

RAIN GARDEN INSTALLATION GUIDE

Consultation

The consultation is an opportunity to meet with the homeowner, and gather the necessary information to generate a design and estimate for the installation.

Step 1: Verify the Location

The rain garden should meet the following criteria:

1. The rain garden should be 10' from all basements or sub-surface structures.
2. The rain garden should be near a downspout or near where water collects, but not located in a soggy spot where water already ponds.
3. The rain garden should not be near a septic field.
4. There should be a suitable spot for overflow from the rain garden that will not impact any nearby structures or properties (e.g. area drain, pervious surface, etc.).

Step 2: Size the Rain Garden

The rain garden should be designed to manage a 1" storm. The surface area and depth of the rain garden are constrained by the space available, the amount of water draining to the rain garden, and the water infiltration capacity of the soil. The following steps are requirements for sizing the rain garden.

1. **Check the contributing area to the rain garden.** The "contributing area" is the total area of the impervious surfaces that contribute to the proposed rain garden.
2. **Determine the top surface area of the rain garden.** The top area of the rain garden should be determined in consultation with the homeowner, based on the space available in their yard.
3. **Determine the depth and bottom area of the rain garden.** Now that the contributing area to the rain garden and top surface area of the rain garden have been determined, use this information and the rain garden sizing tables to determine the flat bottom area and depth of the rain garden. These tables assume gently sloping sides. Note that final rain garden areas and depths cannot be any lower than the sizes shown in the tables for the property's specific contributing area.
4. **Check the infiltration rate.** Complete an infiltration test to verify that the infiltration rate is the same as or greater than the rate listed in the rain garden sizing table. The rate must be fast enough to drain the maximum depth of water held in the rain garden in 24 hours or less. See page 22 in the Rutgers Rain Garden Manual for instructions to complete an infiltration test. Complete the initial saturation test (Step 2), then refill the hole and record how many inches the water drops in one hour (instead of the recommended 4 hours).

Step 3: Design the Rain Garden

The design of the rain garden should be discussed with the homeowner.

1. Use a garden hose or string to outline the size and shape of the rain garden so the participant can visualize the proposed installation.
2. Determine the plant selection:
 - a. Determine the sun exposure of the proposed rain garden. Use this information and conversations with the Rain Check participant to choose the plants for the rain garden.
 - b. Consult the Rain Garden Plant Lists in the Rutgers Rain Garden Manual (pgs 60-67).
 - c. All plants should be native to this region, and adaptive to the conditions of a rain garden including draught tolerance.

- d. Note: We will not be doing soil quality tests as part of Rain Check. However, the installer should evaluate the existing soils on site through simple visual and feel techniques or other methods.
- 3. Design the planting pattern:
 - a. The planting pattern should be based on several factors, including: color, the moisture levels of the rain garden (i.e. plant more water tolerant plants at the deepest, central part of the rain garden), and the height of full grown plants (i.e. taller species in the middle or back of the rain garden).
 - b. Plants by rain garden zone can be found in the Rutgers Rain Garden Manual (pg 60).
 - c. Plan to arrange plants in groups of species.
 - d. There is no specific pattern required for Rain Check rain gardens. Consult pages 64-66 of the Rutgers Rain Garden Manual for different planting pattern ideas that may be adaptable to smaller, residential rain gardens.
 - e. Plant size and density can vary, but PWD recommends 1 gallon plants spaced 24" on center.

Step 4: Prepare a cost estimate for installation. In your estimate, please list separately information about the portion of the job included within the Rain Check program and any additional work requested by the homeowner. E-mail the estimate to the homeowner and PHS program administrator.

Recommended elements for the cost estimate:

1. Design Summary
 - a. Top surface area, flat bottom area, and depth of rain garden
 - b. Measured infiltration rate
 - c. Simple description of existing site soil characteristics
2. Labor
 - a. Number of people
 - b. Estimated hours
 - c. Hourly rate(s)
3. Materials
 - a. Plants (name, number, size, cost, supplier)
 - b. Mulch (type, quantity, cost, supplier)
 - c. Stone (type, quantity, cost, supplier)
 - d. Other (ex: sand, compost, soil amendments, materials used to convey water to the rain garden, soaker hose, supplier, etc.)
4. Additional costs
 - a. Access to the site
 - b. Estimated excavation volume
 - c. Estimated quantity and description of removal and disposal of materials from site (if any)
 - d. Travel
 - e. Any additional requests from the homeowner

Installation

Step 1: Dig the Rain Garden (pgs 34-41 of the Rutgers Rain Garden Manual)

1. If you are using machines to dig the rain garden, make sure you use PA One-call to identify the location of underground utilities.
2. Remove existing grass, if needed.

3. Dig out and level the bottom of the rain garden to the appropriate depth. Remember that the required depth from the rain garden sizing tables represents the required water storage depth. The final depth to the bottom of the rain garden should also make sure to account for a minimum of 3" of mulch.
4. Make sure that people or equipment do not compact the bottom of the rain garden during construction.
5. Use the excess soil to build a berm at the low end of the rain garden.
6. Till the soil and amend with a mixture of sand and compost to prepare a healthy planting soil.
Note: If this rain garden is following a de-pave, then complete a soil infiltration test at this point to verify that the size and infiltration rate are appropriate.
7. Prepare the overflow:
 - a. The overflow can be a notch or low-point in the berm, and it must include some form of erosion protection. Lining the overflow with landscape fabric and river stone is one way to prevent weeds and slow water to prevent erosion at the overflow and down-slope of the rain garden.
 - b. Contractors may also consider other methods to direct the overflow away from the rain garden (including piping, if it is an easy solution).
 - c. **You must ensure** that the overflow is positioned high enough to allow the rain garden to fill to the required depth, but is still lower than the stormwater inlet in order to prevent water from backing up upstream of the inlet.

Step 2: Direct Water to the Rain Garden

1. If the rain garden will be collecting roof runoff, run a path from the downspout to the rain garden. The path can be an extension of the downspout, a swale, or some other means of safely conveying water to the rain garden.
2. Make sure that the path does not cause a tripping or other type of hazard.
3. Arrange stone decoratively at the inlet to the rain garden to slow the flow and prevent erosion.

Step 3: Plant the Rain Garden

1. Make sure the base of the rain garden is level.
2. Mark out the location of each plant, and plan for the mature size of each plant when spacing. Purchase plants that will generally reach their mature size in about 2-3 growing seasons (this may vary by species; plugs or potted plants may both be appropriate).
3. Plant size and density can vary, but PWD recommends 1 gallon plants spaced 24" on center
4. If plants are root-bound in pots, pull the roots apart so the plant grows freely in the ground. Plant the plants so that the rootball is entirely covered by soil.
5. Mulch around the plants with hardwood mulch, 3-inches deep (do not use Cypress or mulch with dyes).
6. Water the plants immediately after planting. Consult with homeowner about the most desirable method of watering. Include soaker hose installation in estimate if appropriate.

Care and Maintenance

While it is not required that the installer provide maintenance information to Rain Check participants, here are a few points about maintenance that would be beneficial to discuss with participants before leaving property:

1. Plants should be watered regularly until they become established, and during dry periods of the first growing season.
2. Weed the rain garden to prevent weeds from choking the plants.

3. Do not be afraid to move plants around if you think they would do better in a drier or wetter part of the rain garden.
4. Add mulch every spring to maintain a 3" mulch layer on your rain garden