



NORTHEAST JOURNAL

OF TRENCHLESS TECHNOLOGY PRACTICES



NASTT-NE 9TH Trenchless Conference 2025

Grape Street Collector

Subject Matter Experts

Managing Noise Control

2025 FALL EDITION

ECI

ENGINEERS CONSTRUCTION INC.

FULL SERVICE HEAVY CIVIL CONTRACTOR
OFFERING A FULL RANGE OF TRENCHLESS SERVICES

**100% Employee
Owned**

**HDD • AUGER BORING • PNEUMATIC PIPE RAMMING • GUIDED BORING
SBU TUNNELING • TBM TUNNELING • PIPE BURSTING • DESIGN-BUILD**

*Our corporate mission is to serve our clients with quality work at a fair price.
Safety, quality, and integrity are a priority on our projects.*



*Celebrating 60 Years in Business!
1965 – 2025*



Phone: 802-863-6389 | 98 Engineers Drive | Williston, VT 05495

www.ecivt.com

"Always Recruiting Quality People"

HDPE PE4710 PIPE

The Best Choice for Water Systems

	TOP 10 Features & Benefits	HDPE	D. Iron	Sample References
1	Applications: Potable Water (Lead Free), Raw Water, Reclaimed Water, and Wastewater	✓	✓	AWWA C901, C906, C151, and NSF 61 + Health Effects of HDPE Pipes and Fittings for Potable Water Applications, NSF 2024
2	Open Cut Construction: Design and install per AWWA Standards and Manuals	✓	✓	AWWA M55, M41 + MAB-3, MAB-6
3	Trenchless Construction: Material of choice for HDD, Creek Crossings, Pipe Bursting, Sliplining, and Compression Fit	✓	✗	ASTM F585, F1962, F3508 + MAB-5, MAB-7, MAB-11
4	Fully Restrained Joint-Free System: Minimize need for fittings to facilitate horizontal and vertical deflections	✓	✗	AWWA M55, M41
5	Longevity & Corrosion: Pipes, Fittings, and Joints have the least potential for corrosion or tuberculation	✓	✗	Durability and Reliability of Large Diameter HDPE Pipe for Water Main Applications, EPA/WRF/WERF 2015 + The Critical Need for Corrosion Management in the Water Treatment Sector, NACE 2019 + PPIFACE.com + Long-Term Aging of Polyethylene Pipes, UKWIR 2020
6	Flow Capacity: New pipes have similar flow capacity per AWWA Standards and Manuals	✓	✓	AWWA M55, C906, M41 + PPIFACE.com
7	Water & Energy Conservation: Fused joints have zero allowable water leakage, zero infiltration, and lowest carbon footprint	✓	✗	AWWA M55, M41 + ASTM F2620, F3190, F3565 + MAB-1, MAB-2, MAB-8 + TEPFPA Polyethylene Plastic Pipe Systems vs Ductile Iron Environmental Impact Comparison, TEPFPA EPD Calculator
8	Cost Effective: Has the lowest initial cost, lowest life cycle cost, and lowest restoration cost for trenchless installations	✓	✗	Life Cycle Analysis of Water Networks, CSIRO 2008 + Annual Drinking Water Quality Report for 2014, Kittery Water District, 5/31/2015
9	Resilient: Ability to resist ground movements due to droughts, freeze/thaw, earthquakes, hurricanes, with ability for flow control/squeeze off	✓	✗	Recent Earthquakes: Implications for U.S. Water Utilities, WRF 2012 + Polyethylene Pipeline Performance Against Earthquake, Kubota 2018 + MAB-9
10	Permeation/BTEX: Pipes and elastomeric joints need to be properly engineered for contaminated conditions	✗	✗	AWWA C901/C906 and C111/C151, Sec. 4

Additional information including MAB-3 Model Spec Guide can be found at
www.plasticpipe.org/mabpubs





Ditch Witch®

Experience the Evolution

For all your Directional Drilling and Vacuum needs call **JESCO** today at **800-241-7070** or visit one of our convenient locations.

Shrewsbury

167 Memorial Dr.
Shrewsbury, MA
Phone: 508-719-0200

South Plainfield

118 Saint Nicholas Avenue
South Plainfield, NJ
Phone: 908-753-8080

Lumberton

1799 Route 38
Lumberton, NJ 08048
Phone: 609-534-7477

Fairfield

1275 Bloomfield Avenue
Fairfield, NJ 07004
Phone: 973-227-2221

Deer Park

110 East Jefryn Blvd.
Deer Park, NY 11729
Phone: 631-392-2605

Beacon

497 Fishkill Avenue
Beacon, NY 12508
Phone: 845-831-1800

Middletown

1001 Industrial Drive
Middletown, DE 19709
Phone: 302-376-0784

Rosedale

9000 Yellow Brick Road
Rosedale, MD 21237
Phone: 443-460-1070

CONTENTS



Features:



13

NASTT-NE TRENCHLESS TECHNOLOGY CONFERENCE 2025: 9th Annual Conference - November 10-11 Nashua, New Hampshire: Appreciation to Our Sponsors, Exhibitors & Speakers!



20

NASTT NO-DIG 2025 PAPER OF THE YEAR – REHABILITATION

By: Jesse Herman, P.E., PMP, CDM Smith; and Shawn Syde, P.E, Jamie Pont, Justin Chicca, Jim Costa, City of New Bedford MA



35

THE NEED TO HAVE CERTIFIED SUBJECT MATTER EXPERTS

By: Dennis J. Doherty, P.E., BC.PLW, F. ASCE, Terracon Consultants



38

NOISE IMPACT MANAGEMENT FOR HDD OPERATIONS

By: Matt Cott & Amanda Gilliam, Environmental Noise Control

ALSO:

- 16 UMass Lowell Student Chapter Report – Fall/2025**
- 44 Transforming Temporary Mitigation into Sustainable Solution**
- 47 Breaking into the Northeast – Meeting Project Goals Below MBTA**
- 52 Seismic Design Criteria for HDPE Pipe Water Mains**

Departments:

Welcome Message from the NASTT-NE Chair	6
Message from the NASTT Chair	8
Introducing the NASTT-NE 2026-2027 Board Executive	10
Introducing the NASTT-NE 2026-2027 Board of Directors.....	12
Index to Advertisers.....	55

Chair – Jonathan Kunay P.E.
kunayje@cdmsmith.com

Vice Chair – Charles Tripp P.E.
charles.tripp@aecom.com

PUBLISHER



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

Wayne Jury
204.803.1300
waynej@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

© Copyright 2025 A to B Publishing Inc. All rights reserved. Contents of this publication may be reproduced or transmitted with written permission from the Publisher. Views expressed in this publication are not necessarily those of NASTT-NE or of A to B Publishing Inc.

Printed 11/25 in Canada.



MESSAGE FROM NASTT-NE CHAIR

Jonathan Kunay, P.E., PMP, NASTT-NE Chair

Welcome to the 19th edition of the *Northeast Journal of Trenchless Technology Practices*! Your support of this organization helps make this publication possible and thank you for taking the time to open this edition of the magazine. The individuals who provided content for this publication are passionate about what they do, and our Publisher does a great job of making it all look good! I hope that you find the content informative and useful to your career development.

2025 NASTT-NE Annual Conference Preview

The 9th Annual 2025 NASTT Northeast Trenchless Conference is being held at the Sheraton Nashua Hotel in Nashua, New Hampshire on November 10-11. You may even be reading this welcome message at the conference right now! If not, you are missing out on a great day of informative presentations and outdoor demonstrations, and I encourage you to mark your calendar for November 2026, so you do not miss out again. Our annual conference, held in November each year, continues to bring together the best minds and leaders in the Northeast trenchless community. We expect over 100 attendees and 30+ exhibitors, four technical presentation tracks, and two interactive outdoor demonstrations.

The 9th anniversary of this conference means a lot to all of the hard working, volunteer Board Members and Chapter Members who run this Chapter and

.....
**“THE INDIVIDUALS
WHO PROVIDED
CONTENT FOR
THIS PUBLICATION
ARE PASSIONATE
ABOUT WHAT
THEY DO.”**
.....

work to organize the annual conference. We are looking forward to the 10th Annual Conference in 2026 (date/location TBD). Over ten years of furthering education, interaction, and relationship building within the trenchless community in New England is certainly a milestone we should all embrace and celebrate! We will be reaching another milestone in spring 2026 when we publish the 20th edition of this magazine. We plan to pull out all the stops and have already been working to develop content that will pay tribute to the past and highlight the achievements over the past 10+ years.

If you are reading this welcome message after the Annual Conference and are feeling left out, we are always looking for good content for the program. With that in mind, please start thinking about an interesting project or case study to present in 2026, and watch out for our “Call for Papers” sometime in July.

NASTT – NEC Board Updates:

2026 will usher in a new era of leadership for the Chapter, as we stay committed to keeping things fresh by changing the Executive Committee roles on a two-year cycle. I will be phasing out into the “Past Chair” role, with the current Vice Chair and Treasurer being elevated one level. As such, in January 2026 we welcome Charlie Tripp as the new Chair and Tom Loyer as the Vice Chair. We are also bringing in two new Executive Committee members to the Chapter. Nick Strater will serve as Treasurer and Sam Wilbur as Secretary. Please join me in congratulating all of our new Executive Committee members. I know they will keep the heart and soul of this organization going strong.

With that, I would like to say, “*Thank You*”. Being the Chair of this Chapter the last two years has been an honor, and it has been an enriching experience for me and my career. I look forward to the leadership that the new Executive Committee will provide to help the chapter continue to grow and push forward the goals of increasing awareness, fostering interaction, and expanding trenchless market growth in the Northeast.

Thank you again for taking the time to read this publication and for allowing me to be part of this Chapter’s journey. I will continue to be involved, so maybe I’ll see you at No-Dig in Palm Springs, CA in 2026. Until then...

Jonathan Kunay

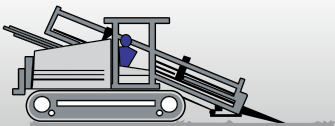
Jonathan Kunay, P.E., PMP
Chair, NASTT-NE

We are

BORING



HDD now offers Auger Boring Services



HDD

Henniker Directional Drilling, L.L.C.

www.hddbore.com

HENNIKER DIRECTIONAL DRILLING

Drilling in New England tough terrain since 2001

HDDBORE.com | 603-428-6333 | dmartin@hddbore.com

Visit us on FB and Instagram





MESSAGE FROM NASTT CHAIR

Greg Tippet, P.Eng., NASTT Chair

Dear Northeast Members & Supporters,

As Chair of the NASTT Board of Directors, I want to take a moment to thank you for your continued commitment to the trenchless industry and your active engagement within your regional community. Our success as a society depends on the strength of our Regional Chapters, and the Northeast region continues to lead by example.

One of the most inspiring aspects of our organization is the dedication of our volunteers. Whether you're serving on a committee, mentoring a young professional, organizing local events, or simply showing up to lend a hand at chapter activities, your time and energy are what make this society thrive. Your expertise, generosity, and passion for trenchless technology are the heartbeat of our mission, and I want to express my deep appreciation for everything you do.

Looking ahead, we're excited about the upcoming **Northeast Chapter 2025 Annual Trenchless Conference**, which will be held in **Nashua, NH on November 10-11**. The conference includes a dynamic program of technical presentations, exhibitors and networking opportunities. Designed for engineers, contractors, suppliers, manufacturers, and other industry stakeholders, this event will explore current challenges, emerging

.....
**“YOUR EXPERTISE,
GENEROSITY, AND
PASSION ARE THE
HEARTBEAT OF
OUR MISSION!”**
.....

trends, and proven solutions in the trenchless field. I encourage all members, whether you're a long-time veteran or new to the industry, to attend and take full advantage of what this regional gathering has to offer.

While our regional events are essential to strengthening local networks, NASTT also provides you with opportunities to engage with trenchless leaders on a global scale. Next up in 2026, we'll head to **Palm Springs, California for the NASTT 2026 No-Dig Show, March 29-April 2**. Palm Springs promises to be an exciting and memorable destination, and our team is already hard at work planning a world-class event with technical sessions, networking opportunities, and the unmatched energy that makes the No-Dig Show such a cornerstone of our industry

calendar. If you've ever considered presenting, volunteering, or exhibiting at a national level, now is the perfect time to start planning for your involvement.

These events, local, national, and international, are only made possible by the engagement and leadership of members like you. As we grow and expand our impact, I encourage you to consider how you might get involved in the months ahead. Whether it's submitting a paper, nominating a deserving peer for an award, supporting student and young professional programming, or participating in one of our many outreach initiatives, your voice matters and your presence makes a difference.

On behalf of the entire Board of Directors, thank you for being a valued member of the NASTT-NE region and the larger NASTT family. Your contributions help move our industry forward, one innovative, trenchless step at a time. I hope you'll join the Chapter in New Hampshire this fall, and perhaps in Palm Springs soon after!

Greg Tippet

Greg Tippet, P.Eng.
NASTT Board of Directors Chair

MAG X GEO



PRECISION GPS DATA LOGGING

- » RTK-Enabled GPS with 1–3 cm Accuracy
- » GPS Tracking including Elevation
- » Automatically Record Rod-by-Rod Metrics



ON-THE-FLY FUNCTIONALITY

- » Views: Overhead Aerial, Side Profile Chart, Rod Table
- » Tools: Bore-To Steering, GPS Dropline, Pitch Guide
- » Logging: Rod Pitch, Roll, Temp, Depth, and GPS Data



REPORTING REDEFINED

- » Add Utility Crossings with Type, GPS, and Depth
- » Generate, Share, and Sync Reports from Receiver
- » Real-time Project Monitoring



INTRODUCING THE NASTT-NE BOARD 2026-2027 EXECUTIVE COMMITTEE



CHAIR
CHARLES TRIPP, P.E., BC.PLW
HDR Inc.
charlie.tripp@hdrinc.com

Charles Tripp, P.E., BC.PLW is a Pipeline Rehabilitation Technical Lead at HDR in Boston, MA. He has 19 years of experience working as a manager, technical lead, and design engineer on a variety of trenchless projects including pipeline rehabilitation, condition assessment, risk modeling, and general asset management.

Charlie was first introduced to trenchless technologies through his involvement in multiple sanitary sewer rehabilitation projects. He also briefly served as a Field Engineer for a world leading CIPP construction company. This experience provided a wealth of exposure and instilled a desire to pursue and advocate for the use of trenchless technologies in projects as a way of mitigating the impacts of excavation in urbanized areas, but also as a means of cost-effective design.

Charlie studied Civil Engineering at the University of Massachusetts Amherst earning his B.S. and went on to receive his M.S. in Environmental Engineering from the Worcester Polytechnic Institute. He is a licensed professional engineer across New England and the Tri-State area, PACP/MACP/LACP certified by NASSCO, and a Board-Certified Pipeline Engineer-Water (BC.PLW) by ASCE.

As Chair of the Northeast Chapter of NASTT, a past recipient of the Trent J. Ralston Young Trenchless Achievement Award, and a qualified NASTT CIPP Good Practices Instructor, Charlie continues to capitalize on his devotion to trenchless technologies and in advocating for its use in the local construction market.



VICE CHAIR
TOM LOYER
ECI – ENGINEERS
CONSTRUCTION INC.
tom@ecivt.com

Tom Loyer serves as the Vice President of the Trenchless Technologies Division at Engineers Construction Inc. (ECI) in Williston, VT, where he leads operations in directional drilling, pipe ramming, auger boring, tunneling, and pipe bursting. Since joining ECI in 2011, Tom has been instrumental in advancing underground utility construction projects and driving business development initiatives. Previously, he owned Trenchless Technologies of New England, Inc., pioneering underground utility installations and introducing pipe ramming technology to the Northeast.

Tom's expertise has been highlighted in numerous industry publications, and he has presented at national conferences, further demonstrating his influence in the field.

Beyond his professional accomplishments, Tom is deeply involved in the community. He has served on several boards, including The Associated General Contractors of Vermont as the chairman of the legislative committee and held a position on the board of directors, and as a trustee for the Fraternal Order of Eagle Aerie # 793 as well as volunteering with Shelburne Little League, CSB Youth Hockey, and the CVU Football Boosters Board.

Since 2011, Tom has been the President of The Classic Mike Loyer Foundation, a non-profit, whose primary mission is to assist Vermont families who are dealing with the accidental worksite death of a loved one.

Tom studied business at Champlain College and continues to lead and innovate in the utility construction industry, drawing on his experience and dedication to excellence. Tom, and his wife, Lori, live in Shelburne, VT.

INTRODUCING THE NASTT-NE BOARD 2026-2027 EXECUTIVE COMMITTEE



TREASURER
NICK STRATER
BRIERLEY ASSOCIATES
nstrater@brierleyassociates.com

Nick Strater, P.G. has over 30 years of design and consulting experience, focusing on trenchless applications throughout the United States, Canada and South America. His specialties include geotechnical characterization, feasibility and risk assessments, detailed design, construction management and forensic evaluation. Nick serves Brierley Associates' Trenchless Sector Lead.

Mr. Strater is a frequent invited lecturer on the topics of trenchless method selection, geotechnical characterization and risk management. He has authored over 25 technical papers on these topics and received the NASTT Outstanding Paper Award in 2020. Nick also represents the industry on multiple ASCE committees and was one of the principal authors on multiple ASCE/ Utility Engineering and Surveying Institute (UESI) Manuals of Practice, including *Pilot Tube and Other Guided Boring Methods* (MOP No. 133), *Horizontal Auger Boring (Jack and Bore) Projects* (MOP No. 106), and *Direct Steerable Pipe Thrusting* (MOP 155).

Nick is passionate about the application of trenchless methods for the purpose of infrastructure expansion and improvement, and recognizes the importance of research, development and continuing education in this expanding arena.



SECRETARY
SAM WILBUR
**DELVE UNDERGROUND
CONSTRUCTION INC.**
wilbur@delveunderground.com

Sam Wilbur, P.E. is a consulting engineer with Delve Underground in Burlington, MA. Over the course of his career in the underground industry, Sam has worked on major tunneling and trenchless projects throughout the United States. He has been involved in projects for clients such as City and Borough of Sitka Alaska; DC Water; Eversource; the Massachusetts Water Resource Authority; the Narragansett Bay Commission; New York City Department of Environmental Protection; the New York State Department of Environmental Conservation; NYC Department of Design and Construction; Nassau County; and the US Army Corps of Engineers.

For the past twelve years, Sam has focused on trenchless construction management, design and construction of transit, water and wastewater projects, and tunnel and conveyance design projects. He has worked on various pipeline projects utilizing auger boring, microtunneling, pilot-tube guided boring, pipe jacking, sliplining, tunnel boring machines, and rehabilitation methods.

Sam has a Bachelor of Science in Civil Engineering and a Minor in Applied Mathematics from the University of Colorado. He is a licensed professional engineer in New Hampshire.

Sam recognizes the importance of the NASTT NE Chapter in its promotion of the rapidly growing trenchless design and construction methods in the United States. One of Sam's goals as a young professional is to engage his peers in the NASTT NE Chapter to become involved in the trenchless industry early in their careers.

NASTT

CHAPTER

TM

INTRODUCING THE NASTT-NE BOARD 2026-2027 EXECUTIVE COMMITTEE



PAST CHAIR
JONATHAN KUNAY. P.E. PMP
CDM Smith
kunayje@cdmsmith.com

Jonathan Kunay, PE, PMP is an Associate Engineer and Conveyance Discipline Leader for CDM Smith in Boston, MA. He has more than 22 years of experience working as a design engineer, project manager and technical specialist on a variety of trenchless projects including infrastructure assessment with traditional and state-of-the-art investigative techniques, rehabilitation using CIPP, CCCP, HDD, microtunneling and pipe bursting, facilities and master planning, leak detection of water distribution systems, enterprise asset management and risk/criticality studies.

While trenchless technologies have been his primary focus over the past 18 years, he has also worked on civil site design for commercial developments and municipalities, navigated Consent Order driven long-term programs, designed new pumping stations and water distribution systems, and developed alternatives for sewer separation projects. Jonathan is based

in New England; however, his diverse project experience has brought him many places to experience unique perspectives in the trenchless marketplace. He has worked on trenchless projects all over the United States including Arizona, California, Texas, Illinois, Tennessee, Louisiana, South Carolina, Nebraska, Virginia, Florida and Georgia. He has also implemented trenchless projects and programs internationally in the Middle East, China, South America, the Pacific Islands, Japan and Europe.

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

Jonathan has a Bachelor of Civil Engineering and a Minor in Environmental Engineering from the University of Cincinnati, is involved in multiple committees in the National Association of Sewer Service Companies (NASSCO), is PACP, MACP and LACP certified, and is the Chair of the WEFTEC Collection Systems Symposia.

NASTT-NE 2026-2027 BOARD OF DIRECTORS



BILL JEFFERY
TT TECHNOLOGIES INC.
bjeffery@tttechnologies.com



JAMES P SMALL JR.
**THE HALLEN CONSTRUCTION
CO., INC.**
jsmall@hallen.com



SAHAR KUNAY
CONSTRUCTIVE SOLUTIONS
skunay@csmwbe.com



KEN TRAUB
HEMLOCK DIRECTIONAL
boringguy@hdboring.com



JESSE LUBBERS
NATIONAL GRID
jesse.lubbers@nationalgrid.com



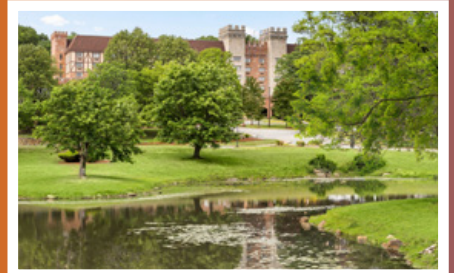
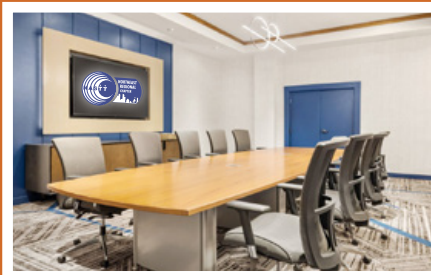
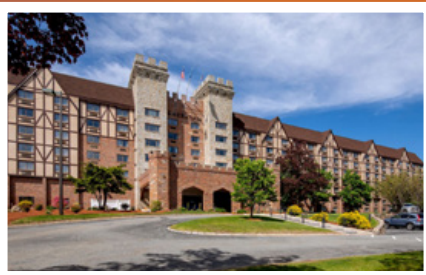
JOIN US IN
Beautiful Historic Nashua, New Hampshire
for the 9th Annual
NORTHEAST REGIONAL CHAPTER
TRENCHLESS CONFERENCE

November 10-11, 2025

Sheraton Nashua
11 Tara Boulevard, Nashua, NH

**Attendance
Scholarships Available
for Municipal & Utility
Attendees!**

Technical Demonstrations and Presentations on Trenchless Technology Applications for Water, Sewer, Stormwater, Gas and Power Transmission. Planning, Condition Assessment, Risk-based Engineering & Construction for Trenchless Projects and more!



Visit www.nenastt.org
for information on future conferences



NASTT Northeast Chapter Technical Sessions - Nashua, NH Nov. 11, 2025				
Time	Presentation	Speaker	Presentation	Speaker
7:30 AM	Registration Desk Opens			
7:30-8:15	Breakfast and Networking - Vendor Area Open			
8:15-8:30	Opening remarks - NASTT-NE Chair			
	AM Track 1 - HDD		AM Track 2 - Pressure Pipe Solutions	
	Moderator - Dennis Doherty		Moderator - Raj Gondle	
8:35am-9:00am	Griswold Street HDD	P. Gilliam - Bradley Marin	Sleep Sound Knowing What's in the Ground: Inspecting Force Mains	C. Kowash - HDR
9:05am-9:30am	Pipeline and HDD Noise Standards and Regulations	M. Cott - Behrens and Associates	Route 6 Water Main Brook Crossing Slipline in Westport, MA	A. Silveri - Kleinfelder
9:35am-10:00am	Multi-Discipline Execution in Remote HDD Campaigns: Lessons from the Champlain Hudson Power Express	P. Perron - The Crossing Group	Reviving Rose Alley: Collaborative Rehabilitation of a Critical Sanitary Force Main	B. Cotter - Jacobs
10:05am-11:35am	Live Outdoor Demonstrations DCI- Demonstration (10:05-10:50); MTC - Demonstration (10:50-11:35)			
11:35am-12:00pm	Break - Vendor Time			
12:00pm-1:00pm	Lunch Keynote Speaker - Brian Dorwart, PE, PG - Brierley Associates			
1:00pm-1:25pm	Break - Vendor Time			
	PM Track 1 - Sewer Rehabilitation		PM Track 2 - New Trenchless Installation	
	Moderator - Charlie Tripp		Moderator - Sahar Kunay	
1:30pm-1:55pm	Don't Drain the Pond - Rehabilitating the City of New Bedford's Grape Street Collector Sewer	J. Herman - CDM Smith	The need to increase Subject Matter Experts (SME's) in a growing Trenchless Market	D. Doherty - Terracon Consultants
2:00pm-2:25pm	Digging Up the Past: Utilizing Trenchless Methods in an Open-Cut Emergency	C. Ganley - Onondaga County DWEP	Alignment and Equipment Recovery During Challenging Trenchless Construction	S. Wilbur - Delve Underground
2:30pm-2:55pm	A Marsh-Velous Adventure! - Cohasset, MA Coastal Resiliency Sewer Improvements	D. Scott - Woodard & Curran	Assessing Ground Movements after Microtunnel Installation Beneath an Urban Transportation Corridor	S. Dutta - Simpson Gumpertz & Heger
3:00pm-3:25pm	Geopolymer or Not Geopolymer...that is the Question! Large Diameter Sewer Rehab with Geopolymer Mortar and/or CIPP Trenchless Technology Options	S. Naiva - GeoTree Solutions	A conductor Casing Bottom Seal from head Scratching to Implementation	J. Corbin - CJGeo Contractors

NASTT-NE TRENCHLESS TECHNOLOGY CONFERENCE 2025

SPONSORS & EXHIBITORS

THANKS TO OUR SPONSORS!

PLATINUM SPONSOR:

Hemlock Directional Boring



GOLD SPONSORS:

DL VIEWS



Jacobs Engineering Group



Northeast Remsco Construction



TT Technologies



SILVER SPONSORS:

Galloway Group



OBIC



Omega



BREAKFAST SPONSOR:

Vector Magnetics



LUNCH SPONSOR:

ECI - Engineers Construction, Inc.



COFFEE SPONSOR:

Akkerman



LANYARD SPONSOR:

CJGeo Contractors



2025 CONFERENCE EXHIBITORS

Aaron Enterprises, Inc.

Constructive Solutions

DCI (outdoor demo)

Environmental Noise Control

FW Webb

GeoTree Solutions

JESCO

MTC/Azuria (outdoor demo)

On-Point HDD

Vari Tech LLC

Vermeer All Roads

Vortex Companies

Westlake Pipe and Fittings

KEYNOTE SPEAKER



Brian Dorwart, PE, PG Brierley Associates, is an accomplished and knowledgeable professional with a lifetime of experience in many aspects of trenchless technology. His clients have included contractors, private industry, public agencies, owners, engineers, and other governmental agencies in numerous business sectors such as oil and gas pipelines, telecommunications, water and waste water, power transmission, rehabilitation of pipes and culverts, and transportation. Brian is a registered Professional Engineer in 33 states and a Registered Professional Geologist in 2 states. He has more than 40 years' experience in underground engineering and more than 25 years design and field experience with various types of horizontal directional drilling (HDD) including subsurface characterization, design, cost analyses, construction management, forensics, and construction. He has worked in all 50 states, throughout Canada, Central and South America, and New Zealand. Qualified as technical expert in Federal and State courts, Brian is a "Friend of the Court" in Canadian Provincial Courts supporting both contractors and owners in claim negotiation and remediation for geotechnical and geological matters associated with tunnels, directional drills, shoreline development, landslides, and forensic studies for geologic and geotechnical issues in jury trials, hearings, and before public boards. In 2024 at the NASTT No-Dig Show in Providence RI, Brian was honored for his lifetime achievement as that year's sole inductee into the NASTT Hall of Fame.

UMASS LOWELL NASTT STUDENT CHAPTER REPORT FALL/2025



By: Dr. Raj K. Gondle, UMass Lowell, Department of Civil & Environmental Engineering

OBJECTIVES:

The objective of the UMass Lowell NASTT Student Chapter is to actively engage in trenchless activities and practice trenchless engineering. Students, faculty, and industry professionals are involved to promote learning of the leading-edge trenchless technologies and build opportunities to advance trenchless practices and underground engineering.

Our Student Chapter continuously strives to:

- (1) participate in conferences related to trenchless technologies and underground engineering,
- (2) invite and attend guest lectures by trenchless leaders to promote the learning and understanding of different techniques,
- (3) identify field projects and schedule site visits to experience trenchless methods and underground engineering,
- (4) encourage students who have not yet had an experience with trenchless technologies into learning about the exciting world of trenchless technologies and,
- (5) conduct trenchless research.

HISTORY:

The NASTT Student Chapter at the University of Massachusetts Lowell (UML) was established in Fall 2016 semester. UMass Lowell is an urban public university located in the greater Boston area. The city of Lowell was the first planned industrial city in North America. James B. Francis for whom the University's College of Engineering is named after. Lowell was the first urban national park. UMass Lowell is the largest university in the Merrimack Valley and is committed to preparing students for work in the real world by providing affordable, high-quality education. Prof. Raj Gondle from the Department of Civil & Environmental Engineering (CEE) initiated the student chapter with strong support from the trenchless industry. Prof. Gondle continues to serve as the faculty advisor to oversee the chapter and help as needed. Also, our Student Chapter is fortunate to have industry leaders like Dennis Doherty, a National Practice Leader, to serve on our Industry Advisory Board and encourage students from early on



UMass Lowell Student Chapter members with NASTT-NE Board at the NASTT 2025 No-Dig Show in Denver

.....
**"THE STUDENT CHAPTER ACTIVELY
PARTICIPATES IN NATIONAL AND
REGIONAL EVENTS."**
.....

to step into the world of trenchless and underground construction. Today, the UML NASTT student chapter is a long standing civil/geotechnical engineering club in the northeast focused on trenchless engineering and underground construction.

The first ever NASTT Northeast regional conference was held at UMass Lowell and since then we have been involved in a plethora of NASTT events all over the country. With strong support from industry, students at UMass Lowell had the opportunity to visit local construction sites such as the MassDOT I-495/I-90 Moles Student Day Tour and be a part of heavy construction competition teams such as the Construction Industries of Massachusetts Labor Relations Division (CIM-LRD) and the 3rd Annual Design/



In conjunction with the NASTT-NE Board, the UMASS Lowell Student Chapter members keep everything running efficiently at the Annual Northeast Trenchless Technology Conference



Construction student competition held at Tufts University. In addition to the University-level activities and local events like the BSCES events, the student chapter actively participates in national and regional events, including the annual NASTT No-Dig Show, and the NASTT-NE Northeast Regional Trenchless Technology Conference. Through these activities and a strong emphasis on collaboration and innovation, the chapter has become a vital part of the civil and environmental engineering community at UMass Lowell, inspiring students to pursue impactful careers in trenchless technology and underground construction.

EXPERIENTIAL LEARNING ACTIVITIES:

The Student Chapter continues to recruit students passionate about trenchless technology and underground construction. Geotechnical aspects of trenchless engineering and activities related to underground construction are the primary areas of interest. Following is a summary of the experiential learning

activities offered to the chapter members, including site demos, workshops and presentations:

- **Proposed Allston Landing Project – Heavy Civil Infrastructure Design/Construction**, 4th Annual CIM-LRD Competition, April 11, 2025.
- **MassDOT District 4 construction tour** (in planning)
- **Boston Concrete Plant tour**, October 28, 2025.
- **I-90/I-95 construction** (planned w. 25 students), Oct. 24, 2025. (the Moles group)
- **2025 BSCES Arthur Casagrande Lecture** (w. 3 students), Oct. 16, 2025. (the Moles group)
- **MassDOT's Research and Materials Guest Lectures by Jason Roberston** (w. CIVE.3100 class), Oct. 15, 2025. (at UMass Lowell)
- **James B. Francis Lecture on Built Environment: AI and Robotics**, Sep. 24, 2025. By Steven Fallon, MBTA and Jessica Boatright, Reframe Systems.
- **Design and Construction of Underground Infrastructure including insights of GDR and GBR by Luis Avila, WSP**, August 13, 2025.

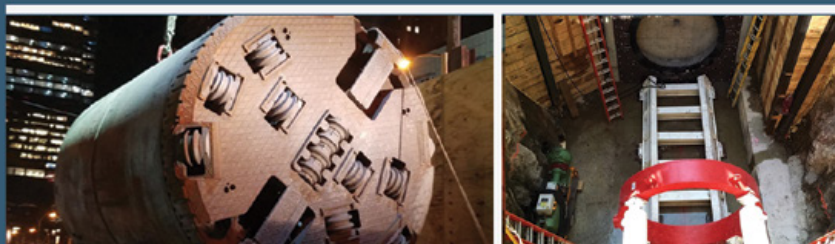
WWW.TECTONICENGINEERING.COM
Tel. 800-829-6531

- Geotechnical Engineering
- Soil & Rock Mechanics
- Geologic Site Characterization
- Rock Reinforcement Design
- Support of Excavation Design (SOE)
- Surveying & Mapping
- Environmental & Regulatory Permitting
- Vibration Monitoring
- Construction Materials Testing
- Special Inspections



NY|NJ|CT|PA|VA|FL|CA

Engineering Design & Construction Support Services



Tectonic

PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.



Fadilat Amisu, UMASS Lowell Student Chapter member, recipient of NASTT 2025 Michael E. Argent Memorial Scholarship at the NASTT 2025 No-Dig Show

- **Forensic Investigations and Failure Analyses related to Ground improvement and Microtunneling** by Susom Dutta and Ronan Bates, SGH, August 13, 2025.
- **Proposed Blue Line Western Extension Project**, 3rd Annual CIM-LRD Competition, April 12, 2025.
- **Trenchless Lead Service Replacement** by Kleinfelder at UMass Lowell, Dec. 19, 2024.
- **Live Demonstrations**, Northeast Trenchless Conference Nov. 13, 2024.
- **MassDOT's I-495/I-90 construction** (w. 13 students), Sep. 27, 2024. (the Moles group)
- **The Heat Beneath your Feet: Geothermal Energy**, Sep. 25, 2024. (James B. Francis Lecture by Heet)

LOOKING AHEAD:

The student chapter is planning to achieve several goals in 2025-2026, including OSHA-10 certifications, attending the NASTT-NE 2025 Northeast Regional Trenchless Technology Conference in Nashua, NH, and the 2026 NASTT No-Dig Conference in Palm Springs, CA.

The chapter remains committed to recruiting students passionate about trenchless technology and putting them into real world practical situations. ✚



ABOUT THE FACULTY ADVISOR:

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

VXT600 VAC TRUCK

SMALL FOOTPRINT. BIG IMPACT.

The Vermeer VXT600 is lightweight, quiet, & powerful —the perfect combination for your underground utility operation.

📞 844-VERMEER
🌐 VermeerAllRoads.com
📱 @VermeerAllRoads

 A photograph of a yellow and black Vermeer VXT600 VAC truck operating on a residential street. The truck is equipped with a large vacuum hose and a worker in a safety vest is visible near the front.

Connect • Learn Achieve • Influence

**Join to be part of
an elite community of
trenchless professionals!**



Career Advancement Doors Opened!

“Because of NASTT, I have a pretty stacked tool belt that helps me bring innovative approaches to infrastructure concerns. My experiences with trenchless technologies gives me a ‘leg-up’ over others.”

~ Eric Schuler, PE, Onondaga County Department Water Environment Protection



Education Second to None

“NASTT is far and away the leading educator and networking pool in the trenchless industry. If your company plays a part in the trenchless industry, you will benefit from NASTT membership much more than you realize.”

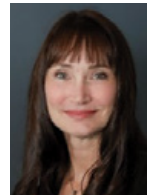
~ Joe Lane, Azuria Water Solutions



Tops at Staying on Top of the Industry

“I first joined NASTT to stay current on technological developments, best practices and market trends. Participating in NASTT committees and events and accessing its expert mentors and professionals is essential to the success of almost any project.”

~ Marya Jetten, AECOM



Amazing Network

“NASTT has been the most significant vehicle relative to the industry-specific connections I've made and cultivated throughout my career.”

~ Cindy Preuss, PE, CDM Smith



Membership Helps Me Strut My Stuff

“I would not be doing what I love to do without the presence and impact of NASTT. I wanted the industry to know about a record HDD project and NASTT gave me the access and opportunity to tell to the industry.”

~ Jim Murphy, UniversalPegasus International



nastt.org/membership

membership@nastt.org
888-388-2554

**NASTT membership
equips and empowers you
to thrive in your career.**

Join as an individual or get group savings as an organization with a corporate or government/education/utility membership.

NASTT NO-DIG 2025 PAPER OF THE YEAR – REHABILITATION

“Don’t Drain the Pond - Rehabilitating the City of New Bedford’s Grape Street Collector Sewer”



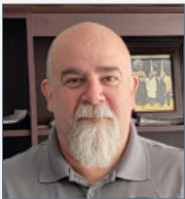
ABOUT THE AUTHORS:



Jesse Herman, P.E., PMP is a Project Manager for CDM Smith with ten years of experience working on a variety of water and wastewater projects. Jesse is a Professional Civil Engineer registered in Massachusetts and Rhode Island. His work experience has focused on sewer collection system design, condition assessment and rehabilitation, and infiltration and inflow (I/I) studies.



Shawn Syde, P.E., City Engineer is the City Engineer for the City of New Bedford, Massachusetts. Mr. Syde is a registered professional engineer in Massachusetts and Rhode Island with 25 years of experience. His work experience includes planning, analysis and design of wastewater collection systems, CSO abatement planning and design, infiltration and inflow remediation projects, and development of asset management programs.



Jamie Ponte, Commissioner of Public Infrastructure is the Commissioner of the City of New Bedford's Department of Public Infrastructure with 15 years of experience for the City of New Bedford and 8 years as Commissioner. Mr. Ponte is responsible for the management and oversight of an annual \$60 million budget with 190 employees. He is licensed in both Water and Wastewater.



Justin Chicca, Deputy Commissioner of Public Infrastructure is the Deputy Commissioner of the City of New Bedford's Department of Public Infrastructure with 7 years of experience at the City of New Bedford. Mr. Chicca served as the City's Superintendent of Wastewater for the first three years before accepting the position of Deputy Commissioner.



Jim Costa, Superintendent of Wastewater is the Superintendent of Wastewater for the City of New Bedford with over 15 years of experience working with the City's Department of Public Infrastructure. His responsibilities include operation and maintenance of 350 miles of sewers and 150 miles of storm drains, management and oversight of the City's IPP program and shellfish program, and contract operator oversight at the City's 75 MGD wastewater treatment plant and 27 wastewater pumping stations.

1. ABSTRACT

In the fall of 2018, the City of New Bedford (City) Department of Public Infrastructure (DPI) initiated a multi-sensor inspection (MSI) program of 40 miles of large diameter interceptors and collector sewers, and segmental block and brick sewers. This program included the inspection of the Grape Street Collector (GSC), comprised of approximately 12,900 linear feet (LF) of 36- to 72-inch diameter brick and vitrified clay (VC) pipe constructed in 1912. A portion of the 36-inch VC section of the GSC pipeline is located in an easement through the City's Fredrick Law Olmsted- designed Buttonwood Park and travels directly beneath Buttonwood Brook and Pond. Adjacent neighborhoods are serviced by lateral sewers that also flow under the Brook and Pond to the GSC. Inspections of these pipelines revealed broken pipe, cracks, intruding roots and excessive infiltration and inflow (I/I) through leaking joints and manholes. One manhole on the GSC, located within the extents of the Buttonwood Park Pond, was subject to substantial inflow.

To address these deficiencies, the City implemented a rehabilitation project to improve access and repair 2,000 LF of the GSC, including cured-in-place pipe

This paper was selected as Outstanding Paper – Rehabilitation, from all the presentations at the 2025 NASTT No-Dig Show in Denver Colorado. NASTT-NE salutes the City of New Bedford for its proactive infrastructure rehabilitation programs.

(CIPP) lining, chemical root treatment, cementitious lining of manholes, adding new access manholes, and replacement of existing manhole frames and covers. This project was challenging to implement due to access constraints, complex by-pass pumping operations around the brook and pond, the need to maintain public access to park amenities throughout the project and coordinating work with existing Park projects. Work was successfully completed between March 2024 and October 2024. With the project complete, significant I/I has been removed from the City's collection system and the sewers are fully reinforced under the pond, with improved access for maintenance of the GSC.

2.0 INTRODUCTION AND BACKGROUND

In 2017, the City finalized a Long Term CSO Control and Integrated Capital Improvements Plan (Integrated Plan) that was developed in accordance with the Environmental Protection Agency's (EPA) 2012 Integrated Municipal Stormwater and Wastewater Planning Approach Framework. The goal of the Integrated Plan was to capture all of the City's Clean Water Act obligations into a single roadmap of projects and programs that prioritized the City's most pressing needs. The Integrated Plan included eight priority needs areas: wastewater treatment; combined sewer overflows (CSOs); wastewater collection system; stormwater system; wet weather flooding; pumping stations; flood control structures; and organizational improvements.

One of the priorities identified by the Integrated Plan was the need to inspect and rehabilitate the City's sewer collection system. This included recommendations to implement a formalized I/I program

as well as inspection of the City's major interceptors and collector sewers:

1. A formal I/I program had not been completed on the system in over 30 years and no recent data existed on the sources and extent of I/I entering the system.
2. The City's interceptors and collector sewers are generally more than 75 years old and the structural condition and operation and maintenance (O&M) condition (i.e., sediment, infiltration, roots, pipe sags, etc.) for the majority of the pipelines was unknown. In total, approximately 40.7 miles of interceptors and collector sewers, large diameter concrete sewers, and brick/segmental block sideline sewers were recommended to be inspected as part of the program. Figure 1 shows and overview of the Interceptor and Collector Sewer network.

In 2017, the City began the process of implementing the first phase of the I/I program; a flow monitoring program. The flow monitoring program included

assessment of 58 subareas covering approximately 103.5 miles of gravity sewer pipe to determine the general extent of I/I entering the system. The study area focused on the sanitary portions of the City's sewer collection system (approximately 42 percent of the total system by length). The program identified excessive infiltration and/or inflow in 36 priority sub-areas, 21 of which exceeded both the infiltration and inflow thresholds. These 36 sub-areas account for approximately 77.4 miles of gravity sewer pipe. The GSC extended through several sub-areas.

In October 2018, the City began their interceptor and collector sewer investigation program (Investigation Program) of approximately 40.7 miles of interceptor and collector sewers. The Investigation Program included pipeline MSI consisting of National Association of Sanitary Sewer Companies (NASSCO) Pipeline Assessment Certification Program (PACP) compliant pipeline inspections as well as the collection of sonar data below the flow line to quantify

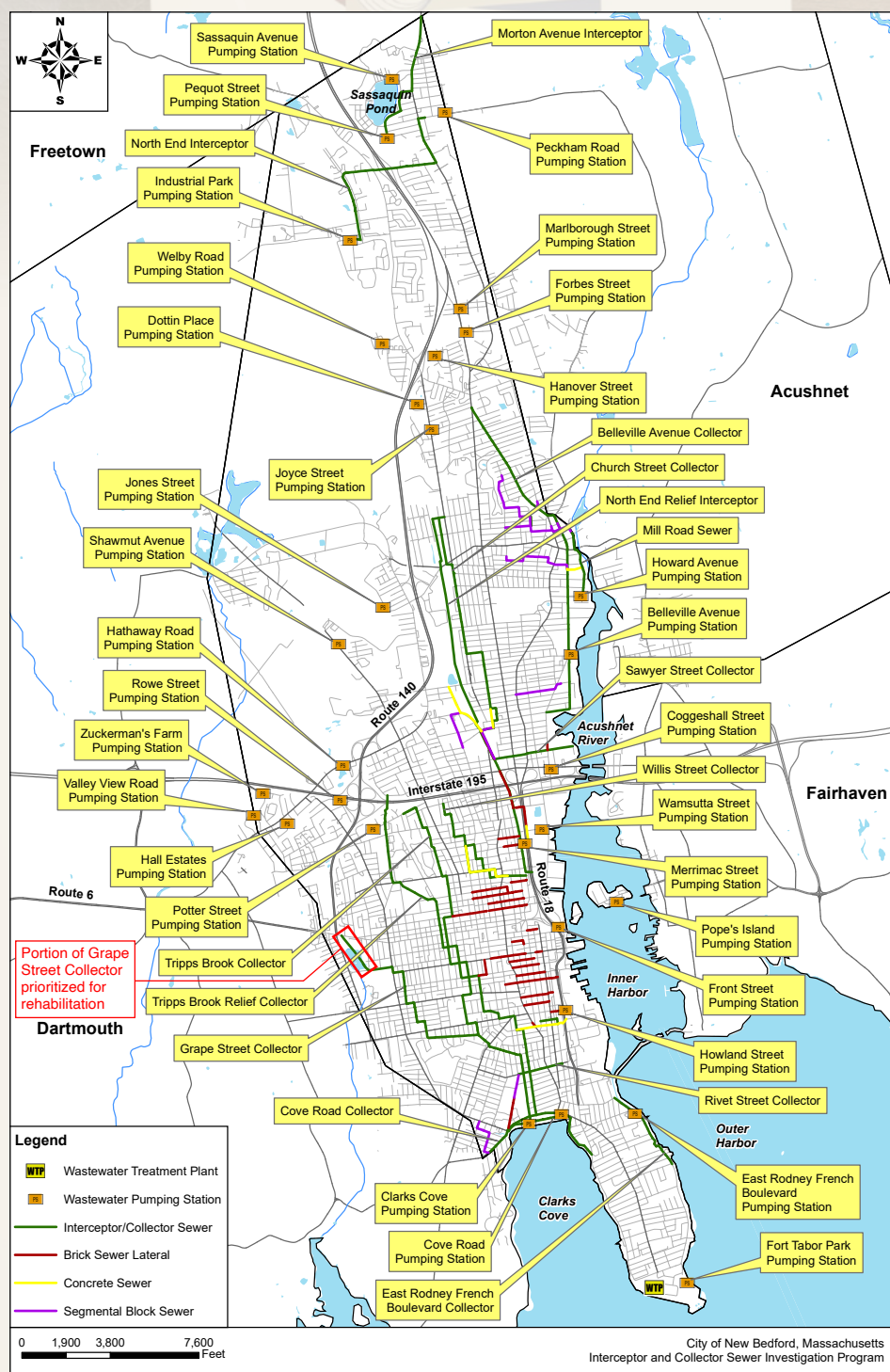


Figure 1: General Location Map of Interceptor and Collector Sewers and Brick Lateral Sewers

levels of debris throughout the pipelines and lidar profiling above the flow line to determine pipeline integrity and defects. The Investigation Program found over 3,300 defects ranging in severity from minor PACP Grade 1 defects to major Grade 5 defects. In total, 98,000 LF (18.6 miles) of pipeline was recommended for

rehabilitation at an estimate cost of \$56.7 million (2022 dollars).

The GSC, which was included in the flow monitoring program and the Investigation Program, was highlighted as a pipeline of concern. Flow monitoring data identified Sub-area 52, located along the GSC, as the 12th highest sub-area

based on the I/I severity (i.e., gallons per day per inch-mile of pipe), contributing an estimated 556,000 gpd of infiltration and 400,000 gallons of inflow to the system. Sub-areas 53 and 54 were located along lateral sewers connecting to the GSC and were ranked 3rd and 14th highest, respectively, in terms of I/I severity. MSI data identified numerous pipeline defects along the entire pipeline route such as root intrusion, broken pipes and offset joints, and a manhole (MH-5035) that was acting as a pond overflow (Figure 2). Due to the severity of I/I found to be entering the pipeline beneath Buttonwood Park Pond, the pipe condition and the potential impacts resulting from reconstruction of the Buttonwood Park Pond Dam, which the pipeline crosses under, the City decided to prioritize the repair of the uppermost reaches first (Refer to Figure 1 for location of work in comparison to the GSC location). The inspection work also identified the need to rehabilitate several lateral sewers that convey flow from adjacent neighborhoods to the GSC and are located under the Pond.

This paper will provide a summary of the following:

1. Issues identified during GSC investigations including flow metering and the MSI program, and the need to coordinate projects which drove the prioritization of repairs.
2. Design process and development of an approach to rehabilitate the pipelines while addressing City concerns related to impacts to the park and adjacent Pond and Brook.
3. Construction and implementation approach including the CIPP lining process, manhole rehabilitation, by-pass pumping approaches to mitigate interference with existing park activities and navigating the Brook and Pond.
4. Lessons learned during construction and by-pass pumping operations during rehabilitation of the pipeline and manholes.
5. Project results.

2.1 Department of Public Infrastructure

The City's Department of Public Infrastructure (DPI) is a multi-faceted City department consisting of seven separate divisions: Water, Wastewater, Highways, Engineering, Greenspace Maintenance,



Figure 2: Manhole MH-5035 within Buttonwood Park Pond allowed inflow from the pond to enter the City's collection system.

Cemeteries and Forestry. This structure breaks down the traditional silos of municipal government and allows the Department the flexibility of managing projects, programs and staff to gain efficiencies and cost savings, and promotes the integrated approach outlined in the Integrated Plan. The DPI is responsible for the implementation and management of the approximate \$1.78 billion Integrated Plan.

3.0 SYSTEM AND PROGRAM DESCRIPTION

The City's sewer collection system is comprised of approximately 259 miles of sanitary and combined gravity and pressure sewers ranging from 6- to 96-inch in diameter. In addition, there are approximately 164 miles of separate storm drains. The network of interceptors and collector sewers convey combined, sanitary, and stormwater flows to the City's Main Intercepting Sewer (Main Interceptor) which transports the flow to the City's Wastewater Treatment Plant (WWTP). Many of the City's older collectors and interceptors are constructed of brick, segmental block, reinforced concrete (RC), and vitrified clay (VC).

Figure 1 shows the general location of the brick, segmental block and concrete sewers, interceptors and collector sewers and highlights the portion of the GSC included for rehabilitation as part of this project.

4.0 GRAPE STREET COLLECTOR

The GSC is located in the southwest section of the City between Route 6 and Clarks Cove. The surrounding area is primarily residential and is bounded to the south by the Rural Cemetery. The northern portion of the collector crosses through Buttonwood Park. Refer to Figure 1 for the location of the entire GSC.

4.1 Description

The GSC is approximately 12,900 feet in length, originating at the intersection of Kempton Street and Oesting Street and ultimately discharging to the Rivet Street Collector at the intersection of Bonney Street and Rivet Street. The collector ranges in size from 36-inch to 72-inch diameter and is primarily comprised of brick, RC and VC pipe. At the upstream end, the GSC flows south from Kempton Street to Lieutenant Walter E. Fuller Memorial Parkway, which requires crossing beneath Buttonwood Park Pond (see Figure 3). This portion of the collector is 36-inch diameter VC pipe. An 18-inch diameter VC sewer main from Brownell Avenue discharges to the GSC just north of Buttonwood Park Pond. An 8-inch diameter cast iron (CI) sewer main from Brownell Avenue also crosses beneath the pond and discharges to the GSC near the dead end of Lake Street.

4.2 Nature Of The Problem

The GSC was originally constructed in 1912 to collect flow from expanding

service areas in the west and central areas of New Bedford. Over time, the pipeline was extended north as the City continued to expand, eventually requiring service to Buttonwood Park and the areas west and north. To serve these areas, the GSC was extended northerly and was constructed in conjunction with the Fredrick Law Olmstead-designed Buttonwood Park. This included the construction of the Buttonwood Park Pond and Buttonwood Park Pond Dam. The Dam and Pond were constructed on Buttonwood Brook to provide recreational opportunities and a gateway entrance to the park. In addition, to accommodate alignment of the GSC with park aesthetics, the pipeline and tributary sewers were built in the flood waters of the Pond and under the dam.

Since construction of the Pond and Dam, the areas to the north of the pond eventually became wooded and overgrown. Challenges associated with maintaining pipelines under a dam and pond prohibited normal maintenance of the sewer pipes.

In 2017, the City began the process of implementing a flow monitoring program of its sanitary sewer system and MSI program of its major collector sewers and interceptors. The results of the programs showed that the area where the northern reaches of the GSC serviced, were some of the worst areas in terms of I/I. Based on the metering data, Sub-Areas 52, 53 and 54 contributed more than 7.3 percent of the total calculated I/I and represented 52 inch-miles of pipe out of a total 1,236 inch-miles included in the program (4.2 percent). All three subareas exceeded the excessive infiltration and inflow thresholds set by Massachusetts Department of Environmental Protection (MassDEP). The infiltration threshold is a severity of 4,000 gpd/in-mi and the excessive inflow threshold is the highest severity subareas accounting for 80 percent of the total calculated inflow. See Figure 4 for the general location of Sub-Areas 52, 53 and 54 in relation to the GSC.

MSI data collected under the Investigation Program found that the pipeline had a number of defects such as roots, broken pipe segments and joints, sediment build-up, and infiltration (Figure 5). Follow-up closed circuit television (CCTV) inspection of the lateral sewers that serve the neighborhoods to the west of the park exhibited similar issues as the GSC. These defects, combined with the fact that one of the lateral sewer manholes was located on the Pond bank and one of



The initial proposed schedule would have allowed follow-up work on several planned projects in the same location which included rehabilitation of the dam and construction of green infrastructure associated with the addressing water quality in Buttonwood Brook. Unfortunately, the delay in starting the project created a schedule conflict which complicated the GSC rehabilitation project. To address the scheduling conflict with other planned projects, the City and CDM Smith needed to develop an approach to implement the green infrastructure construction and GSC work simultaneously.

The following summarizes the development of the project and its design

Jesse Herman, PE, PMP, CDM Smith, Providence, Rhode Island
Shawn T. Syle, PE, Department of Public Infrastructure, City of New Bedford, Massachusetts
Jamie Ponte, Department of Public Infrastructure, City of New Bedford, Massachusetts
Justin Chicco, Department of Public Infrastructure, City of New Bedford, Massachusetts



Figure 5: Typical defects observed along the GSC and broken pipe along the 18-inch diameter lateral sewer

5.1.1 Design Challenges

The location of the project created unique design challenges including:

1. Accessing manholes located in wooded wetland resource areas during construction
2. Accessing and rehabilitating manholes located in the pond
3. Bypassing sewage flow within the City's over/under system (i.e., storm drain constructed parallel with and directly above the sanitary sewer)

4. Mitigating construction related impacts to the Buttonwood Senior Center
5. Mitigating traffic impacts along Kempton Street
6. Developing a design that allowed continued service of the GSC and tributary sewers while minimizing impacts to Buttonwood Park Pond and Buttonwood Brook
7. Allowing continued use of the Buttonwood Park multi-use path during construction

8. Coordinating simultaneous green infrastructure projects in the same location

Through a series of design workshops with the City and public outreach meetings with the local neighborhood association, members of the City Council, and Friends of Buttonwood Park, an approach was developed that addressed both the City's and resident's concerns regarding the project and a coordinated approach to simultaneous project implementation.

5.1.2 Accessing Manholes in Wetland Areas and the Pond

Several manholes on the GSC are located in a forested wetland area adjacent to the Brook and Pond. Completed NASSCO Manhole Assessment Certification Program (MACP) Level 1 manhole inspections indicated that these manholes had vented covers, were in low lying areas and subject to inundation and flooding. Defects identified within the manholes included root intrusion, leaking pipe connections, and signs of I/I. Figure 6 shows photos of manhole MH-5294 from the manhole inspection program.



TURNER UNDERGROUND INSTALLATIONS

Over 25 years of experience!

Contact us Today!

585-359-2531
www.turnerunderground.com

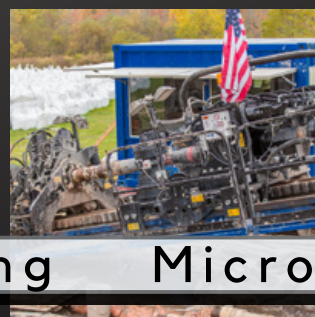
Knowledge and Experience Matter!



HDD



Auger Boring



Microtunneling



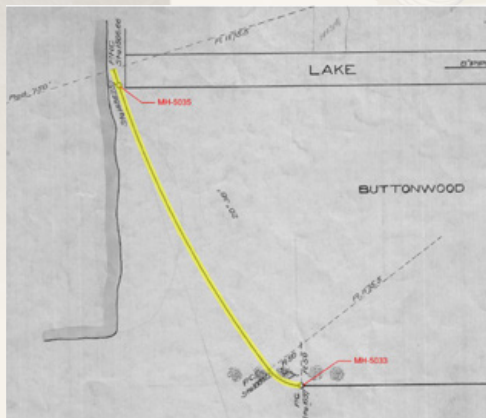


Figure 7: GSC record drawing showing design radius

One manhole was located directly in Buttonwood Park Pond at the end of Lake Street near the Buttonwood Senior Center. This manhole was identified as leaking considerably and acting as a pond overflow (Figure 2). A second manhole was found to be located directly adjacent to the Pond bank. This manhole was located on the 8-in lateral sewer that flows under Buttonwood Park Pond.

Based on the NASSCO MACP manhole inspections, it was determined that the manholes along the GSC and those along the lateral sewers needed to be rehabilitated. Cleaning followed by chemical root control and cementitious lining along with replacement of existing frames and covers was recommended with flexible chimney liners to ensure a tight seal between the manhole frame and cone section. For those manholes in the wooded wetland area, watertight frames and covers along with polyethylene manhole inflow covers were recommended. Epoxy lining was considered; however, because there was no indication of excessive hydrogen sulfide or other corrosion issues, it was not recommended.

Additional measures for the manholes located on the pond bank and within the Pond were proposed to mitigate water from the Pond entering the collection system. For the manhole adjacent to the Senior Center in the Pond, it was proposed in the contract documents to construct a small cofferdam around the manhole and completely replace the cone section with a new watertight structure. A flexible chimney liner was also recommended to create a watertight joint between the new cone section and manhole barrel followed by replacement of the frame and cover with a watertight casting and lining of the manhole.

The manhole adjacent to the pond bank was recommended to be abandoned in place as part of the lining of the 8-in lateral sewer. Following lining of the sewer thru the manhole, the structure would be filled, and the frame and cover removed. A new manhole was proposed away from the pond bank allowing easier access and mitigating flooding potential from the pond.

Access to all manholes was a challenge especially those located in the wooded areas. For those structures, it was recommended that a “cart” path be constructed using natural mulch or timbers to stabilize the ground surface to mitigate rutting and protect exposed or shallow root systems in the wetland areas. This approach was developed in cooperation with the local Conservation Commission to mitigate impacts to wetland resource areas.

5.1.3 Pipeline Rehabilitation Approach

Selection of the most appropriate and cost-effective approach to rehabilitating the GSC and lateral sewers under Buttonwood Park Pond required careful consideration of access requirements, maintenance of flows, provisions should equipment become lodged in one of the pipelines under the

pond during construction and the ability to minimize disturbance to use of the Park and Senior Center.

5.1.3.1 Liner Selection and Design

The project contains approximately 1,130 LF of 8- to 18-inch diameter lateral sewers and 1,930-feet of the 36-inch diameter GSC pipeline that required rehabilitation. As previously mentioned, pipeline inspection data of the GSC and lateral sewers indicated that roots were prevalent along all pipeline reaches. In addition, leaking joints and broken/offset joints also existed along all pipeline reaches. Debris within the GSC also needed to be removed prior to any type of rehabilitation.

At the southerly end of the GSC which was proposed to be rehabilitated, the pipeline was constructed with a radius of approximately 750-ft with reverse curvature to a radius of 1,175-ft followed by a radius of 50-ft (Figure 7). These radii made it a challenge to select a rehabilitation approach that could navigate the bends without the need for the construction of access pits or manholes.

The difference in pipe diameter, the pipe radii, the challenges associated with flow maintenance and access to manholes, identified pipeline defects and the need to mitigate impacts to the Brook, Pond and maintain access to park amenities like the multi-use path drove decision-making on the selection of liner alternatives and ultimately the recommended approach to pipeline rehabilitation. The following list summarizes the alternatives considered to rehabilitate the pipelines:

1. Cured in Place Pipe Liner
 - a. Steam or hot water curing
 - b. Ultraviolet light curing
2. Slip Lining
 - a. Fiberglass Reinforced Plastic (FRP) pipe lining
 - b. Swagelining with High Density Polyethylene (HDPE) pipe

Liner Alternatives	Risk	Access	Maintenance of Flow	Traffic Impacts	Disturbance to Park Amenities	Range of Use (small and large)	Disturbance to Pond/Brook	Cost	Ranking
Cured in Place Pipe									
Steam or hot water curing									1a
UV Curing									1b
Slip Lining									3
Swage Lining									4
Spin Cast or Spray-on Lining									5
Joint Testing and Sealing									1c
Chemical Root Control									2

Figure 8: Comparative Analysis of Rehabilitation Alternatives

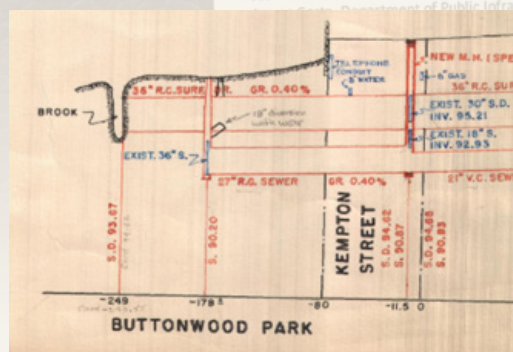


Figure 9: Record plan of over-under system flowing to Grape Street Collector

3. Spin Cast or Spray-on Lining
4. Joint Testing and Sealing
5. Chemical Root Control

Figure 8 below shows the results of the alternatives analysis completed to support the selection of the most appropriate rehabilitation method. One of the key considerations was the range of use and the ability of the rehabilitation approach to be utilized on both small and larger diameter pipes.

As shown, three alternatives ranked highly in the comparative analysis, primarily driven by their ability to be flexible with the implementation on both smaller and larger diameter pipelines, navigating pipe bends, as well as the need to mitigate disturbance to the Buttonwood Park and Brook.

Ultimately, CIPP lining was selected in combination with joint testing and sealing and chemical root control. It was determined that the project would leave the selection of the curing method to the contractor based on means and methods of construction. The alternatives analysis did show, however, that with the selection of CIPP lining, management of flows would be the biggest implementation hurdle to overcome.

Slip lining with FRP pipe was given strong consideration for this project due to its ability to be constructed under live flow; however, its uses on smaller diameter pipelines and the need for construction of larger access pits brought down its ranking. Similarly for swage lining, access issues and maintenance of flow also were drivers for not selecting these methods. It was determined that spin cast lining was not cost-competitive in smaller diameters over traditional CIPP lining.

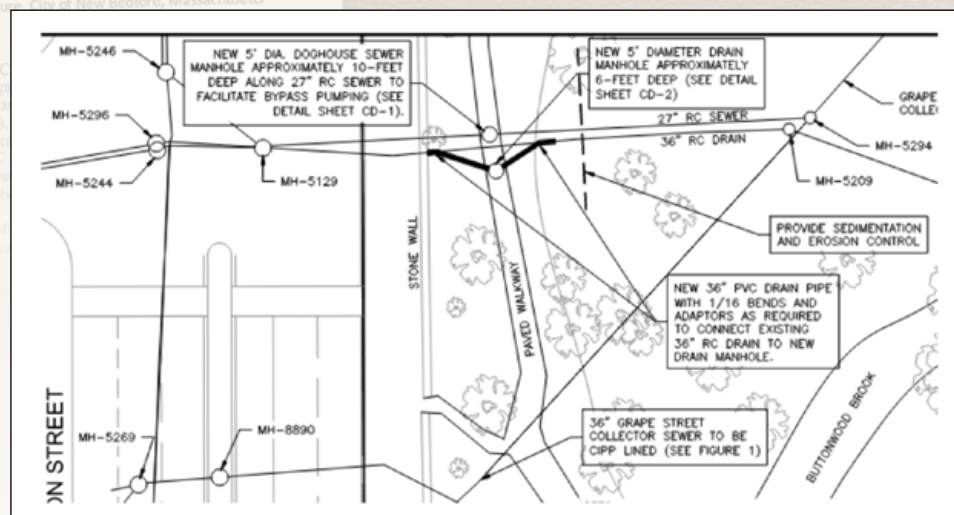


Figure 10: Over-under Sewer Access Design

5.1.3.2 Maintenance of Flow

The biggest challenge of the project design was to develop an approach for maintenance of flow during the lining process. The following obstacles created challenges for the development of an approach to maintain flows on the project:

1. Flows in the GSC ranged between 1.3 mgd and 5.8 mgd depending on the time of day and weather conditions.
2. Most of the flow from the north comes from an existing 27-in sewer that is constructed in an "over-under" manner with a 36-in storm drain. The 27-in sewer pipe connects to a manhole on the GSC located in a grassed area just prior to the wooded wetland area. Over-under sewers are prevalent in New Bedford and consist of a drain and sewer line in a common trench with the drain line typically stacked directly over the sewer line. Refer to Figure 9.
3. Routing of flows from the northerly end of the project to the southerly end of the project requires crossing of the Buttonwood Park multi-use path, the Brook and depending on the by-pass piping route, the Pond.
4. The most upstream manhole of the area to be rehabilitated is located in Kempton Street, a major City roadway.

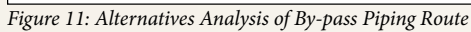
The wide range of flows, the Brook and Pond, traffic mitigation and ensuring that the multi-use path remained operational throughout construction created a

challenge for selection of the best method for maintenance of flows.

Following assessment of locations to by-pass pump from and to, it was determined that pumping from the upstream manhole of GSC which is located in Kempton Street was not possible due to traffic issues, nor was it needed as minimal flow was conveyed from the pipe from the west. Most of the flow to the GSC was being conveyed from the 27-in sewer from the north. Unfortunately, due to lack of access along the 27-in sewer, it was determined that new access manholes would be needed on the over-under sewer and drain system.

Providing access would mean constructing an offset drain manhole and a new sewer manhole directly over the sewer pipe. Although not an "ideal" solution as it results in the drain being installed with horizontal pipe bends, it was determined with the City that it would be best for the drain to have the bends and the sewer to continue straight allowing easier lining in the future and for future inspection. The only available location for these new manholes was determined to be in the share-use path. Figure 10 shows the final recommended design.

Once it was determined where flows could be by-pass pumped from and to, determining a route of the by-pass main was then required. Following discussions with the City, three alternatives were developed for inclusion in the contract documents. Figure 11 shows each alternative that was considered during the design phase and discussed with the awarded contractor.



Jesse Herman, PE, PMP, CDM Smith, Providence, Rhode Island
Shawn T. Syle, PE, Department of Public Infrastructure, City of New Bedford, Massachusetts
Jamie Ponte, Department of Public Infrastructure, City of New Bedford, Massachusetts
Justin Chicca, Department of Public Infrastructure, City of New Bedford, Massachusetts



Figure 12: Kempton Street looking west at upstream manhole on Grape Street Collector located in the median

strategies, determining a constructable liner implementation approach was needed. Constraints associated with maintenance of flow, minimizing traffic disturbance and lack of access to manholes in the wooded wetland area created challenges in development of an implementable approach. Although the final approach would ultimately be left up to the contractor, both CDM Smith and the City wanted to make sure that a constructable approach was developed and provided to the contractors in the bid documents as a “suggested” sequence of construction.

Although not ideal, a design solution was developed that included lining from a manhole in the park. This approach was determined to be the most appropriate solution to mitigate traffic disturbance in Kempton Street while still maintaining access to the shared-use path. This approach did create a challenge for lining of the GSC. Once it was determined that lining from the park could be completed, this forced a longer liner length to a manhole with no access in the wooded wetland area. The next closes manhole was approximately 800-ft south.

To address the lack of access and longer liner lengths, a leap-frog scenario was developed such that the contractor could line from a single manhole north and south and then leap-frog downstream where access was available and complete the same type of lining approach until all reaches of the GSC were lined.

5.1.3.5 Liner Design

Following selection of the lining approach using CIPP, a liner design was developed. The design approach included a Fully Deteriorated Gravity

Pipe Condition design under ASTM F1216 for maximum structural strength and durability. Although much of the pipeline was not subject to traffic loading because it is in the park area, a more robust liner design was selected due to the future possibility of pond dredging activities and reconstruction of the dam. Large construction equipment would have to be used over the pipeline and the City did not want any damage to occur.

End seals were required as well as pre-sealing of any infiltration along the pipeline route to mitigate water entering behind the liner. A two-year warrantee was required. A minimum liner thickness for pipes 12-in and larger was set to 6 mm and all liner design was established with a minimum service life of 50 years. The following summarizes key design parameters which were governed by ASTM F1216, ASTM F1743, ASTM F2019 and ASTM D5813 for minimum initial and long-term properties of the liner:

5.2 Project Permitting

As part of the CWSRF application, all applicable construction-related permits are required to be identified at the time of



ParaTrack™

Congratulations to our partners for their successful delivery of the Champlain Hudson Power Express.

ParaTrack is proud to have provided guidance across all segments of the terrestrial contract.

Gyro · At-Bit Inclination · Magnetic Intersect · P2 AC Wire Guidance · EM



THE GUIDANCE SPECIALISTS
vectormagnetics.com/paratrack

application submission and obtained prior to receiving MassDEP's Permission to Advertise and Authorization to Award. For this project, a Notice of Intent (NOI) was filed with the MassDEP and application submitted to the New Bedford Conservation Commission. Following presentation of the project to the Conservation Commission, an Order of Conditions was issued by the Commission and appended to the construction contract specifications.

Close coordination upfront in the project design with the Conservation Commission helped to streamline the permitting process. As part of this process, the project team developed a route of the proposed "cart path" and the use of organic wood chips to access the manholes in the wooded areas. In addition, an approach to minimize disturbance to the manhole in the pond was developed that included use of oil-sorbent booms, sandbags, and the construction of a working platform around the manhole.

6.0 PROJECT IMPLEMENTATION

In August 2023, the GSC rehabilitation project was publicly bid. Three bids were received for the project, with prices ranging from \$994,994 to \$1,394,059. The project was awarded to low bidder Green Mountain Pipeline Services (Green Mountain) of Bethel Vermont in the amount of \$994,994 which resulted in a total project cost of approximately

Property	Test Method	Initial (psi)	Long Term (psi)
Flexural Strength	ASTM D 790	4,500	2,250
Flexural Modulus of Elasticity	ASTM D 790	350,000	175,000

\$2,355,344 that included construction, contingency, police details and engineering services during construction.

In June 2024, Green Mountain was acquired by Azuria Water Solutions (Azuria); formally Aegion Corporation (Aegion) which was rebranded to Azuria in April 2024. For the purposes of this paper, Azuria will be called by its subsidiary Insituform which completed most of the project work.

6.1 Mobilization And By-Pass Pumping

In March 2024, Insituform's subcontractor mobilized to the site to begin installation of a doghouse manhole at the northern end of the project area for use as a bypass suction manhole. Insituform also began installation of the 18-inch SDR 17 HDPE bypass piping. Due to the GSC being located within the combined portion of the City's sewer collection system, the Contract Specifications included a provision for the Contractor to submit a wet weather bypass plan. Based on flow monitoring data collected between March 6 and May 31, 2017, the 36-inch GSC had an average dry weather flow of approximately 900 gallons per minute (gpm) and a peak wet weather flow of close to 4,000 gpm. Data was collected in 15-minute intervals utilizing area-velocity sensors.

By-pass pumping Alternative 3 was selected by Insituform to by-pass flows around the project area. The only major difference in the approach implemented was the use of the next adjacent manhole downstream from that shown (MH-5034) on Figure 11. This allowed access for Insituform to line to this manhole and not have to work around discharge piping.

The bypass pumping setup for the GSC consisted of two Godwin CD225M 8-inch pumps operated in a primary/stand-by configuration. Both pumps utilized the same suction manhole (new sewer doghouse manhole) which was plugged at the outgoing pipe. Discharge lines were isolated with check valves and combined into a single 18-inch line. Figure 13 shows the GSC bypass pumping setup. The 18-inch and 10-inch sideline sewers were bypassed using CD100M 4-inch pumps operated in a primary/stand-by configuration. Flows were pumped to 4-inch saddle taps along the 18-inch HDPE bypass pipe.

The bypass piping extended approximately 3,100 LF from the new sewer doghouse manhole to existing manhole MH-5034, located within a rotary at the intersection of Lieutenant Walter E. Fuller Memorial Parkway and Buttonwood Street. Figure 14 shows the discharge configuration at MH 5034 and the brook crossing at the shared-use path.

The majority of the bypass piping was installed along the ground surface with only one location requiring the piping to be buried



Figure 13: Bypass Pumps at Upstream GSC Manhole



Figure 14: Bypass Discharge at MH-5034 and Brook Crossing

Jesse Herman, PE, PMP, CDM Smith, Providence, Rhode Island
 Shawn E. Syke, PE, Department of Public Infrastructure, City of New Bedford, Massachusetts
 Jamie Ponte, Department of Public Infrastructure, City of New Bedford, Massachusetts
 Justin Chicco, Department of Public Infrastructure, City of New Bedford, Massachusetts



Figure 15: Buried by-pass piping at the Senior Center

at the entrance to the Buttonwood Park Senior Center as shown in Figure 15.

HDPE saddled vents were installed every 800-1,000 LF and at all high points along the bypass piping for air release purposes. In coordination with the New Bedford Police Department, a portion of the round-a-bout was temporarily closed for the bypass piping and discharge (Figure 13). A New Bedford Police Officer was stationed at the rotary for the duration of the bypass operation.

Where required, air release valves were installed along the pipeline route. This

occurred at approximately every 800 feet and at high points along the pipeline route. Figure 16 shows a typical air release valve setup and laydown of above ground piping.

6.2 Pipeline Rehabilitation

Prior to CIPP lining, pipelines within the wooded area of the park were treated with a chemical root control application to ensure complete removal of the intruding roots prior to installation of the liners. Following chemical root treatment, the pipelines were cleaned, and CCTV

inspected to verify the existing condition of the pipes. Based on the Contractor's pre-construction inspection, all pipelines were confirmed suitable for CIPP lining without any additional repairs including the portion with horizontal bends.

All CIPP liners were installed utilizing air inversion and steam curing, except the reach between MH-5288 and MH-5035 which was installed using water inversion and hot water curing. Several factors contributed to the decision to install this liner using water inversion, including limited access to upstream manhole MH-5288, preference to install from the downstream manhole MH-5035, the diameter and length of the pipe being 36-inch and 800-feet, respectively, access to water and the ability to discharge back into the sewer system, and the desire to minimize disturbance of the park. See Figure 17 for a photo of the CIPP liner installation at manhole MH-5035 which is located in the Pond.

All liners were installed successfully with no reported issues. Following installation of the liners, the Contractor completed a post-construction CCTV



THE HALLEN CONSTRUCTION CO., INC.

"Leaders in Heavy Construction since 1927"

- Distribution Contracting Services
- Installation of Replacement Steel & Plastic Main
- Vacuum Excavation
- Metering & Regulating Stations
- 24/7 Emergency Response

11 COMMERCIAL STREET | P.O. BOX 664
 PLAINVIEW, NY 11803
 TEL: (516) 432-8300 | FAX: (516) 432-8406

98
 Years
 1927-2025





Figure 16: Typical Air Release Valve and Above Ground Piping



Figure 17: CIPP Installation at MH-5035

inspection of each pipe reach (manhole to manhole). CDM Smith review of the CCTV tapes concluded that the liners were installed properly and satisfactorily.

6.3 Manhole Rehabilitation

Manhole rehabilitation generally included the replacement of existing frames and covers, installation of a cementitious monolithic manhole lining system (CMMLS), application of a flexible chimney liner to the top vertical foot of the cementitious liner, and the installation of polyethylene inserts in GSC manholes north of the pond. See Figure 18 for a photo showing the installation of the CMMLS within manhole MH-5033.

In addition to this rehabilitation, two new sewer manholes and one new drain manhole were installed as part of the project. The first sewer manhole was a doghouse style manhole installed along the 27-inch RC sewer upstream of the GSC and located at the north end of the project site to facilitate bypass pumping operations, as previously mentioned. The new drain manhole was installed along

the 36-inch drain pipe which diverted the drain around the new doghouse sewer manhole. Refer to Section 5.1.3.2 above for a detailed description of the design. The second sewer manhole replaced existing manhole MH-5089 located along the 10-inch VC sewer at the south-west edge of Buttonwood Park Pond (Figure 19).

The final rehabilitation of Manhole MH-5035 included the installation of 10-foot by 10-foot concrete pad centered around the manhole to improve access to the manhole for the CIPP lining effort. The top section of the manhole was replaced with a precast concrete flat-top section and an additional precast concrete riser section to elevate the manhole above the surface elevation of the pond (Figure 20). Construction at manhole MH-5035 required the installation of a turbidity curtain to prevent transport of sediment into the pond, and a cofferdam to create a dry work environment. Once complete, 6-inch riprap was installed around the concrete pad to facilitate access to the manhole. Permanent installation of the riprap was included in the NOI and



Figure 18: Manhole 5033 Pre-lining and cementitious lining application



Figure 19: Existing manhole MH-5089



Figure 20: Rehabilitated manhole MH-5035

approved by the New Bedford Conservation Commission.

7.0 PROJECT RESULTS

The Grape Street Collector Rehabilitation project was completed with only minor issues and considered a successful project by the Owner, Engineer, and Contractor. The liner was successfully installed in the pipes under the pond and along the GSC including those segments with horizontal bends. Figure 21 shows images of the installed liner. Lessons Learned

Key lessons learned during the project included the following:

1. **Coordination with stakeholders results in minimal disruptions and concerns:** The multiple meetings

Jesse Herman, PE, PMP, CDM Smith, Providence, Rhode Island
 Shawn T. Syts, PE, Department of Public Infrastructure, City of New Bedford, Massachusetts
 Jamie Ponte, Department of Public Infrastructure, City of New Bedford, Massachusetts
 Justin Chicca, Department of Public Infrastructure, City of New Bedford, Massachusetts



Figure 21: Installed liner along 36-inch GSC at the horizontal bend downstream of manhole MH-5035 (left photo) and installed liner along 18-inch lateral sewer (right photo)

that were held prior to the start of construction engaged key stakeholders such as the Friends of Buttonwood Park, the local ward councilor, and residents. As a result of this outreach, minimal complaints were received from the public during construction. In addition, the design team and City were able to listen to concerns from the public and integrate solutions to address those

concerns in the contract documents. This helped ensure that the recreational facilities were in use through the duration of the project with minimal disruption. Even with the multiple meetings and outreach completed as part of this project, communication with internal City Departments could have been better. Although aware of the project, the City's

Parks, Recreation and Beach's Department (who manages park activities but not the upkeep of the parks) could have been better informed of the details of the project. The Department did not have any concerns regarding the proposed work, especially with the issuance of an Order of Conditions from the Conservation Commission; however, they expressed frustration that they were not made aware of the project in greater detail.

CUSTOM PUMP SYSTEM PREVENTS SERVICE INTERRUPTION

See how custom-engineered temporary pumps kept a major municipal wastewater facility operating during a 12-month pump station replacement.

© 2025 Sunbelt Rentals Inc.

SUNBELT
RENTALS

16

WEEKS FROM
DESIGN TO
INSTALLATION

14M

GALLONS/DAY
CAPACITY
MAINTAINED

0

OVERFLOW
INCIDENTS

READ THE CASE STUDY

This was a good reminder to take time to think through all stakeholders at the onset of any project.

2. Additional time to think about constructability of the project during design leads to streamlined construction and sequencing:

The design of the project carefully considered constructability and sequencing especially by-pass pumping alternatives and installation of the CIPP lining. Although this led to a longer design schedule; it minimized downtime, minimized disturbance to park facilities and reduced the potential for change orders resulting from lack of coordinated efforts. In addition, the sequencing allowed coordination between projects within the park to ensure that work would not interfere with other on-going activities.

3. Over-under sewers create challenges during construction:

One of the biggest challenges of the project was working on the over-under systems. Constructability issues were apparent while attempting to replace manhole MH-5089 located immediately adjacent to the Buttonwood Park Pond. This manhole was also located along a sewer that was installed directly below a 12-inch drain pipe. The record drawing for the sewer showed this configuration and also showed the drain pipe being diverted around the south side of the manhole structure. To increase the distance between the pond and the new manhole, the new manhole was proposed to be located approximately 7-feet upstream of the existing manhole. This located the new manhole along the portion of the sewer that was directly below the drain pipe. Both the existing 10-inch sewer and 12-inch drain were shown on the plan, but a proposed relocation of the drain pipe around the new structure was not shown or called out. As a result, the subcontractor performing the manhole replacement hit the top of the drain pipe causing the pond to

begin to enter the excavation. The subcontractor had to use multiple pumps to lower the water enough to make an emergency repair along the drain pipe.

4. Contract documents were clear;

however, payment methods could have better aligned with certain subcontractor work: The measurement and payment for the project was carefully thought out; however, consideration regarding subcontractor work for the general contractor could have been better defined. Since the project included the removal and replacement of existing frames and covers, the removal of manhole top sections to facilitate CIPP lining of the pipelines was included in the CIPP lining bid item. This was known by the Contractor at the time of bid and did not result in a dispute; however, the Contractor noted that work on manhole structures is typically performed by a subcontractor (not the lining contractor) and inclusion of this work in the CIPP lining item(s) makes it challenging to modify CIPP bid quantities during construction, especially if additional work is requested by the Owner. Since the type of work and entity performing the work are different, it is best to keep the unit prices separate.

5. Identifying a staging area and location to dispose of grit prior to construction rather than during pre-construction meeting: The contract documents identified that the Contractor was not responsible for the cost of the grit disposal. In addition, the contract documents also required the contractor to locate a staging area at their cost. During the pre-construction meeting for the project, the City noted that the Contractor was responsible for finding space to store their equipment but could dispose of grit at the septage receiving facility. Based on discussions with the Contractor, they had no issues

with that but felt that it would be more beneficial to identify a staging area and location to dispose of grit up front in the contract documents rather than during the pre-construction meeting.

8.0 CONCLUSIONS

The project was a success. It was completed on budget and schedule with no issues or disruption to the use of the park. Careful planning, coordination with various other park activities, and communication with project stakeholders were key to its success. Construction considerations such as bypass pumping, pipe lining staging and setups, access to manholes along the wooded easement, traffic management and pedestrian safety were evaluated early in the design to ensure project success. During the design phase of the GSC Rehabilitation project, the design team coordinated closely with the New Bedford Conservation Agent, The Friends of Buttonwood Park, designers working on other City projects in close proximity to this project, and various lining contractors.

9.0 REFERENCES

- Syde, S., and Beaton, N. (2017) – City of New Bedford Long Term CSO Control and Integrated Capital Improvements Plan, CDM Smith Inc.
- Syde, S., and Herman, J. (2019) - City of New Bedford, Massachusetts Infiltration/Inflow Analysis – Flow Monitoring Summary Report, CDM Smith Inc.
- Carolan, J., and Herman, J. (2022) – Interceptor and Collector Sewer Investigation Program – DEP Project No. CWSRF 4170. Massachusetts Department of Environmental Protection, (2017), Guidelines for Performing Infiltration and Inflow Analysis and Sewer System Evaluation Surveys.
- Pelletier, M., and Herman, J. (2023) – Grape Street Collector Rehabilitation – Project No. CWSRF 7004, Contract No. 4, Bid No. 23439172.

THE NEED TO HAVE CERTIFIED SUBJECT MATTER EXPERTS (SMES) IN A GROWING TRENCHLESS MARKET



By: Dennis J. Doherty, P.E., BC.PLW, F. ASCE, Terracon Consultants

According to the January 2025 article in Trenchless Technology Magazine, “Long-term projections continue to highlight robust growth, driven by the increasing focus of cities on upgrading and maintaining their underground infrastructure using trenchless technologies and methods.” Trenchless Technology methods have now become a mainstream construction method used in the oil and gas pipeline industry, as well as in high-voltage power transmission for Hydro-Québec Power, to the northeast United States as well as for offshore wind. It is also employed in Florida, California, Virginia, and many other states for undergrounding of power transmission to improve hurricane resiliency and for the urban renewal of various utilities, including large Combined Sewer Overflow (CSO) programs and stormwater separation projects in highly urbanized areas. Trenchless Technology methods have become more advanced, requiring specialized expertise in both rehabilitation and new installation techniques that can determine a project’s success or failure.

John Ruskin, an English critic, essayist, and reformer (1819–1900), is attributed with saying, “There is scarcely anything in the world that some man cannot make a little worse and sell a little more cheaply. The person who buys on price alone is this man’s lawful prey.” The truth in this statement is that less experienced individuals and possibly unethical people may attempt to design a trenchless project without fully understanding all the small but critically important details of both rehabilitation

“TRENCHLESS TECHNOLOGY IS NOW A MAINSTREAM CONSTRUCTION METHOD.”



Depth of bore needs to consider geometry AND geology AND hole size (Strater, Dorwart)

and new installation methods, which can determine the success or failure of a project. They are essentially drawing lines on paper, copying and pasting different technical specifications or details without fully understanding what they mean or what they are asking the contractor to do, then expecting the contractor to perform miracles. This approach is risky when installing what is essentially an engineered

product, and it is not a good practice as our industry evolves. We need a team of subject matter experts who are certified through testing so you can rely on them to help design, manage, and build more complex trenchless projects. We have a growing team of highly knowledgeable individuals, but as demand and the sophistication of trenchless methods increase, we will need many more.

"WE HAVE A GROWING TEAM OF HIGHLY KNOWLEDGEABLE INDIVIDUALS."

My friends Nick Strater and Brian Dorwart express their views well in their article: **"Warning - do not bid this project."** They emphasize that "For projects advertised and awarded through bidding, it's the responsibility of the Owner to prepare a design package which is readily constructible within standard industry practices" and that "Design efforts should follow standards of the practice (at a minimum)." Furthermore, they point out that this statement should not exempt the trenchless designer from the requirement that "The Contractor shall perform additional test borings to determine geotechnical and groundwater conditions, as he considers necessary to complete the installation at no additional cost to the Owner." How does a contractor price this? Is there a bid item for this? Is this Design Build or Design Bid Build?

Nick and Brian, in their presentation, showed several examples that are really not feasible based on basic principles and tenets of Trenchless Engineering. In other words, do not draw a line on a piece of paper and expect it to be built as shown without a deep and detailed understanding of how the specific trenchless method proposed actually works. I like to teach my staff about the 3-G's. That is, the basic principles are generated through the use and application of the "3 G's," which

are essential for properly designing a trenchless project. The "3 G's" stand for Geology, Geography, and Geometry when considering a specific trenchless solution:

- **Geology – How will I drill through the subsurface successfully?**
 - What is the actual geology in the trenchless alignment?
 - How will the ground behave when I put a hole in it?
 - Is the ground weak or hard?
 - Are difficult drilling conditions present such as cobbles, boulders, and gravels?
- **Geography – What are my restrictions?**
 - What is on the surface? Is it roadway, city streets, waterways, wetlands, driveways, etc.?
 - What is below surface in terms of utilities, what are sizes, function, and depth?
 - Are there property rights issues, who owns the property, do you have a right to be there?
 - Is there sufficient workspace to place the required trenchless surface support equipment?
- **Geometry – Does the alignment work?**
 - Will the alignment overstress the pipe during installation, causing failure?
 - Can I be in favorable geology?

- Will I cause settlement of critical surface features and underground utilities?
- Will inadvertent returns occur based on the geometry?

Without these tenets and best practices, how can we ensure that the person responsible for trenchless design has the necessary experience and expertise to oversee a competent, constructible trenchless project?

The American Society of Civil Engineers (ASCE) recently launched a Civil Engineering Certification program. It is the only professional credential designed by civil engineers, for civil engineers. It recognizes civil engineers who demonstrate advanced knowledge and skills in a specific specialty, creating more value for civil engineering stakeholders. To become certified, candidates must meet the established education, licensure, and experience requirements and pass the certification exam.

Civil Engineering Board Certification is available in these specialty areas:

- Coastal Engineering • Geotechnical Engineering • Navigation Engineering • Ocean Engineering • Pipeline Engineering - Water • Port Engineering • Water Resources Engineering. Civil Engineering Certification, Inc. (CEC) is expanding its board certification offerings to include additional specialties. Eligibility for these credentials generally requires a P.E. license, a bachelor's degree in engineering or a related field, and at least 10 years of relevant experience, with additional requirements depending on the specific specialty.

Specialty board certification is crucial for enhancing the professionalism needed to tackle challenges in our infrastructure. It recognizes engineers who have demonstrated advanced knowledge and skills in a specific specialty area, providing greater value for civil engineering stakeholders. Certification benefits the public, infrastructure owners, employers, and practicing engineers. I received a Board Certification for Pipeline Engineering in Water because I contributed to developing the exam. From the review, I know there are questions related to using trenchless methods for installing water pipes, but I believe a standalone test for trenchless engineering is necessary since its body of knowledge is extensive. My friend Charlie

What do you think?

What are the most common ethics violations?

- ❑ Advertising and/or practicing engineering without a license
- ❑ Sealing plans when the engineer lacked competence or did not have direct control
- ❑ Gross negligence or a lack of care or diligence (not conforming to applicable codes and standards)

"The person who buys on price alone is this man's lawful prey." (John Ruskin, English Essayist)



Pipe selection is designer's responsibility (Strater, Dorwart)

Tripp took the actual test – it's on the computer, closed-book, and you are on camera. If the computer detects you're not looking at the screen, it alerts you because it is a closed-book test.

Board certification for civil engineers is essential for raising the professionalism needed to address the challenges facing the nation's infrastructure. It benefits the public, infrastructure owners, employers, and practicing civil engineers. The same applies to engineers designing trenchless projects, but how do you establish standards? How do we distinguish between basic and advanced knowledge in all areas of trenchless technology? This article provides food for thought on how to certify trenchless engineers.

I'm not suggesting that certifications for Trenchless Engineering need to be overly strict, but the knowledge required for designing and executing a successful trenchless project is extensive. It includes geotechnical engineering, utility engineering, pipeline hydraulics, traffic management, construction management, public relations, surveying, structural engineering, construction inspection, and alternative delivery methods, among others.

As I tell my colleagues, trenchless work is centered around the 3 G's: Geology, Geometry, and Geography. All three are interconnected. I also clarify the difference between a high-pressure system and a low-pressure system, as well as an open-face versus a closed-face, so they understand how excavating certain ground types can pose risks and how different types of ground behave when a hole is being drilled. I also emphasize the need to understand geological history

when selecting a trenchless method, not only to recognize that other utilities are buried within the alignment, but also to identify the type of utility it is. An old cast-iron pipe or a clay pipe from the 1920s will behave a lot differently than a steel or plastic pipe installed in the past 20 years when being disturbed by moving ground caused by a trenchless installation method.

There is no college degree called Trenchless Technology Engineering, although in my humble opinion, there should be. The challenge is finding adequately knowledgeable and experienced Trenchless Engineers to fill a full course load. Meanwhile, we should consider establishing a Certification Program for Trenchless Engineering, possibly modeled after the program ASCE is exploring for New Installations and Rehabilitation, which would go beyond just drawing lines on paper. Such a program could improve design quality and reduce risks to owners, contractors, engineers, and the public overall.

I am working with UMass Lowell Department of Civil and Environmental

Engineering in developing a Graduate Level Certificate in Trenchless Engineering. Recently, Lowell has provided Grad Level courses online, and this would be a good candidate. +

ABOUT THE AUTHOR:



Dennis J. Doherty P.E., BC.PLW, F. ASCE is Senior Consultant-Trenchless Technology with Terracon Consultants with deep understanding of

everything from sales to operations. He was inducted into the North American Society for Trenchless Technology Hall of Fame (Class of 2022) because of his involvement in the trenchless industry in general and trenchless industry standardization. Dennis has worked on five different award-winning Trenchless Projects of the Year (4 microtunnel, 1 HDD), as well as several runner ups and honorable mentions. He is the founding member of the NASTT Northeast Chapter and started a student chapter in Trenchless Technology at UMass Lowell.




Your Video Library Resource

HDPE Installation Reports from the Field

Find out more:



© 2024 Plastics Pipe Institute, Inc.

NOISE IMPACT MANAGEMENT FOR HDD OPERATIONS



By: Matt R. Cott & Amanda Gilliam, Environmental Noise Control

The rise in HDD projects heightened the awareness of equipment noise in sensitive areas, leading to more federal, state, local, and contractual sound requirements. Following regulations and minimizing the noise impact is especially important near residences and sensitive wildlife areas. In areas without formal guidelines, project owners increasingly adopt best practices to set limits and align expectations with regulators and neighboring communities.

Noise Management Plans (NMPs) are a common submittal requirement to acquire construction or operating permits. However, the development of an accurate bid/tender includes careful consideration of requirements, regulations and goals related to noise management early in the process.

When reviewing a potential project, clients and design engineers should consider including an NMP in the specifications. Clear NMP requirements

help manage stakeholder expectations. Consulting a noise engineer early can confirm the feasibility of these requirements.

An NMP analyzes HDD projects from start to finish, aiming to reduce noise

and vibration impacts while ensuring regulatory compliance. Challenges arise from variations in local and federal codes, as well as project-specific factors like equipment, operating times, and compliance needs.



Freestanding panels provide noise mitigation for HDD project near a usually quiet neighborhood

Contractors should review NMP requirements before pricing to assess compliance feasibility. This may affect equipment selection, site layout, or necessitate design changes to increase distance from sensitive areas. If engineered noise controls – such as barriers, perimeter walls, enclosures, or absorbers – are required, they must be factored into both pricing and layout.

Upon receiving plans, contractors should confirm whether a noise survey was completed, understand noise limits, and determine responsibility for mitigation, as these directly impact costs. When required, HDD contractors may engage an acoustic engineer to assess compliance based on local ordinances, project-specific requirements, or general guidelines.

A contractor may be able to use GIS software (such as Google Earth) to overlay the proposed trenchless route and establish a baseline for horizontal distances in populated areas to determine the potential effect equipment may have on residents. GIS software may also help to outline access routes that may be affected by trucks and equipment traveling during construction. Any natural barriers that have the potential to help reduce the noise levels, such as vegetation or change in elevation, can also be identified.

The contractor and the acoustic engineer may be best to work together to establish an approach and mitigation measures to give the project a high probability of complying the specifications. This may include the need for additional surveys or more information to clarify questions that come up during the review process.

There may be a need to ask additional questions if the bid/tender is unclear rather than make assumptions that could lead to inadequate control measures or increased pricing should a contingency measure be needed. For a bid/tender to be accurately prepared, specifications should clearly define the requirements of sound mitigation measures such as dBA levels, equipment considerations and allowable mitigation tools (i.e. barriers, mufflers, etc.).

Broad perimeter-based sound mitigation plans often lack clarity, leading

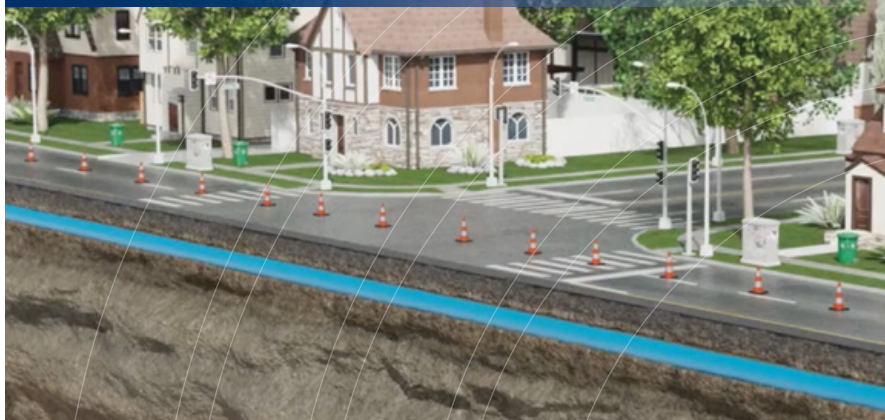
"STRICTER REGULATIONS MAKE EARLY NOISE MANAGEMENT ESSENTIAL."

to misinterpretation, non-compliance, and excess material costs. Conducting a detailed front-end analysis or providing specific contractor guidelines offers a clearer, more efficient approach, reducing the likelihood of affecting nearby communities or sensitive areas.

Pre-construction noise modeling, combined with ambient sound measurements, provides a reliable method for estimating impacts and selecting mitigation measures. This engineered approach supports compliance, fulfills approval

Trenchless replacement of
Asbestos Cement (AC) pipelines

FOR GOOD



Insituform® Corrpro® MTC® Underground Solutions® C&L

As pioneers of trenchless technology, we now offer a patented trenchless service that safely encapsulates and removes AC pipe, while simultaneously installing a new pipe in its place. With more than 600,000 miles of asbestos cement pipe buried across the United States that have reached or are reaching the end of their useful lives, we can rehabilitate pipelines safely with minimal disruption.

Watch the video



Fusible PVC® // TerraBrute CR® // Vylon® Slipliner Pipe // Primus Line® // InsituMain® // Weko-Seal®

azuria.com

requirements, and helps justify mitigation expenses.

Another benefit to computer modeling is the potential to identify whether localized mitigation is necessary on or near a single residence rather than surrounding the entire site. Having this knowledge up front may save the client both financially and in the schedule as less mitigation panels may need to be erected.

If sound mitigation is necessary to reduce impact on a neighboring residence or sensitive area, the workspace may be set up to accommodate the mitigation measures and its securement. Due to the size of the HDD equipment and setup, various types of sound control may be needed, including source panels typically up to 16' feet tall, acoustic blankets and perimeter sound walls up to 40' tall.

Contractors may also have other methods to reduce impact of the construction noise rather than erecting sound panels, including enclosures around engines (either premanufactured or built onsite), and noise reducing mufflers for the exhaust systems.

Equipment layout can be optimized to reduce the impact or disruption of the neighboring communities. Although space may be limited, identifying the areas that may be impacted the most by construction noise can assist with determining the size and layout of the equipment used for the project. Placement of auxiliary equipment, such as mud systems, generators, pumps, and planning truck traffic routes, are major components to consider when building a Noise Management Plan.

Ambient sound level surveys establish the background noise levels of an area or job site before any operations begin. The documented background sound levels are sometimes used as the basis for noise codes when determining the maximum allowable additional impacts for proposed operations and are essential prior to construction to understand the current conditions. If the allowable noise levels are currently exceeded prior to any job site activities taking place, it provides the operators valuable data to request a change or variance to the allowable noise levels for the duration of the project.

Pre-construction ambient sound levels surveys are generally completed

at compliance points and / or off-site receptors to document existing sound levels prior to construction activities. Ambient sound level surveys are completed in accordance with code requirements and can vary on duration, placement of data collection systems, requirements for inclusion of weather data collection, and data presentation format.

Typical surveys last between 24 and 72 hours with occasional requirements for longer term data collection. Although data is generally collected continuously from deployment to collection of systems, code requirements may only look at existing sound level averages used during certain periods of time (ex: daytime or nighttime hours).

Site-specific noise impact modeling considers the site's noise generation, equipment positioning, topography, adjacent surface land cover, and adjacent structures to develop a map showing anticipated noise levels at distance from the job site. For accurate noise propagation modeling, measured operational sound levels, including frequency spectra data of the proposed equipment and operations, are recommended for use as data inputs.

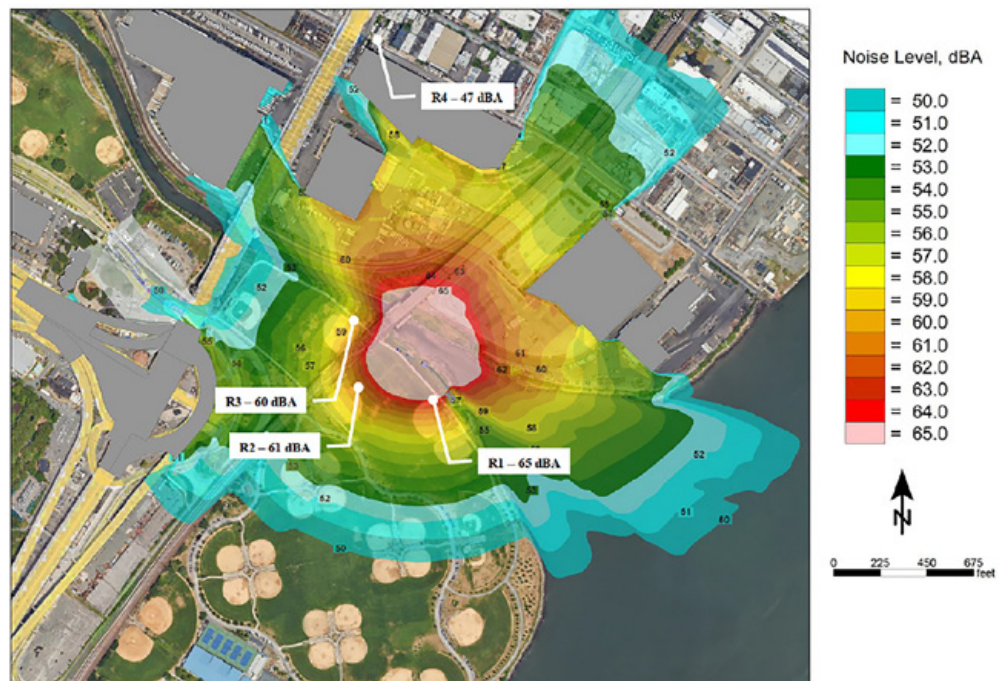
Additional analysis can be completed during the noise modeling phase

including both noise and vibration impacts during site construction as well as vehicle traffic impacts in and out of the location.

Noise impact modeling can account for fixed "do not exceed" dBA levels, other filters, intermittent noise, tonal impacts, and other specific requirements. Outputs typically include noise maps showing how unmitigated HDD site noise propagates, along with data tables of predicted impacts at nearby receptors. These predictions are compared to code limits to determine if additional controls are required for compliance.

When sound reduction is required, computer modeling can be used to design mitigation plans and predict noise reductions at compliance points or agreed limits. Noise is typically controlled at the source, the receptor, or along the path. In HDD projects with limited space, path treatments – such as engineered sound walls, equipment enclosures, acoustical blankets, and absorber materials – are most common. When possible, free-standing panels and other systems can also be applied at the source for added protection.

Once completed, a mitigated noise model may provide the operator with a cost-effective noise barrier solution to meet the design criteria, without resorting



Unmitigated noise model of HDD Entry Site



Noise monitoring equipment provides data on operational noise levels

to guesswork or on-site testing while the job is operational. The mitigated model may be able to demonstrate to concerned neighbors and government officials the expected noise levels during operations. This information may also be used for any permitting approvals or license application requirements that may exist.

Compliance monitoring can be conducted using Type 1 sound level meters configured to continuously log readings at set locations during site work. Meters can store data locally or transmit it to a secure web platform, often powered by solar panels with cellular connectivity.

Web-based systems stream live dBA readings, other filters, full-frequency measurements, and weather data from a cell connection. Project owners can access this information 24/7 and set alerts that trigger notifications when sound exceeds a set threshold. When triggered, the system automatically records audio for event review.

Reports can be generated daily, weekly, or monthly as needed to meet submittal requirements or address complaints.

Understanding conditions for a typical HDD setup and operation is critical to understanding the potential challenges

operators face when assessing and recommending solutions to minimize the operations noise and vibration impact during drilling. Factors to be considered that limit mitigation design are the existence of above ground obstructions (ex: power lines, trees, etc.), underground obstructions (ex: existing pipelines, underground utilities, etc.), site and equipment access requirements, safety concerns, and exposure to potential high wind conditions. All the potential limitations common to HDD operations must be considered when designing effective noise mitigation.

Despite all the operational challenges and restrictions of some HDD sites, specialized noise mitigation solutions exist to accommodate the most restrictive sites while still complying with the local rules and regulations. Due to the general size and nature of noise mitigation systems, potential overhead or underground obstructions can prevent certain types of mitigation from being effectively utilized. To accommodate these obstructions, the mitigation design may call for free-standing panels without any ground penetrating support structure to avoid any underground obstructions. To avoid

any overhead obstructions, the mitigation design may call for smaller, portable panels that are designed to be placed closer to the equipment to maximize the effectivity of the panel.

When designing the noise barrier systems, it is best practice for the operations and safety groups of the HDD operator to collaborate and approve the mitigation design to ensure the noise barriers maintain a safe and efficient job site. If the mitigation design negatively impacts the HDD operator's safety considerations or operational pace, the noise mitigation would be a roadblock to success instead of a mutual benefit for all stakeholders.

The effect of wind and weather can influence the design and construction of the noise barrier systems. Large noise barrier walls must be engineered to withstand the environmental rigors of the job site. On job sites with high wind exposure, it can be beneficial to have an engineered noise barrier system, backed with P.E. stamped drawings.

None of the challenges are insurmountable and taking the approach during the evaluation process and taking into consideration the potential pitfall down the line is an important step in planning properly from design and allowing for a successful project through completion.

Understanding the concerns of all project stakeholders and the impact of a construction project, such as an HDD set-up or other trenchless construction project, are key components of a successful project. Managing expectations surrounding construction noise must be considered. Early involvement and planning can reduce the risks associated with not having the proper mitigation measures in place.

HDD projects often occur in sensitive areas where noise is a growing concern for both permitting and construction. Stricter regulations make early noise management essential. By following the framework in this paper and engaging a sound engineer, contractors can better assess, predict, and mitigate noise impacts. Incorporating best practices early in design and construction can reduce permitting delays, minimize downtime, and foster positive relationships with nearby communities. ➦

PROJECT HIGHLIGHTS

FALMOUTH TO MARTHA'S VINEYARD CABLE PROJECT – LINE 70 & LINE 91B



The Falmouth to Martha's Vineyard Cable Project – Line 70 & Line 91B is an ongoing infrastructure upgrade project aimed at improving the long-term dependability of electrical service between Martha's Vineyard and the Massachusetts mainland. These projects involve replacing aging submarine transmission cables to ensure the island's power supply remains stable and resilient for years to come. Given the proximity of work areas to residential neighborhoods and coastal environments during the horizontal directional drilling (HDD) phase of the project, completed earlier this year, managing environmental impacts – particularly construction noise – was a top priority.

To address these concerns, a 16-foot-high temporary sound wall system with a verified Sound

Transmission Class (STC) rating of 25 was installed at both the Martha's Vineyard and mainland project sites. The sound walls were designed to surround key work zones, including drilling and equipment staging areas, creating an effective acoustic buffer between the active construction sites and nearby communities. The barriers provided a significant reduction in noise from HDD operations, generators, and heavy equipment, while maintaining a clean, professional site appearance.

The deployment of this mitigation system reflected a proactive commitment to community relations, minimizing disruption to local residents and businesses throughout the duration of the project.

Noise control measures were closely coordinated with Huxted



All project sites operated in full compliance with local noise ordinances

Trenchless, the HDD contractor, as part of an integrated approach to environmental compliance and project efficiency. This collaboration ensured that mitigation systems were positioned



The sound walls were designed to surround key work zones



Barriers effectively reduced noise from all drilling and equipment staging areas



The barriers provided a significant reduction in noise

effectively and maintained throughout the construction process.

The results were highly successful: all project sites operated in full compliance with local noise ordinances, and no noise complaints were reported

from nearby residents. The project demonstrates how well-planned, site-specific noise mitigation can support essential infrastructure upgrades while protecting surrounding communities and the natural environment. 🏡

ABOUT THE AUTHORS:



Matt R. Cott is
Business Development
Director for
Environmental Noise
Control, and has

provided noise mitigation consultations for HDD projects throughout the United States for over a decade. He is involved in many of the local and national NASTT events, helping operators understand how to address their noise challenges effectively.



Amanda Gilliam is
Inside Sales Manager at
Environmental Noise
Control, bringing two
years of experience

helping customers implement effective noise management solutions for HDD and construction projects nationwide.

Performance You Can Count On.

Peace of Mind You'll Appreciate.



You want piece of mind when spec'ing a rehab product. With OBIC, you can rest easy.

We offer a wide range of lining solutions engineered to restore structural integrity for wastewater and storm systems that ensure durability and reliability for the long term. Call us to learn how we can help on your next project.

Watch an OBIC
Case Study



obicproducts.com | 866-636-4854

TRANSFORMING TEMPORARY MITIGATION INTO SUSTAINABLE SOLUTION



48-Hour Primus Line Trenchless Rehabilitation Rosman Road Bridge Water Main Crossing, Thiells, NY

By: Ahmed Hassan, J. Fletcher Creamer & Son, Inc.

Built in the 1960s, the 12-inch Ductile Iron water main runs approximately 125 linear feet beneath the Rosman Road bridge, which spans Minisceongo Creek in Thiells, New York.

In late July 2025, the watermain suffered a significant pressure loss, prompting Veolia Water to call J. Fletcher Creamer & Son, Inc. (Creamer) for an emergency investigation at 3:00 p.m. on July 23. The objective was to determine the cause and carry out immediate repairs to restore pressure at this critical junction, which had adversely affected water supply in the surrounding districts.

The investigation discovered a significant rupture in the water main beneath the bridge over the creek, leading to considerable accessibility challenges since repairs could only be performed safely from the top of the bridge.

**"THE PRIMUS LINE SYSTEM
ACCOMMODATES CONTINUOUS
BRIDGE MOVEMENT."**

On July 23rd, Creamer's team worked throughout the evening and night to excavate the site and install an insertion gate valve, effectively isolating the water main.

As a temporary solution, the crew attempted to install repair clamp on the heavily corroded pipe. However, the corrosion made this challenging, requiring extra packing and gasket materials for



Repair clamp did not fully resolve the issue



The 12-inch Ductile Iron water main runs under the Rosman Road bridge, spanning Minisceongo Creek



Liner is delivered on large reels, easily handled and installed

a proper seal. While the clamp significantly reduced the leak, it did not fully resolve the issue.

This outcome led to a comprehensive collaboration on July 24th among the engineering, construction, and technical teams

at Creamer's and Veolia. After thorough evaluation, the teams decided that installing the Primus Line System in the affected water main would be the most effective solution, as this advanced technology will transform the temporary mitigation into a



Watermain was fully restored to service within 48 hours

OVER 100 YEARS OF
INFRASTRUCTURE SOLUTIONS





TRENCHLESS PIPELINE REHABILITATION
DISTINGUISHED & PROVEN LEADER

• UTILITY • HEAVY/HIGHWAY • TRENCHLESS REHABILITATION
• EMERGENCY WORK • TRAFFIC SAFETY

For over 100 years, J. Fletcher Creamer & Son, Inc. has led in innovative infrastructure solutions, including Trenchless Technologies. We're proud to continue that legacy into our next century of service.

800-327-8276

TO LEARN MORE VISIT
JFCSON.COM

CREAMER100+

J. FLETCHER CREAMER & SON, INC.
POWERED BY API GROUP



Permanent sustainable solution extended watermain's lifespan by at least 50 years

permanent, sustainable, and expedited solution, extending the water main's operational lifespan by at least 50 years.

With the execution plan finalized, Creamer's crew re-excavated around the insertion gate valve and poured a concrete thrust block to secure the pipeline, effectively absorbing pressure thrust forces during valve closure for water isolation. Following this, the crew excavated and installed timber shoring for two lining access pits. At the end of each day's operations, all excavation pits were plated to ensure overnight site safety.

On the morning of July 25th, Creamer's crew began operations by cutting the water main at the lining pits, which allowed access for cleaning, CCTV inspection, and installation of the Primus liner. The CCTV inspection confirmed that the pipeline's internal surfaces were clean and suitable for liner installation.

Creamer's crew successfully completed the liner installation by mid-afternoon and subsequently integrated the rehabilitated segment into the existing piping network.

By 5:30 PM on July 25th – 48 hours after Creamer received the initial emergency service call – the water main was fully restored to service, with the system exhibiting no signs of pressure loss or leaks.

After system reactivation, all excavation pits were securely plated to ensure overnight safety in preparation for backfilling, road paving, site cleanup, and demobilization, all of which were completed the following day.

The successful completion of this project was attributed to the close collaboration between Veolia and Creamer teams and their shared dedication to excellence. ✚

ABOUT THE AUTHOR:



Ahmed Hassan has been the Trenchless Technology Lead at J. Fletcher Creamer & Son, Inc. since October 2022 in the areas of Spray-in-place Pipe (SIPP Epoxy and Cement lining), and

Flexible Fabric Reinforced Pipe (FFRP) modified slip-lining. He has over 25 years of experience in pumps and pumping systems, serving numerous water and wastewater markets and clients. Ahmed is a member of NASTT & NASCO.



BRIERLEY ASSOCIATES
Creating Space Underground

Brierley is Proud to be the Lead HDD Designer for the World Record Crossing of the James River

Trenchless • Tunnels • Ge structural • BIM

Nick Strater
603.918.0606

Brian Dorwart
617.510.8090

www.brierleyassociates.com

BREAKING INTO THE NORTHEAST:

GEONEX Helps National Grid Meet Their Project Goals Below MBTA in Braintree.

By: Richard Revolinsky, Geonex Inc, (GEO)

Buried among the foundations of our nation, it should be no surprise that operating a utility system in the suburbs of Boston requires true stewardship. It should be no surprise that National Grid (Grid), one of the largest energy providers to millions in the Northeast maintains a heavy book of projects to upgrade their assets. As part of Grid's commitment to long term management, Grid focused in 2025 on replacing a 12-inch gas main in Braintree MA with the installation of a new main below a high speed MBTA track.

The initiative to undertake the critical trenchless crossing ahead of planned work that would see the replacement of a much larger section of the 12-inch gas transmission main exemplifies the forethought to tackle the hardest parts first and then mitigate any potential delays in completing a larger project in the coming years.

The trenchless installation below the MTBA commuter rail tracks was required to avoid disruption to the daily transportation of a system that keeps the region moving. In June of 2025, trenchless

contractor Henniker Directional Drilling, based in Henniker NH (Henniker) set up and began performing a Jack-Bore installation. Soil investigations during design indicated the 6.5-foot-deep installation would go through sandy soils. During excavation of the Jacking pit, Henniker noted the presence of large cobbles and solid rock above the elevation of the installation. Working together, Grid, Henniker and the general contractor decided to attempt the Jack-Bore while working on a backup plan that could get through the rock as well as handle the anticipated ground water.

"We had 3 options if the bore failed. First, we proposed using the GEONEX system for rock boring, as it was far less disruptive to the community and overall, more efficient. Second we were looking to move off the road, remove three railroad ties, vacuum excavate and if necessary, mechanically excavate under the tracks. That option would have required a service shutdown. The third option would have been a longer shutdown of train service, while we remove the existing tracks from t

"GEONEX IS A TOTAL SOLUTION SYSTEM."



During auger boring at the outset, the casing waffled and the cutting head could barely turn

“OPERATING A UTILITY SYSTEM IN THE SUBURBS OF BOSTON REQUIRES TRUE STEWARDSHIP.”



The launch pit was located in a narrow strip of the roadway between single lane opposing traffic

roadway, excavate and when complete have a new set of tracks installed,” said Mark Van Dam, Senior Supervisor of Complex Construction at National Grid. “Geonex was more expensive than jack-bore, but it would be a lot cheaper and better than the other two options.”

GEONEX is a total solution system. A hydraulic power pack is placed on grade near the launch pit and umbilical hydraulic and compressed air lines are connected to the horizontal drill rig in

the pit. The drill rig is controlled via remote control. Hydraulic cylinders allow for quick and efficient vertical and horizontal adjustments, so the pit floor does not need to be graded to perfection and there is no anchoring of tracks or a pouring of a thrust wall behind the rig. Hydraulic motors provide the force for the rack and pinion drive system, and a hydraulic rotary head provides the rotation force for turning auger and the down-hole hammer (DTH Hammer).



A new 12-inch gas main was installed below a high speed MBTA track

Hollow stem, threaded auger is used to convey cuttings back to the launch pit and provide a means for getting compressed air to the DTH Hammer. Peripheral cutting ring bit, center pilot-bit and start casings are unique to the GEONEX system enabling them to withstand the forces necessary to break the rock and pull the casing along the bore path with each cycle of the hammer. The specific design parameters of the GEONEX System allow for precise control and response to changing conditions making the complete system work harmoniously and efficiently to bore through solid granite, cobbles, boulders, clays and mixed face conditions with an astounding success rate.

With a back-up plan in place, the team proceeded with the proposed Jack-Bore, and as anticipated, it was unsuccessful. Jeff Martin, president of Henniker recapped the events: “We installed 6 feet before getting jammed up on the rock and couldn’t advance. We tried a few times to go further. The casing waffled and the cutting head could barely turn so we agreed it was time to call GEONEX in. They had already provided pricing on a rental unit and looked at the excavated material from the launch pit and were confident they could get it done.”

The total bore length was 160 feet. In order to retrieve the start casing and ring bit, a total of 170 linear feet of 16-inch steel pipe would be installed. From the face of bore pit to the zone of influence for the MBTA tracks was also about 45 feet. For railroad operations, the work in the zone of influence, which was also about 45 feet, had to be performed on a 24-hour basis. After that, the bore would continue another 70 feet to the receiving pit wall.

“Rich and the GEONEX team were able to mobilize and quickly set equipment up in the limited space,” explains Matthew Adam, Lead Project Manager at National Grid. Geonex arrived 1 week prior to review the site conditions and constraints with the project team, and delivering the start casing so it could be welded to the casing pipe off site, reducing the set-up time on site. The layout of all equipment was agreed upon. Work plans and anticipated production rates discussed, site hazards and safety measures identified. Inspection of the launch pit preparations confirmed the site would be ready to go the following Monday.

The project location required precise planning. The launch pit was located in a



Down Hole Tooling ready to begin

.....
**“HAVING THE RIGHT
 TOOLS FOR THE JOB
 MAKES ACCOMPLISHING
 CHALLENGING TASKS
 MUCH EASIER.”**

the narrow strip of the roadway between single lane opposing traffic. One lane of traffic could be shut down during the work, but the contractor was required to maintain access to a business adjacent to the launch pit. Because the pit was in the middle of the road, and traffic flow would have to resume in both directions at the end of each shift, concrete barriers needed to be moved at the beginning and end of each day. The air compressor required to power the DTH-Hammer had to be moved each day, and with no place for spoils to be stored, access for a vac-truck was needed to remove spoils.

EXCEEDING EXPECTATIONS:

The plan was to complete the bore within a week. Unfamiliar with how quickly the GEONEX system would chew through the rock, the work plan included sufficient durations and reasonable day-end goals to be achieved that allowed for unanticipated delays. The goal was to have the installation complete with the next section of casing welded on by the end of the day before entering the MBTA Railway zone of influence. That would allow the following day to be utilized in its entirety to cross the zone of influence at which time normal working hours could resume, and the most critical part of the installation would be complete.

On Monday, September 22, the equipment arrived around 09:00 and 4 hours later, the equipment was assembled, placed in the launch pit,

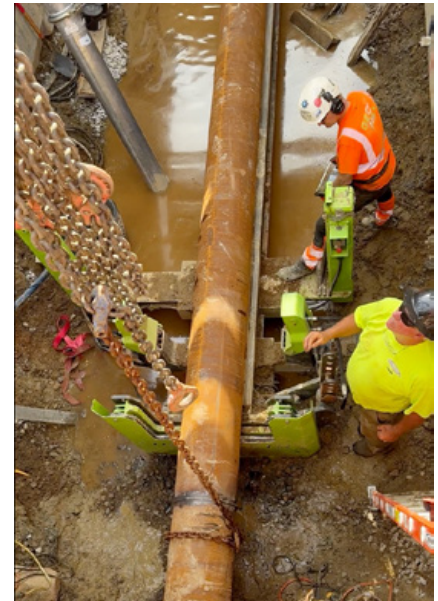


Mixed face conditions were encountered throughout the installation





System bored efficiently through solid granite, cobbles, boulders, clays and mixed face conditions with an astounding success rate



Chains were used to rotate the casing in order to finish welding the sections

and the lead section of casing with the DTH-Hammer was lowered on to the frame. Using the hydraulic adjustments of the frame. At 14:00 the survey team confirmed the alignment of the lead casing allowing Henniker to begin installing the first section of casing. To ensure the installation follows the desired path the first casing is stopped several times within the first 20 feet to check alignment and slope and adjust the drill machine accordingly. This typically results in a longer duration for the first casing to be installed compared to later casings.

At 16:00 the crew completed installation of the lead casing section. Of the 20-foot length of casing, 17 feet was installed through the face of the bore pit, leaving the back 3 feet of the casing sticking out into the launch pit. This is done intentionally to allow the next casing to be aligned properly with the previous casing. Aligning casings is not just about closing the gap for welding but making sure the sides of the casing are straight across the joint to avoid putting a dog-leg, or bend, in the installation. Within an hour the crew was ready to resume boring and based on the success of the first 17 feet, the decision was made to push up to the zone of influence before stopping for the night. With 37 feet installed and only another 8 feet to go before reaching the zone of influence, the

3rd section of casing was welded on and pushed 8 feet before stopping. In just under 11 hours, the GEONEX equipment was delivered, set up, and used to install 45 feet of casing, 1 day ahead of the anticipated schedule.

The material encountered during the first 45 feet varied in composition. Upon removing the casing that was attempted to be installed by Jack-Bore, DGA was placed in the hole. Once through the DGA, the spoils coming from the rear of the casing represented a variety of hard rock rounded cobbles. Observing the landscape, it became clear that the installation was taking place in a natural low-point or valley, which became more evident as ground water volumes increased as the installation moved further toward the area of lower grade elevations. Material coming out was a gray, wet, and coarse with chunks of broken rock loosely held together with clay. On day 2, the material changed consistency with more rock and less clay. Increased ground water flowing through the casing at the head and out the tail end washed clean the pile of larger rock fragments removed from the casing by the rotating auger.

On the second day, installation began around 09:00 and the leading edge of the casing was within a foot or two of the railroad zone of influence. The 5th

casing experienced heavy groundwater which resulted in ponding of water in the launch pit. With GEONEX, excessive ground water is rarely a problem because the in-pit components are mostly hydraulic, and all electrical components are designed for submersion. Even in completely flooded excavations the equipment can be operated although flushing of the rotary head is recommended afterwards.

By 14:45 on the second day, the first 120 feet was installed, placing the leading edge of the installation beyond the zone of influence. With daylight left to burn and pending inclement weather the next day that would prohibit the necessary lane closure to work at the launch pit, the decision was made to finish the installation that day.

Welding of the 7th casing proved difficult. A steady flow of groundwater was coming through the casing which posed a problem for welding the bottom of the casing. Geonex manufactures a water-tight weld ring that can be attached to the rear of the casing if Groundwater is anticipated, but this needs to be welded on prior to beginning the installation. Since Groundwater was not anticipated to be a problem for the installation the water-tight seals were not installed so the crew had to come up with another solution.

When using Horizontal Hammer Boring, the constant rotation of the auger results in

transfer or rotational force to the casing when the shoulder of the pilot bit strikes the internal collar of the steel casing. Although this is not intentional, it can be beneficial, almost rifling of the casing in the bore hole. It is not uncommon to observe a full 360-degree rotation of the casing over a 20-foot length. If the casing rotates, it is an indicator of how straight the installation is.

The top 80 percent of the welding was complete, but the bottom could not be completed until the casing was rotated or the water stopped. Having observed rotation during installation, the GEONEX technician was confident that with light firing of the hammer and utilizing chains and an excavator, the casing could be rolled, placing the unfinished weld at the top, enabling completion of the weld. It worked, and by 16:00, the 7th casing was being installed.

Groundwater continued to flow clean through the casing. The hammer fragmented the rock depositing a pile of what looked like 2-inch clean stone in the bottom of the launch pit as the casing

advanced. By the end of the 7th casing, the water had stopped, and, with 20 more feet, the head would reach the receiving pit.

At approximately 19:40 on the second day, the head reached the receiving pit 160 feet from the face of the launch pit. To retrieve the start casing, and provide a sufficient length of casing in the receiving pit, another 10 feet of casing would be welded on and pushed in. Overall, 170 feet of casing was installed in 18 hours of boring and welding, averaging just under 10 feet per hour. The crew worked late that night to remove all auger and equipment from the excavations in preparation of the inclement weather coming Wednesday.

This project serves as an example of what can be achieved with proper planning, teamwork and having the details of a back-up plan in advance of performing the work. Having the right tools for the job makes accomplishing challenging tasks much easier, turning potential problems into success stories.

Matthew Abram of National Grid summarizes his experience with the

project team and the GEONEX equipment, attesting to the success achieved. "Once the operations started, it broke through the rock with ease and performed more efficiently than we expected. Watching the equipment, which is all hydraulic, adjust vertically and horizontally to maintain the depth and centerline was very impressive. We are very happy with the outcome of the casing installation and the services provided by GEONEX and Henniker. National Grid will look to GeoNex in the future for any work requiring rock drilling." 🛠️

ABOUT THE AUTHOR:



Richard Revolinsky is the North American Operations Manager for Geonex Inc. He has served the trenchless industry for the past 10 years in various roles as Project Manager for Auger Boring and HDD projects and material sales. He is committed to furthering the Trenchless Construction industry with viable innovative solutions.

GEONEX HORIZONTAL HAMMER BORING EQUIPMENT

GROUNDBREAKING TECHNOLOGY FOR BREAKTHROUGH RESULTS

- ✓ FAST SET-UP / NO THRUST WALLS OR FOUNDATIONS NEEDED
- ✓ OVER 50,000 PSI ROCK IS NO PROBLEM
- ✓ SAME DRILLING TOOL FOR EVERY GEOLOGY
- ✓ NO FLUIDS NEEDED
- ✓ WIDE DIAMETER RANGE 5"-48"

FOLLOW US

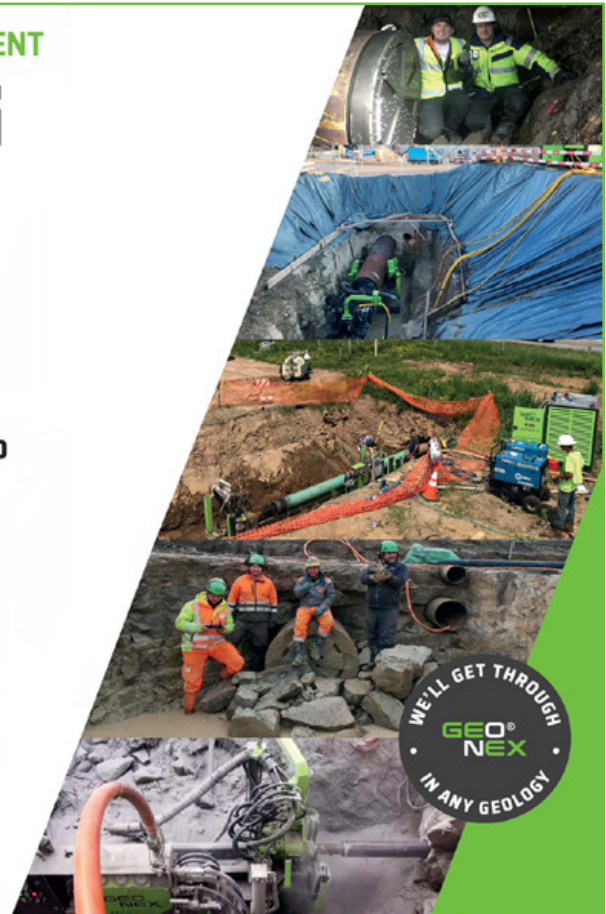


**GEO[®]
NEX**

HAVE A PROJECT IN MIND?

Email: info@geonexgroup.com
or visit www.geonexgroup.com

1-844-4GEONEX



WE'LL GET THROUGH
IN ANY GEOLOGY
**GEO[®]
NEX**

SEISMIC DESIGN CRITERIA FOR HDPE PIPE WATER MAINS

Technical Document Important for Utilities in Earthquake Prone Areas

By: Steve Cooper, SCA Communications

A pioneering report provides documentation for the required wall thickness of a fully fused, high-density polyethylene (HDPE) water main pipeline to withstand the lateral spread from an earthquake. Researched and authored by Michael O'Rourke, Ph.D., P.E., F.SEI, M.ASCE Professor Emeritus Civil Engineering at the Rensselaer Polytechnic Institute, the *Design of HDPE Water Mains for the Lateral Spread Seismic Hazard* (MAB-9) can be found at the website of the PPI Municipal Advisory Board: www.plasticpipe.org/MABpubs

"This critically important document provides the criteria for the proper design of an HDPE water main system," stated Camille George Rubeiz, P.E., F. ASCE, co-chair, HDPE Municipal Advisory Board, and senior director of engineering for the PPI Municipal & Industrial Division. "It is the first report of its kind that provides the rationale, data and formulas for determining the proper wall thickness for a fused, highly ductile and highly flexible HDPE water main in a seismically sensitive area, subjected to an induced lateral spread.

"According to the latest United States Geological Survey, nearly 75 percent of the United States could experience an earthquake during the next 100 years that would cause significant damage to underground water mains. Professor O'Rourke's analysis of possible seismic events, lateral spreads and wave propagation hazards with formulas and charts provides the much needed data to help design a resilient water system."

"EXPERIENCE SUGGESTS THAT HDPE PIPE DOES VERY WELL IN EARTHQUAKES."

- Michael O'Rourke, Ph.D., P.E., F.SEI, M.ASCE Professor,
Emeritus Civil Engineering, Rensselaer Polytechnic Institute

The MAB serves as an independent, non-commercial adviser to the Municipal & Industrial Division of PPI, the major North American trade association representing the plastic pipe industry

The two primary seismic hazards to buried pipelines are wave propagation and permanent ground deformation. Because earthquakes are caused by movement at a fault, the resulting movement results in waves traveling away from the fault. These waves stretch and bend pipeline infrastructure at or near the ground surface and is referred to as the wave propagation (WP) hazard.

"The WP hazard occurs in all earthquakes and is most commonly quantified by the resulting ground strain," O'Rourke explained. "The WP hazard is also transitory in that after the shaking ends, the ground returns to its original pre-quake position. If the earthquake is large, it can also result in permanent offsets at the surface or movements of the ground (lateral spread hazard) both referred to as permanent ground deformation (PGD). The report addresses the lateral spread hazard and the strains due to PGD which

are larger and hence more important than those due to WP."

O'Rourke's document contains formulas, calculations, empirical data, and illustrations plus nomenclature and definitions, all of which can be used in designing the HDPE water piping system.

"Experience suggests that high-density polyethylene pipe does very well in earthquakes," O'Rourke said, "but engineers like to have ways to calculate and substantiate their design. Listening to what somebody else says that, 'Oh yes, the



The ductility of HDPE pipe provides high resistance to earthquakes and is also an important factor for ease of installation



Heat fusing HDPE pipe sections provides a leak-free joint plus heightened security and protection from seismic events

pipe is great, but they still are faced with the question of ‘what wall thickness do I need?’ ‘I have this particular diameter pipe and it’s going to be buried this far underneath the ground so what wall thickness do I need for some expected seismic event?’ The goal is to have HDPE pipe that will be able to withstand the expected earthquake loads on this inherently ductile material. With that in

mind, MAB thought it would be useful to develop a document that provides designers with some relationships, tables, formulas, et cetera, that they can use to figure out how thick the wall would need to be for an expected lateral spread. And that’s the purpose of the MAB-9.

“HDPE is known as a continuous pipe, which means the pipe segments, which are 40 feet to 50 feet long, are fused together,” he continued. “The ductile iron or cast iron pipe has joints every 15 or 20 feet, and the damage from a seismic event frequently occurs at those joints. Continuous pipe, whether it’s welded steel or high-density polyethylene, usually does better than segmented pipe in earthquakes. HDPE has the added advantage over steel (and all other materials) in that it is highly ductile, flexible and corrosion resistant and so it can move with the earth as opposed to trying to resist the deformations that the earth is imposing on it.”

Rubeiz elaborated, “MAB-9 is essential for many reasons. Proper wall thickness is very important, especially with earthquakes, and ground movement. Plus, there continues to be a dire need to replace the aging infrastructure, especially pipes that are older and brittle that many seismic events will cause them to crack. HDPE pipe and the information contained

“NEARLY 75 PERCENT OF THE UNITED STATES COULD EXPERIENCE AN EARTHQUAKE DURING THE NEXT 100 YEARS.”

- Camille George Rubeiz, P.E., F. ASCE, Co-chair, HDPE Municipal Advisory Board



RIDGECREST, Calif. - A formerly straight section of pipe broken by shifting earth during a 7.1 earthquake that shook Southern California in July 2019, cracking buildings, breaking roads and causing power outages. The quake, centered 11 miles from the Ridgecrest area, is the largest quake to hit Southern California in at least 20 years. It was followed by a series of large and small aftershocks, including a handful above magnitude 5.0. (Credit: Gene Blevins/ZUMA Wire/Alamy Live News)

in MAB-9 will help in those replacement programs to provide a proper and resilient water main system.

“Being intrinsically able to withstand seismic shifts along with corrosion resistance, leak-proof fused joints creating a monolithic HDPE piping system, having a high degree of flexibility, and high ductility, are among the many reasons HDPE pipe is recognized to be the best product used for seismic installations and, of course, trenchless and open cut installations,” Rubeiz stated.

“We would also like to thank the other MAB members and supporting engineers who provided their time and expertise to the project - Robert Diamond, P.E., City of Palo Alto, CA; Casey Haynes, P.E.,

City Utilities, Springfield, MO; Bill Heubach, P.E., M. ASCE, Seattle Public Utilities, WA; Harvey Svetlik, P.E., GPPC, TX; and Gerry Groen, P.Eng., Infra Pipe Solutions, ON.”

Additional information can be found at www.plasticpipe.org/mabpubs or www.plasticpipe.org/municipalindustrial 

ABOUT PPI:



The Plastics Pipe Institute, Inc. (PPI) is the major North American trade

association representing the plastic pipe industry and is dedicated to promoting plastic as the materials of choice for pipe and conduit applications. PPI is the premier technical, engineering and industry knowledge resource publishing data for use in the development and design of plastic pipe and conduit systems. Additionally, PPI collaborates with industry organizations that set standards for manufacturing practices and installation methods.





NORTH AMERICAN SOCIETY *FOR*
TRENCHLESS TECHNOLOGY

Your Trenchless Engineering Resource



Seattle Public Utilities Pump Station 043 Emergency Force Main Repair,
Hiram M. Chittenden Locks (the Ballard Locks) in Seattle, WA.

Pipeline construction is booming and the need for installation beneath USACE structures using trenchless technologies is increasing. Horizontal directional drilling, microtunneling, pipe ramming and pipe bursting offer positive solutions to installing pipelines with minimal disruption.

Pipeline construction can pose risks to a project if the construction is not approached properly. Risk mitigation is critical to the success of the project. NASTT is a not-for-profit engineering society offering education and training for the **engineer** that can help mitigate these risks and result in successful project planning and completion!

Visit nastt.org to see how we can help you succeed!

NASTT.ORG

INDEX TO ADVERTISERS

ADVERTISER	WEBSITE	PAGE
Azuria.....	www.azuria.com	39
Brierley Associates.....	www.brierleyassociates.com	46
ECI - Engineers Construction Inc.....	www.ecivt.com.....	Inside Front Cover
Geonex.....	www.geonexgroup.com	51
Hallen Construction	www.hallen.com	31
Henniker Directional Drilling, LLC	www.hddbore.com	7
J. Fletcher Creamer & Son, Inc.	www.jfcson.com.....	45
Jesco Inc.	www.jescoditchwitch.us.....	4
OBIC LLC.....	www.obicproducts.com	43
Plastics Pipe Institute, Inc.	www.plasticpipe.com/MABpubs	3, 37
Progressive Pipeline Management.....	www.progressivepipe.com.....	Outside Back Cover
Sunbelt Rentals, Inc.	www.sunbeltrentals.com.....	33
Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C.	www.tectonicengineering.com	17
Turner Underground Installations inc.	www.turnerunderground.com	25
Underground Magnetics	www.umaghdd.com	9
Vector Magnetics	www.vectormagnetics.com	29
Vermeer Allroads.....	www.allroads.com.....	18



NASTT NO-DIG SHOW 2026
MARCH 29-APRIL 2 | PALM SPRINGS, CA

See you next year in **2026**
PALM SPRINGS

The NASTT No-Dig Show is the largest trenchless technology conference in the world, where professionals attend to learn new techniques that will save money and improve infrastructure. This show offers topic tracks over the course of three days with peer-reviewed, non-commercial presentations, including case studies detailing environmentally friendly trenchless solutions and cost-saving opportunities for municipalities and utilities. With over 2,000 attendees and 200 exhibiting companies and multiple networking events, spend quality time with current colleagues/customers and grow your connections. Whether you're a newcomer or a show veteran, the NASTT No-Dig Show is the must-attend conference for underground infrastructure professionals.

Learn more at nastt.org/no-dig-show



CURED-IN-PLACE-LINING (CIPL) IS A PROVEN TECHNOLOGY FOR RENEWAL OF LEAK PRONE PIPE



**ELIMINATES
METHANE EMISSIONS**



**SEALS & PREVENTS
FUTURE LEAKS**



**ADDS 100 YEARS
OF NEW SERVICE LIFE**

