4.4.2 Filter Sock

Definition

A filter sock is a three-dimensional, tubular sediment control and stormwater runoff filtration device, typically used for the perimeter control of sediment and soluble pollutants.

Purposes

1. *To trap sediment and soluble pollutants by filtering runoff water as it passes through the fiber matrix, allowing the deposition of suspended solids.*
2. *To decrease the velocity of sheetflows and low- to moderate-level channel flows.*

Conditions Where Practice Applies

1. *Site perimeters.*
2. *Below disturbed areas where erosion would occur in the form of sheet and rill erosion.*
3. *Above and below exposed and erodible slopes.*
4. *Around curb and drop inlets.*
5. *Along the toe of stream and channel banks.*
6. *Where the size of the drainage area is no more than ¼ acre per 100 feet (1.3 ha/100 m) of silt fence length, the maximum slope length behind the barrier is 100 feet (30 m), and the maximum gradient behind the barrier is 50% (2:1).*
7. *Around sensitive trees where the trenching of a silt fence is not beneficial for tree survival or may unnecessarily disturb established vegetation.*
8. *In areas where it is necessary to minimize the obstruction of wildlife movement and migration.*

Planning Considerations

A filter sock can be easily implemented as a BMP within a treatment train onsite. The filter sock is installed on top of the soil and does not require soil disturbance for installation and removal. A filter sock contains organic material that can be direct seeded at the time of application to provide greater stability and filtration capacity once vegetation is established. The mesh socks are biodegradable or photodegradable and can be left onsite after construction activity. Filter sock performance depends on ground surface contact and may not be suitable for an extremely bumpy or rocky land surface.

Design Criteria

1. *No formal design is required for many small projects and for minor and incidental applications.*
2. *Filter socks shall have an expected usable life of 9 months. They are applicable in ditch lines, around drop inlets, and at temporary locations where continuous construction changes the earth contour and runoff characteristics, and where low or moderate flows (not exceeding 1 cubic foot per second [cfs]) (0.03 cubic meters per second [m^3/sec]) are expected.*
3. *Filter socks also are applicable where sheet or overland flows are expected. They can be used in channel flow applications to slow the water down and allow time for sediment to settle out of suspension.*

Construction Specifications

Materials

1. *A synthetic filter sock shall be a photodegradable or biodegradable mesh netting material providing a minimum of 9 months of expected usable life at a temperature range of 0°F. to 120°F. (-17°C. to 49°C.).*
2. *The media within the filter sock shall contain composted material suitable for removing solids and soluble pollutants from stormwater runoff.*
3. *Socks are available in 9-inch, 12-inch, 18-inch, and 24-inch diameters for a variety of applications and may be stacked for increased storage capacity.*
4. *Posts for the filter sock shall be 2 x 2 inches (2.5 x 5 cm) wood (preferred), or equivalent metal with a maximum height of 3 feet.*

Installation

1. *Posts shall be spaced a maximum of 10 feet (3 m) apart at the barrier location and driven securely into the ground a minimum of 8 inches (30 cm) in clay soils or 12 inches for sand soils. For use on pavement, heavy concrete blocks shall be used behind the filter socks for stabilization.*
2. *When joining two filter socks together, overlap the two sections by about a foot. Drive a stake into the ground through each filter sock.*
3. *Filter socks shall be removed or cut open when they have served their useful purpose, but not before the upslope area is permanently stabilized.*
4. *Filter socks shall not be used in perennial, ephemeral, or intermittent streams.*

Maintenance

1. *Filter socks shall be inspected at least once per week and within 24 hours of each ½ inch or greater rainfall event. Replacements and repairs must be made within a maximum of 7 days.*
2. *Sediment deposits should be removed when deposits reach approximately one-half the height of the barrier.*

4.6 Temporary Sediment Trap

Definition

A small, temporary ponding area formed by excavation and/or an embankment across a drainageway.

Purpose

To detain sediment-laden runoff from small disturbed areas long enough to allow most of the sediment to settle out, thus protecting drainageways, properties, and rights of way from sedimentation.

Conditions Where Practice Applies

1. *A sediment trap is usually installed in a drainageway, at a storm drain inlet, or at other points of discharge from a disturbed area.*
2. *It is installed below drainage areas of 5 acres (2 ha) or less.*
3. *It is installed where the sediment trap will be used less than 18 months.*
4. *The sediment trap may be constructed either independently or in conjunction with* ***TEMPORARY DIVERSION BERM (Chapter 4)****.*

Planning Considerations

The sediment trap should be located to obtain the maximum storage benefit from the terrain, for ease of cleaning out and disposing of the trapped sediment and to minimize interference with construction activities.

Sediment traps should be used only for small drainage areas. If the contributing drainage area is greater than 5 acres (2 ha), refer to **Temporary Sediment Basin** (listed under **PERIMETER CONTROLS** in **Chapter 4**).

Sediment must be periodically removed from the trap. Plans should detail how this sediment is to be disposed of, such as by use in fill areas onsite or removal to an approved offsite dump.

Sediment traps, along with other perimeter controls, shall be installed before any land disturbance takes place in the drainage area.

Design Criteria

Trap Capacity

The sediment trap must have an initial storage volume of 134 cubic yards, or 3,600 cubic feet per acre (252 m^3/ha) of drainage area, measured from the low point of the ground to

the crest of the gravel outlet. Sediment should be removed from the basin when the volume is reduced by one-half.

For a natural basin, the volume may be approximated as follows:

$$V = 0.4 \times A \times D$$

where:

V = the storage volume in cubic feet (ft^3).
A = the surface area of the flood area at the crest of the outlet, in square feet (ft^2).
D = the maximum depth, measured from low point in trap to crest of outlet, in ft.

Excavation

If excavation is necessary to attain the required storage volume, the side slopes should be no steeper than 2:1.

Embankment Cross-Section

The maximum height of the sediment trap embankment shall be 5 feet (1.5 m) as measured from the low point. **Table 4.2** shows minimum top widths (W) and outlet heights (Ho) for various embankment heights (H). The side slopes of the embankment shall be 2:1 or flatter.

Table 4.2. Minimum Top Width (W) and Outlet Height (Ho) Required for Sediment Trap Embankment According to Height of Embankment (feet)

H	H_O	W
2.0	1.0	2.0
2.5	1.5	2.5
3.0	2.0	2.5
3.5	2.5	3.0
4.0	3.0	3.0
4.5	3.5	4.0
5.0	4.0	4.5

Outlet

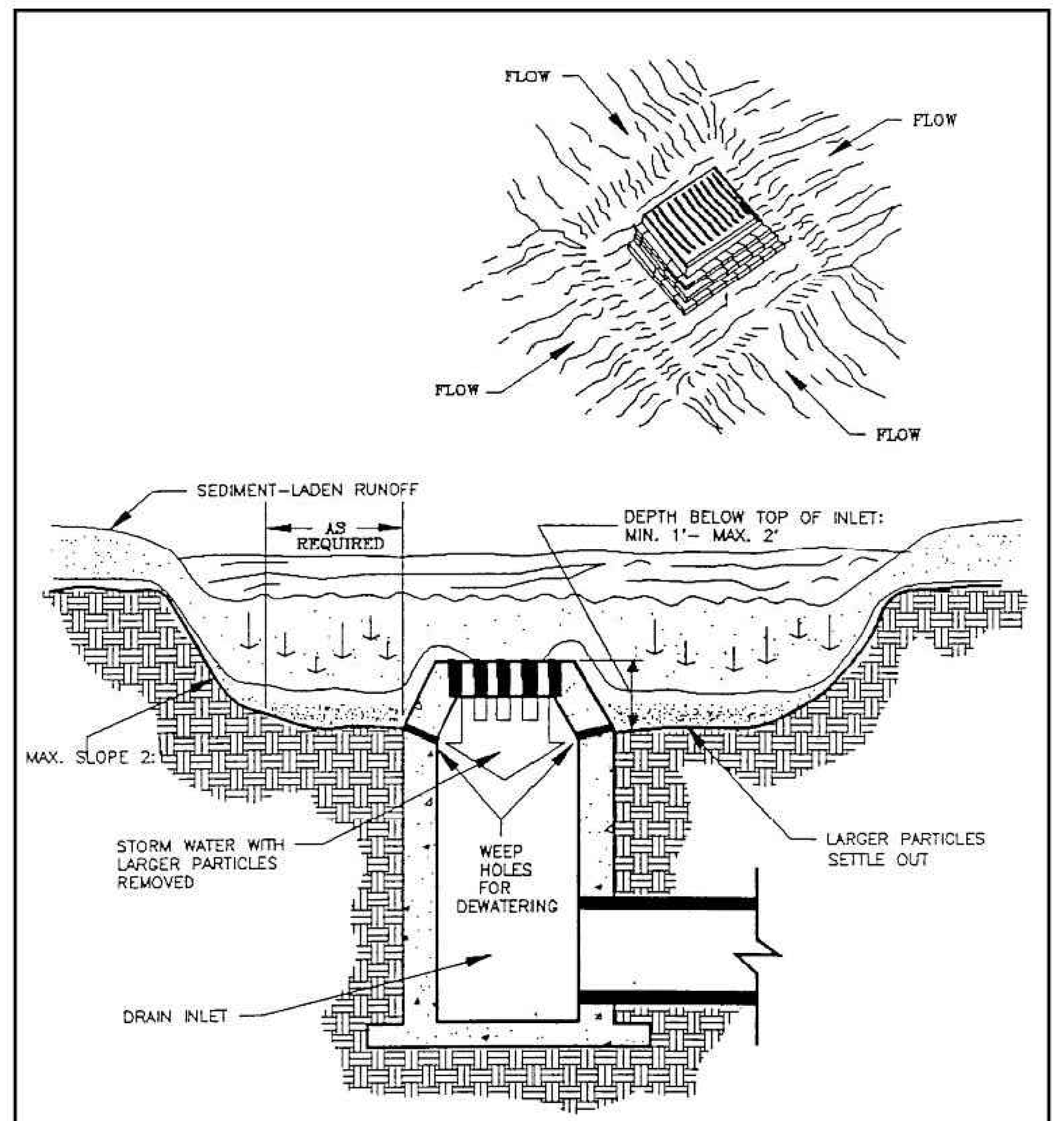
The outlets shall be designed, constructed, and maintained so that sediment does not leave the trap and erosion of the outlet does not occur. A trap may have several different outlets, with each outlet conveying part of the flow based on the criteria below. The combined outlet capacity shall be sufficient for the drainage area. For example, a 12 foot (3.6 m) earth outlet, adequate for 2 acres (0.8 ha), and a 12 inch (30 cm) pipe outlet, adequate for 1 acre (0.4 ha), could be used for a 3 acre (1.2 ha) drainage area.

There are four types of outlets for sediment traps. Each sediment trap is named according to the type of outlet that it has. Each type has different design criteria and will be discussed separately. The types are as follows:

1. ***An Earth Outlet Sediment Trap*** *consists of a basin formed by excavation and/or an embankment. The trap has a discharge point over or cut into natural ground. The outlet width (feet) shall be equal to 6 times the drainage area (acres). If an embankment is used, the outlet crest shall be at least 1 foot (30 cm) below the top of the embankment. The outlet shall be free of any restriction to flow. The earthen embankment shall be seeded with temporary or permanent vegetation (see* ***Chapter 7****) within 15 days of construction (see* ***Figure 4.6a****).*
2. ***A Pipe Outlet Sediment Trap*** *consists of a basin formed by an embankment, or an excavation and an embankment. The outlet for the trap is though a perforated riser and a pipe through the embankment. The outlet pipe and riser shall be made of corrugated metal. The riser diameter shall be of the same or larger diameter than the pipe. The top of the embankment shall be at least 1½ feet (45 cm) above the crest of the riser. At least the top two-thirds of the riser shall be perforated with ½ inch (13 mm) diameter holes spaced 8 inches (20 cm) vertically and 10 to 12 inches (25 to 30 cm) horizontally. All pipe connections shall be watertight (see* ***Figure 4.6b****). Select the pipe diameter from the specifications listed in* ***Table 4.3****.*

Table 4.3. Minimum Pipe Diameter for Pipe Outlet Sediment Trap According to Maximum Size of Drainage Area

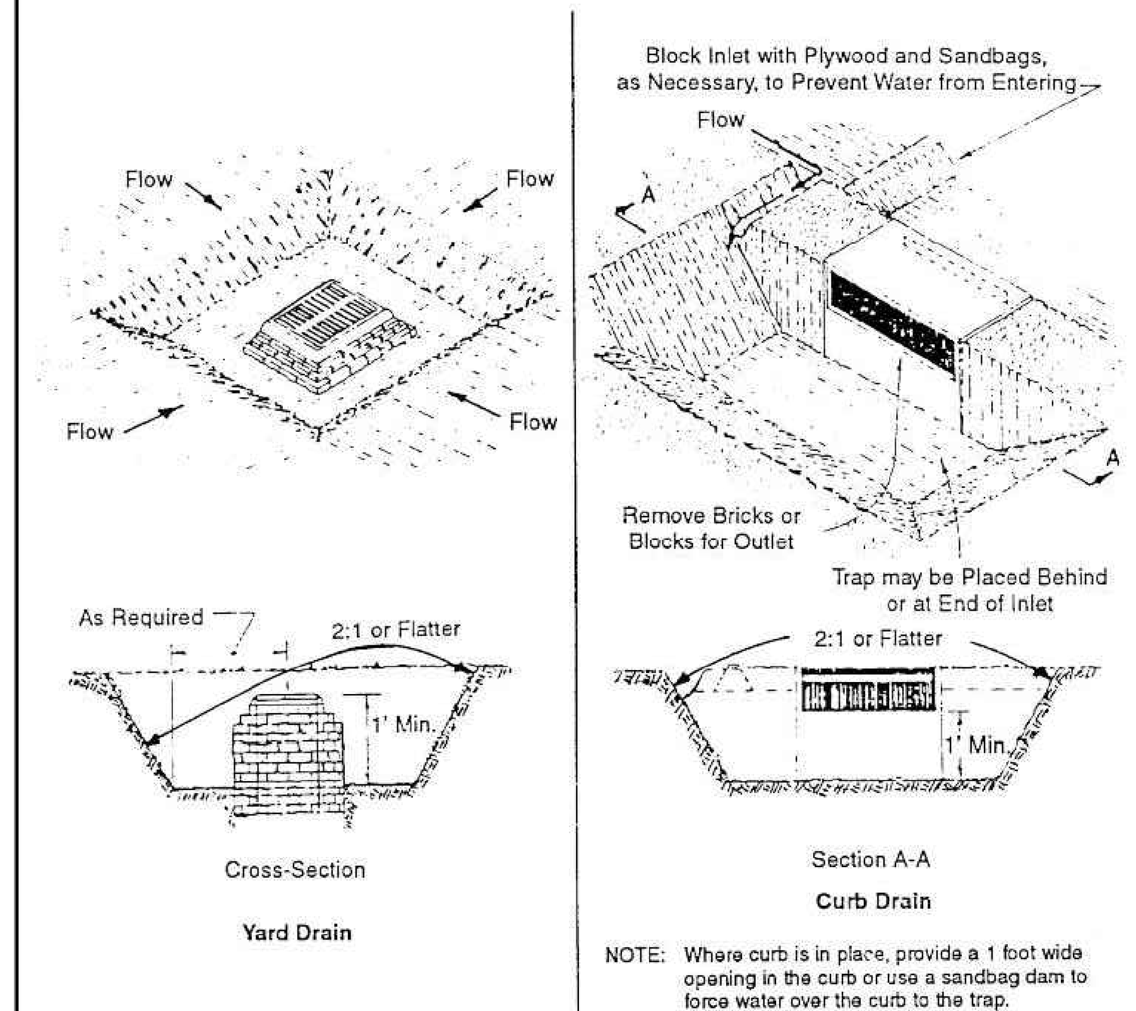
Minimum Pipe Diameter in Inches (cm)	Maximum Drainage Area in Acres (ha)
12 (30 cm)	1 (0.4 ha)
18 (45 cm)	2 (0.8 ha)
21 (53 cm)	3 (1.2 ha)
24 (60 cm)	4 (1.6 ha)
30 (75 cm)	5 (2.0 ha)



SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPABILITY AND EASE OF MAINTENANCE ARE DESIRABLE.

Figure 4.6e. Excavated Drop Inlet Sediment Trap
Source: Michigan Soil Erosion and Sedimentation Control Guidebook



NOTE: Where curb is in place, provide a 1 foot wide opening in the curb or use a sandbag dam to force water over the curb to the trap.

Construction Specifications

1. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to 1/2 the design depth of the trap. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.
2. The structure shall be inspected after each rain and repairs made as needed.
3. Construction operations shall be carried out in such a manner that erosion and water pollution shall be minimized.
4. The sediment trap shall be removed and area stabilized when the remaining drainage area has been properly stabilized.
5. All cut and fill slopes shall be 2:1 or flatter.

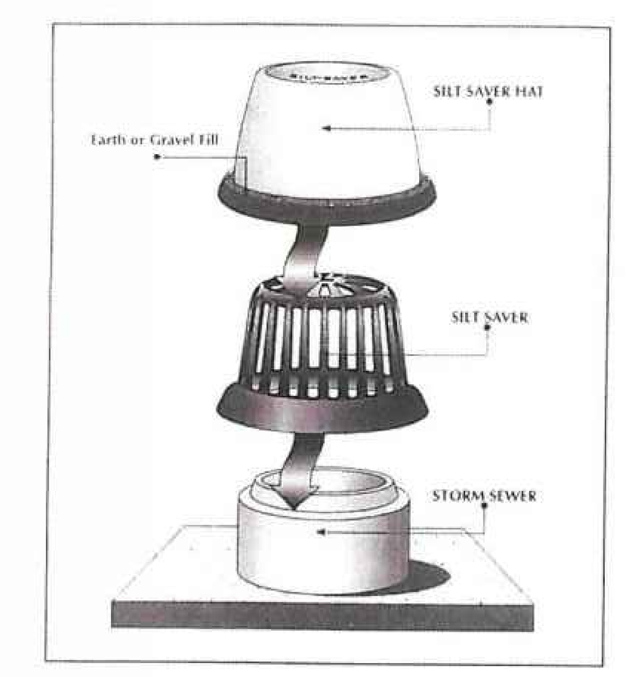
Figure 4.6f. Storm Inlet Sediment Trap
Source: NRCS

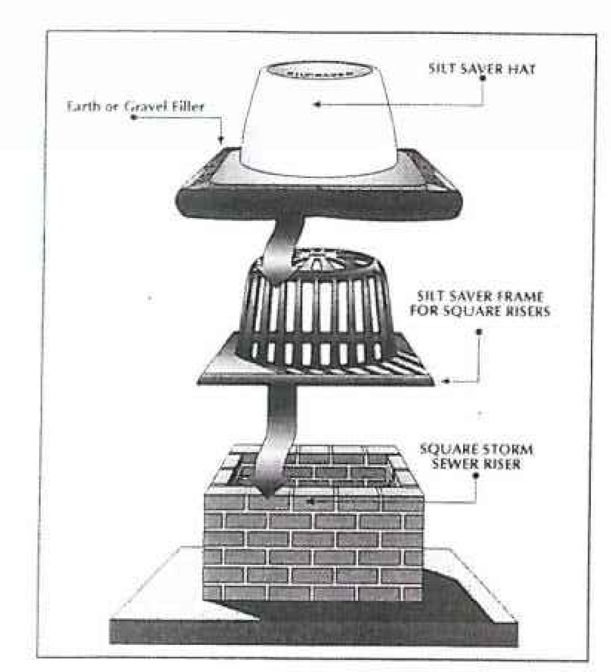
Specifications

The patented **Silt-Saver Frame** is constructed of partially recycled, high molecular weight, high-density polyethylene copolymer (HDPE). This material has super stress crack resistance combined with high impact strength and rigidity.

Frames are currently available in 2 models:
R-100A - Round Base to fit the 60"O. D. precast risers as used in most residential and light commercial applications and
S-200A - Square Base to fit the 60" O.D. brick or precast designs as used in most D.O.T. Highway applications.

Silt-Saver Frame and Filter Assembly will also accommodate drainage structures smaller than these listed with no special design required.





Silt-Saver, Inc. warrants all products against material defects and workmanship at time products are received. However due to the nature of construction jobsites, the durability and long term use of these products is not warranted.

All statements, information and data given herein are believed to be accurate and reliable but are presented without guaranty, warranty or responsibility of any kind, expressed or implied. The user should not assume that all safety measures are indicated, or that other measures of safety may not be required.

The patented **Silt-Saver Filter** designed to custom fit each frame and is constructed of non-woven polyester, needle punched and heat-set to provide durability. This material was chosen for its ability to provide **consistent** and **continuous** filtration under everyday job site conditions. The woven high visibility green filter top not only provides the **visible safety** but also provides a **higher flow** for the unexpected rain events.

Weight	D-3776	3.0 oz y^2
Tensile strength	D-4632	80lbs
Elongation	D-4632	50%
Mullen burst	D-3786	150
Puncture strength	D-4833	50
Trapezoid tear	D-4533	30
AOS-US std sieve	D-4751	70
Permittivity, -1 *	D-4491	2.0
Flow *	D-4491	102 gal/min/ft2
U.V. Resistance, %	D-4355 (500 hrs)	70

* Due to the variations in soil conditions, (soil types, soil stability, etc.) Silt-Saver, Inc. does not specify long-term effectiveness, (resistance to clogging). If this is a concern, one may want to conduct a gradient ratio test that will compare a specific soils hydraulic gradient to the hydraulic through the filter.

For Product Information Contact Your Local Distributor or Silt-Saver, Inc.
(770) 388-7818 -or- Toll Free 1 (888) 382-SILT (7458)
Web: www.siltsaver.com **Email: sales@siltsaver.com**

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#	DATE	REVISIONS	BY

COOPER'S HAWK WINERY & RESTAURANT AT THE PROMENADE AT COCONUT CREEK
JURSIDICTION: CITY OF COCONUT CREEK
LANDLOT: SECTION 18, TOWNSHIP 48 SOUTH, RANGE 42 EAST, BROWARD COUNTY
LOCATION: PROMENADE AT COCONUT CREEK 4473 LYONS ROAD COCONUT CREEK, FL 33073

EROSION CONTROL DETAILS
JOB NO: 15-187
SHEET C7.6
DATE: 02/16/16
PLAN REVIEW