

Sizing

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Acknowledgement: Content adapted from Dr. Michael Dietz,
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Rain Garden Sizing

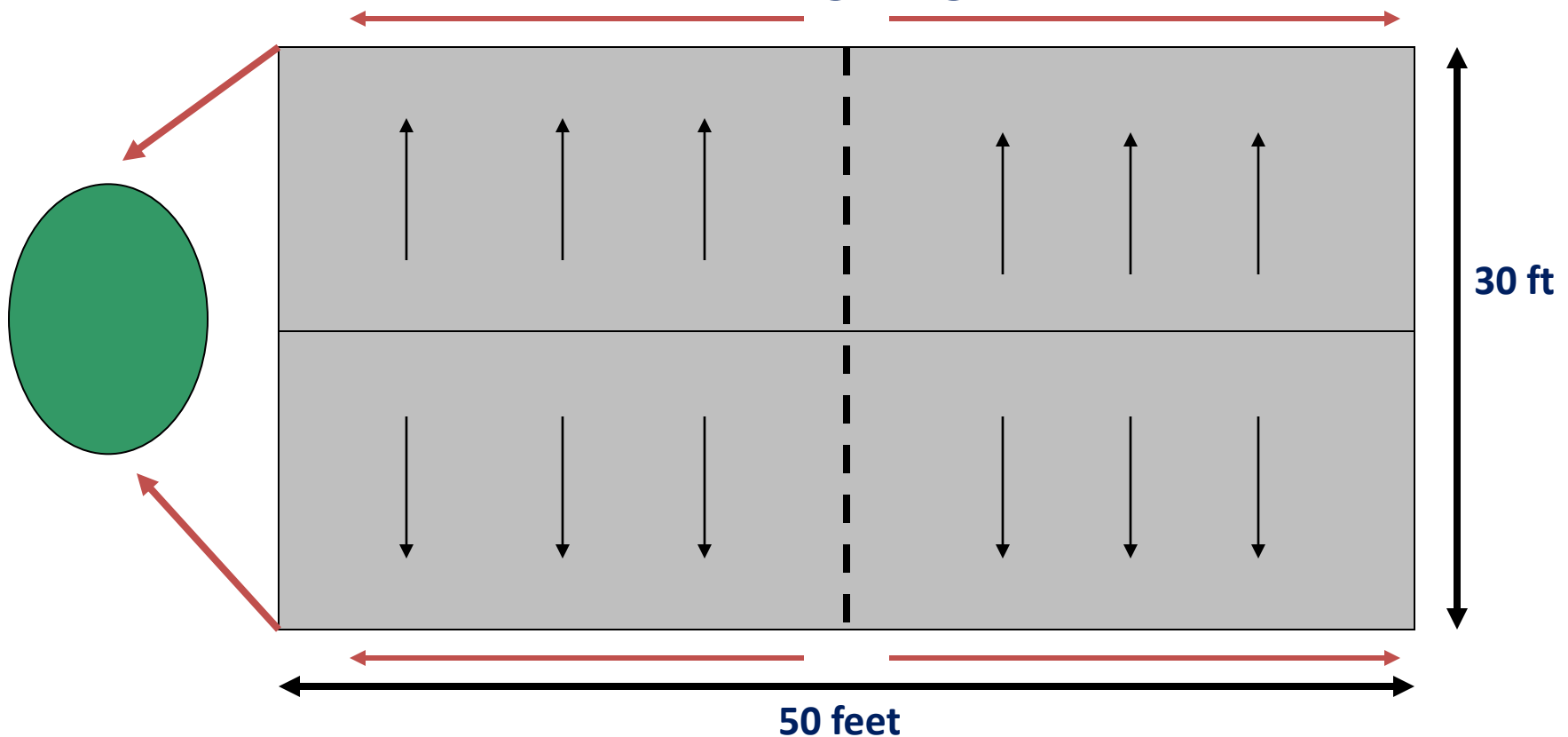
Two options:

- Simple Method
 - Sized to store 1 inch of runoff from 100% impervious watersheds
- Soil-Based Method
 - Multiply drainage area by soil sizing coefficient based on DIY texture analysis

Rain Garden Sizing

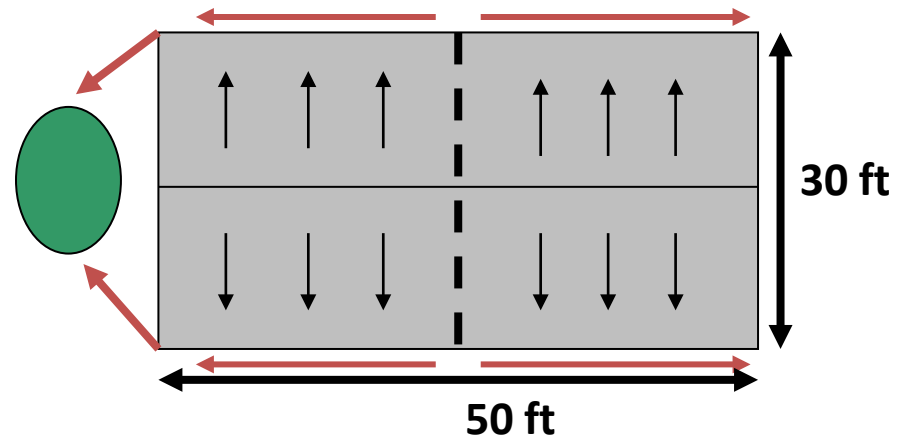
Simple Method

- Calculate area of roof feeding to garden



Rain Garden Sizing

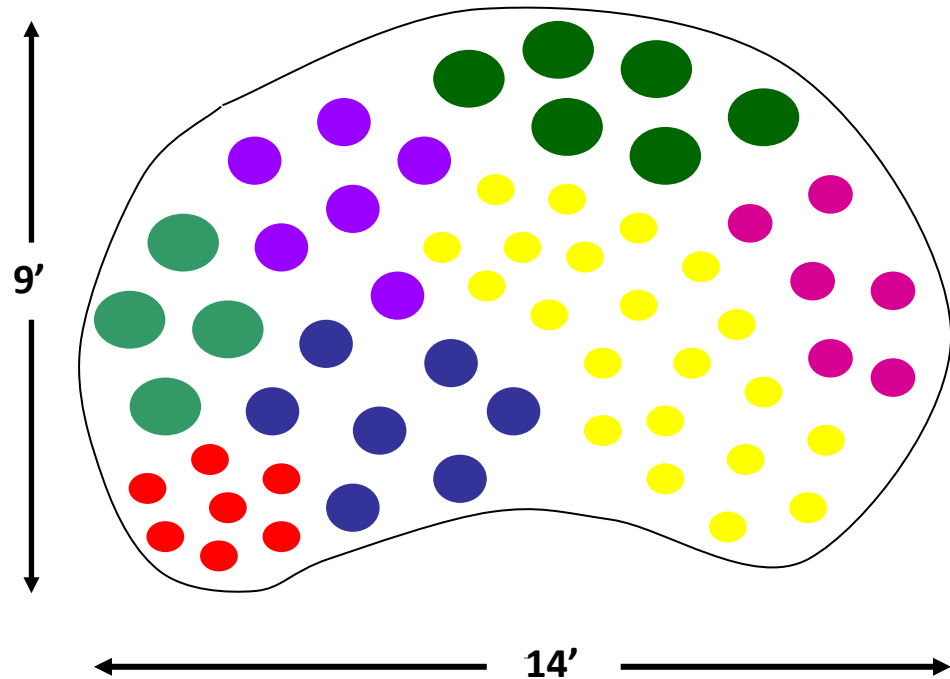
- Impervious surface:
 $50' \times 30' = 1500 \text{ ft}^2$
- Drainage area:
 $1500 \text{ ft}^2 / 2 = 750 \text{ ft}^2$
 - This is because only half the roof contributes to the garden
- Rain Garden area:
 $750 \text{ ft}^2 / 6 = \underline{\underline{125 \text{ ft}^2}}$
 - This just sizes the garden to hold 1 inch of water from the roof in a 6 inch deep rain garden



Rain Garden Sizing

How do I lay out 125 ft²?

- Garden can be shaped in a variety of ways
- Should be twice as long as it is wide
- Should be oriented to intercept as much runoff as possible



Rain Garden Sizing

- In the East and Midwest, around 90% of storms are 1" or less



Rain Garden Sizing

Soil-Based Method

- Based on infiltration rates of soil texture groups and rain garden depth

Rain Garden Surface Area in Sandy Soils (Sand, Loamy Sand and Sandy Loam)
(square feet)

Drainage Area (Square feet)	for 4 inch deep garden	for 6 inch deep garden	for 8 inch deep garden
200	38	30	16
400	76	60	32
600	114	90	48
800	152	120	64
1000	190	150	80

Rain Garden Sizing: Example

Your turn...

Drainage area

Rain Garden Location



Drainage area is 100% impervious = 1,917 ft²

Rain Garden Sizing: Example

Simple Method

- If watershed is 100% impervious, size to capture 1" of runoff
- $1,917 \text{ ft}^2 / 6 = \underline{\mathbf{320}}$ square feet (6 inches deep)

Rain Garden Sizing: Example

Soil-Based Method

- Drainage Area: 1,917 ft²
- Rain Garden Depth: 6"
- Soil Type: Sandy

Generally:

- 4" deep → multiply drainage area by 0.19
- 6" deep → by 0.15
- 8" deep → by 0.08

Rain Garden Surface Area in Sandy Soils
(Sands, Loamy Sands and Sandy Loams)
(square feet)

Drainage Area (Square feet)	for 4 inch deep garden	for 6 inch deep garden	for 8 inch deep garden
200	38	30	16
400	76	60	32
600	114	90	48
800	152	120	64
1000	190	150	80
1500	285	225	120
2000	380	300	160

Rain Garden Sizing: Example

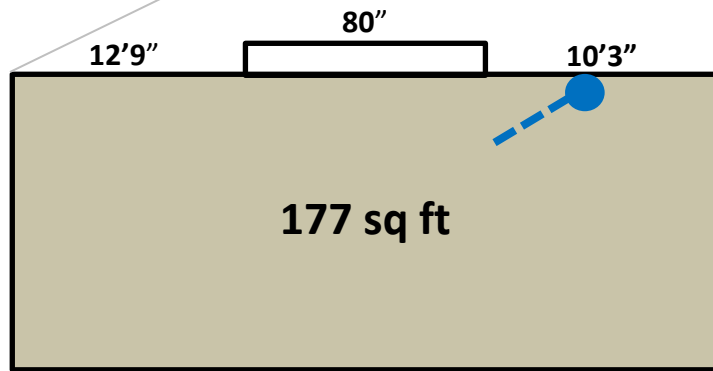
Soil-Based Method

- $1917 \text{ ft}^2 \times 0.15 = \underline{288 \text{ square feet}^*}$
- Why less surface area than Simple Sizing Method?
 - Sandy soils = faster infiltration and less surface area

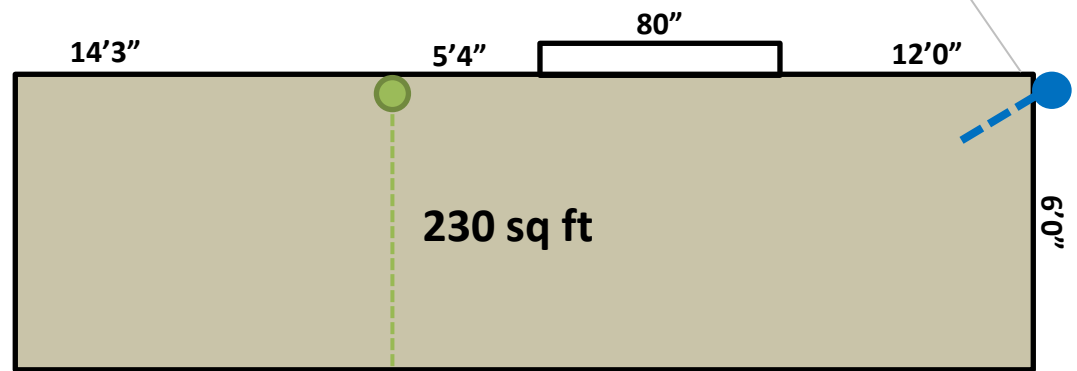
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One plot side was not large enough for our required rain garden area, so we oversized it!




← 29'6" →



← 38'3" →

Walkway

Walkway slope = 1%
toward storm drain



Rain Garden Sizing

**Is it really that big of a deal?
1 inch of rain isn't much, right?**



**Let's see how Google sees the
world...**

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Rain Garden Sizing

- Impervious
Cover =
24,879 ft²
- 1" of rain =
**15,509 gallons
stormwater**
- Average year =
48" or **744,432
gallons!**

