From runoff to rain garden

Throughout the country, cities and suburbs replace forests and agricultural land. When it rains the impervious surfaces of rooftops and roads increase the runoff to lakes, wetlands and streams. This is a problem because the runoff carries pollutants into these water resources through storm sewers, degrading water quality. The increased runoff erodes lakeshores and stream banks and can also cause localized flooding.

Planting a rain garden is one way to reduce runoff. A rain garden fills with a few inches of water after a rain storm and then allows it to slowly filter into the ground.

Here is an overview of how to plan, prepare and plant a rain garden.

Plan

Careful planning is important in designing a rain garden. The size, location, soil type and depth of the rain garden will all influence the amount of infiltration it will provide. Careful planning is also important to integrate the rain garden into the rest of the landscape to provide aesthetic as well as water quality benefits.

Size

The size of your rain garden will depend on the size of the area draining into it, the existing soil type, the depth of the rain garden and its distance from the main sorce of storm water (e.g. roof downspout). See page two for sizing guidelines.

Location

Sit your rain garden where it can receive storm water from a roof downspout or from a downhill slope or swale.

IMPORTANT:

- A rain garden should be placed at least ten feet away from the foundation of your house.
- Provide an overflow path for water to take if the rain garden fills and more rain comes. Stabilize the path with a hardy grass or ground cover, or use underground piping or drain tile. Storm water should drain out of a rain garden in one day—these are not water gardens.

Soil Type

Soil types fall into three main categories:

Sandy (drain quickly)

Silty (drain more slowly)

Clayey (drain slowly)

Clay soil, which are prevalent in Plymouth, require at least two inches of compost to improve infiltration.

A percolation test (see next page) will tell you how well your soil drains.

Depth

Rain gardens can vary from three to eight inches deep (see page 3).

LEARN MORE at www.bluethumb.org

City of Plymouth www.plymouthmn.gov

Plymouth Water Resources Technician Kevin Springob, 763-509-5527 kspringob@plymouthmn.gov

Prepare

Call Gopher State One (651-454-0002) before you dig.

Remove the sod and dig out a shallow, flat-bottomed trench (see details on next page).

Create a berm on the back (downhill) side of the garden. Spread an erosion blanket over the berm to prevent erosion during heavy rains.

Add up to six inches of compost* to the bottom of the rain garden. (For soils with very poor permeability, dig the garden deeper and add topsoil or sand to improve infiltration.)

Spread mulch over the entire area to be planted*.

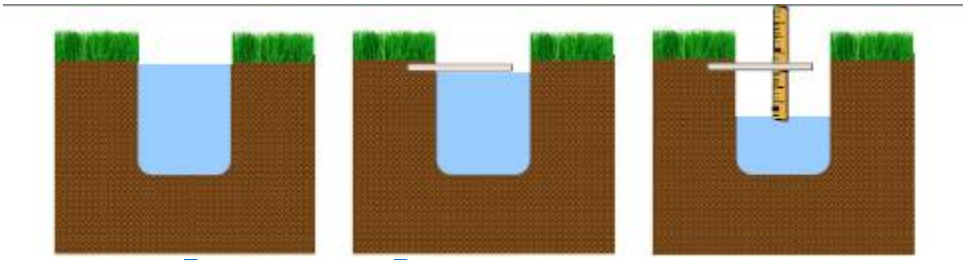
*Free compost and mulch may be available at Plymouth's Yard Waste Site. Call _____ for availability.

Soil Infiltration Test

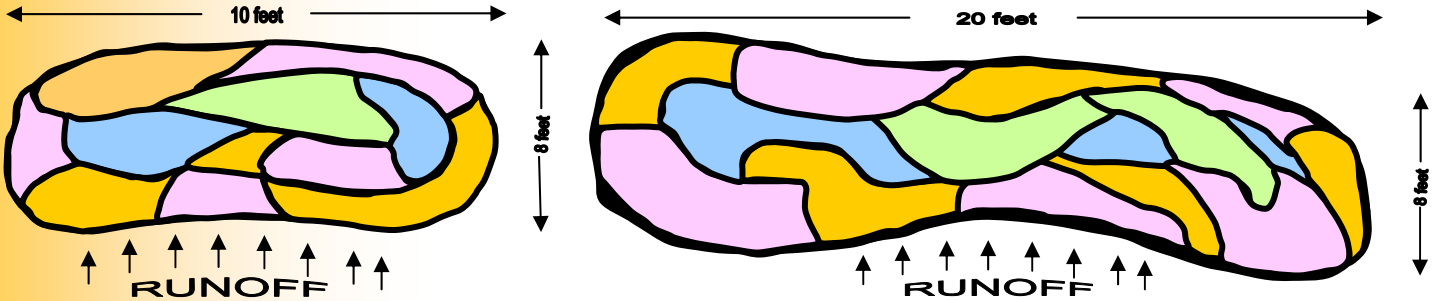
1. Dig a coffee can-size hole in the rain garden site and fill it with water.
2. After two hours, refill the hole and insert a marker (a popsicle stick works well) level with the top of the water. Make note of the time.
3. Return after one and measure how many inches the water has gone down from the level of the marker. That tells you how many inches the water will infiltrate in one day.

Example: If the water level went down one inch in four hours:

$\frac{1 \text{ inch}}{4 \text{ hrs.}}$ X 24 hr. = 6 inches/day, so the garden should be 6 inches deep.



Sizing your rain garden



Small, 80 square foot rain garden, located less than 30 feet from the downspout will provide infiltration of a half-inch rainfall for the following areas.

Soil type	3-5 inches deep	6-7 inches deep	8 inches deep
sandy	420 sq. ft.	540 sq. ft.	1000 sq. ft.
silty	240 sq. ft.	320 sq. ft.	500 sq. ft.
clayey	200 sq. ft.	250 sq. ft.	400 sq. ft.

Large, 160 square foot rain garden, located less than 30 feet from the downspout will provide infiltration of a half-inch rainfall for the following areas.

Soil type	3-5 inches deep	6-7 inches deep	8 inches deep
sandy	850 sq. ft.	1070 sq. ft.	2000 sq. ft.
silty	250 sq. ft.	640 sq. ft.	1000 sq. ft.
clayey	370 sq. ft.	500 sq. ft.	800 sq. ft.

Small, 80 square foot rain garden, located more than 30 feet from the downspout will provide infiltration of a half-inch rainfall for the following areas.

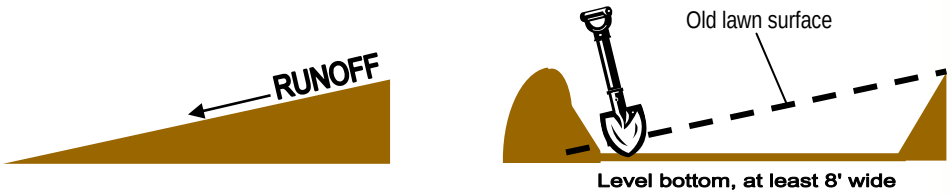
sandy	2700 square feet
silty	1350 square feet
clayey	800 square feet

Large, 160 square foot rain garden, located more than 30 feet from the downspout will provide infiltration of a half-inch rainfall for the following areas.

sandy	5400 square feet
silty	2700 square feet
clayey	1600 square feet

Dig the rain garden to a depth of 6 to 8 inches. Increase that original depth to accommodate compost and dig it deeper still if adding topsoil or sand to improve soil permeability. Make sure the bottom of the rain garden is level to allow water to spread out evenly over the entire surface.

3 to 7-inch deep garden with low berm on gentle slope. This is the depth of the plantings. Dig the garden site deeper to accommodate compost and topsoil.



8-inch deep garden with higher berm on steeper slope. This is the depth of the plantings. Dig the garden site deeper to accommodate compost and topsoil.

Position the rain garden perpendicular to the slope to increase the volume of water intercepted from downspout or lawn.

Plant

Choose moisture-loving native plants to fill the rain garden, and plants that can withstand dry conditions for the berm (there are some selections below).

Keep your design simple, remembering to plant taller species toward the center or back and shorter ones toward the front of the rain garden (the plant list below is color-coded for use with the rain garden designs on the previous page).

Mark the plants to help identify them when they come up in the spring.

Suggested native plants for sun to part shade

MEDIUM GRASSES AND SEDGES — 2-4 ft. tall

		Recommended space between plants
Carex vulpinoidea	Fox Sedge	12—18 inches
Schizachyrium scoparium	Little Blue Stem	18 inches

TALL GRASSES AND SEDGES — 3-6 ft. tall

		Recommended space between plants
Carex crinita	Fringed Sedge	24 inches
Scirpus cyperinus	Wool Grass	24 inches
Sorghastrum nutans	Indian Grass	24 inches
Spartina pectinata	Prairie Cordgrass	24—36 inches

MEDIUM PERENNIAL FLOWERS — 2-4 ft. tall

	(flower color)	Recommended space between plants
Chelone glabra	Turtlehead (cream)	6 inches
Iris versicolor	Blueflag Iris (blue)	12 inches
Lilium micheganese	Turk's Cap or Michigan Lily (orange)	12 inches
Zezia aurea	Golden Alexander	12 inches

TALL PERENNIAL FLOWERS — 3-5 ft. tall

	(flower color)	Recommended space between plants
Asclepias incarnate	Swamp Milkweed (pink)	18 inches
Aster puniceus	Purple-stemmed Aster (light blue)	18 inches
Lobelia cardinalis	Cardinal Flower (red)	12 inches
Eupatorium maculatum	Joe Pye Weed	18 inches

GOT SHADE?

While the plants above will tolerate moderate amounts of shade, it would be good to substitute some of the following in full shade:
Wild columbine, tall bellflower, bur sedge, wild geranium, cardinal flower, Virginia bluebells, Jacob's ladder, ferns and zig zag goldenrod.