



RELIEF DRAINS AND DAYLIGHTING

Approaches to Solve Neighborhood
Street Flooding and Stream Velocities



SPEAKERS



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AGENDA

- Project Background and Objectives
- Preliminary Drainage Assessment
- Project Phasing and Procurement
- Phase I Construction
- Next Steps



PROJECT BACKGROUND

Kiln Brook Watershed

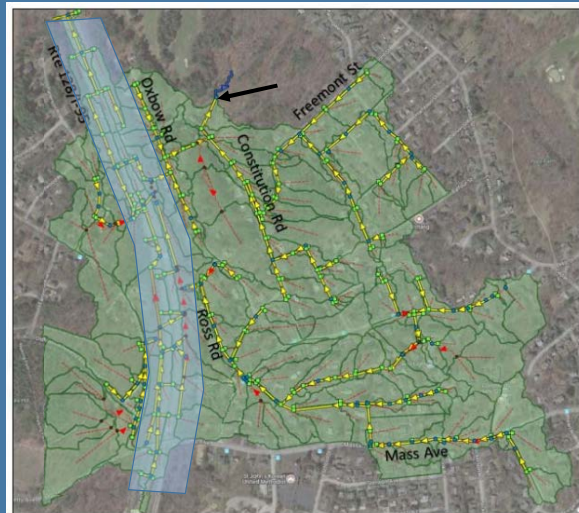


JULY 2017 STORM EVENT



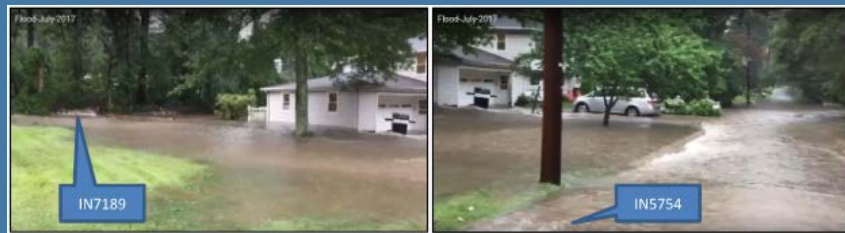
PROJECT AREA

- Large watershed - 179 Acres
- Residential neighborhood and 128/95 drainage areas
- Closed and Open Drainage System components
- Culverted portion of Kiln Brook



ISSUES

- Topography and Impervious Area
- Intense rainfall events
- Overland flooding and street ponding
- Drainage system capacity, operation and maintenance



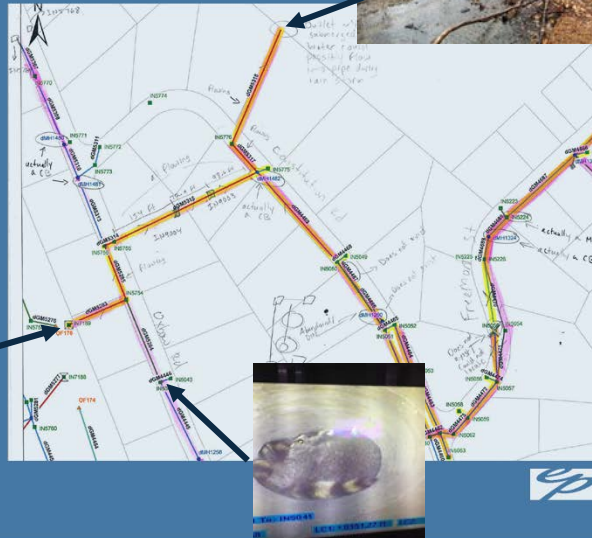
PRELIMINARY DRAINAGE ASSESSMENT

Existing Conditions



EXISTING CONDITIONS ASSESSMENT

- Data and Record Plan Review
- Site Recon – Dry and Wet Weather
- CCTV
- Flow Monitoring



PRELIMINARY ASSESSMENT

- Update Drainage System GIS
- Delineate Watershed
- Land Use Data
- Soils and Bedrock Geology
- Design Storms



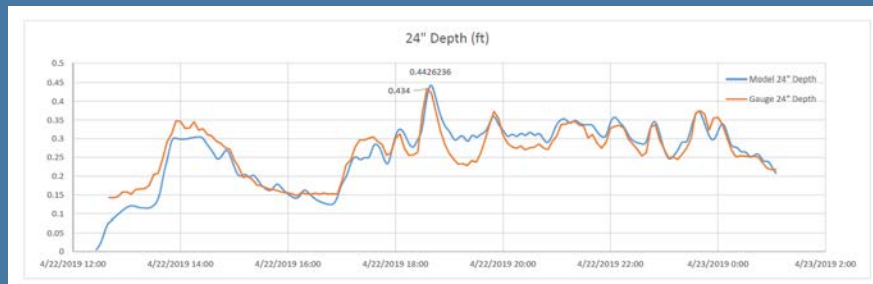
HYDROLOGIC AND HYDRAULIC MODEL DEVELOPMENT

- Developed a watershed scale drainage model using PCSWMM
- Analyzed existing conditions under design storms and July 2017 storm event

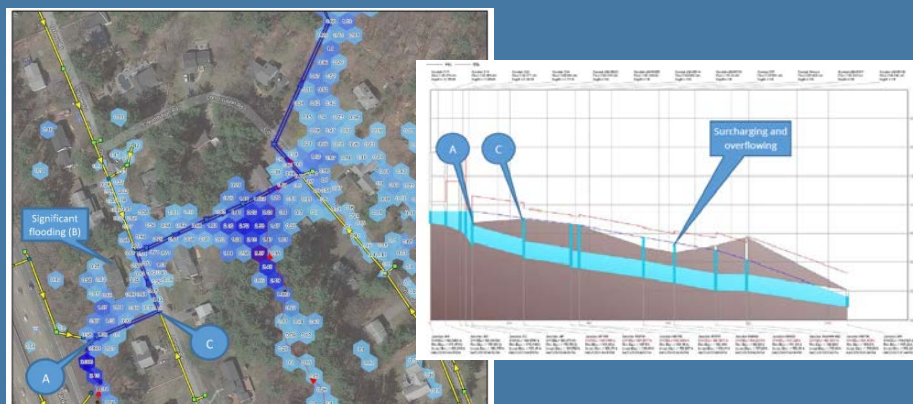
Table 1 – NRCC/NRCS Design Storms
(Inches of Rainfall)

Frequency	6 hour	24 hour
2 year	2.01	3.17
5 year	2.55	4.01
10 year	3.07	4.79
25 year	3.89	6.07

Source: <http://precip.eas.cornell.edu/>

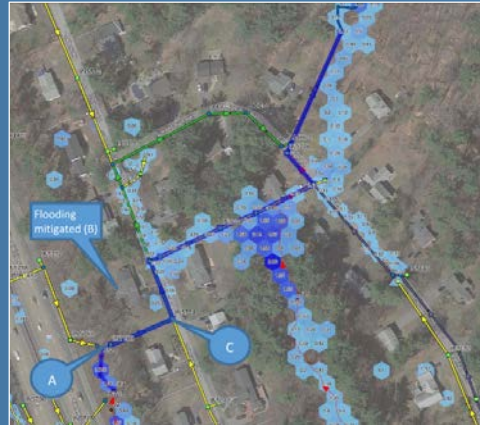


EXISTING CONDITIONS ANALYSIS



ALTERNATIVES ANALYSIS

- Minimize street ponding and overland flow
- Evaluate potential upstream detention/infiltration opportunities
- Prioritize improvements within ROW/existing easements
- Segregate Municipal and DOT drainage

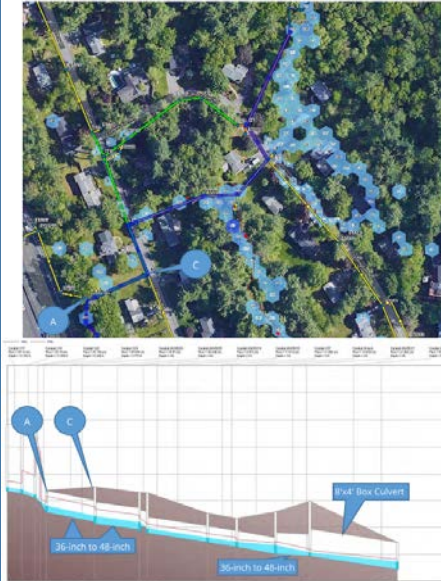


RECOMMENDED APPROACH



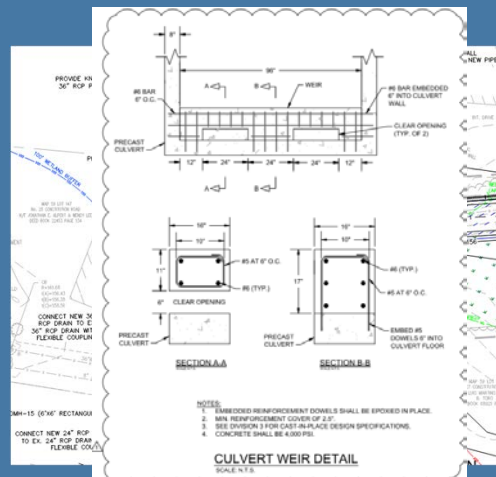
RECOMMENDED APPROACH

- Daylight approximately 175 feet of Kiln Brook outfall
- Install relief drain from Oxbow Road to Kiln Brook outfall
- Increase the size of drains on Oxbow Road and Constitution Road
- Restoration of stream bed and wetland area
- Public outreach to abutters
- Post-Construction Metering and Modeling



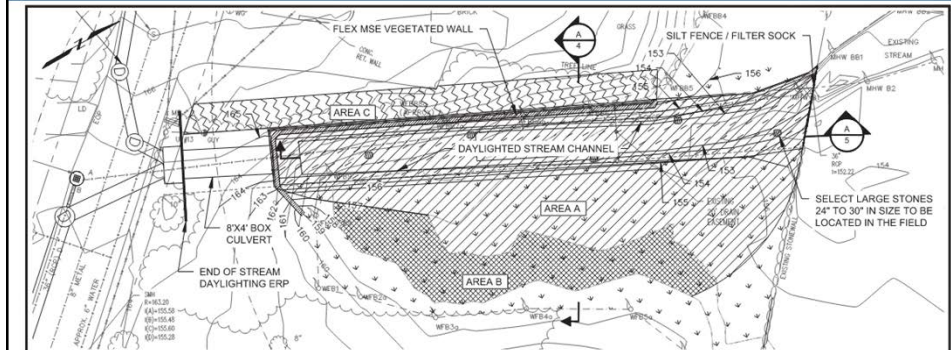
PHASE I - DRAINAGE IMPROVEMENTS

- Upsize approx. 100 feet of existing drain
- Install Phase II relief drain connection
- Install special manhole for connection to box culvert
- Install weir within culvert
- New deep sump catch basins, road restoration

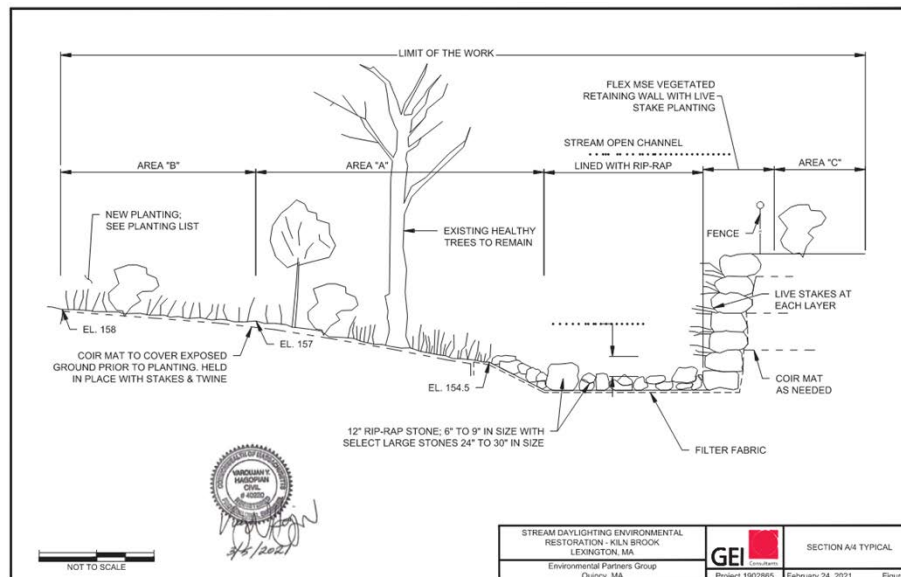


STREAM DAYLIGHTING AND WETLAND RESTORATION

- Approx. 30 feet of 8-ft x 4-ft box culvert
- Approx. 175 feet of Engineered stream channel
- Vegetated retaining wall
- Terraced stream bank
- Native wetland plantings / invasive species removal



STREAM DAYLIGHTING AND WETLAND RESTORATION



PHASE I CONSTRUCTION KILN BROOK DAYLIGHTING

August to December 2021

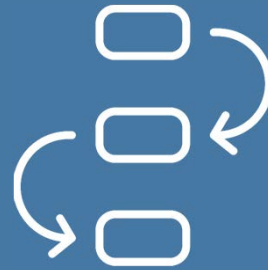


CONSTRUCTION TEAM



SEQUENCE OF WORK

- Pre-Purchase Drainage Structures
- Erosion Controls
- Clearing and Grubbing
- Bypass and Dewatering
- Stream Rough Grading
- Vegetated Retaining Wall
- 5' H x 8' W Culvert
- Wetland Plantings
- Culvert to Local Drainage Connections
- Site Restoration



PRE-CONSTRUCTION AND CLEARING AND GRUBBING



BYPASS OPERATIONS



CONSTRUCTED STREAM





JUNCTION BOX AND CULVERT

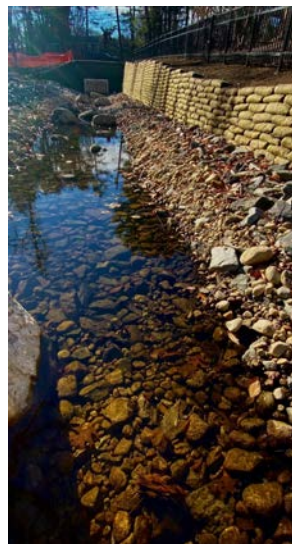


ROADWAY DRAINAGE IMPROVEMENTS



NEXT STEPS

- Wetlands permitting for Phase II Improvements – Oxbow headwall – Winter 2022
- Complete upland landscaping from Phase I – Spring 2022
- Prepare Bid Documents for Phase II Improvements
- Evaluate performance of Phase I/II Improvements – Flow Metering and Modeling



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Q&A

Constitution Road Drainage Improvements
& Kiln Brook Daylighting

