

The Official Magazine of the North American Society for Trenchless Technology



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Winter 2019

Volume 9 | Issue No. 1

Introducing NASTT's 2019 Board of Directors



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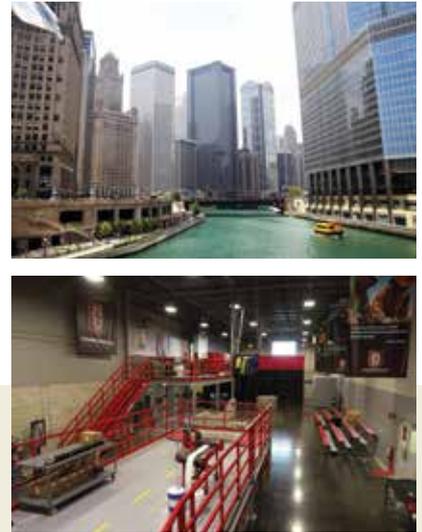
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EXECUTIVE DIRECTOR MESSAGE



NASTT Returns to Chicago for the 2019 No-Dig Show

We are excited about the coming year and all the possibilities it has to offer our Society and the trenchless industry. The 2019 Board of Directors met for their first meeting of the year in Fort Worth, Texas, at the end of January. The January meeting is where we introduce the incoming Board of Director seats. We have four new volunteer Board Members who are eager to offer not only their enthusiasm, but their expertise to the committee and the Society. We also have a lot of good things in store for NASTT in the coming year and for our upcoming annual No-Dig Show.

NASTT's 2019 No-Dig Show will be held in Chicago in March. We can't wait to head back to the Midwest for the first time since 2010. With more than 160 technical presentations, forum discussions with industry experts and pre- and post-course training classes, the educational component of NASTT's No-Dig Show is unrivaled. The leaders of the trenchless industry come together for this event. If you want to stay up on the latest techniques and innovations in trenchless, meet us in Chicago.

We're also looking forward for the exhibition hall. Nearly 200 organizations will be on hand to discuss and demonstrate their trenchless products and services. If you are looking for the latest innovations, or have a special need for an upcoming project, we bet you will find what you are looking for on the exhibit hall floor.

The networking aspect of the conference is a very special part of NASTT's No-Dig Show. We kick off with a breakfast event Monday morning. While you fuel up for the busy day ahead, you'll experience an industry awards presentation and great entertainment to get you pumped up for the day.

Later in the day on Monday evening, NASTT's 18th Annual Educational Fund Auction and Reception may be the most fun you've ever had at an auction. This year, we hope you'll meet us in the Chicago-style speakeasy for a 1920s-themed party! Since 2002, NASTT has raised more than \$1.1 million and used those funds in support of our many educational initiatives. Due to your generosity, NASTT can 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. See you in the speakeasy – no password required!

The evening of Tuesday, March 19, will feature NASTT's Gala Awards Dinner, which is probably my favorite event of the year. This formal affair is a time for us to recognize some of the trenchless champions of our industry with the presentation of NASTT's annual Hall of Fame induction. The intent of the Hall of Fame is to preserve the outstanding accomplishments of exceptional individuals and to honor their contributions to the advancement of both the trenchless industry and the Society. This year I am pleased to recognize Maynard Akkerman of Akkerman Inc., Chris Macey of AECOM and Robert Westphal of Michels Corp. These fine gentlemen embody the spirit of the NASTT mission and have dedicated their careers to the promotion of trenchless technology. Read more about them on pages 22-23.

On Tuesday evening, we will also recognize the recipients of the Chair Award for Lifetime Service, the Abbott Awards for Innovation Products and Services in New Installation and Rehabilitation and the Ralston Young Trenchless Achievement Award.

Every year, the industry comes together at NASTT's annual No-Dig Show to celebrate the great work we've all done in support of our trenchless efforts. Please consider joining us in March in Chicago. For more information on the show, be sure to check out the following pages in this publication and visit the conference website at nodigshow.com.



Michael J. Willmets
 NASTT EXECUTIVE
 DIRECTOR

These Successful Trenchless Jobs have One Thing in Common



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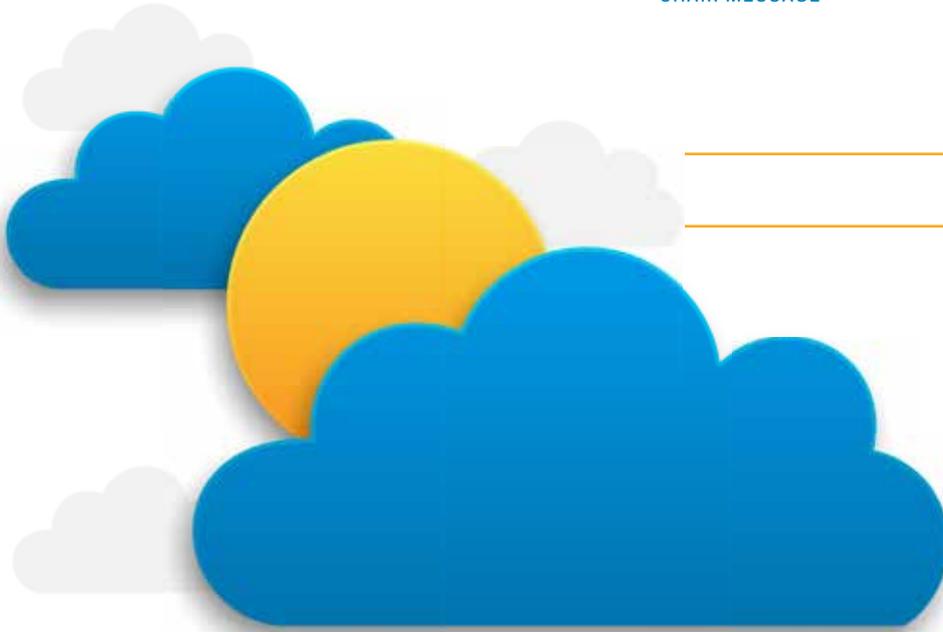


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This year I begin my term as Chair of NASTT's Board of Directors, and I am looking forward to seeing the continued progress and expansion of not only NASTT, but of the trenchless industry.

Last year was another excellent year for us, where we saw growth in our Society, along with growth of our flagship event, NASTT's No-Dig Show. We rolled out three new levels of membership to match the direction of our industry. Now, along with Corporate, Government and Individual membership tiers, we offer a Student Non-Affiliated membership (discounted rates to University students outside of our Student Chapters), Retiree membership for those legends of the industry who wish to stay involved and an International Individual membership for our colleagues living outside of North America. We saw the need to make our membership offerings more inclusive, and we're excited to welcome our newest members.

We are looking forward to NASTT's 2019 No-Dig Show, and we are in good hands with our Show leadership: Cindy Preuss of HydroScience Engineers serves as this year's Program Chair and Joe Lane of Aegion joins her as Vice Chair. The abstracts submitted for the 2019 program were of the highest caliber, and the technical schedule reflects this level of excellence. This year we are also featuring three brand new Forums during the technical program: Direct Pipe Forum, Advanced Pressure Pipeline Condition Assessment Forum and Inno-

vative Products Forum. If you work in the trenchless industry (and if you're reading this magazine I suspect you do!) then you must meet us in Chicago in March.

NASTT exists because of our volunteers, and the 2019 Board of Directors includes many of the top people in our industry. One of our goals is to make sure our Board reflects an industry cross-section of trenchless technology segments. I'd like to introduce our newest Board members: Alan Ambler, Owner, AM Trenchless LLC, and Greg Tippett, Regional Discipline Lead, Western Canada Water Group, Stantec, both representing the Consultants/Engineers category. Also joining the Board are Tiffanie Mendez, Director of Sales, Western States at Sunbelt Rentals, and Chris Sivesind, Area Sales Manager at Akkerman Inc., representing the Manufacturers/Suppliers/Contractors category. We know your industry knowledge and leadership capabilities will benefit our organization and the industry.

I'd also like to recognize the outgoing Board members who volunteered for six years to serve on the Board of Directors.

Thank you, Kim Staheli, Principal at Staheli Trenchless Consultants. For the past two years of Kim's Board involvement, she has served as the Immediate Past Chair. Kim is also active on many NASTT committees including the No-Dig Show Program Committee and is an instructor for NASTT's New Installations Good Practices Course and the New Installations Short Course. Kim, we will miss your leadership at the Board meetings!

Thank you, Frank Firsching. Frank has served as Chair of the Board for the past two years and will continue as Immediate

Past Chair. Frank's strong leadership has been invaluable to our Society and he has served as a mentor to many in our ranks.

Thank you, Erez Allouche, Technology Leader, Tunneling and Trenchless Group, Stantec. Erez's technical expertise has been very beneficial to our decision-making process.

Thank you, Tony Hranicka, Consultant. Tony's gas industry knowledge has helped our organization develop new training courses to expand our reach.

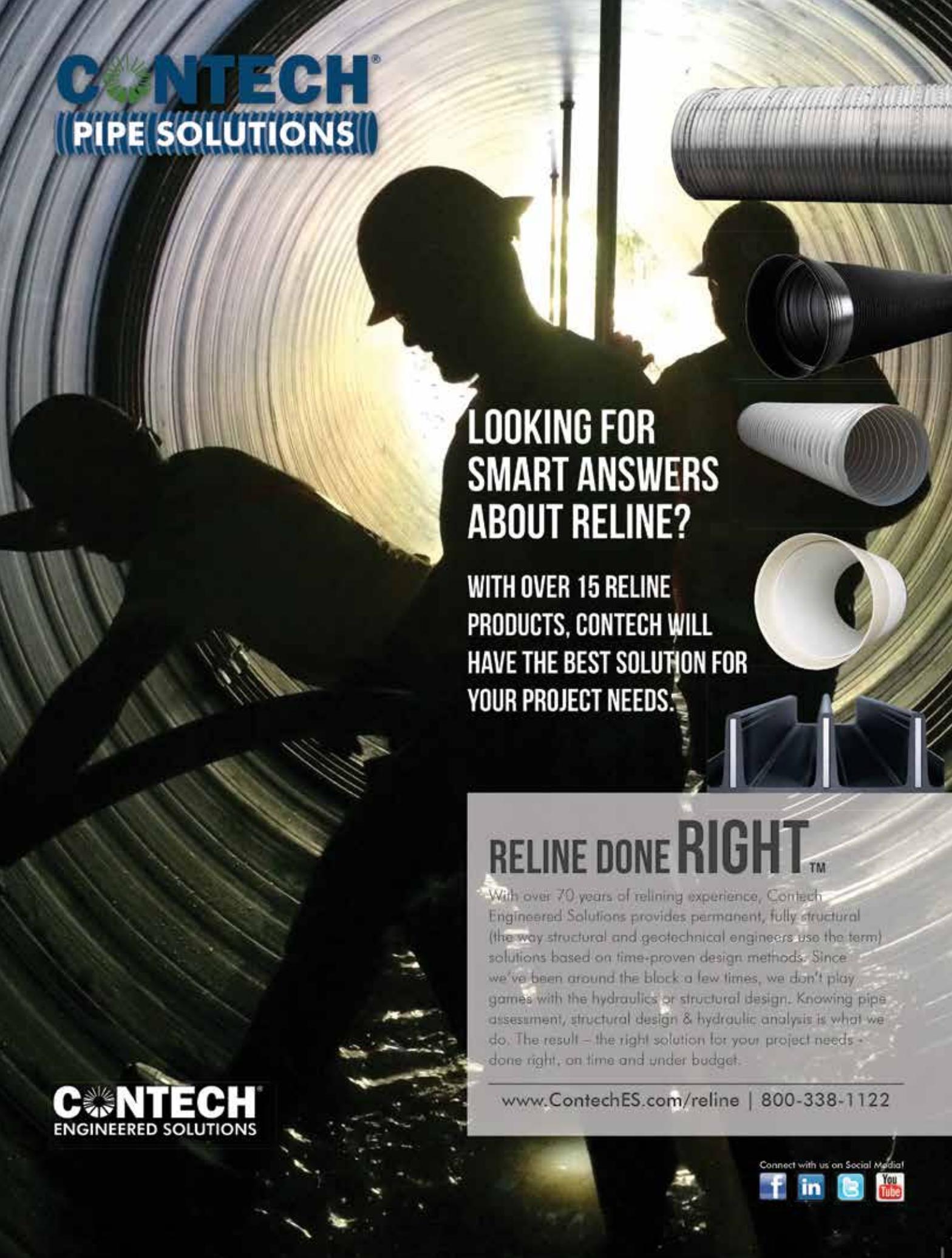
Thank you, Larry Kiest, LMK Technologies. Larry is a long-time NASTT member and committee volunteer. We will miss him in the Board room, but we know we can count on his continued involvement in the industry and the organization. We appreciate all your time and commitment to so many NASTT committees and to the trenchless industry. We are lucky to have you among us.

The first issue of the year is always a special one because we highlight and thank our Board members, so please turn to page 24 and read about the newest Board members and the returning members who will continue their service in 2019.

Our Society is only as strong as our members and volunteers. With that in mind, we are in great shape! We truly thank you for your dedication.



Craig Vandaele
NASTT CHAIR



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HOW DO YOU LEARN?

NASTT's No-Dig Show Adopts VARK Model with Added Demonstrations for Gas Industry Conference & Exhibition

Memorization is not my strong suit. I definitely learn more by physically doing something as opposed to sitting down and reading a book. I know I'm not the only one. The truth is, when it comes to learning, one method does not fit all.

Scientists and medical professionals have developed a number of different models to understand learning habits. One popular theory, the VARK model, identifies four primary types of learners: visual, auditory, reading/writing and kinesthetic. Each learning type responds best to a different method of teaching, and each student is able to learn better using one learning type over another.

Are you wondering why I'm mentioning all of this? Well, the main reason is because here at NASTT, we're all about education. We need to know how people learn in order to properly educate them about the trenchless industry. If we just used one mode of teaching, we would be doing the industry a disservice. We are gearing up for NASTT's 2019 No-Dig Show, and I'm happy to confirm that the conference provides opportunities to learn through all of the VARK avenues.

For example, attendees can experience visual learning by exploring the exhibit hall. This is a great opportunity to see the biggest and best in the trenchless industry. The great thing about the exhibit hall is that it's not just visual, but it's for our kinesthetic learners (like me!), as well. Vendors often have equipment on hand so you can see it in person.

For our attendees who are more auditory, each of our 160 technical sessions have built-in time for Q&A after the presentation. This is a great opportunity for folks to

dive deeper into what they just heard. If you are interested in meeting up with the presenter after the Q&A for more discussion, you can connect via our app and meet up at one of our many networking events.

If reading/writing is your preferred learning method, join us for a Pre-Good Practices Course on Sunday before the conference or a Post-Good Practices Course on Wednesday and Thursday for a traditional classroom setting. A manual of slides and a book are provided with every course registration, so you'll definitely get your fill of reading material.

Although we've covered all of the VARK learning methods with our standard program, we're always looking for new experiences for our No-Dig Show attendees. I'm excited to announce a new kinesthetic option for our oil and gas pipeline industry folks. Our Gas Industry Conference & Exhibition is getting an added bonus this year with a tour of the Gas Technology Institute (GTI) facility. The tour will showcase a variety of demonstrations of various trenchless and low-dig technologies including, but not limited to, plastic pipe slitting; keyhole technologies; vacuum excavation; metallic service line extraction; HDD; pipe lining and insertion; locatable plastic pipe and pavement coring. Registration for the Gas Industry Conference & Exhibition includes admittance to track sessions, an exhibit hall pass, a seat at the closing luncheon

Join us for the Gas Industry Conference & Exhibition at No-Dig!

Wednesday, March 20

8:00-10:05 am
Track sessions

10:05 am-12:30 pm
Exhibit hall pass

12:30-2:00 pm
Closing luncheon

2:30-6:30 pm
Gas Technology Institute Tour

Thursday, March 21

8:00 am-12:00 pm
NASTT's Gas Good Practices
Post-Conference Course

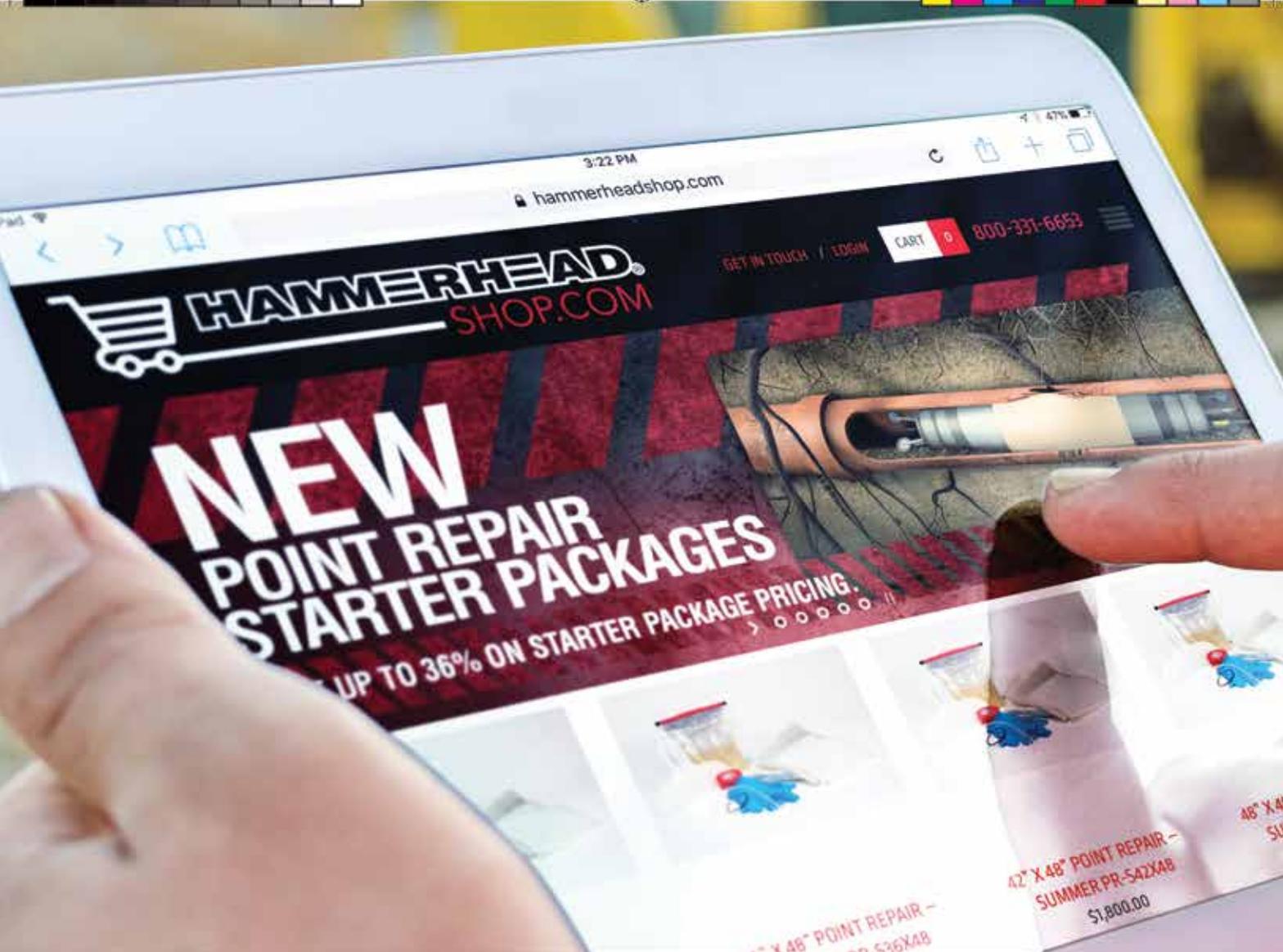
and the GTI tour on Wednesday. On Thursday the program will feature NASTT's Gas Good Practices Course. Not only is this a great way to get a variety of training in the gas field, but attendees can also earn CEUs/PDHs for the track sessions and the Gas Good Practices Course. You can also add the GTI tour onto your full conference registration at no cost.

I know that's a lot of information, and you know I wouldn't expect you to memorize it, so visit nodigshow.com to get all of the details on our upcoming conference in March. I look forward to seeing you in Chicago!



Michell Hill
NASTT PROGRAM
DIRECTOR





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A Conversation with ISTT's Peter Smeallie

This month, NASTT's Trenchless Today sat down with Peter Smeallie, executive director of the International Society for Trenchless Technology (ISTT), to discuss his introduction to the trenchless industry, the current challenges facing the global market in underground construction, as well as what's on the horizon for ISTT.



Smeallie assumed executive directorship of ISTT in April 2017, succeeding John Hemphill. Smeallie is president of Research Opportunities Management, a consulting firm offering strategic advice on developing research and development programs for universities, professional firms and other organizations. Prior to this, he worked at the National Academy of Sciences where his responsibilities included directing advisory research studies in areas such as geotechnology, rock mechanics, tunneling methods and safety, energy engineering, infrastructure and urban systems. Smeallie has a degree in Urban Studies from St. Lawrence University and he resides in Alexandria, Va.

What first piqued your interest in working in the construction business?

I always wanted to design buildings, but I just couldn't draw very well so I went into research and development (R&D) for construction-related technologies including advanced drilling technologies. Many of the advances in materials science, visualization, rock physics and drilling engineering led me to trenchless.

Tell us about your introduction to the trenchless technology industry.

My introduction was way back when I was a staff officer at the U.S. National Academy of Sciences. I was put in charge of the U.S. National Committee on Tunneling Technology where I met and worked with Ray Sterling and others. Again, primarily from an R&D standpoint.

What are your thoughts on the current state of the trenchless industry? What are the trends? What areas do you see evolving?

I am optimistic about the evolution of trenchless for the simple reason that as the world's population becomes more urbanized and denser, alternatives such as trenchless that have less societal costs become more likely to be used. The tremendous gains made in petroleum drilling and exploration will work their way into other drilling industries such as mining and civil. It is the path of technology diffusion, and it will greatly benefit the trenchless industry.

How did you first get involved with ISTT?

I have worked on and off within the trenchless industry for a number of years since leaving the Academy in the mid-1990s. I had done some work with NASTT in the late 1990s, but, though I knew of ISTT, did not really interact with the Society until the notice for an Executive Director was issued in late 2016.

Briefly summarize some of your goals or initiatives for the organization in 2019.

ISTT has been involved in developing a plan of action for 2019 that we started to implement in January. Briefly, the plan emphasizes new activities in regional projects, education and training, professional recognition, marketing and outreach, and finance and administration. The ideas were generated from one-on-one interviews with the 27 national Affiliated Societies, thus reflecting what the ISTT members desire.

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

Like many construction technologies, trenchless is virtually global in its application and markets. The biggest challenge, as I see it, is maintaining and encouraging free and open markets to allow companies to assemble an international portfolio. I don't know if acceptance has improved, but I do know the critical role marketing and outreach play in "selling" the technology. This is why this area of interest is high on the action agenda for ISTT.

You are also the president of Research Opportunities Management, a consulting firm that assists with R&D programs for universities, professional firms and other organizations. Tell us about some of your current initiatives there.

Much of my work in the past has involved working with universities and the U.S. federal government on R&D initiatives. I also direct the American Rock Mechanics Association, a membership society of rock engineers and scientists.

Does the international trenchless community do a good job of promoting the benefits of trenchless methods? What is needed?

I believe the international community is getting better at promoting the benefits of trenchless. The large shows in Asia and the Middle East, for example, draw good-sized crowds including representatives from relevant ministries. ISTT is going to try hard in 2019 to sharpen the message of trenchless and make this available to its Affiliated Societies.



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In the TRENCHES

By Andrew Farr



Marshall Gaston

FUSS & O'NEILL INC.

Construction has always been second nature for Marshall Gaston. Like so many others across the industry, Gaston grew up in a construction family and he admits that he realized early on that he belonged in the business.

"In my childhood, I don't remember a time when business wasn't being discussed," he recalls talking about the small, family-owned business. "Each project was small, but each one had its own unique feature that proved to be interesting and challenging. As I look back on it now, it was a great foundation to build my engineering career on, and even today, I lean on those home-schooled lessons."

Trenchless technology entered Gaston's world in the early 1980s, when he was working in Northwest Indiana. He says communities in the region were growing and infrastructure construction was necessary to meet the demands of the expanding population. Gaston worked as a field engineer and monitored local water and sewer system projects to meet future commercial expansion. Most of the sewer pipe was installed via open cut trench excavation with the exception of five auger borings that ranged from 80 to 240 ft long that carried 8 to 12 in. diameter pipe. It was the first time Gaston had worked extensively using a trenchless approach and the first time he worked with HDPE pipe.

Gaston now works as a senior project manager with Fuss & O'Neill Inc., a full-service civil and environmental engineering firm based in Manchester, Conn. Since his early days in the industry, Gaston acknowledges the changes in the acceptance of trenchless, noting the growth in different markets that utilize trenchless construction.

"The industry has evolved over these many years with so many different niche markets," he says. "It is definitely not a one solution to fit all projects. While I'm partial to direction drilling, with all this advancement of technology, drill heads now go farther and faster, and are more accurate and efficient than just 10 years ago."

Gaston says the biggest challenges facing the niche trenchless industry in the future will be the emergence of more complex projects that require the limits of the technology to be pushed. In the pipe liner segment, he notes, there is an increasing number of large diameter and lengthier pipe lining projects being completed.

"You're also seeing stronger lining materials that are able to support higher pressures and recently a number of new materials have been released that in certain applications allow pipe renewal around bends," he says. "As the less rigorous

In the TRENCHES

projects are completed, the new, more complicated projects will be developed and trenchless technology will continue to grow to meet those needs.”

Gaston’s involvement in volunteer work in the industry started when he began attending Northeast Trenchless Association (now the Northeast chapter of NASTT) meetings. He says he was fascinated by the programs that were provided. He has now served on the Northeast Chapter’s board of directors for the past three years as the chapter secretary, where he has been working behind the scenes on the website and the chapter’s outreach conferences. He also says he’s impressed by the chapter’s work with young professionals in the industry.

To reach a younger audience, the Northeast Chapter has developed an affiliation with NASTT’s Student Chapter at the University of Massachusetts, Lowell campus. The students hear presentations from trenchless industry experts, conduct field trips to working trenchless projects and much more.

Gaston says that while the underground construction sector has advanced significantly since the inception of trenchless methods and techniques, the advancement will continue because the demands of modern society will necessitate construction with minimal disruption

to daily life. He also adds that while trenchless has its advantages in solving these complex projects, it’s up to owners and engineers to acknowledge that it’s not always the right solution despite its increasing applications.

“Not every project is a trenchless project,” he says. “However, as natural resources have become [scarcer], as project disruptions to local neighborhoods have increased, and as coastal resiliency and sea level rise become more prominent issues, governmental leaders are increasingly adopting trenchless technology’s holistic approach to resolving these types of issues that could not prudently be accomplished by other means.”

For Gaston, working in the trenchless industry has been rewarding both professionally and personally. In addition to working closely with colleagues across the industry who have, in turn, helped him learn more about trenchless technology, Gaston says he still enjoys seeing a project come to fruition from concept to completion.

“For me, this has been a most rewarding experience, he says. “I have met industry professionals and have had the opportunity to learn myself,” he says. “I receive great satisfaction from taking an idea and developing it into a viable concept and ultimately a constructed project.”

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In the TRENCHES



Chris Knott

BTRENCHLESS

After finishing high school, Chris Knott began working as a laborer for a contractor in Colorado. The construction company was owned by a family friend, and Knott enjoyed working outside and it paid well. What he didn't realize at the time is that the job would lead him to a career in the specialty market of trenchless technology.

"Being able to work in different areas of the state of Colorado excited me, learning not only the open cut aspects, but the trenchless methods as well," he says. "Every trenchless project was unique in its own way, each job having its own separate challenges and it kept the trenchless side stimulating."

Knott quickly advanced in his role and transitioned from laborer to operator. He worked on an auger boring crew for a while and when the company decided to start a second auger crew, it approached Knott about running it. He took the opportunity and it eventually led him to run directional drill and pipe ramming crews, as well.

"My passion for trenchless work has grown over the years, based on the fact that no job is ever the same and the days are never dull," he says of his time in the industry. "Every project requires innovative forethought and planning to determine the best method not only financially, but the constructability required to complete the project."

Today, Knott is the director of business development and an estimator with BTrenchless in Henderson, Colo., where he has worked since 2005. BTrenchless, a division of BT Construction, performs trenchless construction and has completed several difficult and high-profile projects across several states. The company can do small diameter auger bores to 10-ft diameter microtunnels. The company can provide complete utility services for owners and municipalities.

From his perspective as a contractor, Knott says technology has truly been the key factor in the evolution of trenchless methods and applications.

"It is a great time to be in the trenchless industry because of the ever-growing technology," he says. "Newer technology has now become essential in today's market based on the booming population, the requirements for larger diameter water, sewer and storm pipe,

and increased pipe lengths. The Midwest and Rocky Mountain regions are moving more towards the larger trenchless methods, such as microtunneling and TBM, as it is less disruptive to communities."

When it comes to challenges, Knott believes education is still the most important component for steering the industry in the right direction. With many municipalities having little to no background in trenchless technologies and limited forums to educate them, Knott says it has been a slow, difficult, yet evolving mission to help owners, municipalities and engineers understand the services and benefits that switching to trenchless can provide.

"Teaming with organizations such as NASTT and educating them on the quality of new and evolving trends, as well as older trenchless methods, is helping owners and municipalities broaden their minds to other opportunities besides open cut," he says. "I see that site visits have been one of the most beneficial avenues in helping the local region understand what is involved in certain technologies."

BTrenchless has strived to be one of the leaders on the education side as well as the construction side of the trenchless industry. Knott himself has attended several of NASTT's No-Dig Shows and has been involved with NASTT's Rocky Mountain Chapter (RMNASTT) since its inception nearly 10 years ago. He serves on the RMNASTT board and assists with the chapter's local conferences and annual clay shoot. He also recently joined the Program Committee and Auction Committee for the national No-Dig Show.

For Knott, the two most exciting things about working in the trenchless industry have been the opportunity to work with the ever-evolving technologies and the people in the industry he has had the chance to meet and learn from.

"I have had the opportunity to look at multiple new and exciting job opportunities all over the United States," he says. "The opportunity to meet new people from general contractors, owners, suppliers and equipment manufacturers in this industry not only allows me opportunities to share trenchless knowledge, but I gain an education from them as well."



Mike Rocco

AUI INC.

Mike Rocco's introduction to the trenchless industry came in the early 1990s when he joined New Mexico-based contractor Albuquerque Underground Inc., now known as AUI. Rocco says he never thought trenchless construction would be his career path but he's been immersed in the industry ever since.

AUI, founded in 1984, specializes in heavy civil construction and offers a wide variety of services across New Mexico, Arizona, Utah and Colorado. The company has about 300 employees with about 10-20 percent of its volume being in trenchless work, Rocco estimates.

Rocco joined AUI in 1991, working with the company while earning his degree at the University of New Mexico. He soon advanced in his role at AUI and became involved in trenchless methods when the company worked on an early pipe bursting project for the City of Santa Fe.

Rocco has since led a myriad of trenchless projects as AUI's expertise and capabilities have expanded, and he now serves as AUI's trenchless manager. Rocco says it's been a notable expansion into the trenchless sector for AUI as crews in the past would perform the oc-

In the TRENCHES

casional trenchless job among its more common work in asphalt and concrete paving, bridge work, pile driving, shoring and water/sewer utility work involving open cut. Now, he says, there are three full crews at AUI designated just for trenchless work. In the trenchless space, AUI specializes in pipe bursting, sliplining and spiral-wound sewer pipe replacement.

Rocco says the Southwest region of the United States can tend to lag slightly behind other regions of the country in terms of adopting trenchless methods. "It always seems that everything starts east and moves west," he says of technology acceptance in the industry. "At first it was scarce. In the early 90s we were doing 2,000 ft or 5,000 ft, and maybe in a good year we would do 10,000 ft [of pipe rehabilitation work]. Now that the technology has been way more accepted, a lot of [municipalities] are looking at it as an alternative."

Rocco says an advantage AUI has is the ability to offer the owner open cut, a semi-trenchless approach or a complete trenchless approach on any given project. He says the capabilities the company can offer reflect the current demands of the market.

"You also have a lot of new engineers coming into the market wanting to try more cost-effective methods that are faster, more economical and have less carbon footprint," he says. "Now that they have options, I think engineers look at trenchless quite a bit. We're seeing it in our market with different municipalities that haven't done it before."

"The trenchless industry has made great strides towards promoting the product and promoting the acceptance and I don't see it slowing down."

Rocco is passionate about his work in trenchless construction. In fact, he has an uncle who works in book binding, which inspired Rocco to develop an interest in collecting issues of Trenchless Technology magazine as a hobby. He has been an NASTT member since 1993, shortly after he entered the industry. Rocco attends the national No-Dig Show each year and serves on the board for NASTT's Western Chapter. He also participates in NASTT's Pipe Bursting Center of Excellence technical group.

"It's never the same each day," Rocco says about working in the trenchless field. "In our neck of the woods you have to self-promote it in a way. We don't have huge engineering firms that know all about it in our area. But there are always different projects to do in different cities and they all have similar infrastructure problems they're trying to solve. "Trenchless [offers that alternative] to digging up roads and other invasive approaches. It's a great industry with great people to work with."

Andrew Farr is the associate editor of NASTT's Trenchless Today.

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NASTT's
2019 NO-DIG SHOW

March 17-21, 2019 | Chicago, Illinois

Trenchless Industry Heads to Chicago

NASTT's No-Dig Show Returns in March

The Chicago River will be dyed green when the North American trenchless community arrives in the Windy City next month. In addition to its famous St. Patrick's Day festivities, Chicago will play host to NASTT's 2019 No-Dig Show, March 17-21, the largest and most comprehensive conference in North America devoted entirely to trenchless technology.

With attendee and exhibitor numbers on the rise in recent years, NASTT's annual No-Dig Show is known for engaging all industry segments – municipalities, engineers, contractors, manufacturers and service providers – to showcase the latest advancements across the trenchless marketplace. One of the unique aspects of NASTT's No-Dig Show is the ease of access to leading trenchless experts and thought leaders across the industry. NASTT members volunteer their time as course instructors, track leaders and technical paper presenters, and industry pioneers and legends are also recognized throughout the week.

"NASTT's No-Dig Show is THE conference to attend if you are looking to enhance your career in any way. Not only can you attend the top technical sessions and learn about advancements in trenchless, but you can network with the best and the brightest in our industry," said 2019 Program Chair Cindy Preuss and Vice Chair Joe Lane in a joint statement previewing this year's conference.

NASTT's 2019 No-Dig Show will convene at the Donald E. Stephens Convention Center in Rosemont, Ill., just outside downtown Chicago. Owned by the North American Society for Trenchless Technology

and managed by Benjamin Media, the No-Dig Show, now in its 28th year, is as much a celebration of the trenchless industry as it is a focus on professional development and new technologies. The last time the No-Dig Show was held in Chicago was 2010. Attendance numbers for that show were tallied at 1,666, including 137 exhibiting companies. The 2019 conference is expected to attract approximately 200 exhibitors and more than 2,000 attendees who include public works, contractors, engineers, utility owners, damage prevention and industrial facility personnel.

The conference's top-notch technical program features more than 160 peer-reviewed, high-quality technical papers, as well as opportunities for continuing education units (CEUs). The topics focus on both the trenchless installation and rehabilitation industry. NASTT's No-Dig Show also includes an exhibit hall that covers more than 92,000 sq ft and special networking events including a Kick-Off Breakfast, Gala Awards Dinner, NASTT's Hall of Fame induction, the 18th Annual Education Fund Auction and Reception and Closing Luncheon.

Smart phones and social media apps are becoming the norm at conferences and NASTT's No-Dig Show is no different. Attendees can plan their 2019 No-Dig Show experience, learn about the networking events, view speaker information and connect with other attendees by using the official 2019 mobile event app. To download the app, download "CrowdCompass AttendeeHub" from your app store. Then, search "NASTT's No-Dig Show" to join.

Educational Program

The No-Dig Show's strong technical program is spearheaded by NASTT's all-volunteer Program Committee, which works tirelessly throughout the year to bring attendees the best presentations in the industry.

The 160 peer-reviewed technical papers to be presented put the spotlight on a wide range of trenchless topics, including horizontal directional drilling (HDD), cured-in-place pipe rehabilitation (CIPP), microtunneling, inspection, asset management, pipe jacking and ramming, water and sewer rehabilitation, inspection and project planning. Papers are presented in a six-track schedule and grouped mostly by subject matter so attendees can choose to attend six presentations at any given time.

A recent addition to the technical program is the No-Dig Show Forums – 50-minute interactive educational opportunities where audience participation is encouraged. The forums take place during the technical sessions and, in the past, have highlighted topics such as water and sewer main rehabilitation, HDD, mud disposal, sliplining and more. This year, the show will feature some special new events and forums throughout the program.

On the morning of Sunday, March 17, NASTT's new Grouting Course will be introduced. On Monday, March 18, the Direct Pipe Forum will provide a discussion of direct pipe driven by audience participation. Tuesday, March 19, will feature two forums: The Advanced

Pressure Pipeline Condition Assessment Forum and the Innovative Products Forum. The latter will showcase innovative product releases in the trenchless industry and companies presenting products in this forum will be this year's Abbott Innovative Product Award finalists. On Wednesday, March 20, as part of Gas Industry Day, the No-Dig Show is featuring a group tour to the Gas Technology Institute (GTI) facilities in Des Plaines, Ill. Transportation will be provided.

Stay connected!

Download the app to stay up-to-date on the week's activities



To download the app, download "CrowdCompass AttendeeHub" from your app store. Then search "NASTT's No-Dig Show" to join.

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Popular Events

The conference gets under way with its annual Kick-Off Breakfast from 7:30 to 9:15 a.m., March 18. During the breakfast, *Trenchless Technology* editor Jim Rush and managing editor Sharon M. Bueno, along with publisher Bernard P. Krzys, will formally recognize *Trenchless Technology* magazine's 2019 Person of the Year. Look for a complete profile of the award-winner in the March issue of *Trenchless Technology*. In addition to the Person of the Year presentation, *Trenchless Technology* will formally recognize the recipients of its 26th annual Projects of the Year for Rehabilitation – the 36-in. CIPL Gas Main Rehabilitation Project in South Orange, N.J. – and New Installation – the Valley Crossing Pipeline Project in the Gulf of Mexico Using the Direct Pipe Method.



Jody Urquhart

Also, at the breakfast, NASTT will introduce its incoming board members for 2019 and preview the show for attendees. Breakfast closes with NASTT's 2018 Outstanding Papers in Rehabilitation and New Installation Awards. The breakfast will conclude with entertainment featuring motivational speaker Jody Urquhart.

Later that night, NASTT's 18th Annual Educational Fund Auction & Reception will be held from 5:30 to 7:30 p.m. This fundraising event benefits NASTT's educational initiatives. The auction sponsors for this year are Bennett Trenchless Engineers, Ditch Witch and Interplastic Corp. The auction and reception is known for its themed fun. This year, NASTT is featuring a Prohibition-era speakeasy theme. Come dressed in your 1920s gangster or flapper attire at the auction's annual costume contest. Prizes will be awarded. The auction will also feature a Hawaii vacation raffle and 50/50 raffles. Since starting the auction in 2002, NASTT has raised more than \$1 million 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.



Events

Kick-Off Breakfast & Entertainment
Monday, March 18, 2019
 7:30 AM – 9:15 AM

Exhibit Hall Hours
Monday, March 18, 2019
 11:45 AM – 3:45 PM

Tuesday, March 19, 2019
 12:00 PM – 3:30 PM

Wednesday, March 20, 2019
 10:00 AM – 12:30 PM

NASTT's 18th Annual Educational Fund Auction & Reception
Monday, March 18, 2019
 5:30 PM – 7:30 PM

Gala Awards Dinner
Tuesday, March 19, 2019
 7 PM – 10 PM (*ticketed event*)

Industry Forums

Direct Pipe Forum
Monday, March 18, 2019
 3:45 PM

Advanced Pressure Pipeline Condition Assessment Forum
Tuesday, March 19, 2019
 8:00 AM

Innovative Products Forum
Tuesday, March 19, 2019
 10:20 AM

Closing Luncheon
Wednesday, March 20, 2019
 12:30 PM – 2:00 PM

Gas Technology Institute (GTI) Tour
Wednesday, March 20, 2019
 2:30 – 6 PM

Free shuttle to/from the Hyatt Regency O'Hare will be provided.



On Tuesday March 19, NASTT will host its annual Gala Awards Dinner featuring the induction of NASTT's 2019 Hall of Fame Class: Maynard Akkerman, president, CEO and owner of Akkerman, Inc., Chris Macey, Americas Technical Practice Leader – Condition Assessment and Rehabilitation of Linear Infrastructure at AECOM and Robert Westphal, senior advisor of operations at Michels Corp. (read more about this year's Hall of Fame inductees on p. 22-23). The event will also feature the presentation of NASTT's Abbott Innovative Product Awards, NASTT's Chair Award for Outstanding Lifetime Service and the Ralston Award for Young Trenchless Achievement.

Beginning on Wednesday, March 20 and continuing on to Thursday,

March 21, NASTT's No-Dig Show will host the Gas Industry Conference & Exhibition. This special program will feature a technical paper track (on Wednesday) specifically for those involved in the oil and gas pipeline industry. Also on Wednesday, attendees will have the opportunity to tour the Gas Technology Institute campus from 2:30 – 6 p.m. A free shuttle to/from the Hyatt Regency O'Hare will be provided. On Thursday, the program will wrap up with NASTT's Gas Good Practices Course taught by George Ragula of PSE&G.



The No-Dig Show Closing Luncheon at 12:30 p.m. on Wednesday will be the final event for NASTT's 2019 No-Dig Show. The luncheon provides a recap of NASTT's initiatives going forward as NASTT's next program chair, Joe Lane of Aegion, will preview NASTT's 2020 No-Dig Show in Denver. For more info, visit nodigshow.com, email conferences@benjaminmedia.com or please call 330-467-7588.

Compiled by NTT staff.



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2019 NASTT NO-DIG SHOW



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NASTT's 2020 NO-DIG SHOW

April 5-9 | Denver, Colorado
Colorado Convention Center

CALL FOR ABSTRACTS

Submission Deadline: June 30, 2019

Questions? Please contact:

Michelle Hill | NASTT Program Director
E: mhill@nastt.org | P: 888-993-9935

Photo: Scott Dressler-Martin

The North American Society for Trenchless Technology (NASTT) is now accepting abstracts for its 2020 No-Dig Show in Denver, Colorado at the Colorado Convention Center on April 5-9, 2020. Prospective authors are invited to submit a 250-word abstract outlining the scope of their paper and the principal points of benefit to the trenchless industry. The abstracts must be submitted electronically at NASTT's website by **June 30, 2019**: nastt.org/no-dig-show.

Abstracts from the following subject areas are of interest to the No-Dig Show Program Committee:

Potable Water and Pressure Systems

- Pipeline Inspection, Locating, and Condition Assessment
- Pipe Rehabilitation
- Pipe Bursting
- Emerging Technologies
- Case Studies

Wastewater, Storm water, and Non-pressure Systems

- Advanced Pipeline Condition Assessment
- I&I and Leak Detection
- Pipeline and Laterals Rehabilitation
- Pipeline Inspection, Locating, and Condition Assessment
- Cured-in-Place Pipe Lining
- Sliplining
- Pipe Bursting
- Spray Applied Linings
- Grouting
- Manhole Rehabilitation
- Case Studies

Energy Pipeline Systems

- Pipeline Inspection, Locating, and Condition Assessment
- Aging System Rehabilitation
- New Trenchless Installation
- Standards and Regulations

Trenchless Research and Development

- University and Industry Initiatives
- Education and Training

Industry Issues

- Subsurface Utility Engineering
- Submittal Requirements and Quality Assurance/Quality Control
- Project Budgeting and Prioritization
- Funding for "Green" Technologies
- Selection Criteria for Contractors
- Social Costs and Impacts
- Carbon Footprint Reduction
- Sustainable Construction Practices
- Industry Trends, Issues and Concerns
- Differing Site Condition Claims

New Installations – Tunneling, Boring and Pipe Ramming

- New Concepts or Trenchless Equipment, Materials and Methods
- New Applications for Boring Techniques (Auger Boring and Pipe Ramming)
- Pilot Tube Boring (Tunneling)
- Case Studies

Horizontal Directional Drilling (HDD)

- New Concepts and Applications for Horizontal Directional Drilling Equipment, Materials and Methods
- Case Studies

Microtunneling

- New Concepts and Applications for Microtunneling Equipment, Materials and Methods
- Case Studies



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.

For more information visit
NODIGSHOW.COM



Celebrating Excellence in Trenchless

NASTT's 2019 Hall of Fame Class to be Recognized in Chicago

NASTT is pleased to announce the inductees of the Society's eight Hall of Fame class. Joining this exclusive group of trenchless technology innovators and pioneers are Maynard Akkerman, president, CEO and owner of Akkerman, Inc., Chris Macey, Americas Technical Practice Leader – Condition Assessment and Rehabilitation of Linear Infrastructure at AECOM and Robert Westphal, senior advisor of operations at Michels Corp.

The careers of the 2019 Hall of Fame class will be recognized and honored on the evening of March 19 when they will be formally inducted at the Gala Awards Dinner at NASTT's 2019 No-Dig Show in Chicago. The new inductees will

join a distinguished group of trenchless icons who have helped transform the underground construction industry.

Maynard Akkerman, president, chief executive officer and owner of Akkerman, Inc., has dedicated his career to the principles of the NASTT's mission through trenchless underground construction equipment innovation and advocacy. Chris Macey has worked in the trenchless industry as a consultant, mentor, educator, and leader for more than 40 years and has facilitated the widespread deployment of trenchless technologies across North America and globally. Robert Westphal started at Michels in 1965 as a pipeline laborer and has since been a driving force in

the management and growth of Michels' industry-leading operating divisions.

"The NASTT Hall of Fame inductees for 2019 continue to exemplify extraordinary leadership and innovation, says NASTT Executive Director Mike Willmets. "Maynard Akkerman, like his father, has played an impactful role in development of our amazing industry. Chris Macey is not only an ambassador for trenchless education but is undoubtedly revered worldwide as a respected industry expert. Bob Westphal's career speaks of immeasurable success but also of respect, kindness and dignity. It is truly an honor for our society to praise the collective accomplishments of these longtime NASTT members."



Maynard C. Akkerman

President, Chief Executive Officer & Owner
Akkerman Inc.

Maynard Akkerman began full-time employment at his father's sewer and water construction company as a young adult 45 years ago. His father, D.H. Akkerman developed his own line of pipe jacking equipment and in 1973 launched Akkerman Manufacturing. From 1973 to 1987, Maynard was part of the construction crew on numerous tunneling and pipe jacking projects and in the plant involved with various phases of equipment fabrication.

In 1987, Maynard purchased the manufacturing business and renamed it Akkerman, Inc., and has been at its helm ever since. Under his leadership, the company has grown expeditiously. In 1995, Akkerman successfully introduced the first U.S.-based microtunneling system, a distinction that still stands. Now in 2018, Akkerman manufactures five distinct lines of trenchless equipment, reports worldwide sales and employs 75 full-time employees.

Throughout his career, Maynard has cultivated many relationships in the tunneling industry and has been a strong promoter of trenchless methodologies. He was an original member of NASTT, joining just a few months after its incorporation in 1990. He was nominated to The Moles in May of 2009. He's had longstanding

memberships with the National Utility Contractor's Association and the Underground Construction Association of Society of Mining, Metallurgy, and Exploration.

Maynard served two terms on NASTT's Board of Directors from 1995 to 1998. He was a contributing member to the microtunneling standards committee for ASCE for the first microtunneling standard in 2001. He was named the 2003 Underground Construction MVP by the Gulf Coast Trenchless Association and the 2008 Person of the Year by *Trenchless Technology* magazine. In 2015, he was on the Blue Ribbon Review Committee for the ASCE's Pilot Tube and Other Guided Boring Methods standard.

Akkerman is a leading employer in Southern Minnesota, and Maynard is a steadfast supporter of community development, betterment and fundraising initiatives as well as promoting manufacturing in Minnesota. A lifelong resident of Brownsdale, Minnesota, Maynard and his wife, Robin, have three sons – two who have joined Akkerman – and six grandchildren. Outside of family activities and travel, Maynard is enthusiastic about classic Mopar car restoration and collecting, is an amateur drag car racing competitor, hunter, fisherman and golfer.

Chris Macey has worked in the trenchless industry as a consultant, mentor, educator and leader for more than 40 years. He has developed large, sustainable programs for condition assessment and rehabilitation that have facilitated the widespread deployment of trenchless technologies across North America and globally. He has also worked on numerous complex assessment and trenchless rehabilitation projects including both shallow ground tunneling and extensive use of a diverse array of lining techniques.

Trenchless has been a way of life for Chris, growing up in the Winnipeg, Manitoba marketplace where very innovative horizontal earth boring technologies were patented in the early 1970s and cured-in-place pipe (CIPP) was piloted in 1978. Chris has worked at AECOM since 1978 (his legacy company from 1978 to 2004 was UMA Engineering). In the early 1990s, he became the National Technical Specialist for Canada, and since the early 2000s, has worked as AECOM's Technical Practice Leader for Condition Assessment and Rehabilitation for the Americas.

Chris is a widely-published author and pre-

sender, having presented or co-authored more than 140 papers since 1985. He has been a member of NASTT since 1997 and has written and taught many courses on condition assessment, pipe design and trenchless design and rehabilitation for NASTT, AWWA, ASCE and both the American and Canadian Precast Concrete Pipe Associations. Chris was a co-author of both the NASTT CIPP Good Practice Guidelines course and manual. He has been a frequent instructor of the course all across North America since 2006, and in 2015 and 2018, delivered the course in Australia and New Zealand. Chris received his Engineering Degree at University of Manitoba and is a registered Professional Engineer in British Columbia, Alberta, Saskatchewan, Manitoba and Ontario.

Chris and his wife, Chrystal, live in Winnipeg, along with daughter Aurora, her significant other Mikey and two dogs, four cats and three kittens (came in as fosters and now reside with failed foster parents). When they have time, the C2 duo love to travel and try out different golf courses around the planet.



**Chris Macey,
P. Eng.**

Americas Technical
Practice Leader –
Condition Assessment
and Rehabilitation of
Linear Infrastructure
AECOM



**Robert H.
Westphal**

Senior Advisor of
Operations
Michels Corp.

Robert Westphal started at Michels in 1965 as a pipeline laborer. He steadily advanced through the ranks as a foreman, superintendent, project manager, vice president and senior vice president of Michels Corp. Over the course of his career, Bob has been, and remains, a driving force in the management and strategic growth of several of Michels' industry-leading operating divisions including Michels Communications, Michels Pipe Services, Michels Pipeline Construction and Michels Directional Crossings. Bob's hard work and strategic guidance have contributed to the noteworthy growth of both Michels Canada and Michels Corp.

In the trenchless industry, Bob led Michels' entry into horizontal directional drilling (HDD) in 1986. With his vision, along with the leadership of Tim McGuire, vice president of Michels Directional Crossings, Michels is now regarded as a leader in the HDD industry across the United States and around the world. Today, 53 years after Bob's career began, he continues to champion Michels' advancement in HDD, direct pipe, tunneling, microtunneling, pipe rehabilitation and pipeline construction.

Colleagues regard Bob as a true statesman in

the construction industry. In 2011, he was named *Trenchless Technology's* Person of the Year. He remains active in the Pipe Line Contractors Association (PLCA) and has served on its Board of Directors, Labor Committee and Pipeline Industry Advancement Fund. In 2005, Bob was elected president of PLCA. In 2018, he was recognized for his contributions to the pipeline industry when he was named an honorary member of PLCA. To this day, he continues to serve on the Board of Trustees of the Laborer's National Pension Fund.

Bob has always believed that his greatest and lasting contribution to the construction industry comes through the power of mentorship. It is his strong investment in mentorship both at Michels and across the construction industry, where Bob's influence and positive contributions to the industry are on display. On a regular basis, colleagues at Michels and around the construction industry, seek out Bob's guidance and follow his strong examples of vision in the trenchless construction industry and personal integrity in business.

Bob and his wife, Jone, reside in Fond du Lac, Wisconsin. They are both involved with several civic and charitable causes. They have four sons and 12 grandchildren.

NASTT's Hall of Fame was created by the NASTT Board of Directors to celebrate the Society's most outstanding and accomplished members who have made a lasting impact on the trenchless industry. Members may be elected from all five NASTT membership categories: Manufacturers and Suppliers; Engineers

and Consultants; Municipal and Utility Employees; Contractors; and Academia. The NASTT Board of Directors met last year and voted these trenchless icons as members of the 2019 class. Congratulations to the new inductees!

Maynard Akkerman, Chris Macey and Bob Westphal are the eighth Hall

of Fame class to be commemorated by NASTT. To learn more about NASTT's Hall of Fame and its inductees, visit nastt.org. NASTT's 2019 No-Dig Show will be held March 17-21 at the Donald E. Stephens Convention Center in Rosemont, Ill., just outside of Chicago. For details, visit nodigshow.com.

Introducing NASTT's 2019 Board of Directors

Society's Diverse Leadership Reflects Expanding North American Trenchless Marketplace

Each year, the North American Society for Trenchless Technology works to achieve countless initiatives across four key areas – education, training, research and publishing – that define the Society's role in the industry. The value NASTT provides the industry would not be possible without the many volunteers who make the organization a go-to resource for all things trenchless.

Leading this effort are the individuals who set the tone for the association's goals, growth and future direction. We're talking, of course, about our Board of Directors! The Board works tirelessly throughout the year, devoting their own time to help coordinate the activities and events of the organization on behalf of the membership. The Board is made up of 19 officers and directors from across North America who are elected by the Society's members each fall.

Ending their tenure on the Board in 2018 were Erez Al-louche of Stantec, Tony Hranicka of Tony Hranicka Inc., Larry Kiest, Jr. of LMK Technologies and Kimberlie Staheli of Staheli Trenchless Consultants. NASTT would like to thank Erez, Tony, Larry and Kim for their outstanding contributions and looks forward to continuing to work with them in other facets of the organization.

Even with these invaluable members leaving, NASTT is very excited to welcome to the Board: Alan Ambler, Owner, AM Trenchless; Tiffanie Mendez, Director of Sales, Western States, Sunbelt Rentals; Chris Sivesind, Area Sales Manager, Akkerman Inc.; and Greg Tippett, Regional Discipline Lead, Western Canada Water Group, Stantec.

Meet NASTT's Board of Directors for 2019!



NASTT'S 2019 BOARD OF DIRECTORS



Officers

Chair & International Representative



Craig Vandaele

General Manager of Alternative Delivery and Business Development, Michels Corp.

Craig Vandaele is the general manager of alternative delivery and business development for Michels Tunneling, a division of Michels Corp. Craig has more than 20 years of experience in the North American tunneling and trenchless technology industries. His vast experience includes design, inspection, construction and construction management of trenchless projects throughout North America.

Craig has a deep understanding of the complexities of trenchless projects. In his 11 years at Michels, he has served as the project manager on many significant tunneling, HDD, and cured-in-place pipe (CIPP) rehabilitation projects. Among them are the McOrmond Drive Sanitary and Storm Sewer Trunks in Saskatoon, Saskatchewan, Canada; Big Lake Offsite Gravity Portion (W14) in Edmonton, Alberta, Canada; Vancouver City Central Transmission Project, Vancouver, British Columbia, Canada; and Upper Northwest Interceptor Sections 3 & 4 in Sacramento, Calif. He has worked on projects that include conventional tunneling, microtunneling, EPBTBM, pipe jacking, pipe bursting, CIPP and shaft construction of various types and sizes.

Craig is proud to be a leader and an advocate of the trenchless technology industry. He is active in many other industry organizations, including NASTT's Northwest Chapter (past chair) and the Tunnel Association of Canada (TAC). Craig has also co-authored papers for several No-Dig Shows.

Vice Chair



Alan Goodman

Strategic Account Sales Manager, HammerHead Trenchless

Alan Goodman has more than 18 years of experience in the underground construction industry. Alan began his career in the auger boring industry as a sales representative and is currently employed with HammerHead Trenchless as strategic account sales manager in the United States and Canada. After learning Japanese in high school, Alan studied abroad in Japan and served as an Ambassador for the Rotary International exchange program. Alan completed his education with a B.A. in International Business from the Stephen F. Austin State University in East Texas, and had the opportunity to manage the Asia/ Australia business and utilize his Japanese.

During his tenure at HammerHead Trenchless, he has worked closely with municipalities, engineering firms and contractors around the world providing customer training, technical support, pre-project planning, project specifications, and installations for pipe ramming, pipe bursting and slitting, cured-in-place pipe (CIPP) and other trenchless projects.

Alan currently serves as Vice Chair on NASTT's National Board and sits on the Program Committee. He is also Chair of NASTT's South Central Chapter, which includes Oklahoma and Texas.

Alan is also an active member of the following industry associations: Distribution Contractors Association (DCA), American Gas Association (AGA), Pipe Line Contractors Association (PLCA), Pipe Line Contractors Association of Canada (PLCAC) and the National Utility Contractor's Association (NUCA).

Secretary



Joe Lane

Vice President of International Operations, Aegion

Joe Lane is the vice president of international Operations for Aegion's Infrastructure Solutions Platform. Prior to this role, his positions included general manager of Insituform's Asia and Pacific CIPP operations and president of HEBNA Corp., an international energy services pipeline rehabilitation company. Joe started his career in the trenchless pipe-

line industry with Insituform in 1991 holding positions in operations, training, business development, sales management and finally as general manager of business units in the central and western United States. Joe currently resides in The Hague, Netherlands, with his wife, Theresa.

Joe holds a bachelor's in biology from the University of Northern Colorado and is a graduate of the University of Michigan School Of Business Management and the Leadership Program of the Rockies. He is active in several water and energy pipeline focused organizations, is an Executive Board Member for the North American Society for Trenchless Technology (NASTT) and is past president of the Rocky Mountain Chapter of NASTT.

Michael Davison, P.Eng. is currently Product Director for the Aqua-Pipe division at Sanexen Environmental Services Inc. in Montreal, Canada. Since 2002, he has been involved in the design and manufacturing of the product, the creation and maintenance of installation operation procedures, training of operators and licensees, the development of QA/QC procedures, the planning and management of the largest Aqua-Pipe projects to date and improvements through research and development. Mike is currently the lead for all technical aspects within the Aqua-Pipe team.

A graduate of McGill University in civil engineering, Mike is an active member of the NASTT No-Dig Show Program Committee and is a technical session leader. He is also involved in ASTM International standard committees and is the Chair of the American Water Works Association (AWWA) standards and M28 CIPP subcommittees. Mike is a member of the American Society of Civil Engineers (ASCE), and also works locally to improve the trenchless industry with the Bureau de Normalisation du Québec (BNQ).

Outside of the office, Mike is an avid hockey player, coach and fan.

Treasurer



Michael Davison, P.Eng.

Product Director, Aqua-Pipe Division,
Sanexen Environmental Services Inc.

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Officer-at-Large

Matthew Wallin, P.E.

Partner & Senior Project Manager,
Bennett Trenchless Engineers

Matthew Wallin is a partner and senior project manager with Bennett Trenchless Engineers (BTE), located in Folsom, California. BTE's engineering practice is focused entirely on trenchless technology design, construction management and claims assistance with clients and projects located throughout California, as well as Texas, Florida, Nebraska, Iowa, South Dakota and Tennessee.

Matthew holds both bachelor's and master's degrees in civil engineering from Case Western Reserve University in Cleveland, Ohio. He began his career working for URS in Oakland, California in 2001 in their geotechnical group. Since that time, Matthew has focused his practice on geotechnical engineering and the design and construction management of new pipeline projects using horizontal directional drilling, microtunneling, open-shield pipejacking, pipe ramming, and auger boring.

Matthew has been a member of NASTT since 2002 and has participated in the organization in many capacities. He has been an active member in the Western Chapter (WESTT) since 2003 and has served as a member of the Board of Directors and as the chapter's treasurer since 2008. He joined NASTT's No-Dig Show Program Committee in 2010 and has acted as a session leader for the annual No-Dig Show since that time. Matthew is also an instructor for NASTT's HDD Good Practices Course as well as the Introduction to New Trenchless Methods Course, each of which are taught annually at the No-Dig Show and at other off-site venues throughout the year.



Immediate Past Chair

**Frank Firsching,
B.Sc., MBA**

Water Industry Consultant

Frank Firsching is an independent business consultant serving the water industry. Prior to this role he served for three years as president of Aegion's Infrastructure Solutions Platform, which is comprised of the global business units of Insituform Technologies, Fyfe Company, Fibrwrap Construction Services, MTC and Underground Solutions. Previous positions included executive vice president, general manager

and vice president of sales during his 10 years with Underground Solutions. Before joining Underground Solutions, Frank worked for USFilter Corporation as president of its \$1 billion Water and Wastewater Systems Group with responsibility for USFilter's global process equipment and technology divisions. Frank also held the positions of executive vice president of the Process Water Group, west regional manager and general manager during his 13 years at USFilter. Prior to joining USFilter he worked at Deloitte & Touch Management Consulting and at GE Corp. He received an MBA at the Wharton School Business and a B.S. in Mechanical Engineering from the University of Virginia.

Directors

Alan Ambler, P.E.

Owner, AM Trenchless LLC



Edward "Alan" Ambler has 17 years of experience working on engineering projects including the World Islands in Dubai and cruise ship berth construction in Alaska. While an employee at the City of Casselberry, Florida, Alan managed the day-to-day operations of a municipal utility while developing the capital improvement program and executing projects. Alan has designed more than 370,000 lf of pipeline projects and is a national leader in trenchless technologies, such as pipe bursting.

Alan joined NASTT in 2013 and serves as a track leader on the No-Dig Show Program Committee. Alan is the chair of NASTT's Pipe Bursting Center of Excellence and a co-author of the forthcoming Pipe Bursting Good Practices Guidelines, 3rd Edition. He also volunteers as an instructor for NASTT's Good Practices Training Courses. Alan has a B.S. in Civil Engineering, a M.S. in Environmental Engineering, holds two patents and is the owner of AM Trenchless LLC.

Alan loves to play guitar, cook for his wife and coach baseball for his three boys.

Lisa Arroyo, P.E.

President, Arroyo Trenchless



Lisa Arroyo is the founder and president of Arroyo Trenchless, Inc. Prior to starting Arroyo Trenchless, Lisa was the Wastewater System Manager for the City of Santa Barbara, California.

During her 17-year tenure with the City of Santa Barbara, Lisa held progressively increasing roles of responsibility in the areas of engineering design, project development, and program management. She oversaw the operation and maintenance of the city's wastewater treatment plant, collection system and laboratory. She managed a multi-million-dollar capital improvement program and a \$20 million operating budget.

Over the past several years, Lisa has used her knowledge and experience to focus on capital improvement projects that leverage trenchless technology to economically renew aging wastewater collection systems. She has experience with both CIPP and directional drilling methodologies. Lisa has long been a champion of trenchless technology, as it is proven to be both an effective and economical solution for improving wastewater collections systems.

Lisa holds a bachelor's in both mathematics and civil en-

gineering, and she is a licensed professional civil engineer in California. She was elected to the Board of Directors for the Western Chapter of NASTT in 2016, and served as secretary. Currently she serves as WESTT's vice chair and was the conference chair for WESTT's 2018 Trenchless Conference in Arizona. She is also a member of NASTT's No-Dig Show Program Committee.

000 MGD recycled water facility, 256 miles of wastewater collection system infrastructure and a water resources laboratory. Lisa holds Bachelor of Science in both mathematics and in civil engineering and is a licensed professional civil engineer.

During her 16-year tenure with the City of Santa Barbara, Lisa held progressively increasing roles of responsibility in the areas of engineering design, project development and program management. She managed the operations and maintenance of the wastewater treatment plant and collection system, and managed a multi-million-dollar capital improvement program focused on upgrading the wastewater treatment plant's processes.

Lisa is an active wastewater professional and was elected to the Board of Directors for the Western Chapter of NASTT in 2016, where she served as the Secretary. Lisa has long been a champion of trenchless technology, as it is proven to be both an effective and economical solution for improving wastewater collections systems.



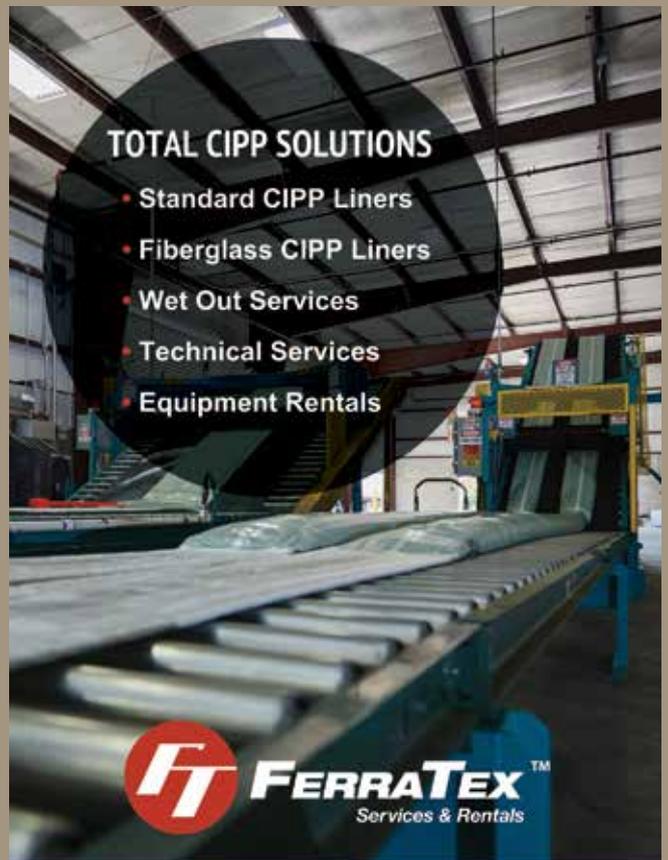
The North American Society for Trenchless Technology Canadian Chapters will be hosting the first annual No-Dig North in Calgary, AB October 28-30, 2019.

The show will consist of two days of technical paper presentations and industry exhibits in the trenchless technology field. Pre-event technical short courses will also be available on Monday, October 28, 2019.

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Maureen Carlin, Ph.D.

Strategic Marketing Manager, Laney Directional Drilling



Maureen has more than 14 years of experience in construction engineering and project management for both vertical commercial construction and trenchless pipeline construction. Carlin's areas of expertise are in advanced project planning and market analysis for Horizontal Directional Drilling and Direct Pipe® engineering and

construction projects both domestically and internationally. This includes knowledge of established markets such as oil, gas, water and power in addition to emerging markets such as desalinization, offshore cabling and wind farming and military applications.

Carlin earned her B.S. in Civil Engineering and Architectural Engineering from the Missouri University of Science and Technology. While working on large-scale and complicated projects in Las Vegas, Nevada, she received a M.B.A from the University of Nevada-Las Vegas. Carlin went on to receive a Ph.D. Civil Engineering with an Emphasis in Construction Engineering and Management. Carlin spent extended time in mainland China developing her dissertation studying horizontal directional drilling methods in China compared to North America.

Gerard P. Lundquist, P.E.

Director, Gas Construction, National Grid



Gerry Lundquist is a director with National Grid, USA. National Grid is an International Electric and Natural Gas Transmission and Distribution Company. He is the director of gas construction for New York State and has more than 30 years of experience in all phases of construction, design, engineering and project management. His

responsibilities include the execution of the capital work plan while also insuring the safety, security and reliability of the natural gas distribution system. Prior assignments have included project manager for the JFK Airport Cogeneration Facility, and the Stony Brook Cogeneration Facility. He integrates innovative technologies to reduce costs and increase operational efficiencies.

Gerry has a bachelor's in civil engineering from The Cooper Union, a Master of Business Administration from Adelphi University, and a master's in Economics and Finance from NYU. He is a New York State Registered Professional Engineer.

He has served on NASTT's Board of Directors and the No-Dig Show Program Committee since 2015.

His affiliations include serving on the on the Board of Directors for the Northeast Gas Distribution Council (NEGDC),

consisting of natural gas utilities throughout the northeast, an active member of the National Society of Professional Engineers (NSPE) and the American Society of Civil Engineers (ASCE). He is also a member of the American Public Works Association (APWA) and serves on the Utility and Public Right of Way (UPROW) Technical Committee for the past four years and chairs the Construction Practices Subcommittee.

Michelle L. Macauley, P.E., LEG

Owner, Macauley Trenchless, PLLC



Michelle Macauley is a geotechnical engineer and the founder and owner of Macauley Trenchless, PLLC. Prior to starting Macauley Trenchless, Michelle was the National Trenchless Practice Lead for Jacobs Engineering and oversaw multiple trenchless projects across the company. She earned her B.S. in Geological Sciences from the University of Washington and her

M.S. in Geological Engineering from the University of Alaska, Fairbanks. She is a licensed professional engineer in Washington, Oregon, Arkansas, California and Texas, and a licensed engineering geologist in Washington.

Michelle has more than 20 years of experience in geotechnical engineering, with a particular emphasis on trenchless feasibility, design and constructability. Prior to joining Jacobs, Michelle was a senior geotechnical engineer specializing in trenchless design and construction with GeoEngineers and Staheli Trenchless Consultants. She has been involved in projects using horizontal directional drilling, microtunneling, pipe bursting, auger boring, pipe ramming, conventional tunneling, and pilot-tube guided auger boring — just to name a few.

Michelle has been involved with NASTT since 2006. During that time, she has been involved with the Pacific Northwest Chapter both as a chapter president and an organizer of the chapter's inaugural trenchless technology symposium. She has been a contributor to the PNW Chapter Trenchless Review (bi-yearly publication) and is a regular speaker, attendee and program committee member for No-Dig. She has also presented at the Washington State chapter of the American Public Works Association conference on trenchless technology. Michelle is a member of the ASCE Trenchless Installation of Pipelines group and is helping update the Manuals of Practice for Pipe Ramming (MOP 115) and Pipe Bursting (MOP 112). Additionally, she is a member of the committee to write the new manual of practice for Direct Pipe.

As the founder of Macauley Trenchless, Michelle is excited to work with trenchless professionals across the nation and expand her trenchless expertise to other regions. She is looking forward to bringing that experience and passion to bear on the national level as part of the NASTT Board of Directors.

Jeff Maier, P.E.

Water Technology Team Infrastructure Practice Leader, Garver



Jeff Maier, P.E., is a Water Technology Team Infrastructure Practice Leader at Garver, a leading multi-disciplined engineering, planning and environmental services firm, based in Denver, Colorado. He is responsible for business development, client services and providing technical expertise for a variety of trenchless re-

habilitation technologies, advanced pipeline condition assessment methods and asset management strategies.

Prior to joining Garver, Jeff worked for more than four years as the director of engineering at C&L Water Solutions, a trenchless water and wastewater rehabilitation services contractor, and prior to that, for more than 10 years as an engineer with the Metro Wastewater Reclamation District (MWRD) in Denver. He is a Colorado and Utah registered professional engineer and a graduate of the University of Michigan – College of Civil & Environmental Engineering with over 19 years of project management and engineering design experience, primarily in the water and wastewater industry. He is recognized as an expert in the fields of advanced condition assessment and trenchless rehabilitation of pipelines, manholes, and wastewater facility structures.

Jeff is actively involved in the Rocky Mountain NASTT regional chapter and was the Conference Chair for the 2016 No-Dig Show in Dallas, Texas. Jeff also serves as the Vice Chairman of the ASTM F17.67 subcommittee on Trenchless Plastic Pipeline Technology. He is a National Association of Corrosion Engineers (NACE) Certified Coating Inspector – Level 3 and is a certified NASSCO cured-in-place pipeline rehabilitation inspector.

Babs Marquis, CCM

Trenchless Practice Lead – East Coast, McMillen Jacobs Associates



Babs Marquis has more than 26 years' experience in underground project design and construction. He is the McMillen Jacobs Associates Trenchless Practice Lead for the East Coast, and is located in the Burlington, Mass., office. Previously, Babs worked for Jacobs Engineering Group for 10 years and Stone & Web-

ster Engineering Corporation for 11 years as a construction manager. During his extensive career in the trenchless industry, Babs has been involved in major tunneling and trenchless projects in the northeast for clients such as the Massachusetts Water Resources Authority, Boston Water & Sewer Commission, the Metropolitan District Commission

(Hartford, CT), and Narragansett Bay Commission (Providence, RI), District of Columbia Clean Waters, New York City Department of Design & Construction, and New York City Department of Environmental Protection.

For the past 17 years, Babs has focused on underground construction management for tunnels and conveyance, including water and wastewater pipeline design and construction projects, with an emphasis on trenchless construction methods. He has worked on various pipeline projects utilizing microtunneling with wet retrieval; pipe jacking; horizontal auger bore; and pipeline renewal methods such as pipe bursting, sliplining, and relining. Babs was involved with the planning and design of the East Boston Branch Sewer Relief Project as part of the Boston Harbor cleanup, ordered under a Massachusetts Water Resources Authority (MWRA) consent decree. From 2009 to 2011 he was resident engineer on the project's pivotal microtunneling and pipe bursting components. In 2011, East Boston Branch Sewer Relief was named North American Society for Trenchless Technology (NASTT) Project of the Year. Babs has authored and coauthored several papers for the NASTT No-Dig Show, American Society of Civil Engineers (ASCE) Pipelines Conference, and Rapid Excavation & Tunneling Conference (RETC); and is a member of NASTT, ASCE, Underground Construction Technology (UCT), and the Construction Management Association of America (CMAA).

Babs is an active member on the board of directors for the NASTT Northeast Regional Chapter and serves as its vice chair. He played an active role in the launch of the chapter and its successful inaugural conference and journal for trenchless practices for the Northeast Region.

John Matthews, Ph.D.

Director of the Trenchless Technology Center & Associate Professor, Louisiana Tech University



Dr. John Matthews has more than 14 years of experience in the rehabilitation and inspection of infrastructure systems. He is the director of the Trenchless Technology Center (TTC) and an Associate Professor of Civil Engineering and Construction Engineering Technology at Louisiana Tech University. Prior to rejoining

the TTC, he served as the pipe renewal service line manager at Pure Technologies, providing clients with guidance on the selection and use of trenchless rehabilitation technologies. Prior to joining Pure, he served as Battelle's water infrastructure management lead, where he led multiple water and sewer infrastructure research studies. Prior to joining Battelle, he led multiple projects at the TTC relating to the development of automated decision support systems for technology selection. He has also been involved in nu-

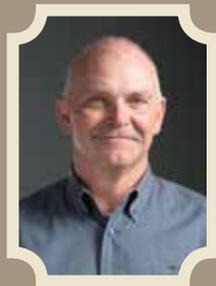
merous projects relating to condition assessment technology selection and field evaluation of trenchless rehabilitation technologies.

He has given more than 110 conference presentations and authored more than 160 publications in the area of trenchless technology for which he has received two International Society for Trenchless Technology (ISTT) No-Dig Awards (2005, 2012) and a North American Society for Trenchless Technology (NASTT) Outstanding Paper Award (2015). He has been an active member of NASTT since 2003, serving on the No-Dig Program Committee and various other committees. He also serves as a NASTT Course Instructor for both the Laterals Good Practices and Intro to Trenchless Technology – Rehabilitation Good Practices Courses.

In 2013, he was awarded the NASTT Trent Ralston Award for Young Trenchless Achievement. He is also an active member of the American Society of Civil Engineers (ASCE) and American Water Works Association (AWWA) and he currently serves on the Editorial Advisory Boards for both Trenchless Technology Magazine and the ASCE UESI magazine. He also serves as an Associate Editor for the ASCE Journal of Pipeline Systems Engineering and Practice.

Rick Melvin

National Product Specialist, TT Technologies, Inc.



Rick Melvin is a national product specialist for TT Technologies, Inc. He has been involved in a variety of underground construction applications for more than 20 years. This includes sales and servicing of pipe ramming, horizontal directional boring machines and pipe bursting systems. Rick has also been heavily

involved in pursuing overall growth of the trenchless technology market. He has assisted in educating engineers and contractors on the extensive benefits of various available trenchless technologies and trenchless equipment techniques.

Tiffanie Mendez

Director of Sales, Western States,
Sunbelt Rentals



A 23-year liquids solutions and management professional, Tiffanie began her career in the early 90's in Yuma, Ariz., focusing on specialty equipment rental systems and design/build liquids handling systems. Her early focus was groundwater dewatering, pump and treat systems, sewer bypass systems and construction stormwater runoff management. After relocating to Northern California in 2005, the design-build systems focus grew to include temporary plants for environmental remediation, low and medium voltage electrical power systems and compressed air systems.

Tiffanie is now the director of sales for Sunbelt Rentals, Western States. She holds a BSBA from Northern Arizona University and an MBA, General Management from California State University, East Bay. Tiffanie has been a part of NASTT's No-Dig Show Program Committee since 2016 and believes the future of the industry lies in preparing the new leaders of the trenchless industry now. As such, she is particularly passionate about the student programs and student chapters associated with NASTT.

Charles Pullan, P.Eng.

Senior Project Engineer, City of Calgary's Water Resources Department



Charles Pullan is a senior project engineer with the City of Calgary's Water Resources Department in Calgary, Alberta. Charles holds a Bachelor's of Science in Civil Engineering from the University of Calgary. In his current role, Charles focuses on linear capital construction of water, sanitary and drainage systems. Charles has been involved with various trenchless technologies, including electromagnetic inspection of PCCP water mains, HDD projects and microtunneling installations.

Charles has been heavily involved in the Northwest Chapter of NASTT since 2014 and has been part of the organizing

work for the 2019 NASTT Conference in Denver, Colorado.

committee for the 2015 and 2017 Northwest Trenchless Conferences. Charles has also co-authored papers for NASTT's No-Dig conference and various Northwest Trenchless Conferences.

Chris Sivesind

Area Sales Manager, Akkerman Inc.



Chris Sivesind is an area sales manager with pipe jacking and tunneling equipment manufacturer Akkerman. Sivesind is responsible for sales in the western most portions of the United States as well as Western Canada, Europe and Southeast Asia. Chris' career in the pipe jacking and tunneling industry has been multi-

faceted. Early on, he was regional manager for his family's pipe jacking and auger boring construction business. Following this, he worked as west coast sales representative and specialty shoring installation consultant for a trench safety rental group. Prior to Akkerman, Chris worked for another pipe jacking equipment manufacturer. Chris is an active participant in industry associations NASTT, ISTT and CSITT, has authored and presented several papers at their conferences and served as chair and secretary for the Pacific Northwest Chapter of NASTT. He received his formal education from Washington State University with a bachelor's in Business Administration. Go Cougs!

has successfully designed and implemented a number of projects within the Capital Region that included the use of several trenchless technologies. His past trenchless experience includes case bore, pipe jacking, horizontal directional drilling, microtunneling and conventional tunneling.

Greg has been an active member of the Northwest Chapter of NASTT since 2009 and is the current Chair of the Chapter's Board. In 2010, Greg joined the NASTT-NW Conference planning committee and has never looked back. Since then he has served in many different capacities on these committees, including Conference Chair for the 2016 and 2018 Conferences. In particular, Greg is very proud of his team's efforts in jointly presenting the Tunnelling Association of Canada's National Conference in 2018. Learning from the 2018 show, Greg is now excited to chair another planning committee to bring the first-ever No-Dig North conference to Calgary in 2019, the first ever national show for NASTT in Canada (read more on page 34!).

Dennis Walsh, P.E.

Senior Project Manager, Horizontal Directional Drilling, PSE&G



Dennis M. Walsh, P.E., is a senior project manager, horizontal directional drilling for Public Service Electric & Gas in New Jersey. Dennis is a 1972 graduate of the University of Dayton, Ohio, with a B.S. in Civil Engineering and a 2002 graduate of the Polytechnic University of New York with a M.S. in Technology. He retired from KeySpan

Energy Company in 2005 after a 28-year career in the gas utility field with a background in engineering, operations, construction, Quality Assurance and HVAC. He led KeySpan's efforts to expand the use of trenchless technology in the early 1990s to decrease its main and service installation costs. Prior to joining PSE&G, he was a consulting engineer for various clients in the natural gas industry.

In addition to serving on the Board for NASTT, Dennis is also a Board member for the NASTT Mid Atlantic Chapter and on the annual No-Dig Show Program Committee. Dennis has designed numerous HDD installations for various utilities; including a 1,800-ft HDD for a 30-in. gas main under a tidal basin in Brooklyn, N.Y.; a 2,000-ft, 12-in. HDD under an environmental sound in South New Jersey; a 400-ft long jack and bore installation in Newark, N.J.; and he was the senior project manager for an 1,900-ft HDD of a 30-in. steel pipeline with PVC conduits for a 69kV electric system. Dennis is a licensed professional engineer in five states. When he is not involved in trenchless projects, he enjoys traveling, co-chairs a 9/11 memorial golf outing and 5K walk, and is still trying to play golf.

Greg Tippett, P.Eng.

Regional Discipline Lead, Western
Canada Water Group, Stantec Consulting Ltd.



Greg Tippett is the regional discipline lead for the Western Canada Water Group at Stantec Consulting Ltd. He is currently responsible for the group's project delivery and quality control. Greg graduated from Lakehead University in 2003 and has been working as a consulting engineer in Alberta's Capital Region since. Throughout his

career, Greg has specialized in the design, assessment, and construction of municipal underground infrastructure. Greg



NASTT chapters aim to bring new, comprehensive trenchless conference to Canada with No-Dig North

The North American Society for Trenchless Technology's Canadian regional chapters are bringing a new conference and tradeshow to the trenchless technology industry north of the border. Billed as No-Dig North, the conference will host its first-ever event in Calgary, Alberta, Canada on Oct. 28-30, 2019.

No-Dig North was created as part of agreement between NASTT's Northwest Regional Chapter (NW-NASTT), the Great Lakes, St. Lawrence & Atlantic Chapter (GLSLA) and the British Columbia Chapter (NASTTBC). The event is being organized with support from the national NASTT organization with show management activities being handled by Benjamin Media, manager of NASTT's No-Dig Show and publisher of Trenchless Technology magazine.

"The NASTT-NW Chapter has been running our annual conference for over 20 years," said Greg Tippett, chair of NASTT-NW and regional discipline lead for Stantec's Western Canada Water Group. "We have seen it grow from a small symposium to a well-attended regional conference with multiple technical tracks and a balanced trade show. With the support of the other Canadian NASTT chapters, we are excited to bring this national show to all of Canada."

No-Dig North will be held at the Calgary Telus Convention Centre. The show will consist of two days of technical paper presentations and industry exhibits in the trenchless technology field. Pre-event Good Practices courses will also be available on Monday, Oct. 28.

The technical program will look to highlight a number of topics across the Canadian trenchless market, including lining/sliplining/coating, pipe bursting, microtunneling/pipe jacking, horizontal directional drilling, auger boring and inspection and maintenance technologies. A full unveiling of the 2019 No-Dig North Show agenda and networking events will be coming soon, as well as early registration details. As of Jan. 15, Aegion's Insituform has signed on as platinum sponsor, along with gold sponsors Akkerman and Michels.

"NASTT and our U.S. Chapters are excited to welcome a Canada-wide trenchless conference," said Mike Willmets, NASTT executive director. "We are supporting the event in various ways, including our Good Practices training courses."

For more information on sponsorships and exhibiting at the show, contact Brittany Cline at bccline@benjaminmedia.com or call 330.315.2150. For show information, visit nodignorth.ca.

Primus Line system used on Tacoma water rehab project



In 2017, Camp Murray Military Base near Tacoma, Wash., was replacing its water supply system due to age concerns. The majority of the system was renewed with open trench remove and replace, one of the two supply lines to the base was unable to be accessed in this manner. The supply line runs under a railway as well as Interstate 5, the main interstate highway on the west coast, making a trenchless operation the only solution. The engineers had to select from two options for this project: Primus Line, or HDPE lining. Primus Line was ultimately selected to maximize the hydraulic capacity in the line.

The project owner, the U.S. Army Corps of Engineers, opted to have Primus Line installation partner, Insta-Pipe Inc., renew the water main with the Primus Line system, a proven solution for the trenchless

EYE ON THE INDUSTRY

HydroScience opens new office in Carlsbad



HydroScience Engineers has announced the opening of its fifth office, located in Carlsbad, California, and led by Regional Manager Robert J.

(Jud) Warren, PE, BCEE. Warren will be leading efforts to provide water, wastewater, and recycled water engineering services in Southern California.

Warren has close to 40 years of project delivery experience for clients throughout the Western United States, and most recently in San Diego County. He will be backed by the full resources of our engineers and support staff in our other HydroScience offices. Led by Jud, HydroScience looks forward to implementing our mission of providing the highest quality work for our clients in this new region—the first time and every time.

HydroScience Engineers is a full-service civil engineering firm based in California that provides planning, design, and construction phase services for water, wastewater, and recycled water projects and related civil engineering projects.

rehabilitation of pressure pipelines. The three-layer composite liner consists of an NSF/ANSI 61 certified PE inner coating, a Kevlar core to accommodate the operating pressure, and an abrasion-resistant PE outer layer to protect the Kevlar core during the installation process. The semi-structural solution is not bonded to the host pipe, can traverse bends of up to 45 degrees, and can be inserted in lengths of up to 8,000 ft in one single pull.

Maximizing hydraulic capacity was top priority on this project, leading to the selection of Primus Line as the rehabilitation method. The host pipe was cast iron with an internal diameter of approximately 16.38 in., a length of 305 ft, and contained no

HammerHead Trenchless training facility up and running



HammerHead University is a new two-story, 5,000-sq-ft educational facility that provides both classroom and hands-on application training for every HammerHead product line.

The first class of contractors to graduate from HammerHead University, an advanced trenchless technique learning center, received manufacturer certification after three days of hands-on, guided instruction in September 2018. The training facilities and curricula had been officially announced as fully operational at the Lake Mills, Wis., headquarters of HammerHead Trenchless, a Charles Machine Works company, during its annual August sales meeting last year.

The new two-story, 5,000-sq-ft educational facilities provide trenchless method contractors, plumbers, project engineers and utility company and municipal crews both classroom and hands-on application training for every HammerHead product line. Courses are available for the pipe ramming, pipe bursting and pipe slitting methods; lateral and vertical cured-in-place pipe (CIPP) cleaning, preparation and rehabilitation; and pipe and culvert spot repair (continued on p. 36).

bends. With the combination of a short run with no bends, the decision was to install a Primus Line DN 450 MD with a nominal diameter of 18 in. and a nominal design pressure of 232 psi.

To complete the system, the medium pressure connectors with an operating pressure of 150 psi were used to guarantee a durable and tensile strong connection. In a first step, the two excavation pits for the installation of the Primus Line system had to be created and the water main was disconnected from the pipeline network, opened and CCTV inspected. After that, incrustations and debris were removed with pull through metal scrapers, rubber disks and a vac truck to cre-

ate a free inner diameter, which is required to make sure the liner is not damaged during the installation process. After cleaning the host pipe, the pre-folded and coiled on a transport reel Kevlar reinforced composite liner was inserted and subsequently the liner was inflated with 7 psi to turn it into a round shape.

Finally, the medium pressure termination fittings were installed and a leak test with a test pressure of 150 psi was performed and successfully completed. Concentric reducers were then used to adapt the 18-in. flanges of the Primus Line connectors down to the 16-in. flanges used in the rest of the supply system.



HammerHead University's first graduates included six Apollo Home employees. Founded in 1910, the Cincinnati-based business provides sales, service and repair of home mechanicals including heating, cooling, ventilation, electrical, plumbing and sewer systems for more than 800,000 customers in its Ohio, Kentucky and Indiana service area.

Services such as drain cleaning, water line replacement and sewer repair are overseen by Apollo Excavation Manager Dustin White, who was one of those returning for a three-day course on HammerHead cured-in-place pipe (CIPP) lining systems and point repair. White received his initial HammerHead CIPP certification prior to the existence of the facilities. He compared how much the university-like setting improved the learning experience for four Apollo technicians attending with him for their initial certification.

"The controlled environment really makes a difference," White said. "The mockup creates a better real-life experience. It takes away the anxiety of a 'game-time' situation. The pipe was embedded in gravel, but everything was above ground, giving our people who are new to CIPP better visual access to see exactly how it works."

Jeff Urbanski, HammerHead training and technical services manager, said a fully controlled learning environment allows students to focus on the fundamentals of the applications without the distraction of specific, site-based complications. Initially grounded in an application's principles, students are better prepared to anticipate how such jobsite factors will affect an operation, as well as help them to more

quickly determine the root cause of any problem that arises.

"This is innovative education. It's not just reading from a book," said Urbanski. "We simulate real-life applications, replicating situations that put participants inside a house or a manhole on a street. But taking away the soil, watery ground conditions and confined entries in their first experience with the method results in more consistently repeatable performance over a wide range of worksite conditions."

The HammerHead University setting enables courses to be held year-round. "No matter what the weather is outside, 365 days a year, participants can be using Same Path technologies to install, replace or rehab pipe, from gas-line slitting to CIPP applications."

HammerHead is currently in the process of establishing an "e-learning platform" with continuing education units for its courses. Urbanski said, "In association with our courses, students will be able to go online and for a small fee take a pass-fail course to receive certification that applies specifically to their state or a given municipality if its governed by specific guidance. Certification will be annually renewable."

Average class sizes in a given application range between two and five people. The University demonstration area accommodates up to 18 participants in as many as eight separate application stations simultaneously. Larger class sizes can be accommodated in the HammerHead University conference room.

To enroll or request information about specialized courses, please visit hammerheadtrenchless.com/training.

Vermeer acquires Vac-Tron, forms Vermeer MV Solutions with McLaughlin

In November, Vermeer Corp. announced its purchase of Vac-Tron Equipment, LLC, and its plans to bring the Florida-based company together with McLaughlin Group, Inc. which was purchased by Vermeer in 2017. This acquisition and integration of the two companies builds on the Vermeer strategy to provide a comprehensive suite of vacuum excavation technology, equipment, training and support to the growing underground utility and soft dig markets.

Founded in 1997, Vac-Tron has grown to become a respected brand known for innovative, high-quality vacuum excavation products sold and serviced across underground utility markets. Headquartered in Okahumpka, Fla., Vac-Tron offices and production facilities employ more than 100 people. For the last 13 years, Vac-Tron products have been sold almost exclusively through the Vermeer dealer network.

McLaughlin, a drill tooling and vacuum excavation company founded in 1921 and located in Greenville, S.C. with more than 100 team members, brought nearly a century of industry knowledge into the Vermeer fold last year.

"This acquisition allows us to leverage the innovation, market expertise and production capabilities across our McLaughlin, Vac-Tron and Vermeer brands to meet increasing customer demand while giving our dealers a more efficient, single-point connection to a full

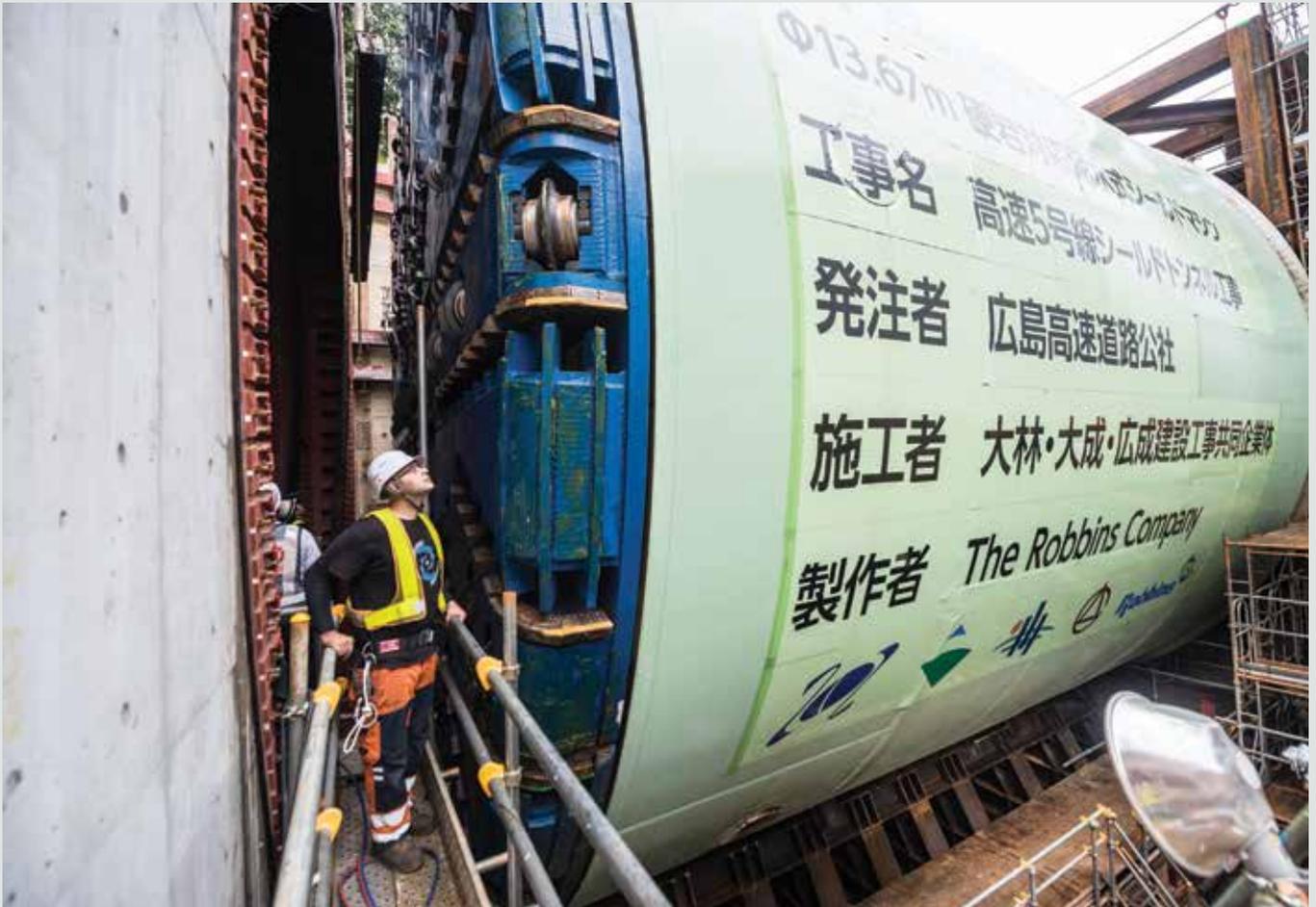
product lineup. Coming together solidifies the long-term strategy and commitment to support customers and dealers in a unified way," said Jason Andringa, Vermeer Corp. president and CEO.

Operating under the combined group, Vermeer MV Solutions, the organization will continue to provide Vermeer-branded vacuum excavation equipment and technology through dedicated Vac-Tron and McLaughlin series product lines as well as McLaughlin branded utility accessories and auger boring systems.

Vermeer MV Solutions will operate under one combined leadership and sales team led by General Manager Dave Van Wyk. Leadership at both Vac-Tron and McLaughlin will come together and serve as a unified team, bringing the strengths and best practices together in the areas of innovation, design, manufacturing, sales and customer support. The Florida and South Carolina locations will continue production as they work together to meet the growing demand within the soft dig markets.

"We've been proud to have the Vermeer name on our equipment for the past 13 years. Now, we are proud to formally be a part of the Vermeer family. We look forward to investing with McLaughlin and Vermeer to deliver the technology and equipment our customers need as we provide the highest quality product for the customer," said Tim Fischer, Vac-Tron president.

Huge Robbins slurry TBM makes first cut on Hiroshima Expressway project in Japan



The 13.7 m (44.87 ft) diameter Robbins Slurry machine launched on September 18, 2018 in Hiroshima, Japan.

In September 2018, a Robbins mega-sized slurry machine, measuring 13.7 m (44.8 ft) in diameter, made its first cut into hard rock during a launch at an urban jobsite made possible by Onsite First Time Assembly (OFTA) of the TBM in Japan for the Hiroshima Expressway Line 5 project.

The contractor, a joint venture of Obayashi-Taisei-Kosei, had a strict timeline of eight months to adhere to when it came to machine assembly. “This deadline was very important. After assembling the TBM, I think OFTA was appropriate for this project,” said Ryota Akai, deputy project manager for the Obayashi JV.

Due to the project location there were also restrictions on delivering the TBM—in order to meet controlled transportation limits within the city, the TBM had to be divided into small transportable weights and sizes, then assembled in a small jobsite measuring just 30 m (100 ft) wide x 60 m (200 ft) long. The 2,400 metric ton (2,650 US ton) machine will bore 1.4 km (0.9 mi) of the 1.8 km (1.1

mi) long tunnel that, once completed, will significantly improve traffic conditions in Hiroshima.

The massive machine is the country’s first foreign-made large diameter Slurry TBM to excavate hard rock in Japan. “There is a lot of hard rock in Hiroshima,” said Mr. Akai, “and Robbins has a lot of experience boring hard rock.” The machine is expected to encounter granite with rock strengths up to 130 MPa (19,000 psi) UCS. Those involved in the project are excited to see what effect this will have on how Slurry TBMs are used in the future. “The development of this TBM is a milestone,” said Mr. Kiyomi Sasaki, General Manager of Robbins Japan, “it will lead to new tunnel applications worldwide.”

The new Expressway Line 5 tunnel will directly connect Hiroshima’s urban area with a major national highway network and is expected to improve access to Hiroshima Airport. Tunnel completion is planned for 2020.



NASTT Chapter News



British Columbia

The British Columbia Chapter (NASTT BC) has recently entered into an agreement with the GLSLA and Northwest Chapters to host No-Dig North, a new conference geared specifically toward the trenchless market in Canada. The first annual No-Dig North will be held Oct. 28-30, 2019 in Calgary, Alberta. Please visit nodignorth.ca for more info.

The chapter is also continuing its efforts to introduce trenchless technologies into educational institutes. In 2017 and 2018, the chapter 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.



Great Lakes, St. Lawrence & Atlantic

The GLSLA Chapter has recently entered into an agreement with the British Columbia and Northwest Chapters to host No-Dig North, a new conference geared specifically toward the trenchless market in Canada. The first annual No-Dig North will be held Oct. 28-30, 2019 in Calgary, Alberta. Visit nodignorth.ca for more info. For more information on GLSLA, events and chapter training sessions, please visit glsa.ca.



Mid Atlantic

The Mid Atlantic Chapter (MASTT) held a successful Trench-

less Technology, SSES and Buried Asset Management seminar in Virginia Beach, Va., on Dec. 12, 2018 at the Wyndham Virginia Beach Oceanfront Hotel. The guest presenter was Phil Hubbard of Hampton Roads Sanitation District (HRSD) in Virginia Beach, who presented on HRSD's trenchless program. ASCE Norfolk Branch was the seminar co-sponsor.

In 2019, MASTT proposes to conduct the Trenchless Technology, SSES and Buried Asset Management seminar in Mt. Laurel, Md. on April 3, 2019, and in Arlington, Va., on Aug. 24, 2019. Please place these dates on your calendar and plan to participate. Please visit mastt.org to learn more about MASTT and the seminar program or contact executive director Leonard Ingram at leonard@engconco.com or (334)-327-7007.

MASTT published its annual *Mid Atlantic Journal of Trenchless Technology* in May of 2018 and plans to publish the 2019 issue again this May. Please contact Andrew Pattison, A To B Publishing, at (204)-275-6946 to participate.



Midwest

The Midwest Chapter (MSTT) held a very successful Trenchless Technology, SSES and Buried Asset Management seminar in Minneapolis on Nov. 28, 2018, at the Hyatt Regency Minneapolis Downtown Hotel. The guest presenter was Kathrine Kessler of the Surface Water and Sewers Division of Minneapolis who presented on trenchless technology in Minneapolis. APWA's Minnesota Chapter and ASCE Minnesota Section were the seminar co-sponsors. The seminar offered seven professional development hours and included a ton of networking and learning.

In 2019, MSTT proposes to conduct a

Trenchless Technology, SSES and Buried Asset Management seminar in Indianapolis on June 26 and another in Council Bluffs, Iowa, on Dec. 4. Please plan to place these dates on your calendar and plan to participate. Please go to mstt.org to learn more about MSTT and the MSTT seminar program or contact Leonard Ingram, MSTT executive director, at leonard@engconco.com or (334)-327-7007.

MSTT published its annual *Midwest Journal of Trenchless Technology* in September of 2018 and plans to publish the 2019 issue again this September. Please contact Andrew Pattison, A To B Publishing, at (204)-275-6946 to participate.



Northeast

The Northeast Regional Chapter of NASTT recently completed a very successful 2018 annual conference in Mystic, Conn. last November. A welcome reception was held at Mystic Pizza the night prior to the conference, and two outdoor technology demonstrations were completed during the conference. Planning for the early November 2019 annual conference in Syracuse, N.Y. is underway. The spring edition of the *Northeast Journal of Trenchless Technology Practices* is being prepared for release at NASTT's No-Dig Show this March, and we're looking forward to the fall edition as well.

We are also actively working with our student chapter at UMass Lowell to identify potential presentations and field trips over the coming semester to engage the next generation of trenchless experts, and we are also talking with leadership at the university about establishing a trenchless technology institute. See our website, nastt-ne.org, for more information and please

join us!



Northwest

Continuing again this year, the NASTT Northwest Chapter (NASTT-NW) will be presenting its Technical Lunch Program. This program provides a venue for our members to learn from each other's accomplishments and from suppliers/manufacturers about new innovative products. There will be three Technical Lunches in Edmonton scheduled for Jan. 24, Feb. 28 and March 28. Additionally, NASTT-NW is proud to be returning to Winnipeg in February 2019 with the CIP-PGood Practices Course. For registration or further information on these events, please visit nastt-nw.com.

NASTT-NW is proud to be jointly presenting No-Dig North in partnership with the Canadian chapters of NASTT. The conference will take place in Calgary, Alberta, Oct. 28-30, 2019 at the TELUS Conference Centre. The call for abstracts is officially open with a deadline of Feb. 15. Full conference registration is now open. For more information on sponsorship, tradeshow booth and delegate registration, please visit nodignorth.ca.

We are also accepting applications for the NASTT-NW Municipal and Utility Scholarship for the No-Dig North. The scholarship is open to employees of municipalities, government agencies and utility owners who have limited or no training funds due to economic challenges. To apply for the scholarship, please visit nastt-nw.com. The deadline to apply is April 30, 2019. For more information, email Greg Tippett at gtippett@nastt-nw.com.



Pacific Northwest

The Pacific Northwest Chapter continues the charge forward. Our chapter magazine, *Pacific Northwest Trenchless Review*, is scheduled to hit the presses and be delivered in February 2019. If you are interested in receiving a copy, please contact our new chair, Carl Pitzer, at cpitzer@thompsonipegroup.com to be added to the distribution list.

The chapter also recently wrapped up its biennial Chapter Symposium held in Portland, Ore., on Jan. 16-17, 2019. The event

featured the NASTT HDD Good Practices Course on Day 1 and an excellent slate of presentations and exhibitors on Day 2. We had a great attendance from engineers, manufactures and contractors within the trenchless community! At our last chapter meeting, held during the symposium, we executed the transition of our board members and will be seeking to fill the vacant secretary position in the near future.



Rocky Mountain

This past year for the Rocky Mountain Chapter of NASTT went by in a whirl. We had our annual chapter conference on Nov. 1, 2018, and ended up with a record turnout for both vendors and attendees. The group is excited for future conferences and looks to host its next annual conference in Utah on the heels of NASTT's No-Dig Show coming to Denver in 2020. Outreach will be the goal of the chapter in 2019, encouraging existing area participation and memberships as well as reaching out to Nebraska and Kansas for some much-needed participation. We have been hosting more and more field trips, as well. Our most recent trip was on Dec. 7 where a 72-in. steel casing shot of over 600 ft was installed via a microtunnel boring machine. The job was hosted by Lithos Engineering, Icon Engineering, BT Construction and the City of Brighton. It was a smashing success!



South Central

The South Central Chapter is in the process of developing the second annual Texas and Oklahoma Trenchless Report, building on the success of the 2018 inaugural edition, which will highlight new technologies, technical trenchless editorials, case studies and more from players throughout the trenchless industry. Look for this publication in early 2019.

The chapter is also preparing for the fourth annual chapter conference, being held this year again at the University of Texas at Arlington on May 20-21. Mark your calendars now, and we look forward to seeing you there again this year.



Southeast

SESTT conducted a successful Trenchless Technology, SSES and Buried Asset Management seminar in Tampa, Fla. on Dec. 12, 2018. Cassidy Barrett of the Wastewater Department/AWTP, City of Tampa, was the guest presenter who presented on trenchless technology in Tampa. ASCE Florida Section – West Coast Branch was the co-sponsor for the seminar, which offered seven PDHs.

In 2019, SESTT proposes to conduct Trenchless Technology, SSES and Buried Asset Management seminars in Charleston S.C. on May 22 and in Charlotte, N.C. on Sept. 25. Please mark these events on your calendar and plan to participate. Please visit sestt.org to learn more about SESTT and the SESTT seminar program or contact Leonard Ingram, executive director, at leonard@engconco.com or (334)-327-7007.

SESTT published its 2018 *Southeast Journal of Trenchless Technology* in January 2019. The chapter plans to publish the 2019 version in November. Please contact Andrew Pattison, A To B Publishing, at (204)-275-6946 to participate.



Western

The Western Chapter (WESTT) had a very successful Western Regional No-Dig Conference and Exhibition last September in Scottsdale, Ariz. Approximately 80 engineers, contractors and vendors attended the first day of technical paper presentations. We hosted 14 attendees at the two Introduction to Trenchless Technology courses on the second day. The board is already planning our 2019 event.

We are also working hard to collaborate with the Hawaii Water and Environment Association (HWEA) to produce a joint conference. If everything works out our 2019 event will be held in Oahu, Hawaii sometime in November. All chapter members are welcome to attend the WESTT Chapter meeting to be held at NASTT's No-Dig Show in Chicago from 3-4 p.m. on Sunday, March 17. See on-site brochure for location information.



How the City of Aurora, Colorado, Implemented Its Trenchless Rehab Programs

By Swirvine Nyirenda



With an estimated population of nearly 375,000, the City of Aurora is one of the fastest growing communities in Colorado and the third largest city in the state. Financed by an enterprise fund, Aurora Water manages the operation, maintenance and improvement of its water, stormwater and wastewater infrastructure. The Planning and Engineering Division of the utility is primarily responsible for the coordination and delivery of capital projects to support both the current and future needs of the utility.

Over the years, the city has accrued 404 miles of stormwater mains with pipes ranging in age from 1-59 years, with an average of 24 years; 19 miles of Wastewater force mains; and 1,084 miles of gravity mains for combined length of 1,102 miles of pipe. These wastewater pipes are aged between 1-69 years, with the average age being 31 years old.

The responsibility that comes with the management of such vast network of

pipes is tremendous, and Aurora Water recognizes the importance of industry education and the role it plays in identifying and implementing new infrastructure technologies to better serve its customers. The utility was a charter member of the Rocky Mountain Chapter of NASTT (RM-NASTT), and I have served on the board in various capacities for over seven years. Last year, I was the chair for the chapter conference and I am currently the chapter secretary. I have also presented more than 10 papers on a variety of topics. For the past decade we have been represented at every NASTT No-Dig Show and many of our inspectors and engineers have participated in local micro tunneling conferences.

Our involvement in RM-NASTT has helped us resolve a number of infrastructure challenges over the years. As an example, in 2008 our operations department began receiving a high volume of maintenance calls pertaining to the sanitary sewer collection system in an

older part of the city. In subsequent updates to our sanitary sewer modeling, we discovered that part of the city was also exhibiting higher inflow and infiltration (I&I) rates. To address the problem, Aurora Water developed a cured-in-place pipe (CIPP) rehab program to systematically rehabilitate all the sanitary sewer collectors in the troubled area. The effort resulted in the lining of approximately six miles of collector sanitary sewer. By 2015 – in keeping with our dedication to continuous process improvement – we had all of our pipeline inspection staff certified through NASSCO's Pipeline Assessment and Certification Program (PACP). That was the first step in enabling us to evaluate and develop CIPP projects in-house and further maximize our budget for pipeline rehabilitation.

At about the same time, another part of our sanitary system included critical reaches of reinforced concrete pipe that were more than 40 years old and had never been inspected due the complexity of the



bypass pumping required to facilitate the inspection. Some of these pipes had actually failed and inspections of other, similarly aged pipes that were part of a parallel system revealed severe deterioration. Aurora Water resolved this challenge by developing an interceptor lining program for all concrete pipe. We developed decision-making criteria to help us better determine when to line a pipe:

1. RCP at least 30-in. in diameter.
2. More than 40 years old.
3. Carrying at least 5 MGD.
4. Flowing more than half full.
5. No record of previous inspection.

Using these standards, Aurora Water developed a five-year program to line approximately 6,000-ft of sanitary sewer interceptor a year. Aurora Water's largest trenchless rehabilitation projects (by technology) to date have been:

- CIPP: 1,100 ft of 72-in. storm sewer in a single shot.
- Sliplining: 3,000 ft of a 120-in. diameter storm line.
- Centrifugally Cast Concrete System: 1,000 ft of 96-in. diameter storm line.

Our methodologies for new pipeline installations have also evolved over time. Projects are scoped in the preliminary design phase of a project, stipulating that all major road, railway and water crossings must be evaluated using trenchless technologies. In final design, trenchless methods are selected based on geotechnical data. Crossing designs are supported by a Geotechnical Baseline Report (GBR). More recent installations have included the use of microtunneling, directional drilling, pipe ramming, auger boring, pipe bursting and pilot tube methodologies.

Aurora Water has used various techniques of trenchless technology over the years and we are always striving to select the right technology for the right job. When we learn of a new or emerging methodology – whether from a consultant or our participation in RM-NASTT, NASTT's No-Dig Shows, micro-tunneling courses or municipal forums – we are eager to train staff in the application and education them about the risks. As trenchless technologies evolve so does Aurora's enthusiasm for their possible application.



Swirvine Nyirenda, P.E., CFM, PMP, is a principal engineer the City of Aurora's water department. He is responsible for providing strategic planning and guidance to the utility in the areas of wastewater and stormwater.

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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
Website: nastt-bc.org

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

Chapter Contact
Charlotte Wong
charlottenapwong@gmail.com

Elected Officers
Chair - Ophir Wainer
Treasurer - Preston Creelman



Great Lakes, St. Lawrence & Atlantic
Website: glsla.ca

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



Mid Atlantic
Website: mastt.org

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
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leonard@engconco.com

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



Midwest
Website: mstt.org

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



Northeast
Website: nastt-ne.org

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



Northwest
Website: nastt-nw.com

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
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greg.tippett@stantec.com

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



Pacific Northwest
Website: pnwnastt.org

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

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Elected Officers
Chair - Carl Pitzer
Treasurer - Heidi Howard



Rocky Mountain
Website: rmnastt.org

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

Chapter Contact
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clarson@clwsi.com

Elected Officers
Chair - Chris Larson
Vice Chair - Benny Siljeborg
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

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Elected Officers

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



Southeast
 Website: sestt.org

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

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Elected Officers

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



Western
 Website: westt.org

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
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Elected Officers

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

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North American Society for Trenchless Technology
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 Phone: 888-993-9935

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 19 Student Chapters, visit nastt.org/student-chapters.



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IT'S NOT JUST A LINE ON A PIECE OF PAPER

Risk-Based Engineering for Trenchless Projects

Dennis J. Doherty, P.E., F. ASCE

*Senior Consultant, National Practice Leader,
Trenchless Technology*
Haley & Aldrich, Inc., Bedford, N.H.

The growth and acceptance of trenchless technology as an alternative construction method has made great strides in the past 20 years. Owners and the public are demanding trenchless methods be used because of its many benefits. Many engineers are jumping on the band wagon, especially in adopting new installation methods. Unfortunately, many of these engineers do not fully understand the issues and problems that can arise due to their limited technical understanding of a specific trenchless installation method (such as horizontal directional drilling or microtunneling) or other new installation methods under development. A detailed understanding of the geology, pipe material, work zone requirements, crossing length, and how each method actually excavates and stabilizes the ground are required.

Too often, engineers draw “a line on a piece of paper” without understanding the implications of the line, and then state, “It is up to the contractor to figure it out.” This is not an acceptable approach for professional engineers as designers, and needs to be stopped for the good of the industry. Trenchless crossings are “engineered products,” not a directive to make the contractor build it no matter what the conditions. This approach puts the owner and contractor at risk. This paper explores the use of risk-based engineering to reduce the risk of just drawing a line on a piece of paper.



Figure 1 – Driving risk down. The intent of risk-based engineering is to drive cost down from red to orange to yellow to green by driving risk down to more manageable levels.

INTRODUCTION

The design and construction of projects using one or more trenchless installation methods is more than just a line on a piece of paper. It does not require just a good survey plan, it requires an understanding of the geological conditions, an understanding of just how the selected trenchless method excavates and removes the ground and installs the pipe, and the required equipment within a specific work zone. It also requires an understanding of a of existing “other issues.” For example, other issues can include contaminated ground and the need to understand how to identify and plan for handling and disposal of contaminates. Another example is understanding that former and existing building foundations exist and can be impacted by or impact the project. The most common issue is knowing where and the type of other utilities in the ground, traffic volumes on surface streets, the all-important egress/ingress points to local commercial, public and private properties. What is often overlooked but is just as important are the local social issues and stakeholder issues and how to manage them.

It also requires an understanding that there is risk and that not all risk is equal. The cause and effect, or trigger, of the risk event occurring for a specific trenchless method are dependent on engineering and human error from operations in engineering and construction that can be controlled through changes in the design and/or construction operations. These risk events can

include ground settlement, ground heaving, creating large voids, movement of sensitive buildings, inadvertent returns, changed ground conditions, broken down-hole tooling, damage to third party property, damage to other utilities and structures and even loss of life. So, it requires managing the risk. The risk to the owner to pay for legitimate change orders due to defective designs or changed conditions; the risk of contractor financial losses caused by defective work or underestimating production rates or use of incorrect tooling for the ground conditions; and the risk to third parties caused by settlements of pavements or rails, the movement of ground under or near sensitive structures, or even the loss of life. Someone has to pay for the risk. Not all planned capital construction cost and administrative cost to the owner include cost of risk which could substantially increase the cost of the project if not controlled.

It really comes down to: “Pay me now or pay me later;” to which should be asked, “Which is more expensive?”

Risk-Based Engineering

Risk is defined as the chance or probability of an event that exposes something or someone to a specific level of danger and peril. For each event, there is a cost associated with it. These costs can be monetary, affect schedule, or affect finished product, or in project management terms, cost, schedule, and scope.

Engineering is defined as using the knowledge of science and technology to construct or modify the environment for the benefit of society. In the case of trenchless technologies, it can be the knowledge of the chemicals in a rehabilitation process, or optimal temperature control during a curing process, or long-term stress-strain relationships for rehabilitation methods. For new trenchless installation, an area for which this article is focused on; it is a deep understanding of geology, geotechnical engineering, material science, management of contaminated ground, spatial relationships, and program management; all of which are required for a successful project. Eliminating all risk is almost impossible, but limiting the cost of the risk event is possible by purposefully lowering the probability of the event from occurring.

Risk-based engineering therefore considers the risk involved, the probability of a risk event from occurring when using a specific engineering and construction method, and the potential cost of the should the risk event occur. For each potential risk, there is a cost. These costs are either monetary or time but may be both. There is also a probability that a risk event will happen. The probability ranges from it will not happen to it will happen or someplace in between such as it may

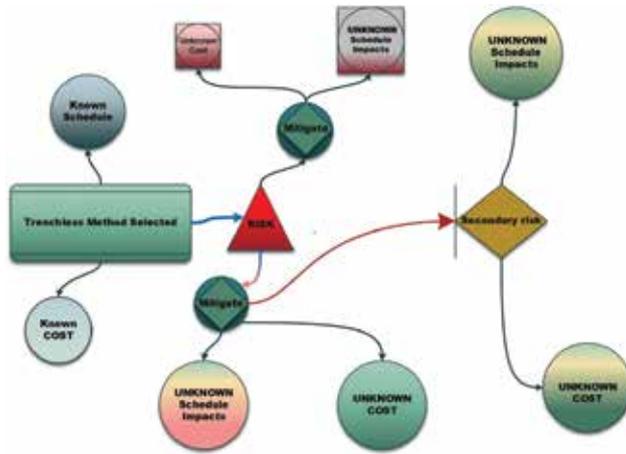


Figure 2 – Trenchless methods cost, mitigation, cost of mitigation and cost of risk. Decisions made early with known schedule and cost can be impacted by risk, with various mitigation methods leading to unknown construction cost and schedule impacts followed by secondary risk impacts.

happen. Assignment of risk and probability can be subjective and are best assessed by experienced engineers, managers, and construction experts in a brain storming session.

And there can be a multitude of secondary risk from selected mitigation methods used to lower cost and probability of the original risk, each with their own additional cost and probability. Trenchless engineering is an iterative process. When you first begin the project, the project is full of risk and uncertainty. As more knowledge is gained through the design process, the risk profile changes. These changes can be in severity of a risk event when it occurs or the probability of the risk event occurring. Should a risk event occur there will be a definitive cost and schedule impact assigned to the event. The intent of risk-based engineering is to drive risk cost down as well as the probability of the risk event occurring.

The Cost of Risk in accounting for Project Cost

Not all risk can be eliminated. Risk, both original and secondary are like project management work packets,

they are distinct. The difference is that each risk event has cost and probability, whereas a work packet has cost and schedule. For a risk event, the cost for the event that would be incurred is affected by the probability that that event will occur. For example, if the cost that would be incurred is estimated to be \$5 million for the settlement of a busy intersection, and the probability it will probably happen is a 70 percent chance of occurring, the cost of that event that enters the project cost will be \$3.5 million that is added to the ledger of total project cost. Whereas changing trenchless construction to another trenchless method or simply going deeper or considering ground modification reduces the probability to a 10 percent chance of occurring, the cost of that event added to the ledger would only be \$500,000 plus the cost of mitigation. But the cost of the secondary risk may also need to be considered.

A secondary risk is a result of changes in design or construction that have a distinct set of their own risk. There is also the cost of implement risk mitigation mea-



Figure 3 – Risk, risk mitigation and secondary risk. Decisions made early in process can affect overall project cost as each trenchless method has its own set of unique requirements and sets of risk class. Understanding all options early is critical.

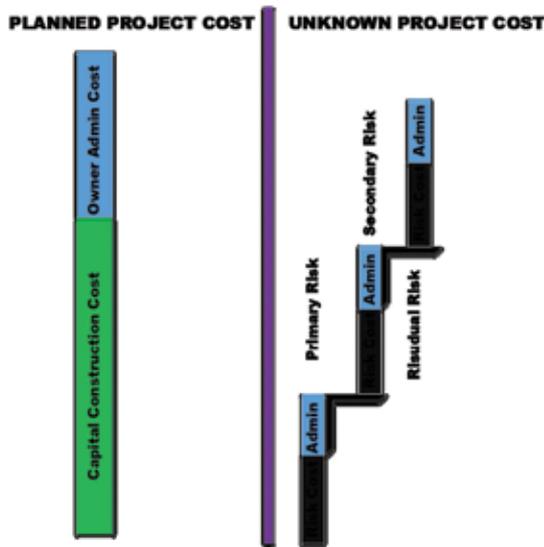


Figure 4 – True cost of a project including risk. True cost are planning cost, preliminary and final engineering cost, permitting cost, property rights cost, and hard construction cost plus the owners administration cost. The cost of risk with owner’s administration cost to manage risk can substantially increase overall project cost.

asures such as ground modification as well as the cost of secondary risk. Please note that the \$5 million cost of risk would include such things as pavement reconstruction, utility replacement, lost revenue cost to the local store that has to shut down for a period of time, and impacts to personnel traversing the area because of a longer detour around the intersection otherwise known as direct, indirect and social cost.

Risk Management

Sometimes risk is caused by the good will attempt of the project owner to appease third party stakeholders. Agreements to appease stakeholders can and often do have effects on technical risk. An example of this is moving a jacking shaft for a microtunneling operation into a busy urban intersection to appease a local social/political group whose own desires are a good cause, the impact that construction operations would have on

a school. The movement of the jacking shaft has many secondary risk that are a direct result of the movement. The cost of these secondary risk may far out-weigh the cost of risk of an event at the school because the control on the probability of occurrence cannot be as effective. A solution to reduce the probability reducing solution to the risk event at the school would be to conduct work at the jacking shaft at the school when school is not in session such as over the summer vacation, introducing extra safety measures, and educating and involving not only the students at the school, but also social/political group being appeased. This does require a good stakeholder management program at a cost, but the cost has certainty whereas moving the shaft to the intersection may not.

Use of risk management techniques need to be utilized to qualify and quantify the risk and probable cost. The use of risk registers is a good start. A simple risk qualitative analysis in terms of probability of the risk event occurring and the impacts will establish risk rating or classification of risk.

Using the same risk probability in the risk quantitative analysis will result in a reasonable cost of risk should the risk event occur. By entering the estimated schedule in cost impact should the event occur and multiplying by the probability in terms of percentage, the cost of the risk can be determined. The cost and schedule estimates can be order of magnitude or detailed. For most projects, an order of magnitude is sufficient, especially early in the life of a project. It also simplifies comparison of alternative risk analysis when detailed costs are not available for alternatives.

Conclusions

Risk-based engineering for trenchless projects is, in all essence, an accounting system based on real risk to the project. The risk arises due to technical limitations of a specific trenchless method or material used, geological conditions not being accurately characterized, sensitive nearby structures and underground utilities that move and cause damage, impacts to traffic, etc. The risk may also arise due to stakeholder demands. In the end, there is cost to these risks, include administrative cost that can substantially increase the cost of the project for the owner if not properly managed.

This paper was edited for style and space for publication in *NASTT's Trenchless Today*. To view the complete version of Paper WM-T2-04, please visit nastt.org/technicalpapers.

Calendar

March

17-20

NASTT's 2019 No-Dig Show
Chicago, Illinois

17

NASTT's Introduction & Trenchless Technology Short Course – New Installations
8:00 am - 12:00 pm
Chicago, Illinois

17

NASTT's Introduction & Trenchless Technology Short Course – Rehabilitation
8:00 am - 12:00 pm
Chicago, Illinois

17

NASTT's Grouting Course
8:00 am - 12:00 pm
Chicago, Illinois

20-21

NASTT's Gas Industry Conference & Exhibition
March 20: 8:00 am - 6:30 pm
March 21: 8:00 am - 12:00 pm
Chicago, Illinois

20-21

NASTT's Cured-In-Place Pipe (CIPP) Good Practices Course
March 20: 2:30 pm - 6:00 pm
March 21: 8:00 am - 12:00 pm
Chicago, Illinois

20-21

NASTT's Sewer Laterals Good Practices Course
March 20: 2:30 pm - 5:30 pm
March 21: 8:30 am - 12:00 pm
Chicago, Illinois

20-21

NASTT's Horizontal Directional Drilling (HDD) Good Practices Course
March 20: 2:30 pm - 6:30 pm
March 21: 7:30 am - 12:00 pm
Chicago, Illinois

20-21

NASTT's Pipe Bursting Good Practices Course
March 20: 2:30 pm - 5:30 pm
March 21: 8:30 am - 12:00 pm
Chicago, Illinois

20-21

NASTT's New Installation Methods Good Practices Course
March 20: 2:30 pm - 6:00 pm
March 21: 8:00 am - 12:00 pm
Chicago, Illinois

June

6

NASTT's Introduction to Gas Good Practices Course
9:00 am - 12:00 pm
Smithfield, Rhode Island

For more information visit nastt.org/calendar.

Future NASTT No-Dig Shows



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

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NASTT'S 2019 NO-DIG SHOW MUNICIPAL & PUBLIC UTILITY SCHOLARSHIP PROGRAM

Congratulations to the following scholarship recipients!

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- City of Winnipeg
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- Colorado Springs Utilities
- County of Kauai
- DC Water
- DeKalb County
- Denver Water
- District of North Vancouver
- District of Saanich
- East Bay Municipal Utility District
- EPCOR Utilities
- Hillsborough County
- Lower Paxton Township
- Madison Metropolitan
- Marshfield Utilities
- Metropolitan Water District of Southern California
- Metropolitan Water Reclamation District of Greater Chicago
- Miami Dade
- Milwaukee Metropolitan Sewerage District
- Montgomery County
- Moorhead Public Service
- Municipality of the County of Kings
- New Castle County
- New Jersey Department of Transportation
- North Davis Sewer District
- NYC Department of Design & Constructoin
- Ohio Department of Transportation
- Orange County
- Oregon State University
- Parker Water & Sanitation District
- Pinellas County Utilities
- Region of Peel
- Salt Lake City
- Sammamish Plateau
- Sanitation District No.1 of NKY
- Seattle Public Utilities
- South Coast Water District
- Taylors Fire & Sewer District
- The City of Calgary
- City of Carlsbad
- Town of Cary
- Town of Devon
- Town of Ipswich
- Town of Normal
- Town of Westport
- Trinity River Authority of Texas
- Vermont Agency of Transportation
- Village of Bellwood
- Village of Lombard
- Village of Wilmette
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- Water Environment Services



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