Geosynthetics in Green Roof/ Landscaping



G AND E COMPANY LIMITED

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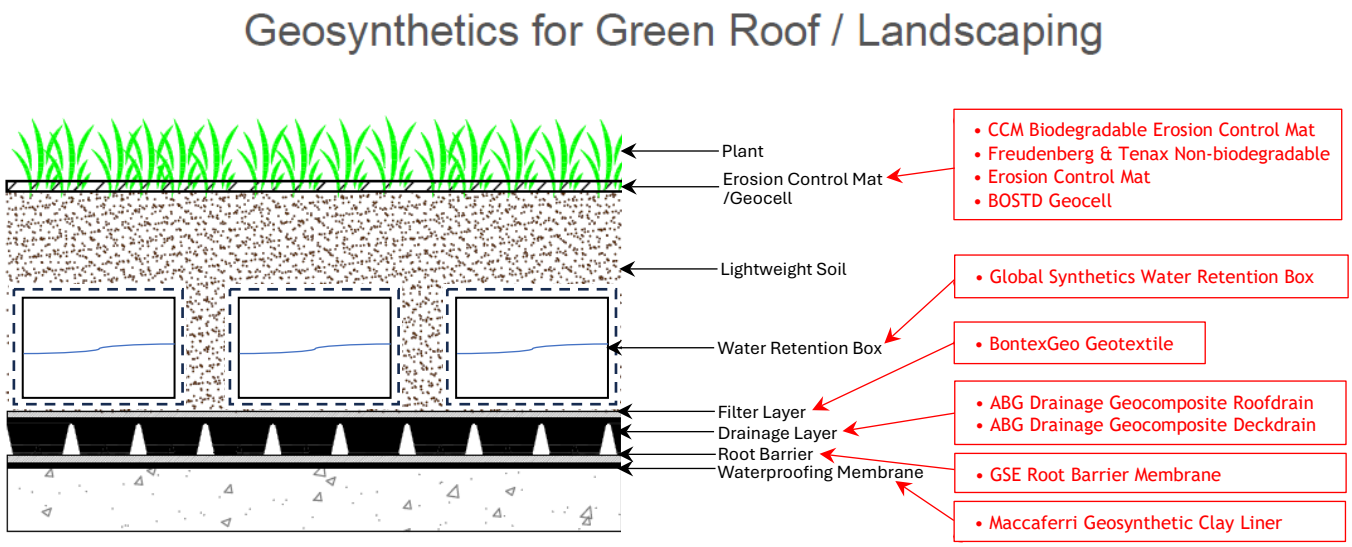
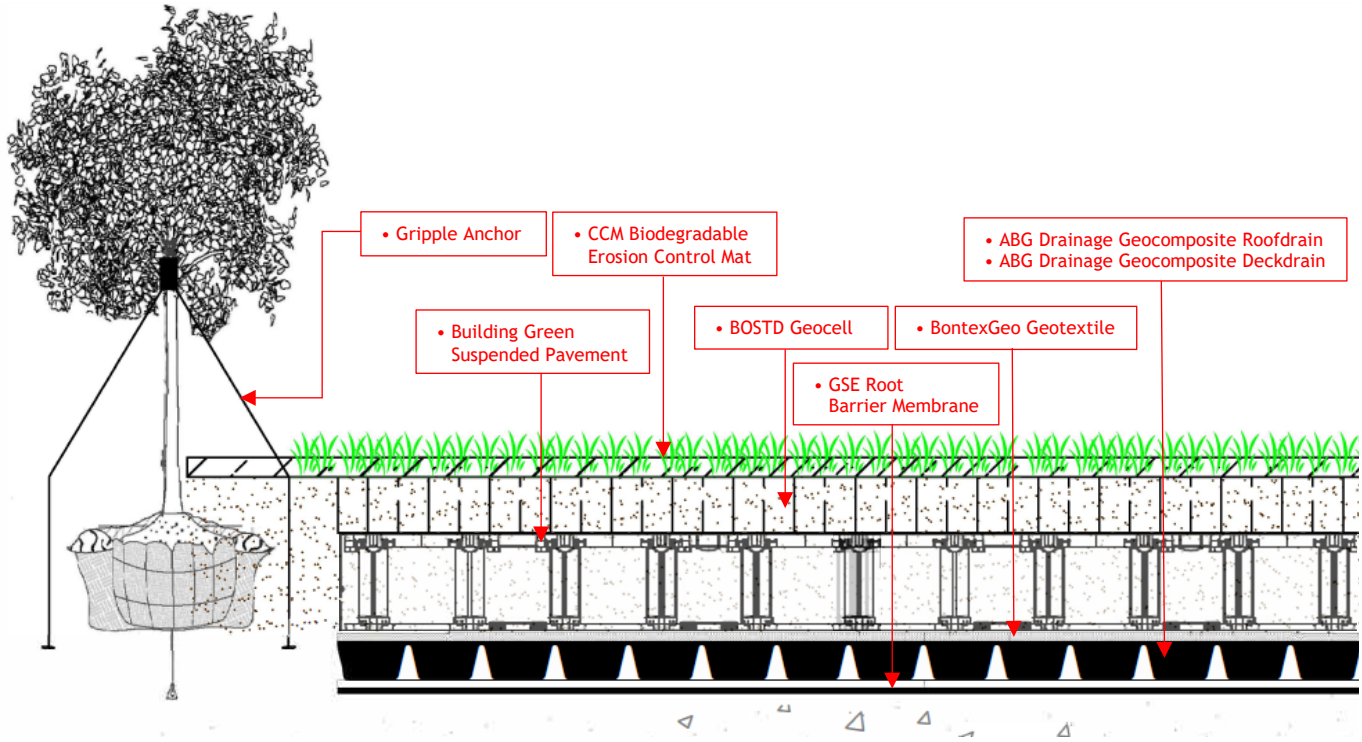
January 2025

Introduction

G and E is a specialist supplier of geosynthetics largely to the geotechnical engineering and in the construction industry. However these materials have found good application in landscaping as soil aggregate separation, plante drainage, root barrier, roof drainage and water retention, erosion protection, soil retaining, weed cover and many others. Here are some of the characteristics that may be of interest to landscapers.





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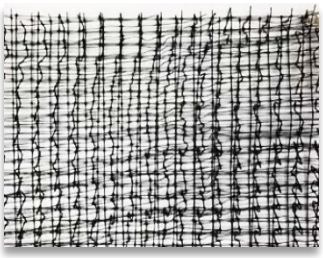
Landscape

Executive Summary



CCM Coir Biodegradable Erosion Mat

Biodegradable Erosion Mat is a natural coir mat weaved from 100% organic coir fiber. It protects surface soil from erosion, and moisture loss promotes vegetation growth. Eventually, it decays into organic replenishment. It helps the natural vegetation take root and provides optimum nutrients.



Freudenberg & Tenax Non-Biodegradable Erosion Mat

A non-biodegradable erosion mat is a three-dimensional PP/PA mat made from weaving or stitching layers of flat and calendar-durable netting for erosion protection. It provides micro stability to prevent washing off and reinforces the root system to form a strengthened soil cover, which helps to develop a long-term green solution.



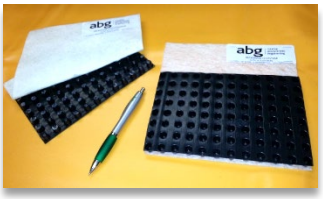
BOSTD Geocell

A Perforated Cellular Confinement System is an expandable honeycomb geocell structure that offers an environmentally friendly and economical solution to slope protection and reliable soil confinement. Soil can be placed in each compartment in which the plant is established. It also provides optimum root lock to vegetation, acting as natural drainage patterns in soil.



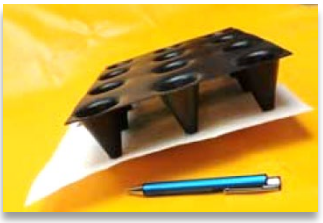
BontexGeo Geotextile

Geotextile is a permeable, non-woven synthetic fabric that allows water to pass through but not soil. It separates soil and drainage aggregate in planter boxes or planting area offering long term drainage reliability to prevent loss of soil.



ABG Drainage Geocomposite

Drainage Geocomposite is a thin composite drainage core that replaces stone filter layers with distinct benefits. Its structural drainage systems have been specifically developed to provide high flow capacity and to add protection to the waterproofing layer.



ABG Roofdrain

Roofdrain is a special geocomposite that offers drainage function, at the same time, water retention to support vegetation growth on roof garden. It helps vegetation grow with minimal thickness of growing medium, a lightweight prerequisite on roof. It also prevents soil wash-off with the separation geotextile.

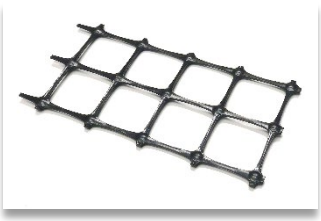
G&E ENGINEERING Since 1984

Executive Summary



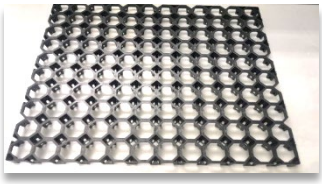
GSE HDPE Root Barrier

Impermeable HDPE membrane serves well as a root barrier. It stops root growth from affecting building structures and interfering utilities, protects waterproofing system and retains moisture from leaching away. HDPE geomembrane is an impenetrable layer to inhibit root migration. It is light weight, flexible, durable, and inert to the environment.



BOSTD Geogrid Climber Mesh

Geogrid Climber Mesh is a square mesh made from extremely strong, lightweight and UV-stable polypropylene (PP) which has high tensile strength and durability. It does not corrode and deteriorate in most environments and inert plant growth, making it an ideal trellis for climbers.



Global Synthetics Drainage Cell

The Drainage cell is a thick rigid plastic drainage core panel that supports extreme loading and provides high transmissivity with overlaying geotextile. It is suitable drainage in planting areas, paving areas, water retention compartments and sustainable landscaping.



Global Synthetics Grass Paver

A grass paver is a lightweight, high-strength turf stabilization paver designed to protect the grass root zones and stabilize the surrounding soil when subjected to vehicular traffic. When filled with gravel instead of soil, it can also be used to construct porous pavements for car parks system.



Gripple Anchor

A unique and versatile percussion-driven earth anchor system using tripod guy fixing kits, steel wire, webbing strap, deadman block, and ratchet tensioning device to secure tree, stabilize rootball and upright trunk, ideal for transplanting large trees.



Kaytech Panel Drainage Composite

The panel drainage composite system is an HDPE panel core wrapped in a non-woven needle-punched geotextile. Its high flow rate capacity and compressive strength resistance are designed for subsoil drainage network. It comes in coils and has an adapter for pipe and other external drain connections.



Global Synthetics Water Retention Box

Water retention boxes are a unique modular subsurface drainage system to collect water and flexibly infiltrate, detain and harvest water for re-use. Its high loading capacity makes it suitable for capturing storm water under water retention compartment and sustaining the sub-irrigation planting system.

Executive Summary



Maccaferri Geosynthetic Clay Liner (GCL)

Sodium bentonite can be encapsulated between two layers of geotextile to form a waterproofing membrane called geosynthetic clay liner. GCL comes in rolls and can be laid over any area needing waterproofing, such as underground structure for Zero Irrigation System. system.



Zero Irrigation System

ZIS is a sub-irrigation system that utilizes capillary action to deliver water collected and stored in an underground modular reservoir beneath the growing medium in a defined and confined planting area. The simple idea is to harvest as much precipitation for irrigation that would otherwise have been drained away. Hong Kong Housing Authority first conceptualized this as the best water use and is the unique prime designer system.



Building Green Suspended Paving System

A structural module made from recycled polymer is introduced to support pedestrian and vehicular traffic loading in amenity areas. The structure comes in rigid plastic component units that can be assembled and interlocked into a hollow matrix of sizable areas within which loamy uncompacted soil can be filled for tree establishment.

Coir Geotextile



Coir geotextile is a natural and biodegradable mat for erosion control. Coir is 100% organic fiber naturally resistant to rot, mold, and moisture. It's tough and durable, with the right characteristics to protect slopes from erosion. Coir is also easy to install, maintain, and patch up. Over time, eco-friendly coir disintegrates completely, leaving only humus nutrients to support vegetation.

Application of Coir Geotextile

- Road embankments
- Soil erosion control
- Re-vegetation
- Hill slide slopes
- Soil bio-engineering
- Landscaping
- Golf courses

Technical Information

- Roll dimension: 1m (W) x 25m (L) OR 2m (W) x 50 m (L)
- Standard weight*: 750g/m^2

**Local project requirement is 750g/m^2. GTG700 complies with this requirement.*

Convenient to Use

- Wide variety of weaves and densities
- Lightweight, simple installation

Selective job reference over the years. Full list available upon request.





Third Golf Course at Kau Sai Chau. Before and after



Access Road joining She Shan Road, Tai Po, and Improvement of Nam Wai Road, Sai Kung, November 2018 (HY/2014/13)



SENT Landfill
August 2022 (EP/SP/10/91)



Third Runway Concourse
May 2022 (C3405)



Station Square at Kai Tak, July 2023 (SS G506)

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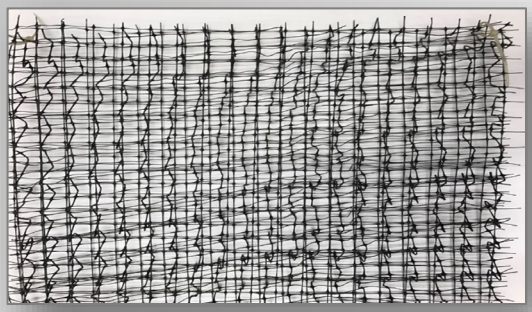
GTG ver. 7 May 2026

Erosion Control Mat

Erosion Control Mat is a 3-dimensional, non-biodegradable polypropylene or polyamide mat with a UV stabilizer master, carbon black, and fire retardant, made by weaving or welding layers of mesh for erosion control and restricting soil movement on sloping ground. Its high tensile strength, corrugated filament, and excellent durability ensure long-term performance.

TENAX **Multimat**

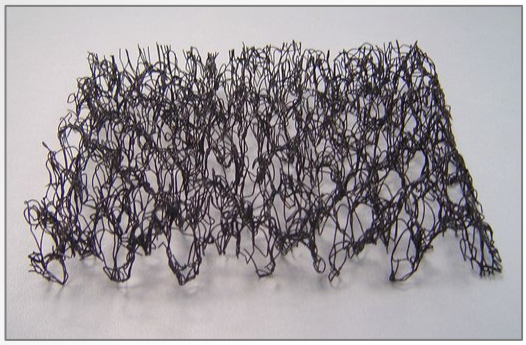


- Made of polypropylene net
- Composed of extruded and bioriented polypropylene grids, laid on top of each other and tied up by means of a black yarn
- Designed for the protection and growing of grass on slopes



Tsing Yi North Coastal Road (HY/98/03) – Multimat 100, still performing well after more than two decades

Freudenberg **Enkamat**



- Made of polyamide filament
- Six monofilaments welded together to form a tough, open-structured matting
- Provides an artificial root system for reinforcement and strong vegetation for erosion protection of slopes



PHD at Pok Fu Lam South
August 2025 (CV/2020/01)



TKO - Ying Yip Road
June 2024 (CV/2021/03)



Anderson Road Quarry Site
December 2023 (ED/2020/02)



Shatin Sewage Treatment Works
April 2020 (DC/2018/05)

ver. 5_May 2026

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Geocell

Perforated Cellular Confinement System

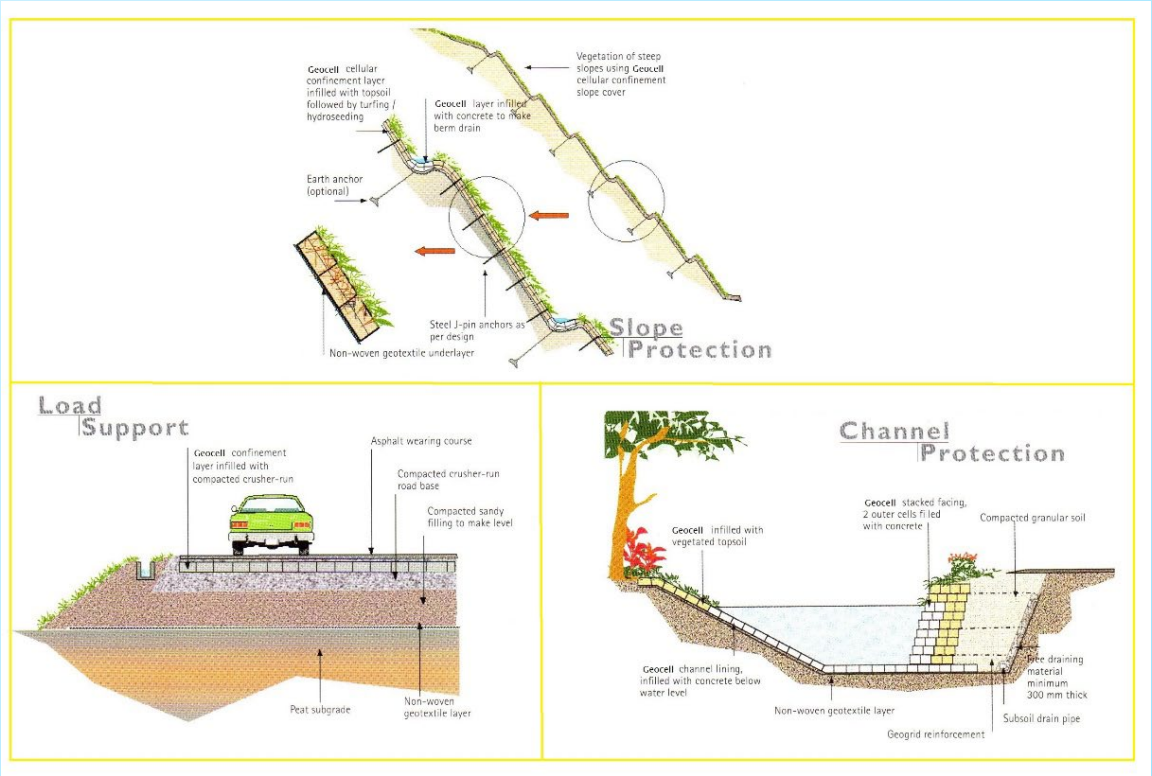
Vegetation on Hard Surface

Geocell Perforated Cellular Confinement Systems are expandable honeycomb structures that offer an environmentally friendly, sustainable, economical solution for earth stabilization, slope protection, erosion control, and channel protection, with low handling costs, minimal waste, minimal maintenance, easy installation, and reliable performance.

The Applications of Geocell

1. Stabilize and vegetate the slope surface
2. Soft soil reinforcement and ground stabilization
3. Shoreline and channel protection

Applications

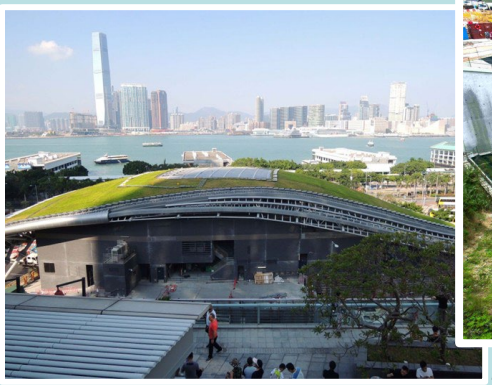


Some Projects in Hong Kong





Geocell stabilizes the soil, which allows vegetation to thrive. (DC/2007/12)



Geocell was used as a Roof Garden Soil retainer - Central – Wan Chai Bypass – Central Interchange. July 2018 (HY/2009/18)



Soil Retainment for Landscaping – Site Formation and Infrastructure Works at Kong Nga Po. March 2023 (ND/2018/01)

Soil Retainment for Landscaping on slope – Anderson Road Quarry Site – Road Improvement Works. March 2025 (NE/2017/03)



Services Provided by G and E Co. Ltd

1. **Engineering design**
2. **Method statement & drawings**
3. **Supply & installation of Geocell**
4. **Horticultural expertise**

Geocell sections are manufactured from High-Density Polyethylene (HDPE) strips that contain carbon black for UV light stabilization.
Sheet thickness of 1.25mm, cell size (L x W) of 244mm x 203mm or 488mm x 406mm.
Collapsible into 2.44m or 3.35m (L) x 125mm (W) for ease of handling.
Cell thicknesses of 100, 150, 200 & 300mm are available.

G & E ENGINEERING Since 1984

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ver. 12_May 2026



Landscape

The landscaping system comprises several components that work together. We at G and E can provide products for filtering, drainage, water retention, and root control.

Filtering Layer – Geotextile

BontexGeo *Bontec NW6*

Bontec NW6 needle-punched and thermally bonded non-woven PP geotextiles, designed to offer optimum performance on planting soil and drainage aggregate separation, as well as waterproofing layer protection.

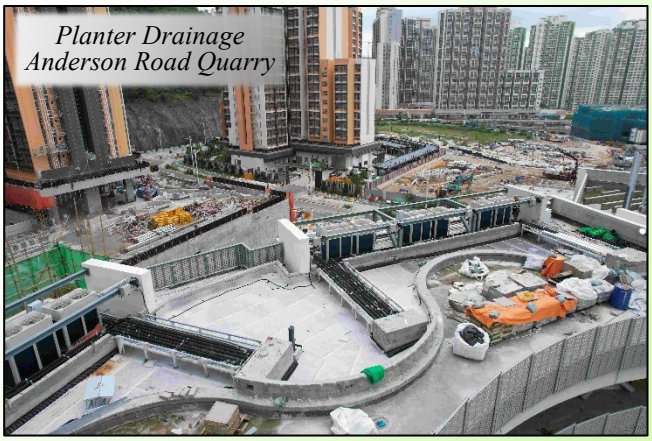


Filter Geotextile Housing Project

Drainage Layer – ABG

Roofdrain / Deckdrain

Roofdrain and Deckdrain are lightweight and robust drainage geocomposites. Their synthetic core thickness ranges from 25 to 50mm and has drainage and filter functions. Roofdrain provides a water storage reservoir of 4-14 L/m^2 to nourish the roof garden via a capillary break. The geocomposites come in a small roll for easy manual handling.



Planter Drainage Anderson Road Quarry

Root Barrier – Solmax

HDPE Membrane

A root barrier is needed as an impermeable HDPE membrane that prevents root growth from affecting building structures and utilities, protects the waterproofing system, and retains moisture from leaching away. HDPE geomembrane is an impermeable layer that inhibits root migration. It is lightweight, flexible, durable, and environmentally inert.



Root Barrier, landscape project, Cyberport

Cellular Confinement System – BOSTD

Geocell

A Perforated Cellular Confinement System is an expandable honeycomb geocell structure that offers an environmentally friendly and economical solution for slope protection and reliable soil confinement. Soil can be placed in each compartment in which a plant is established. It also provides optimal root anchorage for vegetation and acts as a natural drainage pattern in the soil.



Soil Stabilization, Tsuen Wan Drainage Tunnel

Drainage Cell – Global Synthetics

Hydrocell

The Hydrocell is a thick, rigid plastic drainage core panel that supports extreme loading while providing efficient drainage. Its rigid plastic structure with excellent compressive strength and high transmissivity makes it ideal for paving areas, roof gardens, planter boxes, and other sustainable landscaping systems.



Planter Drainage, Ching Hong Road

Grass Paver – Global Synthetics

Turfpro

Turfpro is a lightweight, high-strength turf-stabilization paver designed to protect grass root zones and stabilize surrounding soil under vehicular traffic. It can also be used in the construction of porous pavements for car parks, when filled with gravel chips rather than soil.



Climber Mesh – BOSTD

E'GRID Geogrid

Geogrid Climber Mesh is a square mesh made from extremely strong, lightweight, and stable Polypropylene (PP), which makes it acquire high tensile strength and durability. It does not corrode or deteriorate in most environments and is inert to plant growth, making it an ideal trellis for climbers.



Tongkin Street Nursery

Check with us on applications, specification, price, stock and delivery

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ACT ISO 9001 : 2015 UKAS MANAGEMENT SYSTEMS 0273



Green Roof

A green roof system comprises several components that work together. We at G and E can provide products for filtering, drainage, water retention, and root control.

Filtering Layer – Geotextile

BontexGeo *Bontec NW6*



Bontec NW6 needle-punched and thermally bonded non-woven PP geotextiles, designed to offer optimum performance on planting soil and drainage aggregate separation, as well as waterproofing layer protection.

Drainage Layer – Geocomposite

ABG *Roofdrain / Deckdrain*



Roofdrain and Deckdrain are lightweight and robust drainage geocomposites. Their synthetic core thickness ranges from 10 to 50mm and has drainage and filter functions. Roofdrain provides a water storage reservoir of 4 to 14 L per square meter to nourish the roof garden via capillary break. The geocomposites come in a small roll for easy manual handling.

Root Barrier – HDPE Geomembrane

Solmax *HDPE Membrane*



A root barrier is needed as an impermeable HDPE membrane that prevents root growth from affecting building structures and utilities, protects the waterproofing system, and retains moisture from leaching away. HDPE geomembrane is an impenetrable layer to inhibit root migration. It is lightweight, flexible, durable, and environmentally inert.

Check with us on applications, specifications, price, stock, and delivery

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SOLMAX
HDPE Membrane Root Barrier System

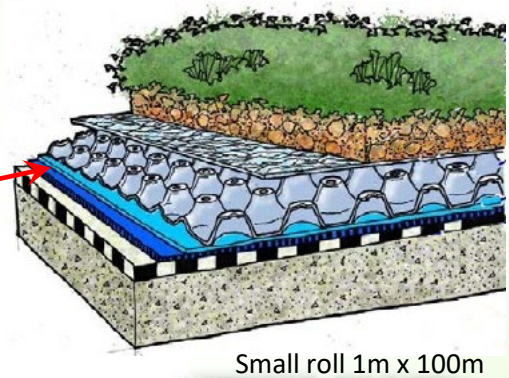


A green roof offers recreational space, which is highly significant for healthy living. It also reduces the maintenance and cooling costs of buildings, as well as other environmental benefits.

A root barrier is needed as an impermeable layer on the roof to prevent plants from affecting building structures, protect the waterproofing system, and prevent moisture from leaching away.

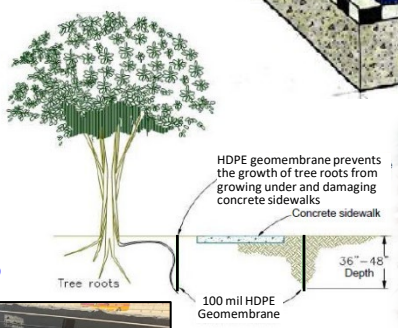
Advantages of Using SOLMAX HDPE Geomembrane

- An impenetrable layer, lightweight and flexible
- Durable, inert to the environment, harmless to plant growth, and strong enough to control root migration
- Act as rooftop waterproofing
- Factory fabricated to sizes, easy to handle
- Readily available stocks in Hong Kong



SOLMAX HDPE Geomembrane

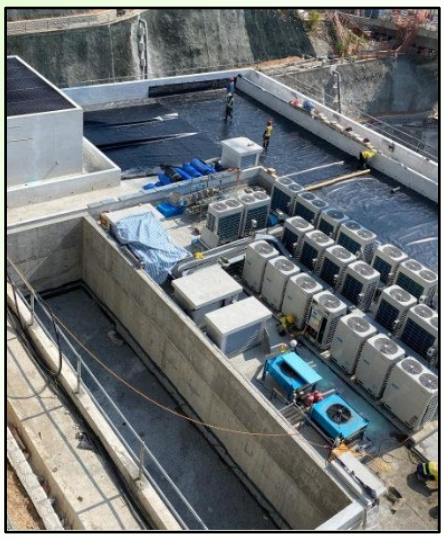
- Can fabricate a width of from 1.0m to 7.0m
- Thickness can range from 0.75mm to 3.0mm
- Uses only virgin resin to ensure durability
- Roll length up to 100m



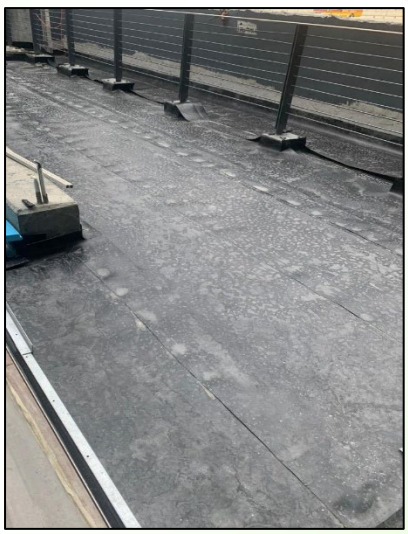


Small roll 1m x 100m

Selective Local Project References



TKO – Lam Tin Tunnel
October 2022 (NE/2015/01)



Station Square at Kai Tak,
May 2023 (SS H508)



Cyberport
October 2021



ver. 15_May 2026

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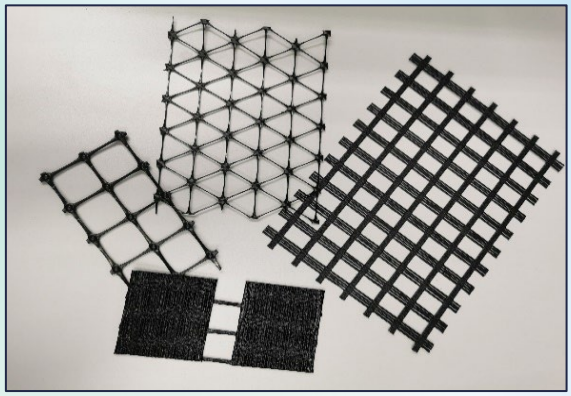
Uni & Bi-Axial Geogrid

Uni & Bi-axial geogrid comes in woven high-strength polyester (PET) filament, extruded polypropylene (PP) sheet, or welded co-polymer yarn. Geogrids are used primarily in civil, marine, and geotechnical engineering. There is a wide range of characteristics and specifications to suit a host of applications.



Key Features

- Large variation in strength
- Large variety of apertures
- Excellent long-term performance
- Stable to UV and aggressive environment

Applications

- Ground improvement
- Road & pavement reinforcement
- Seawall embankment reinforcement
- Subgrade stabilization
- Work platform and foundation

Services offer

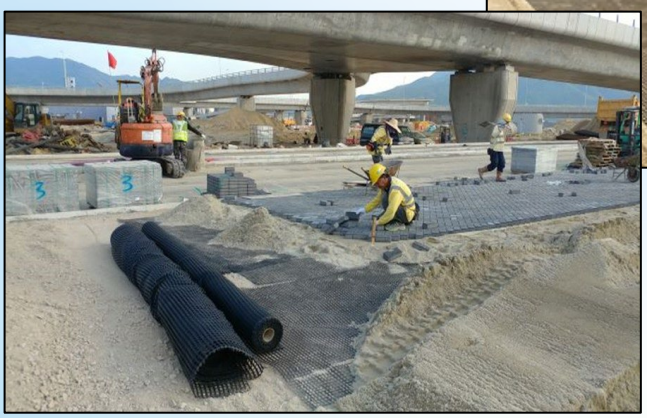
- Application design
- Supplying geogrid
- Customized production
- Installation assistance
- Conformance testing

Hong Kong Zhuhai Macau Bridge Boundary Crossing Facility (2017)





Left: Airport Vehicular Tunnel Advance Works (2021)





Right: Tung Chung New Town Reclamation (2019)

HKZMB BCF (2017)

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ver. 3_Jun 2026

Hydrocell™ Superior Drainage System

General

Hydrocell™ is a unique modular drainage system designed to distribute and support vehicle and landscaping loads, whilst maintaining a positive drainage path for the collection and discharge of water.

In many buildings, owners and architects are recognising the importance of incorporating landscaping features that offer enhanced amenity for residents or workers in these buildings as well as offering significant thermal and environmental advantages.

Podiums, pedestrian areas, roof gardens, planter boxes and sporting fields will all benefit from having a reliable and efficient drainage system installed.

Other engineering structures, such as landfills, where the collection of leachates is required, will benefit from having an efficient system of collection and treatment of these highly polluted wastes such that they cannot re-enter ground water systems. Significant loads are generated in landfills with many metres of waste overlying the drainage system. **Hydrocell**™ is able to withstand very high compressive loads.

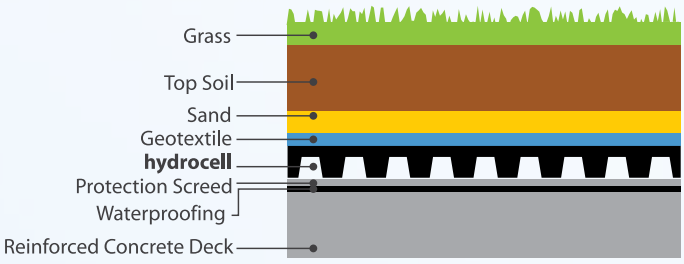
The **Hydrocell**™ product comes in a convenient panel size with integral clips that make the task of installation very simple and economical.

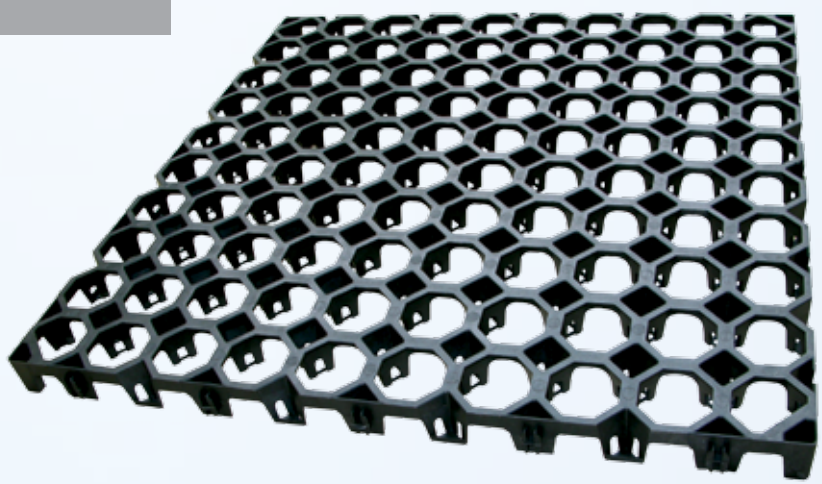
To achieve best performance of the **Hydrocell**™ system, ensure that any waterproofing has been applied and allowed to cure for the manufacturers recommended time prior to placement of the **Hydrocell**™. The installer may need to provide some additional protection to the membrane prior to placement of the **Hydrocell**™ product.

The **Hydrocell**™ is placed into position with the studs facing down. Once suitable areas of **Hydrocell**™ are in positioned, a nonwoven geotextile such as ProFab® AS140 or Geofirma® AS 150A is placed on top of the **Hydrocell**™. Generally a minimum overlap of 300mm at joins of the geotextile should be maintained. It is advisable to place a minimum 150mm of clean washed graded sand above the geotextile and then placement of any additional soils above this layer.

Should you require additional placement advice please do not hesitate to contact you local Global Synthetics office.

TYPICAL DETAILS OF A ROOFTOP GARDEN





Global Synthetics

turfpro™

Grass Paving System

turfpro™ GRASS PAVING SYSTEM

General

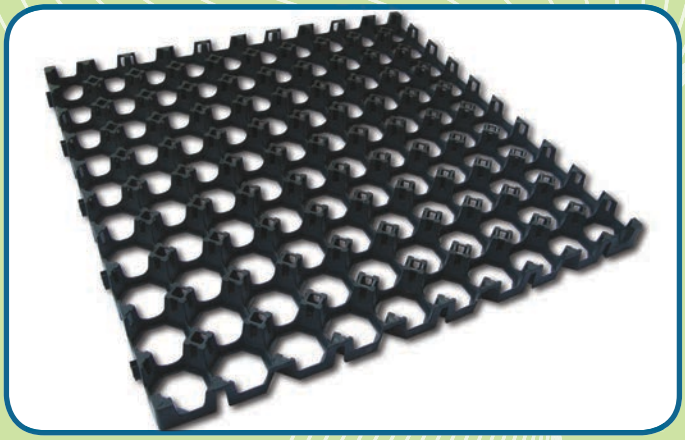
turfpro™ is a uniquely designed grass paving system to distribute and support vehicle loads, whilst maintaining a visually pleasing turf surface.

Vehicular access roads, paths and parking areas can be integrated into the landscape of the project, avoiding the use of concrete or asphalt pavements, which can cause consequent additional discharge issues on the site. **turfpro™** can provide for the recharge of groundwater and can limit the amount of discharge that the site might normally produce using conventional pavement treatments.

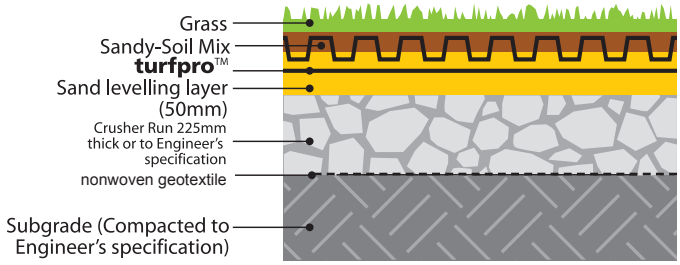
A firm level base, such as a well graded granular road base (20mm maximum nominal size) or crusher run material is required to provide the support for the **turfpro™** system. In most applications of use it is advisable to place a nonwoven geotextile such as **Geofirma® AS 200B or ProFab® AS 501D** at the underside of the granular material to provide long term separation of the natural “in-situ” materials and the imported granular base materials.
Prior to placement of any base materials, the installer shall compact where necessary "in-situ” materials to the requirements of the project specifications.

To achieve best performance of the **turfpro™** system, care should be taken in assessing on site drainage requirements such as the use of subsoil and surface drains to ensure that the long term integrity of the paving system is not compromised. The **turfpro™** cells are placed into position and joined using the integral clip system. The **turfpro™** cells are then filled using a sandy soil mix that is free draining. Trafficking directly on top of unfilled cells is not allowed. Ensure that materials are end dumped over previously filled and compacted cells and that all spreading operations are completed by only driving on filled cells.

Once all cells are filled and compacted to the project specifications either the laying of sodded turf or seeding shall be undertaken over the **turfpro™**. Regular watering and fertiliser (if required) shall be carried out for a suitable period, to establish rapid root propagation and the establishment of a healthy and stable turf surface.



turfpro™ DETAIL



Global Synthetics ProTank®

Global Synthetics is an Australian owned and operated company specialising in subsurface drainage, soil and ground stabilization, retaining walls, erosion control and lining systems.

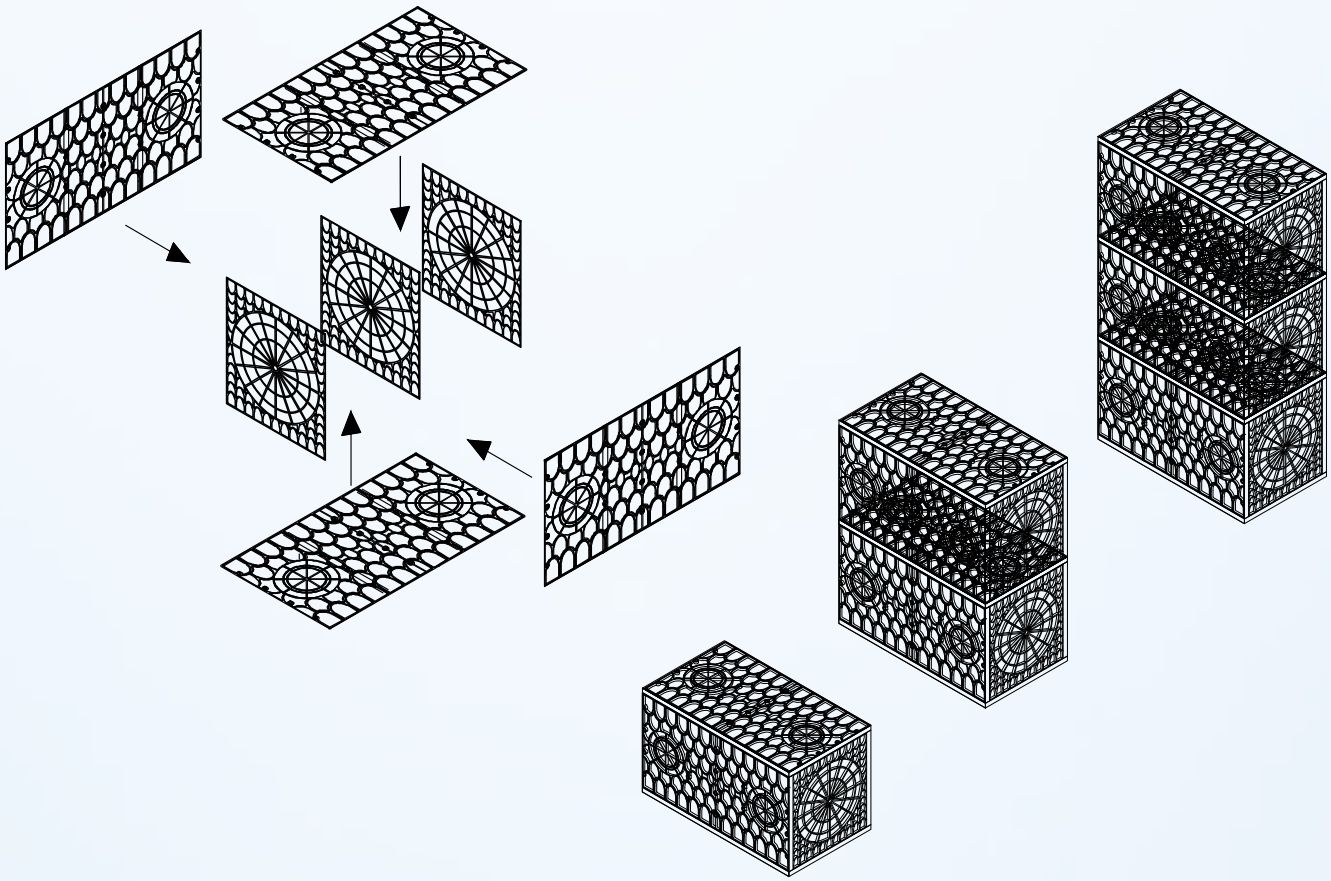
ProTank® is a unique modular subsurface drainage system designed to collect water at its source. **ProTank®** has the flexibility to infiltrate, attenuate, detain or harvest water for re-use.

ProTank® can be installed under driveways, car parks, roads, landscaped areas and other trafficable applications. The unique domed webbing profile of the **ProTank®** components provide exceptional strength (refer to loading allowances on page 7).

Modules are assembled using just two components or 'plates,' both having dedicated entry ports to cater for five different pipe sizes. The smaller plate can accommodate pipes up to 300mm diameter. This makes **ProTank®** modules ideal for connection to domestic and commercial services. The dedicated entry ports negate the need to cut holes in the module which sacrifice structural integrity.

Features and Benefits

- Manufactured from premium quality recycled resin to meet the most demanding performance requirements.
- Generous internal and surface void area provides optimum storage and/or infiltration capacity.
- Easy access via specially designed ports on every surface of the module. This ensures trouble free access and maintenance.
- No requirement for imported drainage aggregate or special fill.
- Low cost, light weight and fast safe installation.
- Can be installed as a 'single block gallery' or 'finger gallery' to accommodate a variety of hydraulic conditions and space allowances.



Applications

Megaflo™ is a cost effective and easy-to-install solution for all subsoil drainage works including:

- Roadside edge drains;
- Under kerb drainage;
- Cross drainage across highways;
- Under drains for road widening;
- Sportsfield drainage;
- Vertical drainage behind retaining walls;
- Vertical drainage behind shotcreting;
- Leachate collection drains;
- Mine tailings and heap leach drains.
- Piggy back drains.



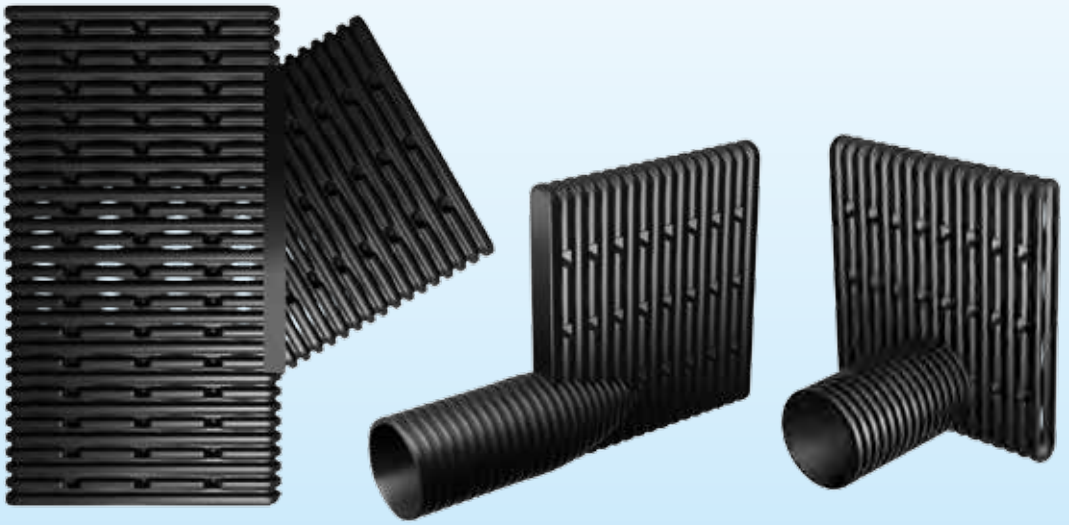


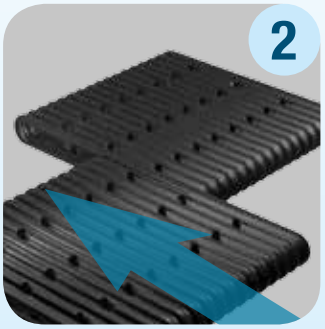


Fittings

Megaflo™ is v-notched and interlocked at the ends. Ends and side outlet fittings are available. T-pieces and Y-junctions are custom made. Ensure the geotextile is wrapped completely around the coupler to prevent ingress of fine soil particles into the drain.









Geosynthetic Bentonite Clay Liner

Sodium Bentonite Waterproofing Layer

Geosynthetic Clay Liner is a geocomposite of a layer of sodium bentonite encapsulated between two geotextiles to form a liner for numerous fluid containment and water barrier applications.



GCL uses non-woven geotextile in the upper layer to encapsulate the bentonite swelling clay as a carrier, and a woven geotextile layer beneath for dimensional stability. Needling punching the layers offers reinforced internal shear. HDPE film lamination offers the best sealing effectiveness.

Versatile Sealing Applications of GCL System

- Flood protection
- Underground waterproofing
- Water containment, ponds & lakes
- Landscape waterproofing
- Waterstop to foundation and basement structure
- Wetland creation



Installation of GCL

Benefits of GCL System

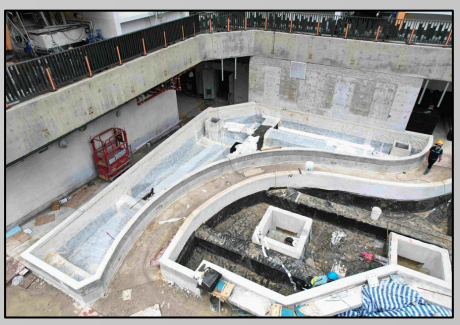
- Reduce construction costs by replacing compacted clay
- Self-sealing overlaps to ensure integrity
- Quick and easy to install, minimal substrate preparation
- Withstands differential settlement
- Flexible with the structure conformity
- Environmentally safe - no chemicals, additives & non-toxic
- Uniform peel strength provides multi-directional shear strength



Pond Lining using GCL

Our Service

- Design, supply, and delivery
- Method statement and testing
- Installation and site report
- System commissioning



ZIS Planter Waterproofing, PHD at Anderson Road Quarry Sites, July 2025 (HKHA20210573)



ZIS Planter Waterproofing, PHD at Wang Chiu Road, April 2026 (HKHA20210526)



Wetland Waterproofing, Development of Lok Ma Chau Loop, January 2022 (YL/2020/02)

G & E ENGINEERING Since 1984

G and E Company Limited

14th Floor, Kiu Yin Commercial Building, 361-363 Lockhart Road, Wanchai, Hong Kong
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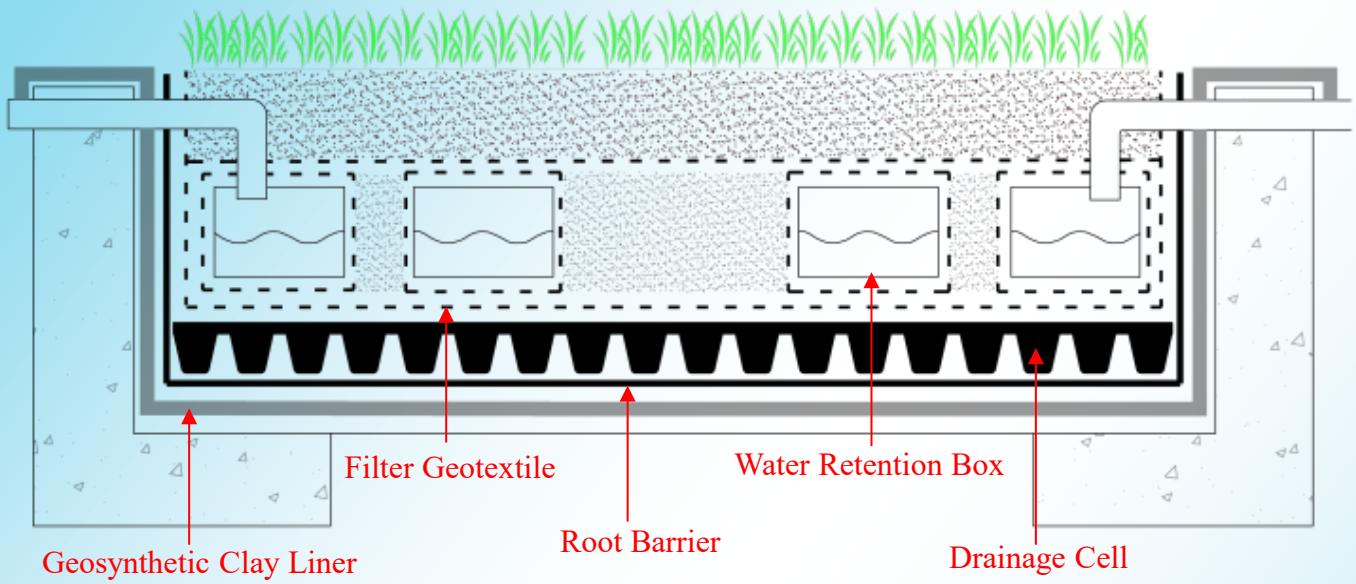
ver. 3 May 2026

Zero Irrigation System



Zero Irrigation System (ZIS) is now a sustainable system that combines rainwater harvesting and urban drainage to nourish subsoil moisture for landscaping. We develop applications and supply a wide range of geosynthetics that serve as basic components – filter geotextile, root barrier, drainage cell, water retention box, and waterproofing geosynthetic clay liner.

Filtering Layer – Geotextile

BontexGeo *Bontec NW6*

A geotextile is a permeable, non-woven synthetic textile material. Geotextile allows water to pass through but not soil. It prevents soil and sand from entering the water retention boxes and the drainage cell at the invert. It is a lightweight fabric that is easy to handle.



Filter Fabric, PHD at Anderson Road Quarry Site, March 2024 (HKHA20190293)

Root Barrier – Solmax *HDPE Membrane*

A root barrier is an impermeable membrane that inhibits root growth, preventing it from affecting building structures, interfering with utilities, damaging the waterproofing system, and retaining moisture that would otherwise leach away. HDPE geomembrane is an impenetrable layer for controlling root migration. It is lightweight, flexible, durable, and environmentally inert.



Root Barrier, Anderson Road Quarry, October 2022 (NE/2016/01)

Drainage Cell – Global Synthetics

Hydrocell

Drainage cell is a thick, rigid plastic drainage core panel that supports extreme loading and provides high transmissivity, suitable for invert draining in planting areas, complementing the Zero Irrigation System and water retention application. A geotextile will prevent fine material from entering the core.



Drainage Layer, PHD at Tai Po Area 9, August 2024 (HKHA20190169)

Water Retention Box - Global Synthetics

ProTank

The water retention box is a unique modular subsurface drainage system that occupies space within the soil to harvest and store water for reuse in sub-irrigation. It comes in panels that can be assembled into standard-sized boxes. A geotextile is needed to wrap around the boxes; therefore, sand and soil can be placed around the boxes, forming an empty water-storage compartment.



Water Retention Box PHD at Wang Chiu Road, January 2026 (HKHA20210526)

Geosynthetics Clay Liner – Maccaferri

Macline WL10 GCL

Sodium bentonite can be encapsulated between two layers of geotextile to form a geosynthetic clay liner (GCL), a waterproofing membrane. It is at the base of the ZIS planting area, essential to supplement the concrete waterproofing system to prevent water harvested from leaking away. It also cushions any waterproofing lining.



Planter Waterproofing, PHD at Wang Chiu Road, January 2026 (HKHA20210526)

We can provide liaison with architects on technical details, shop drawings, mock-up sampling, installation methodology, and site assistance. Check with us on specifications, price, stock, and delivery.

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ISO 9001 : 2015 0273

Ver. 4_May 2026

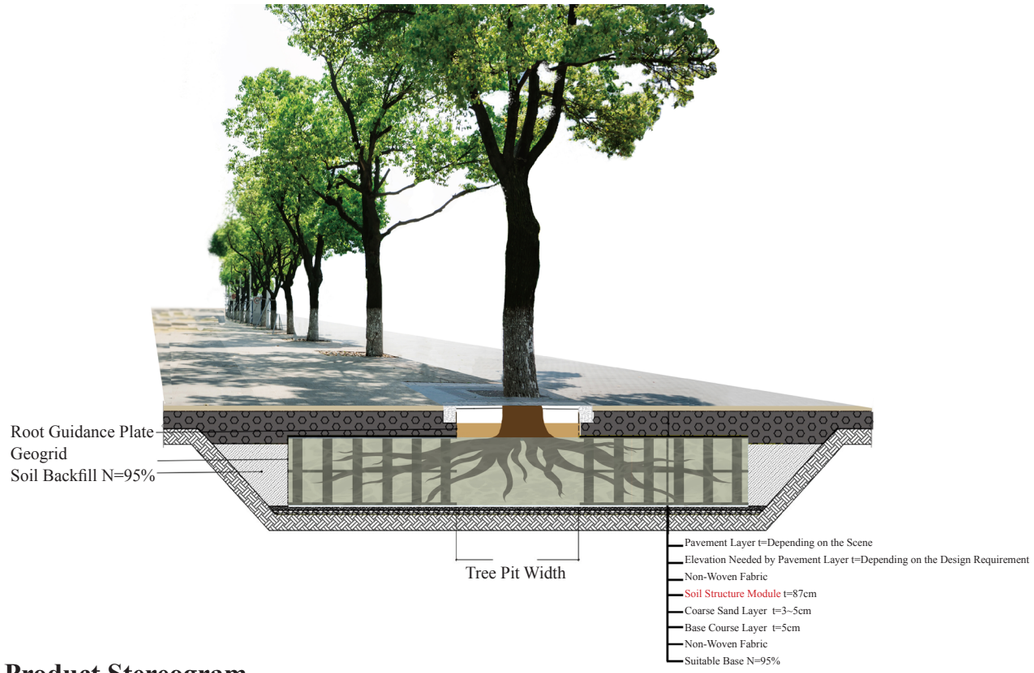
Soil Structure Module

According to a study by the United States Environmental Protection Agency, almost all urban water environment problems are attributed to one cause: soil and vegetation lose the function of water retention and evapotranspiration. The study also pointed out that the pollution purification capacity of trees with 75cm diameter is nearly 70 times that of trees with 7.5cm diameter.

The poor growing environment of sidewalk trees commonly provided in Taiwan, the narrow tree pit and the compacted tree pit soils reduce the water retention environment and filtration capacity of the plant pit, resulting in the poor growth of planting trees, even the floating root effect. This not only leads to the damage of the sidewalk pavement and also affects the streetscape. It is easier to blow down the trees with unstable root systems in the rainy season, causing the loss of social property and even the doubts of the people's safety.

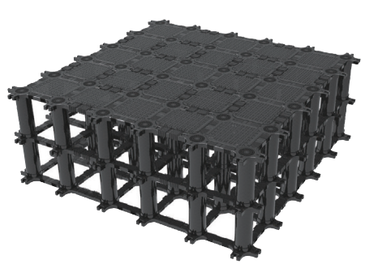
Building Green Ecological Co., Ltd. has developed the Soil structure module. In order to solve the current water environment problems in Taiwan cities, it systematically integrates the tree, soil and urban water retention capacity to improve and protect our important urban water environment and urban landscape.

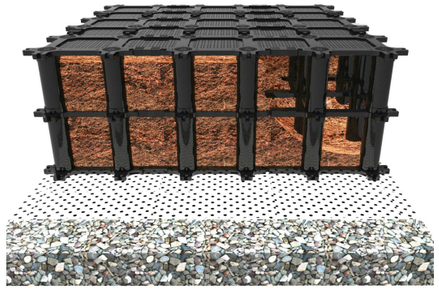
Soil Sturcture Module Diagram



Product Stereogram

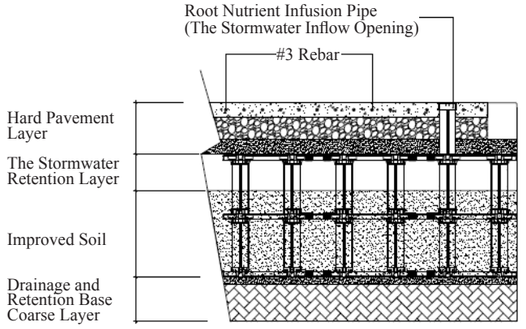
Soil Structure Module Product Developed by Building Green Ecological Co., Ltd.



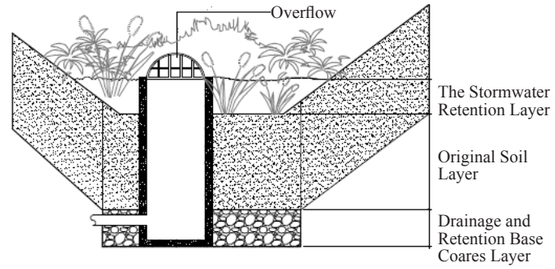


Soil Structure Module/Comparison Diagram of Underground Bioreteneion and Traditional Rain Garden (Bioreteneion)

Soil Structure Module
(Underground Bioretention**)**



Traditional Bioretention



-Characteristics of Soil Structure Module-

Plant big trees to reduce the heat island effect
Provide the root growth space for trees

Reduce peak discharge
Increase infiltration, interception, reduce runoff

Urban water environment pollution filtration

Cover at least 0.5cm soil (withstand 25 tons of trucks)

Environmentally friendly recycled plastic to reduce carbon emissions

Low/no maintenance management

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G and E – A Perspective

G and E, a geosynthetics specialist, distributes a full range of geosynthetics from renowned global manufacturers. The Company also manages a competent installation contracting service team. To better serve our clients, design and engineering services have also been established in our portfolio. We aspire to provide our client engineering solutions, from application and design, supply of materials and their installation, to conformance testing and project commissioning.

G and E takes a strong vision in geosynthetics application, sustainable construction, and development by working closely with engineering communities, consultants, academic, industry organizations, research institutions, testing laboratories, contractors and education bodies, a mission to broaden geosynthetics' versatility.



We offer comprehensive and competitive services to application, design, installation, and testing, with superior attentiveness, professionalism, and international industry standard.



G and E is ISO 9001 quality management certified and a VSRS registered contractor, with a remarkably successful working relationship with a long list of clients, the government, stakeholders, contractors, designers, consultant engineers, overseas distributors and trading partners. The clientele extends to Macau, Southeast Asia and Southern China.

Talk to us today and see how our proposal can be an appropriate, cost-effective and time-saving solutions. We are in our 40th year in the industry, we have a library of experience to share and to support your project.

ISO9001:2015 | International Geosynthetics Society | Product Endorsement | Registered Subcontractor

January 2025

G AND E COMPANY LIMITED

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Tel: 2570 0103 Fax: 2570 0089 e-mail: info@g-and-e.com
website: www.g-and-e.com

G and E runs a global distribution network and sourcing agent of geosynthetics, as well as a provider of professional design and installation services.



Kai Tak Development - Reconstruction and Upgrading of Kai Tak Nullah

GEOTEXTILE:	Woven, non-woven, thermal bonded, needle punched, spun bond, special weave & composite
GEOMEMBRANE:	PE, PVC & EPDM membrane, keyed preformed, conductive & concrete protection liner, gas barrier, waterproofing sheet, leakage collection, contamination treatment & effluent containment system
GEODRAIN:	Geonet, geocomposite, cuspated drain, band drain, PVD, sheet drain, relief drain, raking drain
GEOGRID:	Uni-axial, bi-axial & tri-axial geogrid and composite geogrid, reinforced fill construction
EROSION CONTROL:	Erosion mat, concrete mat, coir mat, geocell, gabion, wire & cable mesh, concrete canvas, flexible rockfall barrier
MARINE:	Silt curtain, turbidity control, block mat, geotextile tube, oil & trash boom, geobag, geotextile container, concrete mattress
CLAY LINERS:	Geosynthetic bentonite liner, GCL and composite
TUNNEL:	Waterproofing membrane, invert drainage void former, GFRP, strip drain, geodrain
LANDSCAPE:	Geotextile filter, root barrier, drainage composite, roof drain, tree anchor, rigid drainage cell, grass paver, zero irrigation system
SERVICE:	Geomembrane leak location survey, HDPE pipe, geosynthetics fabrication, repair & testing, crib wall, reinforced fill slope and wall, ground stabilization, land decontamination

January 2025

REGISTRATION CERTIFICATE

this is to certify that the management system of

G and E Company Limited.

have been assessed by A CUBE TIC LIMITED and registered against the requirements of

ISO 9001:2015

scope of registration

General Construction installation work Service and sales of Construction material such as Geosynthetics

14/F Kiu Yin Commerical Building361-363 Lockhart Road, Wan Chai, Hong Kong

Sites Registered		
28		21/16729
EAC		Certificate Number
22nd January 2014	27th March 2024	27th March 2027
Date Original Registration	Date Of Re-registration	Expiry Date
27th January 2027	N/A	N/A
Next Re-Audit Due Date	Revision Date	Previous Expiry Date

Alfonso Pagliuca, President & Founder, A Cube TIC Limited

UKAS MANAGEMENT SYSTEMS 0273

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

ACT

This certificate is the property of A Cube TIC Limited Unit 5 Middle Bridge Business Park Bristol Road Portishead Bristol BS20 6PN UK and must be returned on request.

CONSTRUCTION INDUSTRY COUNCIL
建造業議會

Our ref本會檔號 ： RS/26/03
Your ref來函檔號：

24 March 2026

Mr Sau Tak NG
G and E Company Limited
14/F, Kiu Yin Commercial Building,
361-363 , Lockhart Road,
Wan Chai, Hong Kong

Dear Mr NG,

Registered Specialist Trade Contractors Scheme
(Register of Subcontractors)
Application for Renewal of Registration
(Application No.: RA028627, Registration No.: R004449)

We are pleased to inform you that your application for the following trade / specialty has been approved with effect from 02 June 2026 to 01 June 2029(both dates inclusive), the approval letter has been uploaded to the RSTCS Portal for download. -

01.09 General Civil Works
    01.09.04 Geotechnical works
02.06 Tanking and Waterproofing

Pursuant to the Registration Undertaking, you are required to comply with the Rules and Procedures for the Register of Subcontractors(accessible via www.rstc.cic.hk), including but not limited to update the Committee of any changes of your Registration Particulars within specified period in the RSTCS Portal (https://eform.rstc.cic.hk).

Please be reminded to arrange for least one of your named company directors or proprietors to complete at least 1 hour of integrity training during the registration period in order to fulfill the renewal requirement of the registration.

Should you have any queries, please contact CIC Secretariat-Registration Services (Email:enquiry-rstc@cic.hk/WhatsApp 2100 9471/Tel: 2100 9400) and browse the Scheme Website (www.rstc.cic.hk) to take note the latest CPD trainings and related information

CONSTRUCTION
INDUSTRY COUNCIL
建造業議會

Our ref本會檔號 ： RS/26/03
Your ref來函檔號：

Yours sincerely,



Jacky Yu
Manager - Registration Services
for Committee on Registered
Specialist
Trade Contractors Scheme

38/F, COS Centre, 56 Tsun Yip Street, Kwun Tong, Kowloon, Hong Kong 香港九龍觀塘駿業街56號中海日升中心38樓
Tel電話：(852) 2100 9000 | Fax傳真：(852) 2100 9090 | Website網址：www.cic.hk