



# Rail Geosynthetics

Product Range  
for Railway  
Applications

**abg** creative  
geosynthetic  
engineering

# About ABG

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ABG are a market leader in the development, manufacture and technical support of high performance geosynthetics with applications across the whole spectrum of rail infrastructure.

ABG specialises in providing geosynthetic systems for a wide range of applications including:

- Drainage, reinforcement, separation and erosion control for railway applications.
- Surface and sub-surface water retention for sustainable drainage (SuDS).
- Green and blue roofs.
- Consolidation layers for embankment earthworks.
- Structural drainage systems.
- Soil retention and erosion control for slopes.
- Low cost retaining walls and reinforced earth structures.
- Tunnel drainage.

Compared with traditional methods of engineering, projects involving earthworks or drainage can be performed with reduced track possession time and environmental impact and at lower cost using sustainable geosynthetic solutions from ABG.

ABG is a privately owned company formed in 1988, with its own manufacturing facility at Meltham, in the heart of the Yorkshire Pennines. Through this time, the company has developed a reputation for delivering innovation using quality products supported

with outstanding customer service. This has resulted in steady and continuing growth.

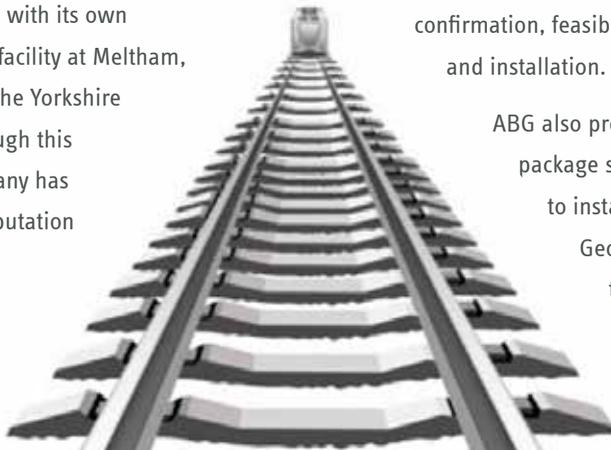
The ability for rapid product development ensures that ABG supply the most innovative and cost effective solution to most engineering problems involving water or soil.

Where required, all products are CE marked, BIM level 2 and approved for use by leading UK and international authorities. Research and development are given high priority. Collaborative research is undertaken with leading British Universities and knowledge hubs to develop improved design methods.

Laboratory facilities are used to undertake regular quality control testing, product development and to provide clients with specific design values. ABG are members of the RAIL ALLIANCE and regularly organise CPD training events.

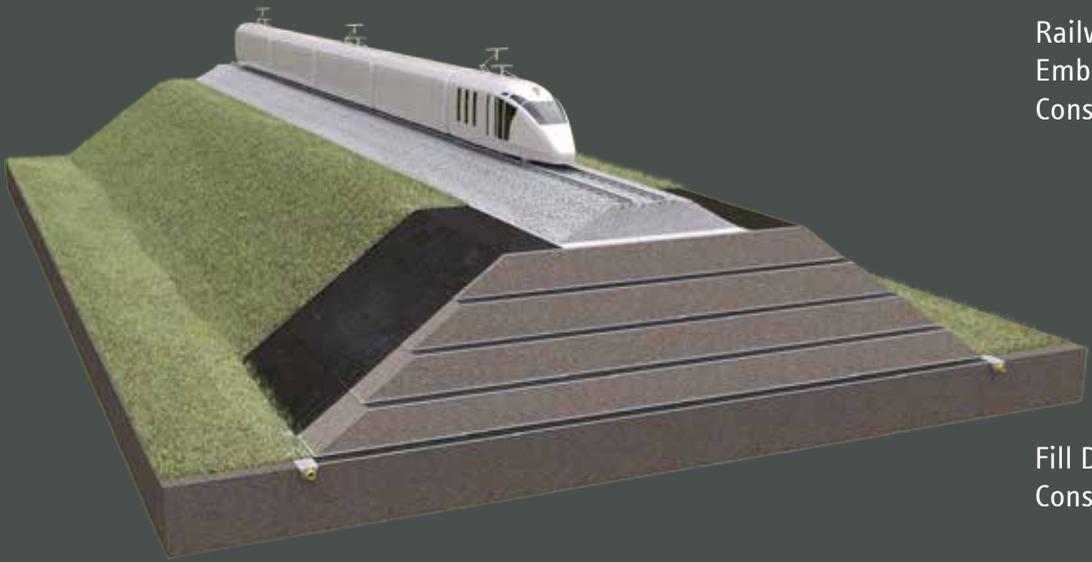
Technical support is provided for all of our products by our well trained and experienced staff, many of whom are Chartered Civil Engineers. This extends to design, design confirmation, feasibility study, cost advice and installation.

ABG also provide a complete package solution from design to installation, through our Geogreen installation team, working in partnership with the design and construction team.



Railway  
Embankments  
Construction

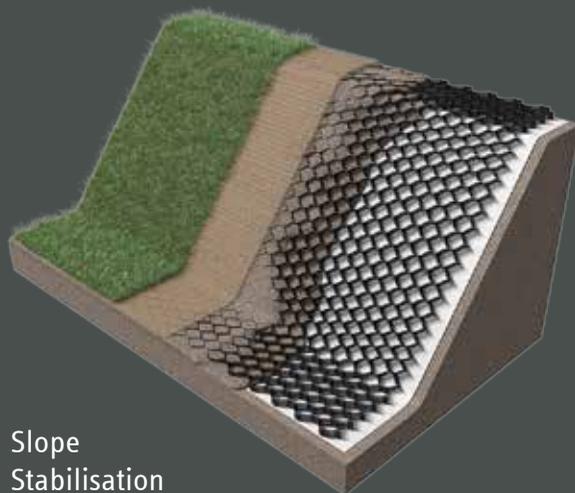
Erosion  
Control



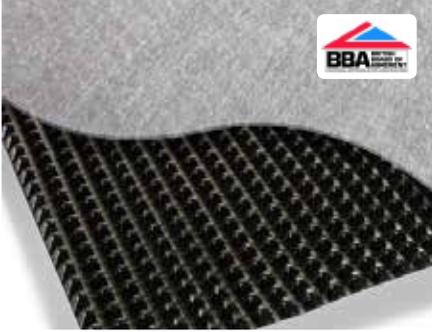
Fill Drainage &  
Consolidation



Slope  
Stabilisation



## Embankment drainage systems

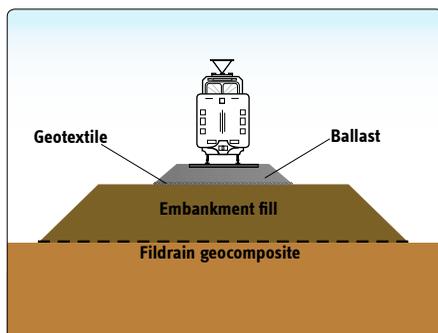


ABG manufacture Fildrain® 7DD and 7DHD geocomposite drainage layers as the most advanced system for relieving pore pressure in the construction of new embankments. This is a proven method of construction that has BBA approval for the starter layer and subsequent layers throughout the height of the embankment.

Full settlement of new embankments must be achieved before the ballast and track is laid. Embankment fill is placed at optimum moisture content for compaction. This invariably means that the compacted fill, as a result of pore pressure, is too wet to support long term loads without settlement. Relief of pore pressure and speeding consolidation is critical to the time management of the project.

Fildrain creates horizontal drainage layers at typically 1 metre vertical spacing for quick reduction of pore pressure. Compared to crushed stone, it is cost effective to install Fildrain at close spacing. Because Fildrain is just 7mm thick, it enables more low cost site suitable fill to be used in the embankment. Fildrain is also impermeable in the vertical plane which means that each layer of Fildrain protects the earthworks from the ingress of rainfall.

Projects have gained full consolidation in 25% of the time normally expected. Fildrain even enables the use of over wet material if required.



## Subbase stabilisation



ABG manufacture a range of geocell systems suitable for sub-base and ballast stabilisation applications. These systems minimise the volume of stone required, which means that the project progresses more quickly and track possession times are reduced.

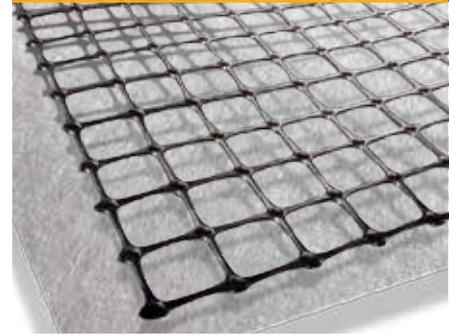
Abweb is a three dimensional cellular matrix that confines and strengthens crushed stone and reduces the required depth by up to 50%. Abweb can be used in the permanent way or as a standalone system for access roads or as the foundation layer for car parks. Abweb is ideal in combination with the ABG Sudspave porous pavers.

Abweb is supplied in zig-zag coils, which are expanded on site into 4m x 6m panels. Other bespoke dimensions can be manufactured..

Abweb TRP is a particular form for the protection of tree roots.



## Reinforcement & separation



ABG hold extensive stock of woven and non-woven geotextiles and bi-axial geogrids for stabilisation and reinforcement.

ABG provide a complementary design service with Professional Indemnity (PI) insurance for our whole range. A cutting service is also available.

Abtex NW non-woven geotextiles are ideal for drainage and filtration as well as separation.

Abtex woven geotextiles are optimised for strength in separation applications.

Abgrid is an extruded geogrid in 20kN/m and 30kN/m tensile strength.

Gridtex is a hybridised geosynthetic that is capable of fulfilling many of the functions of a geogrid at the same time as the separation function of a geotextile.

Trigrig® EX is an innovative high performance geogrid for reinforced earth applications. It has particularly good partial factors for creep and installation damage, making it an economic choice.



## Structural drainage systems



ABG manufacture Deckdrain as a high performance drainage and protection layer for relief of hydrostatic pressure from buried structures such as bridge abutments, retaining walls, culverts, basements, cut & cover tunnels, etc.

Deckdrain is supplied in easy to handle rolls and can be laid onto vertical or horizontal surfaces to create a continuous layer that absorbs water from the adjacent ground before it has chance to damage the structure.

Deckdrain consists of a HDPE core bonded to a geotextile filter for long life performance over the whole life time of the structure. Using Deckdrain reduces the amount of excavation on site and enables excavated material to be re-used as backfill.

### Benefits:

- Cost & time saving
- BBA approved
- 25 years of UK use
- Drainage & protection
- Rolls 1.1 x 50m or 2.2 x 25m
- 250kPa to 1,000kPa long term performance
- Vertical flow range 0.60 to 10 l/m/s



## Tunnel drainage systems



ABG manufacture Cavidrain as an internal drainage layer to collect water that infiltrates through tunnel and station box walls and invert.

Cavidrain is supplied in easy to handle rolls or sheets that are easily installed on uneven or curved surfaces. The cusped core is flexible and creates multiple flow channels that are highly resistant to blockage by precipitation of calcium or iron oxides.

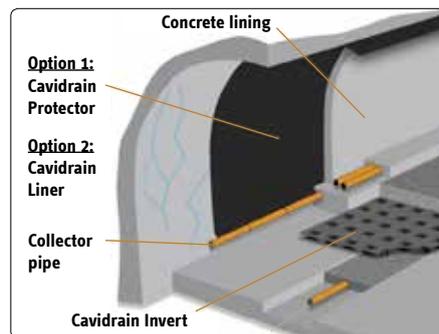
Cavidrain Protector is a HDPE drainage layer that is installed onto tunnel walls before the waterproof liner.

Cavidrain Liner is a LLDPE waterproof drainage layer all in one that has excellent adhesion for sprayed concrete linings.

Cavidrain Invert is a large format HDPE drainage layer for tunnel and station box inverts used in new build or refurbishments. A 60mm Cavidrain Invert typically replaces 500mm of drainage stone. That can be a great benefit for electrification projects through existing tunnels.

### Benefits:

- Can be used as retrofit or newbuild
- Multiple flow channels give high FoS
- Flexible and quick to install
- Used Worldwide since 2000
- Test conducted to fire standard B2
- Vertical flow range 1 to 2 l/m/s
- Horizontal flow range 1 to 16 l/m/s



## Vegetated retaining wall system



ABG manufacture Webwall® as a quick to install vegetated retaining wall for retained heights from 0.5m to 25m. Webwall® uses site won fill and therefore is quicker and more cost effective than gabions, sheet piles, crib walls, precast or cast in-situ concrete.

Webwall® utilises geocellular technology to produce panels that are supplied flat for ease of handling and then expanded on site to create almost vertical vegetated walls. The front of each panel is coloured typically green but any colour is possible.

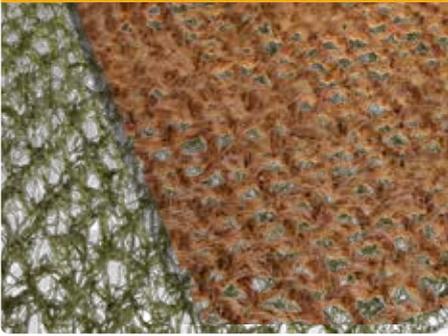
ABG provide a design, supply and install service for Webwall® via Geogreen as either a simple gravity structure or as the facing to reinforced earth.

### Benefits:

- Cost and time saving
- Vegetated face
- Re-use of site fill
- Retained heights from 0.5m to 25m
- Face angle up to 70 °



## Erosion control systems



ABG offer a comprehensive range of environmentally friendly erosion control materials including biodegradable or non-biodegradable, seeded and unseeded. They are designed to provide surface protection and enhance the structural stability of soil slopes in railway applications.

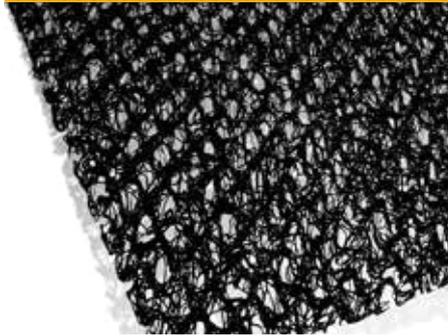
Erosamat® Type 1 & 1A are low cost biodegradable erosion control mats made from woven jute. They are used as a rainfall erosion control material for surfaces that will readily support plant growth.

Erosamat® Type 2 is a heavy duty long life coir biodegradable erosion mat. It is designed to prevent soil erosion and help establish new vegetation on areas of loose soil and in situations of high run-off and medium water velocity.

Erosamat® Type 3 is a closely packed matrix of polypropylene fibres thermally bonded together to create a tough and flexible, long lasting erosion control mat. It is suitable for all situations where a non-biodegradable erosion control mat is required. As a system it provides the structure that allows the root reinforcement necessary for natural vegetation to resist the extreme effects of wind, rain and high water velocity.



## Erosamesh system



Erosamesh is a three dimensional, permanent erosion control system specifically designed to provide surface reinforcement, stop erosion and promote vegetation growth on steep slopes and in areas where high flow velocities occur or rock face protection is required.

Managing erosion on railway embankments and rock face protection is essential when the consequences of failure impact on the safe operation of infrastructure.

Installing an effective erosion control system provides immediate protection to the rock face and underlying soils whilst allowing long-term protection through healthy vegetation development.

The Erosamesh system from ABG combines the proven erosion protection performance of Erosamat Type 3 with the durability of a woven hexagonal steel mesh. Wire mesh has a proven track record in slope stabilisation applications where it is used to prevent rock sliding and progressive stalling.

It is suitable for steep slope erosion control and surface reinforcement for soil nailed slopes in rail sector applications. The Erosamesh system provides immediate protection against erosion occurring in high risk applications. It spreads loads between soil nail heads and stabilises the slope surface.



## Geocellular erosion control systems



ABG manufacture Erosaweb as a three dimensional geocell system developed for top soil/stone retention on steep railway embankment 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 which confines and strengthens the infill material. The polymer strips grip the infill material and provide a tensile force, effectively increasing the cohesion of the infill material. The strips are manufactured from strong HDPE polymer, designed to offer long term protection through extended life.

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.

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

Each Erosaweb panel covers an area of 4m x 6m when expanded.



## Ground drainage systems



ABG manufacture Fildrain as a cost effective alternative to traditional crushed stone filter drains. Fildrain has many applications in railway cuttings, cess drainage, landscape, goods yards and car parks.

Fildrain is BBA approved and consists of a high strength cusped HDPE core wrapped and bonded to a long life geotextile filter. Simply installed in a narrow trench with the excavated soil replaced as the backfill and then topped with a thin layer of crushed stone. Fildrain has a high flow capacity and is supplied in a range of heights to suit each application. It is easily connected into an existing drainage system.

Fildrain Type 10 is a horizontal drainage layer specially for slab track applications to relieve pore pressure under the slab. Fildrain has an upper impermeable surface that keys into the wet concrete and a high friction lower surface to resist the design shear forces.

## Porous paving SuDS systems



For station car parks and loading areas, it is more effective to deal with rainfall through a porous paved area than to use pipes or channels. Climate change and Government regulations lead to source-control as part of a Sustainable Drainage System (SuDS) design. ABG provide the attenuation calculations for each of their plastic porous paving systems.

Truckcell® is a heavy-duty porous paving system designed for intensive usage and high load traffic applications. The cells can be filled with topsoil and seed or with gravel to provide a robust structural surface capable of carrying HGV traffic and fork lift trucks.

Sudspave® 40 max is a porous paving system for areas with cars and light good vehicles. The cells can be filled with topsoil and seed or with gravel.

Sudspave® 40 is a porous paving system for cars. The cells can be filled with topsoil and seed or with gravel.

Sudspave® 30 is a cost-effective porous paving system intended to be filled with gravel for areas with car traffic.

AdvancedTurfSystem (ATS) is a high performance grass root zone reinforcing system that allows the formation of natural grass surfaces with the strength and durability to carry vehicles.

## Green & blue roof SuDS systems



Green roofs are not just for aesthetics and bio-diversity, they can also be designed as a functional and cost-effective Sustainable Drainage Systems (SuDS). A modern extensive green roof is lightweight and can be installed on metal deck as well as concrete roof slabs. A green roof can gain up to 7 BREEAM points and significantly reduce energy demand.

ABG manufacture Roofdrain as an attenuation and drainage layer to retain moisture in shallow (100mm) depths of growing media. ABG also supplies growing media and the sedum and wild flower mats.

The Blue Roof is a new innovation that enables a large volume of water to be stored on the roof which is then released slowly over the period of days. A Blue Roof is often more cost-effective than the installation of a SuDS tank in the ground.

ABG provide a design, supply and install service for Green and Blue Roofs via Geogreen.



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