



The Official Magazine of the North American Society for Trenchless Technology

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Trenchless Today
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Summer 2020
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1990-2020

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SUMMER 2020 EDITION | VOLUME 10, ISSUE NO. 2



16 NASTT Celebrates 30 Years!

By NTT Staff

It's hard to believe it but the North American Society for Trenchless Technology turns 30 in 2020. The road to achieving the kind of reach and impact the Society has today wasn't always easy. In this issue, we take a look back at our rich history full of innovation, challenges and the leadership we've enjoyed from a number of industry pioneers along the way.

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By NTT Staff

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By Andrew Farr

In this month's "In the Trenches" feature, we profile industry veteran George Kurz, recent Ralston Award recipient Brendan O'Sullivan of Murraysmith and Cecilia Zavaleta of Akkerman. We explore how these dedicated trenchless volunteers got their start in the industry and their take on today's market outlook.

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By NTT Staff

Even though we're still looking forward to honoring our 2020 award winners at the NASTT 2020 No-Dig Show and No-Dig North in October, let's take another look at those who have excelled in the industry in the past year. Meet our 2020 Hall of Fame Class and award recipients.

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Trenchless Industry Rallies During Global Challenges

“May you live in interesting times” is an expression that apparently has its foundations as an ancient curse. As time has passed over the last few months, we have seen unimaginable changes to our lives as we have looked at ways of dealing with the challenges we face. However, innovation is often born out of adversity, so the NASTT Board and staff have been busy planning alternative ways of delivering our programs.

In these times the role of a not-for-profit association changes dramatically. From working to promote our industry proactively we've also had to quickly adapt to provide support for our members, exhibitors and sponsors during rapidly changing circumstances. Our diverse membership, from recognized global companies to individual members, have a wide range of requirements that we can help support

as we continue to develop the demand for trenchless technology.

We hope that our members will use our social media platforms and visit our Talk Trenchless online community at talk-trenchless.nastt.org where there are various group discussions and forums with networking opportunities to allow you to keep in contact. We have set up a specific COVID-19 Resource Center with links to various supporting organizations giving helpful information and advice. We encourage members to post their recommendations and to share experiences and assist others. In addition, we are offering free posting and searching on our Industry Job Board page, which can be found at nastt.org/resources/job-board.

We continue to share industry stories and news through our weekly e-newsletter

and our websites, nastt.org and nodigshow.com, which are continually updated with information. You can also contact us directly at info@nastt.org.

Trenchless technology is a special industry to be involved in. We are used to working at the cutting edge and reacting to circumstances outside of our control to find solutions. Those solutions will become the lessons we teach tomorrow. We are proud to be your association through these times as we support each other.



Matthew Izzard
NASTT EXECUTIVE
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NASTT Looking Forward, Building on Recent Success

As everyone is well aware, earlier this spring Canada and the United States, along with the entire globe, began to deal with the COVID-19 pandemic. As shelter-in-place decrees and quarantine measures were enacted throughout the world, the 2020 NASTT No-Dig Show scheduled for April 5-9 in Denver, Colorado, was affected. The conference was unable to proceed as planned, and the staff of NASTT, along with the Board of Directors, began working diligently to re-imagine the show in the best possible way for all our stakeholders.

We are pleased that – at the time of this issue's publication – the NASTT 2020 No-Dig Show and No-Dig North 2020 are coming together as one North American event as NASTT celebrates its 30th anniversary. The event is scheduled to take place at the Vancouver Convention Centre in Vancouver, British Columbia on Oct. 19-21.

We are looking forward to an exciting and collaborative event where we bring together the entire industry from across North America to celebrate our great industry and this milestone for NASTT. This will be a pinnacle event to get out and network and get back to business after these unprecedented times.

We were thrilled with the incredible success of the inaugural No-Dig North conference held in Calgary in October 2019. With nearly 600 attendees and 76 exhibitors, I could not be happier with the outcome of this show and the volunteer participation and leadership efforts of our Canadian Chapters. The 2019 conference set the bar high for 2020 but our volunteers are up to the task!

The 2020 combined conference will begin with four Pre-event Good Practices Courses on Monday, Oct. 19. The

courses include NASTT's Cured-In-Place Pipe Good Practices Course, NASTT's New Installation Methods Good Practices Course, NASTT's Pipe Bursting Good Practices Course and NASTT's Horizontal Directional Drilling Good Practices Course. Following the courses, an opening reception for all attendees will take place in the exhibit hall.

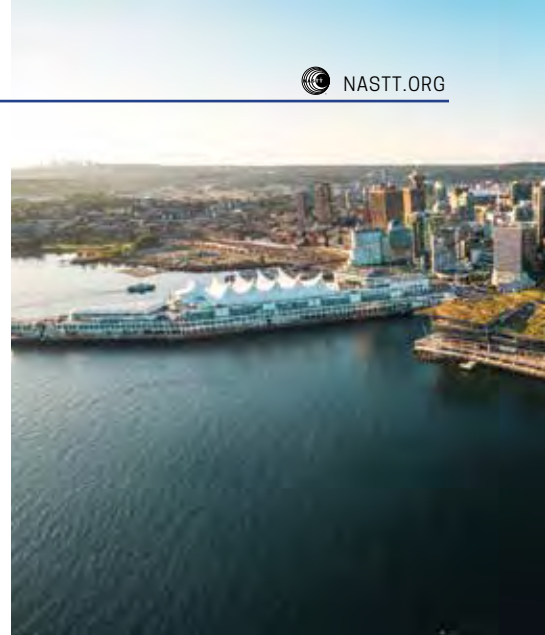
All attendees are invited to join us the morning of Tuesday, Oct. 20, at the Kick-Off Breakfast in the exhibit hall. Additionally, four tracks of technical paper presentations will take place on Tuesday, Oct. 20 and Wednesday, Oct. 21. Tracks include CIPP, Condition Assessment, Horizontal Directional Drilling, Microtunneling, Sliplining, Tunneling and more. The exhibit hall will also be open all day on both Tuesday and Wednesday.

We are also planning additional celebrations and events at the conference to honor our award winners, recognize the Canadian projects of the year, celebrate NASTT's 30th anniversary and more!

We look forward to growing and learning from these recent challenges and coming back stronger than ever. Thank you for all your support and dedication to NASTT and the trenchless technology industry. We are always looking for volunteers and new committee members not only locally but nationally. Don't be afraid to get involved! With the trenchless market growing so fast now is the time to get involved.



Craig Vandaele
NASTT CHAIR



The background of the advertisement is a photograph of three workers in hard hats inside a large, circular tunnel. The tunnel walls are made of corrugated metal. On the right side of the image, several sections of different pipe materials are shown floating, including a large grey corrugated pipe, a black pipe, a white pipe, and a white pipe with a black interior.

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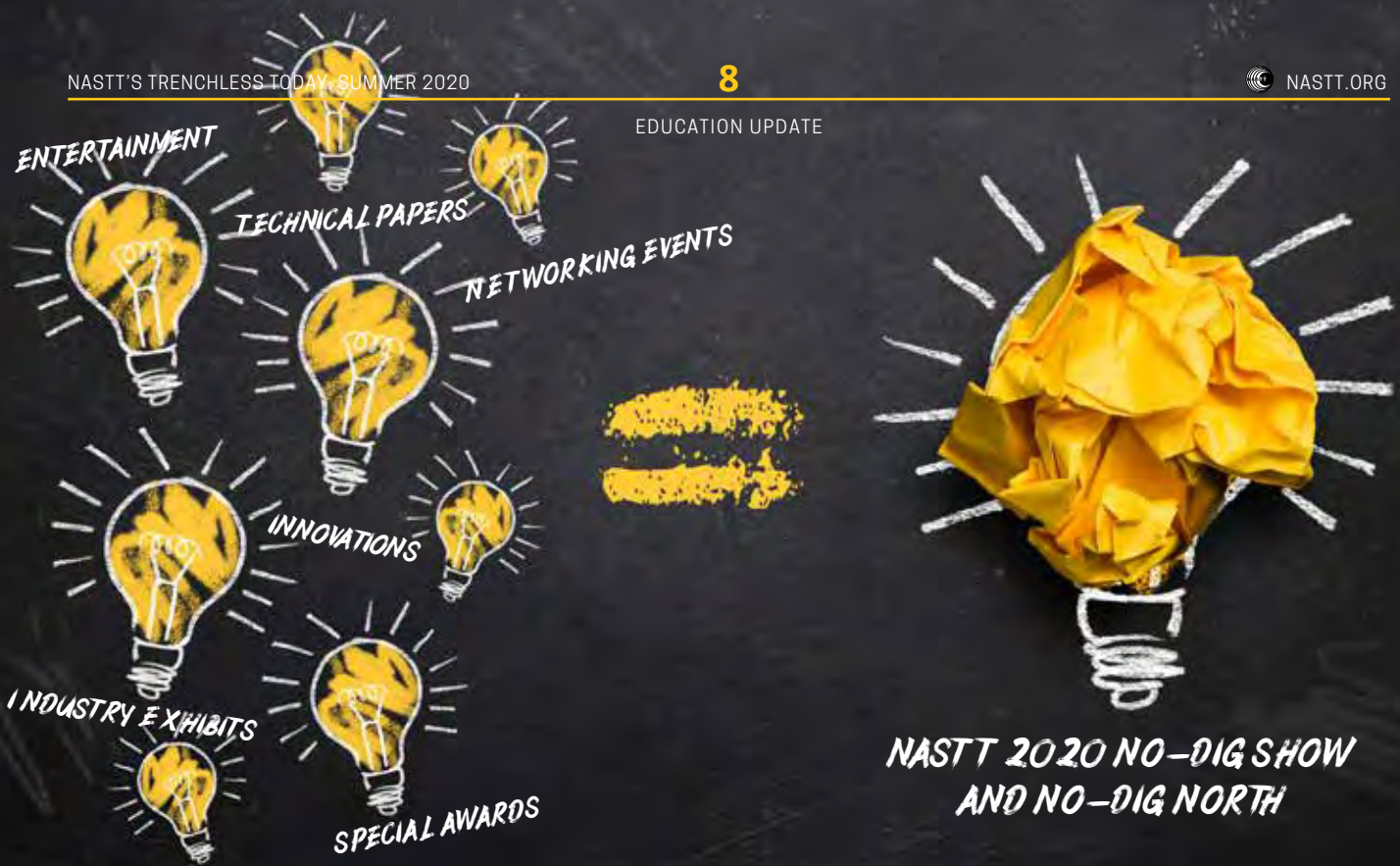
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Gone But Not Forgotten

The NASTT 2020 No-Dig Show Reimagined

I'm writing this article the day I would have returned home from the NASTT 2020 No-Dig Show. All week I've been taking pause and thinking about what I would be doing if I were in Denver. It's surreal, and frankly heartbreaking.

This would have been my 14th No-Dig Show. A day doesn't go by that I don't work on this conference...for the current year, the next year or five years down the line. I didn't get to see all of the hard work come to life for No. 14, and that's tough for a show manager like me.

I hear what you are saying...girlfriend put down the wine glass. But here's the deal. This isn't just a conference. It's not just a trade show. It is an amazing educational event that brings the most incredible people together. It's about sharing ideas and working together as a community. It's where innovators figure out how to make the world a better place. It really is such an honor to be a part of something so special.

What makes all of the hard work worth it is to show up on site and spend nine days seeing the staff and volunteers who helped make it happen. Since I didn't get to see you

all this month, I'm going to have to say my thank yous here.

First and foremost, I have the best co-workers a girl could ask for. Matthew, Jenna, Carolyn and Jessie – thanks for holding my hand during this emotional rollercoaster. Heather, Brittany and Vicki – thank you for being great partners and great friends. Joe and John – I'm so sorry you didn't get to see your show come to life; but, know that we will do our best to honor and incorporate your work throughout the year. To the 110 Program Committee members and Track Leaders – thank you for putting together such an amazing educational program.

We're working hard to bring your ideas to life. To the authors and presenters who dedicated countless hours to create 160 technical papers and presentations – your work will live on at No-Dig North, the NASTT 2021 No-Dig Show in Orlando or on our online paper library. And finally, to the NASTT Board of Directors – thank you for your leadership and for making tough decisions in these unprecedented times.

So now what?

You may have heard that we've been busy

merging our two conferences: NASTT 2020 No-Dig Show and No-Dig North Present 30 Years of Trenchless Excellence. Elements from Denver will now be hosted in Vancouver on Oct. 19-21.

It's been more than 10 years since a No-Dig Show has headed up to Canada, so this is a great opportunity to come together and keep our industry strong. You will see all of the familiar pieces and parts of our annual conference – educational sessions, an exhibit hall, networking, awards and in-depth training courses. What makes this combined show even more special is that NASTT will be celebrating its 30th anniversary.

You can check out more on our plans for the NASTT 2020 No-Dig Show and No-Dig North Present 30 Years of Trenchless Excellence on pages 24-25 of this issue, or go to nodignorth.ca for more information.

I look forward to seeing you in Vancouver!



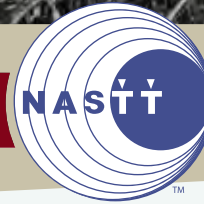
Michelle Hill
NASTT PROGRAM
DIRECTOR

Call for Abstracts

Submission Deadline: June 30, 2020

March 28 -
April 1
2021

Orange County
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MARCH 28-APRIL 1 | ORLANDO, FL

NO-DIG SHOW

2021

The North American Society for Trenchless Technology (NASTT) is now accepting abstracts for its 2021 No-Dig Show in Orlando, Florida at the Orange County Convention Center on March 28-April 1, 2021. 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, 2020: 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

Questions?

Please contact:

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NASTT Program Director

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For more
information visit
nodigshow.com



The No-Dig Show is owned by the North American

Society for Trenchless Technology (NASTT), a not-for-profit educational and technical society established in 1990 to promote trenchless technology for the public benefit. For more information about NASTT, visit our website at nastt.org.



Q&A with Dr. Kalyan Piratla



Amid the past couple months of lockdown and quarantine, we thought it would be a good idea to check in with Dr. Kalyan Piratla, Liles Associate Professor of Civil Engineering at Clemson University and this year's recipient of the NASTT Ralston Award for Young Trenchless Achievement. We chatted with Dr. Piratla about his start in the industry and the state of trenchless education.

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

Growing up, I always knew I wanted to be an engineer who graduated from one of the top tier colleges in India – the Indian Institutes of Technology (IITs). After high school, I was able to get an admission from IIT Madras and civil engineering just happened to be a feasible choice of discipline for me. It was not until the final years of my college education that I gained tremendous interest in construction project management. I enjoyed learning different aspects of it and decided to pursue further studies in construction management in the United States.

Tell us about your first introduction to the trenchless technology?

It happened at Arizona State University (ASU) where I had first enrolled in the construction management Master's program in 2008. At ASU, I took the Trenchless Technology class taught by Dr. Sam Ariaratnam which offered an excellent introduction to a wide variety of trenchless construction methods employed for new installation and rehabilitation projects. I was also recruited as a graduate research assistant to work on a research project focused on estimating pull loads on HDD projects. I ended up doing more research with Dr. Sam on a variety of projects and graduated with my Ph.D. in 2012.

What is the biggest challenge facing the trenchless industry today?

Arguably, one of the biggest challenges continues to be the lag in educational and outreach impact compared to the rapid technological developments in our industry. I feel many owners, especially municipal water and sewer utilities, are still unaware or unconvinced of the benefits offered by trenchless technologies, and as a result, are reluctant to employ them. Understandably, these utility owners are risk-averse. There should be more targeted efforts from our industry to educate such utility owners and build their confidence in trenchless methods. Another important challenge is future workforce development. NASTT has been addressing these challenges through their student chapter engagement and municipal scholarship awards, and I commend NASTT for such efforts.

How did you first get involved with NASTT? Briefly summarize some of your activities.

I first got involved with NASTT as a student chapter member when I was a graduate student at ASU. My first No-Dig Show

was Toronto in 2009 and I still remember that to be an amazingly welcoming experience to the trenchless industry. I have attended nine more No-Dig Shows since then. After joining Clemson University as a civil engineering professor, I established the Clemson student chapter in 2013 and have since served as its faculty adviser. I have also served as the a committee member, track leader and session moderator for multiple No-Dig Shows and have presented multiple papers along with my graduate students at No-Dig.

What are the challenges on the academic side? Is the industry doing a good job of promoting the benefits of trenchless methods?

Although it is promising to see that the number of student chapters affiliated with NASTT is growing, it is important to understand that there is not a lot of scope to include trenchless related courses in undergraduate curriculums that are typically already packed. As a result, the only trenchless exposure many students may be getting is through guest lectures and conference visits which may be limited in comparison to the exposure the students are getting to other areas of civil engineering and construction management.

How did it feel to receive the NASTT Ralston Award for Young Trenchless Achievement this year?

I feel honored to have been selected for this prestigious award. I would first like to thank NASTT for this recognition. I would also like to thank my nominator, Dr. Sam Ariaratnam, and Dr. Jason Lueke who supported the nomination. After hearing about my selection for this award, I felt more encouraged to contribute towards the mission of NASTT.

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

I feel there is a sense of togetherness in the trenchless industry that promotes the welfare of the industry through non-commercial and unbiased information sharing. I enjoy being both a contributor and a beneficiary of such knowledge. As an academic, I also enjoy working with students both in educational and research efforts focused on trenchless technologies. At Clemson, we have enjoyed strong local support from the trenchless industry over the years. Many industry professionals have given guest seminars and facilitated industry/jobsite visits that have been immensely beneficial.



NASTT celebrates 30 years of industry advocacy and education in 2020. We represent more than 2,200 members throughout the United States, Canada and Mexico who all promote better and more responsible ways to manage underground infrastructure.

With education at the forefront of our mission we are offering 30% OFF our trenchless publications in our 30th year!

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In the TRENCHES

By Andrew Farr



George Kurz

CONSULTING ENGINEER

“I wanted to be an engineer before I knew the proper word to describe my interest,” says George Kurz.

Initially, Kurz says he took a keen interest in dams, and systems of dams, for the control and use of water and for generating power. Then in 1964, his family moved to east Tennessee – in the Tennessee Valley Authority territory. “I thought I was in the ‘promised land,’” he says. However, as I learned more in college about the negative environmental impacts of dams, I gravitated towards sewage collection and treatment technology.

According to Kurz, his introduction to trenchless technology came in 1978 at the first WEFTEC show he attended. At the time, he was working for the city on the industrial wastes Pretreatment Program in Chattanooga, Tennessee. The work had to be closely coordinated with operation of the sewage collection system.

“I saw a video of an aboveground demonstration of installing an In-situform pipe liner by inversion. I was awestruck watching this liner invert through bends, and span gaps and holes in the pipe,” he says.

When the EPA promulgated the National Municipal Compliance Plan in 1985, Kurz was assigned to develop the appropriate plan for the city. After evaluating the results from the survey required by EPA, staff concluded that the top priority problem was inflow and infiltration (I/I) leakage in the separate sewer system.

“We launched a comprehensive program of flow and rainfall monitoring, aggressive televideo inspection and urethane grouting by city crews,” he says. “I also designed projects for CIPP lining and segmental sliplining of a 54-in. trunk sewer by contractors.”

Kurz has held a number of engineering positions throughout his career including with cities, on the manufacturing side, with consulting companies and now culminating in his recent stint as an independent consultant in which he focuses heavily on I/I work.

As far as the trenchless industry today is concerned, Kurz says scientists, manufacturers, vendors and contractors have collectively developed a great tool kit of sewer rehabilitation products and techniques for

In the TRENCHES

engineers, designers and operators.

“While there will always be room for improvements, I am more concerned about the lack of a national strategy for application of rehabilitation technologies to stop leaks and reduce the quantity and impacts of I/I and Rainfall Dependent I/I (RDI/I),” he says.

He explains that we do not know the quantity of I/I (or peak rates of RDI/I) handled annually in the United States. Therefore, he says it’s nearly impossible to create and implement a coherent and rational national strategy for I/I reduction. “I believe that this is a major flaw for systematically reducing I/I today,” he says.

Along with the many roles Kurz has had throughout his career, he’s also brought his passion for environmental protection to NASTT to help educate the industry on challenges and best practices related to I/I.

He first attended the 1994 No-Dig Show in Dallas, recalling his excitement about seeing the focus on trenchless technologies. “The technical papers and field demonstrations were especially useful for understanding the application of

**“I WANTED TO
BE AN ENGINEER
BEFORE I KNEW
THE PROPER
WORD TO
DESCRIBE MY
INTEREST.”**

sewer rehabilitation products that we were planning for the Nashville OAP (Overflow Abatement Program) in Tennessee,” he says.

From 2004 to 2019, Kurz has presented eight papers at various NASTT No-Dig Shows. He’s also served several terms on the Board of the Southeast Regional Chapter and has served for more than a decade on the

No-Dig Show Program Committee.

“The developers and vendors of trenchless methods and materials do a good job of evaluating the application of their products,” he adds. “However, I believe that the industry, as a whole, needs to work more together to document a wide range of projects (types of materials and techniques) and develop a reliable predictor for I/I reduction and cost effectiveness in terms of I/I reduction. We all need to remember that the toughest competitor we all face for any project is the ‘do nothing’ alternative.”

Kurz says his favorite part of working in the underground construction industry is the opportunity to satisfy his thirst for more effective environmental protection.

“In the area of protecting the ‘water environment,’ I have seen that the application of trenchless technology has been beneficial and cost effective in reducing I/I in municipal sewer systems,” he says. “I love seeing systems work efficiently and seeing public money spent wisely to get a good return on investment. That is what is exciting and enjoyable every day for me.”



Brendan O'Sullivan

MURRAYSMITH

When his father returned to college to pursue a degree in chemical engineering after serving several years in the U.S. military, a young Brendan O’Sullivan was inspired. He was probably only 11 years old at the time, but O’Sullivan recalls visiting his father in the university laboratory as he was working on his thesis and was enthralled with the equipment, technology and the mathematics.

“That experience informed my decision several years later to pursue a de-

gree in engineering,” he says. While in college, O’Sullivan worked as a laborer for a large heavy civil construction company. He later completed his degree, keen on going into engineering.

About six months into his career, he was tasked with the geometric design of an HDD bore for an 8-in. diameter waterline crossing of a creek. It was his first foray into the design of new trenchless installations and soon he was further exposed to sewer rehabilitation via CIPP. “I have been involved

in both new installation and rehabilitation design of municipal infrastructure ever since,” he says.

One of his early projects was a \$15 million Oregon Department of Transportation project that had him video and field inspecting, performing condition assessment and making recommendations to repair and replace more than 70,000 ft of stormwater pipes along one of the busiest sections of Interstate 5 in Portland.

Since then, O’Sullivan has served as

a project manager, project engineer or technical advisor on most of Murraysmith's trenchless projects, including the City of Portland's \$250 million Large-Scale Sewer Rehabilitation Program (LSSRP).

O'Sullivan believes the state of the trenchless industry is strong. "For almost every trenchless technology, whether it be for inspection/assessment, rehabilitation or new installation, the technical envelope continues to be pushed," he says, noting the advances in guided boring, microtunneling and UV-cured CIPP.

O'Sullivan says the big challenge he sees for trenchless engineers is true for the engineering field in general – a shortage of people entering the industry. "There is a shortage of graduates coming into the civil, mechanical and geotechnical engineering fields and the numbers are shy of those retiring from the field," he says. The vast amount of knowledge driving into the sunset with those retiring from the industry is a significant issue. We need more engineers entering and staying in the STEM fields."

On the advocacy front, O'Sullivan has been an ardent volunteer for NASTT's efforts to spread the trenchless message and enhance education across the industry. He attended his first NASTT Good Practice Course (New Installation Methods) in 2009, around the time that the Pacific North-

“THERE ARE ONLY A FEW INDUSTRIES THAT MOVE AS FAST AS THE TRENCHLESS FIELD TO DEVELOP TECHNOLOGIES AND SOLUTIONS.”

west Chapter Regional (PNW) of NASTT was formed. Since then he says he's been hooked on the educational opportunities offered by NASTT. He's continued to become more involved

in the PNW chapter and has served as vice chair, chair and is currently the immediate past chair. He also served on the NASTT No-Dig Show Program Committee. In 2019, he was the recipient of the Ralston Award for Young Trenchless Achievement at the NASTT No-Dig Show in Chicago.

O'Sullivan says involvement in NASTT regional and student chapters has a number of benefits. But first and foremost, he credits the advancements in methods and technologies, which he says will sell themselves if properly promoted, and will help keep the industry headed in the right direction.

"We, as an industry, need to continue to build on the strong foundation created over the last 40-plus years, and I think the best way to accomplish that is to target the next generation of engineers and build a legion of trenchless advocates," he says.

While many industries move slow in certain aspects, O'Sullivan says technological advancement in trenchless is anything but slow. "There are only a few industries that move as fast as the trenchless field to develop technologies and solutions for tackling our most pressing infrastructure needs," he says. "It keeps us on our toes, forcing us to continue learning, growing, and developing. This constant change, and the opportunities it provides, is really exciting!"



Cecilia Zavaleta

AKKERMAN

Cecilia Zavaleta will tell you the constant variation of challenges that come in construction is what makes the industry unique – and it's what ultimately attracted her to the field.

Not long after finishing high school and beginning college, an opportunity

presented itself for Zavaleta to go into construction and she couldn't pass it up. "What ultimately interested me most about the industry were the challenges that each project presents," she says. "No project mirrors another."

As for trenchless, her first introduction to the industry was in the

horizontal directional drilling (HDD) segment when she worked for a local distributor in Southern California during the Verizon fiber-to-home expansion era. She says it was during this time that she learned about how HDD projects are performed and specifically, the tooling and ground

In the TRENCHES



considerations that go along with it. "I first learned about the Melfred Borzall products to better understand what tooling worked in various ground conditions, and the rest is history," she says.

Already in her young career, Zavaleta has held a number of positions working in the trenchless industry, including positions with reputable manufacturers. She currently serves as a sales engineer with Brownsdale, Minnesota-based Akkerman, responsible for the Latin America, Caribbean and Southwestern United States territories.

Through her role, Zavaleta has unique perspective into the buying tendencies of contractors and what equipment is available in the marketplace to address specific jobsite challenges. In manufacturing, she says the biggest challenge in the U.S. market is competition from Chinese manufacturers, which she says is getting more prominent in developing nations. To address this, she says manufacturers must keep the focus on quality.

"Quality craftsmanship is crucial because if the equipment fails, it can ruin the reputation of emerging technology in areas where they may be trying it for the first time," she explains. "When customers choose quality, the value and reassurance of purchasing from an established company with years of experience is immeasurable."

Another challenge she sees is one that has been an issue facing the construction market for years, let alone

"QUALITY CRAFTSMANSHIP IS CRUCIAL BECAUSE IF THE EQUIPMENT FAILS, IT CAN RUIN THE REPUTATION OF EMERGING TECHNOLOGY."

the trenchless industry. "A common theme is challenges with attracting young talent. Another issue that I see is new product development. The process is long, and the opportunities for testing equipment capabilities in a variety of ground conditions is difficult," she adds.

To help address these challenges,

Zavaleta has been active in NASTT since she began attending the No-Dig Show in 2013 while working for American Augers. She has since been a presenter at regional chapter events. She's also spearheading an important new initiative for NASTT. As the trenchless market has developed and broadened over the years in North America, industry advocacy and acceptance has been well noted in the United States and Canada – in no small part due to the localized events and activities of NASTT's regional chapters. With the reach of trenchless becoming more beneficial in a number of ways, one of Zavaleta's current initiatives with NASTT is to assist with the establishment of a new chapter in Mexico.

"I believe that we are collectively doing a good job, but there is more to do," she says of the overall state of trenchless education and acceptance. "Trenchless is still a methodology that is not seen and, therefore, easily forgotten, but provides so many important benefits.

"I believe that manufacturers should continue to educate engineering firms through small, informal engagements like lunch and learns," she says. "In developing nations, the need for education on trenchless methods is even more necessary."

Of working in the trenchless industry, Zavaleta says she enjoys the fact that the industry continues to evolve, has so much growth potential and presents new challenges every day. "I look forward to being a part of the innovation that is yet to come," she says.

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



NORTH AMERICAN SOCIETY FOR TRENCHLESS TECHNOLOGY

30 YEARS OF EXCELLENCE: NASTT'S PAST, PRESENT & FUTURE

In 1988, five people representing different associations – Richard Thomasson (WEF), Tom Iseley (ASCE), Norman Sirna (NASSCO), Mike Argent (NUCA) and Stephen Cordes – began to brainstorm the possibility of establishing a new association just for trenchless technology.

As Thomasson recalls, the five discussed that although each of their respective associations had some focus on trenchless, it was only a small facet. An organization totally committed to educating

and advancing advocacy for trenchless technology is what was needed. The five put their heads together and the result was a North American Chapter of the International Society for Trenchless Technology (ISTT).

The organization became known as the North American Society for Trenchless Technology (NASTT) and those five people became its founding members. Today, the Society is a vibrant, growing organization of nearly 2,500 members, 11 Regional Chapters and 17

Student Chapters throughout North America.

As NASTT celebrates its 30th anniversary in 2020, we thought it would be cool to take a trip down memory lane and look back at our story, from the growth of the NASTT No-Dig Show to our many other educational initiatives. It's a story rife with invention, innovation, pioneers and thought leaders who have pushed trenchless technology forward for 30 years and will continue to do so for another 30 and beyond.



EARLY DAYS

In June 1990, the five founding members met with a professional management firm headquartered in Chicago. Richard Thomasson was elected to serve as the first Chair. Mike Argent designed the NASTT logo. The two specks above the two T's represent two people. It was Argent's desire to punctuate the belief that people were going to work together for the common good to make NASTT great. NASTT was started with only \$7,000 in seed money. Norman Sirna solicited and received \$1,000 contributions from seven companies who became NASTT's original charter members:

- Avanti International Inc.
- CUES Inc.
- Garney Companies Inc.
- Godwin Pumps of America Inc.
- Insituform Mid America Inc.
- Specialty Sewer Services Inc.
- TRB Specialty Rehabilitation Inc.

Other individuals and their companies would later become very much involved as additional Charter Members, who each contributed \$500 as seed capital. Many would also serve as the first Board of Directors and Officers of NASTT.

GETTING STARTED

NASTT entered its first full year with 114 members and grew to 189 by the inaugural No-Dig Show held in May 1991 in Kansas City. The founding members and directors made a point to ensure that Society leadership was balanced, both geographically and professionally, and dedicated to the advancement of the industry.

"We had both Canadian and U.S. representation, and we made sure our board was set-up to have representation from contractors, consultants, municipal employees, academia and regulatory agencies – we didn't want this to be looked at as just a way for contractors, consultants or manufacturers to be making money. We wanted it to be seen as an independent association interested in the benefits of trenchless technology."

– Richard Thomasson, Past Chair

Membership in the Society continued to climb, reaching a total of 454 by the time of the No-Dig Show in April 1992. NASTT hosted the ISTT International No-Dig Show in Washington, D.C. with more 1,000 registrants, some 200 of which came from 22 countries outside of North America.

ORGANIZATIONAL DEVELOPMENT

Under Chair Tom Iseley's direction, NASTT promoted the idea of establishing Regional Chapters and Student Chapters to provide education and training at the local level.

"The Regional Chapters are instrumental for organizing regional seminars that attract people who can't come to national and international shows. And it is those people who are there day in, day out trying to find solutions for the problems they are facing."

– Tom Iseley, Past Chair

As the Society membership continued to grow and its scope expanded, it was decided to create targeted subcommittees within the Excavation Committee and Rehabilitation Committee.

The No-Dig Show in 1994, held in Dallas, established new highs for attendees (1,335) and exhibitors (100). The 1,300-plus attendees more than doubled the mark from the Kansas City No-Dig Show just three years earlier. In October, NASTT held a Basic Training Seminar for Mini-HDD operators in Nashville, TN that was attended by more than 100 people. The success of the program led the Society to plan an Advanced and Basic Training Seminar for the following year.



“We didn’t want this to be looked at as just a way for contractors, consultants or manufacturers to be making money. We wanted it to be seen as an independent association interested in the benefits of trenchless technology.”

RICHARD THOMASSON, NASTT FOUNDING MEMBER, PAST CHAIR & CHAIR OF THE MID ATLANTIC REGIONAL CHAPTER



MOVING FORWARD

Membership in the Society continued to grow as did the No-Dig Show, which for the first time was held in Canada in 1995. The Show attracted 1,600 participants, up from 1,335 the previous year, and 133 exhibitors. Additionally, the Show featured 10 sponsors and 21 field demonstrations.

NASTT established a Trenchless Education and Research Fund for organizations seeking financial support for research and education efforts. NASTT formed its first Regional Chapters, the Northeast Trenchless Technology Society and the Great Lakes and St. Lawrence Chapter. The first Student Chapters were established at Louisiana Tech University and the University of Waterloo.

“Back then we had different challenges than we have today because when you said ‘trenchless technology’ very few people knew what you were talking about. Many of the people who were familiar with trenchless technology viewed it as something that was only suitable for unique situations in which conventional methods weren’t possible.”

- Tom Iseley, Past Chair

GROWTH

NASTT hosted the ISTT International No-Dig Show in New Orleans in 1996. 1,900 people from 40 countries attended the conference along with 146 exhibiting companies. For the third year, a field demonstration day was held featuring 16 companies demonstrating pipe bursting, pipe ramming, grouting, mini-horizontal directional drilling, microtunneling and more.

“It was an exciting time and an area of growth for NASTT at that time. At the No-Dig Show we had 1,900 people compared to a few hundred just a few years earlier. In fact, we had a riverboat cruise planned, but we had so many people turn out, that we had to set up a second reception with another jazz band at the hotel.”

- Bill Gray, Past Chair

The development of Regional Chapters continued with a charter awarded to the Rocky Mountain Chapter. The Society began its online presence with its first website. NASTT commissioned a committee to establish an in-house headquarters and staff.

OUTREACH

In 1997 NASTT reached out to Mexico for the first time with a seminar held in Mexico City. Additionally, a group from NASTT attended the No-Dig Taipei conference in Taiwan to make presentations on developments in the U.S. market.

“Part of the strategic plan we developed was outreach, and the event in Mexico City was a result of that plan. We wanted to showcase to people in Mexico that benefits could be accrued from using trenchless technologies.”

- Michael Alldritt, Past Chair

Research and outreach initiatives continued with NASTT’s participation in the National Council for Civil

Engineering Research and the ASCE Microtunneling Standards Committee. The Northwest Chapter was formed and the Society began seeking an Executive Director who would establish headquarters in the Washington, D.C., area.

TRANSITION

1998 marked a major turning point for the Society as it hired David Martin, the first in-house Executive Director. Headquarters were relocated from Chicago to the Washington, D.C., area. NASTT also added another Regional Chapter – the Midwest Chapter, and then in 1999, another Student Chapter was established at the University of Alberta in Edmonton.

One of the growing areas within the trenchless marketplace in the late 1990s and early 2000s was directional drilling, which was experiencing a boom with the installation of fiber optic networks throughout the United States and Canada. NASTT worked with the California Department of Transportation on training sessions for permit inspectors to help ensure that roads were not damaged as a result of drilling. The National Transportation Safety Board recommended that NASTT should include recommended safe work practices to prevent damage in its updated Mini-Horizontal Directional Drilling Manual.

In addition to No-Dig Shows, the Society had begun offering training seminars on HDD, pipe bursting and microtunneling. The HDD seminars were being held in conjunction with the California Department of Transportation due in part to its intention to require operator training.



A DECADE OF SUCCESS

By 2000, John Hemphill assumed the role of Executive Director and the Society also welcomed the Southeast Chapter. NASTT celebrated its 10th anniversary by giving awards to people, companies and organizations that were instrumental in the Society's development and success.

"We kind of re-energized ourselves and developed a solid plan for Nashville. We increased the number of papers and we spent a lot of time and effort in creating a breakfast and gala dinner. And those themes have carried into current No-Dig Shows."

- Glenn Boyce, Past Chair

The HDD Good Practices Guidelines book, authored by Sam Ariaratnam, Dave Bennett and Casey Como, was completed. The book marked the growing trend of the Society developing education and training tools. ASCE's Standard Construction for Microtunneling Guidelines, supported by NASTT, was also published. NASTT added another new Student Chapter, this time at Arizona State University.

THE EDUCATIONAL FUND AUCTION

New to the 2002 No-Dig Show, the Educational Fund Auction hosted by Ritchie Brothers Auctioneers raised \$25,000 for the newly established Educational Fund.

"The Auction had a really good turnout, generated a lot of enthusiasm and raised a lot of money that we guaranteed would be spent solely for the purposes of education. It was an important addition to the Society's trenchless education and training program."

- Glenn Boyce, Past Chair

The Fund supported the International Trenchless Technology Research Colloquium, an event that attracted leading international academics and researchers from North America, South America, Europe and Asia to a forum where trenchless technology research initiatives were reviewed and disseminated.

The Board approved stipend and grant programs to strengthen trenchless activities of the Student Chapters.

STEADY GROWTH

Membership was on the rise with 150 members added over 2002 in addition to 100 student members, which included members from new Student Chapters established at Michigan State University, Bowling Green State University, Vanderbilt University and Queen's University.

Membership reached about 1,000 - a 45% increase over two years - and interest continued at the regional levels. The Western Chapter was formed, and its first meeting was in conjunction with the No-Dig Show in New Orleans. The Western Chapter brought the number of Regional Chapters to six, while over the past two years the number of Student Chapters increased from three to nine.

Efforts continued on the educational front with the beginning of CIPP and Pipe Bursting Good Practices training courses that expanded the scope of the Society's education and training curriculum. At the No-Dig Show, a new award - the Chairman's Award for Outstanding Lifetime Service - was presented to Trent Ralston.

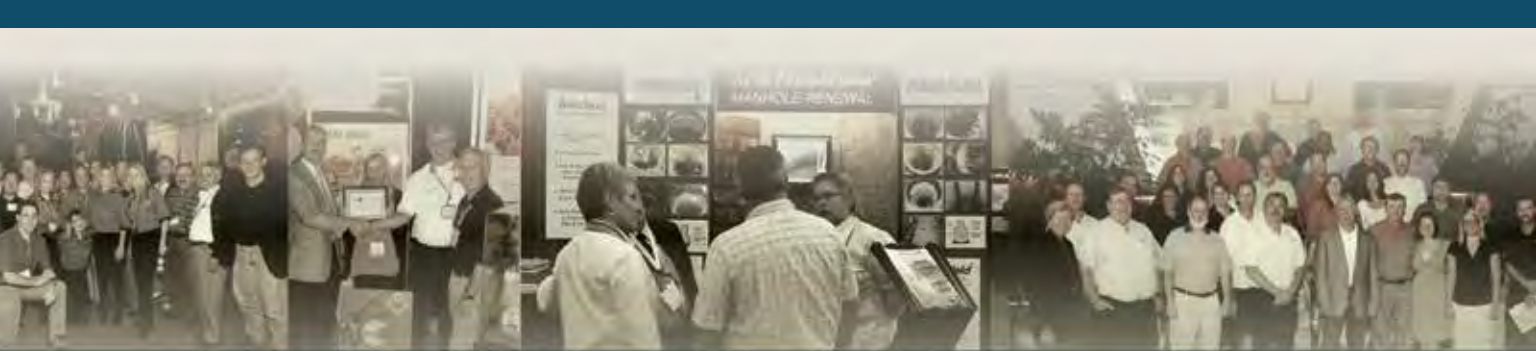
NEW DIRECTION

Interest in the No-Dig Show continued to blossom as the NASTT's annual flagship event attracted in excess of 1,600 people and 115 exhibitors to Orlando in 2005. The Show featured approximately 100 technical papers covering all aspects of the trenchless market.

"During my term we were strengthening financially, and we were looking for opportunities to take NASTT in new directions and began implementing new training initiatives. Because of the increased activities, we needed to expand staff to assist in implementing the education programs we were taking out to different parts of the country. This approach allows NASTT to expand education opportunities to people who can't be at the No-Dig Show while at the same time drawing new people into the Society."

- Mark Bruce, Past Chair

Additionally, NASTT officially welcomed the Mid Atlantic Chapter and the British Columbia Chapter.



MARKETING

The training modules that were introduced over the last few years continued to be expanded and were offered throughout North America. Courses were held on the topics of CIPP, Pipe Bursting, HDD and Lateral Rehabilitation.

The No-Dig Show marked its 15th anniversary and celebrated the occasion by honoring more than 100 companies, municipalities and educational institutions for the significant contributions they had made. The Educational Fund Auction raised more than \$46,000, which brought the total amount raised since 2002 to \$166,000.

The interest in trenchless education continued to grow, as evidenced by the fact that NASTT welcomed new Student Chapters from McGill University and Concordia University.

“The focus during my term was marketing – marketing the membership and marketing our deliverables, which were at that time our training courses. We added two more training courses and increased the number of instructors. We developed a five-year marketing plan in order to grow NASTT and make it more relevant to the industry in general.”

– Joanne Carroll, Past Chair

QUALITY TRAINING

2007 was a busy year! Over 20 training events were held throughout North America and NASTT rolled out its fifth course on New Installation Methods. This course debuted in Reno, NV that year.

“The demand for quality trenchless training had increased, and NASTT responded to that need with a suite of good practices training courses covering various trenchless methods. The Society will continue to offer, refine and expand our courses, as well as grow our pool of qualified course instructors.”

– Piero Salvo, Past Chair

On the local level, the Northwest Chapter achieved a milestone as it celebrated its 10th anniversary, and the Great Lakes-St. Lawrence Chapter was expanded to include Canada's four Atlantic Provinces, now known as the GLSLA Chapter. A new Student Chapter was also established at the University of Texas, Arlington.

GRASSROOTS

John Hemphill, who served as the Society's Executive Director for eight years, moved on to become the Executive Director of ISTT in 2008. Michael Willmets was selected by the Board to replace him. NASTT hosted the No-Dig Show in the Dallas-Ft. Worth area, drawing more than 1,500 attendees. No-Dig 2008 raised a record-setting amount of sponsorship support from among the industry's top manufacturers and suppliers.

One of the emerging trends in the industry was the increasing attention paid to environmentally friendly or “green” construction techniques. The NASTT-BC chapter designed a carbon calculator to estimate the reduction in carbon dioxide emissions when trenchless technology methods are used vs. open-cut.

“During my time as chairman one of the issues that I tried to address was going back to the grassroots, trying to get the chapters more involved. We had the Mexico initiative where NASTT visited Mexico to try to involve them, and as a result we had some Mexican attendees register for No-Dig 2009. Hopefully over the years their participation will be increased.”

– Piero Salvo, Past Chair

RECORD GROWTH AND INVESTMENT

NASTT Chair Chris Brahler was optimistic about the future of the industry and the Society.

“NASTT is well positioned to face the challenges that lie ahead. Our industry is made up of quality manufacturers, smart engineers and talented contractors and great municipalities and end users. That's a winning combination for any industry.”

– Chris Brahler, Past Chair

In 2009 NASTT hosted the International No-Dig Show in Toronto resulting in a record-setting turnout. It was the fourth ISTT International No-Dig held in conjunction with NASTT (fifth overall in North America) and the first since Las Vegas in 1993. By that point the Educational Fund Auction had raised over \$312,000 and directed those funds exclusively toward educational activities offered by NASTT. A scholarship program named in honor of founding member Mike Argent was established for students in active NASTT Student Chapters.

The Society welcomed the Pacific Northwest Chapter. Previously, Washington State had been part of the Northwest Chapter. The territory was realigned, and Washington, Oregon, Idaho and Alaska joined together to form this new chapter.



“The focus during my term was marketing – marketing the membership and marketing our deliverables. We developed a five-year marketing plan in order to grow NASTT and make it more relevant to the industry in general.”

– JOANNE CARROLL, FIRST WOMAN CHAIR OF NASTT



TWO DECADES OF COMMITMENT

In 2010 the Society designed a special 20th anniversary logo to commemorate this significant milestone. No-Dig 2010 returned to the Greater Chicago area, where NASTT officially formed 20 years earlier.

The founding directors and charter members were recognized for their vision two decades ago. In honor of the late Trent Ralston, the first Award for Young Trenchless Achievement was presented to Dr. Jason Lueke.

Additionally, five students were awarded \$5,000 scholarships in memory of founding director Mike Argent. This scholarship program continues today, with thousands of dollars being invested in the future of the trenchless industry through the students.

The Educational Fund Auction had become a much-anticipated annual event which now included a costume contest and dozens of auction items donated by generous supporting companies.



STRATEGIC PLANNING

By 2013 the NASTT Staff had grown to three full time employees and the volunteer pool continued to expand. The Board of Directors felt it was time to once again focus on the future of the Society and prepared a Strategic Plan for the next three years. A comprehensive member survey was conducted, and the findings were crafted into a document that was used to serve the organization for the years to come.

“The key output of this project was a concise strategic plan document that was anticipated to include NASTT’s mission, vision and values, as well as its strategic objectives, key strategies and initiatives, monitoring framework, and finally, budgetary implications. The committee looked at all of these elements to develop the most comprehensive plan for the society.”

– Derek Potvin, Past Chair

With a focus on training and education, plans were made to expand the bookstore offerings, increase the in-person training events and encourage municipal attendees to the No-Dig Show through NASTT’s Municipal & Public Utility Scholarship Program. The Society was able to award over 100 scholarships to public employees in the first year and the program continues to grow to this day.



MUNICIPAL SCHOLARSHIPS

In order to encourage municipal attendees to the No-Dig Show, NASTT’s Municipal & Public Utility Scholarship Program was developed. The Society was able to award over 100 scholarships to public employees in the first year and the program continues to grow to this day.

“The most exciting achievement of the Board of Directors during my tenure as Chair was the initiation of the Municipal and Public Utility Scholarship Program. This program was the culmination of years of effort led by true champions of the trenchless industry who were dedicated to furthering trenchless education by bringing municipal and utility owners to NASTT’s No-Dig show. These pipeline owners are the backbone of our industry and their education is of paramount importance. The scholarships have allowed hundreds of pipeline owners to learn the value of using trenchless technology to renew our infrastructure.”

– Dr. Kimberlie Staheli, Past Chair

By 2015 NASTT was celebrating their 25th anniversary and had more than 2,000 members. The organization was growing yet again as both the South Central Chapter and the Northeast Chapter were formed to serve members in these regions and the expanding trenchless industry.



EXPANDING PUBLICATIONS

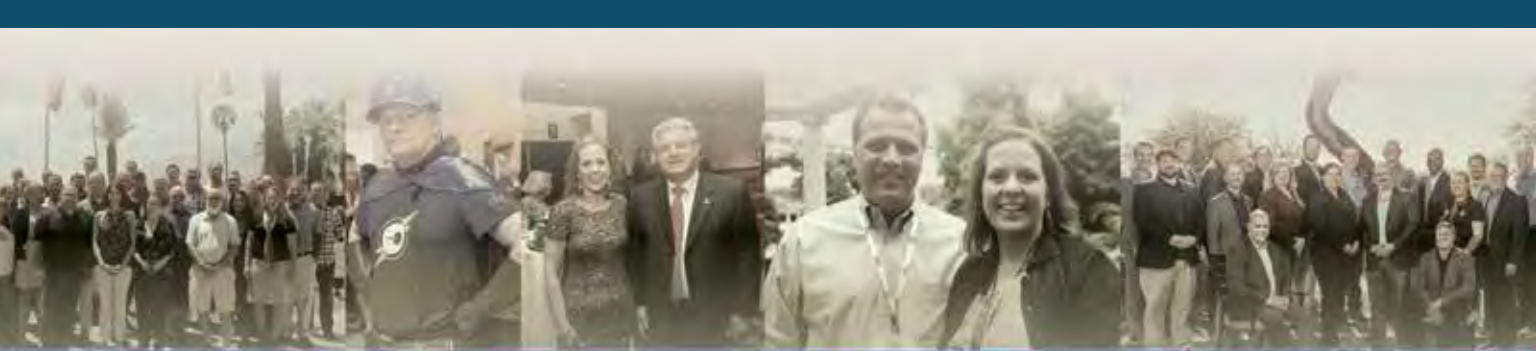
2015 also saw the publication of NASTT’s CIPP Good Practices Guidelines and Laterals Good Practices Guidelines. This brought the Society’s publications up to four books that were companions to the training courses as well as available for sale to the public as an educational resource.

Over the past five years the NASTT Bookstore has continued to expand and now offers over a dozen specialized Good Practices Guidelines books.

In 2017 NASTT’s CIPP Good Practices Guidelines was translated into Spanish when a need was identified to broaden the reach of the training resources.

In 2018 two Introduction to Trenchless Technology books on New Installations and Rehabilitation were published in English and subsequently translated to French to better serve the French-Canadian sector of the membership.

All of the NASTT publications are peer-reviewed and non-commercial in adherence to the mission to provide quality training and education to the public on the benefits of trenchless technology.



CENTERS OF EXCELLENCE

With an eye on industry leadership, NASTT is endeavoring to establish Centers of Excellence for various segments of trenchless Technology. The first to be established is a group focused on pipe bursting.

"Establishing a group focused on driving excellence within the discipline of pipe bursting will create energy and engagement with the trenchless industry and beyond, while continuing to fulfill NASTT's mission to advance trenchless technology and promote its benefits."

- Frank Firsching, Past Chair

Founded in 2017, NASTT's Pipe Bursting Center of Excellence is dedicated to the trenchless pipe bursting method and its full breadth of capabilities for potable water, gas, electrical and sewer applications. The Center provides leadership in education, standards, training and elevating the profile of the method throughout the construction industry. In addition, the group works on the refinement of best practices and acts as a resource and forum for utilities, contractors and manufacturers to share information and continue to move the pipe bursting method forward.

Following the formation of the Center, a revised version of NASTT's Pipe Bursting Good Practices Guidelines was published in 2019. The Center has also updated the content for the Pipe Bursting Good Practices Course that was established in 2007.

NO-DIG NORTH

2019 saw a dream of many NASTT members come to fruition when the Canadian Regional Chapters of NASTT hosted the inaugural No-Dig North conference. Nearly 600 attendees from across Canada met in Calgary, AB to learn from each other, network and discuss all things trenchless. This show is now an annual event with the 2020 No-Dig North being held in Vancouver, BC.

The trenchless market in Canada is strong and growing and NASTT plans to lead the way in education and training. The Society felt that it was important to make these resources accessible to all Canadians and decided to partner with the Canadian Chapters to offer additional resources and expertise in growing the event. NASTT and the Canadian Chapters have joined forces to make the upcoming events as dynamic and valuable as possible.

30 YEARS OF EXCELLENCE

After over 10 years as the Executive Director, Michael Willmets retired, and Matthew Izzard has taken the reigns of NASTT. Matthew oversees a staff of five dedicated professionals that help the Society's volunteer force provide top notch resources for the industry.

Member benefits have expanded to include an online member-only trenchless community called Talk Trenchless. This is a place where NASTT members can grow and succeed through continuous learning and collaboration and is accessible 24/7. Members can network, make new contacts, discuss projects and ideas and even have a little fun!

The Board of Directors is committed to the membership and the industry and they keep their focus on how NASTT can continue to be of service. Future goals include expanding their presence in Mexico with an outreach initiative. NASTT strives to provide a representative voice for all sectors of the trenchless technology industry. For 30 years, the all-volunteer members of NASTT have presented non-commercial information about these "green alternative" engineering methods to North American communities and their commitment is as strong as ever.

"The 30th anniversary of NASTT marks a tremendous milestone and accomplishment for our society and our industry. I am honored to serve on the board of directors, and I am grateful and I appreciate all of the hard work and services of the Board Members that have come before us to lay the foundation of a truly great society. The energy in the board room is electric and the society is focused on growth and giving back to our industry. It's a great time for NASTT and our future could not be brighter!"

- Craig Vandaelle, 2020 Chair



NASTT Celebrates Its 2020 Award Recipients

Through its renowned awards program, NASTT recognizes the many ways individuals and companies contribute significant time, energy and intellect to develop trenchless technology and foster its success. Recipients are recognized at the NASTT No-Dig Show and promoted through NASTT communication outlets which may include *nastt.org*, social media, NASTT E-News, *NASTT's Trenchless Today* and *Trenchless Technology* magazine, published by Benjamin Media, Inc. Let's take a look at this year's recipients.

NASTT Hall of Fame

Honoring NASTT members who have made outstanding accomplishments and exceptional contributions to the advancement of the North American trenchless industry and NASTT.

2020 Inductees:

James Jim S. Barbera

Founder, Barbco (awarded posthumously)

Tom Marti

Vice President, Engineering & Technology,
Underground Solutions, Inc., Part of Aegion Corp.

Lynn Osborn

Retired, Insituform Technologies

Chair Award for Distinguished Service

Recognizing trenchless professionals that have provided both NASTT and the trenchless industry with meritorious, prominent and long-standing service. One recipient each year is chosen at the discretion of the NASTT Chair.

2020 Recipient:

Greg Tippett, P.Eng.

Principal- Regional Delivery Lead, Stantec

Ralston Award for Young Trenchless Achievement

Applauding savvy members under 36 who have demonstrated excellence early in their career by making valuable contributions to the trenchless technology industry, achieving noteworthy professional success and actively participating in NASTT or its regional or student chapters. With their talent and ability, these impressive people are the future of trenchless.

2020 Recipient:

Kalyan R. Piratla, Ph.D.

Associate Professor, Glenn Department of Civil Engineering,
Clemson University

NASTT Volunteer of the Year

Recognizing members who exemplify the mission, vision and core values of NASTT and make an impact in the trenchless industry through their dedication, leadership and volunteer contributions during the past year.

2020 Recipient:

Jeff Maier, Garver

NASTT Outstanding Trenchless Paper Awards

Commending authors of the best NASTT No-Dig Show papers each year. Papers are selected by a review committee in combination with standout feedback received on show evaluation forms.

New Installation

Assessment of Soil and Bedrock Abrasivity for Horizontal Directional Drilling Projects

- Nick H. Strater, P.G., Brierley Associates, Bedford, New Hampshire
- Danny Crumpton, P.E., Inrock, Houston, Texas
- Brian C. Dorwart, P.G., P.E., Brierley Associates, Bedford, New Hampshire
- Jim Williams, P.E., Brierley Associates, Austin, Texas

Rehabilitation

Rehabilitation of the 1917 NATS Trunk Sewer

- Kevin Bainbridge, Robinson Consultants, Hamilton, Ontario
- David Ellis, Halifax Water, Halifax, Nova Scotia
- Roger Levesque, Halifax Water, Halifax, Nova Scotia
- Patrick Moskwa, Robinson Consultants, Hamilton, Ontario

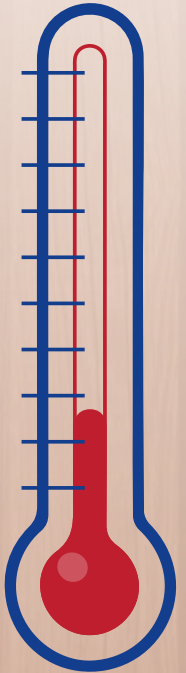
Find out how you can become a NASTT award recipient at nastt.org/awards.

2020 WILD WEST SALOON



EDUCATIONAL FUND AUCTION

30K
FOR
30
YEARS



\$30,000 FOR 30 YEARS OF EDUCATION

The NASTT Educational Fund helps raise money for very worthy causes. 100% of the money raised goes directly toward our programs that allow us to provide targeted trenchless training courses to the industry, publish trenchless resource manuals, sponsor university student attendance at the NASTT No-Dig Show, as well as award student and municipal scholarships. In 2020, NASTT is celebrating 30 years of trenchless excellence and we are asking for your help to raise and additional \$30,000 for our educational fund. Help us secure the future of the trenchless industry. Make a donation to the NASTT Educational Fund today!

ONLINE AUCTION SEPTEMBER 9-11

We are also raising additional funds through our annual auction. Join us September 9-11 for an online auction! We'll kick things off with a virtual Wild West Saloon party and costume contest on September 9. The online bidding will continue through September 11 where you can bid on exciting items like electronics, industry items, jewelry, trips and more.

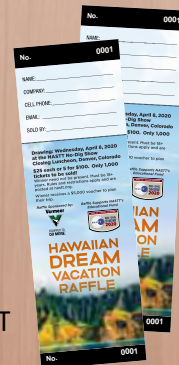
THANK YOU

To our 2020 auction sponsors, Bennett Trenchless Engineers and Interplastic!



HAWAIIAN VACATION RAFFLE

Thank you to Vermeer for sponsoring the raffle! Purchase your tickets online (only 1,000 tickets will be sold!) and the drawing for a \$5,000 voucher will be held on October 21. You do NOT need to be present to win!



sponsored by



MORE INFO

NASTT is a 501(c)(3) not-for-profit corporation. Donations are deductible for income tax purposes to the full extent of the law (tax identification number 36-3727335).

Visit nastt.org/no-dig-show/auction for details and to donate cash, donate an item or place your bids!



NASTT 2020 No-Dig Show and No-Dig North Present 30 Years of Trenchless Excellence



PRE-EVENT GOOD PRACTICES COURSES

MONDAY, OCTOBER 19TH | 8:00 AM – 4:30 PM

NASTT's HDD Good Practices Course

The HDD Good Practices Guidelines course provides an in-depth overview of Horizontal Directional Drilling (HDD) and covers six topics: (1) operation and application; (2) equipment and materials; (3) planning, including surface and geological investigations, utility surveys, bore planning, and regulations and permitting; (4) jobsite safety; (5) risk reduction, trouble shooting and mitigation; and (6) design.

NASTT's CIPP Good Practices Course

The CIPP course provides an in-depth overview of water, wastewater mainline and sewer lateral pipe rehabilitation using CIPP from planning and design to job completion.

NASTT's Pipe Bursting Good Practices Course

The NASTT Pipe Bursting Good Practices Course provides an in-depth overview of pipe bursting and covers four topic areas: (1) the types, methods and application of pipe bursting; (2) planning and preliminary design of a pipe bursting; (3) design and construction considerations; and (4) troubleshooting and problem solving.

NASTT's New Installation Methods Good Practices Course

This in-depth version of our New Installation Good Practices Guidelines course will cover subsurface investigation, pipe ramming and pipe jacking in detail. The presentation will also cover 20-years of lessons learned on microtunneling projects from a leading trenchless engineering team.

2020 PROGRAM OUTLINE

MONDAY, OCT. 19

8:00 a.m. – 4:30 p.m.

Pre-event Good Practices Courses will include:

- NASTT's Cured-In-Place Pipe Good Practices Course
- NASTT's New Installation Methods Good Practices Course
- NASTT's Pipe Bursting Good Practices Course
- NASTT's Horizontal Directional Drilling Good Practices Course

5:00 – 7:00 p.m.

Opening Reception

Join us in the Exhibit Hall for drinks and appetizers while networking with your colleagues.

TUESDAY, OCT. 20

7:30 – 9:15 a.m.

Kick-Off Breakfast

9:15 a.m. – 5:00 p.m.

Registration and Exhibit Hall Open

9:25 a.m. – 12:15 p.m.

AM Session Topics Include:

- HDD
- Microtunneling/Pipe Jacking
- CIPP

12:15 – 1:45 p.m.

Lunch

1:45 – 5:00 p.m.

PM Session Topics Include:

- HDD
- Microtunneling/Pipe Jacking
- CIPP

WEDNESDAY, OCT. 21

7:00 a.m. – 1:30 p.m.

Registration Open

8:30 a.m. – 12:00 p.m.

AM Session Topics Include:

- HDD
- Tunnelling
- Slipline
- Condition Assessment

8:30 a.m. – 3:30 p.m.

Exhibit Hall Open

12:00 – 1:30 p.m.

Lunch

1:30 – 4:45 p.m.

PM Session Topics Include:

- HDD
- Emerging Technologies
- Slipline
- Maintenance Hole Rehab

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REGISTRATION IS NOW OPEN

Register by September 4, 2020 to receive the early registration rate for attending the full conference. Attendees can visit the exhibit hall only for \$50.



The North American Society for Trenchless Technology and the Canadian Chapters will be hosting the No-Dig Show and No-Dig North in Vancouver October 19-21, 2020.

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, October 19, 2020. The exhibit hall will be open all day October 20 and October 21. The event will be held at the Vancouver Convention Centre in Vancouver, BC.



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Westphal leaves a lasting impact on Michels, industry

Robert H. Westphal, of Fond du Lac, Wisconsin, passed away on March 31, in Naples, Florida, from complications related to COVID-19. Michels Corp. announced the death of the trenchless industry icon on April 2.

Born on May 4, 1944, in Hartford, Wisconsin, Westphal grew up on a farm outside of Iron Ridge, Wisconsin. He married Jone Schultz on Nov. 10, 1963.

Westphal was still actively working for Michels Corp., the company he joined in 1965. He devoted 55 years of his life to Michels, tirelessly pushing the company's performance, and the pipeline and trenchless construction industries' potential to higher levels.

Hired by Dale Michels in April 1965 as a pipeline laborer, Westphal quickly established himself as a great leader, generous mentor and valued friend to those he

worked with, including the Michels family.

"It is our belief that the strength of his successors defines a leader's true success," said Pat Michels, president and CEO, Michels Corp. "In that regard, Bob was the best. He was selflessly devoted to improving the abilities and skills of those who worked with him."

"Throughout the decades, I have had the privilege of calling Bob my boss, my mentor, my colleague and my friend," Michels said. "He had a major impact on me in each of those roles."

In his career, Westphal filled many roles, including laborer, operator, foreman, superintendent, general superintendent, vice president, senior vice president and, at the time of his death, senior construction advisor. He helped guide Michels' development and execution of strategic business initiatives domestically

and internationally.

A statesman in the construction industry, Westphal was a valued member of many organizations. In 2019, he was inducted into the North American Society for Trenchless Technology's (NASTT) Hall of Fame. Previously, he was named *Trenchless Technology* magazine's Person of the Year in 2011. Westphal was an active member of the Pipe Line Contractors Association (PLCA), where he served on the Board of Directors for 13 years and as president in 2005. In 2018, he was named an Honorary Member.

Westphal's legacy will leave a significant impact on Michels and the industry he loved. NASTT extends its thoughts and condolences to his wife, Jone; his sons Scott, Jeff, Matt and Chad; his many other family members; and his large extended family at Michels.

The Toro Co. gives \$500,000 to global coronavirus relief efforts

The Toro Co. is donating \$500,000 to assist families and communities worldwide that have been impacted by the COVID-19 pandemic.

Grant funding from the Toro Foundation will span all regions where The Toro Co. operates, and will focus on providing food, health and humanitarian assistance to helping people adversely impacted.

"Supporting our customers and communities is an important part of our culture and core to who we are as a company," said Rick Olson, chairman and CEO of The Toro Co. "Now more than ever, it is critical that we come together to respond to the unprecedented challenges posed by COVID-19 and to support those most vulnerable in our communities."

The contributions include commitments to several global nonprofits that are assisting in the relief efforts. This includes the American Red Cross and



the International Committee of the Red Cross, Feeding America, the World Food Program, the United Way Worldwide, and United Way organizations in communities where The Toro Company's employees live and work.

An additional element of the global giv-

ing effort includes a special program for its employees who wish to personally give to designated COVID-19 relief organizations.

Under the program, The Toro Co. will match employee contributions to a nonprofit organization of their choice in support of relief efforts.

Carylon Corp. tackles COVID-19 cleanup

Several Carylon Corp. companies have taken up the fight against COVID-19 by providing disease cleanup and disinfection services to ensure facilities are clean and employees are working in a safe environment.

These companies include Ace Pipe Cleaning Inc., Deep South Industrial Services Inc., Metropolitan Environmental Services, Mobile Dredging & Video Pipe Inc. National Industrial Maintenance-Indiana and National Water Main Cleaning Inc.

In performing disease cleanup and disinfection, all the Carylon Corp. companies:

- Follow CDC protocols and use CDC approved industrial-strength disinfectants with a broad spectrum kill claim.
- Utilizes the Halo Disinfection System by Halosil International and includes HaloMist disinfectant (5 percent H2O2 and 0.01 percent ionic silver) that is dispensed by HaloFogger machines.



HaloMist is an EPA-registered hospital and healthcare broad-spectrum disinfectant for use on hard, porous or non-porous surfaces, which “kills” 99.9999 percent of *difficile* spores in all the nooks and crevices of complex rooms. It is:

- Safe for office space, vehicles, industrial equipment, large auditoriums, mass transit and airplanes.
- Will not fade or discolor upholstery, which means disinfecting can occur in an entire area without removing furniture.



Over the course of the coronavirus-pandemic in the United States, the Carylon Corp. companies have been performing this work on an emergency and regular basis for customers such as Menzies Aviation (at O’Hare International Airport), Around the Clock Ambulance Service, Lake County Indiana Government Center, US Steel and the Boston Transit Authority, including 900 buses and 700 trains per week.

For more information on disinfection services, visit caryloncorp.com or call 800-621-4342.

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Dana

HOBAS Pipe USA announces leadership transitions

HOBAS Pipe USA, recently announced a pair of leadership changes. Edward “Ed” Kocurek stepped down as president and CEO. Taking his place in that role – effective April 1 – is Martin W. Dana, former vice president of sales.

Dana joined HOBAS Pipe USA in that role in January 2018 after spending the previous 18 years at Northwest Pipe Co. in Portland, Oregon. Northwest Pipe is the largest manufacturer of engineered steel water pipe systems in North America. While at Northwest Pipe, Martin held various positions including, vice president of sales, vice

president of the tubular division and vice president of business development.

“Martin has done an outstanding job of leading our sales efforts for the past two years and we are confident that he is the right person to take HOBAS Pipe USA to even greater heights going forward”, said Kocurek. “We continue to be excited about the future of the company as we build on our past successes, expand our product portfolio, and continue to provide both outstanding products and services to our clients.”

Kocurek has served HOBAS Pipe USA for nearly 34 years in a variety of roles in-

cluding president and CEO for the past 20 years. He will remain with the company through 2021 as an advisor to the new president and CEO.

Under his leadership, the company has grown from a relatively small market segment pipe supplier to the successful international business it is today. Hobas Pipe is currently in water and sewer systems throughout North America; from Hawaii to Newfoundland and from Mexico to Alaska. From its original 36,000 sq-ft facility, HOBAS Pipe USA has expanded to more 150,000 sq-ft under roof and has a workforce of more than 170 employees.

Robbins Main Beam overcomes tough obstacles in China

Earlier this year, a Robbins 5.97 m (19.6 ft) diameter Main Beam TBM cleared its final hurdle when it broke through in Guangxi Province, China. The TBM excavated its first of two tunnels, an 11.9 km (7.4 mi) long conduit for Lot 1 of the North Line Water Irrigation Project, Letan Water Reservoir, Drought-Relief. The tunnel was marked by a gauntlet of challenges, from karst cavities to fault zones and water inflows. The workers on the jobsite, contractor Guangdong No. 2 Hydropower Bureau Co., Ltd., and the owner, Construction Management Bureau for the Letan Water Reservoir, had much to celebrate after completion of what is widely regarded as the most complex and longest tunnel on the North Line project.

Boring with the Robbins Main Beam TBM and continuous conveyor system began in summer 2015. “There was no precedent in this province for using a Main Beam TBM to excavate a tunnel longer than 10 km. We didn’t have relevant local experience to use for reference,” explained Yongjiu Jin, Deputy Manager of the Project for contractor Guangdong No. 2 Hydropower Bureau Co., Ltd. The machine did encounter a number of difficult geological obstacles as it bored through limestone rock, but was still able to achieve advance rates up to 40 m (130 ft) per day in good ground.

Much of the geology consisted of lightly weathered limestone in rock class II to III, with some sections in class IV to V rock that required the heaviest amount of ground support, ranging from rock bolts to ring beams and mesh. “Our team encountered a coal seam, gasses in the tunnel, two large water intrusions, three fault zones up to 103 m long, 11 karst cavities, and more. In order to solve the ground problems, there were more than 160 special technical research meetings held,” said Yongjiu.

While the completion of the first tunnel—the longest single-heading construction on record for water tunnels in Guangxi—is a mile-



The Robbins Main Beam TBM bored through limestone rock, and installed a full range of ground support, from rock bolts to ring beams and wire mesh.

stone, there is more to do. The Robbins machine will be inspected and relaunched to bore a second tunnel 4.2 km (2.6 mi) in length. The ground conditions are predicted to be equally challenging, but the tunneling operation has some help from ground prediction methodology. Tunnel Reflection Tomography (TRT)—consisting of ground prediction using seismic waves—is being used to detect changing conditions ahead of the TBM. The method can predict the distribution and scale of joints and fissures, allowing the crew to plan ahead.

Located near Laibin City, the North Line project provides much needed drought relief using a network of tunnels totaling 29.4 km (18.3 mi). “This tunnel will realize the dream of drought control that people in Central Guangxi have had for many years,” said Yongjiu.

HammerHead introduces new pipe extraction system for replacing steel gas services

HammerHead Trenchless, a manufacturer of trenchless installation, rehabilitation and replacement solutions for underground utility infrastructure, recently announced a new addition to its award-winning line of Same Path technology: the NEW SLX1300 trenchless pipe extraction system for small diameter steel natural gas services.

Pipe extraction using the patented SLX1300 is an innovative new method of replacing coated and bare steel gas service lines 0.5 to 1.25 inches in diameter, up to 100 feet in length. The hydraulically powered SLX1300 unit produces up to 13.3 tons of pulling force to extract the pipe from the ground while simultaneously pulling new HDPE or MDPE pipe into the same location as the existing pipe, reducing risk to surrounding utilities.

"HammerHead has a strong track record of working closely with crews in the field to find cost-effective solutions for addressing deteriorating gas pipelines," said Josh Hood, HammerHead Trenchless senior product manager. "A gas company approached us about finding a trenchless way to replace bare steel and our engineering team applied operator feedback to design the SLX1300 to meet needs unique to the gas market. The final design includes innovative features to minimize excavation and reduce operating requirements."

One feature is the unit's on-board pipe shear that the operator engages to cut the pipe material as it is extracted into manageable segments for easy disposal.

The pipe extraction process requires two access points: a machine pit located where the service connects to the main, and an access point opposite the machine from which to pull in the new pipe. A cable is fed from the machine through the pipe and attached to the new pipe at the other end. The machine's jaws clamp the steel pipe and the cable within it, and the machine is then engaged to pull the pipe from the ground. The jaws release and the machine cycles forward to clamp and pull another segment. The pipe shear located behind the machine's clamping jaw can be engaged at the operator's discretion to segment the extracted pipe in any length as space allows.

The compact size of the unit requires a

working pit approximately 4 feet wide by 4 feet long and the entire system can be transported in the back of a standard pickup truck, reducing costs associated with extensive excavation and support equipment needs.

"The U.S. DOT reports that there are more than 1.5 million of bare steel services still in operation in the US and the lack of a protective coating can cause the steel to corrode and deteriorate faster than other materials. Having efficient and cost-effective replacement methods for these kinds of pipes is critical," explained Hood.

"Operators across the country have observed the cost savings and benefits of trenchless construction methods so we're proud to introduce a new trenchless technology that facilitates rapid replacement of at-risk steel gas pipes."

The HammerHead Trenchless line of Same Path Technology also includes a patented pipe slitting system used for the trenchless replace-



The HammerHead Trenchless SLX1300 pipe extractor offers a trenchless solution for replacing 0.5-1.25-in. steel gas services by extracting the steel pipe and simultaneously pulling new PE pipe into place.

ment of plastic gas services. The SLX1300 is designed for steel pipe but preliminary field testing on additional pipe materials is underway.

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Vermeer introduces new line of high-capacity, truck-mounted vacuum excavators



Vermeer Corp. recently announced it has purchased a minority equity investment in and signed a distribution agreement with Vacuum X-Traction Products Inc. (VXP). Through the agreement, VXP will supply a series of Vermeer-branded, high-capacity, truck-mounted vacuum excavators to be sold exclusively through Vermeer industrial dealers. The first of these products, the VXT500 Vacuum Excavator, was introduced during the 2020 WWETT Show in Indianapolis in February.

The VXT500 is an 8-in. vac with an eight-yard spoil tank capacity. It is ideal for utility applications where a higher capacity machine with a smaller footprint is desired. The VXT500 joins a family of proven VXP-manufactured vacs featuring vacuum blowers that deliver 5,000-6,400 cubic feet per minute and spoil tank capacities ranging up to 16 yards. In addition, VXP has built and will offer a vacuum excavation truck equipped with a pressurized detachable box, and a truck with an extendable long-reaching boom for specialty applications.

This new lineup and strategic partnership with VXP are the next step in Vermeer's commitment to offer the widest range of in-

novative and specialized vacuum excavation solutions across industries where soft-dig technology is in demand. Vermeer created a leading powerhouse for vacuum excavation solutions for the underground utility markets in 2018 after bringing together the McLaughlin and Vac-Tron brands. Adding a high-capacity product offering means Vermeer will have one focused product team working together with its dealers to provide one of the most comprehensive lineups of vac solutions on the market.

"Building on our strong Vermeer vac lineup and our recently introduced XR2 vacuum excavator, this VXP partnership will help us offer an even broader range of equipment for our customers to consider depending upon their unique jobsite needs," said Doug Hundt, president of Vermeer Industrial Solutions. "From utility, to oil and gas, to industrial plant and environmental clean-up applications, these VXP products are proven to meet the specific demands of customers looking for high-capacity vac solutions that will improve their productivity."

Based in Fort Morgan, Colorado, VXP was founded in 2014 by Gary Harms and Juan Mota, long-time innovators of vacuum excavation equipment. They will continue as

majority shareholders and product development leaders through the new partnership with Vermeer. Their expertise and experience, combined with the product innovation Vermeer was founded on, will help drive the continued advancement of soft dig technology in the high-capacity arena.

"The needs for soft dig equipment are ever-changing with customers requiring a wide variety of products on a wide variety of jobsites. We are excited to partner with Vermeer and its dealers who are well equipped to offer and support our range of high-capacity solutions designed to help customers work more efficiently and cost-effectively," said Harms.

VXP will begin supplying Vermeer machines to Vermeer dealers in mid-2020 with a focus first in North America, and later expanding into other regions of the world where large truck-mounted vacs are in high demand. For more information about these products, please visit vermeermvs.com/truckvacs.

To learn more about Vermeer, products, the dealer network and financing options, visit vermeer.com. Learn more about Vermeer MV Solutions by visiting vermeermvs.com.



NASTT

Chapter News



British Columbia

The British Columbia Chapter (NASTT BC) looks forward to participating in the co-located NASTT 2020 No-Dig Show and No-Dig North in Vancouver that will serve as one big North American event this October. With the success of the inaugural No-Dig North, Oct. 28-30, 2019, the British Columbia Chapter was proud to serve as co-host along with the GLSLA and Northwest Chapters of NASTT. This conference was the first trenchless conference produced by NASTT to exclusively cover the trenchless construction market in Canada. No-Dig North was held in Calgary, Alberta, and brought nearly 600 attendees. The show also featured more than 75 exhibiting compa-

nies from across the industry. You can view information on the conference on the website, nodignorth.ca.



Great Lakes, St. Lawrence & Atlantic

Last October, the GLSLA Chapter co-hosted the first-ever No-Dig North in Calgary, along with the British Columbia and Northwest Chapters. The GLSLA Chapter is looking forward to spearheading future No-Dig North conferences beginning with the combined NASTT 2020 No-Dig Show and No-Dig North conference, Oct. 19-21. As many events across the industry are being rescheduled due to COVID-19, please stay up to date with chapter information and other upcoming events



Mid Atlantic

The Mid Atlantic Chapter (MASTT) had to postpone and may even cancel its Trenchless Technology, SSES and Buried Asset Management seminar originally planned for Baltimore, Maryland, on May 6. As of now, MASTT plans to conduct the seminar in Atlantic City, New Jersey, on Sept. 16, 2020. Please place this date on your calendar and plan to participate. Please go to mastt.org to learn more about MASTT and the MASTT seminar program or contact Leonard Ingram, PWAM, MASTT executive director, at leonard@engconco.com or (334) 327-7007.



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MASTT plans to publish its *Mid Atlantic Journal of Trenchless Technology 2020* in July. The journal will have numerous excellent Mid Atlantic project articles and other stories. The 2020 edition along with past journals can be seen at mastt.org. Please contact Andrew Pattison, A To B Publishing, at (204) 275-6946 to participate with an article ASAP. The publication will be distributed to more than 4,000 water and sewer decision makers in the MASTT area. Thank you for your support and please be safe!



Midwest

The Midwest Chapter (MSTT) had a very successful Trenchless

Technology, SSES and Buried Asset Management seminar in Kansas City, Missouri on March 11, just before COVID-19 shut down everything. The guest presenter was Karine Papikian, P.E., collections systems engineering manager for Kansas City Water, who presented on trenchless technology in Kansas City.

MSTT is proposing a seminar in Cincinnati, Ohio, on Oct. 28, 2020. Please plan to support the seminars as an attendee, presenter, exhibitor and/or food sponsor. There will be ample networking and learning opportunities at the seminar. Please go to mstt.org to learn more about MSTT and the MSTT seminar program or contact Leonard Ingram, PWAM, MSTT executive director, at leonard@engconco.com or (334) 327-7007.

MSTT is publishing its *Midwest Journal of Trenchless Technology 2020* on Sept. 25, 2020. Past journals can be seen at mstt.org. Please contact Andrew Pattison, A To B Publishing at (204) 275-6946 to participate with articles in the 2020 journal. Each journal publication is distributed to more than 4,000 water and sewer decision makers in the MSTT area. Thank you for your support and please be safe!



Northeast

The Northeast Chapter recently concluded its election announcing

regime change and new Board of Directors taking over leadership and vision for the chapter in 2020-21. The Northeast student chapter at UMass is pressing forward



Karine Papikian, collections systems engineering manager with Kansas City Water presents on trenchless technology in Kansas City at an MSTT seminar on March 11.

with the establishment of the Center for Excellence in Trenchless Technologies & Underground Engineering (CETTUE). The Center is seeking industry partnership as it moves into the next phase preparing for the National Science Foundation (NSF) workshop. We were looking forward to the NASTT 2020 No-Dig Show in Denver, Colorado, and we're hoping the rescheduled joint NASTT 2020 No-Dig Show and No-Dig North in October will be a huge success. We are also working on our 2020 edition of the *Northeast Journal of Trenchless Technology Practices* which we had planned to release at the Denver No-Dig Show. Please see our website, nastt-ne.org, for updates and more information.



Northwest

The NASTT Northwest Chapter closed out another great

Technical Lunch Program in both Edmonton and Calgary, where we had not only spotlighted some of our great local projects, but also national projects and new products in the market. We will be planning the 2020-2021 program this summer and I would like to extend an invitation to our chapter members to submit topics for this program. If you have a specific topic or project that you would like to see us spotlight, please reach out and let us know.

The chapter is proud to be assisting with the now-combined NASTT 2020 No-Dig Show and No-Dig North conference in October. Registration is now

open and you can register by Sept. 4 to receive the early bird rate. The conference will take place in Vancouver, British Columbia on Oct. 19-21, 2020, at the Vancouver Convention Centre. Prevent Good Practices Courses will also be available on Monday, Oct. 19. The exhibit hall will be open all day on Oct. 20-21. More information on sponsorships, tradeshow booths, delegate registration and municipal scholarships can be found at nodignorth.ca.

For more information, please email Greg Tippett at gtippett@nastt-nw.com.



Pacific Northwest

The Pacific Northwest Chapter was pleased

to announce the recent addition of Oregon State University as a new student chapter of NASTT and the first in the Pacific Northwest region. Please extend a warm welcome to any OSU students you see at upcoming shows or events.

For further updates on chapter meetings, events and activities, please visit our website at pnwnastt.org. You can also check out the recent edition of our chapter publication, the Pacific Northwest Trenchless Review, as well as project updates.



Rocky Mountain

The Rocky Mountain Chapter did not

schedule its regularly-planned regional show this year as the NASTT No-Dig Show had been planned for Denver in April before the coronavirus pandemic hit. Please visit our recently revamped website, rmnastt.org, for updates on chapter events. We are also excited to announce that we have been active in our outreach to Kansas and Nebraska and look forward to bringing on some new city involvement to the chapter. Stay tuned for more on this news!

Our Young Professionals group has been afforded a new budget for this year and they are active in setting up new social events. Our last social event was packed and a huge success.



South Central

Although the South Central chapter was sad to see the NASTT

No-Dig Show in Denver be postponed, we are happy that we will be able to have presenters from Texas, Oklahoma and elsewhere present their No-Dig topics at our upcoming chapter conference later this year to ensure these exciting topics still have the opportunity to be shared with our peers. The conference will be held at the Sugar Land Marriott Town Square on Oct. 5-6, 2020. We are very much looking forward to the interesting and exciting exhibitors and presentations on the newest industry developments and compelling case studies and technologies that will be showcased.

Conference information and registration can be found at nastt-sc.ticketleap.com/nastt-sc. If you are interested in exhibiting please reach out to Jim Williams at jwilliams@brierleyassociates.com or Justin Taylor at justin.taylor@cciandassociates.com. Some sponsorship opportunities are also still available at this time.



Southeast

In 2020, the Southeast Chapter (SETT) is planning seminars in Savannah, Georgia on Aug. 5 and in Miami, Florida on Dec. 9. Please plan to support these seminars as an attendee, presenter, exhibitor or/or food sponsor. There will be ample networking and learning opportunities at these seminars. Please visit sett.org to learn more about SETT and the SETT seminar program or contact Leonard Ingram, PWAM, MST executive director, at leonard@engconco.com or call (334) 327-7007.

SETT is publishing its 2020 annual journal, the *Southeast Journal of Trenchless Technology* on Nov. 20. The journal will have numerous excellent trenchless technology project articles and messages focused on the Southeast region of the United States. Past journal editions can be seen sett.org. Please contact Andrew Pattison of A To B Publishing at (204) 275-6946 to participate with articles in the 2020 journal. Each journal publication is distributed to more than 4,000 water and sewer decision makers in the SESETT area. Thanks for your support and please stay safe!

SETT is publishing its 2020 annual journal, the *Southeast Journal of Trenchless Technology* on Nov. 20. The journal will have numerous excellent trenchless technology project articles and messages focused on the Southeast region of the United States. Past journal editions can be seen sett.org. Please contact Andrew Pattison of A To B Publishing at (204) 275-6946 to participate with articles in the 2020 journal. Each journal publication is distributed to more than 4,000 water and sewer decision makers in the SESETT area. Thanks for your support and please stay safe!



Western

The Western Chapter (WESTT) is going online in 2020! Due to COVID-19, WESTT is moving forward with a series of live online webinars covering a range of exciting trenchless topics in lieu of our annual conference. We will be re-vamping our website this summer to help keep our members up to date on chapter information and the webinar series. Keep an eye out for upcoming emails with more information on this new program.

WESTT kicked off the spring with election of our board's new Executive Committee: Lisa Arroyo of Arroyo Trenchless, Inc. – WESTT Chair, Kate Wallin of Bennett Trenchless Engineers – Vice Chair, Tim Taylor of Carollo Engineers, Inc. – Treasurer, and Rachel Martin of McMillen Jacobs Associates – Secretary.

We look forward to seeing all of our members at our live webinars in 2020 – stay tuned for upcoming details!



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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
Phone: (905) 304-0080
kbainbridge@rcii.com

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
Phone: (888) 817-3788
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
Phone: (314) 229-3789
jeffboschert@ncpi.org

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
Babs Marquis
Phone: (781) 852-0462
marquis@mcmjac.com

Elected Officers
Chair - Babs Marquis
Vice Chair - Eric Schuler
Secretary - Jonathan Kunay
Treasurer - Paul Savard



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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Elected Officers
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.

Chapter Contact
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Elected Officers
Chair - Carl Pitzer
Vice Chair - AJ Thorne
Secretary - Glen Wheeler
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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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 - Jim Williams
Vice Chair - Jonghoon "John" Kim
Secretary - Luis Cuellar
Treasurer - Josh Kercho



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

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Elected Officers

Chair - Lisa Arroyo
Vice Chair - Kate Wallin
Secretary - Rachel Martin
Treasurer - Tim Taylor



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

Leonard Ingram
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Elected Officers

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



Introducing NASTT's Regional Chapter Relations Manager, Jessie Clevenger! Jessie is here to provide enhanced services and support to our Regional and Student Chapters. Are you looking to get more involved with your Regional Chapter? Look for Jessie at an upcoming regional event or reach out to her via email with any questions at jclevenger@nastt.org.






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



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Advisor: Dr. Nenad Gucunski
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NOMINATIONS BEING ACCEPTED FOR NASTT'S HALL of FAME Class of 2021

View nomination details at nastt.org/no-dig-show/hall-of-fame

Completed applications along with three letters of recommendation and biographical information on the nominee should be submitted online and must be received no later than August 1, 2020.

In 2010, the NASTT Board of Directors voted to create a Hall of Fame in order to ensure that the Society's most outstanding and praiseworthy members received due recognition. The intent of NASTT's Hall of Fame is to preserve the outstanding accomplishments of these exceptional individuals and to honor their contributions to the advancement of both the trenchless industry and the Society. Members may be elected from all NASTT membership categories: Manufacturers and Suppliers; Engineers and Consultants; Municipal and Utility Employees; Contractors; and Academia.



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(1940-2019)
Barbco



TOM MARTI
Underground Solutions, Inc.



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Insitufirm Technologies

**2020 HALL OF FAME
RECIPIENTS**



REHABILITATION OF THE 1917 NATS TRUNK SEWER

KEVIN BAINBRIDGE

Robinson Consultants,
Hamilton, Ontario

PATRICK MOSKWA

Robinson Consultants,
Hamilton, Ontario

ROGER LEVESQUE

Halifax Water, Halifax,
Nova Scotia

DAVID ELLIS

Halifax Water, Halifax,
Nova Scotia

Halifax Water (HW) is the largest water, wastewater and stormwater utility in Atlantic Canada, servicing a population of more than 360,000. As part of its innovative and proactive wastewater asset renewal program, the Northwest Arm Trunk Sewer (NATS) was identified for rehabilitation to remove debris, restore structural integrity, eliminate exfiltration and infiltration, establish a corrosion barrier, and extend the life of the sewer. The NATS began service in 1917 and was constructed using open excavation and tunneling at depths ranging from 300 mm to 5 m (11.18 in. to 16.4 ft.). The sewer runs parallel to the Northwest Arm inlet off the Atlantic Ocean ranging from 0 m to 15 m (0 ft. to 49.2 ft.) from the shore and is generally located in an easement on privately owned multimillion-dollar residential properties. The sewer's existing pipe varied in shape and materials, mainly consisting of 1200 mm (47.2 in.) diameter round poured concrete pipe or segmental clay block and 1200 mm x 1500 mm (47.2 in. x 59.1 in.) arched segmental clay with concrete bottom or poured concrete. In order to successfully complete the rehabilitation of the NATS, it was necessary to overcome numerous significant technical challenges, including extremely limited access, bypassing flows, onerous cleaning of debris, and complex engineering design and installation of a CIPP in an arch-shaped pipe structure—all on an accelerated completion schedule.

This paper outlines the challenges and solutions to the numerous challenges faced on arguably the most difficult CIPP project completed in Canada.

INTRODUCTION

The NATS first began service in 1917. It had been constructed using open excavation and tunnelling at depths ranging from 300 mm to 5 m (11.18 in. to 16.4 ft.). The sewer runs parallel to the Northwest Arm, an inlet off the Atlantic Ocean that adds recreational and economic value to the community and increases its quality of life. The NATS sewer alignment is 0 m to 15 m (0 ft. to 49.2 ft.) from the shore and is generally located in an easement on privately owned multimillion-dollar residential properties. The location of the NATS was further complicated by a CN rail track running parallel to the water, which land locked waterfront homes and required crossing load restricted bridges to access the sewer location.

The sewer's existing pipe varied in shape and materials, consisting of the following components:

- 1200 mm (47.2 in.) diameter round poured concrete pipe
- 1200 mm (47.2 in.) diameter round segmental clay block
- 1200 mm x 1500 mm (47.2 in. x 59.1 in.) (height x width) arched segmental clay with concrete bottom
- 1200 mm x 1500 mm (47.2 in. x 59.1 in.) (height x width) poured concrete arch pipe.

In 2010, Halifax Water undertook a trial project to determine whether it could feasibly use Cured-in-Place Pipe (CIPP) technology to rehabilitate the NATS. Based on the results of the trial project, which lined 440 m (1,320 ft.) of the NATS, the utility concluded that CIPP was the preferred technology for rehabilitating the remaining 4 km (2.49 mi.). The trial also allowed Halifax Water to identify some of the unique challenges faced in rehabilitating the remainder of the NATS, including removal of debris and access.

There were four primary objectives of the NATS rehabilitation including removal of debris to restore flow capacity, restore structural integrity, eliminate exfiltration during wet weather surcharge and establish a corrosion barrier.

The project scope described in the RFP allowed bidders to propose the use of either CIPP or a combination of CIPP and Grouted-in-Place Pipe (GIPP). The round sections of the NATS were required to be CIPP, while the arch sections could be either CIPP or GIPP. The winning proposal involved rehabilitating all 4,000 m (13,100 ft.) using CIPP, including the

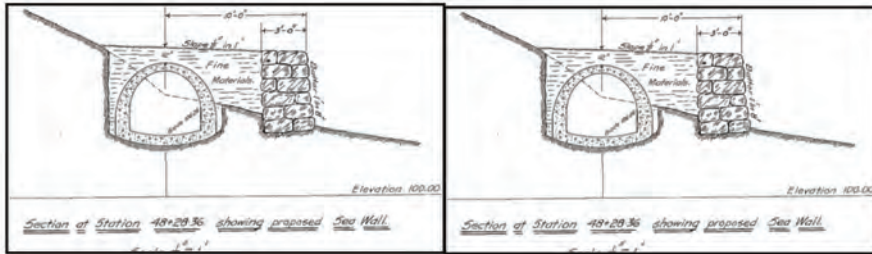


FIGURE 1 – NATS 1917 Cross Sections

arch sections. CIPP technology provides significant economic and socioeconomic benefits because it involves installing a new pipe inside an existing pipe, thereby limiting the need to excavate trenches to replace sewers. In the case of the NATS, while some excavation would still be needed, no linear length of sewer pipe required excavation. This made it possible to avoid excavating through properties along the Northwest Arm shoreline, significantly reducing the socioeconomic cost of the project. It also provided major environmental benefits by resulting in comparatively much lower levels of greenhouse gas emissions. However, to successfully complete the rehabilitation, it was necessary to overcome numerous technical challenges, including extremely limited access, bypassing flows, onerous cleaning of debris, and complex engineering design and installation of a CIPP in an arch-shaped pipe structure — all on an accelerated completion schedule. There were also unique challenges related to explaining the project to the community and other stakeholders to obtain their support.

IDENTIFYING AND MITIGATING RISKS

In order to support the successful completion of the project, a risk workshop was completed to review the tasks involved in rehabilitation via CIPP or Grouted in Place Pipe (GIPP) and identify all the risks associated with implementing it on the NATS. The top risk identified was that heavy rains could exceed the bypass system's capacity to complete the work. The project team concluded that this risk could be substantially mitigated by retrofitting and upgrading the primary sewerage pump station feeding the NATS, allowing the station to divert flow to another trunk sewer system and treatment facility. This work was tendered and completed before the sewer rehabilitation work began—an arrangement that significantly benefited the rehabilitation project

while also reducing the combined sewer overflow frequency, since the diversion was a permanent alteration to the sewer collection system. The second major risk concerned the condition of the bottom of the NATS sewer. During the CCTV inspection completed in the planning stages, debris and flow covered the bottom, making it impossible to assess its condition. This risk was mitigated through the design of the liner and contingency allowances for the repair of isolated sections, should any be identified after the cleaning process.

A full risk register was established and maintained throughout the projects implementation including these risks and all others identified.

REHABILITATION DESIGN

While CIPP was a practical solution to address the previously mentioned rehabilitation challenges, the design of the CIPP liner required a unique approach. CIPP design standards (ASTM F1216 or WRc) assume the sewer being rehabilitated is circular (round, egg-shaped or oval). As a result, the project re-

quired the use of a unique first-principles design approach that included developing a specialized design calculator for the arch-shaped portions of the sewer totaling approximately 2000 m (6,562 ft.) in length.

The design approach assessed the pipe in three distinct components: the arch top, the vertical sides and the dished bottom. The design parameters for each of these individual components (i.e. minimum beam length on bottom, detailed dimensions, ground water height, performance requirement, etc.) were established along with design equations to identify the CIPP thicknesses required to meet the expected loads. These engineering designs for each component specified the individual liner thicknesses required to resist the identified loads acting on each component, with the largest liner thickness across the components being the governing thickness for liner design. Given constructability constraints associated with CIPP liner thicknesses and the rehabilitation objectives, the arch pipe sections were designed as partially deteriorated on the dish bottom and full deteriorated on the sides and arch top. This approach provided a liner which could meet the rehabilitation objectives while making the CIPP constructible. The round portions of the NATS were designed under a fully deteriorated condition state as the liner thicknesses were well within the constructability limits of the technology. CIPP thicknesses on the project ranged from 27 mm to 37 mm (1.06 in. to 1.46 in.) based on the location, parameters and geometry of the pipe.

FIGURE 2 – NATS Arch Pipe Liner Design

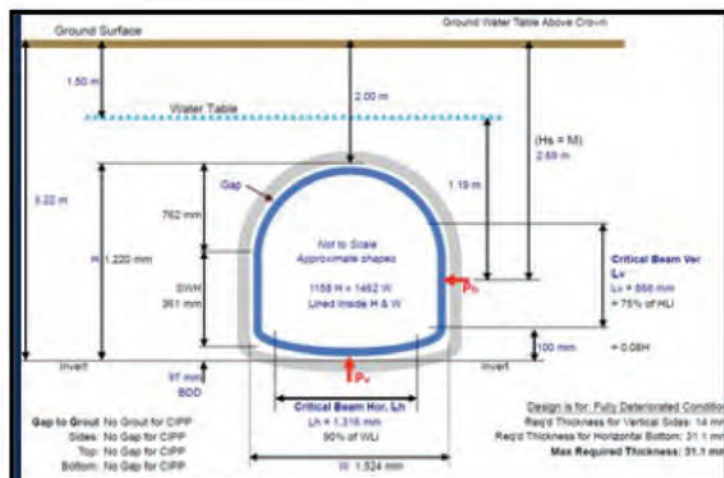




Table 1; Contractor Evaluation Criteria

Category Number	Evaluation Category	Maximum Possible Score	Minimum Required Score
1	Contractor Credentials and History	5	
2	Sub-Contractors to Be Used	5	
3	Materials and Methods (CIPP & GIPP)	30	24
5	Capability to Perform the Work	50	40
6	Experience with Similar Projects	30	24
7	Work Site Access	30	
8	Flow Control Plan	50	40
9	Project Management	15	
Total Possible Score for All Categories		215	172

TABLE 1— Contractor Evaluation Criteria

PROCUREMENT OF CONTRACTOR

Given the significance and complexity of the NATS rehabilitation, the procurement of the contractor was completed through a Request for Proposal (RFP). The RFP outlined the requirements of the rehabilitation, the completion time frame, access restrictions, etc. which the contractors would need to address while meeting the objectives of the rehabilitation. The evaluation of the proposals considered several elements, each scored and weighted based on their importance as described in Table 1.

Each category had between 4 and 20 specific elements which were required to be addressed in order to sufficiently evaluate the contractor's ability to successfully complete the NATS rehabilitation. The evaluation considered the extent to which the proposal demonstrated both the capability of the contractors and the completeness of their project plan. Proposals which achieved an overall minimum score of 80 percent, in addition to a minimum score of 80% in four critical categories, were considered under the cost proposal.

ENGAGEMENT WITH STAKEHOLDERS

Engaging property owners was a vital component of the project's success. Because the sewer was located through an easement running parallel to the shore of the Northwest Arm in the front yards of residential properties, it was critical to stay in contact with property owners throughout the project. The project team began engaging with these and other stakeholders early on—during the de-

sign process—through a multi-channel communications plan that included formal open houses. We invited the whole community, issuing personalized invitations to waterfront property owners, and had all collaborators (HW, Consultants and Contractor) present. The communication focused on providing residents with a clear understanding of the issues and concerns related to the condition of the NATS as well as the community benefits that would be achieved by rehabilitating the existing sewer. Since CIPP was the technology that would allow the team to complete the project with the least amount of disturbance to shoreline properties, we emphasized the project's environmental, economic and socio-economic value to the community.

The team also discussed the typical alternate construction methodology (cut and cover pipe replacement) in detail with property owners. Given that replacing this sewer would mean disturbing a well-established and naturally beautiful shoreline, the general public easily recognized the benefits of CIPP. Public open houses allowed residents to ask questions, whether related to the project as a whole or to their own properties specifically. To maintain ongoing communication with property owners and the public, the project team also used individual mailings and literature drop-offs. This allowed quick, efficient responses to public issues and concerns. In turn, it also allowed the project team to make alterations to planned processes or procedures for the benefit of the community. In instances where property owners had unique concerns, we held location-specific commu-

nity meetings. Finally, a NATS project page on Halifax Water's website to provide residents with ongoing information about the project was built and maintained. The page featured videos about CIPP, information about the process, regular and timely updates on the project status, and contact information for inquiries. We also posted signs along the project route displaying QR codes linked to the project website. In essence, communication in every practical way to express and explain both the need for the rehabilitation project and the benefits of the chosen method was carried out. This generated significant support from the community throughout the project.

Beyond the property owners, several other stakeholders needed to be engaged in the project. Halifax Regional Municipality (HRM) was one of the project's major stakeholders; its engineers and other professionals were engaged early and throughout the project. We initiated significant discussions with HRM about the key project challenges and the engineering solutions that would be used to overcome them. These ideas were widely discussed, particularly with respect to roadways, parks and the sea wall. Facilitating a strong understanding of the project among HRM professionals was a key to building the robust project support that was necessary during the more challenging construction periods. CN Rail was another key stakeholder. The weight of the CIPP trucks that would need to cross the railway's load-restricted bridges carrying materials needed for the project was beyond the bridges' restricted load limits. Engaging with CN Rail during the planning stages including working together with the railway to complete a structural assessment of the bridges with the aim of determining their maximum load capacities. This entailed conducting detailed assessments of the trucks that needed to cross, including axle numbers and spacing, and resulted in adjusting the trucks to allow CN to issue safe overload permits.

NATS CLEANING AND PREPARATION

To facilitate the CIPP installation on the 100-year-old NATS trunk sewer, significant



cleaning was required, as the pipe was approximately 15% to 20% full of debris. Two primary challenges regarding the cleaning were: the large flat bottom of the arch pipe sections (see Figure 1), and the very limited access points available.

Addressing these challenges required ingenuity and unique equipment. A 900 m (2,900 ft.) cleaning shot proved particularly challenging, and was accomplished by “backflushing” approximately 300 m (980 ft.) of the trunk sewer, then flushing the debris the rest of the 600 m (1,970 ft.) downstream to the next access point for removal with a vacuum truck. This required the use of two sewer flushers with water flow capabilities in the range of 260 gpm at 2,300 psi and delivering the water via twin 30 mm (1.25 in.) hoses. This process uses a very large volume of water along with high pressure to scour the pipe walls and effectively pull debris down the sewer to the vacuum location. The flat floor of the arch pipe presented a cleaning challenge as well, as it could not be accomplished using traditional flusher heads. The approach resulted in the design of a custom nozzle to suit the application in the flat floor of the pipe and its onsite build to facilitate the cleaning work in the very tight schedule. In total, the sewer cleaning process removed approximately 750 cubic meters (26,500 cubic feet) of debris from the NATS.

The preparation of the NATS to facilitate lining primarily involved the minor repair of two locations where the pipe wall was missing portions of the concrete tile used in the original construction and the preparation of the service connections to mitigate the risk associated with resin migrating into the lateral during the inversion process. In both cases these issues required man entry into the NATS to place hydraulic cement into the areas of missing tiles and placement of temporary covers over each lateral connection. The covers over the laterals mitigated the migration of resin and were cut out as part of the lateral reinstatement process.

BY-PASSING FLOW IN THE NATS

The primary contributor of flow to the

NATS is the 1200mm (47in) Chebucto Road combined sewer. This sewer collects much of the flow from the west end of the peninsula and connects to the NATS at the Armadale Rotary. A significant bypass effort was required to maintain the NATS sewer’s function during the rehabilitation. Bypass for sewer replacement or rehabilitation typically involves temporary pumps and pipes, which can represent a significant lost cost to the project, which for the NATS was estimated to be in the order of \$2 million.

As a part of the planning phase, a review of the surrounding Halifax Water sewer collection system and an existing pump station in an adjacent sewer shed on Joseph Howe Drive was completed. The review found the pump station demonstrated poor pump performance, required frequent maintenance, overflowed regularly and was scheduled for upgrading in the near future. This presented an opportunity to upgrade the Armadale Pump station diverting flows to another trunk sewer and eliminate the requirement for the NATS to bypass the Chebucto sewer flow entering the NATS. This eliminated the need for a temporary bypass pump at Chebucto and upgrading an existing distressed pump station resulted in a financial savings to the NATS project and the Halifax Water operations and maintenance budget. This work was tendered and completed prior to the sewer rehabilitation work, and not only provided significant benefits to the rehabilitation project, but also reduced the frequency of combined sewer overflow into the Northwest Arm during rain events, since this diversion was made to be a permanent alteration to the sewer collection system. The Armadale Pump Station and associated engineering work was completed for \$1.4 million, providing a cost savings to the rehabilitation project while providing Halifax Water with a long term benefit associated with the capital expenditure.

Despite the upstream diversion of flows from the NATS, the bypass for the NATS project remained an intensive endeavor. Aside from managing/maintaining the mainline trunk sewer flows, the contractor was also

responsible for maintaining an additional 24 inflow points (sidelines) and approximately 125 residential lateral lines that connected directly to the NATS. The NATS system has a series of built-in overflow lines to the Northwest Arm (inlet) that also needed to be managed throughout the process. While liners were in the ground, we were in essence limiting the ability of the Northwest Trunk Sewer to surcharge and overflow at these known locations upstream of our working area. To compensate for this impact on the system, 7.6 cm × 30.5 cm (3 in. × 12 in.) centrifugal pumps at strategic locations were established.

CONCLUSION

The NATS rehabilitation planning began in July 2016 with the CCTV inspection of the sewer to determine the exiting condition and concluded with the issuance of a request for proposals (RFP) for construction in early February 2017 (7 months). Construction began in May 2017 and was substantially completed in December 2017 (8 months). The \$23 million rehabilitation project was partially funded from the Canadian Clean Water and Wastewater Fund (CWWF) and completed on budget and 3 months ahead of the required March 2018 completion. The importance of thorough planning, stakeholder engagement, constructability review, risk identification and mitigation, understood rehabilitation objectives, clear technical specifications linked to the objectives, sound quality control and the evaluation of contractors’ ability and rehabilitation plan were key elements to the success of the NATS rehabilitation.

This paper was edited for style and space for publication in *NASTT’s Trenchless Today*. To view Paper MM-T5-02 in its entirety, including the portions that cover the rehabilitation process and challenges of the 1917 NATS Trunk Sewer, please visit nastt.org/technicalpapers.

Calendar

NASTT is continuing to monitor the COVID-19 situation with guidance from federal, state and local governments and health officials, in determining whether to cancel or postpone scheduled events. Please visit nastt.org/training for the latest information.

August

5
SESTT Trenchless Technology Seminar (tentative)
Savannah, GA

September

16
MASTT Trenchless Technology Seminar (tentative)
Atlantic City, NJ

October

5
NASTT's CIPP Good Practices Course
Sugar Land, TX

5
NASTT's Pipe Bursting Good Practices Course
Sugar Land, TX

6
2020 NASTT South Central Trenchless Technology Conference (TTC)
Sugar Land, TX

19
NASTT's New Installation Methods Good Practices Course
Vancouver, BC

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NASTT's HDD Good Practices Course
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NASTT 2020 No-Dig Show and No-Dig North Present 30 Years of Trenchless Excellence
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NASTT's CIPP Good Practices Course - In conjunction with The Water Expo
Miami, FL

28
NASTT's Pipe Bursting Good Practices Course - In conjunction with The Water Expo
Miami, FL

November

9
Northeast Regional Chapter Trenchless Conference
Portland, ME

December

9
SESTT Trenchless Technology Seminar
Miami, FL

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April 10-14
Minneapolis Convention Center
Minneapolis, Minnesota



NASTT 2023 No-Dig Show
April 30-May 4
Oregon Convention Center
Portland, Oregon



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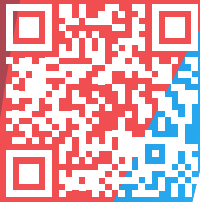
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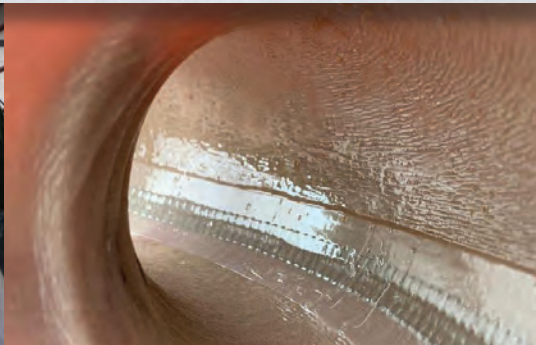


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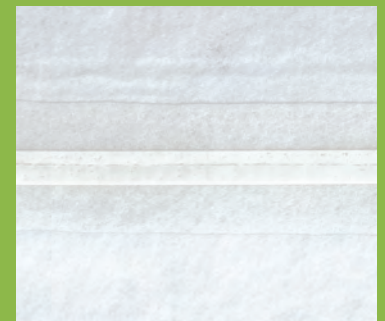
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