



**SLOPES & WALLS
SELECTION GUIDE**

GEOFABRICS®
Sustainable solutions





Geofabrics Centre for
**GEOSYNTHETIC
RESEARCH,
INNOVATION &
DEVELOPMENT**



**Built for
strength
& tested for
longevity**

Why use geosynthetic engineering in slopes & walls?

Geofabrics offers a range of engineered embankment, slopes and retaining wall solutions for infrastructure projects. Our solutions support embankments over soft ground, the reconstruction of failed slopes, steep reinforced soil slopes, and retaining walls for highways, land development, and water courses.

To support the design of embankments, slopes and retaining walls, our team of engineering specialists provide technical advice, in-house or seminar training and certified designs if required.

Our GRID (Geosynthetic Research, Innovation & Development) laboratory is a specialist facility that works with clients to develop the right geosynthetic solution for each project.

Benefits

ECONOMIC

Using Geofabrics slopes and wall solutions provides significant cost savings with faster, more efficient construction, less materials required and a reduction in maintenance.

TECHNICAL

Our products are developed through world-leading research and innovative design to deliver high performance and durability.

To determine the most appropriate solution to meet your project requirements, there are several factors that should be considered:

- Geometry and overall aesthetics
- Construction access
- Height of the structure and the load imposed on it
- Quality and availability of fill materials
- Permanent or temporary structure
- Budget constraints

There is a slopes and wall solution for every project, whether it be for a small domestic retaining wall or a large-scale reinforced soil structure for a major highway. The objective is the same, regardless of the project size – to win back space and provide safe soil retention.

QUALITY & TRACEABILITY

Geofabrics manufactures in compliance with the Australian and International Quality Standards and is ISO 9001 assured. We operate two QA laboratories in Australia – Albury is NATA accredited, Ormeau GRID is GAI LAP accredited and products are tested frequently and transparently.

ENVIRONMENTAL

Geofabrics is dedicated to reducing the environmental impact of construction. Our solutions are designed to integrate with natural surroundings and use less carbon-intensive materials. This approach helps mitigate environmental risks and ensures projects are sustainable and eco-friendly.

Geofabrics is a proud member of the Infrastructure Sustainability Council (ISC).

SAFETY

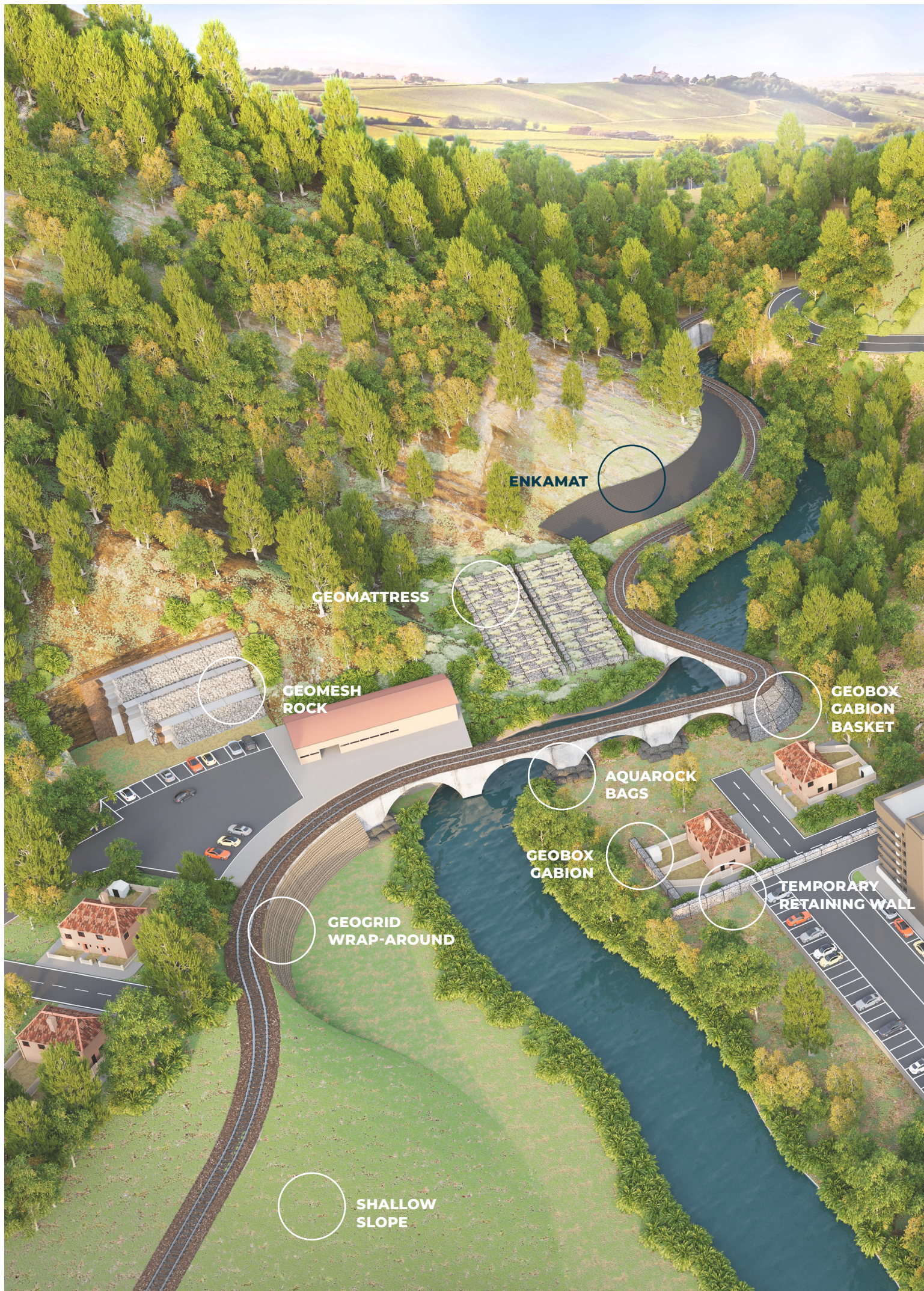
Our solutions are certified and ensure compliance with industry standards, prioritising safety across all projects.



$>70^\circ$

AS A GENERAL GUIDELINE, A STRUCTURE IS CLASSIFIED AS A SLOPE IF THE FACE ANGLE IS 70° OR LESS, WHILE IT IS CLASSIFIED AS A WALL IF THE FACE ANGLE EXCEEDS 70°





ENKAMAT

GEOMATTRESS

GEOMESH
ROCK

GEOGRID
WRAP-AROUND

SHALLOW
SLOPE

AQUAROCK
BAGS

GEOBOX
GABION

GEOBOX
GABION
BASKET

TEMPORARY
RETAINING WALL



**GEOMESH
NATURAL**

**GEOMESH
GABION**

**SHALLOW
SLOPE**

**CONCRETE
PANEL**

**KEYSTONE
TW3**

VERTI-BLOCK

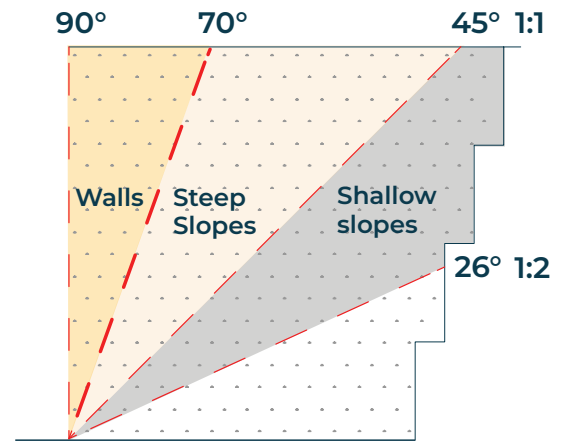
**SEGMENTAL
BLOCK**

GEOFABRICS



Retaining walls & reinforced soil structure selection guide

As a general guideline, a structure is classified as a slope if the face angle is 70° or less, while it is classified as a wall if the face angle exceeds 70° .



LONG TERM SLOPE STABILISATION SOLUTIONS TO SUIT THE UNIQUE NEEDS OF THE PROJECT

MSE & RSS structures

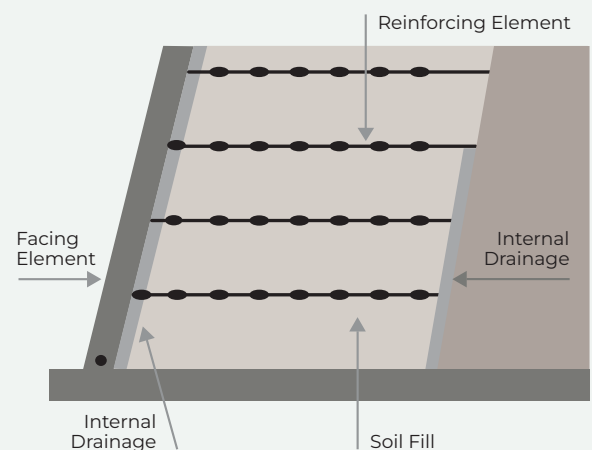
Mechanically Stabilised Earth (MSE) wall systems and Reinforced Soil Slope (RSS) systems are modular, soil retention systems that combine engineered backfill with reinforcing elements such as wire mesh and geogrids, finished with rock or vegetation. These systems offer a cost-effective, durable and visually appealing alternative to traditional retaining walls.

MSE walls are vertical or near-vertical retaining structures built with compacted engineered fill and reinforcement materials such as woven wire mesh and geogrids. MSE wall systems are finished with a gabion or concrete-block facing.

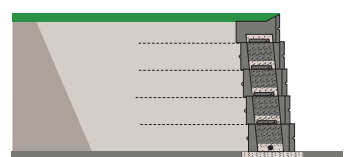
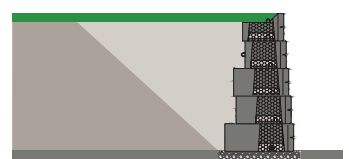
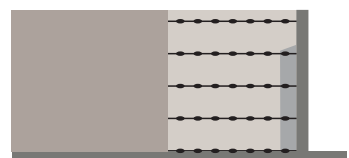
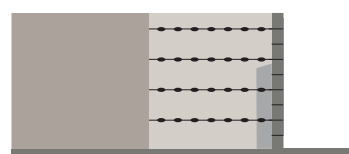
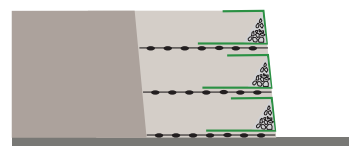
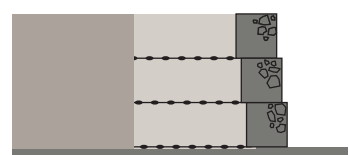
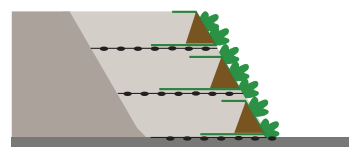
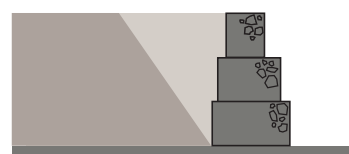
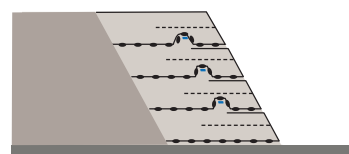
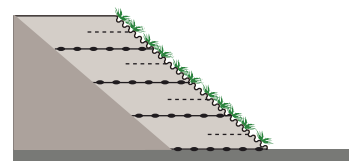
RSS systems extend the same concept to sloped surfaces, typically with inclinations between 45 degrees and 70 degrees and are often finished with vegetation for a natural appearance. These systems rely on the interaction between the reinforcing materials and soil to resist the outward movement of the reinforced fill, allowing the structure to perform under static and seismic loads.

Reinforced soil is widely used for its simple design, fast construction and reliable performance. It outperforms traditional systems, especially in dynamic and seismic conditions, and is ideal for walls, abutments, steep slopes and landslide repairs.

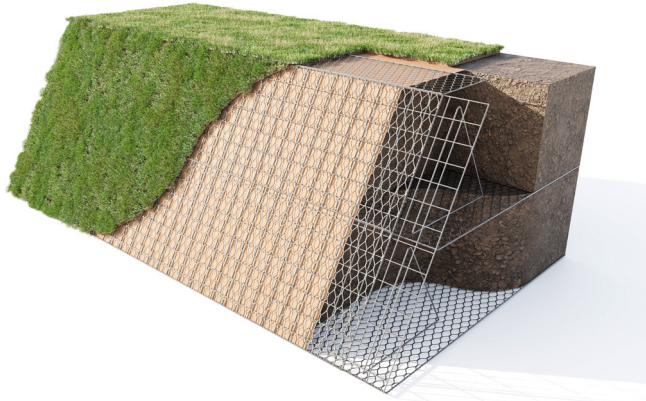
A reinforced soil structure relies on four key components: soil fill, reinforcement, facing and internal drainage. Compacted, well-graded granular soil is preferred for stability and drainage.



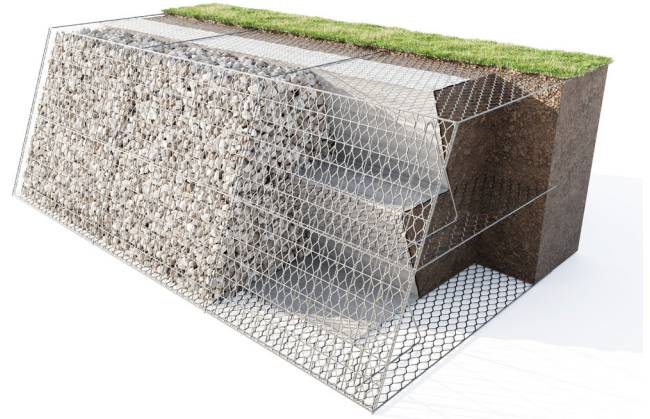
Use the selection guide to determine which system is right for you. Our team is available to assist with advice, engineering and designs.



Retaining Walls & Reinforced Soil Structures		
System	Angle	Key Features and Benefits
≤ 45° SLOPE	20°– 45°	- Geogrid terminated at the front face - Site-won fill may be used - Erosion control mat utilised on slope surface - Front face is usually vegetated
WRAP-AROUND (veg/non-veg)	45°– 90°	- Face geogrid protection - Temporary or permanent with vegetation - Needs formwork or sandbags - Thrust relief behind structures
GEOBOX GABION BASKET	45°– 90°	- Double-twisted steel wire mesh - Interconnectable units - High corrosion resistance - More cost-effective than traditional systems - Greater tolerance to differential settlement
GEOMESH NATURAL (RSS)	45°– 70°	- Modular wire mesh system - Designed to create an angled vegetated finish - Improved structural performance - Cost-effective with compliant site-won backfill
GEOMESH GABION (MSE)	63°– 90°	- Supports vertical or stepped facings for tall structures >20m - Polymer-coated wire mesh for corrosion resistance - Expected working life of up to 120 years - Designed for building rock-faced Mechanically Stabilised Earth (MSE) walls
GEOMESH ROCK (MSE)	70°– 87°	- Modular polymer-coated wire mesh system - Angled gabion rock-face finish up to 87° - Expected working life of up to 120 years - Face angles of 70°, 80° and 87°
SEGMENTAL BLOCK WALL	84°– 90°	- Maintenance-free retaining wall structure - Dry laid, hand-stacked precast blocks for easy installation - Various textures/colours - Positive or friction-based connections
PRECAST CONCRETE PANEL WALL	90°	- Full-height panels with custom textures/patterns - Integrated geogrid starters in panels - Primary reinforcement geogrid connected with polymeric bodkin connectors
VERTI-BLOCK GRAVITY WALL	Up to 90°	- Structures up to 3.66m without geogrid reinforcement - Hollow, large-format blocks reduce weight and cost - Easy and fast installation with light equipment - Interlocking design ensures stability and accuracy
VERTI-BLOCK (MSE)	Up to 90°	- Requires soil reinforcement (geogrid/tiebacks) - Allows for taller wall heights - Support high external loads - Cost-effective alternative to cast-in-place concrete



Geofabrics Geomesh Natural



Geofabrics Geomesh Rock

Reinforced slopes, retaining walls & embankments

SLOPES & GRADE STABILITY

Safe & durable slopes

Reinforced slopes are a practical and cost-effective solution to increase usable land area or address topographic challenges.

Using Geofabrics Geomesh® Natural or Rock systems, vegetated or rock-faced solutions can be constructed to reinforce slopes up to 70° using engineered fill and high-strength steel mesh. These RSS and MSE systems deliver strength, flexibility and natural aesthetics.

Where vegetated finishes are preferred, soil-filled systems like Geomesh Natural allow

integration of native plants for environmental blending and erosion control.

- Allows steep slope construction without concrete
- Fast and flexible installation
- Vegetated or rock-faced options depending on project needs

VERTICAL & NEAR-VERTICAL STRUCTURES

Retaining walls are critical where vertical grade separation is required. We offer modular systems such as Geofabrics Geomesh Gabion (rock-faced), segmental and concrete block walls, precast concrete panel walls and Verti-Block for higher-load applications.

Strong & versatile retaining walls

Geomesh Gabion forms a vertical or stepped stable mass-gravity wall with enhanced drainage and durability, ideal for road and infrastructure projects. Where aesthetics and easy installation are priorities, segmental block systems provide a clean, architectural finish. Precast concrete panel walls are constructed with full height panels customised with pattern

or texture. Geogrid reinforcement starters can be integrated into the panels for stability.

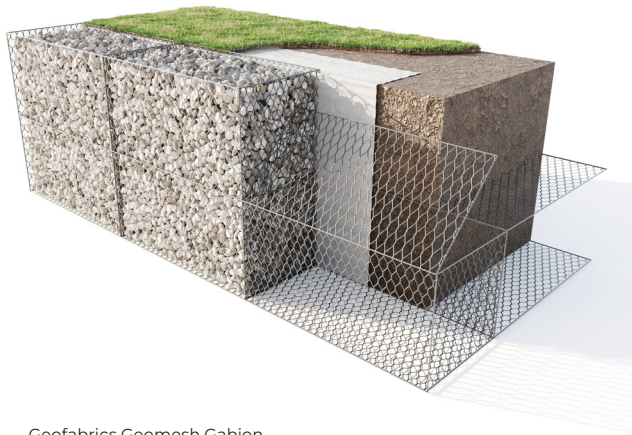
- Supports significant earth pressure
- Multiple face finishes: rock, modular block, precast panel
- Systems suitable for permanent or temporary works

RECOMMENDED REINFORCED SLOPE PRODUCTS

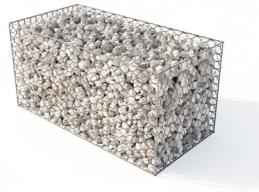
Geomesh Natural
Geomesh Rock

RECOMMENDED RETAINING WALL PRODUCTS

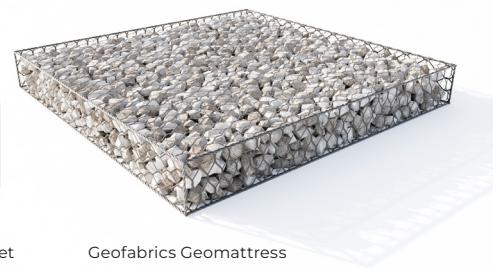
Geomesh Gabion
Keystone TW3 concrete block
Verti-Block concrete block
Precast Concrete Panel Wall



Geofabrics Geomesh Gabion



Geofabrics Geobox gabion basket



Geofabrics Geomattress

REINFORCED FILL STRUCTURES OVER POOR GROUND

On soft or unstable soils, reinforced embankments using MSE systems, like Geomesh Gabion, can improve bearing performance and allow rapid construction.

These systems can accommodate differential settlement, reduce loads on foundation soils and allow steeper side slopes. High-strength geosynthetics can be used to reinforce and stabilise the soil, and Geofabrics Geomattress® provides enhanced erosion protection where there is potential for scour.

- Reduces need for deep foundations
- Accommodates settlement without cracking
- Compatible with staged or high-fill embankment design

Erosion Control

SURFACE STABILISATION SOLUTIONS

Erosion control is critical for exposed slopes, drain lines and infrastructure cuttings. Geofabrics offers both soft and hard face options.

Geofabrics offers a range of slope protection products, from soft to hard solutions for dry or wet slopes. Options include contained rock, topsoil and vegetation reinforcement, grassroots systems, and hard surface protection using hydrated concrete roll products.

- Protect slope surface from erosion and maintains slope integrity
- Compatible with revegetation strategies
- Supports environmental compliance and land rehabilitations

Effective
**erosion
control**
with long-term
benefits

Flood protection

SLOPE & WALL SYSTEMS FOR FLOOD-PRONE AREAS

Geomesh Gabion, Geomattress and Geobox gabion basket are commonly used in levees, bunds and flood barriers.

Their permeability and structural flexibility allow them to dissipate hydraulic forces and reduce scour during flooding events. These systems are often specified along riverbanks, around culverts and for protecting infrastructure at risk of over topping.

- Withstands repeated hydraulic loading
- Fast installation in emergency situations
- Easily integrates with drainage and geotextile layers

Engineered for
**flood-
prone
areas**

RECOMMENDED EMBANKMENT PRODUCTS

Geomesh Gabion
Geomesh Natural
Geomesh Rock

RECOMMENDED EROSION CONTROL PRODUCTS

Geomattress rock mattress
Geomat HD
Grassroot
Enkamat
Jutemat
Geoweb

RECOMMENDED FLOOD PROTECTION PRODUCTS

Geomesh Gabion
Geobox gabion basket
Geomattress rock mattress



Flexible systems post-disaster

Disaster prevention & recovery

STABILISING INFRASTRUCTURE AFTER FAILURE

Post-disaster reconstruction often requires rapid, durable slope and wall solutions. Our Geofabrics Geobox® gabion baskets and Geomattresses are ideal for emergency works, offering easy handling, fast installation and adaptability to irregular terrain.

For long-term slope repair, MSE structures like Geomesh Gabion or Natural systems provide permanent stability with minimal site disturbance.

- Ideal for slip repairs and flood-damaged slopes
- Quick mobilisation with site-won fill compatibility
- Durable steel mesh systems reduce risk

High velocity & fluctuating flow capability

Hydraulic engineering & structures

PROTECTING INFRASTRUCTURE FROM FLOWING WATER

Where water flow interacts with sloped surfaces, such as spillways, canals and drainage channels, protection systems like Geomattress or Geobox gabion basket are used to stabilise surfaces and control erosion.

These systems offer permeability, flexibility and strength, especially when used in combination with geotextile underlayers to prevent subgrade washout.

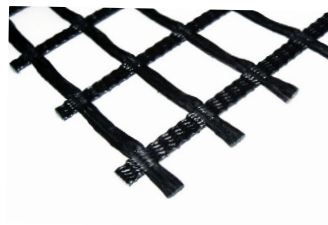
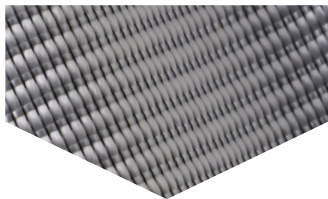
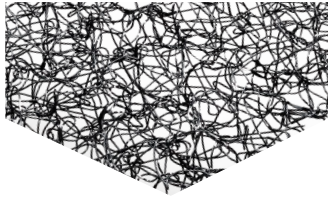
- Suitable for high-velocity and fluctuating flows
- Conforms to irregular channel geometry
- Durable mesh and confined stone solution with low maintenance project needs

RECOMMENDED DISASTER PREVENTION PRODUCTS

Geobox gabion basket
Geomattress rock mattress

RECOMMENDED HYDRAULIC ENGINEERING PRODUCTS

Geomattress rock mattress
Geomesh Rock



Complimentary Products for Slopes & Walls

Products	Typical Application	Key Features and Benefits
ENKAMAT	Turf reinforcement mat for vegetation root reinforcement	• 3D open structure for greater area holding capacity of topsoil • PA polymer does not promote or propagate fire • Greater elongation at break minimises installation damage on steeper slopes
MIRAFI PET	Basal reinforcement for structures	• High strength with grades up to 2000kN/m • Long term properties for proven performance over the lifetime of the structures • Custom roll length can be manufactured for ease of installation and to reduce wastage • Excellent in-ground durability over long periods of time
GEOMATTRESS ROCK MATTRESSES	Hydraulic structures	• Double-twisted steel wire mesh filled with rock • Internal diaphragms for rock stability • 70% more effective than rip-rap • Withstands water velocities of 5–6 m/sec • Supports ecological regeneration

Geogrid reinforcement in slopes and walls

Geogrid Type	Role	Key Features and Benefits
UNIAXIAL RE	Monolithic HDPE	• Inert to high pH • Carbon black additives for UV resistance • Positive connection via bodkin joint
MIRAGRID GX	Woven polyester	• Wider roll width • Flexible geogrid without the memory



AUSTRALIAN-MADE GEOFABRICS

Geofabrics is the only geotextile manufacturer in Australia, with plants in Albury and Ormeau. We pride ourselves on providing unrivalled service to our customers. We can recommend the best geosynthetic product to achieve the objectives of your project and ensure it's available when you need it.

Over 40 years of experience allows our technical staff to provide practical support, based on local conditions. We are proud to have been recognised in the Australian Financial Review (AFR) Most Innovative Company list in 2020 with Bidim Green.

In 2021, Geofabrics ranked #1 in AFR's Most Innovative Company for Manufacturing and Consumer Goods for Sorbseal.

With a view to the future, we are committed to improving the sustainability of our business by reducing waste to landfill, lowering our carbon emissions and investing in our people.

— FINANCIAL REVIEW **BOSS** —
MOST INNOVATIVE
COMPANIES

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OR **GEOFABRICS.CO.NZ** OR CALL 0800 60 60 20 (NZ)



GEOFABRICS®
Sustainable solutions

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