

Rain Garden (bio-retention)

Rain gardens are bio-retention facilities very similar to infiltration basins, but generally on a smaller scale. They can be found from the back yards of homes to along the side of a street. A rain garden collects immediate stormwater runoff and infiltrates in a ponding zone in the middle of the BMP.



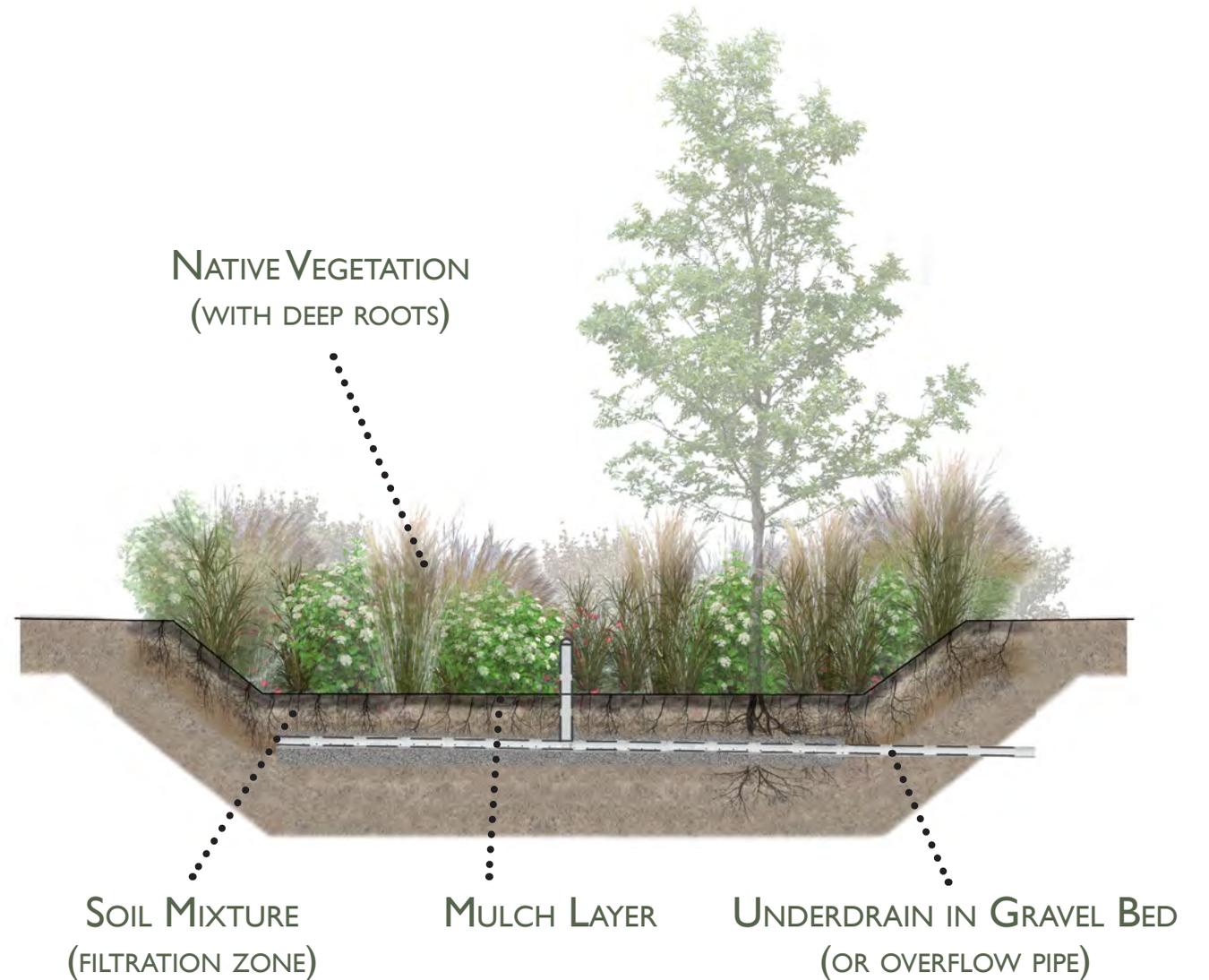
Photo: DIYNetwork.com

OVERFLOW STRUCTURE

STONE DISSIPATOR

SOIL MIXTURE

NATIVE PLANT



Rain Garden Maintenance

Typical Maintenance Indicators	Typical Maintenance Actions
Accumulation of sediment (over 2 inches deep or covers vegetation), litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation. Confirm that soil is not clogging and that the area drains after a storm event. Till or replace soil as necessary.
Poor vegetation establishment	Ensure vegetation is healthy and dense enough to provide filtering and to protect soils from erosion. Replenish mulch as necessary (if less than 3 inches deep), remove fallen leaves and debris, prune large shrubs or trees, and mow turf areas.
Overgrown vegetation—woody vegetation not part of design is present	Mow or trim as appropriate but not less than the design height of the vegetation. Replace dead plants and remove noxious and invasive weeds.
Erosion due to concentrated stormwater runoff flow	Repair/re-seed eroded areas and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or re-grading where necessary. Remove obstructions and sediment accumulations so water disperses.
Standing water (BMP not draining) <i>If mosquito larvae are present and persistent, contact PADEP. Mosquito larvicides should be applied only when absolutely necessary and then only by a licensed individual or contractor.</i>	Where there is an underdrain, check the underdrain piping to make sure it is intact and unobstructed.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet, or outlet structures	Repair or replace as applicable.

The original design for your rain garden most likely outlined an amended soil mixture. The soil mixture is an important component for both the vegetation and to allow stormwater to infiltrate. It is important to maintain good draining soils for the health of your rain garden.



What to Look For

Accumulation of Sediment, Litter, Debris, Dumping, Grease

Standing Water

Erosion

Poor Vegetation/Invasive Weeds

Overgrown Vegetation/Invasive Weeds

Clogged Inlet/Outlet Structures

Structural Damage

Common Rain Garden Issues

Poor Vegetation/Invasive Weeds

- The designed vegetation for a rain garden is critical for the BMP's function and performance. With poor vegetation cover, the rain garden does not perform as intended.
- New rain gardens that are poorly maintained will result in invasive weeds quickly taking over (or, as in the case with example pictures, crabgrass or other similar weeds will take over and inhibit the BMP's function).
- Invasive weeds and dead vegetation should be removed and replaced with the original designed vegetation. A rain garden should be monitored at least monthly during the growing season to ensure invasive weeds are not taking over.
- Refer to the invasive weed section of this guide for pictures of common weeds. If these weeds are encountered, they should be removed.



Standing Water/Poor Drainage

- Standing water in a rain garden is generally a sign of poor soil mixture (filter media). A number of factors could have caused such an issue, but this indicator generally means that the soil mixture needs to be replaced.
- Standing water can create a mosquito breeding ground, so rain gardens should be checked after rain events to ensure it is draining properly.
- Standing water may kill vegetation and thus leading to more problems with clogged overflow structures, erosion, and sediment accumulation that will need to be dealt with in addition to the poor soil mixture.



Rain Garden Considerations



Overflow Structures

Most rain gardens are intended to infiltrate a portion of the stormwater runoff. However, and for larger storm events, rain gardens will have an overflow structure for the runoff to go somewhere instead of flooding the immediate area.

Overflow structures come in all shapes and sizes. Most overflow structures are set just a few inches higher than the bottom of the rain garden to allow the runoff to be captured and treated.

Overflow structures should be free of debris, clogs, and defects. These structures perform an important role when considering flooding and the overall health of the rain garden and should be checked at least twice a year.

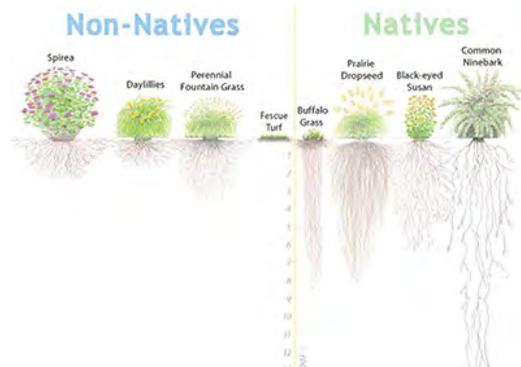


Inlet Points

Stormwater runoff can enter rain gardens either through a very defined point or over a broad area (for “sheet flows”).

Defined entry points or broad entry areas are generally identifiable by stone in the area. The stone serves the purpose of a “dissipator” that is intended to capture larger debris and sediment before entering the treatment area of the BMP.

Stone areas of a rain garden should be checked periodically for trash, sediment, and other large debris; and such debris should be removed.



Vegetation

The vegetation for a rain garden is critical for the performance and function of the BMP. It is important to maintain deep-rooted native vegetation (with proper soils) that was most likely in the original design for the rain garden. Mulch coverage should always be present to protect the root systems. Invasive weeds and non-native plants can push out the deep-rooted native vegetation—so keep them out with consistent weeding!