



# Ocean Avenue West Stormwater Pump Station

Evaluation and Preliminary Design

(Second Public Meeting – May 27, 2020)



**Hosts –**

Deb Duhamel – City of Salem, Assistant City Engineer

Ken Mavrogeorge – Woodard & Curran, Project Manager

**Panel –**

Patti Morsillo – City of Salem, Ward 3 Councilor

David Knowlton – City of Salem, DPS Director/City Engineer

Barbara Warren – Salem Sound Coastwatch Executive Director

Ken Carlson – Woodard & Curran, Vice Present

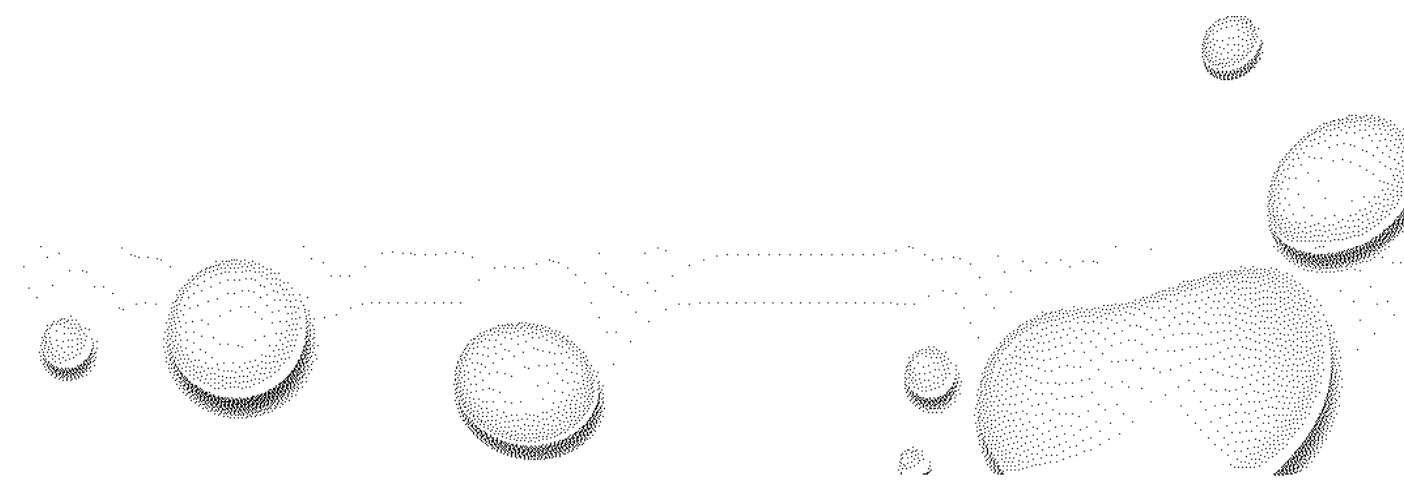
Jason Kreil – Woodard & Curran, Technical Manager

Kevin Trainor – Woodard & Curran, Project Engineer





# ZOOM Meeting

- This meeting is being recorded & will be posted to the project webpage
  - Presentation followed by discussion/Q&A
  - Please use the “Raise Hand” feature on ZOOM to ask a Question
  - On phone press \*9 to “Raise Hand”
  - Comments/questions can be sent after to either host
- 



# Ocean Avenue West Stormwater Pump Station



Evaluation and Preliminary Design

COMMITMENT & INTEGRITY DRIVE RESULTS

# Agenda



- Recap Public Meeting #1
- Project Overview / Goals
- Project Schedule
- Existing Conditions/Conditions Assessment
- Drainage Evaluation
- Alternatives Analysis
- Proposed Plan
- Questions / Feedback



Photo Source: City of Salem, MA

# Recap Public Meeting #1

- Held on April 21, 2020
- Topics:
  - MVP Program
  - Impact of stormwater runoff
  - Planning for the future
  - Impacts of climate change
  - Existing stormwater pump station
- More information available at <https://www.salem.com/city-engineer/pages/ocean-avenue-west-pump-station>



**Come Join Us!**  
April 21, 2020, 5:00pm  
Virtual Public Meeting



To discuss the Evaluation and Preliminary Design for the Ocean Avenue West Stormwater Pump Station.

Go to: [zoom.us/join](https://zoom.us/join)  
Enter meeting ID: 928 0457 3925  
Enter password: 062123

Or call toll-free: 888-475-4499 or 877-853-5257

---

Questions – call City Engineer David Knowlton 978-619-5673

*Salem*  
1636 Building History  
[www.salem.com](http://www.salem.com)

## Project Overview / Goals

- Funded by a Municipal Vulnerabilities Preparedness (MVP) Program Action Grant
  - \$233,000 total cost (\$58,250 is a City match, \$174,750 is from MVP grant)
- Evaluation and Preliminary Design
- Alternatives analysis of various pumping equipment, storm drain upgrades, and resiliency measures
- Report with Preliminary Design Criteria
  - Capacity to handle the 100-year storm event as reported by the Northeast Regional Climate Center (NRCC)

# Project Schedule

- Public Outreach (Key Part of MVP Program)
  - April 21, 2020
  - May 27, 2020 (This Meeting)
- Final Preliminary Design Report
  - Must be completed by June 30, 2020



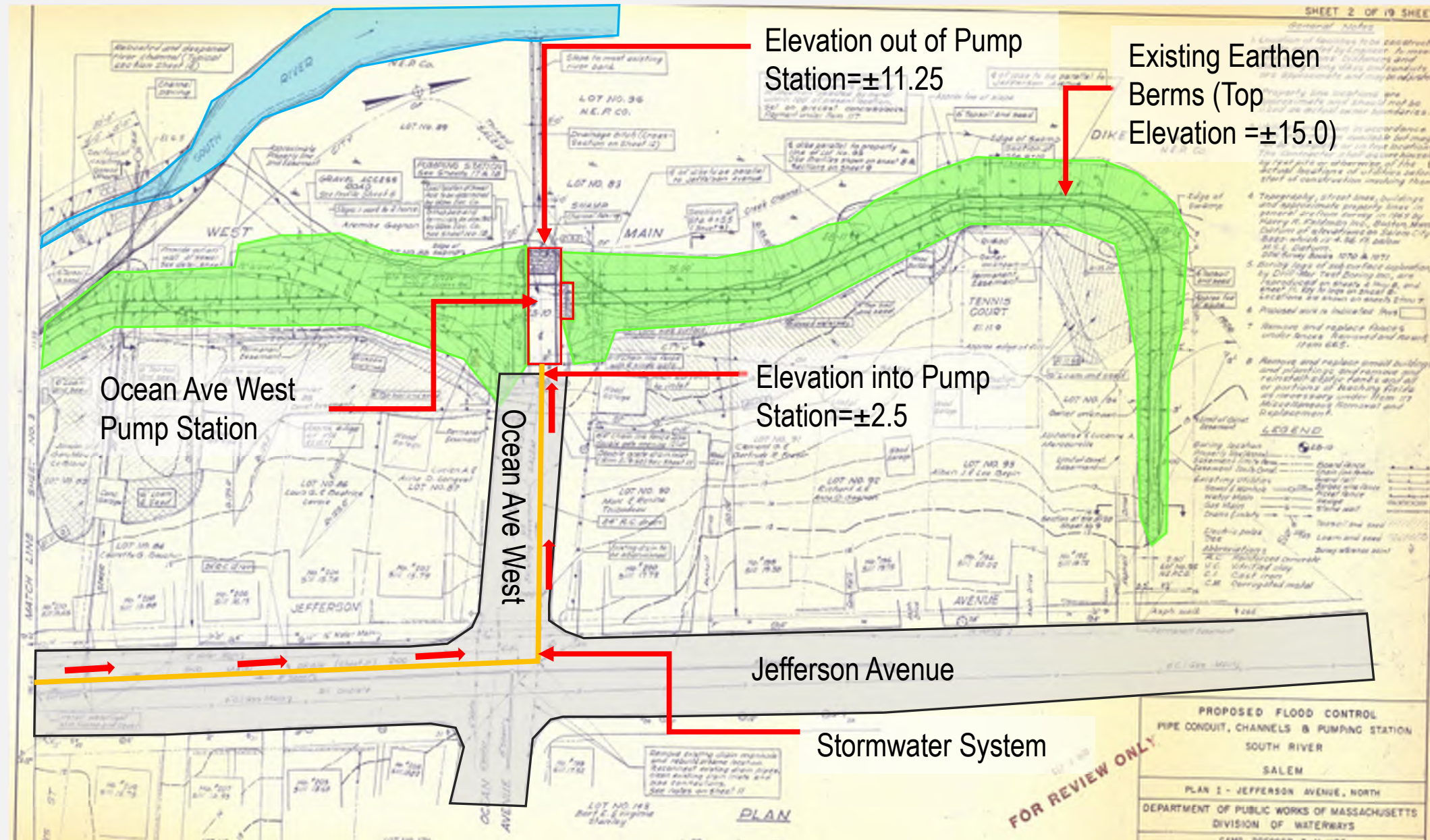


# Existing Conditions

- Building constructed in early 1970s by Massachusetts Department of Public Works
- Structural concrete in building in generally good condition
- Structure not in line with current building code and best management practices
- Pumping equipment and controls well beyond their expected service life (20-30 years expected service life)
- PS Capacity: +/- 20 CFS (two pumps running)

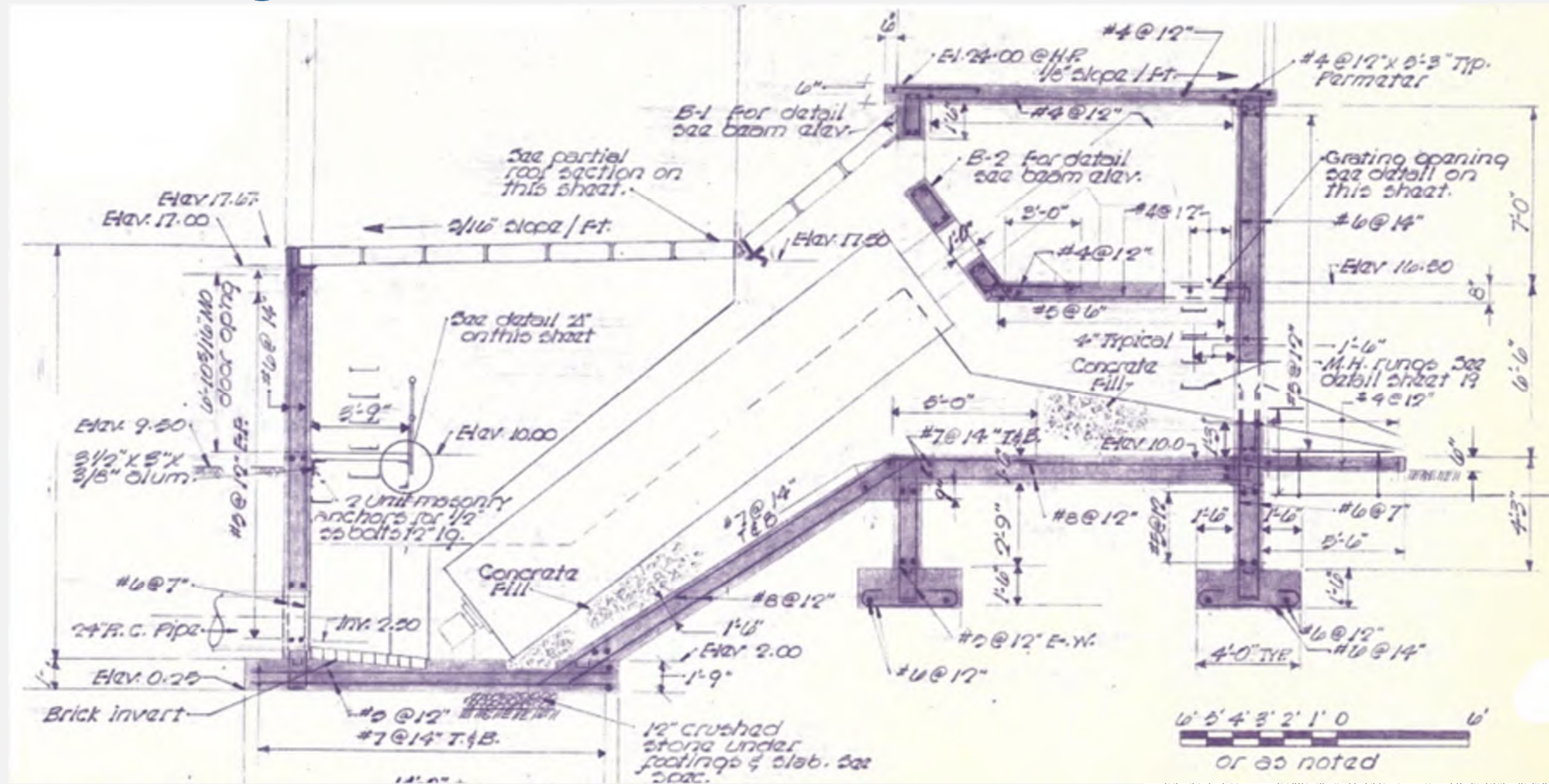


# Existing Conditions



FOR REVIEW ONLY

# Existing Conditions





# Existing Conditions



# Condition Assessment

## ■ Screw Pumps

- Pump 1 not operational, reducing PS capacity
- Edge deterioration of both pumps
- Rust prevalent on torque tubes, motor housing, and belt guards
- Pump mount for Pump 2 has dislodged, broken concrete on the side of the mount
- Generally, pumps are in similar condition to the previous inspection in 2009

## ■ Building

- Structurally sound but not suitable for upgrade or expansion due to projected flows.



# Condition Assessment



## ■ Electrical System

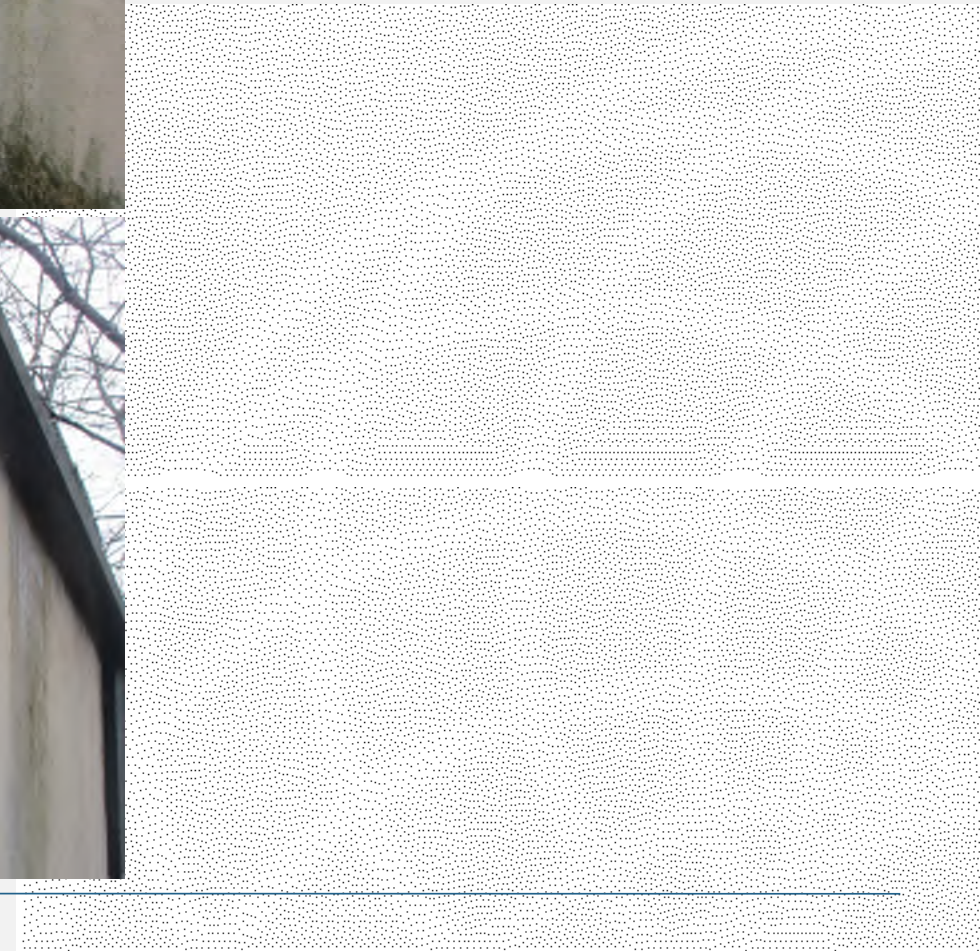
- No emergency generator, though City has supplied temporary generators for large storms
- Grounding rods unburied and visible (subject to damage)
- Low voltage panel is less than 10 years old

## ■ Heat, Ventilation, and Air Conditioning

- No mechanical ventilation
- Electric heater on upper level



# Condition Assessment - Structural





# Condition Assessment



## ■ Grounds

- Fence surrounding building for security
- Erosion of soil at rear corners of building, fence line (see photo) and upper level access stairs
- Erosion of subbase soils under discharge chute slab
- Discharge chute rip rap movement



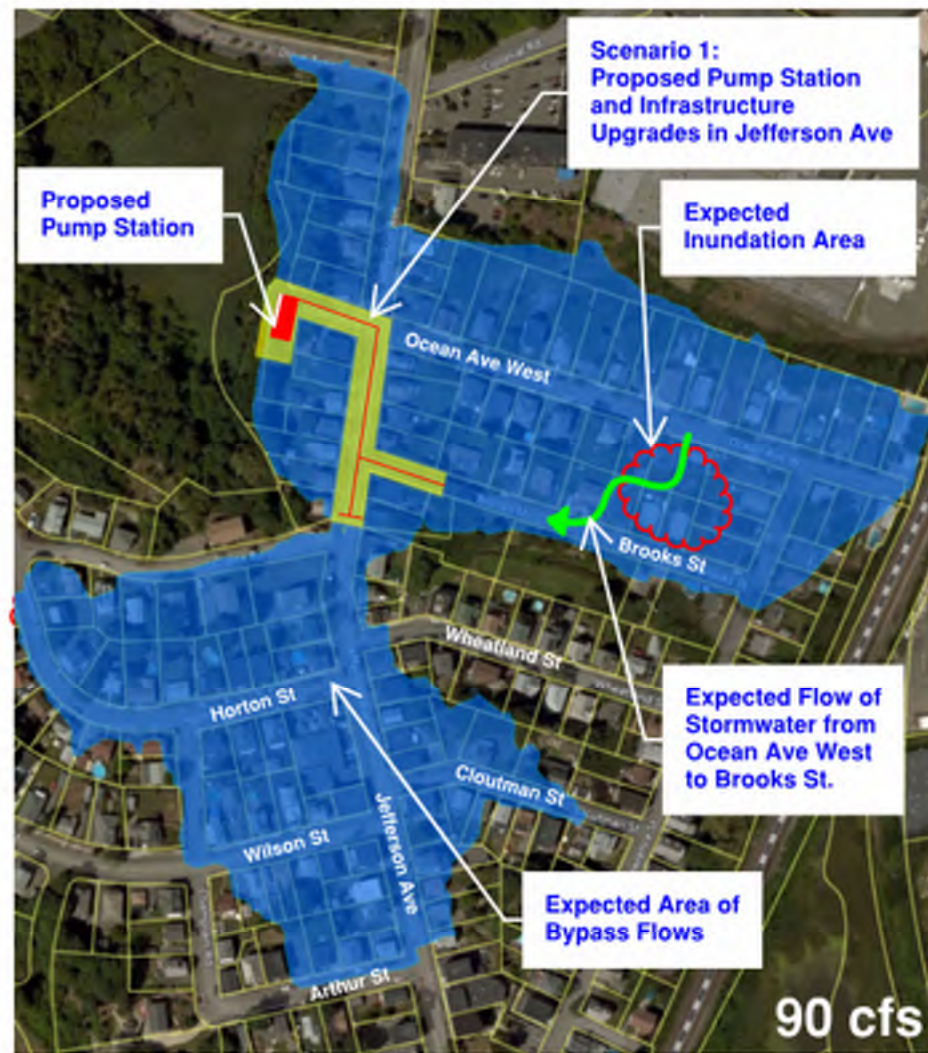
# Drainage Evaluation



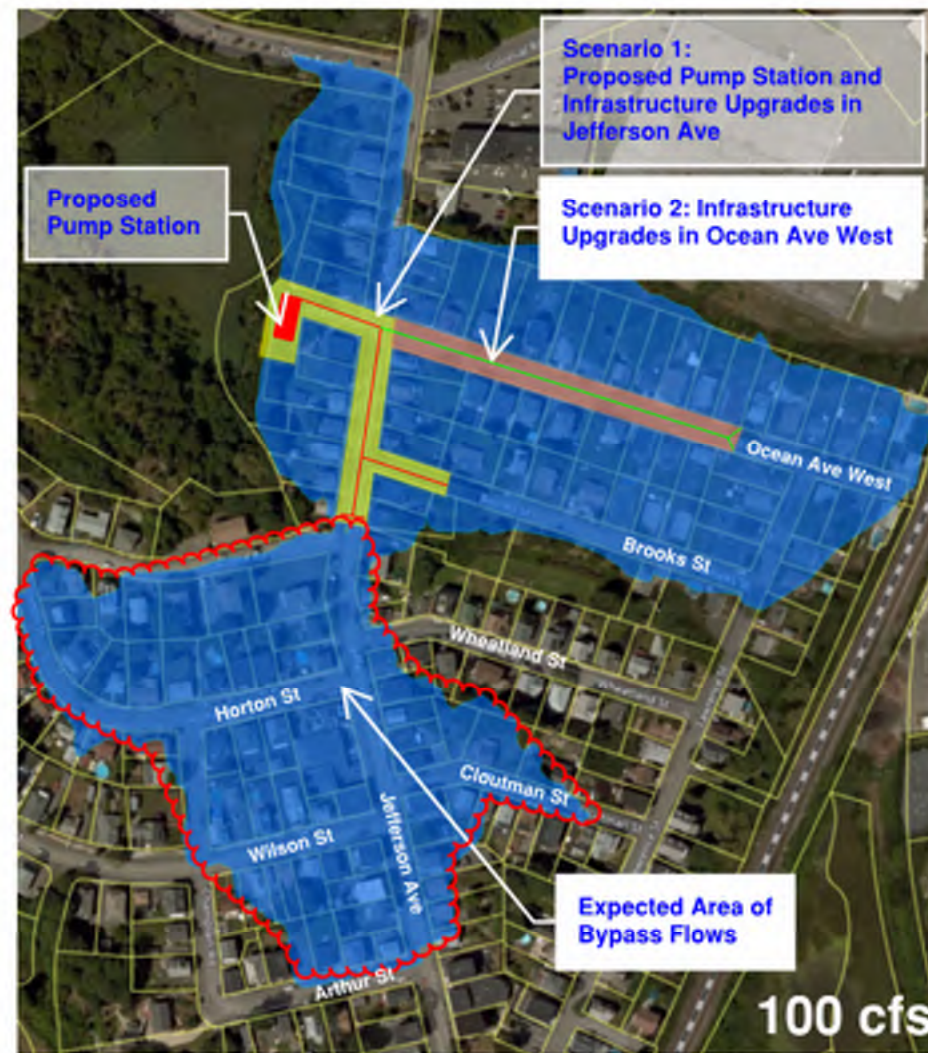
- Criteria:
  - 100-year 24-hour NRCC storm event (8.75 inches of rainfall over 24 hours)
  - FEMA Base Flood Elevation (BFE) of 15.26 (Salem, MA Sewer Datum)
  - Contributing Drainage Area = 20.7 acres (blue shaded area)
  - Evaluation of 3 scenarios to minimize flooding in streets



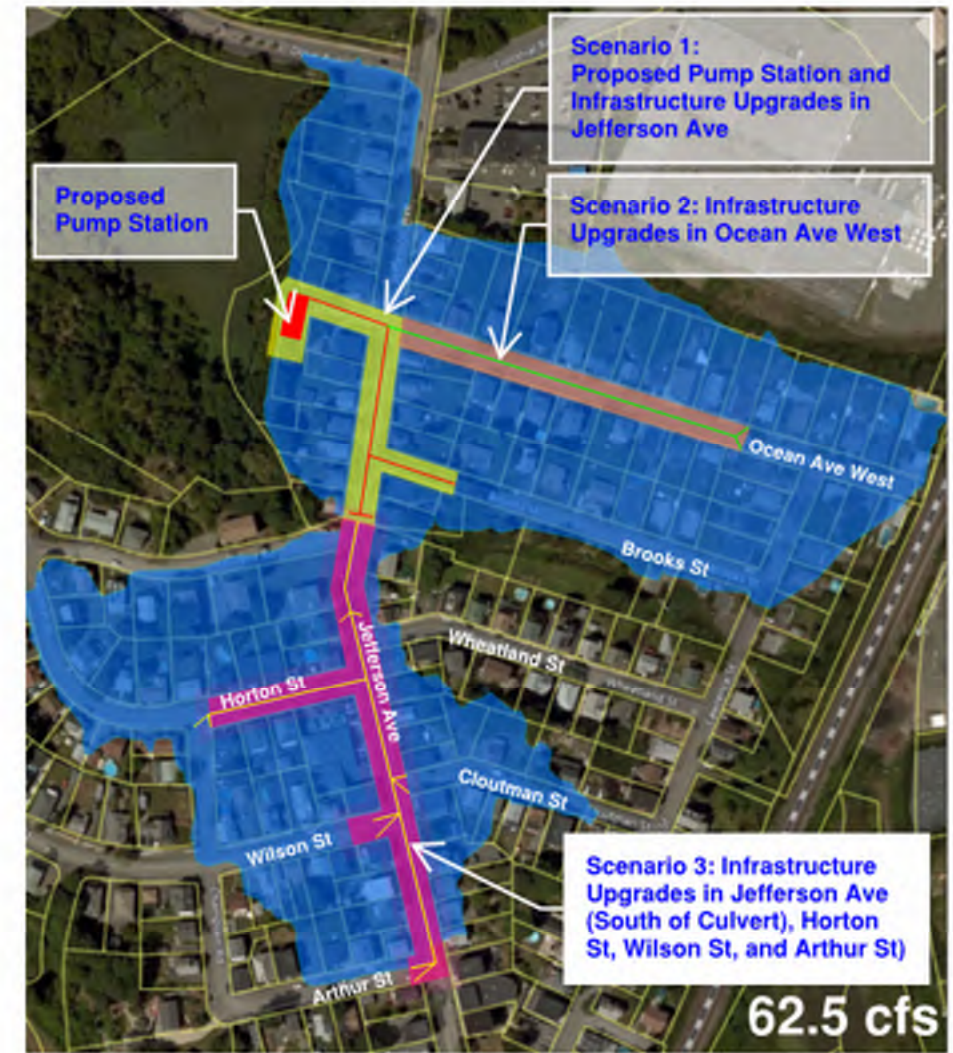
# Drainage Evaluation



**Scenario 1**



**Scenario 2**

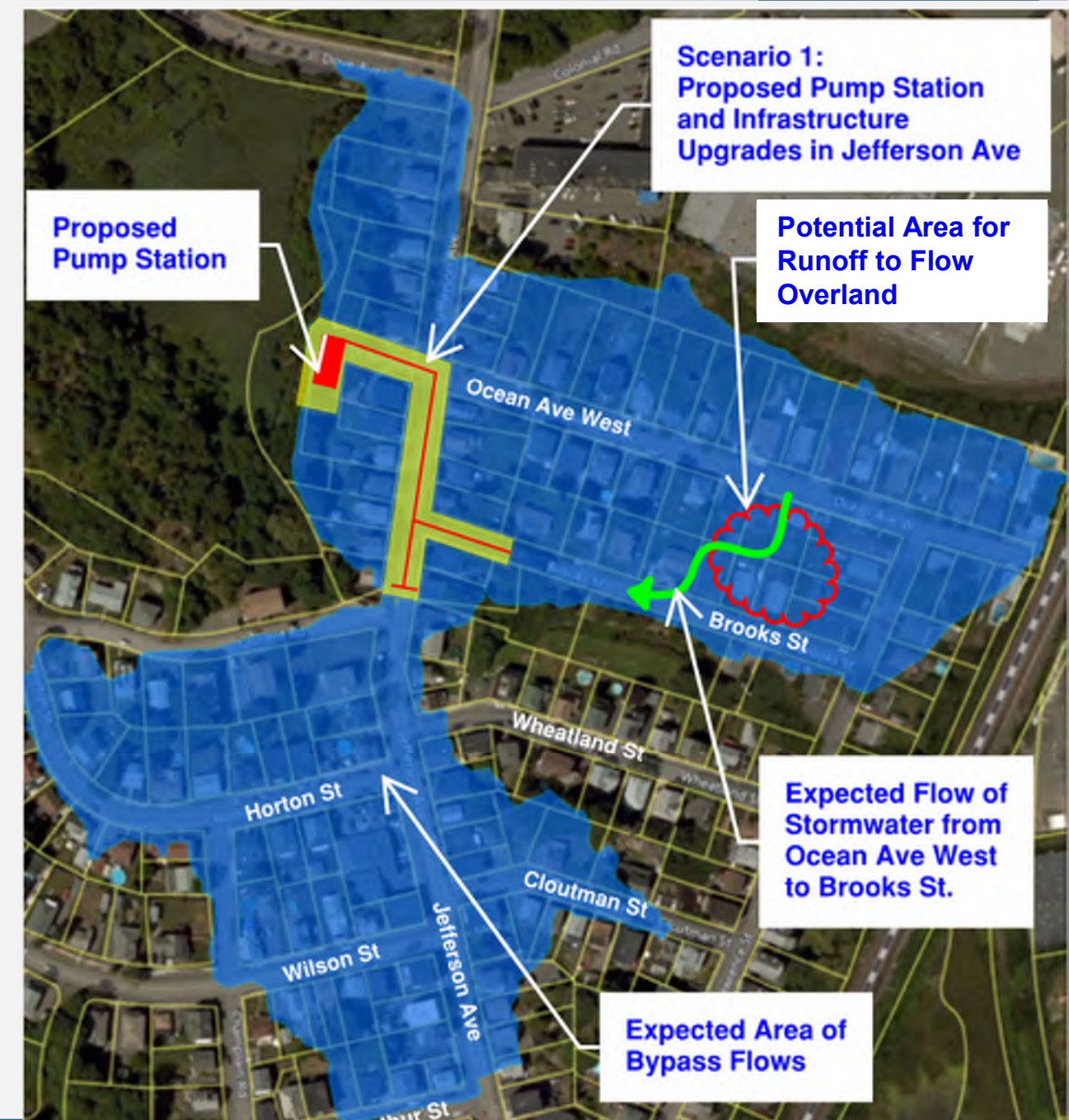


**Scenario 3**

# Drainage Evaluation Scenario 1



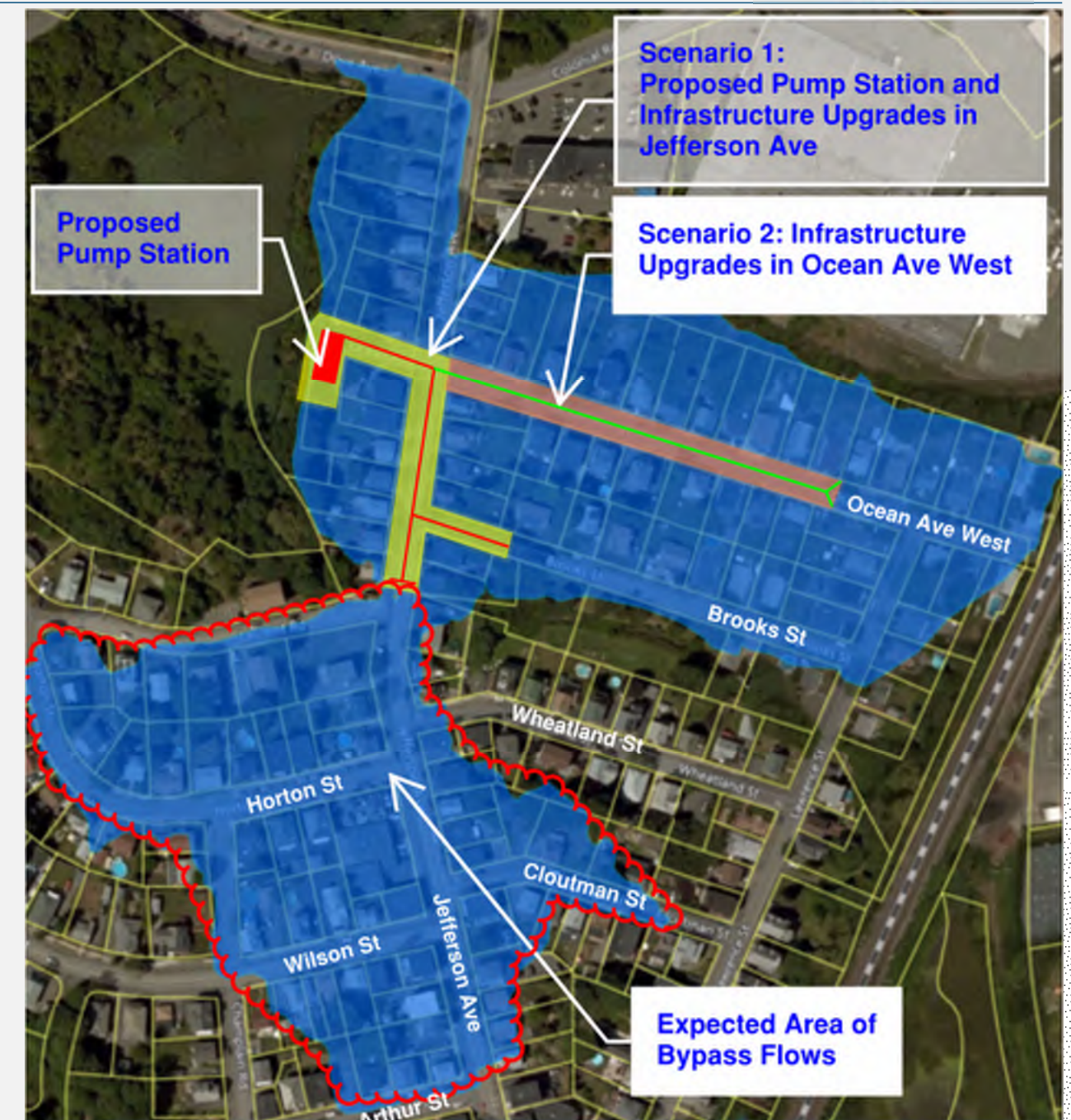
- Flow Contributing to Pump Station: 90 CFS
- Improvements:
  - New Pump Station
  - Upgrade Drainage Infrastructure in Jefferson Ave
- Properties South of Ocean Ave West Could See Runoff from Ocean Ave West
- Bypass Flows from Area South of Jefferson Ave Culvert



# Drainage Evaluation Scenario 2



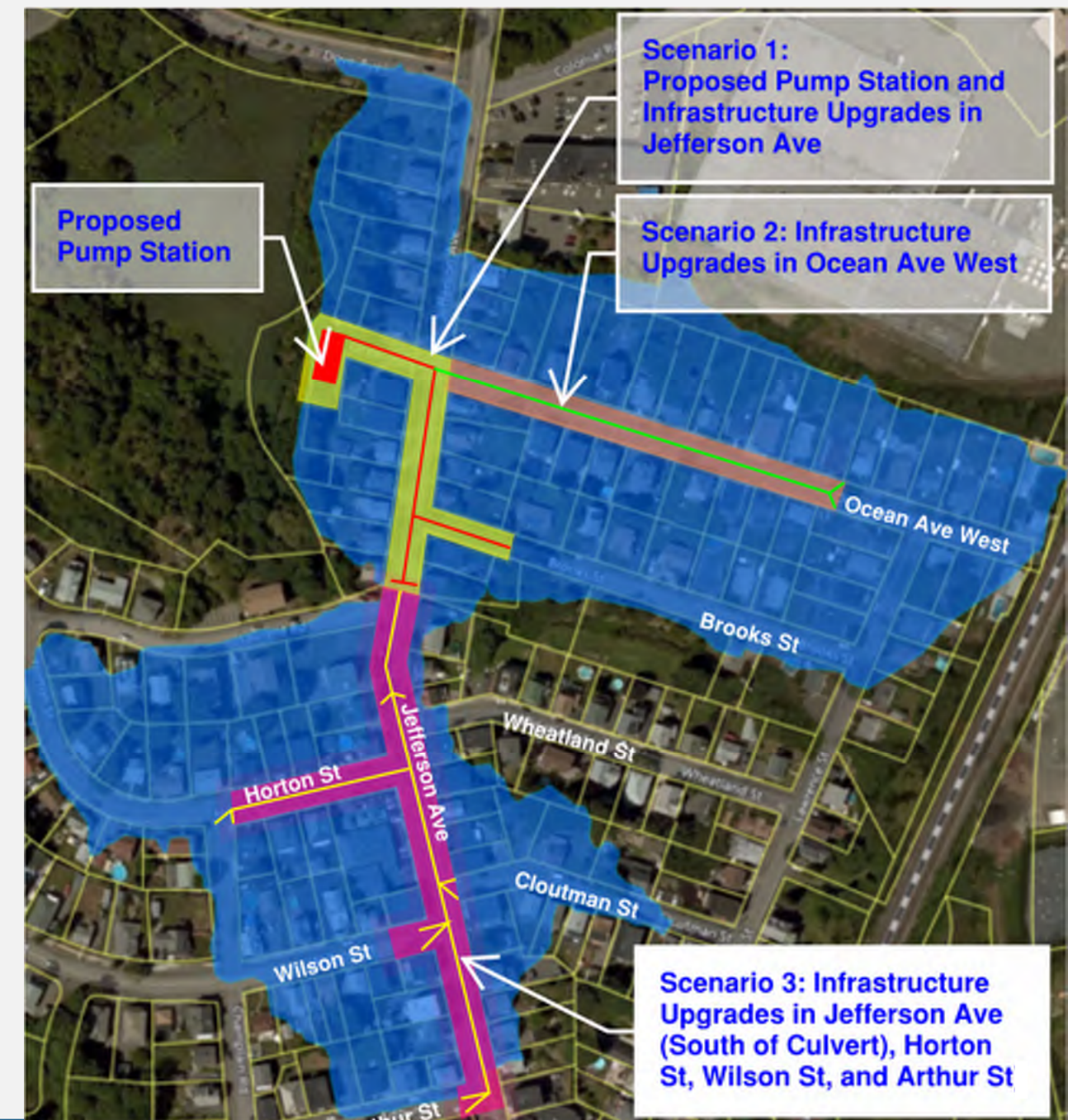
- Flow Contributing to Pump Station: 100 CFS
- Improvements:
  - Upgrade Drainage Infrastructure in Ocean Ave West to Reduce Flows to Properties South of Ocean Ave West
- Bypass Flows from Area South of Jefferson Ave Culvert



# Drainage Evaluation Scenario 3

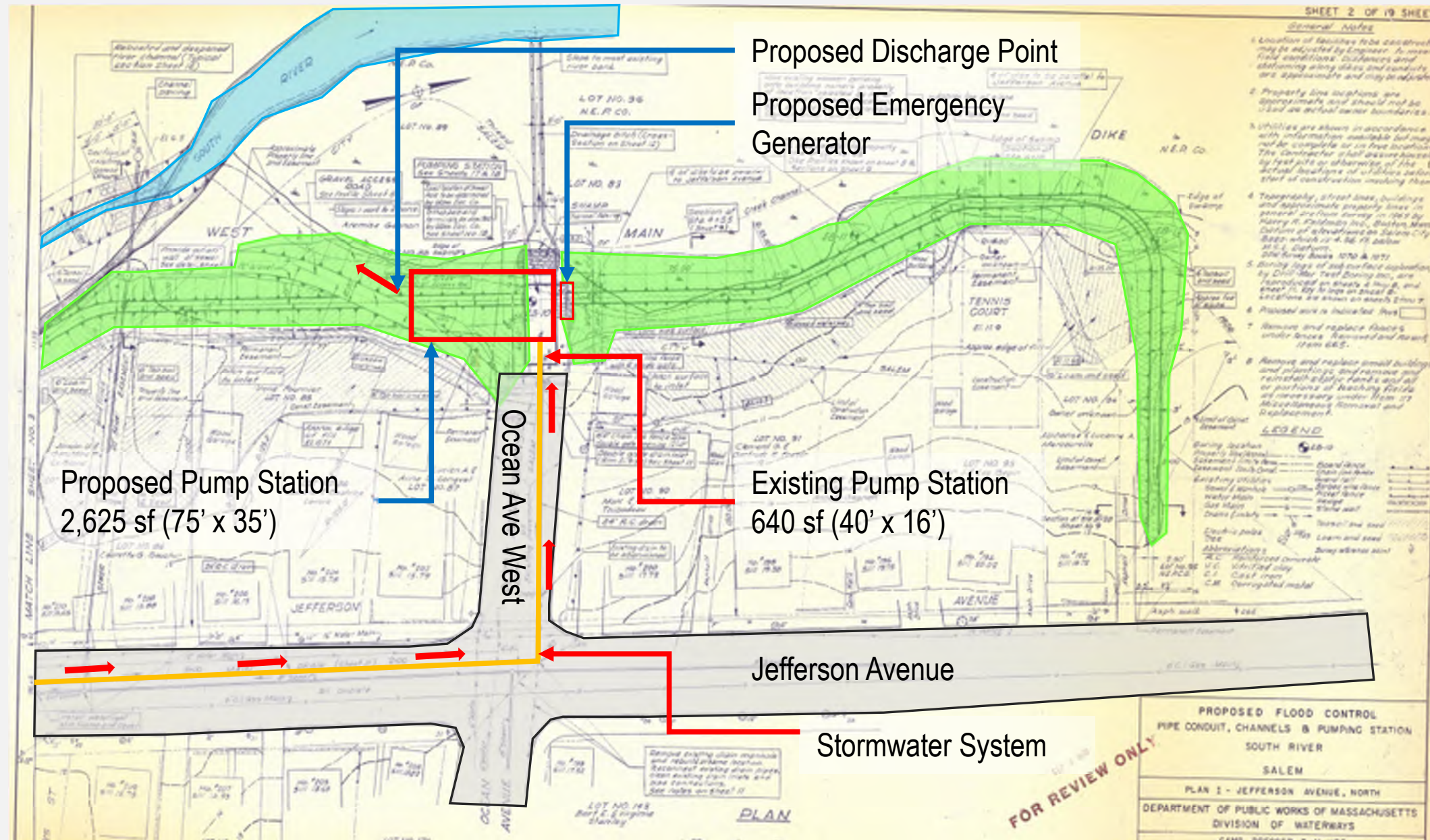


- Flow Contributing to Pump Station: 62.5 CFS
- Improvements:
  - New Drainage Infrastructure in Jefferson Ave, Horton St, Wilson St, and Arthur St to Increase Conveyance Capacity to Pump Station
  - New Infrastructure South of Jefferson Ave Culvert Will Reduce Flows to Pump Station



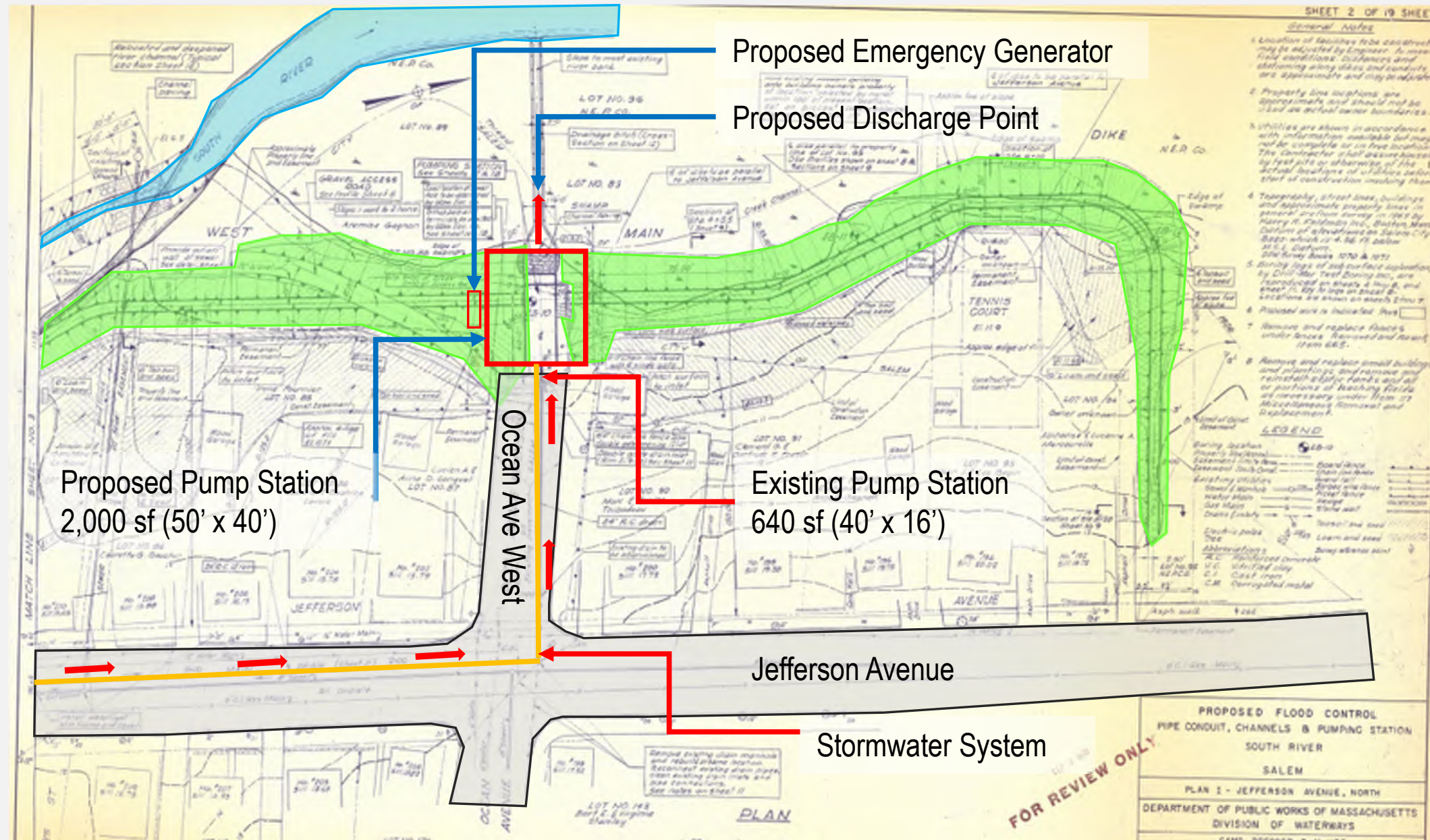


# Alternatives Analysis: Pump Station Placement (Screw Pumps)





# Alternatives Analysis: Pump Station Placement (Axial Pumps)





# Proposed Plan

- Pump
  - Design for Scenario 2 (100 CFS)
    - Screw Pump (Archimedes Screw)
    - Three pumps (2 duty & 1 standby)
    - No screening required
    - Less maintenance
- Pump Station Placement
  - Along Jefferson Ave Berm Parallel to Jefferson Ave
  - Larger building footprint (35' x 75')
  - Less excavation required for installation
- Increase Capacity of Station by Selective Infrastructure Upgrades
  - Reducing flow from neighborhoods south of Jefferson Ave culvert (+/- 40 cfs)

# Questions? Contact Us

- City of Salem
  - Deb Duhamel, PE
  - [Email: dduhamel@Salem.com](mailto:dduhamel@Salem.com)
  - Phone: 978-619-5661
  
- Woodard & Curran
  - Ken Mavrogeorge, PE
  - [Email: Kmavrogeorge@woodardcurran.com](mailto:Kmavrogeorge@woodardcurran.com)
  - Phone: 978-482-7811