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The Official Magazine of the North American Society for Trenchless Technology



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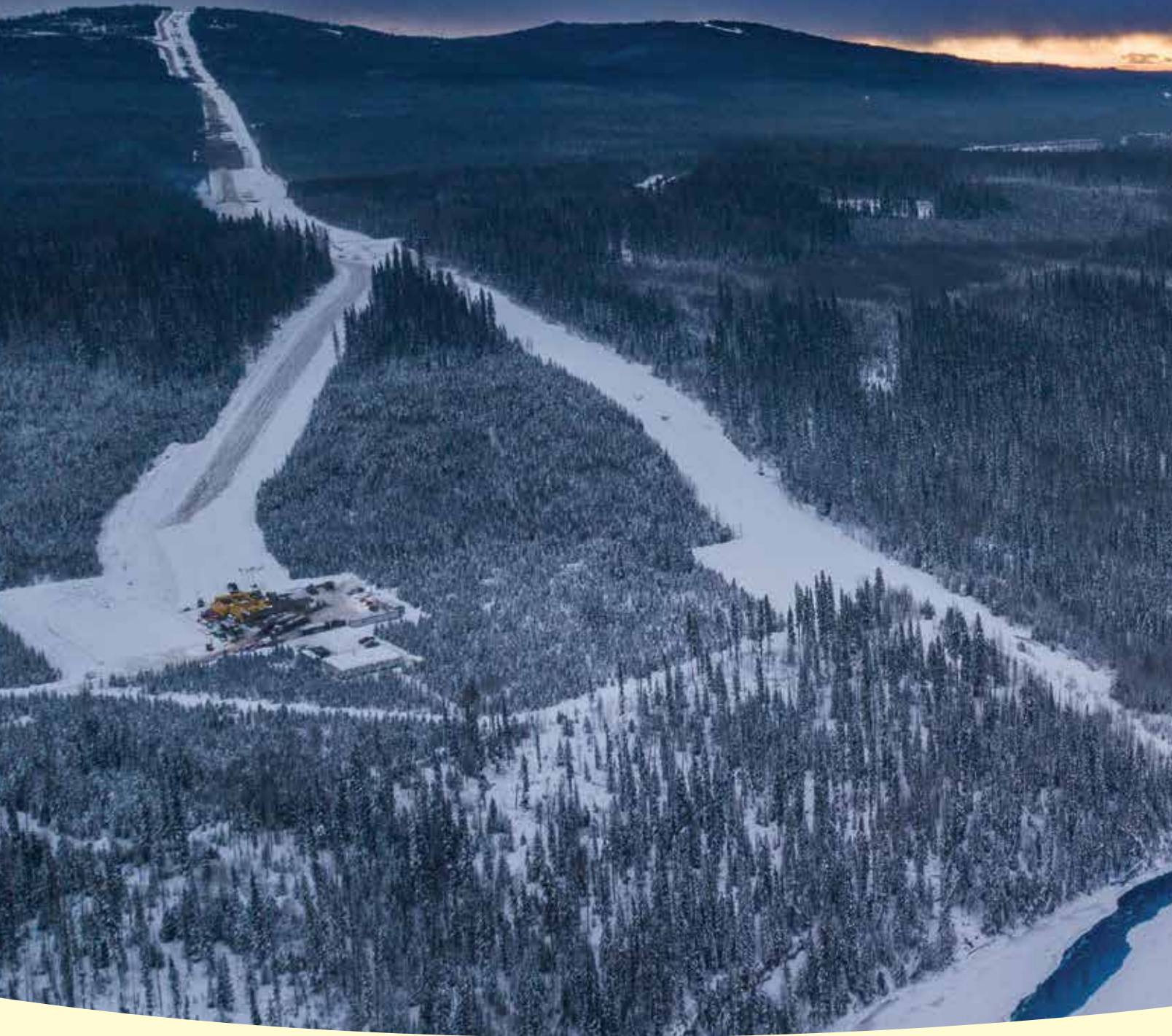
NASTT 2022 Board of Directors

**NASTT 2022 NO-DIG SHOW
Conference Preview**



SPRING 2022
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The Official Magazine of the North American Society for Trenchless Technology

SPRING 2022 – VOLUME 12, ISSUE No. 1

NASTT 2022 NO-DIG SHOW

WELCOME Trenchless Colleagues! Spring excitement is in the air, and the world's largest Trenchless Technology conference & trade show is back in action in beautiful Minneapolis. Full conference preview, events and networking schedule. Enjoy!

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FEATURES

10 Q&A: Aswathy Sivaram P.E., P.Eng, Black & Veatch

Interview with Aswathy Sivaram P.E., P.Eng, rising trenchless star and current Tunnel Business Planning Lead & Engineering Manager at Black & Veatch in Houston. She served on the NASTT Technical Program Committee and presented papers at the NASTT No-Dig Show in 2019 & 2021.

24 Hall of Fame 2022

A legacy of trenchless technology leadership, innovation and success. The NASTT Hall of Fame honors members who have made outstanding accomplishments and exceptional contributions to the advancement of the North American trenchless industry. Profiles of the three exceptional 2022 inductees: Dennis Doherty, Paul Nicholas and Mike Willmets.

28 NASTT 2022 Board of Directors

Meet YOUR 2022 NASTT Board of Directors and Officers! At the helm of the largest and most active trenchless technology organization in the world! Guiding the way are the twenty members of the NASTT Board of Directors, generously volunteering their own time to provide overall direction for the organization. A salute to the NASTT leadership!

48 HDD Lessons You Can Only Learn in the Field

Awarded Most Outstanding Paper – New Installations at the 2021 NASTT No-Dig Show in Orlando, this paper presents several case histories illustrating lessons learned on high-risk projects over a 20-year period. An examination of HDD risks and how they are managed in design and construction is thoroughly reviewed.

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WELCOME TO THE SPRING 2022 EDITION OF TRENCHLESS NORTH AMERICA!

This issue highlights the NASTT 2022 No-Dig Show in Minneapolis, also known as the City of Lakes. There are thirteen in fact, part of the huge Mississippi water network and was the site of the first bridge to span the river. The strength in bridges is in the keystone, which is something the NASTT Board of Directors are looking to provide all members through our recent initiatives.

In this magazine you will read about the various programs we are involved with. You or your company can be directly involved with these, as our diverse committees encourage non-Board involvement to be as representational of membership as possible. These include contributing to developing training courses and publications, instructing, student education projects, award selection, paper reviewing as well as the No-Dig Show and No-Dig North programs. These provide a great platform to contribute directly to the development of trenchless technology, as well as raising your awareness and profile through NASTT.

The quality of an organization is often reflected through the quality of the Board. It was rewarding to provide the Nomination Committee with such a challenge to select the election candidates from such a quantity and quality of exceptional applications. Thank you to every one of you and congratulations to Andrew Costa of Insituform in his election as Director as he continues his strong active involvement with NASTT. Our recent broader reach has focused on bringing greater engagement between Student and Regional Chapters as well as funding a full Municipal and Public Utility and Student Scholarship program for No-Dig Show. We have also increased participation with similar organizations such as Distribution Contractors Association, NASSCO, Plastics Pipe Institute and Underground Construction Technology to provide a wider range of networking and opportunities for everyone.

As we look to the future and the development of our education program, we are now able to offer virtual Good Practice training by request to groups or companies - saving the need for travel costs and time out of the office, are developing young professional opportunities in association with Underground Construction Association and have been invited to include trenchless technology in the West Point Academy education syllabus through Northeast Regional Chapter. Finally, are proud to welcome the US Army Corp of Engineers Technical Library as Affiliate Members of NASTT, providing their interested employees accessibility to our services and a knowledge of our organization.

Engineers and bridges seem a suitable concluding combination (usually - some dramatic notable exceptions!) – to thank all of you for your contribution, as we continue to promote and encourage the best of our present and future to choose a career and engage in trenchless technology. The motto of Minneapolis is 'en avant', or forward - and that is a great direction to go.

Thank you for taking the time to read *Trenchless North America*, we hope you enjoy it.

Matthew Izzard

Matthew Izzard, Executive Director

North American Society for Trenchless Technology (NASTT)
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in bridges is in
the keystone”*

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RESILIENCY, GROWTH & COMMUNITY

This year I begin my second year as Chair of NASTT's Board of Directors. I am looking forward to seeing the continued progress and expansion of trenchless technology through NASTT and the partnerships that bring education to each industry in North America. 2021 was an excellent year for us, despite all the challenges we have faced as a society over the past two years. We saw growth in our organization, and we welcomed our 12th Regional Chapter that represents the country of Mexico. We hosted multiple virtual Good Practices Courses throughout the year and our Regional Chapters held many in-person and virtual events as well. We also hosted a successful in-person and on-demand event, the NASTT No-Dig Show in Orlando last March. Our second annual No-Dig North in Vancouver, BC was well attended in November, and we lead the industry in coming back to safe in-person events and feel blessed to have such a vibrant, supportive community of innovative trenchless champions!

We are looking forward to the NASTT 2022 No-Dig Show being held in Minneapolis in April. The abstracts submitted for the 2022 program were of the highest caliber and the technical schedule reflects this level of excellence. This year we are also featuring several brand-new Forums during the technical program. If you work in the trenchless industry (and if you're reading this magazine, I suspect you do!) then you must meet us in Minneapolis in April. Meet with 200 exhibitors, learn about innovative products and services, attend technical sessions for real world solutions and network with your colleagues throughout the week at the many events designed to allow you to make connections you might not otherwise have the opportunity to make.

Mark your calendars for October 17-19 for the third annual No-Dig North in Toronto. The NASTT Canadian Regional Chapters come together with the entire trenchless industry for two days of training courses, technical sessions and networking opportunities. If you do business in Canada, this is the must-attend trenchless event.

Over the next 10 months, don't miss out on the virtual Good Practices Courses which are offered on a monthly basis and target a wide range of trenchless topics. There is a lot of excitement around the committee growth which is leading to new publications and the virtual Good Practices Courses.

NASTT exists because of our volunteers and the 2022 Board of Directors includes many of the top people in our industry. One of our goals is to make sure our Board reflects an industry cross-section of trenchless technology segments. I'd like to introduce our newest Board member: Andrew Costa, Vice President, Business Development at Insituform Technologies. Andrew represents the Manufacturers/Suppliers/Contractors category. We know your industry knowledge and leadership capabilities will benefit our organization and the industry.

The first issue of the year is always a special one because we highlight and thank our Board members, so please turn to page 28 and read about the newest Board members and the returning Board members that will continue their service in 2022. Our Society is only as strong as our members and volunteers. With that in mind, we are in great shape! We truly thank you for your dedication.

Alan Goodman

Chair
North American Society for Trenchless Technology (NASTT)

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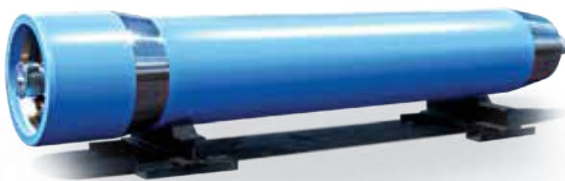


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with

Aswathy Sivaram PE, P.Eng

Aswathy Sivaram PE is Tunnel Business Planning Lead & Engineering Manager at Black & Veatch in Houston, Texas. She has served on the NASTT Technical Program Committee and presented papers at the No-Dig Show in 2019 & 2021. Aswathy has more than 9 years of experience in tunneling and civil construction projects, including most recently Lead Tunnel Engineer, on the Ashbridges Bay Treatment Plant Integrated Pumping Station Contract 3 in Toronto, ON, where she was design lead for all heavy civil and geotechnical related project elements.



What first inspired you to become interested in the construction & engineering field, particularly underground construction?

I have shared this story elsewhere, but I love repeating it! When I graduated from Georgia Tech, I had applied for two different positions. One was for more of a traditional role and the other was for Black & Veatch, where tunneling was part of the job description. While the role at Black and Veatch seemed somewhat unknown, I knew I would still be using fundamentals from my education. I met a senior engineer, sort of a “genius grandpa” named James McKelvey (who unfortunately passed away in 2015) who helped me make my decision. He didn’t say, “You should definitely go into a career in tunneling.” Instead he said, “If you choose to come work with us, you will be working on large infrastructure projects. You can always downsize from there.”

Outline your experience of first being introduced to trenchless technology methods and applications.

My first major project was the Fort Wayne 3RPORT (Three Rivers Protection and Overflow Reduction Tunnel) project for the city of Fort Wayne, Indiana. As an engineer just out of school, I supervised and logged over 60 borings along the 5-mile tunnel alignment, conducted various in-situ and lab tests, and wrote the geotechnical data and baseline reports. I was also instrumental in drawings and specifications development. That project gave me an all-round experience on seeing a project from feasibility and planning stages all the way through bidding and construction. My first experience underground was in Charleston, SC where I filled in for an inspector on vacation. The first time I stepped in to the man cage and the crane lowering me into the shaft is a memory that I will cherish forever. I

felt like a kid riding the Ferris Wheel for the first time! Since then, I have spent the past several years juggling design work in the office and on construction sites supervising TBM/MTBM excavations, associated shafts and other linear work.

How did you first get involved with NASTT? What are some of the goals and initiatives you would like to see NASTT pursue?

My first rendezvous with NASTT was when a colleague suggested that I submit an abstract for No-Dig conference on a project I was working on in Chicago. The abstract was accepted, and I presented the paper during No-Dig 2019. Attending that conference was one of the highlights of my professional career that year. I met with and formed relationships with several industry peers and municipal clients, most of which I still continue to be in touch to this day. That made me realize the importance of such societies and the impact it has on younger professionals. I wanted to contribute, and I reached out to Michelle Hill to see if I could become a program committee member – and the rest is history.

NASTT has a wide membership base – one that includes both municipal/governmental agencies as well as contractors, suppliers and consultants. I would like to see a forum for younger members from varied backgrounds and career paths come together, whether it is to share their career stories or understand industry trends or to just discuss problems and tap into the industry knowledge base. I also would like NASTT to consider forming strategy teams or committees to understand and better prepare for changes – understanding what could cause a major shift in the industry or how contracts might be written in the future or in what new areas can trenchless technology be used will be powerful and help members prepare for the next big thing.

“I felt like a kid riding the Ferris Wheel for the first time!”

What are your thoughts on the current state of the trenchless industry? What areas do you see evolving in STEM education and post-secondary academics?

Trenchless technology is gaining ground and more and more owners are open to the idea of a microtunnel or a jack and bore installation. There is generally more awareness and embracing of new technologies, however we still have a long way to go. As a graduate student, I never was exposed to underground construction or trenchless technologies in my coursework. I just picked it up on the job, and I believe that continues to be the norm (although there are exceptions). More coursework targeted to underground construction and trenchless technology will certainly help create a stronger workforce for the future. More and more engineering programs are starting to include industry professionals on their board. This influence will be instrumental in creating coursework specific to the trenchless industry.

Is the trenchless industry generally doing a good job of attracting young professionals? What do you think can be done to better engage students and young professionals in the trenchless industry?

I think we are doing a good job but we can certainly strive to do better. Currently we provide scholarships to municipal agencies to attend conferences. We can extend this to younger professionals as well. We should also strive to create stronger ties with student chapters and professional chapters to facilitate more hands-on experiences for students. NASTT may also consider instituting trenchless ambassadors that act as a bridge between the industry and the academia – to collaborate with professors and organize site visits, internships and career guidance for students.

What is the perception of trenchless technology among your clients? Has acceptance and understanding of trenchless technology improved?

I have found that more and more clients are keeping their eyes and ears open, and jump at the opportunity to co-present with us at conferences. Trenchless technology is an easy sell to these clients – they do their research and understand the cost to benefit ratio of using trenchless technologies on their projects when relevant. Clients who have had a bad experience with trenchless technology projects gone wrong are of course more hesitant to jump on the bandwagon again, however with

the right consultants, engineers and contractors, their faith can be restored. As it pertains to almost everything, good people make or break a job and that is true of our industry as well. While acceptance and understanding has tremendously improved, so has grown the need to be ethically and technically strong – it is a responsibility we owe to our peers, clients, and society as a whole.

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

I have said this before – the massive scale of projects we design and build makes me feel insignificant in the large scheme of things, however when I take a step back at the magnificent infrastructure we have been able to create as part of the larger team, it is awe-inspiring. We are a team, and we are nothing without each other. What inspires me to stay on in this field are the myriads of people I work with – the many laborers who have taught me how things are actually done in the field, the foremen and the superintendents who make sure I am safe on site and treated with respect, the contractors that come up with ingenious concepts, and last but not the least my family at Black & Veatch that endure my high energy, entertain my ideas and provide a platform for me to contribute to this field that we serve relentlessly.



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Aging Infrastructure Presents Opportunities

By: Anil Dean, P.E., G.E., P.Eng., MBA, Stantec
Bryan Perkins, P.E, Contra Costa Water District

Aging infrastructure combined with 21st century challenges present opportunities that we as the trenchless industry are uniquely suited to help utility owners resolve. In this edition of Morty's Trenchless Academy, I wanted to drill down on these opportunities through a project example that is also a great opportunity for the community to construct a notable HDD project, the Shortcut Pipeline Phase 3 Walnut Creek Crossing, in Concord, CA. Stantec was selected by Contra Costa Water District (CCWD) of Concord, CA to review alternatives and design a replacement of an existing 48-inch raw water main crossing of Walnut Creek. The project serves as a timely case study that illustrates many of the challenges and opportunities our industry faces such as reliability, resiliency, environmental stewardship, land use management, and ability to meet future demand.

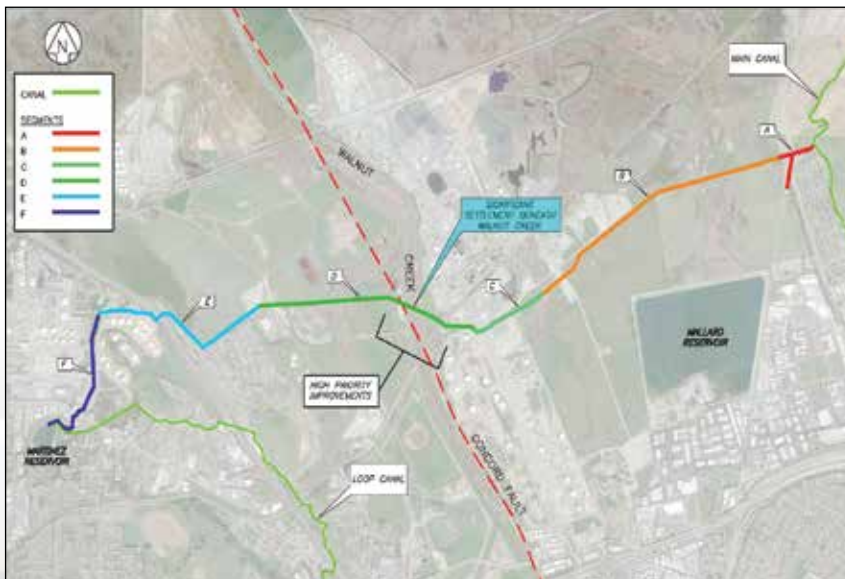
CCWD operates four intakes, four untreated water reservoirs, the 48-mile Contra Costa Canal (Canal), three treatment plants, 30 treated water reservoirs, and hundreds of miles of pipelines to provide untreated and treated water to a population of 500,000 in Central and East Contra Costa County, California. Untreated water is provided to the City of Martinez and large industrial customers, including several refineries, through the Canal system and the 5-mile long Shortcut Pipeline.

The Shortcut Pipeline was constructed in the 1970s by the U.S. Bureau of Reclamation using Bar Wrapped PCCP to connect the Canal to the Martinez Reservoir, a distance of about 5 miles. The pipeline, operated and maintained by CCWD, passes under two creeks, through wetlands, industrial facilities,



and a former hazardous waste facility. In 2017, CCWD initiated a phased improvement project of the Shortcut Pipeline. This article focuses on the design of Phase 3 of the Shortcut Pipeline Improvement Project to install a 1,950 foot crossing beneath Walnut Creek using twin 36-inch HDPE raw water pipelines.

As trenchless contractors, designers, and engineers, we know that each site has its own unique geologic setting, and the San Francisco Bay Area is no exception. Walnut Creek traverses through the cities of Walnut Creek Concord, and Martinez, CA before discharging into the Sacramento-San Joaquin River Delta at the northeast end of San Francisco Bay. The project area around Walnut Creek is underlain by a clayey





material generally referred to as “Bay Mud.” Bay Mud is subject to consolidation over long periods of time, and as the Bay Mud is thick in the area, consolidation settlement is significant. The Bay Mud is underlain by stiffer or denser alluvial materials and is in turn underlain by zones of older alluvium with variable composition from fine grained materials to silty and clayey sands. Importantly, the Concord Fault, an active fault, proceeds under the west side of Walnut Creek at the crossing location. Land use considerations included an existing levee system on the west side of Walnut Creek, green fields sites on the west side and a significant oil refinery on the east side of the crossing.

As with any trenchless project, the team had to balance the needs of all stakeholders while considering subsurface environmental and geotechnical conditions, existing easements and land use, flood control, and site access, while providing a robust replacement pipeline that could meet the District’s projected future demands. To back up this decision, an alternatives analysis was conducted to evaluate a variety of installation methods based on multiple variables, such as constructability, cost, and risk, and ability to integrate into the existing Shortcut Pipeline system. Some options, such as open cut, while used in the original construction over 50 years ago, were not carried forward because of the complexities involved with environmental permitting. Other options, such as Microtunneling, required deep shafts that

would present significant costs. Of all the options, a twin bore HDD crossing of Walnut Creek was determined to best meet the District’s needs. The HDPE HDD installation can also handle a significant amount of fault displacement, should fault rupture occur along the Concord Fault.

The project team was able to navigate the complexities of a large HDD project in the Urban SF Bay Area, including environmental and geotechnical exploration, alternatives analysis, fault studies and assessments, surveying, hydraulics, HDD design, and many other disciplines in concert with the CCWD staff and consultants.

The Shortcut Pipeline Phase 3 HDD Project will be going out to bid later in 2023. This will be a great opportunity for the trenchless industry to construct a showcase HDD project in Northern

California that will stand the test of time and balance environmental, geotechnical and land use considerations to maximize value for CCWD.



Anil Dean is based in Walnut Creek, CA and is Stantec’s Tunnel and Trenchless Practice Leader for the Water Business Group. He is a member of NASTT, and has been on the No-Dig Show Technical Program Committee for many years.



Bryan Perkins P.E. is a Senior Engineer with the Contra Costa Water District in Concord, CA.

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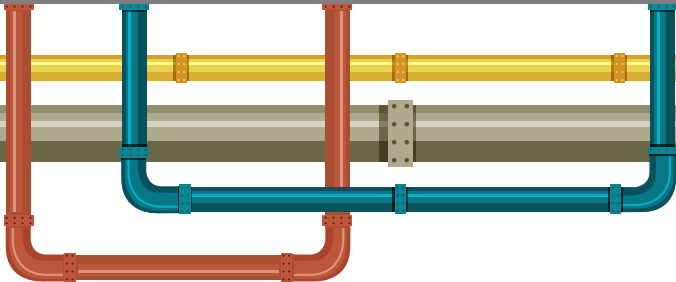
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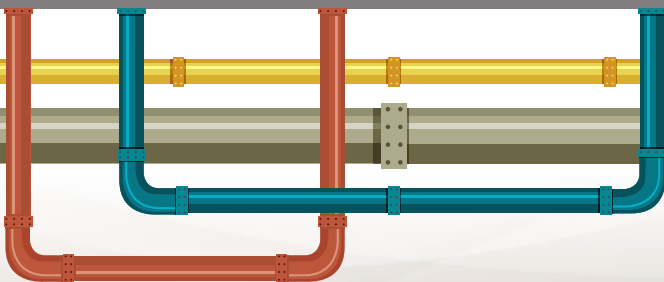
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NO-DIG SHOW

2022

Spring excitement is in the air, and the world's largest Trenchless Technology conference & trade show is back in action in beautiful Minneapolis, the second in-person event since the cancelation of the 2020 No-Dig show in Denver CO due to the onset of Covid-19.

With six tracks of 130 peer-reviewed technical presentations, detailing environmentally friendly trenchless solutions and cost-saving opportunities for municipalities and utilities, the 2022 NASTT No-Dig Show features the latest technology and research, over 200 innovative trenchless product and service exhibits and unmatched networking opportunities. This is the premier educational opportunity for trenchless infrastructure professionals from across North America, expanding their knowledge toolbox.



The NASTT No-Dig Show is a great opportunity to meet the hard-working NASTT staff in person! From left to right: Jenna Hale – Marketing Manager, Jessie Clevenger – Regional Chapter Relations Manager, Matthew Izzard – Executive Director, Michelle Hill – Program Director, Carolyn Hook – Membership Outreach & Database Manager, Kari Schiffner – Education Specialist

Check the overview schedule in this preview for more information. Included in the session schedule are four interactive forums where audience participation is encouraged. One of them is the Innovative Products Showcase featuring the newest innovative product releases in the trenchless industry. Companies presenting products in this session are also this year's Abbott Innovative Products & Services Award finalists.

There are an abundance of opportunities for business development, networking, and renewing friendships with trenchless colleagues including luncheons in the Exhibit Hall, the Educational Fund Auction & Reception, and the NASTT Gala Awards Dinner. Former NASTT Executive Director Mike Willmets will be inducted into the NASTT Hall of Fame at this event, along with long-serving titans of the trenchless industry Dennis Doherty and Paul Nicholas.

Finally, be sure to download the NASTT No-Dig Show Smart Phone App! The app is a great way to get involved with the attendee community. Everything you need to make the most of your time at the NASTT No-Dig Show will be right at your fingertips. Enjoy the Show!



2022 No-Dig Show Technical Program Committee Vice Chair – Joe Lane, Aegion



2022 No-Dig Show Technical Program Committee Chair – John Milligan, Vermeer Corporation



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.



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KARI SCHIFFNER
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NASTT Awards Program

The NASTT awards program recognizes the commendable achievements and remarkable accomplishments of the individuals and companies associated with the trenchless technology industry.

NASTT Hall of Fame

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



NASTT Chair Award For Distinguished Service

This award acknowledges individuals who have selflessly given of their time and talents to enhance the Society and the industry. The person selected for the Chair Award is the decision of the NASTT Chair.

NASTT Volunteer of the Year Award

This award recognizes a NASTT member who has shown great energy and pride with respect to volunteer duties and responsibilities. Volunteer contributions may include committee involvement, participation in training seminars, webinars and/or panel discussions, presenting educational content at the NASTT No-Dig Show and volunteer efforts for NASTT Regional Chapters.

Ralston Award For Young Trenchless Achievement

This award applauds savvy NASTT 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.

Abbott Innovative Products & Services Award

This award celebrates companies with a state-of-the-art product or service making a significant impact in advancing the trenchless industry in the areas of rehabilitation or new installation. All applicants will discuss their product at the Innovative Products Forum at the No-Dig Show.



DOWNLOAD THE ND22 APP!

Download "CrowdCompass AttendeeHub" from your app store. Then search "The NASTT 2022 No-Dig Show" to join the fun.



No-Dig Show Events & Networking Schedule:

Sunday
APRIL 10, 2022

Attendee & Exhibitor Registration
 7:00 AM – 5:00 PM - Lobby

Introduction to Trenchless Technology Courses
 8:00 AM – 12:00 PM - 101F & 101H

Pipe Bursting Center of Excellence Meeting
 12:00 PM – 12:30 PM - 101E

Annual General Meeting
 1:00 PM – 2:00 PM - 101E

NASTT Regional Chapter Meetings
 1:00 PM – 6:30 PM - 205/208 Rooms

Student Orientation Meeting
 4:00 PM – 6:30 PM - 101E

Municipal Scholarship Reception
 (Invitation Only Event)
 5:30 PM – 6:30 PM - Seasons

Young Professionals Social
 (Open to age 35 and under)
 7:00 PM – 9:00 PM - 208B

NASTT Past Chair Dinner
 (Invitation Only Event)
 7:00 PM – 10:00 PM - 101A

Monday
APRIL 11, 2022

Attendee & Exhibitor Registration
 7:00 AM – 5:00 PM - Lobby

Kick Off Breakfast
 (Full Conference Attendees Only)
 7:30 AM – 9:15 AM - Ballroom A

Technical Sessions
 9:55 AM – 11:35 AM - 101A, 101C, 101E, 101F, 101H, 101J

Exhibit Hall Ribbon Cutting Ceremony
 11:45 AM - Hall C Lobby

Exhibit Hall Open
 11:45 AM – 3:45 PM - Hall C

Technical Sessions
 3:45 PM – 5:00 PM - 101A, 101C, 101E, 101F, 101H, 101J

NASTT Annual Educational Fund Auction & Reception
 5:00 PM – 6:30 PM - Hall C

Tuesday
APRIL 12, 2022

Attendee & Exhibitor Registration
 7:00 AM – 5:00 PM - Lobby

Technical Sessions
 8:00 AM – 10:05 AM - 101A, 101C, 101E, 101F, 101H, 101J

Technical Sessions
 10:20 AM – 12:00 PM - 101A, 101C, 101E, 101F, 101H, 101J

Exhibit Hall Open
 12:00 PM – 3:30 PM - Hall C

Technical Sessions
 3:30 PM – 5:10 PM - 101A, 101C, 101E, 101F, 101H, 101J

NASTT No-Dig Show Gala Awards Dinner
 6:00 PM – 10:00 PM - Ballroom A

Wednesday
APRIL 13, 2022

Attendee & Exhibitor Registration
 7:00 AM – 12:00 PM - Lobby

Technical Sessions
 8:00 AM – 9:15 AM - 101A, 101C, 101E, 101F, 101H, 101J

Recruitment Connection Hours
 9:00 AM - 12:00 PM - Hall C

Exhibit Hall Open
 9:00 AM – 1:00 PM - Hall C

Closing Luncheon
 12:00 PM – 1:00 PM - Hall C

No-Dig 2022 FORUMS

MONDAY, APRIL 11, 2022

9:55 AM – 11:35 AM – 101E

Innovative Products Forum

MM-T3-01-04

Moderator: Matthew Izzard, NASTT

Join us for a showcase of innovative product releases in the trenchless industry. Companies presenting products in this forum are this year's innovative product award finalists.

3:45 PM – 5:00 PM – 101E

Trenchless Technology Magazine

Projects of the Year

MA-T3-01-03

Moderator: Kelly Vannatten, BMI

Presenting the Trenchless Technology Magazine Project of the Year Awards. Winners and Runners-Up in the New Installations and Rehabilitation categories.

TUESDAY, APRIL 12, 2022

8:00 AM – 10:05 AM – 101E

Environmental Forum

TM1-T3-01-05

Moderator: Joe Lane, Aegion

This forum will provide a panel discussion regarding environmental factors related to trenchless project design.

3:30 PM – 4:20 PM – 101E

Future Trends in Infrastructure

TA-T3-01-02

Moderators: John Milligan, Vermeer Corporation & Dennis Doherty, Kleinfelder

Panel discussion on future trends in infrastructure.



APRIL 30-MAY 4 | PORTLAND, OR

NO-DIG SHOW

2023

Call for Abstracts

Submission Deadline: June 30, 2022



The North American Society for Trenchless Technology (NASTT) is now accepting abstracts for its 2023 No-Dig Show in Portland OR at the Oregon Convention Center April 30 - May 4, 2023. 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, 2022: nastt.org/no-dig-show.

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

Michelle Hill
NASTT Program Director
E: mhill@astt.org
P: 888-388-2554

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.

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APPLICATIONS:

- Sewer Main Pipelines
- Sewer Overflow Pipelines
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- Sewer Inverts
- Storm Water Drains
- Seawater Cooling Pipelines
- Large Diameter Culverts and Tunnels
- Railway & Road Culverts
- Manhole Liners
- Multisegmental Liners

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NASTT Celebrate Trenchless Awards honor the growth and advancements in the trenchless industry. NASTT recognizes the many ways that these individuals contribute significant time, energy and intellect to developing trenchless technology and fostering its success.



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 NASTT Member each year is chosen at the discretion of the NASTT Chair.

Tiffanie Mendez

National Director of Sales, Sunbelt Rentals, Pump Solutions

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

NASTT's Board of Directors Chair, Alan Goodman, has chosen Tiffanie Mendez as the recipient of the 2022 Chair Award for Distinguished Service. Tiffanie is the National Director of Sales for Sunbelt Rentals, Pump Solutions. As a 25 year liquids solutions management professional, Tiffanie began her career in the early 90's in Yuma, AZ., focusing on specialty equipment rental systems and design/build liquids handling systems. Her early focus was groundwater dewatering, filtration systems, sewer bypass systems and construction storm water runoff management. After relocating to Northern California in 2005, the design/build systems focus grew to include temporary plants for environmental remediation, low and medium voltage electrical power systems and compressed air systems.

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

NASTT Chair, Alan Goodman states that he chose Tiffanie for this year's award because, *"Tiffanie Mendez always brings a Can Do Attitude with Care. She is a true reflection of what a volunteer can do within this organization. Her passion and enthusiasm for students will bring a whole new level of excitement with prestige. I want to thank Tiffanie from the bottom of my heart for making NASTT a better society to get engaged."*



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.

Brian Avon

Associate Vice President & Trenchless Technology Practice Lead, Carollo Engineers

The NASTT Staff is excited to announce they have chosen Brian Avon as their 2022 Volunteer of the Year! Brian Avon is an Associate Vice President with Carollo Engineers, located in Walnut Creek, California. Brian has more than 14 years of experience in design, preparing contract documents and cost estimates, and facilitating the acquisition of permits for pipeline projects. His work has included systems evaluation, development of rehabilitation/replacement improvements, construction, geotechnical engineering, and specialty inspection. Over the past 12 years most of Brian's projects have been trenchless focused. Brian serves as Carollo's trenchless technology lead, is the immediate past chair of the WESTT Regional Chapter and teaches courses on Trenchless New Installation Methods and Horizontal Directional Drilling for NASTT.

Brian is a dedicated and selfless volunteer to both the national organization and his Western Regional Chapter. Brian has served on the board and as the Chair of the Board of the WESTT Chapter for many years and never tires of jumping in to plan events and provide innovative ideas for outreach and trenchless education. Brian is also the first to step up when the call for NASTT Good Practice instructors is put out.

Brian's enthusiasm for the NASTT Educational Fund Auction is contagious. He is currently serving his third (or is it fourth??) term as Chair of the Auction Committee. Need someone to encourage volunteers and attendees to bid, donate or help out? Brian is your man!

Thank you, Brian, for your endless energy. We appreciate you!

Celebrate Trenchless Award 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, and NASTT's Trenchless North America. Find out how you can become a NASTT award recipient at nastt.org/awards.



TRENCHLESS NORTH AMERICA





NASTT Hall of Fame Honors Class of 2022

A Legacy of Trenchless Technology Leadership

The NASTT Hall of Fame honors members who have made outstanding accomplishments and exceptional contributions to the advancement of the North American trenchless industry and NASTT. We are grateful for their years of service and lasting impact on trenchless technology.

Nominees can be current or former NASTT members who have been members for a minimum of 10 years and are age 50 or older. Nominations accepted online March through August. Only current NASTT members can submit nominations. Visit www.nastt.org/no-dig-show/hall-of-fame for details.

The 2022 Hall of Fame inductees will be recognized at the 2022 No-Dig Show in Minneapolis MN.

The NASTT Hall of Fame is pleased to present its Class of 2022 honorees to NASTT members and trenchless professionals across North America.

“Each of the inductees have worked diligently and selflessly in both the trenchless industry and as NASTT volunteers,” said NASTT Executive Director, Matthew Izzard. “On behalf of the NASTT Hall of Fame committee, we thank them for being trailblazers who shaped the profession and for their contributions that continue to impact the development of trenchless technology solutions.”

Papers authored or co-authored by the inductees are available for download in the NASTT product store. Come celebrate the Hall of Fame at the NASTT 2022 No-Dig Show in Minneapolis at the Gala Awards Dinner on Tuesday, April 12 from 6-10pm. Visit nodigshow.com to register.

“We thank them for being trailblazers who shaped the profession.”

– Matthew Izzard, Executive Director, NASTT



Dennis Doherty, P.E., F.ASCE

Senior Principal Professional at Kleinfelder

Dennis is a versatile senior principal engineer with proven experience and is recognized nationally as a leader in trenchless technology. With more than 40 years of industry experience – the last 30 of which have been focused on design, construction, and management of underground infrastructure. Described as applying a “think outside the box” approach to his projects, he has successfully delivered significant projects involving environmentally sensitive sites, congested urban areas, river/body-of-water crossings, and sites with challenging terrains.

A NASTT member since 1992, Dennis has been a champion of bringing trenchless technology to the next generation. His efforts raising money for NASTT’s Education Fund and sponsoring NASTT student chapters provided resources for student scholarships and attendance at the NASTT No-Dig Show and regional conferences. He is helping UMass Lowell develop a first-of-its-kind, graduate-level certificate in trenchless technology, which will count toward a Master’s degree in civil engineering.

Dennis believes in continuous lifelong learning and self-improvement in a holistic approach to life. His approach to solving engineering problems is based on risk-based engineering principles. In his spare time, Dennis enjoys his dogs Rylee and Daisy, his wife Debra, his immediate and extended family, and his grandchildren. His hobbies include cooking, gardening, long rides with Debra, New England sports, drum corps, and hanging with the dogs.



NASTT Hall of Fame Inductees (2012 – 2021)

2012

Frank Canon
Bernie Krzys
Gary Vermeer
(1918-2009)

2014

Bob Affholder
Joe Loiacono
Dr. Ray Sterling

2016

Martin Cherrington
Ken Foster
Richard Thomasson

2018

Chris Brahler
Ian Doherty
George Ragula

2020

James S. Barbera
(1940-2019)
Tom Marti
Lynn Osborn

2013

Dr. David Bennett
Ed Malzahn (1921-2015)
Eric Wood (1935-1994)

2015

David Magill, Jr.
(1943-2014)
Ron Halderman
Kaleel Rahaim

2017

John Hemphill
David T. (Tom) Iseley
Roderick W. (Rod) Sutliff
(1934-2014)

2019

Maynard Akkerman
Chris Macey
Robert Westphal
(1944 – 2020)



Paul Nicholas

VP Market Sector Manager Tunneling & Trenchless Technology at AECOM

Paul was a driving force behind the evolution and acceptance of microtunneling. His experience and knowledge soil behavior, gained during his time in the Europe, the Middle East and Africa helped develop and propel trenchless technology. He and his company contributed technically and financially to the U. S. Army Corps of Engineers Construction Productivity Advancement Research (CPAR) program. Listening and humility have been described as the “hallmarks of his character” – always working in the best interests of clients and contractors.

Paul has been involved with NASTT for more than 30 years serving on its Board of Directors from 1999-2003. He also served as NASTT’s representative to ISTT. A frequent speaker and author, his presentations cover microtunneling and advances in trenchless technology trends and the technologies that continue to influence the industry today.

Paul has been a serious sailor since his youth and has completed numerous offshore sailing races including Fastnets and a Trans Atlantic race as captain. He lives in Seattle with his wife, Sherrie, and their dog, Oscar.



Michael J. Willmets

Former NASTT Executive Director

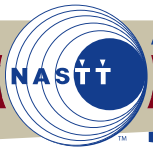
Mike started his working life in communications with the Canadian Army and then moved to a position with the Canadian Transport Commission. In 1973, he was approached by the Water Works Department in Ottawa, Canada. Thirty-five years later, he retired – only to begin his next career as the NASTT Executive Director. He described that transition as the “pinnacle of his career.”

Prior to his executive position, he served as an active NASTT volunteer bringing his expertise as the primary municipal representative for the Region of Ottawa-Carleton in Ottawa. In 2004, he served as Chair of the Great Lakes, St. Lawrence & Atlantic Chapter and then in 2005, he was elected to the NASTT Board of Directors. Mike has authored or co-authored many technical papers presented at the NASTT No-Dig Show as well as provided articles on infrastructure management for several industry publications. He is also the co-author of NASTT’s Introduction to Trenchless Technology Rehabilitation Methods Good Practices Guidelines book.

In his spare time Mike enjoys spending time with his wife Widy and their children and grandchildren. He is a music aficionado with a museum-worthy vinyl record collection. Mike also works tirelessly for a military history not-for-profit organization and collects military medals.

NASTT EDUCATIONAL FUND AUCTION

APRIL 11, 2022 | 5:00-6:30 PM | MINNEAPOLIS, MN



APRIL 10-13 | MINNEAPOLIS, MN

NO-DIG SHOW

2022

NASTT'S 21st Annual Educational Fund Auction & Reception in the Exhibit Hall!

The Annual Educational Fund Auction helps raise money for important causes. Due to your generosity, NASTT is able to provide targeted trenchless training and courses to the industry, publish resource manuals and sponsor university students' attendance to the NASTT No-Dig Show, as well as award scholarships. *Text NASTT243725 to start bidding or make a donation!*



\$5,000 Prize Drawing Sponsored by Vermeer



Every paid in-person Full Conference and One-Day Conference attendee at the 2022 No-Dig Show will be entered for a chance to win a \$5,000 cash prize! You will also have the opportunity to purchase additional prize drawing tickets on the auction website. The drawing will be held in the Vermeer booth (booth # 110) on Wednesday, April 13 but you need not be present to win.

50/50 Raffle

Win some cash for yourself and help our Educational Fund! Buy your tickets through the auction website. The winner will be drawn during the auction on April 11 and you must be present to win! The winner splits the cash pot with the fund.

Exciting Auction Items

Bid all day via your mobile device on great items like electronics, wine, spirits, industry items and more! Bidding is open to anyone in North America and items will be shipped to winners.

Auction Reception sponsored by :



For more information visit nastt.org/no-dig-show/auction

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Introducing the **NASTT 2022 BOARD OF DIRECTORS**



We Are a Resilient Industry!

The 2022 NASTT Board of Directors is poised to resume the rapid growth NASTT and the trenchless technology industry have experienced in recent years. As the organization leading and promoting the trenchless technology industry, NASTT provides the membership with educational resources, activities, national and regional conferences, networking events, webinars and much more. With creativity and hard work from both the NASTT Board and Staff, the organization has been able to maintain its position over the past two years as the leading-edge organization for underground construction professionals, showing exceptional leadership navigating through recent challenges into more promising times.

The Board is comprised of 20 directors, who are elected by the Society's members. Only elected Directors may serve as Officers of

the Society and are appointed by the Board of Directors.

The NASTT Board of Directors manages the affairs of the Society, on behalf of NASTT and its membership. Guiding the way are the twenty members of the NASTT Board of Directors, generously volunteering their own time to provide overall direction for the organization. Directors are elected by the NASTT membership each year in the fall.

New to the Board for 2022 is Andrew Costa Vice President, Business Development, Insituform Technologies, LLC. This brings the Board to the full complement of 20 Directors. Welcome to the NASTT Board Andrew!

Meet and welcome YOUR NASTT Board of Directors for 2022!

Executive Officers



CHAIR & INTERNATIONAL REPRESENTATIVE

Alan Goodman

*Market Development Manager,
HammerHead Trenchless*

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

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

Alan currently serves as Chair on NASTT's National Board and sits on the Program Committee. He is also Past Chair of NASTT's (North America Society for Trenchless Technology) South Central chapter which includes Oklahoma & Texas.

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



VICE CHAIR

Matthew Wallin, P.E.

*Partner & Senior Project Manager,
Bennett Trenchless Engineers*

Matthew Wallin is a Principal Partner and Senior Project Manager with Bennett Trenchless Engineers, located in Folsom, California. BTE's engineering practice is focused

entirely on trenchless technology design, construction

management, and claims assistance with clients and projects located throughout California, as well as Texas, Florida, Nebraska, Iowa, and Canada.

Matthew holds both bachelor's and master's degrees in civil engineering from Case Western Reserve University in Cleveland, Ohio. He began his career working for URS in Oakland, California in 2000 in their geotechnical group. Since that time, Matthew has focused his practice on geotechnical engineering and the design and construction management of new pipeline projects using horizontal directional drilling, microtunneling, open-shield pipejacking, pipe ramming, tunneling and auger boring.

Matthew has been a member of NASTT since 2002 and has participated in the organization in many capacities. He has been an active member in the Western Chapter (WESTT) since 2003 and previously served as a member of the Board of Directors and as the Chapter Treasurer from 2008 to 2016. He joined the No-Dig Program Committee in 2010 and has acted as a session leader for the annual No Dig Conference since that time. Matthew is also an instructor for NASTT's HDD Good Practices Course as well as the Introduction to New Trenchless Methods Course, each of which are taught annually at the No Dig Show and at other off-site venues throughout the year.



SECRETARY

Tiffanie Mendez

*National Director of Sales,
Sunbelt Rentals, Pump Solutions*

A 25-year liquids solutions management professional, Tiffanie began her career in the early 90's in Yuma, AZ., focusing on specialty equipment rental systems and design/

build liquids handling systems. Her early focus was groundwater dewatering, filtration systems, sewer bypass systems and construction storm water runoff management. After relocating to Northern California in 2005, the design/build systems focus grew to include temporary plants for environmental remediation, low and medium voltage electrical power systems and compressed air systems.

Tiffanie is the now the National Director of Sales for Sunbelt Rentals, Pump Solutions. She holds a BSBA from Northern Arizona University and an MBA, General Management from California State University, East Bay. Tiffanie has been a part of NASTT's No-Dig Show Program Committee since 2016 and believes the future of the industry lies in preparing the new

NASTT 2022 Board of Directors

leaders of the trenchless industry now. As such, she particularly passionate about the student programs and student chapters associated with NASTT.



TREASURER

Greg Tippett, P.Eng.

*Regional Delivery Lead,
Western Canada Water Group,
Stantec Consulting Ltd.*

Greg Tippett is the Regional Delivery Lead for the Western Canada Water Group at Stantec Consulting Ltd.

He is currently responsible for the

group's project delivery and quality control. Greg graduated from Lakehead University in 2003 and has been working as a consulting engineer in Alberta's Capital Region since. Throughout his career, Greg has specialized in the design, assessment, and construction of municipal underground infrastructure. Greg has successfully designed and implemented a number of projects within the Capital Region that included the use of several trenchless technologies. His past trenchless experience includes case bore, pipe jacking, horizontal directional drilling, microtunneling and conventional tunneling.

Greg has been an active member of the Northwest Chapter of NASTT since 2009 and is a past Chair of the Chapter's Board. Greg's journey with NASTT began in 2010 when he joined the NASTT-NW 2010 Conference planning committee and has never looked back. Since then, he has served in many different capacities on these committees, including Conference Chair for the 2016 and 2018 NASTT-NW Conferences. In 2019, Greg was very proud to Chair the first ever No-Dig North, NASTT's inaugural Canadian Conference.



OFFICER-AT-LARGE

Richard (Bo) Botteicher, P.E.

*Senior Project Manager,
Rehabilitation Services Market Sector,
Lithos Engineering*

Bo Botteicher currently serves as Senior Project Manager for the Rehabilitation Services Market Sector for Lithos Engineering. Bo brings

over 20 years of experience in the underground infrastructure industry including extensive trenchless new installation and rehabilitation projects for the water, wastewater, reclaimed

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water, stormwater, industrial and power markets. Bo has been involved with multiple historical projects related to horizontal directional drilling (HDD), sliplining, and pipe bursting across the US.

Bo has been involved with the North American Society for Trenchless Technologies (NASTT) since 2008. He is a past Chair and board member of the Rocky Mountain Chapter of NASTT. He has also participated on the program committee and was the 2015 Program Committee Chair of the NASTT No-Dig Conference. Bo is a member of the American Society of Civil Engineers (ASCE) and the American Water Works Association (AWWA) organizations.



IMMEDIATE PAST CHAIR

Craig Vandaele

General Manager of Alternative Delivery and Business Development, Michels Corporation

Craig Vandaele is the General Manager of Alternative Delivery and Business Development for Michels Tunneling a Division of Michels

Corporation. Craig has more than 20 years of experience in the North American tunneling and trenchless technology industries. His vast experience includes design, inspection, construction and construction management of trenchless projects throughout North America.

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

Craig is proud to be a leader and an advocate of the trenchless technology industry. He is active in many industry organizations, including North American Society for Trenchless Technology Northwest Chapter (Past chair), Tunnel Association of Canada (TAC) and of course NASTT. Craig has co-authored papers for several No-Dig conferences.



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Alan Ambler, P.E.

Owner, AM Trenchless

Edward "Alan" Ambler has 18 years of experience working on engineering projects including the World Islands in Dubai and cruise ship berth construction in Alaska. While an employee at the City of Casselberry, Florida, Alan managed the day to day

operations of a municipal utility while developing the capital improvement program and executing projects. Alan has designed over 370,000 linear feet of pipeline projects and is a national leader in trenchless technologies, such as pipe bursting.

Alan joined NASTT in 2013 and serves as a Track Leader on the No-Dig Show Program Committee. Alan is the Chair of NASTT's Pipe Bursting Center of Excellence and a co-author of the forthcoming Pipe Bursting Good Practices Guidelines, 3rd Edition. Alan also volunteers as an instructor for NASTT's Good Practices Training Courses. Alan has a BS in Civil Engineering, a

MS in Environmental Engineering, holds two patents, and is the owner of AM Trenchless LLC.

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



Lisa Arroyo, P.E.

Project Manager, Carollo Engineers

Lisa Arroyo is a Project Manager with Carollo Engineers and is located in southern California. She is a registered civil engineer in both California and Florida with over 20-years of planning, design, construction, and asset management related experience.

Prior to joining Carollo, she owned her own construction company. She has also held progressively increase roles of responsibility while at the City of Santa Barbara, including Wastewater System Manager, where she managed a multi-million-dollar Capital Improvement Program and \$20 million operating budget.

Lisa has used her knowledge and experience to focus on Capital Improvement Projects that leverage trenchless technology to

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economically renew aging wastewater collection systems. She has experience with CIPP and pipe bursting methodologies. Lisa has long been a champion of trenchless technology, as it is proven to be both an effective and economical solution for improving wastewater collections systems.

Lisa holds Bachelor of Science degrees in both mathematics and civil engineering, and she is a NASTT Good Practices Instructor for the CIPP and Laterals courses.



Dan Buonadonna, P.E.

*Global Technology Leader,
Jacobs's Condition Assessment and
Rehabilitation Services
(CARS) Practice*

Dan Buonadonna is the Global Technology Leader for Jacobs's Condition Assessment and Rehabilitation Services (CARS) practice. He has over 17 years of

pipeline analysis, design, and rehabilitation experience for over 1,400 miles of buried water, sewer, and industrial infrastructure.

As a junior engineer, Buonadonna began in the field, doing inspections on buried pipelines. Of the man-entry pipe crawling, Buonadonna jokes, "Being of modest build, it was once said that I was 'made for the work' and found myself being 'volunteered' for many of the confined space pipe crawling tasks. It taught me a healthy respect for the practical aspects of pipeline condition assessment, and also a great appreciation for the technical innovations that could improve the accuracy and safety of our work."

As a consulting engineering his focus has evolved to trenchless condition assessments, trenchless rehabilitation technologies, and buried infrastructure asset management. Speaking on the state of the trenchless market today, Buonadonna says the industry overall is robust and increasing demand has resulted in a healthy, competitive marketplace. One of the challenges, he notes, will be continuing to innovate and increasing the value proposition of a trenchless approach. Buonadonna says, "If elected to the NASTT board I would advocate for increased dialogue and coordination between the condition assessment and rehabilitation technology markets. These fields go hand-in-hand in providing solutions to our communities. In addition to the

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continued investment in new tools to break technical frontiers, I support improved education and understanding between owners, engineers, contractors and manufacturers to manage the risk exposure of all parties.”

He has authored over 20 technical publications on pipeline asset management and holds a seat as an Industrial Advisory Board Member for the Trenchless Technology Center at Louisiana Tech University. Dan holds a Bachelor’s degree in Civil Engineering from the University of Notre Dame, and a Master’s in Environmental Engineering from the University of California, Berkeley. Buonadonna is a regular presenter at the NASTT No-Dig Show and is also a member of the Society’s Pacific Northwest Chapter. He’s also served on the No-Dig Show Program Committee and has participated in NASTT training and webinars. He’s also active with the Trenchless Technology Center at Louisiana Tech as a member of its Industrial Advisory Board and is involved with the Water Research Foundation as part of Peer Advisory Committees.

“I feel the trenchless technology field is exceptionally dynamic and I enjoy the exercise of constantly applying critical thinking to new challenges, I appreciate the opportunity to serve a widespread need and I feel privileged to work with similarly dedicated professionals every day.”



Maureen Carlin, Ph.D.

Vice President of Engineering and Preconstruction Services for the US Division, Bothar Group

Dr. Maureen Carlin is the Vice President of Engineering and Preconstruction Services for the United States (US) Division of the Bothar Group of companies. Prior

to her involvement with Bothar, Dr. Carlin spent six years with Laney Group, Inc. Maureen has more than 16 years’ experience in construction engineering and project management for both vertical commercial construction and trenchless pipeline construction. Carlin’s areas of expertise are in advanced project planning and market analysis for Horizontal Directional Drilling and Direct Pipe® engineering and construction projects both domestically and internationally. This includes knowledge of established markets such as oil, gas, water and power in addition to emerging markets such as desalination, offshore cabling and wind farming and military applications.

Carlin received B.S. degrees in Civil Engineering and Architectural Engineering from the Missouri University of Science and



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



Welcome to the board!

Andrew Costa

Vice President, Business Development, Insituform Technologies, LLC

Andrew Costa has worked in the trenchless water/wastewater industry since 2006. His experience includes positions in the contracting, manufacturing, and distribution

sectors. His expertise in the water/wastewater markets includes cementitious/polymer manhole rehabilitation, specialty coatings, cured-in-place pipe (CIPP) rehabilitation, carbon fiber remediation, geopolymer solutions, and concrete corrosion. He is currently the Vice President of Sales, East Region for Insituform Technologies – the leading worldwide provider of CIPP and other technologies/services for the rehabilitation of gravity and pressure pipeline systems.

Andrew has been with Insituform Technologies since 2014 and is heavily involved with NASTT at the national and regional levels, including active participation in a variety of NASTT committees including: No-Dig Show Technical Program Committee, No-Dig Show Track Leader, No-Dig Show Planning Committee, No-Dig Show Technical Session Moderator, No-Dig Show Innovative Product Award Committee, No-Dig Show Regional Ambassador, NASTT Education/Training Committee – CIPP Subcommittee Chair and SESTT Board Member.

Andrew holds a NACE Level 1 Coatings Inspector License and is also a member of AWWA and NASSCO.



Chris Knott

Lead Trenchless Estimator, BTrenchless

With more than 26 years in civil utilities construction, Chris Knott began his career as a laborer and quickly progressed to an operator for an auger bore crew. He then advanced to supervisor, overseeing the auger bore crews, pipe ramming crews and

the directional drilling operations. Chris enjoyed working with a variety of trenchless methods, and ultimately took on project management and estimating.

Chris began working at BT Construction, Inc. in 2005 in the role of both trenchless estimator and project manager. He has been integral to the formation of their trenchless division, BTrenchless, and is currently the lead trenchless estimator, reviewing all work involving bores and tunnels. Additionally, his expertise is utilized to market BTrenchless, Inc. as the region's premier tunneling contractor, showcasing their ability to perform Pipe Ramming, Auger Boring, Pilot Tube, TBM, Microtunnels, Hand Tunneling and Slip Lining as the Director of Business Development.

Over the years, Chris has become a valuable resource for engineers and owners alike, helping to determine the best trenchless methods in a wide array of soil conditions. He has a passion for sharing the capabilities and opportunities of trenchless construction, helping to inspire young engineers by presenting the applications of trenchless construction at annual presentations, hosted by The Colorado School of Mines (Microtunneling Short Course) and the University of Colorado-Boulder.

His natural ability to convey an aggressive but attainable game plan stems from decades of coaching lacrosse. Chris often brings



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the enthusiasm of a championship game to his professional endeavors, as witnessed in the organization of the inaugural Rocky Mountain NASTT No-Dig in Denver in 2010.

Involved with RMNASTT since its inception, Chris serves on its board as an officer, helping with the local NASTT show, clay shoot, and recently contributing to the Program and Auction Committee for the National show.

Chris continues to contribute fully to the foundation and growth of the trenchless industry and progress the NASTT membership. He generates energy and provides expertise to all his pursuits, both on and off the field or in this case, in and out of the field.



Babs Marquis, CCM

*Trenchless Practice Lead – East Coast,
McMillen Jacobs Associates*

Babs Marquis has more than 26 years' experience in underground project design and construction. He is the McMillen Jacobs Associates Trenchless Practice Lead for the East Coast, and is located in the Burlington, MA office.

Previously, Babs worked for Jacobs Engineering Group for 10 years and Stone & Webster Engineering Corporation for 11 years as a construction manager. During his extensive career in the trenchless industry, Babs has been involved in major tunneling and trenchless projects in the northeast for clients such as the Massachusetts Water Resources Authority, Boston Water & Sewer Commission, the Metropolitan District Commission (Hartford, CT), and Narragansett Bay Commission (Providence, RI), DC Clean Rivers Project, (Washington, DC), New York City Department of Design & Construction, and New York City Department of Environmental Protection.

For the past 18 years, Babs has focused on underground construction management for tunnels and conveyance pipelines, including water and wastewater pipeline design and construction projects, with an emphasis on trenchless construction methods. He has worked on various pipeline projects utilizing microtunneling with wet retrieval; pipe jacking; horizontal auger bore; and pipeline renewal methods such as pipe bursting, slip-lining as well as cured in place pipe lining. Babs was involved with the planning and design of the East Boston Branch Sewer Relief Project as part of the Boston Harbor cleanup, ordered under a Massachusetts Water Resources Authority (MWRA) consent decree. From 2009 to 2011 he was resident engineer on the project's pivotal microtunneling and pipe bursting components. In 2011, East Boston Branch Sewer

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Relief was named North American Society for Trenchless Technology (NASTT) Project of the Year. Babs has authored and coauthored several papers for the NASTT No-Dig Show, American Society of Civil Engineers (ASCE) Pipelines Conference, and Rapid Excavation & Tunneling Conference (RETC); and is a member of NASTT, ASCE, Underground Construction Technology (UCT), and the Construction Management Association of America (CMAA).

Babs is immediate past chair for Northeast Regional Chapter of NASTT (NASTT-NE).



John Matthews, Ph.D.

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

Dr. Matthews has over 17 years of experience in the rehabilitation and inspection of infrastructure systems. He is the Director of the Trenchless Technology Center (TTC), the Eminent

Scholar Chair in Construction, and an Associate Professor of Civil Engineering & Construction Engineering Technology at Louisiana Tech University. Prior to rejoining the TTC, he served as the Pipe Renewal Service Line Manager at Pure Technologies providing clients with guidance on the selection and use of trenchless rehabilitation technologies. Prior to joining Pure, he served as Battelle's Water Infrastructure Management Lead, where he led multiple water and sewer infrastructure research studies. Prior to joining Battelle, he led multiple projects at the TTC relating to the development of automated decision support systems for technology selection. He has also been involved in numerous projects relating to condition assessment technology selection and field evaluation of trenchless rehabilitation technologies.

He has given over 180 conference presentations and authored more than 260 publications in the area of trenchless technology for which he has received two International Society for Trenchless Technology (ISTT) No-Dig Awards (2005, 2012) and a North American Society for Trenchless Technology (NASTT) Outstanding Paper Award (2015). He has been an active member of NASTT since 2003, serving on the No-Dig Program Committee and various other committees. He also serves as a NASTT Course Instructor for both the Laterals Good Practices and Intro to Trenchless Technology – Rehabilitation Good Practices Courses. He was elected to the ISTT Board of Directors in 2020. In 2013, he was awarded the NASTT Trent Ralston Award for Young Trenchless Achievement and in 2021 he was awarded the NASTT Chair Award for Distinguished Service. He is also an active member of the American Society of Civil Engineers (ASCE) and American Water Works Association (AWWA) and he currently serves on the Editorial Advisory Board for Trenchless

Technology Magazine. He also serves as an Associate Editor for the ASCE Journal of Pipeline Systems Engineering and Practice.



Rick Melvin

National Product Specialist, TT Technologies, Inc.

Rick Melvin is a National Product Specialist for TT Technologies, Inc. He has been involved in a variety of underground construction applications for over 20 years. This includes sales and servicing of pipe

ramming, horizontal directional boring machines and pipe bursting systems. Rick has also been heavily involved in pursuing overall growth of the trenchless technology market. He has assisted in educating engineers and contractors on the extensive benefits of various available trenchless technologies and trenchless equipment techniques.



Stephanie Nix-Thomas, P.E.

President, Claude H. Nix Construction Co.

Stephanie Nix-Thomas earned her degree in civil and environmental engineering with a business minor from Utah State University in 1984. She worked as a consultant engineer in Salt Lake City for seven years before moving to the State Department of

Environmental Quality where she worked in water quality as an environmental engineer. In 1992 she moved to the policy office of DEQ as a liaison with small businesses and Native American tribes.

In January 2000 Stephanie joined her family's construction business, Claude H. Nix Construction Co. Her experience in engineering and government proved to be beneficial as she and her brother, Jon Nix, purchased and took control of the business from their parents in 2002. She also found that underground construction, especially trenchless technologies, was her career of choice. It has held her attention for 20 years!

In 2004, Nix Construction completed the first pilot tube microtunneling project in the state of Utah and, in 2005, they made the decision to focus their general contracting company on trenchless methods of construction. In the same year, they won recognition from NASTT for pioneering pilot tube pipe ramming on the commuter rail project in Utah. Over the years, the company has gained expertise in not only pilot tube microtunneling, but also tunnel bore, auger bore, pipe ramming, pipe bursting and any combination of methods. They have

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made choosing the “right horse for the course” with respect to trenchless methods, a resource for construction projects and for assisting engineers with trenchless designs.

At the inception of the Rocky Mountain Chapter of NASTT, Nix Construction established Utah’s first group of participants. Stephanie was involved from the beginning and organized one-day Training Day Conferences in Utah in 2015 and 2016. In the fall of 2016, she led the organization of the first regional chapter conference on the west side of the Rockies and has led or helped with conferences in Utah and Colorado since. She has also served as the chapter treasurer since 2016. Recently, she has volunteered on the Auction Committee for No-Dig. In addition to NASTT, Stephanie is an active member of Associated General Contractors and American Society of Civil Engineers.



Charles Pullan, P.Eng.

*Senior Project Engineer,
City of Calgary Water
Resources Department*

Charles Pullan is a Senior Project Engineer with The City of Calgary’s Water Resources department in Calgary, Alberta. Charles holds a Bachelor of Science degree in Civil

Engineering from the University of Calgary. In his current role, Charles focuses on linear capital construction of water, sanitary, and drainage systems. Charles has been involved with various trenchless technologies, including electromagnetic inspection of PCCP water mains, HDD projects, and microtunneling installations.

Charles has been heavily involved in the Northwest Chapter of NASTT since 2014 and has been part of the organizing committee for the 2015 and 2017 Northwest Trenchless Conferences. Charles has also co-authored papers for NASTT’s No-Dig conference and various Northwest Trenchless Conferences.



Chris Sivesind

Territory Sales Manager, Akkerman

Chris Sivesind is a Territory Sales Manager with Akkerman, pipe jacking and tunneling equipment manufacturer. Sivesind is responsible for sales in the western-most portions of the United States as well as Western Canada, Europe

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



Andrew (Drew) Sparks

*Director of Engineering,
Integrated Trenchless Engineering,
(Laney Group, Inc.)*

Drew Sparks is geotechnical engineer with 23 years of experience and is a registered professional engineer in 24 states. He has 16 years of experience in designing Horizontal Directional

Drill and Direct Pipe® projects up to 48-inches in diameter and lengths over 13,000 feet.

Drew worked on a team of engineers to develop a design procedure for Direct Pipe® design as well as developed a proprietary software program to evaluate the hydraulic fracture and drilling fluid surface release risk for Horizontal Directional Drill crossings.

Drew received his B.S. in Civil and Environmental Engineering and a M.S. in Geotechnical Engineering from Brigham Young University. Drew currently holds the position of Secretary for the ASCE Manual of Practice Committee for Direct Pipe® and is serving as the Director of Engineering for Integrated Trenchless Engineering, Inc.





Jim Williams, P.E., PMP

Senior Associate,
Brierley Associates

Jim Williams' experience includes 26 years in the trenchless industry in design and project management in HDD and other trenchless projects including design/build and EPC delivery methods, allowing him to

remain on the cutting edge of current technology in this niche. He has completed projects as an owner, a consulting engineer, and a contractor, resulting in a uniquely comprehensive perspective on project execution in the areas of water, wastewater, gas distribution, and other conveyance needs.

Jim has a BS in Environmental/Civil Engineering from the University of Florida and is the Immediate Past Chair of the South Central Regional Chapter of NASTT.

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HammerHead Trenchless Increases Focus on Utilities Market Takes Leading Role in Toro's Newly Created 'R&R Division'

Since 1989, you've known HammerHead® Trenchless as a leading no-dig industry educator and provider of the market's widest array of minimally invasive pipe solutions. Over the past few years, challenges facing its water, wastewater and gas market customers have required an ever-increasing focus on improving pipe rehabilitation and replacement (R&R) techniques. That's why today HammerHead now leads the newly formed R&R division within Toro, its parent company.

Managing Director of the new R&R division Jeff Gabrielse said, "Rehabilitation and replacement of underground utility infrastructure is one of the most important focuses in the life cycle of the pipe." Allowing HammerHead to operate within the R&R division, he explained, increases manufacturing efficiencies that enable HammerHead to continually improve

design and manufacture of no-dig solutions for the ever-growing market, as well as to provide industry-leading education for the market's contractors, project design teams and project owners.

HammerHead will conduct live demonstrations of underground solutions for the gas utility market at the 2021 Utility Expo in Louisville, Kentucky. Expo attendees will be among the first to see three newly launched machines: the HB100XTR for pipe bursting operations, the HG550 for pipe slitting, and the SLX1300 for pipe extraction.

In addition, several sewer and water R&R solutions will also be showcased, such as the compact, manually portable PB30G2 lateral pipe bursting system and innovative Bluelight CIPP lining system.



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Sunbelt Rentals Named One of Nation's Top Military Friendly® Employers *Designation based on the company's active Veterans Program*

Sunbelt Rentals, North America's premier equipment rental company, has been named a top 2022 Military Friendly® Employer in the nation. This is the second time in recent years they have received the distinction. Sunbelt Rentals received a Silver Designation, indicating the company meets the requirements and scored within 20% of the 10th ranking employer in this category — an achievement attained by only select companies.

Methodology, criteria and weightings were determined by VIQTORY with input from the Military Friendly® Advisory Council of independent leaders in the higher education and military recruitment community. Final ratings were determined by combining an organization's survey score with an assessment of the organization's ability to meet thresholds for Applicant, New Hire Retention, Employee Turnover and Promotion and Advancement of veterans and military employees.

"Sunbelt Rentals is very proud to receive this recognition," says Brad Lull, Executive VP of Central Operations, Sunbelt Rentals. "We value the work ethic and dedication of our military employees and are committed to growing our Veterans Program to support them. We operate our program on four foundational pillars: resources, recruitment, recognition and retention."

Sunbelt Rentals has built a robust program aimed at recruiting and retaining veteran employees. The company focuses on aligning the skills that veterans gain during military service with a suitable position where they can thrive. Sunbelt Rentals values safety, action, teamwork and innovation — ideals shared by veterans. They help enrich the company's culture and contribute to the "Power of Sunbelt" — the promise to offer a rental experience that's defined by availability, reliability and ease.

Veteran ambassadors support military employees from onboarding and throughout their career at Sunbelt Rentals, serving as liaisons to the Veterans Program and its offerings. The program includes resources such as a hotline,



By operating on four foundational pillars — resources, recruitment, recognition and retention — Sunbelt Rentals is able to support its military employees in the civilian sector

administrative support, accommodation support and interagency coordination. Along with these resources, Sunbelt Rentals launched a uniform program, allowing military employees to show their service branch with a patch on company apparel.

"We are very intentional in our approach to recruiting and retaining those transitioning to life after service, at Sunbelt Rentals," says Shane McKenzie, director, Veterans Program. "Every aspect of our program focuses on ways we can coach, mentor and develop veterans so they can have a thriving career in the civilian sector. We are proud of the successes we see our military employees achieve."

"When I left the U.S. Marine Corps, I was looking for a company that had a work-life balance and would encompass my skill set from the military and my previous career. I immediately felt at home when I interviewed with Sunbelt Rentals," says Daphne Manning, director, Customer Service Strategy and Planning.

Veterans interested in becoming Sunbelt Rentals team members can text "Sunbelt" to 51893 to see current job postings and receive alerts about opportunities in different markets.



Michael Byrne Mfg. Names Dave Kauffman as Manufacturing Engineer

Michael Byrne Mfg. names Dave Kauffman as Manufacturing Engineer. Dave has a B.S. in Business Administration/Management and brings over 25 years of experience in the Trenchless Industry. He received extensive training in fluid power at The Ohio State University's - ATI. Dave began his career at American Augers; working his way up from saw operator, fabricator, assembler, Lead man, CIP manager, and manufacturing manager. He was then employed at Underground Professionals Inc., specializing in HDD repair, refurbishing, and parts sales.

Prior to joining the Michael Byrne Mfg., Dave & a partner started D&L Underground Solutions, which specialized in parts sales, service, HDD repair, modernization & refurbishments. Dave supplies a wealth of knowledge with hydraulic and can

bus systems relating to the Mobile Construction industry. Dave brings a hands-on approach to implementing incremental improvements and problem solving for HDD and Auger boring equipment. Michael Byrne Mfg President Jim Weist adds, "Dave's addition to the Michael Byrne Team brings another perspective from a respected industry leader with experiences hard to find today".



For more information on Michael Byrne Manufacturing, visit their website at byrnegroup.com.

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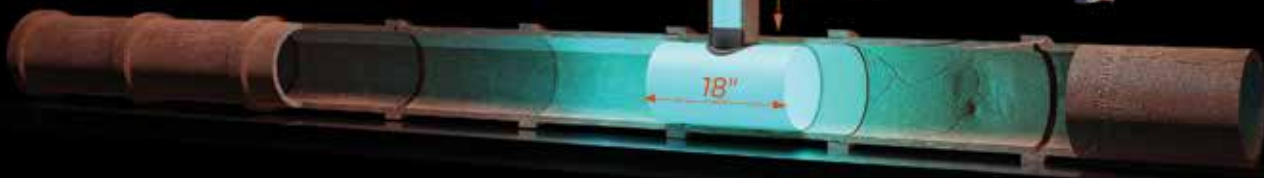
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Direct Steerable Pipe Thrusting in Municipal Markets - What We Need to Understand

By: Kimberlie Staheli, Ph.D., P.E., Staheli Trenchless Consultants, Inc.

Direct Steerable Pipe Thrusting (DSPT) is relatively new in North America, with approximately 165 completed installations worldwide since the first installation in 2007 (Herrenknecht). DSPT refers to a pipeline installation technique where a Microtunneling machine is propelled by steel pipe strings by the use of a thruster to achieve curvilinear alignments, long drive lengths, avoid the use of deep shafts, and minimize the potential of hydrofracture, which is typically the driving design factor behind HDD designs. The method was marketed by Herrenknecht Corporation who introduced Direct Pipe® to the trenchless industry. Of the 165 installations completed to date, 58 have been completed in Canada, the United States and Mexico combined. The use of DSPT is now being considered on many municipal projects as an alternative to horizontal directional drilling (HDD) and microtunneling.

The vast majority of projects in North America have been for the energy industry with only 4 of the 58 projects (just under 7 percent) constructed for municipalities. As such, data from the installation is often not shared or easy to obtain. As such, information on project challenges, solutions, and the advancement of the technology are not widely published due to the confidentiality that is required by Energy Companies. In addition, many contractors will not share the details of specific projects and challenges, as they try to maintain competitive advantage.

As this method transitions into the municipal market, there is little understanding and some confusion in the industry regarding the capabilities of DSPT, what parameters influence the success of the method, and why one would specify DSPT over the use of either HDD or Microtunneling. Understanding the differences between the three methods (HDD v. Microtunneling v. DSPT) and the appropriate application for each is critical to ensure that the method is used appropriately and successfully on projects.

There are a number of important technical topics that require further research and evaluation to develop a full understanding of the DSPT method such as:



Courtesy Michels



Courtesy Michels

- Inadvertent Returns and the reduction of hydrofracture potential. Inadvertent returns are well understood in the HDD industry, and the engineering guidelines available to assess the potential for inadvertent returns has been studied and used for over 20 years. However, the potential for inadvertent returns is not well understood with DSPT. The mechanisms that govern inadvertent return potential on HDD projects are very different than those that exist in DSPT applications. Understanding why inadvertent returns occur in HDD and do not occur in DSPT is a topic that must be understood to allow appropriate specification of the method.
- Understanding properties for drilling mud (HDD), slurry (microtunneling), and lubrication (both microtunneling and DSPT), and how they impact each of these technologies differently.
- Development of thrust loads and how to estimate thrust loading for a DSPT installation. It is important to understand the frictional loading that develops during DSPT and how it is different than the pull loads that develop during HDD installation. Equally important is to evaluate how jacking loads are developed on microtunnels and what differs between a standard microtunneling jacking force evaluation and one for DSPT. In the upcoming Summer edition of the NASTT magazine, *Trenchless North America*, Morty's Technical Academy will address the DSPT method and the current state of practice in North America. It will also address key features that should be evaluated when determining whether a project is well suited to DSPT, as opposed to HDD or microtunneling. Inadvertent returns and thrust loading will also be addressed in detail as well as drilling fluid and lubrication properties.

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Lithos Engineering Proudly Announces Addition of Three New Team Members

In keeping with their core values, the Lithos team has grown substantially over the last few years, and remains committed to developing a diverse team of experts that bring recognizable value to their clients and their projects.

James Halverson joined the Lithos Denver Team in March as a Geological Engineer, having previously served in multiple industries including Seismic Exploration, Geotechnical Engineering, Electrical Construction, and Mining Geology. His diverse experience, attention to detail, project and cost management, analysis and management of complex data systems, teamwork, communication, and subsurface analyses are but a few of the assets that James brings to the Lithos team.



James Halverson



Adisa Husejnovic



Keely Stevenson

Keely Stevenson joined the Lithos Fort Collins team in July as a Geological Engineer, having recently received a B.S. Degree in Geological Engineering from the Colorado School of Mines. During her time at Mines, she worked as an undergraduate research assistant on a project modeling flat roofed mine excavations and optimizing rock bolt placement for maximum stability and minimum cost, primarily programming in UDEC.

Adisa Husejnovic joined the Lithos Denver team in August as an Administrative Assistant. Prior to joining Lithos, Adisa worked at a commercial General Contractor where she managed the bidding process and supported multiple project management teams, in addition to assuring the whole office ran smoothly.

The Lithos team is excited to welcome James, Keely and Adisa!

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McLaughlin, a Vermeer® Brand, Achieves 100 Years of Equipment Innovation and Service

GREENVILLE, S.C., December 21, 2021 — McLaughlin, a Vermeer® Brand, was founded in 1921 and has proudly marked a century providing workable solutions for the construction, utility and trenchless industries. Today, the brand continues to innovate and expand the capabilities of auger boring equipment for customers worldwide.



"Through much of the McLaughlin company's 100-year history, Vermeer and its network of dealers have been important partners," said Dave Gasmovic, business development manager for Vermeer MV Solutions.

"That mutual commitment solidified when Vermeer acquired McLaughlin. Since then, we're proud to say that many of our original product lines have been incorporated into the Vermeer-branded product line-up".

McLaughlin's own roots go all the way back to the early part of the last century. After returning to the U.S. from service in World War I, ex-coal miner Joseph McLaughlin had an idea for a product that would simplify a coal miner's job and make the coal industry itself more productive. In 1921, in a rented space in Rockdale, Illinois, he began production of his innovative improvements to the mining auger, and the company that would become McLaughlin Group, Inc. was born.

By the early 1950s, McLaughlin was a leading supplier of drilling tools to mines across the U.S. and was ready to expand its operations, moving into a new facility in Joliet, Illinois. In the 1960s, the company once again expanded, building a new, state-of-the-art facility in Plainfield, Illinois.

Company leadership began working on a new type of system that would drill under roads, driveways and sidewalks to allow installation of small diameter services. The resulting product was called the Mighty Mole, and it set the stage for McLaughlin's future success in the development and deployment of trenchless construction technology.

Continuing to grow its brand presence in the utility market, in 1970 McLaughlin bought Western Boring Equipment Company, an auger boring manufacturer. The purchase allowed McLaughlin to expand its business, and it gave them larger-diameter boring machines for an entirely new market.

This led to a decade of significant company growth and expansion. McLaughlin added plants in Greenville, S.C., and Arlington, Texas. The Texas facility began the redesign of their auger boring machines, particularly in regard to increases in thrust and horsepower.

When horizontal directional drilling began to take off in the late 1980s, McLaughlin saw the need for tracking and detection systems. The company brought to market the original Spot D Tek I. Development and improvements continued, and in the mid-1990s, the Verifier® G3 utility locator was introduced. "That same legacy lives on today in the form of the Vermeer Verifier G3 utility locator," said Gasmovic.

In 1999, Vacuum Source, Inc. was founded as a subsidiary of McLaughlin serving customers with a new line of vacuum excavation and sewer cleaning systems. In 2001, Vacuum Source was made a division of McLaughlin, and the products took on the McLaughlin brand name. A major milestone was reached for these products in 2006 when McLaughlin began manufacturing them for Vermeer.

In 2012, Vermeer bought a minority interest in McLaughlin, selling McLaughlin's vacuum excavators, utility locators, pneumatic piercing tools, core saws and auger boring equipment to contractors through the Vermeer dealer network. In 2017, after the synergies of the two companies were well-understood, Vermeer acquired the rest of McLaughlin. Then in 2018, Vermeer purchased Vac-Tron Equipment, LLC, and integrated the two companies' product lines as Vermeer MV Solutions.

Vermeer MV Solutions continues to produce the McLaughlin auger boring products and has introduced important innovations, like the Workhorse 225 and Workhorse 175 auger boring machines, to the trenchless industry.



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HDD LESSONS YOU CAN ONLY LEARN IN THE FIELD

Kimberlie Staheli, Ph.D., P.E., Staheli Trenchless Consultants, Seattle, WA
 Jake Andresen, P.E., Staheli Trenchless Consultants, Seattle, WA

1. ABSTRACT

Horizontal Directional Drilling (HDD) has been used extensively for pipeline installation in environmentally-sensitive and congested areas; however, some of the projects carry high risks and challenges due to the geotechnical conditions, site constraints, locating interference, and risk of hydrofracture. There are many lessons learned from previous HDD projects that can be used to inform designers on the reduction of risk on future projects. This paper will present a number of case histories and illustrate lessons learned on high-risk projects over a 20-year span. Examination of HDD risks and how they are managed in design and construction will be presented. The paper addresses a wide range of topics including complications in constructing gravity pipelines with HDD, problems associated with perched water, and the value of a swab pass and what it tells you about borehole preparation. It will also present information on using down-hole pressure sensors and the value to the operator, and the importance of the HDD Specifications. The paper presents approaches developed in the field for a variety of problems encountered during construction.

2. INTRODUCTION

As the HDD industry has evolved over the last 20 years, there have been tremendous advances in the technology as well as the standards of practice. Many of the advancements have been a result of field modifications that have been necessitated by challenges that manifest during construction. Innovative contractors have developed procedures to handle a wide variety of challenges as they have manifested in the field. As such, many of these procedures are far from standardized and are often based on the experience of a single person working on a project. In addition, many



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Horizontal Directional Drilling (HDD) has been used extensively for pipeline installation in environmentally sensitive and congested areas; however, some of the projects carry high risks and challenges due to the geotechnical conditions, site constraints, locating interference, and risk of hydrofracture. There are many lessons learned from previous HDD projects that can be used to inform designers on the reduction of risk on future projects. This paper will present a number of case histories and illustrate lessons learned on high-risk projects over a 20-year span. Examination of HDD risks and how they are managed in design and construction will be presented. The paper addresses a wide range of topics including complications in constructing gravity pipelines with HDD, problems associated

This paper was awarded 2021 Outstanding Paper – New Installations at the 2021 NASTT No-Dig Show in Orlando. NASTT No-Dig Papers are available for download, free to members, at www.nastt.org

with perched water, and the value of a swab pass and what it tells you about borehole preparation. It will also present information on using down-hole pressure sensors and the value to the operator, and the importance of the HDD Specifications. The paper presents approaches developed in the field for a variety of problems encountered during construction.

HDD Lessons You Can Only Learn in the Field

2. INTRODUCTION

As the HDD industry has evolved over the last 20 years, there have been tremendous advances in the technology as well as the standards of practice. Many of the advancements have been a result of field modifications that have been necessitated by challenges that manifest during construction. Innovative contractors have developed procedures to handle a wide variety of challenges as they have manifested in the field. As such, many of these procedures are far from standardized and are often based on the experience of a single person working on a project. In addition, many contractors are very cautious about sharing their experiences and giving away information that was learned on challenging projects as they feel it compromises their competitive advantage on low bid projects. As a result, much of the information base is “handed down” rather than memorialized in formal documents or training. Engineers designing HDD projects who do not have field experience often are unaware of the aspects of the project that create the biggest challenges for the contractor. This results in designs that are difficult to build and carry bid prices that are higher than expected due to risks of which the designer may not be aware.

Many of the challenges that have resulted in significant lessons stem from what would appear to be relatively simple modifications to the “standard” HDD bore, constructed in a parabolic shape, with entry and exit points of similar elevation, and in stable soils that are easy to stabilize with drilling mud. When designs deviate significantly from standard practice, the complexities are often multiplied and can result in unintended consequences. In addition, the designer may be unaware of the design parameters that introduce construction challenges and may not plan for adequate contingencies or provide mitigation measures for a wide variety of risks.

3. GRAVITY INSTALLATIONS

The installation of gravity pipelines with HDD has gained popularity as the uses for HDD has expanded. There have been many gravity pipelines installed with HDD to different degrees of success. Often the designer is primarily concerned with the ability to maintain design line and grade and expected tolerances. This is of significant concern as HDD steering equipment is not designed for precise installations at large depths or beneath overland obstructions. However, HDD can be used to install gravity pipelines if sufficient grade exists to account for localized deviations in line and grade.

There are other implications about gravity HDD bores that often get overlooked but can cause serious problems with installation of the pipeline in the field. It is widely known that the proper management of drilling mud is a critical part of the HDD process, providing a medium to remove excavated material, a means for cooling the down-hole tooling, and providing stability to the borehole. Ideally, the borehole will stay full of drilling mud throughout the entire drilling operation. However, with a gravity bore, if the borehole remains open, the drilling mud is going to drain to the lower end of the bore, seriously limiting the potential for the mud to fulfill its intended purpose. Drilling from the upper or lower end of the bore may

be the contractor’s choice; however, when the pullback occurs, the mud will drain to the lower elevation in an uncontrolled manner and will not have the ability to support the borehole. If the soil through which the bore is designed is not self-supporting, the borehole will collapse, making completion of the bore and a successful pull-back difficult. This risk greatly increases as the diameter of the bore increases.

3.1 Drilling from the lower elevation – Maintaining Drilling Mud in the Borehole

To guard against bore collapse, contractors have adopted numerous approaches to allow drilling gravity installations with the aid of the drilling mud. One such way is to use a packer or backflow preventer at the lower elevation end of the bore through which drilling takes place. These devices vary widely across contractors and projects, depending on the manufacture of the device, the way in which pressure is released from the borehole, and the amount of full column mud loading that must be contained by the device. Figure 1 shows a packer that was built in the field for a project with approximately 60 feet of elevation difference between the entry and the exit. Figure 2 shows a backflow preventer, similar to those used in the oil industry that was used on a project with 40 feet of elevation difference between the entry and the exit location.



Figure 1. Field-manufactured Packer for maintaining drilling fluid in the borehole during the pilot bore

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Figure 2. Backflow preventor used to maintain drilling fluid in a gravity HDD with a 40-ft elevation difference between the entry and exit location

The packer and the backflow preventers have vastly different levels of sophistication; however, both were effective at allowing drilling to take place from the lower elevation while maintaining drilling mud in the borehole. The packer or backflow preventer is typically mounted to a casing at the borehole entrance. This casing may be

a conductor casing, used to limit the potential for inadvertent drilling fluid returns or a very short casing to support the seal. Alternatively, a bulkhead wall can be constructed at the borehole entrance to mount the seal. Design of the packer or backflow preventer is highly dependent on the bore geometry as large deviations in entry and exit elevation will necessitate a robust seal to prevent unwanted drilling fluid leaks from the borehole. If the design of the packer or backflow preventer does not account for the full column mud loading, failures in the devices can occur, resulting in a tremendous amount of mud losses as well as possible borehole collapse. Figure 3 shows the entry location of a borehole with over 60 feet of elevation difference where the packer was insufficient to contain the full column mud weight, resulting in uncontrolled mud releases at the entry.



Figure 3. Mud loss at the downstream entry location due to packer unable to maintain adequate pressure in the borehole

The challenge with using a packer or backflow preventer occurs when moving from the pilot bore to the reaming process. Since the drill pipe is integrally sealed into the borehole with the packer, the packer must be removed to allow the installation of the reamer if forward reaming is desired. Even if the soil is relatively stable, the full borehole volume will drain to the entry location. Depending on the length and size of the

bore, this can be a tremendous volume of mud that is difficult to effectively contain, even with the use of pumps and storage tanks.

To keep the seal intact, the reamer can be attached to the drill pipe at the upper elevation of the bore for pull reaming when the pilot bore holes out. This allows the packer to stay in place; however, reaming then takes place in the downward direction. When this occurs, cleaning the borehole can be very difficult as the excavated material must be lifted to the exit in the drilling mud. This often results in a large ball of soil accumulating in front of the reamer. As the reamer approaches the entry location, the soil can become highly packed into the casing on which the packer is mounted. This material must be removed prior to pulling the pipe or it will pack off the casing, resulting in very high pull loads at the completion of the pull-back operation. However, it is very difficult to remove this compacted material as it is the farthest away from the mud circulation location (upstream) can be very dense and has the full pressure of the drilling mud column behind the blockage. Figure 4 shows a ball of soil carried from the upper end of the HDD to the bottom end during reaming operations. This is seen after the packer is removed. Although the ball of soil was sufficient to hold back the mud pressure for a limited time, once the packer was removed the mud pressure forced the plug from the packer and all of the drilling mud in the bore drained to the site at the lower elevation within 12 hours.

Regardless of the approach used to ream the borehole, it is necessary to remove the backflow preventer or packer at the completion of the pull-back operation. It is significantly important to consider that the mud in the annulus of the bore will drain by gravity when the device is removed. This can be a significant volume that must be planned for prior to removal of the packer.

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(a)



(b)

Figure 4. (a) Packer on lower end of HDD with very high torque; (b) after removal of the packer – dense ball of soil at leading edge of packer at the completion of reaming downhill, temporarily holding back the pressurized mud in the bore

3.2 Drilling from the Upper Elevation – The loss of Drilling Mud

Another approach has been to drill from the upper elevation to keep the drilling mud in the borehole. This has been met with limited success because it is necessary to induce a pressure gradient in the borehole that is of sufficient to lift the spoils-laded drilling fluid from the bore. This often results in the development of pressure that is sufficient to create inadvertent drilling fluid returns as the drilling mud finds a path of least resistance that is not through the borehole. Once inadvertent returns have started, it is difficult to stop the mud flow and regain circulation as the minimum mud pressure may be too high to arrest the mud flow to the ground surface.

This should be considered when designing a bore and allowing the drilling to take place at the upper elevation. The designer must select a bore geometry that allows sufficient overburden to resist drilling mud returning to the surface laterally. The designer must also consider the proximity of storm drains, sewer, or any other feature that might allow drilling fluid to escape into the ground instead of returning to the entry location at the upper elevation of the bore.

When drilling from the top, consideration must be given to the termination of the pilot. If the pilot bore holes out, drilling mud will drain by gravity to the lower location, resulting in

a dry borehole that is prone to collapse with the evacuation of the drilling mud. Often the pilot bore is terminated prior to reaching the exit location. The drilling pipe is then withdrawn, and forward



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Figure 5. Inadvertent Drilling Fluid Returns at a ditch line when drilling was taking place from the upper end of the bore with over 140-ft of elevation difference

reaming takes place. With each reaming pass, the ream is also terminated prior to the exit to ensure drilling mud remains in the borehole. However, after the bore is fully prepared, it is necessary to drill through the plug (from either end of the bore) at which time drilling fluid will escape to the lower elevation. The pipe is then pulled into a borehole that is not supported by drilling fluid.

4. PERCHED WATER

A number of HDD installations have faced significant challenges due to the presence of perched water along the bore path. Depending on the amount of water that is perched in formation

and the recharge of the water source, perched water can cause a host of problems when drilling. The problems are primarily caused when the perched water flows into the borehole, washing out or thinning the drilling mud, causing borehole collapse, or resulting in a migration of soil around the drill pipe that can resist rotation of the drill to the point that the drill pipe becomes stuck in the borehole.

There are a number of installations with elevation differences where the drill traversed through an aquitard over which high groundwater levels were perched. When this occurs, the borehole failure is often rapid and results in a large volume of water migrating to the entry of the HDD. If the recharge of the perched water is near infinite, borehole stability may never be maintained.

One way to successfully construct a borehole with perched water is to grout at the interface of the aquitard and the overlying soil to prevent the migration of soil and groundwater into the borehole. Figure 6 shows a profile of an HDD bore in where perched water was expected to wash out the bore from below and cause borehole collapse. To prevent this from occurring, the contractor installed a conductor casing from the upper elevation and injected a grout bulb at the interface where the bore traversed through the perched water. Figure 7

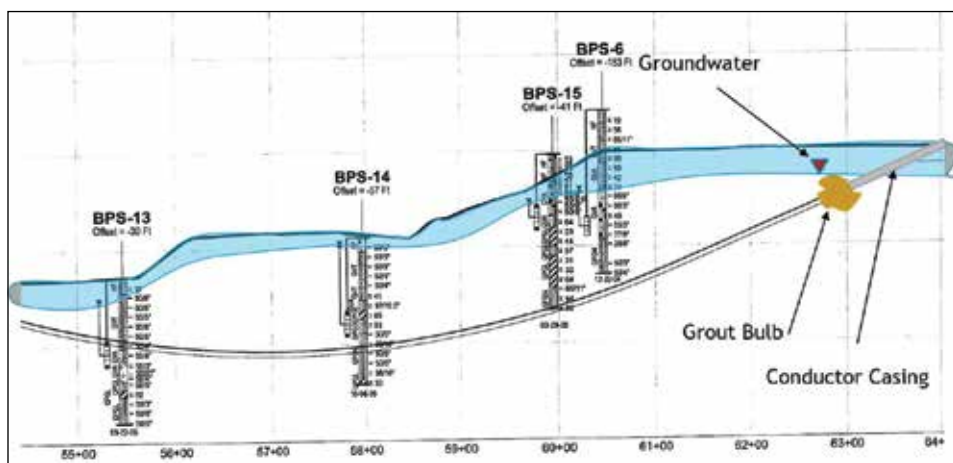


Figure 6. HDD Profile with perched water where a conductor casing and grout was used to bridge the location where perched water could enter into the borehole



Figure 7. Exit of the pilot bore into the grouted conductor casing used to cut off perched groundwater

shows the completed grouting operation and the exit of the pilot bore at the upper elevation.

Drilling on this HDD took place from the lower elevation; however, when the aquitard was breached, soil did not flow into the borehole as the groundwater was isolated from the borehole with the conductor casing and sealing grout.

5. IMPORTANCE OF A SWAB PASS

One important step in HDD operations that can be over-looked is the swab pass. A swab pass is conducted after the completion of the reaming process to compact the perimeter of the borehole and clear any soil or obstructions in the bore path that might remain after the final reaming process. A swab pass is conducted with a barrel reamer. A significant feature of the barrel reamer is that drilling mud is not allowed to pass through the swab reamer. Figure 8 shows a typical barrel reamer that is used for swabbing the borehole.

A swab barrel should be larger than the outer diameter of the product pipe but smaller in diameter than the final reaming pass. With the barrel smaller than the excavated borehole, the bore will not be enlarged during the swab pass. As such, the torque on

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Figure 8. Typical barrel reamer used for a Swab Pass after the completion of reaming to the final diameter

If the torque in the borehole during the swab pass approaches the torque that was required to ream the borehole, it is indicative of new excavation, indicating that the borehole is not sufficiently prepared for pull back. If the torque remains high over a significant length, it may be necessary to re-ream the borehole prior to conducting the pull-back operation.

At times the swab pass has been omitted from the HDD operations, often in an attempt to save schedule or finish a project by a milestone date, to the peril of a successful HDD pull back. However, if the swab pass provides a clear interpretation of the condition of the borehole. Eliminating the swab pass to save schedule is very short sighted as it does not allow for a positive indication that the borehole is properly prepared for pull back. For HDD installations over 12 inches, it is recommended that the specification include the requirement for a swab pass and that the swab pass is clearly defined.

the reamer should be relatively low as the swab pass is conducted. The torque will increase when the barrel reamer traverses through any curves in the borehole geometry but should be fairly stable on the entry tangents and at the lowest elevation of the bore.

6. CHALLENGING LAYOUTS WITH STEEL PIPE

Many large diameter HDD installations are constructed with steel pipe, often for water transmission projects with high pipeline pressures. A significant amount of attention is typically given to the borehole geometry due to the limitations of the bend radius of the product pipe. However, often the layout area is not given the attention that is required to ensure a successful pullback operation. The layout area for the pipe assembly may be sufficient in size; however, the overbend before entry into the borehole is not always considered and is left to field operations. Further, many specifications do not call for the Contractor to provide details on the layout of the pipe that accounts for crane placement and pipe stresses. This can prove to be critically important if the layout area is not directly in line with the bore or

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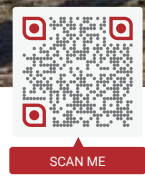
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Figure 9. HDD Bore Layout and area used for Pipe Assembly

requires a horizontal bend (or compound curve) in the steel pipe at or near the location where the pipe enters in the borehole. It is often necessary to loft the steel pipe to facilitate entry into the borehole; however, any horizontal bends in the pipe results in a compound curve at the entry location can result in significant stresses in the pipe during pullback.

Once such incident occurred on an installation of a 36-inch steel pipeline of approximately 2,000 feet in length. Although there was sufficient layout area



Figure 10. Pulling pipe into alignment for pull-back results in overstressing the pipe at the compound curve

at the project site surrounding the HDD bore to allow for the steel pipe assembly, the pipeline had to be assembled at an offset angle to the borehole, along a curved roadway, resulting in a horizontal and ultimately a compound curve near the entry location. Figure 9 shows the location of the bore in plan view and the staging area that was used for assembly of the pipeline. As is often the case, a significant amount of jockeying was required to place the cranes to allow movement of the pipe toward the borehole. Due to the induced pipe stress, a significant amount of resisting force exerted strain on the cranes, pulling the pipe slings at a significant angle.

When the pipeline was moved into place, the horizontal bend in the pipeline

resulted in the need to force the leading end of the pipe towards the entry to the borehole. The contractor planned for only two major cranes and used side booms and excavators to move the pipeline. The lateral offset distance was more than 25 feet as can be seen in Figure 10, showing the stages of lining up the steel pipeline with the borehole. Forcing the leading edge of the pipeline to the borehole resulted in a pinch-point along the alignment that significantly damaged the pipeline as can be seen in Figure 11.

An engineered pick plan is often necessary to determine the number and size of cranes that are needed to



Figure 11. (a) Pipe pick just prior to failure. (b) Location of failure point in the pipe. (c) Close-up of crimped pipeline

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facilitate movement of the pipe without inducing excessing stresses in the pipe. Once the pipe was damaged, it was necessary to suspend pull-back operations until the damaged section was removed. This took a significant amount of time as the pipe had to be re-welded, as well as lined and coated with fusion bonded-epoxy. In the interim, the Contractor engineered a pipe pick-plan, discovering that it was necessary to have a significant number of cranes to support the pipe through the compound curve. In addition, the cranes were placed to minimize the free span of the pipeline. It is worth considering adding the requirement for an engineered pick plan whenever layout area is restricted or not in line with the borehole.

7. DOWNHOLE PRESSURE SENSING TOOLS

One of the most significant lessons learned is the value of the use of down-hole pressure sensing tools to minimize hydrofracture potential and extent. Many projects have used downhole pressure sensing tools as a means to provide information to the operator. During design, one of the primary factors that impacts bore geometry is potential hydrofracture. Many papers have been presented on hydrofracture analysis and the determination of limiting borehole pressures. Designers use soil properties to calculate the limiting pressure, or a maximum pressure that can be applied to a formation without causing hydrofracture. Further, the minimum pressure needed to create a borehole is also calculated and compared to the limiting confining pressure. In theory, if the borehole pressure is lower than the pressure required to initiate hydrofracture, the drilling fluids should remain in the borehole, rather than creating inadvertent fluid returns at the ground surface.

The use of the cavity expansion model to predict hydrofracture has been discussed by others on many occasions (Withers, 2013; Osbak, 2011; Bennett, 2012; Staheli

2010) however, how the downhole pressure sensing tool is used in practice is very different to the theoretical argument presented above. It is rare that the drill operator will have the calculations for limiting and minimum borehole pressures in the field. The down-hole pressure sensor will provide real-time information to the operator; however, the true value of the tool is the rapid response that is allowed by the driller. During drilling, the operator

can see two conditions that can warn of potential frac-out: a spike in the drilling pressure or a total loss of drilling pressure.

If the borehole collapses behind the drilling head and drilling mud is continuously pumping to the bit, pressure can build rapidly in the bore annulus. With the use of the downhole pressure sensor, the operator can see the dramatic

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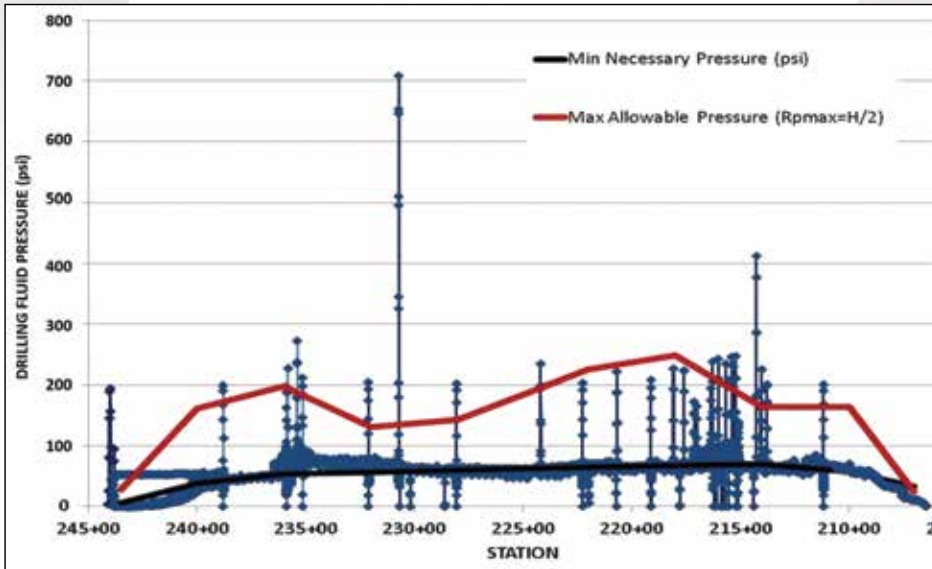


Figure 12. Maximum Allowable Pressure, Minimum Borehole Pressure and Actual Pressure measured with a Down-hole pressure sensing tool (Staheli, et. al. 2010)

Figure 12 shows a graph of the pressures measured during an HDD, as well as the maximum allowable pressure (calculated with the Delft equation and a R_{pmax} equal to half of the depth of cover from Staheli et.al, 2010). As the bore progressed, there were several locations where the actual pressure was in excess of the calculated maximum allowable pressure. At the time of these occurrences, the driller immediately stopped the mud pumps. On each occasion the alignment was walked to find possible frac-out locations. The most significant location was above the bore at station 231+00; however, the total amount of mud that escaped was under five gallons as can be seen in Figure 13.

increase in pressure very rapidly, sometimes before drilling fluid circulation is arrested at the entry location. If the operator is paying close attention, the mud pumps can be

stopped immediately upon realizing a pressure spike. In such a case, even if inadvertent fluid returns occur, the amount of drilling mud that escapes to the surface can be severely curtailed.

8. CONCLUSIONS

HDD is being used to install pipelines in geotechnical conditions that are increasingly challenging and within space constraints that seem to be increasingly small. As designers push the limits of the technology, a number of challenges

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(a)



(b)

Figure 13. (a) Looking for inadvertent drilling fluid returns after down-hole pressure sensor indicated pressure spike. (b) Fluids discovered on the ground surface (approx. 5 gallons) after pumps stopped immediately on pressure spike

are faced by the drillers that can be unintended consequences of pushing the technology. There are many lessons that have been learned on HDD projects that area often the result of an unintended consequence rather than a planned event that could be anticipated during design. As these lessons are learned, they provide the opportunity to introduce continuous improvement into the HDD design.

Depending on the extent of the risk that any particular item places on the chance of a successful HDD bore, many of these risks can be addressed in design and communicated to the Contractor to allow pre-planning and the avoidance of issues that often lead to claims. By continually striving to learn, the risks associated with HDD can be better understood and mitigated.

9. REFERENCES

Bennett, R., Osbak, M., and Wallin, M. (2012). Improving the Standard of Mud Management (2012). Proceedings for the NASTT's No-Dig Show 2012. Nashville, Tennessee, March 11-15, 2012.

Osbak, Manley. (2011). Theory and Application of Annular Pressure Management (2011). Proceedings of NASTT's No-Dig Show 2011, Washington D.C., March 27-31, 2011.

Staheli, K., Price C., and Wetter, L. (2010). Effectiveness of Hydrofracture Prediction for HDD Design. Proceedings of NASTT's No-Dig Show 2010, Chicago, Illinois, May 2-7, 2010.

Withers, James D. (2013). Application of Fluid Mechanics and Transport Modeling to Bentonite Drilling Fluid in Horizontal Directional Drilling. Proceedings of the NASTT's No-Dig Show 2013, Sacramento, California, March 3-7, 2013.

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Meet NASTT's Newest Staff Member!

KARI SCHIFFNER

Recently NASTT onboarded an Education Specialist to grow our educational offerings and opportunities. Meet Kari Schiffner! Prior to joining NASTT, Kari worked as the Financial and Education Coordinator for CDI College in Red Deer, Alberta. She received her B.A. in Education at the University of Wyoming. Maintaining a passion for education, she has also worked as a teacher for various organizations.

Kari's responsibilities at NASTT include managing our Good Practices Course schedule, facilitating in keeping course materials updated, managing the NASTT Educational Fund Annual Auction as well as growing fundraising opportunities throughout the year.

In her free time, you can find Kari searching for the best coffee shop around or relaxing with her dog and cat at home. You can reach Kari at kschiffner@nastt.org.

The following is a proposed schedule for upcoming Good Practices Courses offered throughout 2022. Additional in-person and virtual courses will be added, along with complementary webinars.

Please visit nastt.org/training/events for the latest schedule.



February 17:	Introduction to Trenchless Technology - New Installations - VIRTUAL
February 24:	Introduction to Trenchless Technology - Rehabilitation - VIRTUAL
April 10:	Introduction to Trenchless Technology - New Installations – Minneapolis, MN
April 10:	Introduction to Trenchless Technology - Rehabilitation – Minneapolis, MN
April 27- 28:	Horizontal Directional Drilling (HDD) - VIRTUAL
May 25 -26:	Cured-in-Place Pipe (CIPP) – VIRTUAL
June 22- 23:	Pipe Bursting - VIRTUAL
July 28:	Municipal Sewer Grouting - VIRTUAL
August 24 - 25:	New Installation Methods- VIRTUAL
October 26-27:	Cured-in-Place Pipe (CIPP) - VIRTUAL
November 16-17:	Horizontal Directional Drilling (HDD) - VIRTUAL
December 14-15:	Pipe Bursting - VIRTUAL



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Two Cents...

In this regular NASTT Membership Feature, four NASTT members give their opinions on a burning question of the day, sharing how trenchless industry professionals are responding to present-day trends, innovations and events. Interested in participating? Contact Carolyn Hook at chook@nastt.org.



Well over 20 million people quit their jobs in the second half of 2021. In its wake, the Great Resignation has left businesses understaffed, employers scrambling to hire new staff or reconfigure teams, and those remaining with increased workloads and the growing pains of incoming hires. How has your organization been impacted by the mass exodus of employees? See more responses online at nastt.org/resources/blog.



Janine Alexander
Senior Project Manager
Tetra Tech
Orlando, FL

The economic trend of the 'Great Resignation' has significantly impacted all levels within AEC industry. In talking with colleagues and friends, I hear of similar resource issues engineering and contractors alike. Compensation can be a way to retain employees and attract new talent. However, I strongly believe in the foundation of mentoring/coaching new and existing employees. As a Senior Project Manager, I have been blessed with many lessons learned that has created invaluable knowledge and experiences to share with others to support the success of their professional growth and journey. As a company, we have increased incentives, provided referral bonuses, enhanced career growth and opportunities for existing employees, and shown appreciation for our employees which are all valuable assets.



Lester M. Bradshaw, Jr.
President
Bradshaw Construction Corporation
Eldersburg, MD

As a family-owned firm, Bradshaw Construction Corporation's culture has always placed employees first – resulting in no mass exodus during the pandemic. The pandemic has accelerated the redefinition of work and even more disturbingly, the retirement of baby boomers from the workforce taking their wealth of hard-earned knowledge with them. On the positive side, these trends provide the future generations with the greatest opportunity ever for jobs and promotions. The number one key to success going forward for all companies, and especially construction firms, will be hiring, training, and retaining new and existing employees. To meet this challenge, we have substantially raised wages for all employees and new hires, promoted from within like never before, and greatly increased our referral bonuses to attract those interested in joining our family of underground builders.



Jen Glynn, PE
Senior Technical Practice Lead
Woodard & Curran
Sacramento, CA

Woodard & Curran has flourished through the Great Resignation thanks in large part to our commitment to creating a safe and rewarding work culture. This was written into our mission statement and expressed in our core values: put people first, operate with integrity, cultivate autonomy, work as one team, and act like owners. This creates an environment where people of all backgrounds can thrive. Woodard & Curran give me a place to do meaningful work with colleagues who care about my success and happiness. As we look to the future, we are expanding our ability to support clients as they wrestle with climate change. We are adopting transformative technologies like machine learning that will change our work. And we are building the systems that help our people thrive in a distributed environment, working from anywhere on projects that matter.



George Ragula
CEO
Ragula Tech
Morris Plains, NJ

I tend to always be ahead of the pack and quit my utility job after 43 years in late 2020 to pursue trenchless and other related natural gas expertise areas in my tool belt. Looking at this resignation trend from outside the proverbial box, I see that experienced and knowledgeable employees are often unappreciated and under-rated. Retention can be driven by economics. Having an engineering mindset, I can appreciate what it takes to attract and retain employees while at the same time working to meet the bottom line. Succession planning is moving toward becoming a remnant of the past with recognition and reward for long-standing employees looked at as an unnecessary perk. Overall, this trend presents an ideal opportunity for one to reinvent themselves and – in a sense start again – with a fresh outlook for those willing to take that leap. It ain't over till it's over.



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NASTT Regional Chapters

The NASTT network of 12 regional chapters throughout the United States and Canada offer valuable educational and networking opportunities in your local area. With a single NASTT membership, you're automatically enrolled in the national organization, the international organization (ISTT) and also in your regional chapter. Share your ideas, network with trenchless technology colleagues and find solutions to your construction challenges.



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charlottenapwong@gmail.com

Elected Officers
Chair - Sam Eichenberger
Treasurer - Rob Epp

British Columbia
www.nastt-bc.org

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



Chapter Contact
Leonard Ingram
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Elected Officers
Chair - Richard Thomasson
Vice Chair - John Hrabosky
Secretary - Dennis Walsh
Treasurer - Michael Hoffmaster

Mid Atlantic
www.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.



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

Great Lakes, St. Lawrence & Atlantic
www.glsa.ca

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



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Elected Officers
Chair - Eric Schuler
Vice Chair - Jonathan Kunay
Secretary - John Altinyurek
Treasurer - Charles Tripp

Northeast
www.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.



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Elected Officers
President - Sergio Alvarado Martin
Vice-President - Adrian Cordero
Secretary - Itzel Mora

Mexico
Website coming soon!

The Mexico Chapter was established in 2021 and represents the country of Mexico's perspective of the trenchless technology marketplace. MXTT members are currently from the entire country of Mexico.



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Elected Officers
Chair - Shane Cooper
Secretary - Jeff Galloway
Treasurer - Keith Moggach
Past Chair - Ben Campbell

Northwest
www.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.



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Elected Officers
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Vice Chair - John Hrabosky
Secretary - Dennis Walsh
Treasurer - Michael Hoffmaster

Mid Atlantic
www.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.



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Vice Chair - Glen Wheeler
Secretary - Rylee Archuleta
Treasurer - Heidi Howard

Pacific Northwest
www.pnwnastt.org

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

NASTT Regional Chapters



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 Chair - Benny Siljberg
 Vice-Chair - Stephanie Nix
 Treasurer - Chris Knott
 Secretary - Becky Brock
 Past Chair - Chris Larson

Rocky Mountain
www.rmnaastt.org

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



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

Southeast
www.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.




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Elected Officers
 Treasurer – Josh Kercho

South Central
www.nastt.org

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.



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Elected Officers
 Chair - Brian Avon
 Vice Chair - Kate Wallin
 Secretary - Rachel Martin
 Treasurer - Tim Taylor

Western
www.westt.org

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



For quick links to all NASTT Regional Chapters, visit

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There are many benefits for students who belong to a NASTT Student Chapter – scholarships, networking opportunities, education and career opportunities, to name a few. Members of NASTT Student Chapters attend and participate in regional events and the NASTT No-Dig Show where they present trenchless research posters, participate in competitions, and provide event support, monitoring the technical paper sessions.



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To learn more about the 17 NASTT Student Chapters, please visit:

www.nastt.org/student-chapters

NASTT Events Calendar



Since its inception in 1991, NASTT's No-Dig Show has been the premier North American conference and trade show for the trenchless technology industry. Thousands of professionals from around the globe attend to learn new methods and systems that will save money and improve infrastructure. This conference provides attendees an opportunity to learn trenchless methods, network with peers and gain knowledge from vendors during exhibit hall hours. NASTT's No-Dig Show is the ideal event for municipalities, contractors and engineers.

Upcoming Conferences, Courses & Events

April 10-13
NASTT 2022 No-Dig Show
Minneapolis, MN

April 10
Introduction to Trenchless Technology – New Installations
Minneapolis, MN

April 10
Introduction to Trenchless Technology – Rehabilitation
Minneapolis, MN

April 11
NASTT's Educational Fund Auction
Minneapolis, MN

April 14
ISTT Webinar
Virtual Event

May 24-25
NASTT-SC 6th Annual Trenchless Technology Conference
Arlington, TX

October 17-19
No-Dig North 2022
Toronto, ON



April 10–13, 2022

Minneapolis Convention Center
Minneapolis, Minnesota



April 30–May 4, 2023

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March 30 - April 3, 2025

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