

Stormwater Treatment

PURPOSE: A stormwater treatment unit installed online or offline of a storm drain filters contaminants from runoff entering the inlet to aid with improving the water quality of runoff delivered to storm sewer systems and streams.

Manufactured stormwater treatment units that function similarly to conventional oil-water separators are effective at removing organic pollutants (oil, grease, etc.) and sediment from runoff, having the ability to remove up to 80% of total solids and 95% of oils and hydrocarbons from runoff.

The stormwater treatment device featured here consists of a concrete tank that houses separate runoff treatment and overflow bypass chambers partitioned by a fiberglass insert. Runoff initially enters the upper bypass chamber of the tank. Low-velocity flows are diverted by a weir and drop-pipe to the unit's lower settling chamber, to be held for gravity settling of sediments. Floatable pollutants, such as oil and grease, being less dense than water, rise and are trapped in the lower treatment chamber by the fiberglass insert. After contaminants are separated, the treated water is displaced up through a riser pipe and is discharged to the storm sewer. The device is designed so that the water surface level inside the chamber is permanently above the level of the riser outlet to prevent collected particles from being discharged into the storm sewer or a waterway.

High velocity flows pass through the the upper bypass chamber directly downstream to the storm sewer to prevent resuspension of trapped contaminants in the lower chamber.

In addition to pollutant removal, diverting flows to the treatment area aids with slowing the speed of runoff released to a storm sewer or stream, which decreases the impacts of erosion downstream.

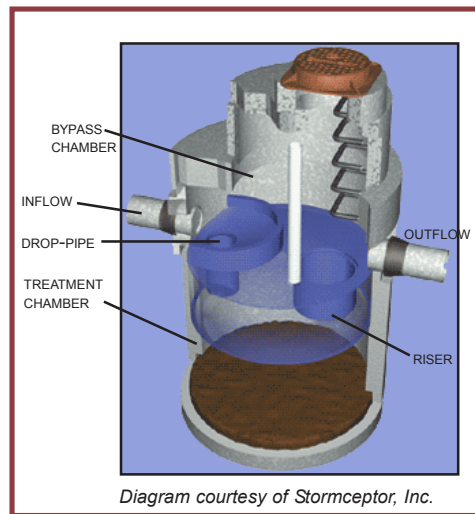


Diagram courtesy of Stormceptor, Inc.

General Design Considerations

- Units can be custom-sized for retrofitting
- Follow manufacturer's guidelines regarding installation
- Base should be placed on level grade
- Use grout or pipe seals to attach inlet and outlet pipes to bypass chamber
- Placement should be accessible for maintenance by vacuum truck
- Inspect at six month intervals; unit should be cleaned when sediment reaches 15% of tank capacity
- If used, flow control devices must be implemented upstream of the device
- Follow erosion control procedures during installation
- Unit should include overflow drainage to remove excess stormwater



Benefits and Uses

- Filters contaminants from runoff prior to its discharge to the storm sewer system
- Applicable to residential developments/commercial/ industrial sites
- Less expensive than oil-water separators
- Can be installed online or offline of a storm drain
- Requires less space than detention basins
- Alleviates flooding and erosion downstream

Additional Resources

PA Department of Environmental Protection
- www.dep.state.pa.us
- Pennsylvania Stormwater Best Management Practices Manual

US Environmental Protection Agency
www.epa.gov

Low Impact Development Center
www.lowimpactdevelopment.org

Metropolitan Council Environmental Services
www.metrocouncil.org - click on "Environmental Services" to find the link to the *Urban Small Sites BMP Manual*

Stormwater Manager's Resource Center
www.stormwatercenter.net