

# Modular System for Reinforcing Drainage Channels and Trenches

## ► Technical Data and Examples



- Optimum erosion control
- Fits in well with natural surroundings
- Extremely cost-effective
- Four sizes
- Supplied ready to use

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### TECHNICAL DATA

Basic product:	Ritter grass securing honeycomb, Approx. size 50 x 39 x height 4.5 cm
Load:	100 tonnes per m <sup>2</sup> , LGA-Bayern, MK 3503513/2
Size:*	2-part approx. 85 x 50cm/3-part approx. 125 x 50 cm 4-part approx. 165 x 50cm/5-part approx. 205 x 50 cm
Weight:*	2-part approx. 2.2 kg / 3-part approx. 3.3 kg 4-part approx. 4.4 kg / 5-part approx. 5.5 kg
Material:	Genuine HDPE recycling material (polyethylene), recyclable
Colours:*	Black as standard, green on request
Structure:	Strong honeycomb structure, approx 90% green area
Connection of trench section:	Two purpose-built hinged clips on each section connect the individual panels together
Connection in situ:	The units are connected in situ using U-shaped clips (see diagram)
Laying angle:	+90° to -90°, variable
Other features:	All versions of the units are supplied ready to use and can be installed immediately on site. The various unit sizes can also be combined with each other.
Packaging unit:	Each delivery pallet holds 70 units. This is sufficient to cover approx. 35 metres of trench.

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### Some examples of major installation projects

This is an extreme example with a gradient of approx. 30°. A blend of materials is used as a filler. Grain size approx. 16/45. The cross section shows how well the units mould into the trench profile.



In the example the water seeping down the embankment from the forest soil is caught in the trench at the mouth of the tunnel and drained off.



Given the minor amount of material used in the reinforcement system, the trenches need not detract from the natural surroundings. Approx. 90 % remains for natural cover.



In major projects the units help protect entire trench systems from erosion.



Distributor for Australia:



Eco Animal Bedding Pty Ltd  
Factory 1 /10 Slater Parade  
East Keilor Vic 3033  
Phone 1300 726 406, Fax 03 8336 1184  
[ecoab.com.au](http://ecoab.com.au)

\*Colours, weights and sizes may vary slightly owing to the use of recycled material. Subject to technical modifications, issue D 08/2006.

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## ► The Reinforcement System in Detail

### Advantages and Features

#### The Problem:



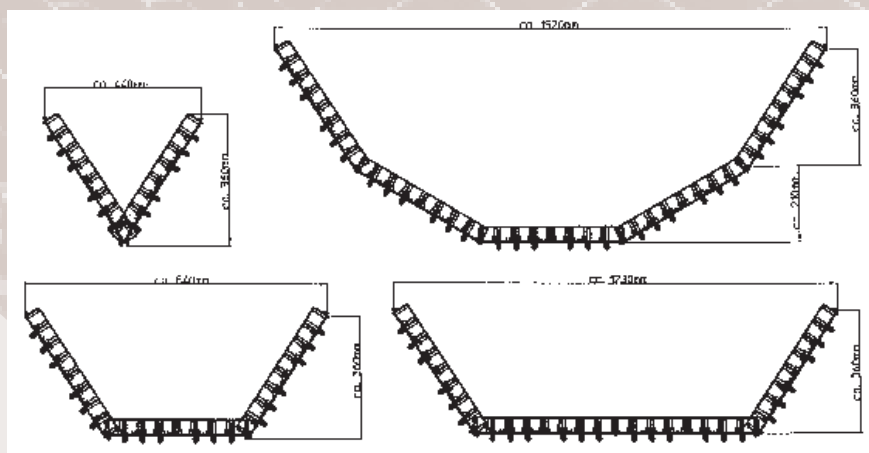
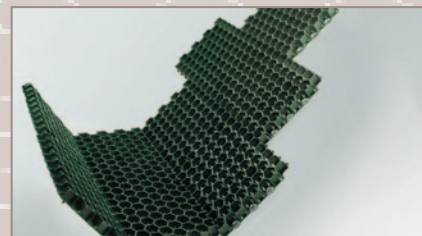
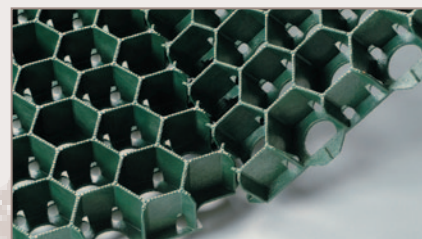
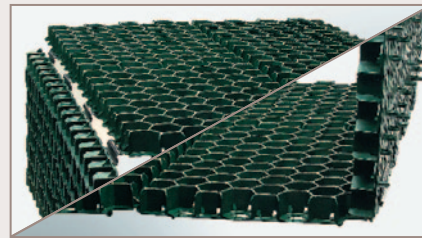
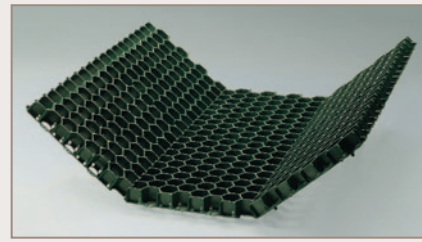
► Ditches with no protection from erosion constitute an enormous potential risk in the event of torrential rain.

#### The Solution:



► A standard half-metre stretch of trench with a base width of 40 cm can be permanently protected from erosion in one single procedure by fitting this system. The units can also be connected to each other. Trenches which are reinforced in this way are capable of diffusion and provide sufficient room for natural growth.

- The standard unit consists of three panels which are joined together by means of custom-designed hinged clips. The units are supplied ready assembled and are extremely cost-effective to install because they are so light.
- The pre-assembled hinge has a range spanning from +90 to -90°. This offers enormous flexibility both for installation and use. For example, stepped terrain can also be protected from erosion.
- The U-shaped clips also allow the units to be connected with each other in a line. The clips are inserted to form a type of bridge where the panels meet. They also act as a type of height stabiliser and provide a cohesive composite network.
- The open sides allow the panels to be fitted together firmly at the bend. This makes them easier to clean, where necessary, with a blunt dredger shovel.
- It is possible to fit single panels of the grass securing honeycomb anywhere as required, e.g. where the trench meets the escarpment.



**The alternatives:** There are four different systems available: 2-part for V-shaped profiles (approx. size 85 x 50 cm), 3-part, the standard unit for standard trenches with a base width of 40 cm (size 125 x 50 cm), 4-part (approx. size 165 x 50 cm), 5-part, ideal for wide trench profiles or ditches (approx. size 205 x 50 cm). The various systems can also be combined with each other.

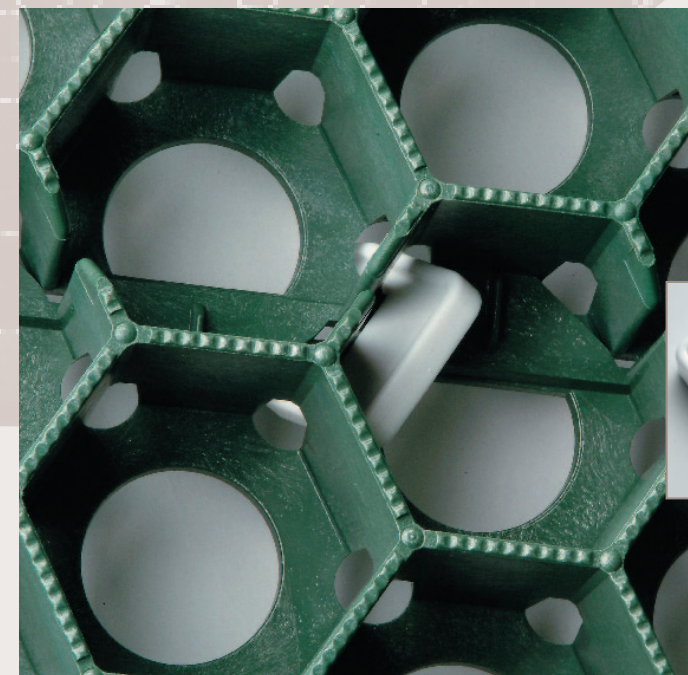
## ► Installation Instructions and Example Applications

#### Installation instructions:

1. **Preparing the trench section:** It is often sufficient for the trench section to be evened out using a scoop and slightly compacted (base width approx. 40 cm), abutment gradient 1:1 or 1:1.5 or similar.
2. **Installing the units:** Lay out the pre-assembled units and line them up in the prepared trench section. Install another unit after the final positioning.
3. **Fitting the pegs:** The only material we recommend for the pegs is constructional steel. 10, 12 or 14 mm pegs can be used. Nails which are bent at the head are ideal. Pegs are recommended for slopes in excess of 3%.
4. **Filling the units:**
  - > 3 % gradient topsoil
  - 3 – 5 % gravel and turf mix, ideal with crushed material
  - 6 – 15 % 0-16 crushed material
  - > 15 % 0/32 or 16/32 crushed material, depending on water intake
5. **Sowing:** For extensive growth with minimum tending we recommend seed blends 7301 and L 730 supplied by the firm Juliwa-Hesa ([www.juliwa-hesa.de](http://www.juliwa-hesa.de))



These photographs show examples of the system in use on new stretches of ICE high-speed railway routes, e.g. Frankfurt – Cologne. The main criteria in these projects are natural-looking erosion prevention and reduced maintenance costs.



U-shaped clips are available for connection in situ. Three to six clips are recommended for each unit.