

## DESIGN GUIDE FOR RAIN GARDENS

Rain gardens are typically depressed landscaped areas in the yard (1-foot deep) that capture stormwater runoff. The runoff then either infiltrates into the ground or evapotranspires through the landscaping.

### Calculate "Stormwater Runoff Volume" created by new impervious cover.

- a. Calculate the square footage of the drainage area (the new impervious cover)

Length \_\_\_\_ (feet) x width \_\_\_\_ (feet) = drainage area (square feet, ft<sup>2</sup>)

- b. If multiple drainage areas (D.A.) are being created (more than one area of new impervious cover), calculate the square footage of each drainage area then add them together.

D.A. No. 1 \_\_\_\_ (ft<sup>2</sup>) + D.A. No. 2 \_\_\_\_ (ft<sup>2</sup>) = Total D.A. \_\_\_\_ (ft<sup>2</sup>)

- c. Calculate the volume of stormwater from the drainage area created by 2-inches of rainfall

Total D.A. \_\_\_\_ (ft<sup>2</sup>) x 2 inches x 1ft/12 inches = "stormwater runoff volume" \_\_\_\_ (cubic feet, ft<sup>3</sup>)

Calculate the surface area of the rain garden. Even though the overall depth of the rain garden shall be 1 foot, the maximum ponding depth of water is 6". Therefore the surface area calculations are based on a 6" ponding depth (0.50').

- a. Calculate the length and width of the raingarden:

"Stormwater runoff volume" (section 'c' above)/0.50ft=surface area of the rain garden\_\_ (ft<sup>2</sup>)

Length\_\_(ft) x width\_\_(ft) must be equal to or greater than surface area of the rain garden\_\_(ft<sup>2</sup>)

### Other rain garden requirements

- Surface Side Slopes cannot be step than 3 horizontal to 1 vertical
- A minimum 18" depth of amended planting soils shall be installed throughout the surface area of the rain garden calculated above. Amended planting soils shall be 20-30% compost (organic material) and 70-80% topsoil
- Required plantings: native floodplain plant species (one example is Ernst Rain Garden Grass Mix: ERNMX #180 or #180-1) and 1 shrub per every 60 ft<sup>2</sup> of surface area of the rain garden calculated above.
- A cleanout with domed grate on top of the riser must be installed to allow the raingarden to drain once the depth of water in the raingarden exceeds 6 inches. This cleanout shall be connected to an outlet pipe. **See attached detail.**
- The outfall pipe shall not adversely affect neighboring properties.

### Example

A 20 foot by 30 foot detached garage is proposed.

Calculate "Stormwater Runoff Volume" created by new impervious cover.

- a. Calculate the square footage of the drainage area (the new impervious cover)

Length 20 (feet) x width 30 (feet) = drainage area = 600 square feet, (ft<sup>2</sup>)

- b. If multiple drainage areas (D.A.) are being created (more than one area of new impervious cover), calculate the square footage of each drainage area then add them together.

D.A. No. 1 600 (ft<sup>2</sup>) + D.A. No. 2 0 (ft<sup>2</sup>) = Total D.A. 600 (ft<sup>2</sup>)

- c. Calculate the volume of stormwater from the drainage area created by 2-inches of rainfall

Total D.A. \_\_\_\_ (ft<sup>2</sup>) x 2 inches x 1ft/12 inches = "stormwater runoff volume" \_\_\_\_ (cubic feet, ft<sup>3</sup>)

600 ft<sup>2</sup> x 2inches x 1 ft/12 inches = 100 ft<sup>3</sup>

Calculate the surface area of the rain garden. Even though the overall depth of the rain garden shall be 1 foot, the maximum ponding depth of water is 6". Therefore the surface area calculations are based on a 6" ponding depth (0.50').

- a. Calculate the length and width of the raingarden:

"Stormwater runoff volume" (section 'c' above) / 0.50 ft = surface area of the rain garden (ft<sup>2</sup>)  
100 ft<sup>3</sup>/0.50 ft = 200 ft<sup>2</sup>

Length\_\_(ft) x width\_\_(ft) must be equal to or greater than surface area of the rain garden\_\_(ft<sup>2</sup>)  
17 ft x 12 ft = 204 ft<sup>2</sup>                      204 ft<sup>2</sup> > 200 ft<sup>2</sup>

**The Final Rain Garden Dimensions      17 ft length x 12 ft width x 1 ft depth**