

A blue and white VL360 locomotive is shown on a railway track. The locomotive has "GURNER'S LANE VL360" written on its side. A person in an orange safety vest is visible in the driver's cab. In the foreground, a large white geofabric is laid out on the ground. The background features trees and a brick building.

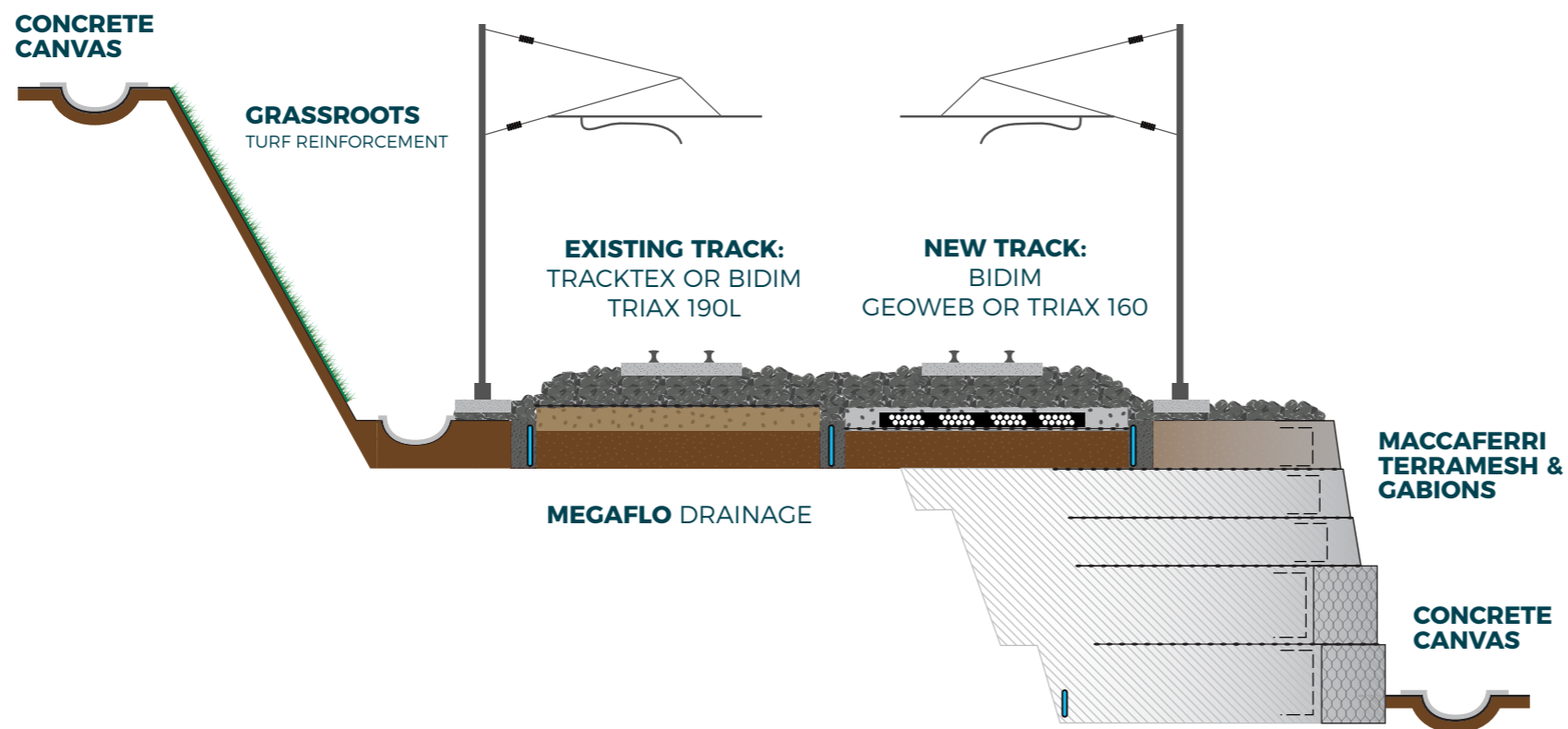
RAIL & TRACK SPECIALIST

Geofabrics offers a range of solutions for new track construction as well as renewal or maintenance of existing railway tracks which can deliver both construction savings and life-cycle optimisation.

Our solutions incorporate control of track geometry and rail alignment, stabilisation of the ballast and capping layers and complete drainage systems.



THE RAIL CORRIDOR



A rail track is made up of the rail, the fastening system, sleepers, ballast and capping/structural layer. The system needs to survive the trafficking and climate so that the subgrade is adequately protected and that the performance of the track is effectively supported during the design life. A primary function of the capping/structural fill layers is to distribute forces to make sure that the stresses in the subgrade are at a satisfactory level.

The use of geosynthetics within the ballast and capping/structural fill layers can significantly reduce track substructure renewal costs as well as enhancing its performance, reducing maintenance costs and increasing the lifetime of the design. In order to understand which materials will enhance the system we must first examine the track sub-structure. The track sub-structure is the foundation that supports the track and facilitates drainage.

MUD PUMPING SOLUTION

TRACKTEX® LAMINATED COMPOSITE

Subgrade erosion or mud pumping can result in loss of line and level and the creation of mud holes which requires extensive maintenance and monitoring to keep under control.

Tracktex®, which is approved by Network Rail in the UK and specified within the AREMA manual in the US, is a long term solution which prevents the mud pumping phenomenon of fine grained particles in the formation layer beneath the ballast being mobilised upwards into the ballast layer above.

Tracktex® is a proven mud pumping solution which has been used around Australia and New Zealand to deliver significant reductions in maintenance cycles on affected sections of track.



ADVANTAGES

- Reduce maintenance costs associated with mud pumping, supported by years of local and international installations
- Conforms to surface depressions in the formation layer preventing the creation of slurry pockets
- Fast installation rates reducing the construction costs and increasing the coverage for a given possession time
- The United Kingdom Accreditation Service (UKAS) accredited laboratory testing supported by local and international rail authority approvals
- Rolls are produced in the Geofabrics' Albury manufacturing facility, allowing bespoke production, including custom roll dimensions to suit your project requirements.

SEPARATION SOLUTION

BIDIM® & BIDIM® GREEN NON-WOVEN GEOTEXTILE

bidim® geotextiles are commonly used in the rail sector to separate the capping layer from the ballast layer, providing separation and filtration. The rail industry typically demands bespoke bidim grades due to the nature of their aggregates and applied loads.

SEPARATION

bidim® geotextile should be used in the construction of rail formation to separate the ballast and capping layers and also at subgrade capping layer interface. Using a layer of bidim® geotextile will help to protect the capping layer from the ballast above, helping to preserve track geometry, minimizing maintenance cost.

FILTRATION

bidim® geotextiles are highly porous and it allows water to pass through while preventing soil migration. Helping to prevent fines contaminating rail formation and ballast layers.

DRAINAGE

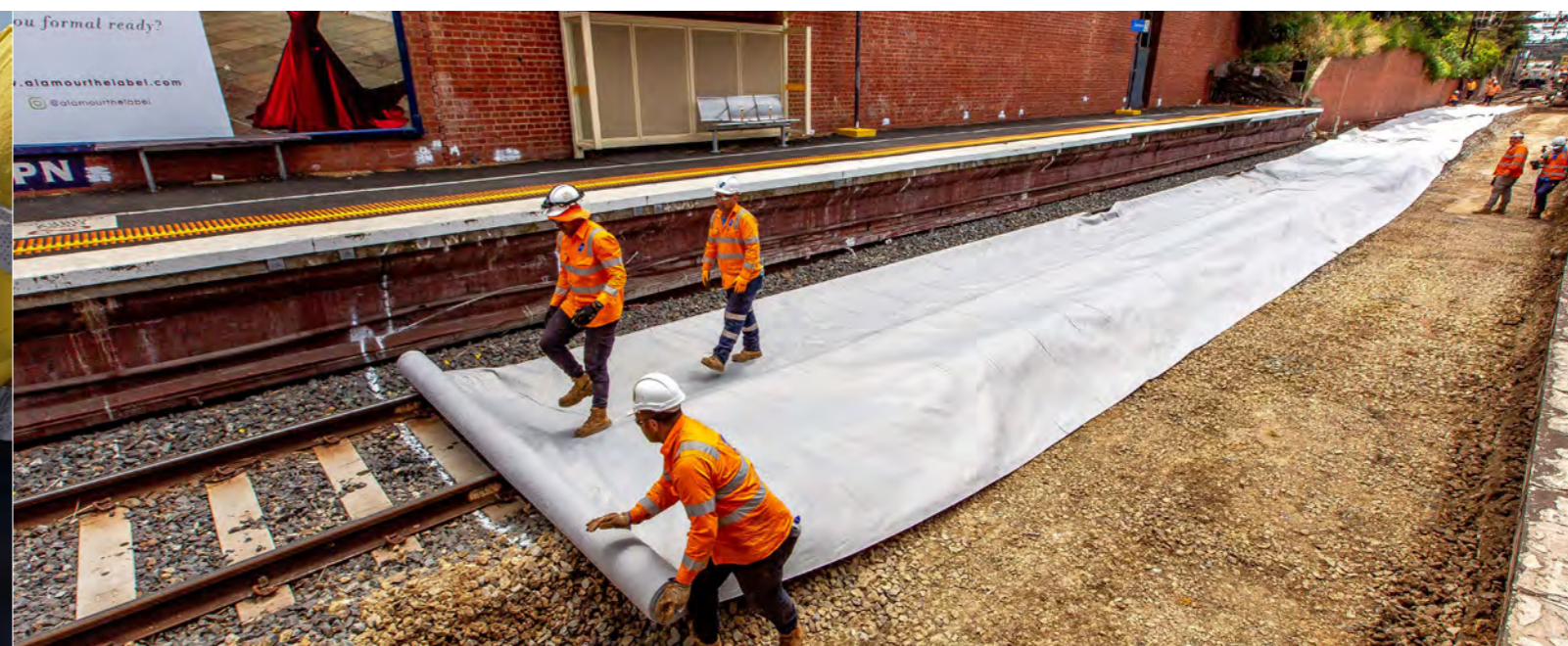
bidim® geotextiles have a three-dimensional structure designed to improve drainage performance. Ideal for use in subsoil drainage systems, bidim® geotextiles will allow the dissipation of pore water pressure which can have a detrimental effect on rail formation.

bidim® Green geotextile is a premium geotextile that incorporates Australian recycled material that leads the way in terms of technical performance and versatility. Geofabrics now offers a sustainable solution that has applications in virtually every civil engineering construction project.

- ✓ Recycled Geotextile
- ✓ Recycled Wrap
- ✓ Recycled Core

ADVANTAGES

- The incorporation of bidim geotextiles reduces the need for quarried fill materials and reduces construction times.
- Tightly rolled wide rolls can result in significant transportation cost savings.
- An Australian made product, allows full QA traceability of every roll, with many customers auditing our local production facilities.
- Local UV testing conducted over many years, which is important as Australia experiences some of the highest levels of UV radiation in the world.
- Complies with all road, rail and landfill authority specifications.
- Local stock holdings ensure we have the right product in the right place at the right time.

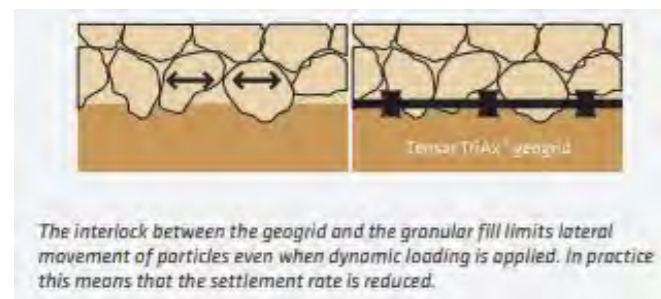


BALLAST STABILISATION

Approved by Network Rail in the UK and national rail authorities across the world, Tensar® TriAx® Tx190L geogrid is specially designed for use in track beds. The unique large aperture triaxial structure of Tensar® TriAx® Tx190L is designed specifically for track ballast stabilisation. It is scientifically proven to lock ballast in place limiting lateral movement and keeping tracks aligned. This technology reduces the rate of ballast degradation and settlement to extend the track maintenance cycle.

TENSAR® TRIAX® Tx190L GEOGRID

Tensar® TriAx® Tx190L geogrid is widely used with rail ballast and is supported by international rail research. Using Tensar® TriAx® Tx190L geogrids to mechanically stabilise ballast will reduce the rate of ballast settlement, maintain track geometry for longer and extend maintenance cycles delivering real cost savings in construction.



Geoweb® cellular confinement system can help create high-stiffness ballast layers by confining the ballast within the 3D structure, creating a stiffened slab which increases load-bearing capacity and minimises horizontal and vertical movement. The perforated structure of Geoweb® allows lateral drainage of water from within the ballast.

ADVANTAGES

- The interlocking structure of a Tensar® TriAx® geogrid gives it greater strength and endurance.
- Extensive traffic trials in the UK support outstanding performance.
- Using triaxial geogrids also saves on costs in terms of sub-base and aggregate requirements.
- Tensar® TriAx® geogrids triple the load capacity on road and highway projects.
- Tensar® geogrids are cost-effective and have a proven performance record in New Zealand and Australia.



TRACK BALLAST STABILISATION WITH GEOWEB®

In areas of soft subsoils, our **Geoweb®** can help create stiffness foundations under the track, at bridge approaches, and turnouts.

By creating a more stable and stiffer layer under track, the **Geoweb®** soil stabilization system is a proven solution for ballast stability problems.

The 3D system delivers **performance and constructability benefits** especially in soft subgrades.

Extreme field testing and research at TCI and Oregon State University substantiated the **Geoweb®** system's benefits to the ballast layer - **reducing settlement and track displacement under heavy freight loading** over very soft subgrades.

University of Kansas SmartRock testing also revealed a significant reduction in ballast abrasion, movement and rotation **resulting in extended ballast life.**

ADVANTAGES

- Geoweb® is manufactured to ISO 9001 quality standards. Its robust UV resistant structure is ideal for use in harsh environments.
- Geoweb® can be installed quickly, particularly through the use of the patented ATRA Key connection system or high strength tendons, saving on installation costs.
- It is an eco-friendly soil stabilisation solution that blends into the natural environment.
- Its strong, three-dimensional structure means it can easily withstand construction activities.

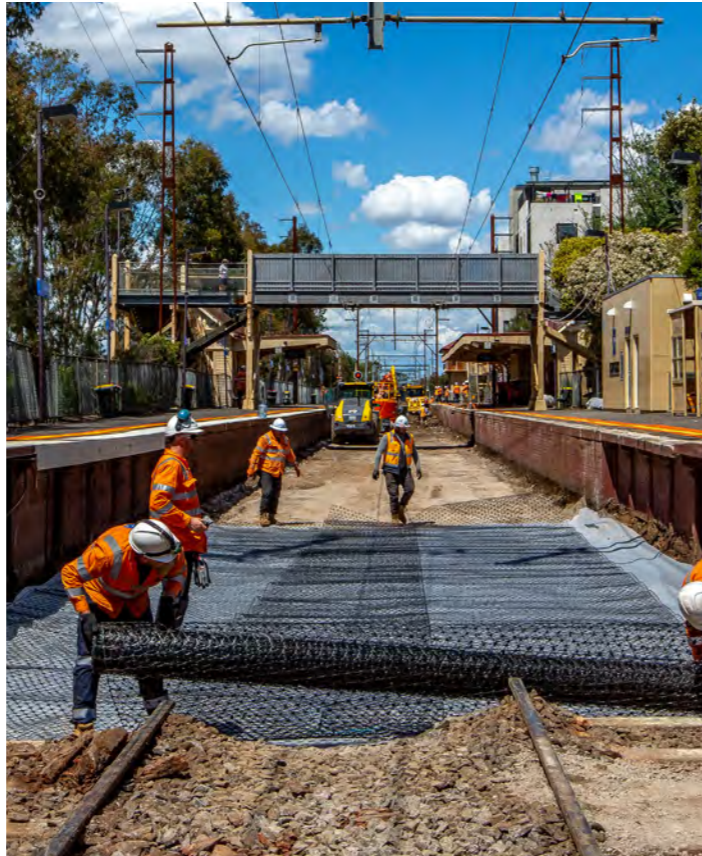


SUB - BALLAST STABILISATION

When constructing track over soft subgrade soils having a low bearing capacity, it is necessary to improve the foundation to support the ballast effectively. This can involve a time-consuming chemical stabilisation of the subgrade or deep excavation followed by importation and placement of a thick and expensive granular sub-ballast layer.

TENSAR® TRIAX® Tx160 GEOGRID

Tensar® TriAx® Tx160 geogrids are used within the track substructure by improving the track foundation through the mechanical stabilisation of the capping layer. When constructing track over soft subgrade soils having a low bearing capacity, it is necessary to improve the foundation to support the ballast effectively. Capping layers reinforced with Tensar® Tx160 geogrids can increase load carrying capacity and prolong service life.



ADVANTAGES

- The interlocking structure of a Tensar® TriAx® geogrid gives it greater strength and endurance.
- Extensive traffic trials in the UK support outstanding performance.
- Using triaxial geogrids also saves on costs in terms of sub-base and aggregate requirements.
- Tensar® TriAx® geogrids triple the load capacity on road and highway projects.
- Tensar® geogrids are cost-effective and have a proven performance record in New Zealand and Australia.

GEOWEB® - CELLULAR CONFINEMENT SYSTEM

Geoweb® was initially developed by Presto Geosystems together with the US Army Corp of Engineers to allow heavy vehicles to travel over soft ground. Geoweb® comes in collapsed, lightweight panels which can be handled easily and safely onsite.



ADVANTAGES

- Creates a stable surface—diffuses vertical pressures and lateral stresses.
- Allows the subgrade material to withstand more than 12-15 times the number of load cycles with less deflection and less long-term settlement.
- Can reduce the structural infill depth by 50% or more.
- May allow use of on-site sand or lower quality aggregate.
- Lowers maintenance requirements and costs.

SUBSOIL DRAINAGE SOLUTIONS

Bearing capacity of foundation material below ballast is affected by excess moisture unless effective subsurface drainage is in place. Megaflo® panel drains have a profile that offers higher resistance to deformation and loss in discharge capacity required for use under rail track.

Megaflo® is a proven quick response drainage solution which has been widely used across Australasia to remove water from rail track formations.

MEGAFLO® FLAT PANEL DRAIN

Megaflo® is an excellent drainage system, removing water from the rail related structure faster than any other drainage system.

The Megaflo® system is manufactured as a corrugated panel supported by internal pillars along the length of the drain. This shape and structure gives Megaflo® a high crush resistance whether the drainage system is used vertically or horizontally.

Bearing capacity of foundation material below ballast is affected by excess moisture unless effective subsurface drainage is in place. Megaflo® panel drains are manufactured from HDPE and have a profile that offers a higher resistance to deformation and loss in discharge capacity required for use under rail track.

ADVANTAGES

- Megaflo® is manufactured in Australia, allowing full traceability of every roll while supporting local communities.
- It is narrow in width, making it easy to install and is stiff in the vertical axis.
- Megaflo® is supported by testing, design software and local stock holdings, as well as thousands of kilometres of installation over the past decade.
- The Megaflo® system's design simplifies the installation process, significantly reducing costs.
- Megaflo® has a high crush resistance and an unmatched drainage response time.
- Megaflo® complies with the local road, rail and landfill specifications.



WALL SYSTEMS

Reinforced soil structures involves the inclusion of geogrid soil reinforcing element spaced within the soil fill to create a composite engineering structure with vastly improved characteristics.

This ensures that the soil structures are able to be constructed steeper and higher than naturally compacted soil angle and also enhance the load-carrying performance.

GABION MASS GRAVITY WALLS

Maccaferri® gabions and Reno Mattresses® are a trusted, technically sound way to retain earth and combat soil erosion.

Maccaferri® gabions are rectangular woven wire mesh baskets that can be filled with rock to create flexible, permeable structures.

Their strength comes from a double twisted hexagonal mesh of steel wire, reinforced by heavier gauge wire along the edges and internal diaphragms.

Maccaferri® gabions and Reno Mattresses® have been widely used across Australasia for over 50 years.



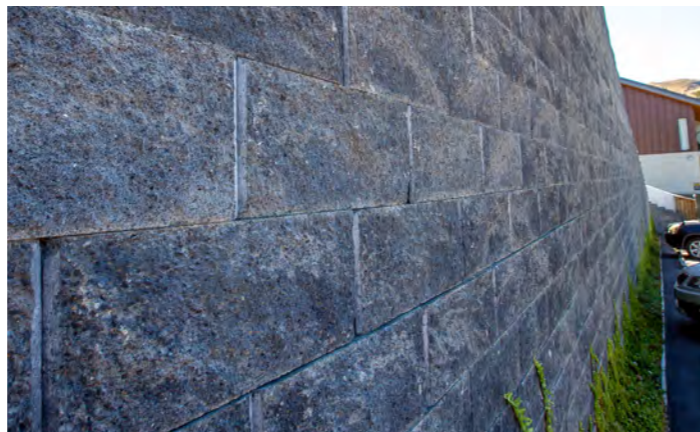
MACCAFERRI® TERRAMESH® & GREEN TERRAMESH®

Maccaferri® Terramesh® is a versatile, modular system for reinforced slope systems and mechanically stabilised earth walls that can be a more cost effective solution than the mass gravity gabion wall because of the speed of installation and reduced rock fill requirements.



KEYSTONE® TW3® WALL

Keystone® TW3® Wall System is a proven, practical engineered solution for bridge abutments and retaining walls. The Keystone® TW3® Wall System is a cost-effective alternative to traditional retaining walls offering both versatility and substantial savings in cost and construction time, especially for high walls with high loads.



In recent years, reinforced soil techniques have gained much popularity in many parts of the world due to the ease of design and construction. With modern design code of practices written around these structures, it is now one of the fastest developing fields in civil engineering.

Engineers are attracted by the greater reliability and control arising from the consistent properties of modern reinforcement.

ROCKFALL PROTECTION

Rockfall protection and rockfall mitigation are key elements in the security and safety of infrastructure, mine works, buildings or people. Even small rockfalls, or debris flows can block infrastructure and can have far-reaching economic effects beyond the immediate disruption.

ROCKFALL & LANDSLIDE EMBANKMENTS



Rockfall protection embankments are an effective option to intercept rockfalls or shallow landslides; especially when there are very frequent rockfalls that needs to be intercepted or when the anticipated impact energies are too high for a standard rockfall catch fence to handle.

MESH DRAPERY SYSTEMS



Geofabrics offers a complete range of Maccaferri® mesh systems for rockfall protection. The Maccaferri® range of high strength mesh systems encompasses a group of high durability products with a range of strengths and corrosion protection options.

FLEXIBLE STRUCTURAL FACING FOR SOIL NAILING



DEBRIS FLOW AND SHALLOW LANDSLIDES



Maccaferri® Debris Flow Barriers have been developed to intercept soil/water flows or shallow landslides on slopes, channels and chutes.

DYNAMIC ROCKFALL BARRIERS



In certain rockfall hazard situations, it may not be practical to install rockfall drapery mesh protection or surface stabilization mesh due to scale, complexity, technical, topographic, access or economic issues. In these cases, a cost-effective solution is provided by installing dynamic rockfall barriers.

The objective of using Flexible Structural Facing is to provide stability of the face by supporting the soil in between the soil nail locations and transmitting the load from the soil to the nail heads via mesh membrane stiffness.

EROSION CONTROL FOR SLOPES

Enhancement of erosion performance of vegetated cover material on dry land slopes can be achieved using a range of different vegetated and non-vegetated geosynthetic solutions.

These include temporary and permanent erosion control mattings, some designed to withstand higher-velocity water flows.

BIODEGRADABLE

JUTE MAT

Jute Mat is the robust weed and erosion control geotextile made of natural jute fibres. It comes in two grades, thick and fine, to accommodate any use.

Jute Mat acts as a mulch, providing weed suppression and moisture retention to enhance plant establishment, while protecting the topsoil from erosion. Jute Mat is laid over the top of the seeded area, protecting topsoil and seed from water and wind erosion while promoting a moist micro-climate for seed germination.

Jute Mat is ideal for the stabilisation of low-flow drainage lines, and assisting grass establishment on batters of up to 1:1.



SYNTHETIC GRASSROOTS®

Grassroots® is an erosion control matting designed to protect underlying soil in steep slopes, and channels from moderate to high-velocity water flow, rain splash and other erosive conditions. While allowing seeds to germinate successfully and grow through the matting providing permanent vegetative reinforcement. Grassroots® is made in Australia by Geofabrics from heavy synthetic UV stabilised fibres which are needle punched together into an open weave synthetic scrim.



MACMAT®

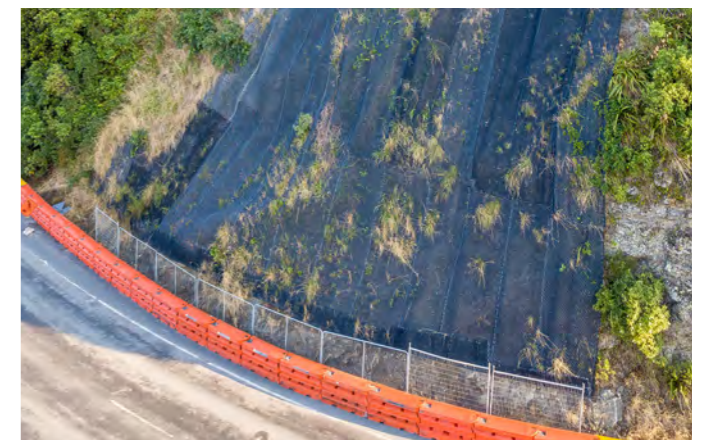
MacMat® is a three-dimensional matrix of UV stabilized, non-degradable synthetic fibres, heat bonded where they cross. It is used for long-term erosion protection applications and it immediately increases the soil's resistance to erosion by providing an environment that enhances the growth of vegetation through the mat.



MATMAT® R

MacMat® R is a permanent erosion control material which was both strong and environmentally acceptable.

It is a mesh reinforced three-dimensional geomat that can be applied as an erosion control mat for sloped embankments, channel linings and soil-veneer applications.



CONCRETE CANVAS®

Concrete Canvas® is a flexible, concrete impregnated fabric that hardens when hydrated to form a thin, durable, water proof and fire resistant concrete layer.

Concrete Canvas® is used in a variety of civil infrastructure applications, such as ditch lining and slope protection.



GEOWEB®

The Geoweb® system consists of a robust three-dimensional structure housing a network of interconnected cells that confine and compact soil. The confinement action prevents erosion and improves the structural performance of the soil or aggregate infill providing an alternative to reinforced concrete or armour. The Geoweb® cellular confinement system comes in collapsed, lightweight panels which can be handled easily and safely onsite.



SMARTER INFRASTRUCTURE

For 30 years in New Zealand and 40 years in Australia we have supported the infrastructure sector on significant projects from the Victorian Level Crossing Removal projects to APLNG in Queensland to the Christchurch Gondola in New Zealand. On these projects, and every project we undertake, we have a singular focus: to provide smarter infrastructure solutions for our clients.

For us smarter infrastructure is about using smart products, smart solutions and smart people to help our clients develop value engineering opportunities for their projects. We believe this delivers greater opportunities to lower risk, cost and construction time frames whilst increasing maintenance cycles and whole of life opportunities.

WHERE YOU NEED US

Geofabrics has the largest regional footprint of any geosynthetic supplier in Australasia.

We have branches throughout Australia, New Zealand and Papua New Guinea. Within Australia we have branches in every state as well as offices in strategic regional centres along the east coast staffed by Geofabrics own employees. In New Zealand we have offices throughout the North and South Islands.

This means that we can deliver product where you need it, when you need it while providing local expertise to support your project.



GEOFABRICS.CO

IMPORTANT NOTICE - DISCLAIMER - The information contained in this brochure is general in nature. In particular the content of this brochure does not take account of specific conditions that may be present at your site. Site conditions may alter the performance and longevity of the product and in extreme cases may make the product wholly unsuitable. Actual dimensions and performance may vary. If your project requires accuracy to a certain specified tolerance level you must advise us before ordering the product from us. We can then advise whether the product will meet the required tolerances. Where provided, installation instructions cover installation of product in site conditions that are conducive to its use and optimum performance. If you have any doubts as to the installation instructions or their application to your site, please contact us for clarification before commencing installation. This brochure should not be used for construction purposes and in all cases we recommend that advice be obtained from a suitably qualified consulting engineer or industry specialist before proceeding with installation. © Copyright held by Geofabrics Australasia Pty Ltd. All rights are reserved and no part of this publication may be copied without prior permission.