

# What Came First? The Pump Station or the Shopping Plaza?

## Major Sewer Pump Station Replacement in Fall River

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# Presentation Overview

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Background  
Design  
Construction  
Lessons Learned  
Q&A

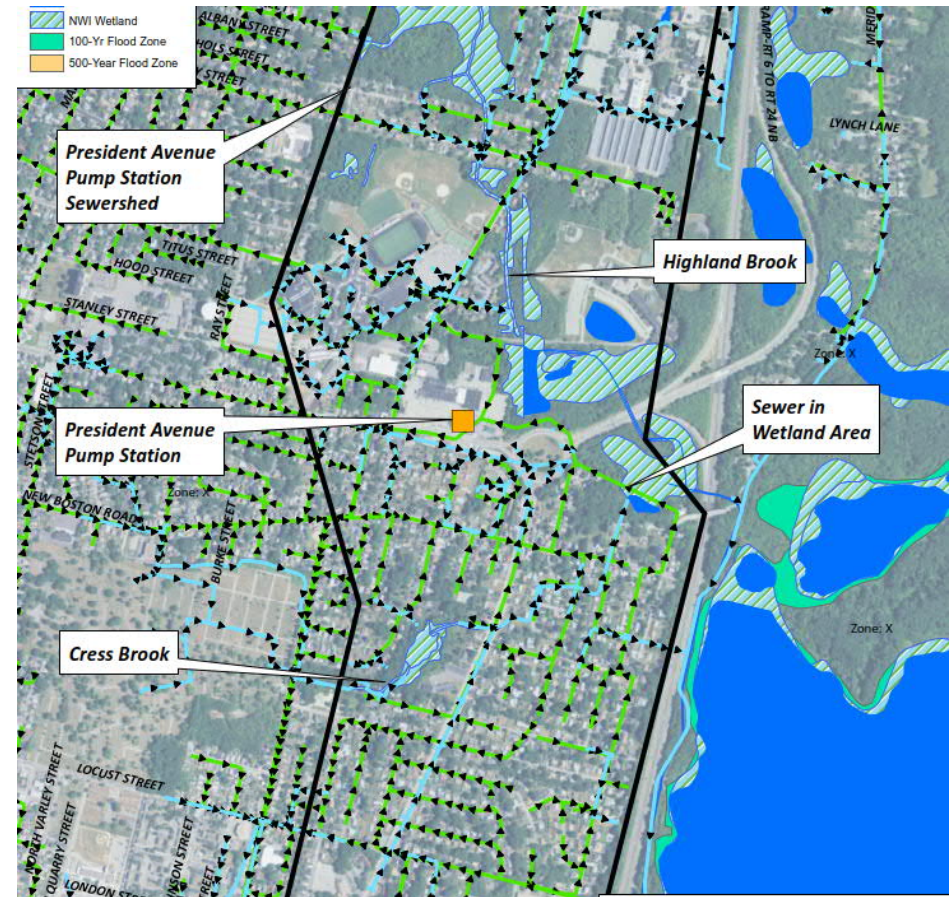
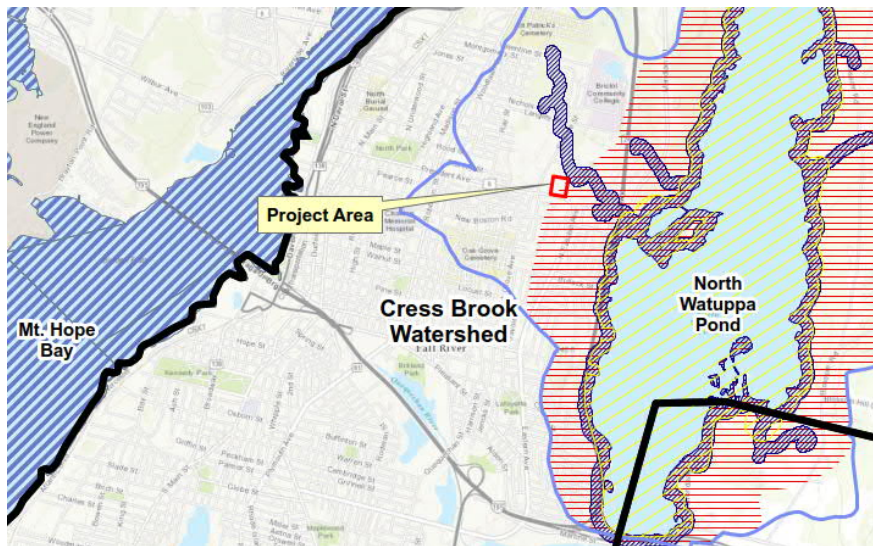
# Background



- Built in 1965 ahead of shopping plaza and surrounding residential growth
- Plaza operational issues
  - Traffic
  - Less than 100 ft from food-related businesses

# Project Area

- 725-acre contributing area
- Adjacent to wetlands and perennial streams
- Proximity to drinking water supply



## Background: Condition



## Background: Operating Issues



- SSO's
- Bypassing
- Safety and confined space



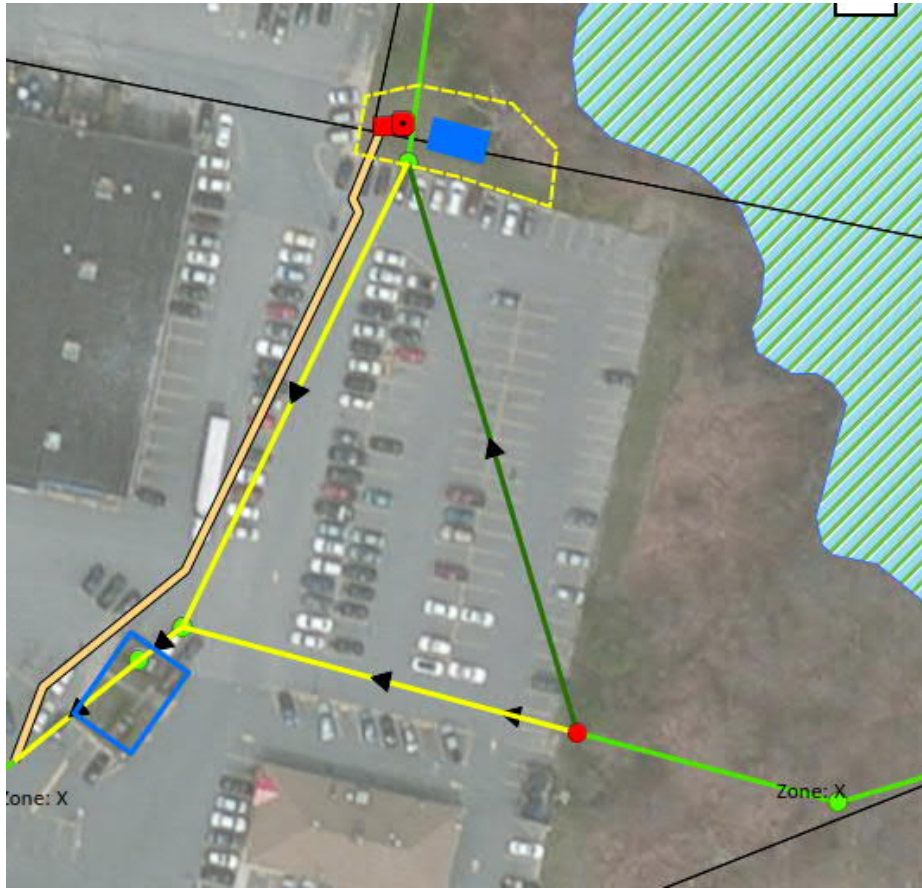
# The Perfect Balance

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## Site Layout Constraints / Evaluation Criteria

- Constructability
  - Staging construction
  - Balance between ideal location and cost
- Wetlands and MassDOT Right of Way
- Satisfying the plaza owner
  - Parking and traffic impacts
  - Aesthetics
  - Minimize disruption

# Alternatives: SRF Project Evaluation Stage

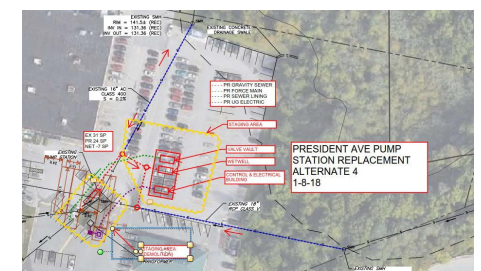
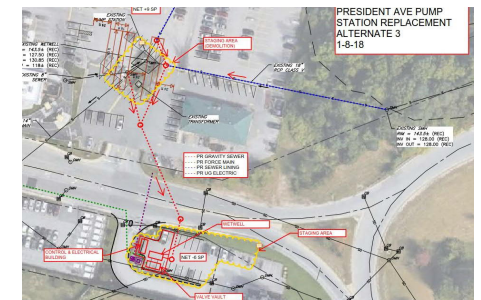
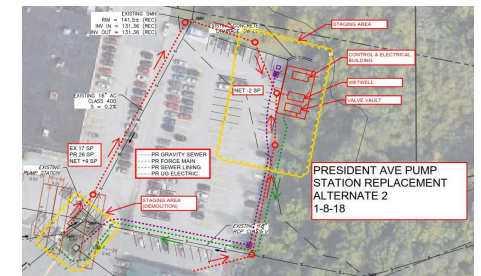
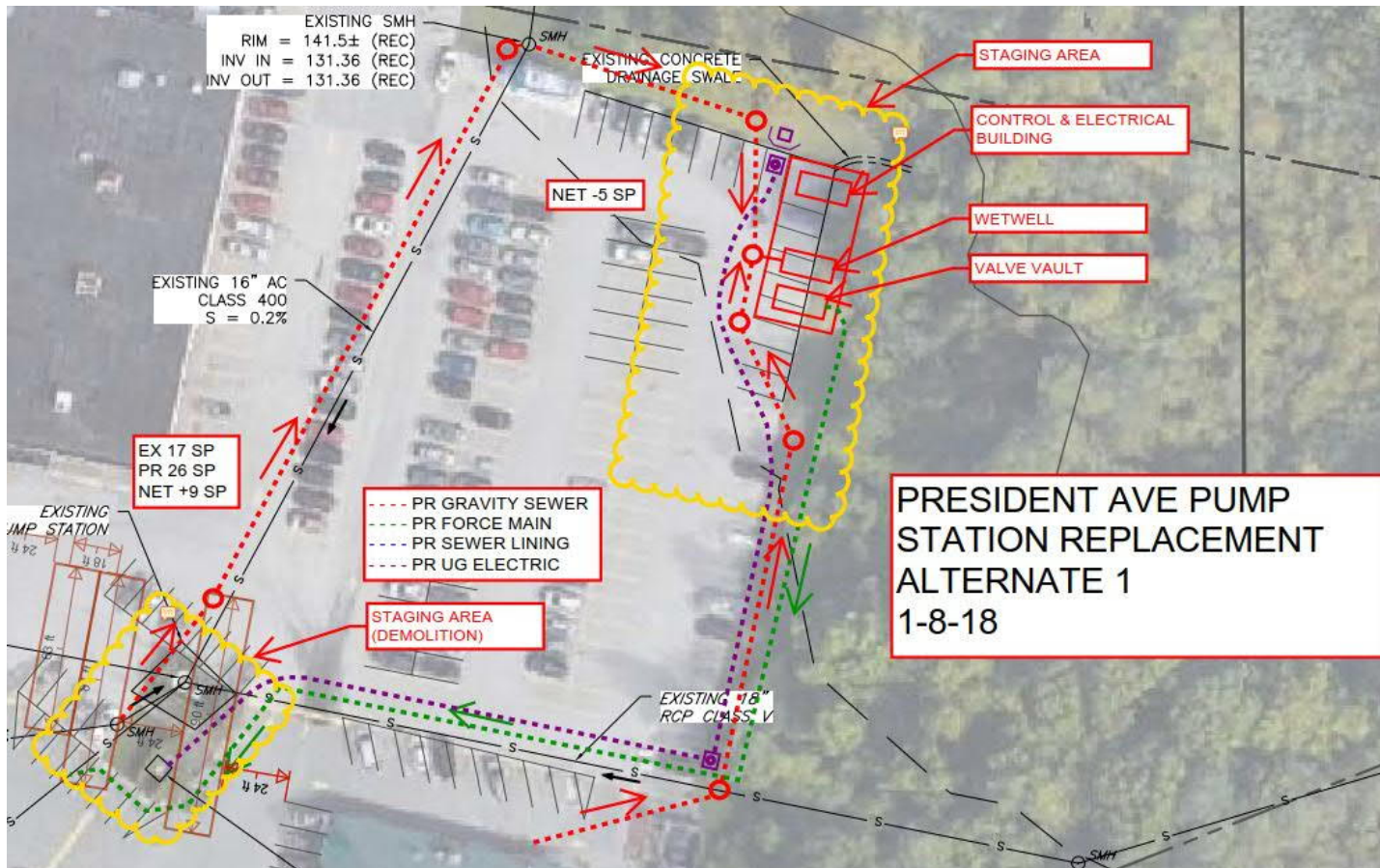




# Alternatives: Pre-Design



# Alternatives: Vetting 4 Options



# Alternatives: Pre-Design



## Field Investigations

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- Wetlands assessment
- Survey
- Geotechnical borings and probes
- Flow monitoring & Drawdown testing
- Sewer TV Inspection
- Hazardous materials survey
- Pre-characterization of soils and groundwater

# Alternatives: Easements

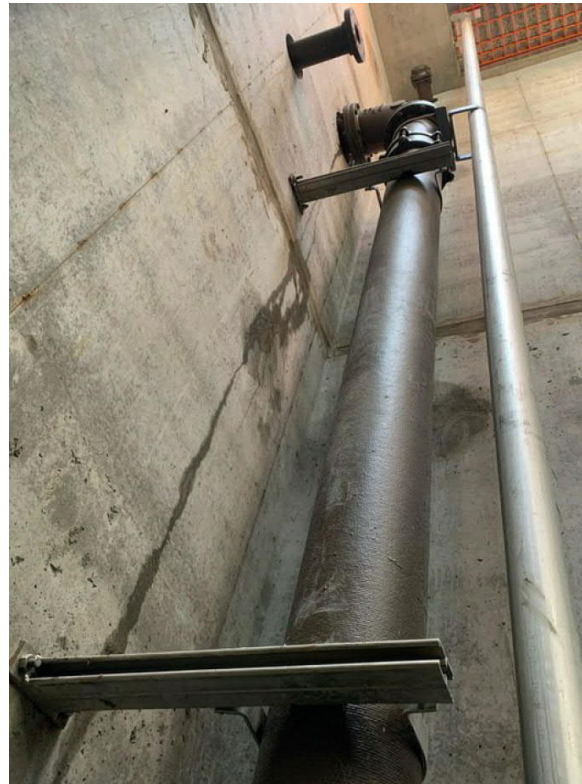


## Design: Permitting

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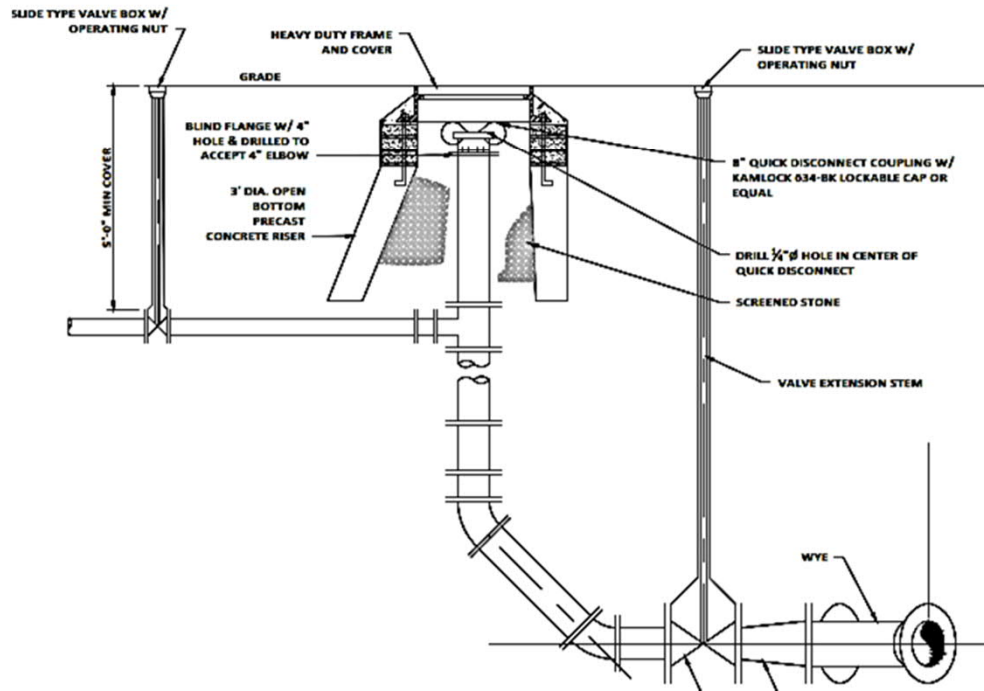
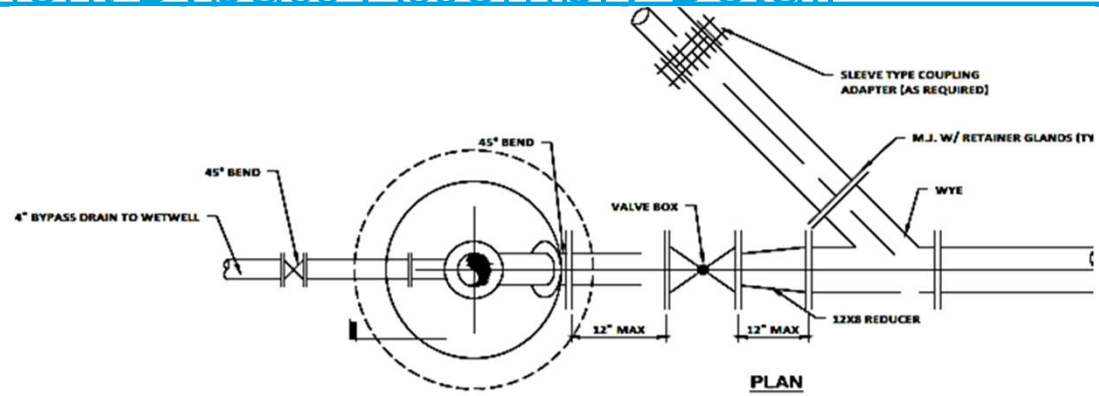
- Wetlands
- Plumbing Variance – State Plumbing Board
  - Need for a variance to construct a building without a bathroom
  - Arguments:
    - New facility will be fully automatic and monitored at the plant
    - Operators visit daily for a few minutes for visual check
  - Went through variance and hearing at the State Plumbing Board
  - Without plumbing inspector's support, variance was denied
  - Cost and design ripple effect

## Design Features: Triplex Pump System



- 1 pump to handle typical flows
- 2<sup>nd</sup> available for wet weather flows
- 3<sup>rd</sup> standby
- Flygt 50 hp pumps with VFD drives

# Design Features: Permanent Bypass Assembly Detail





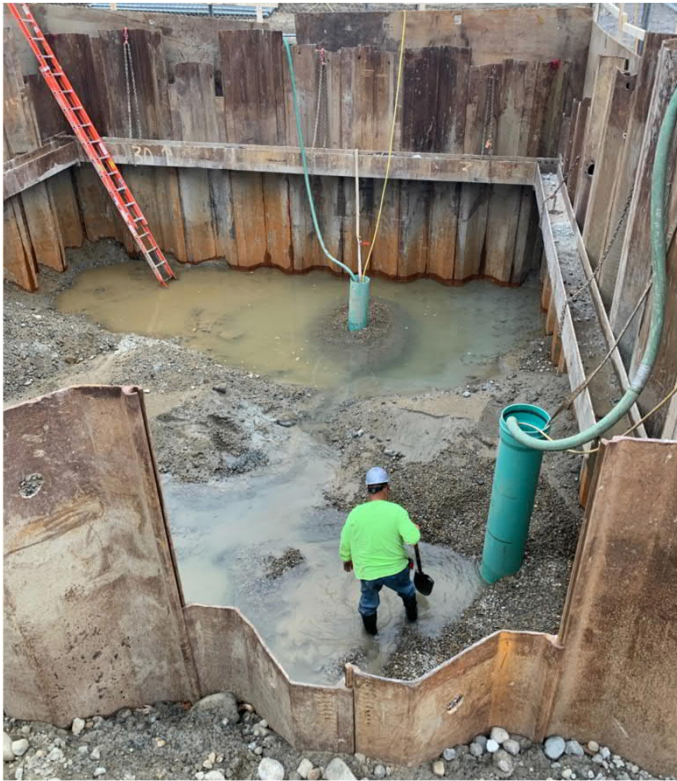
# Design Features: Control Building



# Construction Challenges



# Dewatering: Issues with Methods



**Initial Method**  
Sumps within shoring ring

**Revised Method**  
Deep wells outside shoring ring

# Shoring



- Initial dewatering method resulted higher water table
- Resulting leaky shoring

# Blasting



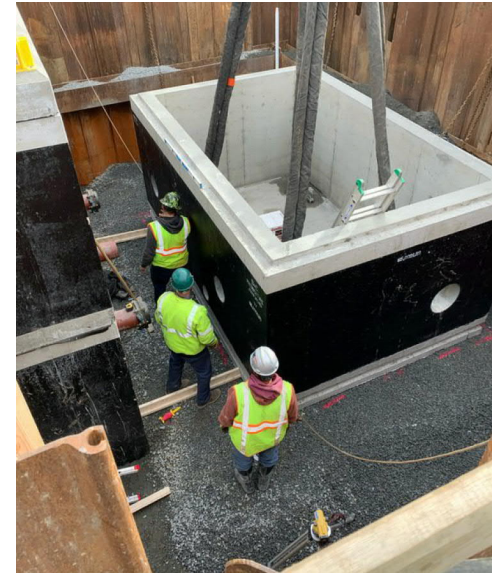
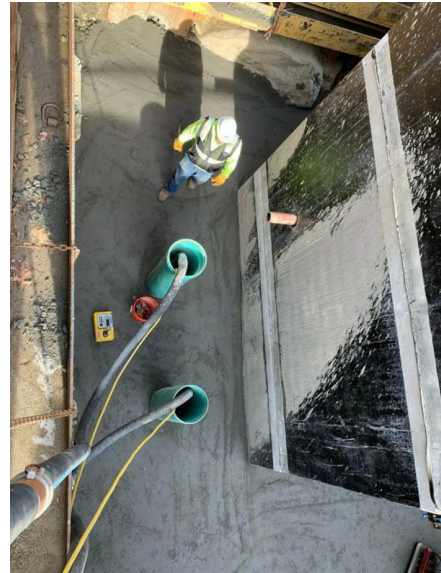
- Predrilled through overburden
- After shoring installation and overburden removal, intent was to blow out holes and blast
- MDB could not find and clear enough holes to blast
- Hydrostatic pressure and fractured rock fouled holes





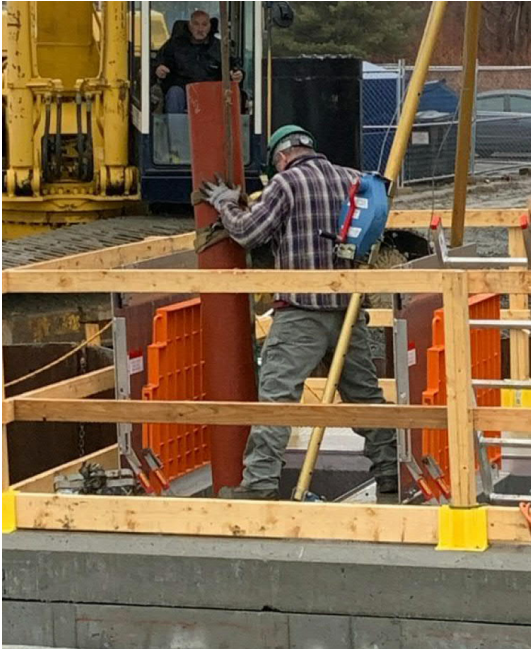
# Wetwell & Valve Vault

- 89,000 lb lifts
- No issues





# Worker Safety



## Existing Force Main Connection

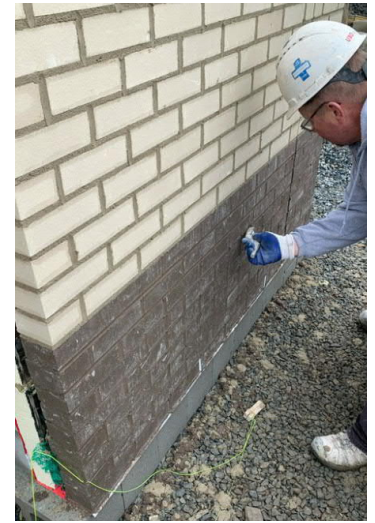
- Well planned
- Well Executed
- Completed in 1 night



# Aesthetics: Masonry

Required to match Newport Creamery architectural style

- Samples/selections
- Mockup
- Skilled mason

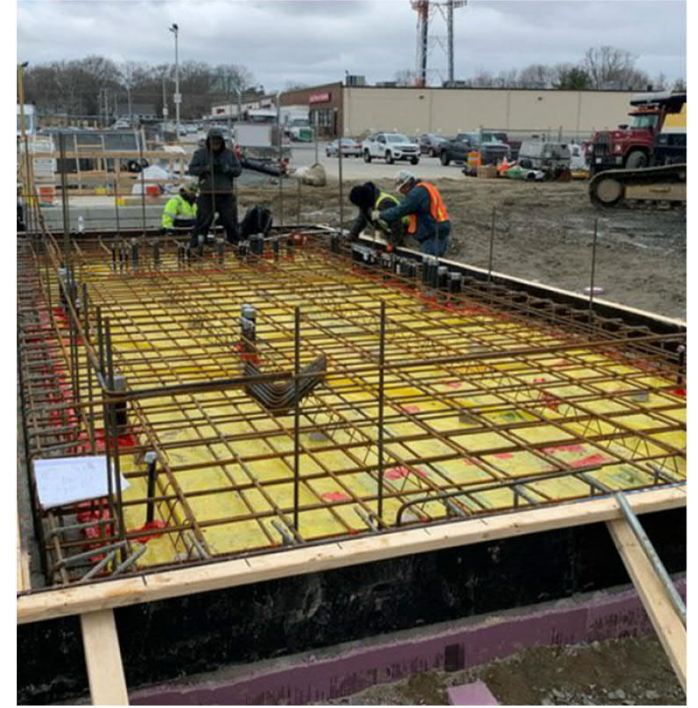
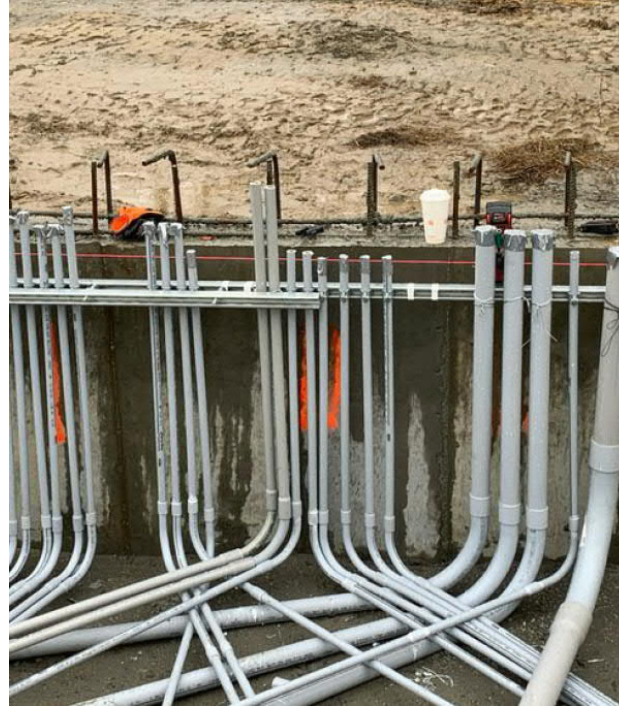


# Force Main Evaluation



- Properties
  - 1800 ft of 14-inch DI
  - No valves
  - Costly to drain and TV inspect
  - Specified a non-invasive assessment method
- Pipeline Inspection and Condition Analysis
  - Thickness readings – top, sides, bottom; high and low readings

# Control Building: Underslab Prep

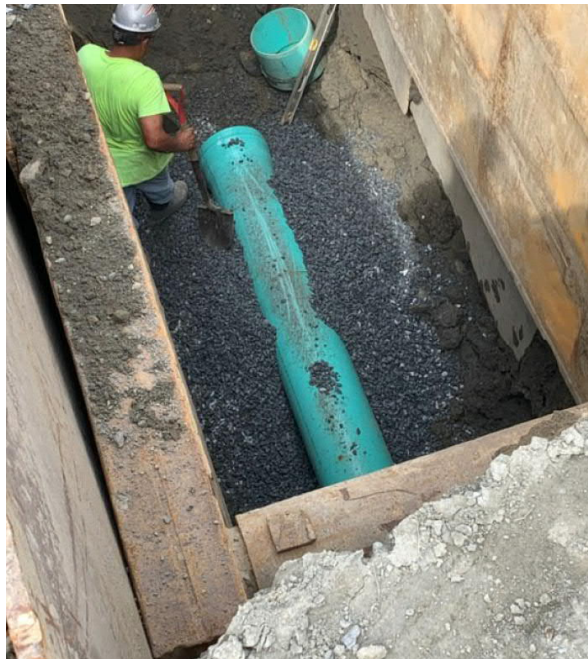


# Control Building: Features



- Simple touch screen control settings
- SCADA system
- Access control
- Complete remote capabilities at WWTP

## Site Restoration



- Demolition and removal
- Complete sewers
- Paving and striping
- Swales
- Bollards
- Fencing
- Cantilever gates











NO PARKING FIRE LANE

STOP

STOP

STOP

VAN

STOP  
ENTER  
FROM  
HERE

## Lessons Learned

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1

Property/owner coordination

2

Dewatering/shoring/rock removal

3

Efficient building size slowed contractor down

# Acknowledgements

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## City of Fall River

- Paul J. Ferland, EIT
- John Lincourt
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- Veolia, City's O&M Contractor

## Supporting Firms

- Bryant Associates
- Engineering Concepts
- Flow Assessment
- JM Fiske Environmental
- Lahlaf Geotechnical
- Nover-Armstrong (BETA)
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- Woodard & Curran

## Wright-Pierce

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- Edward Whatley, PE
- Jennica Srey, EIT
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THANK YOU

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