Sewer Separation of the Roxbury Canal Sewer

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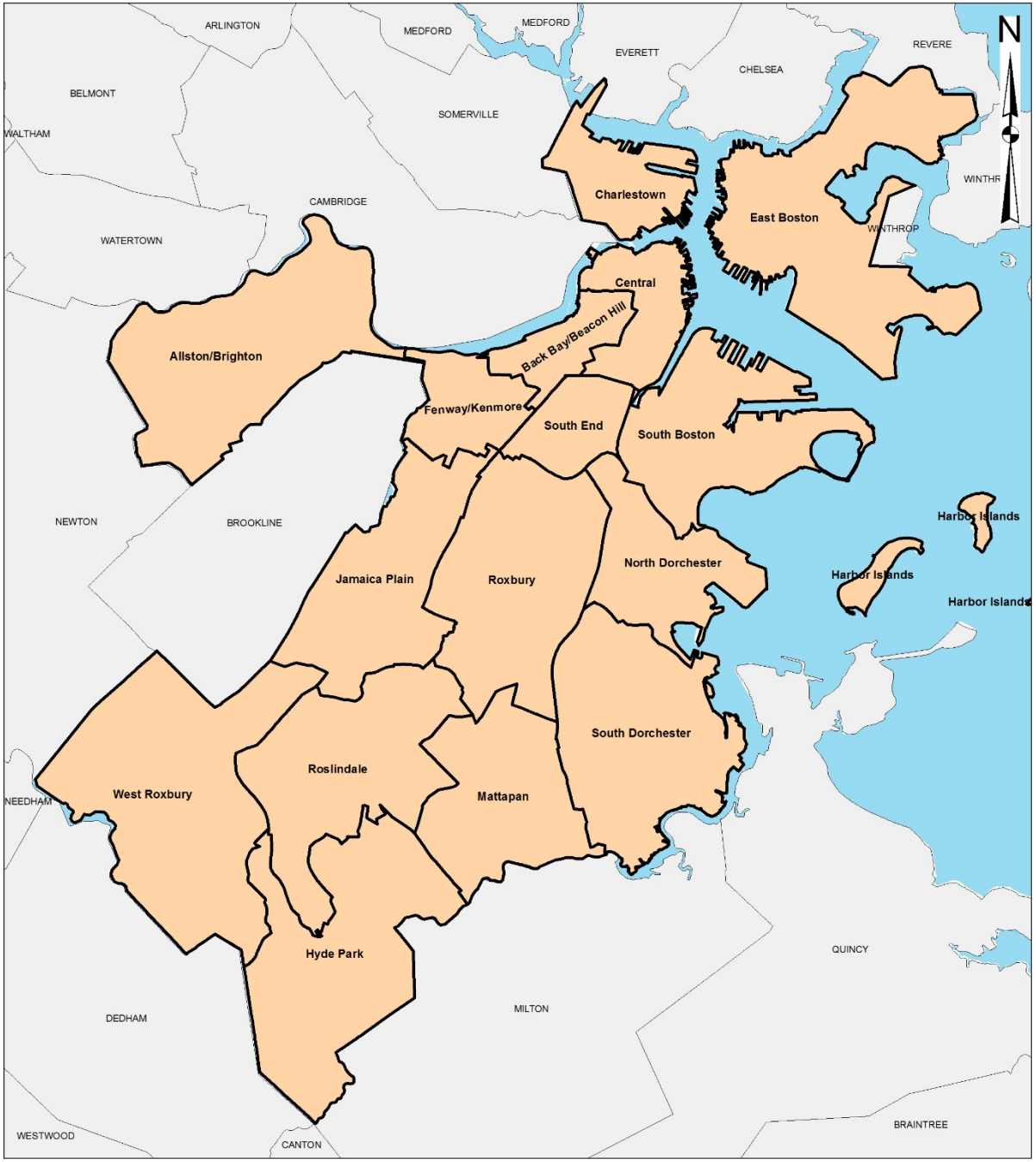
BOSTON WATER AND SEWER COMMISSION

Agenda

- The Big Picture
- Roxbury Canal Sewer Separation
- Where We Are Now

City of Boston

- 30,600 Ac (48 Sq. Mi)
- 16 Neighborhoods
- Population: 673,000
  (8.4% increase 2010-2015)
- Health Care
- Education
- High Tech Industry
- 83 Projects Under
  Construction - $7B



Boston Water and Sewer Commission

Engineering Services

- Planning
- Design
- Construction

BWSC Systems

• Water Mains:	1,018 miles
• Sanitary Sewers:	622 miles
• Combined Sewers	235 miles
• Storm Drains:	595 miles

MWRA Long-Term Control Plan

- Commenced: 1996
- Completed: 2015
- Projects: 35
- Cost: $907 M

- Court-mandated levels of CSO control employing a variety of techniques

- Sewer separation identified as most cost-effective for many watersheds in Boston

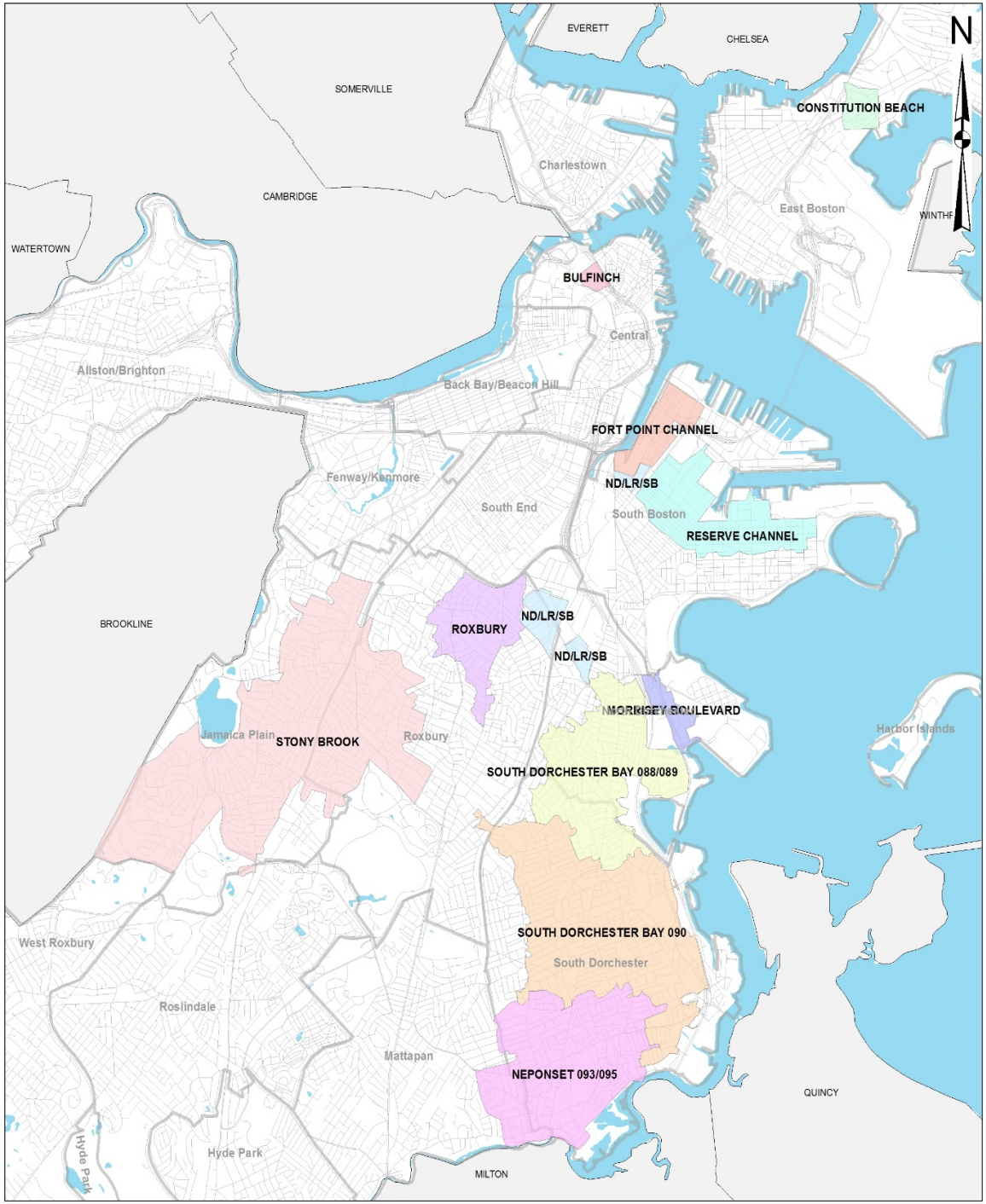
Figure courtesy of the MWRA.

Water Quality

System-Wide Improvements 1988 to 2015

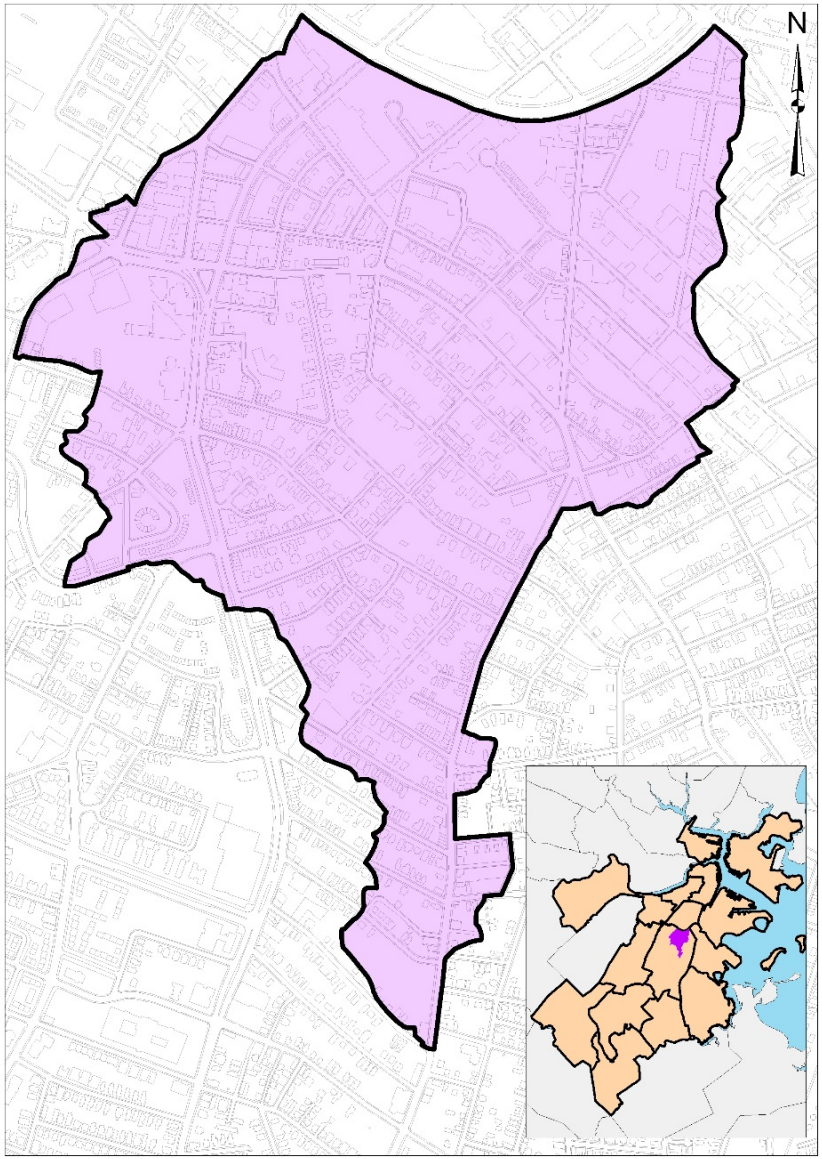
BWSC CSO Control Projects

- Total Area: 5,192 Ac
- Total Cost: $367 M



Roxbury Canal Sewer Separation Project Goals

- Revitalize Commercial Center
- Upgrade Infrastructure
- Restore Capacity of Sewer System
- Mitigate CSOs
- Improve Water Quality of Fort Point Channel
- Reduce Stormwater Flow Conveyed to Deer Island Wastewater Treatment Plant



Roxbury Canal Sewer Separation Project Schedule

Preliminary Design:

July 2008 – January 2010

Final Design:

May 2010 – Fall 2019

Construction:

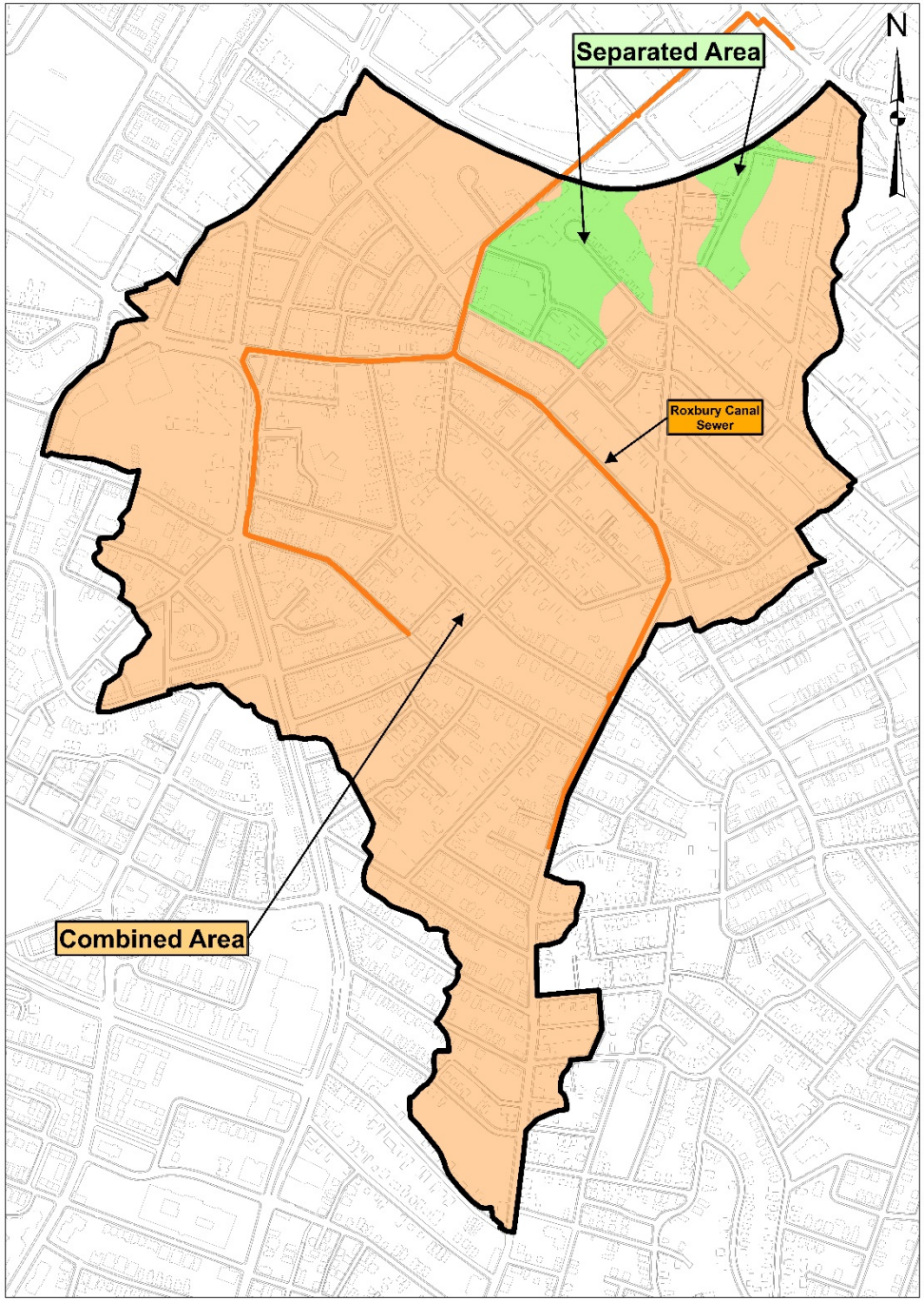
April 2012 – Fall 2021

Preliminary Design

- Storm Drain Design
- Building Inspections
- CCTV Inspections
- IDDE Investigations
- Water Main Evaluation
- Geotechnical & Haz. Mat. Assessments
- Recommended Plan

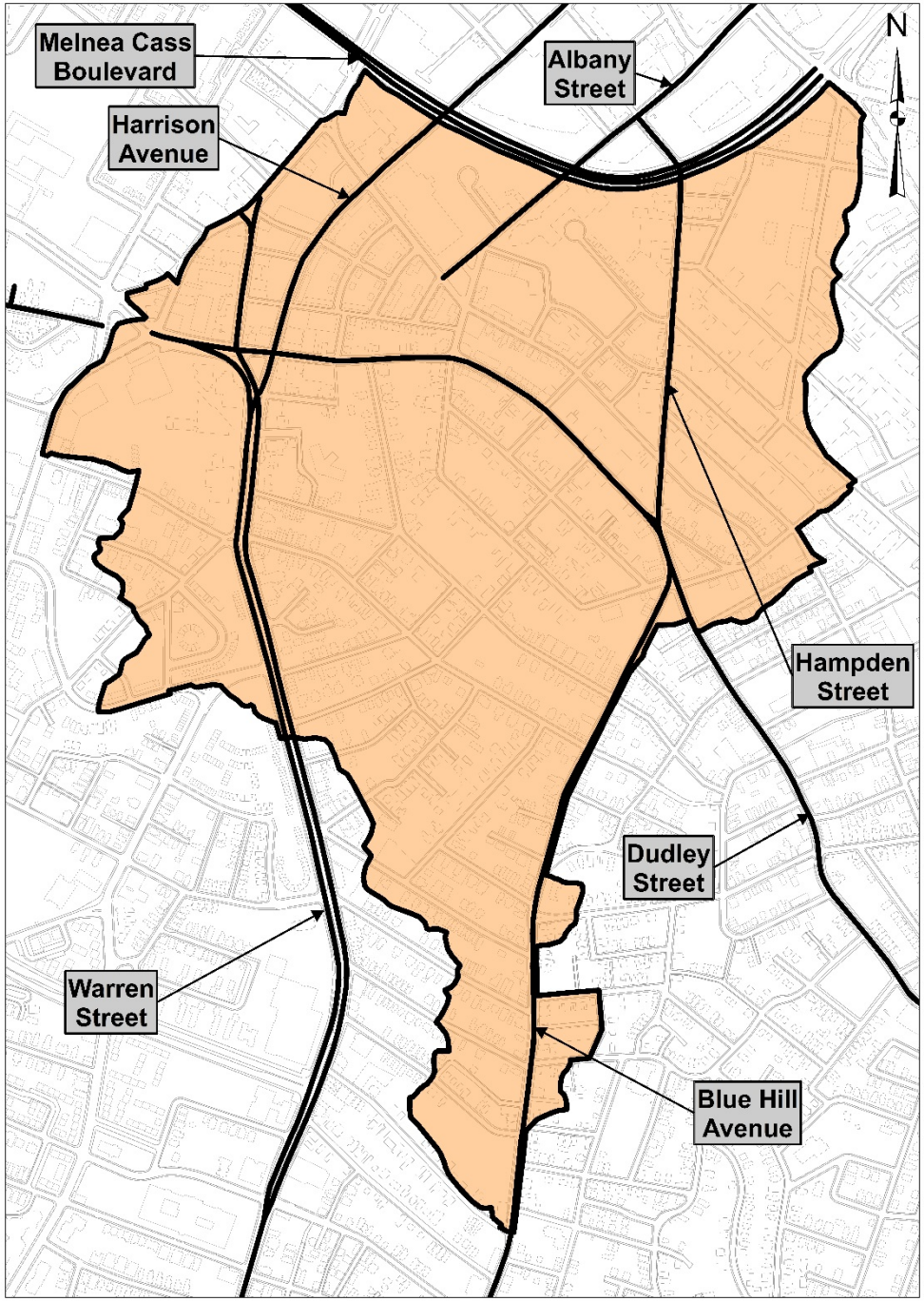
Collection System Service Area

COMBINED	270AC
SEPARATED	17AC
TOTAL	**287AC**



Roadway System

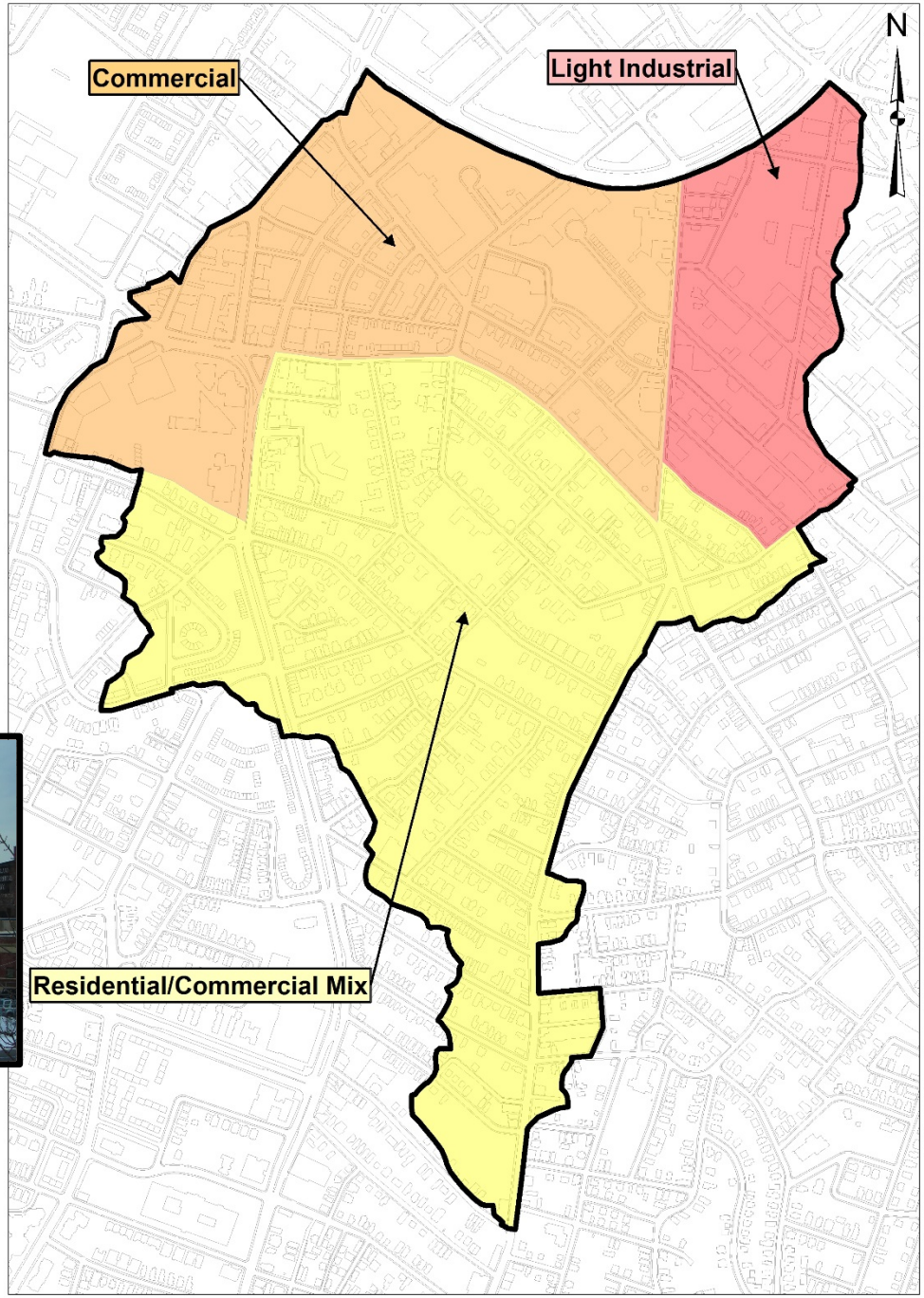
- Heavy Traffic Volumes
- Utility Congestion
- Coordination with BTD
- Develop Detailed TMPs



Land Use

- Commercial: 90 Ac
- Light Industrial: 40 Ac
- Res./Comm. Mix: 157 Ac

- **Total** **287 Ac**



Stormwater Sources To Be Disconnected

Roadway Catch Basins

Parking Lot Drainage

Private Site Drainage

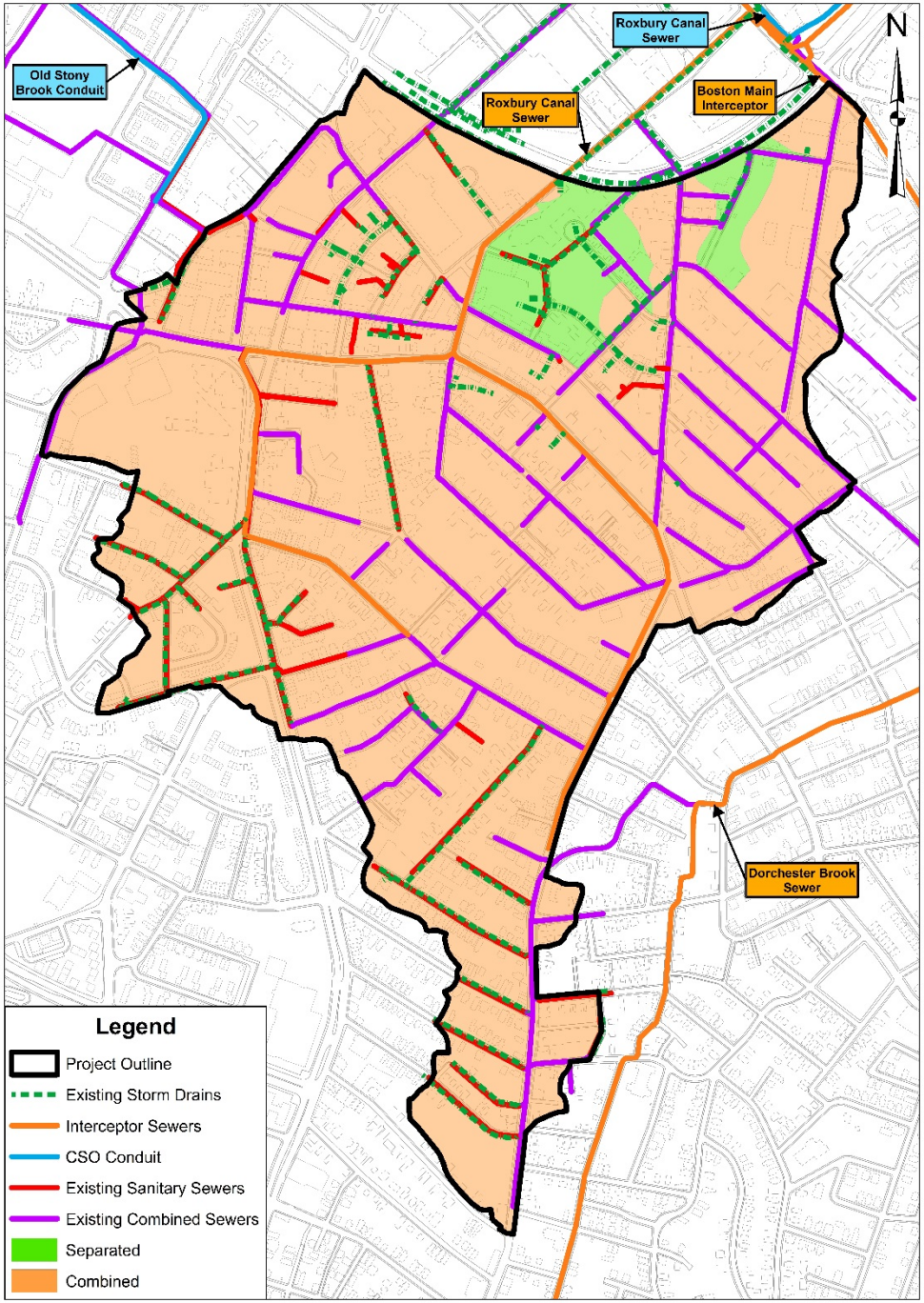
Building Roof Drainage - Downspouts

Building Roof Drainage - Internal

Sump Pumps

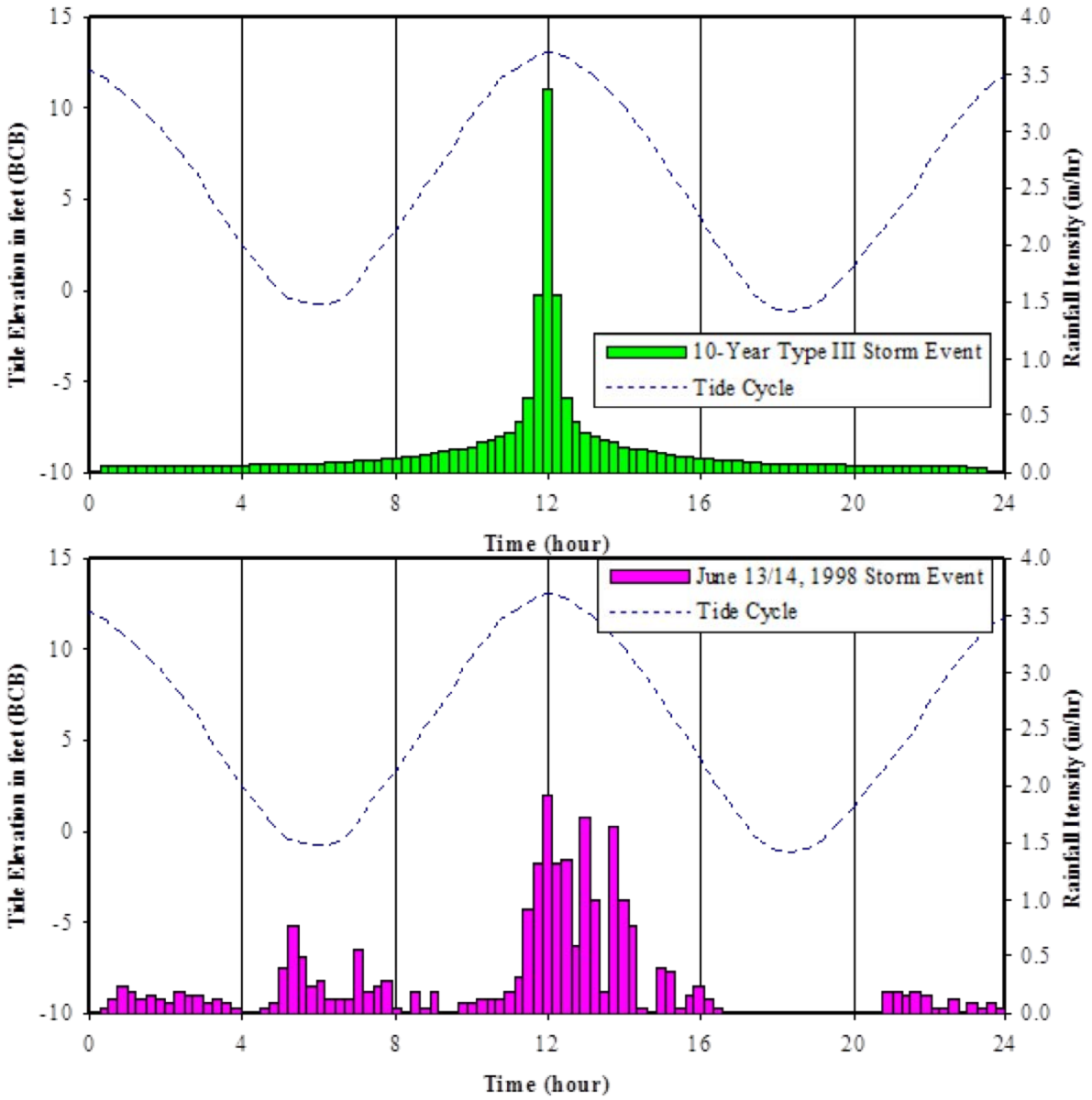
Existing Collection System

- Roxbury Canal Sewer
- Local Combined Sewers
- Storm Drains: 18,600 LF
- Four Potential Connection Points for New Storm Drains



Collection System Design & Evaluation

- BWSC H/H Model – Mike URBAN
- Design to Convey the 10-Year, Type III rainfall event
- June 13/14 1998 Rainfall Event
- High Tide Elevation: 13.0 feet, BCB



Proposed Storm Drain System

New SD: 32,650 LF

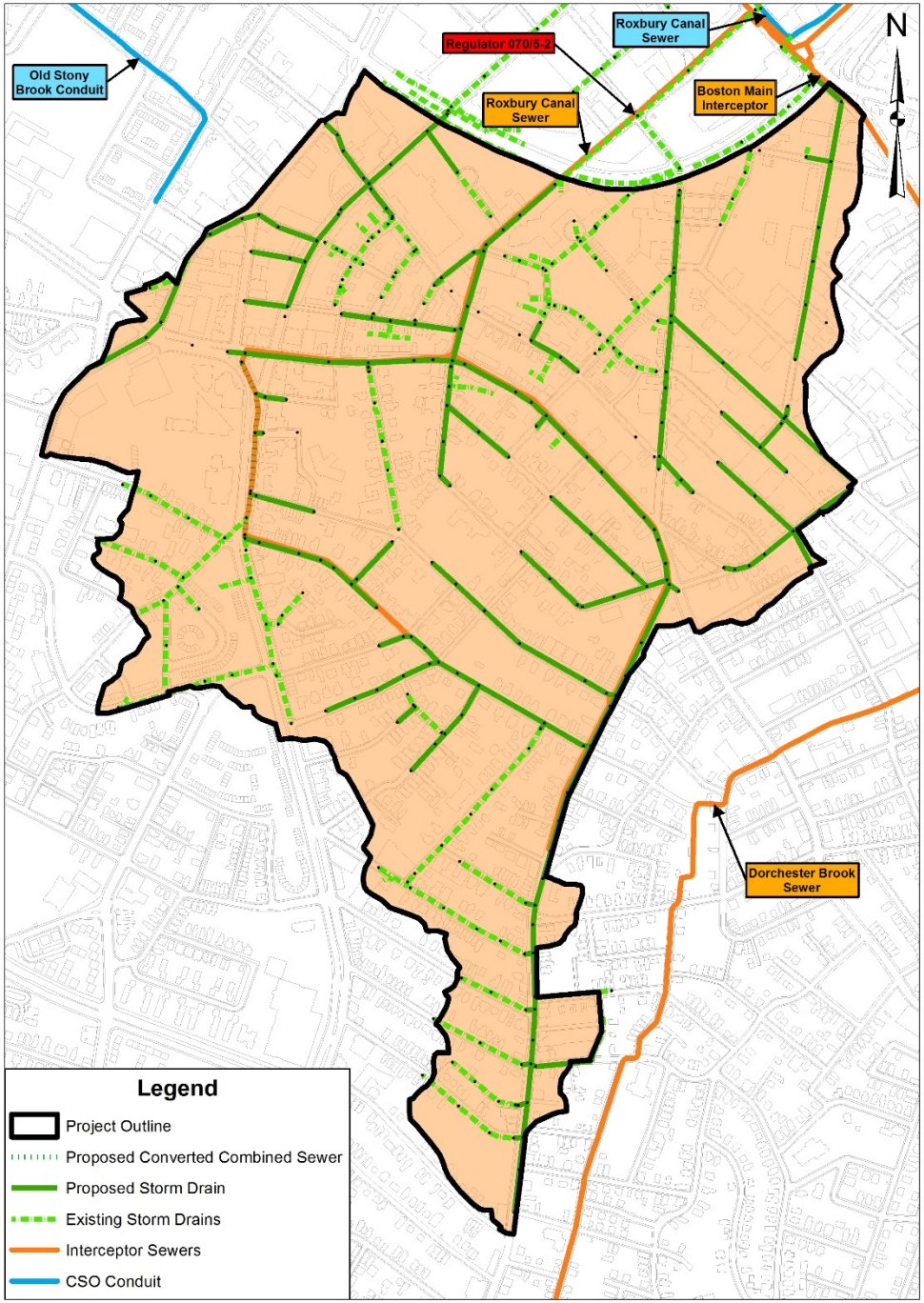
Existing SD: 18,600 LF

CS Conversion: 995 LF

Pipe Size Range:

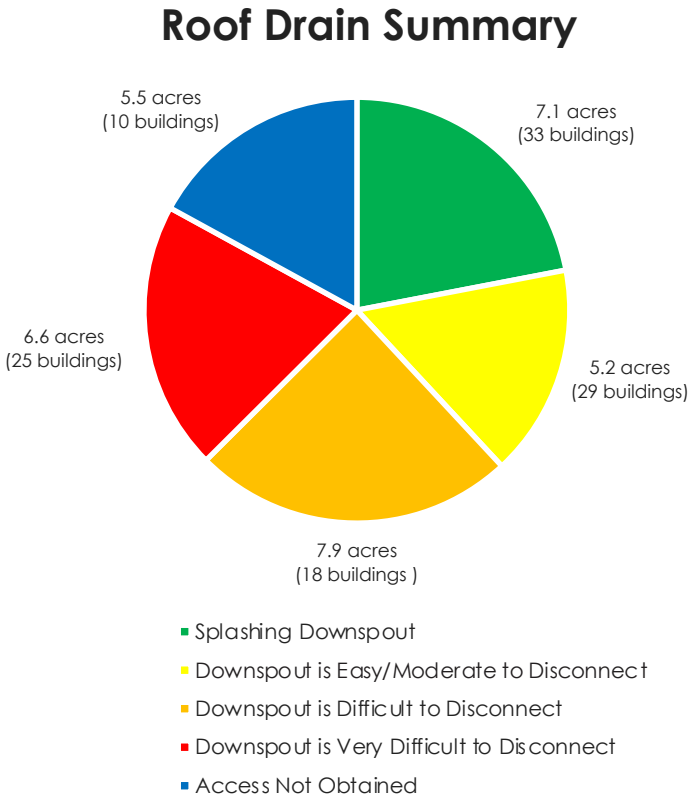
12” Dia. PVC to

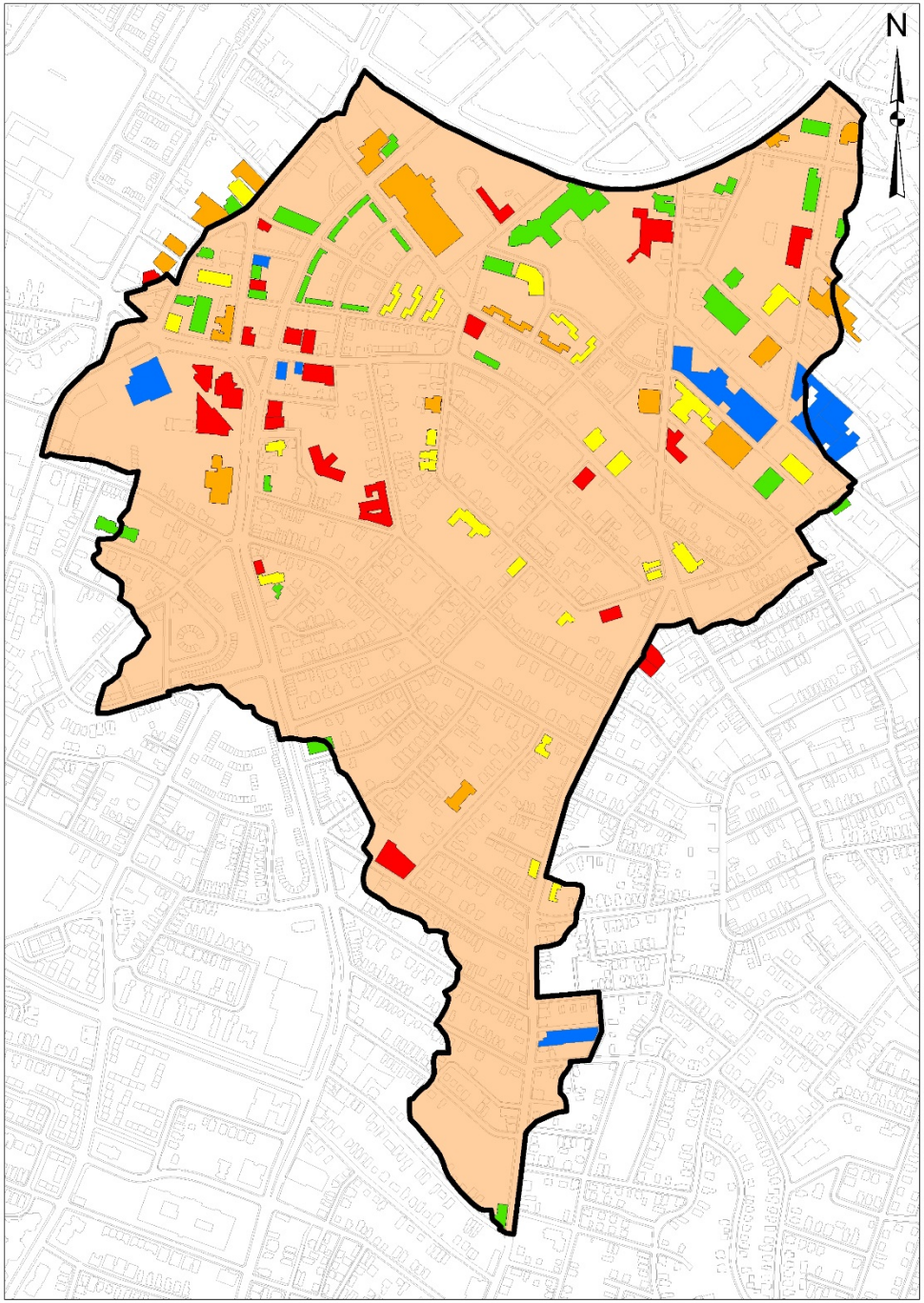
6’x4’ RC Box Conduit



Large Buildings

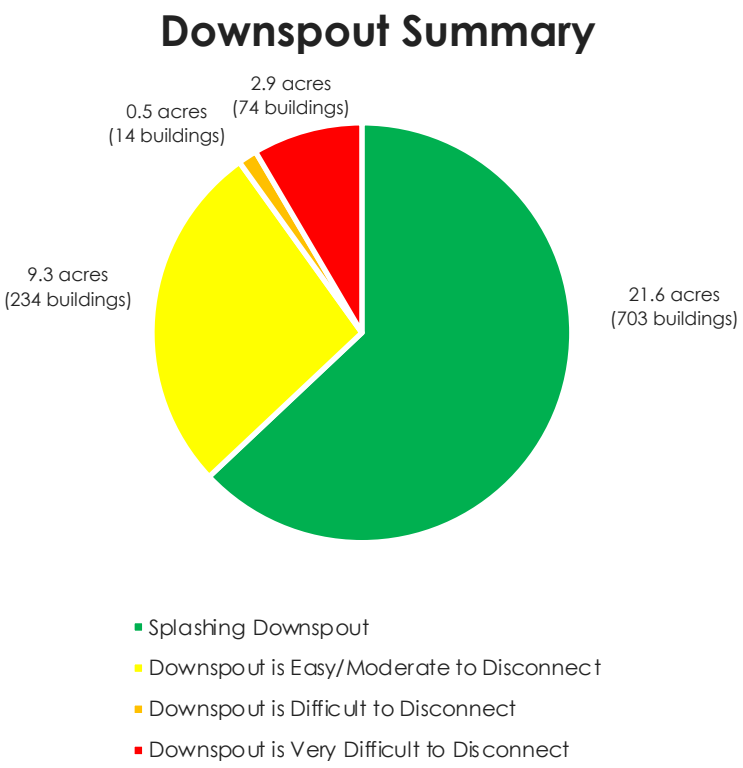
- 115 buildings
- 32.3 acres of roof area (11.3% of project area)

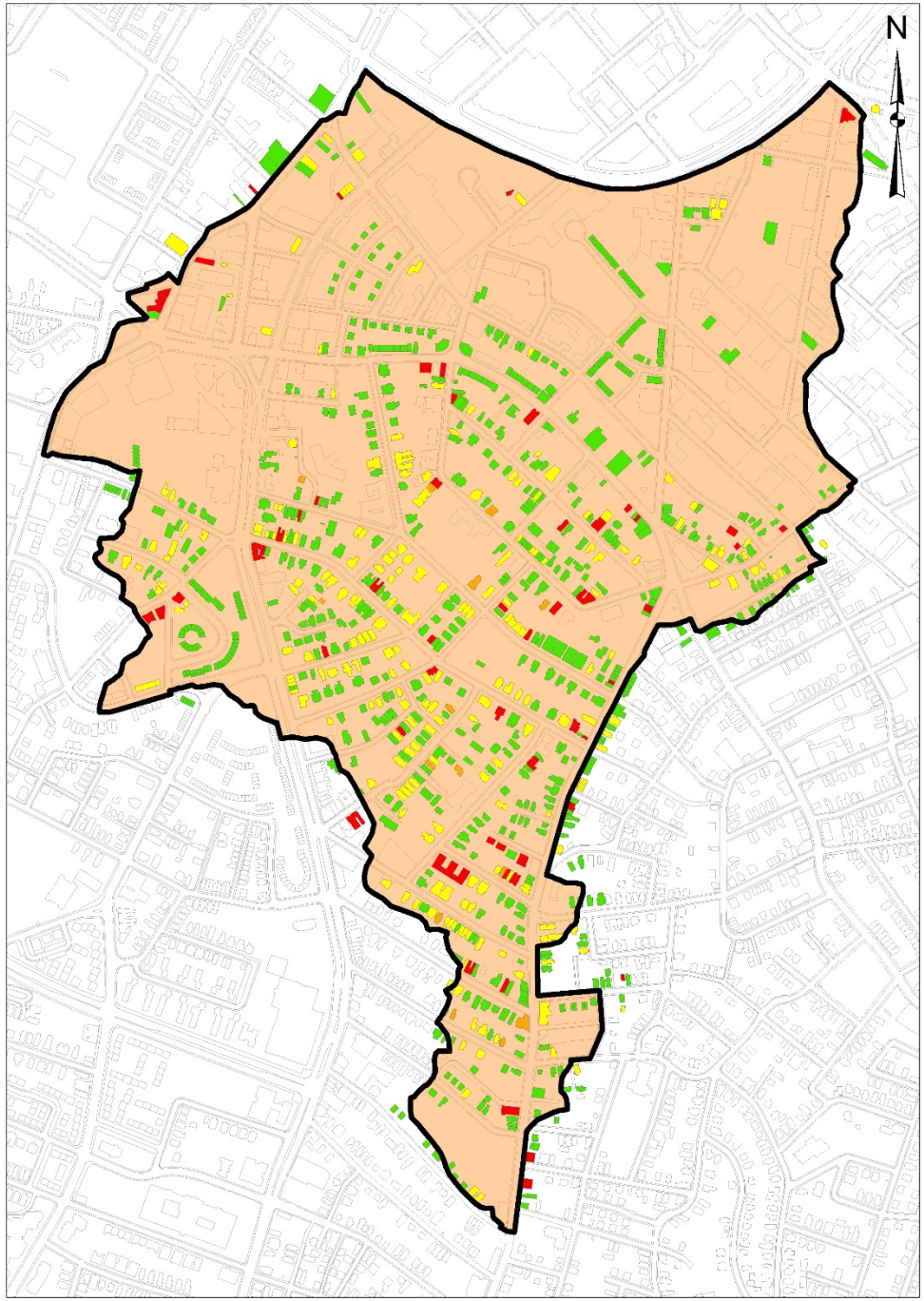




Small Buildings

- 1,025 buildings
- 34.3 acres of roof area (12.0% of project area)



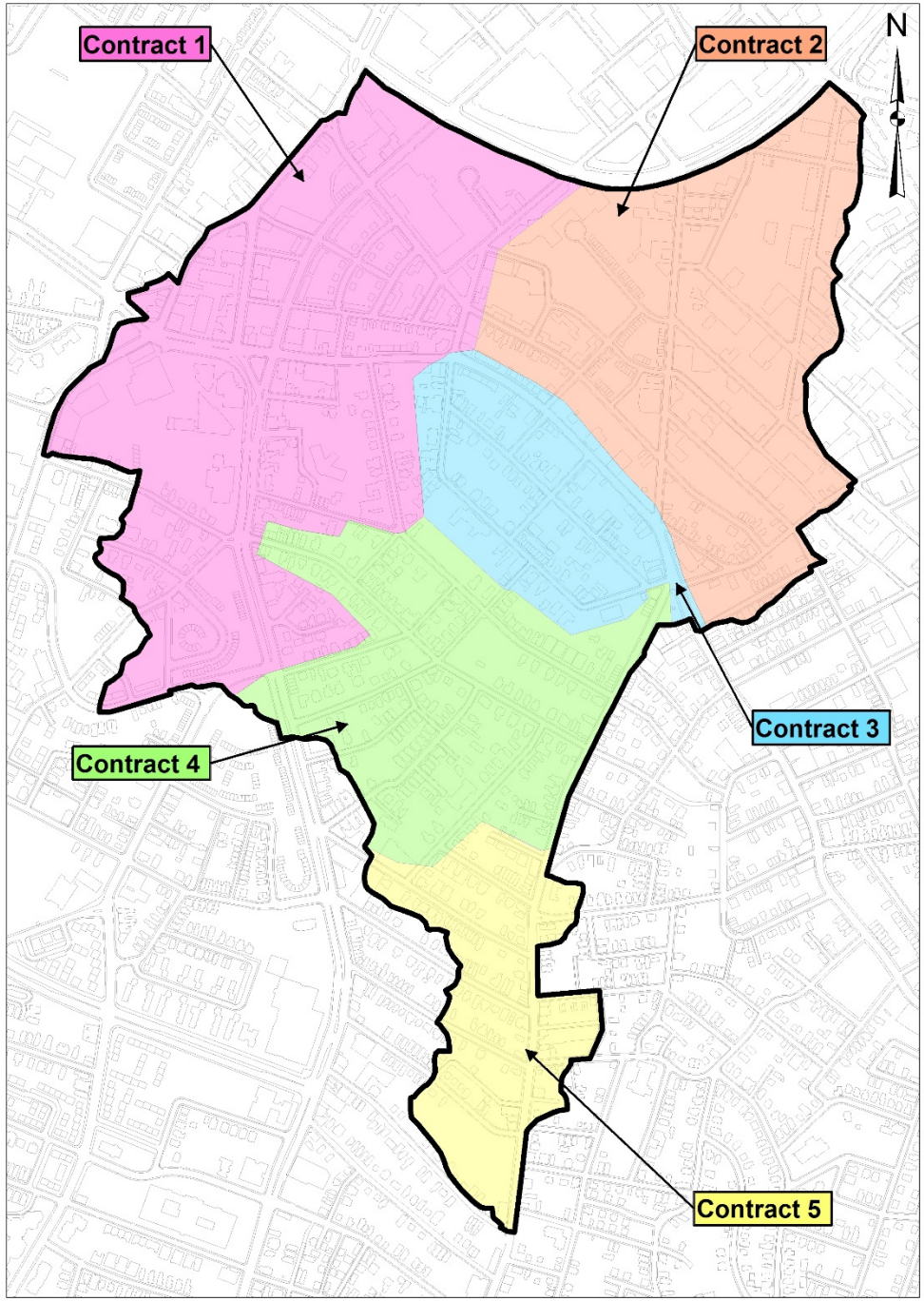


Recommended Plan

- Construct New Storm Drains
- Rehabilitate Wastewater Piping
- Replace Older Water Mains
- Separate Roofs & Site Drain System
- Disconnect Downspouts
- Redirect Sump Pumps
- Identify & Correct Illicit Connections

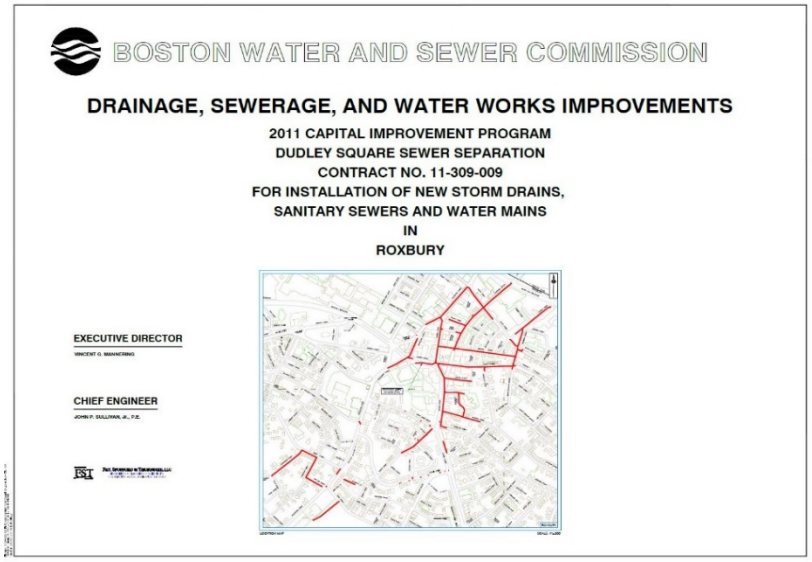
Contract Packaging

- 5 Contracts
- Drains: 34,550 LF
- Sewers: 28,940 LF
- Water Mains: 17,155 LF
- Cost: $44.46M



Final Design

- Detailed Building/Site Investigations
- Field Survey and Base Mapping
- Geotechnical and Haz. Mat. Borings
- Subsurface Utility Exploration
- Develop Construction Bid Documents
- Public Outreach
- Permit and Easement Acquisition



BOSTON WATER AND SEWER COMMISSION

DRAINAGE, SEWERAGE, AND WATER WORKS IMPROVEMENTS

2011 CAPITAL IMPROVEMENT PROGRAM
DUDLEY SQUARE SEWER SEPARATION
CONTRACT NO. 11-309-009
FOR INSTALLATION OF NEW STORM DRAINS,
SANITARY SEWERS AND WATER MAINS
IN
ROXBURY

EXECUTIVE DIRECTOR

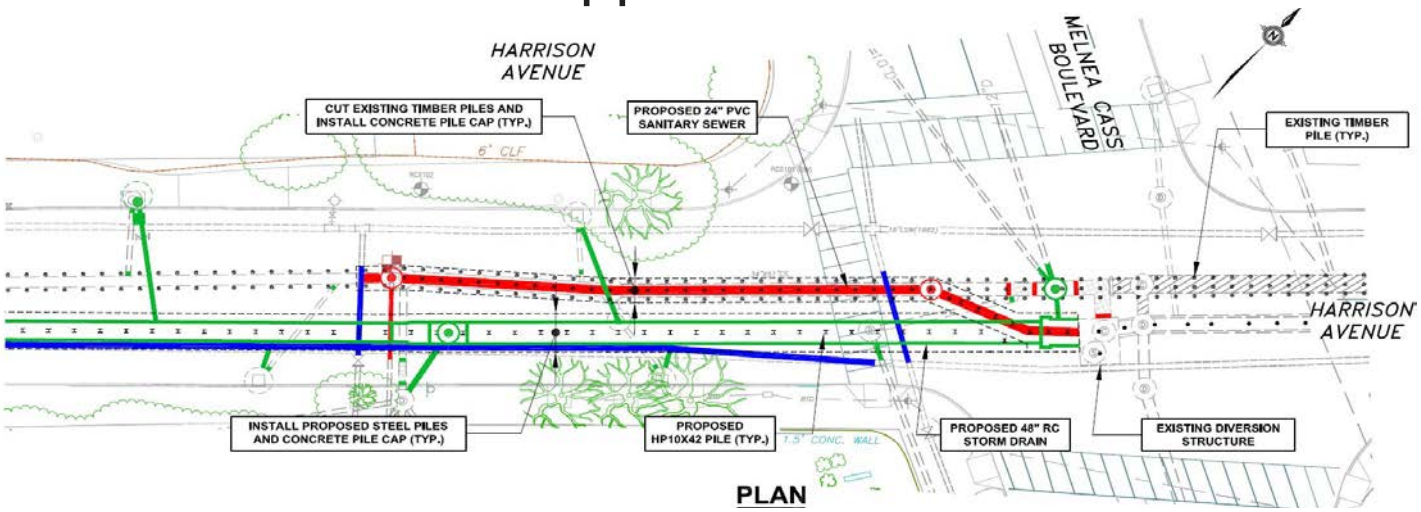
CHIEF ENGINEER

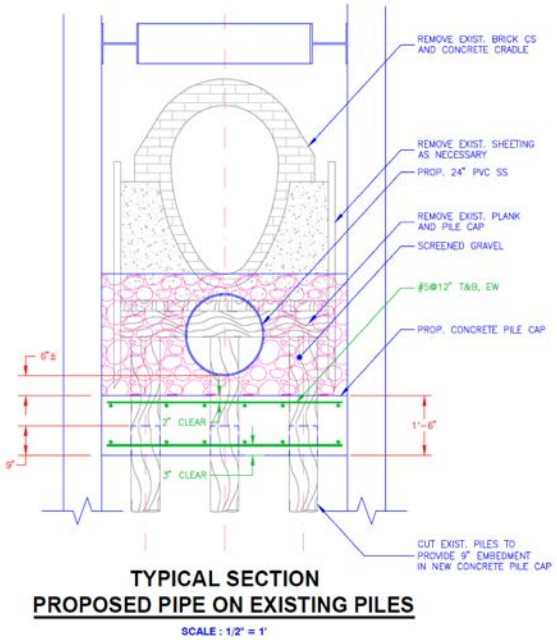
Design & Construction Challenges

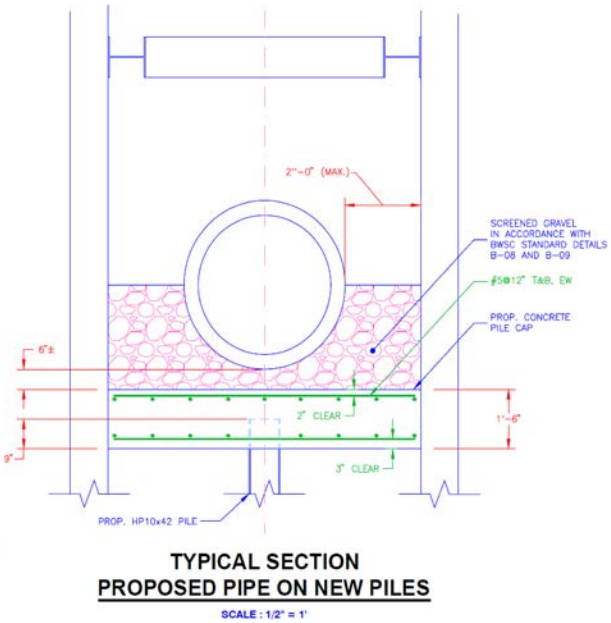
- Traffic Management
- Geotechnical Issues
- Utility Conflicts

Geotechnical Challenges

Harrison Avenue – Pile Support

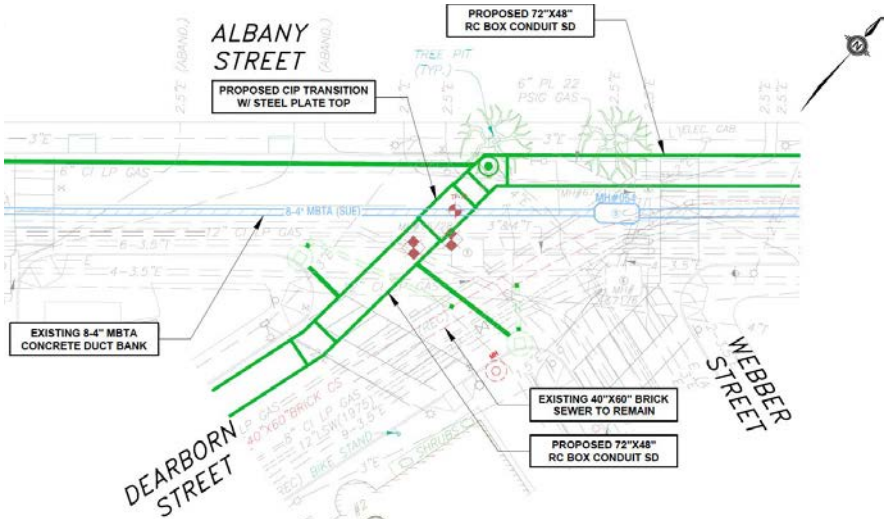


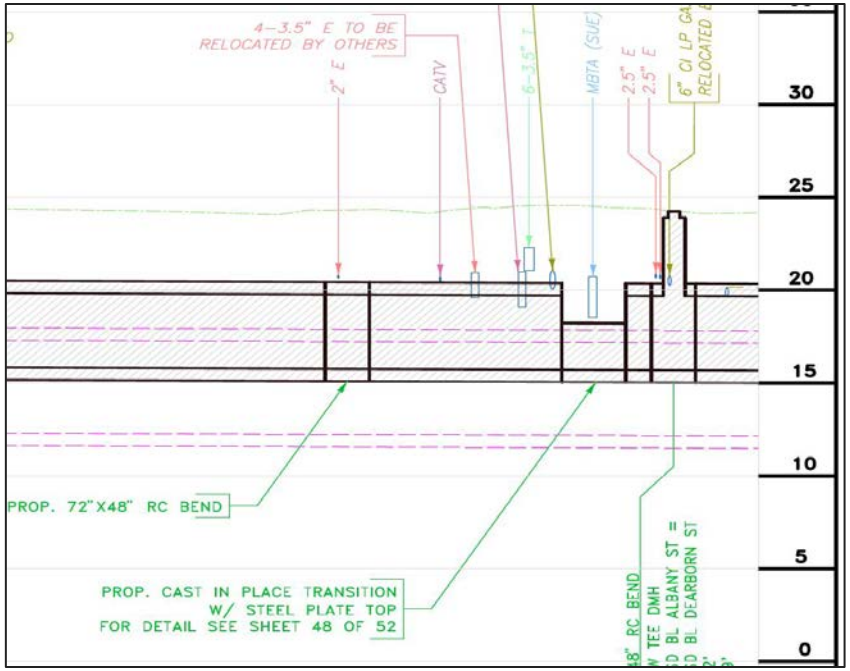




Utility Conflicts

MBTA Duct Banks



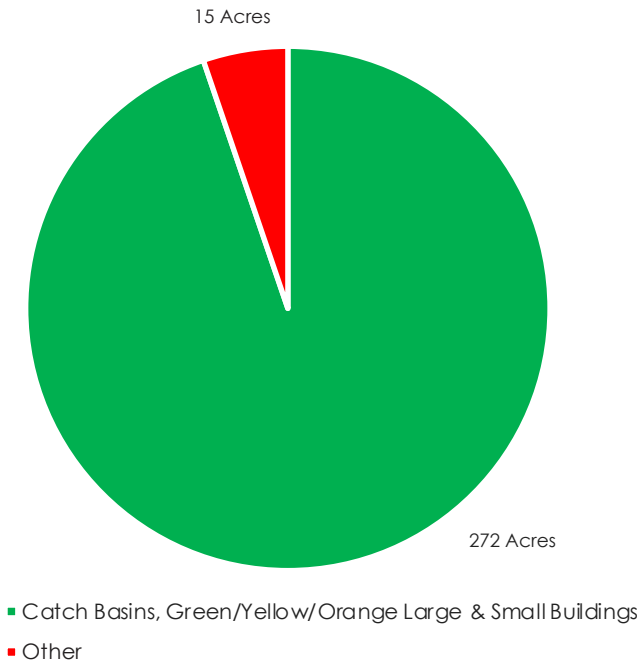


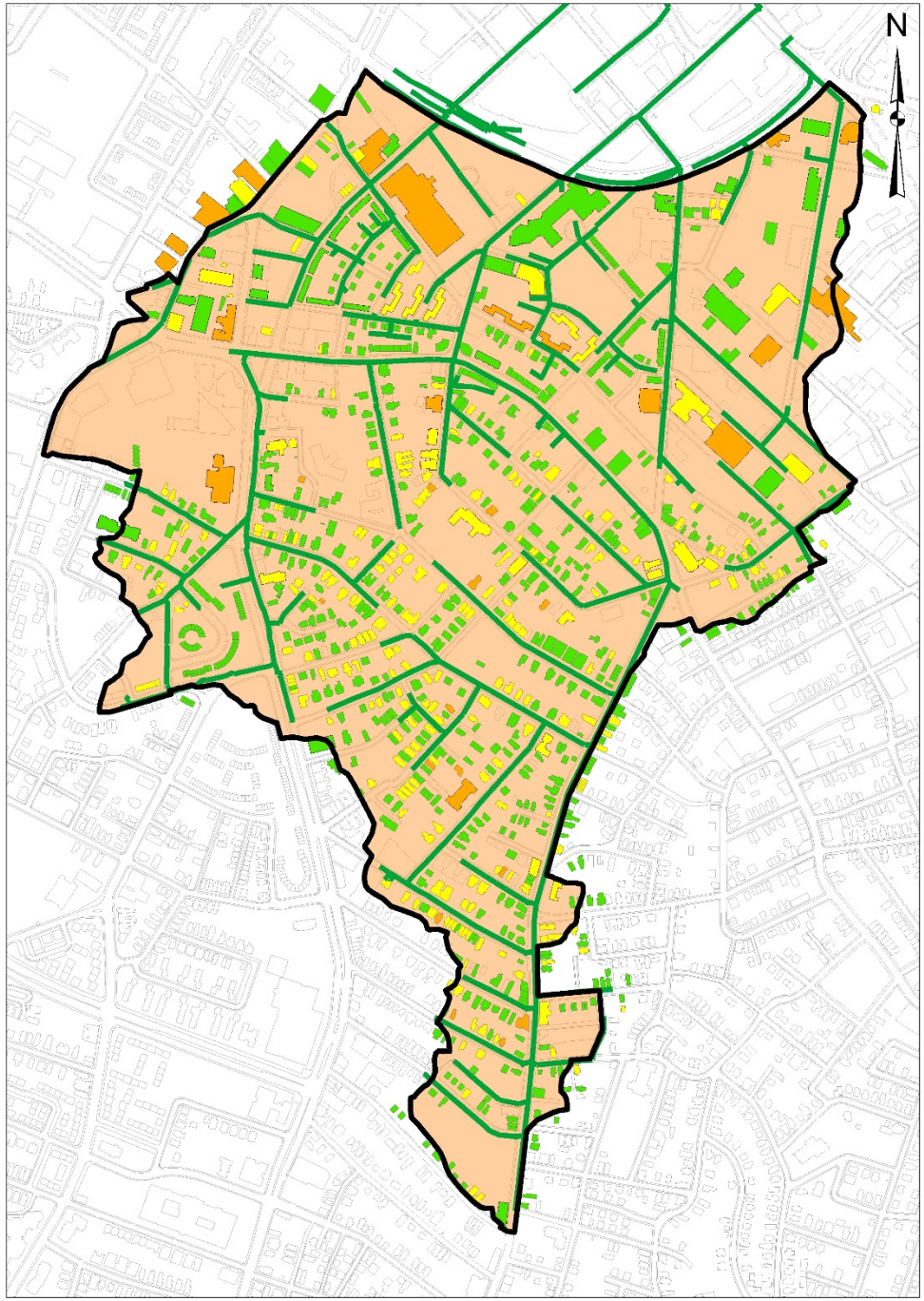
Utility Conflicts

MBTA Duct Banks

Stormwater Sources Disconnected

- Roadway Catch Basins, Site Drainage & Green Buildings:
  - ❑ 249 Ac (87% of project area)
- Yellow & Orange Buildings
  - ❑ 272 Ac (95% of project area)





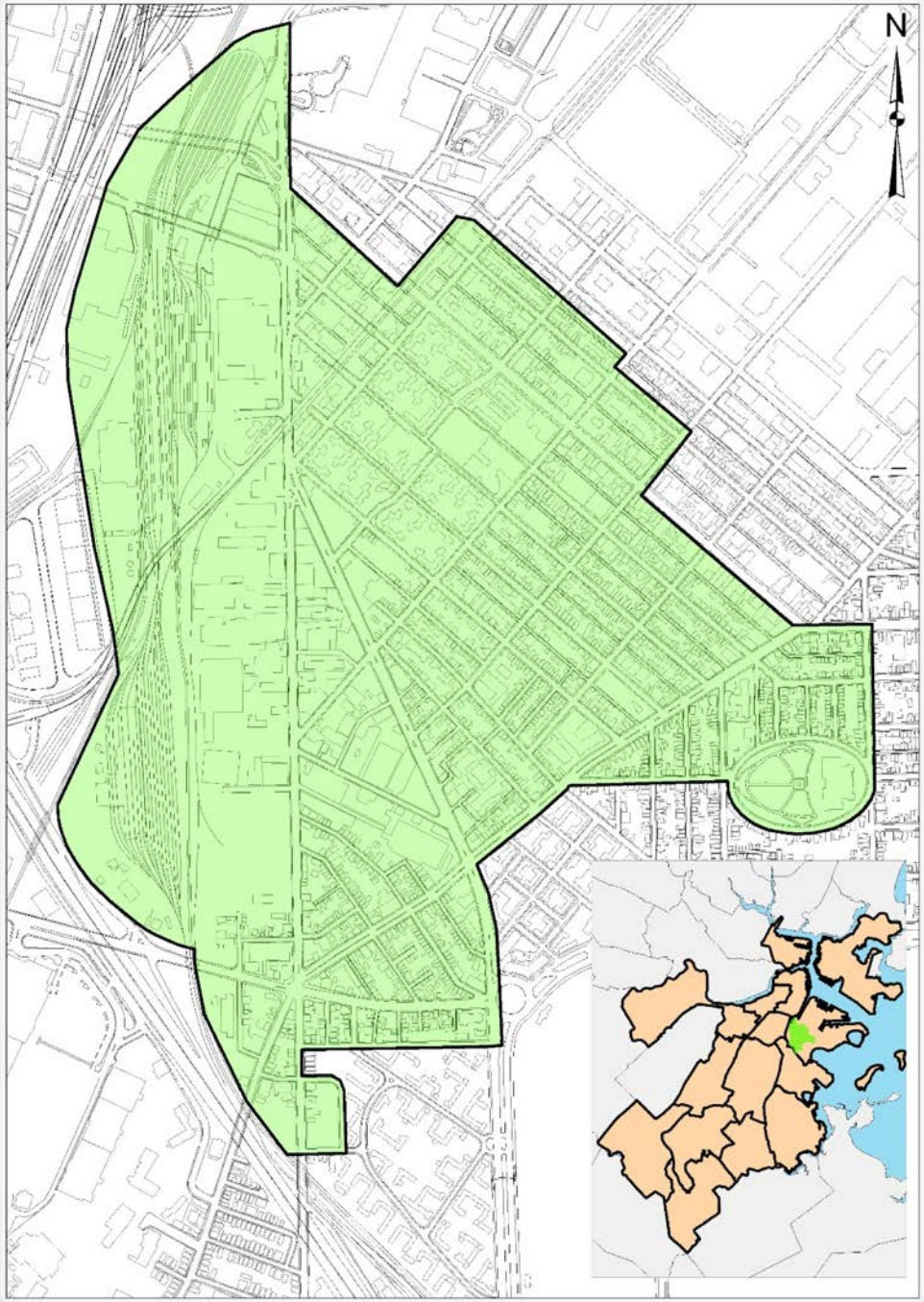
Project Status

- Dudley Square: Completed – May 2015
  - 4,979’ of Sewer
  - 9,537’ of Drain
  - Cost: $16M
- Hampden Street: Completed – August 2016
  - 8,729’ of Sewer
  - 7,600’ of Drain
  - Cost: $10M
- Upper Roxbury – Phase I: Construction 82%
  - 3,725’ of Sewer
  - 3,740’ of Drain
  - Cost to Date: $5,31M
- Upper Roxbury – Phase II: Construction 21%
  - 1,700’ of Sewer
  - 1,530’ of Drain
  - Cost to Date: $1,72M
- Upper Roxbury – Phase III: 90% Design

What's Next…

South Boston Sewer Separation

- Restore Capacity of Sewer System
- Improve Water Quality of Fort Point Channel
- Revitalize Commercial Center
- Upgrade Infrastructure
- Reduce Stormwater Conveyed to Deer Island WWTP



THANK YOU!

QUESTIONS?

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