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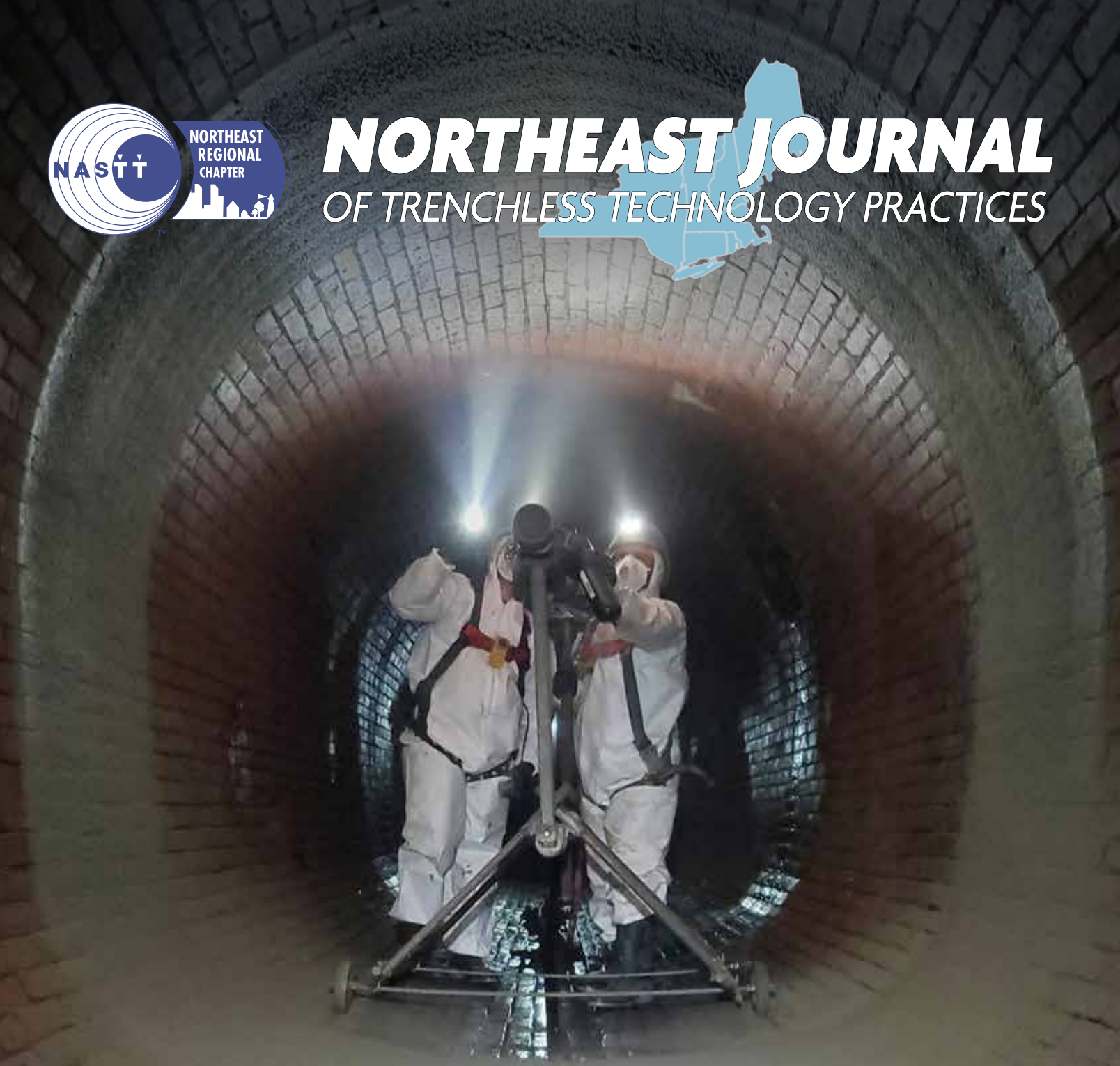
NORTHEAST JOURNAL
OF TRENCHLESS TECHNOLOGY PRACTICES



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2023 SPRING EDITION

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CONTENTS

Features:

Marginal Interceptors Rehabilitation Project: City of Somerville MA

By: Gus O'Leary, PE, Kleinfelder

Subsurface Conditions Do Impact Your Drill Fluid

By: Brian Dorwart, P.E., P.G., Brierley Associates
J. Mark Hutchinson, Right Turn Supply
Dennis Duty, Baroid IDP

Turnkey Alliance Manages Leak-Prone Infrastructure

By: Mario Carbone,
Progressive Pipeline Management

Do Your Manholes Look Like This?

By: Ray Bahr,
Green Mountain Pipeline Services

ALSO:

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MESSAGE FROM NASTT-NE CHAIR

Eric G. Schuler, P.E., NASTT-NE Chair

Welcome to the 14th edition of the ***Northeast Journal of Trenchless Technology Practices***! Thank you for taking the time to open this publication and check out the content that our Chapter has pulled together for this Spring 2023 edition. A lot of hard work goes into pulling these magazines together, and our Publisher does a great job keeping us volunteers looking good. I hope that you find the content in this publication to be forward-thinking and practical.

In 2023, the NASTT-NE Board remains unchanged at the Exewcutive Committee level, but has lost a couple 2022 Directors going into the start of the year. This Spring we have added 4 new Directors to the Board, and an online election ballot will be rolled-out later this year to formalize the 2024-2025 leadership roster.

This Regional Chapter is always evolving, growing, and learning from our past experiences relating to both Journal content and annual conference results. We are a volunteer-run organization and it takes a strong commitment from a select group within this industry to keep things moving forward as we strive to provide sound educational and networking experiences for our 7-state region. As you read this magazine, I encourage you to get involved with our close-knit group if you are located within our region as we are always looking for individuals from the underground infrastructure sector to get involved with our conferences and Journal content development.

2022 NASTT-NE Conference Recap

- Our annual conference was deemed a success; again. It definitely was a risk to hold our annual conference on a chilly November day up in Portland, Maine. Maine is at the outer reach of our Chapter's footprint and we were not too sure if we could generate enough attendance/interest to minimize financial risk, but we hit our attendance metrics and enjoyed a great event.
- We did not have a large representation from New Hampshire or Maine in attendance, as attendees from Massachusetts and New York carried our numbers. Our technical agenda consisted of our two typical tracks, with the biggest hit seeming to be a Roundtable titled "Trenchless 101: Experiences and Lessons Learned". There were a couple gas industry-specific presentations built into our agenda, and we hope to expand gas-related offerings at future conferences. We are always looking for good content! So please keep your eyes out for our "Call for Papers" for our 2023 Conference that will be held in Albany, NY. I would say that our Call for Papers notification will probably hit the streets in July; right after our Conference Registration page goes live.
- The tradition of Live Outdoor Demonstrations continued as well with Vortex Companies conducting a CIPP presentation in the venue parking lot. Vortex was well-represented at this Conference, partially due to Matt Timberlake having the role of Keynote Speaker during the Lunch Hour. Matt is from Maine, and brought a great personal touch to the Conference.
- Our Social Event also was a big hit, as we had Chapter-sponsored food and drinks on a floating restaurant. We had the pleasure of 3 individuals from National (NASTT) attend and partake in our event. As always, we appreciate the support of National and continue to use our events to learn and grow our experience for attendees. (see pgs 45 – 52 for conference photos and coverage)

As you take a read through this publication, please try to take note of the messaging portrayed throughout the articles and the criticality of these topics. This magazine does a great job at portraying the positive role that the various trenchless technologies can play within our utility engineering world. The individuals who provided content for this product shows how passionate they are about this industry, and how committed they are to moving the messaging in a positive manner consistent with industry goals (i.e: NASTT's "Green Above, Green Below").

We also are using this edition to continue driving interest and excitement for the 2024 No-Dig Show that will be held within our Region's very own Providence, RI. There is a very good potential that this show in the Northeast will net the largest attendee numbers that No-Dig has ever seen; not to mention the vendor participation that will be present. The Countdown for No-Dig 2024 has begun…

On that note, I'll close this introductory message with another Thank You! Thank you for being a part of our Chapter's journey and hopefully I see you in Albany NY this November. Enjoy the Day!

Eric Schuler

Eric G. Schuler, P.E.
Chair, NASTT-NE

MESSAGE FROM NASTT CHAIR

Matthew Wallin, PE, NASTT Chair

The 2024 No-Dig Show Comes to the Northeast!

Hello Northeast Chapter Members & Associates! We've just wrapped the NASTT 2023 No-Dig Show held in Portland, Oregon, which was a great success and a wonderful opportunity to see our industry friends and colleagues while we celebrated all things trenchless. We've already jumped into planning for the 2024 No-Dig Show and we are so excited to bring the conference to your Northeast Region and meet in Providence, Rhode Island next April 15-17. The Northeast Chapter is one of our strongest Regional Chapters and a big part of why the trenchless community in this area is thriving. Providence is a great location for our industry to come together to network and educate with our Show motto, *Green Above, Green Below.* It is important that our industry is a steward of our precious natural resources, so we welcome the opportunity to provide a forum for learning about the latest in innovative trenchless products and services that help us all accomplish that lofty goal. Learn more about all the No-Dig Show has to offer at **www.nodigshow.com**.

In the coming months we have many additional events planned to bring the underground infrastructure community together. Our ever-popular NASTT Good Practices Courses are being held both virtually and in-person throughout the year. Visit **www.nastt.org/training/events** to find a course that fits your schedule.

This fall we are excited to head to Edmonton, Alberta for the 2023 No-Dig North conference, October 23-25. No-Dig North is hosted by the Canadian Chapters of NASTT and offers three full days of training, education, and networking. This is a must-attend event for trenchless training and networking in Canada and nearby portions of the US. Please visit **www.nodignorth.ca** for details!

> **"OUR VOLUNTEERS AND COMMITTEE MEMBERS ARE WHAT KEEP US MOVING IN THE RIGHT DIRECTION!"**

If you have attended an NASTT event (national or regional) you probably left feeling excited and eager to get more involved. I ask that you consider getting engaged in one of the many NASTT committees that focus on a wide variety of topics. Some of our committees that are always looking for fresh ideas and new members are the Training and Publications Committee, the individual topic Good Practices Course Sub-Committees, the Educational Fund Auction Committee, the No-Dig Show Planning Committee and the No-Dig Show Technical Program Committee. There are many opportunities for you to consider where your professional expertise can be put to use through networking with other motivated volunteers. With education as our goal and a strong drive to provide valuable, accessible learning tools to our community, we are proud of our continued growth as both an organization and as an industry. Our volunteers and committee members are what keep us moving in the right direction.

For more information on our organization, committees, and member benefits, visit our website at nastt.org and please feel free to contact us at **info@nastt.org**.

We look forward to seeing you at a regional or national conference or training event soon! And we hope you are planning to join us in Providence for the 2024 No-Dig Show April 15-17!

Matthew Wallin

Matthew Wallin, PE
NASTT Chair

NASTT-NE BOARD 2023-2024

ERIC SCHULER – CHAIR

Eric Schuler is a Deputy Commissioner for a public wastewater system serving a population of roughly 350,000 residents. In his leadership role, he oversees all of Capital Programming, Construction, Asset Management, Fleet, and Inventory Control. Mr. Schuler has over 10 years of experience in both the private and public sectors. He earned his Bachelor of Science in Civil Engineering degree from Clarkson University in Potsdam, NY and has primarily been involved in wastewater, drinking water, civil-site, and stormwater sectors. Eric is a licensed Professional Engineer in New York whose design, project management, and construction-related experiences have helped successfully execute many "trenchless"-focused projects.

Early in his engineering career he gained exposure to various trenchless technologies through utility evaluations and development of utility project design alternatives. He immediately started to envision great opportunities for communities plagued by utility deficiencies and construction constraints to utilize CIPP, HDD, among other trenchless technologies; and for them to be able to benefit from both social and economic perspectives. Eric has also stressed the importance for municipalities to incorporate asset management into utility system evaluations and system rehabilitation designs in order to aid development of capital projects and to determine the most suitable trenchless applications for implementation.

In addition to NASTT-NE, Eric is also a Vice President for the Central New York Branch of the American Public Works Association (APWA), and a Director of the Central New York Water Works Conference (CNYWCC). Eric continues to push for growth of trenchless technologies in upstate-New York and has trained utility owners on the use of hydraulic modeling methods for proper development of utility rehabilitation project design. He is an advocate for educating (designers & installers) of trenchless applications through proper training and increased accessibility of industry standards/guidelines to ensure successful project design and execution. The successful use and increased awareness of modern-day trenchless technologies that incorporate innovative equipment and materials are what Eric believes will continue to shape and drive the direction of the utility industry for the coming decades.

JONATHAN KUNAY – VICE CHAIR

Jonathan Kunay, P.E., PMP is an Associate Engineer and the global Conveyance Market Discipline Leader for CDM Smith in Boston, MA. He has 20 years of experience working as a design engineer and project manager on a variety of trenchless projects including infrastructure assessment with traditional and state-of-the-art investigative techniques, rehabilitation using CIPP, HDD and pipe bursting, facilities planning and master planning, leak detection of water distribution systems, enterprise asset management and risk/criticality studies.

While trenchless technologies have been his primary focus over the past 16 years, he also has worked on civil site design for commercial developments and municipalities, navigated Consent Order driven long-term programs, designed new pumping stations and developed alternatives for sewer separation projects. Jonathan is based in New England; however, his diverse project experience has brought him many places to experience unique perspectives in the trenchless marketplace. He has worked on trenchless projects all over the United States including California, Texas, Illinois, Tennessee, Louisiana, South Carolina, Nebraska, Virginia, Florida and Georgia. He has also implemented trenchless projects and programs internationally in the Middle East, China, South America, the Pacific Islands and Europe.

Jonathan was the project manager and design engineer responsible for helping to bring service lateral lining into the New England market in 2008 as part of a comprehensive sewer system rehabilitation program. This comprehensive model has now been adopted across the country as a proven methodology by which infiltration and inflow can be removed in large quantities from the sewer collection system. This comprehensive approach has been presented at conferences to showcase the validity of utilizing a holistic trenchless methodology when large percentages of I/I by volume must be eliminated.

Jonathan has a Bachelor of Civil Engineering and a Minor in Environmental Engineering from the University of Cincinnati, is certified in NASSCO's Pipeline Assessment and Certification Program (PACP), Manhole Assessment and Certification Program (MACP), and Lateral Assessment and Certification Program (LACP), and is involved in multiple committees in the National Association of Sewer Service Companies (NASSCO).

EXECUTIVE COMMITTEE

CHARLES TRIPP – TREASURER

Charles Tripp, P.E. is a Technical Manager focusing on Pipeline Rehabilitation Design and Condition Assessment for the New England Water Business Line at AECOM in Chelmsford, MA. He has 17 years of experience working as a design engineer and project manager on a variety of trenchless projects including pipeline rehabilitation, condition assessment, risk modeling, and general asset management. His varied design experience also includes collection systems design and peer review, wastewater treatment, water resources, and site-civil design to improve municipal infrastructure.
Charles was first introduced to trenchless technologies through his involvement in multiple sanitary sewer rehabilitation projects starting early in his career. He also briefly served as a Field Engineer for a world leading CIPP construction company. This experience provided a wealth of exposure and instilled a desire to pursue and advocate for the use of trenchless technologies in projects as a way of mitigating the impacts of excavation in urbanized areas, but also as a means of cost-effective design.

Charles studied Civil Engineering at the University of Massachusetts Amherst earning his B.S. and went on to receive his M.S. in Environmental Engineering from the Worcester Polytechnic Institute. He is a licensed professional engineer across New England and the Tri-State area. He is also PACP/MACP certified by NASSCO.

As Treasurer for the Northeast Chapter of NASTT, Charles continues to capitalize on his devotion to trenchless technologies and in advocating for its use in the local construction market. He continues to apply his experience to the effective management and administration of fiscal matters of the organization.

JOHN ALTINYUREK – SECRETARY

John Altinyurek is presently a Senior Staff Engineer with the New York,NY office of Delve Underground. He previously worked for WSP for 6 years. During his career in the underground industry, John has been involved in major tunneling and trenchless projects in the New York City area for clients such as the NYC Dept. of Design & Construction, New York City MTA Transit, Port Authority of New York New Jersey, Amtrak and continuing his work on New York State Department of Environmental Conservation/Nassau County Design-build Bay Park Conveyance Project in Long Island, NY.

For the past 7 years, he has focused on underground construction management and design for tunnels and conveyance including transit projects, water and wastewater pipeline design and construction projects. He has worked on various pipeline projects utilizing microtunneling, pipe jacking, horizontal directional drilling, and other tunnel rehabilitation methods.

John views NASTT-NE Regional chapter as a very important organization in promoting the rapidly growing trenchless design and construction methods in the United States. As a young professional, John hopes to bridge the gap for his peers to get engaged with the NASTT-NE Chapter and be involved in the trenchless industry early on in their careers.

NASTT-NE BOARD 2023-2024 EXECUTIVE COMMITTEE

BABS MARQUIS – PAST CHAIR

Babs Marquis is presently the Trenchless Practice lead for the East Coast and Construction Manager with the Burlington, Mass., office of Delve Underground. He previously worked for Jacobs Engineering Group for 10 years and Stone & Webster for 11 years. 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), Narragansett Bay Commission (Providence, RI), NYC Dept. of Design & Construction, NYC Dept. of Environmental Protection and continuing his work with the New York State Department of Environmental Conservation/Nassau County Design-build Bay Park Conveyance Project in Long Island, NY.

For the past 26 years, he has focused on underground construction management for tunnels and conveyance including water and wastewater pipeline design and construction projects, with emphasis on trenchless construction methods. He has worked on various pipeline projects utilizing microtunneling, pipe jacking, horizontal directional drilling, horizontal auger bore, pipe bursting and other pipeline renewal methods.
Babs views the NASTT-NE Regional Chapter as an important vehicle to promoting greater awareness and understanding of trenchless applications at the local level. He sees the level of interest and confidence in trenchless technology growing among owner groups based on the successful completion of many high profile projects across the Northeast. Drawn to the varied unique and innovative aspects of trenchless technology, Babs believes access to ongoing education is key to even greater owner acceptance and NASTT-NE Chapter is a key component towards achieving this acceptance by making information available at the grassroots level as well as attracting student chapters from the region and a robust local participation in the Chapter activities throughout the region.

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WELCOMING NORTH AMERICA'S UNDERGROUND INFRASTRUCTURE COMMUNITY TO THE POPULOUS NORTHEAST!

The NASTT-NE Chapter looks forward to hosting the 2024 No-Dig Show in Providence, Rhode Island April 15-17. Hosting North America's premier trenchless educational and networking event in the Northeast for the first time, presents a golden opportunity for the Northeast Trenchless community to showcase the progress it has made in utilizing trenchless applications as the preferred method for underground infrastructure construction in the Northeast.

"BE A PART OF THE EXCITEMENT AS A PRESENTER, SPONSOR AND EXHIBITOR!"

Within an easy day's drive from most cities in the populous northeast – Providence is just a few hours' drive from Portland ME, Philadelphia, PA, NY, NJ, VT and CT – the 2024 NASTT No-Dig Show promises to draw significant attention from top infrastructure decision-makers across the Northeast including municipal authorities, utilities, engineers, contractors, suppliers and policy-makers.

The 2024 NASTT No Dig Show motto "Green Above, Green Below" exemplifies the trenchless industry's position as an important steward of our environment and natural resources, utilizing approaches that have significant environmental and social benefits. Trenchless Technology is at the forefront of ongoing efforts to reduce GHG emissions.

As our planning kicks into high gear, check the website www.nodigshow.com for updates and further information. Additional details are provided in subsequent editions of this magazine as we get closer to the event.

Call for Abstracts deadline for the 2024 No-Dig Conference in Providence, RI is Friday, June 30, 2023, so there is still time to submit papers for this important event. The excitement and anticipation is building – be a part of the excitement as a presenter, sponsor and exhibitor!

Babs Marquis CCM
Delve Underground
2024 No-Dig Show Planning Committee Chair
Past Chair, NASTT-NE Chapter

The NASTT No-Dig Show is being hosted in the Northeast for the first time

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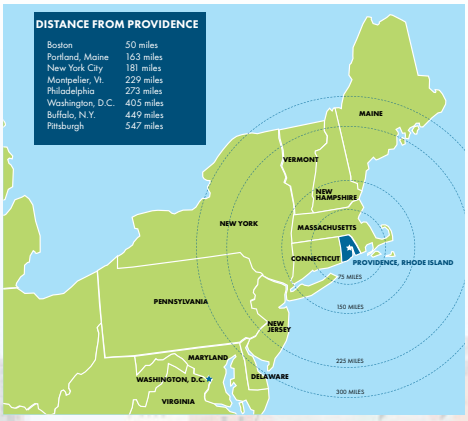

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TRENCHLESS TECHNOLOGY NETWORKING: STUDENT PERSPECTIVES

UMass Lowell NASTT Student Chapter Report

By: Tieren Adams & Iverson Rodriguez, with Dr. Raj Kumar Gondle (Faculty Advisor)

Tieren Adams:

My name is Tieren Adams and I am a freshman civil engineer at University of Massachusetts Lowell. I'm also part of research on campus, a volunteer and presenter for events such as Mass STEM week, the Cowell Research Symposium and guiding tours for prospective students in addition to being an honors college student. My goal is to promote sustainable practices and combat climate change by updating old infrastructure in urban areas with new technology that will conserve energy.

The opportunities that the trenchless industry has offered me were beyond my expectations as a freshman. I never expected that I'd be awarded a scholarship, much less invited to a conference across the country in Portland OR. Since I've yet to take many specialized engineering courses, this was my chance to listen to these industry professionals talk and get an in person glimpse of the work that they do everyday. The chance to go meet other professional engineers to understand what their work was like on a day to day basis was invaluable since I will need to decide which education track to take in a few years.

When I first arrived at college many of the older student leaders of the engineering club were excited to explain the concept of trenchless technology to myself and the other freshmen. It was something that I hadn't really heard about before, though I didn't find it difficult to understand the concept. When researching the field I found the technology's environmental benefits to be very compelling. Since this technology is more accurate than traditional methods which need to clear the entire area of soil, the trenchless technique uses less energy and disturbs less soil. These properties would help new engineers further promote environmental policies that the United States needs to attain in order to reach its goal of net zero emissions by 2050, which is a goal I want to help us reach. By further implementing these practices in the north east and offering these opportunities to students, we will increase project opportunities for the industry as a whole.

In Portland however I was happy to find that there were more applications and interest than what I was already aware of. My classmates and I spent much of our first day at the convention talking to individuals about drilling and sealing processes of the products featured at each booth we visited. I was aware that drilling through solid rock and large boulders was a time consuming process but it was really interesting to learn that some of the newer drill models, the one that comes to mind being from GeoNex, can cut through the same amount of rock in a third of the time of a normal drill. I even learned a bit about the legal side of these large construction projects when my senior classmate, who's been studying construction management, was conversing with another student working in law.

Additionally, I enjoyed the booths promoting the use of robotics and VR in this field. I had seen videos of scopes and other small, wheeled robots crawl through the pipes but it was my first time seeing a drone that worked under water. Unfortunately, their line was a little too long for us to have time to try maneuvering the robots, but I was able to watch the VR demonstration of the drilling process. I've heard of the possibilities of using VR as a teaching tool in lieu of using physical items, or in this case, heavy machinery, which was effective when demonstrating to students and other colleagues how the process works. I haven't seen the educational and practical applications of this technology utilized in person since the visor and hand controls are so expensive, but the demonstration was impressive to watch. I've been wanting to learn how to design objects and images using three dimensional computer modeling. I'm planning to begin practicing AutoCAD again, learn how to use Solid Works this summer and I hope to further my understanding of programming languages in the near future too.

When thinking of the future, I could envision myself working alongside these companies to decrease the environmental impact of repairing our infrastructure. I'm drawn to repairing piping and improving water quality in particular, since I'm already

Exciting opportunities are offered as a part of experiential learning and engineering education outside of the classrooms

working in water contaminants research with my professor and the interaction between the water supply of towns and the environment is something that has fascinated me. One of my classmates who works at a water treatment plant found one table that worked in cleaning buildup, removing blockages and resealing those newly cleaned pipes and the ensuing conversation was both informative and interesting to listen to. I didn't know that if the pipes weren't sealed with epoxy or another substance that the buildup would return much quicker than before, I was told in a matter of months in some cases rather than years. There were some vendor stations that I wasn't expecting to see, such as Sherwin Williams, which I was unaware was part of the

assortment of sealant and sewer and pipe restoration companies at the conference.

Lastly, and most importantly, were the people I met at the conference. During our first day at the conference my service partner and I spent a lot of time getting to know each other over the course of a few hours and passed the time talking about recent news and generally what to expect in later engineering classes. This was my first successful networking event outside of the university campus and it was also a heartwarming experience since most individuals would check in every so often to make sure we were comfortable. This was also the first time I had contact with students and companies outside the United States in a formal industry setting, and while the trip unfolded differently than expected I felt that we were welcomed by everyone.

I also want to acknowledge the kind treatment and well wishes of all the participants at the conference while my professor was injured. On our second to last day I met another student from Louisiana during the auction. He sat at the same table as me, introduced me to the rest of his classmates and found a get well card for my professor in addition to organizing a plan to have a bunch of the attendees and organizers sign their names and write messages. Everyone we met was incredibly welcoming and made sure that we were comfortable and tried their best to make sure we had everything we needed and checked in periodically to be sure we were alright which I found thoughtful. I was grateful for this opportunity and even though things didn't go as planned it was still a great experience overall.

Iverson Rodriguez:

As a sophomore in Environmental Engineering the North American Society of Trenchless Technology provided countless resources and knowledge about the geotechnical industry at the 2023 No-Dig Conference in Portland Oregon. The different companies attending were very insightful. It was an unforgettable experience that broadened my knowledge about the latest technologies in the field of underground construction.

As soon as I entered the conference venue, I was amazed by the number of attendees and the diverse backgrounds they came from. There were engineers, contractors, utility owners, and researchers from all around the US and the world, all gathered to share their knowledge and expertise in trenchless technology.

Iverson speaks at the 6th Annual Northeast Trenchless Technology Conference in Portland ME, November 15 2022.

The conference kicked off with a keynote speech by a professional that specialized in cleaning rivers, and making sure that our rivers in the United States were cleaned up especially the Mississippi River. He talked about the challenges in getting a project of that magnitude started. I was impressed by his insights and the potential for the field to reduce the impact on the environment and increase efficiency.

Throughout the day, there were several sessions that covered various topics related to trenchless technology, such as micro-tunneling, horizontal directional drilling, pipe bursting, and cured-in-place pipe. Each session was presented by experts in the field, who shared their research and experiences with us.

I particularly enjoyed the panel discussion on the future of trenchless technology. It was fascinating to hear the different perspectives and ideas from the panelists, who were all leaders in the industry. They discussed the challenges that the field faces and the innovative solutions that are being developed to overcome them.

Overall, attending this conference was an incredible learning experience. I gained valuable insights into the latest trends and technologies in trenchless technology, and I was able to connect with experts in the field. I am grateful for the opportunity to attend and look forward to applying what I learned in my future studies and career.

ABOUT THE FACULTY ADVISOR:

***Dr. Raj K. Gondle** is an Assistant Teaching Professor in the Department of Civil and Environmental Engineering at the University of Massachusetts Lowell (UMass Lowell). He serves as a faculty advisor for the NASTT UMass Lowell Student Chapter. He was recognized with the 2020 UMass Lowell Departmental Teaching Excellence Award and the 2017 ASCE ExCEEd teaching fellow. His students think he's awesome!*

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MARGINAL INTERCEPTORS REHABILITATION PROJECT: CITY OF SOMERVILLE, MA

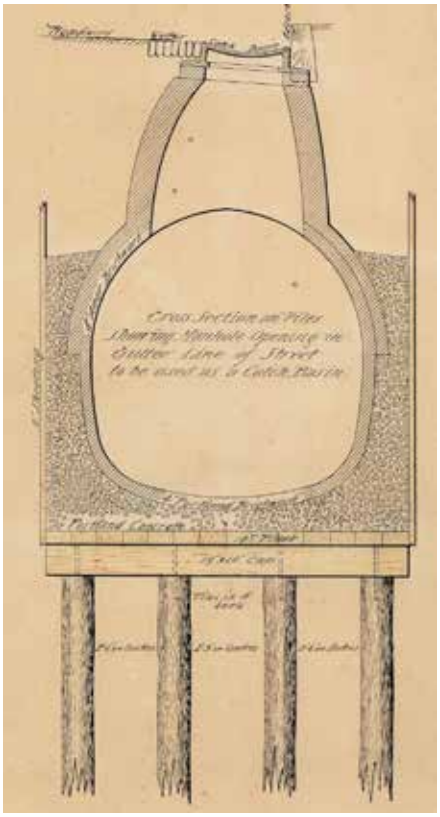
By: Gus O'Leary, PE – Kleinfelder

The Marginal Interceptors are located generally within McGrath Highway and Saxton Conant Foss Park (Foss Park) between Broadway and Mystic Avenue, in the City of Somerville (the City), immediately south of I-93. The interceptors consist of an 85- by 90-inch brick combined sewer ("the interceptor") and an approximately 60-inch diameter brick combined sewer of varying geometries. These combined sewers collect dry weather sanitary and wet weather flows from the nearby Winter Hill and East Somerville neighborhoods, and convey them to the 42-inch diameter MWRA Medford-Somerville Branch Sewer. Wet weather overflows pass through the MWRA Marginal CSO Treatment Facility situated on Mystic Avenue below I-93 and eventually discharge to the Mystic River.

HISTORY OF THE MARGINAL INTERCEPTOR

This large-diameter brick interceptor was constructed in approximately 1897, at the curb of what was formerly Winthrop Avenue, before the subsequent widening and the construction of McGrath Highway in the 1950s. The pipe itself was generally constructed on timber piles with a timber pile cap for support in the poor soil subgrades of the area.

From the invert up to approximately the 10 and 2 o'clock positions on the pipe wall, the pipe consisted of a single course of bricks set in Portland cement. At the 10 and 2 o'clock positions, a second course of bricks was laid, forming the crown of the pipe. Record drawings made available by the City indicated that Portland cement was used to fill the haunches between the pipe wall and the support of excavation around the interceptor up to approximately the 10 and 2 o'clock positions.



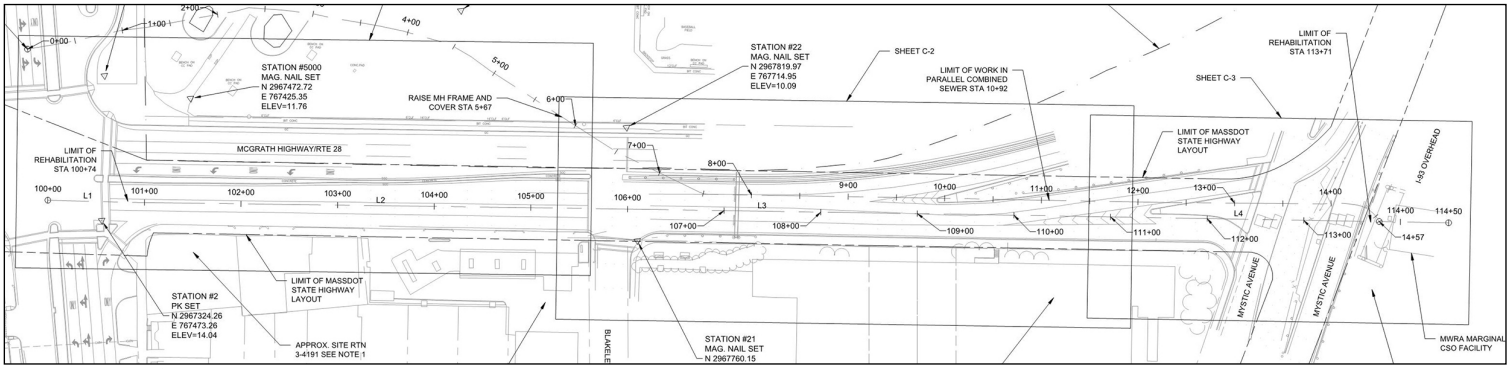
85 x 90-inch Cross-Section Showing Original Catch-Basin Access Structure Construction

The access structures on this pipe, constructed as risers from the top of the pipe, were originally intended to serve as catch basins, since it was located within the curb-line of the former Winthrop Avenue. When the roadway was widened, the catch basins were converted to access structures; however, since they are supported by the crown of the pipe, they transfer highway traffic loads directly to the pipe crown. While the pipe is certainly substantially constructed, the designer could not have anticipated that loading condition.

CLEANING AND ASSESSMENT

In July of 2019 Kleinfelder re-evaluated prior inspections conducted by the MWRA and the City in 2013 and 2015, conducted additional investigations including cleaning and multi-sensor inspection of the interceptor and presented a rehabilitation recommendation, placing an emphasis on the impact to pipe storage volume based on feedback from the MWRA. Prior to performing a condition assessment of the interceptor, between the months of January and April 2020, National Water Main Cleaning Company (NWMCC) worked for approximately 10 weeks, overnights, to clean the interceptor. The debris in the pipeline had accumulated over a significant period and consolidated into a "concrete-like" mass requiring significant effort to remove. Approximately 250 tons of accumulated sediment and debris were removed over the 1,300 linear foot length of the interceptor. Concerns over the ongoing COVID-19 pandemic forced a pause in the cleaning and inspection work in April of 2020 but work was able to restart in late June, at which time NWMCC returned and over the course of an additional week removed an additional 12 tons of debris to allow RedZone Robotics (RedZone) to perform the multi-sensor-based pipeline inspection.

The existing condition of the interceptor is best described in two reaches; roughly 863 linear feet upstream of the diversion weir extending to the intersection of Broadway and McGrath Highway (***Upstream Reach***), and 468 linear feet downstream of the weir ending at the Marginal CSO Treatment Facility (***Downstream Reach***).



Interceptor Site Plan

Upstream Reach

This reach of the pipe alignment, in general, was found to be in fair condition, given a pipe of this age. The one defect of concern that was noted was a longitudinal crack which had formed at each access structure location within the reach, likely because of surface loads being transferred directly to the pipe crown from traffic above. The cracks extended 20-50 feet from each access structure up- and downstream and decreased in severity as they extended away from the access structures. These defects were expected to continue to widen over time, eventually causing bricks to fall out, and causing the pipe crown to deform, impacting its structural integrity.

The MSI Report for this reach showed variances between the measured inner dimensions and reference shape were minimal. Kleinfelder attributed these variances to the original hand-laid brick construction of the pipe and did not consider them significant defects.

Downstream Reach

This reach of the interceptor was constructed in a similar fashion to the upstream reach – a single course brick invert set in Portland cement, cement haunching, a two-course brick crown, and brick riser access structures. While the construction was similar, this reach had deteriorated significantly more than the upstream reach. The inspection revealed a large crack at the crown of the pipe through which the second course of bricks was visible and which spread into multiple smaller fractures approaching the downstream Marginal CSO Treatment Facility. This crack had begun to open as the crown of the pipe deformed, allowing

bricks to loosen and fall into the invert. A former access structure riser which had been partially demolished at some previous point in time was also found.

Multi-sensor inspection in this reach of the pipe showed more significant variances between the measured inner dimensions and the reference shape. The most significant variances were 3.9 inches inside the reference shape and 6.3 inches outside the reference shape. Deflections inward at the 12 o'clock position and outward at the 10 o'clock and 2 o'clock positions were suspected based on the pipe crown fracture observed in the 2014 evaluation and the multi-sensor inspection was able to confirm them.

REHABILITATION RECOMMENDATION AND DESIGN

Several rehabilitation technologies were evaluated by Kleinfelder for this pipeline. Ultimately, we selected and recommended a Sprayed in Place Concrete or Geopolymer (SIPP) liner. During wet weather, the full capacity of the pipe is used by the MWRA for storage of combined sanitary and stormwater flows prior to accepting combined flows at the Marginal CSO Facility and ultimately discharging combined flows to the Mystic River after screening and disinfection. This technology minimized the loss of pipe storage volume in the 85 x 90-inch sewer while also minimizing the risk of wet weather and impacts to traffic on the highway.

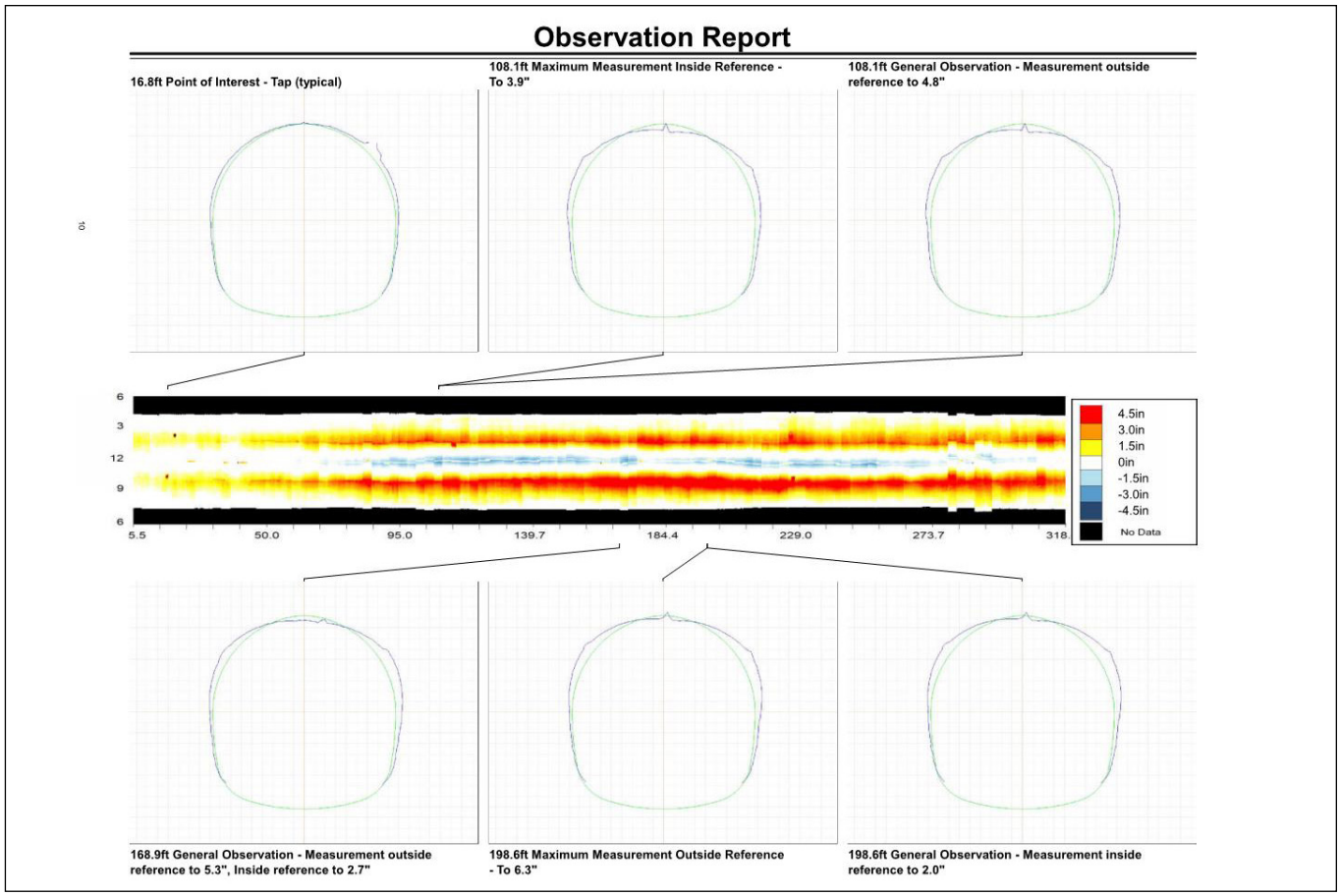
Similar to the approach many engineers take with specialty rehabilitations, Kleinfelder specified this lining design as a delegated design, meaning calculation of the design thickness will be performed by an Engineer specializing in design of these liners hired by the awarded contractor.

Particularly in the case of SIPP liners, specifying a delegated design requires careful consideration of several factors to ensure the project accomplishes the Owner's objectives, including:

- Should the specification include a minimum thickness to counteract cost pressures in a low bid environment? How should this be specified in light of the lack of a published standard for design of SIPP liners?
- How to manage wet weather and joint CSO operations with the MWRA, balanced against minimum cure time before restoring flows in emergencies, and requirements if that timing cannot be met?
- How should sampling and testing for quality control and acceptance be performed?
- How to specify access structure rehabilitation and reinforcement.

Liner Design and Minimum Thickness

Industry literature specifically recommends against specifying a minimum thickness of liner alone. As there is currently no ASTM standard for design of SIPP liners, a host of design approaches are in use throughout the industry. The intent of specifying a thickness is to



MSI Report showing deflection of the crown inside the reference shape, and at the 10 and 2 o'clock positions outside the reference shape

procure multiple bids that will deliver an equivalent rehabilitation. By specifying a thickness, but no basis for that thickness or additional parameters such as flexural strength, that intent may not be achieved. Instead, bidders might be motivated to reduce costs by selecting a design methodology that most closely matches the specified minimum thickness in order to be cost competitive.

Kleinfelder addressed this issue in the bid documents by specifying a minimum flexural strength for acceptable rehabilitation materials as the basis for the specified minimum thickness. In order to determine the specified minimum thickness, we calculated the required thickness using several of the different design methodologies in use in the industry and selected a conservative thickness based on the results. The documents were also explicit as to what loads must be accounted for as part of the rehabilitation design. By doing this, we were assured that the bids would be based on equivalent materials and would address the loads and conditions specific to the site.

Requirements for Wet Weather

One of the advantages of SIPP liners is the reduced risk associated with wet weather because of both the faster cure and the ability to start and stop the lining work within a shift. Kleinfelder heard varying claims about cure time, from as little as 30 minutes to 6 or more hours in preparing our specifications.

Due to the nature of the operation of the system, wet weather bypass was not possible as the pipe must function without interruption to store combined sewage flows. Dry weather flows were such that the bypass could be operated full time without the need to reinstate flows through the pipe except in wet weather. Thus, the contract documents called for dry weather flow bypass.

Based on this set of conditions and input from MWRA operations personnel, we established a simple go\no go criteria for lining: lining would not be conducted when the forecast indicated precipitation or snow-melt temperatures during the time period for which the work would be interrupting the wet weather conveyance

Spraying the first 0.5-inch layer of liner in the interceptor

Spraying liner over basalt reinforcing bar (left) and completed manhole rehabilitation (right)

capacity of the pipeline, plus a contingency of 16 hours. We also specified a minimum of an 8-hour cure. If newly applied liner was exposed to flow less than eight (8) hours after application, additional testing would be required.

QA\QC Sampling

SIPP liners are constructed without the benefit of factory level QA\QC procedures. The quality of the liners are therefore significantly dependent on the skill and experience of the personnel applying them. As such, to ensure a high-quality finished product for the owner, Kleinfelder specified an extensive QA\QC regimen based on lessons learned described in several published industry papers.

QA\QC requirements included thickness gauges, cylinders for compressive strength testing, and in-situ core samples for properly cured liner. In-situ core samples were specified to be collected from the liner by coring at one location every 100' of liner, and two additional locations at the discretion of the resident engineer.

For liners that were exposed to flow prior to the specified minimum cure time Kleinfelder elected to specify rebound hammer testing to quickly inform decision making around corrective actions during construction. Testing liners in this manner was somewhat informal – typical liner thicknesses are not enough to properly test using this standard. To work around this, we specified that the test first be performed on a similar age, but properly cured, segment of liner to establish a baseline. Then the test could be performed on the segment in question. Some variability was to be expected given the nature of the test and the reduced thickness versus the standard, but if the two segments of liner were approximately consistent, there would be a comfort level in performing additional testing rather than immediately removing an improperly cured liner.

Access Structure Rehabilitation

As described above, the existing access structures are supported off the crown of the pipe rather than being a separate structure. This construction had led directly to the crown fracture that was evident extending up and downstream from the upper two access structures. Our initial preference was to replace these access structures with new precast structures; however, new precast structures suitable for this diameter pipe would have necessitated excavations extending across most of two lanes of McGrath Highway and would have been extremely expensive to construct.

Internal rehabilitation, or more appropriately, construction of a new structure within the existing access structure to remove the load from the pipe crown, was significantly more attractive. This approach eliminated excavation within the State Highway right-of-way, significantly mitigated associated permit and restoration costs and timeframes, minimized the construction footprint both during active construction (already planned for overnight shifts) and off-shift during rush hour, and allowed all the work to be done by one contractor.

After determining that internal rehabilitation was feasible and constructable, the Consultant specified that the access structures be rehabilitated to meet the loading conditions.

CONSTRUCTION

The construction contract was awarded to National Water Main Cleaning Company in early 2022. Construction began in Summer 2022 and was completed by December 2022. Generally the provisions included in the contract to address anticipated issues were very successful.

Liner Design

Kleinfelder's design documents specified a 2-inch minimum thickness for the liner. Brierley Associates was the delegated designer for the project and recommended a minimum 1.75-inch thick liner based on the design criteria described in ASTM F 1216. Ultimately NWMCC elected to spray a full 2 inches of a Portland cement based liner.

Requirements for Wet Weather

The Summer of 2022 was ideal for performing the work as the crew had multiple consecutive week stretches with no wet weather. When wet weather did occur, the specified go\no-go criteria was applied as intended and coordination with the MWRA was generally seamless. A pop-up thunderstorm in the fall of 2022 lead the contractor to have to reinstate flows before the minimum cure time had elapsed for a segment of liner. The specified rebound hammer test allowed Kleinfelder and the City to make an informed decision to preliminarily accept that improperly cured section of liner with additional core samples taken from that reach forming the basis for final acceptance.

QA\QC Sampling

Compressive strength and in-situ core sampling was successfully performed as specified. Additional core samples in the improperly cured segment confirmed that there was no delamination or lack of adhesion in the improperly cured layer.

One issue that was encountered was the use of cube test specimens (ASTM C 109) in addition to the specified cylinders (ASTM C 39). Kleinfelder specified cylinders for testing, and the average strength based on the cylinders was within tolerance, but lower than the cubes. We understood in specifying cylinders for compressive strength testing that the two test standards generally do yield different results, with the cubes typically yielding a higher compressive strength, but ultimately accepted the cube samples as the manufacturer's material design properties were based on cube tests.

Access Structure Rehabilitation

Several issues plagued construction of this element of the work, and ultimately this scope resulted in a change order request and additional costs to the owner.

Kleinfelder specified rehabilitation of the access structures to address direct traffic loading on the pipe crown. Unfortunately the approach to rehabilitation was far more extensive than anything we had discussed with manufacturers engineers during development of bid documents. The intended structural reinforcing was constructed, but a more direct approach in developing bid documents, like specifying a minimum design, would have been preferable.

ABOUT THE AUTHOR:

***Gus O'Leary** is a Principal Engineer and Project Manager with 16 years of experience in the design and construction of municipal utilities including trenchless rehabilitation technologies such as Cured-in-Place Pipelining (CIPP), sliplining, pipe bursting and trenchless construction technologies such as pipe jacking, microtunneling, and horizontal directional drilling. Gus' experience includes extensive municipal on-call experience with the City of Somerville among other municipalities, Water and Sewer Commissions, and State agencies. Gus is the Technical Lead and Engineer of Record for the City of Somerville's Marginal Interceptors Rehabilitation Project.*

SUBSURFACE CONDITIONS DO IMPACT YOUR DRILL FLUID

By: Brian Dorwart, P.E., P.G., Brierley Associates
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Drill fluid is a key component of HDD project success

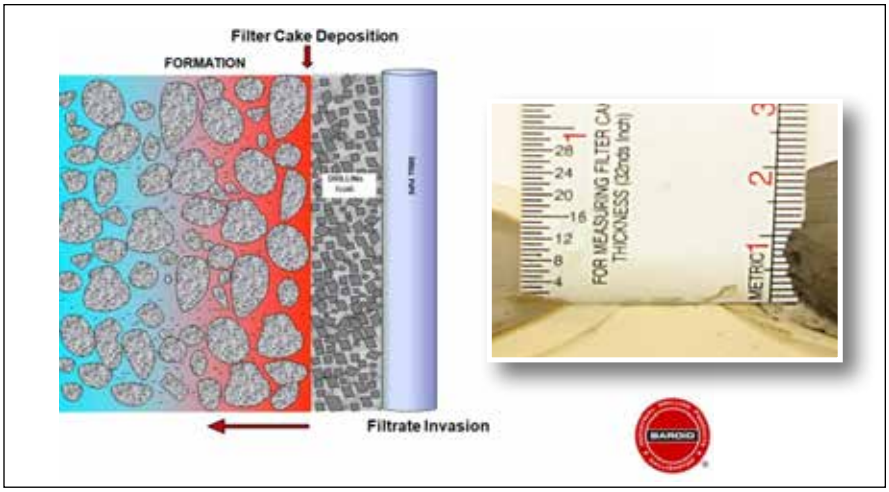
Drill fluid support must last until carrier pipe is in place

Drill fluid is a key component for project success. Initially, the ground at all sites is stable. Excavation destabilizes soil leading to collapse over time. Some conditions collapse rapidly while others may remain open for extended periods. Excavation instability is caused by the difference between the external soil and groundwater pressure at the edge of the hole and the internal drill fluid pressure. The excavation is unstable unless the internal pressure can apply the same pressure as applied by the excavated material. Because drill fluid typically does not provide full replacement of the original supporting pressure, it only extends the time that the hole will stay open. However, this temporary support must last until the carrier pipe permanent support is in place.

Excavation in HDD bores requires spoil removal at the same rate as the excavation progresses. The Horizontal Directional Drilling (HDD) process consists of fluid assisted mechanical excavation with a drill bit, spoil removal by drill fluid and temporary support of the hole by drill fluid pressure acting on the mud cake. Subsurface conditions will interact with the drill fluid performance. The wide variety of soil types in New England encountered along most bores means that there is no single drill fluid suitable for all conditions. Understanding the data produced by drill fluid testing provides the information necessary to properly optimize performance of the fluid, thus optimizing daily production rates.

Important to properly optimize fluid performance

"NOT KNOWING SUBSURFACE CONDITIONS MEANS YOU ARE AGREEING TO BE PART OF THE PROBLEM."



Optimal filter cake thickness is 2/32 inch

Drill fluid must be adaptable to react in a predictable manner to support the HDD process over multiple types of subsurface conditions. New England soils can react unfavorably to basic drill fluid without proper additives. Basic drill fluid to soil reaction problems may include the following:

1. **Flocculation:** Brackish groundwater, low pH swamp water, hydrogen sulfide, and road salt chlorides chemically react with bentonite drill fluid causing flocculation of the bentonite, a cottage cheese appearance. The reaction makes the fluid much harder to push along the bore annulus resulting is less load carrying capacity and higher pressure in the annulus.
2. **Thick filter cake:** Jetting fluid needs sufficient pressure and turbulence to generate the differential pressure required to create a filter cake. Pressure is fully contained within a few feet of the drill bit. Differential pressure between the bore and the surrounding ground 'squeeze' the water out of the fluid leaving the bentonite flakes behind creating a mud cake around the hole. Ideally, the pressure in the bore annulus is completely confined by the filter cake to the bore annulus leaving surrounding ground fluids unaltered and unpressurized. The filter cake should form a balloon like structure to isolate the inside from the outside. Filter cakes have an optimal thickness of about 2/32 inch. Poor quality drill fluid can make the filter cake too thick or too weak to support the surrounding soil.

Reduced bit life and inefficiency

> ***"THE HIGH VARIABILITY OF NEW ENGLAND SOIL OFTEN FAVORS A BASIC DRILL FLUID BLEND AND THE USE OF APPROPRIATE ADDITIVES."***

3. **Bit balling in clay:** Jetting fluid needs sufficient pressure and turbulence and proper additives to help control sticky clay to clean a drill bit. Improper tooling for jetting makes for inefficient use of the jets for cleaning resulting in bit balling in clay.
4. **Bit wear from re-grinding abrasive granular soil:** High pressure jets quickly remove bit excavated material from the excavation face. The faster this material can be removed the more efficiently the bit can operate. Basic fluid with enhanced suspension properties can assist in abrasive quarts and some metalic mineral cuttings removal from the bit. Inefficient cutting removal from the face reduces bit life and efficiency.
5. **Cuttings clogging the hole:** Thicker drilling fluid is not a good idea. Thick drilling fluid removes less cuttings as the fluid can only support a percentage of its volume in cuttings. The result is a buildup of excess cuttings in the bottom of the bore often at joint upsets that chokes the circulation, increases annular pressure, and prevents the bit from cutting efficiently.
6. **Blinding screens or low cutting load on recycler:** HDD operations that use drill fluid recycling systems can have screens blinded and cutting loads that cannot be cost effectively removed thus requiring costly replacement of the drill fluid, or additional methods for cutting removal such as centrifuges. Additionally, sending contaminated drill fluid back into the hole will cause significant abrasion wear on your pumps and mud motor whenever sand content increases above 0.5 percent.
7. **Over excavation/sinkholes:** Unit weight will indicate over or under excavation. This will also show up in filter cake test.

Each of these drilling problems can be solved by designing a basic drill fluid program enhanced with appropriate additives suited for the soil. Besides being flexible in composition, drill fluid needs to bring the following attributes to the table:

- Low unit weight to carry the optimal cutting load without over-pressurizing the bore walls.
- Sufficient Yield Point (YP) low enough to allow low annular pressure to initiate fluid movement.
- Sufficient gel strength and short gel time to keep cuttings in suspension during rod changes at low flow or no flow.
- Ability to transmit high pressure at a design constant volume and density to ASSIST with mechanical excavation and to power down hole tools.
- Low Plastic Viscosity (PV) which is resistance to free flow to have the ability to carry excavated material in suspension at lower annular pressure then enable mechanical cleaning tools such as screens and cyclones to remove the cuttings.
- Ability to quickly form a filter cake with sufficient strength to support the hole and prevent fluid to ground contamination.
- Ability to carry additives to enhance drill fluid properties.

Basic drill fluid can be either a bentonite based or bentonite/with polymer additives fluid. In some scenarios an all polymer system might be applicable. Both can work but at different costs and care in mix design. Every supplier has technical support to assist you with developing a base fluid plus an assortment of additives necessary to adjust the drill fluid to your soils. Additives are used to enhance the basic drill fluid to address site specific soil conditions. Additives like polymers, xantham gum, PHPA's and others are often the critical factor in handling site specific soil related problems. Discussion of additives is a whole different topic from basic drill fluid understanding therefore will not be covered further. There are engineers that specialize in drill fluids that provide mix design, design modification, or full-time assistance with variable subsurface conditions that can provide recommendations for both basic drill fluid design and the application of various additives to enhance drill fluid properties when encountering various site-

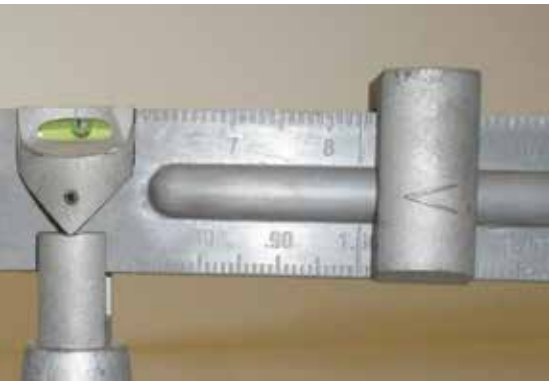
"NEW ENGLAND SOILS CAN REACT UNFAVORABLY TO BASIC DRILL FLUID WITHOUT PROPER ADDITIVES."

specific soil conditions. It is important to understand the proper use of additives so you do not become the source of drilling problems. Use your available resources wisely.

Planning and maintaining a basic drill fluid system includes field confirmation measurements recorded daily. **This data may be one of the drillers' best records for recognizing and documenting changed conditions**.

Understanding what the drill data means can provide significant information as to a cause of drilling problems.

- Soil description is possibly the most important piece of information in the selection of a drill fluid system. Not knowing subsurface conditions means you are agreeing to be part of the problem. No single drill fluid can perform efficiently for all soil conditions just like soil duckbill drill bits do not work well in rock. Basic information includes grain size to determine if soil is granular or cohesive, pH and hardness of soil and groundwater, and moisture content of the soil. Note that grainsize can provide an excellent indicator as to how the soil will perform during excavation. If the #200 sieve material is more than 20 percent and has a plastic index (PI) determined by Atterberg limits greater than 10 then the material will react like clay, otherwise it reacts as a granular material. Additionally, the Atterberg liquid limit (LL) provides a moisture content where a clay is at a boundary of acting like a clay solid (stable) or a clay liquid (unstable). When the formation moisture content is less than the Atterberg plastic limit then the formation clay will start to suck the water out of your drill fluid possibly swelling resulting in a smaller than drilled annulus.
- Match your pump and drill bit to optimize drill fluid circulation. Select a bit and pumping rate to clean the bit and remove the cuttings. Drill fluid needs velocity in the annulus to move suspended cuttings. A good rule of thumb is to have an up-hole fluid velocity around 80 feet per minute for a pilot hole. However, reaming enlarges the hole annulus thus significantly reducing return fluid annular velocities as a square root function of diameter; sometimes to less than 5 feet per minute. Annular Flow = $24.512*(Pump)/(Dh^2 - Dr2)$ with Pump in gpm and Dh and Dr equal to hole diameter and rod diameter in inches. Circulating time in minutes is Length of hole in feet/Annular Flow. Basically, it will take longer to clean a larger hole as you always need about 3 to 5 gallons of drill fluid to remove 1 gallon of excavated hole volume.



Drill fluid most efficient when transporting 8 – 12% solids

Keep marsh funnel readings between 45 – 75 seconds

Sand content significantly reduces equipment life

- pH and hardness: ALWAYS check mix water prior to making any drill fluid. Do not underestimate the value of soda ash or sodium carbonate (not bicarbonate) pH conditioning to get the best yield and efficiency out of your drill fluid. Hardness means that you have calcium in the makeup water. Calcium prevents the bentonite from fully yielding therefore you do not have the properties you need unless you add more bentonite (cost) to your drill fluid. Desirable mix water pH 8.5 to 9.5 and hardness less than 100 ppm.
- Unit Weight of both reconditioned supply and return fluids – As Baroid's Frank Canon asks: Are you cleaning the hole? Water is 8.3 ppg, fresh mud 8.5ppg about 1 percent. Everything above 8.5 percent may be considered as solids. Drill fluid is most efficient when it transports between 8 to 12 percent solids.
- Unit weight is the drill fluid property that provides internal support of the hole. The amount of support (pressure, P in psi) may be calculated by ((Drill fluid density in pcf)/144)*Vertical depth of hole below entry.
- The following procedure/example by Frank Canon lets you know if you are cleaning the hole:
  1. Hole area (in^2)/24.5 = Gallons of soil per foot of hole
  2. Gallons of soil per foot * Rod Length = Gallons of soil per rod
  3. Pump rate (gpm) * Minutes per rod = Gallons of drill fluid pumped per rod
  4. Gallons of soil per rod + Gallons of slurry per rod = Total slurry volume per rod
  5. Calculated % Solids (%Sc) = Gallons of soil per rod/Total slurry volume per rod
  6. Measure return fluid unit weight (ppg) = UW_m
  7. Actual percent solids content (%Sa) = UW_m * 8
  8. RESULT: If %Sc ~ %Sa 'Life is Good'
     If %Sc > %Sa Where did the solids go?
     If %Sc < %Sa Where are the extra solids coming from?
- Marsh funnel provides an indication of drill fluid viscosity, thickness and ability to suspend cuttings. A simple test is to put return fluid in a glass jar and watch to see if the cuttings stay in suspension (good) or collect in the bottom of the jar (bad). Low viscosity allows your pump to work as designed and relates to how much pump pressure and annular pressure is required to move drill fluid. High marsh funnel readings indicate that higher annular pressure is required to move the drill fluid increasing risk of uncontrolled drill fluid loss and eventually damage to the pump should the intake stroke cause cavitation. There will be a 'sweet spot' between low and high readings to effectively remove cuttings. Charge pumps help but are not the right answer. Pumps typically operate best when inflow to the pump is in the range between 1 and 3 feet per second. Typically try to keep marsh funnel readings between about 45 to 75 seconds. Water is 26 seconds.

When running mud motors, or when encountering highly abrasive soil, the following testing may be recommended by your drill fluid specialists:

- Sand Content significantly reduces pump, mud motor, and equipment life. (Less than 1 percent by volume)
- Filtrate 30 min test water loss reading between 6 ml to 8 ml, 2/32 thick cake, AND fold paper to observe for plastic or cracking in filter cake.
- Plastic Viscosity, PV = Rheometer Fann 600 – Fann 300, Desire PV ~20 for working drill fluid.
- Yield Point, YP = Rheometer Fann 300 – PV, Desire as close to PV as possible but typically ~15. Typically (as a rule of Thumb) YP for proper hole cleaning will be 1.5 to 2 times your bit size.
- Gel Strength (Lb/100 ft^2) at 10 seconds, ability of drill fluid to suspend cuttings in a timely manner after circulation has stopped. Excessive gel strength requires high pump pressure to restart circulation which can

cause high annular pressure possibly resulting in fracturing the hole and uncontrolled drill fluid loss. Low gel strength can cause cuttings to build up on the bottom of the hole resulting in restricting of the annulus size which again can cause high annular pressure and uncontrolled drill fluid loss. Gel Strength is calculated from a Rheometer by rotating at 1,100 RPM for 10 seconds; stop and wait 10 seconds, rotate at 3 RPM and take a Fann reading which will be the 10 second gel strength.

Basic drill fluid often needs help from additives to enhance the properties to drill effectively in New England soils. Additives are used to tailor the basic fluid to site-specific subsurface conditions. Each drill fluid manufacturer has additives that they use to enhance their drill fluid. The high variability of New England soil often favors a basic drill fluid blend and the use of appropriate additives. Proper interpretation of drill fluid data will tell you how the drill fluid is reacting to the soil.

Match your drill fluid to anticipated subsurface conditions. Take advantage of manufacturer's technical specialist to properly enhance the properties of your drill fluid for anticipated subsurface conditions. For high-risk projects, consider hiring independent certified drill fluid specialists to help setup a drill fluid program and/or provide full time services to manage your drill fluid system. In all situations, the drill fluid that best addresses the encountered subsurface conditions will provide the best daily production rates with the least amount of tool wear.

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TURNKEY ALLIANCE MANAGES LEAK-PRONE INFRASTRUCTURE

Complex Lining Meets (almost every) Challenge in Queens NY

By: Mario Carbone, Progressive Pipeline Management

Specs:
Project: 24-inch Cast Iron Main Rehabilitation with Starline ® 2000 Cured-in-Place-Lining
Location: New York City, Queens, 134th Street
Length of Project: 6,960 feet, 1.3 miles
Client: National Grid NY (NGNY)
Contractors: Progressive Pipeline Management (PPM) and Hallen Construction

After a big lining project, I often go back to the site and think about what went well and any lessons learned that we could apply to future projects. I was standing on the corner of 134th Street and 97th Ave. in Queens, New York City. Cars were parked on both sides of the one-way street. There was a constant hum from cars and vroom from the trucks two blocks north along the Van Wyck Expressway. Overhead was the intermittent high-pitched whir of plane engines as they fly in and out of JFK airport 2 miles to the South. PPM was tasked with remediating an underground gas main that traversed over 1 mile in this densely populated, heavily trafficked urban area.

The 24-inch cast iron National Grid gas main pipeline underneath 134th Street was lined using the Starline® Cured-in-Place-Lining (CIPL) technology. The 1.3-mile project extended along 134th Street from 97th Ave. and the Van Wyck Expressway all the way to 116th Avenue. PPM's advanced leak repair technology is a trusted strategy enabling gas utilities to comply with the PHMSA PIPES ACT regulations for reducing methane emissions. CIPL technology is integral to National Grid's long-term strategy to manage leaking infrastructure.

> **"THE CIPL ELIMINATES LEAKS, REDUCES EMISSIONS AND EXTENDS THE LIFE OF THE PIPELINES BY ANOTHER 100 YEARS, SUPPORTING OUR NET ZERO VISION AND NY CLCPA MANDATE."**
>
> -Saadat Khan, Director Gas Distribution Asset & Engr., NYS at National Grid

PPM crew with ARIES LETS CCTV camera used to inspect the pipeline prior to lining

The Starline ® Cured-in-Place-Lining Inversion Drum on 134th Street

Concrete Median in Williamsburg, Brooklyn and site of the Chair Challenge

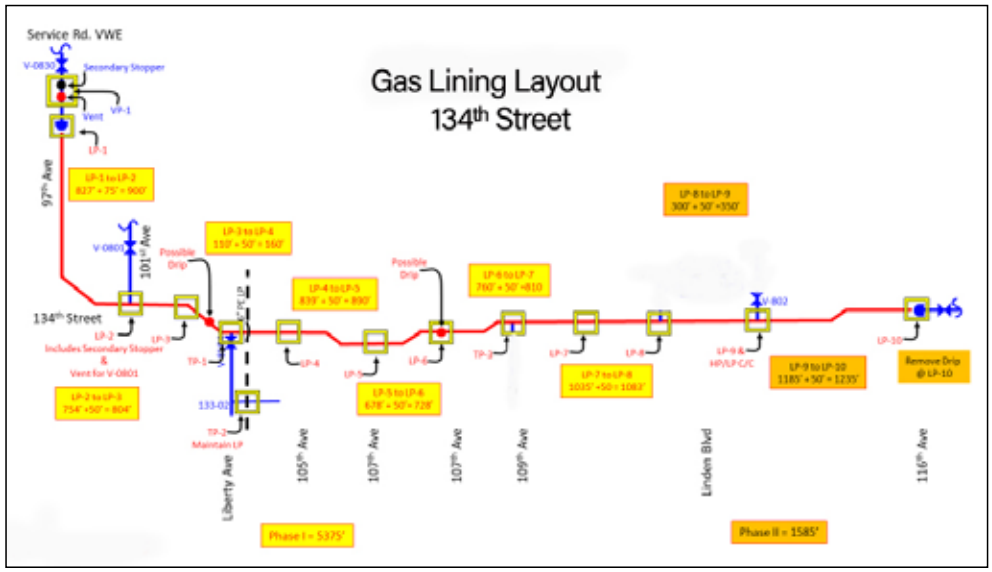
TACKLING LEAK PRONE PIPE WITH A TURNKEY SOLUTION

This section of cast iron gas main in Queens is part of National Grid's strategic mandate to rehabilitate over 100 miles of leak prone pipe throughout New York and New England. Taking advantage of the 100+ years of additional life that the Starline CIPL restores back into their aging infrastructure, National Grid's Leak Prone Pipe is being lined and rehabilitated. PPM and Hallen Construction, National Grid's primary contractor, deliver a

> **"WE SPEAK THE SAME LANGUAGE."**
>
> -Shep Poole, President, Hallen Construction

"THE CIPL ELIMINATES LEAKS, REDUCES EMISSIONS AND EXTENDS THE LIFE OF THE PIPELINES BY ANOTHER 100 YEARS, SUPPORTING OUR NET ZERO VISION AND NY CLCPA MANDATE."

-Saadat Khan, Director Gas Distribution Asset & Engr., NYS at National Grid



The Gas Lining Layout (GLL) maps the lining project with locations and details of the pits for lining and gas shutdown

turnkey solution that has been a cost-effective and critical alliance for National Grid's Leak Reduction Program.

The dense, urban neighborhood in Queens has modest single-family homes, apartments, and tree-lined sidewalks. Along the sixteen-block stretch is a Sikh temple, a used car lot, a 24-hour grocery store and a few local bars and restaurants.

This was a complex project. 1.3 miles is quite long for a CIPL project. The 24-inch main under 134th Street changes direction multiple times with zigs and zags. Every joint where a length of the cast iron pipe connected to the next length of pipe was leaking. PPM needed ten pits for the lining and two additional pits for the gas shut off, an essential step in the CIPL process.

When we talk about lining projects, engineers often ask, 'how long did it take?' On paper, the planning, excavation, cleaning, pipe preparation, lining and completion took approximately four months. But that is not completely accurate. It really took five decades, which is as long I have been in the gas pipeline business. The relationships with Hallen, National Grid and PPM were built on trust and competence across several decades. We execute complex lining projects successfully, safely, and cost-effectively, because we have an alliance that is focused on a single goal, successfully eliminating leaks from existing gas mains.

AN EXTRAORDINARY ALLIANCE

I have had the privilege to know and work with Hallen and National Grid almost the entire 52 years I've been in the gas industry. The combined expertise encompasses the best of rehabilitation technology, pipeline construction, gas engineering and distribution practices. Our training took place on these streets of New York, and the northeast.

Hallen has been in business for ninety-five years. Hallen and National Grid, formerly Brooklyn Union Gas, have been working together since the early 1970s. I've known Hallen since I started out at Brooklyn Union Gas. As PPM's construction management arm of the turnkey operation, Hallen handles the excavation, the pipe work, paving and putting it all back together. The crews support PPM with manpower, traffic control and offer invaluable input at every stage.

"We speak the same language." explained Shep Poole, President of Hallen Construction. *"Whatever PPM or National Grid needs for the project, it will get done. Our partnership operates from a deep level of trust while at the same time being open to new ideas and solutions."*

Most of PPM's engineering team was at one time part of the National Grid ecosystem. We learned the gas industry the old-fashioned way, starting at the "Brooklyn Union Gas School of Hard Knocks." They gave us shovels and put us to work in a ditch. I loved every minute of it. Brooklyn Union Gas (BUG) ultimately became National Grid. I worked my way through National Grid and "retired" after 35 years. I "unretired" twenty years ago to join David Wickersham at PPM.

David Wickersham, PPM's CEO said about the alliance, *"Our alliance with Hallen Construction and the Turn-Key CIPL program for National Grid is an industry first. It demonstrates proven value and showcases our companies' mutual commitment to excellence. We offer CENTURIES of experience in gas system engineering, gas construction, excavation, safety and pipeline rehabilitation in a single offering."*

> ***"OUR ALLIANCE WITH HALLEN CONSTRUCTION AND THE TURN-KEY CIPL PROGRAM FOR NATIONAL GRID IS AN INDUSTRY FIRST."***
>
> **-David Wickersham, CEO, PPM**

He continued, "This experience and partnership enables PPM, with Hallen, to synchronize all aspects of pipeline rehabilitation seamlessly from initial project design to final restoration."

STEP ONE – PLANNING

Once National Grid had identified that this pipe would need to be rehabilitated, their engineers provided drawings and

> **"WE REALLY WENT THE EXTRA MILE TO CARRY OUT WHAT WE ARE PLEDGED TO DO BY REPLACING THE ENTIRE MAIN."**
>
> **- Joe Pantalone, Vice President, Wastewater Division, ACUA**

PPM crew prepare the transfer hose for lining the 24" cast iron natural gas pipeline on 134th Street

specified the sections that we were to line. We studied every detail, collaborated with our internal teams, and designed the Gas Lining Layout (GLL). The GLL maps the entire project laid out from the gas perspective and the lining perspective.

The location and details of the lining pits and gas shutdown pits were identified along 134th Street and 97th Street. Our operations team led by Tom Nestoras weighed in on the execution and safety protocols.

When we presented the Gas Lining Layout to National Grid, we talked through the geographic location of the ten pits that were required to support the lining. National Grid has a gas feed system that regulates gas services in the neighborhood. By redirecting the service to an alternate main, they ensured that service to their customers was never interrupted during the project. Gas shutdown procedures and pits were also reviewed.

The GLL worked perfectly... on paper. However, when we walked the site with National Grid and Hallen to see the exact sites for excavation, we realized that we had not fully considered the impact that one of the pits would have on traffic at a key intersection. Hallen recommended we move that specific pit about 25 feet to minimize the traffic impact.

LINING COMPARED TO TRADITIONAL TRENCH AND REPLACE

National Grid could have opted not to install a CIPL in this 1.3-mile-long section of gas main. Upon closer analysis, however, this would have been a more daunting challenge. To 'trench and replace' would have meant excavating over every connecting joint within the scope of the project. That would have required 580 individual pit openings. Each pit requires a road permit. The pits are large and sheeted because the pipe is large in diameter. There would have been a pit every twelve feet along the 1.3-mile section of pipe. Not only would the hard costs have been astronomical, the carbon footprint and environmental impact of pulling all that soil out of the ground and then having to replace it all again is unthinkable. Furthermore, the entire project would have taken about two years to complete.

Rehabilitating the pipeline with 12 pits total was the most sensible option.

"PPM and Hallen are crucial to National Grid's Leak Reduction Program." Saadat Khan, Director Gas Distribution Asset & Engr. NYS at National Grid explained. *"CIPL rehabilitates large diameter leak-prone pipes permanently. The technology eliminates leaks, reduces emissions and extends the life of the pipelines by another 100 years. They support the Company's net zero vision and NY CLCPA mandate."*

PREPARATION & LINING

After the gas was shut down, the pipeline was excavated, purged and cut up for PPM's crews to lead the lining portion of the scope. Using a CCTV Aries LETS camera, PPM examined the pipe internally looking for anomalies before cleaning, while also confirming that the pipeline was dry. After the first camera inspection, the pipe was sandblasted and cleaned. The next CCTV inspection showed that it was clean without any obstructions.

Lining was executed section by section, pit to pit. As soon as the first pit was ready and prepared, the crews lined, cured and moved to the next section. It was seamlessly orchestrated by the field and lining teams. After lining, the pipeline was inspected for the third time using CCTV. It looked exactly like it should.

The pipeline was put back together with compression couplings. Pressure tests were executed per National Grid's test procedures and oversight. Once the team verified there were not any leaks, the pipe was blown down. Cathodic protection was applied to the couplings, then the pits were backfilled and paved. The main was put back online.

THE CHAIR CHALLENGE

Challenges come from different directions, and this project was no exception. The large diameter services and major connection points at some intersections required special attention. National Grid has a pressure control device that allows the high-pressure gas to be regulated into the low-pressure system. A unique shut-down procedure added some complexity that required the lining project to be divided into two phases.

Sometimes the challenges come from the neighborhood, unrelated to the pipeline itself. The team executed a project for National Grid in Williamsburg, Brooklyn with an unforeseen challenge. The pipeline to be remediated was in the middle of the highway, under a concrete median. Across the street was a synagogue. The team was prepping for a few days on the street and in the median. When we showed up early Saturday morning to line the pipe, on the median were about 300 wooden folding chairs, stacked about 6 high. 'What in the heck are all these chairs doing here?' I cried. The name of the synagogue was stamped on the chairs. I knocked on the door at the synagogue. No answer. A police car drove up. He said the chairs belong to the Rabbi. I walked back towards the synagogue. The policeman asked, "Where are you going?"

'I'm going to tell him to get the chairs out of here!' I exclaimed. The policeman laughed.

'Rabbi, are those your chairs?' I asked. "Yeah," he replied. He said he had seen our crews working on the pipeline.

I asked, 'Why are your chairs in the middle of the street? Our guys will put them back for you.' I offered.

"No. I have to put them somewhere." The Rabbi answered. "We have services on Saturday, and I need the space in our auditorium." He explained that he stacks his wooden chairs on the median in the middle of the street every Friday afternoon for the services Friday night and Saturday. "This is where I've been putting them for years. You can have the space back Monday." Then he closed the door.

Those chairs never moved until Monday morning. The team had to call National Grid and explain. We laugh about it now. We were able to adjust the project schedule without any adverse impact. I have 100 percent certainty that whatever complications or challenges come up, we can always find a workable solution.

The effectiveness of the PPM-Hallen Construction turnkey alliance boils down to three things. Our collective expertise across disciplines minimizes our blind spots; our decades of experience and connections in the region allow us to lessen the impact that unforeseen obstacles throw at us; and the extraordinary trust we have in each other enables us to put the client's issues front and center. As lining becomes integral to operator's strategy for leak elimination, we encourage more operators to consider the turnkey model for infrastructure management.

Progressive Pipeline Management (PPM) is a NJ-based, full-service contractor that has been committed to improving the safety and longevity of pipeline infrastructure for more than 20 years. PPM offers the latest trenchless robotics and technologies to perform condition assessments and renew aging, damaged or leaking underground infrastructure, including pipelines of all types and sizes. The Starline® Cured-In-Place-Lining (CIPL) technology is the only approved liner for natural gas pipelines and adds 100 years of new service life to the existing pipe while eliminating methane leaks and emissions. This innovative and green solution has been installed in over 1 million feet of gas mains in 20 states.

ABOUT THE AUTHOR:

***Mario Carbone**, Chief Operating Officer leads PPM's key projects and spearheads the testing of new technologies and robotics. He spent thirty-two years in design, maintenance and construction with Brooklyn Union Gas/KeySpan Energy and ten years as the senior manager for gas research and development with KeySpan Energy. Mario holds three gas pipeline industry patents for new technologies in gas pipeline purging, live gas polychlorinated biphenyls (PCBs) pipeline sampling, and live service pipeline transfer without interruption. In addition to his expertise in Starline® CIPL, engineering and managing field operations, Mario is versed in current regulations for corrosion and pipeline environmental procedures. His inventiveness to overcome challenges led PPM to win the Trenchless Technology Project of the Year multiple times.*

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DO YOUR MANHOLES LOOK LIKE THIS?

By: Ray Bahr, Green Mountain Pipeline Services

INTRODUCTION

Several precast manhole structures were recently rehabilitated by Green Mountain Pipeline Services, LLC (GMPS) in the two towns of Westport, CT and Plymouth, CT. Both town projects involved deteriorating precast manholes that were located immediately downstream of a force main discharge.

Force mains, particularly those with long travel times, can cause the flow stream to become anaerobic, resulting in the creation of high levels of H2S. Hydrogen sulfide (H2S) is a colorless, poisonous gas with a rotten egg odor, which is commonly referred to as "sewer gas". When that flow is discharged into the receiving structure, the transition from anaerobic to aerobic transforms the H2S into sulfuric acid. Sulfuric acid is highly corrosive, and eats away at Portland cement and metallic structures, in both pipes and manholes. This corrosion usually affects structures two to three segments downstream of a force main discharge. As can be seen in Figure 1 for both Westport and Plymouth, over time the corrosion in a manhole can be significant, creating unsafe conditions. This condition is also seen at pump stations with low cycle times, where H2S gas can be generated in the anaerobic conditions in the wet well and force main.

The Town of Westport identified three manholes that were severely deteriorated from hydrogen sulfide downstream of the discharge point of a 12-inch diameter, 2-mile-long force main. The force main discharge manhole was particularly difficult to access since the force main entered the manhole from the bottom as shown in Figure 2. This configuration required bypassing of the force main flow to allow for rehabilitation. A bypass connection in the force main was installed thirty feet upstream of the discharge manhole, resulting in additional cost for the Town. What is interesting is that these manholes were only six to eight years old and were epoxy coated from the manufacturer. What was not known at the time was that the joints in the manholes should have been filled in with a cementitious material and then epoxy coated to ensure the manhole epoxy coating was monolithic throughout the structure with no pin holes.

Figure 1. Over time corrosion in a manhole can be significant, creating unsafe conditions

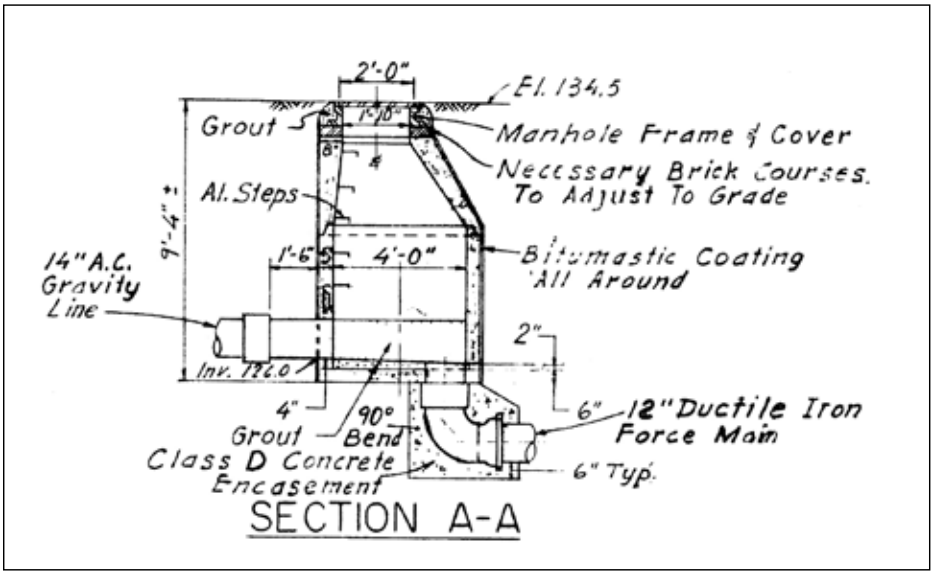

Figure 2. The force main discharge manhole was particularly difficult to access

Figure 3. Completed rehabilitated manholes

The Westport manholes were rehabilitated using a composite system that Green Mountain Pipeline Services has had tremendous success with for over the past 20 years. The manholes were first pressure washed and after being properly prepared 1 to 2 inches of Strong Seal MS-2C was applied and troweled to ensure a good mechanical bond with the original structure. After troweling the surface was lightly brushed to create a textured surface which increases the surface area of the applied MS-2C and also creates the opportunity for a mechanical bond between the cementitious liner and the epoxy. After the MS-2C was cured the GMPS crew applied 125 mils of Parson's Parsonpoxy SEL-80.

A similar situation existed in the Town of Plymouth, CT where three manholes downstream of a 10-inch diameter force

Figure 4: Rehabilitation on this manhole was done 14 years ago using the same composite system

FORCE MAINS, PARTICULARLY THOSE WITH LONG TRAVEL TIMES, CAN CAUSE THE FLOW STREAM TO BECOME ANAEROBIC, RESULTING IN HIGH H2S LEVELS.

main, with a 5,165 foot long force main discharge, were also suffering from severe H2S corrosion. These three manholes received a ½-inch to 1-inch coating of Strong Seal MS-2A and 125 mils of Parson's Parsonpoxy SEL-80.

Figure 3 shows the completed rehabilitated manholes for Westport and Plymouth. Note that in the Westport photo on the left the flows were bypassed and the force main discharge connection can be seen at the bottom of the manhole. On the right is the Plymouth, CT discharge manhole and the force main enters the structure on the left.

A manhole which had experienced severe H2S corrosion prior to rehabilitation is shown in Figure 4. The same composite system was used on this manhole as well. The rehabilitation on this manhole was completed in 2008 and 14 years later it still looks like it was just rehabilitated.

Green Mountain Pipeline Services, LLC has extensive experience in manhole and wet well rehabilitation and has used the Strong MS-2A and Parsonpoxy SEL80 for over 20 years, only experiencing success with this system.

ABOUT THE AUTHOR:

***Ray Bahr PE**, is the VP of Sales and Business Development at Green Mountain Pipeline Services and has over 35 years of experience working in and around collection systems. He has varied and extensive experience in SSES, I/I studies, cleaning & TV, grouting of manholes and pipelines as well as cured in place pipe. He is also experienced in pump station design, pump selection, low pressure sewer design and operations. He has held various roles as estimator, operations manager, project manager and business development. He holds a NEWEA Collections System Grade IV certification and is a past NASSCO BOD member.*

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HDPE ELECTROFUSION PIPE JOINTS

By: Camille George Rubeiz, P.E., F. ASCE, Plastics Pipe Institute, Inc. (PPI)

High-density polyethylene (HDPE) pipe has been used for municipal and industrial water applications for almost 50 years. HDPE's heat-fused joints create a leak-free, self-restrained, monolithic pipe structure. The fused joint will also eliminate infiltration into the pipe and exfiltration into the environment. HDPE pipe has other benefits including chemical, abrasion, fatigue, seismic and corrosion resistance, and is designed for water and wastewater applications meeting the latest AWWA C906 and ASTM F714 standards.

Heat fusion can be used to join sections of HDPE pipe, including high-performing PE 4710 pipe, while electrofusion is used to add couplings, tapping tees, branch saddles and other fittings. Proven to be an extremely reliable joining system, an electrofusion joint is heated internally, either by a conductor at the interface of the joint or by a conductive polymer. Heat is created as an electric current is applied to the conductive material in the fitting.

TYPICAL ELECTROFUSION JOINT

All heat fusion joining methods require that there is no water flowing or standing in the pipe that can reach the fusion surfaces. Flowing water in contact with the fusion surfaces during the assembly or fusion cycle must be avoided as it can cause voids as the moisture turns into expanding steam during the fusion process. PE squeeze-off tools can be used to control the flow of water in cases where a valve is not present or will not shut off completely - refer to ASTM F1041.

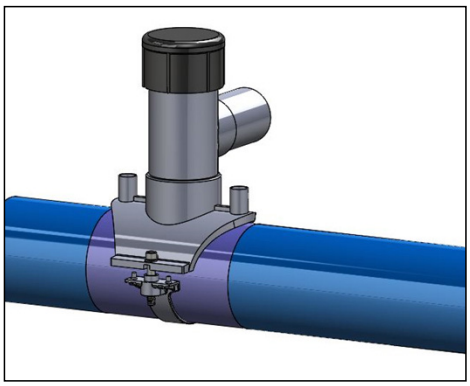
Electrofusion fittings can be installed in ambient temperatures as recommended by the manufacturer. A typical qualified temperature range for installation is 14°F minimum to 113°F maximum. Contact the fitting manufacturer to verify.

Improper pipe preparation is overwhelmingly the leading cause of unsuccessful electrofusion joint. The goal of pipe peeling is to remove a thin layer of the outer pipe surface to expose clean virgin material beneath.

> **"PIPE PREPARATION IS AMONG THE MOST IMPORTANT ASPECTS OF MAKING A SOUND ELECTROFUSION JOINT"**

Pipe surfaces exhibit surface oxidation from the extrusion process, transportation, and outdoor exposure. This oxidation acts as a physical barrier and therefore those surfaces cannot be heat fused. Simply roughing the pipe surface is not sufficient. In order to achieve fusion, this layer must be removed. Even new pipe must be properly peeled before a fusion will be successful.

Electrofusion in Pit



Saddle Electrofusion

An adequate minimum amount of material that must be removed is just seven one-thousandths of an inch (.007") – approximately the same thickness as two sheets of ordinary paper.

Sandpaper, Emory cloth, or other abrasives should ***never*** be used to prepare a pipe surface for electrofusion. The only tools are those that are specifically designed for electrofusion peeling, which can peel the pipe surface to a controlled depth. Types of scrapers that are ***not*** recommended are "hand scrapers" such as wood rasps and metal files.

"Witness" marks should be made on the pipe surface prior to peeling with a permanent marker, such as a Sharpie® marker, which dries fast and contains no oils.

Avoid all possible recontamination of the prepared surface. This includes handling or even touching the peeled pipe surface or the inside of the coupling as body oils and other contaminates can affect fusion joint performance. If the surfaces become contaminated, clean thoroughly with a clean, lint-free towel and a minimum 90 percent concentration of alcohol isopropyl and allow to dry before assembling. Do not use alcohol with any additives other than water.

Gouges deeper than 10 percent of the pipe wall thickness require that the pipe section be cut out and replaced to maintain the maximum pressure rating of the pipe.

The *MAB Generic Electrofusion Procedure for Field Joining of 12 Inch and Smaller Polyethylene (PE) Pipe (MAB-01-2022)* guide has been updated by the Municipal Advisory Board (MAB) and is available as a free download from the MAB website: **www.plasticpipe.org/MABPUBS**

ABOUT PPI:

The Plastics Pipe Institute, Inc. (PPI) *is the major North American trade association representing the plastic pipe industry and is dedicated to promoting plastic as the materials of choice for pipe and conduit applications. PPI is the premier technical, engineering and industry knowledge resource publishing data for use in the development and design of plastic pipe and conduit systems. Additionally, PPI collaborates with industry organizations that set standards for manufacturing practices and installation methods.*

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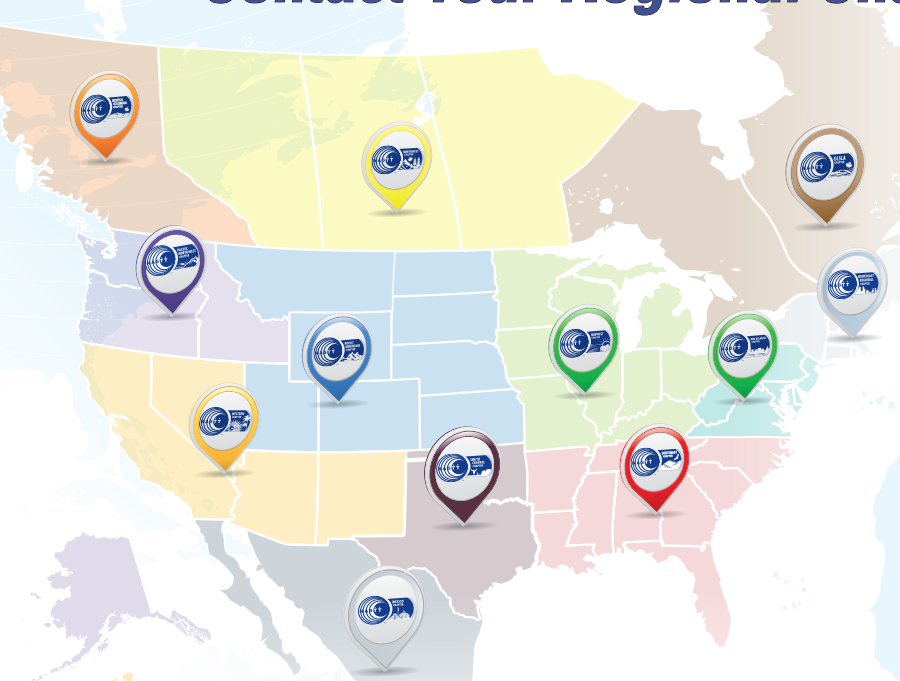

The grassroots of NASTT is a network of 12 Regional Chapters throughout the United States, Canada and Mexico. Regional Chapters network at the local level, share infrastructure challenges and develop new ideas. Regional Chapters hold various events throughout the year, and like NASTT, are dedicated to the advancement of trenchless technologies for the benefit of the public and the environment.

With your NASTT membership you are automatically enrolled not only in the national and international organization, but also in your Regional Chapter. So join today and get to know the "local heroes" that are making their communities better places through the innovative engineering solutions of trenchless technologies.

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SIXTH ANNUAL NASTT-NE NORTHEAST TRENCHLESS CONFERENCE 2022 MAINE SUCCESS!

Luxurious Portland Sheraton at Sable Oaks Conference Center was host venue for the conference

Building on previous conference successes and ongoing outreach efforts by the NASTT-NE Chapter, the sixth annual NASTT-NE Northeast Trenchless Technology Conference 2022 held November 14 – 15 at the luxurious Portland Sheraton Sable Oaks Conference Center in Portland Maine reminded everyone once again of the value and productivity of live, in-person gatherings. Very well attended, the Conference reaffirmed and strengthened the presence of trenchless technology in Maine, the easternmost state in the US.

Delegates agreed the 6th annual conference was another worthwhile happy success. The Northeast Trenchless Conference has become a well-established must attend opportunity for friends and colleagues, both old and new, to convene again, exchange ideas and the latest innovations and advancements, and continue

Fun social evening at De Millos on the Water, a former car ferry converted into a huge floating restaurant, was a Conference highlight

Networking and close personal access to industry expertise is an important aspect of the annual NASTT-NE Conference

the noble work of raising awareness of the many benefits and application of various trenchless methods across the Northeast.

More than 150 trenchless professionals, municipal attendees, industry exhibitors and students gathered together to enjoy a full day of networking and 13 peer-reviewed, presentations in two tracks, detailing environmentally friendly trenchless solutions and cost-saving opportunities for municipalities and utilities. There were also 17 informative trade exhibits showcasing a wide range of leading edge trenchless and condition assessment technologies, along with a morning live outdoor trenchless

Free transportation was provided to Conference delegates between the Conference Center and downtown Portland

NASTT-NE Chair Eric Schuler gives opening remarks at the kick-off breakfast

demonstration of UV CIPP proudly presented by the Vortex Companies.

The conference began with a lively fun social evening at De Millos on the Water in the downtown Portland harbor. This huge floating restaurant is a converted old car ferry and offers spectacular views of both the harbor and downtown Portland.

To ensure a good safe time was had by all, free bus service was provided between downtown and the Conference Center in South Portland. It was a relaxing and enjoyable evening on the water and everyone was in good spirits.

Next morning events begin with welcoming remarks from Eric Schuler, NASTT-NE Chapter Chair, and Matthew Izzard, the

Delegates took in a very entertaining keynote address from Matt Timberlake, CAO, Vortex Companies, and mainstay of trenchless technology in Maine

UMass Lowell NASTT Student Chapter members speak at the kick-off breakfast

UMass Lowell Student Chapter members are an integral part of each year's Trenchless Technology Conference, helping with logistics, networking, and having a good time

NASTT Executive Director. Matthew commended the Northeast Chapter members for their tremendous growth and role as trailblazers among NASTT Chapters. The upcoming No-Dig Show 2024 in Providence RI is an excellent opportunity to raise the profile of trenchless in the Northeast. Matthew's remarks were followed by comments from UMass Lowell NASTT Student Chapter members on their yearly activities.

After the morning's technical sessions and live field demo on UV CIPP, Matt Timberlake, CAO at Vortex Companies, and one of the founding Board Members of the NASTT-NE Chapter gave a very informative and heart-warming lunchtime keynote address. Interweaving the history of the development of trenchless in Maine, with his own early memories and personal anecdotes, Matt gave a solid plain-spoken presentation not soon to be

Matt Timberlake, CAO Vortex Industries, receives a plaque of appreciation from NASTT-NE Chair Eric Schuler (right) and Vice-Chair Jonathan Kunay (left), for his lunch-hour keynote presentation

Delegates had easy access to 17 trenchless technology exhibits featuring innovative new technologies

Informative & Educational Trenchless Technology Presentations

Brian Dorwart P.E., Brierley Associates, Tom Loyer, ECI Engineers Construction Inc.: "Trenchless Goes Hybrid"

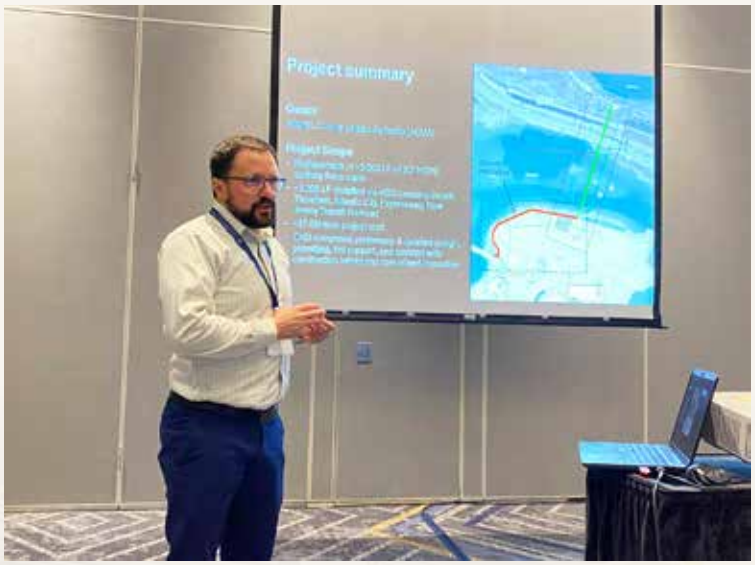
Dan Scott, P.E., Kleinfelder, "Challenges Beneath the Streets of Downtown Newport"

Steve Soldati, AEGION: "Innovative Repair Solutions to Address Bridge-Mounted Water Mains"

forgotten! Following his speech, he was presented with a plaque of appreciation by NASTT-NE Chair, Eric Schuler and NASTT-NE Vice-Chair, Jonathan Kunay. Many thanks Matt for such an inspiring lunch hour presentation! Eight more technical sessions throughout the afternoon rounded out the day's proceedings.

Advancing the Chapter's training and educational goals, Dr. Raj Kumar Gondle, faculty advisor for the UMass Lowell Student Chapter, along with Dr.Pradeep Kurup, and student members, met industry professionals at their exhibit booths, participated in the conference as presenters, and also provided logistical support for the conference, such as staffing the registration table, and other help as required. Once again the students were an integral part of the conference – clearly the future for trenchless is bright!

Tyler Pitts, GHD "Water/Sanitary/Storm Trenchless Evaluation"



Mike Bisignani, GHD "ACUA Ventnor Margate Emergency FM HDD Replacement"

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Visit www.nenastt.org
for information on future conferences

Live field demos are a much anticipated regular conference highlight

The NASTT-NE Chapter Board of Directors thanks everyone for their participation in a very successful sixth annual 2022 NASTT-NE Northeast Trenchless Conference. We wish to extend our appreciation to all our volunteers, presenters, moderators, and attendees for their participation, time and effort. A special note of thanks also goes out to our Premium Sponsors & Exhibitors. We thank you for your support!

Join us again in Albany NY November 13-14, 2023 where we continue building towards a bright future ahead for trenchless technology in the northeastern US!

"THE NASTT-NE CHAPTER BOARD OF DIRECTORS THANKS EVERYONE FOR THEIR PARTICIPATION IN A VERY SUCCESSFUL SIXTH ANNUAL NASTT-NE NORTHEAST TRENCHLESS CONFERENCE. WE LOOK FORWARD TO SEEING YOU LATER THIS YEAR IN ALBANY NY NOVEMBER 13-14!"

For further details and updates please visit:

www.nenastt.org

We look forward to seeing everyone again November 13 - 14, 2023 in scenic Albany New York for the Seventh Annual Northeast Trenchless Technology Conference!!!

THANKS TO OUR SPONSORS, EXHIBITORS & KEYNOTE SPEAKER!

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KEYNOTE SPEAKER

Matt Timberlake *currently serves as the Chief Administration Officer at Vortex. Matt oversees the HSE, HR, Fleet and Procurement divisions, and helps develop and implement processes designed to improve performance for business units and employees. Matt is focused on inspiring his team to change how underground infrastructure in maintained globally. Prior to joining Vortex, Matt grew up in the family business, the Ted Berry Company, where he started his career as a field technician in industrial facilities and provided cleaning services to municipal wastewater collection systems in the Northeast. Matt went on to serve as President of Ted Berry, where he expanded the business from a cleaning and CCTV contractor to offering a full suite of trenchless solutions ranging from CIPP lining and pipe bursting to manhole rehabilitation and slip lining. In February 2019, Vortex Companies acquired the Ted Berry Company.*

"A SHIP IN HARBOR IS SAFE, BUT THAT IS NOT WHAT SHIPS ARE BUILT FOR."

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NO-DIG SHOW 2024

Call for Abstracts

SUBMISSION DEADLINE: JUNE 30, 2023

The North American Society for Trenchless Technology (NASTT) is now accepting abstracts for its 2024 No-Dig Show in Providence, RI at the Rhode Island Convention Center April 14-18, 2024. 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 by June 30, 2023 on the NASTT website:

nastt.org/no-dig-show

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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