

Rain Garden Construction

Rain Garden Certification
Alabama Cooperative Extension System

*Adapted from North Carolina State University
USDA Southern Regional Water Program*

Goal: Improve Water Quality

Can Proper Amount of Water be Captured?

Can Water Get In & Out w/o Problems?

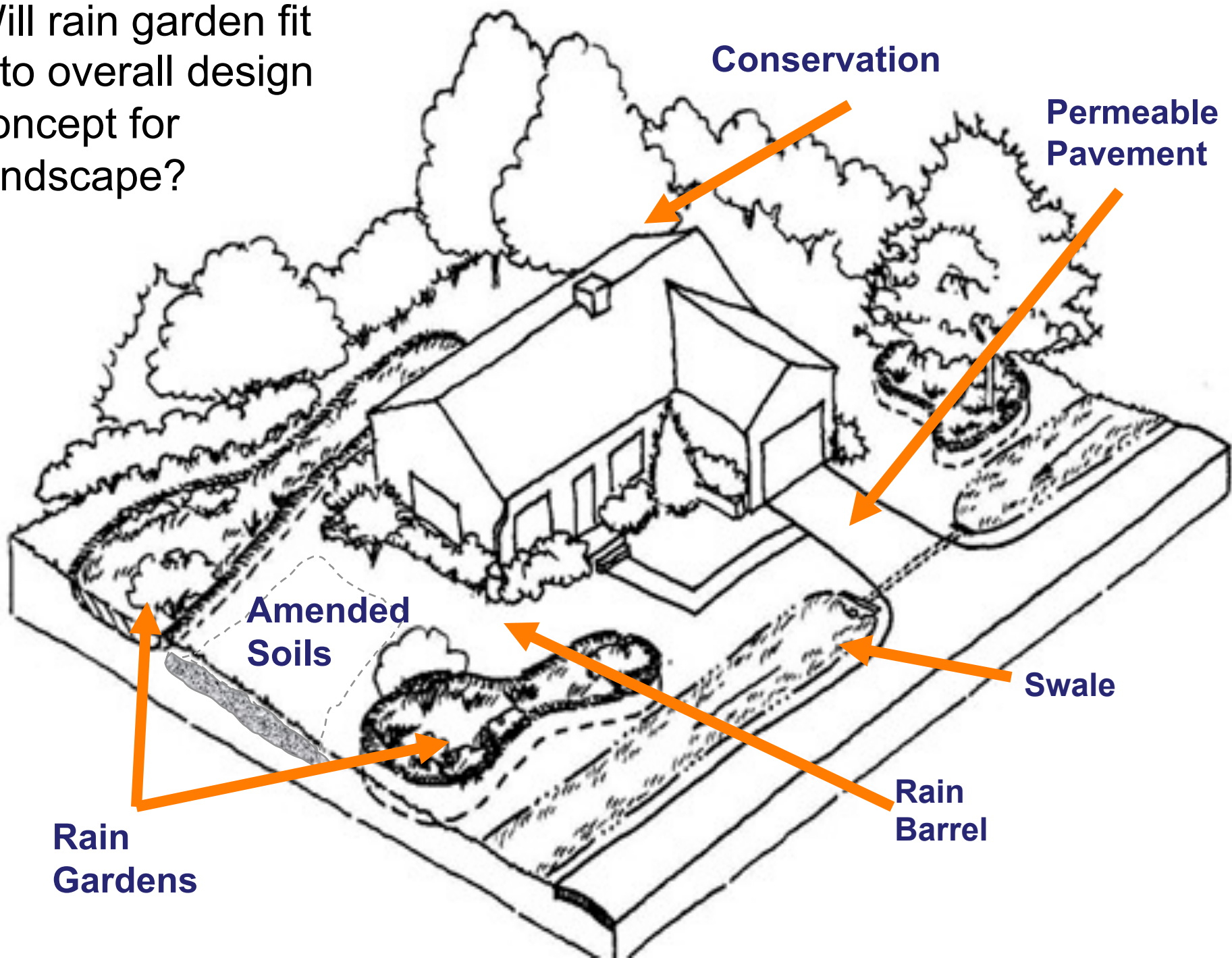


Homeowner's Goal:

Will it look better than the area or lawn it replaced?



Will rain garden fit into overall design concept for landscape?



Conservation

**Permeable
Pavement**

**Amended
Soils**

Swale

**Rain
Barrel**

**Rain
Gardens**

Reminders

Locate wells, septic systems, and utilities (Call 811)

Ask the homeowner (verify, verify, verify!)

Add garden after other construction is finished and soils are stabilized



Suggested Tools

Backhoe, shovels, rakes

Tiller

Soil Tamper

Wheelbarrow

Stakes and String

Tarps

Soil Test Kit, Clean Bucket

Sight Level, Level, Line Level, Ruler

Labor!



Excavation Tips:



Excavation Depth = Ponding Depth (3" to 6") + Mulch Depth (3")

Aim for flat bottom, but slight center depression is OK

Stockpile removed grass / soil for berm

Reapply removed topsoil back into garden (it's the best soil)

Beware of Soil Compaction!



Work the soil as deep as possible to improve drainage

Good time to add limestone if needed (based on soil test)

Fertilizer?

Follow soil test ~ probably not necessary in bowl – check lime recommendations



Berm Construction

Berm is sufficient for rain gardens treating less than 2,000 ft²

Mounded structure designed to help store capture depth

Top is flat to encourage sheet flow leaving garden during heavy events



What about weirs?

Needed if rain garden treats impervious areas greater than 2,000 ft²

Length of overflow weir = Imp Area / 2,000

Materials compacted clay or treated wood

Elevation is critical ~ determines ponding depth and berm height

Erosion most likely to occur on down slope side ~ armor with rock or erosion control blanket



Alternative Design Options



Other Design Options - Dry stream bed – Infiltration trench



Other Design Options - Dry stream bed – Infiltration Trench



Cumberland County, PA

French Drain Installation



Dealing with Slow Draining Clay Soils



What if infiltration tests indicate slow draining soils?

When and where to consider an under drain and / or soil amendments?

How to design and install?

Costs?



What drainage time is acceptable?

> 3 days to drain ~ 3 options to consider:

1. Look for another location
2. Work with it! Install backyard wetland
3. Under drains? Must be sized and installed at correct elevations – may represent long-term maintenance hassle beyond what a homeowner wants to handle (clogging, rodents, etc.)



A photograph showing a trench dug into the ground. Two black corrugated pipes enter the trench from the top, labeled as 'Inlets'. A third black corrugated pipe exits the trench from the bottom, labeled as 'Outlet - Solid Drain pipe Section'. The trench walls are lined with a dark, textured material, possibly geotextile or a similar fabric. The ground around the trench is reddish-brown soil. A black metal fence is visible in the upper left corner.

Inlets

**Outlet – Solid
Drain pipe Section**

Pike Pioneer Museum, Troy, AL





Demonstration Rain Garden

Treating 2,000 ft² of rooftop
200 ft², 3” ponding depth

Notice the wheels of
the big yellow piece of
machinery













Auburn University Turf Unit



04/29/2013



© 2013 Google

Auburn University Turf Unit

Collecting rooftop runoff from $\frac{1}{2}$ 30'x60' = 1800 ft²

200 ft² of parking lot draining to rain garden

Soil has good infiltration (> 1 in / hr)

2000 / 20 = 100 ft²

Upsized to 175 ft² because we had room!



16 ft

14 ft

Auburn University Turf Unit

Indian blanket
Inkberry
Veronica
Butterfly weed
Muhly grass



Questions? Comments?

July 2011



Sonora Community Hall, Baldwin Co, AL

LID without decreasing building
functionality

Compromise!

Cistern to water community
garden

2 rain gardens

Capturing ~68% of roof runoff



Cistern Support

- 7.5 ft x 7.5 ft gravel foundation
- Timing – before cistern arrival
- Water is heavy
- 1 gal = 8.34 lbs
- 50 gal rain barrel = 417 lbs



Cistern Specs



- 1320 gal capacity
- 32% roof runoff captured
- 6ft tall and wide



First Flush Diverter & Rain Head

- Collects 1st inch of runoff and diverts away from cistern
- Rain head filters out debris or leaves before entering cistern



Construction



Full Sun Rain Garden

- Receives 6% roof runoff
- 8 ft diameter = 50.25 ft²
- 6" ponding depth
- 25 ft³ or 188 gal storage
- Native plants
 - *Hypericum densiflorum*
 - *Physostegia virginiana*
 - *Hibiscus coccinea*
 - *Morella cerifera*



Part Shade Rain Garden

- Receives 30% roof runoff
- 4 ft x 50 ft = 200 ft²
- 2" ponding depth
- 34 ft³ or 255 gal storage
- Native plants
 - *Illicium floridanum* 'Shady Lady'
 - *Physostegia virginiana*
 - *Dryopteris* sp.
 - *Morella cerifera* 'Tom's dwarf'
 - *Agarista populifolia* 'Leprechaun'



Full Sun Rain Garden

