

THE BENEFITS OF BUILDING YOUR OWN

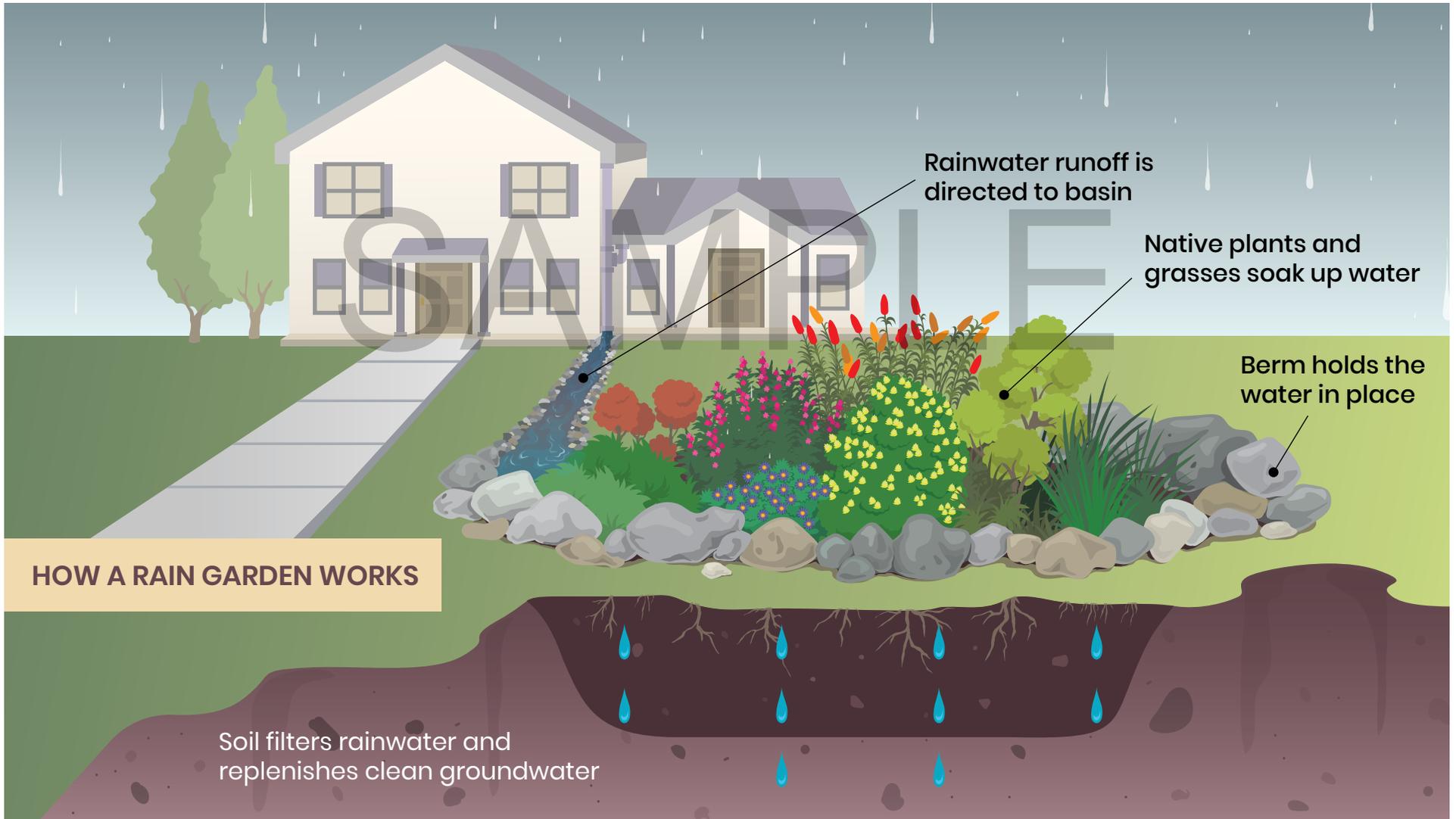
RAIN GARDEN



WHAT ARE RAIN GARDENS?

Looking out at a garden in front of your home can be a great way to start the day. Rain gardens not only provide the aesthetic appeal of a garden but also capture and filter stormwater runoff. They can help prevent flooding. They work by absorbing the stormwater that falls on impervious surfaces, such as roofs, driveways, and sidewalks, and giving it a safe place to be absorbed into the ground. Filtering stormwater prevents pollutants such as oil, pesticides, and sediment

from making it to our waterways, protecting the local environment. And preventing still water from collecting elsewhere on a property prevents mosquito infestations. Just to recap, a well-planned garden can help protect against flooding, reduce mosquitos, and protect local waterways from pollution, all while being a beautiful addition to your home. Rain gardens really are win-win-win-wins!



PICKING A LOCATION FOR YOUR RAIN GARDEN

Proper placement will lead to an effective and environmentally beneficial rain garden. A variety of factors need to be taken into consideration when picking a location:

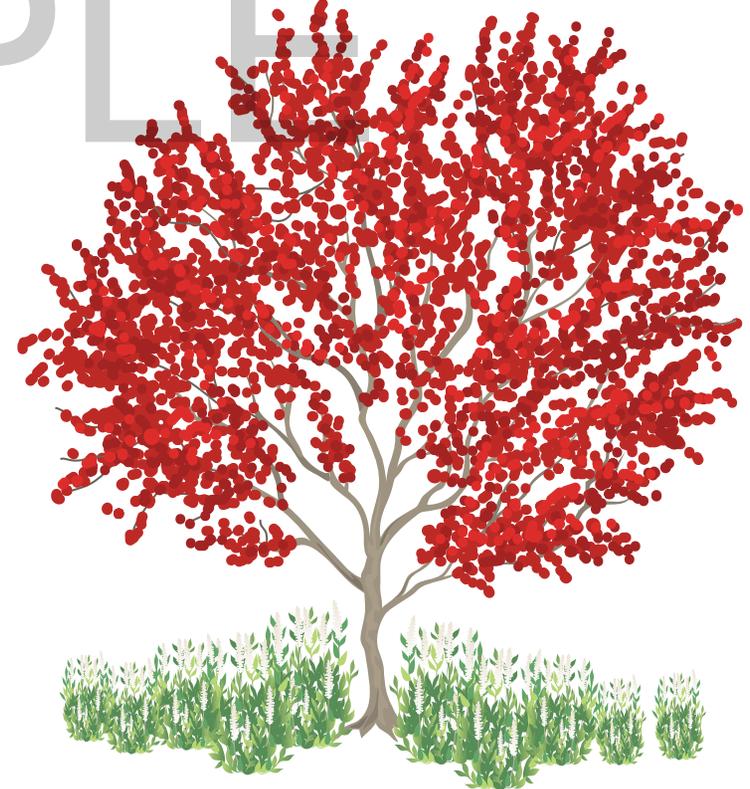
- **Topography:** Examine your land during storms to determine where water naturally flows and accumulates. Consider placing your rain garden at the bottom of a slope or in a depression in your yard.
- **Soil:** Well-draining soil allows stormwater to infiltrate the ground beneath your rain garden. To determine the type and quality of your soil, you can perform a percolation test. If your soil has heavy amounts of clay or compaction, you can amend it with a mix of compost, topsoil, and sand to improve the drainage.
- **Sunlight:** The amount of sunlight that your rain garden receives will determine the types of plants that will thrive. Observe the sun exposure of your potential rain garden site to find out whether it receives full sun, partial sun, or full shade.
- **Trees:** Place the rain garden away from large, well-established trees to avoid having to deal with large tree roots.

There are a number of safety precautions to be aware of when designing and implementing your rain garden:

- **Proximity to buildings:** Build your rain garden at least 10 feet away from the foundation of your home to prevent the groundwater from damaging your home. Also stay away from sheds, power lines, and other structures.
- **Proximity to neighbors' land:** Keep your rain garden a safe distance from neighbors' properties, as the overflow water could spill into their yard.

- **Water systems:** Avoid placing your rain garden near septic systems, wells, or water lines. The garden may cause problems with their operation.
- **Proper sizing:** Construct a rain garden large enough to handle the amount of rainwater it will receive. Otherwise, you could cause new water management issues in your yard.
- **Call before you dig:** Ensure that you don't come in contact with underground wires and pipes. Call 811 and get nearby underground lines marked before you start. No matter how deep you plan to dig, it's better to err on the side of caution.

Consult with your local planning and building department to ensure that all necessary permits and inspections are obtained and other requirements are followed. If you notice any signs of backflow, contact your water utility immediately.



SIZING A RAIN GARDEN

Rain gardens are typically measured by either their surface area or the volume of water they can hold. To determine the right size for your rain garden, you need to understand the size of the area that it will collect water from.

As a general guideline, the surface area of your rain garden should be at least 10% of the area of the roof, driveway, or other surface that it collects water from. If your rain garden will receive runoff from a 1000 ft² roof, then at least a 100 ft² garden is needed to accommodate the stormwater.

If your rain garden will be fed by a downspout, calculate the area of the roof that supplies the downspout. For hard-to-measure spaces like a roof, try using Google Earth's measurement tool or estimate the area to the best of your ability.



BUILDING A LAYERED SYSTEM

Most rain gardens incorporate layers of soil amendments to optimize water retention and plant growth. It's important to spend time researching the right combination for your location and soil. The average rain garden (well-draining soil and expected rainfalls of 1" to 2" per hour) can be excavated to a depth of 9" and has three main layers: a layer of a sand/compost mixture, a layer of amended soil, and a layer of mulch. These layers supply nutrients to the plants and allow the garden to soak up more stormwater. Always call 811 before you dig to ensure you're staying away from buried cables.

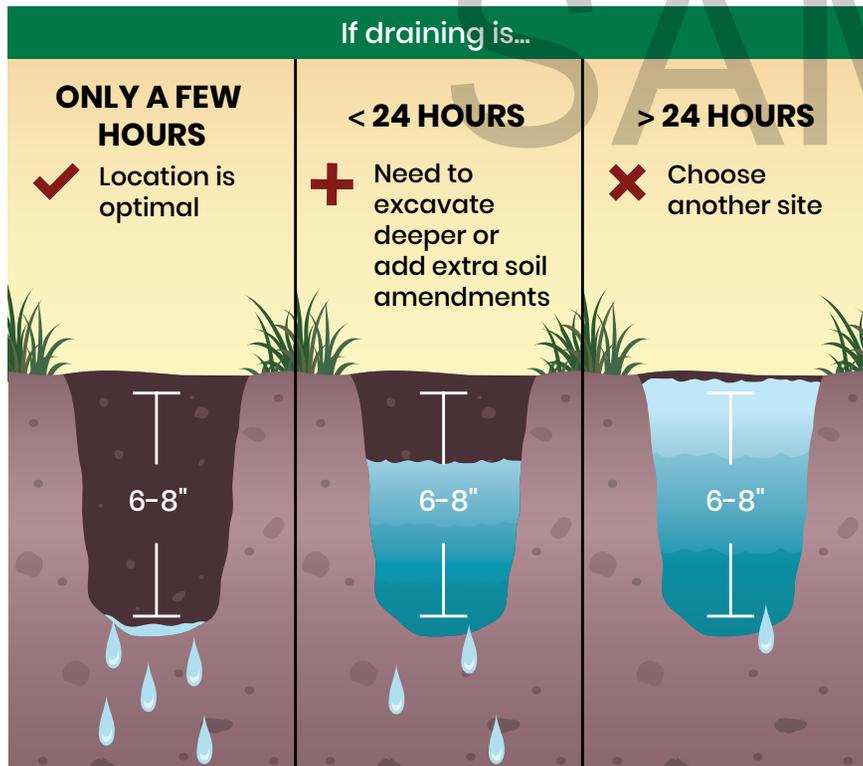


SOIL DRAINAGE TEST

To help determine the layers and amendments required for your rain garden, perform a quick soil drainage test using these steps:

1. Grab a shovel and dig a hole 6" to 8" deep in the area where you plan to place your rain garden.
2. Fill the hole with water.
3. Measure the time it takes for the water to drain.

If the water drains in a few hours, then you have an optimal location for a rain garden! If the water drains in less than one day, you will need to add extra soil amendments or excavate deeper to improve the drainage. And if it takes longer than 24 hours, you should choose another site for your rain garden.



PICKING PLANTS AND OTHER MATERIALS

The best types of plants for your rain garden will be ones that are native to your area and have low maintenance needs. Native plant species will be adapted to your region and environment, requiring less upkeep and providing nectar and pollen to local insects.

Rain gardens should be planted with a variety of plants, including trees and shrubs, tall grasses, and shorter plants with deep roots.

- **Trees and shrubs:** This layer will slow down and deflect rain, allowing the water to absorb into the soil instead of immediately running off.
- **Tall grasses:** Native grasses act as a filter for your rain garden. They soak up water, trap pollutants, and prevent the top layer of your garden from being washed away.
- **Shorter plants:** Deeply rooted, shorter plants will help retain the soil and hold moisture beneath your rain garden.

Use perennial species whenever possible to limit the amount of replanting you need to do in future years.



DRAINAGE TO THE RAIN GARDEN

The path that rainwater takes to your garden will depend on the existing natural landscape and your own preferences. The three most common residential drainage options are gutter downspouts, piping, and swales.

Downspouts from roof gutters are the best tools for guiding stormwater from a roof into a rain garden. You can use downspout extensions to send the water wherever you need to, which allows you to place your rain garden away from the home.

Underground PVC pipes are another option for directing water into your rain garden. This method is useful for yards that receive excessive stormwater, or in situations where downspouts would cause aesthetic concerns. This method will involve higher costs and more manual labor than a simple downspout system.

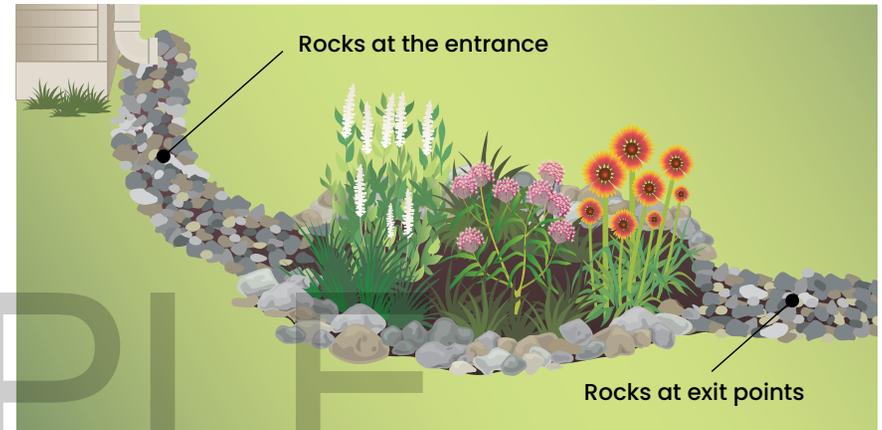
Swales are grass-lined ditches that can be used to direct large amounts of stormwater throughout your yard. The swale should have gentle side slopes to prevent erosion. You can line your swales with rocks and stones to accommodate heavier flows of water.

During heavy storms, your rain garden will overflow. Consider the path that the overflow water will take. You may wish to use the drainage options above to direct excess water into another landscape area. For example, you could create a swale at the exit point of your rain garden and send the water to a grassy lawn.

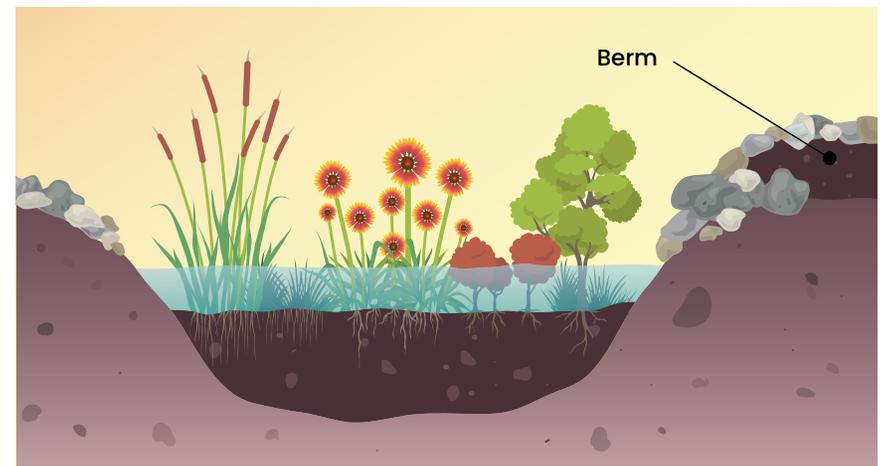


USING ROCKS AND BARRIERS TO CONTROL THE FLOW OF WATER

A bed of stones at the entrance to your rain garden will slow the water down and disperse it throughout the garden. Rocks placed at the exit points will serve a similar purpose, preventing erosion and slowing the flow of water.



You can build berms to control the flow of water throughout your rain garden system. If water is leaving your rain garden from an undesirable location, you can build up a berm to retain the water. Cover your berms with rocks, grass, or plants to avoid erosion.



MAINTAINING THE RAIN GARDEN

Your rain garden should be a self-sustaining ecosystem if the proper perennial plants are planted in the right places. There will inevitably be a small amount of maintenance to perform, including:

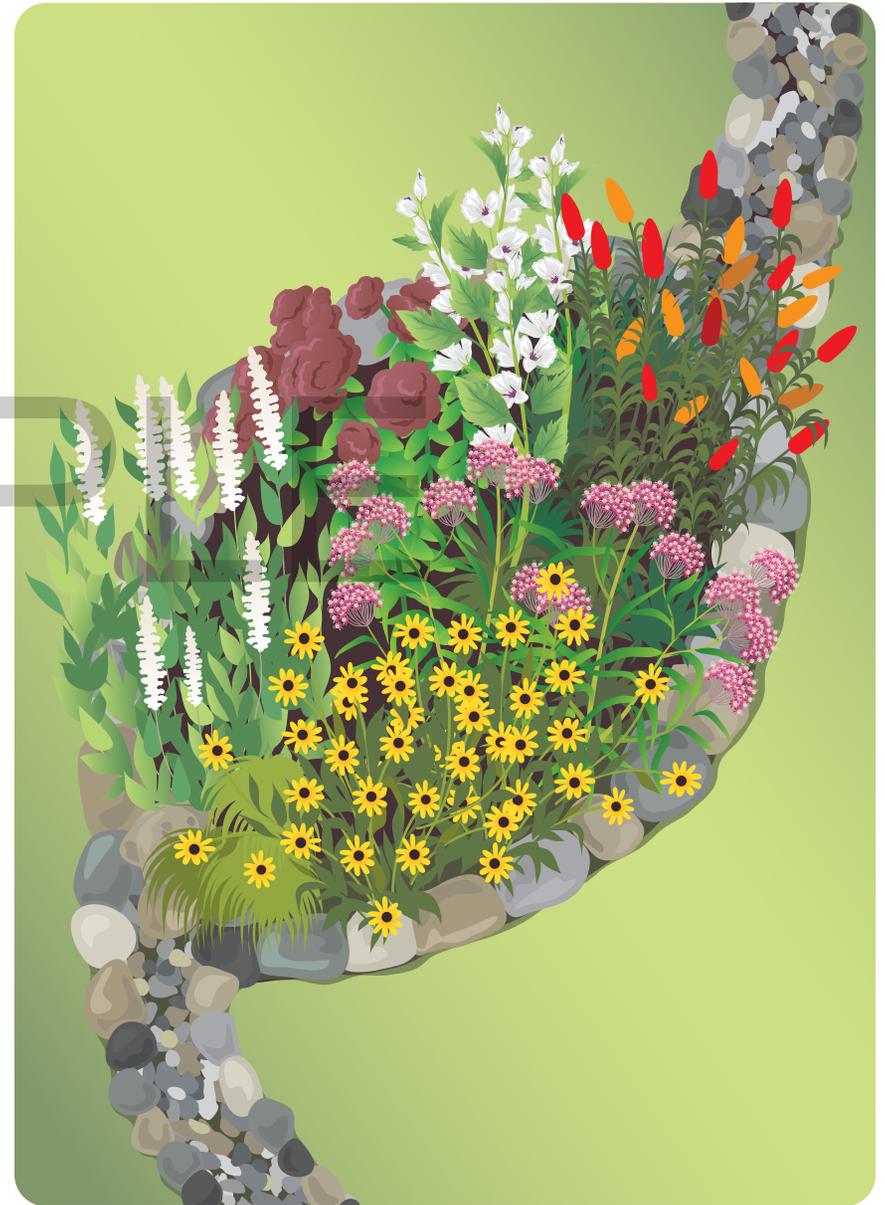
- **Watering after initial planting:** Your rain garden will be a delicate ecosystem when it is first planted. During periods of drought, water any plants that may need the extra moisture. After a year or two, your garden should become much more resilient against drought, pests, and other issues.
- **Inspect regularly:** Keep an eye on your rain garden, especially after heavy storms. If any areas begin eroding, consider replanting or replacing the plants there with a more suitable species.
- **Prune and weed:** Perform regular pruning, weeding, and other maintenance as with any other garden.
- **Replace mulch:** Add more mulch material as needed to increase moisture retention, block out weed growth, and provide nutrients to your garden.
- **Remove sediment:** Your rain garden is filtering sediment before it reaches waterways. Remove sediment and aerate bare soil that might be clogged with fine sediment.

If mulch and topsoil are continuously being washed away, you may need to make changes to your rain garden's inlet. Add more stones at the inlet to slow down the entrance of water.

As you inspect your garden, you may notice that stormwater is exiting from an unintended spot in your garden. Try adding more soil to that side of the garden to direct the water elsewhere.

Keep records of your initial planting plan so you can monitor the activity of your various plants. If one species is becoming invasive

and crowding out the others, you may need to cut it back or replace it altogether. Likewise, consider replacing plants that are not thriving. In future years, you may want to add on to your rain garden. Increasing the size of your garden will allow it to filter and hold more stormwater.



RAIN GARDENS IN A BOX

Stormwater planters are raised garden beds contained by a permanent or semipermanent structure made of stone, concrete, brick, or wood. They serve the same function as rain gardens, which gives them their common nickname: “rain gardens in a box.” Stormwater planters are more adaptable than traditional rain gardens, so they can function in situations where other water management techniques are impractical.

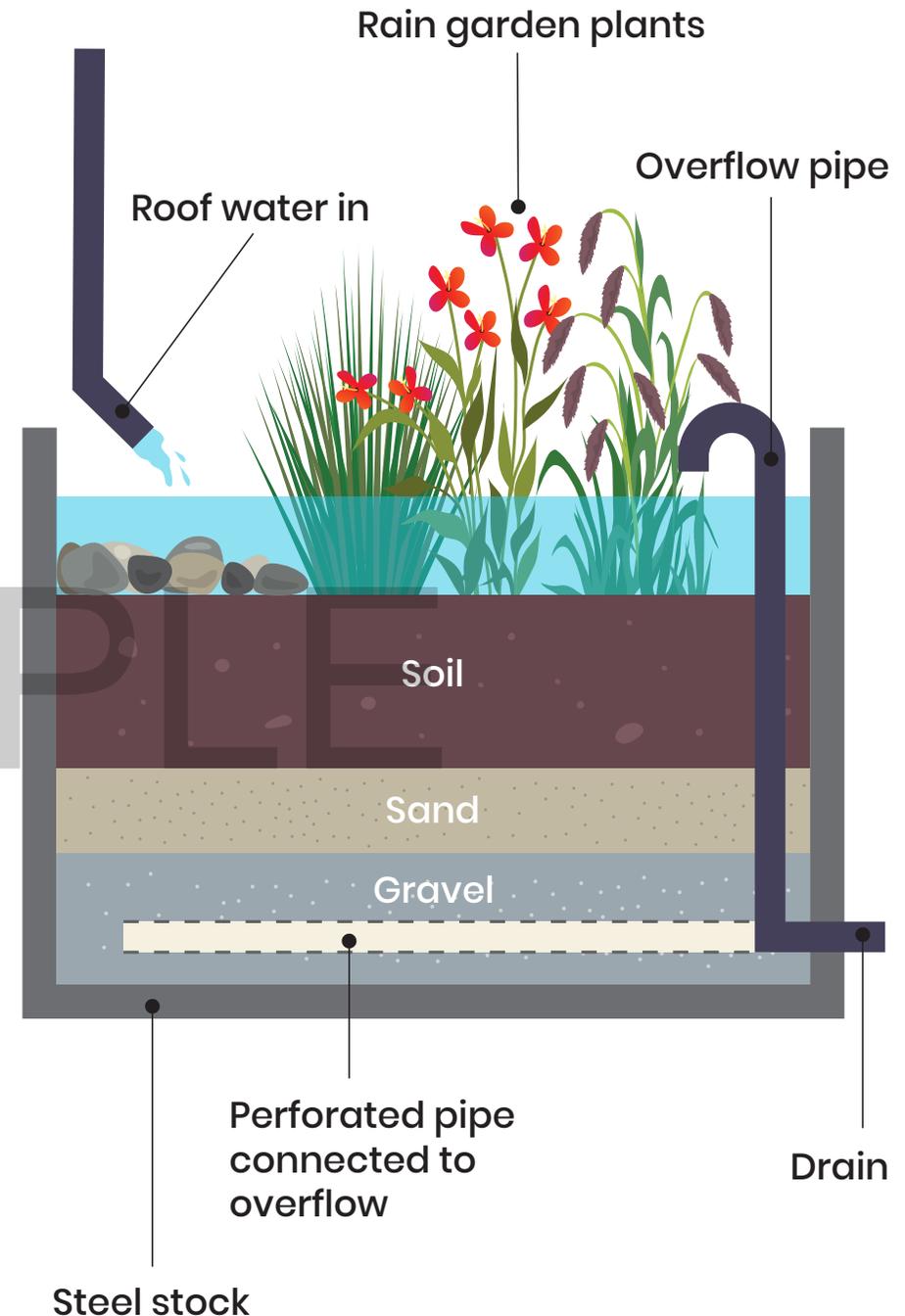
There are two types of stormwater planters: infiltration and filtration. Both planter types will filter pollutants and sediment out of rainwater.

Infiltration planters reduce stormwater runoff levels by allowing the water to soak into surrounding soils. Filtration planters only cleanse and store the water internally, with excess water being piped away. A plastic liner prevents water from seeping into the surrounding soil. This type of planter does not reduce stormwater volume and is often used when the stormwater will be contaminated.

Filtration planters can be used in any situation, while infiltration planters create a risk of contaminating the soil and groundwater. When installed in the wrong location, infiltration planters can also damage the foundation of nearby structures. When in doubt, a filtration planter is the safer bet. This is especially true in these situations:

- Within 100 feet of a well, 10 feet of a building, or 5 feet of underground utilities
- On steep slopes or potential landslide areas
- In areas with contaminated groundwater and/or soil

Stormwater planters have one advantage over in-ground rain gardens: the vertical space allows more water to be filtered with less surface area. This is especially useful in areas where plantable surface area is limited.



RESOURCES

Visit these sites for additional information:

US EPA SOAK UP THE RAIN

epa.gov/soakuptherain

US EPA NONPOINT SOURCE POLLUTION

epa.gov/nps

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