Rain Gardens in Austin

John Gleason, Landscape Architect

City of Austin Watershed Protection Department

What is a Rain Garden?

A shallow, vegetated depression designed to absorb and filter runoff from hard (impervious) surfaces like roofs, sidewalks, and driveways

grow green

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 our 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.

growgreen.org

Austin Parks and Recreation - 919 West 28th Street

Create A Rain Garden in Six Steps

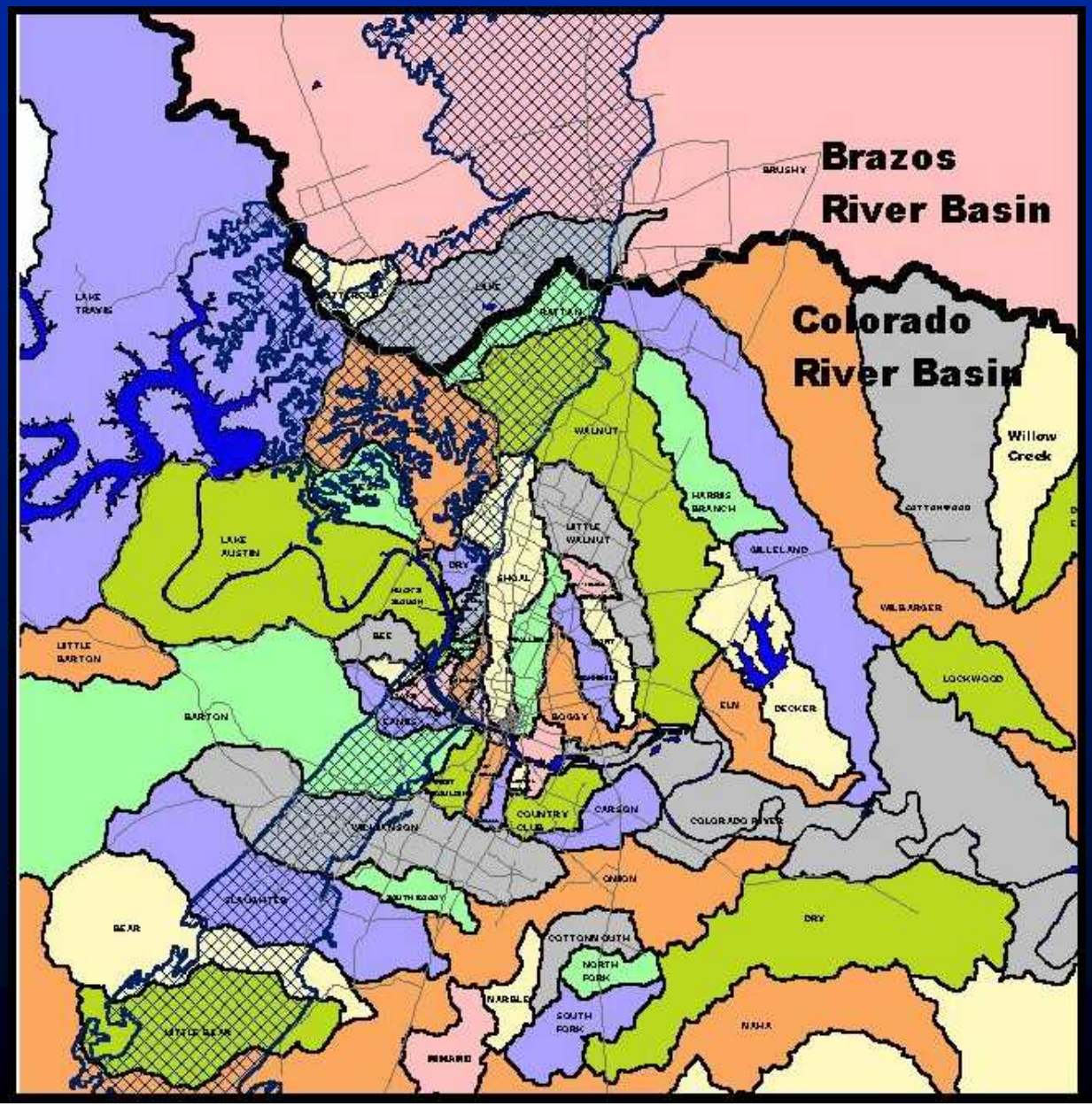
1 Find the Right Location

- 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

Why Build a Rain Garden

- Protect Watershed
- Conserve Water
- Conserve Energy
- Wildlife Friendly
- Aesthetics

Watersheds & Impervious Cover



Impervious cover disrupts watershed hydrology and leads to flooding, erosion and water pollution.

Flooding, Erosion & Water Pollution

Deluge, more floods sock region

■ 1 teen dies, 2 are rescued in swollen South Austin waterways

By Bob Banta and Claire Osborn
American-Statesman Staff

The day's routines — taking a casual morning walk, driving from point A to point B, even staying at home and minding your own business — were often dangerous in Central Texas on Tuesday as clouds dumped more rain onto already-saturated soil, turning gullies and dry creek beds into dangerous white-water streams.

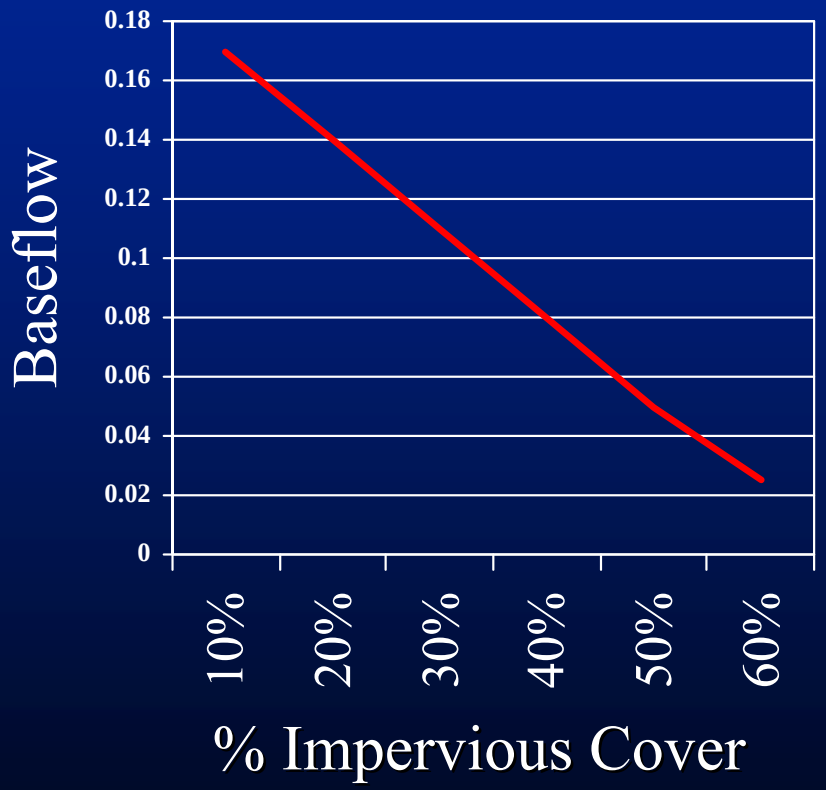
A 17-year-old woman who was walking with friends along South First Street accidentally stepped into a raging drainage ditch and drowned. She was found 200 yards downstream by Austin Fire Department divers.

Hays County Sheriff Don Montague said Tuesday night that his office intended to announce today that two people were missing, but he could not confirm earlier reports that the people's absence was related to the flood.

That tragedy wasn't more

Creek Baseflow & Degraded Habitat

Baseflow: Stream flow due to groundwater seepage, not runoff



Rain Gardens Benefit the Environment

Watershed Benefits

- Reduce Stormwater Runoff
- Increase Baseflow
- Minimize Erosion
- Cleanse Stormwater
- Reduce Water Pollution

Rain Gardens Keep Water on the Land

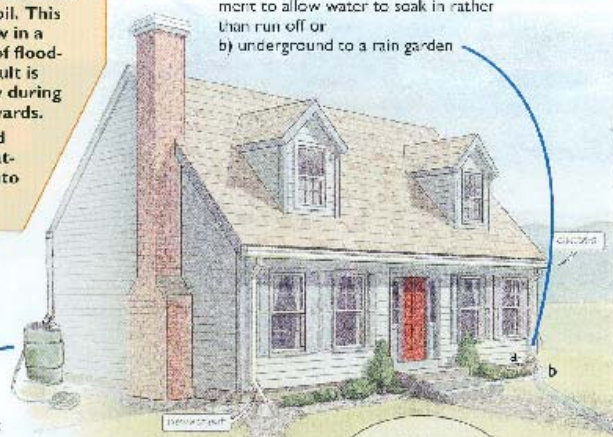
KEEP WATER ON THE LAND

With increased population growth and smaller lots, much of our land is being covered with roadways, rooftops, parking lots and sidewalks that do not let water soak into the soil. This decreases baseflow (the constant flow in a creek) while increasing the chances of flooding and streambank erosion. The result is that many creeks have excessive flow during heavy rains and dry up shortly afterwards.

You can help both our waterways and your drainage problems by incorporating some "greenscape" techniques into your landscape plans.

Gutter downspouts

Direct downspouts to either
a) vegetated areas rather than pavement to allow water to soak in rather than run off or
b) underground to a rain garden



Rainwater Harvesting

By directing rooftop gutters to a rain barrel, you can then use the collected rainwater on areas of the land that most need water.

Swale or "Dry Creekbed"

Install a stone or grassed channel that directs rainwater to an area of the yard where it can be better absorbed.

Soils

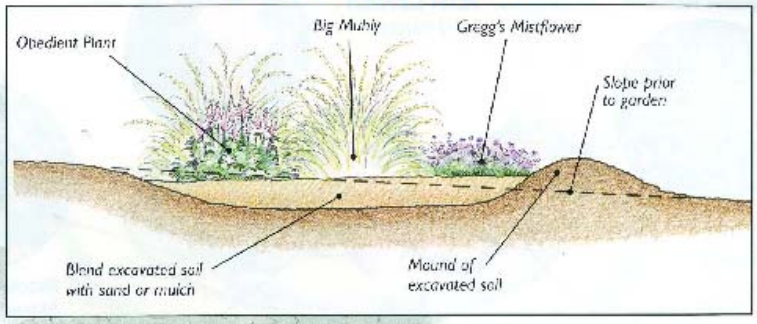
At least 4 inches (and ideally 6-8 inches) of organic topsoil should be added to help keep nutrients and water on the land.

Berm

This could be a mound of earth or a low stone wall. It is typically at the bottom of a slope to help retain water or prevent erosion.

Reminder: When you change your landscape design, remember to change your sprinkler system as well!

Cross Section: Rain Garden



Trees

Plant disease-resistant natives to promote water retention, improve air quality, provide shade and habitat.

Porous Pavement

An alternative to asphalt, porous materials contain voids to encourage water to infiltrate the land. Some options include bark mulch, gravel, pervious concrete, paving stones and tumbled glass.

Your Lawn As a Filter

Grass slows down water flow and allows infiltration. Lawn does best in an area that is nearly level and should not be treated with chemicals in order to reduce the potential for water pollution.

Rain Gardens

These gardens are designed to catch and store rainfall for short periods of time and then dry out; they can be filled with attractive plants and often help solve drainage issues in the yard. For details on rain garden design and plant choices, see the following page and visit www.growgreen.org/plants.htm.

Illustration adapted from the Family Handyman, April 2007

Find the Right Location for Your Yard

Capture Runoff From:

- Roof Valleys & Downspouts
- Within Existing Flowpaths

Avoid:

- Utility Easements
- Rights of Way (ROW)
- Steep Slopes & Bedrock
- Existing Tree Roots
- Foundation Problem Areas
- Impacting Your Neighbor

Rain Garden in a Small Front Yard

Sotiva Townhomes on Harmon Ave.

Test the Soil to Determine Infiltration

Dig A Hole and Fill w/Water:

- 6” Wide x 12” Deep
- Fill w/Water Twice
- 2nd Time Fill to 6”

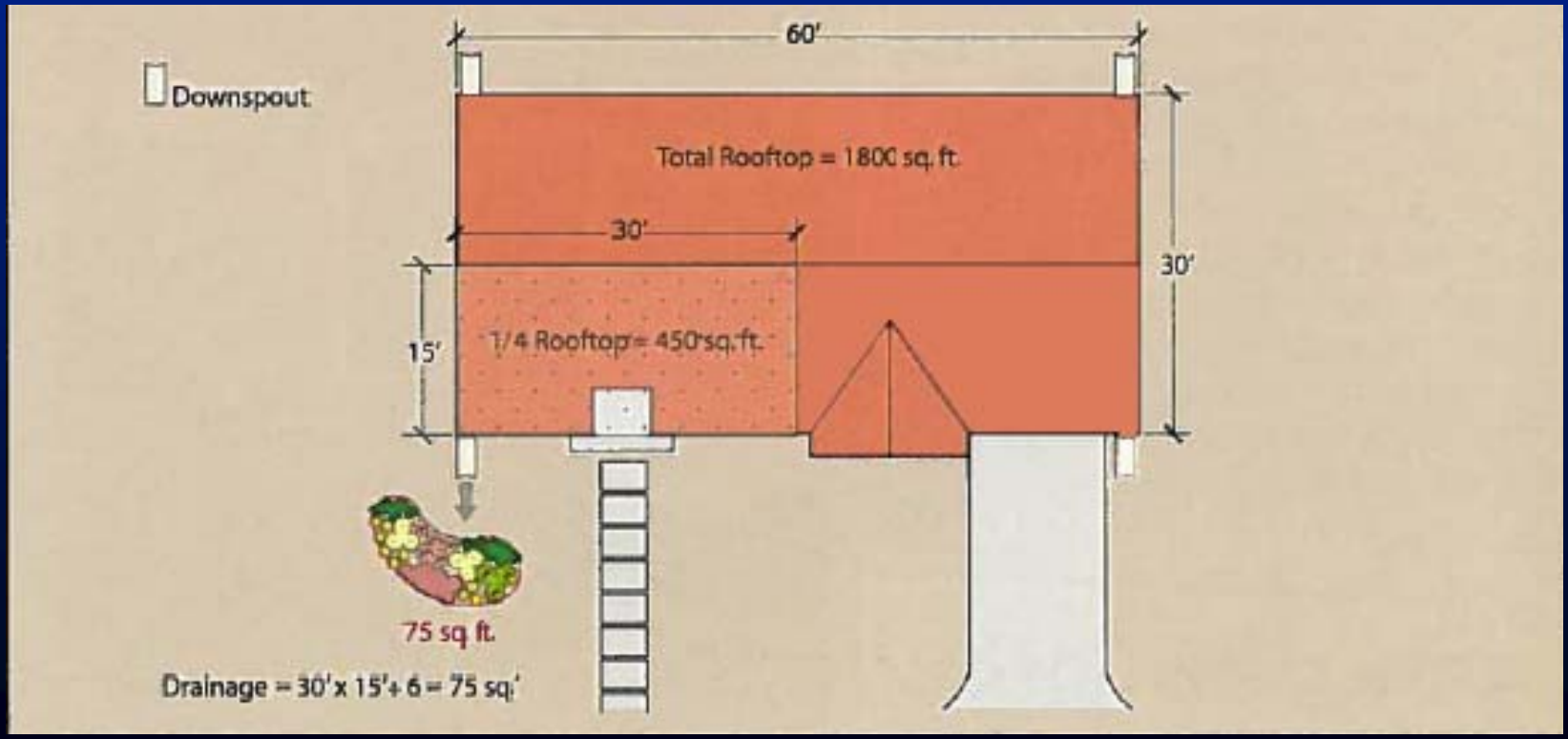
Determine Infiltration Rate:

- Insert Ruler to 6” level
- Measure Soaking Time
- Should Absorb in 24 hrs. min.

Determine the Size of Your Garden

A Design to Hold 1” of Runoff in a 6” Deep Rain Garden

- Determine Drainage Area (DA) Size in Square Feet
- Divide DA by 6 to Determine Garden Area Size

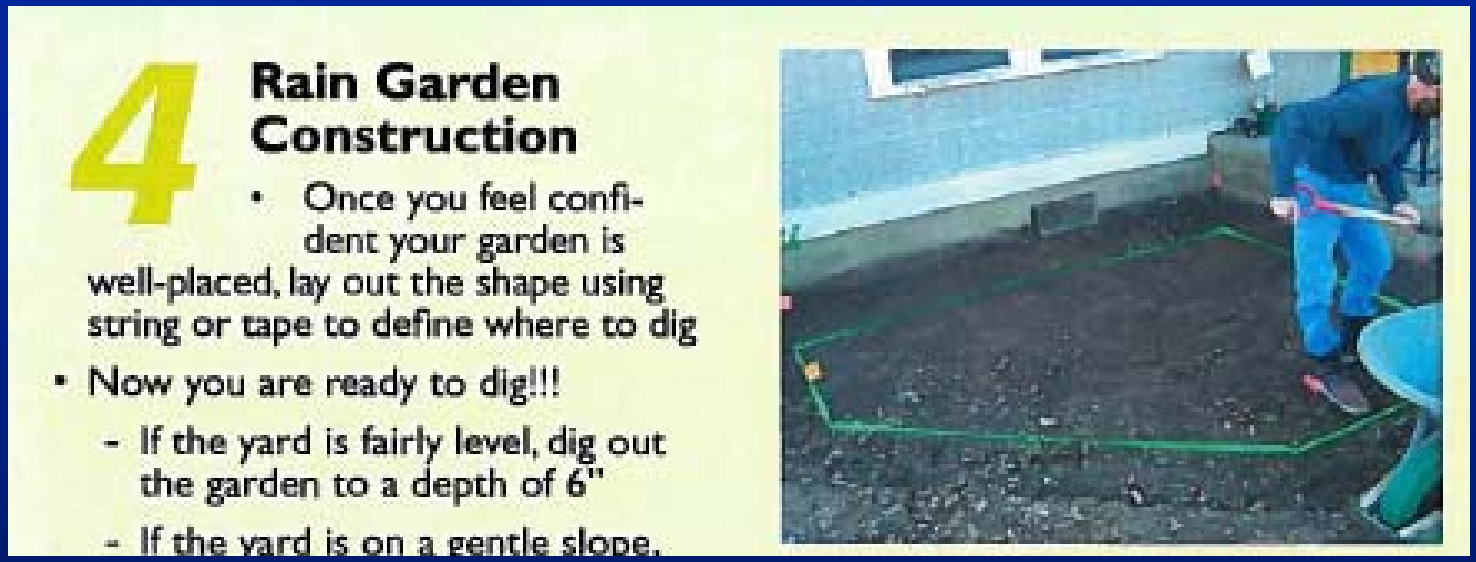


Example Garden Sizes

- Gardens Can Be Any Size
- All Numbers are in Square Feet
- Example Calculation $200 \div 6 \approx 33$

Drainage Area	Rain Garden Size	Example Dimensions
200 s.f.	33 s.f.	3’ x 11’
400 s.f.	67 s.f.	7’ x 10’
600 s.f.	100 s.f.	5’ x 20’
800 s.f.	133 s.f.	6’ x 22’
1000 s.f.	167 s.f.	10’ x 17’

Determine Shape and Remove Existing Plants



- Envision the Garden Size and Shape on the Ground
- Transplant any Existing Desirable Plants
- Thoroughly Eradicate All Weeds

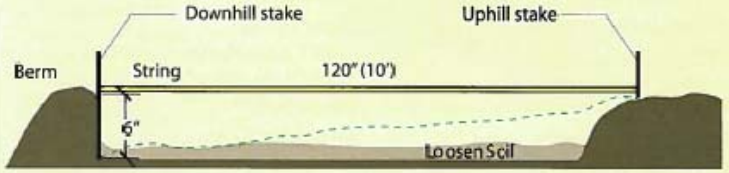
Dig a Hole - Create a Basin

- Excavate 6” - 8” of Soil
- Avoid Tree Roots
- Create a Berm to Hold Water
- Figure Out Overflow

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 typicaly constructed with rock and extenc 2 to 3' from the point of entry. ¡ to 2" gravel or river rock is often a sufficient size for splash pads



Enhance Garden Soil & Verify Depth

- Enhance Garden Soil with Compost, etc.
- Use a Level to Verify Depth

Plant Selection and Installation

- Use Drought-Tolerant Plants
- Avoid Plants That Require Well-Drained Soils
- Plant Roots Will Maintain and Increase Soil Porosity
- Add Mulch (Gravel or Wood)

Suggested Plants for Central Texas Rain Gardens

Tall Plants

Cherry Laurel
Eastern Gamagrass
Maximilian Sunflower
Possumhaw Holly
Red Buckeye
Switchgrass

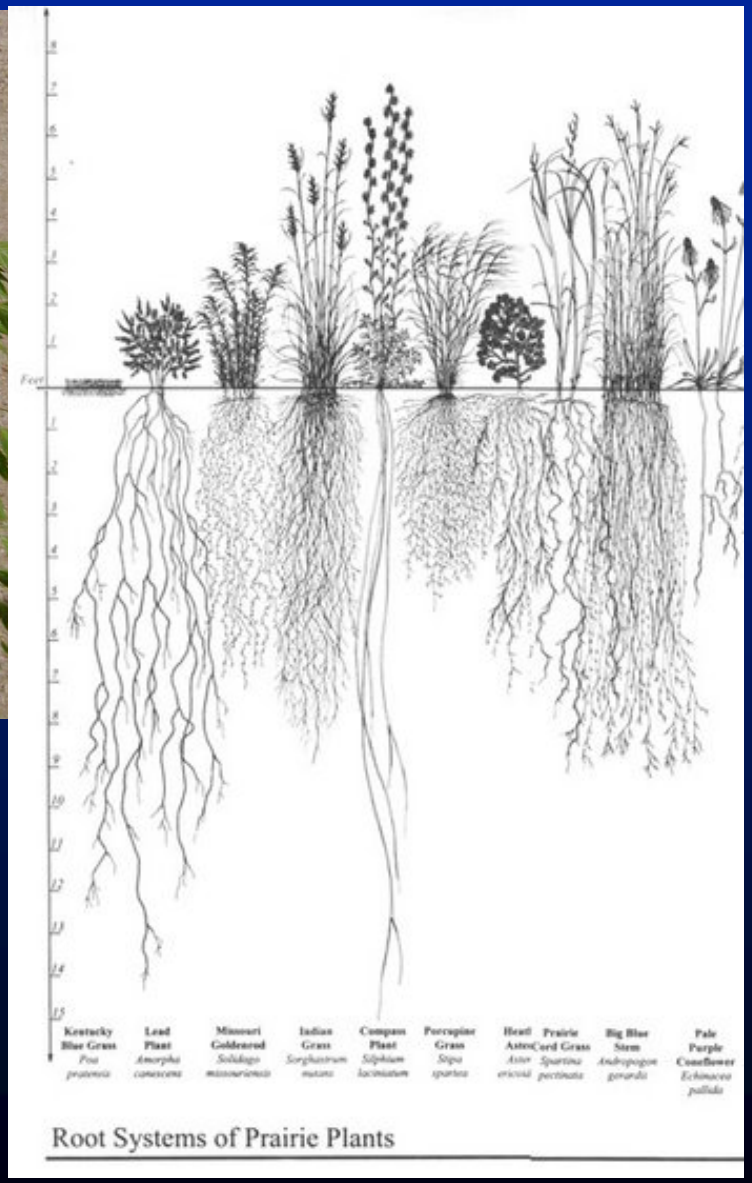
Medium Plants

American Beautyberry
Bicolor Iris
Big Bluestem
Big Muhly
Bushy Bluestem
Cherokee Sedge
Chili Pequin
Indian Grass
Little Bluestem
Obedient Plant
Prairie Wildrye
Purple Muhly
Turks Cap

Low Plants

Black-eyed Susan
Blue Mistflower
Cherry Sage
Coreopsis
Deer Muhly
Gulf Coast Muhly
Gulf Coast Penstemon
Horseherb
Inland Sea Oats
Liriope
Meadow Sedge
Missouri Violet
Monkey Grass
Pigeonberry
River Fern
Spiderwort
Tropical Sage
Water Clover
Zexmenia

Rain Garden Plants - Grasses



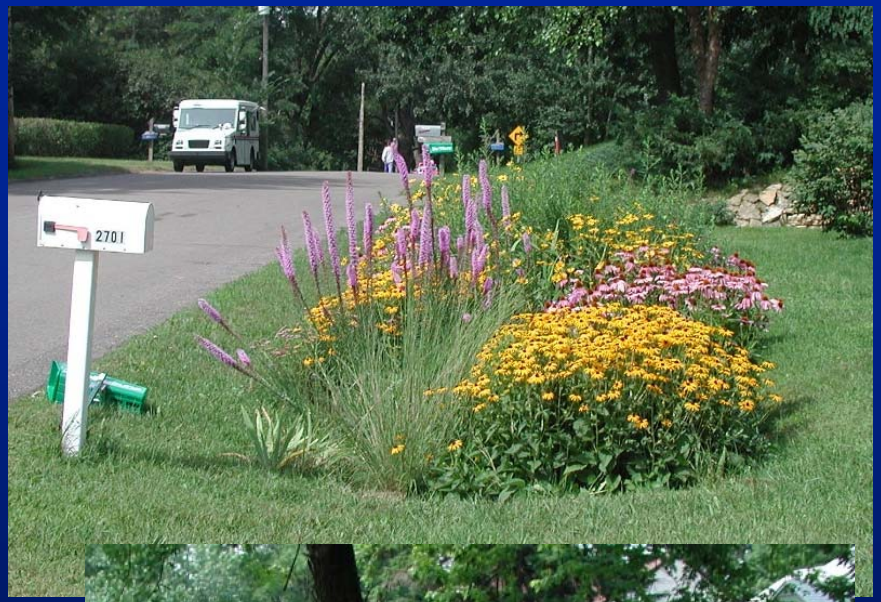
Root Systems of Prairie Plants

Some Plants for Shady Areas

- Inland Sea Oats
- Frostweed
- Southwestern Bristlegrass
- Native Sedges

Bellamy Residence Rain Garden

Rain Gardens Require Maintenance



Maintenance of Rain Gardens

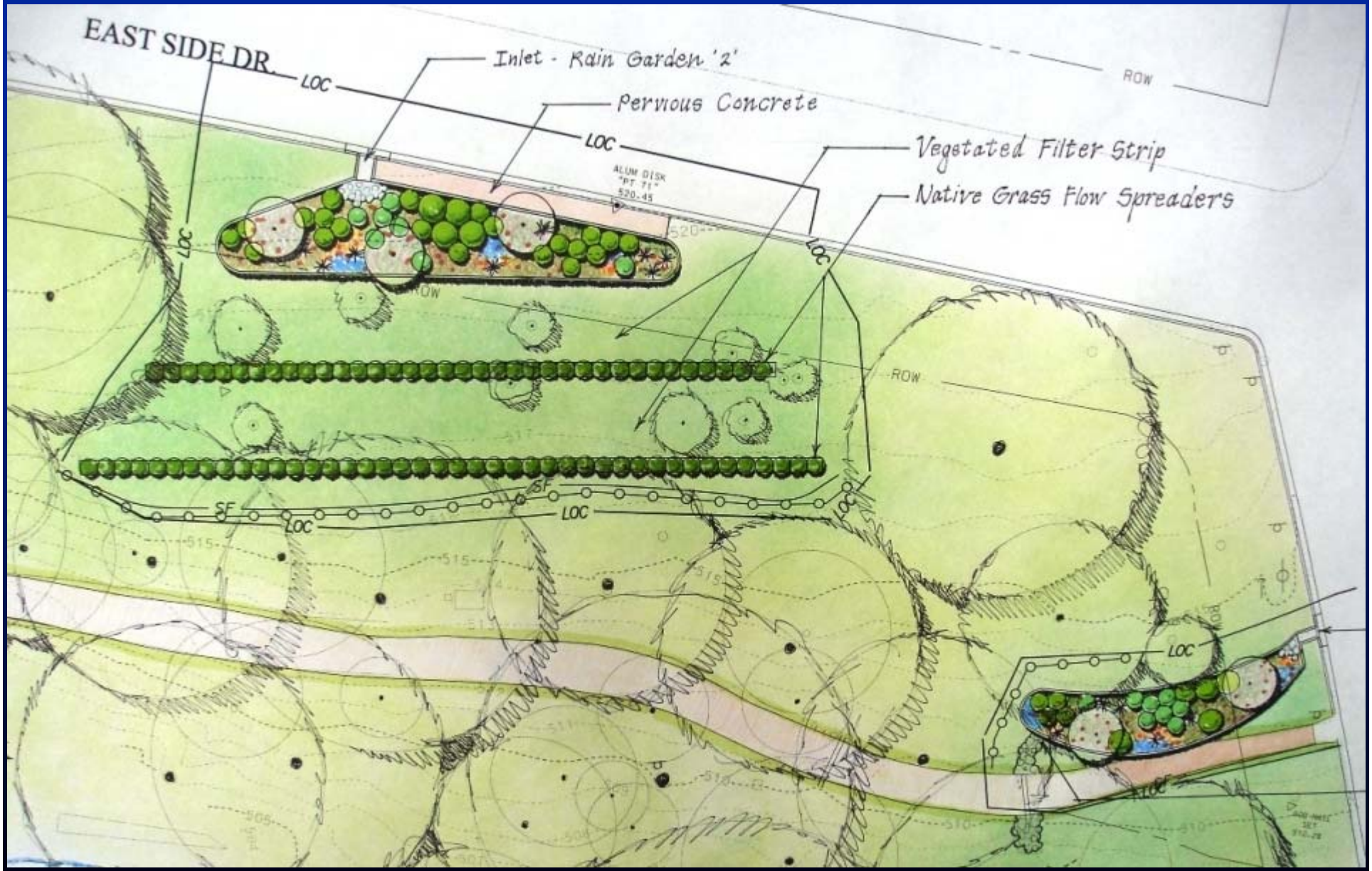
http://www.growgreen.org

- Water Plants to Establish Root System
- Infiltration Prevents Mosquitoes
- Remove Weeds
- Add Mulch to Minimize Weeds, Moderate Soil Temperatures, and Provide a Finished Appearance
- Fertilizing is Unnecessary

Public Rain Gardens

Big Stacy Park: Travis Heights neighborhood

Stacy Park Rain Gardens – Plan View



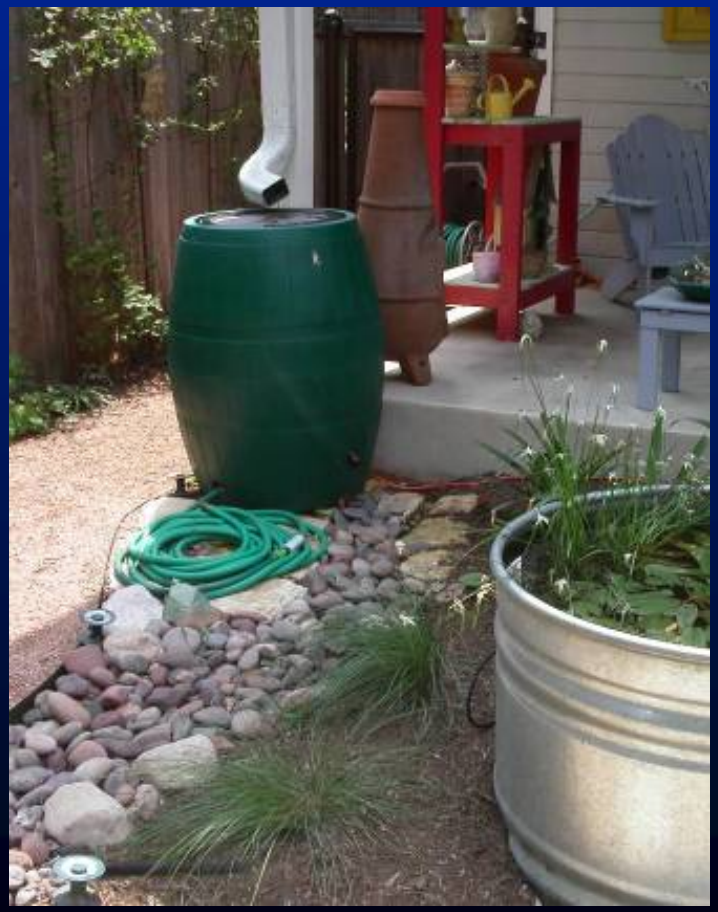
Stacy Park Rain Garden – inlet

Stacy Park Rain Garden

Stacy Park Rain Garden

Rainwater Harvesting and Rain Gardens

- Are an Ideal Combination
- Direct Overflow From Container to Rain Garden

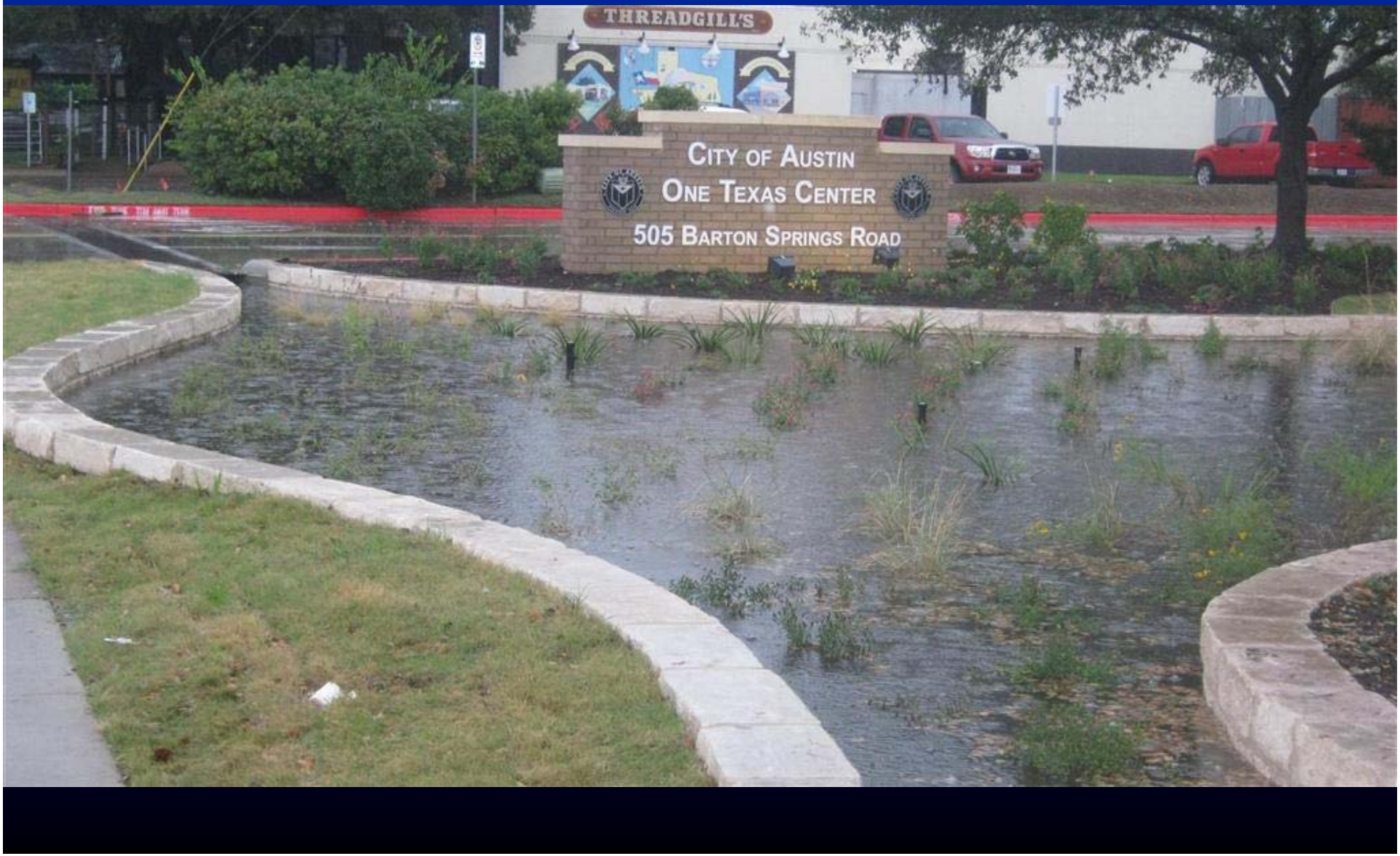


Rainwater Harvesting and Rain Gardens

LCRA Redbud Center

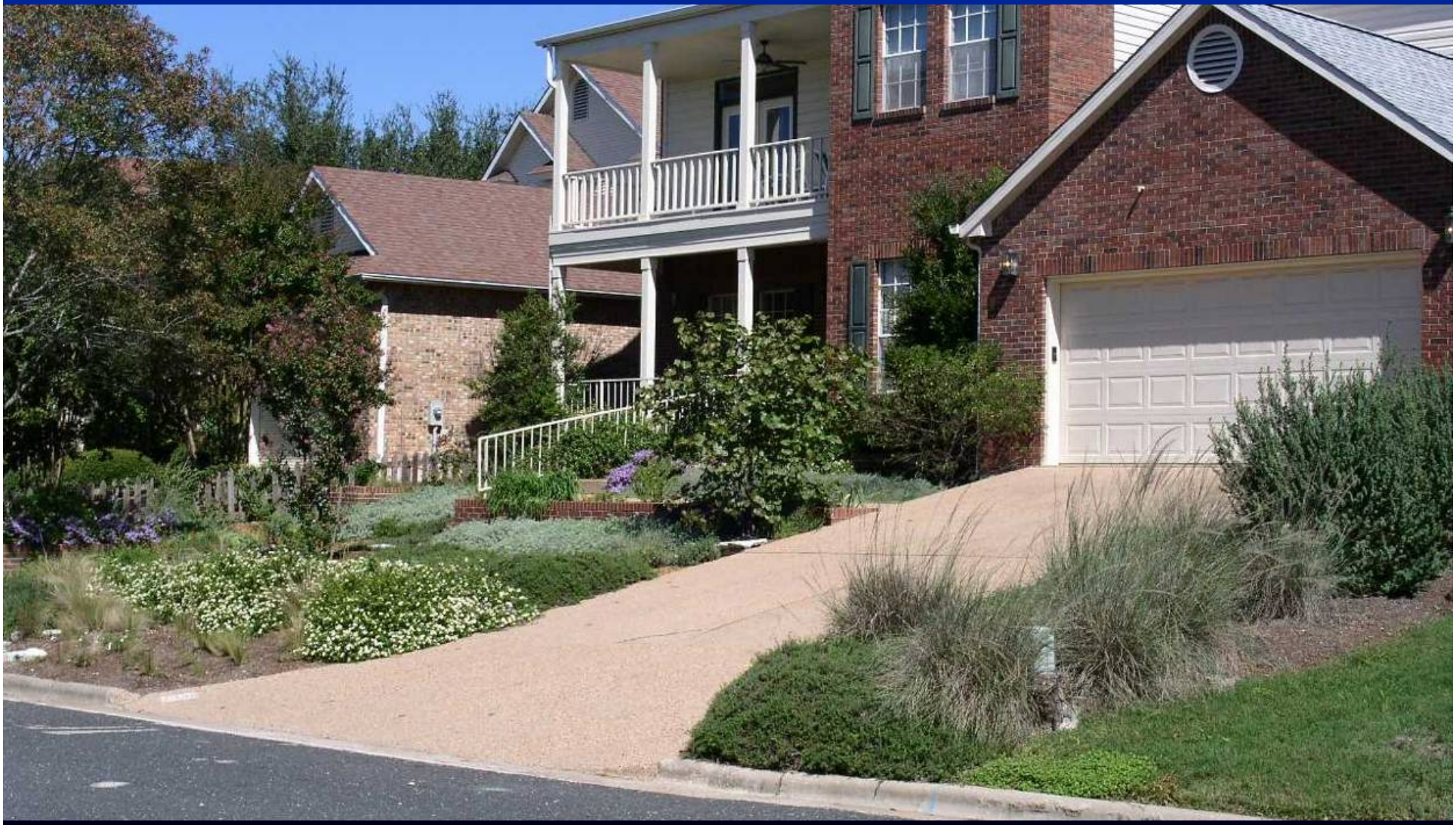
Sand Beach Biofiltration: Downtown Austin

One Texas Ctr. Rain Garden



One Texas Ctr. Rain Garden

Jester Estates Infiltration Gardens



Glen Ellyn, Illinois – Ennis Residence

Glen Ellyn, Illinois – Ennis Residence

Porous Pavement

- Water Infiltrates Through Pore Space
- Regular Sweeping Prevents Clogging

Pervious Concrete

Permeable Pavers

Soil Restoration

Blend compost into soil for better infiltration and vegetative growth