



THE **UNDERGROUND** UTILITIES EVENT

Underground Construction Technology | Jan. 29-31, 2019 | Fort Worth, TX

Passaic Valley Sewer Commission Main Interceptor Rehabilitation

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WHAT TO EXPECT

- **Project Overview**
 - Project Specifics
 - Installation Complexities
 - Challenges to Overcome
- **CIPP Materials & Specialty Installation**
 - Over-the-Hole (OTH)
 - Transition Liners



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PROJECT OVERVIEW

- 1,100 LF of 65" Circular to 68" Equivalent Semi-elliptical
- Single Installation
- Over-the-Hole (OTH) Install
- Deep Installation
- Large Access Pits



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PASSAIC VALLEY SEWERAGE COMMISSION

- Established in 1902
- Comprised of 48 municipalities spanning 5 counties – NJ
- 1.4 million resident service area
- 300 MGD treatment plant
 - One of largest in Eastern US and one of half dozen in entire US
- 22 mile interceptor line

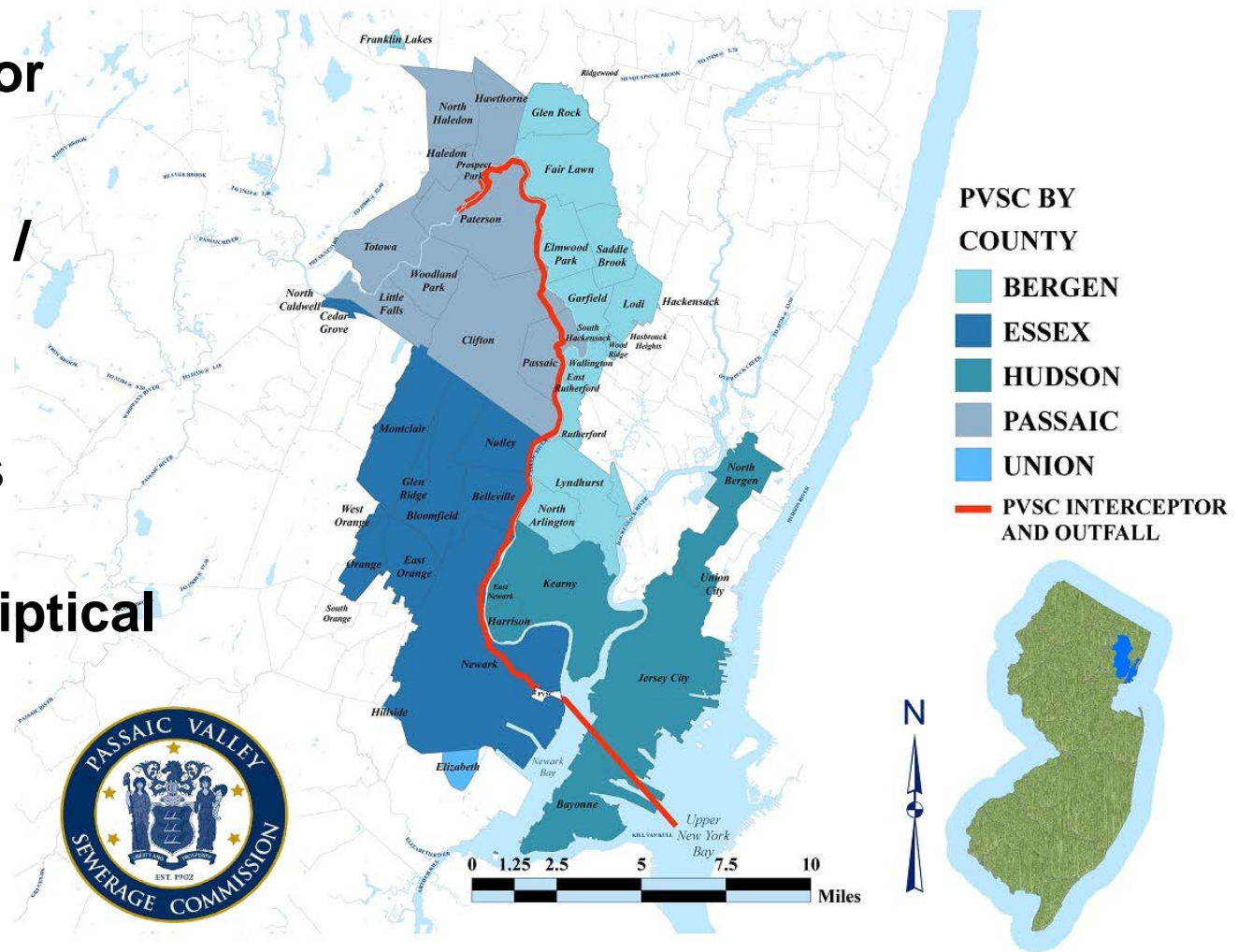


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PVSC MAIN INTERCEPTOR

- 22-Mile Interceptor
- Poured Concrete / Brick
- Diameter Ranges
 - 3.5' Circular
 - 12.5' Semi-Elliptical
- Follows Contour of Passaic River



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ORIGINAL FULL REHAB SCOPE

- **5,500 LF of Composite Fiberglass Sliplining**

- 5' 8" dia. circular brick
- 5' 9" (eq.) dia. semi-elliptical concrete
- 6' 0" (eq.) dia. semi-elliptical concrete
- 6' 9" dia. circular concrete
- 7' 6" (eq.) dia. semi-elliptical concrete

- **2,260 LF of CIPP**

- 5' 5" (eq.) dia. semi-elliptical concrete
- 5' 8" dia. circular brick
- 6' 9" dia. circular concrete
- 7' 6" (eq.) dia. semi-elliptical concrete

- **Additional Scope**

- Bypass Pumping
- Structure Access / Restoration
- Rehab – 18 MH's



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REVISED FULL REHAB SCOPE

- **6,660 LF of Composite Fiberglass Sliplining**

- 5' 8" dia. circular brick
- 5' 9" (eq.) dia. semi-elliptical concrete
- 6' 0" (eq.) dia. semi-elliptical concrete
- 6' 9" dia. circular concrete
- 7' 6" (eq.) dia. semi-elliptical concrete

- **1,100 LF of CIPP**

- 5' 5" (eq.) dia. semi-elliptical concrete
- 5' 8" dia. circular brick
- ~~6' 9" dia. circular concrete~~
- ~~7' 6" (eq.) dia. semi-elliptical concrete~~

- **Additional Scope**

- Bypass Pumping
- Structure Access / Restoration
- Rehab – 18 MH's

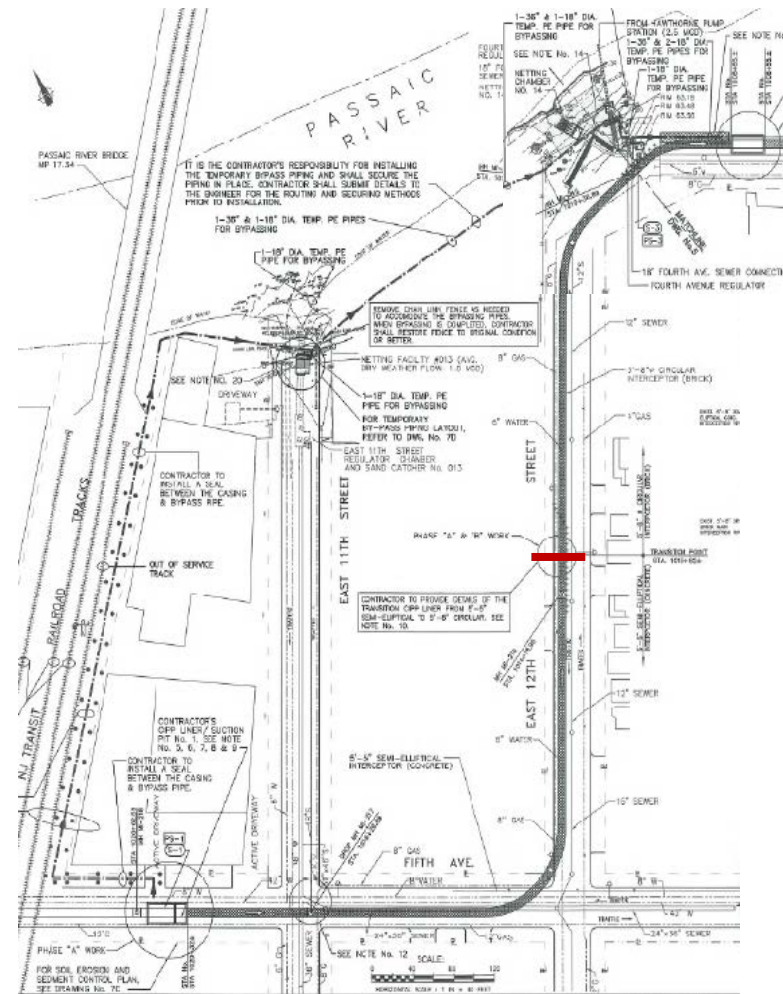


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HIGHLIGHTED SCOPE – CIPP

- **1,100+ LF**
 - Spanned 5 Line Segments
 - Two Sweeping 90-degree bends
- **Transitional Diameters**
 - 65" Circular to 68" Semi-elliptical
- **Single Installation – “1 Shot”**
- **Over-the-Hole (OTH) Install**
- **30-36' Install Depth**



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KNOWN CHALLENGES

- **Project Challenges**

- Access
- Depth
- Diameter Changes
- Over-the-Hole

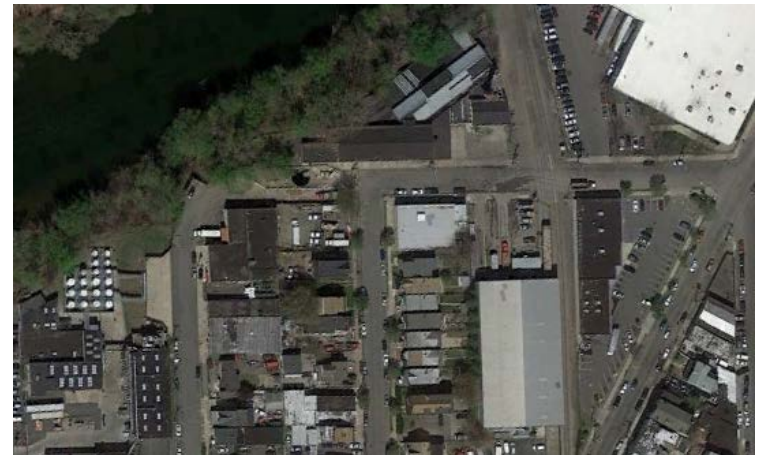
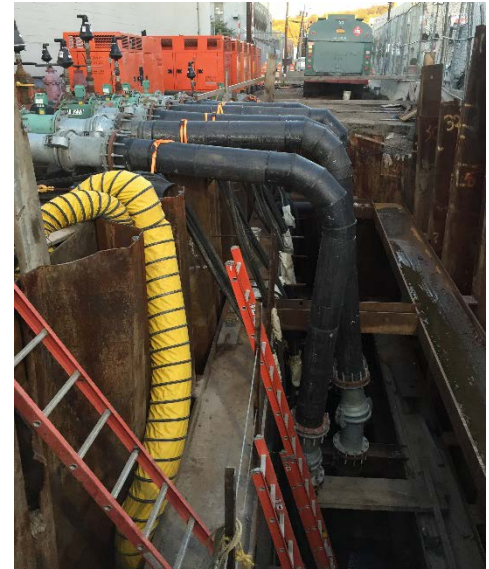


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CHALLENGES – ACCESS

- **Patterson, NJ**
- **Close proximity to Passaic River**
- **Tight Working Conditions**
 - Bypass Operations – Shared Space
 - Adjacent buildings/businesses
- **200' x 50' CIPP equipment setup footprint**



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Host Pipe Depths of 30-36'

- ~50 LF of additional dry material
- Increased hydrostatic head
- Material stretch

20' Wide x 40' Deep Access Pit

- Production Impact
- Safety
- Inversion Pit Stairs



CHALLENGES – DIAMETER CHANGES

- **Single Installation / Tube**

- 65" Circular → 68" eq. Semi-elliptical
- 42mm design thickness

- **Installed in Upstream Direction**

- 640 LF of 68" eq. semi-elliptical concrete
- 515 LF of 65" circular brick
- Transitional Footage ~6-7 LF

- **Potential Issues**

- Stretch
- Accuracy
- Wrinkling

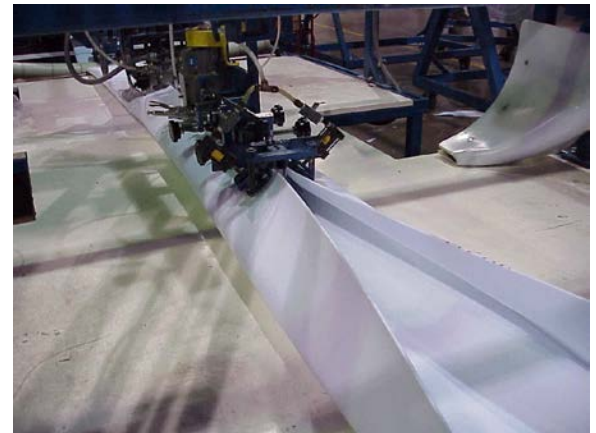


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TRANSITIONAL CIPP LINERS

- **Accommodate changes in:**
 - Diameter
 - Thickness
- **Enable installations to be combined**
 - Prevents breaking up “shots”
 - Maximizes installation lengths
 - 1 LF / Inch of Dia. Change – Min 6 LF
- **Managing Expectations**
 - Wrinkles & Imperfections
 - Annular Space
 - Accuracy



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CHALLENGES – OVER-THE-HOLE INSTALLATION

Movement of Shop Wetout to Field

- Focus on quality/accuracy

Synthesis of Combined Wetout + Install

Large Diameters / Bulky Materials

Huge Equipment Footprint



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OVER-THE-HOLE (OTH) CIPP

Two Primary CIPP Liner Wetout Methods:

1. Traditional / Trucked-in
2. Over-the-hole / Field wet-out

Over-the-Hole (OTH) Installations:

- Large diameters / longer lengths
 - Overcomes trucking limitations
 - Increases shot lengths
- Field Resin Impregnation at Install Point



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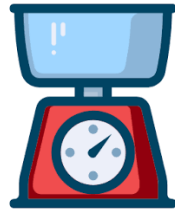
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SUMMARY

Takeaways/Tidbits:



1,100 LF single
shot transitional
OTH CIPP liner
through multiple
bends



187,000+ lbs.
of resin
(~94 tons)



Job duration:
~10 days
(on time)



Completed **safely**
and on budget
(~\$1.2M)



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QUESTIONS?

THANK YOU!

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