

Rain Garden Sizing exercise for the Rain Garden Rebate

Sizing Rain Gardens...

as easy as 1, 2,3.

Step 1: Decide the storm intensity to capture. (1.2” is recommended)

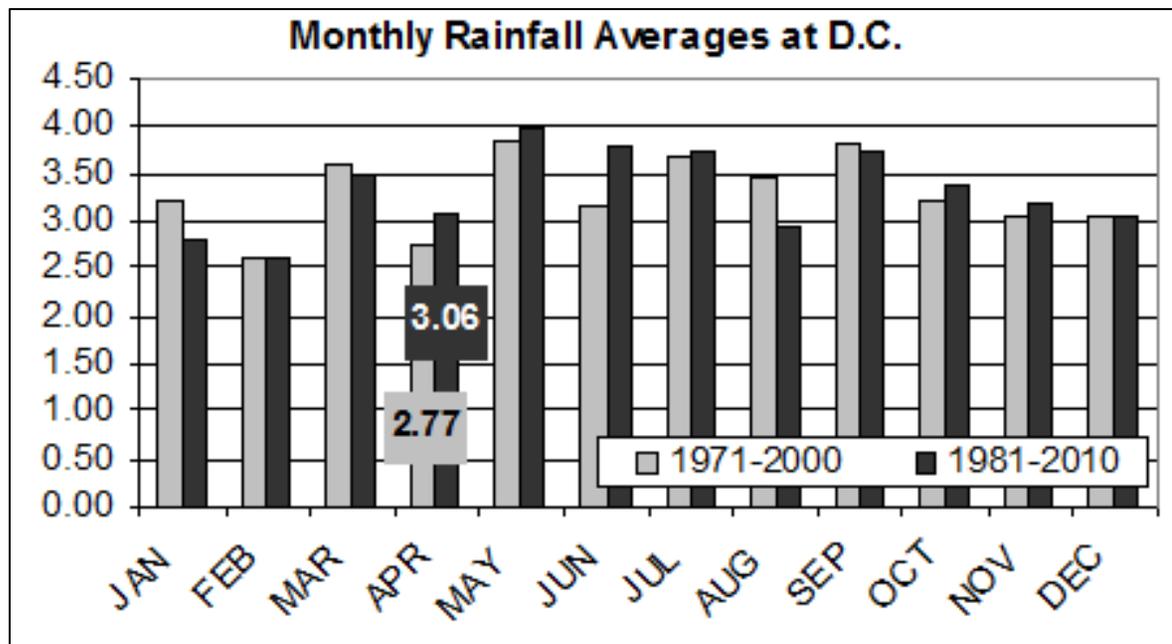
Step 2: Determine the volume of runoff that will be captured in the rain garden by following the following three steps:

1. Calculate the amount (in square feet) of roof or other impervious area draining into the rain garden
2. Determine land use and runoff coefficient within the drainage area
3. Compute the runoff volume using the given formula.

Step 3: Calculate required surface area of the rain garden.

Step 1: Decide the storm intensity that you want to control.

We recommend designing your rain garden to treat a 1.2” rainfall.



Step 2: Determine your drainage area

1. *The most effective way to deliver storm runoff into a rain garden is by extending downspouts from the house directly into the rain garden.*

Using a the GreenUp DC tool, calculate the square footage of roof area draining through each downspout that will be directed into the rain garden. Calculate the additional impervious area that may also drain into the rain garden such as driveways, patios, and walkways.

Add up all the roof and impervious areas which drain into the rain garden

For example: This property has two roof areas directed into the rain garden, one is 130 ft² and the other is 390 ft². The total area treated will be 130 + 390 which equals **520 ft²**.



Step 3: Size the rain garden (i.e., determine needed rain garden surface area) using the following formula.

1. Calculate the volume your rain garden will need to hold in a 1.2" rain:

$$\begin{aligned}\text{Volume} &= \text{Drainage Area} \times \text{Depth}_{\text{rain}} \\ &= 520 \text{ ft}^2 \times 1.2 \text{ in } (1 \text{ ft}/12 \text{ in}) \\ &= \mathbf{52 \text{ ft}^3} \text{ or } \mathbf{387 \text{ gallons}} \text{ (7.48 gallons/ft}^3\text{)}\end{aligned}$$

2. Calculate the surface area you will need:

$$\begin{aligned}\text{Surface area} &= \frac{\text{Volume (ft}^3\text{)}}{.3\text{Depth}_{\text{mix}} \text{ (ft)} + \text{Depth}_{\text{ponding}} \text{ (ft)}} \\ &= 53 / (.3 \times 2 + .5) = \mathbf{\underline{48 \text{ square feet}}}\end{aligned}$$

Step 3: Size the rain garden (i.e., determine needed rain garden surface area).

Determining inputs...

Drainage area (ft²)...as calculated in slide 4

Depth_{mix} = planting bed depth (ft)...1.5ft to 2ft is recommended

Depth_{ponding} = average ponding depth (ft)...use .5ft

i = infiltration rate (ft/day) ... as calculated in the “Rebate Perc Test” worksheet. This figure is not needed for calculations, but if the value is less than .3in/hour, then the rain garden is not recommended.

Step 3: Size the rain garden (i.e., determine needed rain garden surface area).

Design considerations

- The sides of the rain garden should be cut back to a 2:1 slope.
- The rain garden should be placed perpendicular to the slope and the length should not exceed 2x the width
- The rain garden will have a ponding zone of 6 inches, so the total garden depth will be 6 inches plus the depth of soil mix. For example, if you are planning for 2 feet of soil mix, your garden will be dug to 2.5 feet deep.