Grass Filter Strips

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] Grass filter strips function best on sandy soils, but will provide some benefit even on clayey soils.

Symbol GFS

Photo 1 – Grass filter strips placed on a newly vegetated slope

Photo 2 – Grass filter strip placed along the contour on a sandy soil

Key Principles

1. Grass filter strips can perform various functions including reducing the risk of rill erosion on steep newly seeded slopes (Photo1), erosion control benefits (for the soil beneath the turf), and sediment control.
2. Sediment trapping is primarily achieved through 'sedimentation' within the shallow pond the forms up-slope of the turf, and to a limited degree by 'filtration' as the sediment-laden water passes through the grass.
3. When placed at regular intervals down an earth slope, grass filter strips also help to maintain sheet flow conditions down the slope, thus delaying the formation of rill erosion on newly seeded slopes.
4. Key operational factors include ensuring the filter strips are placed exactly along the land contour to prevent surface runoff being diverted along the turf strips. In circumstances where the filter strips must be placed at an angle to the contour (Photo 6), an irregular up-slope edge must be formed (e.g lateral strips of turf) that promotes flow through the grass rather than along the edge of the turf strips (Photo 8).

Design Information

Turf strips at least 300mm wide (when placed along the contour), and preferably 600mm wide when placed adjacent an impervious surface such as a footpath or road kerb.

If the filter strips are placed at an angle to the land contour (i.e. such that stormwater runoff will be deflected along the upper edge of the turf), then lateral strips of turf must be placed at maximum 5m intervals along the up-slope edge of the filter strip (Figures 1 and 3).

When used on steep, newly seeded slopes, the turf strips must be placed (and pegged where necessary) in continuous rows along the contour at a 'vertical' fall not exceeding 2m, but wherever practical, not exceeding 1m (Figure 4).

Reducing the spacing of the turf strips down a slope (Photo 3) will increase the erosion control and sediment trapping ability of the filter strips. Typically, the preferred spacing of turf strips (measures down the surface of the slope) is around 2m, which is significantly less than a vertical fall of 1m (refer to Figure 4).

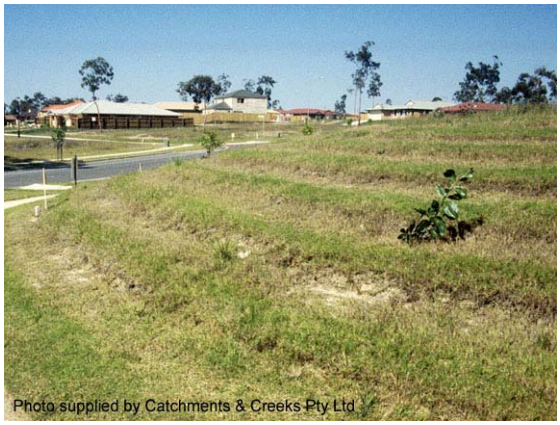

Photo 3 – Grass filter strips placed along the contour

Photo 4 – Turfed roadside verge used as a grassed filter strip

Photo 5 – Turfed roadside verge used as a grassed filter strip

Photo 6 – Example of grass filter strips with lateral turf strips used to reduce the risk of rilling along the up-slope edge of the turf

Photo 7 – Grassed filter strips will not function if flows are allowed to concentrate through the grass

Photo 8 – Example of rilling caused by surface runoff being diverted along the up-slope edge of the turf

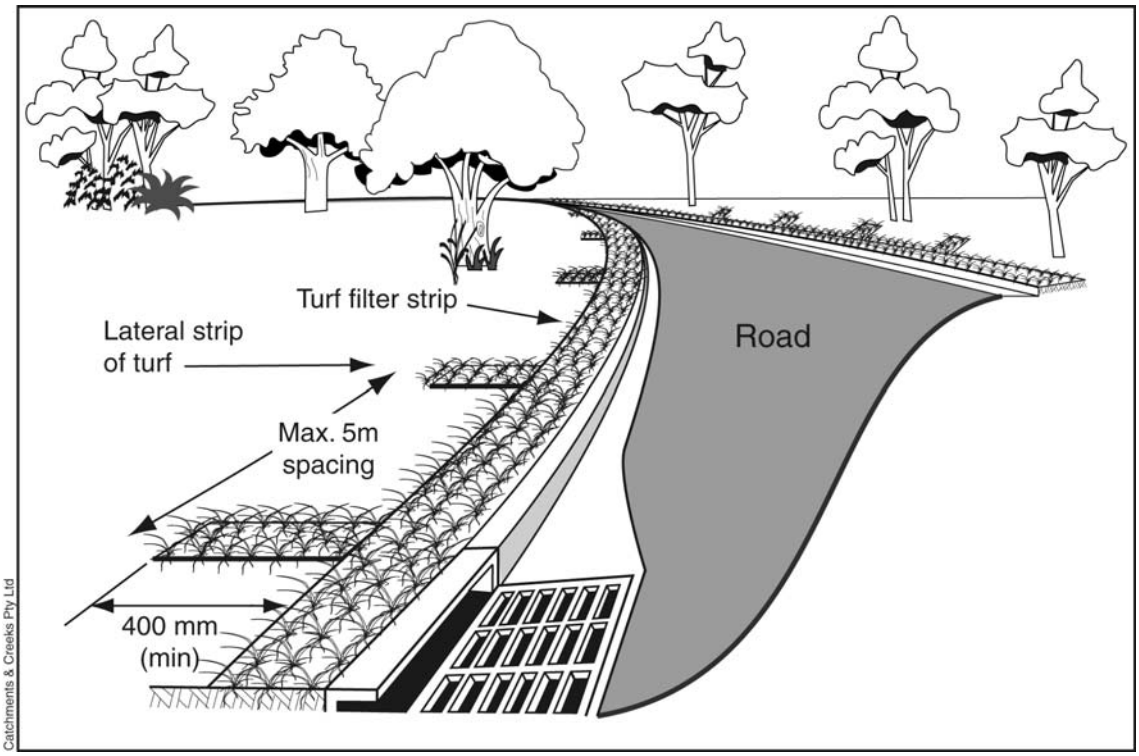

Figure 1 – Grass filter strips placed along the edge of road kerb

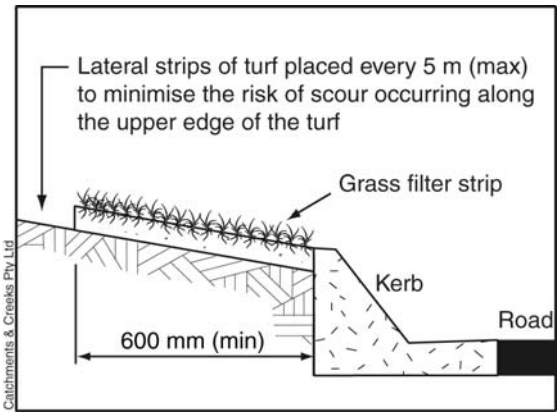

Figure 2 – Placement of turf along the up-slope edge of sealed surfaces such as footpaths and road kerbs

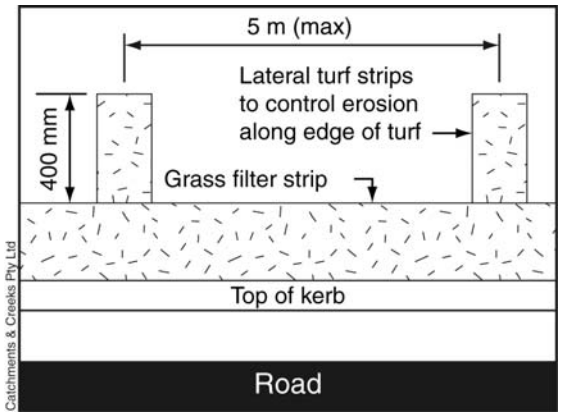

Figure 3 – Use of lateral turf strips to control rilling along the up-slope edge of the grass filter strip

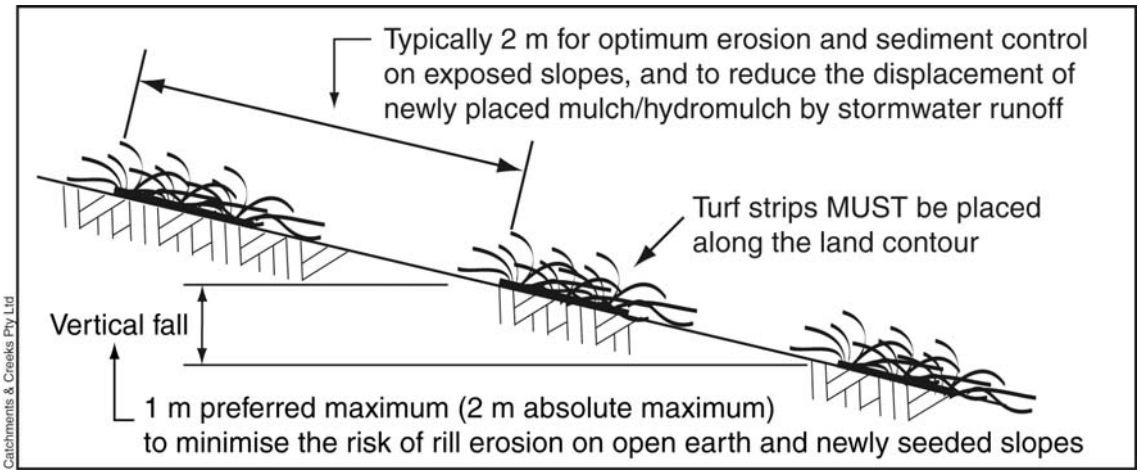

Figure 4 – Grass filter strips placed at regular intervals down an earth slope

Description

Grass filter strips consist of either turf strips placed along the contour at regular intervals down newly seeded slopes, or one or more parallel strips of turf placed along the edge of impervious surfaces such as footpaths and road kerbs.

Purpose

Grass filter strips can perform various functions depending on their placement. When placed along the contour on steep, newly seeded slopes (Photo 1), they can help to maintain sheet flow conditions down the slope (thus reducing the risk of rill erosion) in addition to trapping sediment.

When placed around impervious surfaces such as roads and footpaths they can trap small quantities of sediment from passing runoff. In such circumstances, the turfed area also helps to reduce soil erosion and the generation of mud.

Limitations

Generally considered a low efficiency sediment trap. Clays and silt-sized particles readily pass through the grass.

Advantages

When placed along the edge of roads and footpaths, grass filter strips can greatly improve the overall appearance of the construction site, thus giving the appearance of a well-managed work site.

Most efficient in sandy soil regions.

Disadvantages

Ineffective during periods of heavy rain.

Readily damaged by construction vehicles.

Common Problems

Rilling often occurs along the upper edge of the turf if not placed along the land contour.

Location

Placed along the edge of newly formed roads, pathways and other impervious surfaces.

Placed on steep, newly seeded slopes.

Special Requirements

Important to ensure stormwater runoff passes either uniformly through the turf (on open slopes), or at regular intervals when placed diagonally to a slope.

If the filter strips are placed at an angle to the land slope (i.e. such that up-slope runoff will be deflected along the upper edge of the turf), then lateral strips of turf must be placed at maximum 5m intervals.

Installation

1. Refer to approved plans for location, extent and construction details. If there are questions or problems with the location, extent, or method of installation contact the engineer or responsible on-site officer for assistance.
2. Ensure all necessary soil testing (e.g. soil pH, nutrient levels) has been completed, and required soil adjustments performed, prior to planting.
3. Remove all objectionable material from the area to be turfed.
4. All turf should be used within 12-hours of delivery, otherwise ensure the turf is stored in conditions appropriate for the weather conditions.
5. Moistening the turf after it is unrolled will help maintain its viability.
6. Turf should be laid on a minimum 75mm bed of adequately fertilised topsoil. Rake the soil surface to break the crust just before laying the turf.
7. Ensure the turf is not laid on gravel, heavily compacted soils, or soils that have been recently treated with herbicides.
8. Ensure that intimate contact is achieved and maintained between the turf and the soil such that seepage flow beneath the turf is avoided.
9. If the filter strips are required to be placed along the contour, then ensure each row of turf is placed along a line of constant land elevation.
10. If the filter strips are placed at an angle to the land slope (i.e. such that up-slope runoff will be deflected along the upper edge of the turf), then lateral strips of turf must be placed at maximum 5m intervals and extending at least 400mm up-slope of the filter strip.
11. Water until the soil is wet 100mm below the turf. Thereafter, watering should be sufficient to maintain and promote healthy growth.

Maintenance

1. Inspect the grass filter strips after each runoff event. Check for evidence of concentrated rill-forming flow along the upper edge of the turf.
2. If excessive erosion is occurring along the up-slope edge of the turf, then place additional diagonal turf strips. Alternatively, use sandbags to appropriately divert runoff through the grass.
3. Maintain a healthy and vigorous grass condition whenever and wherever possible, including watering and fertilising as needed.
4. Where practicable, maintain a minimum leaf length of 50mm. Mowing should not be attempted until the turf is firmly rooted, usually 2 to 3 weeks after laying.