



# Introduction to Rain Gardens

An Online Continuing Education Course for Engineers

**Course Number: C-2036**

**Credit: 2 Hours / 2 PDH / 2 CPD**

## What is a rain garden?

A rain garden acts like a native forest by collecting, absorbing, and filtering stormwater runoff from roof tops, driveways, patios, and other areas that don't allow water to soak in. Rain gardens are simply shallow depressions that:

- ◆ Can be shaped and sized to fit your yard.
- ◆ Are constructed with soil mixes that allow water to soak in rapidly and support healthy plant growth.
- ◆ Can be landscaped with a variety of plants to fit the surroundings.

## THE BIG PICTURE

Rain gardens are one of the most versatile and effective tools in a new approach to managing stormwater called low impact development (LID). An LID project may incorporate several tools to soak up rain water, reduce stormwater runoff, and filter pollutants. Some examples of these tools include permeable paving, compost-amended soils, vegetated roofs, rainwater collection systems, and rain gardens.



Photo by Seattle Public Utilities

## Rain gardens provide multiple benefits, including:

Reduce flooding on neighboring property, overflow in sewers, and erosion in streams by absorbing water from impervious surfaces.

Filter oil and grease from driveways, pesticides and fertilizers from lawns, and other pollutants before they reach the storm drain and eventually streams, wetlands, lakes and marine waters.

Increase the amount of water that soaks into the ground to recharge local groundwater.

Provide habitat for beneficial insects and birds.



# 4 STEPS TO BUILDING A RAIN GARDEN

## 1 LOCATE



- ◆ Identify areas draining to the rain garden.
- ◆ Identify the best location for the rain garden.
- ◆ Test the soil.

## 2 DESIGN & BUILD



- ◆ Determine the size and shape of the rain garden.
- ◆ Excavate soil (18-30 inches typical).
- ◆ Level bottom of rain garden (**do not compact**).
- ◆ Mix compost with soil.
- ◆ Place soil mix and leave at least 6 inches below edge of rain garden for ponding.
- ◆ Level surface of soil.
- ◆ Create an entry for water (swale, pipe or landscape area) into rain garden.
- ◆ Provide a rock-lined overflow.

## 3 PLANT



- ◆ Use a variety of small trees, shrubs, herbs, or grasses.
- ◆ Select plants that enhance the area and have appropriate water needs (native plants and hardy cultivars are preferred).
- ◆ Cover exposed soil with 2-3 inches of mulch.
- ◆ Water to establish plants.

## 4 MAINTAIN



- ◆ Mulch as needed to prevent erosion and weeds.
- ◆ Keep inlet and outlet clear of debris and well protected with rock.
- ◆ Do not fertilize or use pesticides.
- ◆ Water as needed.

Rain garden, City of Maplewood MN

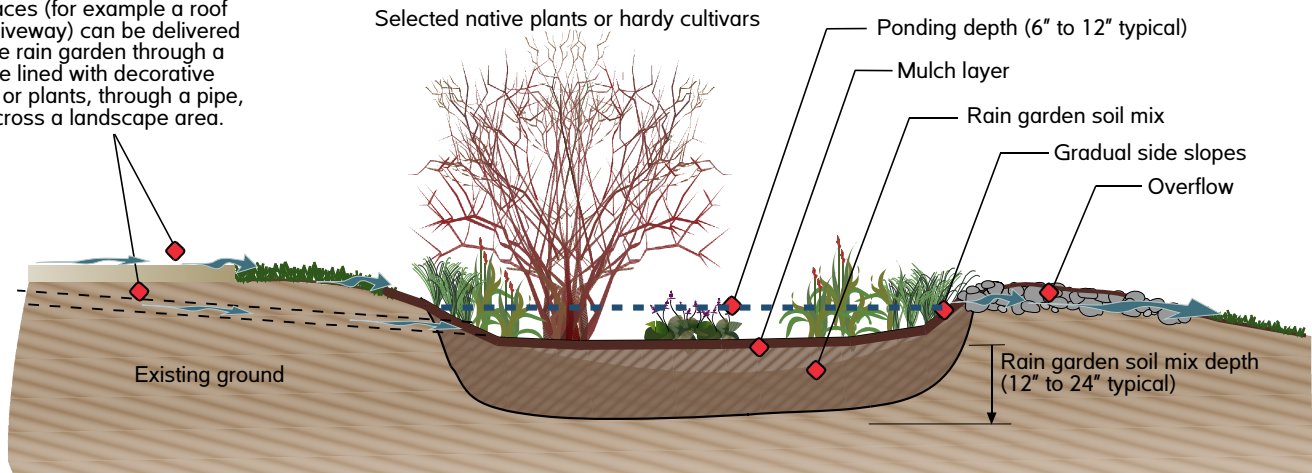
# ANATOMY OF A RAIN GARDEN



Newly planted Seattle rain garden

*Photo by Seattle Public Utilities*

Water flowing off impervious surfaces (for example a roof or driveway) can be delivered to the rain garden through a swale lined with decorative rock or plants, through a pipe, or across a landscape area.



When properly designed and constructed, rain gardens drain rapidly with surface water present for only 1-2 days. Mosquitos take a minimum of about 4 days (many types of mosquitos take several days longer) to become adults after eggs are deposited in water.

# 1 Locate



Evergreen huckleberry



Sword fern



Tall Oregon grape

## LOCATING THE RAIN GARDEN

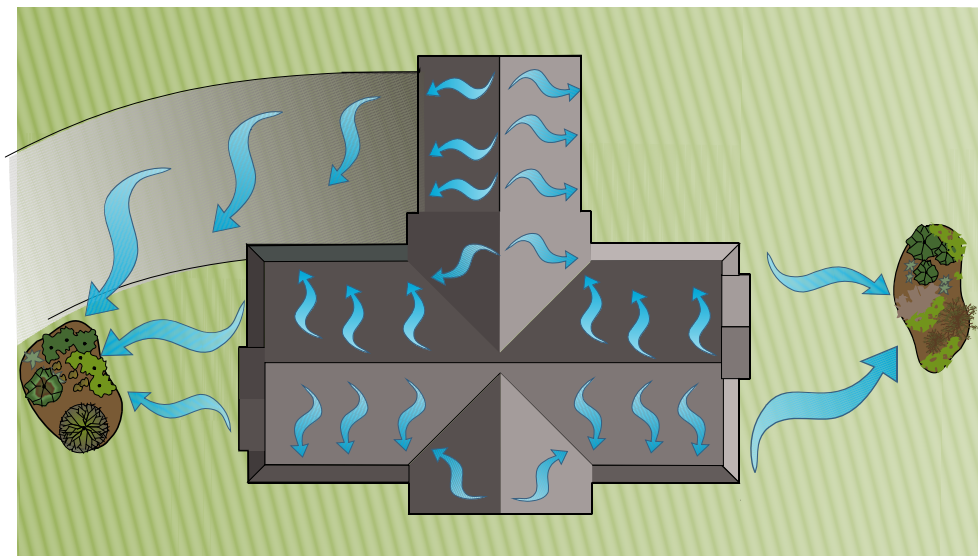
### IN THIS SECTION

- ◆ Identify areas draining to the rain garden
- ◆ Do's and don'ts for locating a rain garden
- ◆ Testing the soil

**Rain gardens** can be sized and shaped to fit into a variety of locations on your property; however, there are important considerations for a successful design.

### What areas will drain to the rain garden?

First, you need to assess your property to determine the areas that will drain to the rain garden. Roof tops, driveways, patios, and landscaped areas with compacted soils produce runoff that rain gardens can absorb and filter. You may want to capture all or part of the water from these areas in one or more rain gardens.



### Consider the following when determining what areas you want to drain to the rain garden:

- ◆ Water can be delivered to the rain garden across a landscaped area, through an open swale lined with plants or decorative rock, or through an underground pipe (for example from a roof downspout). See page 17 for details.
- ◆ Rain gardens can be placed in more than one location. For example, you can direct water from one part of the roof to a rain garden in the back yard and water from another part of the roof to a garden in the front yard.

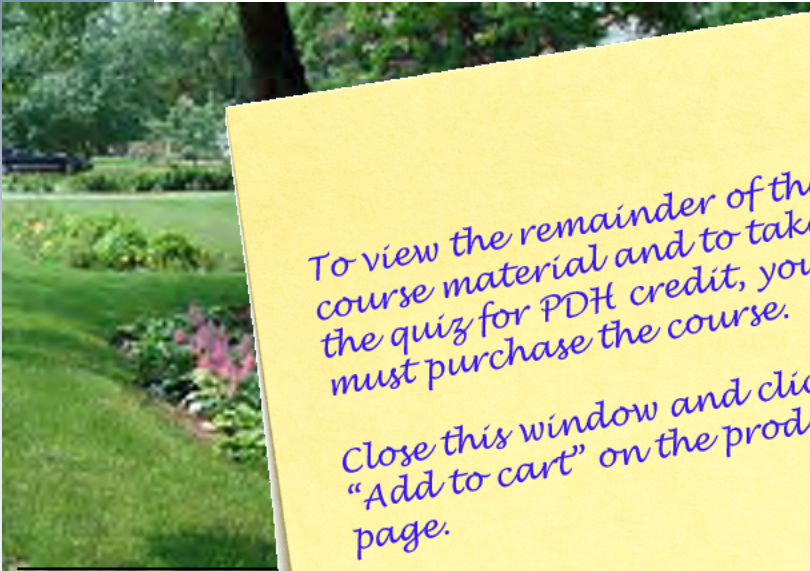
# 1 Locate

## DO LOCATE A RAIN GARDEN



Wild ginger

- ◆ Where it improves the appearance of your home. Rain gardens can provide attractive visual buffers from roads or neighboring homes.
- ◆ Where an overflow can direct water safely away from the home and neighboring property.
- ◆ Where water drains to the garden by gravity. While it is possible to pump water up to a rain garden, this will increase costs and maintenance.



To view the remainder of the course material and to take the quiz for PDH credit, you must purchase the course.

Close this window and click "Add to cart" on the product page.

If you live on or near a slope with a greater than 15% slope, a geotechnical engineer evaluate the site for potential erosion. Runoff water flowing down steep slopes can cause in...

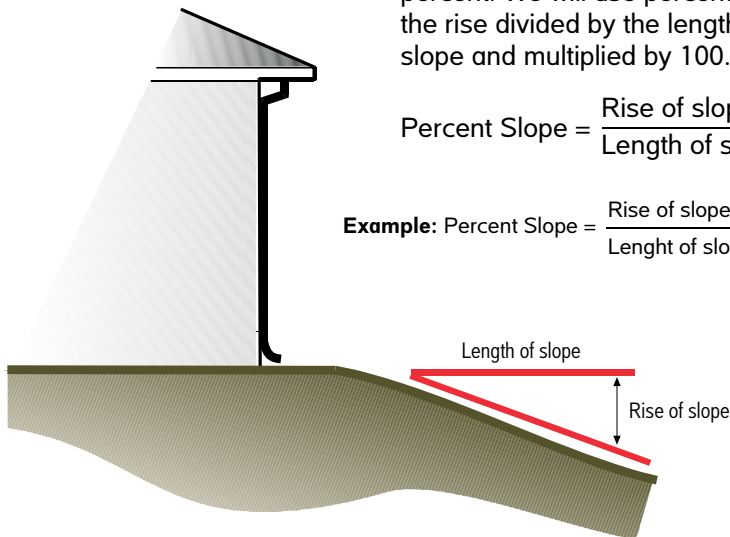
Slope can be described in degrees or percent. We will use percent which is the rise divided by the length of the slope and multiplied by 100.

$$\text{Percent Slope} = \frac{\text{Rise of slope}}{\text{Length of slope}} \times 100$$

**Example:** Percent Slope =  $\frac{\text{Rise of slope} = 3 \text{ ft.}}{\text{Length of slope} = 20 \text{ ft.}} = 0.15 \times 100 = 15\%$



Salal



\*consult an geotechnical engineer or geologist if the slope is 15% or more.