Mulch Filter Berms

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] Mulch filter berms provide limited capture of clay-sized particles occurs.

Symbol MFB

or MB

Photo 1 – Large mulch filter berm

Photo 2 – Suitable mulch fibres

Key Principles

1. Sediment trapping is primarily achieved through gravity-induced settlement resulting from ponding up-slope of the berm; however, significant filtration is achieved on water passing through the berm.
2. Primarily used to collect the coarser sediment particles. This technique has limited ability to capture the finer silt and clay-sized particles.
3. The key performance objective is to maximise the surface area of ponding up-slope of the berm such that coarse sediments are allowed to settle under gravity. Thus it is essential for the berm to be placed along the contour in order to gain maximum benefit.
4. Mulch filter berms placed across the slope (i.e off the contour) will act as *Flow Diversion Banks*, thus reducing their sediment trapping ability.
5. The mulch must be obtained from a tub grinding (or similar) process that fractures the woody vegetation into interlocked fibres rather than chipping the vegetation.

Design Information

Mulch must comply with the requirements of AS4454.

Mulch must be produced only from green waste won from on-site clearing and grubbing.

Mulch must be generating through either horizontal or tub grinder, **not** chipping.

Grade 3 mulch is recommended, i.e. mulch containing 90% by mass of material with a maximum size of 150mm (Table 3).

Maximum drainage area of 250m^2 per 10m length of berm in sheet flow conditions.

Table 1 provides the recommended maximum spacing of mulch filter berms down long slopes.

Table 1 – Recommended maximum spacing of mulch filter berms down slopes

Land slope (H:V)	Bank slope (%)	Maximum spacing (m)
flatter than 50:1	flatter than 2%	30m
20:1	5%	25m
10:1	10%	15m
5:1	20%	8m
steeper than 4:1	steeper than 25%	not recommended

Table 2 provides the recommended minimum bank heights for mulch filter berms. The base width of berms should be at least twice its formation height.

Table 2 – Recommended dimensions of mulch filter berms

Conditions	Land slope perpendicular to bank	
	Less than 5%	Greater than 5%
Minimum bank height at time of formation	750mm	1000mm
Minimum bank height after natural settlement and organic breakdown	500mm	500mm
Top width of bank (min)	100mm	100mm
Base width (min)	1600mm	1600mm
Side slope (max)	1:1 (H:V)	1:1 (H:V)

Table 3 provides a classification system for mulches used within the sediment control industry.

Table 3 – Classification of mulches for use in sediment control activities

Grade 1	Grade 2	Grade 3
90% by mass of material with a maximum size of 60 mm	90% by mass of material with a maximum size of 100 mm	90% by mass of material with a maximum size of 150 mm

Photo 3 – Smaller berms are best formed from composted material

Photo 4 – Mulch filter berms need to be sufficiently large (high) to allow for possible slumping and damage by foot traffic

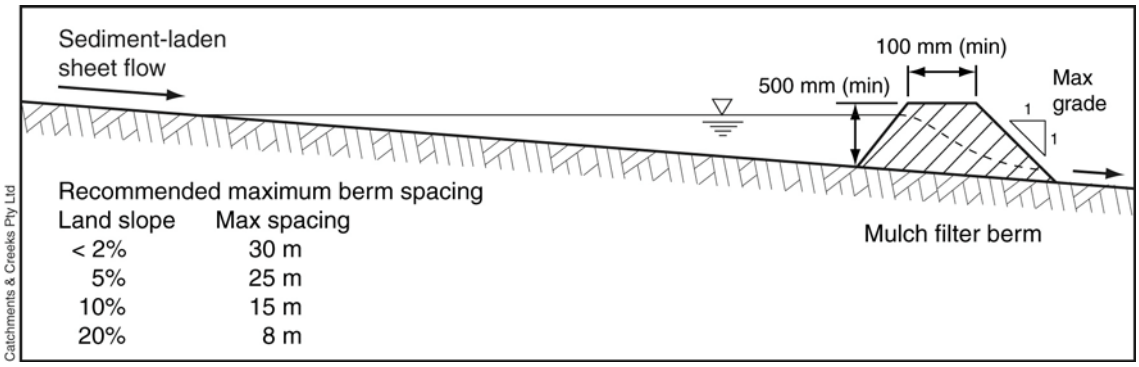

Figure 1 – Placement of mulch filter berms

Description

A sediment filter berm formed from site-generated green waste. Mulch filter berms are generally constructed along the contour to allow the even filtration of sediment-laden sheet runoff.

Also known as *Filter* Berms and *Mulch Berms*.

Purpose

Used to 'filter' and 'settle' sediment from sheet flow.

Used as an alternative to a *Sediment Fence* and *Compost Filter Berm* in areas of sheet flow.

Can be used for flow diversion under controlled conditions—more commonly referred to as *Flow Control Berms*.

Limitations

Not suitable for land subjected to concentrated flow.

Not suitable to active work areas where the berm is likely to be damaged by pedestrian or vehicular traffic.

Advantages

Mulch filter berms can filter medium to coarse sediments from low-discharge, sheet flows.

Good use of cleared vegetation.

Unlike a *Sediment Fence*, mulch filter berms are usually left in-situ to become an integral part of the vegetated slope. In such cases, the berm must be identified within the permanent drainage plan and/or site revegetation (landscape) plan.

Mulch filter berms generally represent a lower safety risk compared to a *Sediment Fence*.

No risk of importing weed seed as the material must be formed only from site material. If the site material contains weed seed, then the material should not be used.

Disadvantages

Cannot be used if the site contains no suitable green waste (i.e. cleared woody vegetation).

Can cause the concentration of stormwater runoff if poorly located.

Lower sediment trapping efficiency compared to *Compost Filter Berms*.

Common Problems

Berms placed along the top of cut slopes (i.e. off the contour) cause flow diversion rather than sediment capture.

Low berms can be easily damaged allowing flows to breach the berm.

Special Requirements

Mulch certification must comply with the requirements of AS4454.

Application is usually by pneumatic systems using a special berm-forming device.

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

Location

Mulch filter berms should ideally be located along the contour (i.e. a line of constant land elevation).

Best used as a sediment control system in locations where:

- stormwater runoff does not contain fine, particulate or dissolved pollutants; or
- there is the potential for ongoing sediment-laden runoff for a limited period after vegetation establishment.

Site Inspection

Ensure the berm has been placed such that ponding up-slope of the berm is maximised.

Check for damage to the berm, and actual or potential wash-outs points.

Materials

- Mulch must comply with the requirements of AS4454.
- Maximum soluble salt concentration of 5dS/m.
- Moisture content of 30 to 50% prior to application.

Installation

1. Refer to approved plans for location and extent. If there are questions or problems with the location, extent, material type, or method of installation contact the engineer or responsible on-site officer for assistance.
2. When selecting the location of a mulch filter berm, to the maximum degree practical, ensure the berm is located:
   - totally within the property boundaries;
   - along a line of constant elevation (preferred, but not always practical);
   - at least 1m, ideally 3m, from the toe of a fill embankment;
   - away from areas of concentrated flow.
3. Ensure the berm is installed in a manner that avoids the concentration of flow along the berm, or the undesirable discharge of water around the end of the berm.
4. Ensure the berm has been placed such that ponding up-slope of the berm is maximised.
5. Ensure both ends of the berm are adequately turned up the slope to prevent flow bypassing prior to water passing over the berm.
6. Ensure 100 per cent contact with the soil surface.
7. Where specified, take appropriate steps to vegetate the berm.

Maintenance

1. During the construction period, inspect all berms at least weekly and after any significant rain. Make necessary repairs immediately.
2. Repair or replace any damaged sections.
3. When making repairs, always restore the system to its original configuration unless an amended layout is required or specified.
4. Remove accumulated sediment if the sediment deposit exceeds a depth of 100mm or one-third the height of the berm.
5. Dispose of sediment in a suitable manner that will not cause an erosion or pollution hazard.

Removal (if required)

1. When disturbed areas up-slope of the berm are sufficiently stabilised to restrain erosion, the berm may be removed.
2. Remove any collected sediment and dispose of in a suitable manner that will not cause an erosion or pollution hazard.
3. Rehabilitate/revegetate the disturbed ground as necessary to minimise the erosion hazard.