

12 December 2018

Australian Concrete Mats
PO Box 94
ALSTONVILLE 2477 NSW

Attn: Mr Richard Mould, Director

Re: Hydraulic performance data applicable to Australian Concrete Mat

This memorandum reviews published and available information on the hydraulic performance of products similar to the Australian Concrete Mat to provide a guide to the use of the Australian Concrete Mat in a range of land stabilisation projects.

1. Properties of Australian Concrete Mat (ACM)

We are advised that the ACM product consists of concrete blocks fixed to a 35/35 polypropylene geogrid. The blocks are 146 mm X 165 mm (maximum height 55 mm), with a 40 mm spacing between the blocks.

Tensile strength of the geogrid used is reported by Australian concrete Mats as:

Ultimate Tensile Strength (ASTM D6637):

- Longitudinal 50KN/m
- Transverse 50kN/m

2. Existing information from testing of similar products

2.1 Relevant report

A search of reports available on the internet identified one report that deals with a very similar product, at:

http://s3.amazonaws.com/landscape-dev-heroku/uploads/161/Flume_Test.pdf?1489587187

That report is:

Large-Scale Channel Erosion Testing (ASTM D 6460 modified) of Flexamat Channel Lining over Sandy Loam, February 2009, prepared by TRI/Environmental, Inc. 9063 Bee Caves Road Austin, TX 78733.

The product is **Flexamat**[®] (www.flexamat.com).

2.2 Flexamat[®] properties

The **Flexamat**[®] product is reported to consist of concrete blocks fixed to a polypropylene Fornit[®] 30 Geogrid. The blocks are 6.5 inches X 5.5 inches (165.1 mm X 139.7mm), and give 75% ground cover.

The geogrid material has reported tensile strength of 25kN/m (MD) and 32 kN/m (CMD) (<http://www.usconstructionfabrics.com/specs/fornit/Fornit-30.pdf>)

Consequently, it can be concluded that the **Flexamat**[®] product is very similar to that being produced by Australian Concrete Mats.

3. Performance data

Data reported for the Flexamat[®] product show the following key properties:

Critical flow shear stress for initiation of scour:	24+ psf (1.149 kPa)
Maximum flow velocity	19+ fps (5.79 m/s)
Manning's n	0.05

It should be noted that the critical shear and maximum flow velocity values were estimated by extrapolation, and it is possible that the actual values may have been at least slightly higher.

It seems quite reasonable to suggest that similar performance data can be expected for the ACM product.

4. Application of data in planning and potential failure mechanisms

The data reported for the Flexamat[®] product could be used in designing channels or slopes to be stabilised using the ACM product.

The Flexamat[®] testing specifically considered detachment and movement of soil from below the matting. For practical and successful application of the ACM product under Australian conditions, it should be noted that:

- Care should be taken to ensure that the soil underlying the matting is not dispersive (a considerably more common problem in Australia than in the US, especially if dealing with exposed subsoils).

- Anchoring the product to the soil surface will be an important aspect of installation. It seems more likely for the strength of anchoring to be exceeded than for flows to succeed in moving or damaging the product, given the extremely high flow shear stress reported in the US testing as being necessary solely to move soil particles from under the matting.
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5. Disclaimer

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6. Closing comments

The data available provide a sound basis for development of designs using the ACM product for a range of environmental stabilisation projects.

Yours Faithfully



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PRINCIPAL CONSULTANT

