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A6.1 PRODUCTS

Since the first edition of this guideline in 1997 many new products have been introduced and existing products have been refined and improved. It is important that the most appropriate product is used. Products are not normally interchangeable eg. load bearing geo-textile fabric should not be used as erosion control matting on vegetated slopes (and vice versa). Always apply sound engineering judgement and practice.

Refer to the local telephone directory under Geo-synthetic Products, Erosion Control & Soil Stabilisation, Landscape Supplies and Soil Conditioners & Treatments (or similar) for a list of suppliers.

The following is a brief description of products commonly used on creek stabilisation works. Refer to the manufacture’s specifications and seek independent advice when unsure of a product’s suitability.

Erosion control mats

1. Temporary, 100% biodegradable
These mats are generally not suitable for areas subject to significant overland flow velocities unless anchored with a reinforcing mesh or stabilised with a bitumen spray etc. Erosion control mats can supply temporary erosion control, suppress weed growth, provide a mulch layer and assist with seed germination.

2. Semi-permanent, non-UV stabilised synthetic reinforced
These mats usually consist of a biodegradable mat reinforced with a UV-sensitive reinforcing mesh that provides temporary anchorage and reinforcing during the vegetation establishment period.

Caution should be taken when using synthetic reinforced mats in bushland areas as birds can become tangled in the nets. Ground-dwelling animals such as lizards have been strangled while attempting to pass through the fine mesh. In such cases, a 100% biodegradable mat anchored with un-galvanised, large grid wire mesh may be preferred.

3. Permanent root/grass reinforcement mats
Permanent mats are usually black or include black synthetic reinforcing mesh (the black colour means UV-stabilising carbon is included). It is important to note which parts of a particular mat are permanent and which are temporary (ie. biodegradable). Erosion control mats can contain the following permanent or temporary features:-

(i) mat reinforcing (to limit mat distortion in high-flow velocity areas or areas of mass soil movement)

(ii) root reinforcing/protection (limit soil erosion around the root system of living plants/grass - permanent root reinforcing will protect the soil and roots during drought or otherwise poor vegetation cover)

(iii) mulch layer or synthetic mulch substitute (assist seed germination, control soil temperature, erosion control and protection against raindrop impact).

Almost all permanent erosion control mats provide permanent root reinforcement. However, not all root reinforcement mats can provide permanent erosion control in the absence of vegetation (ie. after grass die-back or after a drought). Some root reinforcement mats provide only limited defence against the effects of raindrop impact. Such mats have an open structure and usually contain a biodegradable mulch layer.
Take care when using certain synthetic reinforced mats in bushland areas, as birds can become tangled in the fine, flexible nets. Ground dwelling animals, such as lizards, have been strangled while attempting to pass through the fine mesh. In such cases, a 100% biodegradable mat anchored with either a tackifier or a large grid, synthetic or un-galvanised wire mesh may be preferred.

**Erosion control blankets - Hydraulically applied**

Hydraulically applied or spray-on mats need less surface preparation before application of the mat. Spray-on mats can be successfully applied on steep slopes and irregular surfaces. They can control wind and water erosion and assist in retaining seed, fertiliser and topsoil. Regular inspection and maintenance is usually required.

**Gabions, mattresses and earth reinforcing**

A retaining wall constructed from rock-filled wire baskets (gabions) built along the creek bank to provide erosion protection and structural stability to the bank. Rock mattress lining consists of rock-filled wire mattresses laid over the bed and banks of the creek to provide a protective layer against the erosive forces of the stream flow.

Earth reinforcing is usually made from geo-textile or wire mesh (galvanised and plastic coated is preferred). These are used for embankments, over soft ground, steep slopes and rock fall areas. Although, these linings improve the stability of the bank material, the main role of the lining is as a protective layer.

(N.B. Some Geocells can also be installed to provide earth reinforcement)

**Geocells - Cellular confinement systems**

Geocell systems stabilise the selected infill material through confinement of soils in its network of interconnected cells. They can provide erosion control on steep batters, temporary roads and retaining walls.

**Geotextile filter fabric**

Geotextiles are permeable fabrics which, when used in association with soil, have the ability to separate, filter, reinforce, protect or drain. As the use of geotextile fabrics has expanded there has been the introduction of geotextile composites and the development of products such as geogrids and meshes. Overall these materials are referred to as geotextiles and related products. All have a wide range of applications and are currently used to advantage in many civil engineering applications including roads, airfields, railroads, embankments, retaining structures, reservoirs, canals, dams, bank protection and coastal engineering.

**Grass-block semi-hard porous paving**

The terms ‘permeable’ and ‘porous’ pavers refer to pavers which allow water to percolate through them.

**Permeable pavers** present a solid surface but allow natural drainage and migration of water into the earth by permitting water to drain through the spaces between the pavers.

**Porous pavers**, on the other hand, present a surface with “holes” which can be filled with vegetation or aggregate depending upon the need.

Porous/permeable pavers provide the same advantages as traditional concrete pavers, including resistance to heavy loads and flexibility of repairs.
**Hard surfacing products**

Typically, hard surfacing is done by grout filling loose rock, a gabion or revetment mattress or concrete filling a geocell product. These products provide immediate erosion control, bridge abutment protection and can be used in high velocity channels.

**Reinforced turf**

Turf reinforcement matting systems are among the most recently accepted methods of managing moderate to low velocity flow events; and they do so with minimum impact on the environment. These products interlock with the root and stem structures of natural vegetation, dramatically increasing their resistance to shear stresses. Turf reinforcement is appropriate for small channels and slope protection on the high bank of a waterway.

**Sediment fences***

Sediment fences can be constructed at the downstream side of a building site to trap coarse sediments. Usually not appropriate as an in-stream control device.

**Flotation sediment curtains***

Used when working along a creek or other waterway, where land based sediment control would not be effective.

**Hydraulically filled groyne**

High strength geotextile sausage groyne hydraulically filled on-site with sand to provide a temporary dam or water exclusion and/or pollution control zone within or adjacent to a watercourse, lake or wetland.

* Refer Brisbane City Council’s Instream Sediment Control Guidelines.