



City of Fairhope

Rain Garden Project

December 2003

What is a Rain Garden?



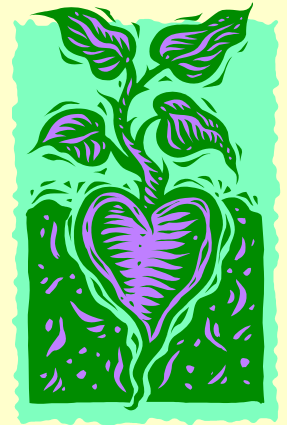
- A rain garden (aka bio-retentive area) is a depressed, landscaped area that treats storm water run off.
- A rain garden should look like part of the landscape.
- Rain gardens have two important goals:
 - Aesthetic appeal
 - Water quality improvement

Rain Gardens 101

- Rain gardens are designed to hold storm water for short periods of time, typically less than 48 hours.
- By holding storm water and allowing it to slowly percolate into the ground, rain gardens improve the quality of storm water runoff.
- The vegetation located within these gardens acts as a natural filter, plus the volume of storm water is decreased.
- A decrease in storm water volume is beneficial to area streams and waters that may be receiving higher volumes than can be handled.

How Do Rain Gardens Work?

- ***Absorption*** – takes place in the mulch / soil, removing some metals and phosphorus
- ***Microbial Action*** – takes place in the shallow root zone, breaking down organic substances and eating some harmful pathogens
- ***Plant Uptake*** – plants use up some of the nutrients (nitrogen and phosphorus) from water run off



How Do Rain Gardens Work?

- ***Sedimentation*** – soil particles and litter debris are removed from the storm water by settling into the garden
- ***Infiltration*** – storm water must pass through vegetation where some pollutants, including sediment particles, are “snagged”

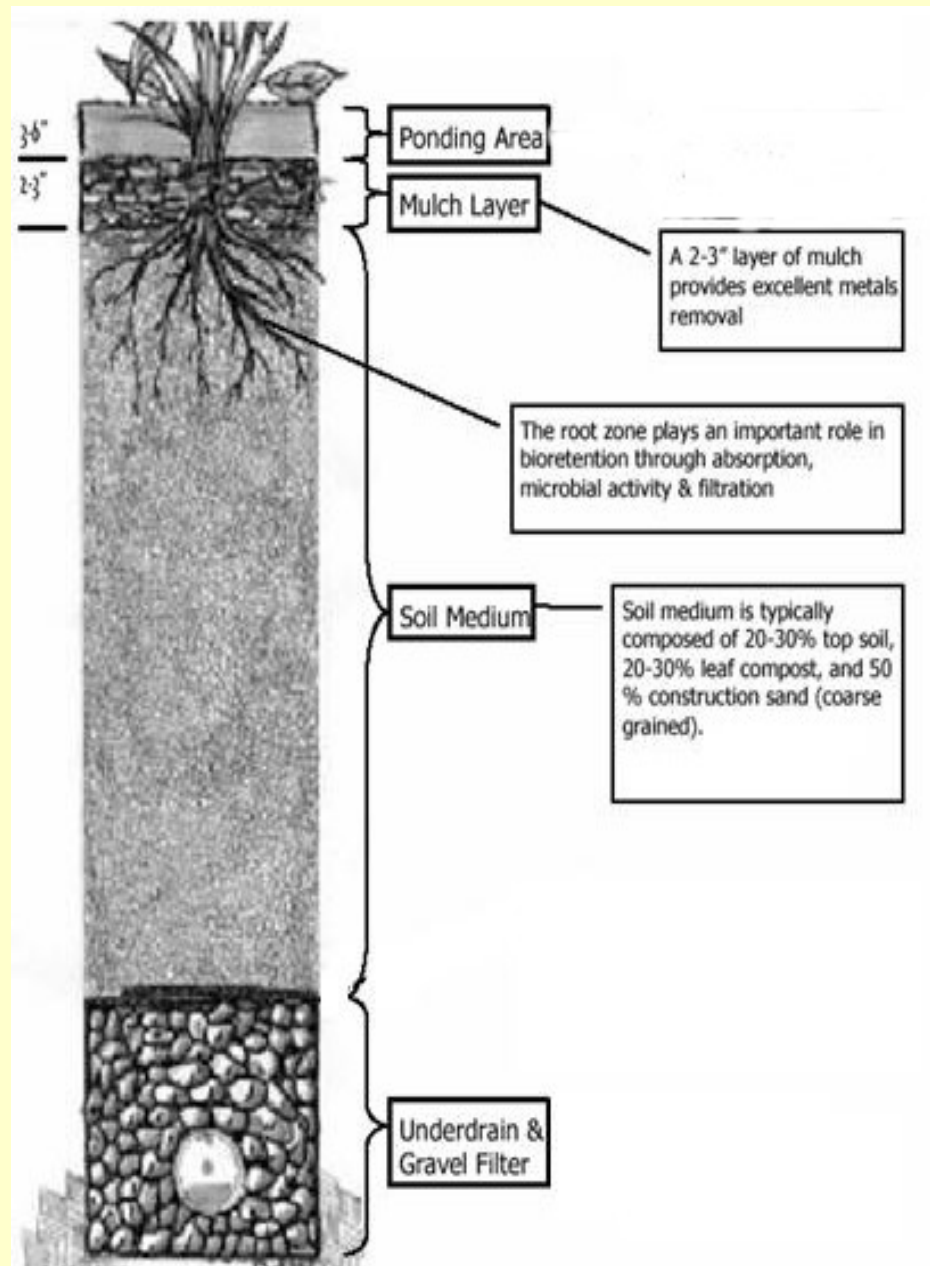


Rain Gardens Improve Water Quality



...by naturally purifying storm water before entering storm drains, and ultimately, Mobile Bay

Typical Rain Garden Cross Section



Fairhope Rain Garden Grant

- \$3,898 Grant
- Grant provided for by Gulf Coast Resource Conservation & Development Council

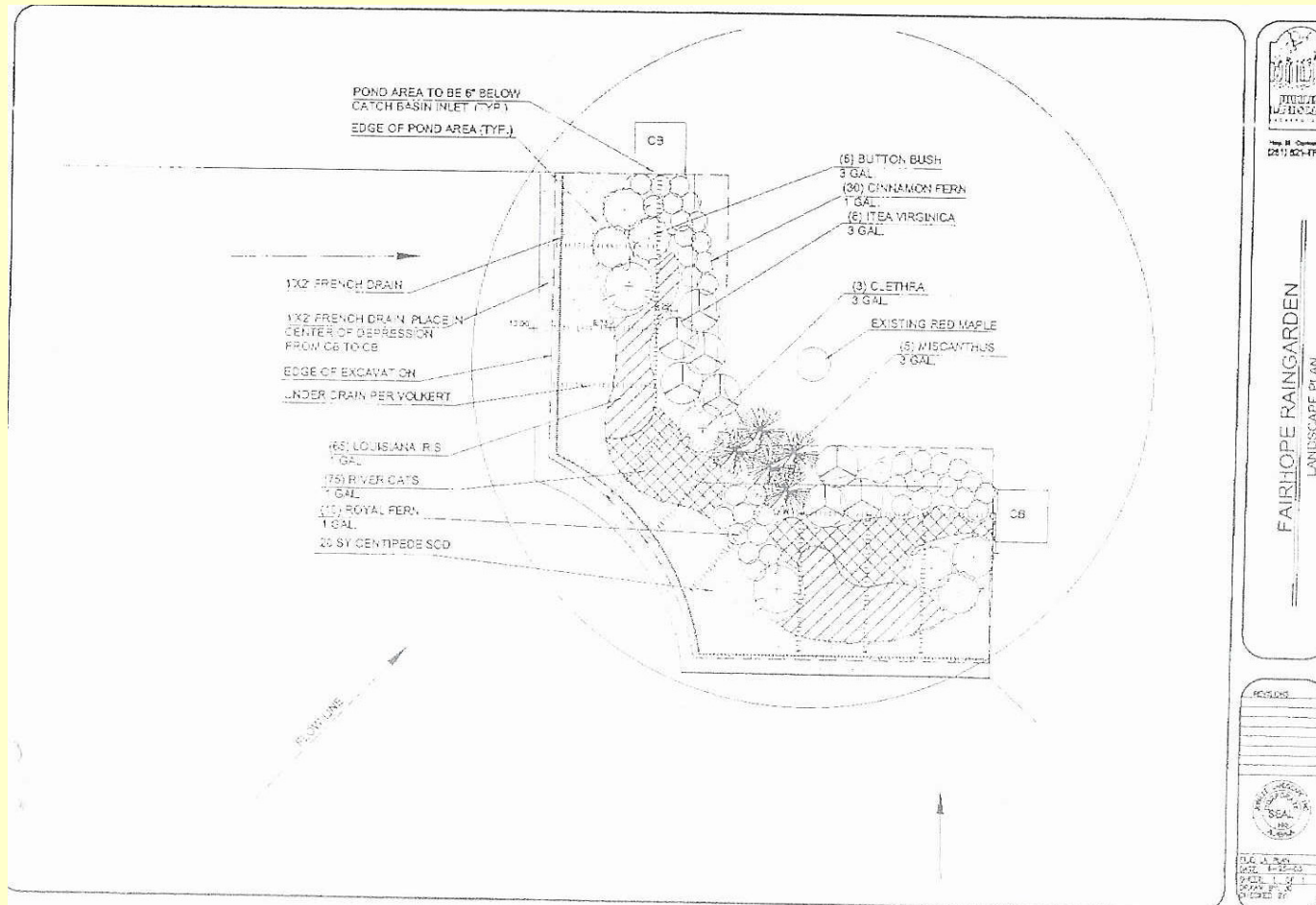


Fairhope Rain Garden Location

- Location: NW corner of City Hall Parking Lot, North Section Street @ Oak Street
- Site was selected for water quality improvement potential & high visibility to the public
- Rain Garden will receive water run off from approximately 26,000 sq. ft. of impervious (asphalt) surface
- Rain Garden Size: Roughly 12' x 40'
- Replaced: 480 sq. ft. of existing asphalt

Fairhope Rain Garden Design

Provided by Joe Comer (Jubilee Landscape) & Matt Bell (Volkert & Associates)



Materials Used

- 12 concrete blocks plus 2 bags mortar mix (for drain boxes)
- 15 c.y. #57 stone (washed)
- 130' of 4" black corrugated pipe, perforated
- 100' Filter Sock
- 1,000 sq. ft. geo-textile fabric
- Fittings: (13) tees, (3) elbows, (5) caps, (2) Y pipe fittings
- 40 c.y. leaf mulch mixed with sand (80/20)
- 7 bales of pine straw
- 1/2 pallet of sod

Material Cost

- #57 Stone @ \$35 / c.y. = \$525.00
- 4" Corrograted Pipe @ .23/ ft. = \$ 29.90
- Filter Sock @ .20 / ft.= \$ 20.00
- Filter Cloth @ .19 / ft.= \$190.00
- Tee fittings @ \$3.92 each \$ 50.96
- Elbow fittings @ \$3.97 each \$ 11.91
- Cap fittings @ \$1.46 each \$ 7.30
- Y Pipe fittings @ \$4.97 each \$ 9.94
- Concrete Blocks @ \$1.09 each \$ 13.08
- Mortar Mix @ \$5.70 / bag \$ 11.40
- Sod @ .30 / piece \$ 19.50
- Mulch / Sand Mix (market value) \$10 / c.y. \$400.00
- Total Material Cost: \$1288.99

Equipment Used

- Backhoe
- Dump Truck
- Flat Bed
- Work Truck
- Concrete Saw



Equipment Charge Rates

- Backhoe – 12 hrs. @ \$14.50 / hr. = \$174.00
 - For removal of asphalt and dirt
- Dump Truck – 4 hrs. @ \$32.00 / hr. = \$128.00
 - For hauling of asphalt and dirt
- Flat Bed – 10 hrs. @ \$ 8.75 / hr. = \$ 87.50
 - For hauling french drain materials and plants
- (2) Work Trucks – 10 hrs. total @ \$ 6.30/hr. = \$63.00
 - For Street crew & Landscape crew
- Concrete Saw – 2 hrs. @ \$ 2.40 / hr. = \$ 4.80
 - For cutting asphalt

Total Equipment Charges: \$457.30

- **Rates derived from FEMA rates*

Labor Used



- Construction began on December 16th and was completed on December 23rd.
- City crews provided 100% of the installation of the rain garden.
- 63 man hours for installation of the garden
- 30 man hours for landscaping of the garden
- Total of 11 employees participated in creating the rain garden
- 93 hours x \$20 average salary (includes benefit package) = **\$1,860 Total Labor Charges**

Cost Summary

- Material costs
totaled \$1288.99
- Equipment charges
totaled \$457.30
- Labor charges
totaled \$1,860
- Total Spent To date:
\$3,606.29



Rain Garden Phase I

- 480 sq. ft. of asphalt was removed
- Two parking spaces were removed



Rain Garden Phase II

- Dirt was removed to a depth of about 3' on one end to about 4' on other end
- (2) existing drain boxes were rebuilt to allow for drain pipe fittings
- 3" of stone was added to floor



Rain Garden Phase III

- Filter sock was placed on pipes to prevent clogs
- Pipes were put in and connected to (2) existing drain boxes
- Pipes were covered with 2-3" of stone



Rain Garden Phase IV

- Stone was covered with geo-textile fabric
- Geo-textile fabric was covered with mulch / sand mix



Rain Garden Phase V

- Center of mulch area was formed into a 6” swale (towards drain boxes)
- Two pipes are left horizontal to allow for cleaning of pipes



Rain Garden pre-Landscaping



- Sod is added to the perimeter of the garden
- Existing Red Maple and hollies are intact
- Mulched area is ready for landscaping

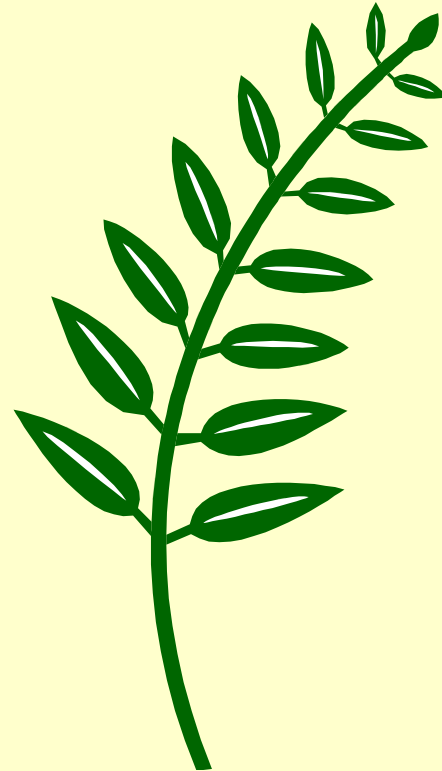
Rain Garden Phase VI

- Area is landscaped with selected plants
- 8 different wetland type plants were used
- Plants are all drought tolerant



Rain Garden Plants

- Butterfly Iris (65)
- River Oats (75)
- Royal Fern (10)
- Button Bush (6)
- Cinnamon Fern (30)
- Itea 'Henry's Garnet' (8)
- Clethra 'Ruby Spice' (3)
- Miscanthus Maiden Grass (5)



Rain Garden Bloomers



Clethra 'Ruby Spice'



Button Bush

Rain Garden Bloomers



Butterfly Iris

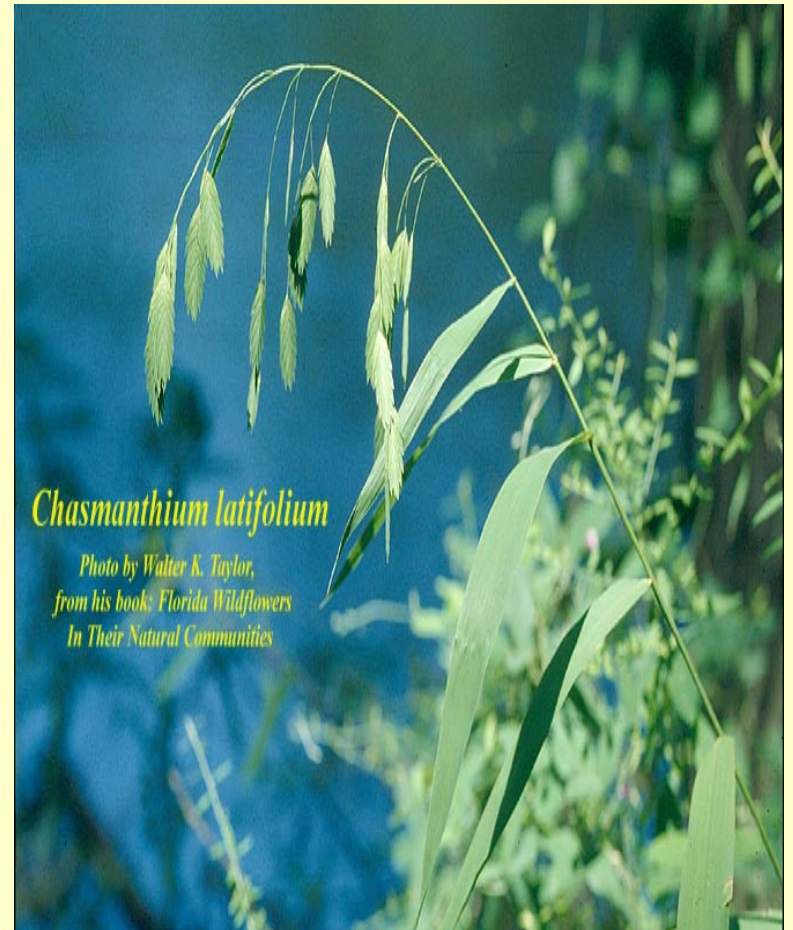


Itea 'Henry's Garnet'

Rain Garden Grasses



Miscanthus Maiden Grass



Chasmanthium latifolium

Photo by Walter K. Taylor,
from his book: *Florida Wildflowers
In Their Natural Communities*

River Oats

Rain Garden Ferns



© 2000 Janet Novak

Cinnamon Fern



Osmunda regalis var. spectabilis

Photo by Kenneth Sytsma
University of Wisconsin

Royal Fern

Rain Garden Final

