

# Surface Sand Filter



The coarse sand [center] used in this surface sand filter [left] provides physical and chemical water quality treatment. Erosion control matting protects the treatment after installation [right] until surrounding slopes are vegetated.

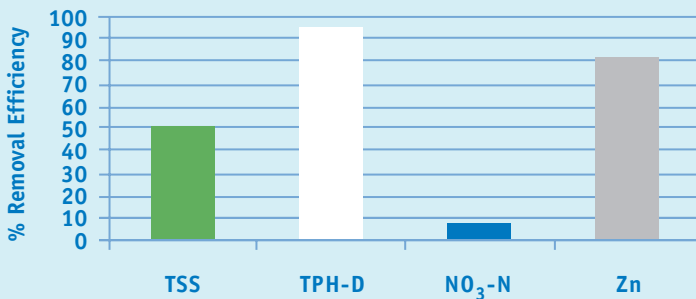
Surface sand filters, like other infiltration/filtration systems, have a tremendous capacity to reduce peak flow. This treatment is a Low Impact Development (LID) design comprised of a sedimentation forebay and an adjacent filter basin. The bottom of the basin is lined with two feet of sand that acts as a filter.

Stormwater flows into the forebay, which holds 25 percent of the water quality volume (WQV), and serves to remove solids that may clog the filter basin. Water then drains through a standpipe into the adjacent sand filter basin, which holds the remaining 75 percent WQV. When the forebay reaches capacity,

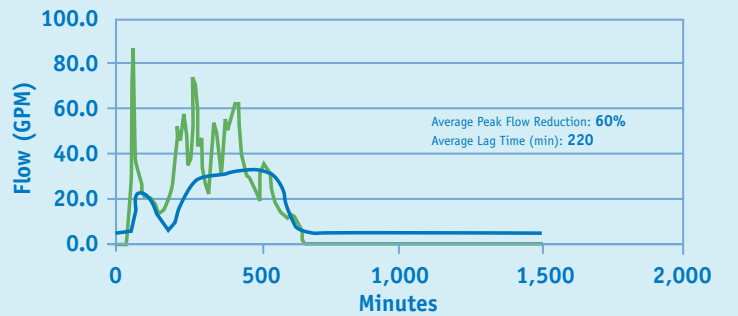
overflow spills across a weir and into the filter basin. Heavier rains may saturate the subsurface and cause temporary ponding. The system is designed to drain within 24 to 48 hours. Influent exceeding the design volume overflows into a nearby swale.

Maintenance typically involves removing up to one inch of clogged sand from the surface of the filter bed, and fine particles from the pretreatment forebay. After repeated maintenance, sand may need to be added to the filter bed to maintain two feet of media. Depending on the size of the basin, sediment removal can be done by hand or with heavy machinery.

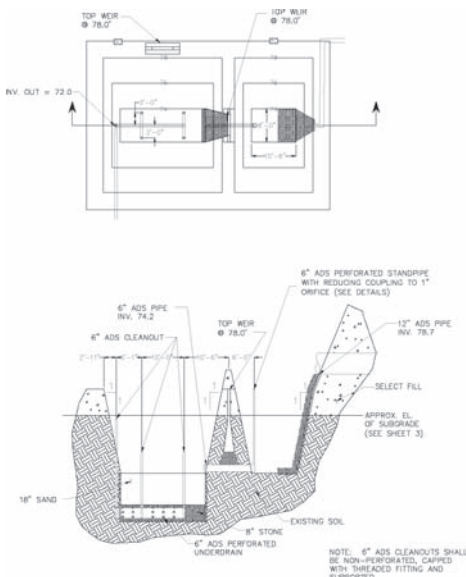
## WATER QUALITY PERFORMANCE



## PEAK FLOW REDUCTION



## Water Quality Treatment Process



The surface sand filter uses coarse to medium grain sand to provide physical and chemical filtration of stormwater. As with many stormwater management approaches, pretreatment is important to prevent clogging of the filter media.

Physical settling of particles occurs in the sedimentation forebay. This is facilitated by slow stormwater drainage through a standpipe and into the sand filter basin.

Physical and chemical water quality treatment occurs in the basin. As stormwater infiltrates the pores of the sand filter bed, it is physically filtered by the sand particles and chemically adsorbed to particle surfaces.

Over time, the sand clogs and reduced rates of infiltration are observed. Typically, sand filters are very good water quality performers. The factors that most impact their performance are the depth and thickness of the filter media, the drainage to filter area ratio, and proper maintenance.

**Category Type**  
Filtration

**BMP Type**  
Low Impact Development Design

**Design Source**  
New York State Stormwater Management Design Manual

**Basic Dimensions**  
Filter Bed: 8 ft X 20 ft  
Top Width: 31 ft X 41 ft

**Specifications**  
Catchment Area: 1 acre  
Peak Flow: 1 cfs  
Treatment Volume: 3,264 cf

**Treatment Function**  
Physical / Chemical

**Cost Per Acre**  
\$12,417.14

**Maintenance Data**  
Maintenance Sensitivity: High  
Inspections: High  
Sediment Removal: High