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Background

The state owned property, 39 Woodland Street, Hartford, CT, has a large parking lot in close proximity to the Park River. Site design alternatives utilize bioretention basins to reduce runoff volume and sediment and pollutant loading to the North Branch of the Park River in an attempt to mitigate issues of flooding, erosion, and other harmful effects to the stream ecology.

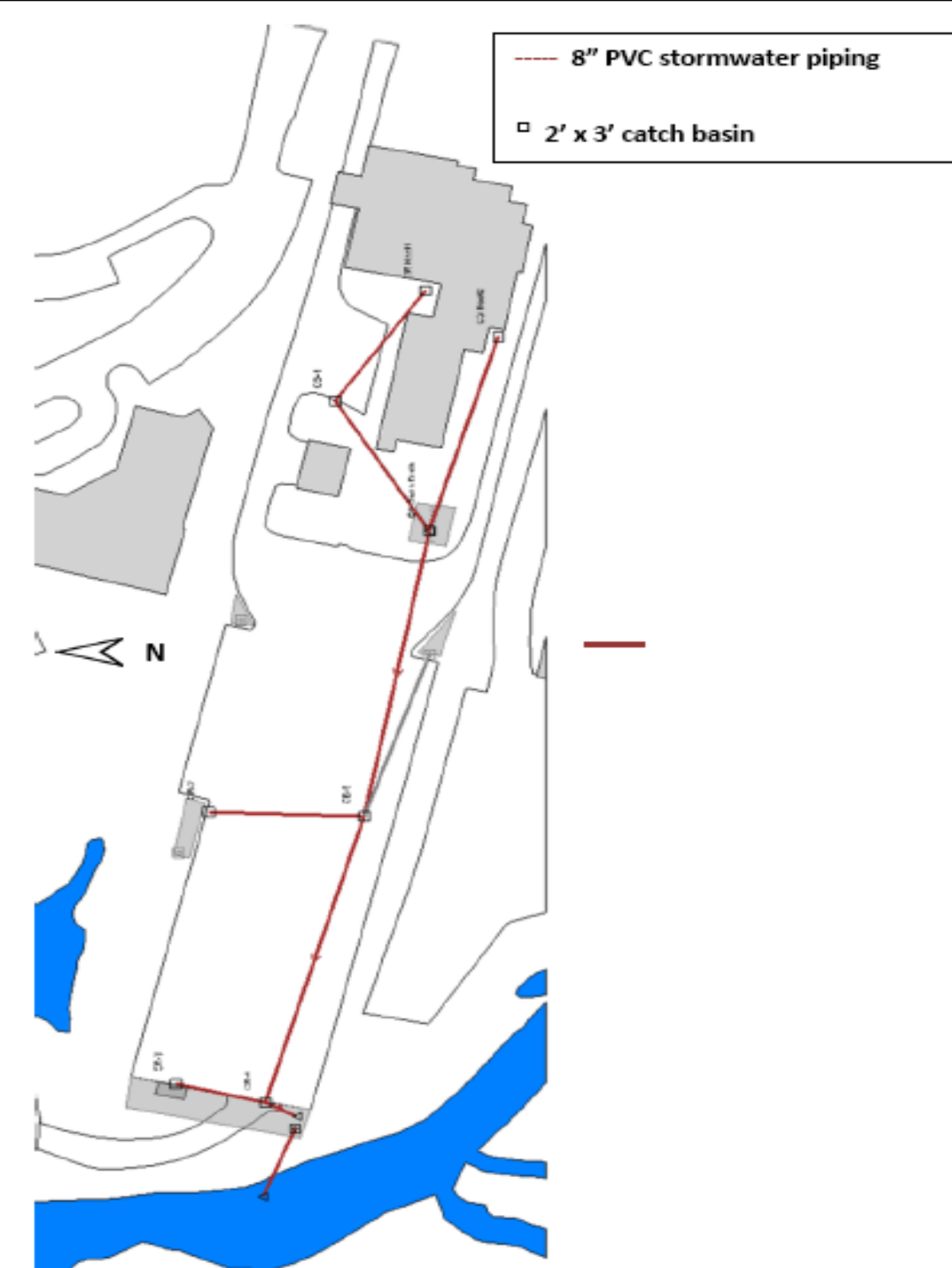
Objectives

- Reduce peak flow off the lot
- Reduce sediment release into the river
- Return hydrology to pre-development conditions
- Improve water quality of stormwater runoff
 - Capture & treat first 1" of runoff

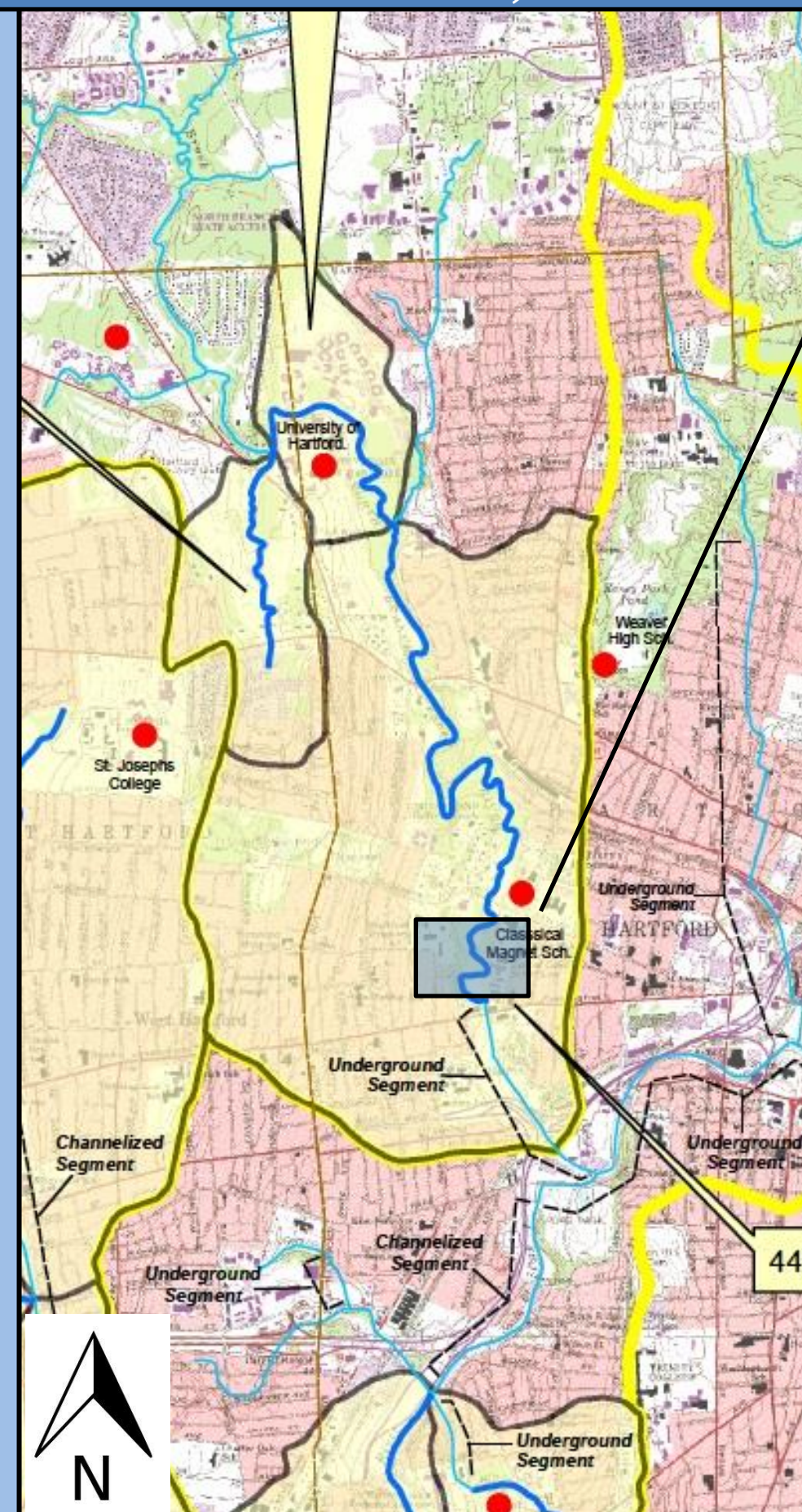
Design Analysis

The proposed design incorporates a system of six bioretention basins that are fully distributed over the entire parking lot. The combined effect of these basins is the interception and capture of stormwater before it reaches existing catch basins, preventing stormwater flow for the 1" 24-hr storm.

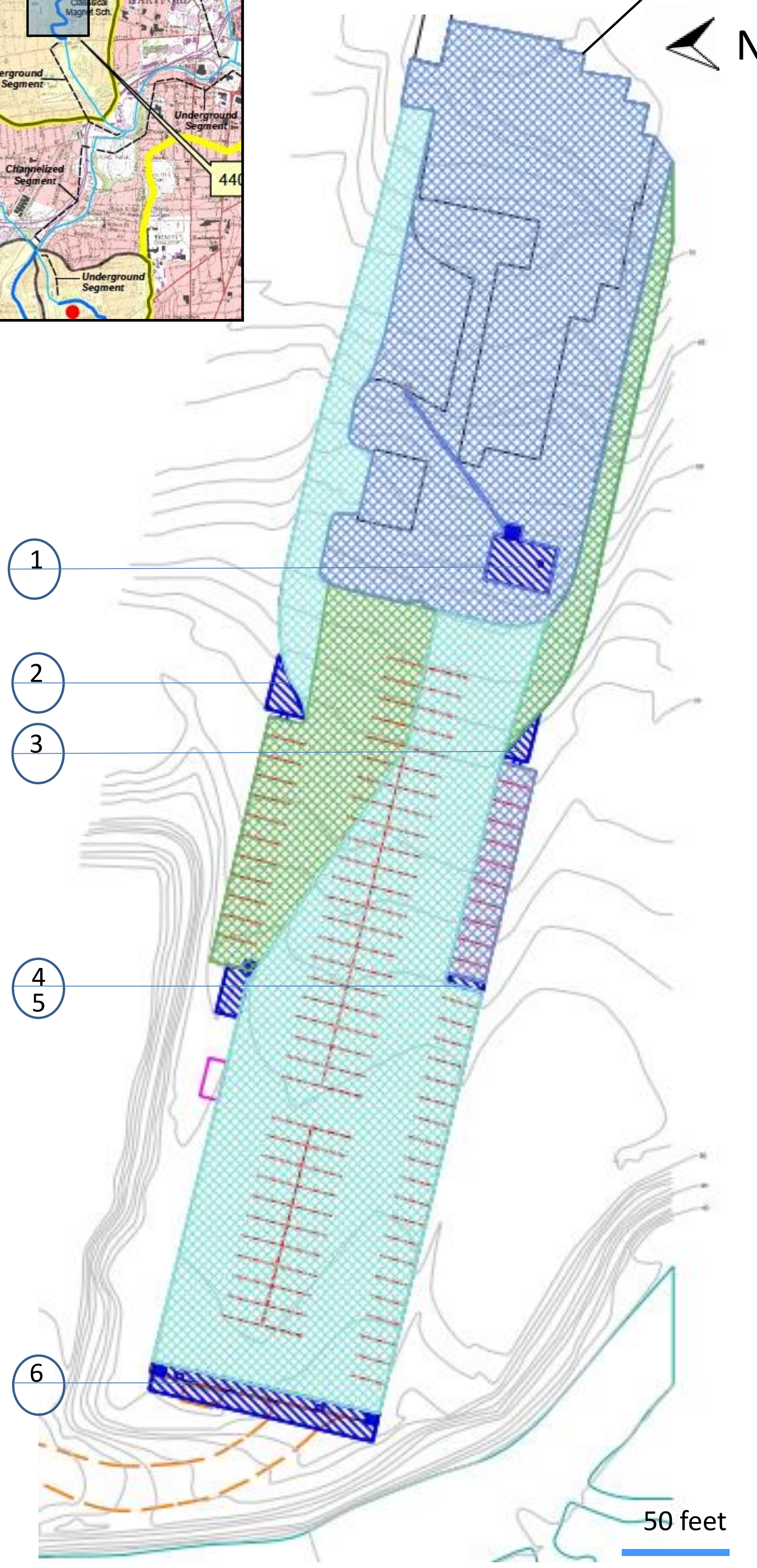
Bioretention basins were selected as the optimal SCM since they are effective at reducing runoff volume through capture and storage both above grade and in engineered soil media, and physical and chemical treatment occurs in their beds. They have been shown to remove a more diverse array of pollutants than other SCMs. This design eliminates the need to alter existing stormwater infrastructure and eliminates the need for an expensive retaining wall. This selection was based on a mid-range price, flexibility in installment location, and diversity in water quality control mechanisms.



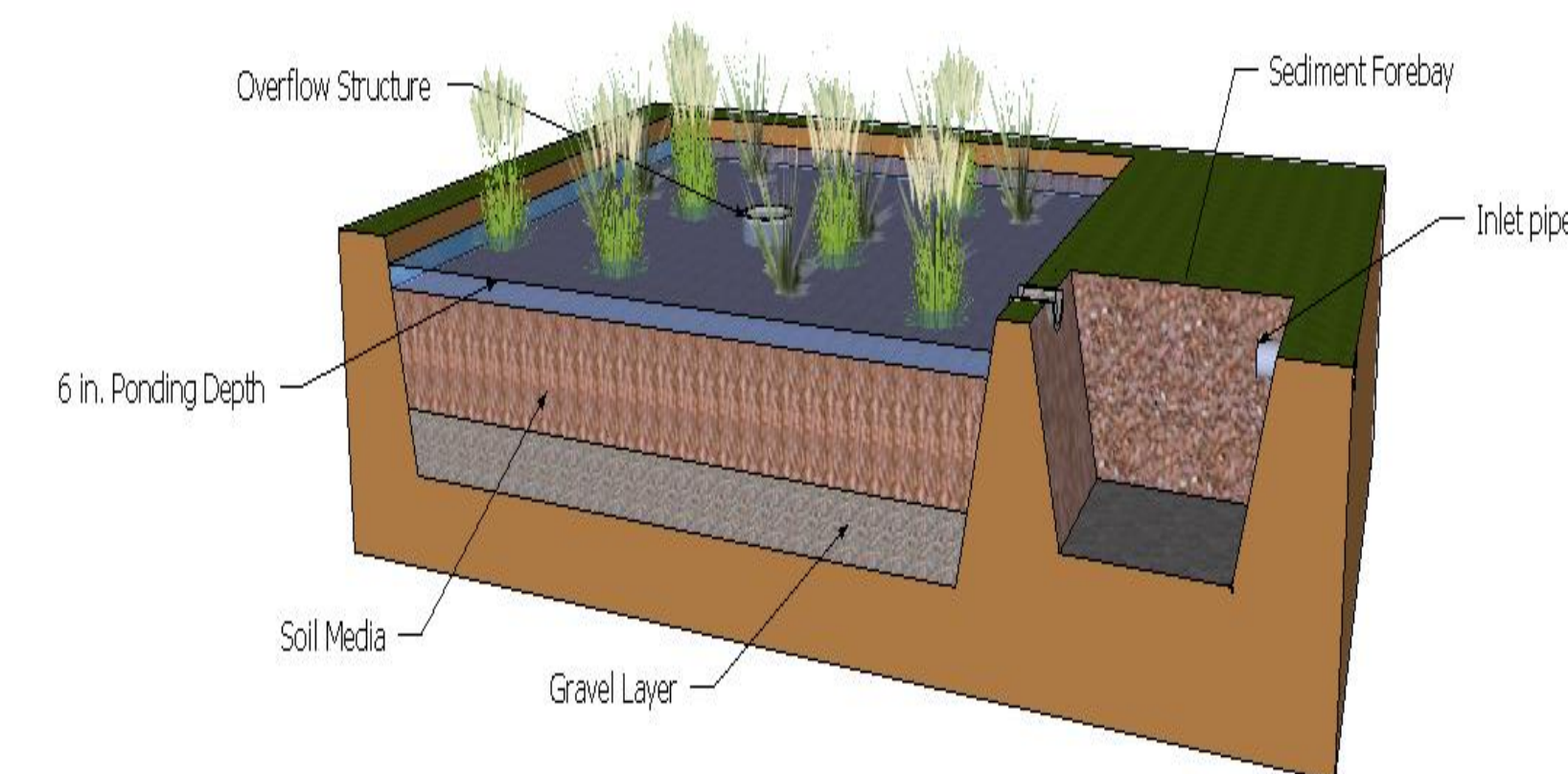
Hartford, CT



39 Woodland St Parking Lot



Bioretention Basin

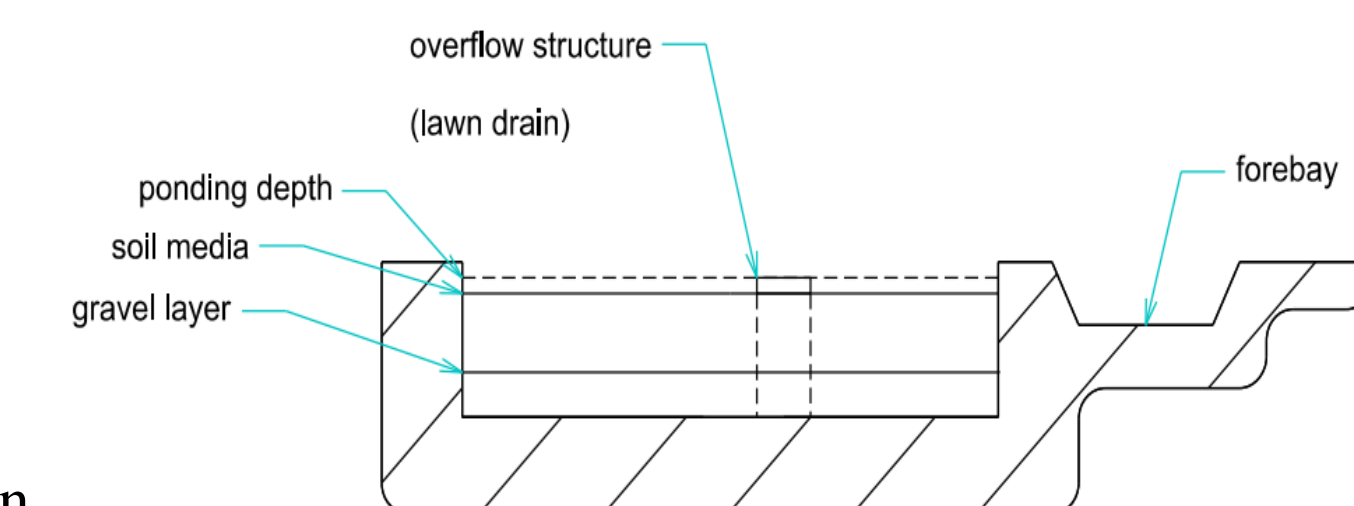


Forebay- collects sediments before entering the system

Soil Media- filters out pollutants; can be planted

Gravel Layer- allows for storage and additional filtration

Overflow Structure- captures excess water; directs into stormwater infrastructure



Runoff Capture

Bioretention Feature	Runoff Capture Volume (ft ³)
1	960
2	330
3	190
4	350
5	100
6	1970
Total Water Capture	3900

Design Evaluation

- Captures runoff close to source(s)
- Does not require significant alterations to stormwater infrastructure
- Economically feasible
 - Initial construction- \$43,200
 - Maintenance (annual)- \$5,000
- Provides opportunities for volunteer work in lawn areas

Special thanks to our advisors Dr. Vadas and Dr. Bushey, our project manager Mary Pelletier, Dan Bowdler, Dr. Yut, Dr. Bagtzoglou, Dr. Warner, and our senior class.