

# Rain Garden Design

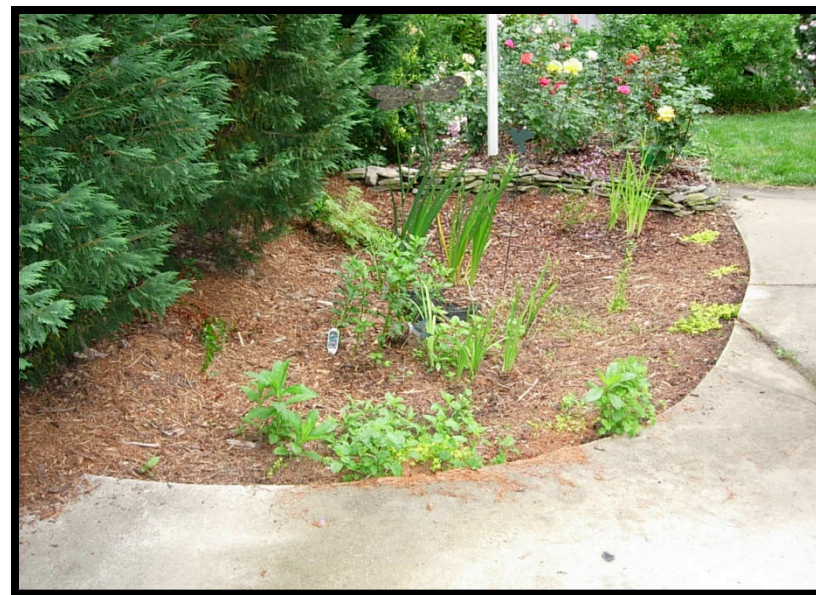


Rain Garden Certification  
Alabama Cooperative Extension System

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

# Reminder Note

The landowner/homeowner **MUST** know that rain gardens will alternate between very wet and very dry.



# Steps to sizing a rain garden:

1. Determine the drainage area
2. Estimate the impervious surface area
3. 10/20 method to calculate size
4. Design the shape



# Determine Drainage Area

Consider how rainwater moves on the property

Is water received from neighbors?



# Estimate drainage area

Mapping program

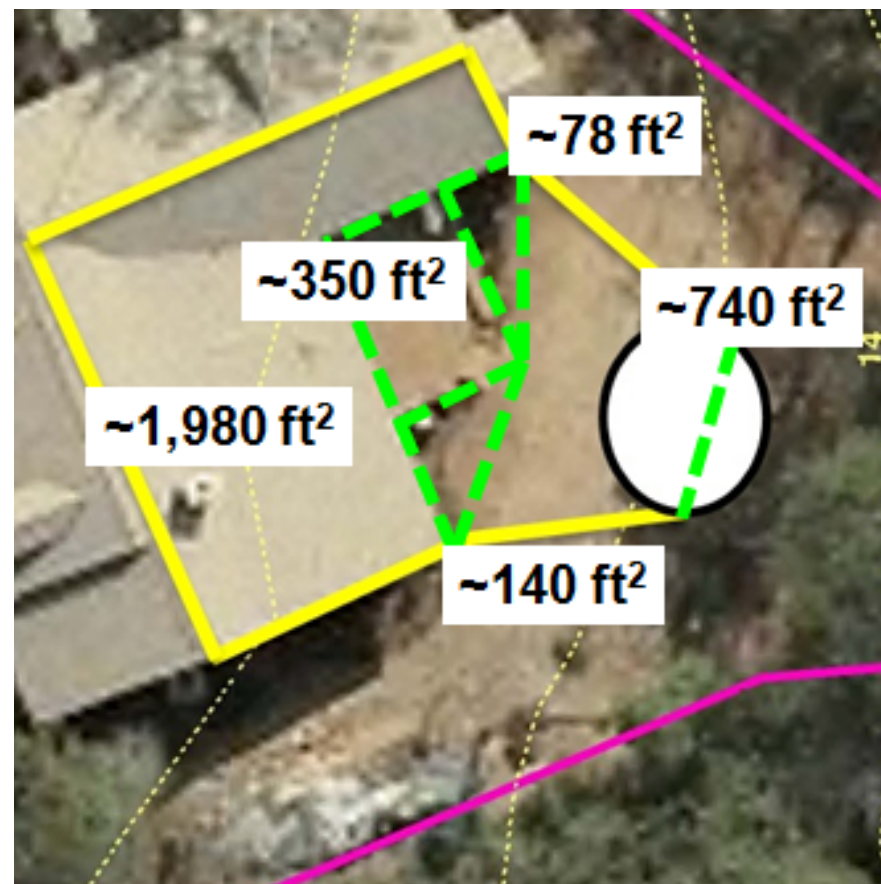
By Hand

1 adult pace  $\approx$  2.5 feet

Measuring tape

Aerial photograph

Site visits should always  
be conducted.



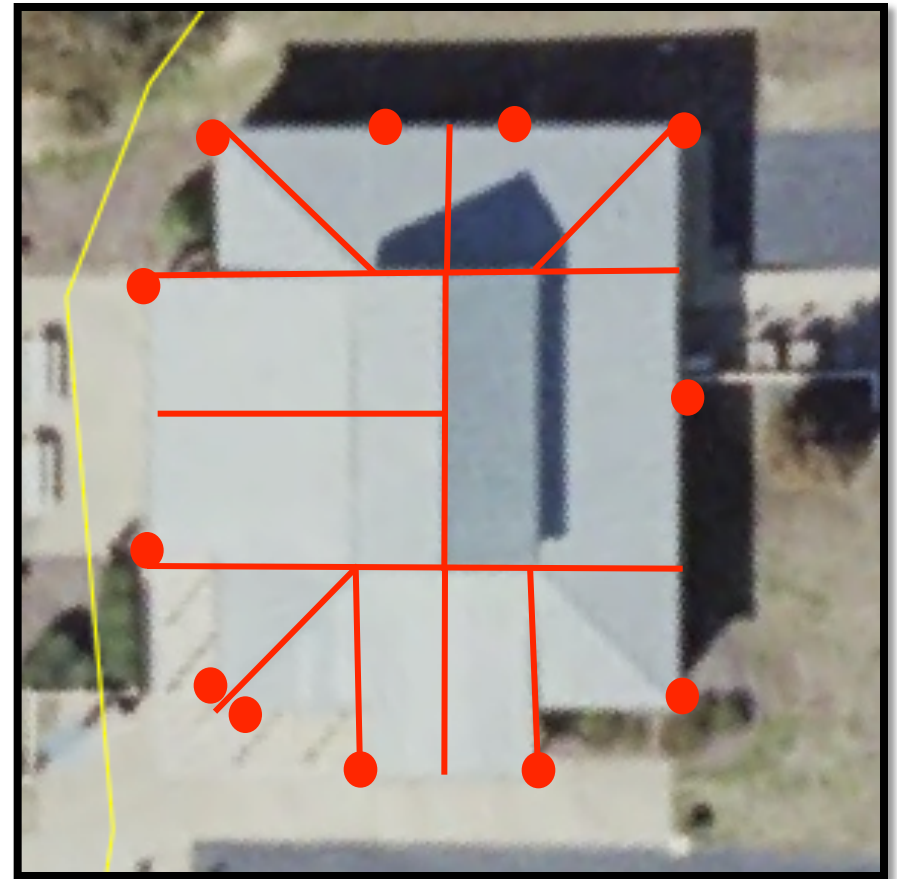
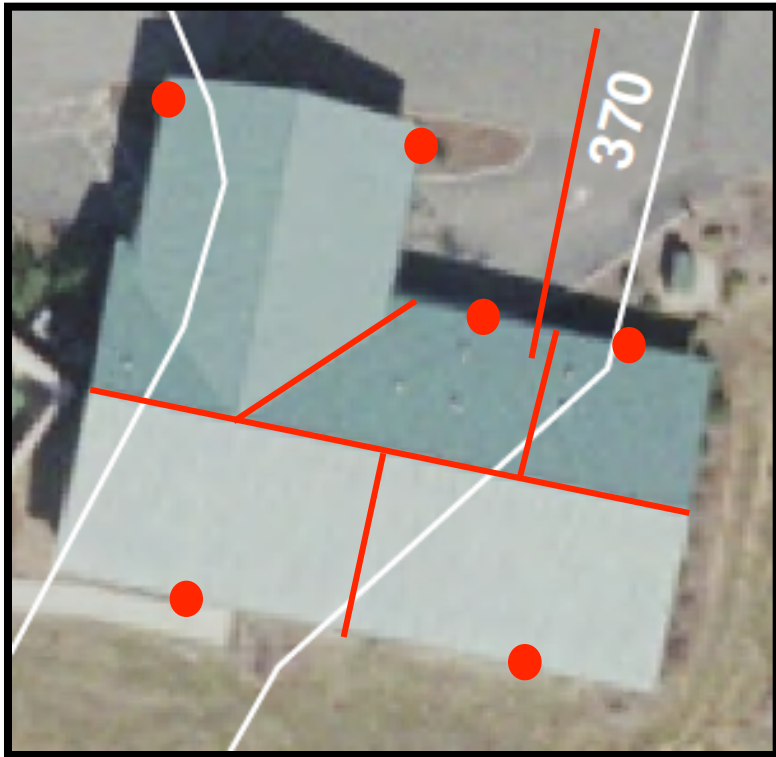
# Estimate Impervious Area

Calculate the square footage of impervious surfaces in the boundaries you have established

Rooftops, sidewalks, driveways



Not all roofs are created equal, but they all shed rainwater  
Don't over complicate, estimate



# Select Ponding Depth

Depth at which water will pond before overflowing

3 inches for clayey soils (< 1 in / hr drainage rate)

3 or 6 inches for sandy soils (> 1 in / hr drainage rate)

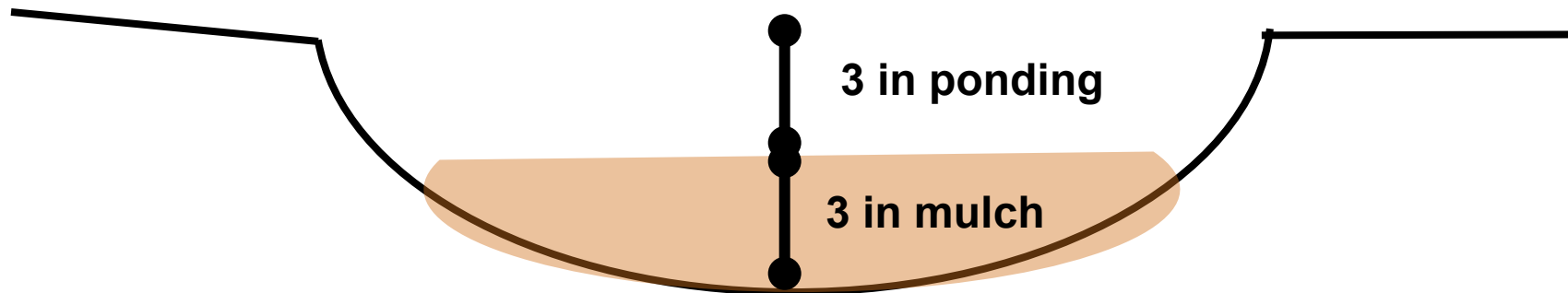




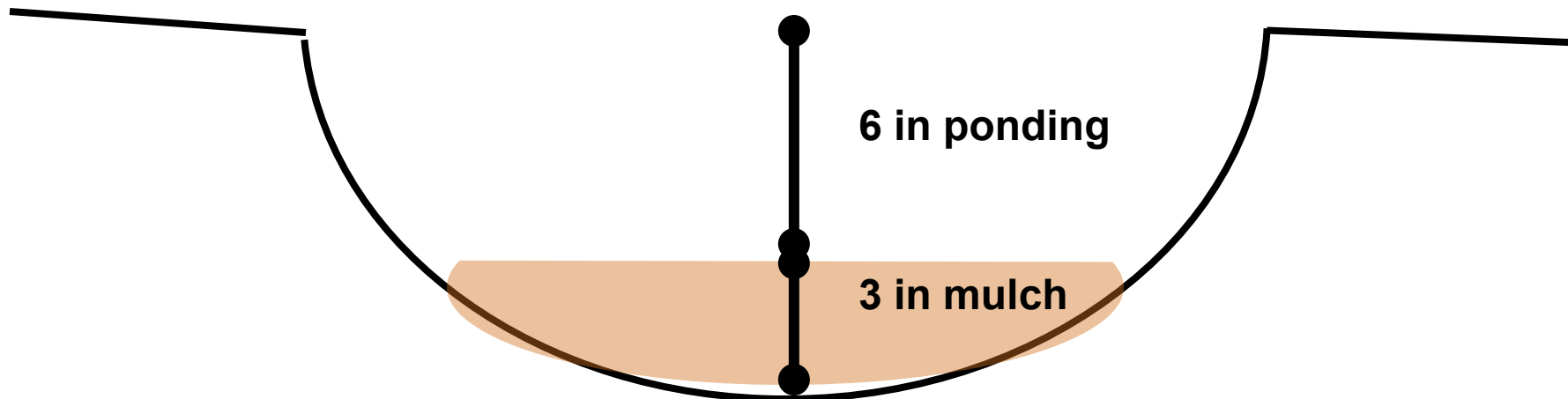
# How Low Do You Go?

Depth = Ponding Depth (3" to 6") + mulch depth (3")





**3 inches ponding depth will require a 6 inch deep rain garden\***



**6 inches ponding depth will require a 9 inch deep rain garden\***

**\* Till or break up native soils at base of rain garden to promote root growth and infiltration**

# Determine Rain Garden Size

For 3 in ponding depth:

$$\text{rain garden size} = \text{Imp Area} / 10$$

For 6 in ponding depth:

$$\text{rain garden size} = \text{Imp Area} / 20$$

# Berm or Overflow Weir?

No overflow weir is needed if rain garden treats < 2,000 ft<sup>2</sup> impervious area

Small berm is sufficient to promote sheet flow

Constructing landscaped depressional areas should not require large berm or constructed weir



# If Needed - Sizing Overflow Weir

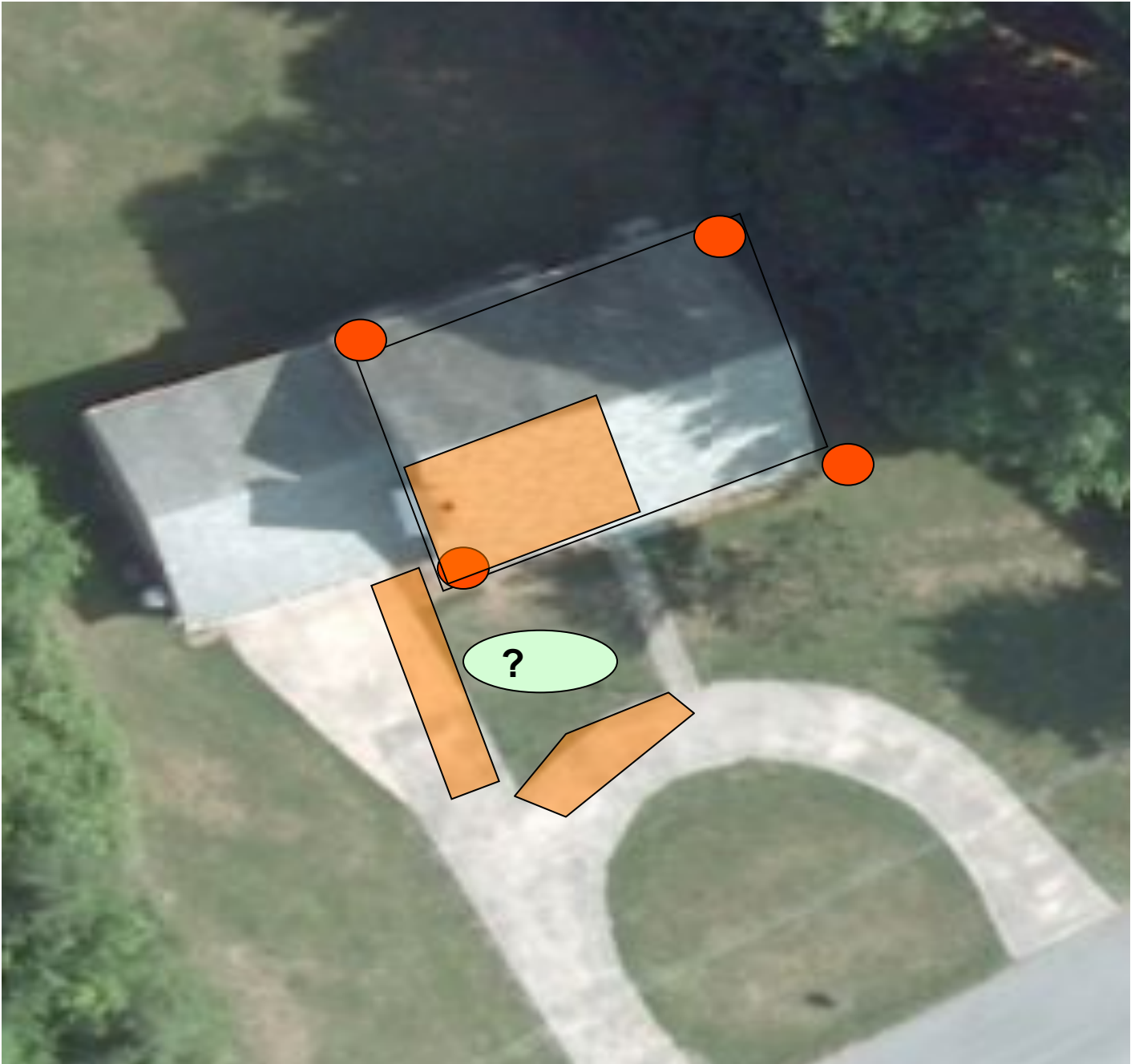
For a rain garden treating  $>2000$  ft<sup>2</sup> of Imp Area

$$\text{Overflow Weir Length} = \text{Imp Area} / 2000$$

Weir should be constructed of wood or concrete



# Example



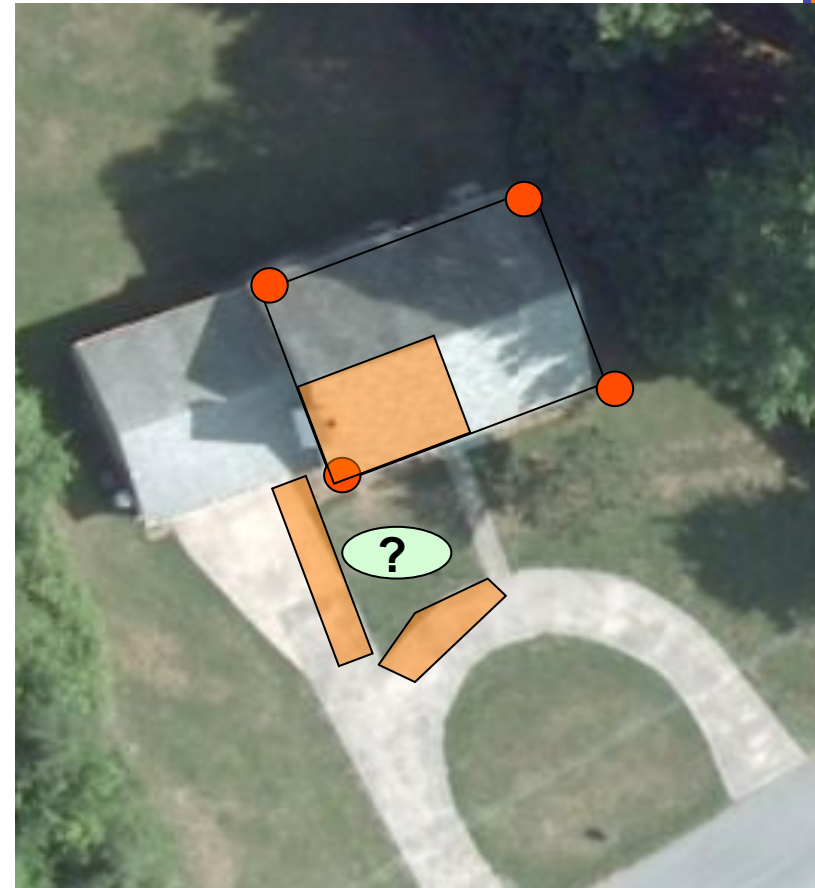
# An Example:

The rooftop for a house is 50 ft by 50 ft. One downspout (there are 4 total) will be directed to the rain garden

Approximately 400ft<sup>2</sup> of driveway will also drain to the rain garden

Soils are loamy sand (>1 in/hr)

With the “10 and 20” rule, what size should the rain garden be?



# Calculations

$50 \times 50 = 2,500 \text{ ft}^2$  roof top total



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$50 \times 50 = 2,500 \text{ ft}^2$  roof top total

$2,500 \times .25 = 625 \text{ ft}^2$  roof top to be treated

400  $\text{ft}^2$  of driveway

$625 + 400 = 1,025 \text{ ft}^2$  Imp Area to be treated

# Calculations

1,025 ft<sup>2</sup> Imp Area to be treated

Set ponding depth at 3 inches

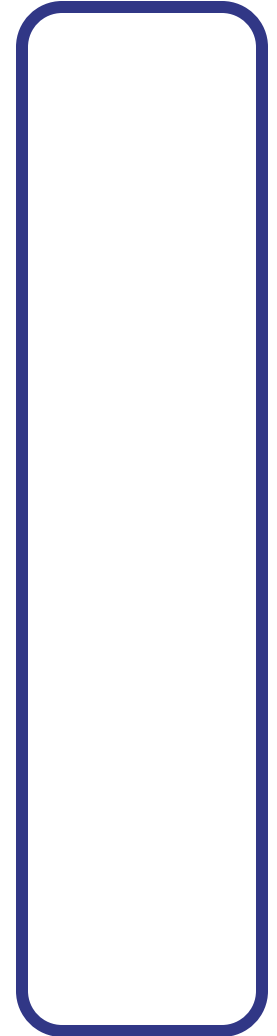
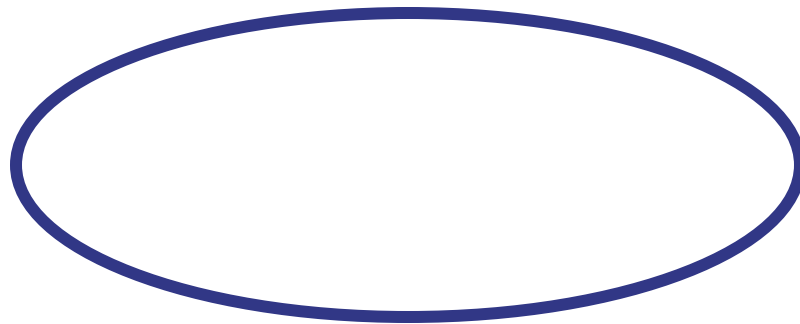
$1,025 \text{ ft}^2 \div 10 = \sim 100 \text{ ft}^2$  rain garden

Set ponding depth at 6 inches

$1,025 \text{ ft}^2 \div 20 = \sim 50 \text{ ft}^2$  rain garden

# Possible Shapes & Sizes

- 100 ft<sup>2</sup>
  - 10' x 10'
  - 5' x 20'
- 50 ft<sup>2</sup>
  - 5' x 10'
  - 7' x 7'



# Questions?



