



## 2.0 TECHNICAL TRAINING

### 2.1 LOCATION & PLACEMENT GUIDELINES



A rain garden can work virtually anywhere. The location, size and effectiveness depends on the amount of runoff going into the garden, the soil type and the plants that are used. Areas along driveways or sidewalks and areas that receive runoff from a downspout may be ideal spots for a rain garden, but you can also consider using a corner of your yard as a rain garden location.

A sandy soil or soil high in organic matter is best suited for a rain garden, BUT rain gardens will work in clay soils, too. Much of Northeastern

Indiana is comprised of clay soil – soil that has very tiny particles and is easily compacted. There are ways to accommodate areas with clay soils to make them suitable as rain gardens.

When selecting a location, keep the following in mind:

- Locate the rain garden where it will collect the largest possible amount of rain water runoff from a downspout or hard surface area.
- Look for a natural depression (low spot) in the yard by finding where water already collects on the property or where the runoff flows. Locate the rain garden up the slope from the low spot to interrupt the flow path and divert water. This will help reduce flow to that area and reduce ponding of water in your yard.
- Don't place the rain garden where water already stands. It is best to capture the runoff before it gets to the low spot.
- Place the rain garden a minimum of 10 feet from your house or building to prevent water from being drawn to the foundation or basement.



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- Rain gardens should not be placed over or near the drain field of a septic system or within existing drainage ways, such as a ditch or swale.
  - Rain gardens should not be installed near large trees. Trees have extensive root systems that could be damaged as you dig the rain garden. Also, some trees may not be able to tolerate the extra moisture being held by the rain garden.
  - If downspouts don't naturally flow to the area where you plan to locate the rain garden, consider creating a swale or using a buried plastic pipe as a way to route the water to the rain garden location (see Section 2.2.5).
  - Place the rain garden downhill from the driveway in order to collect rain water runoff from it.
  - If you live in a subdivision with an active neighborhood association, it may be a good idea to check with the association president or board before you install a rain garden to be sure that your plan does not conflict with the neighborhood covenants or zoning regulations. You may find that your neighborhood association will want to get involved in the rain garden program, too.
  - Don't locate your garden in an area that may be part of the public right-of-way or in a utility easement without getting permission first.
  - Think about where the water will go when your rain garden fills up and overflows. Be sure the overflow does not go toward your foundation or onto a neighbor's property.
  - At least 48 hours before you dig, find out where underground service lines or utilities are located. "Call Before You Dig" – (800) 382-5544 or just 811. Learn more at [www.call811.com](http://www.call811.com).





The illustration below can help you determine possible locations for a rain garden on your property (Figure 2).

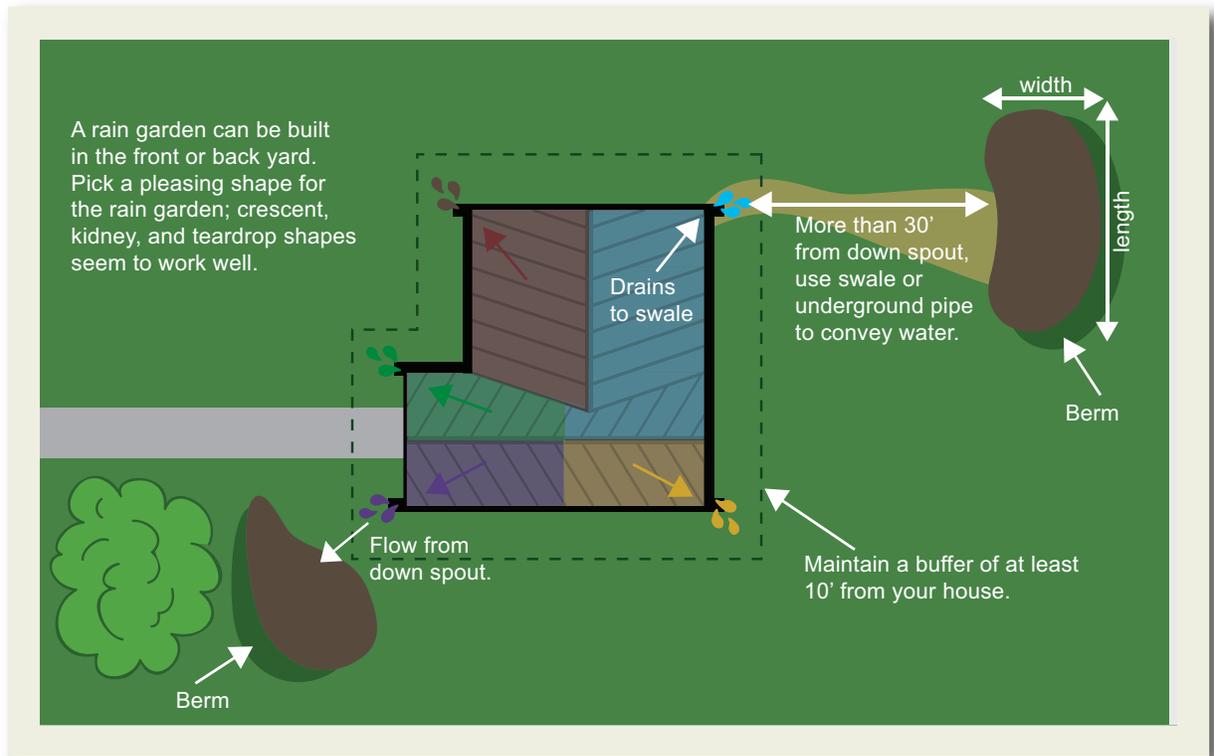


Figure 2. Sample Site Plan for Locating a Rain Garden

## 2.2 SIZING AND SHAPING THE GARDEN

A rain garden can be almost any size and shape. A typical residential rain garden usually covers an area between 80 and 300 square feet.

To determine the optimal size for your rain garden, you'll need to consider how much water will be directed into the garden, the kind of soil you have and how deep the garden should be. In this section, you will learn to:

- Calculate the drainage area (Section 2.2.1)
- Determine appropriate depth (Section 2.2.2)
- Determine garden size (Section 2.2.3)
- Decide rain garden shape (Section 2.2.4)
- Route water to the garden (Section 2.2.5)

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### 2.2.1 Calculate the Drainage Area

In order to determine how much water will go into your rain garden, you will need to determine the size of the area that will drain to it.

If the rain garden is close to a house or building, most or all of the water going into the garden may come from the rooftop. You will need to measure the rooftop area. You don't need to climb onto the roof to do this. There is an easy and accurate way to estimate the rooftop area:

1. Measure the length and width of the house or building (in feet) then multiply the numbers together to determine the approximate area that the house covers. This estimate of the footprint of the building is approximately equal to the size of the roof, in square feet.



2. Count the number of downspouts on the home or building.
3. Divide the roof area (as calculated in #1 above) by the number of downspouts. This will tell you approximately how many square feet of rooftop drain to each downspout.

4. Determine how many downspouts you will route to your garden. Multiply this number by the number of square feet calculated in step #3. This will tell you how many total square feet of roof area will drain to the garden.

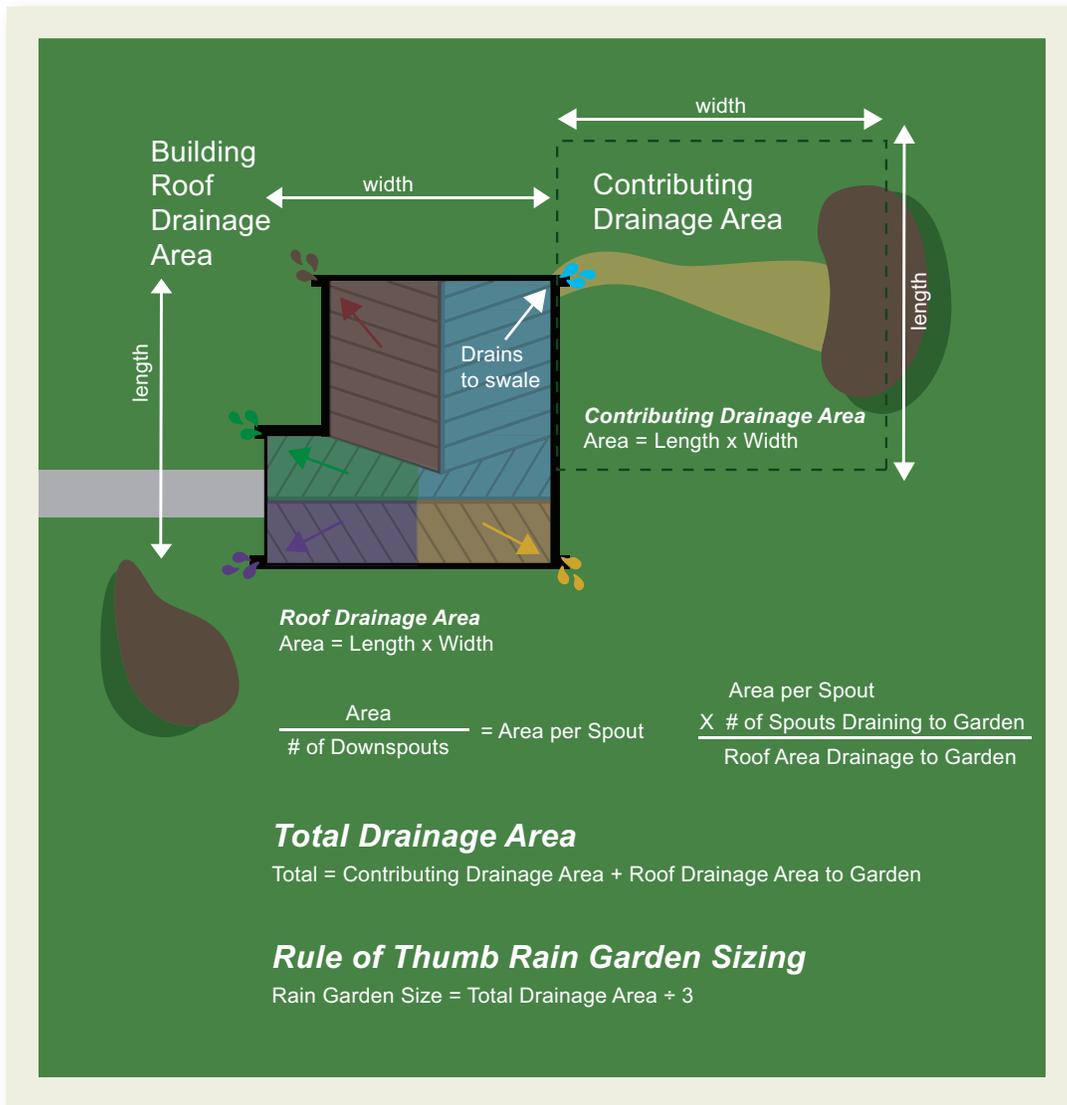
If the rain garden will be located more than 30 feet away from the house or building and downhill from another hard surface (impervious) area such as a driveway, follow these steps to calculate the drainage area going to the garden:

1. Stand where the garden will be located and look around you to see what part of the lawn or impervious area slopes toward you.
2. Use your garden hose or a string to encircle the area that appears to slope toward the garden spot. Move the hose or string to make a square or rectangle that generally covers the drainage area.



3. Measure the length and width of the square or rectangle and multiply these numbers. The result is the square footage of the contributing area of lawn and/or other impervious surface that will drain to the garden.
4. Add the square footage you just calculated to the rooftop area that will drain into the garden. This is the total drainage area. You will use this number when determining the rain garden size in Section 2.2.3.

Figure 3. Determining Drainage Area



Note: Depending on your soil type, you may need to make your rain garden larger to accommodate the water going to it. Check with Fort Wayne City Utilities for more information.

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### 2.2.2 Determine the Rain Garden Depth

A typical rain garden is between four and eight inches deep, but they can be deeper. Making the garden deeper may cause water to stand for too long. If the garden is shallower, it will need to be larger to hold the same amount of rain water runoff.



In Northeastern Indiana, you will want all of the water in the garden to be absorbed into the ground (infiltrate) within one or two days. This will reduce the chance that mosquitoes will breed in the garden and will help ensure that your plants survive. To determine how much water your rain garden can absorb and how deep it should be, you will need to conduct an infiltration test.

The test described here will tell you the maximum depth of water that the garden will absorb in 24 hours.

- 1.** Dig a hole about the size of a gallon jug – approximately eight inches across and eight inches deep. Dig the hole in the area where you plan to locate the rain garden.
- 2.** Remove any loose dirt from the hole, and then fill it to the top with water.
- 3.** Let the water soak in for a minimum of two hours so that the soil around the hole becomes saturated. The hole does not have to drain completely.
- 4.** Fill the hole with water again.
- 5.** You will need to measure how much the water level drops in a given period of time. Put a stick, stake or paint stirring paddle into the bottom of the hole so that the stick is standing up and extends above the top of the hole. Mark the beginning water level on the stick.





6. Note the time that you begin the test.
7. Check the hole after 24 hours. Use a ruler to measure how much the water level dropped.
8. If the hole drains completely in 24 hours, the deepest part of your garden may be as deep as the hole was, but this depth is not required.

A quicker but slightly less accurate way to perform the infiltration test is to follow steps 1 through 6 above. Instead of waiting for 24 hours as described in step 7, check the hole after six hours. Measure how much the water has dropped. If the water dropped one inch in six hours, you can expect that four inches of water will be absorbed in 24 hours. So you can make the deepest part of your garden about four inches deep. This will provide you with the most flexibility in selecting plants because they typically will not be standing in water for more than a few hours. Remember that the longer you allow the infiltration test to run, the more accurate your result will be because infiltration tends to slow after the first few hours.

You will want the water that goes to the garden to absorb in one or two days. Therefore the infiltration rate per day that you observed in the test will determine the maximum depth for your garden. On properties with very good drainage – for example where the home used for the infiltration test drained completely in 24 hours – the garden may be built shallower than the test would indicate. If an eight inch deep hole drains completely in 24 hours, the deepest part of the garden could be eight inches deep or it could be shallower. The garden should not be any deeper than indicated by the infiltration test. If the test shows a slower infiltration rate, you may need to make the garden more shallow, but larger.

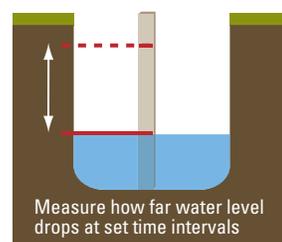
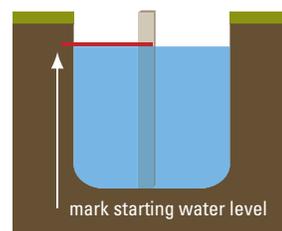
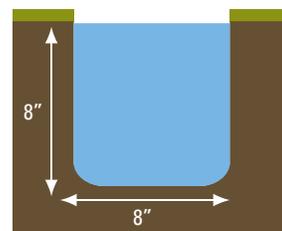


Figure 4: Infiltration Test

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### 2.2.3 Determine the Rain Garden Size

The size of the rain garden, also known as its area (length x width), will depend on how much space you have available and how much rain water runoff you want to capture in the rain garden. A common approach is to size the rain garden so that it will hold the water that will come from the drainage area (determined above) during a one-inch rain fall. This is not an absolute rule because the amount of space you have available may ultimately determine the size of your rain garden.

To calculate the rain garden size:

1. Divide the number of inches of rainfall that you plan to capture by the depth of the deepest part of the garden (determined in Section 2.2.2). One inch of rainfall capture is a good rule of thumb.
2. Next multiply the result by the drainage area that you calculated in Section 2.2.1. The result is the optimal square footage of the garden.

For example, if the base of your house measures approximately 60 feet across the front and is 30 feet from front to back, the square footage of the roof is approximately 1,800 square feet. If you have four downspouts and only one will be directed to the rain garden, the drainage area will be about a fourth of the roof (or about 450 square feet). If you want to capture one-inch of rain from 450 square feet of drainage area in a garden that is four inches deep, you will need to have a rain garden that is about 113 square feet.

$(1\text{''rain} \div 4\text{'' deep}) \times 450\text{ sq. ft drainage area} = 112.5\text{ sq. ft rain garden}$

A typical rain garden size is about 80 to 300 square feet. A rain garden of that size will hold about the amount of water that comes from one residential downspout in a one inch rainfall.



## 2.2.4 Shape

Rain gardens can take a variety of shapes like the ones shown below. Crescents, ovals, teardrops and kidney shapes are popular, but the shape of your garden will be determined primarily by the space you have available, the location and your preferences.

Once you have determined the appropriate size for your garden, you should choose a shape that best fits your yard and existing landscaping.



To help you shape the garden, mark the perimeter by placing stakes, string or even a garden hose along the edge of where you want the rain garden to be. Doing this will provide a defined area that you will dig and it will also allow you to better visualize the final size and shape of the rain garden. **This is the time to make changes, before you start digging.**



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## 2.2.5 Routing Water

If your rain garden will be located more than 30 feet from the home, you may need to plan and construct an arrangement to route water from a downspout to the garden. Although it sounds elementary, remember that water flows downhill, so plan your garden downhill from the water source. Keeping this principle in mind, there are several options for routing runoff from its source to your rain garden:

- Water can be routed to your rain garden through a grassy swale (or a flat grassy channel) that will slow down the water and spread it out as it travels to the garden. This allows for some additional infiltration of the water.
- You can create a creek bed feature or a small waterfall using a rock-lined channel. This can create an attractive “babbling brook” when it rains and can slow down the water going into the garden, dissipating some of its force. A rocky channel requires little maintenance.
- Another option is to use a plastic downspout extender to connect a downspout to the rain garden. If this kind of direct connection is made, almost all of the water coming from the downspout will go directly into the garden, so the garden must be sized correctly. A 4-inch plastic downspout extender can be used effectively and can either be placed on top of the lawn or be buried. If the extender is buried, the plastic should discharge water at the lowest point in the garden.



- Regardless of how the water is routed, some kind of diffuser should be used at the point where the water enters the garden so that plants in the immediate area will not be washed out by the force of the water and to prevent erosion. River rocks make an attractive diffusion structure.