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Concrete Mattress - Slope Protection

Typhoon Mangkhut hit Hong Kong hard last September. Coastal open space was struck hard and flooded, wave brought merciless damage. An earth bund protection barrier was put up to protect part of the Tseung Kwan O coastline. Concrete mattress, a fabric formwork where concrete can be grouted, confined and allowed to set, is used to stiffen the bund face against wave impact, erosion and weathering.

Concrete mattress is produced by weaving two layers of high strength PP & PET geotextile in one operation, with spacer stitched at regular intervals to maintain a uniform thickness. The selvedge is sewn together to form an effectively flexible formwork. Good workability grout can be infilled through funnels, the result is a uniform concrete lining. The pre grout mattress resembles geotextile that conforms well to irregularity. Once grouted, a stable concrete layer offers excellent surface protection, with pleasing aesthetics.



Panel layout

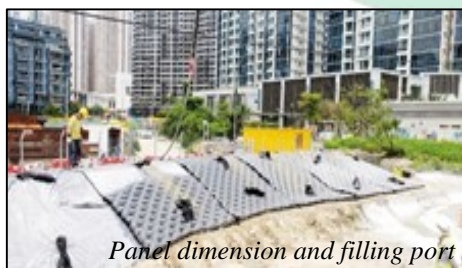


Grouting operation



Bund profile

Filter point ACEFormer with a thickness of 200 mm finds perfect application at Tseung Kwan O. Twenty-nine panels, each measuring 5 m x 4.2 m, are custom fabricated to fit the bund profile with due consideration to shrinkage after grout sets. The panel is light weight and can be laid side by side at precision and anchored manually. It took two days to complete an area of 460 m². For details, stanley@g-and-e.com.



Panel dimension and filling port



Panel laying



File grouted surface



Stacking and storage of ACBM

Articulated Concrete Block Mat

Hong Kong Telephone ultra-express link submarine fiber optic cable runs undersea between Siu Sai Wan and Tseung Kwan O Industrial Estate. A protection layer is sought when the cable crosses a DSD sewage outfall where the cable cannot be buried in the seabed. **Articulated Concrete Block Mat (ACBM)** is an excellent protection ballast when the cable is laid over the outfall. Precast concrete blocks are pre connected by polymer cable into a panel which can be lifted and placed at ease over the cable, the panel can articulate to irregular profile.

G and E Times

Maccaferri develops the mould to cast the concrete blocks to specific panel dimension, at the same time PP rope is laced through the block during casting. The blocks are then fully connected, articulate freely and the entire panel can be lifted. Each block is of the same size with thickness of 150, 200, 250 and 300 mm. Standard panel width of 2 - 3 m and length 3 - 6 m are available. A choice of 1.6 - 8.5 tons panel would match anchorage, ballasting or scouring application.



Panel of ACBM



Excellent articulation



Shipment of ACBM



Handling of ACBM

Forty-two panels of ACBM, were produced in Maccaferri's fabrication yard in Johor, Malaysia and shipped by 7 open-top containers to Hong Kong. Each panel measures 3.14 m x 1.93 x 0.3 m thick and consists of 36 blocks with a total weight of 2.7 tons, a sizeable and heavy dimension. Each panel is looped with a single cable, fully articulated, conforms to profile and is easily manageable by crane, panels can be shackled together. This make installation very straight forward, efficient and accurate. Talk to Ivan ivan@g-and-e.com. 🌴

New Product / Application

Relief Drain

Relief Drain is now available for rock slope to discharge large volume of ground water quickly. Fabrication is undertaken in our depot, with multi layers of high transmissivity geonet wrapped around by a high permeability geotextile jacket. It comes in 200 mm width and standard 4 m length, other dimension can be customized.

Ample stock of geonet and geotextile is normally available, Relief Drain can then be fabricated to order and delivery can be swift, if not immediate. Call Shan shan@g-and-e.com ask for relief drain GERD200/30. 🌴



Relief drain GERD200/30

New Landscaping Highlight

Geotextile as filter fabric and geomembrane as root barrier are originally civil engineering material that usually comes in large and heavy rolls. For mini scale landscaping work and roof garden, smaller and lighter rolls or custom sizing panel are now available as option. Contact Ivan at ivan@g-and-e.com for details, sizing, pricing and delivery. 🌴

Material	Product	Roll Width (m)	Roll Length (m)	Area (m ²)	Weight (kg)
Geotextile Fabric	NW10 non-woven	2.6	100	260	30
Root Barrier	HDPE 1.0mm Sheet	1.0	100	100	94

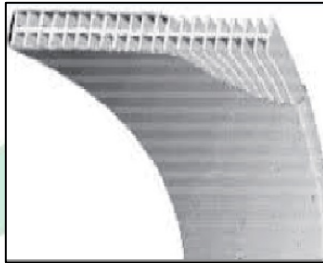
Technical Note

Thicker PVD Does Not Mean a Larger Discharge Capacity

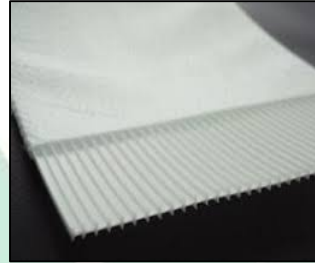
Prefabricated vertical drain (PVD) is to remove water from highly saturated grain soil so that ground consolidation can take effect efficiently. For ease of penetration into soil with mandrel, PVD usually comes in narrow width of 100 mm. A thick PVD, with a large cross-sectional core, should therefore perform better. However, when the ground starts to consolidate, the settlement would crimp, buckle, twist or fold the PVD, thereby clogging the flow path, possibly at multi locations. Experience tells us, with an equivalent core configuration, a thinner PVD, which has stiffer rib, is more resistant to distortion and snapping and therefore more effective in maintaining a basic discharge capacity. The deeper the PVD, the worst a thick PVD would perform. 🌴



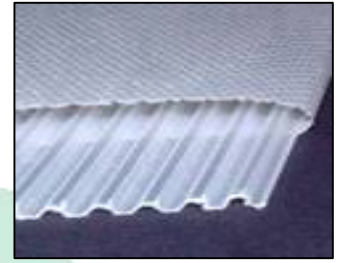
Narrow channel, more rib, higher resistance to collapse



Thick herringbone, rib snap, PVD is flattened easily



Thin herringbone, rib bends to keep flow path open



Trapezoidal channel, less rib, less stiffness, flattened easily

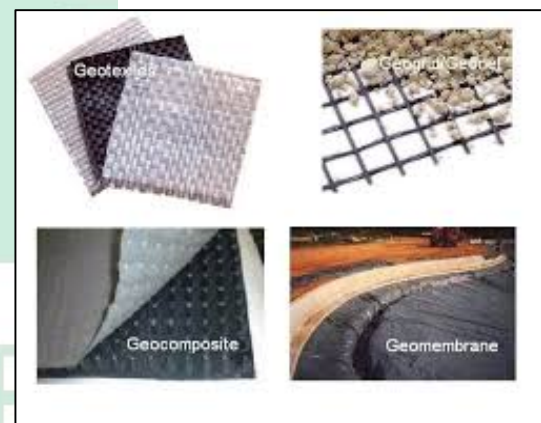
Opinion Column

Opinion from a Dr. Neil Dixon

Dr Neil Dixon, professor of Loughborough University, UK, delivered the welcoming address in GeoAmerica Conference 2016, citing geosynthetics is still “framed” as “forever new technology” after more than 50 years of flying color applications. We couldn’t disagree more. The perception is still vivid now. Why? Indeed why! Perhaps there is limited early start academic training, little syllabus is covered in education program.



While the use of geosynthetics represents an increasing undertaking in our complex projects, some early fundamental knowledge is beneficial, rather than reliance purely on the job learning whenever occasion arises. Specific textbooks are now available, International Geosynthetics Society (IGS) and Geosynthetics Research Institute (GRI) have induction courses. We can summarize and bring some useful insight to your engineers. Talk to Gary on such workshop, gary@g-and-e.com. 🌴



Diversified design of geosynthetic for multi applications



For Your Information

A Word from General Manager

G and E was born as a hard landscape contractor back in June 1984. At that time, planter drainage and soil clogging were consistent problems, until geotextile came. Since this debut, I became fascinated and obsessed with this polymeric fabric, eventually turning geosynthetics into the company's core business.

In the next 35 years, I never stopped pursuing its excellence. Geosynthetics grew from virtual unknown to being used in almost all projects. Over these years, 64.5 million units of related material have passed through our distribution. In the next three issue, we will walk through with our readers the steps we took to come to today stage, our 1st use of what and where, beginning in 1987 when woven geotextile was 1st used at Fanling. 🌴

1987 – Woven geotextile used in civil engineering
 1988 – Woven geotextile, TKO Reclamation
 1993 – Geomembrane pond waterproofing, Penfold Garden
 1993 – Polyester woven, Yau Ma Tei Reclamation
 1994 – Tri-planar geocomposite, NENT landfill
 1995 – T-grip liner, MTR Kwai Chung Park Viaduct
 1997 – Geomembrane Gas barrier, TKO factory
 1998 – Landfill capping lining, Shuen Wan landfill
 1998 – Geomembrane, leakage collection system
 1998 – Erosion mat, Northern Tsing Yi Coastal Road

2000 – Tunnel waterproofing, MTR Lam Tin Tunnel
 2000 – Biodegradable erosion mat, SENT Landfill
 2000 – Gabion, Penny's Bay Reclamation
 2001 – Wire mesh, LPM slope works
 2001 – Submarine Outfall HDPE Pipe, Cyberport
 2002 – HDPE Studliner, Siu Ho Wan Sewage Plant
 2002 – Geomembrane biopile, Kai Tak Development
 2002 – Silt curtain, Penny's Bay Reclamation
 2002 – Geocell for vegetation, Tung Tau Cottage
 2003 – Geomembrane Leak Location Survey, Disney Inspiration Lake


Geogrid Endorsement Certificate

Tenax has renewed her TT geogrid endorsement certificate with GEO, CEDD. The new version, RF1/2019, is basically the same as before, and is valid till April 2021. 🌴

Marco Deana Visit



Marco Deana, Corporate Technical Manager of Maccaferri flexible barrier, presented in Hong Kong last April, the updates on debris flow flexible barrier research and development, the latest European Assessment guideline, the availability of certified debris flow barrier and the perfection of the manufacturing quality assurance program. Maccaferri is bringing to Asia the next phase of flexible barrier technology. 🌴



REINFORCED FILL PRODUCT CERTIFICATE
 Certificate No. RF 1/2019
 Tenax TT Geogrids

Certified Products

Products	: Tenax TT 045 SAMP, TT 060 SAMP, TT 090 SAMP, TT 120 SAMP, TT 160 SAMP geogrids
Certificate holder	: TENAX SpA, Via dell'Industria, 3 I-23897 Vigano (Lecco) Italy
Product distributor	: G and E Company Limited, 14/F, Kiu Yin Commercial Building, 361 - 363 Lockhart Road, Wanchai, Hong Kong

Reader's Response

Let us hear from you. Write to us at newsletter@g-and-e.com. For back issue, please write to nannette@g-and-e.com or visit our website at www.g-and-e.com.

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