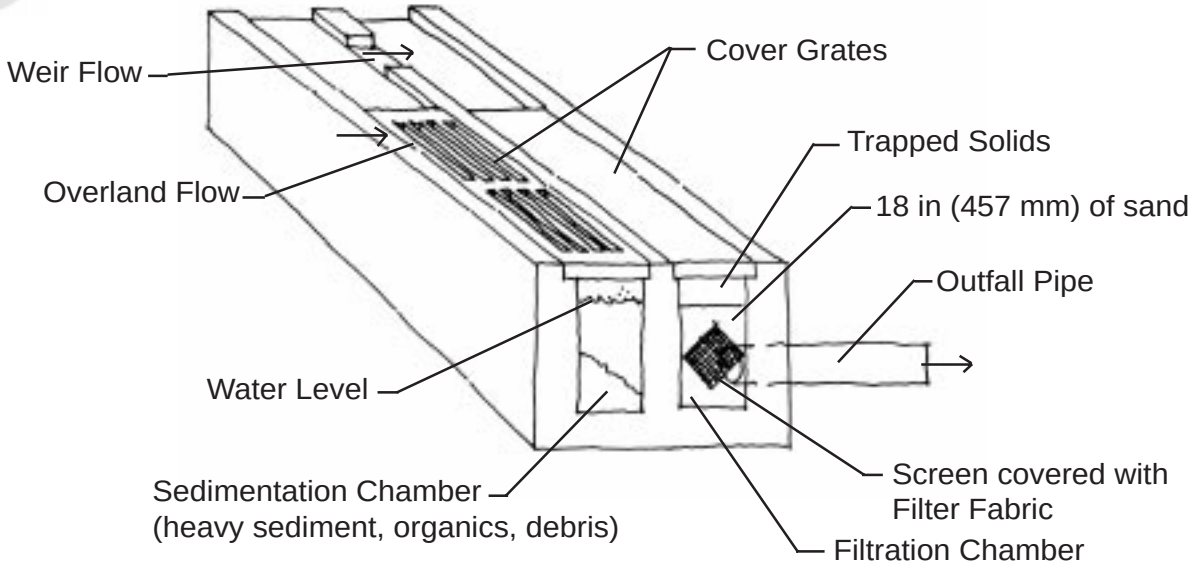
PRIMARY USE: Removal of pollutants from storm water runoff.
ADDITIONAL USES: Pre-treatment for other storm water management practices (e.g., infiltration devices).

SURFACE SAND FILTER

What is it? A composite bed of sand and other material sometimes used in conjunction with detention basins that provide control of quality and quantity of runoff water. The surface sand filter is comprised of three main components - 1.) a flow splitter which diverts first flush to the filter; 2.) a wet/dry sedimentation chamber in which coarse particles are settled; 3.) a sand filter bed which strains and traps pollutants.

Purpose

These filters are used as an initial treatment step to remove suspended materials and pollutants, and reduce clogging of systems further down stream. They are most appropriate for impervious sites or for sites in which vegetated filters are otherwise not practical.



Typical Surface Sand FilterDesign
Perspective View

Limitations

Useful for catchments of at least 3 acres (1.2 ha), but less than 50 acres (20 ha). Flows greater than design (typically flows after first flush) must be diverted past the filter. The practice is mainly limited to urban settings.

Materials

Prefabricated tank or vault (may be constructed on-site from concrete), sand, topsoil, grass, pipe system, pea gravel, geotechnical cloth, grates and/or inlet structure.

Installation

Working from effluent to influent ends: an outflow pipe system is laid down and then covered with a gravel layer. A layer of geotechnical cloth is used to minimize fine particulate matter flow to the pipes. A layer of sand 18-24 inches (457-610 mm) thick is upstream of the filter fabric. A sedimentation chamber will precede the filter chamber in the water flow path. If the sedimentation chamber is omitted, the sand filter must be made larger to compensate for clogging. The sedimentation chamber may also be used as a reservoir to stabilize water flow into the filter.

Source: Shaver, Earl, Use of Sand Filters as an Urban Stormwater Management Practice and The State of Delaware Sediment Control and Stormwater Management Program. In: National Conference on Urban Runoff Management: Enhancing Urban Watershed Management at Local, County, and State Levels, March 30 to April 2, 1993 . Designing for Stormwater Filtering Systems, Center for watershed Protection.