

6.3 Tree Well Filter



Best Uses

- Limited space
- Parallel to roadways

Advantages

- Aesthetic
- Small surface land use
- Blends with the landscape

Limitations

- Can clog without maintenance
- High installation cost
- Surface planting soils require replacement twice a year

Figure 6-13: Tree Well Filter. Source: Americast, 2006. The use of this photo is for general information only and is not an endorsement of this or any other proprietary stormwater treatment device.

Tree filters consist of one or multiple chambered pre-cast concrete boxes or hoops with a small tree or shrub planted in a filter bed filled with engineered media or other absorptive filtering media. As stormwater flows into the chamber, large particles settle out on the mulch layer, and then finer particles and other pollutants are removed as stormwater flows through the filtering media. Underground, physical, chemical and biological processes work to remove pollutants from stormwater runoff. Stormwater flows through a specially designed filter media mixture that has a high rate of infiltration. The mixture immobilizes some pollutants, which may be decomposed and volatilized, or incorporated into the biomass of the tree filter system's micro/macro fauna and flora. Stormwater runoff flows through the media and into an underdrain system at the bottom of the container, where the treated water is discharged. Tree filters are similar in concept to bioretention areas in function and applications, with the major distinction that a tree filter has been optimized for high volume/flow treatment, therefore the size of treatment area is proportionally less. A tree filter takes up little space and may be used on highly developed sites such as landscaped areas, green space, parking lots and streetscapes. A tree filter is adaptable and may be used for developments, in all soil conditions to meet stormwater treatment needs.

Design and Sizing Guidelines

- Flows in excess of the treatment flow rate shall bypass the tree filter to a downstream inlet structure or other appropriate outfall.
- A tree filter shall be reviewed by the manufacturer before installation.
- Manufacturers such as Filterra will size the tree filter based on the impervious surface of a site. The manufacturer shall certify the ratio of impervious area to treatment area for the project. For example, Filterra states that a tree filter of 6 x 6-feet can treat 0.25 acres of impervious surface.
- Tree filters are available in multi-sized pre-cast concrete drop in boxes, Sizes range from 4 x 6-feet up to 6 x 12-feet boxes.
- Tree filters cannot be placed in sump condition, therefore tree filters shall have flow directed along a flow line of curb and gutter or other lateral structure. Do not direct flows directly to a tree filter.
- Filter media in tree filter needs to be specialized for expected site pollutant loads.

Maintenance Agreement

A maintenance agreement shall be provided.

- The maintenance agreement shall state the parties' responsibility for maintenance and upkeep.
- Installation and maintenance can be simple. A flexible, single-unit design is manufactured for drop-in-place construction. Maintenance can be contracted out, sometimes with the manufacturer.
- A tree filter shall be inspected weekly, with trash and debris being removed. Routine and inexpensive landscape care is required.
- The surface soil of the tree filter must be replaced twice a year to maintain treatment quality of stormwater. Replacement media can be purchased from manufacturers of the tree filter.

Maintenance Standards

- Maintenance activities and frequencies are specific to each product. Semiannual maintenance is typical. Maintenance shall be performed per guidance of specifications.
- Manufactured tree filters, like the Filterra filter, can require a maintenance agreement.

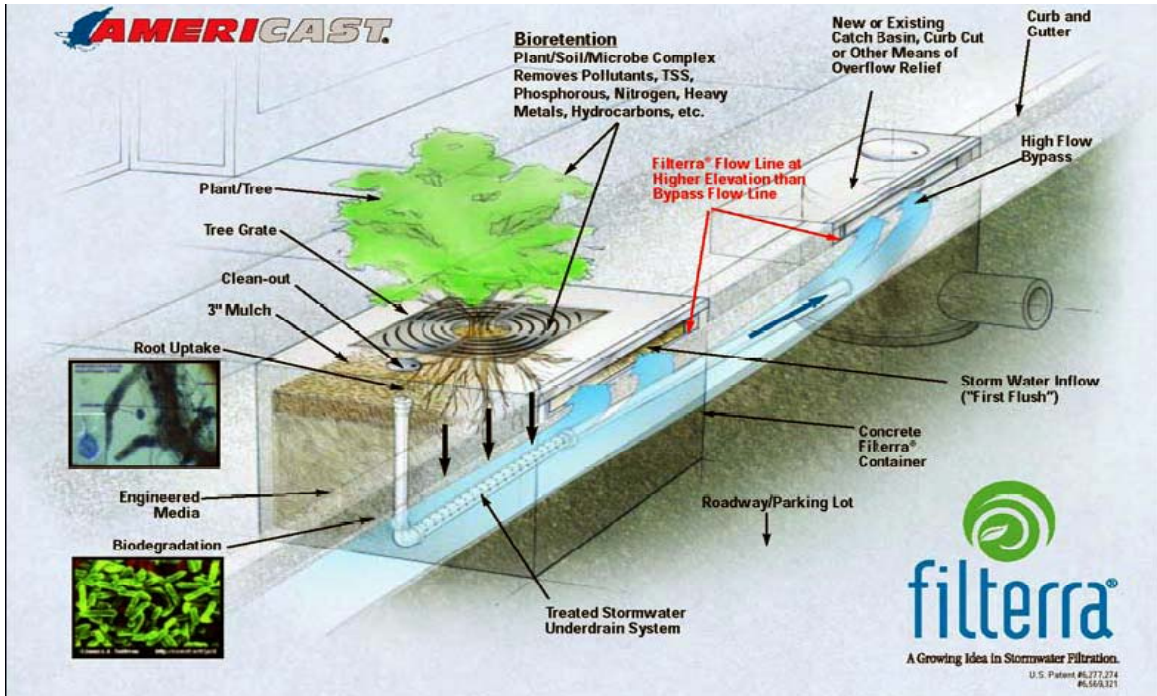


Figure 6-14: Cut Away View. Source: Americast, 2006. The use of this photo is for general information only, and is not an endorsement of this or any other proprietary stormwater treatment device



Figure 6-15: Non-proprietary Tree Filter with Overflow Bypass. Source: University of New Hampshire Environmental Research Group, 2006