

The RiverSmart Rain Garden Rebate

Rain Garden Placement and Design:
Please follow these guidelines when
installing your rain garden.

Rain Garden Defined

- ❑ A type of functional landscaping feature designed to control stormwater runoff
- ❑ Planted with perennial native plants.
- ❑ A bowl-shaped garden with deep, loose soil.
- ❑ Bermed on the downhill side to act as a dam

Things to take into consideration when planning a rain garden

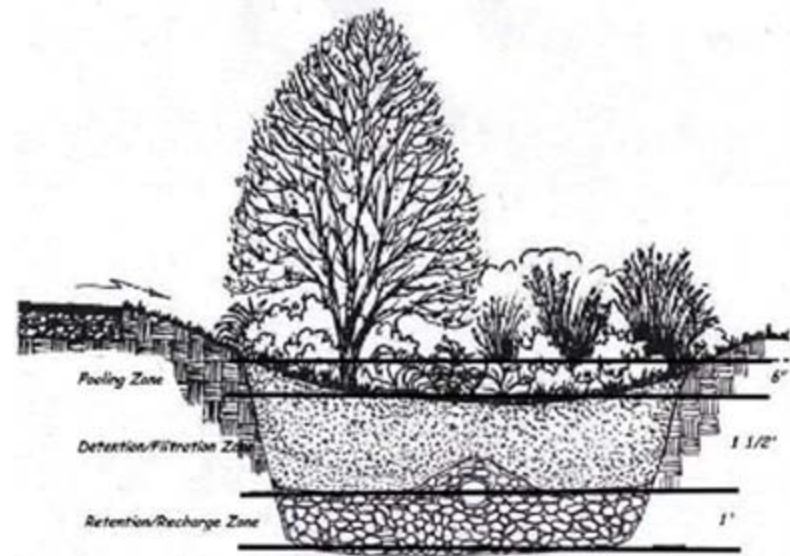
- Placement
- Existing soils
- Existing landscaping including trees
- Size of rain garden
- Bioretention Soil Mix
- Plant Selection
- Mulch


Technique:

Mimic pre-development hydrological conditions on site

- ❑ Observe how water flows naturally
- ❑ Place rain garden in areas that tend to accumulate water
- ❑ Extend downspout to capture rooftop runoff or use other concentrated flow of water
- ❑ Be sure garden overflows into vegetated area

❑ Anatomy of a Rain Garden:





Roof downspout extension directed toward rain garden

Site grading slopes away from house toward rain garden

Rain garden in permeable soil

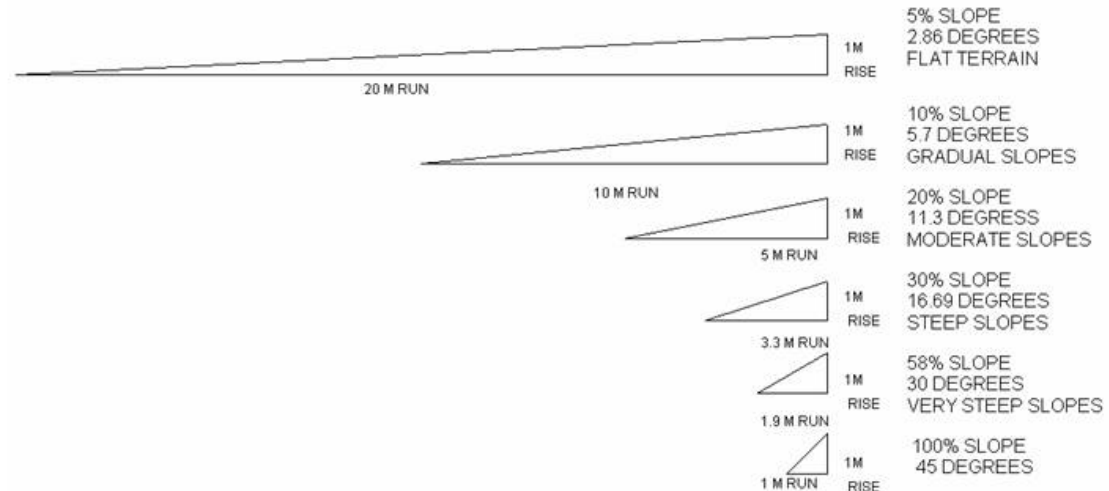
Site Evaluation

- ❑ Slope (2% - 10%)
- ❑ Retaining Walls
- ❑ Drainage area
- ❑ Soil
- ❑ Trees
- ❑ Proximity to foundation, public space, neighbors



Slope

- ❑ Make sure that the slope is away from foundation of your house if you are disconnected your downspout into a rain garden
- ❑ 2% to 10%
 - 1. Flat terrains (0 – 5%)
 - 2. Gradual slopes (5 – 10%)
 - 3. Moderate slopes (10 – 20%)
 - 4. Steep slopes (20 – 30%)
 - 5. Very steep slopes (greater than 30%)



Retaining walls

- ❑ Do not install a rain garden close to a retaining wall

Sometimes ok if there is a lot of space before the retaining wall...

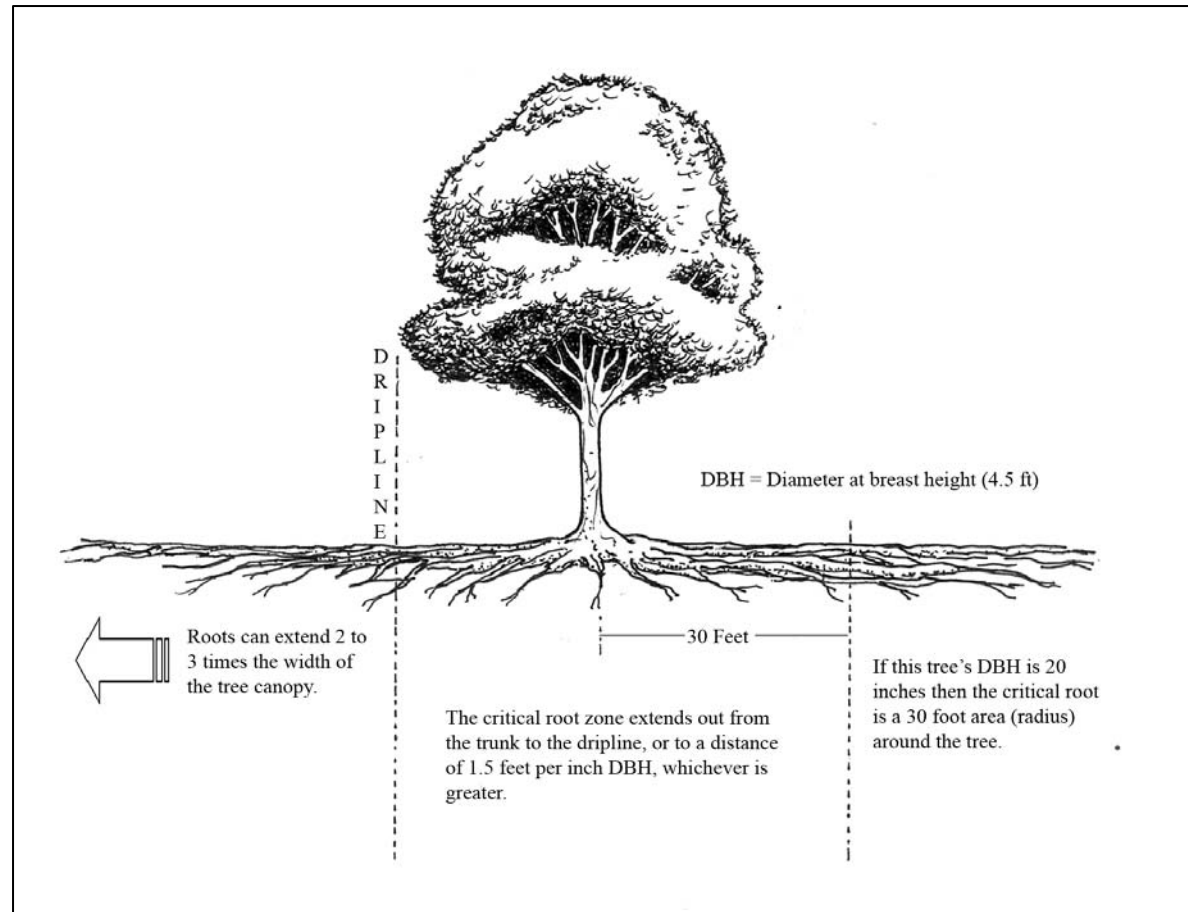


Soil

- ❑ Perc tests must be conducted in the place where you are installing the rain garden – please see the perc test worksheet.
- ❑ Recommended: 1.2" per hour drawdown.
- ❑ If your soils do not drain then you will create a pool of standing water.

Trees

- ❑ Do not install a rain garden within the Critical Root Zone of Trees:
 - Outside of drip line
 - Or 1.5' per DBH in inches



Proximity to Foundation, Neighboring Properties, and Public Space

- ❑ You must install your rain garden 10' from foundations of houses or garages
- ❑ 5' from public space
- ❑ 5' from adjacent properties
- ❑ This can vary based on slope (ie do not want to send water directly to neighbors)

Common DC Site Constraints

- ❑ Row homes usually only have one downspout in back (too much water in very small space)
- ❑ Back yards can be paved over or too small
- ❑ Many retaining walls
- ❑ Poor soils- clay layer found 1-2 feet below surface



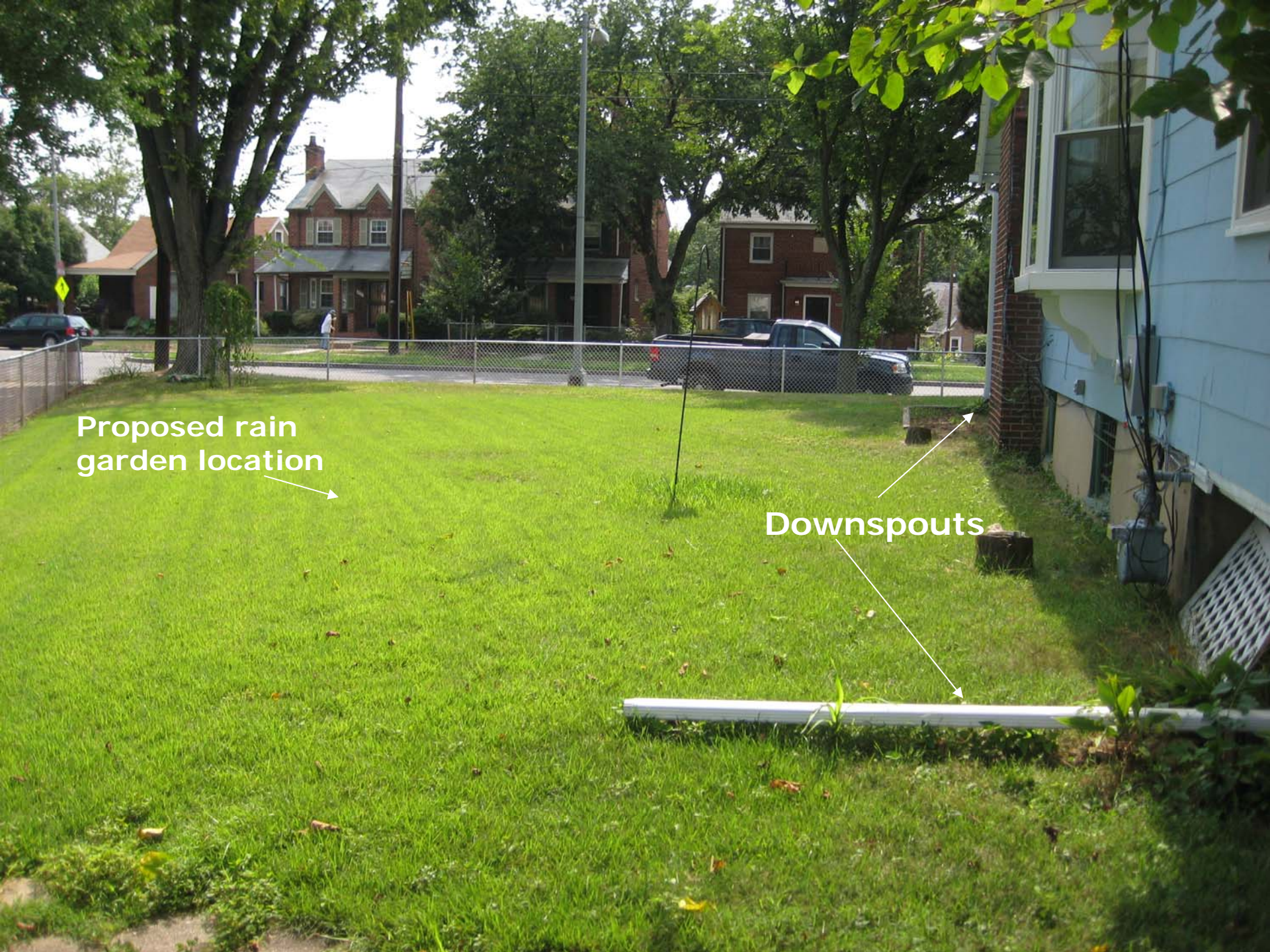
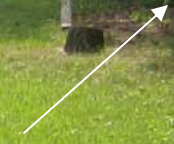
Downspout

Proposed rain garden location

Proposed rain garden location



Downspouts





224



Downspout



**Proposed
location for a
rain garden**

Sizing

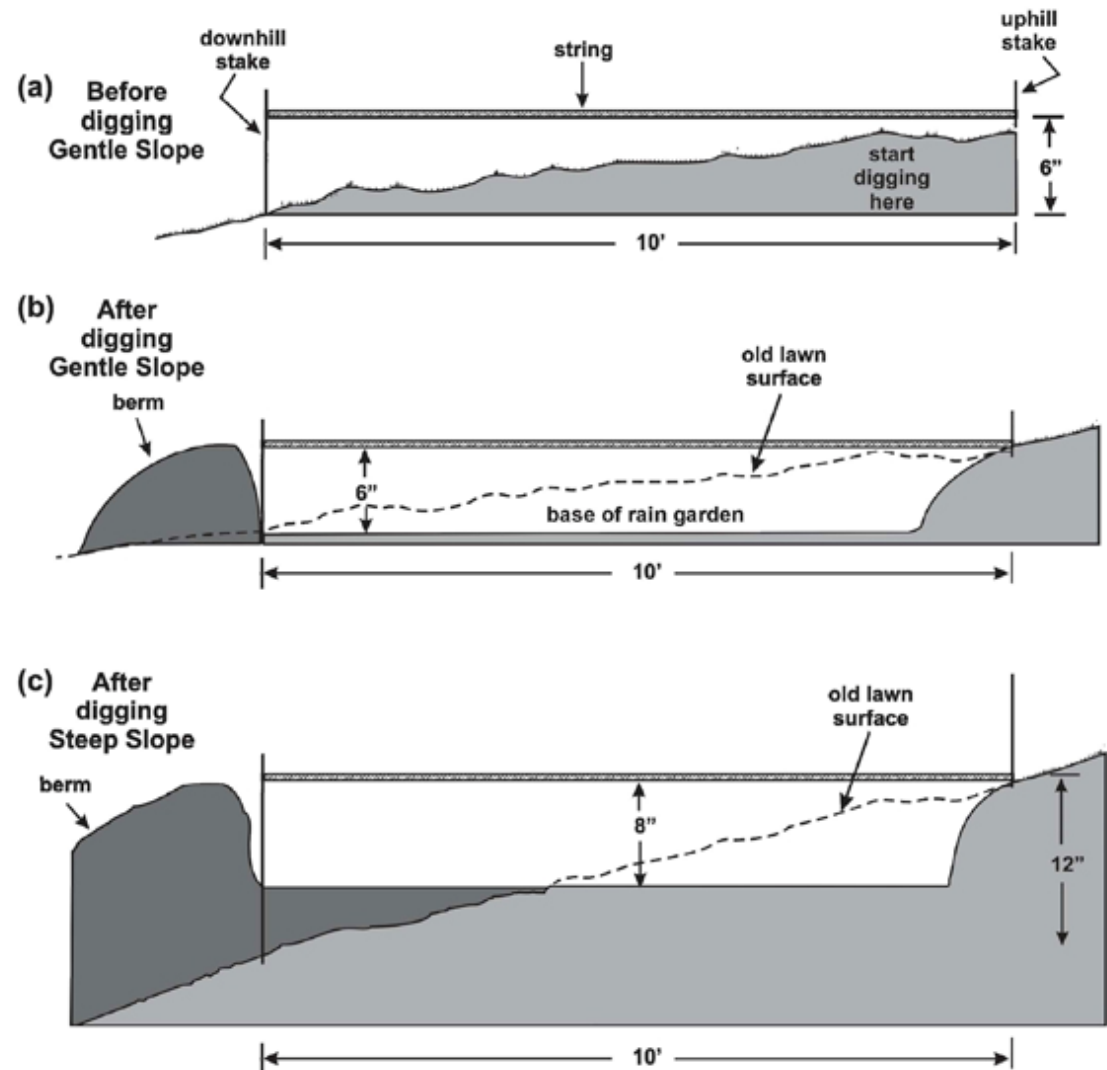
- See the rain garden sizing exercise PowerPoint to size your rain garden appropriately – below is an example to treat a roof area of 465 square feet in a 1" rain storm.
 - 24" depth (18" soil mix and 6" ponding)
 - 50 sq ft surface area
 - Bioretention mix with 30% void space

$$\begin{aligned}\text{Volume} &= [(.5)(\text{area}) + (\text{area})(\text{depth})(\text{void ratio})] \times (7.48 \\ &\text{gal/cu ft}) \\ &= [(.25)(50) + (50 \text{ sq ft})(1.75')(.3)] \times 7.48 = \mathbf{290} \\ &\mathbf{gallons}\end{aligned}$$

*This can treat a roof area of 465 sq ft in a one inch storm
(or 673 sq ft if linked to a 130 gallon rain barrel overflow)*

Excavate and Create Berm

- ❑ The bottom of the rain garden should be level.
- ❑ Create berm downhill
- ❑ The top of the berm should be the same level as the uphill edge of the rain garden.
- ❑ 24-48 hour drawdown





Berm →

Downspout Extension

- ❑ The pipe can be buried underground either a PVC pipe can be used or a corrugated black pipe.
 - Perforated 10ft from house will aid infiltration
- ❑ A shallow swale may be appropriate for some cases and should be lined with turfgrass or rocks to prevent erosion in the swale.
- ❑ In the area between the downspout and the rain garden, there needs to be pervious ground without erosion, and the land should slope down to the rain garden to ensure that water does not stand anywhere around the foundation of the house.



http://nemo.uconn.edu/tools/stormwater/rain_garden.htm

Biotention Soil Mix

- ❑ 65% sand, 20% topsoil, and 15% compost.
- ❑ You can mix your own or find a bagged source that meets these specifications.



Managing Clay

If you use existing top soil for the bioretention mix, the clay content in the soil mix should be no more than 10%.



Control Erosion

- ❑ Establish a grass or groundcover border along the upper edge of the rain garden to slow down the runoff water and do the same over the berm for stabilization.
- ❑ Provide 3 sq ft of inlet protection where the downspout extension enters the rain garden to dissipate the flow of runoff into the rain garden.



Plant Selection

- ❑ The temporary pool in the rain garden makes plant selection important.
- ❑ The soil will retain the greatest amount of moisture at the center of your garden and should be planted with species native that tolerate wet, clay soils and that are native to your area.

❑ Plant Resources

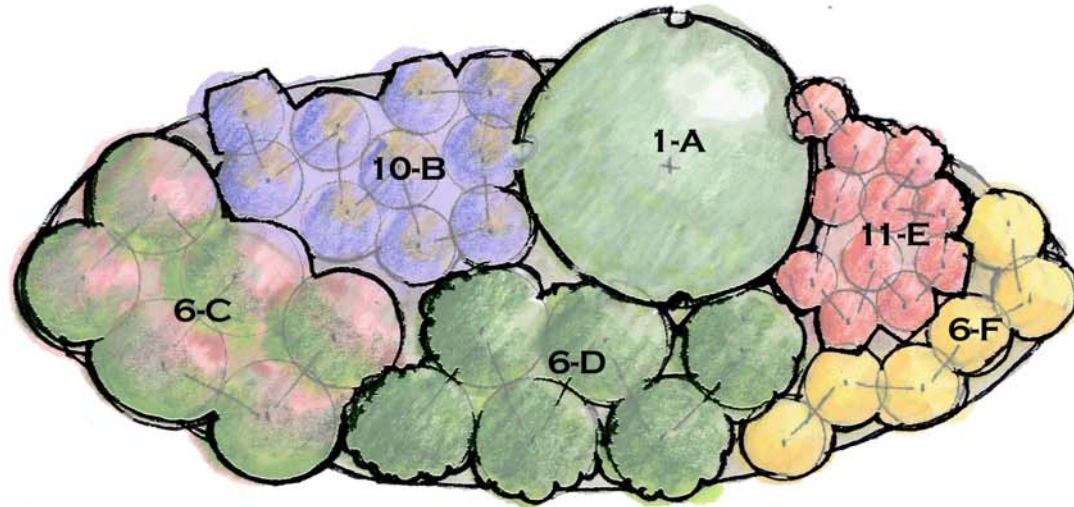
http://www.lowimpactdevelopment.org/raingarden_design/plant_lists.htm

<http://www.nativeplantcenter.net/>

<http://www.nps.gov/plants/pubs/chesapeake/pdf/chesapeakenatives.pdf>

❑ Rain Garden templates:

http://www.lowimpactdevelopment.org/raingarden_design/templates.htm



PLANT CHOICE

- A - *Chionanthus virginicus* (Fringe Tree) or
Viburnum nudum (Wild Raisin)
 B - *Aster novae-angliae* (New England Aster) 2' o.c. *
 C - *Vaccinium angustifolium* (Blueberry), 3' o.c.
 D - *Kalmia latifolia* (Mountain Laurel), 3' o.c.
 E - *Iris versicolor* (Blueflag Iris), 12" o.c.
 F - *Solidago* 'Golden Fleece', 2' o.c. or
Rudbeckia fulgida 'Goldsturm' (Black Eyed Susan)

note: o.c. = on center

* also listed as *Symphotrichum novae-angliae*

DESIGN VALUE

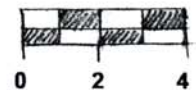
- Tallest/Structural element in garden (8-12')
 Medium coarse texture, white spring flowers, yellow fall color
 Medium Tall perennial, billowing fall color (lavendar), butterflies
 Medium height (3-5'), year round color interest, fruit
 Year round interest, color mass in spring (white)
 Spring color mass, interesting texture
 Fall yellow mass of color, compliments Fringe Tree and Aster, butterflies
 Summer and early fall flowers if the summer flowers are cut

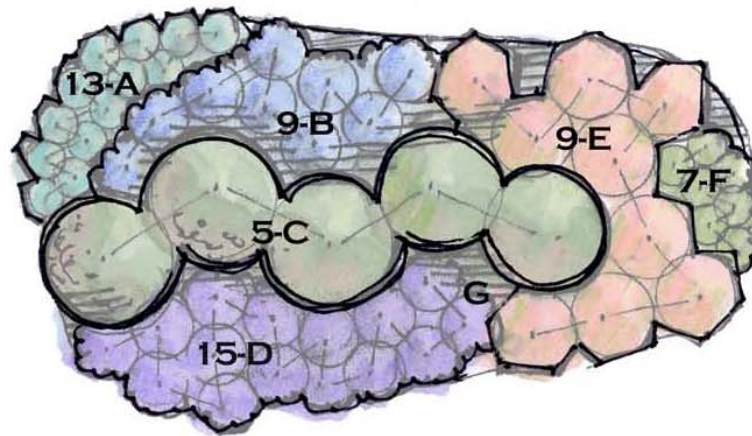
LOW MAINTENANCE RAINGARDEN DEER RESISTANT

200 SF

Full Sun
 Piedmont
 Zones 5a-7b

Scale: 1/4"=1'





- A - *Hemerocallis* 'Happy Returns' (Dwarf hybrid daylily),* 12" o.c.
- B - *Rudbeckia fulgida* (Black Eyed Susan), 18" o.c.
- C - *Itea virginiana* 'Little Henry' (Dwarf Virginia Sweetspire), 3' o.c.
- D - *Tradescantia virginiana* (Spiderwort), 18" o.c.
- E - *Echinacea purpurea* 'Magnus' (Magnus Purple Coneflower), 2' o.c.
- F - *Phlox subulata* 'Emerald Cushion Blue' or 'Emerald Cushion Pink'
(Creeping Phlox, aka Thrift), 12" o.c.
- G - *Narcissus* naturalizing type (Daffodils), 4" o.c.

note: o.c. = on center

*substitute *Iris fulva* for *Hemerocallis* if native is desired

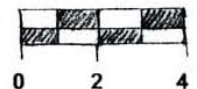
**note: G indicates daffodils
4" o.c., total 200 bulbs**



**DIVIDER RAINGARDEN
130 SF**

Full Sun, Piedmont
Zone 5a-8a

Scale: 1/4" = 1'



Mulch

- ❑ Use 2" to 3" of dense materials such as pine straw, wood chips or shredded wood.
- ❑ Lighter mulch such as pine bark or straw will float and may be washed away.



Digging two rain gardens:



Two rain gardens—after:



Before:



Setting out new plants:



Filling the hole with soil mix:



After:

