

PC-10 SUBSURFACE SAND FILTER

Reference: Maryland Stormwater Design Manual.

**BMP Objectives**

- Perimeter Control
- Slope Protection
- Borrow and Stockpiles
- Drainage Areas
- Sediment Trapping
- Stream Protection
- Temporary Stabilizing
- Permanent Stabilizing

Definition and Purpose

Subsurface sand filters are used to capture and treat a volume of stormwater runoff. The structure consists of an underground concrete vault with distinct chambers designed for various levels of treatment. Flows enter and exit the structure through underground pipes, and flows from the filter are conveyed into a storm sewer or open channel.

Appropriate Applications

Upstream grass channels, grass filter strips, or other BMPs can be used to help remove sediments and particulates before they enter the filter. A subsurface sand filter is:

- Used to enhance stormwater quality.
- Subject to clogging if moderate to high levels of silts and clays flow into facility and should not be used while construction is occurring in the upstream catchment.
- Particularly useful at sites with limited space for water quality treatment or in high-value real estate areas. Filter vaults can be installed under parking lots and streets, but maintenance access needs to be considered.
- Most effective in treating runoff from small storms or early stages of larger storms.
- Generally used in areas where sediment loads are low and there is no base flow.
- Used to treat drainage areas of 5 acres or less.
- Useful in watersheds where groundwater quality is a concern or where low-permeability soils prevent infiltration.

Design Parameters

- Generally, basins are designed to infiltrate retained runoff within a 40-hour period.

- A dense vegetative cover needs to be established over all contributing pervious areas before runoff can be conveyed to the filter.
- Screens/grated inlets should be considered in design to keep debris out of filter chambers.
- Filter bed typically has a depth of between 18 and 30 inches.

Maintenance and Inspection

- Conduct inspections as required by the NPDES permit or contract specifications during construction.
- Periodic inspection and maintenance will be required based on post-construction site conditions.
- Make any repairs necessary to ensure the measure is operating properly.
- Regular maintenance is necessary to remove surface sediment, trash, debris, and leaf litter.
- Outlets and chambers need to be cleaned/repared when drawdown times in the filter exceed 36 hours.
- In certain cases, layers of sand may need to be replaced every 3 to 5 years.