MAHOPAC
CENTRAL SCHOOL DISTRICT
179 EAST LAKE BOULEVARD
MAHOPAC, NY 10541

MS4PY10 STORMWATER PROGRAM

FACT SHEET #1
NOVEMBER 2019

RAIN GARDENS FOR STORMWATER MANAGEMENT

FOR MORE INFORMATION, CONTACT YOUR STORMWATER COORDINATOR:

MICHAEL SHORE AT:
845-621-6610
OR AT
shorem@mahopac.org

1. WHAT IS A RAIN GARDEN?

Rain gardens are gardens containing plants and grasses that can survive in soil soaked in water from rain storms. A rain garden is a shallow depression of about 5" to 10" that collects stormwater from a roof, driveway, parking lot or yard. The stormwater that collects in the rain garden is discharged as follows:

- **Groundwater Infiltration:** The collected water may infiltrate, if the soils permit infiltration
- **Discharge to the Nearest Storm Drain:** The collected water may be discharged to the nearest storm drain, if the soils are unsuitable for infiltration into the ground

Rain gardens typically include plants and a mulch layer (6") and an underdrain collection stem, if the underlying soils are unsuitable for groundwater infiltration.

2. BENEFITS OF A RAIN GARDEN

The rain gardens collect and slow stormwater, during heavy rainfalls. The rain garden reduces runoff volume, peak flow and flow duration and increase infiltration into the ground. Some of the benefits of a rain garden include:

- **Groundwater Infiltration:** A rain garden allows more water to seep into the ground than a conventional lawn. This seepage increase helps sustain stream flow during dry spells through infiltration and groundwater recharge
- **Evapotranspiration and Photosynthesis:** Plants in the rain garden improve the environment through:
  - Transpiration: Plants increase the transpiration of water into the atmosphere which impacts the atmospheric precipitation cycling

- **Photosynthesis:** Plants increase absorption of carbon dioxide from air pollution and release oxygen into our atmosphere

- **Habitat for Birds and Wildlife:** Rain gardens provide a habitat for birds and other wildlife
- **Reduction of Flooding:** Rain gardens protect communities from flooding and drainage problems
- **Reduction of Stormwater Structures:** Rain gardens reduce the need for costly municipal stormwater treatment structures

3. DESIGNING YOUR RAIN GARDEN

Step 1. Picking a Site: Picking a rain garden site is a critical first step. Not every location in your yard is ideal for a rain garden. For most rain gardens, you can pipe the downspout directly into your rain garden Alternatively, you can let the runoff flow over your grassed area before entering the rain garden.

- **Avoid Low Spots and Poor Soils:** Avoid placing the garden in a low spot. Placing a rain garden in poorly drained soils may lead to unwanted ponding
- **Building Foundation**: Select a site that is at least 10 feet away from your building foundation. Infiltrating water close to your foundation can lead to water problems in your basement
- **Septic/Well System**: Select a site that is at least 100 feet away from your septic system or your drinking water well
- **Bedrock:** Do not install a rain garden where bedrock or stone outcrops are closer than 2 feet to the surface
- **Steep Slopes:** Avoid steep slopes and select a site that is flat
- **Emergency Overflow:** Although your garden should be designed to handle most rainfall events, you should be prepared to handle increased volumes of water from larger storms. This can be accomplished by installing an emergency overflow pipe that will direct excess rainfall to a nearby waterway or storm drain

Step 2. Checking the Soil Infiltration: It is important to know how your soil infiltrates water into the ground. The "infiltration rate" refers to the speed at which water enters the soil.

- **Test Hole:** Dig a hole 6-8" deep in the area of the selected rain garden site.
- **Pre-Soaking and Testing:** After the hole is completed, fill the hole with water to the top of hole and check the level of the water after 6 hours.
- **Soil Infiltration Results:**
  - **Less Than 6 Hours:** If the water is gone after 6 hours, the site is suitable for a rain garden
  - **Greater than 6 Hours**: If the water takes 6-24 hours to disappear, the site is probably acceptable, but you may have to install an undrain system to direct excess water not infiltrated into the ground to a nearby waterway or storm drain

- **After 24 Hours**: If the water has not disappeared after 24 hours, the site is not suitable for a rain garden

Step 3. Sizing Your Rain Garden:

1. Building Size: Determine the size of your rain garden by first measuring the footprint of your building (length x width)
2. Rooftop Area: Determine how much rooftop area you are draining to the downspout you are connecting to your garden (for gutters with a downspout at each end, assume that half the water goes to each downspout, (say 60ft x 30 ft. or 1,800 square feet)
3. Rain Garden Surface Area: Divide the surface area by 6. This calculation sizes the garden to hold one (1) inch of roof runoff in a garden that is 6 inches deep. (1,800 /6 = 300 square feet)
4. Designing the Shape: Use your water hose to lay out the perimeter of the rain garden to approximate the size of your garden (30x10 ft.)

Step 4. Constructing Your Rain Garden:

Small gardens can be dug by hand.

1. **Underground utilities:** Be sure to "**Call Before You Dig"** hotline to locate any underground Utilities
2. **Excavating the Garden:** Dig out the garden to a depth of 10" to accommodate 6" of mulch. Slope the edges of the garden

Step 5. Planting Your Rain Garden:

Plants should include plants that are native to the area that can tolerate wet conditions, and can grow well in full sun to partial shade.

1. Planting Configuration: Group shorter plants around the perimeter of the garden, utilizing grouping of the same species and the same color to produce a visual impact. Taller plant groupings should be placed in layers behind shorter plants, with the tallest grouping in the center of the garden
2. Plant Selection: Check with your local nursery to determine which plants are suitable for your area Plants may include: **Swamp Azalea, Cardinal Flower, New York Aster, Black Eyed Susan, Iris, Lanceleaf Coreopsis, Ferns, Astilbe and Switch Grass**
3. Plant Maintenance: Plants will have to be watered daily until established. Weeding should be performed as needed
4. Overflow: Install an emergency overflow pipe in the middle of the garden, a few inches higher than the bottom, so that water can overflow to a nearby storm drain

4. WHY A RAIN GARDEN?

Plants in a rain garden provide many environmental benefits.

- **Reducing Pollution:** By building a rain garden in your home, or school yard, you are helping reduce pollutants that are carried by stormwater runoff to our waterways, lakes streams and wetlands
- **Flooding:** Rain gardens reduce basement and street flooding
- **Habitat Improvement:** Rain gardens improve habitat for insects, butterflies and birds