

# A.G.A. REINFORCEMENT & SUPPORT

Different projects may demand diverse solutions. We can evoke both hard and soft engineering systems to achieve the specified and required engineering parameters.

We understand the environment and where appropriate we offer clients a sympathetic solution in keeping with reliable engineering protocols.

- Ground reinforcement
- Permanent turf reinforcement
- Cellular soil confinement
- Monolithic retaining structures
- Steep retained earth slopes
- Mechanically stabilised earth
- Vegetated bunds
- Abutments

*Concept to  
Completion*



T: 01953 886824



## A.G.A. GABIONS AND MATTRESSES.

Our gabions and mattresses come in sizes and finish to suit any application.

Whether stacked, bonded or installed individually, once filled with selected material they form a monolithic retaining wall to stabilise earth and control erosion. They are a totally reliable product for use in high velocity and turbulent rivers, revetments, drainage channels and tidal waters.

Gabions form a flexible monolithic structure and can maintain total structural effectiveness even on land liable to differential settlement.

The use of natural stone at the face of gabions will result in an attractive appearance, moreover above or below the water line they provide excellent habitat for a host of different species.

A.G.A. Gabions are proven and well established tools for the construction of: river walls - waterways - canals - reservoirs - revetments - drainage channels - flood protection - coastal defences - retaining walls and many other applications.



## A.G.A. GEOCELL.

A.G.A. GeoCell is a cellular matrix of interconnecting polymer strips that form pockets to locate and strengthen the fill material, providing a tensile strength that very effectively increases the shear resistance and cohesion of the fill. The system supports a viable layer of topsoil on steep slopes and banks.

A.G.A. GeoCell forms a flexible revetment structure for the lining of ditches and water channels and may be filled with concrete or crushed stone. The web is also available with holes to attach to securing ropes.

A.G.A. Group GeoCell is manufactured from high density polyethylene sheet and is securely welded at the joints to provide strength at least equal to the strip material itself. It is available in depths of 100 mm and 200 mm and various cell diameters; it is folded flat for transport and expanded to form the full cell web area on site. Inter-cellular drainage holes prevent saturation of the fill material.

Applications include: Protection and vegetation over spoil tips: Basal support for block paving under heavy loading: Sand dune stabilisation: Reinforced grass surfaces for accesses roads, car parks etc.



## A.G.A. GEO-GRID.

A.G.A. Geo-Grids provide soil reinforcement of non-cohesive, cohesive soils and formations made of coarse-grained materials. Geo-Grids are very effective on steep earth slopes, retaining walls and for the stabilisation of weak ground by supporting the penetration of soil/rock particles or other geotechnical materials through the grids apertures by interlocking the particles.

On reinforced steep slopes and embankments geogrids cost significantly less than conventional concrete or gabion retaining structures.

Geogrids when used in layers with suitable fill will create a stiff mechanically stabilised layer within the soil, vastly improving its load bearing capacity to accommodate very high loads.

Vegetation is often an integral part of the design where geogrids are used, by suitable planting methods and species selection they can help improve or enhance the environment.

A.G.A. Geo-Grids are available in strengths from 20kN/m to 350kN/m. Bi-axial grids offer strength in both directions. Uni-axial grids provide the principal strength in one direction.



## A.G.A. TRM 350.

A.G.A. TRM 350 is the tested and proven technology for immediate and effective long-term erosion control and the reinforcement of vegetation and is particularly effective on steep banks.

Constructed from coir fibre matting stitched between high tensile strength UV stabilised PP nets provides the strength and longevity that enables TRM 350 to be used for bank protection even where high flow or heavy run off conditions are encountered. It enables planting to be carried out in locations where heavy forces exerted by water and/or wind exceed the shear limits of un-reinforced vegetation.

We recommend TRM350 for high-flow channels, stream banks, shorelines and other areas needing permanent vegetation reinforcement and support against the elements.

Under seeding of TRM350 is usually carried out prior to installation thus, the over pinning provides a micro climate and a permanent shoot reinforcement zone, ensuring excellent cover during germination and establishment so limiting the damage that can be caused from rainfall, runoff or birds grazing.



## A.G.A. TRM 700 & 900.

A.G.A 700 and 900 TRM's are high strength biodegradable reinforcement mats manufactured using 100% coir fibre, machine spun and woven into flexible matting. They are a particularly effective solution in environmentally sensitive areas needing tough erosion control measures.

The TRM materials flexibility means it maintains very close contact with the seeded surface ensuring moisture retention and creating a micro-climate for quick seed germination, thus ensuring better and speedy establishment by the vegetation for long term erosion control and they mitigate against loss of underlying material prior to root establishment. Unlike traditional synthetic TRMs these require no costly imported soil fill.

700 TRM is a long term erosion control mat with 100% natural biodegradable coir 10 to 11mm thick with good tensile strength up to 8.5 kN/m and biodegrades in about 4 to 6 years.

900 TRM is a longer term erosion control mat with 100% natural biodegradable coir 12 to 13mm thick with higher tensile strength up to 13.8 kN/m and biodegrades in 5 to 7 years.



## A.G.A. ARMORMAT.

ArmorMat is used on steep soil slopes vulnerable to erosion; once installed it immediately increases the soil's resistance to erosive runoff displacement by providing conditions that enhances the growth of underlying vegetation through the medium, which may be existing foliage or quality topsoil that is blinded into the ArmorMat matrix following installation.

ArmorMat is a three-dimensional matrix of UV stabilised, non-degradable synthetic fibres, heat bonded where they cross then extruded onto a double twisted steel woven mesh.

When used within water the course, ArmorMat provides hydraulic erosion protection once it is secured with suitable soil nails or ground anchors as specified by the client.

### ArmorMat is used extensively in projects involving

**Erosion control**  
**Rockfall embankments**  
**Surface strengthening and support**  
**Reservoirs, lakes and ponds**  
**Weirs & culverts**

**Longitudinal protection**  
**Channels & culverts**  
**Slope protection**  
**Capping lining systems**  
**River & coastal projects**



## A.G.A. REINFORCEMENT & SUPPORT.

### GABIONS

**Reno mattresses.** We often use this configuration for river bank and scour protection, channel linings for erosion control and embankment stability.

**Weirs constructed with gabions** in a stepped arrangement are commonly used for river training and flood control, this design improves the rate of energy dissipation within the channel.

**Fish screens** within small waterways can be constructed using our Gabions.

### GEOCELL

**Tree root protection mat (TRPM)** incorporates A.G.A. GeoCell with a high performance needle punched polypropylene nonwoven geotextile, to provide long term protection to tree roots whilst providing support to heavy traffic loads. The permeable membrane lets water, nutrients and air percolate the root zone to sustain plant development, while at the same time deflecting fibrous roots rising up through into the GeoCell fill material.

### GEOGRIDS

**Vegetation an integral part of our designs.** Vegetated geogrids can be used to quickly establish riparian vegetation if they are properly designed and installed. Within river work they can enhance conditions for colonisation of native vegetation. The geogrid traps sediment and reinforces and rebuilds the stream bank. A.G.A. Group consultants will always offer advice on suitable planting methods and species selection.

### TRM 350

#### Special Projects

We are the only company uniquely placed to offer extensive covered and outdoor facilities to pre-grow TRM's with the clients locally harvested or indigenous wildflower and/or grass mixtures.

Our expertise in special projects enables the client to plan ahead, use appropriate seeding and take delivery during ideal conditions.

### TRM 700 - 900

#### Environmental concerns

We utilise our A.G.A. 700 and 900 Turf Reinforcement Mats in the solution to the reinforcement and support of steep slopes where vegetation will eventually become the prime stabilising medium, paying particular attention to the needs of the environment and the maintenance of habitat

### ARMORMAT

#### Lining of river banks with low water velocities

ArmorMat is secured to the ground using suitable pins or stakes according to the contract specifications; however installation is invariably used within soil nailed slopes to provide overall slope reinforcement. We also use it on the slopes along the banks of canals and river courses and in drainage channels used in conjunction with our geotextiles or geomembranes.

**Over 20 years the A.G.A. Group has been providing solutions and systems that have built the foundations of stability, reinforcement and support.**

The A.G.A. Group provide current and detailed Technical Specification and Information Sheets for all product groups. These are available as hard copy on request or can be downloaded directly from our website <http://agagroup.co.uk/home-page/product-and-services-info-sheet-downloads>

This information is subject to change arising from new developments and findings. If you are unable to find the item you are looking for, please do not hesitate to contact us immediately.

The A.G.A. Group contracts division are specialist within the field of aquatic and bioengineering. We operate a policy of 'Best Practice' and are bound by the Code of Conduct of both the Institute of Fisheries Management and the Royal Society of Biology.

The A.G.A. Group will quote for the supply of materials, their installation or for 'turnkey' projects.

**A.G.A. is Quality assured to: ISO9001: 2008, ISO14001: 2004 and 18001: 2007**

A.G.A. Group, MMG, MHP and AGACES are trading styles of A.G.A. Bio-engineering Systems Limited.

Merton Hall Ponds, Merton  
Thetford, Norfolk. IP25 6QH

T: 01953 886824

E: [info@agagroup.co.uk](mailto:info@agagroup.co.uk)

[www.agagroup.co.uk](http://www.agagroup.co.uk)



Ecology and Land  
Management Consultants