



earth-wise guide to

# Rain Gardens

*Keeping Water on the Land*

## what is a rain garden?

A rain garden is a shallow, vegetated depression designed to absorb and filter runoff from hard (impervious) surfaces like roofs, sidewalks, and driveways. Rain gardens are usually planted with colorful native plants and grasses. They not only provide an attractive addition to the yard, but also help to conserve water and protect our water quality.

## how does a rain garden help?

As Austin becomes increasingly urbanized, native landscapes are replaced with impervious surfaces that prevent rainwater from soaking into the ground. Stormwater quickly runs off these hard surfaces, picking up any pollutants from the land and carrying them to our creeks. This rapidly flowing water also increases the chances of flooding and erosion.

The goal of a rain garden is to keep water on the land. Rain gardens, with their shallow depressions, capture stormwater and provide for natural infiltration into the soil. This provides water for the plants and helps maintain a constant flow of water in our streams through groundwater. They also help filter out pollutants including fertilizers, pesticides, oil, heavy metals and other chemicals that would otherwise reach our creeks through storm drains or drainage ditches. By reducing the quantity of water that runs off your property, rain gardens help lower the risk of flooding and erosion.

[www.growgreen.org](http://www.growgreen.org)



Photo: Mary Ann Ryan - Master Gardener

## Create A Rain Garden in Six Steps



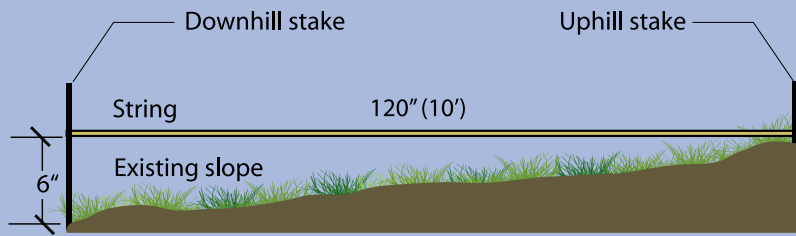
### Find the Right Location

- Observe the flow of water from rooftops, driveways or other hard surface and place the raingarden where this water collects



- Select an area on gently sloping or flat land
- Verify the slope of your lawn (instructions on next page). Slope should less than 10%
- If possible, pick a spot in full to partial sun. Shady locations will still work, but the options for attractive plants are more limited in the shade
- Make sure that any overflow does not cause unintended runoff to a neighbor's property or other structure
- If you are experiencing drainage-related problems (e.g. severe foundation problems, erosion or local flooding), consider placing the rain garden at least 10' away from the structure
- Avoid areas with utility lines. Be sure to call 1-800-DIG-TESS (344-8377) to identify the location of underground utilities – the service is free

## How to Calculate the Slope of Your Lawn



$$6'' \div 120'' = .05 \times 100 = 5\% \text{ slope}$$

1. Pound one stake in the ground at the uphill end of your rain garden site and pound another stake in the ground at the downhill end. The stakes should be about 10' apart
2. Tie a string to the bottom of the uphill stake and run the string to the downhill stake
3. Using a string or carpenter's level, make the string horizontal and tie the string to the downhill stake at that height
4. Measure the distance *in inches* between the two stakes
5. Now measure the height in inches on the downhill stake between the ground and string
6. Divide the height between the ground and string by the distance between the two stakes and multiply the result by 100 to find the lawn's percent slope



## 2 Test the Soil

- When soil is saturated (after you've irrigated or it has rained,) dig a hole 6" in diameter and 12" deep in the area you'd like to put the rain garden. *(Ideally, you want to be sure there is at least the 12" of soil above bedrock)*



- Insert a ruler and fill the hole with water up to the 6" mark. Time how long it takes the water to be absorbed into the ground
- The water should absorb in less than 24 hours. If there is still water in the hole after 24 hours, then the site is not suitable for a rain garden
- If your soils meet the infiltration test requirements, then you are ready to build the garden!

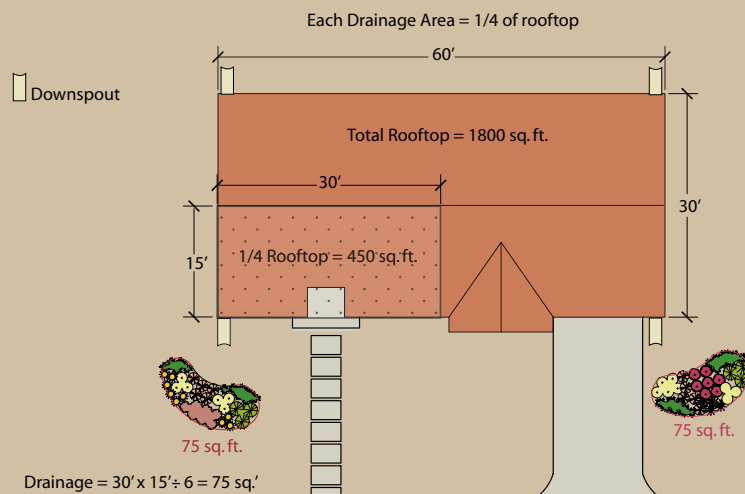
## 3 Calculate the Size and Shape of Your Garden

- Through observation, locate the roof area or other impervious surface that will contribute runoff to your rain garden
- Use a tape measure to estimate the size of the area. This doesn't require climbing on the roof! Standing on the ground, measure the footprint of the area you are interested in (the area taken up by your house if you were looking down from above)
- Once you have estimated the length and width, multiply the two measurements to get the area of the impervious surface in square feet

- Finally, divide this area by 6. This calculation tells you how large the rain garden should be to hold 1" of runoff in a rain garden that is 6" deep (see options below)

Impervious Surface Area (sq. ft.)	Raingarden (sq. ft.)	Size Options (ft. x ft.)
200	33	3x11 or 4x9
400	67	5x14; 7x10
600	100	5x20; 8x12
800	133	6x22; 10x13
1000	167	6x28; 10x17

- Remember more than one raingarden might be needed to collect all the run off from your roof
- Rain gardens shouldn't be just functional - they should be attractive, creative and fun!



# 4

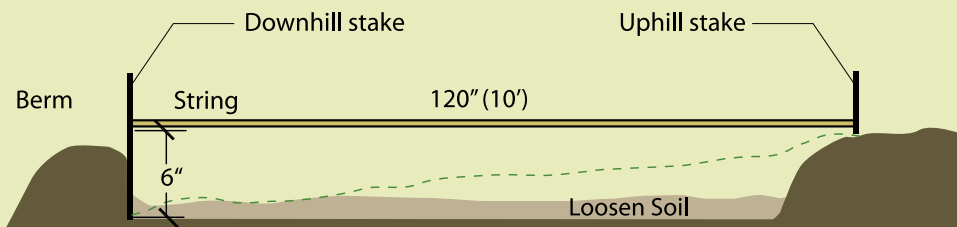
## Rain Garden Construction

- Once you feel confident in the placement of the garden, lay out the shape using string or tape to define where to dig
- Now you are ready to dig!!!
  - If the yard is fairly level (flat), just dig out the garden to a depth of 6"
  - If the yard is on a gentle slope, you may need to dig out soil from the upslope area to construct a small berm (mound of compacted soil) at the downslope side of the garden
- Maintain a depth of 6 inches throughout the bottom of the rain garden. A string level can help you maintain a consistent depth
- Slope the sides of the rain garden using a shovel to create a gentle side slope
- Level the top border of the basin. You can use the top of the existing lawn, an earthen berm or



landscaping material (like stone or timber). This will distribute overflow evenly across the perimeter of the rain garden

- Loosen the soil in the bottom of the rain garden to a depth of 3 inches. Top dress the loosened soil with compost so the soil is ready for planting
- If water flows quickly into the rain garden, you will need to construct a "splash pad" to guide the water to the rain garden. Splash pads are typically constructed with rock and extend 2 to 3' from the point of entry. 1 - 2" gravel or river rock is often a sufficient size for splash pads



Pick up the City of Austin's Grow Green fact sheets and plant guide at most areas nurseries or visit [www.growgreen.org](http://www.growgreen.org) for proper installation and establishment tips

# 5

## Plant Selection and Installation

- Select plants that have a well-established root system (containerized plants vs. seed). Research shows that deep-rooted plants (like native bunch grasses), provide optimal pollutant uptake and maintain the porosity of the soil
- Although rain gardens receive more moisture than surrounding garden areas, it's likely that drought tolerant plants will be the best choice in central Texas. It's wise, however, to avoid plants that need exceptionally well-drained soil (e.g. rosemary or desert plants)
- Consider inoculating your soil with compost tea to jump start the beneficial bacteria in healthy soils. Compost tea is the liquid extract from compost and is available at many local nurseries
- After the plants are in the ground, apply mulch to the exposed soil to retain moisture and discourage weeds. Wood mulch has a tendency to float and can easily wash away. Decorative stone or crushed glass can be an attractive, stable mulch



The City of Austin Resource Recovery Center offers glass mulch for free if you load it yourself. 10108 FM 812, Austin, TX

# 6 Maintenance

- Water regularly until plants are established (usually one growing season)
- Weed as needed
- Avoid fertilizing - it's usually unnecessary for most native plants
- If your rain garden is located near a gutter downspout or roof valley, consider adding rain barrels so that you will have an extra store of water for irrigating the rain garden plants during dry weather. The City of Austin Water Utility offers rebates for the purchase of qualifying rain barrels. <http://www.ci.austin.tx.us/watercon/rainbarrelprogram.htm>
- Observe the performance of your rain garden over time to make sure it functions as planned. If the water remains for longer than 2 days, amend the soil by gently cultivating the top 4" to 6" to break-up any surface crust. Add sand or compost to create a more free-draining soil and then re-apply mulch to the surface

*if there is standing water, will mosquitoes be a problem?*

Mosquitoes should not be a problem because a rain garden is designed to only hold water for a day or two – not long enough for mosquitoes to complete their breeding cycle.

*For more earth-wise gardening tips, visit*

[www.growgreen.org](http://www.growgreen.org)

*For water conserving tips and rebates, visit*

[www.waterwiseaustin.org](http://www.waterwiseaustin.org)



## Suggested Plants for Central Texas Raingardens

### Base of the garden

Bushy Bluestem  
 Cardinal Flower  
 Eastern Gamagrass  
 Fall Obedient Plant  
 Frogfruit  
 Gregg's Mistflower  
 Horsetail  
 Inland Sea Oats  
 Marsh Obedient Plant  
 Maximilian Sunflower  
 Salt Marsh Mallow  
 Scarlet Rose Mallow  
 Slender Rush  
 Soft Rush  
 Swamp Milkweed  
 Swamp Sunflower  
 Switchgrass  
 Water Clover  
 Water Daisy  
 White-topped Sedge  
 Woolly Rose-Mallow

### Sides of the garden

Big Bluestem  
 Big Muhly  
 Black-eyed Susan  
 Brazos Penstemon  
 Claspig Coneflower  
 Cut-leaf Daisy  
 Deer Muhly  
 Eastern Gamagrass  
 Gulf Coast Muhly  
 Illinois Bundleflower  
 Marsh Fleabane  
 Pink Evening Primrose  
 Pitcher Sage  
 Plains Coreopsis  
 Prairie Wildrye  
 Scarlet Sage

Find a Grow Green Landscape Design Template to match your needs and style.



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[www.ci.austin.tx.us/growgreen/landscape\\_templates.htm](http://www.ci.austin.tx.us/growgreen/landscape_templates.htm)