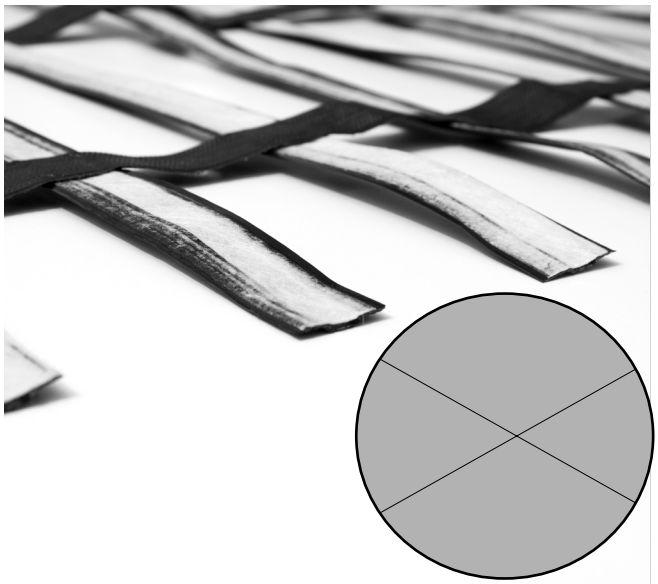
PARADRAIN®

MACCAFERRI

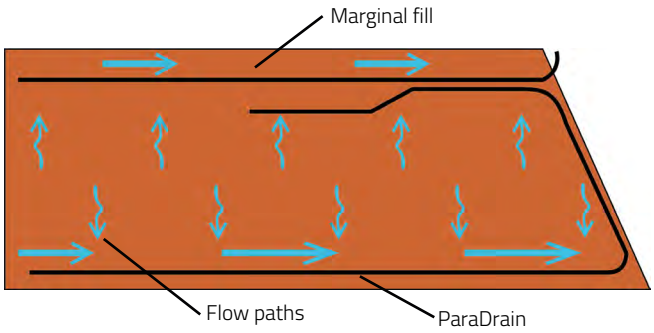
UNIQUE GEOGRID WITH IN-BUILT DRAINAGE

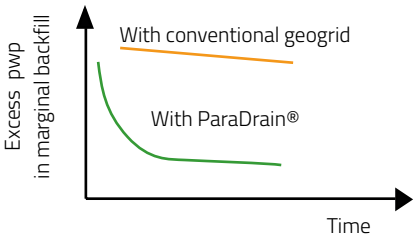
A high performance geogrid that combines soil reinforcement and drainage functions in one product. **ParaDrain®** has been designed with sustainability in mind; it enables the reuse of marginal fills that would normally be disposed of off-site and replaced with quarried materials.

ParaDrain® geogrids are uniaxial. Each longitudinal strap features a drainage channel. These provide a regular array of positive drainage paths that rapidly dissipate the excess pore water pressures generated in poorly draining backfill materials when working with them. This results in early strength gain in the marginal fill and an improved bond between geogrid reinforcement and the marginal soil.



ParaDrain®





Reduction in pore water pressure vs a conventional geogrid.

ParaDrain® has achieved an **Environmental Product Declaration** which provides transparent, reliable and comparable life cycle environmental data.

ParaDrain® is used to reinforce marginal poorly draining backfill materials. These are characterised by a high silt / clay fraction. When compacted or loaded, excess pore water pressure is generated that reduces the available soil strength and the bond between the geogrid reinforcement and the soil.

ParaDrain® improves the properties of these otherwise unsuitable soils by reducing pore water pressure and enabling their use as structural materials. Once the pore water pressures have been dissipated the geogrid continues to reinforce the soil.

Benefits of **ParaDrain®**

- Enables the reuse of many site won fills
- Saves the quarrying of traditional granular backfills
- Saves on polluting truck movements for off-site disposal and the importation of quality backfills
- Speeds up earthworks construction time due to earlier soil strength gain
- Reduces the time for differential settlement of the slope to within the construction phase
- As easy to use as other geogrids
- Geogrid reinforcement design life up to 120 years

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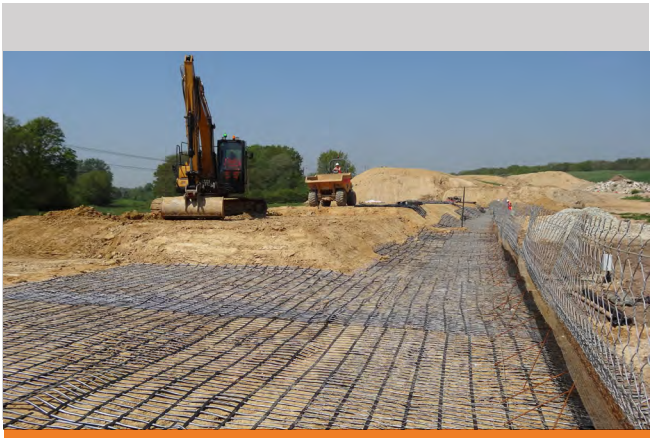
EPD®
Environmental Product Declaration (EPD) in accordance with ISO 14025 and EN 15804+A1
EPD reg no: S-P-01465
www.environdec.com

Key uses:

- Reinforced soil slopes in conjunction with Terramesh® and Green Terramesh®
- Reinforcing shallow clay slopes and swales
- Noise bunds constructed from site-won soils
- Steep slopes with a geogrid wrapped fascia
- In reinforced soil structures where control of settlements and structure movement is important.
- Time-sensitive earthworks construction using marginal fills



ParaDrain® used with Green Terramesh®

Geogrid features:

ParaDrain® is based on our ParaGrid® geogrid, used on thousands of soil reinforcement slopes and walls worldwide.

- The reinforcement element consists of high tenacity polyester yarns encased in a tough polymer sheath to protect the yarns and provide unparalleled LTDS.
- The drainage channel profile of the strap is capped by a non-woven geotextile which acts as a filter to allow pore water to escape, whilst retaining the soil.
- Produced in ISO9001:2015 & ISO14001:2018 certified factories
- Uniaxial strengths: From 50 – 200kN/m

ParaDrain® reinforcing marginal soils

Design Tools:

- MacSTARs – for designing reinforced walls and slopes using geogrids

The evidence – testing of ParaDrain®

Dissipation of PWPs: Lab tests with English China Clay ($k=1x10^{-11}m/s$) showed that after 48 hrs, excess pwp had reduced to 20% of its initial value at 35 and 70mm above the ParaDrain® and 30% of the initial applied stress in the immediate vicinity of the geogrid.
Pullout resistance: Testing after dissipation of excess pwps in China Clay showed peak pullout resistance had increased by 1/3 while at smaller strains a 5x increase was observed, significantly better than non-draining 'traditional' geogrids.
Clogging of the drainage channel: Testing showed minimal clogging occurred and no fines washed through into the drainage channel.

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