# Town Brook Realignment & Restoration Project: an Urban River Case Study

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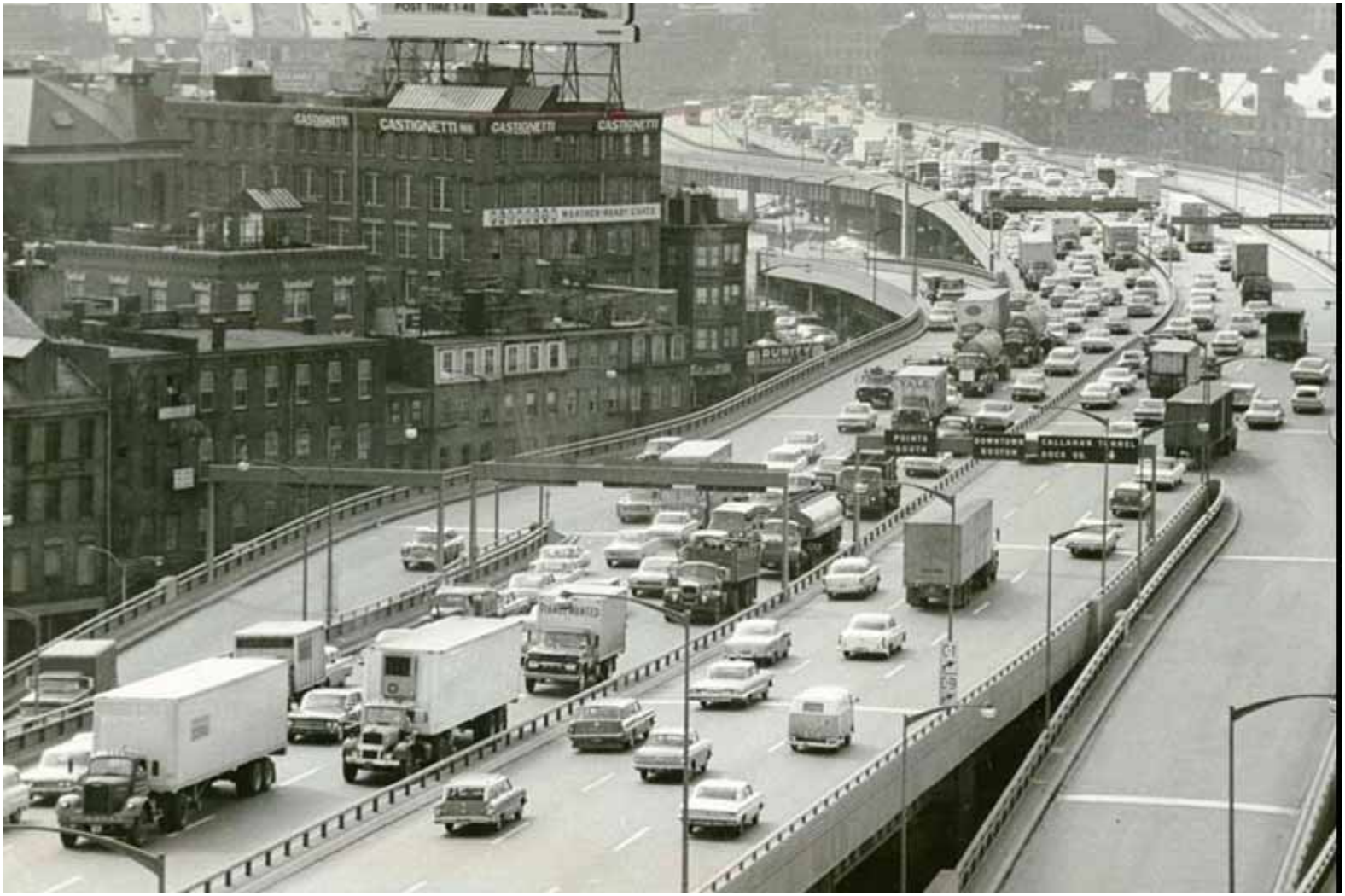
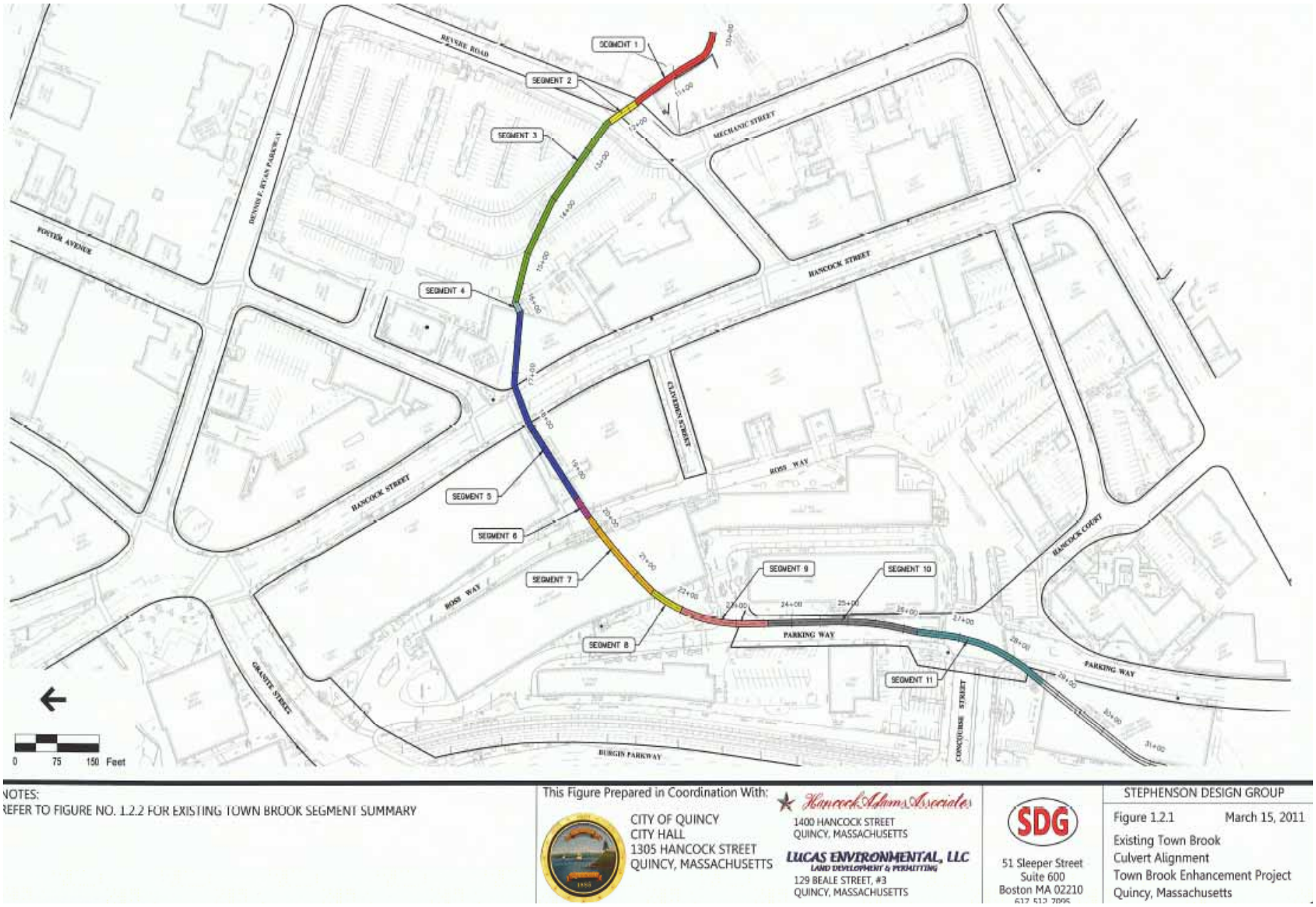
Brewer's Corner, Quincy MA.  Quincy was renowned for 'Quincy granite' and for its shipbuilding industry and once had a vibrant downtown area.




Central Artery, 1959. The shift to an auto-based economy affected many urban downtown areas. In Quincy's case, the construction of the SE Expressway & South Shore Mall contributed to the decline of Quincy's downtown.


This case study looks at the 1st phase of a larger revitalization effort encompassing Quincy's downtown area which realigned Town Brook and daylighted a portion of the new alignment.




Extensive historic alteration of Town Brook placed the majority of the brook in culverts of varying materials & dimensions. This patchwork of culverts is intersected by various utilities & illegal sewer connections.

PHOTO 2 - AT STATION 11+00± LOOKING UPSTREAM TO SEGMENT 2 CULVERT OUTLET AT STA 12+39

PHOTO 9 - AT STA 16+25± - IN HONG KONG EATERY LOOKING AT EXTERIOR WALL OF TOWN BROOK

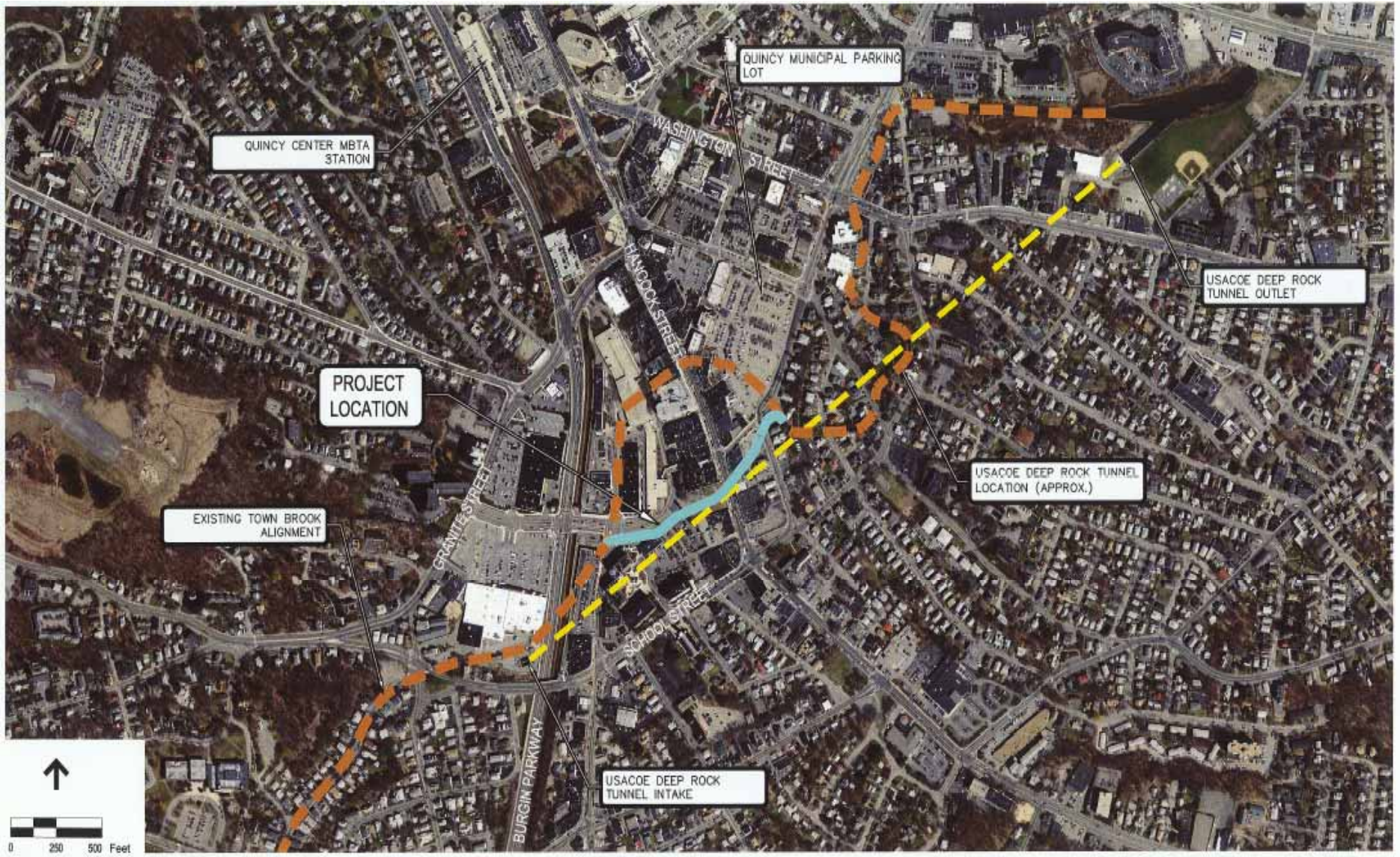
Left: Town Brook is flanked by an American Legion and extensive retaining walls.

Right: photo of a “window” looking from the basement of the Hong Kong Eatery into Town Brook.

- In 1998, ACOE & DCR completed the Town Brook Local Protection Project which was designed to divert flood flows at several locations throughout the watershed.

- Project includes the Deep Rock Tunnel - a 12-foot diameter tunnel 140-180 feet below ground and ~ 4,000 feet in length – and the Burgin Parkway flood relief conduit.

- Though this project has served flood control purposes well, it has resulted in the diversion of base flows needed to sustain the smelt run. Over the last 15 years, normal stream flow has been reduced dramatically on a daily, monthly and yearly average basis.




OTES:

AERIAL MAPPING FROM THE OFFICE OF GEOGRAPHIC AND ENVIRONMENTAL INFORMATION (MassGIS). COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS.

This Figure Prepared in Coordination With:

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Figure 1.1.2 March 15, 2011

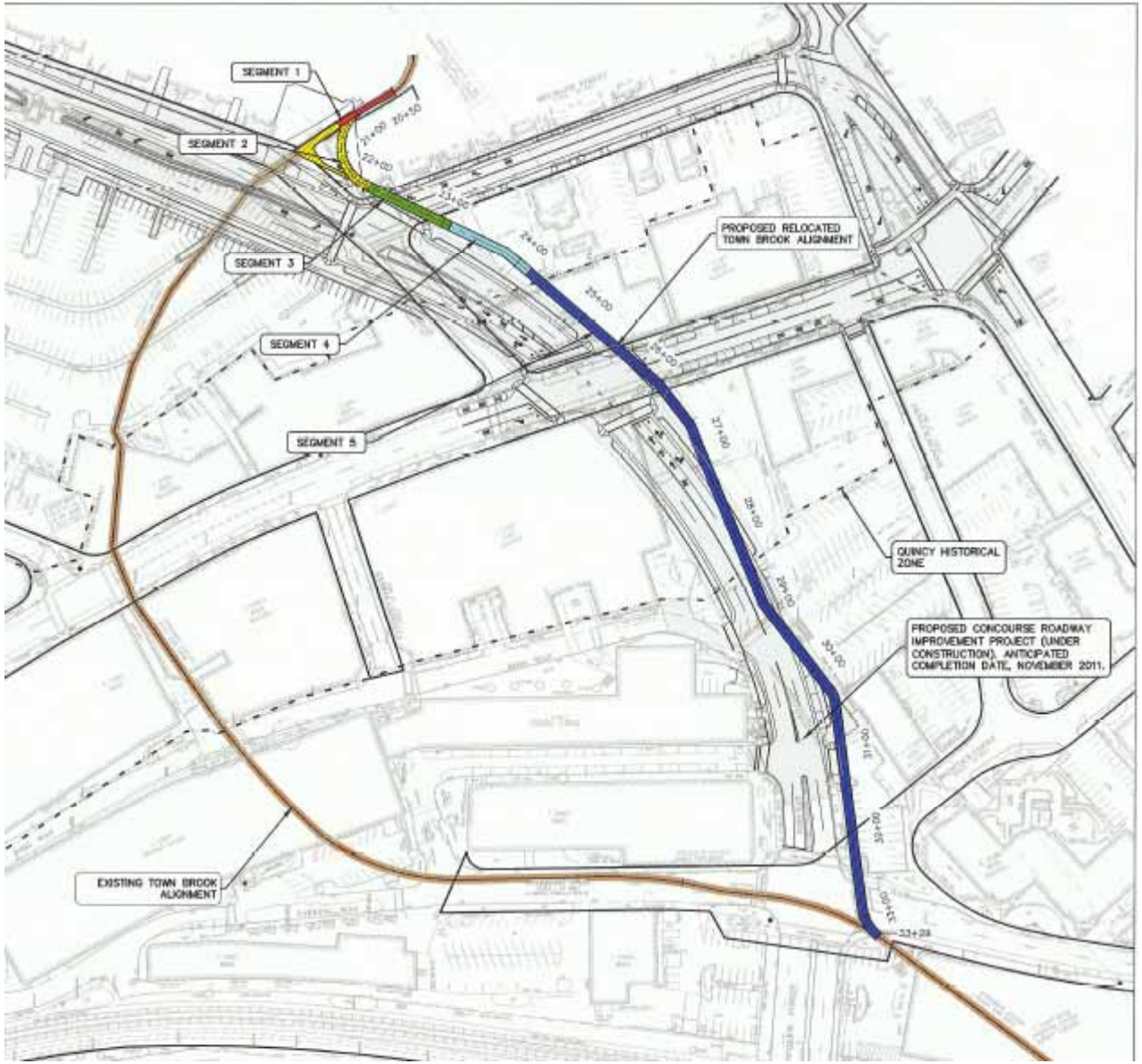
Project Location Map
Aerial Photograph
Town Brook Enhancement Project
Quincy, Massachusetts

# Procedural Background

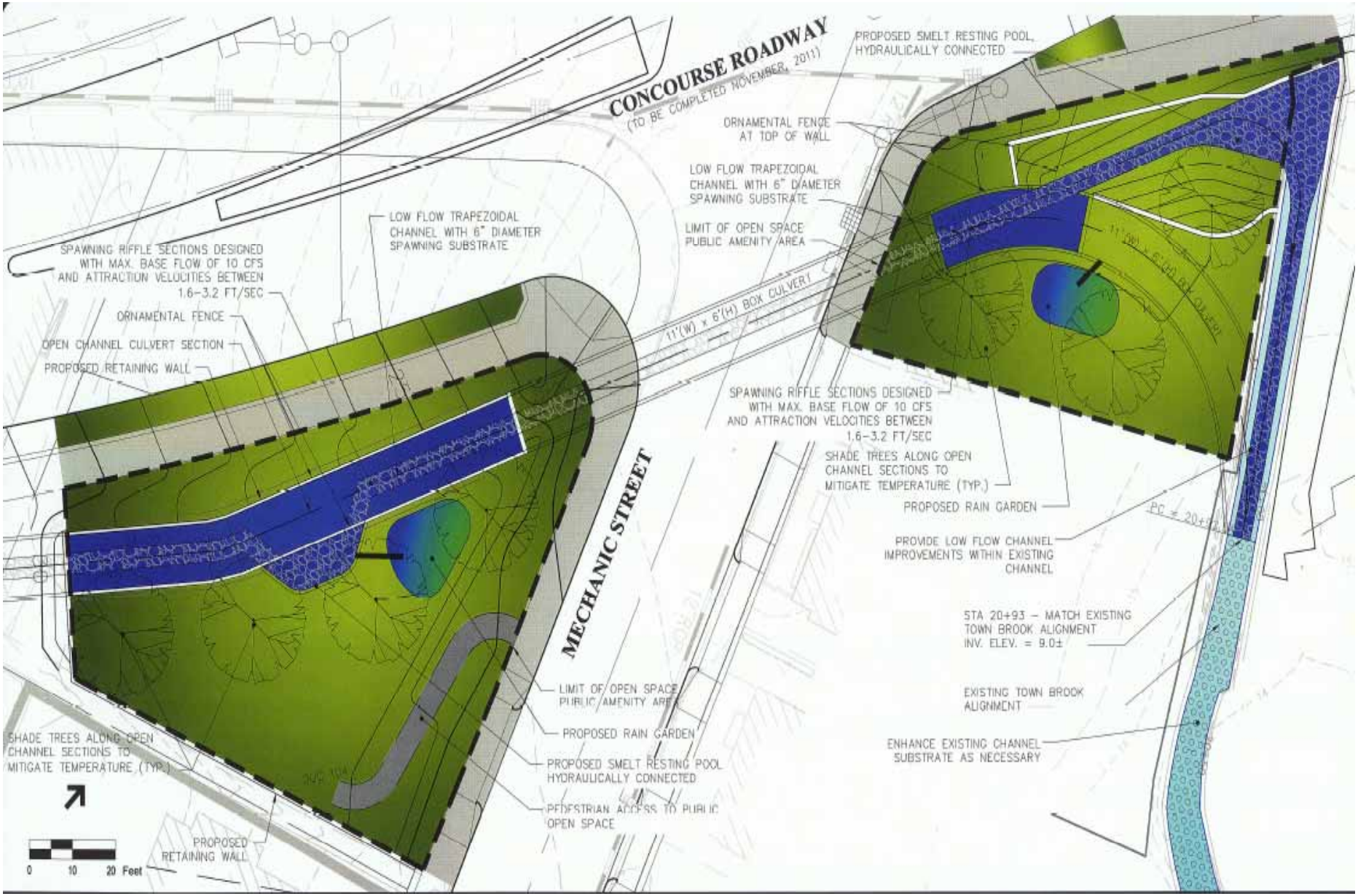
- During the course of MEPA review of the proposed realignment, DEP & DMF raised concerns over the chronic low base flows, the impact to the fish run, and the need to augment the brook's flow. The City of Quincy made a commitment to augment Town Brook flows.

- SOC was issued in December of 2011 containing conditions requiring the implementation of specific flow augmentation alternatives. It also required development of a MOA between the City of Quincy, DMF, DCR, and the developer.

- An adjudicatory hearing decision was issued in May 2012 which upheld the SOC. A 401 WQC was issued in August 2012.




Existing & Proposed Town Brook Alignment




Daylighted section of new alignment and “pocket parks”

Design features include:

- 264 linear feet of new open channel with a low-flow channel designed to achieve attraction velocities. Includes resting pools and spawning substrate.
- 500 sq ft of wetland plantings proposed within the open channel section as well as a vegetated “island”. Plantings are intended to mitigate temperatures within spawning riffles and resting pools.
- Two pocket parks adjacent to the open channel sections will provide 5500 sq ft of open space. Plantings will also provide shade for the open-channel sections.

- The American Legion was demolished in Fall of 2012 and marked the start of construction.

- In January 2013, Quincy submitted a “Town Brook Base Flow Recapture Report” that contained flow augmentation recommendations.

- Flows from the “Crown Colony Stormwater Meadow”, which were previously diverted to the Burgin Parkway culvert and out to the sea were directed into Town Brook.

- 2 new stormwater treatment devices also constructed.

As part of the flow augmentation requirements of this project, flows from Crown Colony Development are now treated & directed into Town Brook.

January 9, 2013

Construction of the open-channel segment of Town Brook begins in January.

Left: looking from Hancock Street towards Mechanic Street.  Right:  open channel segment emerges from sub-surface tunnel.

The existing Town Brook is temporarily placed in a culvert during construction.  Note poly sheeting used for velocity dissipation at outlet.

February 2, 2013

Geogrid matrix keeps stone in place.  Size of stone was selected for suitability as spawning substrate.

Town Brook is not a typical stream restoration project as it took place in an urban setting with severe space constraints (which is why the channel walls are vertical).


As the slope of the channel was such an important part of the design, the elevation of the top of rock was surveyed and marked on the channel wall.


CAT

March 4, 2013

By March 4th, work was proceeding almost around the clock, as all sediment-producing activity had to cease by March 8th, when the smelt were due to arrive.

Formation of the BVW island by the bend in the stream.

On March 6th, the culvert carrying Town Brook was pulled and water flowed through the new alignment for the first time.

Culvert carrying Town Brook flows is removed.

First wildlife!  A curious muskrat checks out the new channel.

First flush as water flows through the new alignment for the 1st time.

Water quality was impacted by the 1st flush but cleared up within around 6 hours.

The BVW island is covered by filter fabric prior to planting.  Planting could not occur until the Time-of-Year restriction for the smelt run was lifted (June 1st).


An abutter keeps an eye on things.

March 11, 2013

All in-stream work has been completed at this point.

May 10, 2013

The toe of the BVW island was secured by stone as high flows were lifting the filter fabric.


Construction of the vegetated retaining wall.

October 18, 2013

Planting of the pocket parks is in progress

Near drought conditions in October, 2013 show flow concentrated in the low-flow channel.

The BVW island has been planted and water is flowing in the new alignment.

Planting of the vegetated wall.