



NASTT-NE's 2018 Regional Trenchless Conference

CONSTRUCTION OF 5,500 LF OF 30 & 48-INCH RELIEF SEWER USING TRENCHLESS AND CONVENTIONAL TECHNOLOGIES

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The Metropolitan District
Hartford, Connecticut

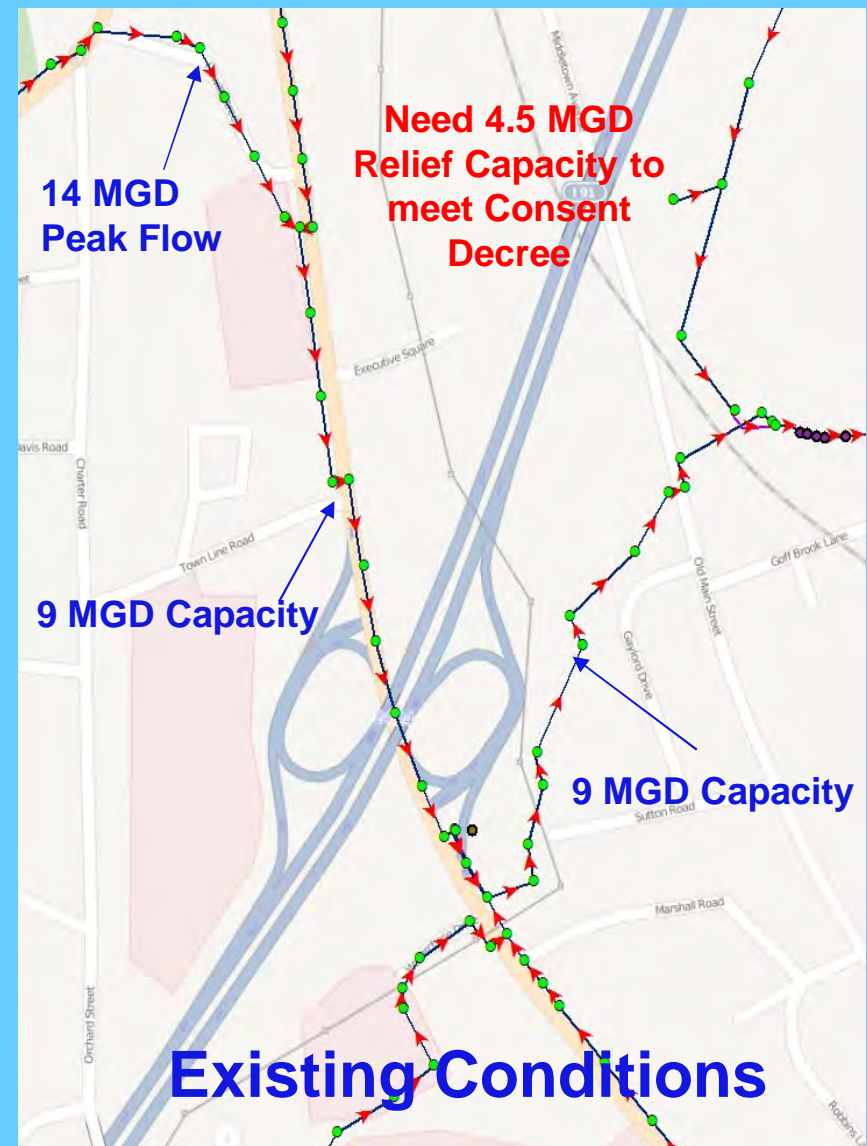
Introduction



- Metropolitan District Commission
 - Regional Water and Sewer Authority – Greater Hartford Connecticut
- US EPA Consent Decree – SSO Elimination
- Goff Brook Sanitary Sewer Overflow Closure Project
- Focus Today – Construction Phase Challenges for Trenchless and Conventional Technologies

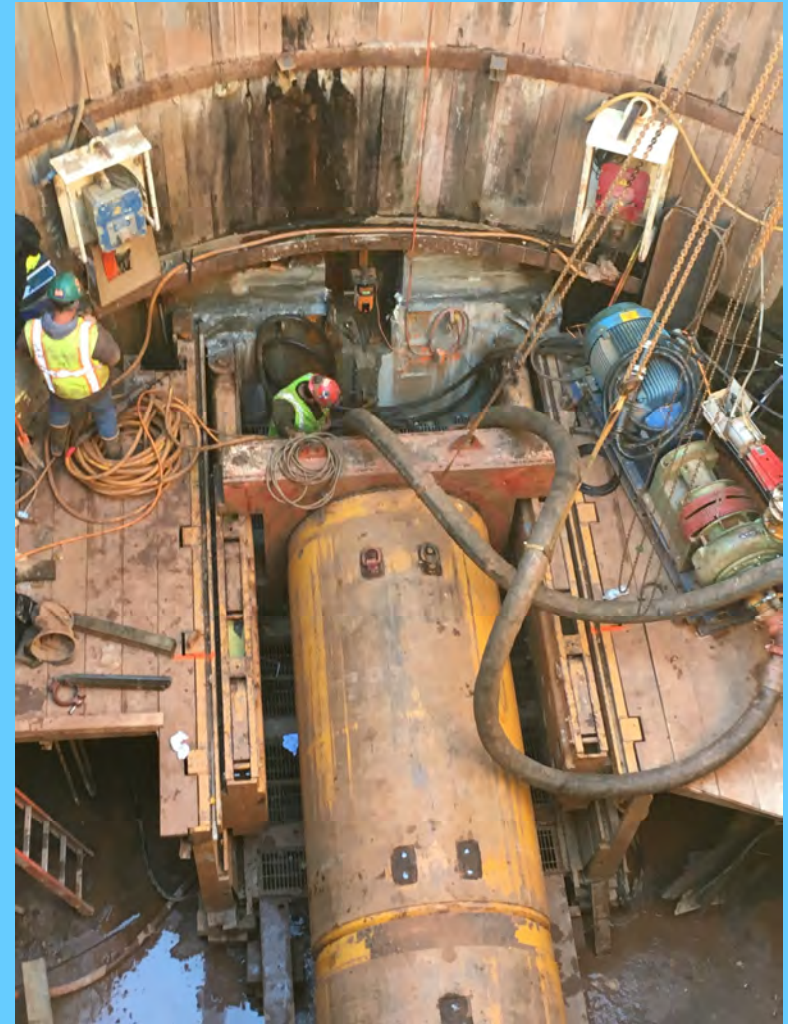
Issue Identification

- Goff Brook Trunk Sewer – Flow Exceeds Capacity – Street Manhole Surcharging
- Rocky Hill Interceptor – SSO to relieve surcharging to Goff Brook
- Additional Collection Capacity Necessary to Close SSO
- Detailed Alternatives Analysis



Alternatives Identification

- 3 Main Alternative Routes
- 13 Sub-alternative Alignments
- Various Soil Strata
 - Solid Rock
 - Clay
 - Mixed Soil Conditions
 - Interface Zones
 - Goff Brook/Wetland Crossings



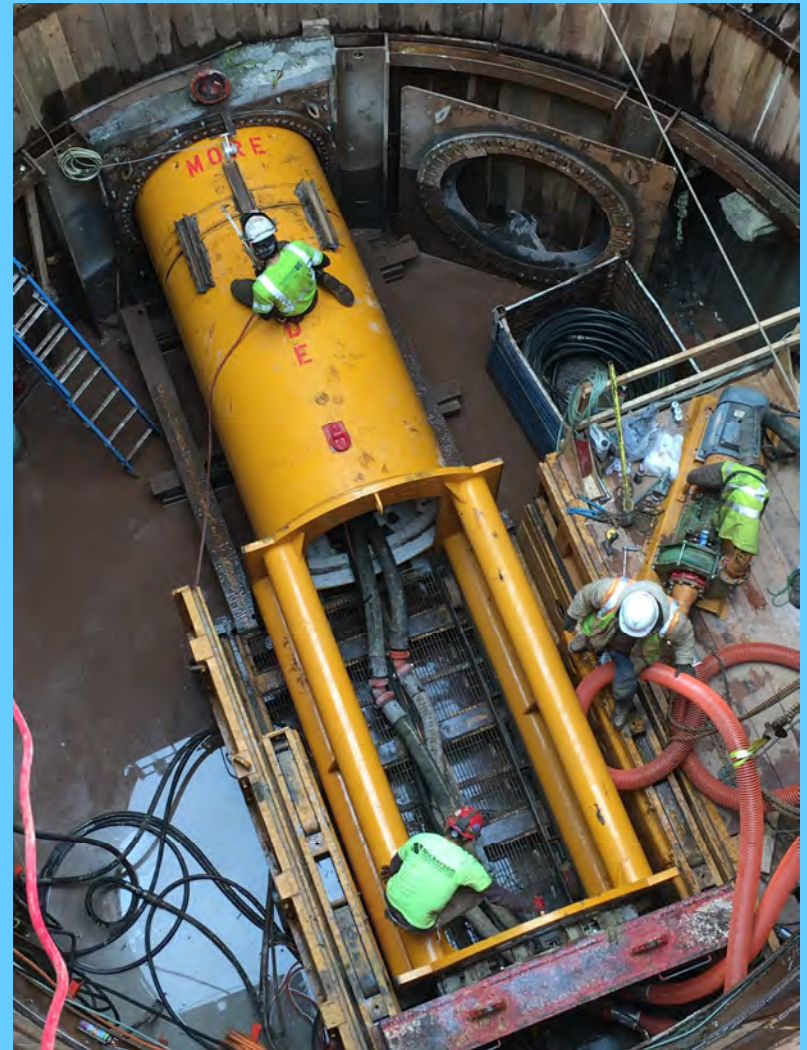
Trenchless Technology

- Auger Boring
 - Least Expensive
 - Short Soft Ground Tunnel Applications
- Rockhead Tunnel Boring Machine (TBM)
 - Can Mine Rock – Groundwater Considerations
- Microtunnel Boring Machine (MTBM)
 - Remote Controlled
 - Lengths up to 2000 feet
 - High Groundwater Table Conditions
 - Varying Soil Strata
- Identification of Mixed Face Soil Conditions Critical



Final Alternative Selected – Project Evolution

- Alternative 3 - Northern Route
 - Most Rock Influences – Most Opportunities for Tunneling
 - Provided Highest Non-Cost Benefits
- Design Progression – Bidding Phase
- In Construction Thru Winter
 - Multiple Phases at Same Time – Open Cut & Tunneling
 - Both TBM and MTBM to be Used
 - Construction and Public Safety Paramount

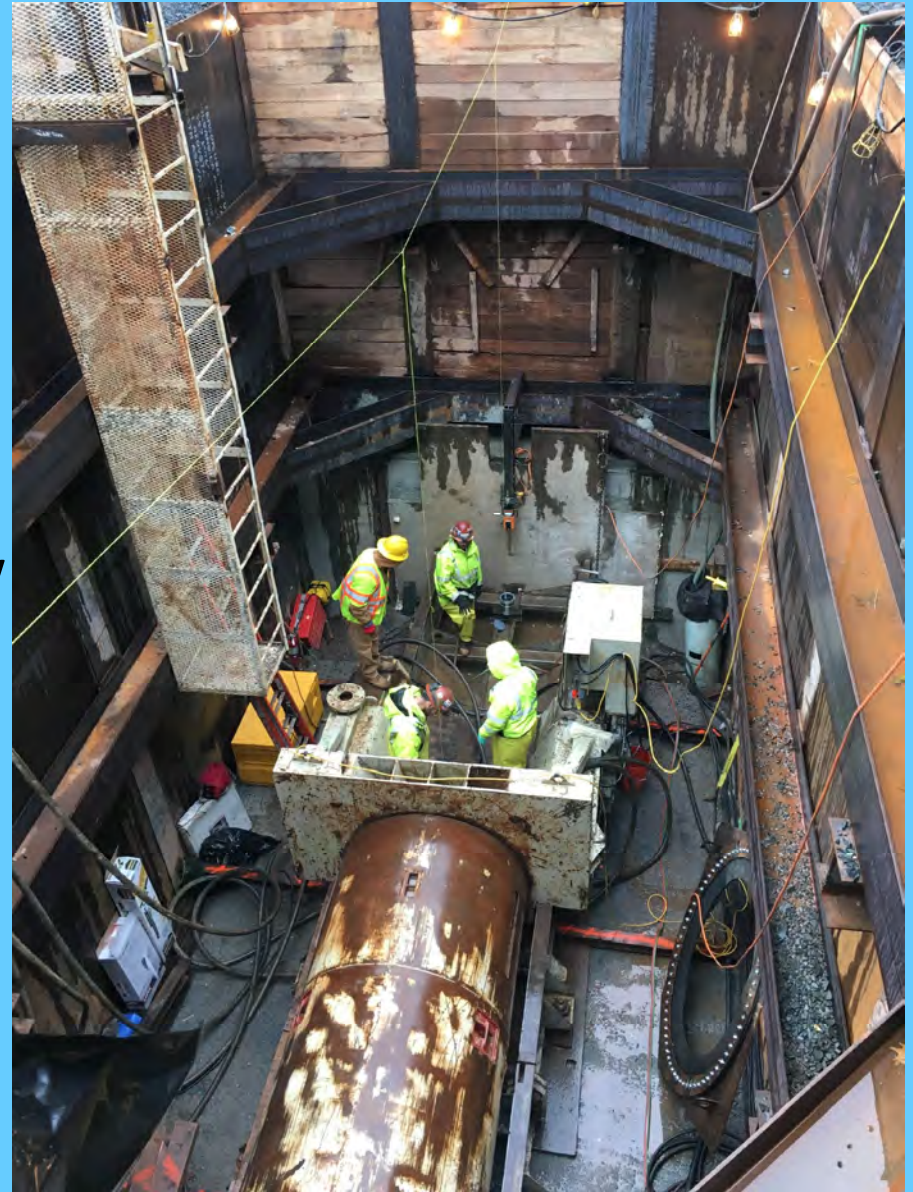


Trenchless Technology in Operation



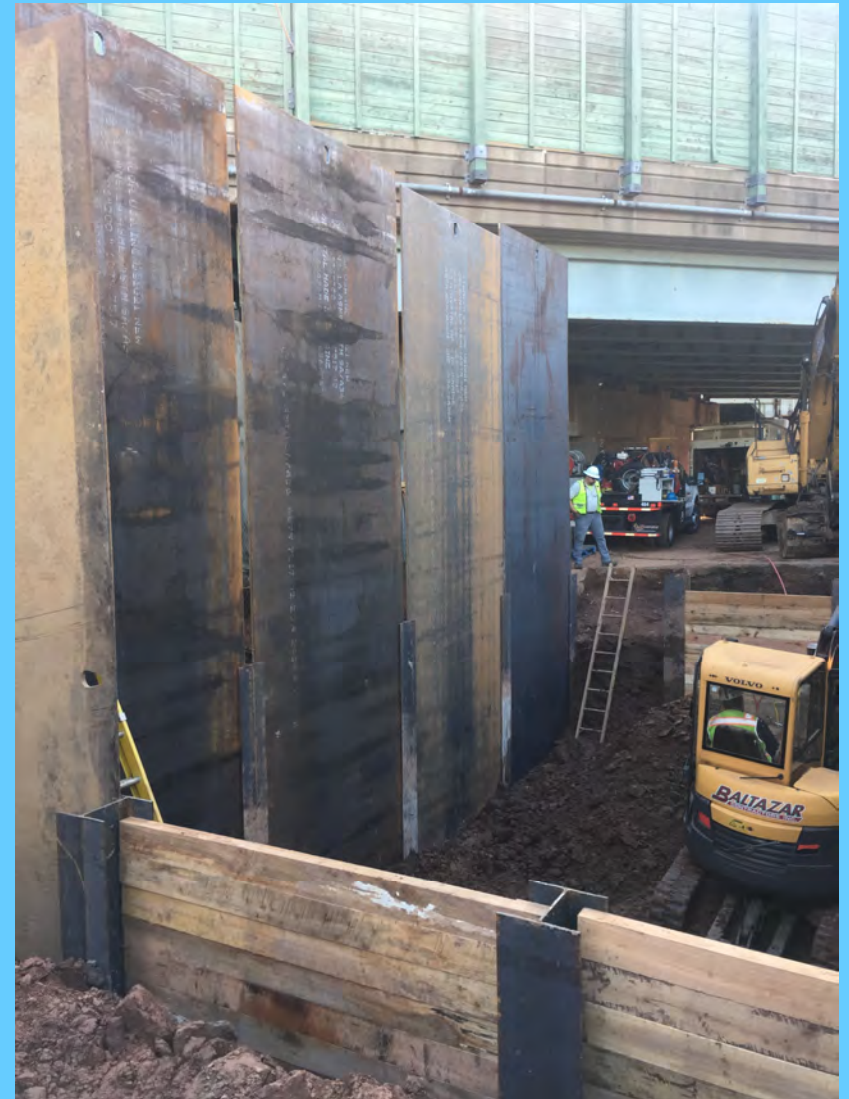
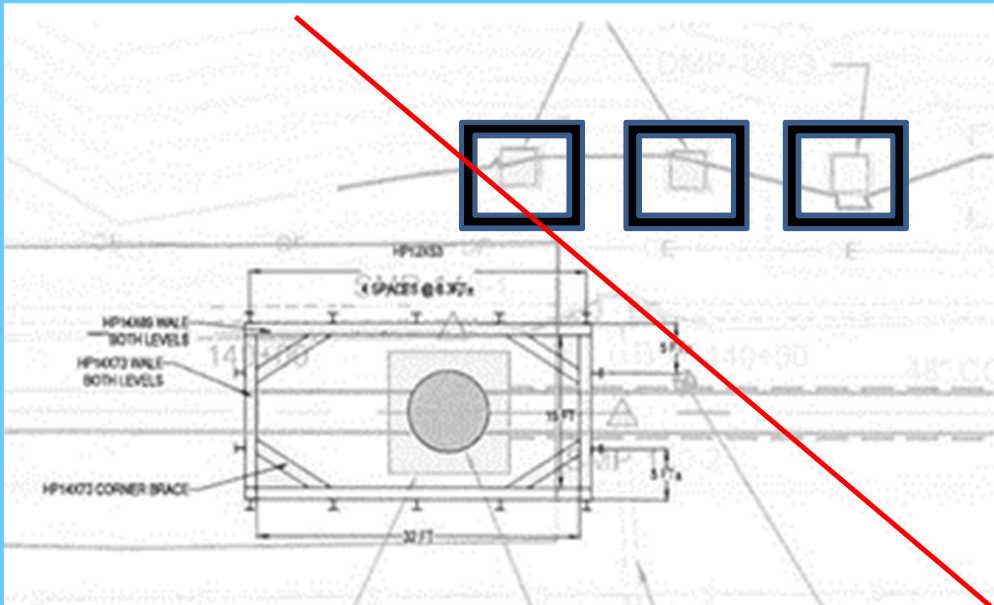
Soft Ground Tunneling Challenges

- Dewatering and Groundwater Affects
- SOE Design Impacts – Hydrostatic Pressures
- Tunneling Constructability – Line and Grade
- Adjacent Bridge Structure Shallow Foundations.
- Construction Sequencing of SOE
- Contractor Selected Means and Methods



Soft Ground Tunneling Challenges (cont)

- Adjacent Bridge Structure Shallow Foundations.
- Construction Sequencing of SOE
- Contractor Selected Means and Methods

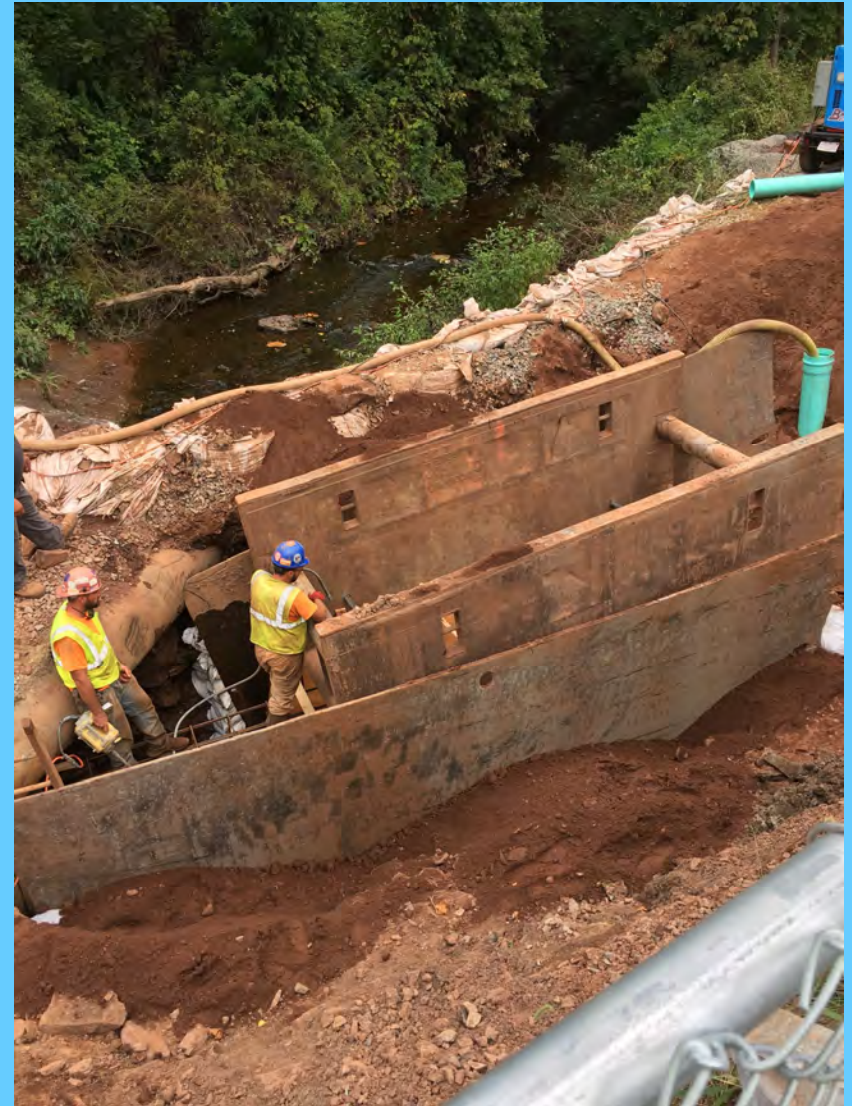


Constructability Issues Due to SOE Selection



Goff Brook Open Cut Stream Crossing

- Flat Pipe Slope to Allow Fall to Plant – Tunneling not Feasible
- MDC – No Siphon
- Stream Flow Isolation
- Temporary Flume Construction (Double Barrel)
- Stream Bed Exposed Rock – Drilling and Hammer Removal
- Permit Condition – Construct in Low Flow Months.
- Numerous Overtoppings due to Seasonal Rain Events



Mid-Construction Change to Tunneling

- Open Cut Crossing of Silas Deane (CDOT Hwy)
- Highway is 5 Lanes-Primary N/S Arterial
- Reason-Mix Face Conditions
- Risk Register Documentation
 - High Risk
- CDOT Permit Condition
 - Night Work
- Open Tunneling Specification
 - No Specified Equipment
- Following NTP MTBM Onsite and Proven

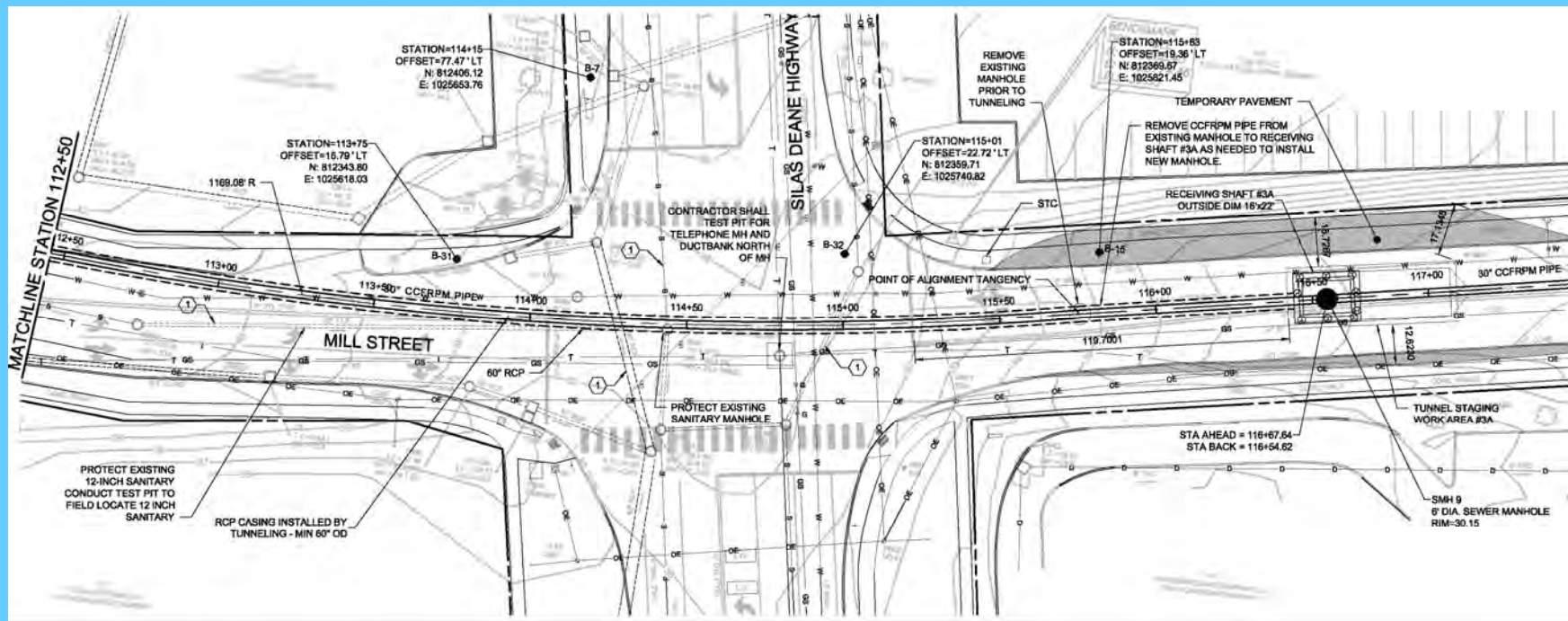


View from Mill St along sewer alignment crossing Silas Deane Hwy

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Mid-Construction Change to Tunneling (cont)

- Curved Tunnel Alignment to Remain in ROW
- Designed to Intercept Downstream Manhole Recently Installed
- Minimal Traffic Disruptions – Westbound Mill Closed
- Risk Register Adjusted - Low to Medium
- Tunneling Modifications Negotiated - Relatively Minor Cost Increase
- Allows Work thru Winter Season





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Contacts/Questions?

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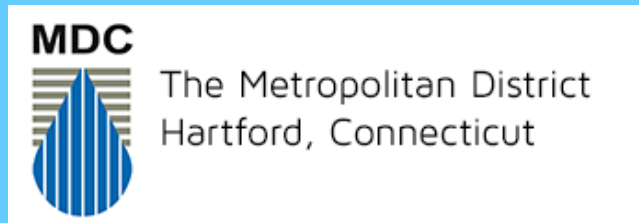
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