

Rain Garden Guidelines

for Gresham Residents



What you need

- ☐ Spade shovel
- ☐ Garden rake
- ☐ Garden fork (*optional*)
- ☐ Line level and string
- ☐ Measuring tape
- ☐ Pencil and paper
- ☐ Two wooden stakes
- ☐ Hammer or mallet
- ☐ Wheel barrow
- ☐ Mulch or bark-dust (*composted, finely shredded*)
- ☐ Soil amendment (*compost, or 3-way or 5-way mix*)
- ☐ Plants
- ☐ Decorative stones, gravel or other hard materials to prevent erosion
- ☐ 3" or 4" ABS pipe and any elbows or collars needed, 5' or 10' long
- ☐ Glue/sealant for ABS pipe
- ☐ Hand saw with blade able to cut through plastic pipe
- ☐ Materials to disconnect downspout(s)

Most of these items can be found at a local hardware or home improvement store



Instructions for building your Gresham rain garden

1. Determine a suitable location/downspout on your property

- Use ABS or aluminum pipe to extend the downspout inflow discharge point into the rain garden so that it is at least 5 feet from your foundation
- The sides of your rain garden should be at least 5 feet from private property lines and 3 feet from public sidewalks



2. Calculate your slope

- Soil should slope gently away from your foundation
- Slopes over 10% that drain to private property may not be suitable

To calculate your percent slope:

- Hammer two stakes into the slope – one at the top of the slope and one at the bottom
- Tie one end of a string to the stake at the top of the slope, at the point where the stake intersects the ground
- Put a line level on the string, and stretch the string taut to the stake at the bottom of the hill
- While holding the string taut, lift the string until the line level indicates that your string is “level”
- Measure the distance between the level string and the ground (this is your height, which we will call “H”)
- Now measure the length of the string from one stake to another, indicated by the dashed line (this is your length, which we will call “L”)
- Calculate the slope – make sure you measured height and length in the same units (i.e. feet or inches)
 - % Slope = $H \div L \times 100$ Ex: Height (H) = 6 inches; Length (L) = 127 inches
 $6 \div 127 = 0.047$, and $0.047 \times 100 = 4.7\%$. Your slope is 4.7%



3. Conduct a percolation test to determine the water infiltration rate for your yard

- Dig one or more holes at least 12” deep where you plan to put your rain garden
- Fill the holes with water and allow it to soak in completely
- Fill the holes a second time, this time measure the water level in the hole at time zero and then again each hour until the hole is dry (you can repeat this step to be extra sure of your drainage)
- An average of .5” of water draining per hour is the minimum for rain garden suitability in Gresham (i.e. a 12” deep hole draining in 24 hours)



4. Safety inspection: Contact City staff for your free pre-construction safety inspection

Matt Henry: 503-618-2657 or
Matt.Henry@GreshamOregon.gov

5. Size and shape your rain garden

The ponding area of the rain garden should be at least 10% the size of the area of roof draining to it (the ponding area is the area of the garden that is below both the in-flow and the overflow; measure length x width to get square feet)

- Ex: If 500 square feet of roof is draining to the garden, $500 \text{ sq ft} \times .10 = 50 \text{ sq ft}$. The ponding area of the garden should be 50 sq ft, or 5 ft x 10 ft.

6. Call 8-1-1 for free utility locates before digging!



Native iris douglasii



This rain garden receives water from two disconnected downspouts

Armor the inflow and outflow with rocks or gravel to prevent erosion



7. Plumbing

- ✦ Disconnect the downspout(s) that will lead to the rain garden (see *Downspout Disconnection manual* at GreshamOregon.gov/watershed)
- ✦ Aluminum downspout materials may be used to connect downspout to ABS pipe, but plumbing code requires that buried, rigid ABS pipe be used to convey all water that passes underground. The pipe should be 3" diameter for 1500sf or less of roof area draining to it and 4" diameter for anything over 1500sf. Be sure the angle and buried height of your ABS pipe is sufficient to prevent backflow; ABS should enter rain garden as close to the top edge of the garden as possible to allow room for ponding beneath the inflow.
- ✦ Use ABS sealant to glue ABS pipe pieces together to prevent leaks
- ✦ Be sure that your gutters and downspouts are free of debris and that water flows freely to your rain garden without leaking at any point (use a hose to test)

8. Dig your rain garden

- ✦ The ponding area must be no deeper than 6"–12" and must overflow to a point lower than the inflow pipe to prevent backflow and should be at least 10 feet from the foundation
- ✦ Remove sod and soil to a depth 4" deeper than your desired final depth (Ex: dig 10" for a 6" final ponding depth)
- ✦ Use rakes to grade gradually back to the lawn on all sides – steeper sides are more prone to erosion
- ✦ Loosen the soil in the bottom of the rain garden with a spade, fork or rake
- ✦ Add a 3" to 4" layer of compost to the basin and lightly mix in. *Do not add sand alone to the rain garden – doing so may result in very poor drainage.*

9. Create a safe overflow

- ✦ Grade the soil in your garden such that water will flow in from the downspout, gather in the ponding area, and then overflow from a notch or other lowest point in the rain garden wall to a safe grassy or landscaped area away from the house and neighbors' properties.
- ✦ To prevent backup, use a line level to make sure your overflow is lower than your inflow.
- ✦ Position your overflow point in a direction that will ultimately convey water back to the street and to the stormwater system in a large rain event, without crossing a neighbor's property on the way. It is a violation of City code to send muddy water to the storm system – be sure your water is clean and clear as it leaves your rain garden. The overflow should be set back a few feet from the sidewalk or street.



10. Plant your garden

- Space plants for their mature size, but consider planting densely in the ponding area to discourage weeds and encourage water to infiltrate faster – 1-foot spacing is suggested for *Carex* and *Juncus* species in the ponding area
- Lining your garden with weed barrier fabric before planting can help minimize future weeds
- Rain water is not likely to reach plants on the garden's outer rim, so plant drought-tolerant plants here
- Laying out your plants in their desired locations before planting can help perfect your design
- See City of Gresham rain garden planting plan examples for design and plant selection ideas at GreshamOregon.gov/watershed

11. Mulch the garden

- Cover the soil in your garden with 2"-3" of composted, finely shredded bark dust (mulch) to keep weeds down and moisture in. Leave a 3" mulch-free zone around the stems of your plants to prevent disease.
- Avoid large wood chips that will float away

12. Post-Construction inspection: Contact City staff for your free post-construction safety inspection

Matt Henry: 503-618-2657 or Matt.Henry@GreshamOregon.gov

For more information:

- On the City of Gresham's rain garden programs, visit our web site at GreshamOregon.gov/Watershed, or call **Matt Henry** at 503-618-2657
- On rain garden design and construction ideas, visit East Multnomah Soil and Water Conservation District's Web site at emswcd.org.



Plant sedges (*Carex* spp.), rushes (*Juncus* spp., right) and other water and drought-tolerant plants in the basin area



A note on rain garden permitting and inspections

These guidelines are intended for residential retrofit projects only. For new construction projects, consult the City of Gresham Green Development Practices manual for technical specifications. The manual is available on the City's website.

A permit is not required to install a rain garden at a single family residence in Gresham. However, to help ensure that your rain garden does not pose a risk to health or property, City staff must inspect your site for safety both before construction and after the garden is completed. Rain gardens that follow the guidelines in this document will be deemed safe, at staff discretion. If your rain garden does not pass a safety inspection but is not an immediate threat to health or property, staff will provide guidance as to how to bring the garden up to safety standards. If the rain garden is not corrected in a timely fashion, or is or becomes an immediate threat to health or property, you will be required to reconnect to the original stormwater system. This reconnection is also subject to City inspection. The City of Gresham is not responsible for any damage caused by rain gardens at single-family residences.

A note on commercial or multifamily stormwater management

Drainage modifications to commercial or multi-family buildings in Gresham must be done by a state-certified plumber, and design drawings of the new drainage system must be completed by a licensed civil engineer. Inspections by City of Gresham staff are also required. For more information on commercial stormwater management, contact Rob Stahle at 503-618-2621 or Robert.Stahle@GreshamOregon.gov.

