

Oil/Grit Separators

Description

Oil/Grit Separators are multi-chambered structures designed to remove coarse sediment and oils from stormwater prior to delivery to a storm drain network, the ground, or other treatment. Separators are often used as pretreatment for infiltration BMPs such as Porous Asphalt Pavements, Modular Pavement or Infiltration Trenches. They are generally used on parking lots, streets or other areas which receive vehicular traffic. Each separator would generally receive runoff from a drainage area of less than 1 acre.

Other Terms Used to Describe

Water Quality Inlets
Oil/Grit Traps

Pollutants Controlled and Impacts

Oil/grit separators provide removal of coarse sediment and oil and grease. They provide little or no treatment of fine sediments and soluble pollutants. Separators have limited storage capacity and therefore very little impact on stream flow. Pollutant removal is enhanced by maximizing storage capacity of the basin.

Pollutants are permanently removed only after the separator chambers are cleaned. Therefore, routine clean-outs are essential in order to gain any benefit from this practice. Without routine cleaning, collected sediment may resuspend and be flushed out during the next storm. The chances of this may be reduced by placing baffles in the chambers to prevent the upward movement of collected sediment.

Application

Land Use

Urban, urbanizing, transportation and rural

Soil/Topography/Climate

Special precautions such as energy dissipation may be necessary to reduce incoming velocities if the incoming sewer is set on a steep slope.

When to Apply

Oil/grit separators should be put into service at the completion of the project. They should not be used as sediment basins during the course of construction. They are considered permanent control structures.

Where to Apply

Oil/grit separators are most appropriate for small areas which produce heavy loads of hydrocarbons and sediment, such as roads, parking lots, gas stations and convenience stores.

Each separator is generally designed to be used on sites 1 acre or less in size.

Relationship With Other BMPs

Oil/grit separators are often used in conjunction with infiltration BMPs such as Infiltration Basins, Infiltration Trenches, Porous Asphalt Pavement and Modular Pavement.

Specifications

Planning Considerations:

Individual separators should serve impervious areas of no more than 1 acre. Multiple separators may be used on larger sites, each one receiving runoff from up to approximately 1 acre. Single separators designed for larger areas would be so large as to be cost prohibitive.

Either the inlet or outlet of the separator must be connected to a storm drain network.

Design Considerations:

As shown in Exhibit 1, oil/grit separators consist of three chambers. The first chamber is used to trap sediment (sediment chamber), the second traps oil & grease (oil chamber), and the third is the discharge chamber. A manhole must be provided to each chamber for maintenance.

Volume:

The separator should be designed to pass the two-year design storm without hydraulic interference. An overflow weir installed between the chambers is recommended to accomplish this. The minimum distance between the crest of the weir and the top of the chamber must be 12 inches. The minimum distance between the weir and the water surface of the permanent pool is 12 inches.

All but the last chamber should be designed to hold a permanent pool of at least 400 cubic feet of stormwater. The permanent pool in each chamber should be a minimum 4 feet deep. A permanent pool in the final chamber is desirable, but not possible if the outlet from the separator is at the bottom of the chamber.

Conveyance:

A recommended conveyance between the first and second chambers consists of two 6-inch orifices protected by a trash rack. The orifices should be placed a minimum of 4 feet above the floor of the separator. The trash rack should be inspected at each cleaning and cleared of debris.

The recommended conveyance between the second and third chambers is an inverted elbow designed to be at least 3 feet in length and 1 foot from the bottom of the separator. The elbow should be a minimum of 18 inches in diameter.

The floor of the separator should be either level or slope only slightly toward the outlet of each chamber.

Construction Considerations:

If oil/grit separators are installed prior to completion of the project, use the necessary soil erosion BMPs or other barrier to prevent sediment from entering the separator. Do not use this BMP as a sediment basin during construction.

At the conclusion of construction, stabilize the surrounding area and any established outlet following the guidance in the Seeding and Mulching or Sodding BMPs.

Maintenance

In order to receive any water quality benefit from these structures, it is critical to regularly clean each chamber. The separators should be inspected after several rain events in the first year after construction to observe the amount of residue collected and determine an appropriate cleaning schedule. Separators should not be cleaned less than twice a year. After a cleaning schedule is implemented, inspections should continue to determine the adequacy of the schedule. Inspections should always be done following storms larger than design.

Oil/grit separators are normally cleaned by pumping out the contents of each chamber to a tanker truck. The collected material is then hauled to an approved disposal site.

Exhibits

Exhibit 1: Typical Oil/Grit Separator. Michigan Department of Natural Resources, Surface Water Quality Division. 1992.

Exhibit 1 Typical Oil/Grit Separator

