



South River Flood Mitigation Project

Status Report to South Salem Neighborhood
Association

May 8, 2012



Introduction

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Alan Benevides, PE, Woodard & Curran

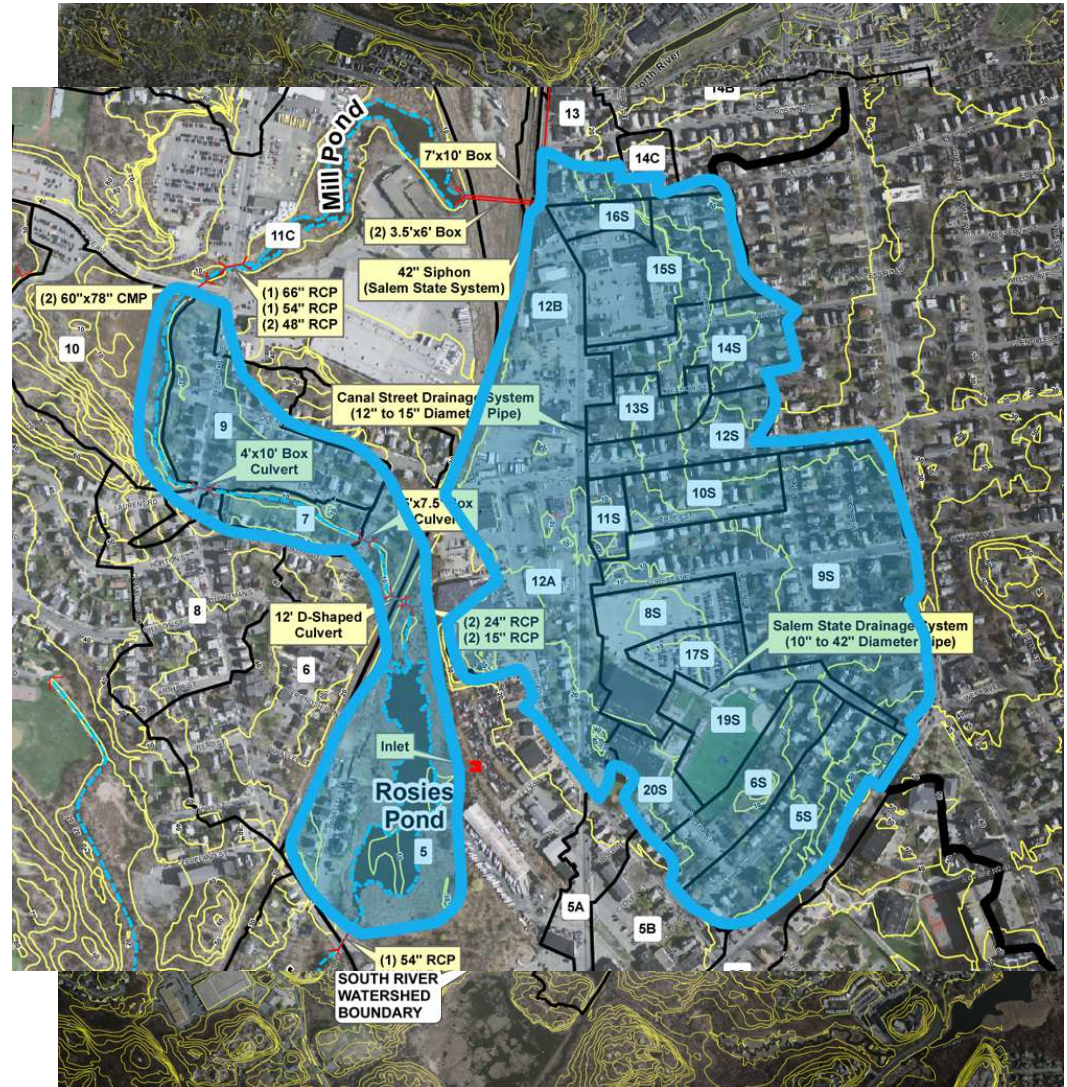
David White, PE, Woodard & Curran

Multi-Phased Approach - Overview

- Phase I – Define & Understand the Problem (Completed)
 - Evaluate Historic Flooding
 - Identify Nature & Extent of the Existing Infrastructure
 - Define Extent of the Study Area
- Phase II – Identify Potential Solutions (Completed)
 - Evaluate the Capacity of Existing Infrastructure
 - Maximize Capacity of Existing Infrastructure
 - Identify Remedy(ies)
- Phase III – Design & Permitting
- Phase IV - Construction



- Canal Street/
SSU Area
- Jefferson Avenue/
Brooks Street/
Rosies Pond

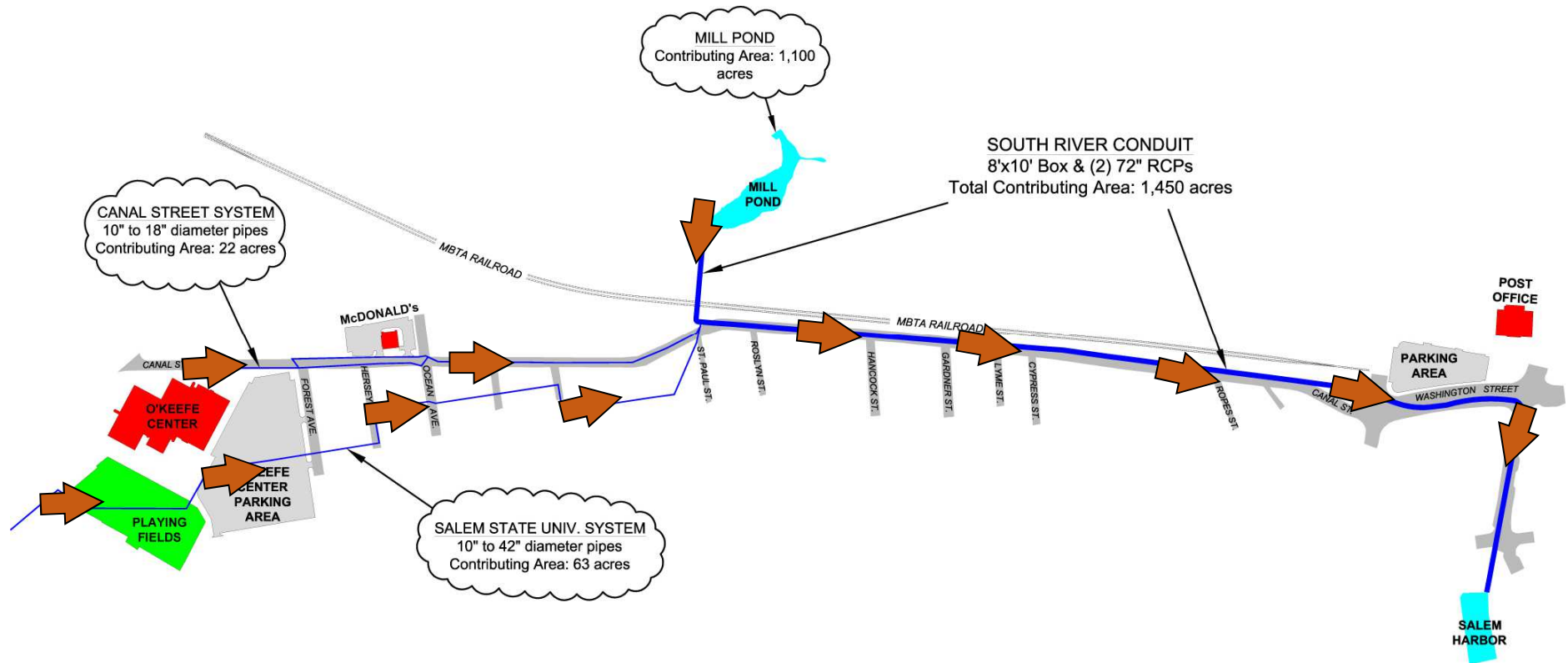


Phase II – Overall Scope of Study

- Infrastructure assessment
- Alternatives analysis
- Flood mitigation recommendations



Overview – Existing Infrastructure



Optimize Existing Infrastructure

Goals:

- Maximize Performance
- Evaluate Condition

Actions:

- TV inspected, cleaned and evaluated 4,000 feet of drainage conduits (South River, SSU, and Canal Street) and 4 storm and sanitary sewer siphons
- Removed 300 tons of sediment and 30 tons of large debris (tires, railroad ties, car parts, etc.)

Results

- Hydraulic capacity improved to degree possible
- Identified Structural/physical repairs needed



Structural/Physical Needs

- Tide Gate at South River
- Conduit support upstream of Tide Gate
- Transition Structure at Lafayette Square
- Spot Repairs upstream of Lafayette Square
- Siphon under RR Tracks
- Misc. Siphon Repairs

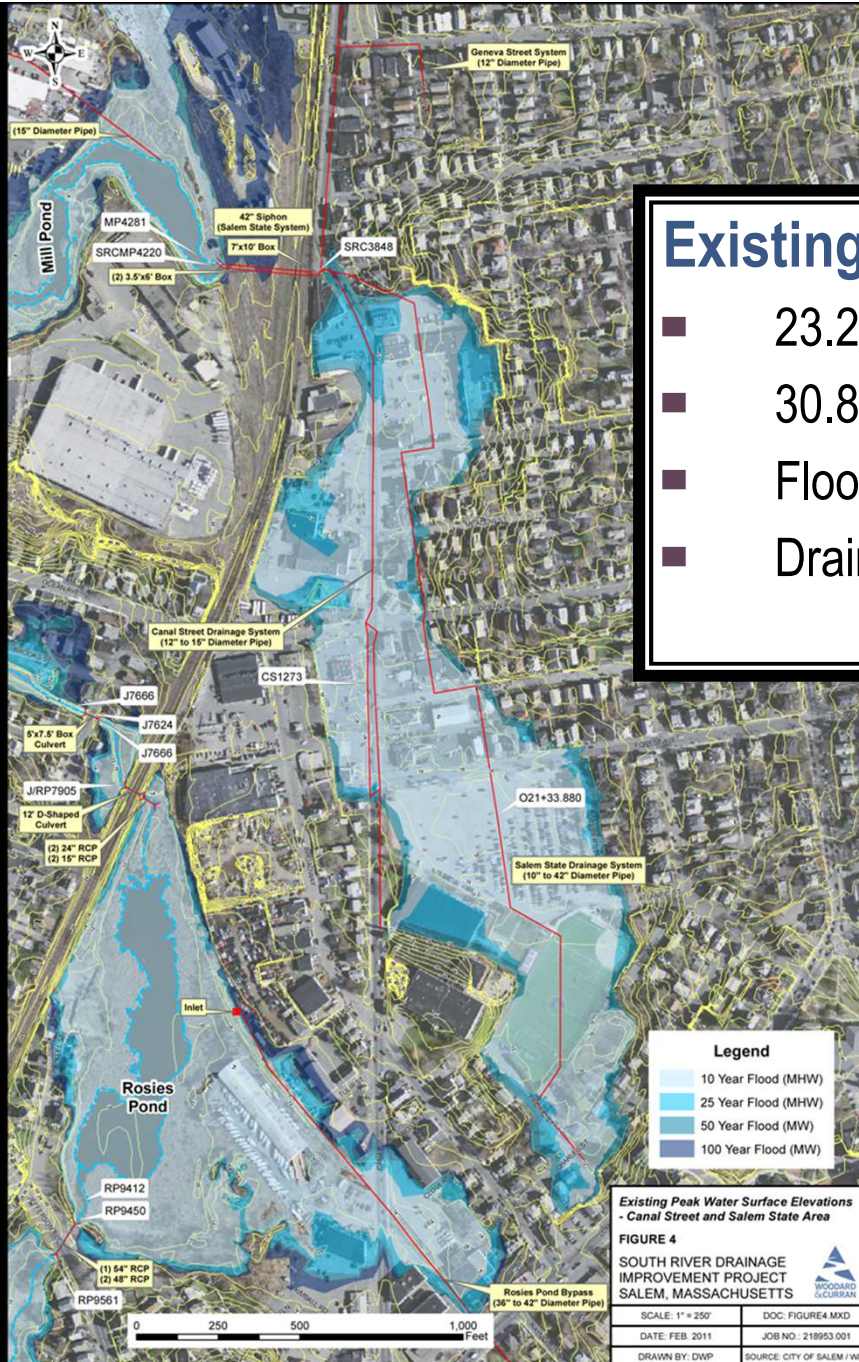
Improvements Do Not Increase Flood Capacity



Hydrologic and Hydraulic Modeling

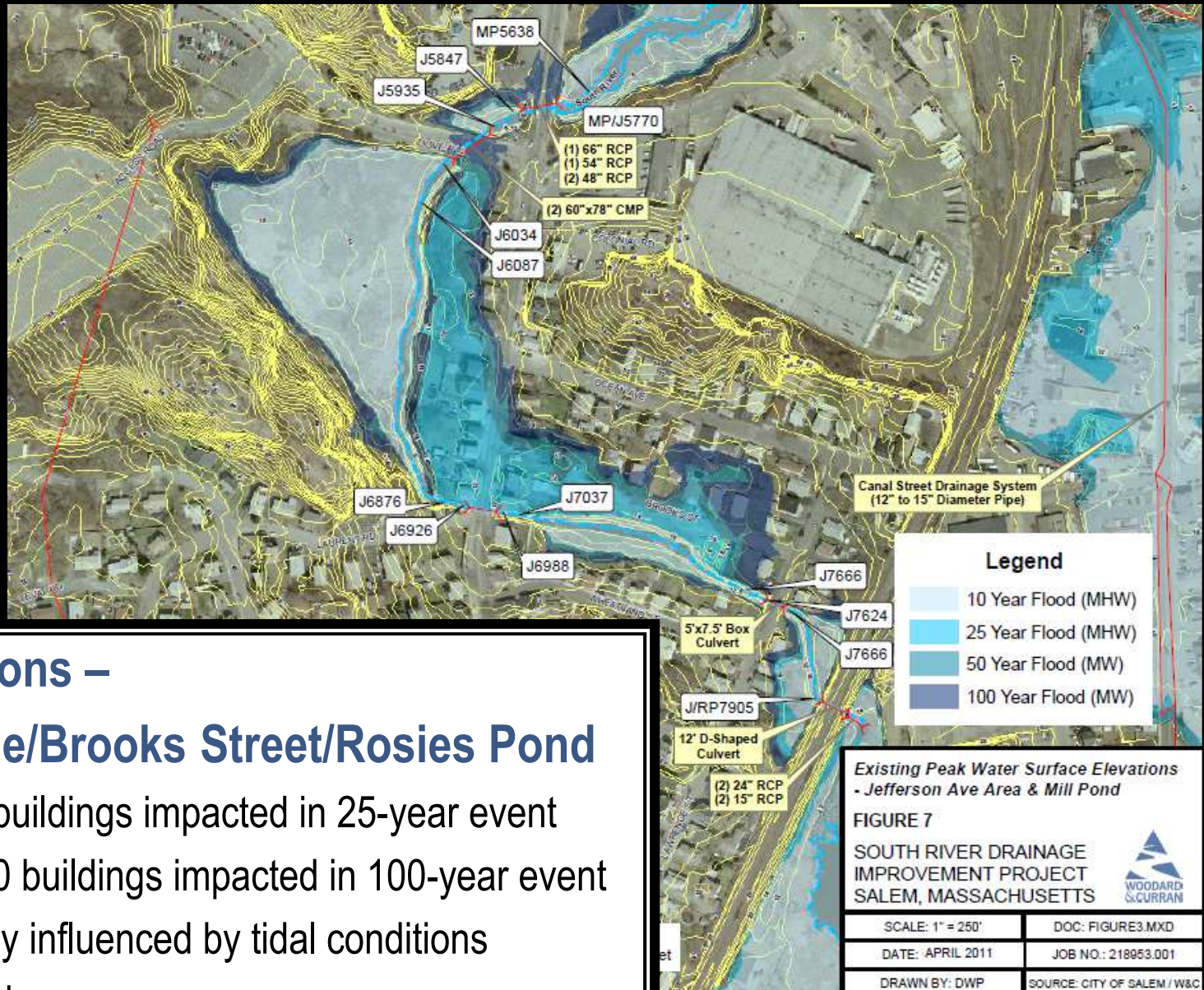
- Existing Conditions
 - Develop initial flood computer model from collected data.
 - Calibrate computer model with flow meters, depth gages and rainfall “real world” data.
 - Simulate flooding under existing conditions.
- Proposed Conditions
 - Identify potential flood improvement measures.
 - Simulate effect of potential flood improvements.
 - Select preferred measures for flood mitigation.





Existing Conditions - Canal Street/SSU Area

- 23.2 acres & 31 buildings impacted in 25-year event
- 30.8 acres & 50 buildings impacted in 100-year event
- Flooding heavily influenced by tidal conditions
- Drainage systems with insufficient capacity

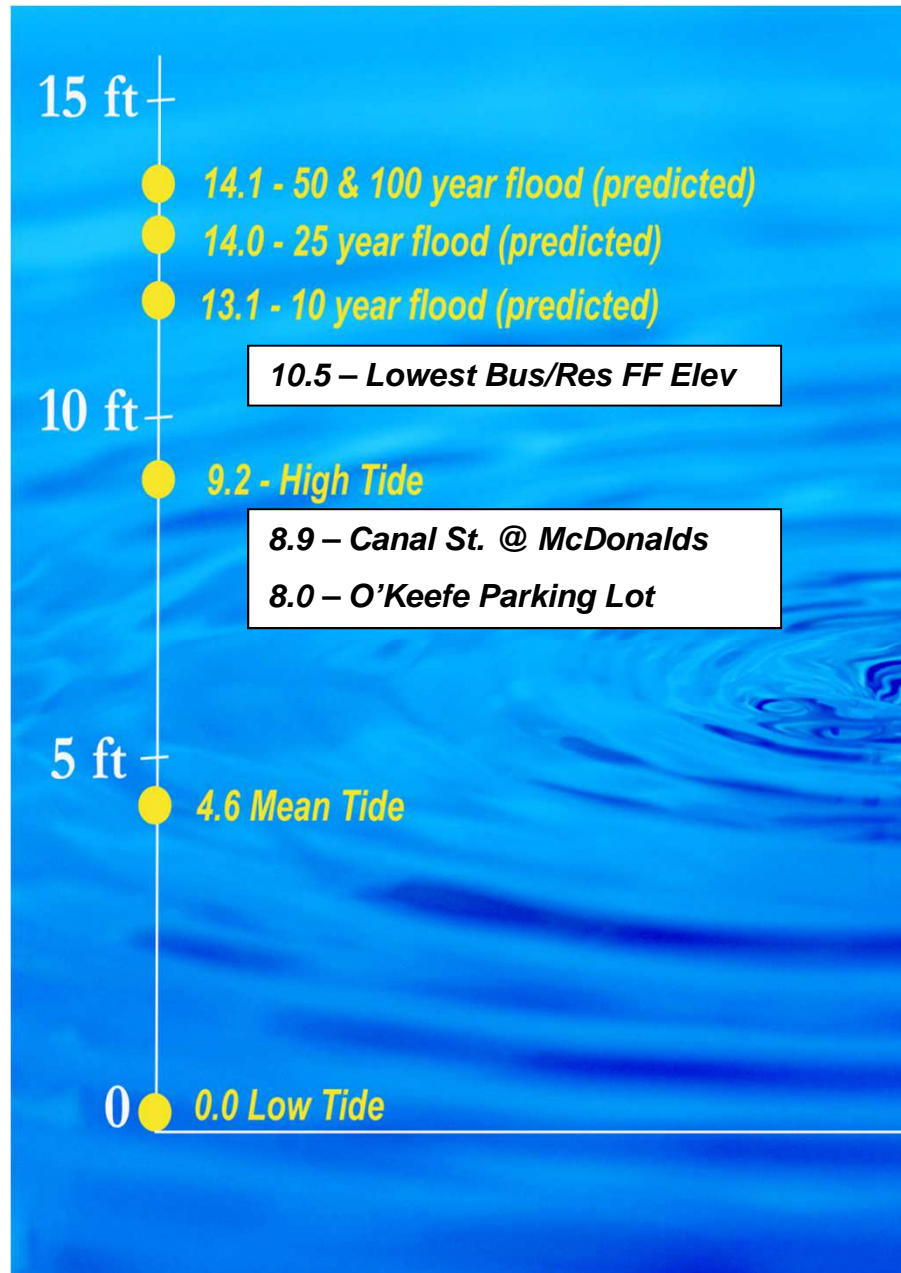


Existing Conditions –

Jefferson Avenue/Brooks Street/Rosies Pond

- 19 acres & 20 buildings impacted in 25-year event
- 12.5 acres & 40 buildings impacted in 100-year event
- Flooding heavily influenced by tidal conditions
- Overtopping of berms
- Drainage infrastructure with insufficient capacity

Existing Conditions- Key Elevations



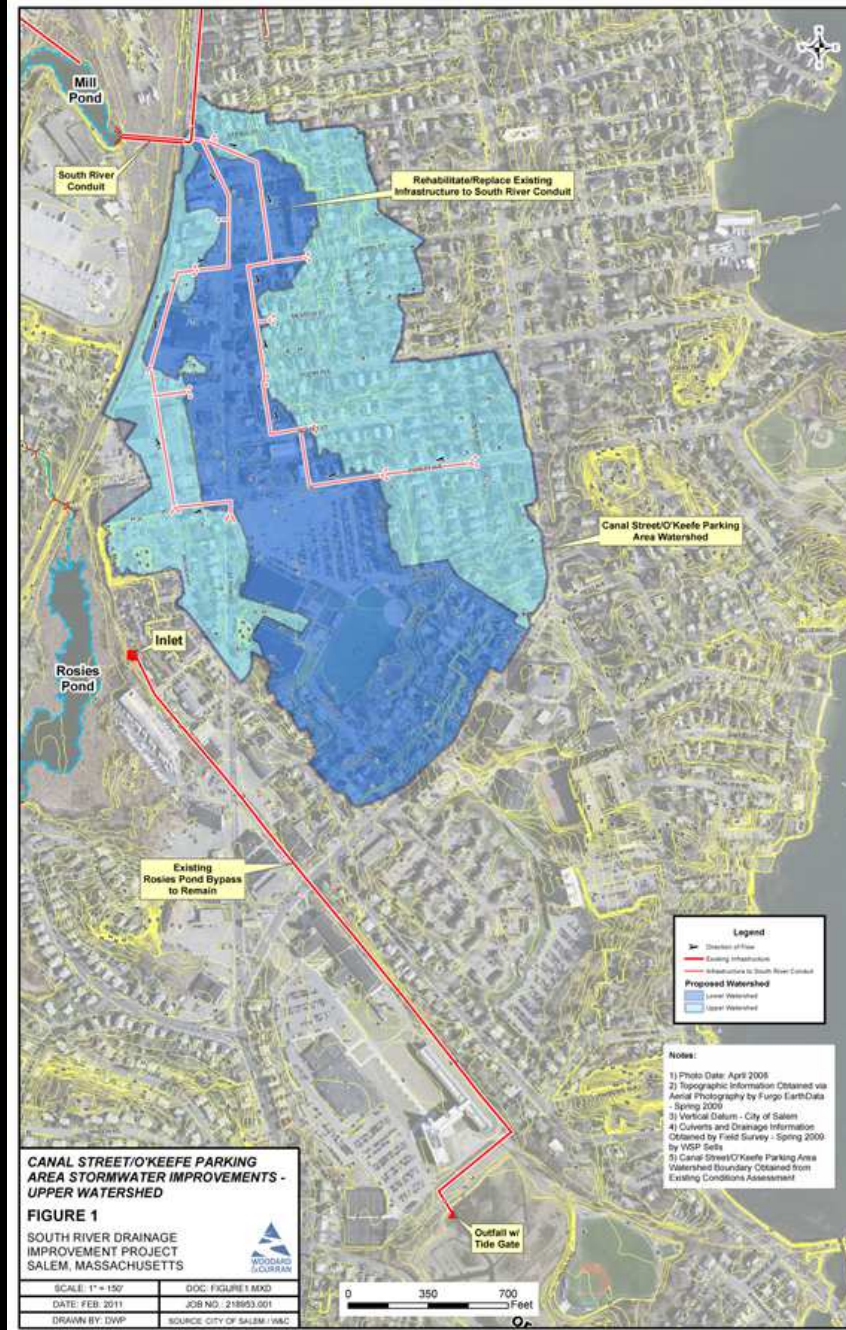
Proposed Conditions

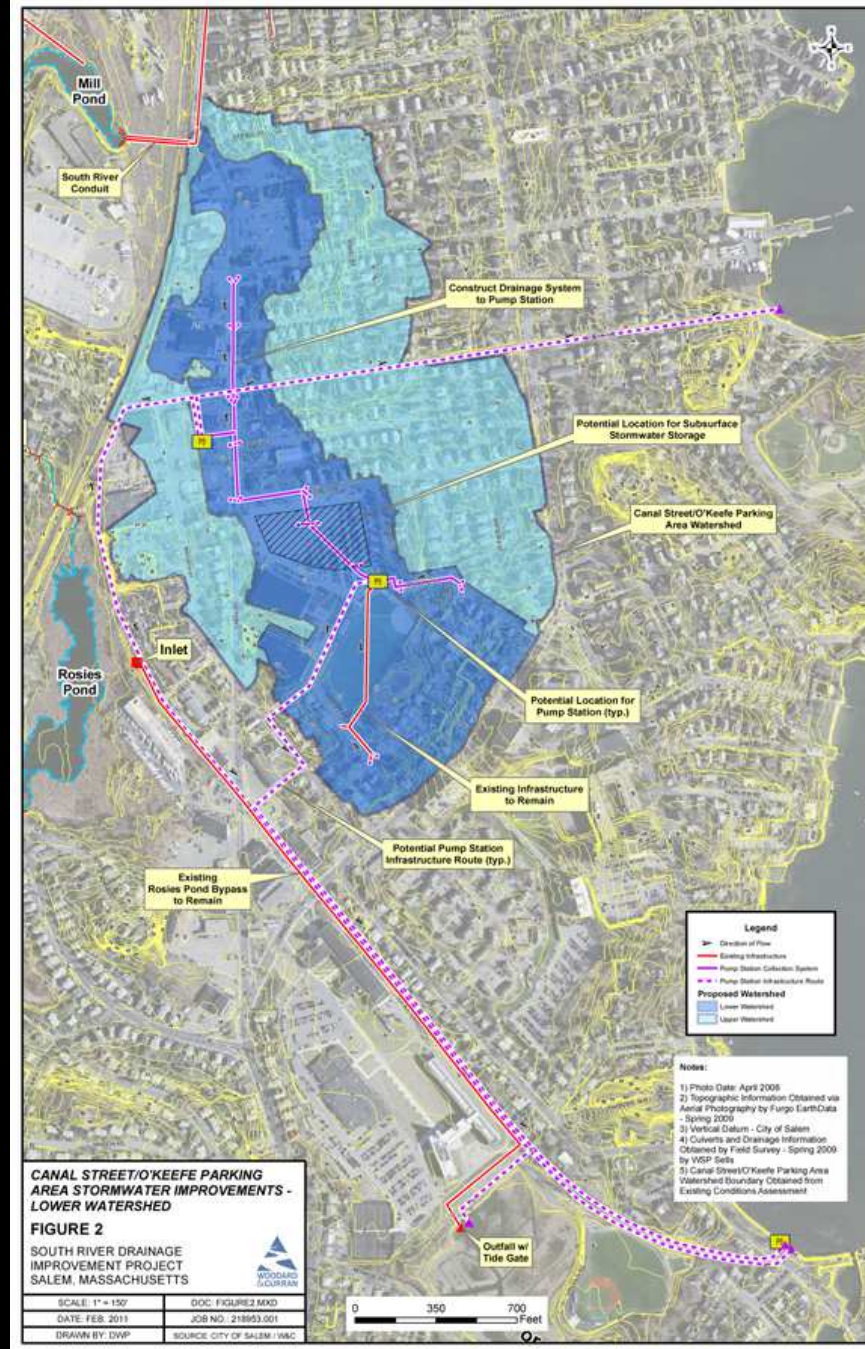
- Evaluated 13 Alternatives to mitigate flooding for 100-year event (1% chance of occurring in any given year)
- Results
 - Physical separation of areas from South River due to tidal influence
 - Additional hydraulic capacity is needed
 - Improvements to one study area does not benefit the other





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Summary of Recommended Solution

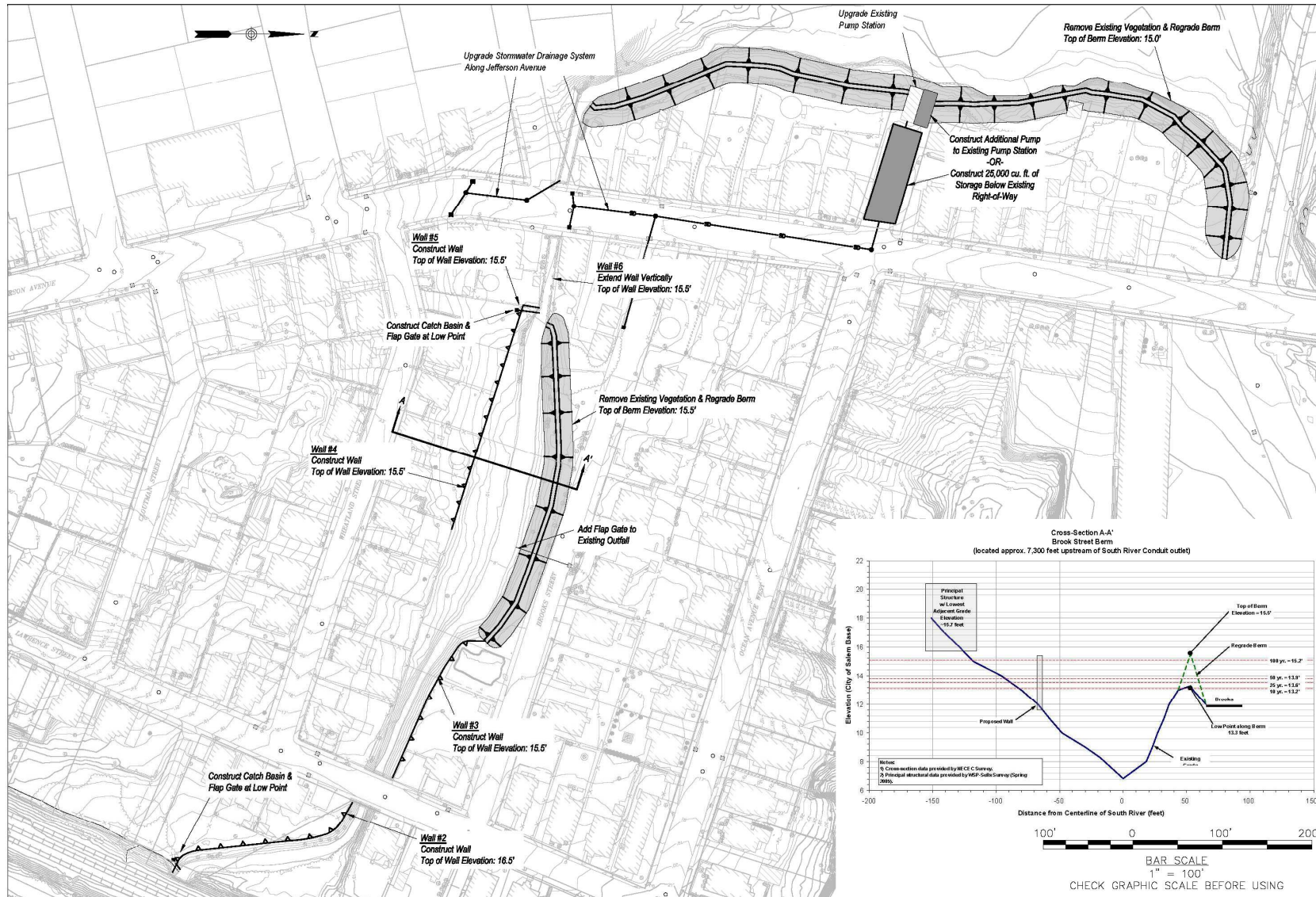
Upper Watershed	<ul style="list-style-type: none">✓ Modify existing drainage systems to more effectively direct runoff to South River Conduit
Lower Watershed	<ul style="list-style-type: none">✓ Construct new stormwater system to convey runoff to new pump station✓ Construct sub-surface storage✓ Construct new pump station✓ Construct new force main to ocean outfall





Jefferson Ave., Brooks Street & Rosies Pond Areas

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**JEFFERSON AVENUE AREA
STORMWATER INFRASTRUCTURE
IMPROVEMENTS**

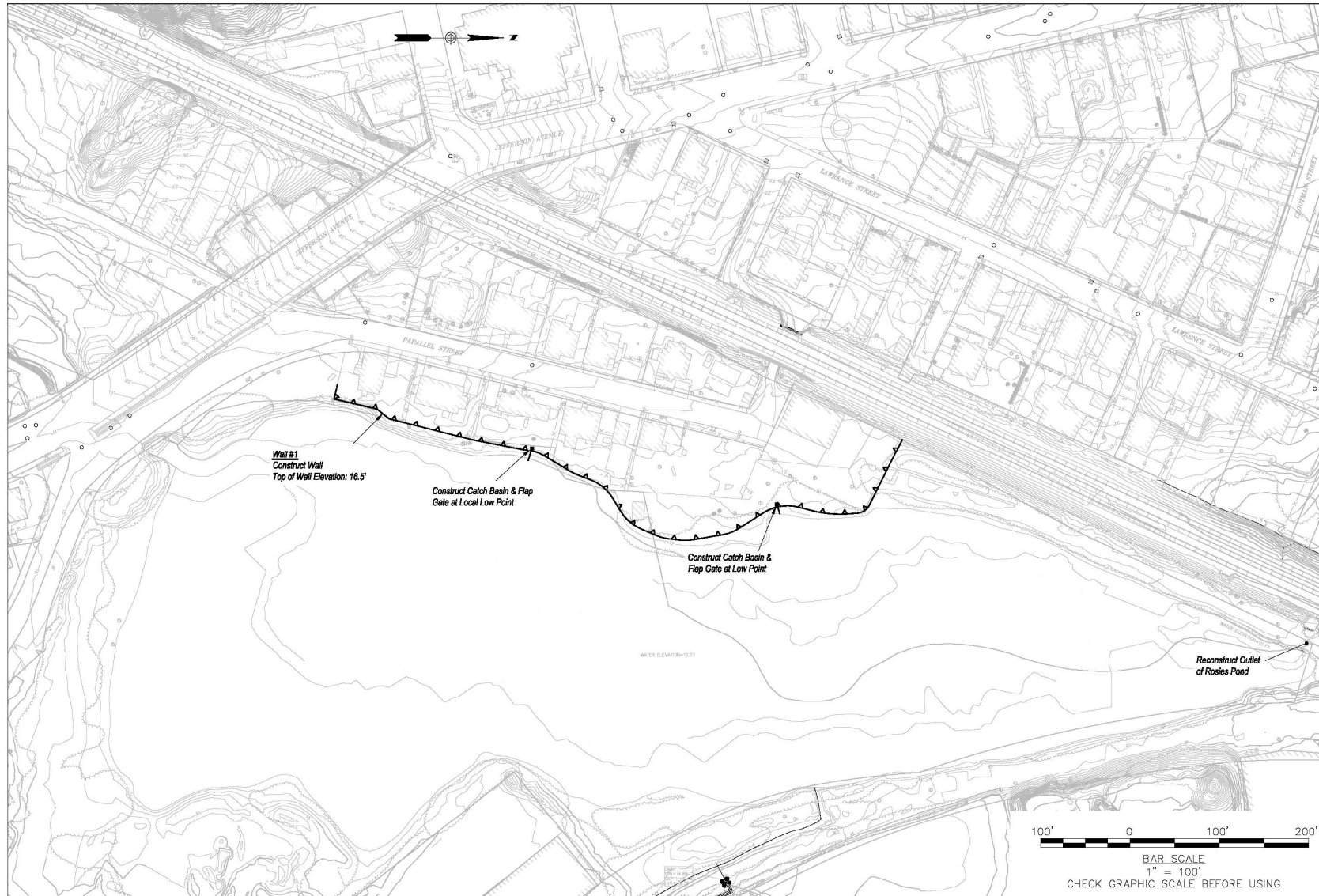
DESIGNED BY: DAW
DRAWN BY: MAP
CHECKED BY: DAW
SW Improvements REV. 04/11


CITY OF SALEM, MASSACHUSETTS

**SOUTH RIVER FLOOD
MITIGATION PROJECT**

JOB NO: 218953.02
DATE: April 2011
SCALE: 1" = 100'

11



 <p>35 New England Business Center Andover, Massachusetts 01810 800.762.5271 www.woodward-clay.com</p> <p>COMMITMENT & INTEGRITY DRIVE RESULTS</p>	<p>ROSIES POND STORMWATER INFRASTRUCTURE IMPROVEMENTS</p>		<p>DESIGNED BY: DAW DRAWN BY: MAP CHECKED BY: DAW SW Improvements REV.dwg</p>
	<p>CITY OF SALEM, MASSACHUSETTS</p>		<p>SOUTH RIVER FLOOD MITIGATION PROJECT</p>

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Summary of Recommended Solution

Improvements

- ✓ Regrade earthen berms & construct retaining walls
- ✓ Increase capacity of local drainage system
- ✓ Construct subsurface storage
- ✓ Rehabilitate Ocean Avenue West Pump Station





Costs and Funding

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Costs & Funding

	Canal Street/SSU Area	Jefferson Ave. / Brooks Street / Rosies Pond
Costs	\$12.5M - \$16.5M	\$2.9M - \$3.2M
Potential Funding Sources	<ul style="list-style-type: none"> • FEMA/EMMA Flood Hazard Mitigation Grants • MassDEP State Revolving Loan Fund (SRF) • City of Salem 	



HMGP – Current Status

- Overview
- Jefferson Ave.
 - FY11 & FY12 Applications Submitted
 - Status is still to be determined
- Canal Street
 - FY11 Application Submitted 11/1/2010
 - MEMA recommends project for funding on 8/4/2011
 - If awarded, minimum \$3M grant
 - Deemed high-priority project
 - Bucket Project – Additional Funds Possible
 - FY11 HMGP Largest Amount to Date
 - Tentative Salem award one of largest under HMGP.



Canal Street HMGP – Next Steps

- MEMA/FEMA/City Meeting on May 5, 2012
- High likelihood of project funding pending:
 - Preparation of an Environmental Assessment
 - Preparation of detailed construction cost estimate
 - Re-confirmation from City to commit non-grant funds
- Anticipate final confirmation of funding within next six months





Next Steps

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Steps Moving Forward

Phase III – Design & Permitting (2012-2014)	<ul style="list-style-type: none">• Preliminary design study• Perform additional investigations• Identify necessary permits• Identify easements & right-of-ways• Select preferred alternatives• Preliminary and Final level design
Phase IV – Construction (2013-2015)	<ul style="list-style-type: none">• Public bidding• Construction<ul style="list-style-type: none">• Initial Phase – Improvements within Canal Street to coordinate with roadway reconstruction (2013)• Subsequent Phase – Complete remaining improvements (2014-2015)





Questions & Answers

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