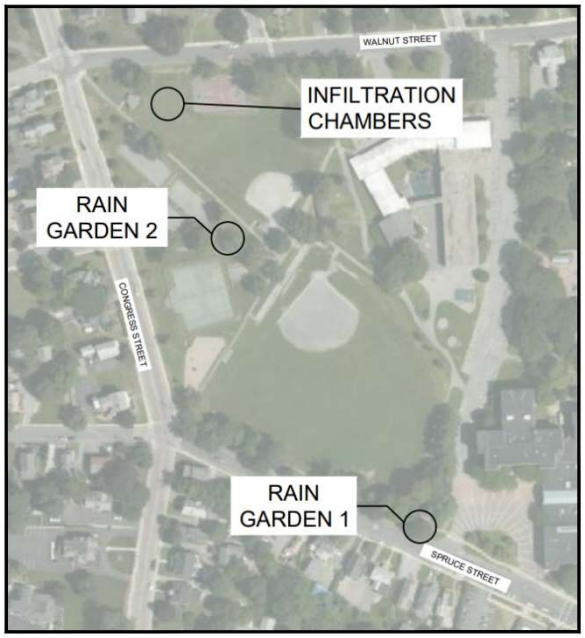
Frequently Asked Questions about Design and Construction of Drainage Improvements in Milford Town Park

How did this project come about?
During 2018 through 2020, Charles River Watershed Association (CRWA) and the Town of Milford work together to prepare a "Subwatershed Restoration Plan" for Milford Pond. The Restoration Plan: (1) Identifies opportunities for infiltrating stormwater runoff to increase groundwater levels and consequently flow in the Charles River (2) Proposes stormwater treatment systems across the subwatershed to comply with the Town's stormwater permit (known as the MS4 permit); (3) Prioritizes key natural areas for protection and conservation to promote healthy land and river use in Milford; and (4) Identifies strategies to help the Town adapt to some expected impacts of climate change including: flooding, increased temperatures, and drought

The site was identified along with many other locations in the Restoration Plan. Milford Town Park was selected as a priority site in part for its large available spaces, good underlying soils for infiltration, and gentle grade to collect runoff from surrounding streets. The Town-owned park contains baseball fields, basketball courts, tennis courts, open grassy areas, and walking paths which are utilized for a variety of recreational activities including concerts and festivals. The park is also centrally located and adjacent to Memorial Elementary School and Stacy Middle School. Its frequent use, proximity to schools, and location near the Town center were major factors in prioritizing this area. Other priority sites identified in the Restoration Plan include Fino Field, Downtown Milford, Tank Field and Brookside Elementary School.

Where is the project located?
Town Park is bordered by Walnut Street, Congress Street, and Spruce Street, in Milford, MA. The infiltration system is proposed to be underground to the west of the basketball courts. One of the rain gardens will be located to the south-east of the tennis courts and the other rain garden will be located at the southern corner of the park next to Stacy Middle School.



How much is the project going to cost? This work was partially funded by a Municipal Vulnerability Preparedness (MVP) Action Grant awarded to the Town by the Executive Office of Energy and Environmental Affairs. The grant is for approximately $419,000. A match of approximately $163,000 consists of a combination of cash from CRWA and in-kind services from Town staff. The grant covers the design and construction work, including extensive education and outreach

What will the project do?
Infiltration captures phosphorus and rain gardens filter pollution. Collectively, the system will reduce the amount of phosphorus entering the Charles River by approximately 25 pounds each year. These systems also limit flooding by reducing the volume and peak rates of runoff and will infiltrate 0.5 acre-feet of rain per year to groundwater, which translates into the total volume of over 55 concrete mixer trucks on a yearly basis.

How does the infiltration system work?
Underground infiltration chambers are designed to store and infiltrate the stormwater.

1. ***Collect***: Stormwater runoff is diverted from the existing drainage system.
2. ***Capture Sediment***: Sand and debris settle out within the separator row, the first row of chambers wrapped in filter fabric.
3. ***Move Water:*** Stormwater is directed through the chamber system via a closed, external pipe/manifold system.
4. ***Treat and Manage***: Stormwater is stored in the chambers and infiltrates into the subsurface soils.
5. ***Overflow:*** Runoff from larger storms will overflow the manifold and return to the existing system, or bypass the system at the upstream diversion manhole.

The chamber system will divert runoff from the almost 22.5 acres of catchment that covers adjacent neighborhoods that currently flows through the existing pipe network. Once diverted, the chambers will remove 80 percent of Total Suspended Solids (TSS) and infiltrate 75% of the Water Quality Volume (1-inch) storm. Larger storms will bypass the chamber system. The chamber system contains a “separator isolator row,” which captures sediment and allows for maintenance.

How do the rain gardens work?
Rain Gardens (also called “bioretention” areas or systems) have layers of soil and sediment and native plants that help filter and cleanse the water. Bioretention areas are a type of green infrastructure design that fit naturally into a site with minimal impact to the surrounding resources while providing the maximum water quality benefits for the pollutants of concern.

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1. ***Collect***: Stormwater runoff is directed to broad dip inlets(s) where stormwater enters the system.
2. ***Capture Sediment***: Sand and debris settle out within the sediment forebay.
3. ***Move Water:*** Stormwater exits the forebay flowing over a stone check dam to enter the Bioretention Area and Vegetated Swale. The Swale both treats the stormwater and conveys it slowly downhill.
4. ***Treat and Manage***: Plants in the vegetated swale help to slow the water down and treat water that filters through the soil and plant roots. Bioretention media and vegetation remove nitrogen and bacteria, and allow stormwater to infiltrate into the soil.
5. ***Overflow***: Level Spreader/Overflow Spillway: Runoff from larger storms will flow over the level spreader to the overflow spillway.

The rain garden in the park will treat runoff that flows onto the three tennis courts and the surrounding grassed area. This area currently flows to an existing catch basin located in a low point of a grassed area, which connects to the Walnut Street drainage system. The drainage area for this system is 0.85 acres, of which 34% is impervious cover. Runoff will flow into the bioretention system via grass swales. Due to high groundwater at this location, the bioretention will have an underdrain to collect treated runoff and discharge it to the outlet structure. The existing catch basin will be removed, and a new

structure will be connected into the existing pipe outlet that ultimately connects into the existing Walnut Street drainage system. The rain garden will capture and treat the first 1 inch of runoff. The runoff will be filtered through the bioretention soil to remove sediments and pollutants, then directed back into the existing drainage system via an underdrain. Volumes greater than the first 1 inch are directed into the existing drainage system via an overflow structure.

The rain garden by Stacy Middle School captures runoff from the surrounding pervious and impervious park area consisting of most of the baseball field and a portion of the tennis courts. This area currently flows to an existing catch basin located behind the backstop. This catch basin appears to be clogged with litter and there is evidence of ponding behind the backstop that overflows down a slope to the school dropoff area adjacent to Spruce Street. There is evidence of erosion and a flow path has formed down the steep slope. The drainage area 3.49 acres, of which 17% is impervious cover. The stormwater will be directed to the bioretention area and the first 0.6 inches of runoff will be treated by filtration through the soil to remove sediments and pollutants and infiltrated. Volumes greater than the first 0.6 inches will be directed back into the existing system via an overflow structure to the existing Spruce Street drainage system. The treatment train will include two deep sump catch basins, an infiltration trench, and a bioretention area. An additional emergency spillway is proposed to safely convey runoff from larger storm events across the paved driveway and into the existing drainage system via a catch basin.

Can this be implemented in other places in Milford?
Yes, CRWA and the Town identified 69 locations in our Milford Pond Subwatershed Restoration Plan to implement similar green infrastructure projects. Some of the other high priority locations are Fino Field, Downtown Milford, Tank Field, and Brookside Elementary School.

How is it going to be maintained?
The Parks Department will maintain the rain gardens and the Highway Department will maintain the infiltration system. A comprehensive Operation & Maintenance Plan has been prepared.

Will you add other features to the project?
The project will include interpretive signage at each system. Signage will explain why the systems are there, that they do, and how individuals can help on their own property. Information is planned to be presented in multiple languages, as well.

What is the schedule for seeing these built?
As of June 30, 2021, the draft designs are nearly complete. Final designs and bidding documents will be prepared and finalized during Summer and Fall 2021, with bidding in Winter 2021/2022 and construction in early spring 2022. Construction timing will consider park use, annual town events, and safety of students and pedestrians.

Who has been working on this project?
A dedicated team of Milford's municipal staff have been dedicated to seeing this project come to fruition:

- Michael Dean, PE, Town Engineer
- James Asam, Parks and Recreation Administrator
- Scott Crisafulli, Highway Surveyor

Engineering design is by the Horsley Witten Group. CRWA is leading public outreach and overall project management.