Residential Rain Gardens

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Rain Gardens

- What are they?
- What are their benefits?
- How do I build one?
  - Site and size
  - Plant selection
  - Installation
  - Maintenance
- How much will it cost?

What is a rain garden?

- **A landscape feature built in a low area to collect runoff water and allow it to infiltrate into the soil**
- **Make it attractive by choosing appropriate plants that**
  - **Tolerate wet/dry soils**
  - **Are suited to sun or shade**
  - **Attract birds/butterflies, pollinators**
  - **Are low maintenance**
  - **Are attractive**

Rain Garden Benefits

- Effective at removing particulates and some nutrients from stormwater runoff.
- A way you can help prevent stormwater from polluting lakes, streams and ponds.
- A way to help control erosion and flooding.

Photo courtesy of Rutgers Univ.

Residential Rain Gardens

They are not…

- Suitable for every site

  Limiting factors:

  - Poorly drained areas
  - Underlying ledge
  - Heavy clay soils
  - High water table
- Mosquito pools
- Located near basements or septic systems
- High tech or hard to install

Sizing Your Rain Garden

- Depth depends on soil type/percolation rate
  - 3” for clay soils
  - 6” for loam soils
  - 8” for sandy soils
- Surface area of rain garden is calculated based on expected treatment volume

Minimum Sizing for Rain Gardens

Drainage Area ft^2	3" Deep Clay + Amend.	6" Deep Loamy	8" Deep Sandy
500	160	80	59
750	240	120	89
1000	320	160	119
1500	480	240	179
2000	640	320	238
% of drainage area	32%	16%	12%

Note: It is highly recommended to oversize the rain garden to account for runoff volume estimation error, variable percolation conditions, increasing impervious surfaces and more flash storm events.

Rain Garden Design

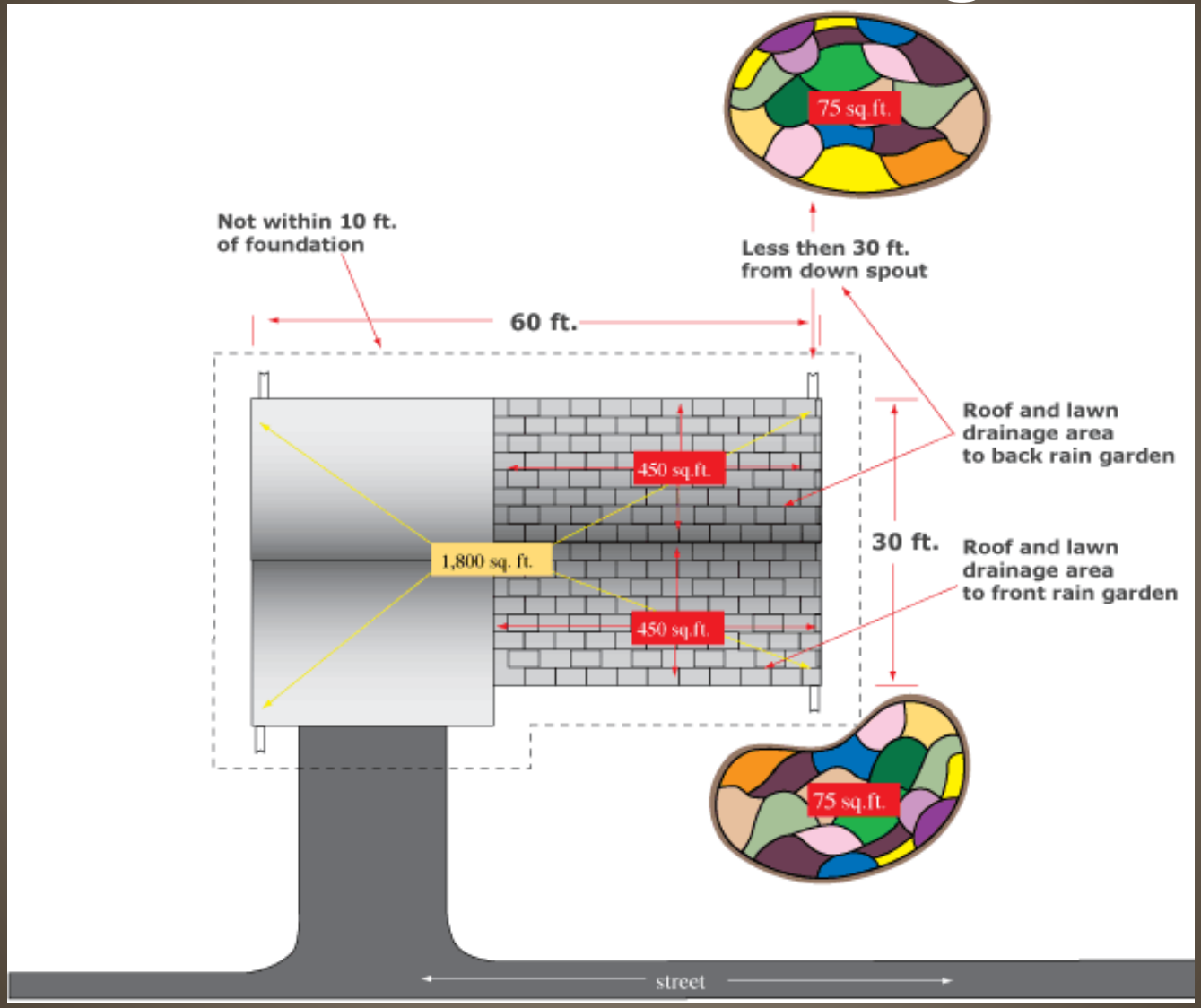
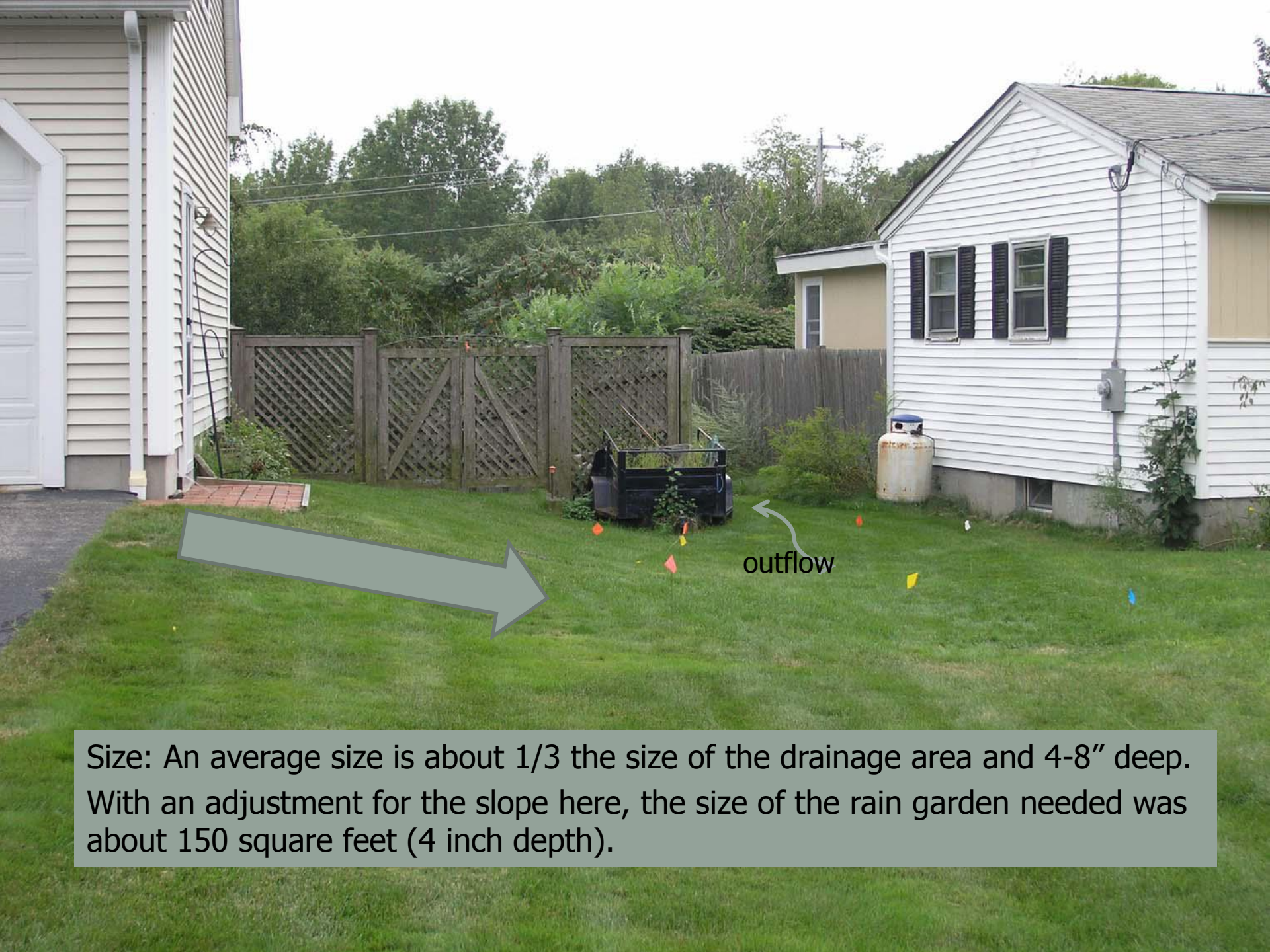


Diagram courtesy of Uconn NEMO, adapted from the Univ. of Wisconsin-Extension,
Rain Gardens: A How-to Manual for Homeowners

Site Selection and Sizing

Measure area of impervious surface to be drained

Where is the water collected?



Size: An average size is about 1/3 the size of the drainage area and 4-8” deep.

With an adjustment for the slope here, the size of the rain garden needed was about 150 square feet (4 inch depth).

Identify the inflow and outflow (overflow).

Remember "Water flows downhill!"

Perc test

An infiltration rate of 1.5” per hour minimum is recommended. In areas with heavy soil, soil replacement is sometimes necessary (a job for a professional).

Outline with flags, string or paint

Call Dig Safe now! Then remove the layer of sod, saving it to use on the berm later, or move it to another spot.

Excavation

The soil removed from the middle can be used to berm the edges on a sloped site.

Hand excavation

Finish up with shovels and rakes to get the surface contoured as desired.

Inflows and Outflows

Sometimes landscape fabric is pinned underneath rock to protect soil against erosion. In other cases pipes may bring water directly to the rain garden.

Leveling

Check the depth using strings a carpenter’s level and measuring tape; adjust as needed.

More leveling

The bottom should be very level so water infiltrates evenly throughout.

Add soil amendments

Compost, lime, nutrients based on soil test and site. Be aware of state/local restrictions within shoreland protection zones.

Grading outflow

You may protect the outflow and inflow areas with rocks to protect against erosion during heavy flow. Besides, all those rocks we dug up have to go somewhere ….

Grading outflow

Recheck depth and grade; remember water flows downhill!

Placing plants

Rain garden plants remove water through their roots and release it to the atmosphere. Their roots also help keep the soil in place and maintain organic matter.

Placing plants

Mostly native plants are used; in this case, herbaceous perennials and grasses are mixed together. In larger rain gardens, shrubs and/or a tree or two may be added. Plant selection is planned for wet to dry zones within the garden, depending on soil and site characteristics. Most rain gardens don't stay very wet very long.

Planting

Fall is a good time for root establishment, even though tops are going dormant.

Minimize compaction

Be gentle and avoid compacting the soil, which reduces drainage. Plant from the edges as much as possible.

Mulching

Three inches of shredded hardwood mulch is commonly used. Chips or nuggets may float. Recycled, shredded yard waste can covered with an inch of a more attractive hardwood mulch, as shown here.

Finished rain garden

The next summer….

Rain Garden Maintenance

- Watering
- Mulching
- Weeding
- Pruning/trimming
- Inspecting
- Removing sediment
- Cleaning clogged inlets/outlets

Maintenance requirements

Water and weed as needed for first season.

Replenish mulch until plants provide adequate ground cover.

Photo: UMaine Extension

Inspect for signs of problems, such as a plugged inflet, uneven flow or gullies during and after a rain event. Does the rain garden overflow through the outlet during a heavy rain?

Look for sediment accumulation in the rain garden. This means it is working! As it accumulates, you will need to remove it occasionally with a flat shovel.

As with other gardens, plants will self-select over time. Don’t fight the site!

Weeding

Learn to identify what grows in your rain garden.

Watch out for aggressive/invasive weeds

Below: Soil/mulch movement at inlet

Inspecting

Inspect for signs of problems, such as a plugged inflet, uneven flow or gullies during and after a rain event. Does the rain garden overflow through the outlet during a heavy rain?

Did water flow too fast, creating rills or gullies or washing soil from around plants?

Replace/add plants
Build up berm or add rocks

Photos courtesy Rutgers Univ. Water Resources program

Photo: Great Bay National Estuarine Reserve by Julia Peterson

How Much will it Cost?

- Estimate $5 - 45 per square foot
- Do it yourself vs. contractor
- Grading, pipes to direct water if needed
- Soil amendments if needed
- Plant selection and plant size
- Rock or gravel if desired

For more information:

http://extension.unh.edu/tags/rain-gardens

Presentation by Dr. Cathy Neal, Extension Professor and Landscape Horticulture Specialist, Univ. of New Hampshire, Durham NH. Additional photos courtesy of Margaret Hagen of UNH Cooperative Extension and Candace Dolan of the Hodgson Brook Restoration Project.