Filter Socks

SEDIMENT CONTROL TECHNIQUE

Type 1 System		Sheet Flow	✓	Sandy Soils	✓
Type 2 System		Concentrated Flow		Clayey Soils	[1]
Type 3 System		Supplementary Trap	✓	Dispersive Soils	

[1] Can be used in clayey soils as a 'supplementary' sediment trap to capture coarse-grained sediments; however, little control exists over the finer silt and clay-sized particles.

Symbol

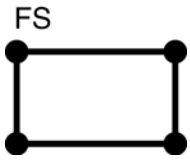

Photo 1 – Filter socks used to form a 'sag' inlet sediment trap

Photo 2 – Filter socks used to form a 'on-grade' kerb sediment trap

Key Principles

1. Sediment trapping is achieved through gravity-induced settlement resulting from ponding up-slope of the socks, and some limited filtration of water passing through the sock.
2. Primarily used to collect the coarser sediment particles. This technique typically has little ability to capture the finer silt and clay-sized particles as shown in Photo 2.
3. The key performance objective is to allow ponding to occur up-slope of the filter sock (Photo 2) such that coarse sediments are allowed to settle under gravity.
4. Ideally, all sediment-laden water should be allowed to pass through the pond before being released over a spill-through weir normally formed by a depression in the sock. The quantity of water bypassing around the pond should be minimised wherever practical.

Design Information

Minimum sock diameter of 200mm.

Maximum stake spacing of 1.2m or six (6) times the sock diameter, whichever is the lesser.

A maximum stake spacing of 0.3m applies when used in areas of potential high velocity. The stability of filter socks (un-staked) when used as check dam sediment traps varies depending on the composition of the sock; however, most socks have been found to be stable when used in shallow drains with gradients less than 5%.

Though generally not suitable in broad areas of sheet flow, if used, the filter socks must be placed along the contour to maintain uniform flow conditions passing through the sock. The use of *Sediment Fence, Compost Berms, Compost-filled Filter Socks* and possibly *Fibre Rolls* are preferred in broad areas of sheet flow.

Wherever practical, adjoining socks should be overlapped at least 450mm.

Photo 3 – 'Sag' inlet sediment trap

Photo 4 – Field inlet sediment trap

Photo 5 – Check dam sediment traps

Photo 6 – Compost-filled filter sock

Description

Filter socks consist of a highly permeability synthetic sock of varying lengths and diameters, and filled with a variety of materials including compost, straw, sand and aggregate.

Filter socks are distinguished from *Fibre Rolls* through the use of non-woven or composite filter fabric in the formation of the sock. In a filter sock, this outer tube aids in the 'filtration' of pollutants.

The synthetic sock can be biodegradable or non-biodegradable depending on desired service life; however, most commercial filter socks are formed from non-biodegradable material.

Known in some circles as 'filter tubes'; however, this can result in confusion with the larger *Filter Tubes* used in de-watering operations and the formation of *Filter Tube Dams*—refer to separate fact sheet.

Purpose

Used as a 'supplementary' sediment trap around or adjacent to minor stormwater inlets.

Can also be used to form *Check Dam Sediment Traps* in minor drains.

Limitations

Generally not suitable in broad areas of sheet flow.

Advantages

Light and easy to transport into difficult locations.

Usually can be installed without trenching.

Disadvantages

Can wash away if placed in areas of high velocity.

Common Problems

Leakage around the socks (Photo 2).

Special Requirements

Ensure both ends of the filter sock are adequately turned up the slope to prevent flow bypassing prior to water passing over the sock.

Location

Placed around or adjacent to minor stormwater inlets.

Site Inspection

Check for displacement of the socks.

Ensure the filter socks have been placed such that water will pond up-slope of each sock.

Check that sediment is being removed from the sediment traps after each storm.

Materials

- Socks: minimum 200mm diameter synthetic or biodegradable tubes manufactured from non-woven or composite fabric suitable for the 'filtration' of coarse sediments.
- Fill material: Straw, cane mulch, composted material (Photo 6), coarse sand, or clean aggregate.

Installation

1. Refer to approved plans for location and installation details. If there are questions or problems with the location, dimensions or method of installation contact the engineer or responsible on-site officer for assistance.
2. Ensure the socks are placed individually or collectively (as a single sediment trap) such that:
   (i) leakage around or under the socks is minimised;
   (ii) adjoining socks are tightly butted or overlapped at least 450mm;
   (iii) the surface area of potential water ponding up-slope of each sediment trap is maximised;
   (iv) to the maximum degree practical, all sediment-laden water will pass through the formed pond before flowing over the down-slope end of the sediment trap.
3. When placed across the invert of minor drains, ensure the socks are placed such that:
   (i) the crest of the downstream sock is level with the channel invert at the immediate upstream sock (if any);
   (ii) each sock extends up the channel banks such that the crest of the sock at its lowest point is lower than ground level at either end of the sock.
4. If stakes are required to anchor the socks, their spacing does not exceeding 1.2m or six times the sock diameter (whichever is the lesser).

Maintenance

1. Inspect all filter socks prior to forecast rain, daily during extended periods of rainfall, after significant runoff producing storms or otherwise at weekly intervals.
2. Repair or replace damaged filter socks.
3. The bulk of the sediment collected behind the filter socks should be removed by shovel after each storm event.
4. Remove collected sediment and dispose of in a suitable manner that will not cause an erosion or pollution hazard.

Removal

1. All sand, soil, sediment or mud must be physically removed from sealed surfaces, first using a square-edged shovel, and then a stiff-bristled broom, and then by a mechanical vacuum unit, if available.
2. If necessary for safety reasons, the sealed surface shall only be washed clean after all reasonable efforts have been taken to shovel and sweep the material from the surface.
3. Dispose of collected sediment in a suitable manner that will not cause an erosion or pollution hazard.
4. All synthetic (plastic) mesh or other non readily biodegradable material must be removed from the site once the slope or drain is stabilised, or the socks have deteriorated to a point where they are no longer providing their intended drainage or sediment control function.