

## Woodland Phlox

*Phlox divaricata*



### PLANT NOTES

*Prefers shady areas and spreads over time; "divaricata" means "with a spreading and straggling habitat." Drought tolerant once established, but does best in medium moisture and well-drained soils. Violet-blue to pink flowers bloom in late May and stand between 1 and 2 feet tall.*

*Photos: Shutterstock*



# Chapter 1

## Locating a Rain Garden

### Location is Critical

The first step in planning a rain garden is to determine sources generating runoff (like a rooftop) and then determining how rainfall is flowing across the property. This can be done by walking the site during a rainfall event. A rain garden must be located so that runoff moves to it.

Start by using a grid sheet to create a sketch of the site. First draw existing buildings, driveways, sidewalks, trees, and other **hardscape** and natural features. Next, identify locations of utilities. Last, identify downspouts and draw in lines where water flows across the property. Mark where water ponds, if applicable. A blank grid sheet can be found in Appendix I. Keep these tips in mind when locating the site of a rain garden:

- **Digging to depths where public and private utilities are buried may occur during the installation of a rain garden.** Contact Iowa One Call to locate buried utility lines on a property. Avoid locating a rain garden above or directly adjacent to marked utilities.
- **Identify all drainage to the proposed rain garden area.** Rain gardens are designed to manage runoff generated from small areas, usually a rooftop downspout and some lawn area. They are not meant to manage runoff from multiple buildings or large drainage areas. A general rule of thumb is to limit the drainage area to no more than 11,000 square feet (or about 1/4 acre).
- **Identify drainage easements.** Rain gardens placed in a **drainage easement** or backyard swale may easily become overwhelmed, even if designed correctly. These locations are not ideal because the drainage area is typically too large for stormwater to be effectively managed by a rain garden.



### Terms to Know

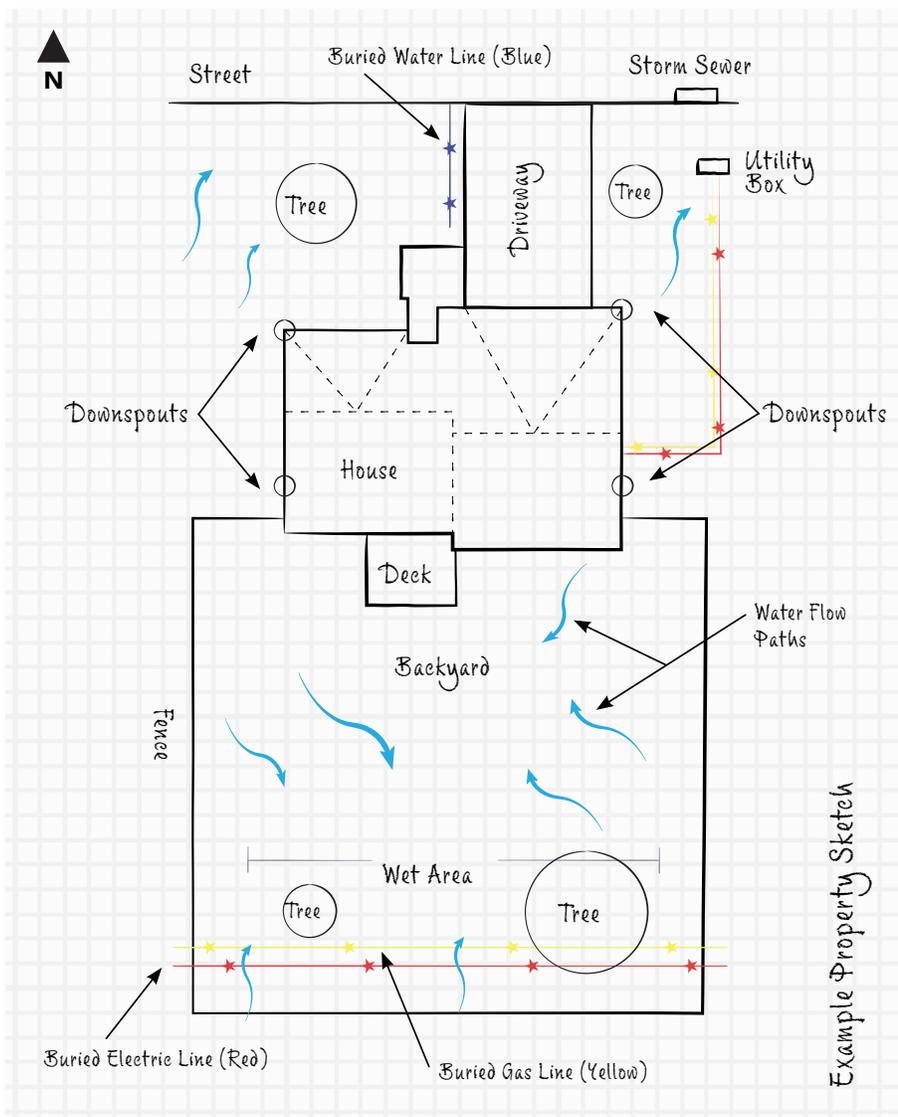
**Hardscape:** Landscaping features built with “hard” materials, such as paved roads, patios, and driveways. Hardscapes typically increase impervious surface area and stormwater runoff.

**Drainage Easement:** Land areas used to control stormwater runoff. Easement allows another party to access land in emergency situations. Rain gardens may be prohibited within drainage easements.

**Steep Slopes:** A steep slope is defined as greater than 10 percent.



- **Locate the rain garden downslope from structures.** Runoff going into the rain garden must be at an elevation higher than where water would be leaving the garden. However, avoid siting a rain garden near **steep slopes**. Stormwater should always move away from structures.
- **Look for low spots.** Where does water flow on the property? Are there areas where water typically ponds? Rain gardens can be used in some situations to address drainage issues. Use caution in placing rain gardens in low spots. There may be poorly drained soils or too much drainage for a basic rain garden to handle. An enhanced rain garden may be needed in some of these situations.
- **Rain gardens can be easily incorporated into existing landscaping or new projects.** As long as soils are suitable, rain gardens work great in areas where there might be traditional landscaping. They can be used along property or fence lines, near a driveway or walkway leading to a front door, or around the perimeter of a fire pit or patio area.





## Runoff, Structures, and Drainage Considerations

Stormwater runoff needs to reach the rain garden. It is often easiest to locate a rain garden close to downspouts. Runoff can be directed to a downslope location using **subsurface drainage** or a **vegetated swale**. In some cases, downspouts can be rehung or redirected.

Rain gardens should be sited in flat areas. Installing a rain garden will be more challenging if steep slopes exist. To minimize erosion or scouring, avoid placing rain gardens on slopes steeper than ten percent. **Saturated soils** on steep slopes can also become very unstable. Retaining walls are usually needed to create a level depression for a rain garden on steep slopes. Work with a landscaping professional in this case.

During large rainfall events, rain gardens may overflow because the soils become temporarily saturated. It is important to route the overflow to a **stabilized area**. Overflow drainage should always be directed away from structures and neighboring properties.

To prevent adverse impacts to your property or other structures, maintain the following minimum distances:

- 10 feet downslope from a basement, 30-40 feet is preferred
- 10 feet from a foundation/slab
- 2 feet from a sidewalk
- 100 feet downslope from a septic system drain field or private well
- 200 feet downslope from a public well
- Near public and private utilities (refer to page 15)

Check with the local jurisdiction to confirm any additional requirements such as minimum separation distances between neighboring properties and if a rain garden can be placed in the right-of-way space between the street curb and sidewalk (see photo to the right).



### Terms to Know

**Subsurface Drainage:** Method of moving excess rainwater via a buried pipe, either to remove excess rainwater or transfer rainwater to the rain garden.

**Vegetated Swale:** Sloped depressions used for above-ground rainwater conveyance. May feature a rock bed with vegetation.

**Saturated Soils:** A soil condition in which the pore space between soil particles is completely filled with water.

**Stabilized Area:** Any area of land (i.e. garden, lawn) that is fully vegetated and bare soil is absent.

Photo: Lim SWCD



Grassed right-of-way space between the street curb and sidewalk.

Locating a rain garden also depends on various natural conditions that determine drainage patterns. To ensure adequate drainage, avoid the following areas:

- **Areas where seasonal groundwater is less than two feet from the bottom of the proposed rain garden.** Shallow groundwater may potentially be discovered during excavation or a soil percolation test. Be aware that if a percolation test is completed during drought conditions, groundwater may not be visible. Shallow groundwater may also be verified by looking at the color of the soil. Gray soil and soil with orange stains may be too wet.
- **Wet areas discovered during a site assessment.** Unless an enhanced rain garden is used, rain gardens should be sited away from areas where soils take longer than 24 hours to drain. Heavy soil compaction and/or shallow groundwater may prohibit adequate infiltration and percolation.
- **Areas where bedrock is less than two feet from the bottom of the proposed rain garden.** Soil survey information from the United States Department of Agriculture's (USDA) online Web Soil Survey may indicate whether high water tables exist or where shallow bedrock might exist. Probing the soil can confirm the existence of both.
- **Areas that have been contaminated by heavy metals or other pollutants.** Do not install a rain garden on a contaminated site. These soils are typically found in ultra-urban areas.
- **Be cautious of tree locations.** Avoid locations near or under trees to prevent harming the root structure of trees.

Photo: Shutterstock



Wet areas likely will not have adequate drainage to support a rain garden.

### Be Careful With Sump Pump Discharges

In some situations, it may be possible to utilize a rain garden to manage discharge from a sump pump. To prevent continuous recycling of groundwater between the rain garden and a home's foundation, consider the following recommendation:

*Never permanently "connect" your sump pump to the rain garden. Continuously saturated soils, the presence of algae, and dead plants are indications that the sump pump is providing too much water to the rain garden. Disconnect the sump pump connection if this is the case and reroute the discharge to a stabilized area. Contact local officials for more guidance.*



## Working Within Existing Site Conditions

Avoid areas where utilities are located. Call “Iowa One Call” at 811 or (800) 292-8989 to locate utilities before any digging begins. Iowa One Call requests can also be completed online. Be sure there are no phone lines, gas lines, or other infrastructure where digging will occur. Call at least 48 hours in advance of digging. Be aware that Iowa One Call will not mark utilities such as electric dog fences, water lines, and electric or gas lines that were installed privately.

Rain gardens should only be installed when surrounding landscapes are stabilized and not subject to erosion. If a rain garden will be installed in conjunction with other landscaping or as part of new home construction, install the rain garden after construction is completed and the surrounding area is fully vegetated. Sediment entering a rain garden will create a plugged surface that will limit the infiltration of rainwater.

Finally, avoid locating rain gardens under trees. Excavation under the drip line of a tree canopy will cause damage to the tree’s roots. There is a much wider selection of plant species suitable for sunny conditions as well.

Photo: Iowa One Call / Facebook



## Understanding Utility Markings

The following colors are used nationwide to mark the locations of buried utilities. Homeowners typically use white flags or white spray paint to denote the proposed area of excavation.

	Electric Power Lines, Cables, Conduit, and Lighting Cables
	Gas, Oil, Steam, Petroleum, or Gaseous Material
	Communication, Alarm or Signal Lines, Cables, or Conduit
	Potable Water
	Sewers and Drain Lines