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# Rain Gardens are Beautiful and Beneficial

By Maria Rose, Environmental Engineer at City of Newton

**R**ain gardens are stormwater management systems designed to receive, infiltrate, and cleanse concentrated flows of stormwater. They collect polluted runoff from impervious surfaces (e.g., roofs, driveways, parking lots, and streets), allowing it to soak into the ground, where the plants, soil, and beneficial bugs filter out pollutants that are picked up by stormwater as it flows across the land. What pollutants you may ask? Many, including phosphorus, bacteria, and oil to name just a few!

It has been shown that the degradation of our streams and rivers increases with our built environment. Many studies have shown that stream ecosystems and water quality become degraded as impervious surfaces increase. When more than 10% of the land within a watershed is covered with impervious surfaces, streams are often impaired. When impervious cover exceeds 25%, severe habitat and water quality impairment tends to result (source: *Impacts of Impervious Cover on Aquatic Systems, Center for Watershed Protection, March 2003*). Installing rain gardens helps to offset the impacts of development.

There are several rain gardens here in the City of Newton. You can find them at Zervas Elementary School, Oak Hill Middle School, and soon near Crystal Lake.



PHOTO: GENE RAYMOND, RAYMOND DESIGN ASSOCIATES

*Oak Hill Middle School roof runoff is piped to the rain garden, where the water slowly seeps into the ground. During large storm events, overflow is directed to the domed open grate.*

Rain gardens planted with shrubs, grasses, and perennial plants can be a cost-effective and beautiful way to reduce runoff, improve the water quality in lakes, ponds, and streams, replenish aquifers and minimize soil erosion. Rain gardens also provide food and shelter for butterflies, songbirds, and other wildlife.

More complex rain gardens with drainage pipes and amended soils are often referred to as “bioretention.” Both rain gardens and bioretention systems are types of Green Stormwater Infrastructure or more simply, **Green Infrastructure**. Green Infrastructure is the intentional

use of plants, soil, and hydrologic processes to treat runoff in a way that mimics natural

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(undeveloped) conditions. Green Infrastructure also provides ecosystem services and aesthetic benefits to our outdoor spaces.

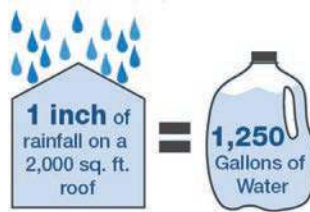


PHOTO: GENE RAYMOND, RAYMOND DESIGN ASSOCIATES

If you would like to suggest a rain garden location within the public right-of-way (e.g., traffic island) for the City's consideration, then reach out to Maria Rose at [mrose@newtonma.gov](mailto:mrose@newtonma.gov).

The first half-inch of runoff from a rainstorm, called the "first flush," is the most polluted and ideally Green Infrastructure designed to capture this first flush. Studies from the University of New Hampshire's (UNH) Stormwater Center demonstrate that capturing the first quarter-inch of runoff also reduces pollution considerably.

**Rain gardens are small but mighty** if properly designed and installed. Depending on your soil type, you may be able to capture and naturally infiltrate your entire roof runoff from a 1-inch storm with a few well-placed rain gardens!



Properly constructed rain gardens are in the natural path of runoff, slightly depressed and designed to infiltrate ponded water in under 24 hours.

Rain gardens can be stand-alone entities or incorporated with existing vegetated areas and provide similar ecological benefits. Here are some factors to consider when locating a rain garden:

- To avoid potential water problems, rain gardens should be placed a minimum of 10 feet from the foundation of your house or structure.
- Avoid placing rain gardens in poorly drained or wet areas. A rain garden is not a water garden. Placing it in poorly drained soil will lead to slow infiltration, long-term ponding, and potentially a mosquito breeding area.

- Flat or modestly sloped areas work best for construction and maintenance.
- Before you dig, always call 1-800-Dig-Safe or visit [www.digsafe.com](http://www.digsafe.com) and call the City's Water/Sewer Division at 617-796-1640 to mark-out the utilities on your property.



Understand your soil type to achieve the best results. One way to determine if your soils are suitable for a rain garden is to perform a small percolation test. Dig a hole about 6 inches deep and 1 to 2 feet wide and fill it with water. If the water drains within 24 hours, the site is suitable for a rain garden. If the water drains within a few hours, the location is also very well suited for a rain garden.

When sizing your rain garden, it may be best to enlist the help of a landscape designer. If you prefer a Do-it-Yourself approach, the University of Connecticut's Center for Land Use Education and Research (CLEAR) program has a wonderful on-line "how to" guide with "rules of thumb," simple sizing calculations, and interactive features to help you design your own rain garden. Check out Rain Gardens: a Design Guide for Connecticut and New England Homeowners (<https://nemo.uconn.edu/raingardens/index.htm>).

Now for the fun part — deciding what plants and shrubs should go in your rain garden! Choosing native plants that can survive New England winters and provide wildlife habitat is an important consideration. There are a multitude of possibilities from traditional perennials like irises and brown-eyed susans to woody plants, such as red twig dogwood and red chokeberry, which provide winter interest. Simply browsing the options can lift your spirits with the promise of springtime and warmer days on the horizon. If you have the space, consider adding a specimen tree, such as Sweetbay Magnolia or a Pin Oak, which can tolerate periodic ponding. Trees soak up more water, add structure to your garden, and provide shade. EPA in collaboration with UNH and others developed a resource guide called Native Plants for New England Rain Gardens (<https://extension.unh.edu/resource/native-plants-new-england-rain-gardens-fact-sheet>). ♦