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Melrose Terrace Floodplain Restoration

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Damage from Tropical Storm Irene

Housing flooded & evacuation needed

- Water jumped river bank and travelled behind and between buildings





Damage from Tropical Storm Irene

Significant damage to buildings, roads, property

- Volume & velocity of water caused erosion and scour
- The most damage was not closest to the river





Flood Mitigation Analysis / Project Identification

2012 – Whetstone Brook Flood Analysis

- Examined broad mitigation alternatives at Melrose Terrace, Hayes Court, Glen Park, and Mountain Home
- Sketch level alternatives for Melrose Terrace

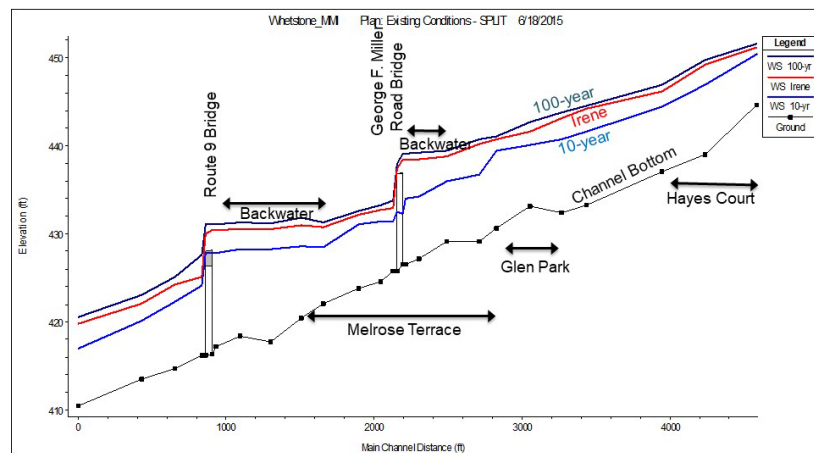
2015 – Vermont Economic Resilience Initiative (VERI)

- Examined broad mitigation alternatives across many municipalities
- Melrose Terrace project described / recommended

2015 – Hydraulic Modelling & Alternatives Analysis

- Detailed hydrologic and hydraulic modelling
- Alternatives for flood reduction
- Concept design

Profile: Existing Conditions



CHALLENGE

Who spearheads these efforts?
How are they paid for?

Melrose Terrace Floodplain Restoration

Removing buildings & people & infrastructure from most vulnerable locations

- Remove 11 buildings
- Relocate road
- Relocate sewer main / utilities

Increase floodplain storage capacity

- Remove 28,000 CY fill in floodplain & lower land average 5 feet
- Plant restored 4.4-acre floodplain with native vegetation



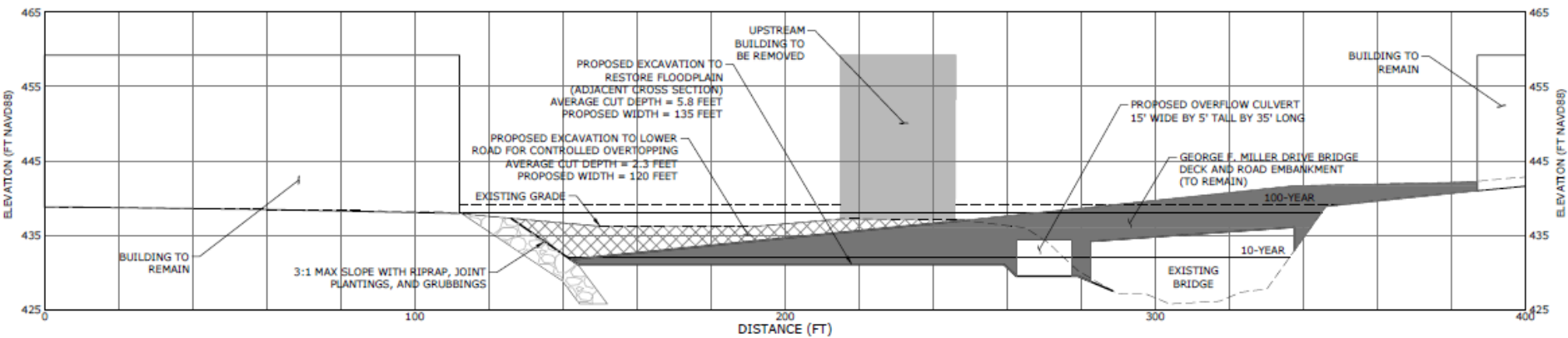
Melrose Terrace Floodplain Restoration

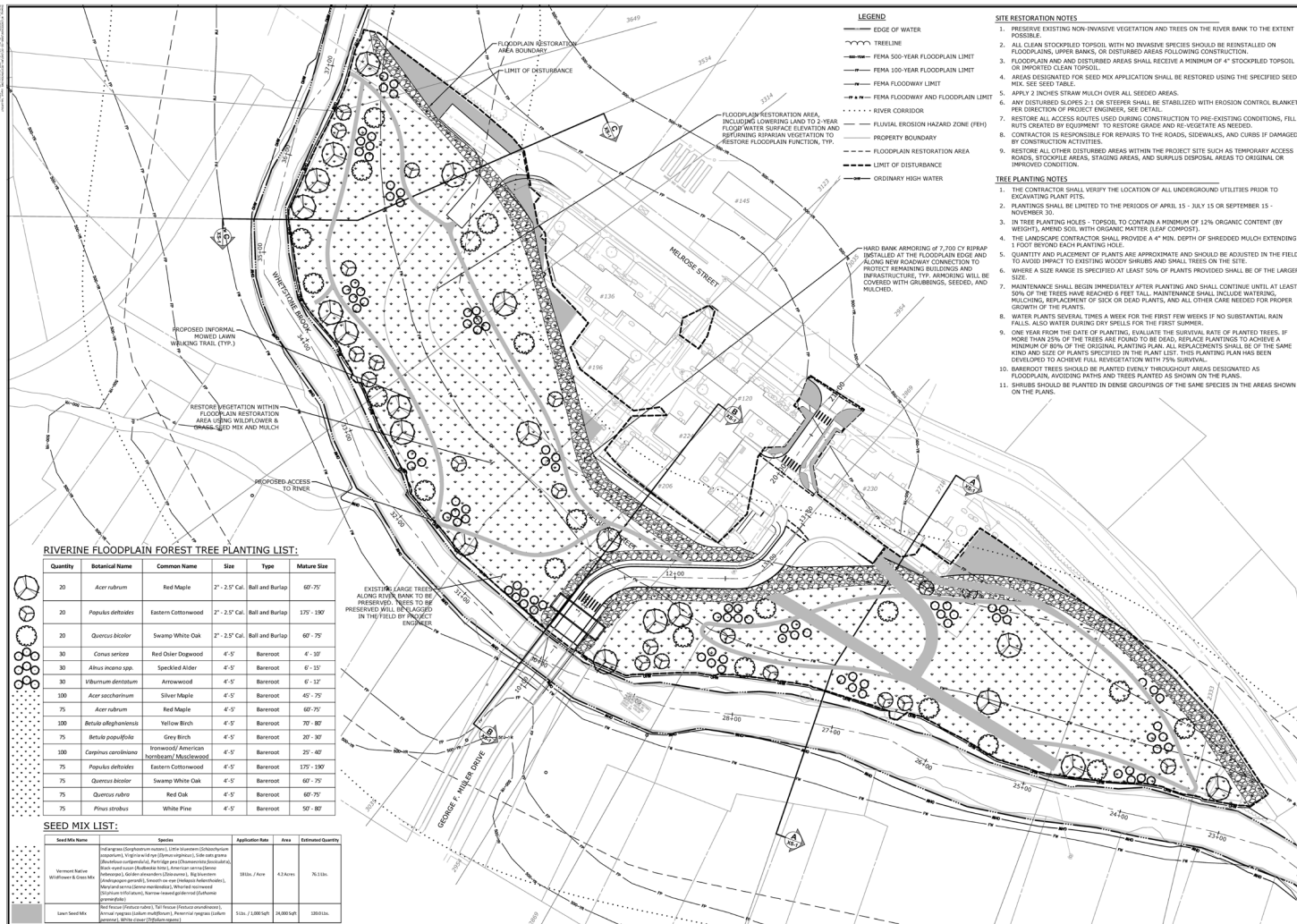
Bridge capacity improved

- Overflow culverts
- Lower road embankment to allow to overtop – road will flood before buildings and before bridge damaged
- Storms >25-year flood had overtopped
- Backwatering raised water 5.5 feet upstream for Irene flood



CROSS SECTION VIEW - B - 29+79





DATE: _____

DESCRIPTION: _____

PR - RESTORATION
FLOODPLAIN RESTORATION PROJECT
WHETSTONE BROOK AT MELROSE TERRACE
BRATTLEBORO HOUSING PARTNERSHIPS
BRATTLEBORO, VERMONT

JCL	JCL	RRS
DATE	DATE	DATE
17402		
JULY 23, 2021		
5896-02		
05 OF 18		
PR-3		



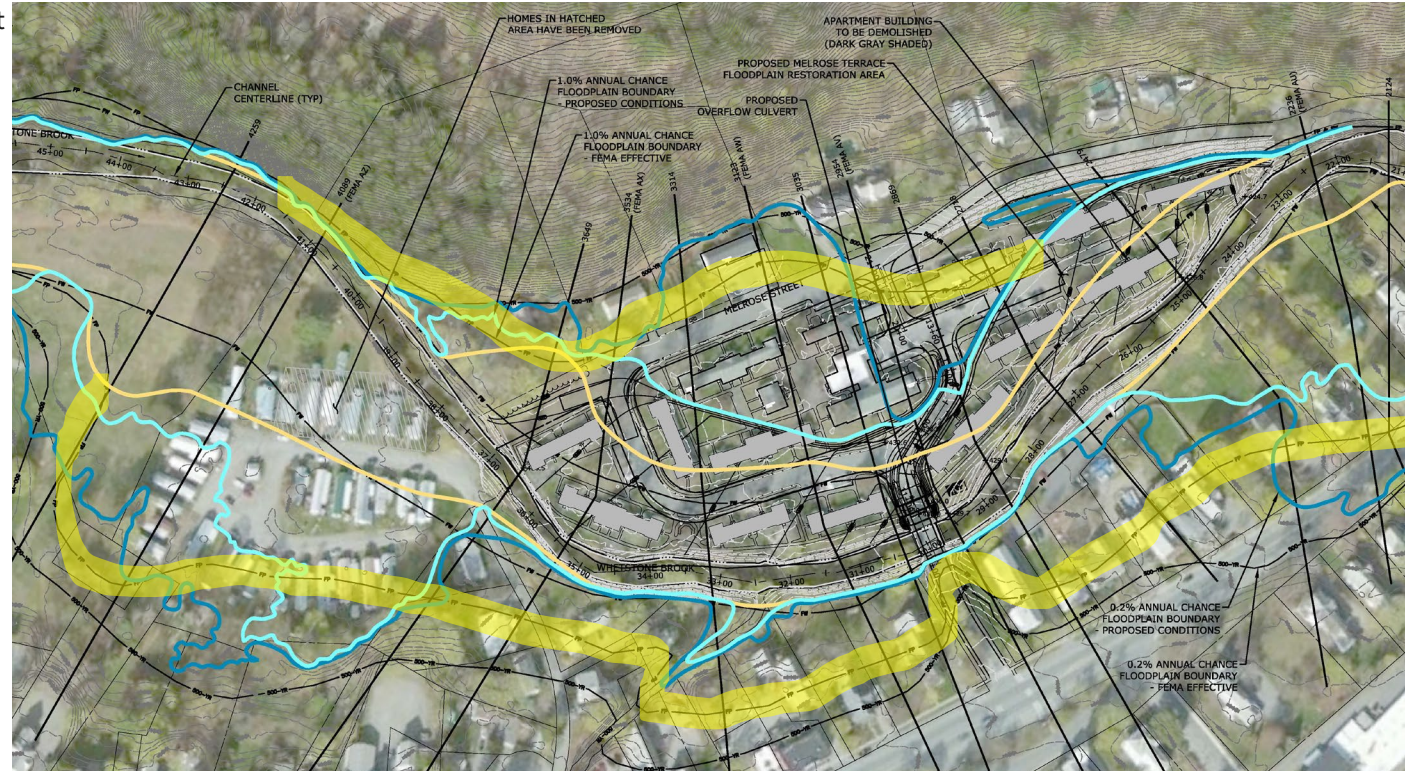
Melrose Terrace Project Benefits

2017 – FEMA Benefit-Cost Analysis

- Building acquisition
- Modelled flood elevation reduction at buildings
- Floodplain ecosystem benefits
- Benefit-Cost Ratio = 2.5

Flood Reduction

- Remaining onsite buildings removed from floodplain
- Reduced flooding across river and upstream
- Irene flood size water elevation reduced:
 - Glen Park = 1.9'
 - Upstream GF Miller = 2.9'
 - Downstream GF Miller = 1.1'
 - Melrose Street = 3.0' - 7.0'
- Flood storage and debris catchment may reduce damages downstream





Melrose Terrace – Completed Project 2022



Pre-construction (Hartgen)



Post-construction



Melrose Terrace – Completed Project

10/28/2020



Pre-construction

6/19/2023



Post-construction

Melrose Terrace – Flooding Post-Construction



River using floodplain

- Meander bend created on upper floodplain, where previously straightened
- River accessed floodplain 4 times
- Flows are slowed, depositing sediment and reducing erosion capacity

7-12-2023



12-23-2022





Melrose Terrace – Flooding Post-Construction

Remaining buildings and infrastructure safe

- Water stayed within the designated onsite areas
- 4.4 acres floodplain covered with feet of water
- Buildings not flooded
- Road overtopped as planned

Flood elevations reduced

- July 10, 2023 estimated approximately 10-year flood based on rainfall (not gauged)
- Modelling predicts this flood had 1.0-2.5 feet lower flood elevations than if project not completed

10-17-2023



10-17-2023

