

# Beachmont – Sales Creek Neighborhood Sewer & Drainage Improvements

City of Revere, MA

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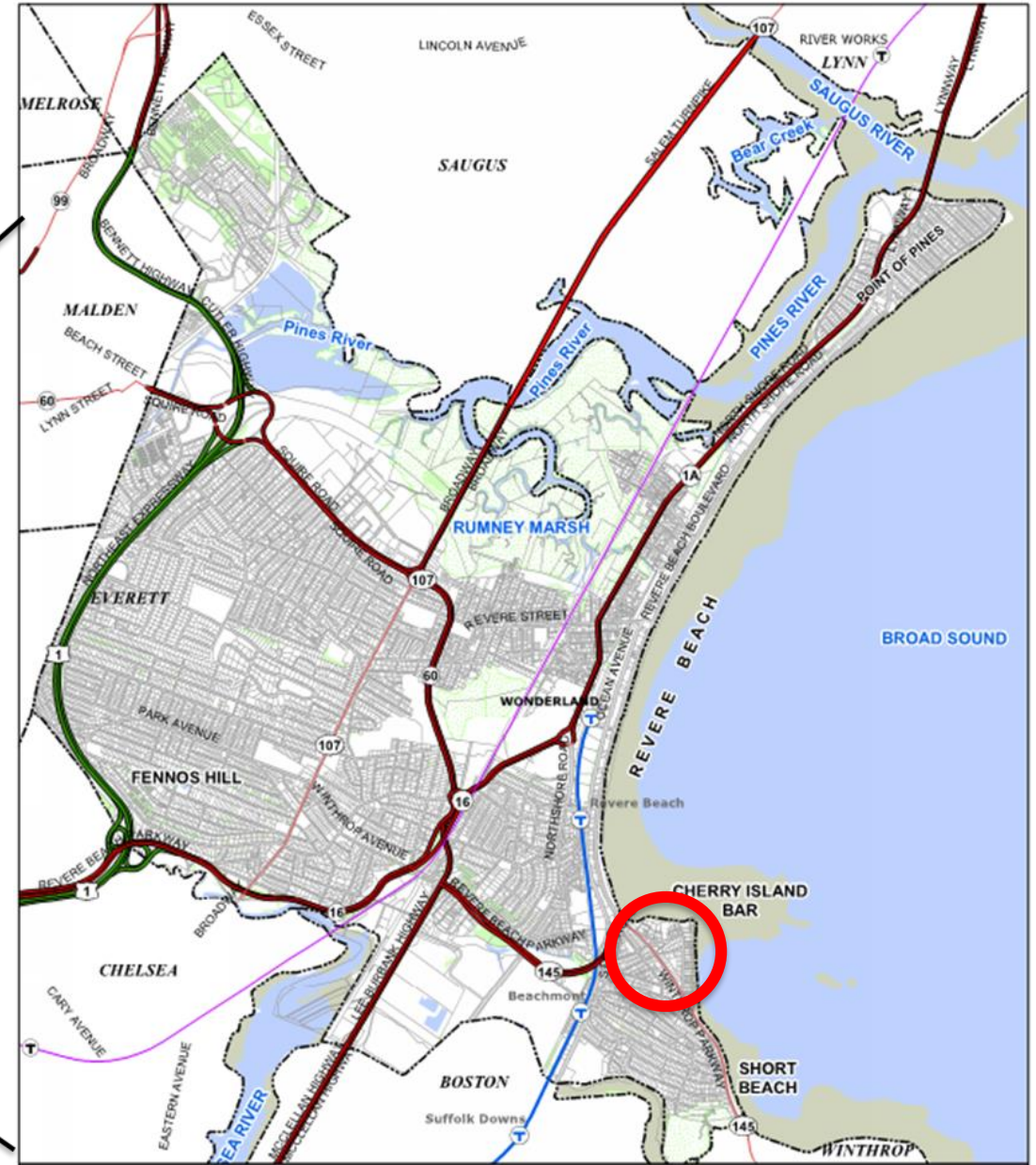
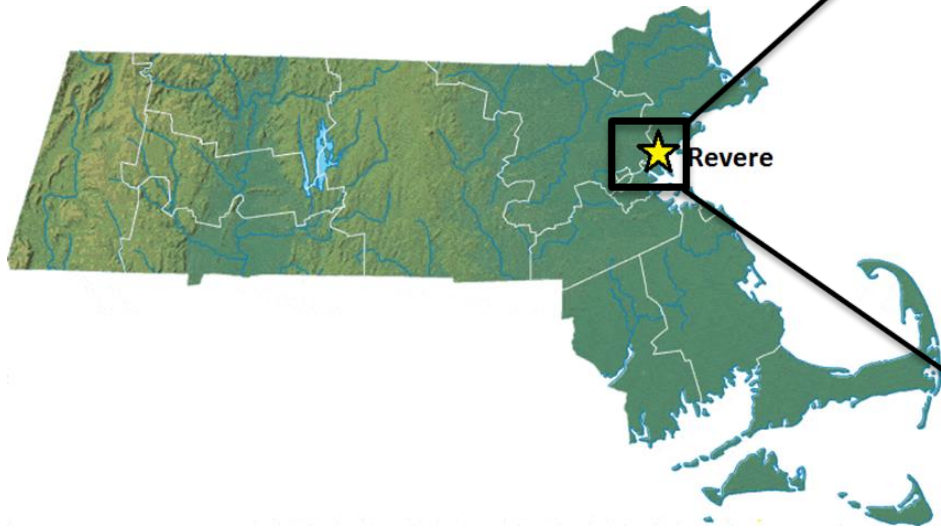
January 25, 2023



2023 Annual Conference & Exhibit  
January 22-25 | Boston

# AGENDA

- Project Overview and Background
- Planning / Field Investigations
- Design
- Construction





# PROJECT OVERVIEW AND BACKGROUND

- **City of Revere, MA:** Dolphin Avenue, George Avenue, Henry Street, and Jones Road
- **\$7,000,000** Construction Budget
- F&I New Wastewater Pump Station
- Upgrade **2,800 LF** of sewer main
- Rehab. **3,300 LF** of drain line
- Redirect **41** private inflow sources
- Full-Depth Road Reconstruction & new concrete sidewalks





# BACKGROUND - OVERVIEW AND BACKGROUND







# BEACHMONT PLANNING / FIELD INVESTIGATIONS

# BACKGROUND – PLANNING / FIELD INVESTIGATIONS

- Records review
- IDDE Investigations
- Dye testing
- Smoke testing
- House-to-house private inflow inspections
- CCTV of culvert
- Test Pits for locating utilities
- Boring Program
- Groundwater Sampling
- Road and sidewalk condition inventory
- FEMA Report Evaluation
- Survey

Red = Private Inflow Source





# PLANNING – SEWER ANALYSIS

- IDDE Hits
- Illegal Sump Pump Connections
- Shallow sewer = sewer blockages, surcharging, SSOs
- Sewer main higher than services/ sewer service pitching backwards
- Sewer smoke testing
  - smoke in DMH indicates cross connection
  - identified possible sewer sags in multiple areas



# PLANNING – DRAIN ANALYSIS

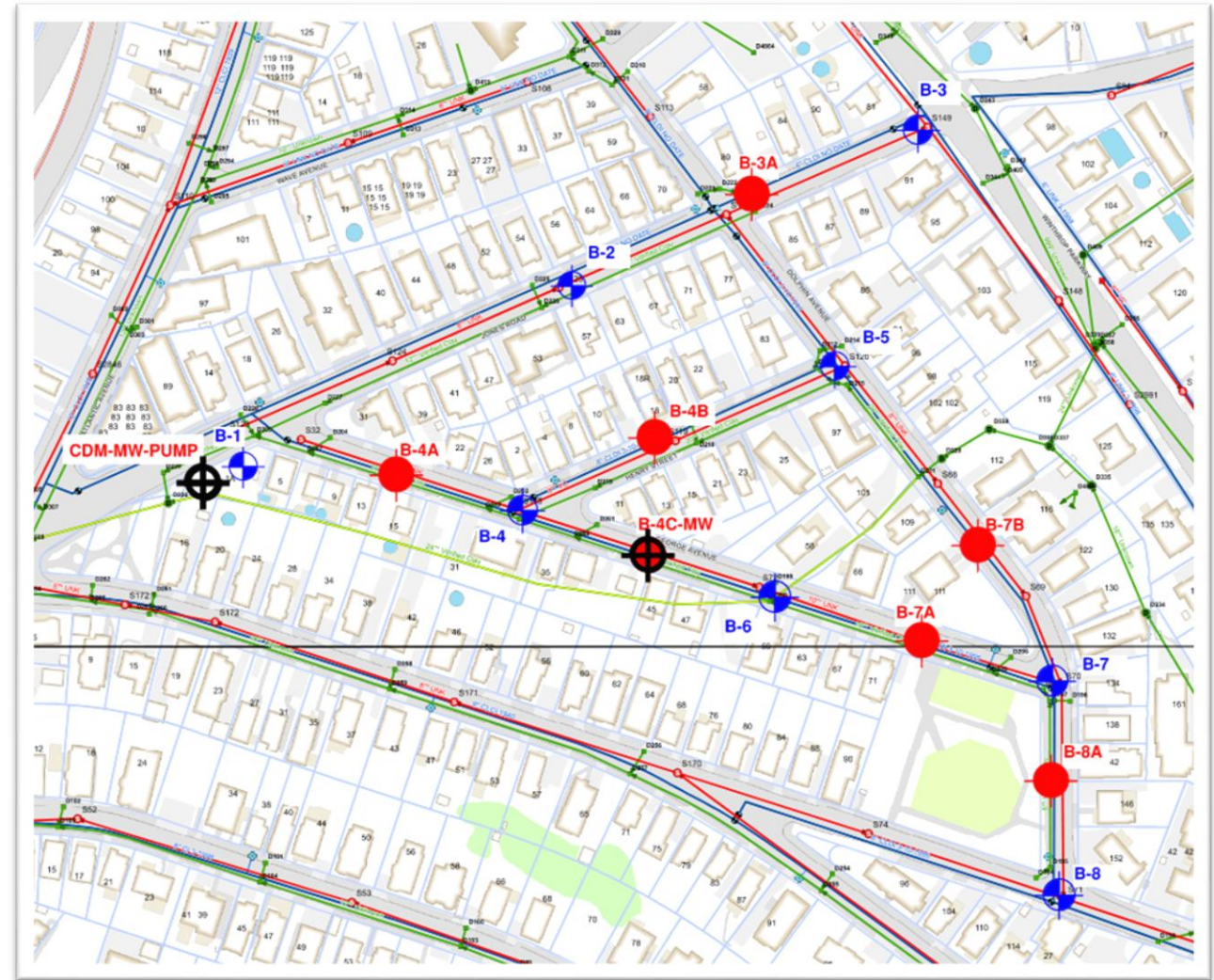
- Review of FEMA flood plain mapping
- 100 year flood plain elevation = 6'
- Ground elevation = ~5'
- Large drainage culvert installed at nearly flat slope to allow drainage to flow in both directions
- Sales Creek = Outstanding Resource Water; Tributary to an Area of Critical Environmental Concern





# PLANNING – BORINGS

- Phase 1 = 8 borings
- Phase 2 = 6 borings + 2 groundwater wells
- Reportable conditions under the Massachusetts Contingency Plan (MCP); Utility-Related Abatement Measure (URAM)
- Groundwater required Remediation General Permit (RGP)
- Layers of peat



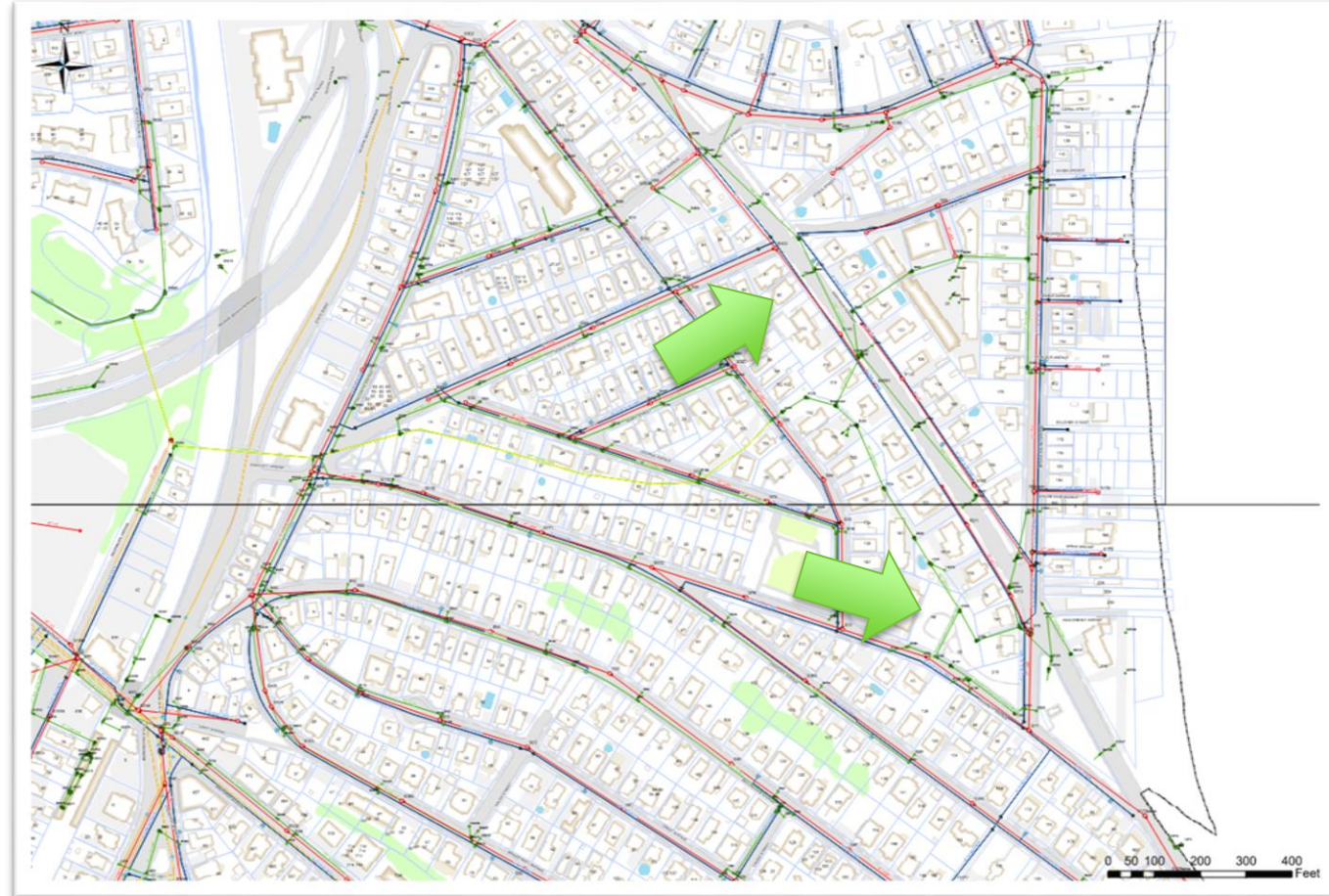


# BEACHMONT - DESIGN

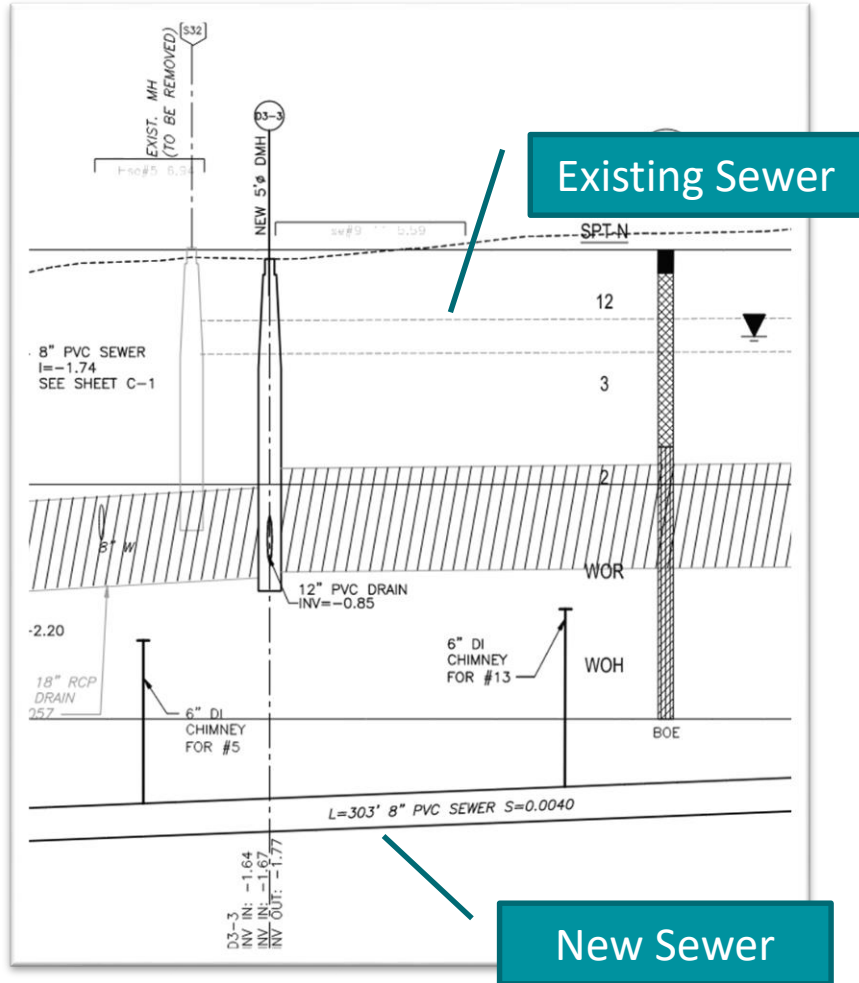


# DESIGN - SEWER

- Lower sewer 3 to 15 FT in areas
- Reverse direction of flow from East to new pump station
- Install 2,800 LF of new sewer
- Raise multiple sewer services on private side to pitch towards street
- Remove sewer services from drainage system



# DESIGN - SEWER





# NEIGHBORHOOD IMPROVEMENTS (BEFORE)



Existing Asphalt Sidewalk

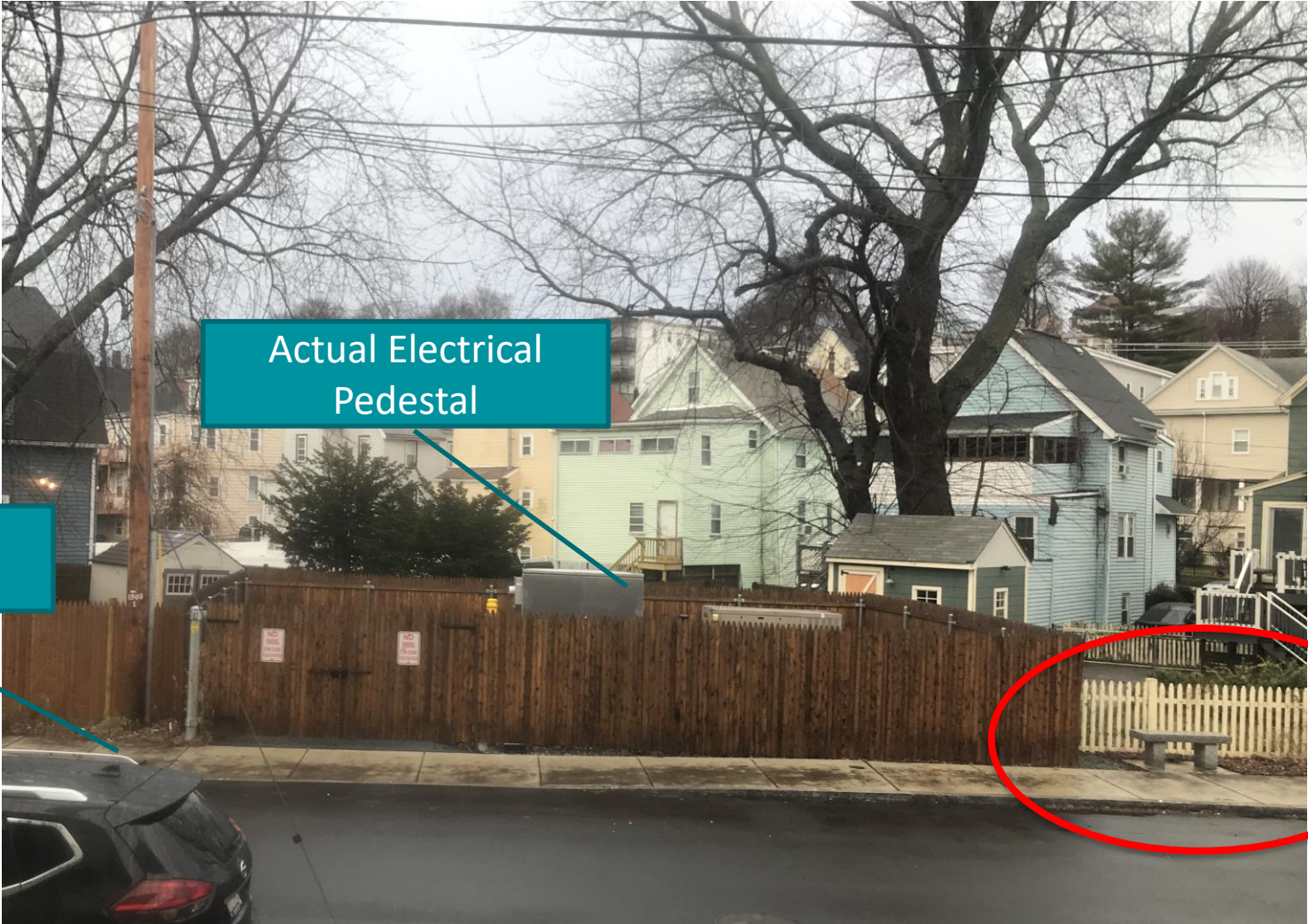


# NEIGHBORHOOD IMPROVEMENTS (ARTISTIC RENDERING)





# NEIGHBORHOOD IMPROVEMENTS (AFTER)



Actual Electrical Pedestal

New Concrete Sidewalk





# BEACHMONT - CONSTRUCTION





# BEACHMONT SEWER SYSTEM UPGRADES

# F&I NEW WASTEWATER PUMP STATION

- Constructed SOE & Dewatering System
- Finish Grade Elev. = 6.66'
- Wet Well Floor Elev. = -13.98'
- Wet Well Influent Elev. = -8.77'
- Wet Well Effluent Elev. = -0.18'
- Force-main (240 LF) to discharge to Atlantic Avenue SMH
- Submersible Pressure Level Transducer with Ultrasonic & Float Back-up

SUBMERSIBLE PUMP LIFT STATION / SLUDGE LEVEL TRANSMITTER

### MODEL BC001 BIRDCAGE®

**FEATURES:**


- 3-inch diameter sensing diaphragm resists clogging
- Protective baffle plate reduces risk of sensor damage
- Corrosion-resistant, all stainless steel construction
- Stock quantities available to ship in 1 to 3 days
- Surge protection from lightning strikes and voltage spikes
- Ranges from 0-5 thru 0-500 PSI (0-10 thru 0 to 1153 meters FTWC)
- Lifetime Surge Warranty Replacement Program when partnered with the BCP3000 Surge Protector (sold separately)

**APPLICATIONS:**



- Submersible pump lift station level monitoring
- Wet wells
- Process sumps
- Water tanks and reservoirs
- Process sludge
- Water and wastewater level monitoring

**PRODUCT OVERVIEW:**

The BC001 Birdcage® Series from Blue Ribbon Corporation is a highly accurate level transmitter designed specifically for sludge level monitoring and pump lift stations. Its all stainless steel design incorporates a 3-inch diameter clog-resistant sensing diaphragm and corrosion resistant protective baffle plate. These features, combined with over 25 years of proven field service, make the Birdcage® the



Model BC001 Birdcage®





# UPGRADES - BEACHMONT SEWER SYSTEM

- R&R 2,800 LF of existing sewer main with new 8" PVC and DI pipe lowering the elevation from 3' to 5-15' below street grade
- F&I new 6" DI Chimneys for deep sewer connections
- R&R 84 Sewer Services (public side), as well as eliminating 2+/- connected to drainage system, and 4 on private-side
- Minimum By-Pass required because existing flow was in the opposite direction.





# BEACHMONT DRAINAGE SYSTEM REHABILITATION



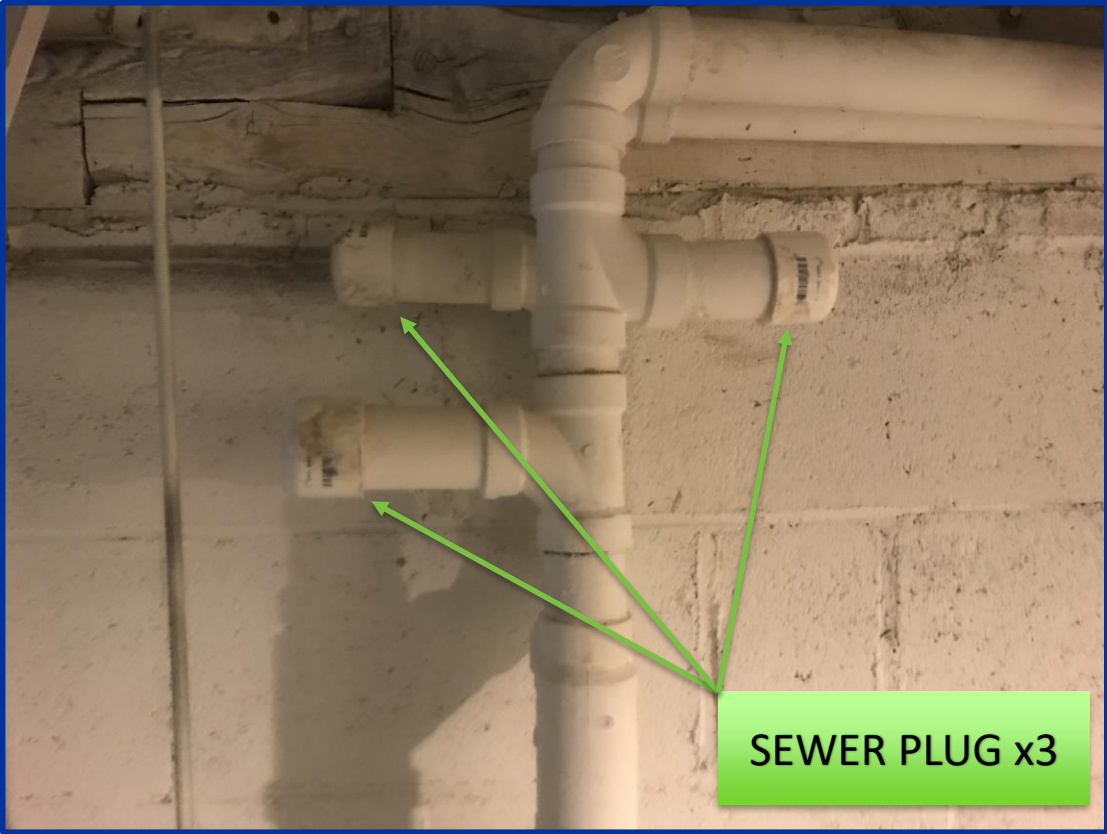
# UPGRADES - BEACHMONT DRAINAGE SYSTEM

- R&R 1,500 LF of existing drain pipe
- F&I 500+ LF of new drain line
- CIPPL all sections of drain that were in acceptable condition (1,100 LF)
- Multiple point repairs conducted
- Increased average pipe diameter
- Rehabilitate all CBs and install additional CBs
- F&I additional DMHs to increase accessibility to drainage system
- Clean and CCTV/ investigate unknown drainage system areas (1,600 LF)



# INFLOW REMOVAL PROGRAM

DISCONNECTED SUMP PUMPS FROM SEWER SERVICES OF INDIVIDUAL PROPERTIES (41) AND REDIRECTED THEM TO THE DRAINAGE SYSTEM (40 – 90 thousand gallons removed per 6-hr storm)







# BEACHMONT CONSTRUCTION CHALLENGES

# SOIL MANAGEMENT

- Removed 10,000 TONS of Soil
- Soil pre-characterized by area and depth (0-8 ft. & 8-16 ft.)
- Soil Classifications
  - < RCS-1
  - In-State Unlined Landfill (> RCS-1)
  - Out of State Disposal (> Comm 97)
- Separate piles created and stored for additional testing and removal





# DEWATERING





# UNFORESEEN ISSUE

ENTIRE SEWER MAIN SUPPORTED BY PIER SYSTEM





# FULL-DEPTH ROAD RECONSTRUCTION & NEW CONC. SIDEWALKS



# BEACHMONT – CONSTRUCTION PHASE SUMMARY

## **COST: \$1.3M under budget**

- Construction Cost Estimate: \$6.9M
- Construction Cost Actual: \$5.6M

## **TIME: 3-year period**

- Sewer and Drainage Work: 15 Months
- Sidewalk Upgrade: 6 Months
- Road Reconstruction: 1 Month



# Q&A

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