

City of Waltham
FY22 MVP Action Grant
Beaver Brook Flood Mitigation - Design and
Permitting

Public Meeting

May 9, 2023



Current Flooding in Linden Street

Flooding of Linden Street impacts emergency response, public safety, and abutters including businesses and residents





Images of 2010 Flooding of Linden Street, Waverly Oaks Road, Oakley Road, Evacuation from Residential Building on Linden Street



Images of 2010 Flooding of Linden Street, Waverly Oaks Road, Oakley Road, Evacuation from Residential Building on Linden Street



Image of 2018 Flooding of Linden Street

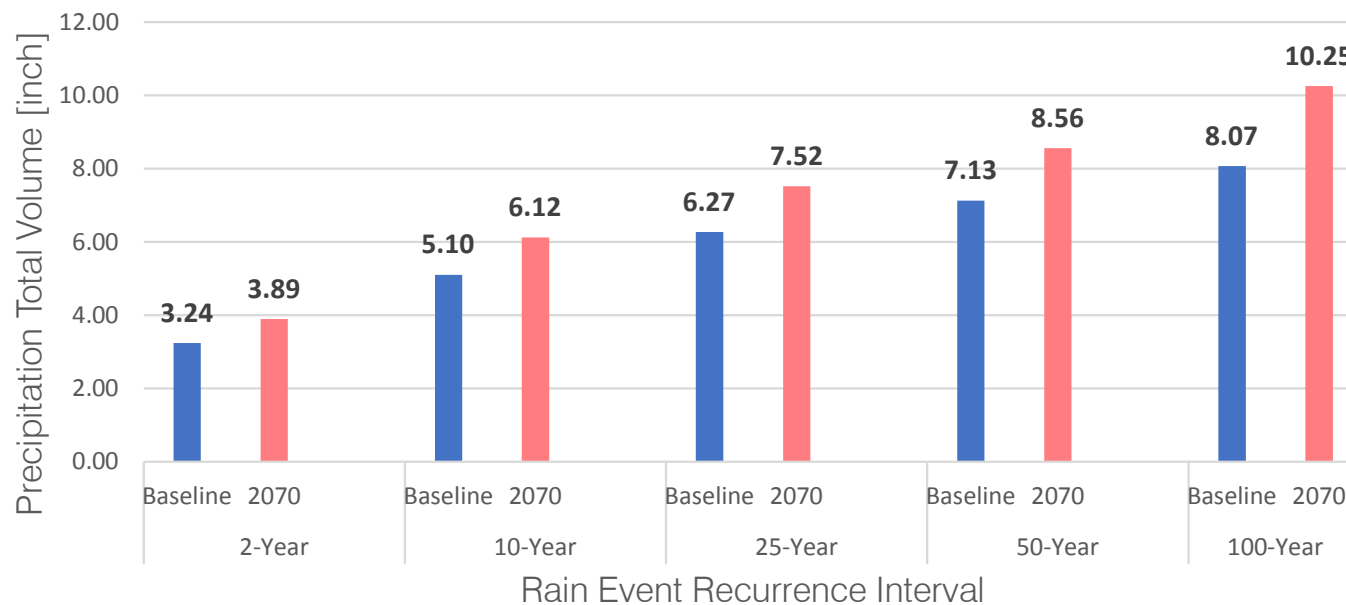
Yoon S. Byun/Globe Staff



Image of 2021 Flooding of Linden Street from Tropical Storm Ida

Climate Change will result in increases in rainfall

Changes in precipitation from Present (Baseline) to 2070 climate conditions



Waltham is working to combat impacts of climate change on Linden Street area with the Beaver Brook Flood Mitigation Project

- Proposed project is located in the area of Beaver Brook and Linden Street at the confluence with Chester Brook
- This location captures streams and stormwater from approximately 11.3 square mile covering Waltham, Lexington, Arlington, Belmont

54% of Waltham's land area drains through the Project Area. This area is over 30% impervious, causing increased peak runoff rates.

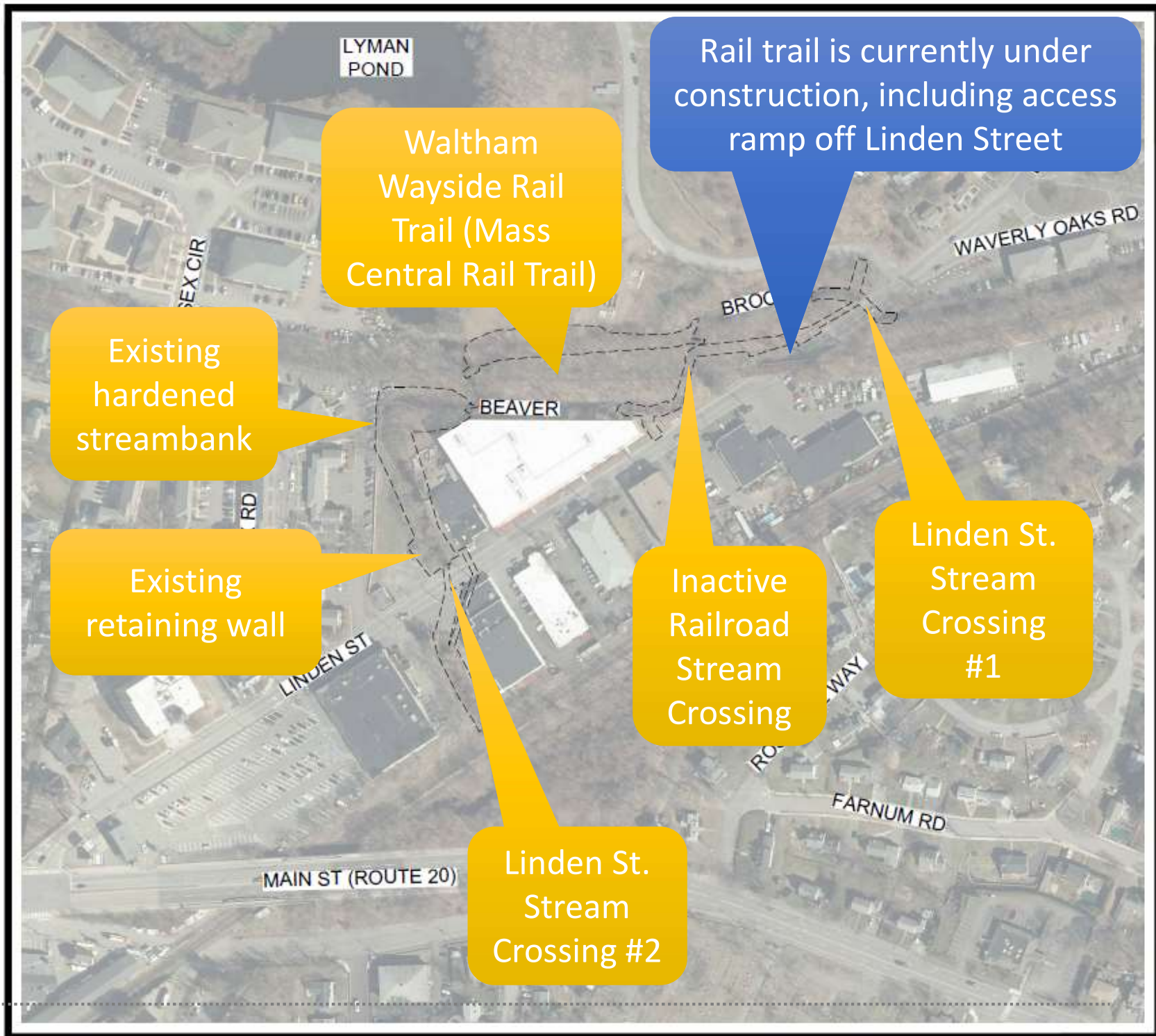


Approximate Project Location



The proposed project is located on Linden Street within Beaver Brook.

The light black dashed lines indicate the project extent.



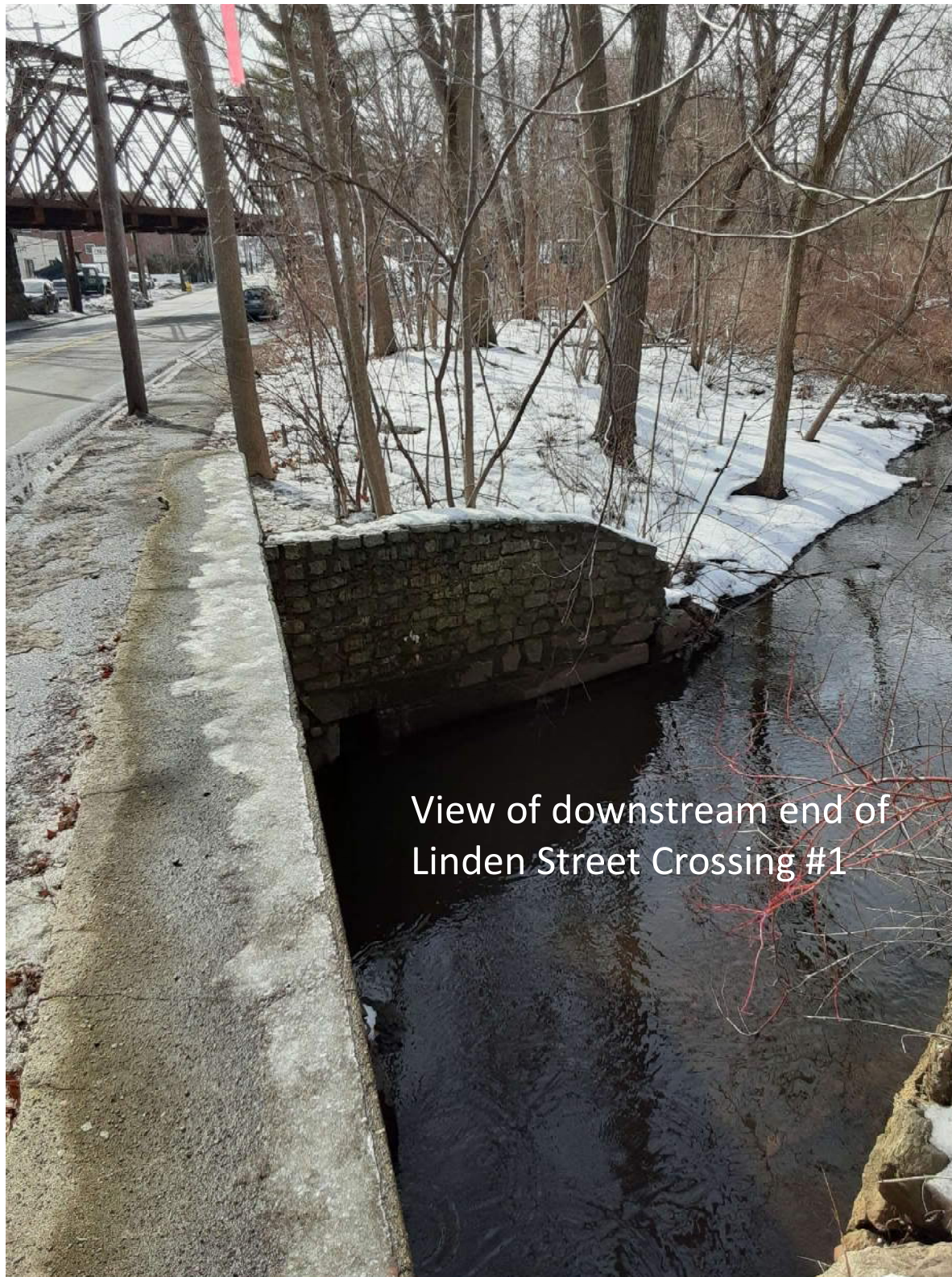
**Observed
Conditions**



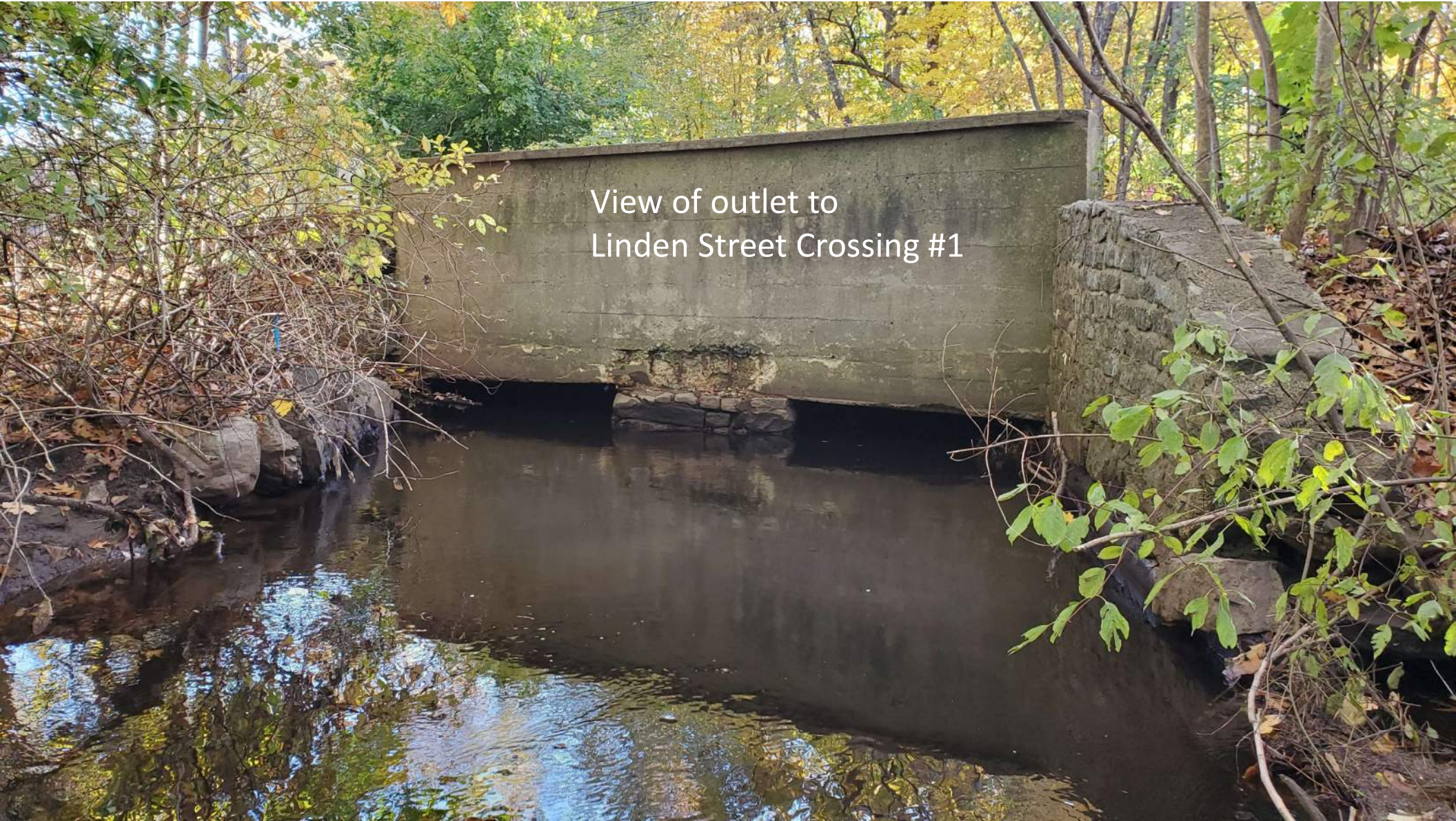
View of upstream end of
Linden Street Crossing #1



View of inlet to
Linden Street Crossing #1



View of downstream end of
Linden Street Crossing #1



View of outlet to
Linden Street Crossing #1



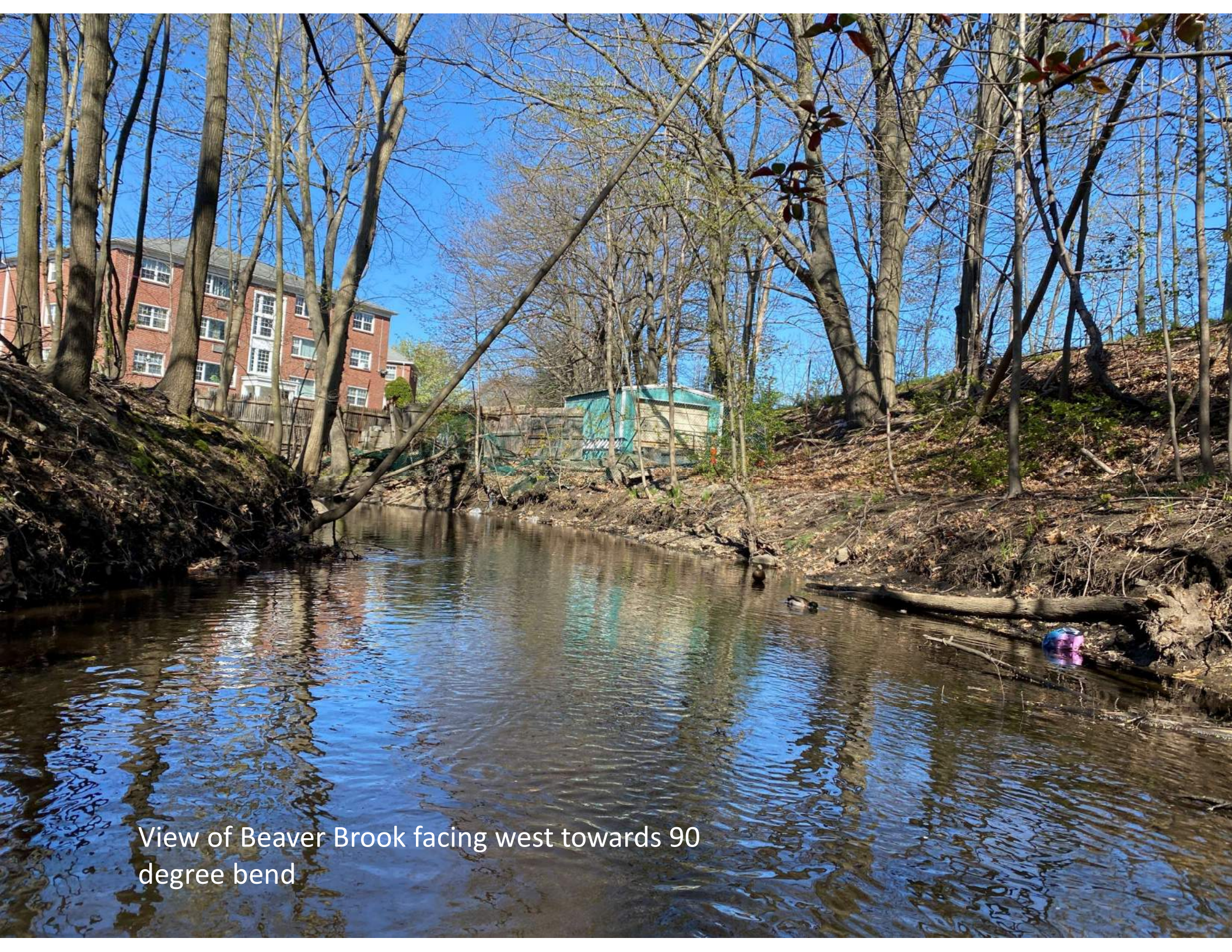
View of Beaver Brook directly downstream of
Linden Street Crossing #1



View of Beaver Brook upstream of
abandoned railroad crossing

View of Beaver Brook downstream of
abandoned railroad crossing





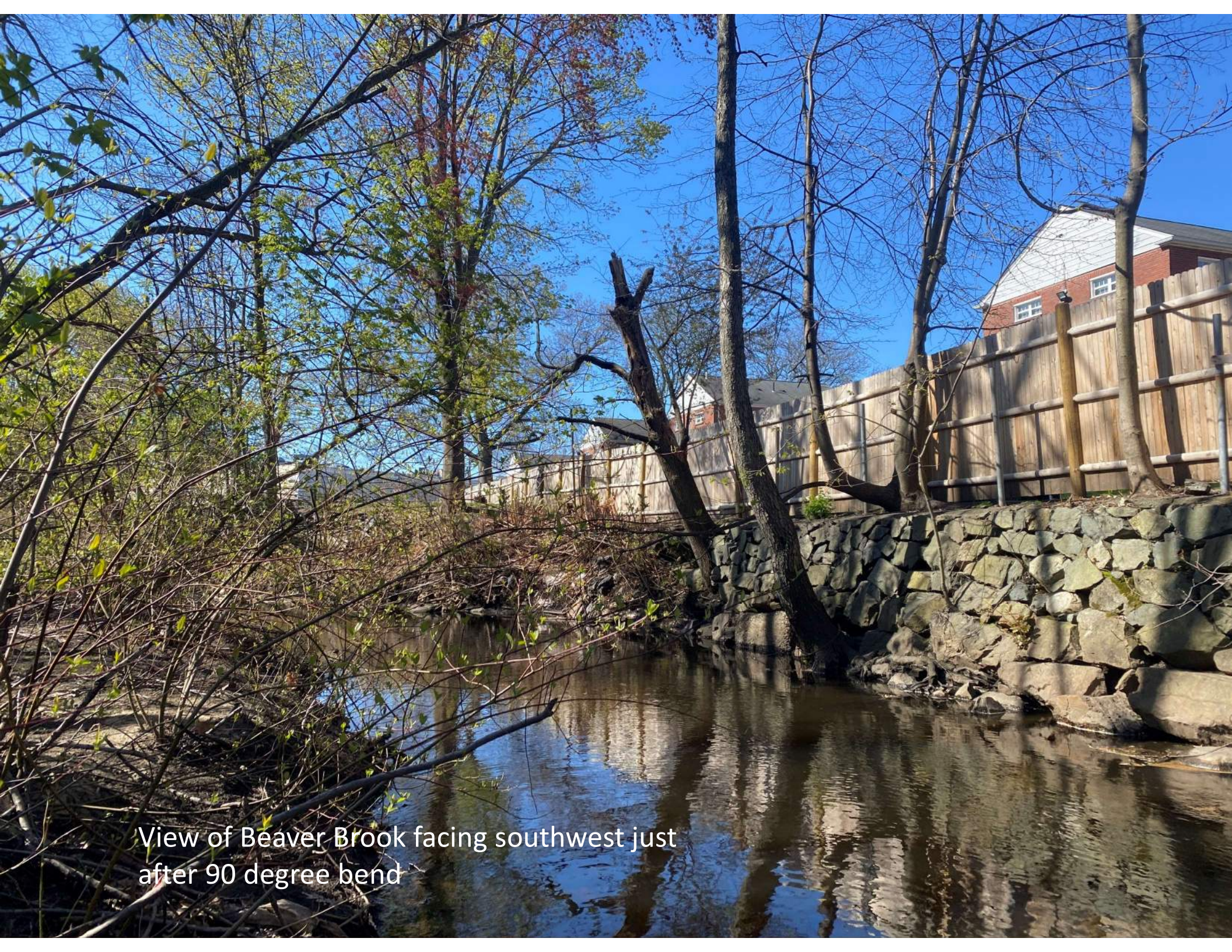
View of Beaver Brook facing west towards 90 degree bend



View of Beaver Brook facing west towards 90 degree bend



Close up of Beaver Brook bank
just entering 90 degree bend



View of Beaver Brook facing southwest just after 90 degree bend



View of Beaver Brook upstream of Linden St
Culvert #2



View of Beaver Brook directly upstream of
Linden St Culvert #2



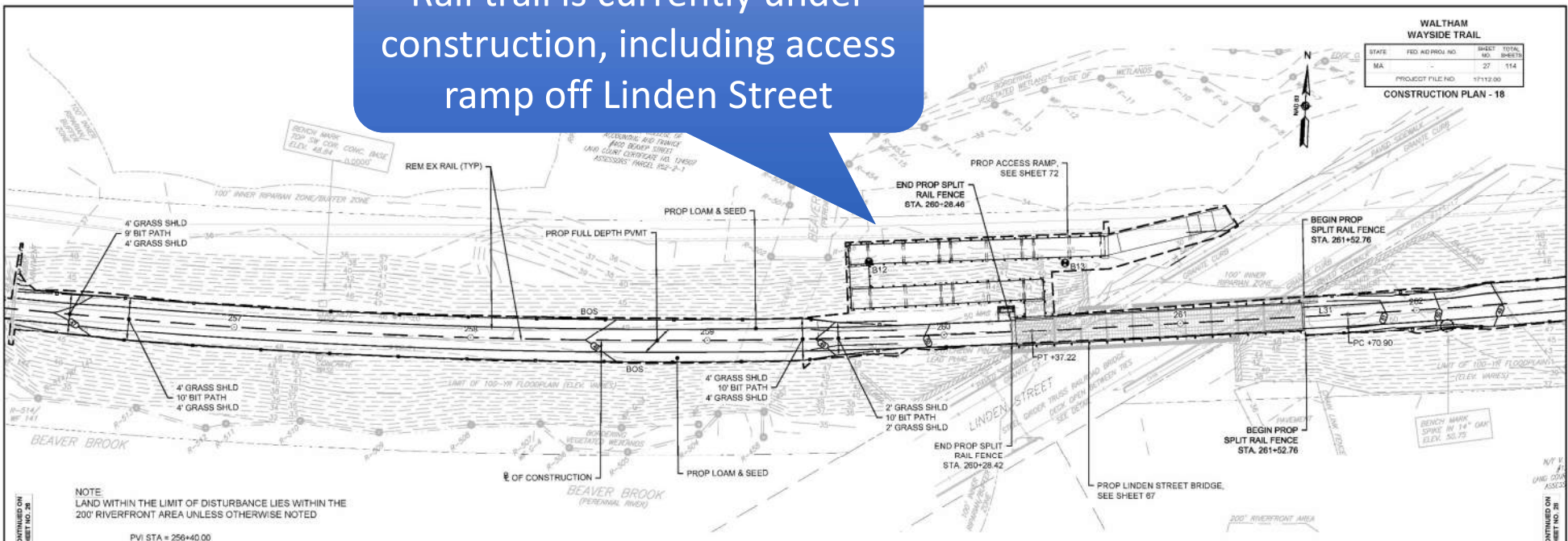
View of outlet of Linden St Culvert #2



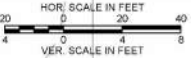
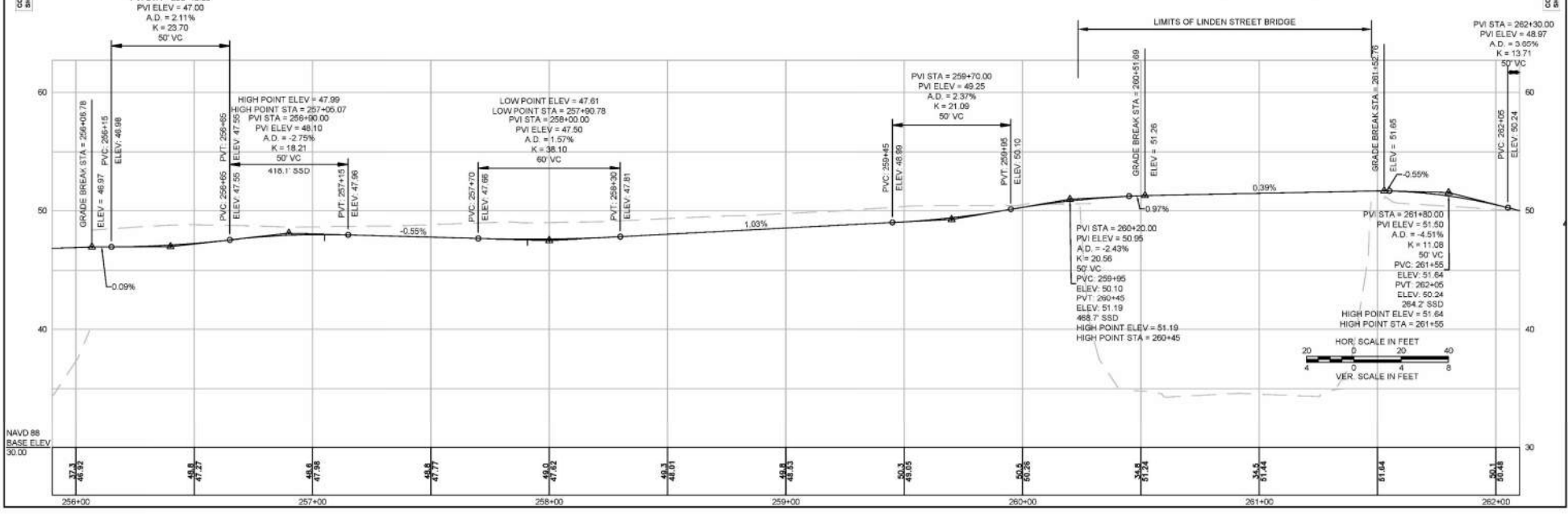
View of stream system downstream of Linden St Culvert #2

Rail trail is currently under construction, including access ramp off Linden Street

WALTHAM WAYSIDE TRAIL			
STATE	FED AID PROJ NO.	SHEET	TOTAL
MA	-	27	114
PROJECT FILE NO.		17112.00	
CONSTRUCTION PLAN - 18			



NOTE
 LAND WITHIN THE LIMIT OF DISTURBANCE LIES WITHIN THE
 200' RIVERFRONT AREA UNLESS OTHERWISE NOTED



TECHNICAL DRAWING
 SHEET NO. 28

NAVD 88
 BASE ELEV
 30.00

NOT A
 FINAL
 ASSESS
 CONTINUED ON
 SHEET NO. 29

8/20/2010 1:03 PM



Rail Trail Construction
3/1/2023

Summary of Proposed Work

- The goal of the proposed work is to protect Linden Street from the year 2070 10-year flood. That equals 6.12 inches of rain in 24 hours.
- The project consists of :
 - Phase 1:
 - Creation of flood protection at “first” Linden Street culvert and along Linden Street
 - Compensatory flood storage
 - Phase 2:
 - Creating stream “bypass” channel and additional flood storage area
 - Streambank stabilization
 - Repair and replacement of existing hardened streambanks
 - Sediment and organic debris removal
 - Creation of habitat

Phase 1 will Help Manage Current Flooding

- The graphics below are showing a comparison for the Flood Barrier + Headwall Implementation under a Present Day 10-Year 24-Hour rain with 5.1-inch precip. volume.
- Under existing conditions, Linden street is experiencing a flood depth of 0.96-ft, which is predicted to be eliminated from this approach.

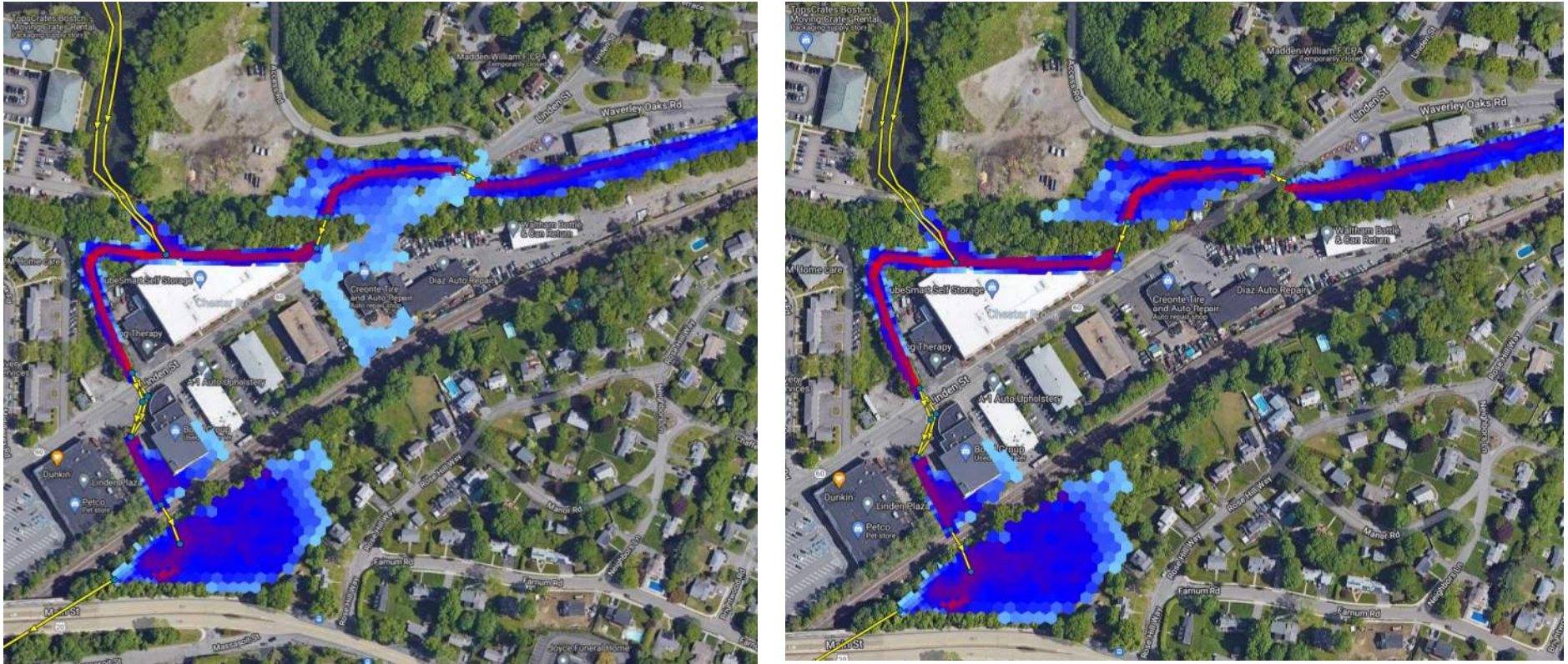


Figure visualizes the 2D model results for the 10-year 24-hour rain event pre- and post- Flood Barrier and Headwall Improvements.

Phase 2: Creating Stream Bypass /More Flood Storage

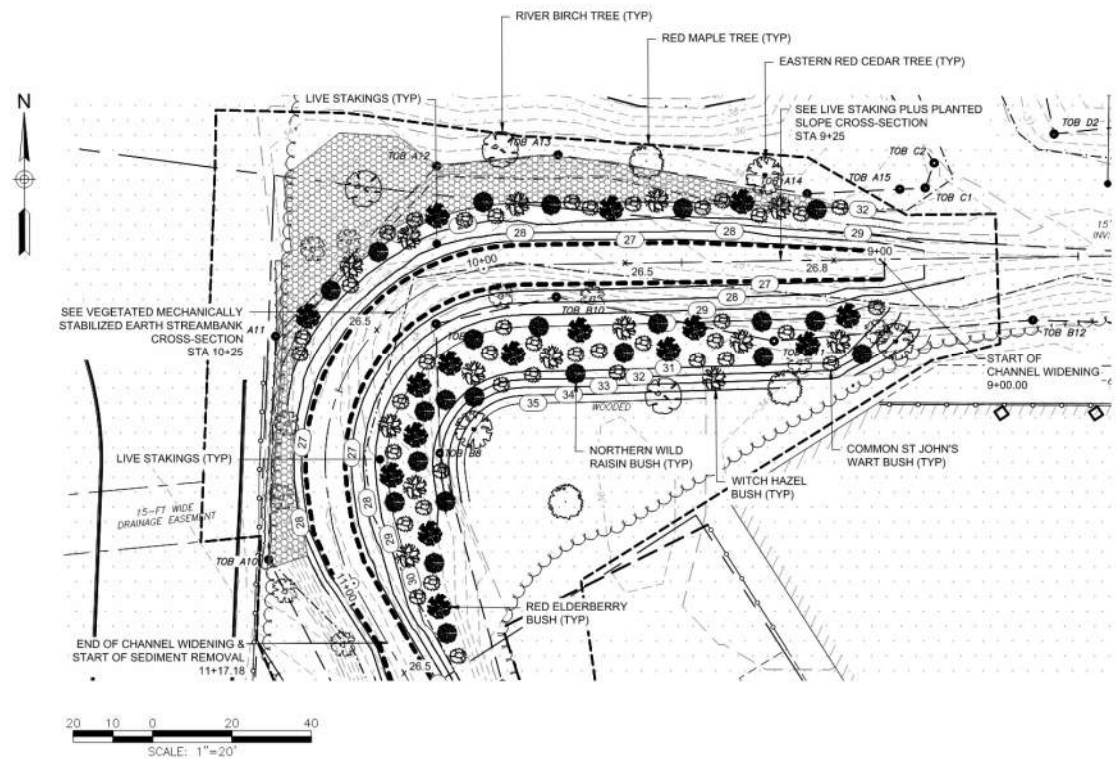
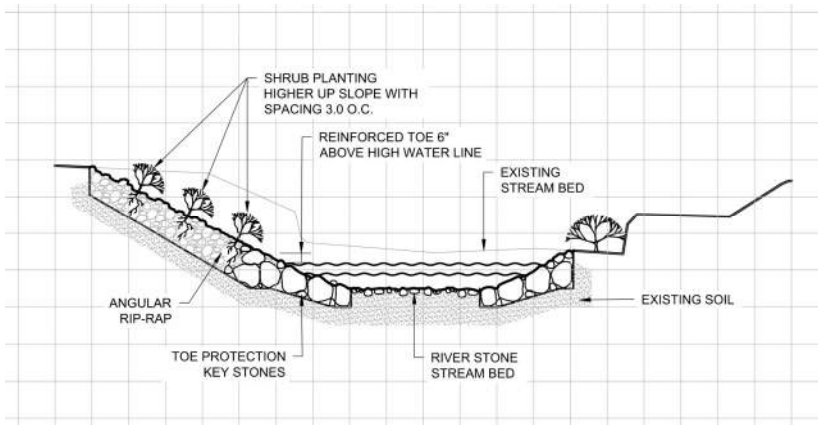
- Proposed bypass channel to reconnect historic floodplain

Potential bypass channel



Phase 2: Streambank Stabilization

- Adding native plantings
- Stabilizing stream bank “edges” at toe of slope



Phase 2: Repair and Replacement of Hardened Streambanks

- New structural wall next to 90 Linden Street
- Repairs to wall next to Middlesex Road access drive



Phase 2: Sediment and Organic Debris Removal

- Stream walks, survey, and modeling have shown buildup of sediment impacts hydraulics of channel and habitat.
- Removal improves flow and reduces flooding



Figure visualizes the 2D model results for the 2-year 24-hour rain event pre- and post-maintenance dredge.

Anticipated Schedule

- **Spring 2023: MEPA Filing (Environmental Notification Form)**
- **Summer 2023, if approved: Review of Phase I Linden Street Flood Mitigation Project by Waltham Conservation Commission**
- **Fall 2023, if approved: Bidding Phase I Linden Street Flood Mitigation Project**
- **Spring 2024, if approved: Construction of Phase I Linden Street Flood Mitigation Project**
- **Fall 2023 through Fall 2024: Permitting of full project**
- **Spring 2025: Bidding of full project & construction in 2025/2026**

Questions?

This project was partially funded by the Massachusetts Executive Office of Energy & Environmental Affairs' Municipal Vulnerability Preparedness (MVP) Action Grant program, which provides support for cities and towns to begin planning for climate change and to implement projects to build local resiliency.

