Erosion Control – General

EROSION CONTROL TECHNIQUES

Photo 1 – Application of erosion control blankets and mats

Photo 2 – Straw mulching

Soil erosion is the process through which the effects of wind, water, or physical action displace soil particles, causing them to be transported. The main factors affecting surface erosion are rainfall erosivity, soil erodibility, slope length, slope steepness, soil cover, and the surface flow conditions (i.e. flow type, velocity, duration, and frequency).

In this context, the term *soil erosion* includes the displacement of soil, earth, gravel, sand, silt, clay, mud, sediment, cement, and contaminated liquid wash-off resulting from such activities as equipment cleaning and material-cutting activities (e.g. concrete cutting).

Controlling the initial erosion of soils is often the only feasible strategy for minimising environmental impacts resulting from disturbances of soils with a high clay or fine silt content.

It should be noted that complying with an agreed sediment control standard does **not** guarantee that environmental harm will be avoided, or that sediment-laden water will not be released from the site during severe storms. Therefore, taking all reasonable and practicable measures to minimise soil erosion is essential if environmental harm is to be minimised.

Erosion control measures concentrate on preventing, or at least minimising, soil erosion, especially erosion resulting from raindrop impact (Photo 3). Technically, erosion control refers to the control of soil erosion caused by both sheet and concentrated flow. As such, those temporary drainage control measures placed on a construction site to appropriately manage stormwater runoff are considered a subset of the overall erosion control process.

The principles of best practice (2008) construction site erosion control are outlined below.

1. Wherever reasonable and practicable, priority needs to be given to preventing, or at least minimising soil erosion (i.e. drainage and erosion control measures), rather than allowing the erosion to occur and trying to trap the resulting sediment. Where this is not practicable, then all reasonable and practicable measures need to be taken to minimise soil erosion even if the adopted sediment control measures comply with the required treatment standard.
2. The standard of erosion control needs to be appropriate for the given soil properties, expected weather conditions, and susceptibility of the receiving waters to environmental harm resulting from turbid runoff.
3. Appropriate erosion control measures need to be incorporated into all stages of a soil disturbance.
4. The timing and degree of erosion control specified in the Erosion and Sediment Control Plan(s) needs to be appropriate for the given soil properties, expected weather conditions, and susceptibility of the receiving waters to environmental harm resulting from turbid runoff.

5. If tree clearing is required well in advance of future earthworks, then tree clearing methods that will minimise potential soil erosion need to be employed, especially in areas of unstable or highly erodible soil.
6. Erosion and Sediment Control Plans (ESCPs) need to specify the required application rates for mulching and revegetation measures.
7. Erosion control measures need to be appropriate for the slope of the land and the expected wind and surface flow conditions.
8. Wherever reasonable and practicable, the use of synthetic reinforced *Erosion Control Mats* and *Erosion Control Blankets* needs to be avoided within bushland and other areas where they could endanger wildlife such as ground-dwelling animals.
9. Wherever reasonable and practicable, measures need to be taken to apply appropriate erosion control practices around the site office area and on temporary access roads to minimise raindrop impact erosion and the generation of mud.
10. Finished soil surfaces need to be left in an appropriate roughened state and quality to encourage revegetation where required.
11. Where appropriate, Erosion and Sediment Control Plans (ESCPs) need to incorporate technical notes on suitable dust control measures.
12. The construction schedule or ESC installation sequence needs to ensure that soil stabilisation procedures, including site preparation and revegetation, are commenced as soon as practicable after each stage of earthworks is completed.
13. Topsoil needs to be appropriately managed to preserve its long-term value.
14. Plant species need to be appropriate for the site conditions, including compatibility with local environmental values, and anticipated erosive forces.

Erosion control techniques include, but are limited to, the following:

- Bonded Fibre Matrix
- Cellular Confinement System
- Compost Blanket
- Dust Control
- Erosion Control Blanket
- Gravelling
- Heavy Mulching (including heavy brush, bark, and woodchip mulching)
- Light Mulching (including brush and straw mulching, and hydromulching)
- Revegetation (permanent and temporary revegetation, including turf, and dead and dormant grass cover)
- Rock Mulching
- Soil Binders (including Polyacrylamide)
- Surface Roughening

For specific information on the above erosion control techniques, refer to the relevant fact sheets.

Photo 3 – Raindrop impact erosion

Photo 4 – Sheet erosion

Photo 5 – Rill erosion

Photo 6 – Gully erosion

Table 1 – Summary of erosion control techniques

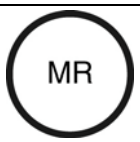
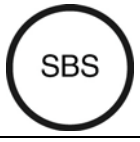
Technique	Code	Symbol	Typical use
Bonded Fibre Matrix	BFM		• Grass establishment and protection of newly seeded areas.
Cellular Confinement System	CCS		• Containment of topsoil or rock mulch on medium to steep slopes. • Control erosion on non-vegetated medium to steep slopes such as bridge abutments and heavily shaded areas.
Compost Blanket	CBT		• Used during the revegetation of steep slopes either incorporating grasses or other plants. • Particularly useful when the slope is too steep for the placement of topsoil, or when sufficient topsoil is absent from the slope.
Erosion Control Blanket	ECB		• Temporary erosion control on exposed soils not subjected to concentrated flow. • Temporary control of raindrop impact erosion on earth embankments before and during the revegetation phase.
Gravelling	Gravel		• Protection of non-vegetated soils from raindrop impact erosion. • Stabilisation of site office area, temporary car parks and access roads.
Heavy Mulching	MH		• Stabilisation of soil surfaces that are expected to remain non-vegetated for medium to long periods. • Suppression of weed growth on non-grassed areas. • Stabilisation of existing and proposed garden beds.
Light Mulching	M		• Control of raindrop impact erosion on flat and mild slopes. May be placed on steeper slopes with appropriate anchoring. • Control water loss and assist seed germination on newly seeded soil.
Revegetation	R		• Temporary and permanent stabilisation of soil. • Stabilisation of long-term stockpiles. • Includes *Turfing* and temporary seeding.
Rock Mulching	MR		• Stabilisation of long-term, non-vegetated banks and minor drainage channels. • Stabilisation of those areas of a garden bed subject to concentrated overland flow.
Soil Binders	SBS		• Dust control. • Stabilisation of unsealed roads.

Photo 7 – Bonded fibre matrix

Photo 8 – Cellular confinement system

Photo 9 – Compost blanket

Photo 10 – Erosion control blanket

Photo 11 – Gravelling

Photo 12 – Heavy mulching

Photo 13 – Light mulching

Photo 14 – Rock mulching