

PURPOSE & DESCRIPTION

The Filtrex® **Rain Garden Bioretention System** is a storm water best management practice (BMP) that **utilizes soil, plants, and microbes to filter, retain, and infiltrate storm water runoff from developed sites**. Rain gardens are an important component of Low Impact Development (LID) strategies because it is relatively simple, inexpensive, effective and aesthetically attractive. Filtrex® GrowingMedia™ is an important component of a successful rain garden installation.

APPLICATION

Rain gardens can be used on virtually any site utilizing a variety of design techniques. The most straightforward designs are on sites that (Winogradoff, 2001):

- Allow the rain garden facility to be located in close proximity to the source of run-off.
- Allow rain garden facilities to be dispersed uniformly throughout the site.
- Allow each rain garden facility to collect runoff from a sub-drainage area of one acre or less (maximum of two acres).
- Are large enough to accommodate the rain garden facilities within required setbacks.
- Contain high infiltration, stabile, and well structured in-situ soils.

Rain gardens can be installed on sites that do not meet all of these criteria, but it can be more difficult and often less successful. The key components of a rain garden are (Winogradoff, 2001):

- Pretreatment – It is important to filter excess debris and sediment from runoff before it reaches the rain garden in order to minimize maintenance.
- Flow Entrance – It is best to allow water to sheet flow directly into the facility, where concentrated flows enter through a curb cut or pipe it is important to dissipate the velocity of the runoff with stone, rip rap, or similar method.
- Ponding Area – The surface storage of runoff is accommodated in the ponding area. Acceptable depths range from 3 in -12 in (75-300mm), with 6 in (150mm) recommended.
- Plant Materials – Plants in a rain garden facility help to bind and uptake pollutants, remove water through evapotranspiration, encourage infiltration, and create an aesthetically pleasing landscape feature.
- Mulch – The mulch layer is an important medium for the adsorption and filtering of pollutants, as well as protecting the soil from eroding and drying out. A 3 in (75mm) blanket of Filtrex® FilterMedia™ is recommended for this application.
- Planting Soil – The soil in a rain garden facility is specifically designed to filter pollutants, infiltrate water, and support plant growth. The soil must have a minimum infiltration rate of 2 in (50mm)/hr. A mixture of 75% coarse construction sand (grain size 0.02 in – 0.04 in [0.5-1.0mm]) and 25% GrowingMedia is recommended for this application.
- Underdrain with Pea Gravel Diaphragm – An underdrain is necessary when in-situ soils have an infiltration rate of less than 1 in/hr in order to ensure that the facility drains properly. A perforated pipe surrounded with a 6-9 in (150-225mm) layer of pea gravel that leads to a discharge point will serve this purpose.
- Overflow Outlet – All rain garden facilities must provide a means for excess water to overflow and be conveyed downstream.

INSTALLATION

1. GrowingMedia used for rain garden facilities shall meet all Filtrex Certified GrowingMedia specifications.
2. Call Filtrex at 877-542-7699 or visit www.filtrex.com for a current list of installers and distributors of Filtrex products.
3. Schedule a pre-construction meeting with Engineer, Filtrex Certified Installer, and any other consultants that will be involved in the rain garden installation.
4. Rain garden facilities will be placed at locations indicated on plans as directed by the Engineer.
5. Rain garden areas should be protected from compaction during the site construction phase.
6. Construction site shall be graded and stabilized prior to the installation of rain garden facilities.
7. If in-situ soils were compacted during site construction, they shall be roto-tilled to a depth of 18 in (450mm) to restore porosity and infiltration capacity in areas designated for rain gardens.
8. Excavation and grading of rain garden areas shall be done by equipment located outside of the limits of the rain garden facility, or by equipment with marsh tracks or light equipment with turf-type tires.
9. Rain garden areas must be protected from erosion and sedimentation after final grades have been established for the facility.
10. Install underdrain system and observation wells, if specified.
11. Rain garden soil mix shall consist of 25% GrowingMedia and 75% coarse (grain size 0.02 in – 0.04 in [0.5-1.0mm]) construction sand that is clean and free of deleterious materials. The soil shall be mixed thoroughly to ensure a homogenous and consistent texture.
12. Rain garden soils shall be installed in lifts of 12 – 18 in (300-450mm) pneumatically or with non compacting methods. Each lift shall be lightly watered to encourage natural compaction. No mechanical compaction is permitted.
13. Rain garden's base should be at least 2 ft (600mm) above bedrock or geologic structures.
14. Rain garden soil mix shall have a minimum infiltration rate of 2 in (50mm) per hour.
15. Ensure that final grades are achieved as specified, taking into account the mulch layer that will be added after planting. Fine grading is extremely important for rain garden facilities. They are typically only 6 in (150mm) deep so an error of 2 in (50mm) may cause a 33% change in storage volume.
16. Install vegetation specified in the planting plan.
17. Install a 3 in (75mm) FilterMedia blanket as mulch over the entire rain garden area, or as specified by the Engineer. Install erosion control at entrance points in the form of surge stone or river rock, or as specified.
18. New planting may require irrigation during establishment. See design drawing details for correct rain garden installation (Figure 7.1 through 7.3).

INSPECTION & MAINTENANCE

Regular inspection should occur throughout the installation process at the following times:

1. Pre-construction meeting.
2. Stabilization of construction site and beginning of excavation.
3. Installation of underdrain.
4. Delivery and installation of soil materials, including

GrowingMedia.

5. Establishment of final grades of rain garden facility.
6. Delivery and installation of plant material.
7. Delivery and installation of FilterMedia blanket or mulch.
8. Establishment phase of plant material.

Regular maintenance shall include:

1. The Contractor shall ensure that the site upstream from the rain garden area remains stabilized and does not contribute excessive sediment that may impair the performance of the rain garden area.
2. Plant materials may need to be irrigated during establishment.
3. Plant materials that do not establish, may need to be replaced.
4. The rain garden facility should be monitored for invasive non-native plant species. Any that are found should be eradicated.
5. FilterMedia should be replaced as necessary to ensure complete coverage of the surface of the rain garden area.

ADDITIONAL INFORMATION

For other references on this topic, including additional research reports and trade magazine and press coverage, visit the Filtrexx website at filtrexx.com

Filtrexx International, Technical Support
877-542-7699 | www.filtrexx.com | info@filtrexx.com
Call for complete list of international installers and distributors.

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Figure 7.1. Typical Rain Garden Cross-Section.

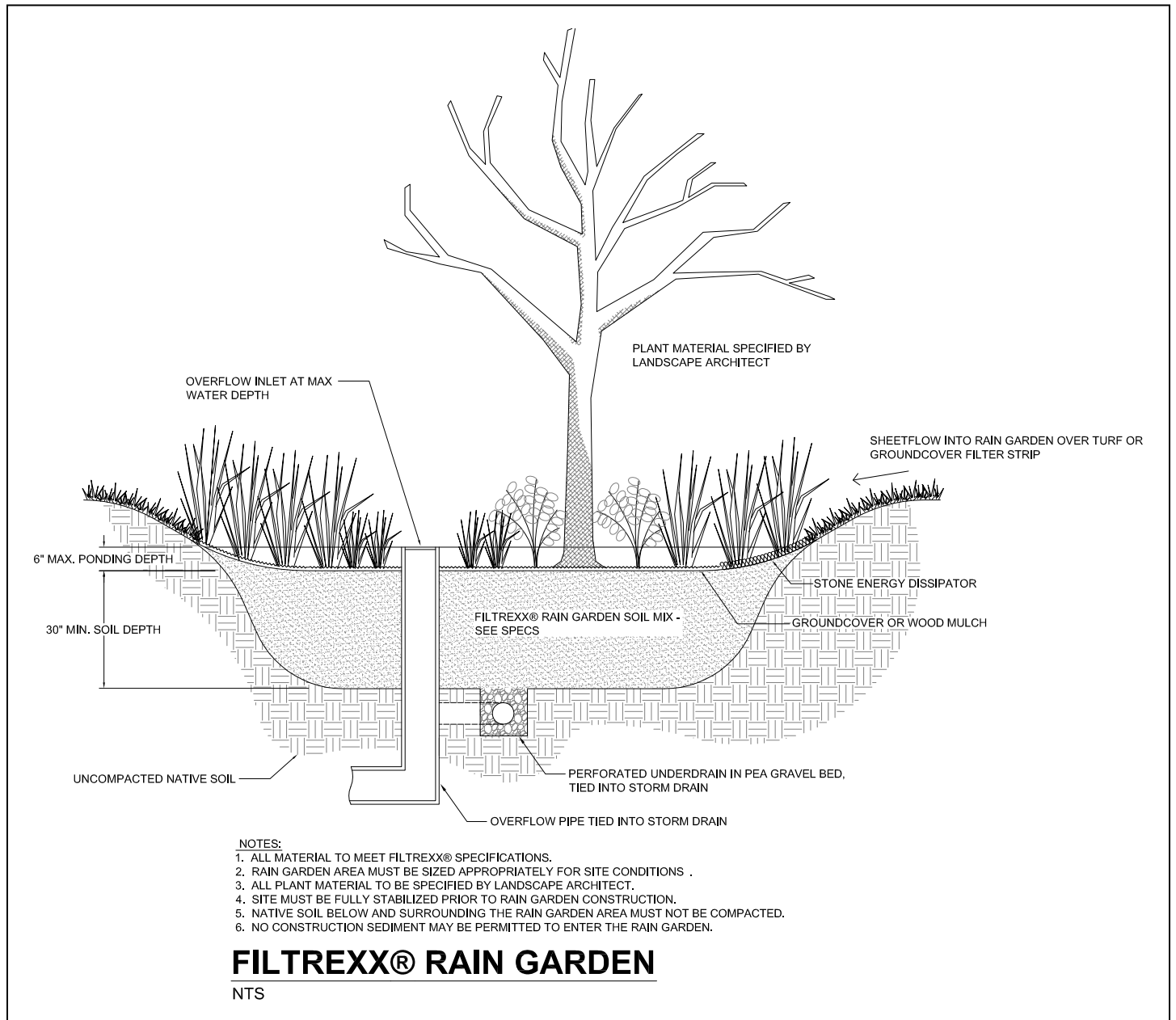


Figure 7.2. Rain Garden Placement on a Residential Site.

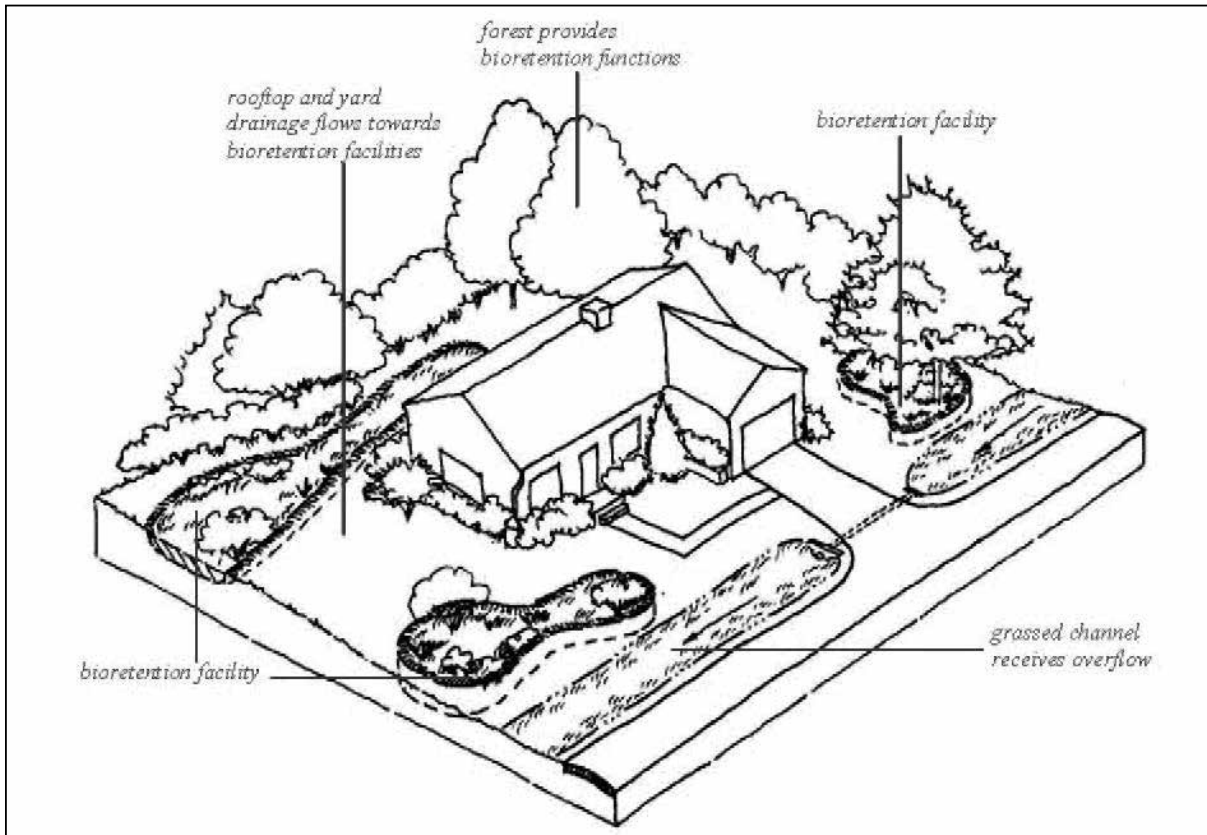


Figure 7.3. Rain Garden Placement in a Parking Lot.

