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

- Ponding Area
- Mulch Layer
  - A 2-3" layer of mulch provides excellent metals removal
- Soil Medium
  - Soil medium is typically composed of 20-30% top soil, 20-30% leaf compost, and 50% construction sand (coarse grained)
- Underdrain & Gravel Filter
- The root zone plays an important role in bioretention through absorption, microbial activity & filtration
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
- ½ pallet of sod
Material Cost

- #57 Stone @ $35 / c.y. = $525.00
- 4” Corrogated 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
• 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)
Clethra ‘Ruby Spice’

Button Bush
Rain Garden Bloomers

Butterfly Iris

Itea ‘Henry’s Garnet’
Rain Garden Grasses

Miscanthus Maiden Grass

River Oats
Rain Garden Ferns

Cinnamon Fern

Royal Fern