT's No-Dig Show in Dallas.

During his time working in the trenchless industry, Ball says he has been amazed with how nomadic many contractors are, particularly those involved with HDD, microtunneling and Direct Pipe.

"They are chasing projects all across North America, and this is mainly due to the fact that there are very few markets that can support back-to-back-to-back projects for these contractors," he says. "As a result, they go where the jobs are. The positive thing for the industry is these traveling contractors have vast experience and know how to build in different geologies using different techniques, including curved microtunnels, which are more commonplace now in the United States."

Ball adds that finding cost-effective learning opportunities for owners in all sectors will continue to help them realize what risk mitigation strategies lead to the most successful projects. "A bad project could turn off an inexperienced owner from pursuing trenchless in the future," he notes.

On the education front, Ball has also been quite involved. He serves as a member of NASTT's No-Dig Show Program

Committee and regularly presents papers at No-Dig Show technical sessions and other tunneling and trenchless industry events. He is serving as a microtunneling track leader at NASTT's 2019 No-Dig Show in Chicago.

Ball says that while internships and hands-on project experience are key for students looking to break into the trenchless market, young professionals don't generally get exposed to trenchless at the university level because it's a niche market. "It is hard to really get a sense of the community and the cool things going on in this industry until you are involved in it," he says. "We need to highlight those aspects as best we can."

Ball also has some interesting thoughts on how to better brand the fascinating engineering aspects of underground construction to young people.

"I think we can market the industry using exciting videos shot from drones or using 360-degree visualizations from 3D renderings and real 360-degree photos," he says. "This creates a 'wow factor' for all ages. Combining this media with short interview videos of people involved in the trenchless industry from all aspects of consulting, marketing and contracting can provide millennials insight into what it is

OUR COMMITMENT TO SAFETY IS PERSONAL.

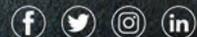
At Miller Pipeline, safety isn't an afterthought. In fact, it's the most important of our core values. We make it personal because of the things in our lives that matter most: our friends, our families, and our well-being. When we make safety a priority, you can trust that we'll provide the quality, commitment, and reputation we're known for.



www.millerpipeline.com



BUILD YOUR CAREER. #JOINOURMILLERTEAM
Submit a quick apply at www.millerpipelinecareers.com



like to be involved with the trenchless industry.

Ball says that despite all the talent in the trenchless engineering field, there is a strong need for engineers who are well-rounded and have the chops to design constructible solutions while balancing field work, jobsite and office work, and who can also communicate well with owners, contractors, stakeholders and young staff.

“Hiring experienced trenchless engineers is difficult – very difficult,” he says. “Young professionals need to realize that there is a tremendous amount of opportunity available in the trenchless market. Trenchless projects are often faster-paced using smaller teams. This industry will continue to provide amazing opportunities and allow for advancement at a younger age if you are willing to put in the work.”



Aaron Cohen

ARIZONA STATE UNIVERSITY

Like many in construction, Aaron Cohen was first introduced to the industry at a young age thanks to his father’s work with Tires N Tracks Inc., the family’s contracting business.

Cohen fondly recalls his love of going to work with his dad and operating some of the smaller pieces of equipment. It is at these sites that he realized how cool the trenchless industry was.

“Our family business did a lot of utility construction and specialized in boring and ramming using pneumatic tools (hole hogs). We bought one of the first Guided Hole Hogs from Allied back in the late 80s,” Cohen says. “It enabled the operator to control the direction of the tool by manipulating the rotation of adjustable tail fins protruding from the body on the back of the tool and the operators console was giant targeting screen that looked like the something you would find in a Star Wars space ship.”

From those early days as a contractor in the trenchless industry Cohen, now a lecturer at Arizona State University, has seen these space-aged technologies and equipment evolve to a point where many of these trenchless methods are now industry standards.

“I remember attempting to grow our business as one of the first directional drilling contractors in our area, before

the process was well understood. We had to find applicable projects and attempt to convince the general contractors that there was a better way to cross that street or creek and have them be willing to give us a try. Good jobs meant you might get another opportunity, but when a job went bad, you had people vowing ‘they would never try that again’ and it felt like bad jobs would set the whole industry back years,” he says.

“Fast forward to today and now our firm is the general contractor on primarily trenchless projects where we subcontract out the open cut work to the same contractors we subcontracted for years ago. Many agencies are even to the point of publishing standard specifications for trenchless scopes of work. We’ve definitely come a long way.”

Even with the sky still being the limit for the trenchless industry, Cohen acknowledges there are hurdles that must be overcome, and like the rest of the construction industry, that points squarely at a lack of qualified workers.

“Finding and retaining quality people is crucial for any company to be successful. Technology continues to drive the complexity of our business and owners have become more sophisticated and more demanding. They are increasingly shifting more risk onto contractors and generally expecting more out of the construction and engineering community,” he says. “Companies that can figure out how to attract and cultivate the top talent will be in the best position to capitalize on the opportunities that a growing economy will present to us.”

Part of attracting top talent to the industry is through organizations like NASTT, and Cohen, like many, first became involved through frequent attendance at NASTT’s No-Dig Show. “No-Dig is how we kept up to date with the latest industry trends and forged new relationships,” he says. “It is the one place you can go to get access to all the brightest minds in our field.”

He recalls that very often, he would be able to leave the show with new ideas or potential solutions to problems that were seemingly unsolvable prior to attending the show. Like many, Cohen has also given back to the industry through his involvement with NASTT as a No-Dig Show moderator, a speaker and a co-instructor for Good Practices Courses. And even though he has transitioned from the contracting side to the academic side, he still retains his membership to maintain a network of close friends and colleagues through NASTT.

“The industry is filled with people who are incredibly determined, extremely good at what they do and are relentlessly hard working. The people specifically involved with

the trenchless technology industry tend to be all that plus some,” Cohen says. “It’s a very down-to-earth family of visionaries and entrepreneurs who are determined to change the way our world is built and I feel fortunate that I’ve been able to play a small part in the tremendous growth that this great industry has experienced over the years.”



Steve Donovan

SHN CONSULTING ENGINEERS & GEOLOGISTS INC.

Steve Donovan recalls watching a news segment in the 1980s about Times Beach, Missouri, where the residents of a small rural town had

a disproportionate occurrence of cancers. The story implied that the frequency and type of cancers were linked to dioxin contaminated water used by a local waste hauler for “dust control” on the gravel roads in the community.

The local hauling contractor was accused of taking contaminated liquids hauled from an industrial client, adding the contaminated materials to waste oils used for dust suppressant and applying the dust suppressant to the roads in Times Beach.

“I remember seeing a man in a white cleanup suit picking up a child playing with a Tonka Toy truck in the contaminated dirt and thinking it would be better to be the guy in the white suit than one of those residents,” he says. “That’s when I became interested in environmental engineering as a career choice.”

Donovan’s introduction to trenchless technologies also came early in his career when he worked on a sewer relief project for the City of Portland. The project required inves-

www.michels.us/GoingTheDistance

MICHEL'S®

Transportation & Utility Contractor

Your story is told
through the **things we build.**







Swift action & attitude are GAME CHANGERS.

UP FOR THE CHALLENGE?

www.michelscareers.us

SERVICES PERFORMED
Michels is an industry-leading utility and infrastructure contractor offering Mainline and Gas Distribution Pipeline Construction, Horizontal Directional Drilling, Electrical Transmission, Substation and Distribution Construction, Pipe Rehab, Direct Pipe, Fiber Optic Networks, Heavy Civil Work, Deep Foundations, Tunneling, Dewatering, Paving, Crushing, Road Building and Bridges.

tigating how to repair and relieve a combined sewer system that had overflow, basement flooding and bypass issues. Options involved trenchless methods employing man entry and non-man entry technologies. The use of cured-in-place pipe, grouting technologies, sliplining, etc., were all under consideration. Donovan was tasked with investigating various technologies, reporting on their applications and then developing an estimate of costs for various rehab and restoration scenarios.

“The data and information convinced me that trenchless technologies were the way of the future,” he says. “After I acquired my [engineering] license, the first project under my care involved a waterline crossing of a pristine river in Oregon. I chose HDD as the method of construction because it represented a lower impact to the waterway than conventional construction.”

Today, Donovan has more than 25 years of civil and environmental engineering experience primarily in the pub-

lic works sector, though he now serves as a principal engineer with SHN Consulting Engineers & Geologists in its Coos Bay, Oregon office. Throughout his career, Donovan has gained extensive experience in trenchless technologies for both new installations and rehabilitated facilities. He specializes in evaluating sewer and water pipeline systems, horizontal directional drilling, sewer rehabilitation techniques, water and wastewater pumping systems and small community wastewater treatment facilities. Donovan’s public-sector projects have ranged in size from 0.05 MGD to 100 MGD systems.

He’s also been involved in designing and constructing ocean outfalls and cable landings in the Pacific Northwest. “The installation of a structure on the floor of the Pacific Ocean, a harsh and unforgiving environment, creates a sense of challenge and uniqueness that I find satisfying,” he says. “These projects are only possible because of advances in trenchless construction.”



NASTT'S 2019 NO-DIG SHOW

MUNICIPAL & PUBLIC UTILITY SCHOLARSHIP PROGRAM

NASTT's 2019 No-Dig Show Municipal & Public Utility Scholarship Award has been established to provide education and training for North American municipalities, government agencies and utility owners who have limited or no travel funds due to restricted budgets.

Selected applicants will be awarded complimentary **full conference registration** to NASTT's 2019 No-Dig Show in Chicago, Illinois, March 17-21, 2019. One day conference registrations will also be available. Registration includes full access to all exhibits and technical paper sessions...all you have to do is get yourself to the conference! Selected applicants will also be eligible to receive overnight accommodations. Selection based on responses to the application as well as need.

Apply today!
Application deadline is November 1, 2018.

MORE THAN 750 SCHOLARSHIPS
awarded and 541 organizations
represented since 2013

Sponsored by:



**APPLY FOR COMPLIMENTARY REGISTRATION,
HOTEL ACCOMMODATIONS AND MORE!
VISIT: NASTT.ORG/MUNICIPALSCHOLARSHIP TODAY.**

North American Society for Trenchless Technology | 14500 Lorain Avenue #110063 | Cleveland, Ohio 44111



Donovan says one of the biggest challenges facing the underground construction sector is misplaced concerns by government agencies who believe that the energy and public works construction industry have a general disregard for the environment or public inconveniences. On that note, he adds that a major challenge for trenchless applications are differentiating the trenchless industry as the preferred construction method because of reduced public inconvenience and minimized environmental concerns.

“The novelty of trenchless technologies is intriguing to contractors and engineers, causing some to jump in without fully understanding what they are getting involved in,” he says. “In some cases, this has resulted in ‘bad’ projects that misrepresent the industry.”

Ultimately, Donovan says trenchless technology is going to continue to expand as existing and new construction methods gain acceptance and are adopted as the preferred method for new or rehabilitation construction. He notes

that some owners are already demanding trenchless methods over traditional construction methods because of the reduced impact on the built and natural environments, and in many cases, reduced costs.

“Overall, the industry is one of the better affiliations that provide education to owners and engineers,” he says. “I think the scholarship program for municipalities interested in attending the No-Dig Show is a great program and an example of the NASTT commitment to education and training.

“My favorite part about the industry is working with some of the pioneers who brought the industry out of its infancy and into the mainstream, especially learning about the challenges they overcame to prove various technologies and techniques and mold the standard of practice into what it is today.”

MIKE KEZDI and **ANDREW FARR** are associate editors of *NASTT's Trenchless Today*.

See what you've been missing



vCam-6 HD Inspection System

- 9.7" HD Display
- 1TB Hard-drive
- 1080 HD Cameras
- 512Hz Sonde
- Locatable Pushrod



vCamMX Mini Inspection System

- 512Hz Sonde
- Locatable Pushrod
- High Resolution Cameras
- Direct to USB Recording



vScan Sonde Locator/Utility Avoidance Tool

- 512Hz & 33kHz Locator
- Avoid Energized Cables

(800) 446-3392 ~ info@vxmt.com

Call us for your no obligation on-site demonstration!

VIVAX
METROTECH

Vivax-Metrotech Corporation

3251 Olcott Street,
Santa Clara, CA 95054, USA

Toll Free: 800-446-3392
Phone: +1-408-734-1400

Email: sales@vxmt.com
www.vivax-metrotech.com

NASTT's 2018 Membership Directory

THE NORTH AMERICAN SOCIETY FOR TRENCHLESS TECHNOLOGY is THE go-to resource for education and information for professionals working in the underground construction field. At NASTT, connecting industry professionals with those resources is our passion.

Trenchless industry professionals know that there's one thing the industry always needs - more education and greater awareness of trenchless options. Making these needed opportunities available requires effective outreach and communication among various industry segments. This annual directory will provide you with a resource for connecting with engineers, contractors, manufacturers, professional service providers and municipal representatives who are NASTT members. Make sure to keep it close by, as it may prove to be helpful when planning your next trenchless project. For more, visit nastt.org to access real-time directory information day or night.

This directory is current as of Aug. 31, 2018. If your information has changed, please contact NASTT's Membership Manager Molly Gallagher at mgallagher@nastt.org. You can also log on to nastt.org/directory to update your information.

Individual Members

John Abdalkhani King County
Dulcy Abraham Purdue University
Hassan Al-Barqawi InfraHydro
John Allen Public Works Commission
Abdulnasser Almadhoun NTH Consultants Ltd.
Edward Ambler AM Trenchless
Pat Ambrosio The Hallen Construction Co. Inc.
Tracey Anderson Aquatera Utilities Inc.
Don Arch Engineered Lining Systems
Samuel Ariaratnam Arizona State University
Alan Atalah Bowling Green State University
Brian Avon Carollo Engineers Inc.
Andrew Baile Union Sanitary District
Richard Bailey Stephl Engineering LLC
Kevin Bainbridge Robinson Consultants Inc.
Thomas Bates National Grid
Alireza Bayat University of Alberta
Michelle Beason National Plant Services Inc., a Carylton Co.
Bruce Beatty Atlas Copco
Grady Bell Bell Trenchless Consulting

Brian Bellamy Bellamy Construction Co. Inc.
Kevin Bentley Golder Associates Inc.
Dale Bergum Webster, Foster & Weston Engineers
Randall Berry Harris & Associates
Peggy Biggs Lawson-Fisher Associates P.C.
Scott Black ASI Group Ltd.
Tony Bokhoven Ring-O-Matic
Marco Boscardin Boscardin Consulting Engineers Inc.
Jeffrey Boschert National Clay Pipe Institute
Adam Braun AECOM
Logan Bridges United Poly Systems
Russell Brown Ace Pipe Cleaning Inc., a Carylton Co.
Douglas Brunning TransCanada
Jeffrey Bryant Bryant Associates
Tom Bryski Golder Associates Inc.
David Buckner Mi-Tech Services Inc.
Paul Bury BASF Corp.
Jeremy Campbell City of Peterborough
Guy Campinha Town of Wareham
Angela Carley The Municipal Infrastructure Group Ltd.
Mark Carpenter Trenchless Professional

Individual Members

Robert Carpenter Underground Construction
Joanne Carroll Subtegit Group Inc.
David Case Trenchless Professional
Jinsung Cho CA State Polytechnic University Pomona
Elaine Chouinard PTR Communications Inc.
Heather Christensen Geneva Pipe & Precast
Greg Christensen MPE Engineering Ltd.
Jan Chwiedosiuk Middlesex Water
Bob Clarke ASI Group Ltd.
Scott Cline Ruby-Collins Inc.
Aaron Cohen Arizona State University
Randy Cooper Evanco Environmental Technologies
Paul Cooper Pipe Spy Inc.
Leif Coponen Schaaf & Wheeler
David Crowder R.V. Anderson Associates Ltd.
Jake Crowe IPR Southeast LLC
Matthew Cruz JR CRUZ Corp.
Luis Cuellar RPS Klotz Associates
Keverly Daniel Montgomery Water Works & Sanitary Sewer Board
Craig Danielson Danielson Inc.
Gayleen Darting Sacramento Regional County Sanitation District
Michael de Hart Trenchless Professional
Denis Demers Aqua Data Inc.
Aaron Dennis Enbridge Inc.
Lee Dester Copperhead Industries LLC
Phillip Dieckmann AECOM
Christopher Dillon JC Dillon Inc.
Ted Dimitroff Trenchless Consulting LLC
Ian Doherty Trenchless Design Engineering Ltd.
Jesse Doolin MJP & Associates
Brian Dorwart Brierley Associates
Jackson Dove Sammamish Plateau Water & Sewer District
Brendan Doyle BLD Services LLC
Darlene Dudych Cambrian Excavators Ltd.
Erik Durshpek City of Portland, Bureau of Environmental Services
Todd Eising City of Folsom
Jack Ellinwood City of Roanoke, Virginia - Stormwater Division
Michael Emerson JC Dillon Inc.
Jeff Enyart Geneva Pipe & Precast
Chantal Evans Aegion Corp.
Chris Everton Hampton Roads Sanitation District
Garth Fallis Vector
Joseph Federico Beta Group Inc.
Siri Fernando SMA Consulting Ltd.
Luis Figueiredo D'Annunzio & Sons Inc.
Tony Fisher BHC Consultants LLC
Joseph Fleming D.M. Wills Associates Ltd.
Jon Ford Highfill Infrastructure Engineering, PC
Wyatt Franks Doosan Portable Power
Kevin Fredley Parkhill, Smith & Cooper Inc.
Walter Fromm National Grid
Gord Gajich Forterra
Don Gallucci Trenchless Professional
Margaret Ganse Shannon & Wilson Inc.
Marshall Gaston Fuss & O'Neill Inc.

Brian Gastrock Coffman Engineers Inc.
David Gellings Trenchless Resources Inc.
Michael Gipsov Washington Suburban Sanitary Commission
Jennifer Glynn RMC Water and Environment
Victor Godfrey Project Engineering Consultants Ltd.
Sean Goin Town of Devon
Sanjiv Gokhale Vanderbilt University
Raj Kumar Gondle UMass Lowell
Joseph Graham Dibble Engineering
John Grennan Ward and Burke Microtunnelling Ltd.
Roberto Guardia Shannon & Wilson Inc.
Nenad Gucunski Rutgers University, Department of Civil and Environmental Engineering
Saul Gutierrez Project Engineering Consultants Ltd.
Scott Hancock Trenchless Professional
Firas Hanna Opus Stewart Weir
Richard Harada Wilson Okamoto Corp.
Glenn Harrah Terracon
Mark Harris Layne Inliner LLC
Jason Hartley City of Campbell River
Larry Hartsell Pacific Gas and Electric Co.
David Haug Woodard & Curran
Ashley Heckman Aldea Services LLC
Michael Helsen Pembina
John Hemphill ISTT
Thomas Hessler DLZ Corp.
Steve Hibbeler Muller Engineering
Kin Hill Charleston Water System
Bob Hogg Enbridge Inc.
Kevin Hoheisel AkzoNobel - International Paint
Jorge Holguin City of Fort Lauderdale
Sue Howard City of Wetaskiwin
Angela Huang Andrews Infrastructure
Geoffrey Hughes JCK Underground
David Hutton Trenchless Professional
Patrick Ilasewich AECOM
Leonard Ingram MASTT, MSTT & SESTT
Kourosh Iranpour Harris & Associates
Jeff Jaeger Kerry T. Howe Engineering Ltd.
Sarah Johnson Johnson Consulting
Allyson Jones IPR Southeast LLC
Sheila Joy NASSCO
Norman Kampbell Rehabilitation Resource Solutions LLC
Clifford Kassouf Triad Engineering & Contracting Co.
Hartley Katz Morrison Hershfield
Michael Keane M. Keane Excavating Inc.
Bob Kennedy Mar-Tech Underground Services Ltd.
James Kercher ISL Engineering & Land Services Ltd.
Joshua Kercho Kimley-Horn and Associates
Siamak Khajehpour Trenchless Professional
William Kiger PA One Call System Inc.
Todd Kilduff Colorado School of Mines
Paul Kilkenny Tetra Tech EBA
Jonghoon Kim Oklahoma State University
Ryan King AECOM
Fritz Klingler FK Engineering Associates
Gabriel Kloet Trenchless Professional
James Kohne RMC, a Woodard & Curran Co.

Dan Koo IUPUI - Purdue School of Engineering & Technology
Andrea Kozak Canadian Concrete Pipe and Precast Association
Todd Kramer CTI Engineers Inc.
Steven Kramer Trenchless Professional
Nick Kravitch Kravitch Machine Co.
James Kriss Carollo Engineers Inc.
Neil Kucharski WSP Canada
George Kurz Sewer Capacity Management
William C. Kwasny CRL Associates LLC
Jim Kyfiuk TransCanada Pipelines
Robert Lamb City of Austin
Rick Landino Silver State Boring
Dustin Langston WL Plastics
Jon Larsen Holland Engineering Inc.
Frank Lau EPCOR Utilities Inc.
Carlos Lazarte Carlos Lazarte
Tom Leavitt MPE Engineering Ltd.
Mark Lee Project Engineering Consultants Ltd.
Stephen Leitch CJS Conveyance
Luis Leon HDR
Johnny Leverette Wade Trim
Tiong Liem Allied Geotechnical Engineers Inc.
Darren Litke NorthStar Fluid Solutions
Samantha Long ELI Directional Drilling
Cody Long SHN
David Longtin City of Sitka
Gerard Lundquist National Grid
Andrew Lytovchenko Scheffer Andrew Ltd.
Michelle Macauley Macauley Trenchless
Chris Macey AECOM
Brendan Macfarlane Revive Pipe Restoration Inc.
David Machado Advanced Trenchless Inc.
Cameron Magnus ISL Engineering & Land Services Ltd.
Mirko Maher Hazen and Sawyer
Kurt Maire Harris & Associates
Danielle Martin Henniker Directional Drilling
Lee Martin Higher Ground Consulting
Tim Martin National Gunitite
Dale Mathison Ayres Associates
David Mathy DCM Consulting Inc.
Ken Matthews Merrick and Co.
Travis McCartney CCI Inc.
Stephen McCauley Trenchless Professional
Joe Mcdivitt South Coast Water District
Kathy Mckune Cherry Hills Village Sanitation District
Aaron McMullen Insituform Technologies Ltd.
Ian Mead Tighe & Bond
Charles Menkhaus CME Services
Alex Merletti Merletti Construction (1999) Ltd.
Steven Meyer Bowen, Collins & Associates
Keith Meyer Ditesco
Brett Mickelson IGES Inc.
Patrick Minger Minger Construction Company Inc.
Christopher Mitchell AECOM
Terence Mitchell Metrolinx
Serge Moalli EBC
Dorian Modjeski Modjeski Engineering LLC

Individual Members

Trevor Moore Pinnacle Engineering Ltd.
Ian Moore Queen's University
Brian Moreau CBCL LTD
Catherine Morley RJN Group
Steve Mortensen Project Engineering Consultants Ltd.
Brad Morton Nelson River Construction Inc.
Patrick Moskwa Robinson Consultants Inc.
Paul Mourt Mott MacDonald
Karl Mueller Kerr Wood Leidal Associates Ltd.
Gerhard Muenchmeyer Muenchmeyer Associates LLC
Gary Munroe Liberty Utilities
Jeffery Murphy DLZ Corp.
Jim Murphy Universal Pegasus International
Howard Murrell Earthview LLC
Mohammad Najafi University of Texas at Arlington
Paul Nicholas AECOM
Jon Nishimura Fukunaga & Associates Inc.
Kyle Obermiller Trenchless Professional
Stephen O'Connell Black & Veatch
Jeff O'Donnell CHA Consulting Inc.
Raymond Offman KGS Group
Ryan Oldham Campos EPC
Lameck Onsarigo Kent State University
Peter Oram Gresham, Smith and Partners
David O'Sullivan PW Trenchless Construction Inc.
Noah Pacatang Select Trenchless Pipeline
Keivan Pak Iman Dibco Underground Ltd.
Marty Paris Kimley-Horn and Associates
James Parrish Urban Contractors
Paul Pasko SEH Inc.
Andrew Pattison A to B Publishing
Genevieve Pelletier University Laval
Brian Pena City of Lawrence
Steve Peterson SEH Inc.
Vern Phillips Harris & Associates
Simon Pianarosa Saloc
Andrew Pinello Colorado Springs Utilities
Kalyan Piratla Clemson University
Steve Porter Greenville Utilities Commission
Derek Potvin Robinson Consultants Inc.
Cindy Preuss HydroScience Engineers
Ajay Puri The Regional Municipality of Peel
Jordan Quick ISL Engineering & Land Services Ltd.
Montazar Rabiei Mott MacDonald
George Ragula Public Service Electric & Gas Co.
Owen Randall City of Fort Collins Utilities
Michael Reardon California Boring Inc.
Jeremy Recklein IPR Great Lakes
Philip Reeve J. L. Richards & Associates Ltd.
Greg Regier Maple Leaf Construction
Anthony Rice Geosyntec Consultants Inc.
Michael Richins Campos EPC
Donna Roberts Q Solutions Inc.
Brent Robertson MPE Engineering Ltd.
Robert Robinson Bob Robinson Construction
Michael Rocco AUI Inc.
Mathew Roder Greeley and Hansen LLC
Russell Russell Fairfax County
Sinisa Saric Krieger & Stewart Inc.

Individual Members

Robert Saunders..... Thurber Engineering Ltd.
Gary Savanyu Trinity River Authority of Texas
Paul Savard Parsons Transportation Group
Jim Schill Lime Valley Advertising Inc.
Ray Schmoldt..... D.R.S. Enterprises Inc.
Jeffrey Schneider..... Golder Associates Inc.
Jeffrey Scholl J. D. Hair & Associates Inc.
Eric Schuler..... Barton & Loguidice, D.P.C.
Ryan Schuster..... MS Consultants
David Scott..... Bay State Piping Co.
Gerald Seki..... Geolabs Inc.
Firat Sever..... American Structurepoint
Joshua Shackelford..... AECOM
Hiren Shah..... Mueser Rutledge Consulting Engineers
Jigar Shah..... Stantec Consulting
Benny Siljenberg..... Lithos Engineering
Dennis Simpson..... Pinellas County Department of Environment & Infrastructure
Sunil Sinha..... Virginia Tech University
William Skerpan Beta Group Inc.
Jeffrey Smaka City of Farmington Public Works
Larry Smith..... Engineering Development Inc.
A.J. Smith H.R. Gray
Gary Smolinski..... OHM Advisors
Martin Soma..... City of Glendale
Alison St. Clair..... Gibson-Thomas Engineering Company Inc.
Bernard Stack..... Golden Heart Utilities Inc.
Gerald Stangl..... DBA Technology Advisors
Gregory Stanley..... Wade Trim
Judd Stattine..... Quam Construction Company Inc.
Matt Stephl..... Stephl Engineering LLC
Raymond Sterling..... Louisiana Tech University
Velimir Stetin..... City of Maple Ridge
Dennis Sullivan..... National Water Main Cleaning Co.
Lawrence Sullivan..... Norwich Public Utilities
Robert Swensen..... Horrocks Engineers Inc.
Lucas Tabolt..... Barton & Loguidice, D.P.C.
Bob Taylor..... Mar-Tech Underground Services Ltd.
Robert Taylor..... Spring & Associates
John Teer..... Prime Horizontal Ltd.
Charlie Thomas..... Norman Utilities Authority
Richard Thomasson..... Arcadis
Dan Toppazzini..... Weinmann Ltd.
Michael Trainque..... Hoyle, Tanner & Associates Inc.
Frank Trinchini..... City of Toronto - Toronto Water
Charles Tripp..... Kleinfelder
Walter Trisi..... CRS Tunnelling Inc.
Gene Tupper..... GRI
Grahame Turnbull..... JR CRUZ Corp.
Robert Turner..... Turner Underground Installations Inc.
Paul Ubrich..... Hexion Inc.
Jesse Vandecreek..... Hubbell, Roth & Clark Inc.
Henry Vanderpyl..... H V Consulting Ltd.
Joshua Vandiver..... City of Redding
Alex Varro..... Thuro Inc.
George Vernon..... Mill Creek Management Technologies Inc.
Eric Vieth..... Strand Associates Inc.
Bertus Vos..... BlueFox Engineering
Ophir Wainer..... T2 Utility Engineers

Dean Walker..... City of Dryden
Dennis Walsh..... PSE&G
Ryan Wamble..... Campos EPC
Edward Ward..... Hill Services Plumbing HVAC
Stuart Warren..... Mott MacDonald
Ron Weigel..... Century West Engineering Corp.
Jon Wicke..... Metro Wastewater Reclamation District
Darrell Wilder..... GeoStructures Inc.
Todd Williams..... Gannett Fleming Inc.
Michael Willmets..... North American Society for Trenchless Technology
Clinton Wilson..... Black & Veatch
David Winston..... Williams
Brian Wirth..... City of Regina
Kyle Wong..... Sammamish Plateau Water & Sewer District
Peter Wood..... Rooter MD Plumbing
Michael Woodcock..... Portland Utilities Construction Company LLC
Sergey Wortman-vayn..... PSE&G
Chad Wright..... LECET Southwest
David Yue..... Sameng Inc.
Michael Yuen..... Andrews Infrastructure
Tarek Zayed..... Concordia University
Mark Zemaitis..... Peters Township

Azo!Grout™

- Concrete repair
- Water control
- Soil stabilization

Azo-Grout™ by Azon, is a diverse family of polyurethane-based waterstop products used for concrete crack repair, stopping water infiltration and soil stabilization




1-800-788-5942 azogrout.com



Aaron Enterprises Inc.

Tom Rice
300 Cloverleaf Rd.
York, PA 17406 USA
717-854-2641
aaronenterprises.com



Ace Pipe Cleaning Inc.

Steve Hontz, Bruce Jameson, Ray Greek, Ryan Poertner, Don Uberroth, Bryan Dobson
4000 E. Truman Rd.
Kansas City, MO 64127 USA
816-241-2891
acepipe.com

Aegion Corp.

Aura Joyce, George Bontus, Andrew Foster, Marty Scanlan, Abu Abraham, Michele McGreal, Ray Dudley, Rachel Maupin, Richard (Bo) Botteicher, Tom Marti, Bob Walker, Frank Firsching, Brett Fornelli, Steve Austin, Brent Lindelof, Steven Ike, Joel Ogle, Kevin Berlinger, Eugene Zaltsman, Joe Lane, Greg Patton, David Reuter, Marvin Lee, Shawn Garcia, Rick Baxter, Ian Lancaster
13135 Danielson St.
Poway, CA 92064 USA
858-218-3738
aegion.com

AGRU America Inc.

Richard Freedom, Ron Pickett, Ernie Heins
500 Garrison Rd.
Georgetown, SC 29440 USA
800-373-2478
agruamerica.com



Akkerman

Maynard Akkerman, Chris Sivesind, Troy Stokes, Brad Wheeler, Jason Holden
58256 266th St.
Brownsdale, MN 55918 USA
800-533-0386
akkerman.com

Alchemy-Spetic

Jim Spiegel
4508 Bibb Blvd.
Tucker, GA 30084 USA
949-233-3112
alchemy-spetic.com

Allstream Waste

Nick Gannon
22541 Komoka Rd.
Komoka, ON N0L 1R0 Canada
519-636-2974
allstreamwaste.com

Alternative Lining Technologies

Jim Rouse, Dace Van Dyken
PO Box 123
Byron Center, MI 49315 USA
616-583-7100
atliner.com



American Augers

Lee Drugan, David Hammond, Kenny Clever
135 State Rt. 42
West Salem, OH 44287 USA
419-869-1819
americanaugers.com



American Pipe & Plastics

Cecelia Cranmer
PO Box 577
Binghamton, NY 13902 USA
617-332-1675
atkore.com

Ameron Water Transmission Group

Michael Saltikov
201 N. Berry St.
Brea, CA 92821 USA
951-232-6174
nov.com/ameron

Am-Liner East

Mel Willett, Sean Merryman, Isy Giuliani, Michael Wadding, Robert Samuels, Richard Cornelius
601 Jack Enders Blvd.
Berryville, VA 22611 USA
540-955-9671
amlinereast.com



AOC LLC

Emilio Oramas, Joe Simpson, Frederick Norman, Fletcher Lindberg, Leslie Beck, Bill Moore
955 Highway 57 E.
Collierville, TN 38017 USA
901-854-2855
aoc-resins.com

AP/M Permaform

William Shook, Keith Walker, Joe Cherry, Brian Culich
6250 NW. Beaver Dr.
PO Box 555
Johnston, IA 50131 USA
515-276-9610
permaform.net



Applied Felts Inc. / Maxliner

David Fletcher
450 College Dr.
Martinsville, VA 24112 USA
540-656-1904
appliedfelts.com

AR Daniel Construction Inc.

Art Daniel
506 Tidwell St.
Cedar Hill, TX 75104 USA
972-291-3304
danielcs.com

Arceneaux Wilson & Cole

Keestan Cole, Joe Wilson, Calvin Prosen, Marc Ochoa, Keith Zotzky
2901 Turtle Creek Dr.
Suite 320
Port Arthur, TX 77642 USA
409-724-7888
awceng.com

Aries Industries Inc.

Steve Cantwell
550 Elizabeth St.
Waukesha, WI 53186 USA
800-234-7205
ariesindustries.com



Arntzen Corp.

Scott Grandrath
14600 Washington St.
Woodstock, IL 60098 USA
815-334-0788
arntzenrolling.com

Associated Engineering

Jason Lueke, Gabriel Jean, Siu Fung Ma, Carlie Pittman, Keith Kingsbury, Cian McDermott, Mark Belanger, Craig Pass
500 9888 Jasper Ave.
Edmonton, AB T5J 5C6 Canada
780-969-6344
ae.ca



Atlas Trenchless LLC

Jim Lagios
1351 Broadway St. W.
Rockville, MN 56369 USA
320-249-8410
atlas-trenchless.com

Avanti International

Don Rigby, Britt Babcock, Frank Aguilar
1100 Hercules Ave.
Suite 320
Houston, TX 77058 USA
281-486-5600
avantigrout.com

Avertex Utility Solutions Inc.

Jason Kottelenberg, Steve Kottelenberg, James Vis, Andy Blokner
205235 County Rd. 109
Amaranth, ON L9W 0T8 Canada
289-237-9670
avertex.ca



Azon USA Inc.

Michael Vennix, Erin Johnson, Larry Medaid
643 W. Crosstown Pkwy.
Kalamazoo, MI 49008 USA
269-385-5942
azonusa.com

Barbco Inc.

David Barbera, Jenifer Barbera
315 Pekin Dr.
East Canton, OH 44730 USA
330-488-9400
barbco.com

Baroid Industrial Drilling Products (IDP)

Buck Hammond
2664 Headwaer Dr.
Ft. Collins, CO 80521 USA
832-472-3465
baroididp.com/idp

BA SF

Ed Paradis
3760 Crane Mill Rd.
Cornelia, GA 30531 USA
404-386-9263
basf.com

Corporate Members



Benjamin Media Inc.

Bernard Krzys, Kelly Dadich,
Brittany Cline, James Rush, Dan
Sisko, Sharon Bueno
10050 Brecksville Rd.
Brecksville, OH 44141 USA
330-467-7588
benjaminmedia.com

Bennett Trenchless Engineers

David Bennett, Matthew Wallin,
Mary Neher, Karen Bennett,
Kathryn Wallin, Sam Ko
950 Glenn Dr.
Suite 115
Folsom, CA 95630 USA
916-294-0095
bennetttrenchless.com

Bestolife Corp.

Mark Porter, Sharon White,
Kimberly Milligan, Melissa
Timpone, Brian Whipple, Steve
Wageman
2777 N. Stemmons Fwy.
Suite 1800
Dallas, TX 75207 USA
214-583-0267
bestolife.com



Big Bore Directional Drilling Ltd.

Tricia Hunter
PO Box 10796
#2 Reinhart Industrial Park
Lloydminster, AB T9V 3A8 Canada
780-875-8845
bigbore.ca



Bit Brokers International

Chester Thomas
5568 Logan Rd.
West Frankfort, IL 62896 USA
618-435-5811
bitbrokers.com

BMC Corp.

Richard Corsetti
PO Box 60
Pinehurst, MA 01866 USA
781-273-0398
tsoil.com

Bore Master Inc.

Dan Olson, Bob Olson, Jakin
Grabau, Jeff Briskie, BJ Kienbaum,
Jon Olson
PO Box 450
Pewaukee, WI 53072 USA
262-246-0600
globecontractors.com



Bradshaw Construction Corp.

Lester Bradshaw, Kyle Bradshaw,
Mike Wanhatalo, Todd Brown,
Eric Eisold, Doug Piper, Jordan
Bradshaw
175 W. Liberty Rd.
Eldersburg, MD 21784 USA
410-970-8300
bradshawcc.com

Brady Risk Environmental

Ralph Sergio, James Alcus, Sean
Brady
24 W. Carver St.
2nd Floor
Huntington, NY 11743 USA
631-549-8561
bradyriskenvironmental.com

Brannan Construction Co.

Corey Marvel
2500 E. Brannan Way
Denver, CO 80229 USA
303-534-1231
brannan.com

The versatile milling robot, way ahead of its time.

ROBOT ARM

- 86° upward lifting, 20° downwards lowering
- Full rotation without interference of supply lines
- Air motor / milling head with a swivel range of 100°

FRONT CAMERA

- High-Resolution CCD-color camera
- High-powered lens / LED lighting
- 200° swivel range
- Swivel movement / electrical focus
- Pressure control

CARRIAGE

- Streamlined design
- Powerful carriage drive
- Integrated hydraulic device to raise the arm and swivel the milling tool
- Inner supply lines
- Tilt measurement, sensor for pressure, moisture and temperature

REAR CAMERA

- CCD-color-camera
- High-resolution wide angle lens
- LED lighting
- Pressure control



Sensor monitoring for the arm angle

www.ist-web.com

CANADA

1098 Industrial Road,
Ayr, Ontario, Canada, NOB 1E0

USA

6142 Nancy Ridge Dr. suite 101
San Diego, CA 92121

Phone: (226) 505-4659
e-mail: brian.gibson@ist-web.com





Brierley Associates Corp.
Heather Stewart, Rebecca Brock,
Nancy Nuttbrock, Nick Strater,
Thomas Pullen, Nathan Stublely
990 S. Broadway
Suite 222
Denver, CO 80209 USA
303-703-1405
brierleyassociates.com

Brown and Caldwell
Don Gordon, Susanne Lockhart,
Ari Elden, Mark Poppe, Elton
DeSouza, Gary Skipper,
Christopher Garrett
290 Walt Whitman Ave.
Newport News, VA 23606 USA
757-897-6349
brwncald.com

Browline Canada Inc.
Chris Frisch
40 E. Lake Green
Airdrie, AB T4A 2J2 Canada
403-512-3181



BT Construction
Chris Knott, Robert "Buck"
Bergstrom, Harper Daniell,
Marilee Bergstrom, David
McCallum, John Beckos, Erica
Sittloh, Kevin Juliano, Catherine
Kornbrust, Josh Livermore
9885 Emporia St.
Henderson, CO 80640 USA
303-469-0199
btrenchless.com



C&L Water Solutions Inc.
Jeff Maier, Tracy Stenger, Danny
Braning, Christopher Jones, Larry
Larson, Chrystalla Larson, Chris
Larson
12249 Mead Way
Littleton, CO 80125 USA
303-791-2521
clwsi.com

Cardno Inc.
Don McCullers, James Anspach,
Kelly Wehner, Chris Proulx,
Lawrence Arcand
380 Park Place Blvd.
Suite 300
Clearwater, FL 33759 USA
541-678-2151
cardno.com

Carollo Engineers Inc.
Tim Taylor, John Malone, Erik
Waligorski, Greg Gould, Brian
Clow, Anne Prudhel, Michael
Fleury, Robert Buss, Keith
Corcoran, Jon Marshall
2880 Gateway Oaks Dr.
Suite 300
Sacramento, CA 95833 USA
602-263-9500
carollo.com

Cartacoustics LLC
Grey Tarkenton
25587 Conifer Rd.
#105-402
Conifer, CO 80433 USA
303-525-1032
cartacoustics.com



Carylon Corp.
Chad Adams, Dennis Keene
2500 W. Arthington St.
Chicago, IL 60612 USA
312-666-7700
caryloncorp.com



CCI Inc.
David Dupuis, Ashkan Faghieh,
Ken Birkett, Samuel Wilson,
Brent Goerz, Ed Douzich, Craig
Lenderbeck, Justin Taylor
Bay 9 214 Grande Blvd W.
Cochrane, AB T4C 2G4 Canada
780-655-2161
ccisolutions.ca

CDM Smith Inc.
Marc Lehmann, Karen Lowe,
Katelyn Biedron, M. Brent
Johnson, Jonathan Kunay, Daniel
Gilroy, Armin Vakili, Ahmad
Habibian, Mohammad Reza Jafari,
Clay Tappan, William Cotter
445 Hutchinson Ave.
Suite 820
Columbus, OH 43235 USA
703-691-6535
cdm.com



CETCO
Debra Bac, Michael Kleespies,
Richard Heskett, Justin Seago,
George Dugan, Mario Brunet
2870 Forbs Ave.
Hoffman Estates, IL 60192 USA
800-527-9948
cetco.com



CIPP Corp.
Steve Gearhart, Robert Peccia,
Giacomo Conte
515 5th St.
P.O. Box 398
Hudson, IA 50643-0398 USA
888-485-2477
usa-cipp.com

CJGeo Geotechnical Engineers
Chris Cline
3402 Acorn St.
Suite 200
Williamsburg, VA 23188 USA
804-551-1424
cjgeo.com



Claude H. Nix Construction
Stephanie Nix, Jon Nix,
Ryan Burton
1893 Skyline Dr.
Suite 203
South Ogden, UT 84403 USA
801-479-9000
chnix.com

Clean Water Works Inc.
Shane Magee
1800 Bantree St.
Ottawa, ON K1B 5L6 Canada
905-433-1261
cwwcanada.com



Contech Engineered Solutions LLC
Gaelyn Cunningham, John
Kanzlemar, Hugh Mickel,
Bob Kerr, Justin Walton, Rian
McCaslin
9025 Centre Pte.
West Chester, OH 45069 USA
800-338-1122
conteches.com



COP Trenchless
Lawrence Triolo, Jasen Bennie,
Zack Marietti, Mike Olson
840 N. 700 W.
North Salt Lake, UT 84054 USA
801-298-9556
copconstruction.com

The Crossing Company
Ryan Maclean, Jesse Funnell,
Manley Osbak, Ryan Bowhay, Ben
Armstrong, Bill Piers
1807 8th St.
Nisku, AB T9E 7S8 Canada
780-955-5051
thecrossingcompany.com

Cretex Specialty Products
Lee Haessig, Kevin Lindner
N16 W23390 Stoneridge Dr.
Suite A
Waukesha, WI 53188 USA
262-542-8153
cretexseals.com



CUES
Terri Mooney, Ed Diggs, Pete
Monday, Richie Sheridan, Mac
McGarry, Mark French, Pierre
Mikhail
3600 Rio Vista Ave.
Orlando, FL 32805 USA
800-327-7791
cuesinc.com

In conjunction with NASTT's No-Dig Show



2019 NASTT SPEAKEASY



EDUCATIONAL
FUND AUCTION



NASTT'S 18TH ANNUAL EDUCATIONAL FUND SPEAKEASY AUCTION & RECEPTION

Join us in a Chicago Speakeasy! The Annual Educational Fund Auction helps raise money for very worthy causes. Since 2002, **NASTT has raised nearly \$1.1 Million** and used those funds in support of our many educational initiatives. Due to your generosity, NASTT is able to provide targeted trenchless training courses to the industry, publish trenchless resources manuals and sponsor university students' attendance at NASTT's No-Dig Shows, as well as award scholarships.

EXCITING AUCTION ITEMS

Come to the auction and bid on great items like trips, tickets, electronics, industry items and more!

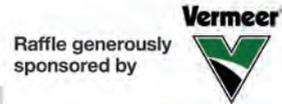
HAWAIIAN VACATION RAFFLE

The winner of this raffle will receive a dream Hawaiian vacation, a \$5,000 value! Tickets are \$25 or five for \$100 with a maximum of 1,000 tickets being sold.



COSTUME CONTEST

Show us your style! Speakeasy style that is! Come dressed in 1920s gangster or flapper attire at the auction's Eighth Annual Costume Contest! Prizes will be awarded- don't miss out!



Raffle generously sponsored by

50/50 RAFFLE

A great way to win some cash for yourself and help out our student chapters! The winning ticket will be drawn immediately following the live auction and you must be present to win. The winner splits the cash pot with the students.

Auction Reception sponsored by



FOR MORE INFORMATION VISIT
NASTT.ORG/NO-DIG-SHOW/AUCTION





Derrick Equipment Co.

Ben Clark
15630 Export Plaza Dr.
Houston, TX 77032 USA
281-590-3003
derrick.com

Digital Control Inc.

**Siggi Finnsson, Eileen Breum,
Brian Mattson, Glenn Halstead,
Mark Gallucci**
19625 62nd Ave. S.
Suite B-103
Kent, WA 98032 USA
425-251-0701
digital-control.com

Dillon Consulting Ltd.

**Doug Onishi, Keith Barnes,
Doug Hartford, Bill Nairn, Jason
Johnson, Denis Viens**
51 Breithaupt St.
Suite 200
Kitchener, ON N2H 5G5 Canada
519-571-9833
dillon.ca



Direct Horizontal Drilling

**Lon Briscoe, Rick Shipalesky,
Ernesto Gabuat, Brian Sadoway,
Ryan Chase, Dave Fisher, Justin
Hedemann**
11507 272 St.
Acheson, AB T7X 6E9 Canada
780-960-6037
directhorizontal.com



Ditch Witch

**Haley Brorsen, Stacy Long, Seth
Matthesen, Ellen Hamburger,
Vince Schielack, Scott Smith**
1959 W Fir Ave.
PO Box 66
Perry, OK 73077 USA
580-572-2653
ditchwitch.com

Doetsch Environmental Services

Joe Schotthoefer
21221 Mullin Ave.
Warren, MI 48089 USA
586-755-2090
doetschenv.com



Duke's Root Control Inc.

**Lynn Heffron, Stuart Tillery, John
Fletcher, Michael Hogan**
1020 W Hiawatha Blvd.
Syracuse, NY 13204 USA
800-447-6687
dukes.com

ECI Drilling LLC

**Greg Horn, Bruce Brasher, Dustin
Brasher, Alfred Domingo, John
Langford**
1306 N. FM 3083 Rd.
Conroe, TX 77303 USA
936-441-9080
ecidrilling.com

Electro Scan Inc.

**Charles Hansen, Henry Gregory,
Mark Grabowski, Charles Wilmut,
Carissa Boudwin, Matt Campos**
1745 Markston Rd.
Sacramento, CA 95825 USA
916-779-0660
electroscan.com

Elite Equipment

**Christopher Chapman, Ken Streit,
Sean Nazer, Tom Muth, David
Sewell**
244 W. Hwy. 40
Roosevelt, UT 84066 USA
435-722-2236
eliterentals.net

Ellingson Cos.

**Jeremy Ellingson, Jeff Saucier,
Jaeson Osborn, Andrea Kvalsten,
Rob Tumbleson, Todd Hoffman**
56113 State Hwy. 56
PO Box 68
West Concord, MN 55985 USA
507-527-2294
ellingsoncompanies.com

THE SHOOTER®

Emagineered Solutions Inc.

**Ray Irvin, Ross Huckfeldt, Grant
Waring, Steve Waring**
527 NW. Elm Ave.
Suite 3-405
Redmond, OR 97756 USA
541-504-0416, option 6
emagineered.com

Environmental Noise Control

Don Behrens
13806 Inglewood Ave.
Hawthorne, CA 90250 USA
310-679-8633
environmental-noise-control.com

ENZ USA Inc.

Dana Hicks
1585 Beverly Ct.
Unit 115
Aurora, IL 60502 USA
630-692-7880
enz.com



Faction Fusion

Robert Morrow, Ricky Diaz
1001 Avenida Pico
Suite C-420
San Clemente, CA 92673 USA
877-387-4669
factionfusion.com

FER-PAL Infrastructure

**Shaun McKaigue, Gerry Ramsay,
Geoff Britnell, Eden McKaigue,
Chris Van Wormer, Scott Strebel,
Blaine Preston, Lou Magurno**
171 Fenmar Dr.
North York, ON M9L 1M7 Canada
416-742-3713
ferpalinfrastructure.com



FerrateX Inc.

**Justin Grabarczyk, Gerhardt
Rodenberger**
16545 Heim
Chelsea, VA 23872 USA
804-451-3667
ferratex.com

Five Star Products Inc.

**Robert Williams, Robert Carlson,
Michelle Narus, Gunnar Busch,
Paul Veillette**
60 Parrott Dr.
Shelton, CT 06484 USA
203-336-7900
fivestarprouducts.com

Flowtite Pipe

**Hillary Leavitt, Mike Leathers,
Jeff Leblanc, Detlev Schlorke,
Eric Davidson, Beza Basiri, Carl
Pitzer**
18585 Samuels Rd.
Zachary, LA 70791 USA
225-658-6166
flowtitepipe.com

Forbest Products Co.

Fei Dai
44130 Old Warm Springs Blvd.
Fremont, CA 94538 USA
877-369-1199
forbestusa.net

GAME Trenchless Consultants

**Piero Salvo, Francois Gelly, Eric
Chavarie, Natasha Hughes, Sandra
Gelly, David Gosselin**
5660 Ch. du Bois-Franc
Montreal, QC H4S 1A9 Canada
514-747-9000
gameconsultants.net

GeoEngineers

**Jon Robison, Sakar Sayem, Drew
Sparks, Galan McInelly, Brian
Ranney, Mark Miller, Gary
Castleberry, Trevor Hoyles**
3050 S. Delaware
Springfield, MO 65804 USA
417-831-9700
geoengineers.com



GHD

**Bradley Marin, Dwayne
Hofstetter, Khaled Elnabolsy,
Allan White, Gabriel Wong, Chris
Hunter, Robert Lannon, William
Wheeler, Thor Young, Marek
Kiedrowski, Kol Tamberh, Aaron
Bruce, Tom Cobitz, Craig Camp,
Michael Bisignani, Jon Putnam,
Greg Watanabe**
651 Colby Dr.
Waterloo, ON N2V 1C2 Canada
519-884-0510
ghd.com



Global Machinery

Jeff Brown
705 W. 62nd Ave.
Denver, CO 80216 USA
303-430-7130
globalmachinery.com

Global Underground Corp.

Rob Powilleit
641 Winters Dr.
Colorado Springs, CO 80907 USA
719-471-7414
globalug.com

Great Lakes TV Seal Inc.

Brett Healy, Greg Healy
3600 Kewaunee Rd.
Green Bay, WI 54311 USA
920-863-3663
greatlakestvseal.com

Corporate Members

Haley & Aldrich Inc.

Dennis Doherty, Mark Brownstein, Abhinav Huli, Carrie Layhee, Brad Miller, Zach Gardner, Adam Coen
3 Bedford Farms Dr.
Bedford, NH 03110 USA
603-320-6331
haleyaldrich.com

The Hallen Construction Company Inc.

Pascale Ambrosio
4270 Austin Blvd.
Island Park, NY 11558 USA
516-432-8300
hallen.com

Hamilton Kent LLC

Randy Reimer, Alan Siebenthaler
77 Carlingview Dr.
Toronto, ON M9W 5E6 Canada
416-675-9873
hamiltonkent.com



HammerHead Trenchless

Kevin Smith, Jason Haas, Paul Rogers, Will LeBlanc, Alan Goodman, John Hrabosky, David Kozman, Jason Klaus, Chelsea Denissen
500 South CP Ave.
Lake Mills, WI 53551 USA
920-648-4848
hammerheadtrenchless.com

HDD Broker Inc.

Rebekah Baker, Cesar Cano, Bill Fluharty, Renee Martin
9240 Bonita Beach Rd. SE.
Suite 3300
Bonita Springs, FL 34135 USA
866-960-3331
hddbroke.com

Hi-Vac Corp.

Daniel Coley
117 Industry Rd.
Marietta, OH 45750 USA
740-374-2306
hi-vac.com

HOBAS Pipe USA

Larry Johnson, Dan Davis, Bijan Khamanian, Bryant Welch
1413 E. Richey Rd.
Houston, TX 77073 USA
800-856-7473
hobaspipes.com

Hoffman Southwest Corp.

Jason Walborn
23311 Madero
Mission Viejo, CA 92691 USA
800-784-7473
pro-pipe.com



Holly Pipe Corp.

Jerry Nugent
406 Mecca St.
Lafayette, LA 70508 USA
337-233-7710
hollypipe.com

Horizontal Boring & Tunneling Co.

Brent Moore
505 S. River Ave.
PO Box 429
Exeter, NE 68351 USA
402-266-5347
hbtrenchless.com

Horseshoe Construction Inc.

Bradley King
2309 S. Battleground Rd.
La Porte, TX 77571 USA
281-478-5477
horseshoe-inc.com

HTS Pipe Consultants Inc.

Tom Schultz, Rick Eastwood
420 Pickering St.
Houston, TX 77091 USA
713-692-8373
htspipeconsultants.com

Huxted Tunneling LLC

Ray Post, Steven Caneen
3208 17th St. E.
Palmetto, FL 34221 USA
941-722-9913
huxtedtunneling.com

Hydra-Flex Inc.

Jessica Anderson
980 Lone Oak Rd.
Suite 128
Eagan, MN 55121 USA
952-808-3640
hydraflexinc.com

Hydromax USA

Jeffrey Griffiths, Tom Hayes, Mark Wallbom, Mark Bruce
PO Box 70
Chandler, IN 47610 USA
757-353-1521
hydromaxusa.com

IDS Corporation North America

Enrico Boi
14828 W. 6th Ave.
Suite 12-B
Golden, CO 80401 USA
303-232-3047
idsgeoradar.com

iMPREG Consulting US LLC

Amber Roberts
5004 Byrd Industrial Dr.
Richmond, VA 23231 USA
804-303-4507
impreg.de

InfoSense Inc.

Alex Churchill, George Selembo
8116 S. Tryon St.
Suite B3-203
Charlotte, NC 28273 USA
704-782-7887
infosense.com

Infratech Sewer & Water Services Inc.

Donald Gunn
790 Lapointe St.
Sudbury, ON P3A 5N8 Canada
705-524-6372
infratechservices.ca

Inliner Technologies LLC

Geoff Yothers, Larry Purlee, Keith Oxner
1468 W. Hospital Rd.
Paoli, IN 47454 USA
812-723-0704
inliner.com

Innovative Pipeline Crossings Inc.

Brett Huffey, Amy Vizina, Kendall Matieshin
205 259 Midpark Way SE.
Calgary, AB T2X 1M2 Canada
403-465-4465
ipipecrossings.com

Integrity Fusion Products Inc.

Greg Swindell
215 Robinson Dr.
Fayetteville, GA 30214 USA
770-632-7530
integrityfusion.com



Interplastic Corp.

Kaleel Rahaim, Jason Schiro, Steve Wetzel
1225 Willow Lake Blvd.
St. Paul, MN 55110 USA
651-481-6860
interplastic.com

Interstate Engineering Inc.

Lonni Fleck, Jordan Mayer, Alan Drews, John Trebesch, Troy Wright, Jim Dahlman, Jed Hastings, Charles Hankins, Kaden Bedwell
202 13th St. W.
Williston, ND 58801 USA
701-774-3637
interstateeng.com

Inversa Systems

John Bowles, Dallas McCready
711 Woodstock Rd.
Fredericton, NB E3B 5N8 Canada
506-455-8845
inversasystems.com



IST Services Inc.

Joerg Kruse
6142 Nancy Ridge Dr.
Suite 101
San Diego, CA 92121 USA
858-997-0004
ist-web.com

IVIS Inc.

Dolores Eaton, Robin Beniot, Don Zaborski
16908 128A Ave.
Edmonton, AB T5V 1K7 Canada
780-476-2626
ivisinc.com

Jack Doheny Supplies

Jack Doheny, Tom Doheny, Kay Doheny-Snyder, Brandon Conley
777 Doheny Ct.
Northville, MI 48167 USA
248-349-0904
dohenycompanies.com

Jacobs Engineering Group Inc.

Jack Burnam, James Chae, Andrew Finney, Robert Martin, Daniel Buonadonna, David Landing, James Wallace, Tennyson Muindi
1100 112th Ave. NE.
Suite 500
Bellevue, WA 98004 USA
425-453-5000
jacobs.com

JD Brule Inc.

John Brule, Brigitte Brule
1800 Bantree St.
Ottawa, ON K1B 5L6 Canada
613-745-2444

Kennedy/Jenks Consultants Inc.

Allen Shewey, Sarah Williams, Ed Barnhurst, Dan Phipps, Jodi Villa, Mark Minkowski, Kathy Fretwell, Xiangquan Li, Greg Sekera
300 N. Lake St.
Suite 1020
Pasadena, CA 91101 USA
626-568-4300
kennedyjenks.com

Kerneos Inc.

Joseph Talley, Michael Spradling, Greg Wallace
1316 Priority Ln.
Chesapeake, VA 23324 USA
757-284-3200
kerneos.com

Corporate Members

Klaasmeyer Construction Co.

Eugene Klaasmeyer, Beth Gray
PO Box 847
Conway, AR 72035 USA
501-327-7860
klaasmeyer.com

Kleinfelder

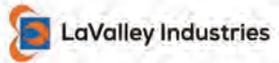
Kenneth Sorensen
2882 Prospect Park Dr.
Suite 200
Rancho Cordova, CA 95670 USA
916-366-1701
kleinfelder.com

Kondex Corp.

Steven Key, John Wagner, Keith Johnson, Diane Riley
1500 Technology Dr.
Lomira, WI 53048 USA
920-269-2007
kondex.com

Laney Directional Drilling Co.

Maureen Carlin, Rob Hotz, Nick Michels, Kerby Primm, Brian Carpenter, Alan Snider
831 Crossbridge Dr.
Spring, TX 77373 USA
281-540-6615
laneydrilling.com



LaValley Industries

Jorge Prince, Craig Larson, Steve Savard
1876 23rd St. SE.
Bemidji, MN 56601 USA
218-444-3030
lavalleyindustries.com

Liqui-Force Services (Ontario) Inc.

Kim Lewis, Bill Thorpe, Darcy Warren, Mike Near, Max Gowdy, John Thompson, Josh Parker
2015 Spinks Dr.
RR#2
Kingsville, ON N9Y 2E5 Canada
519-322-4600
liquiforce.com



LMK Technologies

Larry Kiest, Amana Arayan, Rick Gage, Cody Delmendo, Bevin Beaudet
1779 Chessie Ln.
Ottawa, IL 61350 USA
815-433-1275
lmktechnologies.com

Logan Clay Products

David Gill
9554 County Rd. 36
Blair, NE 68008 USA
402-305-9566
loganclaypipe.com

Logiball Inc.

Marc Anctil, Guy Richard
440 Papin St.
Quebec, QC G1P 3T9 Canada
800-246-5988
logiball.com

Madewell Products Corp.

Steve Hallam, Natalie Steele
Brown, Craig Closser, Jon Steele
7561 Industrial Ct.
Alpharetta, GA 30004 USA
770-856-4470
madewell.net

MALA Geoscience USA Inc.

Philip Oviatt
465 Deanna Ln.
Charleston, SC 29492 USA
843-852-5021
guidelinegeo.com



MarshWagner

Heather Marsh, Fred Wagner, James Carroll, Gary Bulla
175 S. 3rd St.
Suite 200
Columbus, OH 43215 USA
614-484-7078
marshwagner.com



McLaughlin

Dave Gasmovic, Philip Heath, Jake Jeffords, Cory Lee
2006 Perimeter Rd.
Greenville, SC 29605 USA
800-435-9340
mightymole.com

McMillen Jacobs Associates

Glenn Boyce, Babs Marquis, Rebecca Quinette, Greg Rogoff, Michelle van der Pouw Krann, Rick Smith, John Waggoner, Asif Dunga, Luke Erickson, Mark Havekost, Norman Joyal, Joe Schrank, Dru Nielson, Rachel Martin
1350 Treat Blvd.
Suite 100
Walnut Creek, CA 94597 USA
925-705-4114
mcmjac.com

Mears Group Inc.

Neil Smith, Ron Halderman, Gregory Bosch, Jwala Sharma, JB Brown, Jason Steph
5051 Westheimer Rd.
Suite 1650
Houston, TX 77056 USA
281-448-2488
mears.net

Michael Byrne Mfg.

Jim Weist, Dave Miller, Alyssa Turrill
PO Box 444
1855 Earth Boring Rd.
Mansfield, OH 44901 USA
419-525-1214
byrnegroup.com



Michels Corp.

Michelle Trapp, Phillip Michels, Joe Hockberger, Greg Goral, Pat Herzog, Robert Westphal, Tim McGuire, Craig Vandaelle, Brenden Tippets, Matt Smith
817 W. Main St.
PO Box 128
Brownsville, WI 53006 USA
920-583-1448
michels.us



Midwest Mole Inc.

Daniel Liotti, Gary Gagliardi, Brian Brown, Jason Miller, Liviu Ciocan, Steve Abernathy, David Howell, Jason Faucet, Joseph Butor, Ryan Barkdull, Eric Whiteside
6814 W. 350 N.
Greenfield, IN 46140 USA
317-545-1335
midwestmole.com



Miller Pipeline Corp.

Chris Schuler, Ralph Miller, Kevin Miller, Butch Lanaville, Jeff Newman
8850 Crawfordsville Rd.
PO Box 34141
Indianapolis, IN 46234 USA
317-293-0278
millerpipeline.com



Milliken Infrastructure Solutions

John Hepfing, Scott Naiva, Joe Royer, Dave Keaffaber, Jaclyn Deter
1300 Brownwood Ave.
LaGrange, GA 30240 USA
706-880-5054
infrastructure.milliken.com

Mott MacDonald

Michael Vitale, Glenn Duyvestyn, Rory Ball, Rodney Fredericks, Sarah Hammerschmidt, Chris Petta, David Watson, Justin Lianides, Alex Prieto
18013 Cleveland Parkway Dr.
Suite 200
Cleveland, OH 44135 USA
216-535-3652
mottmac.com



mtsPerforator

Eugene Lockhart
4700 Rockside Rd.
Suite 135
Independence, OH 44131 USA
216-990-8005
mtsperforator.de

Munson Pump Systems

Jim Patalano
7398 San Joaquin St.
Sacramento, CA 95820 USA
916-389-7878

Murraysmith

Brendan O'Sullivan, Marshall Meyer, Jason Leman, Dennis Galinato, Kyle McTeague, Rob Lee
888 SW. 5th Ave.
Suite 1170
Portland, OR 97204-2012 USA
503-225-9010
murraysmith.us



National Liner

Scott Roth
375 Williamstowne
Suite 102
Delafield, WI 53018 USA
800-547-1235
nationalliner.com



Neptune Coring

Ben Campbell, Mitchell Campbell, Lars-Erik Larsen, Sabjinder Singh, Justin Goertzen, Ryan Finley
21521 112 Ave.
Edmonton, AB T5S 2T8 Canada
780-486-4050
neptunecoring.com

Corporate Members

North American Pipe Corp.

Mark Dasilva, Robert Eads, Jessica Williams, Rowena Patenaude, Shawn Dunlop, Kyle Kutzak, Greg Corbin, David Moore, Suzanne Scott, Keith Moggach, Preston Creelman, Armand Hoover
750 E. Swedesford Rd.
Valley Forge, PA 19043 USA
610-341-7656
royalbuildingproducts.com

Northeast Remsco Construction Inc.

Richard Palmer, Robert Ross, Peter Sudkamp, Alberto Solana, Giovanni Scotto, Rolando Acosta, George Gutierrez
1433 Rt. 34
Bldg B1
Farmingdale, NJ 07727 USA
732-557-6100
northeastremasco.com

Oxford Plastics

David Sardinha, Sheila Sardinha
101 Dexter Rd.
East Providence, RI 02914 USA
401-497-0821
oxfordplasticsusa.com

Pacific Boring Inc.

David Cline, John Iles, Steve Gallyer, James Gardner, Brad Gardner
PO Box 727
1985 W Mountain View Ave.
Caruthers, CA 93609 USA
559-864-9444
pacificboring.com

Permalok – A Northwest Pipe Company

Henry Goff, Trevor Gonterman, Eric Stokes, Shane Zeeman, Brent Keil, Rich Mielke
472 Paul Ave.
St. Louis, MO 63135 USA
314-888-6811
permalok.com



PICA Corp.

Dave Russell, Ed Brain, Ad Shatat, Chris Garrett
4909 75 Ave.
Edmonton, AB T6B 2S3 Canada
780-468-6800
russelltech.com



Picote Solutions Inc.

Katja Lindy-Wilkinson, Tony Decavitch, Jake Saltzman
20810 SE. 18th Pl.
Sammamish, WA 98075 USA
425-505-0646
picotesolutions.com



Pipe Lining Supply

John Heisler
2970 E. La Palma Ave.
Suite J
Anaheim, CA 92806 USA
888-354-6464
pipeliningsupply.com

PipeFlo Contracting Corp.

Julia Noble
111 Frid St.
Hamilton, ON L8P 4M3 Canada
905-572-7767
pipeflo.ca

Pipelogix Inc.

Jeremy Wagner
36945 Cook St.
Suite 102
Palm Desert, CA 92211 USA
760-779-1700
pipelogix.com



PipeMedic by QuakeWrap Inc.

Mo Ehsani, Tyler Adams, Josh Ahumada
6840 S. Tucson Blvd.
Tucson, AZ 85756 USA
520-791-7000
pipemedic.com



Plastics Pipe Institute

Camille Rubeiz, Dede Hart
2839 Maple Ln.
Fairfax, VA 22031 USA
469-499-1050
plasticpipe.org

PreTec Directional Drilling, a division of Precision Pipeline LLC

Bill Colson, Carter Larson
3314 56th St.
Eau Claire, WI 54703 USA
715-874-4510
pretecd.com

Prime Resins Inc.

Michael Vargo, Billy George, Dave Barton, Adam Goldstone, Kevin Anthony, David Dingler
2291 Plunkett Rd.
Conyers, GA 30012 USA
770-388-0626
primeresins.com



Progressive Pipeline Management

David Wickersham, Christopher Hein, Mario Carbone, Jean Rivard
10 Marissa Ct.
Atlantic Highlands, NJ 07716 USA
732-291-6093
progressivepipe.com

Protective Liner Systems Inc.

Jerry Trevino, Ron Lyons, Joseph Trevino, Nick Lyons
PO Box 921
Lithonia, GA 30058 USA
770-482-5201
protectivelinersystems.com



Pure Technologies Ltd.

Karen Magalhaes, John Galleher, Norvin Eitzen, Edward Padewski, Myron Shenkirky, Jimmy Stewart
5055 Satellite Dr.
Unit 7
Mississauga, ON L4W 5K7 Canada
905-624-2470
puretechltd.com



Radius HDD Direct LLC

Riff Wright
PO Box 3106
Weatherford, TX 76086 USA
800-892-9114
radiushdd.com

Raedlinger Primus Line Inc.

Andreas Fleischmann, Trey Fuller
112 S. Tryon St.
Suite 1130
Charlotte, NC 28284 USA
704-733-0065
primusline.com

Rain for Rent

John Lake, Charlotte Storms, Paul Reilly, Brian Brandstetter, Chris Schill, Todd Dahlstrom
PO Box 2248
Bakersfield, CA 93303 USA
661-399-9124
rainforrent.com

Ramvac Vacuum Excavators

Chris Falk
1590 Dutch Rd.
Dixon, IL 61021 USA
815-600-1171
sewerequipment.com

RapidView LLC

Rex Robison, Matthew Sutton, David Daake, Andy Melton, Guy Leslie, Kris Robison, Richie Notz
1828 West Oslen Rd.
Rochester, IN 46975 USA
574-224-8953
rapidview.com

Rausch Electronics USA LLC

Gregory Hall, Josh Frankenfield, Mike Coons
1686 Opportunity Ave.
Chambersburg, PA 17201 USA
717-372-4878
rauschusa.com



Reline America Inc.

Mike Hoffmaster, Jeff Van Huet, Michael Burkhard, Tim Cook
116 Battleground Ave.
Saltville, VA 24370 USA
276-496-4000
relineamerica.com

The Robbins Co.

Brian Sethman
29100 Hall St.
Solon, OH 44139 USA
253-872-0500
therobbinscompany.com

RS Technical Services Inc. (RST)

Chris Remillard, James Dorough, Bob Grenier
1327 Clegg St.
Petaluma, CA 94954 USA
800-767-1974
rstechserv.com

SAK Construction LLC

Charlie Kuhnmuench, Cory Street, Jerry Shaw, Steve Hirtz, Casey Smith, Joe Feuerborn, Robert Stier, Anthony Aderhold
864 Hoff Rd.
O'Fallon, MO 63366 USA
636-385-1100
sakcon.com

Sanexen Environmental Services Inc.

Michael Davison, Martin Bureau, Robert Dumais, Ron Glive, Ben Cote, Alain Sauriol, Jeff Coffman
9935 Catania Ave.
Entrance I- Suite 200
Brossard, QC J4Z 3V4 Canada
450-466-2123
sanexen.com



Sauereisen Inc.

Mackenzie Paesano, John Davis
160 Gamma Dr.
Pittsburgh, PA 15238 USA
412-963-0303
sauereisen.com

SGS Consulting Group Ltd.

Blair Seeley, Malcolm Catto, Phil Sheridan, Doug Woo, Paul Gioacchini
30 Centurion Dr.
Suite 100
Markham, ON L3R 8B8 Canada
905-475-1900
scsconsultinggroup.com

Sealing Systems Inc.

Pam Sawatzke
9350 County Rd. 19
Loretto, MN 55357 USA
800-478-2054
sssealingsystems.com



Sekisui SPR Americas LLC

Ryan Shallenberger, Chris Lind, Klaus Langenbach, Jacquie Jaques, Christine Carroll
4125 Welcome All Rd.
Suite 100
Atlanta, GA 30349 USA
678-510-1820
sekisuispra.com

SewerVUE Technology Corp.

Nicholas Goertz
7993 Enterprise St.
Burnaby, BC V5A 1V5 Canada
604-421-0600
sewervue.com

Shanghai Construction Group (Canada) Corp.

Michael Badry, Zhongquan Fu, KC Er, Junfeng Ye, Tao Wang
11810 Kingsway Ave.
Edmonton, AB T5G 0X5 Canada
780-455-2207
scg.com.cn

Sinclair Well Products and Services

John Voigt
10602 Midway Ave.
Cerritos, CA 90703 USA
619-300-4518
sinclairwp.com



SIPP Technologies LLC

Kent Weisenberg, Xuanchen Yan, Lin Li
5425 Old Kings Rd.
Jacksonville, FL 32254 USA
9418898318
sippotech.com

SoilFreeze Inc.

Michael McMillan
5931 238th St. SE
Suite 201
Woodinville, WA 98072 USA
206-420-2759
soilfreeze.com

Sprayroq Inc.

Jeremy Huckaby, Art Nilsen, Robert Emmerson
4766 Grantswood Rd.
Suite 150
Irondale, AL 35210 USA
205-957-0020
sprayroq.com



Staheli Trenchless Consultants

Kimberlie Staheli, Joel Staheli, Jake Andresen, Melissa Staheli, Brad Moore, Heidi Howard, Mark Hutchinson
5405 196th St. SW.
Lynnwood, WA 98036 USA
425-205-4930
stahelitrenchless.com

Stantec Consulting Ltd.

Dave Krywiak, Kent Pease, Tony Petrucci, Colin Goodwin, Simon Jeater, Robin Clysdale, Joel Sawatzky, Gerald Bauer, Greg Tippet, Erez Allouche, Juan Morales, Chad Schwartzentruber, Todd Simenson, Joe Linseman, Carrie Murray, Keivan Rafie, Albert Ruiz, Lauren Young, Lawrence Onwude, Olugbenga Ibikunle, Don Silar, Yong Wu, Sam Brancheau, Mark Oberschmidt, Anil Dean, Stephen Maceachern, Jon Pearson, Don Del Nero, Steven Fradkin, Victor Olson, Noel Guercio, Luke Murry, Gregory Hill, Nick Goodenow, Srinil Vallabhaneni, Russell Snow, Mohammad Djavid
10160 112 St.
Edmonton, AB T5K 2L6 Canada
780-917-7101
stantec.com



The Strong Company Inc.

Tim DeJarnette, Emily Lanier, Brian Baughman, Laurel Maranto, Mike Kappler, Bill Strong
455 Emmett Sanders Rd.
Pine Bluff, AR 71601 USA
870-535-7617
strongseal.com



Subsite Electronics

Jeri Lamerton, John Lamerton, Vikki Beier, Levi Valdois
1950 W. Fir St.
Perry, OK 73077 USA
580-370-1459
subsite.com

Sunbelt Rentals

Carrie Gordon, Ladd Gould, Mike Rosbrook, Brant Williams, Carrie Gordon, Tiffanie Mendez
2341 Deerfield Dr.
Fort Mill, SC 29715 USA
678-725-2553
sunbeltrentals.com

Tanner Pacific Inc.

Amelia Wheeler, Daniel Huebner, Jack Cate, Joel Cabrera, David Cusack, Anthony Riddell, Michael Jaeger
751 Laurel St.
Suite 609
San Carlos, CA 94070 USA
650-585-4484
tannerpacific.com

Tecvalco Ltd.

Mike Currie
3481 Stanley Ave.
Niagara Falls, ON L2J 0E4 Canada
866-317-0131
tecvalco.com

Texel Technical Materials Inc.

Louis Bouffard, Richard Faucher, Myriam Simard
485 rue des Erables
Saint-Elzear-de-Beauce, QC G0S 2J0 Canada
418-387-5910
texel.ca



The Toro Co.

Kevin Conry, Brandon Yee, Neil Borenstein, Denny Glasco, Gaylord Richey, Butch Greeninger
8111 Lyndale Ave. S
Bloomington, MN 55420 USA
962-221-4025
thetorocompany.com

TLC Plumbing and Utility

Matt Lehman, Michael Chavez, Brian Baughman
5000 Edith Blvd. NE
Albuquerque, NM 87107 USA
505-761-9696
tclplumbing.com

Transwest Truck Trailer RV

Mike Grieco, Jeremiah Brodal, Brian Bata
20770 E. I-76
Brighton, CO 80603 USA
303-775-2895
transwest.com

Trelleborg Pipe Seals Milford Inc.

Tim Sparrow, Keith Morrison, John Kent, John Shaw, Ryan Klachko, Mark Yanzo
250 Elm St.
PO Box 301
Milford, NH 03055 USA
617-455-5967
trelleborg.com/en/pipe-seals

Trenchless Equipment Co.

Mike Ellis
444 W. 610 S.
Orem, UT 84058 USA
801-227-9710
trenchless.net

Trenchless Marketing Inc.

Matt Benton
4 S. San Francisco St.
Suite 4
Flagstaff, AZ 86001 USA
702-533-3175
trenchlessmarketing.com

Corporate Members



TRIC Tools Inc.

Michael Lien, John Rafferty, David Huff
1350 S. Loop Rd.
Suite 104
Alameda, CA 94502 USA
510-865-8742
trictrenchless.com



TRY TEK Machine Works Inc.

Debbie Miller, Dennis Burger
250 N. Main St.
Jacobus, PA 17407 USA
717-428-0570
trytek.com

TT Technologies Inc.

Chris Brahler, Rick Melvin, Kevin Nagle, Eddie Ward, Sarah Mahlik, Brian Hunter, Bill Jeffery
2020 E. New York St.
Aurora, IL 60502 USA
630-851-8200
tttechnologies.com

TuffRod Pipe Co.

Jim Kavadas
6680 Hodgson Rd.
Lino Lakes, MN 55014 USA
844-586-9354
tuffrod.com



Tulsa Rig Iron

Terry Flynn, Trevor Young, Troy Young, Steve Bartlett
4457 W. 151st St. S
PO Box 880
Kiefer, OK 74041 USA
918-321-3330
tulsarigiron.com

The Tunneling Co.

Harry Dickinson
10085 Dallas Dr.
Kamloops, BC V2C 6T4 Canada
250-573-7814
crossinggroup.com/
the-tunneling-company

UGI Utilities Inc.

Eric Swartley, Allen Fowler, Frank Bennett, Mark Connors
2525 N. 12th St.
Suite 360
Reading, PA 19605 USA
717-255-4357
ugi.com



ULC Robotics Inc.

Gregory Penza, Tony Hranicka, Nathan King, Robert Kodadek
55 Corbin Ave.
Bay Shore, NY 11733 USA
631 667-9200
ulcrobotics.com

Underground Magnetics Inc.

Michael Young
5555 NW. Beaver Dr.
Johnston, MO 50131 USA
515-505-0960
undergroundmagnetics.com

Underground Tools Inc.

Al Chancellor, Ann Peterson
6680 Hodgson Rd.
Lino Lakes, MN 55014 USA
763-354-2839
undergroundtools.com

Uni-Jet Industrial Pipe Services

Shane Cooper, Scott Klapprat, Ryan Slagerman, Ursula Baziuk, Christine Pull, Darrin Lukie
1900 Brookside Blvd.
Box 2 Group 200 RR2
Winnipeg, MB R3C 2E6 Canada
204-633-4879
unijet.ca

Urban Systems Ltd.

Jacob Scissons, Keith Fransson, Mohammed Elenany, Peter Mandzuik, Jared Halter, Scott Shepherd, Jan Korinek, Wade Turner, Jeremy Nutma
200 286 St. Paul St.
Kamloops, BC V2C 6G4 Canada
250-374-8311
urbansystems.com



Vactor Manufacturing Inc.

Kristy Gussarson, Ben Schmitt, Nick Bruhn, Bryan Blankenship
1300 W. Bartlett Rd.
Elgin, IL 60120 USA
847-622-7044
vactor.com

Vac-Tron Equipment LLC

Tim Fischer, Brian Showley, Tim Ross, Cori Walsh
27137 S. Hwy. 33
Okahumpka, FL 34762 USA
352-728-2222
vactron.com

Vermeer

John Milligan, David Wisniewski, Jeff Utter, Kayla Breja, Tod Michael, Tony Briggs
PO Box 200
1210 Vermeer Rd. E
Pella, IA 50219 USA
641-628-3141
vermeer.com



Vivax-Metrotech Corp.

Rich Jordan
3251 Olcott St.
Santa Clara, CA 95054 USA
408-734-1400
vivax-metrotech.com



Vortex Co.

Kit Jones, Andrew Gonnella, Scott Peterson, Brocklyn Stone, Matt Peterson
310 S. 6th
Richmond, TX 77469 USA
713-269-2333
vortexinfrastructure.com

Warren Environmental Inc.

Danny Warren, Steven Fortin, Greg Swartz, Max Silva
PO Box 1206
Carver, MA 02330 USA
508-947-8539
warrenenviro.com

Wearever Inspection Products Inc.

Tom Rebozo
2505 Navarra Dr.
#311
Carlsbad, CA 92009 USA
619-797-7371
trugritraction.com

Wilson & Company Inc.

Steve Salazar, Jesse Giuliano, Charles Loughman, Justin Klaudt, Garrett Lust, Brian Spano
1675 Broadway
Suite 200
Denver, CO 80202 USA
303-501-1239
wilsonco.com

The Wooten Co.

Brian Johnson, Don Gantt, Lee Campbell
120 N. Boylan Ave.
Raleigh, NC 27603 USA
919-828-0531
thewootencompany.com



Wyo-Ben Inc.

John Wornom, Tyson Smith, Stewart Krause
1345 Discovery Dr.
Billings, MT 59102 USA
406-652-6351
wyoben.com

Xylem Dewatering Solutions Inc.

Gregg Leslie, Laura Gibson, Robert Cloud, Mike Sturgill, Michael Ivory
84 Floodgate Rd.
Bridgeport, NJ 08014 USA
412-670-3247
xyleminc.com

Government, Utility and Education Members

Alderwood Water & Wastewater District

Paul Richart, Brigitte McCarty, Chris Schumacher, David MacDonald, Amy Johannes, Chris Danson, Lenny Vander Houwen
3626 156th St. SE
Lynnwood, WA 98087 USA
425-741-7967
awwd.com

Allegheny County Maryland

James Taylor, Mark Yoder
701 Kelly Rd.
Suite 300
Cumberland, MD 21502 USA
301-777-5942
alleghenygov.org

Anchorage Water & Wastewater Utility

Stephen Nuss, Jennifer Satterfield, Mark Queen, James Armstrong
3000 Arctic Blvd.
Anchorage, AK 99503 USA
907-564-2763
awwu.biz

Aurora Water Department

Adam Sharman, Ray Serrano, Swirvine Nyirenda, Andrea Long
15151 E. Alameda Pkwy.
Suite 4400
Aurora, CO 80012 USA
720-859-4402
auroragov.org

Beaufort Jasper Water & Sewer Authority

Ed Saxon, Jeff Boss, Frank Eskridge, Brian Chemsak
6 Snake Rd.
Okatie, SC 29907 USA
843-987-9249
bjwsa.org

Boston Water & Sewer Commission

Irene McSweeney, John Sullivan, Peter Salvatore, Timothy O'Donoghue
980 Harrison Ave.
Roxbury, MA 02119 USA
617-989-7447
bws.org

Boxelder Sanitation District

Teri Jesser, Ryan Kiefer, Noah Allison
3201 E. Mulberry
Unit Q
Fort Collins, CO 80522 USA
970-498-0604
boxeldersanitation.org

Carmel Area Wastewater District

Drew Lander, Daryl Lauer
3945 Rio Rd.
Carmel, CA 95922 USA
831-624-1248
cawd.org

Castro Valley Sanitary District

Landon Lochrie
21040 Marshall St.
Castro Valley, CA 94546 USA
510-537-0757
cvsan.org

Central Contra Costa Sanitary District

Alexandr Mestetsky, Mark Wenslawski, Amanda Schmidt
5019 Imhoff Place
Martinez, CA 94553 USA
925-228-9500
centralsan.org

Charlotte Water

Ethan Brown, Chris Allen, Mike Wirth, Keith Shirley, Micah Burgess
5730 General Commerce Dr.
Charlotte, NC 28213 USA
704-353-0295
charlottenc.gov

City and County of Denver - Public Works - Engineering - Wastewater Capital Projects Management

Charles Hart, Rand Peterson, Lisa Ferreira, David Shaw
2000 W. Third Ave.
3rd Floor
Denver, CO 80223 USA
303-446-3642
denvergov.org

City of Abbotsford

Rhys Francis, Tyagu Mathialagan, Tony Seibert, Gregg Densmore
32315 S. Fraser Way
Abbotsford, BC V2T 1W7 Canada
604-864-5514
abbotsford.ca

City of Bend

Jason Suhr, George Franklet, Joshua Robertson, Nick McAteer
710 NW. Wall St.
Bend, OR 97701 USA
541-317-3053
bendoregon.gov

City of Calgary

Jeffrey Galloway, Joanne Barrett, John Headley, Frank Flaviano, Ron Snoddon, Charles Pullan, Sclater Paterson, Sidney Vasishta, Steven King
625 25 Ave. SE
Calgary, AB T2P 2M5 Canada
403-268-4545
calgary.ca

City of Carlsbad

Terry Smith, David Hull, Lindsay Leahy, Lindsey Stephenson, Cathy Nhothsavath
5950 El Camino Real
Carlsbad, CA 92008 USA
760-603-7354
carlsbadca.gov

City of Columbus

Michael McCloud, Jeff Keener, Paul Fannin II, John Rubadue
1250 Fairwood Ave.
Columbus, OH 43215 USA
614-645-1486
columbus.gov

City of Dollard-des-Ormeaux

Anna Polito, Sabrina Dykes, Charlie Zambito, Eric Bélanger
12001 De Salaberry Blvd.
Dollard-des-Ormeaux, QC H9B 2A7
Canada
514-684-0722
ville.ddo.qc.ca

City of Durham

Jim Harding, Jeffrey Perrigo, Crystal Penton, Lisa Mitchell
1600 Mist Lake Dr.
Durham, NC 27704 USA
919-560-4381
durhamnc.gov

City of Eugene

Patrick Cox, David Starns, Robert Hallett, Mark Smith, Jennah Maier
99 E Broadway
Suite 400
Eugene, OR 97401 USA
541-682-5291
eugene-or.gov

City of Hamilton

Susan Jacob, Harry Krinas, TaufEEK Ameer, Michael Zantingh, Erika Waite, Gary Moore
77 James St. N
Suite 320
Hamilton, ON L8R 2K3 Canada
905-546-2424
hamilton.ca

City of Lethbridge Water & Wastewater

Darcy Fritz, Adam Campbell, Leanne Lammertsen, Randy Bobinec, Neal Povey, Douglas Kaupp
910 4 Ave. S
4th Floor, City Hall
Lethbridge, AB T1J 0P6 Canada
403-320-3097
lethbridge.ca

City of Loveland

Tanner Randall, Craig Weinland
200 N. Wilson Ave.
Loveland, CO 80537 USA
970-962-3715
ci.loveland.co.us

City of Medicine Hat

Evan Laturnas, Brian Graham, Allen Pribyl, Dayna Livingston, Glenn Kessler, James King, Kelly Lawson
2190 Brier Park Place NW
Medicine Hat, AB T1C 1S6 Canada
403-502-8035
medicinehat.ca

City of New York Department of Design + Construction

Mohsen Zargarelahi, Gurdip Saini, Eric Macfarlane, Shahram Jaromi, Thomas Leung
30-30 Thomson Ave.
Long Island City, NY 11101 USA
718-391-2095
nyc.gov

City of Pacifica

Brian Martinez, Doug Trade
700 Pacific Coast Highway
Pacifica, CA 94044 USA
650-922-4072
cityofpacificca.org

City of Port Coquitlam

Gary Goff, Roy Savage, Clarissa Brennan, Carven Ma
1737 Broadway St.
Port Coquitlam, BC V3C 2M9
Canada
604-880-3771
portcoquitlam.ca

City of Regina

Eden Jukes, Gregg Froh, Yafei Hu
1430 McIntyre St.
Regina, SK S4P 3C8 Canada
306-527-3670
regina.ca

City of Reno

Dave Kershaw, Dustin Waters, Jon Simpson
1 E. First St.
Reno, NV 89505 USA
775-689-2961
reno.gov

City of Richmond

Jamie Villaluz, Eric Sparolin, Elena Paller, Roger Keating, Milton Chan, Patrick Lai
6911 No. 3 Rd.
Richmond, BC V6Y 2C1 Canada
604-276-4014
richmond.ca

2019 NASTT's NO-DIG SHOW

March 17-21, 2019 | Chicago, Illinois



Attend NASTT's 2019 No-Dig Show for the networking events.

Strengthen relationships with existing customers, form new ones, and make invaluable connections in the ever-growing trenchless industry.

Networking events include: Kick-Off Breakfast, 18th Annual Educational Fund Auction and Reception, the Gala Awards Dinner and Reception and the Closing Luncheon.

Coffee Breaks and the Exhibit Hall showcasing more than 190 exhibitors are great networking opportunities too!

Plus

- Explore more than 190 trenchless exhibits!
- Attend NASTT's world-class educational program!
- Get involved in the ever-growing trenchless market!

nodigshow.com



The No-Dig Show is owned by the North American Society for Trenchless Technology (NASTT), a not-for-profit educational and technical society established in 1990 to promote trenchless technology for the public benefit. For more information about NASTT, visit our website at nastt.org.



Government, Utility and Education Members

City of San Jose

Amanda Lei, Mellownie Salvador, John Aquino
200 E. Santa Clara St.
Tower 5
San Jose, CA 95113 USA
408-535-8478
sanjoseca.gov

City of Santa Barbara

Lisa Arroyo, Dale Escobar, Louis Gutierrez
PO Box 1990
Santa Barbara, CA 93102 USA
805-564-5412
santabarbaraca.gov

City of St. Albert

Kate Polkovsky, Blair Roy, Larry Galye, Justin VanDorp, Meredith Willacy, Allen MacAllister, Brian Brost, Kevin Cole, Michele Habrylo
5 St. Anne St.
St. Albert, AB T8N 3Z9 Canada
780-459-1689
stalbert.ca

City of Stockton Municipal Utilities Department

Jeffrey Telmo, Ken Merkle, Juan Chavez
2500 Navy Dr.
Stockton, CA 95206 USA
209-937-5647
stocktongov.com

City of Surrey

Parwinder Athwal, Tim Arlt, Cameron Clark
6651 148 St.
Surrey, BC V3S 3C8 Canada
604-590-7235
surrey.ca

City of Vaughan Engineering & Public Works

John Paterson, Jennifer Rose, Jack Graziosi, Vince Musacchio, Paolo Masaro
2800 Rutherford Rd.
Vaughan, ON L4K 2N9 Canada
905-832-8562
vaughan.ca

City of Vernon

Mark Dowhaniuk, John Box, Geoff Mulligan, Sean Irwin
3001-32 Ave.
Vernon, BC V1T 2L8 Canada
250-550-3647
vernon.ca

City of Victoria

Derk Wevers, Nina Sutic-bata, Randy Chang, Carla Coghlan
1 Centennial Square
Victoria, BC V8W 1P6 Canada
250-361-0552
victoria.ca

City of Vista / Buena Sanitation District

Elmer Alex, Alfred Podraza, Tony White
200 Civic Center Dr.
Vista, CA 92084-6275 USA
760-726-1340
cityofvista.com

Colorado Springs Utilities

Holly Link, Dan Derksen, Susan Funchio, Justin Fecteau
1521 Hancock Expy.
Mailcode 1821
Colorado Springs, CO 80947 USA
719-668-4733
csu.org

Con Edison

Richard Trieste, Jake Pettinato
4 Irving Pl.
Room 2215-S
New York, NY 10003 USA
212-460-4830
coned.com

District of Saanich

Jeff Butcher, Peter Kelly, Sean Elliott, Nathan Robertson
770 Vernon Ave.
Victoria, BC V8X 2W7 Canada
250-475-1775
saanich.ca

EPCOR Coronation Yard

Albert Kwan, Mahendra Weeratunga, Thang Ho, Sara Kang, Michael Wong, Aniano Fornelos, Michael Kan, Arbind Mainali, Eduardo Jaramillo, Bernie Canlas, Shiva Shankar, Eric Magtoto, Emilia Rojas, Diana Lu, Nadia Kushka, Max Mao, Allen Xu
14323 - 115 Ave.
Edmonton, AB T5M 3B8 Canada
780-613-4178
epcor.com

EPCOR Drainage Services

Binod Rajbhandari, Darwin Smith, Minnan Liu, Jagdish Tailor, Arjun Aryal
14323 - 115 Ave.
Edmonton, AB T5M 3B8 Canada
780-496-5550
epcor.com

EPCOR Utilities Inc

Tina Yanitski, Gary Eggen, Joseph Areghan, Shawn Rajendra
12116-107 St.
Edmonton, AB T5G 2S7 Canada
780-412-3446
epcor.com

Gwinnett County Water Resources

Phillip Page, Willis Manis, Christopher Miller, Robert Deaton
684 Winder Hwy.
Lawrenceville, GA 30045 USA
678-376-6700
gwinnettcounty.com

Halifax Water

Sheldon Parsons, Danny Patey, Thoren Pelley, Shawn Rowe, Dino Amaral, Chris Weeks, Jamie Hannam, Susheel Arora, Cedric Williams
PO Box 8388 RPO CSC
Halifax, NS B3K 5M1 Canada
902-490-1781
halifaxwater.ca

Incline Village GID

Mike Lefrancois, Joe Pomroy, Brad Johnson, Jim Youngblood
1220 Sweetwater Rd.
Incline Village, NV 89451 USA
775-832-1274
ivgid.org

Joint Meeting of Essex & Union Counties

James Paluch
500 S. First St.
Elizabeth, NJ 07202 USA
908-353-1313
jmeuc.com

Long Beach Water Department

Edward Mendoza, Jinny Huang, Robert Verceles, Wendy Chen, Joe Quiroz, Tyler Powell
1800 E. Wardlow Rd.
Long Beach, CA 90807 USA
562-570-2322
lbwater.org

Louisiana Tech

Mohammadamin Azimi, David Iseley, John Matthews, Shaurav Alam
1207 Agriculture Dr.
Ruston, LA 71270 USA
318-243-8106
latech.edu

Metropolitan Water Reclamation District of Greater Chicago (MWRDGC)

Kevin Fitzpatrick, Carmen Scalise, Joanna Jacobs, Frederick Wu
111 E. Erie St.
Chicago, IL 60611 USA
312-751-3163
mwrdd.org

Ministère des Transports, de la Mobilité durable et de l'Électrification des transports (MTMDET)

Eric David, Bolduc Maxime, Jean-Francois Demers, Marilyn Swiderski
880, chemin Sainte-Foy, 3e étage
Quebec, QC G1S 2L2 Canada
418-643-8577
transportsgouv.qc.ca

Mohawk Valley Water Authority

James Bednarczyk, Christopher Carmody, Richard Goodney, Joseph Gazzal
1 Kennedy Plaza
3rd Floor
Utica, NY 13502 USA
315-792-0329
mvwa.us

Murfreesboro Water and Sewer Dept.

Valerie Smith, Jim Stacey, Matthew Powers
220 NW. Broad St.
Murfreesboro, TN 37130 USA
615-848-3200
murfreesborotn.gov

Niagara Region

Joseph Tonellato, Kyle Moate, Glenn Fulton, Greg Epp, Michelle Moore
3501 Schmon Pkwy.
Thorold, ON L2V 4T7 Canada
905-685-4225
niagararegion.ca

Northeast Ohio Regional Sewer District

Robert Auber, Anthony Vitale, James Jones, Richard (Scott) Keith, Matthew Waite
3900 Euclid Ave.
Cleveland, OH 44115 USA
216-881-6600
neorsd.org

Orange County Sanitation District

Brad Moore, Raul Cuellar, Yvonne Dake, Martin Dix
10844 Ellis Ave.
Fountain Valley, CA 92708 USA
714.861.2615
ocsd.com

Region of Halton

Martin Larkin, Jason McCauley, Mark Bajor, Brena Kingsmill, Rick Ranalli, John Duong, Kiyoski Oka, Jacek Pawlus
1151 Bronte Rd.
Oakville, ON L6M 3L1 Canada
905-825-6000
halton.ca

Government, Utility and Education Members

Ross Valley Sanitary District

Katherine Hayden, Stephen Miksis,
Manuel Vigil, James Smith Ross
2960 Kerner Blvd.
San Rafael, CA 94901 USA
415-259-2949
rvsd.org

Salt Lake City Department of Public Utilities

Jason Brown, Michael Velarde,
Alex Christensen, Jenni Oman,
Steve Terry
546 Water Wheel
Stansbury Park, UT 84074 USA
801-259-0735
slcgov.com

Seattle Public Utilities

Aziz Alfi, Susie Larson, Caroline
Barlow, Reed Blanchard
700 5th Ave.
No. 4900
Seattle, WA 34018 USA
206-386-1834
seattle.gov

South Adams Water & Sanitation District (SACWSD)

Abel Moreno, R. Evans, Joseph
Sandoval
10200 E. 102nd Ave.
Henderson, CO 80640 USA
720-206-0590
sacwsd.org

Spartanburg Water

Ronald Champion, Brian Smith,
Wesley Arrowood
301 South Ave.
Spartanburg, SC 29306 USA
864-598-7204
spartanburgwater.org

Tahoe-Truckee Sanitation Agency

Aaron Carlsson
12084 Lariat Ln.
Truckee, CA 96161 USA
442-236-1720
ttsa.net

Town of Cary

Robert Hirt, Lynn Brilz, Dave
Hallgren, Jonathan Lane
PO Box 8005
Cary, NC 27512 USA
919-481-5099
townofcary.org

Town of Flower Mound

Clayton Riggs, Tiffany Bruce,
Brian Waltenburg
2121 Cross Timbers Rd.
Flower Mound, TX 75028 USA
972-874-6411
flower-mound.com

Town of Grand Falls-Windsor Engineering Dept

Nelson Chatman, Roger
Waugh, Derrick Hounsell, Chad
Cledenning
5 High St.
Grand Falls-Windsor, NL A2A 2J8
Canada
709-489-0426
grandfallswindsor.com

Upper Trinity Regional Water District

Kurt Staller, Adam McKnight,
Ronna Hartt, Elizabeth Boddicker
PO Box 305
Lewisville, TX 75067 USA
972-219-1228
utrwd.com

West Valley Sanitation District

Jorge Picado, Kevin Hatchett,
Edward Oyama, Jason Cumbo,
Alan Kam
100 E. Sunnyoaks Ave.
Campbell, CA 95008 USA
408-378-2407
westvalleysan.org

educate • train • research • publish

NASTT
TM

NASTT CENTER OF EXCELLENCE
PIPE BURSTING

DEDICATED TO TRENCHLESS EXCELLENCE

NASTT's new Pipe Bursting Center of Excellence will elevate the profile of the pipe bursting method throughout the trenchless industry. The Center of Excellence will act as an educational resource and forum for utilities, contractors, and manufacturers to share information and continue to advance this trenchless methodology.

NASTT's Pipe Bursting Center of Excellence will provide leadership in:

- Education
- Standards
- Networking
- Best Practices
- Training
- Research

Find out more about NASTT's Pipe Bursting Center of Excellence today!

nastt.org North American Society for Trenchless Technology
14500 Lorain Avenue #110063 • Cleveland, Ohio 44111
Phone: 888-993-9935



PPI issues advisory for substandard pipe

THE PLASTICS PIPE INSTITUTE INC. (PPI) has issued a warning about substandard high-density polyethylene (HDPE) pipe that does not comply with the relevant product industry standards.

PPI made the Sept. 4 announcement after HDPE had been found in the oil and gas gathering operations of the Permian and Delaware basins in Texas and New Mexico, according to the association. These pipelines are not marked in accordance with the relevant product standard requirements, and therefore, may not comply with those product standards. Pipe that is not properly marked or certified provides no assurance of product quality and may not perform as intended for the application. The notice extends to other areas where HDPE pipe is widely used, such as in potable water, force main sewers, industrial and mining applications.

"We're issuing this advisory because we are seeing HDPE pipes that have significant quality issues," stated Tony Radoszewski, CAE, president of PPI. "In some cases, neither the manufacturer nor the origin of the pipe could be identified. A properly marked HDPE pipe includes relevant standards on the pipe's printline to identify piping materials that meet specific standards, and to help confirm that the pipe is suitable for its intended purpose."

PPI is the major North American plastic pipe trade association with many of its member companies producing resins, pipe, fittings and components.

AOC Resins parent company acquired by CVC Capital Partners

AOC RESINS' PARENT COMPANY, The Alpha Corp. of Collierville, Tennessee, recently signed a definitive agreement with CVC Capital Partners Fund VI to be acquired.

The transaction includes AOC LLC the primary asset and wholly owned subsidiary of The Alpha Corp. Upon completion of the transaction, AOC, under the ownership of CVC, plans to work closely with Swiss-based Aliancys, a manufacturer of quality resins and a CVC portfolio company, to create a global leader in the industry. Aliancys' products are sold to various composite end users in the automotive, building and construction, marine and relining/CIPP sectors.

"AOC is excited about the partnership with CVC Capital Partners as the company moves forward on a new path to future growth that will allow AOC to better serve new and existing customers, strengthen our supply chain, and create additional growth opportunities for our suppliers around the world," said Fred Norman, CEO of AOC, "Aliancys has excellent customer relationships and represents a great strategic and complementary fit with AOC as a market leader in global resin chemistries."

HammerHead Trenchless unveils new purpose-built CIPP trailer



HAMMERHEAD TRENCHLESS, a Charles Machine Works company, recently introduced a new, purpose-built trailer for cured-in-place-pipe (CIPP) applications that gives installers a uniquely versatile and efficient workstation suited to almost any job they encounter.

The LT-20PRO features a modular design with all storage, electrical power and air supply needed for a wide range of lateral lining tasks. The configuration is customizable, allowing the customer to tailor it to their specific needs and avoid duplication of existing equipment. The 20-ft-long trailer's modular design not only maintains an efficient workspace during installations but keeps all components secure and at-the-ready while traveling from job to job.

On more restrictive job sites, all equipment in the LT-20PRO can be unmounted for easy relocation. "Our trailer's modular design accommodates the widest range of environments, difficult site conditions and logistics," said Matt Gabrielse, HammerHead product manager. "Versatility was key in creating these trailers for our customers, but in cases where it is necessary to work from a roof or inside a large building, our rig allows key components to be easily removed from the trailer to work remotely."

Each trailer can be outfitted with the desired inversion drum size, curing equipment, reinstatement and drain cleaning tools to meet each customer's individual needs. HammerHead LT-20PRO CIPP trailers are also available ready-made for immediate sale and delivery. To learn more, visit hammerheadtrenchless.com.



Trenchless work keeps BT Construction positioned as a leader in underground infrastructure

BT CONSTRUCTION WAS BORN OF HUMBLE BEGINNINGS IN 1980. Equipped with a small excavator and a few great employees, Bob Bergstrom and John Turner set out to establish a utility construction company that would be a new standard in the Denver market. Now, 38 years later, BT Construction has become a leader in underground utility and infrastructure construction across the Western United States.

BT Construction is a common name amidst the community of contractors. BTrenchless, a division of BT, performs

trenchless construction and enjoys a resume comprised of some difficult and high-profile projects across several states. The capabilities of BTrenchless ranges from small diameter auger bores to 10-ft diameter microtunnels. Its arsenal of equipment includes tunnel boring machines, pneumatic hammers, guided boring machines, custom hand tunnel shields, and an array of other equipment. Supported by the open cut capabilities of parent company BT Construction, BTrenchless is able to provide complete utility services for owners and municipalities.

Recently, BTrenchless has completed several interesting projects. In the City of Denver, a 210-lf, 10-ft diameter storm sewer was installed under the Union Pacific Rail Yard. In the mountains, a curved

TBM restored the Michigan Ditch after a landslide that cut off a major source of water. In Fort Collins, a 14-ft pedestrian and equestrian tunnel was installed under the BNSF Railroad embankment.

BTrenchless has a long history of success using trenchless technology in overcoming challenges and solving the problems inherent with underground construction. Combining a history of experience with new technologies, BTrenchless is always looking at ways to complete projects in a better, safer and more economical manner. With every passing year, utility corridors are getting more crowded, social and environmental costs are increasing, and the need for creative trenchless solutions are ever increasing. BTrenchless is looking forward to what tomorrow holds.

BTrenchless
A Division of BT Construction

LEADING THE INDUSTRY
THROUGH CUTTING EDGE
TECHNOLOGY AND INNOVATION

MICROTUNNELING
PIPE JACKING
GBM/PILOT TUBE
AUGER BORING
PIPE RAMMING
HAND TUNNELING
PIPE BURSTING
SLIP LINING
VACUUM EXCAVATION

BTrenchless, a division of BT Construction, Inc. has become one of Colorado's most respected trenchless contractors, specializing in underground trenchless technologies. From remotely controlled laser guided techniques, to optically guided pilot tubes, BTrenchless utilizes the newest technologies that provide the most accurate and cost effective tunneling methods to date.

BTC
GENERAL CONTRACTORS
HENDERSON, COLORADO

WWW.BTRENCHLESS.COM
9885 EMPORIA STREET PHONE: 303-466-8309
HENDERSON, CO 80640 FAX: 303-466-8309



NASTT Chapter News



British Columbia

The British Columbia Chapter (NASTT BC) is continuing its efforts to introduce trenchless technologies into educational institutes. In 2017 and 2018, the chapter has had very promising meetings with the University of Victoria and the British Columbia Institute of Technology. Stay tuned for more information on how the chapter is looking to work with these organizations in the future.

NASTT BC has also developed an online Carbon Calculator to identify the reduction in greenhouse gases that can be realized using trenchless technology. The Carbon Calculator is the basis for a more sophisticated calculator being developed in conjunction with NYSEARCH, the R&D arm of several gas companies across North America. For more information, please visit utilitycarboncalculator.com.



Great Lakes, St. Lawrence & Atlantic

The Great Lakes, St. Lawrence & Atlantic (GLSLA) Chapter has held multiple CIPP Good Practices courses in the past two years and has partnered with such organizations as the national NASTT and ACWWA. The courses have been well attended and the GLSLA Chapter would like to thank ACWWA for its partnership in presenting the course and it looks forward to continuing to promote the trenchless industry in Atlantic Canada with ACWWA. For more information on GLSLA, events and chapter training sessions, please visit glsla.ca.



Mid Atlantic

The Mid Atlantic Chapter (MASTT) hosted a very successful Trenchless Technology, SSES and Buried Asset Management seminar in Pittsburgh on July 19 at the Hyatt Place – Pittsburgh – North Shore. The guest presenter was Shawn McWilliams, civil engineer for regional conveyance with the Allegheny County Sanitary Authority (ALCOSAN) in Pittsburgh, who presented on ALCOSAN's trenchless program in Pittsburgh. ASCE Pittsburgh Section was the seminar co-sponsor with special reduced fees. The seminar was a great success with a lot of learning and networking.

MASTT is planning a Trenchless Technology, SSES and Buried Asset Management seminar in Virginia Beach, Virginia on Oct. 3, 2018. Please plan to support and attend this seminar to enjoy the networking and learning. Please go to mastt.org to learn more about this seminar and/or to register online.



Shawn McWilliams, civil engineer for regional conveyance, Allegheny County Sanitary Authority (ALCOSAN), presents at MASTT's Trenchless Technology, SSES and Buried Asset Management seminar in Pittsburgh on July 19.

The *Mid Atlantic Journal of Trenchless Technology 2018* was published in late May 2018. The publication was distributed to more than 4,000 water and sewer decision makers in the MASTT area. Past journal issues can be seen online at mastt.org.



Midwest

The Midwest Chapter (MSTT) hosted a Trenchless Technology, SSES and Buried Asset Management seminar in Des Moines, Iowa, on Sept. 6 at the Embassy by Hilton Des Moines Downtown Hotel. The guest presenter was Steve Naber, city engineer with the City of Des Moines, who presented on Des Moines' trenchless technology work. APWA was the co-sponsor for the seminar. The seminar and offered seven PDHs.

MSTT has also proposed a Trenchless Technology, SSES and Buried Asset Management seminar to be held in Minneapolis/St. Paul on Nov. 8, 2018. Please plan to support and attend this seminar to enjoy the networking and learning. Visit mstt.org to learn more and to register.

MSTT had planned to publish its annual *Midwest Journal of Trenchless Technology 2018* in mid-September. To view past issues, visit mstt.org.



Northeast

The Northeast Regional Chapter of NASTT is continuing planning efforts for its 2018 annual conference, scheduled for Tuesday Nov. 13 in Mystic, Connecticut. A welcome reception will be held at Mystic Pizza on the evening of Monday Nov. 12. Prepara-

tion of the fall edition of the *Northeast Journal of Trenchless Technology Practices* is also underway. The Northeast Chapter is working with its student chapter at UMass Lowell to identify potential presentations and field trips to engage the next generation of trenchless experts during the fall semester. Please visit our nastt-ne.org for more information and to sign up for the fall conference!



Northwest

The Northwest Chapter is proud to be jointly presenting the TT2018 – TAC/NASTT-NW Tunnelling and Trenchless Conference in partnership with TAC featuring the theme Innovation in Underground Infrastructure. The conference will take place in Edmonton, Alberta, Nov. 7-9, at the Fantasyland Hotel at West Edmonton Mall.

Wednesday, Nov. 7 will feature a Microtunneling Short Course. Thursday, Nov. 8, and Friday, Nov. 9, will include all keynote and theme lectures, concurrent technical sessions and panel discussions. The TAC AGM will take place at the end of the technical sessions on Nov. 8, followed by the 2018 TAC Awards Banquet that evening. The NASTT-NW Project of the Year will be presented on Nov. 9. For more information on sponsorship opportunities, tradeshow booth sales and delegate registration, please visit tt2018.ca. For more info, please email gtippett@nastt-nw.com.



Pacific Northwest

The Pacific Northwest Chapter is in early talks regarding an NASTT training event this fall. The biennial symposium will be held in Portland in January 2019. The chapter is seeking volunteers to join the planning committee for this event. If you are a PNW member and interested in getting involved, please contact a PNW Chapter board member. More information is available at pnwnastt.org



Rocky Mountain

The Rocky Mountain Chapter (RMNASTT) is looking forward to a productive local conference come Nov. 1. We have a few exciting field trips in Utah that are lining up for September as well as our annual clay shoot at Kiowa Creek Sporting Club on Oct. 5. Since our last update, we have been reaching out to other state members associated with our chapter. In particular, we are currently forming local teams in Nebraska and Kansas with the idea of each state within our chapter having board representation, as well as a local team to drive events and annual conferences. RMNASTT is in process of updating and revamping its website and will be working to optimize the site through the search engines. The chapter is also looking for part-time administrative aid, as well as employing a public relations/marketing firm as we are starting to outgrow the capacity and time available to our volunteers and board members.



South Central

The South Central Chapter recently released its first annual Texas and Oklahoma Trenchless Report, a new publication highlighting some of the groundbreaking trenchless work being done within the region. The chapter will also be hosting its third annual Trenchless Technology Conference, Sept. 25-27, taking place for the first time at Oklahoma State University (OSU) in Stillwater, Oklahoma. The conference will include two full days of trenchless presentations, exhibits and networking, as well as the opportunity to partake in OSHA training activities offered by OSU. We hope to see you there! For more info, visit trenchless.ceatpd.okstate.edu.



Southeast

The Southeast Chapter

(SESTT) conducted a Trenchless Technology, SSES and Buried Asset Management seminar in Atlanta on May 9, 2018 at the Hilton Atlanta Northeast Hotel. The featured presenter was Maurice L. Horsey, IV, chief EPA municipal and industrial enforcement, with the U.S. EPA Region 4. Horsey presented on “Lessons Learned and Future Efforts” regarding trenchless construction including discussion about EPA’s past, present and future. ASCE’s Georgia Section served as the seminar co-sponsor. Seven PDHs were offered and the seminar was a great success.

SESTT has another Trenchless Technology, SSES and Buried Asset Management seminar proposed for Tampa, Florida, on Dec. 12, 2018. Please plan to support and attend the seminar to enjoy the networking and learning. Please visit sestt.org to learn more about the seminar and to register.

SESTT is also publishing its annual *Southeast Journal of Trenchless Technology 2018* in mid-November. Past journal issues are available at sestt.org. The publication will be distributed to more than 4,000 water and sewer decision makers in SESTT’s area.



Western

The Western Chapter of NASTT (WESTT) is in the final stages of planning its annual Western Regional No-Dig Conference and Exhibition. This year’s conference will be held Sept. 17-18 in Scottsdale, Arizona. The first day of the conference will include presentations of technical papers drawn from NASTT’s national No-Dig Show, and includes a variety of new installation and rehabilitation topics. The second day of the conference will offer the two Trenchless 101 courses: New Installations and Rehabilitation. The keynote speaker will be Jim Thompson, city manager for the City of Scottsdale. The Western Chapter is looking forward to another successful event! To learn more, visit westt.org.

Trenchless Technology Leads to Award for City Project



ENGINEERS IN THE CITY OF BLOOMINGTON, ILLINOIS PUBLIC WORKS DEPARTMENT received an award for the HoJo and Wittenberg Sewer Improvements Project, which used trenchless technology to make the construction of a gravity sewer more cost-effective than replacing a failing pump station. The American Public Works Association, Illinois Chapter awarded it Project of the Year for Environmental Projects in 2018.

The Howard Johnson (HoJo) Pump Station, which Bloomington put into service in 1977, began nearing the end of its useful life in 2013. When studying the options, engineers realized they had an opportunity to make the city's infrastructure more sustainable, because they could use trenchless technology to install gravity flow sewer pipes to eliminate the HoJo Pump Station. The same process could be used to eliminate the Wittenberg Pump Station, upstream from the HoJo Pump Station. The task would have been extraordinarily expensive if not for trenchless technology, because the sewer pipes needed to go underneath two interstates.

Engineers planned to use the technology in two different ways to make the construction of the gravity sewer cost-competitive with replacing two pump stations. Their first strategy repurposed 1,600 ft of previously-abandoned 12-in. force main. The repurposed 12-inch force main helped make the mile-long connection between the HoJo Pump Station and yet a third abandoned pump station. Engineers also planned to use an epoxy resin liner to line the original ductile iron force main. The engineers' second strategy leveraged the advantages of horizontal directional drilling to minimize the impacts to Interstate 55 and Interstate 74, which carry 47,000 vehicles per day. In two pulls, contractors installed 1,035 ft of 14-in. high-density polyethylene pipe (HDPE) that served as the casing. Then, they installed an epoxy resin liner as the

carrier pipe in order to satisfy Illinois Department of Transportation requirements for crossing sewers under highways. Each of these strategies provided significant cost savings and limited the impacts to the adjacent property owners.

The HoJo and Wittenberg Sewer Improvements Project is a great example of how The City of Bloomington Public Works Department maintains its commitment to providing excellence in stewardship and service. The department is figuring out the best ways to leverage trenchless technology by giving importance to educating staff. Using their talent and creativity, employees have found and will continue to find unique and cost-effective uses for trenchless technology in order to tackle projects with ordinary or extraordinary challenges. The Public Works Department provides training for trenchless technology in-house. This approach begins with ensuring that staff knows that digging doesn't solve all problems and raising awareness for what can be accomplished with the technology. The training ranges from informal chats in the hallway to formal training from the best in the industry.

Seventeen employees attended the three-day Pipeline Assessment Certification Program, offered by the National Association of Sewer Service Companies (NASSCO), in June 2018. By training employees on the North American Standard for defect identification and assessment, the department will be able to increase the amount of sewer work that can be provided in-house. Two employees participated in the Inspector Training and Certification Program, also offered by NASSCO. The certification allows the city to line sewers using cast-in-place pipe (CIPP). Sewer lining adds longevity to aging sewers by creating a new pipe within the old pipe, saving replacement costs and avoiding service interruptions. Crews lined 1,100 ft of 36-in. pipe in the city's downtown area without impacting downtown businesses and residences.



Contractors ran 670 feet of HDPE pipe under I-55/I-74 to use as a casing.

In conjunction with the CIPP program, Public Works set the bar for Central Illinois by performing lateral launches using closed-circuit television for every service prior to lining. This allows the city to disconnect abandoned sewer services that would have otherwise formed a sinkhole. During one project, crews identified 56 abandoned sewer services in 3 blocks within the city's downtown area that they were able to disconnect. That project eliminated 56 potential sinkholes due to the creative use of trenchless technology by city staff.

The City of Bloomington, Illinois Public Works Department maintains 254 miles of sanitary sewers, 85 miles of combined sewers, 9 miles of sanitary sewer force mains, and 244 miles of storm sewers in a community of 76,610 people. These pieces of infrastructure are fully funded by user fees that have an annual 3 percent increase to keep up with ever-increasing costs of infrastructure construction. This year, Bloomington's operating, maintenance and capital budgets included \$3.7 million for the stormwater management fund and \$7.2 million for sanitary sewer fund. There is no question that trenchless technology is a necessary tool for making the best use of these available funds.

This article was contributed by **LUKE THOLE, CIVIL ENGINEER, AND MICHAEL HILL, MISC. TECHNICAL ASSISTANT, FOR THE CITY OF BLOOMINGTON PUBLIC WORKS DEPARTMENT IN ILLINOIS.**

nastt chapters

NASTT has a network of 11 regional chapters throughout the United States and Canada. With a single NASTT membership, you're automatically enrolled in the national organization, the international organization (ISTT) and also in your regional chapter. Regional chapters offer valuable educational and networking opportunities in your local area. Share your ideas, network with colleagues and find solutions to your everyday challenges.



British Columbia

The British Columbia (NASTT-BC) Chapter was established in 2005 by members in the province of British Columbia, Canada.

Chapter Contact

Charlotte Wong
nasttbc@gmail.com
Website: nastt-bc.org

Elected Officers

Chair - Karl Mueller
Treasurer - Preston Creelman



Great Lakes, St. Lawrence & Atlantic

The Great Lakes, St. Lawrence & Atlantic (GLSLA) Chapter was established in 1995 and represents the Eastern Canadian perspective of the trenchless technology marketplace. GLSLA members are from Ontario, Quebec and the four Atlantic provinces.

Chapter Contact

Kevin Bainbridge
Phone: (905) 304-0080
kbainbridge@rcii.com
Website: glsla.ca

Elected Officers

Chair - Kevin Bainbridge
Vice Chair - Anna Polito
Secretary - Gerald Bauer
Treasurer - Derek Potvin



Mid Atlantic

The Mid Atlantic (MASTT) Chapter was established in 2004 by members from the states of Delaware, Maryland, New Jersey, Pennsylvania, Virginia, West Virginia and the District of Columbia.

Chapter Contact

Leonard Ingram
Phone: (888) 817-3788
leonard@engconco.com
Website: mastt.org

Elected Officers

Chair - Richard Thomasson
Vice Chair - Michael Delzingaro
Secretary - Dennis Walsh



Midwest

The Midwest (MSTT) Chapter was established in 1998 to promote trenchless technology education and development for public benefit in Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, Ohio and Wisconsin.

Chapter Contact

Jeff Boschert
Phone: (314) 229-3789
jeffboschert@ncpi.org
Website: mstt.org

Elected Officers

President - Jeff Boschert
Vice President - Chris Schuler
Secretary - John Milligan
Treasurer - Ryan Poertner



Northeast

The Northeast Chapter was established in 2015 by members in the states of Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island and Vermont.

Chapter Contact

Ian Mead
Phone: (508) 754-2201
IMead@tighebond.com
Website: nastt-ne.org

Elected Officers

Chair - Ian Mead
Vice Chair - Babs Marquis
Secretary - Eric Schuler
Treasurer - Marshall Gaston



Northwest

The Northwest Chapter was established in 1995 by members in the provinces of Alberta and British Columbia, Canada, and in Washington state. In 2005, the members in BC established the NASTT-BC Chapter. In 2009, members in Washington state established the Pacific Northwest Chapter and the Northwest Chapter adjusted the geographic area to include members in the provinces of Manitoba and Saskatchewan.

Chapter Contact

Greg Tippett
greg.tippett@stantec.com
Website: nastt-nw.com

Elected Officers

Chair - Greg Tippett
Vice Chair - Ben Campbell
Secretary - Jeff Galloway
Treasurer - Keith Moggach



Pacific Northwest

The Pacific Northwest Chapter was established in 2009 by members in the states of Alaska, Idaho, Oregon and Washington.

Chapter Contact

Brendan O'Sullivan
Phone: (503) 225-9010
brendan.o'sullivan@murraysmith.us
Website: pnwnastt.org

Elected Officers

Chair - Brendan O'Sullivan
Treasurer - Heidi Howard



Rocky Mountain

The Rocky Mountain Chapter was established in 2009 by members in the states of Colorado, Utah, Montana and Wyoming.

Chapter Contact

Chris Larson
Phone: (303) 791-2521
clarson@clwsi.com
Website: rmnastt.org

Elected Officers

Chair - Chris Larson
Vice Chair - Benny Siljenberg
Secretary - Swirvine Nyirenda
Treasurer - Stephanie Nix



South Central

The South Central Chapter was established in 2015 to serve the members of NASTT from Texas and the south central area of the United States.

Chapter Contact

Justin Taylor
Phone: (281) 686-1430
justin.taylor@cciadassociates.com

Elected Officers

Chair - Alan Goodman
Vice Chair - Jonghoon "John" Kim
Treasurer - Josh Kercho



Southeast

The Southeast (SESTT) Chapter was established in 2001 to serve the members of NASTT from Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and Puerto Rico.

Chapter Contact

Leonard Ingram
Phone: (888) 817-3788
leonard@engconco.com
Website: sestt.org

Elected Officers

Chair - Jerry Trevino
Vice Chair - Ed Paradis
Secretary - J. Chris Ford
Treasurer - Brent Johnson



Western

The Western (WESTT) Chapter was established in 2003 by members from the states of Arizona, California, New Mexico, Nevada and Hawaii.

Chapter Contact

Cindy Preuss
Phone: (925) 332-5221
WESTTchapter.org@gmail.com
Website: westt.org

Elected Officers

Chair - Brian Avon
Vice Chair - Lisa Arroyo
Secretary - Kathryn Wallin
Treasurer - Norman Joyal



nastt student chapters

Members of NASTT's Student Chapters attend and participate in NASTT's No-Dig Show where they present trenchless research posters, participate in competitions and provide event support monitoring the technical paper sessions. There are many benefits for students who belong to an NASTT Student Chapter – scholarships, networking opportunities, education and career opportunities to name a few. To learn more about NASTT's 20 Student Chapters, visit nastt.org/student-chapters.



University of Alberta Edmonton, Alberta

Advisor: Dr. Alireza Bayat
E-mail: abayat@ualberta.ca



Arizona State University Tempe, Arizona

Advisor: Dr. Samuel T. Ariaratnam
E-mail: samuel.ariaratnam@asu.edu



Bowling Green State University Bowling Green, Ohio

Advisor: Dr. Alan Atalah
E-mail: aatalah@bgsu.edu



California State Polytechnic University, Pomona

Advisor: Dr. Jinsung Cho
E-mail: jinsungcho@cpp.edu



Clemson University Clemson, South Carolina

Advisor: Dr. Kalyan Piratla
E-mail: kpiratla@clemson.edu



Concordia University Montreal, Quebec

Advisor: TBD



Indiana University - Purdue University Indianapolis

Advisor: Dr. Dae-Hyun (Dan) Koo, P.E.
E-mail: dankoo@iupui.edu



Kent State University Kent, Ohio

Advisor: Dr. Lameck Onsarigo
Email: lonsarig@kent.edu



Laval University Quebec City, Quebec

Advisor: Dr. Geneviève Pelletier, ing.
E-mail: Genevieve.Pelletier@gci.ulaval.ca



Trenchless Technology Center/ Louisiana Tech University

Ruston, Louisiana
Advisor: Dr. Shaurav Alam
E-mail: shaurav@latech.edu



University of Massachusetts at Lowell Lowell, Massachusetts

Advisor: Raj K. Gondle, Ph.D.
E-mail: RajKumar_Gondle@uml.edu



Montana Tech Butte, Montana

Advisor: Larry Hunter
E-mail: lhunter@mtech.edu



Oklahoma State University Stillwater, Oklahoma

Advisor: Jonghoon "John" Kim, Ph.D.
E-mail: jongkim@okstate.edu



Purdue University West Lafayette, Indiana

Advisor: Dr. Dulcy Abraham
E-mail: dulcy@purdue.edu



Queen's University Kingston, Ontario

Advisor: Dr. Ian D. Moore
E-mail: moore@civil.queensu.ca



Rutgers University New Brunswick, New Jersey

Advisor: Dr. Nenad Gucunski
Email: gucunski@rci.rutgers.edu



CUIRE/University of Texas at Arlington

Arlington, Texas
Advisor: Dr. Mo Najafi
E-mail: najafi@uta.edu



Vanderbilt University Nashville, Tennessee

Advisor: Dr. Sanjiv Gokhale
E-mail: s.gokhale@vanderbilt.edu



Virginia Tech University Blacksburg, Virginia

Advisor: Dr. Sunil Sinha
E-mail: ssinha@vt.edu



Learning about UV CIPP versus Steam and Water Cure CIPP in Portland, Oregon

Mark W. Hutchinson, P.E.

STAHOLI TRENCHLESS CONSULTANTS
PORTLAND OREGON

Erik Durshpek

CITY OF PORTLAND

THIS PAPER WILL EXPLAIN THE STEPS THE CITY OF PORTLAND (CITY) went through to gain experience with Ultraviolet Cured-In-Place-Pipe (UV CIPP) on three projects. Also, what was learned regarding how UV CIPP compared with steam and water cured CIPP in cost, quality, schedule, constructability, strength and public reaction.

Introduction

The City of Portland has over 2,500 miles of sewer pipes with most of them built prior to 1930 and in need of repair. The City started to rehabilitate pipes with Cured-in-Place Pipe (CIPP) since the 1980s to repair aging sewer and storm-water pipes, first with water cure and later steam cure when contractors began using this technology in the 1990s. CIPP has been a useful tool to rehabilitate the pipes from 6 in. to 60 in. in diameter. Over the years, we have learned many lessons on the difference between steam and water cure CIPP, from the experienced and less experienced installers and workman.

The City of Portland's pipe rehabilitation program has varied over the years from emergency-based replacement to programmatic basin focused pipe replacement. In 2011, we decided to put more emphasis on assessing our existing old sewer system. Having just finished with our \$1.4 billion combined sewer overflow system improvements in 2010, money was then made available to begin an aggressive program to rehabilitate the worst of the worst pipes in Portland utilizing CIPP, pipe bursting and open cut construction methods. This program was called the Large-Scale Sewer Rehabilita-

tion Program (LSSRP). The LSSRP is a \$250 million program to fix the structurally deficient pipes, mostly in the residential neighborhoods of Portland. We were installing 21 miles of pipe a year. CIPP was responsible for 15,000 to 30,000 lf, or a quarter of the new replacement pipe annually. This volume of work allowed the city to experiment and try some newer products and technology, such as UV CIPP. We hoped by adding another tool to our tool box we could achieve our pipe rehabilitation annual goals.

HOW WE DID IT

Initially we researched UV CIPP at the NASTT No-Dig shows and read articles in *Trenchless Technology*. Feeling the need to know more, we put together an in-house half-day session about UV cured CIPP. We invited three manufacturers to Portland from the East Coast and Europe to provide training and answer questions about UV CIPP, for our engineers, inspectors and consultants. This event demystified the product. We also came to realize that we did not have any local UV CIPP contractors in the Pacific Northwest. To attract UV CIPP contractors to the area, we decided to dedicate a large project from our LSSRP program to get experienced contractors to bid and dedicate a UV CIPP project in Portland. Unfortunately, other priorities got in the way. Three years passed and we still hadn't designed and bid a UV CIPP project. Then came the following opportunities to develop, implement, and learn about UV CIPP:

- The first was an emergency project to repair a 42-in. concrete pipe with a severely corroded crown, downstream from a force main discharge adjacent to the Portland Airport (NE 112th & Holman).
- The second was a three-week window of opportunity to rehabilitate century old pipes under our light rail tracks in Portland Central business area (SW Yamhill & Morrison).
- The third was a change order to a project calling for a CIPP rehabilitation to be used in an 8-in. pipe un-

der SE Powell, a major arterial (SE Powell Rehabilitation).

Working through these projects helped the city develop and refine specifications for UV CIPP in its large scale program that first started with listing UV CIPP as an alternate bid item to thermal CIPP when we bid out CIPP work in the LSSRP program. Unfortunately, due to price and lack of local contractor the UV CIPP alternate was not selected by our contractors who won the contracts. Realizing the need to do more, our engineers began extensive outreach to UV CIPP contractors around the country to be engaged in the city's sewer rehabilitation program and developments, which also helped the city's efforts in development of a large-scale project to be bid exclusively as UV CIPP.

PROJECTS

NE 112th & Holman

This was an emergency project to replace a failed 42-in. reinforced concrete pipe downstream from a sewer pressure line discharge after a sink hole developed, shown in Figure 1. The reinforced pipe had deteriorated due to hydrogen sulfide (H₂S) corrosion. This project was an emergency requiring a quick response due to the proximity to the Portland International Airport and because the sink hole closed the street used by semi-trucks serving the airport and also impacted accesses to three hotels. The city hired a contractor, on time and materials basis, to excavate the sink hole and install a sewage diversion system. Our maintenance engineers then developed a design to first replace the failed pipe with fiberglass reinforced pipe, then to line the remainder of the downstream pipe run that was affected by the H₂S with CIPP. The 42-in. HO-BAS pipe was procured and CIPP subcontractors were contacted for quotes, while the sewage diversion pumping system remained in place and was maintained by the open cut contractor. When the quotes came-in, the installer for water cured CIPP was less expensive but took six



Figure 1: Sink hole over failed 42-in. sewer requiring a quick repair

weeks longer to get manufactured as compared to the UV CIPP. The UV CIPP turned out cheaper, overall, when considering projected diversion costs and public disruption. A small local UV CIPP firm was hired by the open cut contractor. While the city was checking references and submittals of the UV CIPP subcontractor, the prime contractor installed the 42-in. HO-BAS pipe in the sink hole area. On the day of the lining the open cut contractor performed most of the support work to help facilitate the progress of the UV CIPP. The UV CIPP subcontractor showed up at 6 a.m. ready to clean and CCTV the pipe. Cleaning and the pre-CCTV inspection was done by 8 a.m. The CIPP installation began by 8 a.m. The light train for curing the liner was pulled thru at approximately 1 in. per minute, ends of the mainline were cut out by 10 p.m., and laterals reinstated by 12 a.m. (midnight). To maximize efficiency, the open cut contractor assisted the subcontractor with the installation of the liner using winches, equipment and workman they had close by, resulting in 402 ft of 42-in., 20 mm thick UV CIPP.

SW Yamhill & SW Morrison Project

The SW Yamhill & Morrison Sewer Repair Project came into being when Portland's Bureau of Environmental Services (BES) found out that the TRIMET Max light rail trains, located in Portland's

Central Business District were going to be closed for upgrades. These planned upgrades were scheduled to occur over a three-week period, working 24 hours/day, in May of 2017. This created an opportunity for BES to rehabilitate some of the oldest sewer in the city, located underneath train tracks during the closure. This project had a short timeline: the design, and procurement had to be completed in three months. The city looked at several options for contracting and determined that the best option was to design and administer the contract under the Urgent pipe contract more formally called the Price Agreement for Urgent Rehabilitation of Sanitary and Storm Sewers (PAURSS). Under the PAURSS contract the city completes a draft design and submits it to the contractor for pricing based on prearranged unit prices and estimated costs. The contractor returns an estimate and a final price is negotiated based on the scope. For this project, the scope of work required replacement of mainline sewers on two parallel streets SW Yamhill and SW Morrison Street, from Naito to SW 13th Ave.

The length proposed to be replaced was 6,000 lf of 100 to 140-year-old deteriorated sewer pipes. The pipes were in dire need of repair showing signs of cracks, breaks, holes, offset pipes, root and grease

obstructions. In the initial considerations, the work included open cut and CIPP type of work, but due to time constraints CIPP was the only option. Thru scope refinement, the project scope and estimate went from \$1.0 million to \$3.5 million. As the cost rose, concerns rose over handing a \$3.5 million contract to a single prime contractor and a single major subcontractor. When considering the City's goal of 20 percent minority subcontractor participation, this contract was not meeting the city's aspirational goals for contracting. To address this concern, we encouraged the prime contractor, JW Fowler, to subcontract as much work as possible to minority- and women-owned firms.

Additionally, the prime contractor was concerned with the 3-week time constraint window, and having one subcontractor not be able to complete the project on time. If they had an equipment breakdown, or a weather issue arose, they were concerned about the ability to maintain or divert flow. As a result, the CIPP subcontract work was to be split between two subcontractors. The work on SW Morrison St. was to be completed by Michels and work on SW Yamhill was to be completed by Final Liner, a small female-owned firm that does UV CIPP. This resulted in all mainline pipes on SW Yamhill Street to be lined using UV CIPP,



Figure 2: Inserting 10-in. UV CIPP liner on SW Yamhill St. located underneath railroad tracks.

and pipes on SW Morrison Street to be lined with conventional Polyester Thermal Cure CIPP.

Some of the project challenges included lining mainline pipe segments that are adjacent to historic buildings varying from five to 20 stories, with major utilities, and vaulted basements protruding well into the right-of-way (in some cases to the face of curb). These challenges posed major implications with sewage diversion, in some cases impossible with the time constraints the project was up against.

JW Fowler worked around the clock, 24 hours/day and seven days/week, from March to May installing cleanouts and preparing flow diversions. In addition, JW Fowler and the city were meeting with building owners to design and plan sewage diversions where deemed feasible.

When the three weeks in May arrived approximately 14 mainline segments, out of the 24 mainline segments planned, were available to be lined. Michels came in and lined one line after the next and left, after completing six of 12 segments. Final Liner, with JW Fowler's assistance, lined eight of 12 segments over the three weeks that were available. At the end of the three weeks in May, there were 1,445 lf of UV CIPP installed, ranging from 9 in. in diameter to 20 in. in diameter, and a total 1,700 lf of thermal cure CIPP was installed ranging from 10 in. in diameter to 16 in. in diameter; 1,355 lf of thermal cure CIPP and 1,120 lf of UV Cured CIPP were uninstalled. Because either lateral could not be located or laterals could not be accessed for installing a sewer diversion in the time available work could not proceed; independent of whether the liners were UV Cure CIPP or Thermal Cure CIPP. To make things worse Finaliner experienced theft of the light train equipment, and lost some of their more experienced staff/ workforce. These posed additional challenges to completing the project within the time constraints.

In the following months, the unused and wetted-out thermal cure CIPP liners expired and were discarded. The city is continuing to work with the prime contractor, and building owners, to complete the flow diversion plans required to finish

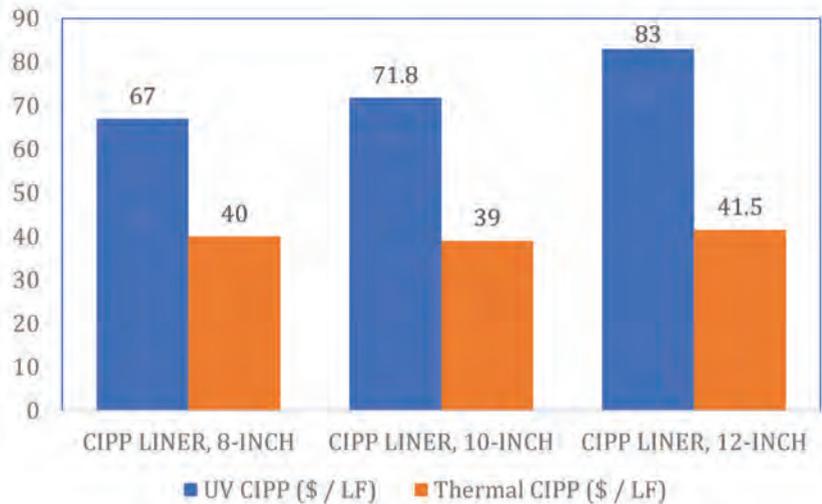


Figure 3: UV and Thermal Cure CIPP Unit Cost Comparison.

the installation of the remaining UV CIPP liners. At the time of this paper, the city has 10 liners to complete, four of which are UV CIPP and six are thermal cure. The work is tentatively scheduled to be completed in early 2018.

Tabor Powell Phase II Sewer Rehabilitation

The Tabor Powell project is a Large-Scale Sewer Rehabilitation Project. The project is located in Southeast and Northeast Portland. The boundaries of these combined projects are I-84 on the north, NE/SE 43rd Ave. on the west, NE/SE 67th Ave. on the east and SE Holgate Blvd. and SE Long St. on the south. This project is to rehabilitate sewer using CIPP to approximately 28,000 ft of deteriorating combination sewer located throughout Tabor and Powell neighborhoods. The sewer pipe in this project was constructed between 1910 and 1955. The sewer pipe sizes range from 8 in. to 36 in. in diameter with depths that range from 7 to 21 ft.

This project was targeted for UV CIPP only. The design documents were developed through the project delivery team in concert and with consulting engineers Brown and Caldwell. Outreach was made to nine UV contractors, resulting in five bidders. The contract was awarded to Precision Trenchless out of New York and the project was in the construction phase at time of this paper's completion.

COMPARING UV CIPP AND THERMAL CURE CIPP

Liner Cost

When looking at average costs of what the City of Portland has seen, on the most common pipe diameters, the cost of UV CIPP is trending to be higher; see Figure 3.

Liner Strength Properties

The typical strength of the UV CIPP trends much higher than that of the thermal cure CIPP. The data shown is an average strength of liners installed of the UV CIPP for a single installer, and the thermal cure of two different local installers.

Similarly, when looking at the typical flexural modulus of the UV CIPP it trends were much higher than thermal cure CIPP. The data shown uses an average flexural modulus of liners installed of the UV CIPP, for a single installer, and the thermal cure of two different local installers.

Liner Constructability

When looking at projects we are often challenged with selecting construction methods that best fit the desired outcome while balancing between risk, cost, schedule, and impacts. When looking at the differences between CIPP Thermal Cure and UV cure we categorize them from the perspective of pros and cons, otherwise known as advantages and disadvantages. Here are some of the comparisons that were observed.

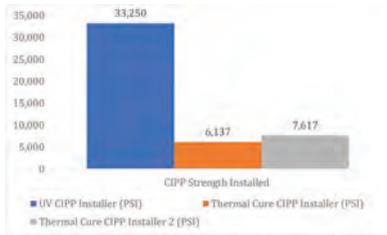
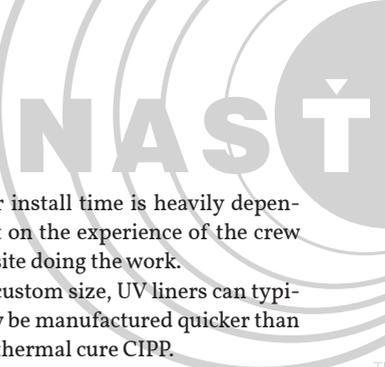


Figure 4: UV and Thermal Cure CIPP Strength Comparison.

Thermal Cure

Pros:

- a. The standard polyester product is flexible, and can mold to the existing pipe and can go through pipe segments with small degrees of turns, radius, or direction changes in the mainline pipe alignment.
- b. Once the product is installed the laterals are relatively easy to locate as most of the time there is a dimple in the liner surface providing indication of the lateral location.
- c. A transitional liner is not uncommon.
- d. There are many experienced installers, with multiple crews, who know what they are doing.
- e. The City of Portland knows the challenges using thermal cure CIPP and has developed protocols for successful projects from over 30 years of experience, we don't have that level of comfort and institutional knowledge for UV CIPP.
- f. Thermal cure CIPP is available in a variety of resin types: polyester, vinylester, epoxy, and reinforced fabrics fiberglass, fiberglass and polyester.

Cons:

- a. The condition of the host pipe needs to be within a range of degradation, due to the lower strength liner or burst pressures. Advance work may be required to correct some of the mainline deficiencies, like pipe loss or gaps, and voids.
- b. Construction footprint is larger than that of UV cure.
- c. When installing the liner, there is limited viewing ability to see what the liner looks like, after putting into

- position, until its cured and a post CCTV inspection has been done.
- d. The workability, or work time, of the thermal cure CIPP is much less than that of the UV CIPP. If a challenge arises, on the day of the inversion, there is less flexibility to adjust to the condition at hand. Liners could prematurely harden.
- e. When the liner is wetted out, it has a short shelf life.
- f. Cure time can be longer, then that of UV cure.
- g. Custom liner sizes can take a while to manufacture.
- h. There are concerns about Styrene odor with traditional styrene systems.
- i. Hot water and steam present safety risks for workers.
- j. The liners can prematurely harden in hot weather, or when refrigeration is challenged.
- k. Liners do not always cure completely, due to heat sinks, water circulation or equipment malfunction and you often don't know until you cut the ends.
- l. Because of the increased thickness of Thermal liners to UV this can be a heavier product to transport.

UV Cure

Pros:

- a. The product is more rigid, allowing the ability to span locations of mainline with larger amount of pipe loss, presence of gaps and/or voids exist. May require less advance work to be done on the mainline host pipe.
- b. Construction footprint is small, making it more convenient and less impactful to the public.
- c. When installing the liner there is pre-curing viewing ability allowing you to see how the liner looks, in position, prior to starting the cure.
- d. The workability, or work time, of the UV CIPP is much longer than of the thermal cure CIPP. If a challenge arises, on the day of the inversion, the liner cure could be delayed. If the liner is not used, and is properly stored, it typically has a 6-month shelf life.
- e. Cure time is much faster than of the thermal cure, however the total

- liner install time is heavily dependent on the experience of the crew on-site doing the work.
- f. On custom size, UV liners can typically be manufactured quicker than the thermal cure CIPP.
- g. Cure time for the section is immediate once the light train passes as opposed to thermal cure where the entire length must be brought up to temperature for cure to occur.

Cons:

- a. Cost of the UV CIPP is roughly 60 percent more than thermal CIPP for small diameters.
- b. The product has little flexibility to expand and requires a feasibility analysis on mainline segments with turns, radius, or direction changes in them.
- c. The light train cannot go thru most bends.
- d. Locating and noting the locations of all laterals is extremely important. Once the product is installed there is no dimple in the liner surface, the locations need to be reinstated based on measured distances and notes recorded. In cases of less experienced installers, this often creates overcutting on the lateral reinstatements.
- e. A transitional liner is less common, and often requires an access point to be dug and a manhole added at the transition point.
- f. Fewer smaller contractors exist that install the UV CIPP lining on a less regular basis. The smaller contractors require assistance from more experienced open cut contractors and can be less efficient. They have little or no experience with City of Portland requirements.
- g. Sizes and thicknesses of liners are limited.

This paper was edited for style and space for publication in *NASTT's Trenchless Today*. To read more about the comparative conclusions on UV CIPP versus steam and water cured CIPP presented in Paper TM1-T6-05, please visit nastt.org/technicalpapers.

calendar



FUTURE NASTT EVENTS

October

24
NASTT's Complementary Webinar Series Presents: Introduction to Rehabilitation Your Computer!

2
NASTT's HDD Good Practices Course
Hosted by NASTT's Rocky Mountain Chapter
 Denver, Colorado

13
Northeast Trenchless Conference
Hosted by NASTT's Northeast Chapter
 Mystic, Connecticut

November

1
Trenchless Elevated 2018
Hosted by NASTT's Rocky Mountain Chapter
 Denver, Colorado

8-9
2018 Northwest Trenchless Conference
Hosted by NASTT's Northwest Chapter
 Edmonton, Alberta

14
NASTT's Complementary Webinar Series Presents: Introduction to New Installations Your Computer!

For more information, visit nastt.org/training/events.

locations

FUTURE NASTT'S NO-DIG SHOWS



NASTT's 2019 No-Dig Show

March 17-21
 Donald E. Stephens Convention Center | Chicago, Illinois



NASTT's 2020 No-Dig Show

April 5-9
 Colorado Convention Center | Denver, Colorado



NASTT's 2021 No-Dig Show

March 27-31
 Orange County Convention Center | Orlando, Florida



NASTT's 2022 No-Dig Show

April 9-13
 Minneapolis Convention Center | Minneapolis, Minnesota

ad index

| | |
|--|------------|
| Aegion | 7 |
| Applied Felts | Back Cover |
| Azon | 21 |
| Btrenchless | 37 |
| Contech Engineered Solutions LLC | 9 |
| Direct Horizontal Drilling Inc. | 2 |
| I.S.T. Innovative Sewer Technologies | 23 |
| Michels Corporation | 15 |

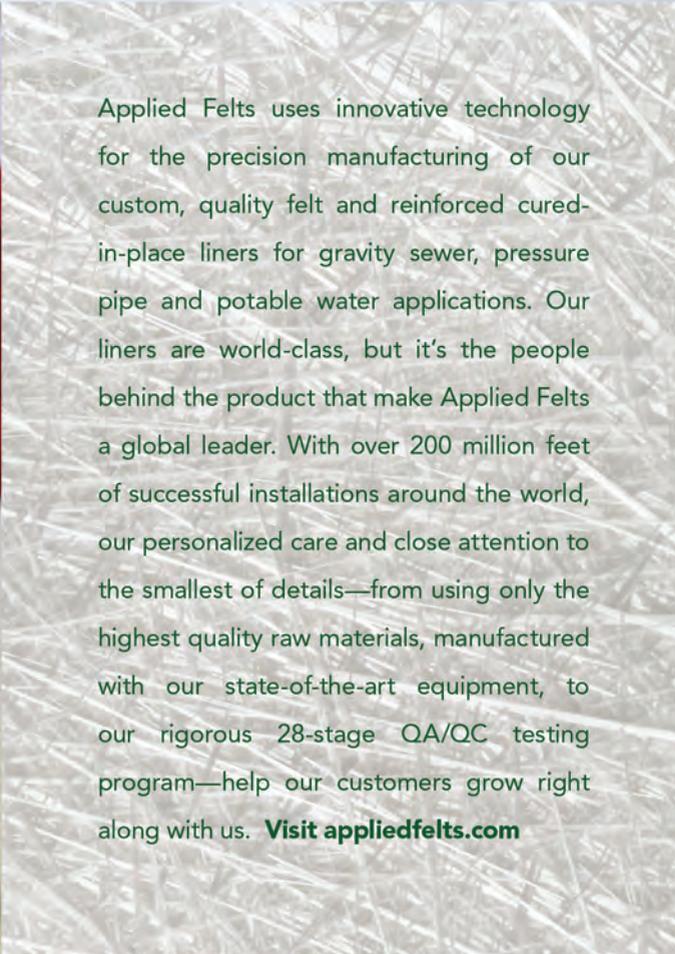
| | |
|---|----|
| Miller Pipeline | 13 |
| NASTT's 2019 No-Dig Show | 33 |
| NASTT's Center for Excellence | 35 |
| NASTT's Education Fund & Auction | 25 |
| NASTT's Municipal Scholarship Program | 16 |
| PICA Corporation | 5 |
| TT Technologies | 11 |
| Vivax-Metrotech | 17 |



THE WORLD'S LEADING CIPP LINERS,
REINFORCED
WITH PERSONAL CARE.



ISO 9001:2008
FM 56735
FM 588513



Applied Felts uses innovative technology for the precision manufacturing of our custom, quality felt and reinforced cured-in-place liners for gravity sewer, pressure pipe and potable water applications. Our liners are world-class, but it's the people behind the product that make Applied Felts a global leader. With over 200 million feet of successful installations around the world, our personalized care and close attention to the smallest of details—from using only the highest quality raw materials, manufactured with our state-of-the-art equipment, to our rigorous 28-stage QA/QC testing program—help our customers grow right along with us. **Visit appliedfelts.com**



APPLIED FELTS

YOUR SUCCESS IS OUR SUCCESS™

