MIDWEST JOURNAL OF

TRENCHLESS TECHNOLOGY 2020

OFFICIAL PUBLICATION OF THE MIDWEST SOCIETY FOR TRENCHLESS TECHNOLOGY

MSTT: A NON-PROFIT ORGANIZATION

Force Main Replacement

What Extra Load?

Lining Multiple Bends

Dundee Road Rehab

Over 30 Years Serving the Midwest and the World!

Trust the international pipe inspection experts from right next door.

Headquartered in Indiana, R&R has been providing unique inspection services to the municipal, nuclear, petrochemical, and industrial sectors throughout the world since 1991. We have strived to be your single source subsurface inspection contractor utilizing the latest in technology coupled with a full staff of trained professionals. Taking on the tough and near impossible projects is our specialty. R&R Visual has pioneered many of the technologies that they use and many have become international standards for sewer inspection and other types of pipeline inspections. We have the ability to inspect pipelines from 1 inch to 30 feet plus in diameter, drilled shafts from 10 inch to 20 foot diameter, and nearly any other subsurface cavity, cavern, or hole.

SERVICES

- Video Inspection
- Sonar Inspection
- Lateral Launch Video Inspections
- Laser Pipe Profiling
- Downhole Inspections
- 360° Scanning Cameras
- Manhole/Confined Inspections
- Smoke Testing
- Deep Tunnel Inspections
- Off-Road Capability
- Eco-Sensitive Inspections
- Drilled Shaft Inspections
- Explosion Proof Equipment
- High Security Qualified
- Petro/Nuclear/Industrial
- High Pressure Cleaning
- Inclination Reporting

R&R VISUAL
Subsurface Search Team

www.seepipe.com Rochester, Indiana 800-776-5653

Environmentally sensitive projects are our specialty!
Tough, and near impossible jobs call for creativity and experience. Let us help you complete your project on time and in-budget!

Here's Why PE 4710 Pipe is the Best Solution for Water Systems

With 100-year design life, zero allowable leakage and the largest internal diameter, HDPE piping is superior for open cut and trenchless installations. It's even recognized by worldwide standards including AWWA C901 and C906, and in the new AWWA M55 Manual.

Just ten of the many reasons HDPE Pipe is the best pipe solution

Properly designed and installed PE 4710 pipe provides:

1. 100-year design life
2. Zero - leakage allowance
3. Larger internal diameter and flow capacity
4. C coefficient of 150 - up to 50% higher C than others
5. Corrosion and tuberculation resistance
6. Lowest initial cost and lowest life cycle cost/CSIRO
7. Popular for open cut & trenchless applications
8. Superior resistance to water hammer, fatigue, earthquakes, ground movements and freeze-thaw cycles
9. Safety factor of ≥ 2
10. DIPS and IPS sizes up to 65 inches

PLASTICS·PIPE·INSTITUTE® 70 YEARS
THE VOICE OF AN INDUSTRY

HDPE MUNICIPAL ADVISORY BOARD

For more details, visit PPI and MAB websites **https://plasticpipe.org/municipal_pipe**

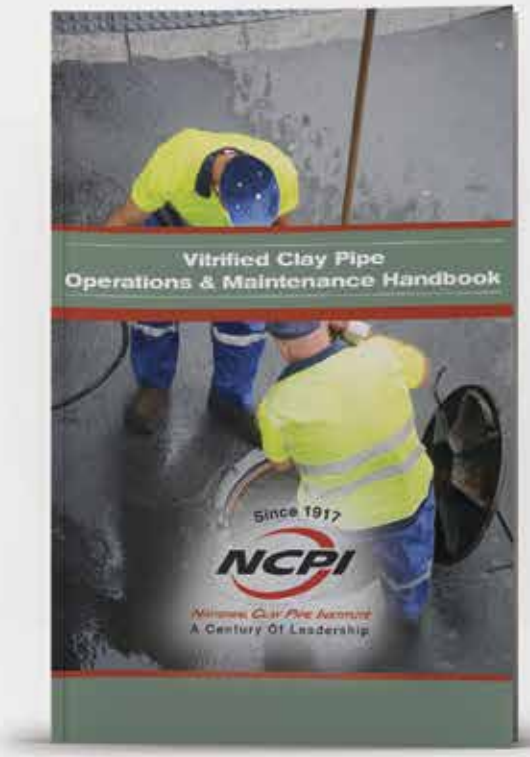
PE4710 Pipe: The Best Solution for Water Systems

KNOW YOUR OPTIONS

WHEN CLEANING PVC, THIS IS YOUR ONLY TOOL CHOICE.*

WHEN CLEANING VCP, THE CHOICE IS YOURS.

The natural abrasion resistance, hardness and ceramic properties of **Vitrified Clay Pipe** allow for usage of a full arsenal of cleaning tools to clear pipelines of common (and uncommon) obstructions. The ability to use these aggressive cleaning tools and methods in VCP as part of a well-structured CMOM (Capacity, Management, Operation & Maintenance) program have been proven to reduce SSOs (Sanitary Sewer Overflows). The restrictions on usage of mechanical methods and the severe limitations on hydro-jet methods imposed by flexible thermoplastic pipe or CIPP products prohibit restoration of a line to its original operational capacity.



Since 1917
NCPI
NATIONAL CLAY PIPE INSTITUTE
A Century Of Leadership

Abrasion resistance is just one of the reasons Vitrified Clay is the only pipe material that hasn't been bypassed by modern technology.

* Per recommendations of the EPA.

Learn More at ncpi.org/workshops

NCPI.ORG

info@ncpi.org | (262)742-2904

CONTENTS

Features:

Also:

Departments:

Leonard Ingram
334.872.1012
leonard@engconco.com

Chris Schuler
317-653-5203
chris.schuler@millerpipeline.com

PUBLISHER

A TO B PUBLISHING INC.
662 Dudley Avenue
Winnipeg, MB CANADA
R3M 1R8

EDITORIAL

Andrew Pattison
204.275.6946
marcomap@shaw.ca

ADVERTISING SALES

Bert Eastman
204.997.6371
bert@atobpublishing.com

PRODUCTION TEAM

harper media
your social media strategy & web marketing partner
700 - 200 Main Street
Winnipeg, MB
R3C 1A8

DIRECTOR

Aaron Harper
204.318.1121 xt. 101
aharper@harpermedia.ca

LAYOUT & DESIGN

Joel Gunter
204.318.1121 xt. 108
joel@harpermedia.ca

Printed 12/20 in Canada.

MESSAGE FROM THE PRESIDENT

Chris Shuler, MSTT President

MSTT:

Advancing the science and practice of Trenchless Technology for the public benefit, to promote and conduct education, training, study and research in said science and practice for the public benefit.

Thanks to everyone for your support over the years. We are now celebrating the eighth annual publication of Midwest Journal of Trenchless Technology. We could not do it without the continued support of the many companies and individuals that comprise the MSTT community.

About MSTT: Established in 1998, MSTT is one of the oldest and the largest of the eleven NASTT Regional Chapters. MSTT encompasses the nine states of Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, Ohio, and Wisconsin.

2020 Seminars: MSTT conducted one live, in person seminar on March 11, 2020. It featured a presentation by Ms. Karine Papikian, P.E., Collection Systems Engineering Manager, Kansas City Water, titled "Trenchless Technology in Kansas City", as well as ten other presentation covering a wide array of topics by industry professionals (see page 38). On December 17, MSTT will conduct the MSTT Trenchless Technology 2020 Fall Webinar featuring an update from Citizens Energy Group's Director of Underground Engineering & Construction Team, John Trypus. He will be giving an update on the DigIndy program in Indianapolis. John is very knowledgeable professional in many areas of water and sewer management and we look forward to hearing from him! Additionally, we will have three other compelling subjects and speakers. This is a free webinar and a great way to spend a couple of hours gaining insight to our industry.

2021 No-Dig Show: While the 2020 No-Dig Show was cancelled despite great efforts to keep things going as planned, the 2021 show is still scheduled for March 28-April 1, 2021 at the Orange County Convention Center in Orlando, Florida. We look forward to having an event in person and getting all of the intelligent and talented members of our trenchless industry back together displaying new and old technologies, continuing the long-standing educational and networking event.

It is no secret that our lives changed after our March seminar in Kansas City. Many of us have learned ways to get our jobs done from home and lead others through the remote workspaces we have mastered. Not all work can be done from home though, and I commend those who persevered through the daily struggles and continued to provide the essential services of maintaining our aging infrastructure. They have been truly heroic.

Overcoming challenges is, however, what this industry is all about. We have for many years encountered what couldn't be done and found a way to do it. We have run into tasks that were marginally successful, or not at all, and found methods to make them better and very successful. The Trenchless Industry will continue to grow through this and come out better and stronger on the other side! While the 'other side' may look different, we will continue to find better ways and better products to meet the demands of our aging infrastructure.

I was elected President of the MSTT in June of 2020. I am thankful for the opportunity to serve. I want to thank Jeff Boschert for his dedication and leadership over the past years as President. He did a great job and will continue to be a very important member of our group.

MSTT is your organization, and this is your publication, so please support us and let us hear what you think. To provide feedback, suggest a location for future events, place an ad, or submit an article for next year's journal; please contact Leonard, me, or one of our directors. Your support and involvement is critical to our success and the success of the Industry as newer faces enter.

Sincerely,

Chris Schuler
President, MSTT
317-653-5203
chris.schuler@millerpipeline.com

MSTT SITE

GREETINGS FROM THE MSTT EXECUTIVE DIRECTOR

Leonard E. Ingram, Sr., PWAM, Executive Director, MSTT

I am the Executive Director for the Midwest (MSTT), Mid Atlantic (MASTT), and Southeast (SESTT) Society for Trenchless Technology. Needless to say, Coronavirus 19 has shut down the seminar programs for all three this year. No municipal guest presenter or municipal attendees… no seminar! I was able to get the MSTT Kansas City seminar conducted on March 11, 2020 as everything was shutting down. My wife and I experienced Coronavirus 19 traveling problems while returning home from the Kansas City seminar. Scary and not good for America! (Details on page 38.)

All MSTT, MASTT and SESTT "Trenchless Technology, SSES and Buried Asset Management" 2020 seminars after Kansas City, were postponed. MSTT, MASTT and SESTT are tentatively planning to conduct all the 2020 postponed seminars in 2021, Coronavirus 19 allowing.

MSTT is conducting a **FREE LIVE** two hour Trenchless Technology webinar through NASTT on Thursday, December 17, 2020 from 11:00 am to 1:00 pm EST. Registration and the program with presentations and presenters can be seen at www.mstt.org under the WEBINAR tab. MSTT will offer 2 PDHs for completion of the webinar.

Thanks for your support!

Please contact Leonard Ingram (334) 327-7007 or leonard@engconco.com to be a webinar sponsor ($200) ASAP. Limited number of webinar sponsorships are available.

Leonard E. Ingram, Sr., PWAM
Executive Director, MASTT, MSTT & SESTT

PLEASE REVIEW THE MASTT, MSTT AND SESTT 2020 PROPOSED SEMINAR, WEBINAR AND JOURNAL PUBLICATION SCHEDULE:

SOCIETY	LOCATION/PUBLISH	PROPOSED DATE	STATUS
MSTT SEMINAR	KANSAS CITY MO	MARCH 11, 2020	CONDUCTED
MASTT SEMINAR	BALTIMORE MD	MAY 6, 2020	POSTPONED
SESTT SEMINAR	SAVANNAH GA	AUGUST 5, 2020	POSTPONED
MASTT SEMINAR	ATLANTIC CITY NJ	SEPTEMBER 16, 2020	POSTPONED
MASTT JOURNAL	PUBLISH DATE	OCTOBER 23, 2020	PUBLISHED
MSTT SEMINAR	CINCINNATI OH	OCTOBER 28, 2020	POSTPONED
MSTT JOURNAL	PUBLISH DATE	DECEMBER 5, 2020	PUBLISHED
MSTT WEBINAR	FREE ONLINE (11 am – 1 pm EST)	DECEMBER 17, 2020	CONFIRMED
SESTT JOURNAL	PUBLISH DATE (DEADLINE 01/15/21)	JANUARY 22, 2021	PROPOSED
SESTT SEMINAR	MIAMI FL	DECEMBER 9, 2020	POSTPONED

Sponsor ($200) the MSTT Fall Webinar on December 17, 2020

Contact Leonard Ingram, PWAM
Executive Director
Leonard@engconco.com or (334) 872-1012

Get Your Message to Trenchless Professionals by Advertising

Contact Andrew Pattison
A to B Publishing, Inc.
marcomap@shaw.ca or (204) 275-6946

MESSAGE FROM NASTT CHAIR

Craig Vandaelle, NASTT Chair

Hello Midwest Chapter Members! For everyone 2020 has been quite a whirlwind year! Like the rest of the world, the staff and volunteers here at NASTT have been pivoting and evolving on a near daily basis to changes in how we do business due to the COVID-19 situation.

As this unprecedented time continues to unfold, NASTT is working diligently to continue to provide the training and education you need to do business and stay up to date with innovations in our industry. We are excited to have rolled out virtual events and training opportunities as we fulfill our mission to be the premier trenchless educational society in North America.

In August we launched our NASTT Good Practices Courses as virtual events. These courses are a rescheduling of the 2020 No-Dig Show Good Practices Courses and our entire suite of courses will be available as live training events. Our four-hour courses will take place in one day and our eight-hour courses will be split into two-day sections to allow for schedule flexibility for our attendees. All NASTT Good Practices Courses include Continuing Education Units, a training manual and the accompanying NASTT Good Practices Guidelines book if applicable. Visit nastt.org/training/events for the full schedule and registration details.

We are also looking forward to holding the Midwest Regional Chapter Trenchless Webinar on December 17. This free training opportunity is a virtual version of the MSTT Trenchless Technology, SSES & Buried Asset Management seminars held throughout the region. Industry experts will be presenting, and a live Q & A session will be available to attendees. We hope you will join us! Visit nastt.org/events for registration.

With the trenchless market growing so fast now is the time to get involved.

Our goal is to represent our industry and provide valuable initiatives. To do that, we need the involvement and feedback from our members. We are always seeking volunteers for our various committees and programs. If you are interested in more information, please visit our website at nastt.org/membership/volunteer. There you can view the committees and learn more about the ways to stay involved with the trenchless community and to have your voice heard. Please consider becoming a volunteer – we would love to tap into your expertise.

We are looking forward to coming together in Orlando next March for the NASTT 2021 No-Dig Show. It will be particularly exciting to come together again as a group and celebrate the trenchless industry in North America as we learn and network together.

1990-2020 NASTT 30 YEARS OF EXCELLENCE

Things may look a bit different at the 2021 show but the top-notch technical training and networking you expect from our conference will not change! We understand how important the in-person conversations are for sharing ideas, networking and growing our industry. With that in mind, we plan to deliver a worthwhile event in a safe manner while still bringing you the value you expect from the NASTT No-Dig Show.

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

Thank you for being a part of our organization and for dedicating your careers to the trenchless industry.

Craig Vandaelle

NASTT Chair

MSTT BOARD EXECUTIVE 2020-2021

Chris Shuler - *President*

Chris Schuler joined Miller Pipeline in 1984 as a laborer in Indianapolis, Indiana. Over the next few years he served the company in many capacities, assuming the role of equipment operator in 1989 and foreman the following year. In 1998 Chris stepped into the role of superintendent over Kansas City and Indianapolis until 2005 when he was promoted to project manager. In 2009 he assumed his current role as general manager of the Municipal Services Division where he oversees Miller Pipeline's water/wastewater trenchless rehabilitation operations.
Chris attended Indiana University from 1983-1986 focusing on Economics and Business. He graduated from the University of Missouri with a B.A. in Commercial Economics in 2001. Chris serves as the current Miller Pipeline Representative for the Indiana Chapter of NUCA. He is also a member of the NASTT Program Committee in addition to his role as President of the MSTT Board of Directors.

Ryan Poertner - *Vice President*

Ryan Poertner is a General Manager of Ace Pipe Cleaning, Inc. and lives in St. Louis, MO. Ryan manages the St. Louis office, as well as the Cured-In-Place-Pipe (CIPP) division within APC. Ryan is directly responsible for the safety and quality of work for these divisions. His main focus is on the growing market involving lateral rehabilitation. APC is a leader in the industry providing all types of investigation and rehabilitation solutions for municipalities in need. Ryan has spent his entire professional career working in the water and wastewater rehabilitation fields. Prior to the 8 years currently with APC Ryan spent 8 years working for Insituform Technologies, Inc. in roles as Engineer, Trainer, Estimator, and Project Manager. Ryan is an active member of NASTT, NASSCO, WEF and local engineering organizations.

MSTT BOARD EXECUTIVE 2020-2021

Robert Martin - *Secretary*

Robert Martin, P.E. has been with Jacobs Engineering Group since 2007 and has over 20 years of comprehensive underground engineering experience on projects including those for the rail transit, water supply, wastewater, and mining. Robert is the Past President of the ASCE Wisconsin Section Southeast Branch and was a contributor of the ASCE/ UESI Manual and Reports on Engineering Practice No. 106, Horizontal Auger Boring Projects, Second Edition. Robert's experience includes construction feasibility assessments, design of soft ground and rock tunneling using various methods including; drill-and-blast, road header excavations, full-face tunnel boring machines in rock and soil, microtunneling, horizontal directional drilling (HDD) and other trenchless methods and has worked on projects all over the world. Robert is an active member of NASTT in addition to his role as Secretary of the MSTT Board.

Jeff Boschert - *Past President*

Jeff Boschert, P.E. is the President of the National Clay Pipe Institute (NCPI), a technical resource for sewer system decision-makers and designers of gravity sanitary sewer lines for more than 100-years. Jeff joined NCPI from Missouri DOT in 2004 to serve as the leader of the organization's trenchless initiatives. His initial research projects began almost immediately with CLSM bedding research. Jeff has become a leading expert in the pilot tube method of guided boring. In 2012 he took on the added responsibility of leading the organization and conducting educational outreach as the new president. In addition to his work with NASTT, he represents the industry on multiple ASCE and ASTM committees.

Jeff was one of the principal authors of the ASCE/ UESI Manual of Practice (MOP No. 133) on Pilot Tube and Other Guided Boring Methods and is currently serving as secretary of the ASCE/ UESI Pipelines Division Executive Committee (EXCOM). As President of NCPI, Jeff has completed comprehensive updates of the Vitrified Clay Pipe Engineering Manual and the Vitrified Clay Pipe Installation & Inspection Handbook. He was an integral part in development of the all new Vitrified Clay Pipe Operations & Maintenance Handbook which was released in August of 2020. He holds a BSCE from Missouri University of Science and Technology.

Gary Smolinski – *Treasurer*

Gary Smolinski a Construction Manager and Partner at OHM Advisors (OHM) with over 30 years of experiential knowledge in the construction industry. He manages the construction phase of projects by working with contractors and technical staff, developing solutions to problems that inevitably arise in the field. Gary is also a hiring manager at OHM, responsible for recruiting, hiring, and training future talent of field engineers, inspectors, and office technicians for OHM's Field Services (Construction) group. Using his expertise in the construction field, he works to continually enhance operational procedures, assigning and directing work accordingly to ensure the success of both the construction engineering teams and the client communities served. Committed to advancing both his own technical knowledge and the use of trenchless techniques, Gary has continued to be an active member of the Midwest Society for Trenchless Technology (MSTT) since 2013, and is an active member of the North American Society for Trenchless Technology (NASTT).

MIDWEST SOCIETY FOR TRENCHLESS TECHNOLOGY
BOARD OF DIRECTORS 2020 - 2021

President – Chris Schuler
Miller Pipeline Corporation
Indianapolis, Indiana
chris.schuler@millerpipeline.com

Vice President – Ryan Poertner
Ace Pipe Cleaning Inc.
St. Louis, Missouri
rpoertner@acepipe.com

Secretary – Robert Martin
Jacobs
Milwaukee, Wisconsin
robert.martin18@ch2m.com

Treasurer - Gary Smolinski
OHM Advisors
Livonia, Michigan
gary.smolinski@ohm-advisors.com

Past President – Jeff Boschert
National Clay Pipe Institute
St. Louis, Missouri
jboschert@ncpi.org

Rory Ball
Brierley Associates
Cleveland, Ohio
rball@brierleyassociates.com

Joe Cherry
AP/M Permaform
Johnston, Iowa
joecherry@permaform.net

Rick Gage
Consultant
Ottawa, Illinois
rgage@lmktechnologies.com

Lee Haessig
Cretex Specialty Products
Waukesha, Wisconsin
lhaessig@cretexseals.com

Nate Hrabosky
Hammerhead Mole
Oconomowoc, Wisconsin
nhrabosky@hammerheadmole.com

Shane Jacobson
Central Iowa Televising
McCallsburg, Iowa
smjcit@outlook.com

Bob Jordan
Covalen
Indianapolis, Indiana
bjordan@covalen.com

Ed Kampbell
Rehabilitation Resource Solutions
Hillard, Ohio
ekampbell@sbcglobal.net

Kerry Koressel
IPEX America
Chesterfield, Michigan
kerry.koressel@ipexamerica.com

Sarah Mahlik
TT Technologies, Inc
Aurora, Illinois
smahlik@tttechnologies.com

Steve Matheny
Logan Clay Products
West Bloomfield, Michigan
stevem@loganclaypipe.com

Tod Michael
Vermeer Corporation
Pella, Iowa
tmichael@vermeer.com

John Milligan
Vermeer Corporation
Pella, Iowa
jmilligan@vermeer.com

Catherine Morley
RJN Group
Wheaton, Illinois
cmorley@rjn.com

Steve Peterson
SEH, Inc
Sheboygan, Wisconsin
speterson@sehinc.com

David Rosenberg
Michels Corporation
Brownsville, Wisconsin
drosenbe@michels.us

Keith Walker
Global Brands
Johnston, Iowa
keith@permaform.net

THE MIDWEST SOCIETY FOR TRENCHLESS TECHNOLOGY (MSTT)

PRESENTS

"MSTT Trenchless Technology 2020 Fall Webinar"

FREE WEBINAR on Thursday, December 17, 2020 – 11:00 am to 1:00 pm EST

(MSTT Will Offer 2 FREE PDHs For Proper Attendance)

WEBINAR PROGRAM

MODERATORS: Chris Schuler, Miller Pipeline and MSTT President • Jeff Boschert, PE, National Clay Pipe Institute and MSTT Past President

11:00 am **Opening Statement,** Chris Schuler

11:02 am **DigIndy Program Update**, John Trypus, Citizens Energy Group

11:25 am **Q&A**, Chris Schuler and John Trypus

11:30 am **20 Tips In 20 Minutes: Handling Contract Risk On HDD Projects,** Ted Roberts, Trenchless Legal Services

11:55 am **Q&A**, Chris Schuler and Ted Roberts

12:00 pm **Remote Lateral Connection Process For Pipe Bursting,** Ted Dimitroff, President, Trenchless Consulting LLC

12:25 pm **Q&A**, Chris Schuler and Ted Dimitroff

12:30 pm **From Deep Trenches to Deep Learning: Innovations in Artificial Intelligence for Sewer Pipe Defect Classification**, Ronald Moore, PMP, MPM, Synergy Construction Group / US Representative for Molfar. AI and Viacheslav Moskalenko, PhD, Director, CTO - Molfar. AI and Elena Lysyuk, MA, Director, CCO – Molfar.AI

12:55 pm **Q&A**, Chris Schuler and Ron Moore

1:00 pm **Closing Statement**, Chris Schuler

WEBINAR SPONSORS

MILLER PIPELINE • NATIONAL CLAY PIPE INSTITUTE • ACE PIPE CLEANING, INC.

MICHELS CORPORATION • KONDEX CORPORATION

Visit www.mstt.org for details & registration

ACE PIPE CLEANING

A Carylon Company

STORM PIPE SPINCASTING

Sewer Cleaning & CCTV Inspection

Cement Pipe Rehab

Spin Cast

Bryan P. Dobson
Operations Manager
m: (816) 807-7947
o: (816) 241-2891
bdobson@acepipe.com

SEWER DIVISION

Pipe Assessment

Pipe Cleaning

Trenchless Rehabilitation

Ryan Poertner
General Manager/St. Louis Division
(314) 368-1574
rpoertner@acepipe.com

certified WBENC

www.acepipe.com

6601 Universal Avenue
Kansas City, MO 64120
800-325-9372

4410 Hunt Avenue
St. Louis, MO 63110
314-531-1127

SINGLE 4,100-FOOT HDD INSTALLATION OF 16-INCH FUSIBLE PVC® SANITARY FORCE MAIN

Spring Lake Pump Station force main replacement - Contract 3, Grand Haven MI

By: John Kosiur, Underground Solutions

The Grand Haven-Spring Lake Sewer Authority (GHSLSA) and the Ottawa County Road Commission located in Western Michigan developed a five-phase project in early 2017 which included upgrades and improvements to sewer lift stations in Spring Lake, Ferrysburg and Grand Haven, along with headworks upgrades at the treatment plant. Phase 3 of the project involved the installation of an approximately 4,000-foot force main underneath the Grand River, which replaced the existing 12-inch ductile iron force main that was installed there in the 1970s. The GHSLSA knew the existing force main was approaching the end of its useful life expectancy and it was time to upgrade to a new force main that would accommodate the recent and future increased flow capacity for the service area.

Prein&Newhof (P&N), an engineering firm located in Grand Rapids were hired to analyze the existing system and force main. Multiple pipe alignments were reviewed and trenchless methods were compared with barge supported open cut or direct bury methods. The direct bury method would require additional permitting and clearance. Additionally, both riverbanks were filled with popular recreational parks, and the river was also a home to an endangered mussel species. Another concern was disturbance to the surrounding neighborhoods. The north end of the pipeline was located in a residential area while the south end was on a truck route for the city. Construction noise and vibration level had to be kept to the minimum to minimize impact to the residents. Because direct bury installation would have caused extended environmental and economic disturbance to the surrounding area a trenchless method was selected for the project.

It was determined that a 16-inch pipe size would handle current and future capacity demands and that horizontal directional drilling the new pipeline under the Grand River was the most suitable and cost-effective method of installation. Matt Hulst, an engineer for P&N designed the HDD bore alignment, layout and installation.

The design considered two pipe material options:

1. A 16-inch DR14 Fusible PVC® pipe
2. A 22-inch DR7.3 high-density polyethylene (HDPE) pipe

Replacement force main alignment

Due to the difference in material properties between PVC and HDPE, the thicker wall of the HDPE pipe required increasing the pipe size to maintain the flow area and pressure capacity the system required.

The project phase was released for a public bid in November 2018 and Gabe's Construction of Sheboygan, Wisconsin was awarded the contract. Gabe's chose the 16-inch Fusible PVC® pipe option as its material of choice, mainly because the smaller, 16-inch pipe size represented major time and construction cost savings compared to installing the larger 22-inch HDPE pipe section and the commensurately larger final ream size required for that pipe section.

Construction started in March 2019 with a tight deadline for completion. Using an American Auger DD330 directional drilling rig, a pilot bore was used to set the alignment, and took about two weeks to complete. The depth of the pilot hole ran about 110 feet beneath the bottom of the river, 20 feet deeper than the design profile. This allowed the USACE 60 feet minimum depth of cover at the edge of the water to be met, while keeping the exit angle lower. In general, ground conditions were favorable for a 4,000-foot HDD, even though there was one difficult area of geology

Pipe was staged in 720-foot sections

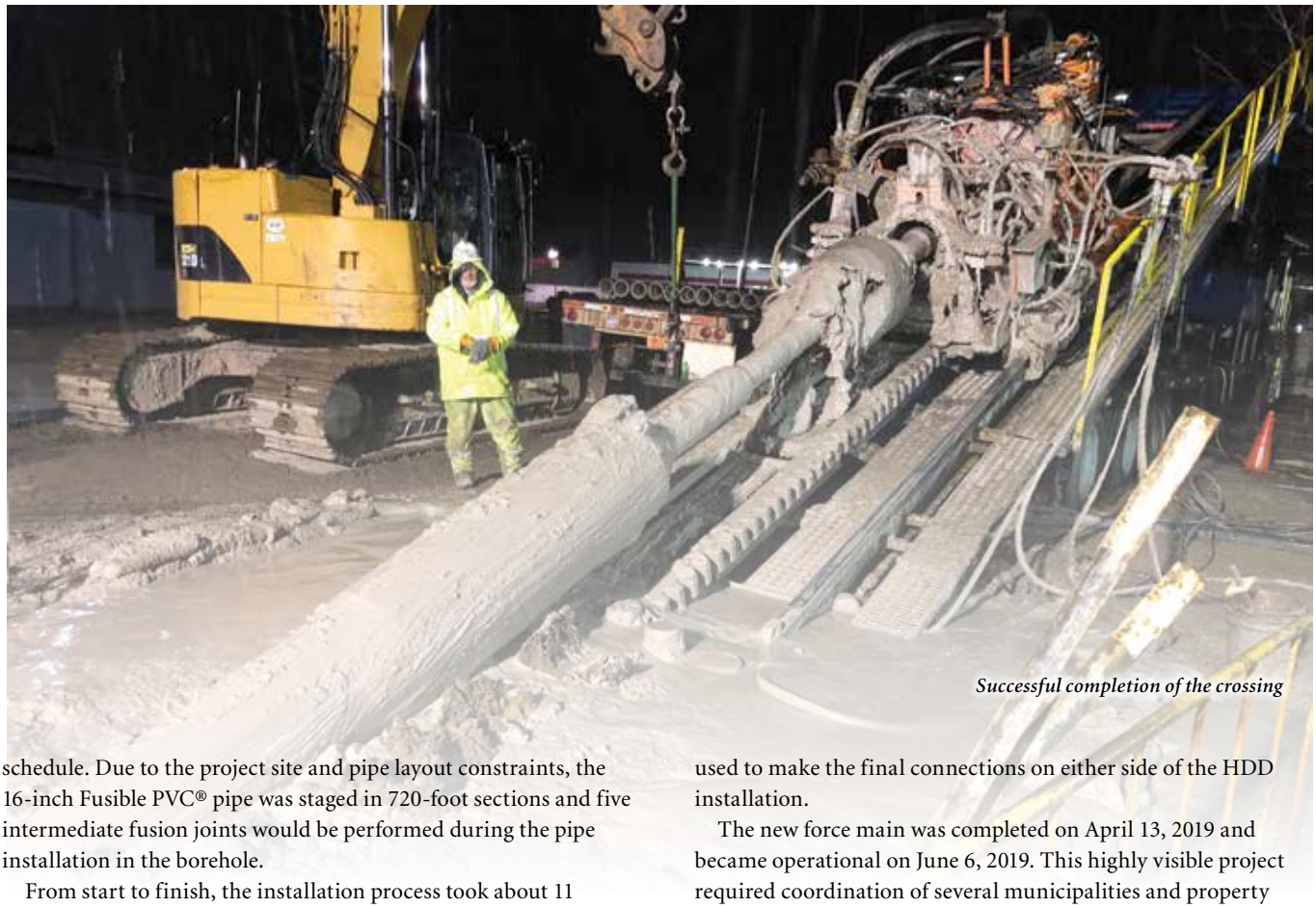
Fusible PVC® pipe entry pit during installation

To minimize impact to the surrounding area, a trenchless method was selected for the project

The Fusible PVC® pipe supported on rollers along the alignment

that they worked through. After the pilot drill, the borehole was increased in size to 26-inches using a single pre-ream pass, which also took about two weeks to complete. A final swab pass cleaned out the finished borehole and it was ready for the pipe installation.

As the drilling and reaming passes were being completed, Underground Solutions performed the thermal butt-fusion services to assemble the Fusible PVC® pipe. Underground Solutions worked side by side with Gabe's to maintain the



Successful completion of the crossing

schedule. Due to the project site and pipe layout constraints, the 16-inch Fusible PVC® pipe was staged in 720-foot sections and five intermediate fusion joints would be performed during the pipe installation in the borehole.

From start to finish, the installation process took about 11 hours. Water ballasting of the pipe (filling the pipe with water to counteract the buoyant forces of the pipe in the borehole) was utilized after the third intermediate fusion joint. Ballasting was not required per specification, but strongly suggested by pipe manufacturer based on pullback calculations. This process reduced drag generated by frictional force between the pipe and the borehole wall and lowered pullback forces from 104,000 pounds to 64,000 pounds, compared to a safe allowable pull force for the 16-inch DR 14 Fusible PVC® pipe of 176,600 lbs. A total of 18,000 gallons of water was used for the ballasting.

After the installation was complete, a pressure test was performed and the pipe passed all inspection requirements. Standard mechanical-joint fittings and PVC restrainer glands were used to make the final connections on either side of the HDD installation.

The new force main was completed on April 13, 2019 and became operational on June 6, 2019. This highly visible project required coordination of several municipalities and property owners to provide the necessary space for the contractor to complete their operations and provide the system owners with accurate estimates for budgeting. Early communication with those involved and bringing in contractors to review the operations were essential to keeping everyone informed of the schedule and potential impacts from construction. A successful crossing was completed with the efforts of all parties and a new, appropriately sized force main is now in place to serve the residents.

Fusible PVC® has been used to complete many long, deep and high-risk HDD crossings for satisfied clients across the United States. This project, which provided a fully restrained, gasketless, leak-free piping product that will serve the Grand Haven-Spring Lake Sewer Authority for years to come, is another example of the benefit of Fusible PVC® pipe to the water and wastewater community.

ABOUT THE AUTHOR:

John Kosiur *is Vice President of Sales, Eastern Region for Underground Solutions and is based out of Macomb, Michigan. John has 25 years of experience in underground construction and the municipal water industry. His construction background includes proficiency in both directional drilling and pipe bursting. He has worked in municipal waterworks sales for the last 7 years, most recently covering the southeastern Michigan market.*

Save Time. Make Money.

TRY THE BETTER WAY TO BORE.

Subsite HDD Guidance systems can improve the accuracy and efficiency of your bores. Our exclusive Green Ops™ process leverages modern data-sharing technology to give you a clear plan, more control, and faster reporting for safer, more productive jobs.

*Learn more at **subsite.com** and ask your Ditch Witch® dealer.*

SUBSITE® ELECTRONICS
subsite.com

WHAT EXTRA LOAD?

Pilot Tube Method Effective Trenchless Option in Novi MI

By: Steve Matheny P.E., Logan Clay Products LLC

Minimal footprint of PTM construction at the east end of the project minimized disruption to the Cadillac dealership

Close proximity to a major roadway and the dealership made this a challenging project site

The ten-acre site was originally developed as a dealership and then sold to a different dealer that wanted a newer image. The new owner in Novi, MI wanted to raise the profile as was befitting the Cadillac brand image. So, ten feet of fill was added. It seemed so simple. But that ten feet of fill was never considered as an additional dead load acting on all of the utilities installed approximately 20-years earlier.

That was 2005. By 2018, the 10-inch PVC SDR 35 flexible sanitary sewer line had over-deflected and was in danger of complete collapse. To complicate matters, soil borings indicated the existence of a marl and peat zone within the west end of the sewer elevation. The seven-foot layer marl zone over a five-foot layer of peat below was just under the proposed invert of a replacement sanitary line. Moving to the east, the marl zone was only two feet in depth, based on the soil borings.

The original repair plan called for an open-cut excavation and replacement of 365 feet of sanitary sewer. This work would require bypass pumping and include significant dewatering due to groundwater conditions near the Great Lakes. The original plan for the new pipeline called for excavation of the marl zone with bedding on two to seven feet of one-inch to three-inch stone aggregate wrapped in geotextile fabric, topped with six inches of crushed aggregate to "float" on the peat zone.

Additional soil borings were taken after the bid. Based on the findings from these tests, the estimated total size of the marl zone increased significantly. To create a solid foundation and have enough bedding material, the amount of one-inch to three-inch stone aggregate would likely double to accommodate another five to ten feet of

Stand tubes, used to place the stabilizing grout, being inserted

The contractor suggested a possible value-engineered alternative: the Pilot Tube Method

The adapter (expander) fabricated by DVM to manage the jacking forces as the 13 5/16-inch O.D. VCP-J final product pipe was used to push the 11-inch casing out of the bore

depth. After winning the bid and getting the results of these additional tests, the contractor, DVM Utilities, suggested a possible value-engineered alternative: **Pilot Tube Method of Guided Boring (PTM).**

PTM is a three-step process using a pilot tube guidance system, auger casings, and the final product pipe. The choice of pipe for jacking and the permanent product pipe was NO-DIG Vitrified Clay Jacking Pipe from Logan Clay Products.

This trenchless option would eliminate excavation south into a major roadway, eliminate the need to remove a manhole on the west-side of the project, and eliminate concerns about foundations of adjacent roadways and buildings. The PTM trenchless installation would cut much of the restoration cost while limiting disruption to the roadway, the dealership, and the general public. Bypass pumping could be eliminated. Dewatering would be minimized by only dewatering in the jacking and receiving shafts. By not using open-excavation, installation depths were reduced to only 18 feet, and no open trenches, trench-boxes or wide trenches were needed (safer to general public and workforce).

While a rigid pipe brings structure of its own, stabilization of the marl zone beneath the bored sewer was still a significant challenge. To stabilize soils and distribute loading over the marl zone, Avanti International's AV-100® Acrylamide chemical grout was injected into the marl zone starting at the sewer elevation. AV-100 is an ultra-low viscosity, chemically reactive grout used to create effective, long-lasting soil stabilization where site conditions dictate modification of existing soil properties.

The increased soil stability provided adequate support for the PTM guided boring installation without the need for subgrade supports. Both shaft bottoms were supported on top of the acrylamide

grouted soil (AV-100) which distributed the construction loads over a larger area creating a snowshoe effect.

AV-100 Acrylamide Grout was injected vertically into the soils using a small drilling rig attached to a skid steer. Injection ports were inserted to approximately 18 feet the level of the deepest part of the final invert, and AV-100 was pumped until refusal (until the soil would not accept any more). Grout pressures were recorded to have an average of 60 psi.

The grout was used to stabilize the marl zone directly below the sewer pipe and below the clays through which the pipe was bored. This created a seal around the sleeve pipe that would later fracture under low pumping pressures allowing the AV-100 Chemical grout to permeate into the surrounding soils.

Once the grouting was in place, the PTM installation was fairly standard. Shallow construction depths of 18 feet allowed for the use of ring beam and lagging construction for the jacking shaft.

The jacking frame was then set to the desired height, grade, and line from control points established using conventional surveying techniques. As in all pilot tube installations, the guidance system consisted of a digital theodolite with an integrated camera mounted independent of the jacking frame, a battery-powered LED illuminated target housed in the slant faced steering head, and a computer monitor screen. This guidance system provides the operator with a "real-time" view of the location and steering head orientation of the pilot tubes together with the ability to adjust accordingly during the entire installation, resulting in pinpoint accuracies.

Once the 4-inch pilot tube path was established, an 11-inch OD reaming head and auger casings followed the path transporting the displaced soil around the pilot tube to the jacking shaft. As the auger casings were advanced, the pilot tubes were removed from the reception shaft.

The final step was installation of the 10-inch NO-DIG jacking pipe behind the auger casings. Since the OD of the 10-inch jacking pipe is 13 5/16 inches, DVM manufactured a special expander to increase the 11-inch auger casing bore to accommodate a 13 5/16-inch pipe. This expander displaced the remaining soils and was placed between the last auger casing and the first length of vitrified clay jacking pipe. The natural compressive strength of the vitrified clay pipe along with displaceable native soils allowed for the use of this expander instead of a larger auger bore. To see the full installation process, visit the NO-DIG Pipe website at: www.NO-DIGpipe.com.

ABOUT THE AUTHOR:

Steve Matheny, P.E., *joined Logan Clay Products LLC as a business development engineer in 2016 after more than 30-years in the field, working for municipalities and manufacturers. Steve is currently consulting on multiple projects throughout the Midwest & East Coast. Many of those projects will employ the Pilot Tube Method for installation.*

Underground Magnetics

SIMPLE POWERFUL AFFORDABLE

MAG 8 HDD LOCATOR
PERFORMING WHERE OTHERS CAN'T

- Sonde Range: 130 feet to 360 feet
- Battery Life: 30 - 120 Hours
- Frequency: 12 Frequencies 4kHz ~ 41kHz
- Single Ball Technology

"With this system in place, the bore shot was completed with no issues on the first attempt. Our crews at Eris Underground are believers in the Underground Magnetics system and recommend it wholeheartedly."

Chris Allen, General Manager
Eris Underground LLC

Demo a system win a Harley

515-505-0960

UMagHDD.com

LINING THROUGH MULTIPLE BENDS IN KANSAS WINTER

Kevlar-Reinforced Flexible PE Pipe Optimal Solution for WaterOne

By: Noel Shanahan, Primus Line

Many areas in the country currently face the daunting task of dealing with aging water and wastewater infrastructure. As municipalities grapple with leaking pipelines and broken water mains, they are often additionally tasked with improving filtration and cleaning systems to meet quality standards for their communities. Due to the multitude of issues our water and wastewater providers face, they are often met with the decision of whether to completely replace older infrastructure with new pipelines or to use more recently available technologies that do not require whole excavation of the old line. In this field there are many different options, from pipe bursting methods to cured-in-place-pipe. Primus Line stands alone as one of the most unique and convenient methods of trenchless rehabilitation of pressure pipelines both in common and more unique circumstances.

Much of Johnson County, Kansas has their potable water infrastructure maintained by Water District #1 of Johnson County (WaterOne), a quasi-municipal water utility that prides itself on the quality of its water and its ability to repair and install pipes with its own construction teams. They were wrestling with a problem that plagues most water authorities. A leaking line that ran directly under a highway, an active rail line and also under a high use roadway. Maintenance on these lines can be challenging not only due to aging pipelines and corrosion, but also due to costs associated with permitting around railroad lines, public roads and thoroughfares, and other infrastructure. Due to operational time constraints, the project was required to be completed in the middle of winter, with temperatures on the job site consistently averaging below freezing.

Lining is inserted from a reel, pull-in lasted approx. 3 hours

WaterOne first became acquainted with the unique properties of Primus Line at a trade show for showcasing trenchless technologies and immediately recognized its potential not only in rehabilitating pipelines in unique situations, but also its capabilities as an emergency repair option. Primus Line simply needs to be pulled into the existing, damaged pipe with a winch, set to form with air pressure within minutes, and the two end connectors that anchor the pipe are installed on either end of the now-rehabilitated section of pipe. Thanks additionally to the installation and anchoring methods used in the installation of Primus Line, no resins or curing processes are used on the pipe, although in higher pressure situations a fast curing resin is used in the implementation of the end connectors that anchor the pipe. No contact is made between the resin and any part of the line, however. With these qualities, WaterOne decided to move forward with a project to take advantage of the capabilities of this trenchless technology.

In this case a 24-inch potable water line was in need of rehabilitation but ran for a length of 1,890 feet under a freshly paved road, railroad crossing, and highway overpass. Not only that, but the line had a 90-degree bend, a 30-degree bend, and multiple 45-degree bends along its run, limiting rehabilitation options.

The Kevlar-reinforced flexible polyethylene pipe manufactured by Primus Line was the optimal solution for this project.

At least three bends in this line, including one at a 90-degree angle, were located directly beneath a freshly paved

Lining requires small crew and is installed in a wide variety of temperatures and climates

The 24-inch line had a 90-degree bend, a 30-degree bend, and multiple 45-degree bends along its 1890 LF length

street and recently redone railroad crossing. The alternative option for repair was to dig and replace, increasing the cost of the project by $1,000,000.00. It would not only increase the price of the repairs due to the street excavations and permitting requirements, but it would also increase congestion and traffic in the area, adding an additional cost to local businesses and commuters.

The additional pits required for the removal and replacement of this pipe was not the only concern. Primus Line's flexible, Kevlar-reinforced technology provided the required minimum operating pressure of 100 psi required for this now-20-inch potable water line navigating the sharp bends.

During the evaluation process for this project the host pipe diameter of 24 inches was compared to the Primus Line 20-inch diameter pipe, the DN500, for hydraulic capacity. It was determined that Primus Line would maintain an adequate flow rate, with a C-Factor of 150, compared to the existing host pipe. The pipe owner determined that as long as the pipe met the expected pressure requirement of the existing line, it would be an acceptable solution for the repair of the pipe.

The flexibility of the liner allowed for the navigation of the 90-degree bend and additional smaller bends in this line, while the Kevlar weave of the liner was able to handle the required pressure the line would be under during operation: about 100 PSI.

Since no excavation was required for the bends under the roadway, the entrance and exit pits were located outside of high traffic areas, minimizing any impact to local traffic. The host pipe was inspected to check the condition for any issues that might impede the Primus installation process. Upon seeing the line was in good condition, the Primus Line was brought on site and inserted from the reel at an angle of 180-degrees, being pulled out of the exit pit at a 45-degree bend by a winch. The pull-in lasted about three hours.

After this, the patented connectors were installed to anchor the Kevlar line in the host pipe and reinstate the water line via an ANSI flange and spool piece. The Primus process was successfully completed by the expert workers of Water One and was finished in less than four days' time.

With cost savings of one million dollars, a short installation period of only four days, no additional permitting from local municipalities required, and a preservation of normal traffic conditions in a busy area with nearby Business Park, the choice was validated.

With the additional benefit of only requiring a small workforce (generally only 4 or fewer workers), the system was an excellent option for Kansas City's WaterOne.

Not only was the success of the product shown in the installation itself, but also in the environment in which it was installed. With the temperature fluctuating between about 20F and 40F, with snow and freezing rain during most of the project, Primus Line was able to still be pulled into the existing host pipe and the end connections established. While other technologies may have relatively strict environmental condition parameters, Primus is able to be installed in a great variety of temperatures and climates, with no effect to the product and very little effect during the installation, this being minor differences in timing. With its use throughout the US, Mexico, and Canada at all times of the year, its ability to be installed in these extremely different climates and conditions again demonstrates its great capabilities.

No other trenchless technology would have the ability to navigate these bends, maintain the required pressure, and be able to be installed in such a short time period entirely with the Owner's own construction personnel.

When asked for their input and impressions, WaterOne provided the following statement:

"WaterOne is a progressive organization that is always looking for new advancements in trenchless technologies. As a largely self-performing water utility, we routinely use directional drilling, pipe bursting, and sliplining methods every year. Primus Line provided us another great tool for our trenchless toolbox in that it allows us to do even more trenchless projects not possible before. It has proven to be a simple, cost-effective solution for many tough projects."

Although this was WaterOne's first project with the Primus Line material, it had already shown its qualities in scores of other projects around the country. From potable water mains in the Southwest to raw water lines in the Northeast, and from sewer force mains in the Pacific Northwest to irrigation lines in the Southeast, Primus Line continues to show its awesome capabilities in the renewal of pressure pipelines through the United States. These successes reflect the previous results of Primus Line installations in Europe and show a history of its fiscal and operational benefits.

"Primus Line provided us another great tool for our trenchless toolbox."

-WaterOne, Johnson County, Kansas

Being satisfied with Primus Line's capabilities in its first application in the District 1 water system, additional projects in the area were found to be excellent applications for the Primus system. 8-, 12-, and 16-inch pipelines running throughout the county that previously seemed too expensive or cumbersome to solve were chosen as new projects for the aramid-fiber reinforced pipe.

With the success of this project and the new applications in the middle of the country, Primus Line has hit its stride in the American Midwest as we continue to see old, problematic pipes renewed quickly and without environmental impact of comparative technologies.

Generally, no resins or curing processes are used on the pipe

WaterOne's project exemplifies the best of what Primus Line can do, not only from the perspective of cost savings, but from environmental impacts, machinery required, time needed, and low impact on surrounding infrastructure. With this new tool in their toolbox, one can expect great new applications of Primus Line in the central US to continue.

As the Primus Line reputation for quality and effectiveness continues to grow, one will certainly see more projects across the country as previously unworkable pipeline problems become an easy and affordable fix with the unique and flexible Primus Line solution.

ABOUT THE AUTHOR:

***Noel Shanahan** is a native of Ohio, living and working for Primus Line in Cincinnati. After growing up in Lima, OH, he attended the University of Dayton for undergrad and Bowling Green State University for graduate school. He began his work with Primus Line in 2017 as Midwest Regional Manager.*

MINIMIZE DISRUPTION

Maximize Production

MARCH 28-APRIL 1 | ORLANDO, FL

NASTT NO-DIG SHOW 2021

Join us at the
NASTT 2021 No-Dig Show
to learn how trenchless technology can minimize disruption and maximize production.

Technical Papers | Networking Events | Innovations | Industry Exhibits

nodigshow.com

DUNDEE ROAD REHABILITATION PROJECT

By: Karol Giokas P.E., RJN Group, Inc.

Background

Wheeling, a northwest suburb of Chicago, tributary to the Metropolitan Water Reclamation District of Greater Chicago (MWRD), has a system comprised of 480,000 linear feet of sanitary sewer. Adhering to MWRD satellite community system management requirements, Wheeling identified priority basins for investigation and rehabilitation through flow analysis to assess inflow and infiltration levels. Rehabilitation of manholes and sewers proceeded smoothly for most of the priority areas. However, approximately one mile of 24- to 30-inch sewer was located in Illinois Department of Transportation (IDOT) rights-of-way (ROW) along Dundee Road. Due to its size, and Village equipment limitations, this section of pipe had not been previously televised. When the CCTV contractors finally put CCTV cameras into the pipe, significant inflow and infiltration (I/I), breaks, and deterioration were revealed.

Challenges

At the project onset, RJN engineering staff walked the alignment numerous times to identify physical constraints, to get in front of potential issues and minimize change orders and scheduling delays. This reconnaissance found several significant hurdles. In addition to the interceptor being located in IDOT ROW, the alignment traveled along a major commercial corridor with potential crossings at a railroad and a creek. It was quickly determined that trenchless rehabilitation, specifically lining the existing section with cured-in-place pipe (CIPP), was the most advantageous course of action. However, because CIPP requires that no flow be present in the pipeline,

Alignment located in IDOT ROW, with crossings at a railroad and a creek

major bypass pumping needs took a large seat at the planning table.

Funding

Lining large diameter sewers in a state road ROW would be higher than lining typical 8-inch sewers in a residential street, so phasing work over multiple years was proposed as a way to keep the annual cost within the Village budget. Fortunately, despite all the logistical hurdles, there was a silver lining: The sewers were located within a tax increment financing (TIF) district, which allowed the Village to fully fund the project using TIF funds. This enabled the project to be completed in entirety in only one year.

Permitting

The Dundee Road rehabilitation project required extensive permitting from MWRD and IDOT. While the MWRD permit was straightforward, the IDOT permit required a bit more finesse. Due to the need to exceed normal IDOT permitting hours (9 a.m. – 3 p.m.) during construction, the permit was initially denied. With a follow-up permit submitted, along with a "gentle" reminder to IDOT permitting staff of the time requirements of sewer lining work, including the fact that once CIPP starts curing the process cannot be stopped, and that all active service connections on the segment must be reinstated prior to leaving the site. This approach was successful and permits were granted, enabling work to proceed.

With service connection reinstatements in mind, establishing the locations of existing service connections and

Every effort was made to minimize impacts on day-to-day activities & there was extensive communication with property owners

Dual 12-inch pumps were installed to pump all of the upstream flow

distinguishing between active and abandoned connections is an important, but often overlooked, part of planning for sewer lining. It would have been easier to just reinstate all connections following lining. However, reinstating dead or abandoned laterals can be the source of significant I/I, making it a critical issue. Using CCTV footage and as-builts, 11 service connections to the interceptor were identified. The active or inactive status of several were obvious; where it was not immediately known, dye testing was performed at clean-outs or in buildings to verify.

Dundee Road's myriad public and private offices, emergency services, and residential properties would inevitably be impacted as work progressed. Crafting an effective communication strategy to explain the work and efforts was imperative to minimize impacts on day-to-day activities. With the implementation of a well-executed campaign put into practice, only one minor complaint was reported and was able to be resolved quickly.

Flow Bypass Planning

The larger sewers for this project consisted of vitrified clay pipe (VCP) and reinforced concrete pipe (RCP), ranging in diameter from 24- to 30-inch. The smaller sewers were VCP and ductile iron pipe (DIP) with diameters ranging from 8- to 12-inch.

Estimated flows for the 30-inch sewer could reach 4.1 million gallons per day (MGD). While lining would not be scheduled during a high flow event, the bypass setup needed to accommodate all potential requirements. Prior to bidding, multiple bypass options were discussed with the Village, with the initial desire to route the bypass piping across the two IDOT roads with either trenching or directional drilling. IDOT rejected the trenching option. The presence of major storm sewer, water, and gas lines made the directional drilling approach very costly; the temporary construction easements required from each affected private business owner would also have caused significant delays. The approach that was finally adopted placed the bypass piping along Buffalo Creek, using openings under Elmhurst Road and McHenry Road for crossing. The project was bid at just under $1 million, with the bypass portion accounting for a quarter of the total cost.

The Bypass Pumping System

The approach diverted flow at Elmhurst Road and forced the flow upstream a few hundred feet to a suction manhole. Dual 12-inch pumps were installed to pump all of the upstream flow into approximately 2,900 LF of 18-inch, high-density polyethylene pipe (HDPE) running from the manhole north, behind a condo development, over a road, under Elmhurst Road at the creek, over an entrance for a storage facility, and under McHenry Road at the creek before discharging back into the sewer. The installation of the two large pumps in the suction manhole required the removal of the existing cone, adjustments, frame, and cover at that structure.

Project Construction

Learning is Fun

The construction of 2,900 LF of 18-inch

It was quickly determined that trenchless rehabilitation with CIPP, was the most advantageous course of action.

8,200 LF of 8- to 30-inch sanitary sewer was lined over nine days

bypass sewer required staging areas for the storage of equipment and assembly of the bypass pipe. A Mexican restaurant near the suction manhole and a vacant property were identified as good candidates for staging.

Use of the property located behind the Mexican restaurant required contacting the restaurant to obtain permission. After initial conversations, permission was given. Plot twist! It turned out that the person who gave permission was not the owner; a fact that did not come to light until truckloads of 50-foot-long sticks of HDPE pipe were brought in and assembly of the bypass pipelines had begun. Once the situation was explained to a very confused property owner, permission to use the property was officially given and assembly of the bypass pipeline continued.

The bypass piping route travelled behind an apartment complex, requiring extensive communication with residents to inform them about the project and keep them abreast of activities and developments. Cones, signs, and safety devices were used to create a safe working environment for these residents.

The bypass alignment also impacted local traffic at two locations, requiring

Fiberglass spot liner used to patch hole discovered on final day of lining

flow-through ramps to maintain access to the neighborhood by residents. Initially a full 30-foot-wide ramp was planned. However, because the crown of the road was significantly higher than the curb, this configuration was not feasible. Instead, the Village agreed to the installation of a 12-foot ramp, temporarily turning that stretch of roadway into a one-way street by blocking off the eastbound lane. The second crossing involved the driveway of a storage facility and used a single flow through ramp to maintain access.

A Bridge Too Far

Bypass pipe crossing at two IDOT roads—Elmhurst Road and McHenry Road—used Buffalo Creek bridges to route the flows under the roadways. The crossing at Elmhurst Road was straightforward, laying the bypass lines directly on the rip rap on the south side of the bridge.

However, the crossing at McHenry Road was more complicated because it required crossing the creek to access the rip rap on the north side. Anchoring to any of the concrete bridge support structures was not an option, which eliminated the possibility of building a temporary framing to support the pipes. The solution was to suspend the pipes from the bridge supports using heavy-duty straps. During installation, the HDPE exhibited significant sagging under its own weight and one of the straps failed. Multiple straps were added at each side of the bridge with jack post supports below to distribute the weight more evenly and reduce the load on the straps and bridge structure. Once the bypass pipeline setup was completed, a full test was conducted to verify the flow was adequately removed from the sewer and that all connections were watertight ready for flows.

The lining east of McHenry Road used the flow diversion down Wheeling Road and a six-inch diesel pump to redirect flows out of the target sewers. To address individual services discharging into the sewer main, businesses were contacted to inform them of discharge restrictions. All service manholes were monitored and a Vactor was used to keep flow levels down.

Main Lining: Letting Off a Little Steam

CIPP liner is cured using either steam or boiling water, and if the proper cure temperature is not achieved, the liner's structural integrity will be compromised, so the ability to maintain consistent temperatures is mission-critical. Lining larger diameter sewers typically uses boiling water, because maintaining the requisite temperature with steam is very difficult. A unique approach to steam curing was used during this project, which ensured the needed temperature was maintained. A continuous fiber-optic temperature sensor was placed in the bottom of the host pipe to ensure a proper cure was achieved.

The 31 sewer segments were lined in 10 "shots," which included two to three sewer segments per inversion, lining right through the intermediate manholes. Two inversions even navigated a 90-degree bend through a manhole. As an added bonus, the lining passed under the rail line, which eliminated the need to deal with the railroad.

So Close…

As the final liner was being readied for installation in two 12-inch ductile iron pipes crossing under Buffalo Creek, a problem was encountered. The iron pipes had received multiple cleanings and several rounds of televising, the last one occurring just the day before. On the day of the liner installation, the TV crew went in one last time and, surprise, a "gusher" was visible coming from the bottom of the pipe. It was speculated that the significantly corroded ductile iron pipe was weakened during the cleanings and that rains from the night before had raised the water table exposing the unseen hole in the pipe.

The CIPP liner could not be installed in a pipe with an active gusher, as the CIPP resin would likely be washed out. A fiberglass spot liner with wash-resistant silicate resin was chosen to patch the hole. It was custom made on-site to fit the exact

Thirty-one sewer segments were lined in ten "shots" with lining through intermediate manholes

size of the repair. The fiberglass was cut from a roll and the silicate resin was then mixed and applied. The resin-impregnated fiberglass was folded over on itself and then wrapped around a packer.

Using the CCTV measured distance from the manhole to the break, the flow through packer was then blind pulled into the sewer to the exact location of the hole and inflated. The silicate resin cured at ambient temperature in approximately two hours. With fingers crossed, the packer was removed, revealing a successful sealing of the hole and the last two segments were able to be lined. Final surface restoration and post televising was accomplished over the course of the following days.

Final Thoughts

This project started August 16, 2019, with the notice to proceed. Final restoration was completed October 15, 2019. In that time:

- 8,200 LF of 8- to 30-inch sanitary sewer was lined
- Initial TV and cleaning took five days
- Bypass setup took 10 days
- CIPP lining took nine days
- The bypass teardown took four days

This project featured many hurdles that even the most extensive preplanning could not have accounted for. However, skilled contractors, rapid responses from the Village, and getting out in front of potential threats, led to the successful completion, on time and within budget—save for the slight overage caused by the emergency ductile iron pipe repair.

Key Points to Success

- ⇨ On-site construction management throughout the process ensured the quick resolution of issues. An example of this was the emergency repair to the ductile iron pipe on the last day of lining.
- ⇨ Extra attention was given to community outreach to ensure impacted residents and businesses were informed of the work and that expectations were properly managed. The use of proper signage and safety equipment also ensured that citizens were at minimal risk during the project.
- ⇨ Attention to detail when planning alignment, as well as adequate testing of bypass pipe setups, ensured that environmental impacts were eliminated. Additionally, the innovative approach of using steam to cure the CIPP saved time and natural resources, as significantly less energy and water were used in the process.
- ⇨ All permitting work was started early in the process, as permitting delays have the potential for causing significant scheduling and cost issues.

ABOUT THE AUTHOR:

***Karol Giokas, PE**, is a senior project manager for RJN Group, Inc., and has a diverse engineering background in wastewater collection system studies and rehabilitation design. Her expertise has contributed significantly to delivering enhanced asset lifecycles and system efficiencies for municipalities throughout the greater Chicagoland area.*

AUTOMATED ARTIFICIAL INTELLIGENCE FOR CCTV REVIEW

More Efficiency. More Inspections. More Bill-able Jobs. Happier Workforce

By: Ryan Poertner, Ace Pipe Cleaning, Inc.

CCTV Sewer inspections are not a new phenomenon. A technology dating back to the 1960s, it is still in widespread use due to its relative economic advantage and the fact that it does not just generate the numerical data but also provides video footage and still images engineers can visually refer to if necessary.

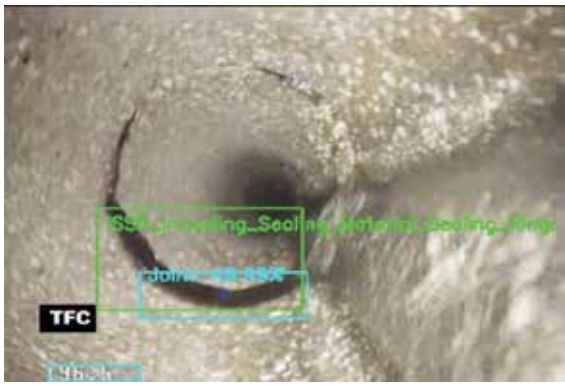
Whilst the hardware for CCTV inspections continues to evolve, there is a part of the process that stubbornly remained unchanged over the years – the process of manually reviewing the CCTV sewer videos to create a report. To this day, millions of man-hours are spent in front of screens, looking for those elusive cracks, roots and protruding sealants. Watching sewer inspections videos for hours on end is a time-consuming and expensive proposition. Once tedium sets in after watching the inside of sewer pipes for hours on end, accuracy tends to suffer as well. Inconsistency due to individual style is also a factor. No two technicians will code the same stretch of pipe exactly the same.

All of this can change with the use of intelligent technologies available today. A cognitive-repetitive process, CCTV footage review and defect coding is a perfect candidate for automation with artificial intelligence. A number of companies looking to do just that have emerged in the recent years – and Molfar.AI, a distributed team working across St. Louis, MO and a number of European locations, including Sumy, Ukraine and Stockholm, Sweden, has a unique approach to solving this problem. Molfar.AI is working very closely with Ace Pipe Cleaning, Inc., a member of the Carylon Corporation, located in the Midwest.

Molfar's approach is focused on completely reducing the cognitive burden on the reviewer. Using its unique approach which analyses the CCTV videos end to end, its cloud platform aims to produce a complete report requiring only the basic information input into the system, such as the pipe length and material type in addition to the videos themselves as input. To achieve this, it goes beyond just the AI-powered detection of objects in each video frame, employing a proprietary two-stage process.

In the first, smart processing stage, several different AI models work at once to detect and classify the objects in each frame. Delegating the specific tasks, such as detecting the construction features, maintenance features, water levels, etc. allows the software to increase the accuracy and make the system more robust.

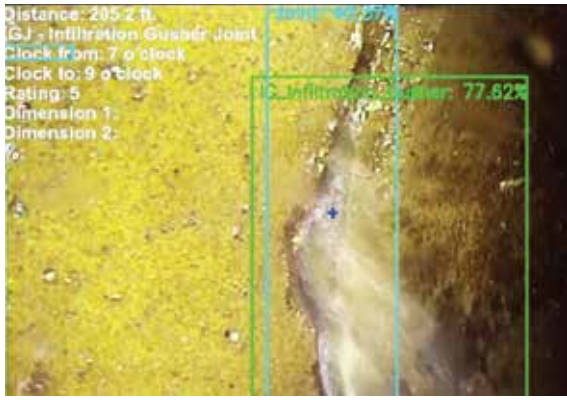
The second, post-processing stage, takes the analysis to the next level, considering the results of the preceding

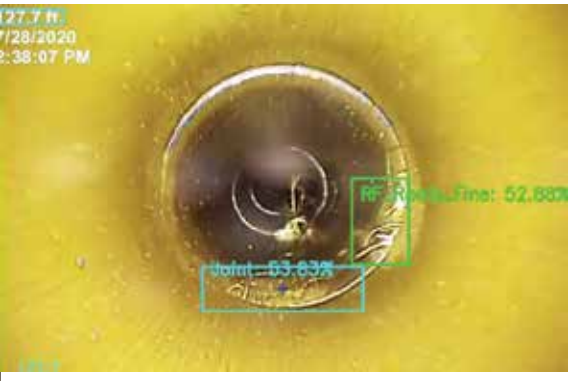


stage within their context in time and space. It is at that stage that the results are also filtered, aggregated, and are analyzed with the help of codified expert knowledge. To correctly identify and represent items such as continuous defects, water lever changes and defects occurring next to the joints it is not enough to know what the camera sees in a particular frame – we need to know what comes before and after. And this is exactly what the second stage of Molfar's platform provides. Analyzing the video end to end allows the platform to deliver a complete report with a high degree of consistency and invariance to size and angle of view.

Consistency is not the only benefit. When processing CCTV footage in bulk, cloud architecture provides considerable scalability and speed advantages, processing 30X more footage than a

The autonomous platform is focused on delivering a complete report with zero cognitive burden for the operator





human engineer can do in the same amount of time.

While some AI systems are built to provide suggestions for the operator driving the crawler, Molfar.AI's experience working with autonomous systems suggested a different approach. Flooding the operator's screen with suggestions and hints increases the cognitive load, forcing the operator to work harder to cope with additional information and potentially slowing the process down. It also leaves humans to do the work to complete the report and determine multiple and continuous defects still. Molfar's autonomous platform is focused on delivering a complete report with zero cognitive burden for the operator instead, leaving the humans to do what they do best – drawing conclusions and making decisions.

The crawlers will continue to be driven by the operators, although Molfar's team expect that their role will change to driving the crawlers through at constant speed and leaving the coding to Molfar.AI software, which will present a completed report once the footage is collected. Another option for CCTV footage collection comes from the recent advances in robotics with fully autonomous crawlers which will be dropped into the sewer main and later picked up through another manhole. With these speedier footage collection methods collecting more footage than ever before, a scalable and fast AI footage processing in the cloud will not be a bottleneck anymore.

While this future may be some time away still, Molfar.AI's cloud platform can be tried and tested today for free– Molfar.AI offers free trials, allowing the CCTV contractors, Engineers, and sewer network owners to upload up to 5,000 feet through the platform without any charge.

So why not try Molfar.AI platform to see if you can save time and money today? Check out this video on Youtube: https://youtu.be/u0812dJErVY

If you have any questions, or to **setup your free trial today**, please contact Ron Moore at ron.moore@molfar.ai or phone 314 229 3713. Ron is based in St Louis, MO.

ABOUT ACE PIPE CLEANING, INC.:

ACE PIPE CLEANING
A Carylon Company

Ace Pipe Cleaning, Inc. *(www.acepipe.com) is the premier provider of turnkey services in the Midwest to maintain critically important environmental infrastructure and help municipalities, utilities, and industrial companies comply with environmental regulations.*

UNDER RIVER HDPE PIPE PULL WINS FOR FORT WAYNE

Large Diameter HDD Project Provides Reliable Water Main for Utility

By: Plastics Pipe Institute, Inc. (PPI)

> **"It was on the higher end of difficulty, probably a seven or an eight."**
>
> **- Jon Hall, P.E., Project Manager, Fort Wayne City Utilities**

The latest improvement to the Fort Wayne City Utilities' water supply required the use of high-density polyethylene (HDPE) pipe horizontally directionally drilled (HDD) under the Maumee River. A total of approximately 4,500 feet of 16-inch, HDPE PE 4710 DR11 DIPS CC3 rated pipe was used to connect to the city's water supply on the north and south sides of the river. Going underground and not affixing the pipe to the nearby bridge was required due to the winter temperatures, which would cause the water in the HDPE pipe to freeze. The *Maplecrest Road Feeder Main – Maumee River Crossing* project was designed and supervised by Fort Wayne City Utilities.

"There's a bridge on Maplecrest Road that we basically laid the pipe parallel to, but installed it under the river," explained Connor Swain, project engineer for Midwest Mole (Greenfield, IN) who installed the pipe. "Our depth under the river was about 10 feet but there was an island between the banks and there we were about 30 feet deep. This part of the project was 2,490 feet total. We took it from a hydrant in the Fort Wayne Biosolids Handling Facility on the north side of the river, under the river up on the south side of the river. We had surveyor stakes every 50 feet and created a drilling path profile."

"This project provided another connection across the river to increase the reliability of our water system," said Andrew Schipper, P.E., water program manager for Fort Wayne City Utilities. "Fort Wayne has three rivers running through downtown providing separation of the water distribution system for significant parts of the city. Adding a transmission main connection nearly four miles from the confluence of those rivers significantly increased the reliability for areas on both the north and south side of the river on this side of town. Anytime you have a river crossing, the complexity of construction increases significantly due to unknowns under the river, the length of the crossing, and the need for significant bends in the main. The total cost for both phases of this project was $650,000 and was completed in December 2019."

Fort Wayne City Utilities is the largest municipally-owned utility in Indiana, with 1,430 miles of mains with 106,000 services and providing water to more than 300,000 residents in three counties.

"Fort Wayne's capital program for the last five years now, has been using HDPE for all new and replacement water mains." Schipper continued. The Maplecrest River crossing is the largest HDD installed transmission main under a river that we've ever done. I would only use HDPE pipe for that."

Jon Hall, P.E., Fort Wayne's project manager said, "At this river crossing it was nearly 600 feet from bank to bank. The bore

Under the river segment was fused all in one long run

Took patience to work through cobble and hard consolidated clay under the river

was also under the Maplecrest road trail which needed to be maintained for public access during construction and is part of Fort Wayne's award-winning trail system. Another obstacle that was successfully located and drilled under was a 48-inch diameter reinforced concrete sanitary sewer main running parallel to the river. The length of the river crossing when including setbacks and items to cross to get back to grade made this a 1,000-foot bore. Midwest Mole was quite creative on this one. It was on the higher end of difficulty, probably a seven or an eight. We haven't done a 16-inch HDD river crossing before.

It is a great relief to have such a successful project as this one completed."

According to the Plastics Pipe Institute, Inc. (PPI), the major North American trade association representing the plastics pipe industry, PE 4710 is the highest performance classification of HDPE piping material for water applications. "PE 4710 HDPE pipe is tough, durable and flexible, meeting AWWA C906 and ASTM F714 standards," stated Camille George Rubeiz, P. E., F. ASCE, senior director of engineering for the Municipal and Industrial Division of PPI and co-chair of the HDPE Municipal Advisory Board (MAB). "The MAB is fortunate to have the Fort Wayne Water Utility as an active member of the Board.

"PE 4710 compounds offer an excellent level of performance for trenchless and open cut installations. This means PE 4710 HDPE pipe can be used with increased flow capacities plus increased resistance to surge pressure, fatigue and slow crack growth. The ANSI/AWWA C906-15 standard includes PE 4710 for sizes up to 65 inches and recognizes the increased durability and reliability of HDPE pressure pipe used in water systems."

"We used a Vermeer D80x100 directional drill rig to basically get our pilot path," Swain explained, "and hooked on a 16-inch reamer, pulling that all the way back to the drill, set up a 24-inch reamer, pulled that all the way back and put the 24-inch reamer on again. Then swab it, and once the crew finished that pass they went ahead and installed the product pipe, which was 16-inch in the 24-inch hole. We took off the reamer, threw it in the back of a truck, drove around and drilled back out. It was very hard consolidated clay under the river plus some cobble. We really had to work our way through it. It just took patience."

The Midwest Mole three-man crew used a fluted reamer with a cutting rig which was able to bore a path through the clay and cobblestone. Drilling fluids included Max Bore bentonite, Swaco platinum packet and also from Baroid.

"We had foreman, drill operator and a laborer," he continued, "reaming and running using 100 - 120 gallons of fluid a minute at a maximum pressure 125 psi or about 12,000 pounds of push pressure. We drilled out to the opposite end, then we put the reamer on the south side of the river and pulled it back to the drill on the north side of the river. The install under the river took about two weeks. We made good time."

The 50-foot lengths of the HDPE pipe were manufactured by WL Plastics (Ft. Worth, Texas), provided by ISCO Industries (Louisville, KY) and were fused together using a McElroy TracStar® 500. "For under the river we were able to fuse it all up in one run which was really nice. Each joint took about 30 minutes to fuse," Swain said.

"The normal operating pressure is 100 psi at the river crossing bottom elevation of 710 feet above sea level," Schipper said. "We successfully pressurized the main to 165 psi to expand and stabilize the main before lowering to the test pressure of 155 psi for an hour. We were pleased to observe no leakage from the main on the first try."

PPI is the major trade association representing the plastic pipe industry. More information can be found at https://plasticpipe.org/municipal_pipe/advisory/

ABOUT THE MUNICIPAL ADVISORY BOARD:

The mission of the Municipal Advisory Board (MAB) is to improve the design, installation, and operation of municipal HDPE water piping systems through the creation of partnerships among utilities, researchers, designers, contractors, and the HDPE industry. MAB serves as an independent, non-commercial adviser to the Municipal & Industrial Division of the Plastics Pipe Institute, Inc.

WATERONE OVERCOMES TIGHT WORKING CONDITIONS & DIFFICULT PROJECT RESTRAINTS WITH PIT-LAUNCHED HDD

By: TT Technologies

Providing solutions for difficult projects is one of the hallmarks of trenchless technology and the advancement of the trenchless industry. And sometimes that means looking beyond the familiar and trying something new. When tasked with figuring out a way to reroute a PVC water line under a major intersection, water utility WaterOne, Lenexa, Kansas, was forced to look outside its current equipment toolbox to find the answer.

Two of the biggest limiting factors of the project were space and the high traffic volume of the intersection. Conventional directional drilling was an early consideration, but ultimately was not an option because of the limited space available for the drill rig. The surface launched drills were too big for the setback and would have required removing part of the road. This was a several-day project, and with a large drill unit, WaterOne crews would not have been able to remove it each day. The traditional open cut approach was never really a viable option.

To find a workable method, WaterOne officials consulted with trenchless equipment manufacturer TT Technologies, Aurora, Ill., the supplier of its pipe bursting equipment. TT Technologies Trenchless Specialist Joe Abell explained, "While WaterOne is proficient in traditional open cut, surface launched horizontal directional drilling and pipe bursting, none of those options would work for this project. Installing the 12-inch PVC lines, as designed within the given restraints, did not allow for any major disruption to traffic flow and required the road to be open fully each night. To facilitate a successful project, we suggested using a Grundopit pit-launched directional drill."

New 12-inch water main needed to be installed under busy street with almost 30,000 cars a day through this intersection. With limited space and other constraints, a compact pit-launched directional drill was chosen for the project

A Utility Moving Forward

WaterOne is an independent public water utility serving Johnson County, KS, and surrounding areas. It was established

The compact directional drill used by WaterOne measures 54 inches long, 43 inches wide and 57 inches tall; and provides 13,489 lbf of thrust and pulling force

in 1957, when area residents, dissatisfied with the service from their water provider, came together and bought out the Kansas City Suburban Water Company. The group reincorporated as public water provider Water District No. 1 of Johnson County. At that time the utility was supplying up to 5 million gallons per day to area customers.

Today, with nearly 425,000 customers and the capacity to supply up to 200 million gallons of water per day, WaterOne serves customers in 17 cities throughout Johnson County. The utility also serves unincorporated parts of the county and its service connections extend into parts of Wyandotte County and Miami County. They have 380 employees, 6 in-house construction crews and on average they install and rehabilitate about 50 miles of pipe each year. WaterOne is able to grow to meet the demand by following a comprehensive master plan. The organization makes continual investments in infrastructure at the right time.

With approximately 2,800 miles of mains in the system, comprised largely of aging cast iron pipe, WaterOne's engineering department has segmented the entire system in order to evaluate it and designate priority for main replacement. The water utility has developed a comprehensive in-house trenchless pipe bursting program and is tackling main replacement head on. Abell said, "WaterOne began transitioning to a trenchless program about 14 years ago in 2006 in an effort to look for efficiencies and same money on restoration costs. Restoration costs alone can end up being over 25 percent of the cost of the entire project. That's why they started looking at trenchless technologies. Unfortunately, as we mentioned, the pipe bursting method would not be able to meet the requirements of this project because the path of the old main was different than the path of the new proposed line."

Project Restraints & Pulling Possibilities

The main relocation took place in Overland Park, KS at the intersection of 95th and Switzer. The city of Overland Park was in the process of overlaying

Providing solutions for difficult projects is one of the hallmarks of trenchless technology and the advancement of the trenchless industry

A 1 ¾-inch pilot bore was completed on the first day in approximately 2.5 hours. After reaming, the entire 100-foot, 12-inch PVC line was installed without incident

a highly traveled busy street with almost 30,000 cars a day through this intersection. The old 12-inch cast iron water main crossing under 95th Street needed to be replaced as part of the project. However, because of the considerable traffic count, the city would not allow any lane closures on the North/South corridor during the project, severely limiting project space. Under the suggestion from Abell and TT Technologies, compact directional drilling with a pit launched HDD unit was selected. In order to install the 12-inch main, the north to south bore path needed to circumvent a phone duct, a 4-inch power conduit (3-phase) and a storm sewer line.

Pit launched, mini-directional drills can be utilized for installing water services, electrical conduit, gas services and small main lines. The units are compact and function well in tight working conditions. The unit utilized by WaterOne measures 54 inches long, 43 inches wide and 57 inches tall; provides 13,489 lbf of thrust and pulling force; and 553 ft. lbs. of torque with typical bore lengths up to 150 feet. Hydraulically operated telescopic bracing supports anchor the unit allowing for proper alignment and maximum thrust and pull back capabilities.

Abell said, "One of the nice things about the pit-launched unit is it's easy to use and portable. The complete unit can be transported in a pick-up truck and operated with a small crew compliment. It also features a patented drill stem plug in that makes loading and unloading the drills simple. The Grundopit is an ideal

was located just within the curb radius, on the edge of the road, heading north. A 4- x 6-foot section of asphalt was removed from the roadway and the rest of the pit stretched back 24 feet through the greenway, ramped at a 30 percent grade.

Abell said, "Over the course of four days, the drilling and reamer portion of the project was completed. The WaterOne in-house crews proceeded in a diligent and methodical manner; as it was their first use of the compact directional drill. They took special care to make sure to avoid damaging the intersection. A 1 ¾-inch pilot bore was completed on the first day in approximately 2.5 hours."

Once the pilot bore was established, a reaming pass was completed with a 10-inch reamer on day two. On day three, a 14-inch reaming pass was completed in approximately six hours. Crews were able to prepare an effective bore path for the new pipe by clearing the heavy clay spoil through the reaming process.

On day four, crews prepared for the final 18-inch reaming pass and pullback of the new Certa-Lok® PVC pipe. Approximately 20 feet of the run was reamed with the 18-inch reamer, which was then pushed back, while crews vacuumed out the spoil and cuttings.

A 60-foot string of new PVC pipe was assembled and readied for pullback. Soil conditions in the area consist of heavy clay which was very conducive for drilling. As a result, the drilling required only 500 gallons of bentonite water mixture.

The first section of 60 feet was pulled in without incident. The remaining 40 feet was pulled back in two 20-foot sections. Once in place, the new pipe was tied into the system past another phone duct on the south side with a new tee and triple valve configuration. On the north side, an existing valve was replaced and the new pipe was tied in there. From start to finish, the project took one week to complete.

Abell said, "It was a challenging project and took a good amount of coordination and skill to pull off. Sometimes taking that leap outside of the equipment comfort zone can pay off, and it did for WaterOne."

One of the nice things about the pit-launched unit is it's easy to use and portable.

- Joe Abell, TT Technologies Trenchless Specialist

ABOUT TT TECHNOLOGIES:

TT TECHNOLOGIES

For more than 45 years, TT Technologies has been the worldwide leader in trenchless technology. Each year, more trenchless sewer, water, gas and electric rehabilitation and replacement projects are successfully completed with trenchless equipment from TT Technologies than any other. TT Technologies is the leader in trenchless!

NORTH AMERICAN SOCIETY *FOR* TRENCHLESS TECHNOLOGY

educate • train • research • publish

YOU'RE AN IMPORTANT PART OF THE NASTT FAMILY!

RENEW YOUR MEMBERSHIP TODAY

When you renew your membership, you help NASTT continue to provide the great programs and initiatives that help grow and expand the trenchless market and the trenchless community. As part of the NASTT family you have access to the best trenchless educational materials, white papers and more.

Not a member? Join the NASTT family today!

NASTT Members Enjoy Great Benefits

- World's largest online trenchless technical library
- Extensive networking
- Trenchless training programs and publications
- Non-commercial technical books and manuals

Family matters and so do you!

Renew or sign up today and help make the NASTT family stronger!

NASTT MEMBER

nastt.org

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

OMAHA SEMINAR DECEMBER 3, 2019: MSTT – RMNASTT - ASCE NEBRASKSA - APWA NEBRASKA

GUEST PRESENTATION

"Trenchless Technology in Omaha"
Mr. Adam Wilmes, P.E.,
Collection System Design Manager,
Public Works, Design Division, City of Omaha, NE

PRESENTATIONS

Welcome to the Trenchless Technology Seminar,
Leonard Ingram, PWAM, MSTT Executive Director

BAMI-I & Certification of Training in Asset Management (CTAM) Program,
Leonard Ingram, Treasurer, Buried Asset Management Institute – International (BAMI-I)

North American Society for Trenchless Technology - Rocky Mountain Chapter (RMNASTT),
Benny Siljenberg, Vice Chairman

Rehabilitating Collapsed Brick Sewers in Omaha, Nebraska,
Brian Culich, AP/M Permaform

Mainline Sewer Grouting,
Frank Augilar, Avanti International

Soft Soil, Smooth Tunnel Operations, Three Methods,
Chris Knott, BTrenchless

Pipe-Jacking,
Jason Holden, Akkerman

How DC Water Is Using GeoSpray Geopolymer To Rehabilitate Large Diameter Pipes And Manholes,
David E. Keaffaber, P.E., Clock Spring / NRI

The Use of Advancing Technologies to Access and Prioritize Rehabilitation for Water Pipeline Infrastructure,
Mark Wade, BlueWater Solutions Group, Inc.

PROMOTING TRENCHLESS TECHNOLOGY IN THE MIDWEST!

MSTT Seminar in Kansas City Held Just Before Pandemic Lockdowns

Now, in the tenth month of this new pandemic reality, in person meetings and seminars might seem like a distant memory, however the Trenchless Technology seminars hosted by MSTT in locations across the Midwest have been a mainstay of trenchless technology outreach and education efforts across the region for nearly two decades.

Since 2003, MSTT has held a total of 37 seminars in 14 different cities across the Chapter's nine state area. These seminars have engaged over 1900 underground infrastructure professionals over this period, facilitating meaningful direct networking between industry and owner groups.

As part of the MSTT mandate to "promote Trenchless Technology through education for the public benefit", the seminar programs are designed to inform public officials, engineers, utility company personnel, designers, and contractors involved with the construction, rehabilitation, and management of underground infrastructure assets, in the Midwestern states. They are great venues for educating decision-makers on the many social and economic benefits of using trenchless technology in their infrastructure renewal and new construction programs.

Ms. Karine Papikian, P.E., Collections Systems Engineering Manager with Kansas City Water delivers presentation on "Trenchless Technology in Kansas City"

In 2019, Chris Schuler, now MSTT President, generously facilitated a very successful two-day Trenchless Technology seminar June 26 – 27, hosted at the Miller Pipeline Training Facility in Indianapolis IN. Consisting of 20 presentations featuring topics ranging from condition assessment to new installation methods, a highlight of the event was an address on "Trenchless Technology in Indianapolis" presented by Mr. John Trypus, Director, Underground Construction & Engineering, Citizens Energy Group, Indianapolis.

At the end of 2019, MSTT conducted a very well-attended single-day seminar December 3, 2019 in Omaha NE, which featured Ms. Katrina Kessler, P.E., Director, Surface Water & Sewers Division, Minneapolis MN, giving a Guest Presentation on "Trenchless Technology in Minneapolis". This event was held in conjunction with the Rocky Mountain NASTT Chapter (RMNASTT) and co-hosted by the ASCE Nebraska section and the APWA Nebraska Chapter.

Due to the Covid-19 outbreak, only one MSTT seminar was conducted in 2020, and it was hosted just ahead of the lockdowns and restrictive measures that swept across North America in early March. Held at the Embassy Suites by Hilton in downtown Kansas City MO, the seminar featured Ms. Karine Papikian, P.E., Collections Systems Engineering Manager with Kansas City Water and her presentation on "Trenchless

MSTT Trenchless Technology seminars are excellent networking and educational opportunities

> **"Next day, March 12, after the seminar, everything had changed."**
>
> **- Leonard Ingram, PWAM, MSTT Executive Director."**

Technology in Kansas City", along with ten other excellent presentations.

The seminar was held on Wednesday March 11, the very same day the NBA game between the Utah Jazz and Oklahoma City Thunder was called off just minutes before gametime, due to the Covid-19 outbreak. As everyone remembers, the sudden postponement of the NBA game was shocking, and heralded an avalanche of hasty closings and shutdowns as everybody scrambled to adapt quickly to the onset of the pandemic.

MSTT Executive Director Leonard Ingram, recalls driving up to the seminar a few days before, and spending time in Memphis and Little Rock with no problems at all traveling. In only a few days, however, the world turned upside down. Leonard recalls, "Next day, March 12 after the seminar, everything had changed. My wife and I drove back down through Branson MO, and the usually busy streets were empty. Never been like that before, I'm sure. Everywhere we looked there were signs, "closed", "closed", "closed", and "closed"… and it was a scary feeling!"

Leonard continues, "The virus spread very quickly. When we left Kansas City on March 12 after the seminar, there were only 3 people with reported Coronavirus. The next day there were around 20 cases, and way over 100 cases by the time we got home. As far as I know, everybody at the seminar got home safely!"

There is renewed optimism as 2021 approaches that MSTT will be able to resume its very effective in person **Trenchless Technology, SSES and Buried Asset Management Seminars** in locations across the Midwest. In the meantime, MSTT is launching its first ever Trenchless Technology Virtual Webinar: the **MSTT Trenchless Technology 2020 Fall Webinar**, Thursday December 17 from 11:00 – 1:00pm EST. If the history of MSTT seminars across the Midwest is any indication, this first-ever MSTT Webinar will be a great success! The webinar is free to all attendees and MSTT will offer two PDHs with a certificate.

Special thanks to MSTT seminar exhibitors, sponsors, presenters and attendees for all our seminars. **THANKS FOR YOUR SUPPORT!!!**

For information dates and locations of future MSTT Trenchless Technology, SSES and Buried Asset Management seminars and virtual webinars planned for the Midwest, visit:

www.mstt.org

KANSAS CITY MO SEMINAR MARCH 11, 2020: - MSTT- ASCE KANSAS CITY - APWA METRO KANSAS CITY -

GUEST PRESENTATION

"Trenchless Technology in Kansas City"
Ms. Karine Papikian, P.E., Collection Systems Engineering Manager,
Kansas City Water, Kansas City, MO

PRESENTATIONS

Welcome to the Trenchless Technology Seminar,
Leonard Ingram, PWAM, MSTT Executive Director

Buried Asset Management Institute – International (BAMI-I) & Certification of Training in Asset Management (CTAM) Program,
Tom Iseley, Ph.D., P.E., Dist. M. ASCE, PWAM, Chair, BAMI-I Board of Directors

The Trenchless Technology Center (TTC), Louisiana Tech, Ruston LA.,
Tom Iseley, Ph.D., Professor Emeritus, Louisiana Tech University, Director of Development, Trenchless Technology Center

PVC Trenchless Applications for Water and Sewer,
Richard Nichols, Uni-Bell PVC Pipe Association

Pipe Bursting,
Joe Abell, TT Technologies, Inc.

Using Advanced Inspection Technologies to Forecast Remaining Useful Life for Large Wastewater Interceptors,
Mark Wade, BlueWater Solutions Group, Inc.

Vitrified Clay Jacking Pipe For Pilot Tube Guided Boring and Pipe Bursting,
Jeff Boschert, PE, National Clay Pipe Institute

PVC Liners for Sewer & Culvert Rehabilitation,
Kerry Koressel, IPEX USA, LLC

Multi Sensor Inspection,
Ed Diggs, Pipeline Inspection Partners Corp. PIPC (Purveyor of Cues High Technologies)

Internal Joint Seals,
Jeremy Keininger, Miller Pipeline Corp.

Large Diameter Pipeline Rehab with Centrifugally Cast Concrete,
Josh McIntire, Ace Pipe Cleaning, Inc.

Sliplining Large and Small Sewers,
Jim Mahony, Hobas Pipe USA

Quick-Lock Mechanical Point Repair System,
Jerry Schroeder, Pipeline Renewal Technologies

-PRESS RELEASE-

BAMI-I
Buried Asset Management Institute - International

Purdue University's CEM EPCom Partners with BAMI-I, WTC-Indy & IIS to develop a 1-day track in Dubai on developing underground space and asset management.

International Conference on Building Materials and Construction Technologies (BMCT) will be held on April 06-08, 2021 in Dubai. The theme of the conference is "Explore the latest innovations in Building Materials and Civil Engineering". BMCT Dubai 2021 primary objective is to exchange ideas and experiences directly with the speakers and also provide various networking opportunities. The Civil Engineering conference is going to provide a great opportunity for the people who are interested to be as an entrepreneur in the field of construction. BMCT Dubai 2021 will create a premier interdisciplinary platform for all Civil Engineering professionals and students to give presentations and discuss the most recent innovations, trends, and concerns, as well as practical challenges, encountered and solutions adopted in the field of Civil Engineering.

World Trade Center Indianapolis (WTC-Indy), Construction Engineering and Management Purdue, Buried Asset Management Institute – International (BAMI-I), and International Infrastructure Solutions (IIS) will be coordinating a 1-day track on the Development of Underground Space & Asset Management in conjunction with the BMCT Conference in Dubai.

For more information please contact Dr. Tom Iseley, diseley@purdue.edu, (404) 386-5667.

Construction almost always begins without a 100 percent complete design. Sometimes this is because of policy decisions by a project owner regarding percentages of planning versus design versus construction fees. Sometimes this is because of site-specific variables that are unknown or uncertain to the designer. Sometimes it is a project timetable issue. Regardless of the reasons, without

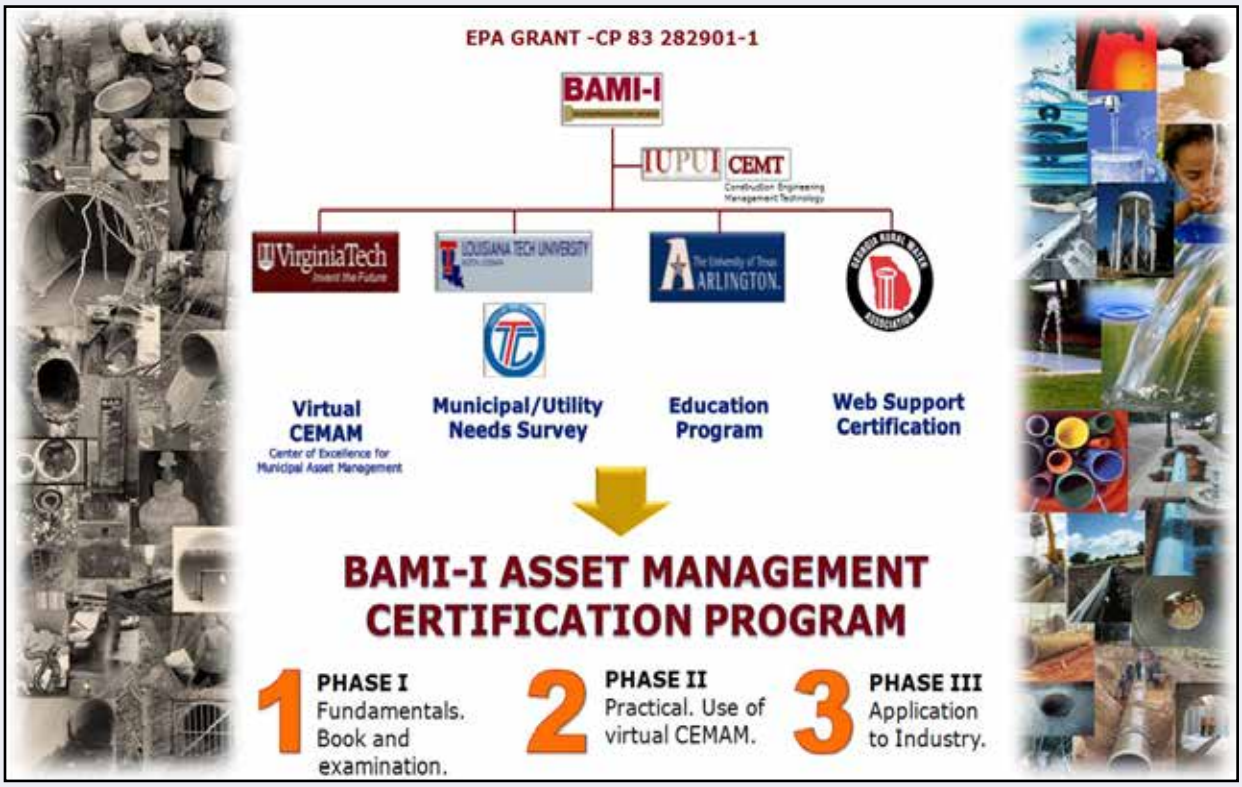
a complete design, safety factors that could be addressed in design may not be. Additionally, engineers may not wish to take on construction safety issues in their design especially if they have no responsibility for managing the construction.

One aspect of construction safety that traditionally straddles the design-construction world is that of existing utilities. Although we have mandated One-Call (811) damage prevention statutes that put the onus of working safely around existing utilities on the constructor and utility owner, engineers can, and should, play a larger role in incorporating knowledge and investigation of the existing project conditions, including utilities, into their design. After all, the engineers' mandate is to protect the public health, safety, and welfare. All three of these items are impacted by existing utilities and should not be expressly disclaimed without good reason.

On Nov 2, 2020 the EPCom (Engineering, Procurement, Construction, Operations and Maintenance) Consortium at Purdue conducted the first webinar on the "Safety: Intersection of the Design & Construction". More than 200 individuals attended this webinar. EPCom provides a resource for advancing project life-cycle management through utilizing an industry/university consortium. This Safety Webinar looked at utilities throughout the life-cycle of a project. It looked at traditional actions by the various stakeholders (Utility Owners, Project Owners, Engineers, Surveyors, and Contractors) in providing safety for existing utilities, and how that safety can be enhanced through engagement of risk management principles during the planning, design, and construction phases of a project. This was the 1st of a Purdue Safety Webinar (PSW) series. EPCom plans to offer one every other month.

Due to the holidays coming up, the next one will be on January 11, 2021. The CEM (Construction Engineering & Management) was established in the College of Engineering at Purdue University over 40 years ago to prepare leaders in construction engineering to produce successful projects. This means safety must be top priority. In addition, it is important to continuously learn about emerging technical and management solutions; therefore, the CEM program plans to produce a PTW (Purdue Technical Webinar) series similar to the PSW series. The first PTW is planned for February 8, 2021.

For more information please contact Dr. Tom Iseley
diseley@purdue.edu | (404) 386-5667



NORTH AMERICAN SOCIETY *FOR* TRENCHLESS TECHNOLOGY

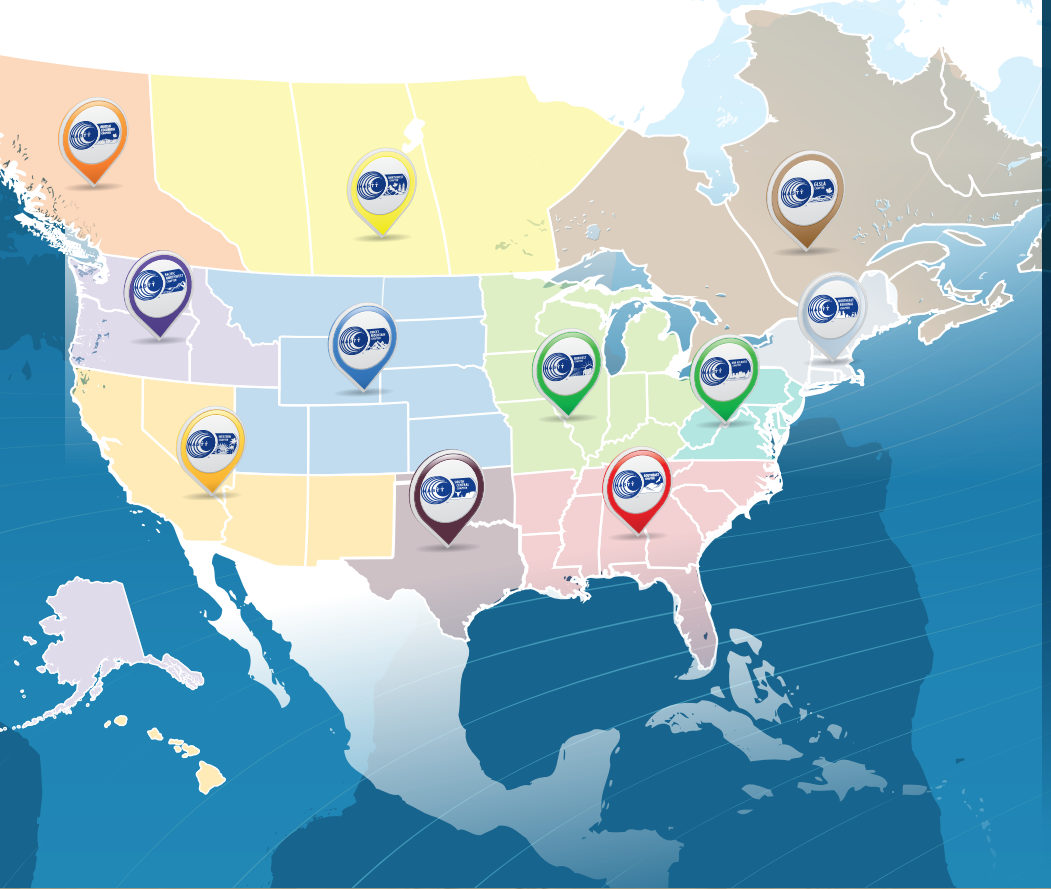
NASTT REGIONAL CHAPTERS

REGIONAL ISSUES, INTERNATIONAL SUPPORT

Contact your regional chapter today.

The grassroots of NASTT is a network of eleven regional chapters throughout the United States and Canada. 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.



REGIONAL CHAPTERS

British Columbia
nastt-bc.org
British Columbia

Great Lakes, St. Lawrence & Atlantic
glsla.ca
Ontario, Quebec, New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland and Labrador

Mid-Atlantic
mastt.org
Delaware, Maryland, New Jersey, Pennsylvania, Virginia, West Virginia and District of Columbia

Midwest
mstt.org
Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, Ohio and Wisconsin

Northeast
nastt-ne.org
Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island and Vermont

Northwest
nastt-nw.com
Alberta, Manitoba and Saskatchewan

Pacific Northwest
pnwnastt.org
Alaska, Idaho, Oregon and Washington

Rocky Mountain
rmnastt.org
Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah and Wyoming

South Central
Oklahoma and Texas

Southeast
sestt.org
Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and Puerto Rico

Western
westt.org
Arizona, California, New Mexico, Nevada and Hawaii

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

INDEX TO ADVERTISERS

CONTECH®
PIPE SOLUTIONS

IS RELINE A VIABLE OPTION FOR YOUR PROJECT?

FIND OUT TODAY.

Use the free DYOReline online design tool to conduct a quick feasibility analysis to determine if a reline solution is possible.

DYOReline™
www.conteches.com/dyoreline

RELINE DONE RIGHT™

With over 70 years of relining experience and 15 reline products, Contech Engineered Solutions provides permanent, fully structural solutions based on time-proven design methods. With experience comes knowledge, we don't play games with the hydraulics or structural design. Knowing pipe assessment, structural design & hydraulic analysis is what we do. The result – the right solution for your project needs - done right, on time and under budget.

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

CONTECH®
ENGINEERED SOLUTIONS