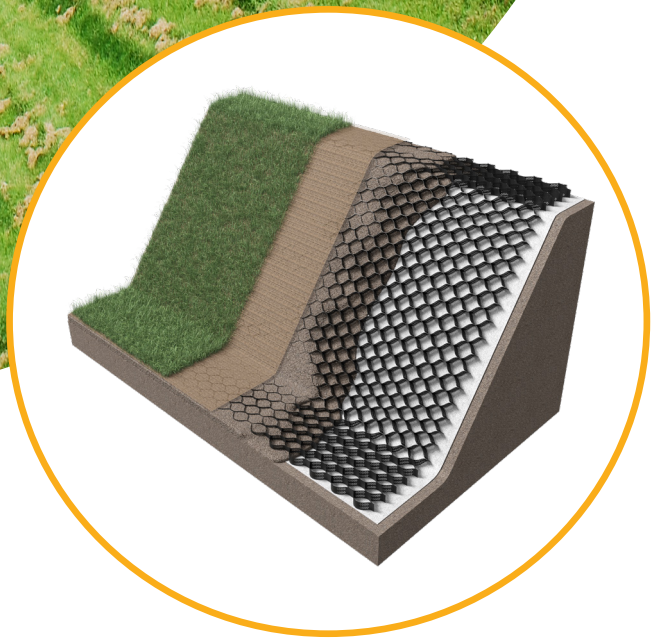


Erosion Control

A guide to ABG surface erosion protection methods

The need for erosion control

Soil erosion most often results from human intervention on the environment and managers of construction projects of all sizes have a responsibility to minimise the impact.

Bare soil will give rise to soil erosion by wind, rain and water. This could be as a result of cut and fill slopes, stockpiles, agriculture and river re-alignment. The issue is not only the potential instability of the slope, but also that the resulting silt laden run-off is deemed to be a pollutant. Legislation in many countries is either prescriptive that bare soil must be protected, or that heavy fines are imposed on those responsible for the pollution. Some soils are more prone to erosion than others, but climate change is leading to more frequent and intense rainfall, so whatever the soil type, the risk of soil erosion is increasing.

Either way, there is an easy solution in the form of erosion control systems. These range from low cost simple soil cover, through permanent surface reinforcement mats, to highly engineered slope stability webs. The benefit is not only soil protection, but also the ability to engineer steeper slopes and maximise the area of flat land available for development. Surface erosion control systems cannot be used to solve deep seated instability within the slope however.

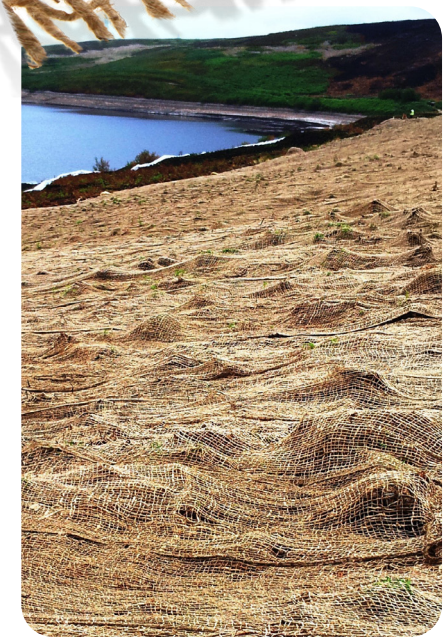
Further information, technical advice, installation instructions, pinning patterns and datasheets are available from ABG.

Erosamat Type 3, Black Moss Reservoir Spillway, Lancashire, UK

Contents

Erosamat Type 1

Biodegradable Jute erosion control mats for short-term protection



Erosamat Type 1 offers two low-cost biodegradable mats made from woven jute. They are an economic and environmentally friendly erosion control material for use on surfaces that have the ability to support growth in a relatively short period of time.

Erosamat Type 1 consists of a dense mesh of jute fibres to absorb the impact of rain and reduce run-off velocity. The mat protects the soil until the seeds have germinated and a root system is established. Thereafter the Erosamat slowly biodegrades releasing nutrients and improving soil quality.

During installation, seed is placed on to the surface of the soil before the mat is overlaid. In some installations, seeding may take place after installation through a hydroseeding process. ,

EROSAMAT TYPE 1 IS AVAILABLE IN TWO GRADES:

Type 1

An open weave of thick jute yarn with a mass of 500g/m^2 in 1.22m wide bales.

Type 1a

A dense weave of fine jute yarn with a mass of 186g/m^2 and giving an extremely high degree of surface cover at very low cost. Type 1a is 1.83m wide as standard, but can also be made to order in 4m wide rolls **for rapid coverage.**

Erosamat Type 2

Biodegradable coir erosion control mats for medium-term protection

Erosamat Type 2 is a heavy duty and long-life biodegradable coir erosion mat. The mat prevents soil erosion and helps to establish new vegetation on areas of loose soil and in situations of high run-off and flooding.

Erosamat Type 2 is ideal for use where plant development could be slow, such as with late season planting or in poor fertility soil. They are suited to extremes of temperature, enabling them to be used to control erosion in conditions from tundra to desert.

Coir is a 100% biodegradable, natural and sustainable product produced from coconut husk. It is one of nature's strongest fibres and maintains its tensile strength even under water. It is also highly UV resistant.

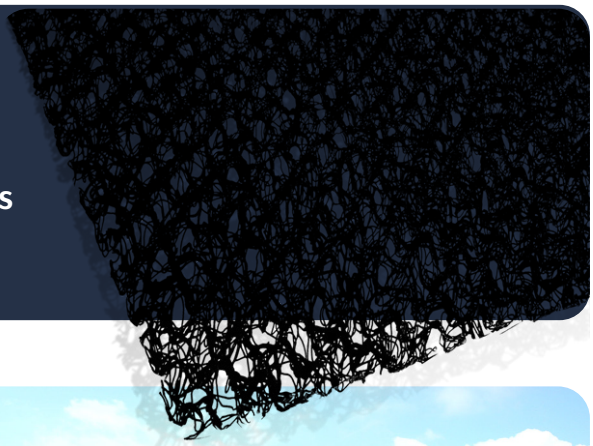
In manufacturing Erosamat Type 2, only high-quality Anjengo yarn is used. This has a high lignin content which helps the fibres resist mould and rot, making the product suitable for use underwater. Coir biodegrades very slowly over a 3-5 year period providing plenty of time for plants to establish, even on very poor soils.

EROSAMAT TYPE 2 YARN:

Mass / unit area of 700g/m^2 (Erosamat 2D product version)

Erosamat Type 3

Permanent polymer erosion control mats for lifetime protection



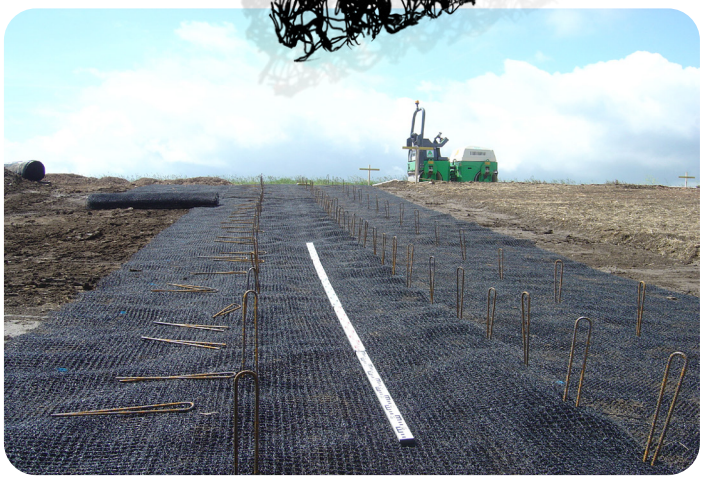
Erosamat Type 3 is for all situations where an element of permanent erosion control is required, or where there is risk of die-back requiring protection while vegetation re-grows.

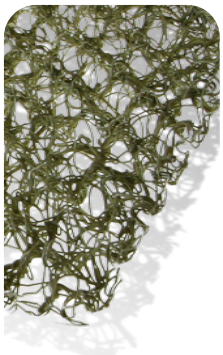
Erosamat Type 3 consists of a dense matrix of polypropylene fibres, thermally bonded together to create a tough and flexible, long-lasting erosion control mat. The mat is non-corroding, hydrophobic and is both chemically and microbiologically inert.

The system provides the root reinforcement necessary for natural vegetation to resist the extreme effects of wind, rain and water erosion. As the vegetation grows into the mat, the roots become entwined within the Erosamat matrix. This provides the anchorage for the vegetation to resist high shear stress situations (e.g. overflow channels). Work by CIRIA has shown that such turf reinforcement mats (TRM) can double the permitted channel velocity.

Erosamat Type 3 is to be laid directly on to compacted ground that is free from existing vegetation, roots and stones before filling with friable topsoil, from the bottom to the top of the embankment to a depth of 10mm. Alternatively, the bare mat may be hydroseeded, especially on steep slopes. Existing vegetation growth should not inhibit the contact between the ground and the Erosamat.

The excellent surface protection is as a result of the product being manufactured significantly heavier and denser than the industry norm. Erosamat Type 3 is coloured black for general use but specific colours can be manufactured, including green and brown.



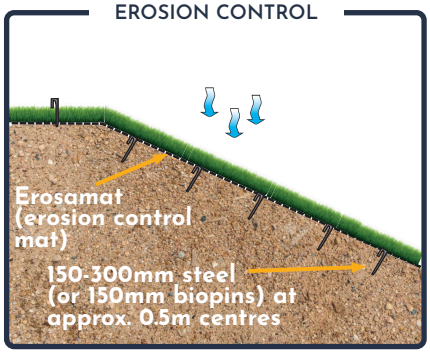


Erosamat 3/20Z 500

Erosamat 3/20Z 500M

Erosamat 3/20Z G50

EROSION CONTROL



EROSAMAT TYPE 3 IS AVAILABLE IN THREE GRADES:

Erosamat 3/20Z 500	Three dimensional open matrix TRM
Erosamat 3/20Z 500M	Three dimensional open matrix TRM with integral mesh
Erosamat 3/20Z G50	Three dimensional, multifilament open matrix with polymer coated reinforcement grid HPTRM

Erosamat Type 4

Biodegradable composite erosion control mats

Erosamat Type 4 is a natural biodegradable mat for immediate surface protection and erosion control until natural vegetation is established.

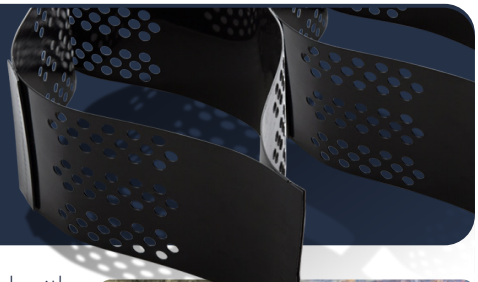
Erosamat Type 4K PP consists of 100% coir matting stitched together between two binding layers of photodegradable polymer mesh.

For effective protection and successful germination, it is essential that the Erosamat is pinned into close contact with the underlying soil.

Erosamat Type 4 products have applications in the initial protection of water channels, highway embankment slopes, landfill caps, restorations and landscaping schemes subject to surface erosion prior to the establishment of vegetation cover.

Erosaweb

Three dimensional geocell for topsoil / stone retention on steep slopes



Erosaweb is a three dimensional geocell system developed to retain imported fill, particularly on steep slopes. Once installed it forms a blanket of shallow pockets across the slope face into which fill is placed. Once filled it protects the slope and fill from erosion forces, whilst allowing vegetation to establish for long-term protection.

Erosaweb comprises interconnecting polymer strips that form a honeycomb of pockets that confine and strengthen the infill material.

The polymer strips grip the infill material and provide a tensile force, effectively increasing the shear strength and cohesion of the infill material.

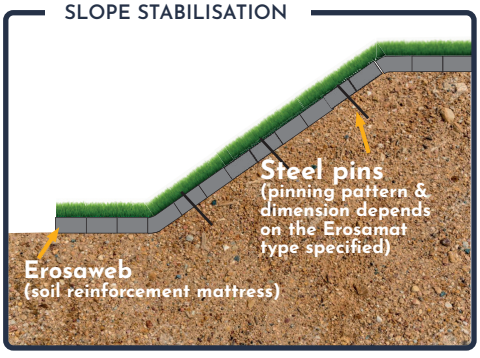
For revetments, the Erosaweb is filled with crushed stone or alternatively, low slump concrete is poured into the Erosaweb.

When Erosaweb is installed over geomembrane liners (typically at the edge of lagoons), it is tied onto a geogrid that is anchored at the crest of the slope.

The strips are manufactured from strong HDPE polymer designed to offer long-term protection. The strips are securely bonded at the joints, with a strength at least equal to the strip material. The strips are perforated to allow water within the fill to move freely down the slope. The Erosaweb is supplied in zig-zag coils and then expanded to form the full panel size on site.

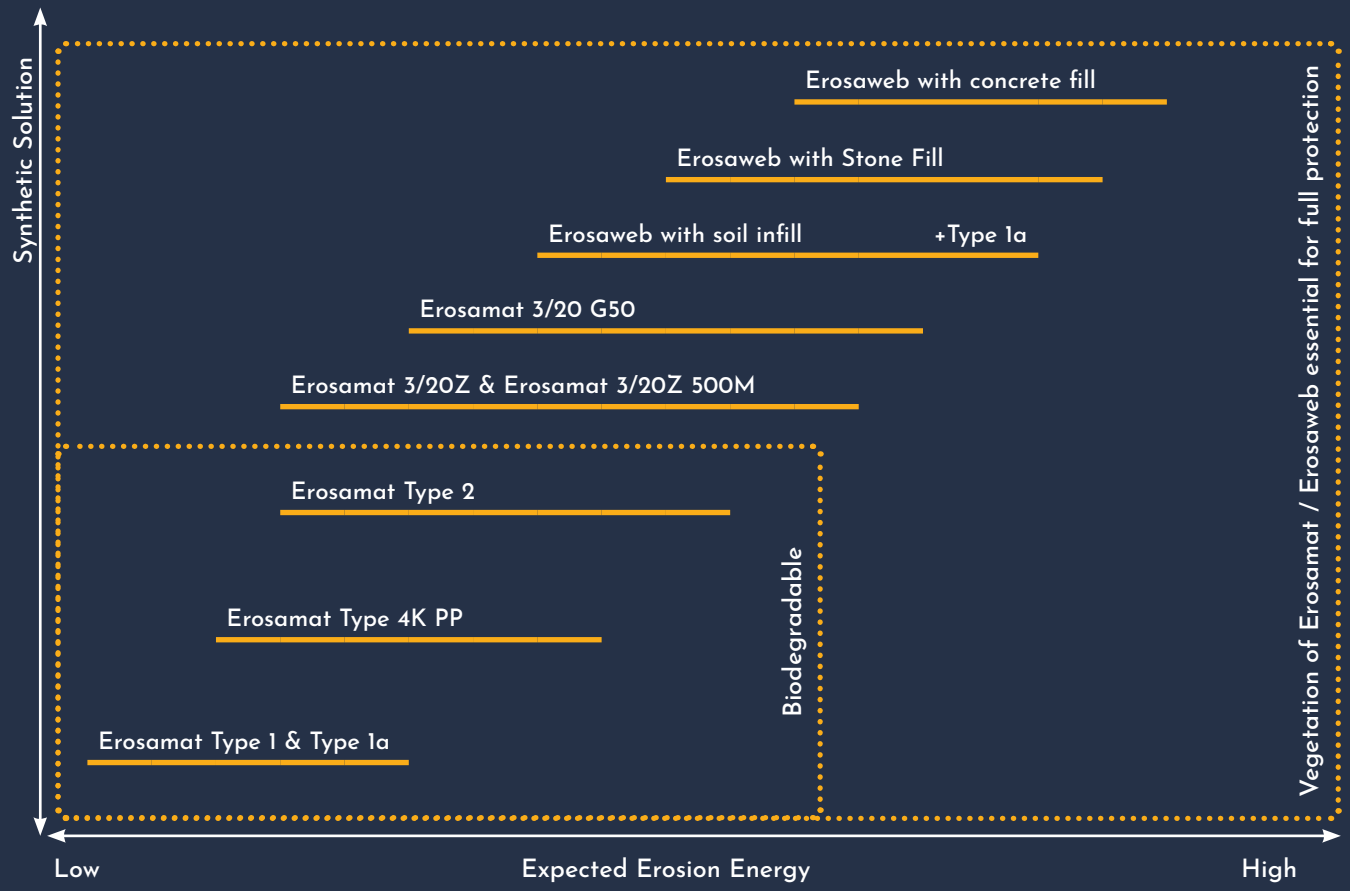
Erosaweb is available in standard heights of 100, 150 and 200mm and the standard panel size is 4m x 6m.

SLOPE STABILISATION



EROSAWEB IS AVAILABLE IN THREE SIZES:

	GWX 100/300	GWX 150/300	GWX 200/300
Depth	100mm	150mm	200mm
Cell Diameter	300mm	300mm	300mm
Perforated	Yes	Yes	Yes



	Material (Note 1)	Max slope angle (Note 2)	Protection grade (Note 3)	Life span (years)	Colour	Suitable submerged	Surface cover
Erosamat Type 1	Jute	45°	Medium	1-3	Brown	No	35%
Erosamat Type 1a	Jute	45°	Medium	1-2	Brown	No	55%
Erosamat Type 2	Coir	65°	High	3-5	Brown	Yes	30-75%
Erosamat Type 3	PP	65°	High	>25	Black*	Yes	75%
Erosamat Type 4K PP	Coir & PP	65°	High	2-5	Brown	Yes	100%
Erosaweb	HDPE	65°	High	>25	Black	Yes	n/a

Note 1 Flat areas may need erosion control

Note 2 In certain situations the mat may be used on steeper slopes, limited only by the ability of the vegetation to obtain moisture for growth. The slope angle for Erosaweb is dependent upon the internal friction angle of the fill intended to be placed into the web

Note 3 Mats and webs may be used in conjunction to offer greater protection

Note 4 *Green and brown also available

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