



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 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.



Austin Parks and Recreation - 919 West 28<sup>1/2</sup> Street

## Create A Rain Garden in Six Steps

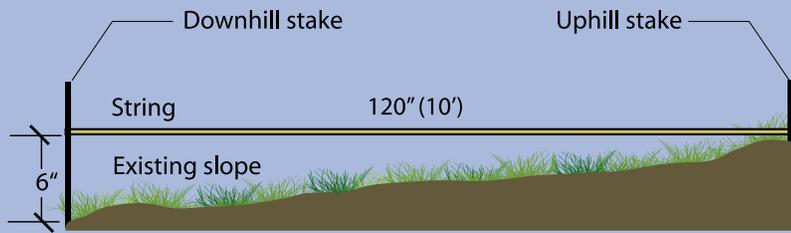
### 1 Find the Right Location

- Observe the flow of water from rooftops, driveways or other hard surfaces and place the rain garden where this water collects



- Select an area on gently sloping or flat land
- Calculate the slope of your lawn (instructions on next page). The slope should be less than 10%
- If possible, pick a spot in full to partial sun. Shady locations will still work, but the options for flowering plants are more limited in the shade
- Make sure that any overflow will not cause unintended runoff to a neighbor's property or other structure
- If drainage-related problems are occurring (e.g. foundation problems, erosion or 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 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 no more than 12" deep in the area you'd like to put the rain garden. (Ideally, you want to be sure there is at least 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 soil meets the infiltration test requirements, then you are ready to build the garden!

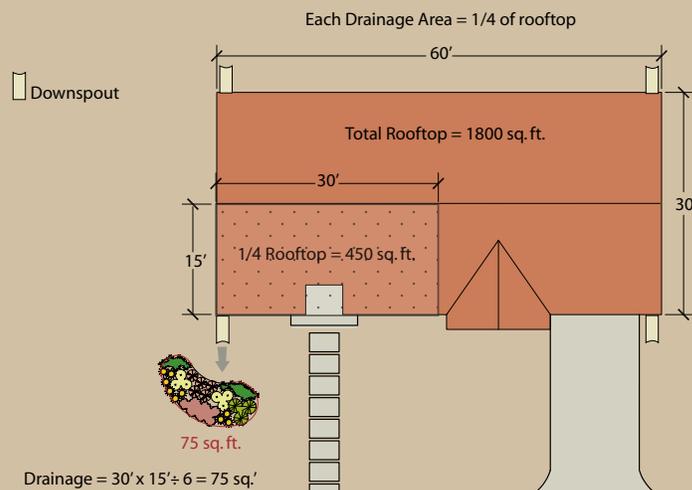
## 3 Calculate the Size and Shape of Your Garden

- Through observation, locate the roof area or other impervious surfaces 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.)	Rain Garden (sq. ft.)	Size Options (ft. x ft.)
200	33	3x11; 4x9
400	67	5x14; 7x10
600	100	5x20; 8x12
800	133	6x22; 10x13
1000	167	6x28; 10x17

- More than one rain garden might be needed to collect all the runoff from your roof
- Rain gardens aren't just functional - they can be attractive, creative and fun!



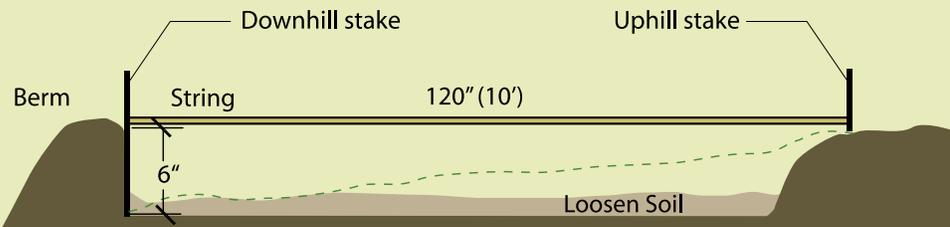
# 4 Rain Garden Construction

- Once you feel confident your garden is well-placed, 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, 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 (see example below)
- Maintain a depth of 6" 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
- 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". Cover 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 to 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)



# 5 Plant Selection and Installation

- Select plants that have a well-established root system (containerized plants instead of seed). Research shows that deep-rooted plants (like native bunch grasses), absorb the most pollutants and help the soil hold more water
- 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)
- Trees and shrubs are generally encouraged in rain gardens except in areas where their roots may clog drain pipes
- After plants are in the ground apply mulch to the exposed soil to retain moisture and discourage weeds. Avoid using mulch that will wash away. Coarsely shredded hardwood mulch, pecan shell mulch, larger and sizes of decorative stone can be attractive, stable options

# 6 • Maintenance

- Water regularly until plants are established
- Weed as needed
- Limit fertilizing - it's unnecessary for most native plants
- If your rain garden is located near a gutter downspout or roof valley, consider adding rain barrels or cisterns so you will have an extra store of water to irrigate the rain garden plants during dry weather. Austin Water offers rainwater harvesting rebates. [www.austintexas.gov/department/rainwater-harvesting-rebates](http://www.austintexas.gov/department/rainwater-harvesting-rebates)
- 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, gently break up any surface crust in the top 4"- 6"

*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 Rain Gardens

### Tall Plants

American Beautyberry  
Yaupon Holly

### Medium Plants

Bamboo Muhly  
Big Muhly  
Cherokee Sedge  
Cherry Sage  
Chile Pequin  
Copper Canyon Daisy  
Dwarf Yaupon  
Fall Aster  
Flame Acanthus  
Lantana  
Mexican Bush Sage  
Mexican Honeysuckle  
Mexican Oregano  
Obedient Plant  
Pine Muhly  
Red Yucca  
Rock Rose  
Turk's Cap  
Twistleaf Yucca

### Low Plants

Blue Grama  
Coreopsis  
Deer Muhly  
Engelmann Daisy  
Frogfruit  
Gulf Coast Muhly  
Gulf Coast Penstemon  
Horseherb  
Hymenoxys  
Inland Sea Oats  
Lawn Sedge  
Liriope  
Meadow Sedge  
Mealy Blue Sage  
Mistflower  
Pigeonberry  
River Fern  
Spiderwort  
Texas Betony  
Texas Sedge  
Tropical Sage  
Winecup  
Zexmenia

Register your rain garden at [www.austintexas.gov/raingardens](http://www.austintexas.gov/raingardens)



**WATERSHED PROTECTION**

512-974-2550

**TEXAS A&M AGRILIFE EXTENSION**

512-854-9600

**Austin WATER**  
Clearly Reliable

Look for Grow Green Landscape Design Templates for other design ideas.



[www.austintexas.gov/landscapedesign](http://www.austintexas.gov/landscapedesign)