Global Synthetics

geonews

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Welcome

Our latest newsletter is now with you. We hope that we have provided you with some interesting engineering applications using an innovative approach by our clients and the use of quality Global Synthetics products.

Global Synthetics have a commitment to our clients to offer exceptional levels of service combined with an extensive range of products that offer best value and performance. We are always happy to discuss your project in detail with suggestions on design optimisation and alternatives.

Global Synthetics is 100% Australian owned and staffed by engineers with extensive experience in geosynthetics in Australian conditions. Large stock holdings are held throughout Australia to service your requirements efficiently.

News

Global Synthetics recently became a Corporate Member of the **International Erosion Control Association**.

IECA International Erosion Control Association AUSTRALASIA

Our website has recently been updated. Visit us at **www.globalsynthetics.com.au** and see how we may assist in your next project.

Beaudesert Boonah Road Realignment – South East Queensland

Global Synthetics Link Gabion and Rock Mattress Success

The Wyaralong Dam located approximately 14kms northwest of Beaudesert is part of the Queensland Governments water sustainability plan for the growing South East Queensland population. Once the construction of the Wyaralong Dam is complete it will supply approximately 21,000 ML/annum to the rapidly expanding region.

One of the many challenges faced was that the existing Beaudesert Boonah Rd would be required to be realigned to accommodate the new dam location. A new section of road, approximately 10.6km in length would need to be constructed.

Tenders were called, with Fulton Hogan Pty Ltd, successful in their tender bid, with commencement of works in mid 2009.

Along the 10.6km realignment there were a number of creek crossings, culvert structures and retaining structures that were required to be constructed.

Gabions and rock mattresses were selected to be used as retaining structures, culvert outfalls/inlets and scour protection. Strict specifications were set out under Queensland Water Infrastructure (QWI) and the Queensland Department of Main Roads documentation. Global Synthetics Qld was awarded the tender to supply the gabions and rock mattresses, meeting all the requirements of the specification. Particular requirements were placed on the quality of the wire coating with a Zinc/Aluminium/Mischmetal product specified. Global Synthetics were able to supply such a product with the licensed Galfan® coating technology used. The originating technology of the Galfan process supports the view that the life of such a coated wire can exceed that of traditional heavily zinc coated product by a factor of 3-4 times.

Fulton Hogan Pty Ltd employed the services of two specialist gabion/mattress installers to undertake the installation; to date there has been some 9600m^2 of mattresses and 4300m^3 of gabions installed on the project, with works still continuing.

Global Synthetics were also successful in supplying the geotextile required for under the gabion/mattresses and other project applications with over 120,000m^2 supplied to date. Some 7km of road edge drainage pipe has also been supplied.

Fulton Hogan Pty Ltd have been very happy with the way Global Synthetics Qld have serviced their tight delivery schedules for construction and their ability to demonstrate product compliance to specification.

Construction is scheduled for completion approximately May 2010.

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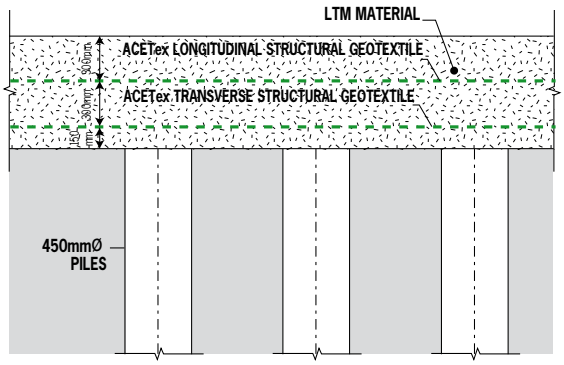
ACETex® – Innovative Ground Improvement Application

Figure 1

TYPICAL ARRANGEMENT – LOAD TRANSFER MAT (LTM)



Brisbane's continued growth in recent times has seen the need to undertake major infrastructure works to improve the flow of traffic around the city. In 2008, the Queensland Government appointed Brisconnections (who contracted work to Thiess John Holland) to commence Australia's largest infrastructure project, worth $4.8 billion. The works comprise three main sections, the Northern Busway, Airport Link and the Airport Roundabout Upgrade.

The Airport Link is a 6.7km toll road passing through the inner north suburbs of Wooloowin, Kedron, Toombul and Hendra before meeting with the Airport Roundabout Upgrade works. Much of the road was to be constructed through low lying relatively soft ground requiring ground improvement to accommodate the works.

Global Synthetics has supplied many thousands of square metres of Geosynthetics to aid in ground improvement at the site. ProFab nonwoven geotextiles have been used for separation under embankment fill, Secugrid biaxial geogrids for reinforcement of working platforms and access roads and ACETex structural reinforcement geotextiles for the Load Transfer Mats (LTM).

Many of the road sections parallel with the existing East West Arterial Road required elevated embankments and flyovers to cross existing roadways. The rigid abutments around flyovers and elevated roadways were founded on Controlled Modulus Columns (CMC®).

Where the piled sections of roadways transitioned to traditional, more flexible earth filled embankments, the design called for an LTM to more evenly distribute imposed loads, reduce lateral loads on outer piles, eliminate the need for pile caps and to minimise differential settlements.

The LTM sits over the CMC piles and consists of a granular blanket reinforced in two directions (longitudinal and transverse in relation to the roadway alignment) by a high strength structural ACETex reinforcement geotextile. Each layer of geotextile is separated by a 300mm granular layer (see Figure 1).

The specification for the reinforcement geotextile within the LTM was for a working strength of 180kN/m @ 5% total strain, limited to 2% creep strain at a 120 year design life. ACETex GT500 woven polyester reinforcement geotextile was proposed and selected for use as it satisfied all of the technical requirements of the specification and provided a commercially attractive solution. An isochronous stress strain relationship curve is required (introducing a time variable relationship between load and strain) when assessing high strength reinforcement geotextiles to determine the available stress at the nominated level of strain and time. Ignoring the strain/time relationship can lead to an underestimation of product strength being offered against the specification. The ACETex GT500 is produced with an ultimate tensile strength of 500kN/m at an ultimate total strain of 10% but with very high resistance to creep strain effects over long periods of time.

The reinforcement geotextile selection process highlighted the limited understanding of the technical specification performance requirements, even by competing suppliers of such material. Global Synthetics was believed to be the only geotextile supply company to understand the specification and offer a product that met the technical requirements of the specification.

Global Synthetics have proudly supported Thiess John Holland in the delivery of the Airport Link Project and continue to supply various geotextiles and subsoil drainage products for the project.

The use of an LTM reinforced with ACETex reinforcement structural geotextile over CMC piles is a relatively new ground improvement technique in construction over soft ground conditions and has been successfully applied in the Airport Link Project (main photo).

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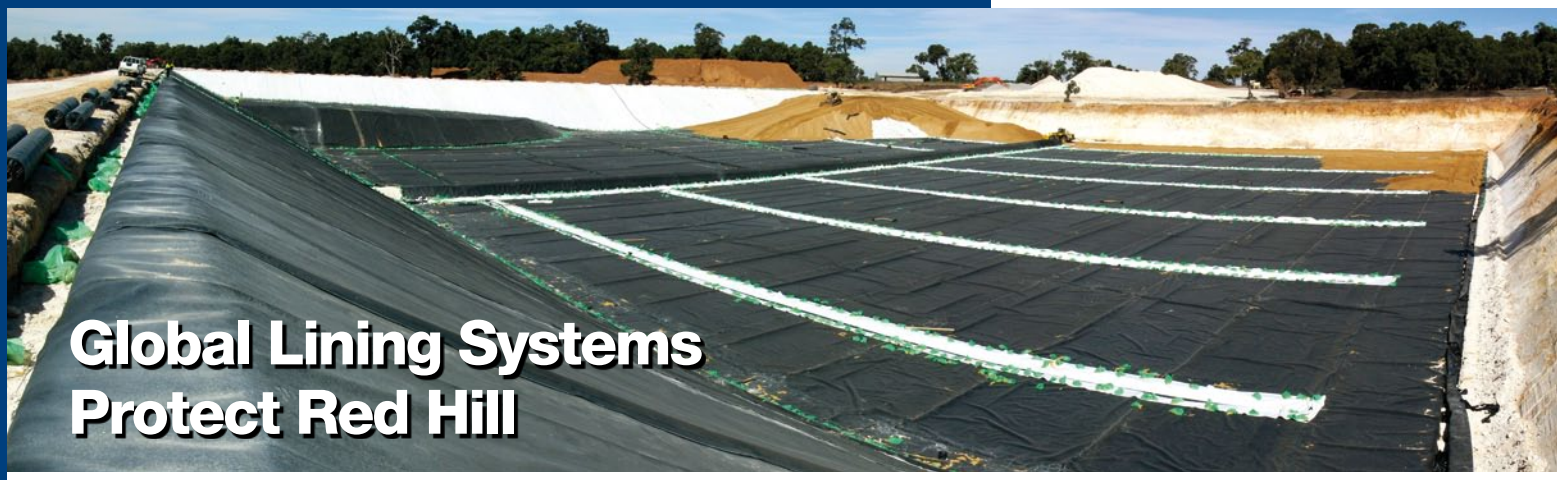

Global Lining Systems Protect Red Hill

Situated on the fringe of the Perth metropolitan area within the Darling Escarpment, the Red Hill Waste Management Facility is another example of one of the more progressive and highly developed waste facilities in Australia. Red Hill adopts the more modern principles of award winning sanitary landfill design, including leachate collection and methane gas capture, which have enabled the site to maintain its operating status within the DEC (Department of Environment & Conservation) guidelines for the last 22 years.

Eastern Metropolitan Regional Council (EMRC) who owns and runs the facility, designed the latest waste cell with stringent criteria in mind given its Class III classification. *Farm Stage 1* incorporated a special 'high asperity' textured ProLiner® HDPE geomembrane enabling a higher friction coefficient on the steeper batters than standard textured liners. Global Synthetics supplied over 50,000m^2 of 2.00mm ProLiner HDPE geomembrane which can be custom manufactured to specific project parameters including high asperity, along with provisions for onerous chemical and UV requirements. ProLiner's 8m roll width also allows faster deployment and fewer longitudinal seaming than the more common HDPE liners in the market.

Paramount in all high profile lining applications is the use of a high performance cushion geotextile. *Farm Stage 1* incorporated ProFab AS680 heavy weight geotextile which carries a minimum of 600g/m^2 of nonwoven fibre, designed to protect the ProLiner HDPE from the underlying coarse subgrade and overlying fill material. ProFab® cushion geotextiles are needled with staple fibre to produce a tightly oriented structure. Independent tests have proven that these higher density geotextiles perform better than the looser structured geotextiles under puncture and compression loads which are typical in cushioning applications.

ProFab AS680 was also utilised as a filter and separation layer for the lateral leachate collection channels at the base of the cell. The dense fibre structure of ProFab enables superior fines retention whilst still allowing a generous permeability due to its staple fibre orientation.

Principal contractor – CECK Civil Construction, and specialist lining installer – Advanced Lining Technologies Australia, delivered the *Farm Stage 1* scope to its client on time and on budget.

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News from New Zealand

This seven metre high structure, a quarry loading platform engineered to take the weight of a fully loaded MOXY dump truck, is designed to take 78 tonne loadings (see left).

ACEGrid soil reinforcement geogrid is the strength behind this wall, being chosen for both its excellent design properties and ease of use and installation. The contractor on site had to work to very tight tolerances when placing the grid, with each layer closely spaced.

The correct placement of each layer at the specified design height combined with adequate compaction is critical to the success of such a project. In this situation ACEGrid excels because of its high resistance to installation damage, wide rolls and ease of placement with no recoil tendencies. ACEGrid is tested in conjunction with the major facing block systems available in New Zealand and detailed software is available for design purposes. Of course fully accredited QA systems are in place to maintain product quality.

Designing a wall of this magnitude requires an in depth knowledge of critical failure modes, Global Synthetics New Zealand distributor Cirtex Industries can provide all test data required for both generic wall design and specific soil reinforced block systems.

Storm Damage on the New Zealand Coromandel Peninsula has been all too common over the last few years. A number of road slips have occurred that required a rapid response from the geosynthetic supplier.

Soil reinforced earth walls and slopes are a specialty area that requires specialist assistance. The New Zealand distributor of Global Synthetics products, Cirtex Industries, quickly responded to the project demands.

Cirtex supplied the Uniaxial primary geogrid, the Biaxial secondary geogrid and the geotextile for this project (see left). Once again the chosen reinforcement geogrid, ACEGrid, proved a winner with both designers and contractors for its design properties and ease of use. The ACEGrid geogrid is a polyester woven product that offers exceptional long term design strength and does not suffer from memory "recoil".

These slip repairs used the GG40 product from the ACEGrid range with a 1m design lift between primary layers, and with some additional secondary grid layers at 250mm centre's to prevent local face instability.

Take a look at how even and straight the facing is thanks to both the skill of the contractors and the wide rolls of easy handling geogrid.

For more information in New Zealand contact
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Take advantage of the Cirtex FREE DESIGN ADVICE SERVICE for your next project, and see how Cirtex Industries can help reduce the overall outlay by utilizing our extensive range of advanced geosynthetics.

Stormwater Solution at Australia's Largest Airport

A Global Synthetics stormwater drainage solution was selected for use by Total Constructions as the best practice for on site infiltration at a Sydney Airport project.

The contractor selected the Rainsmart modular below ground tank based on its ease of installation and cost saving benefits compared to that of other equally performing systems.

Infiltration is the most preferred method of storm water management when downstream discharge facilities are not present or when post development runoff volume is limited.

The Tank modules are wrapped in ProFab® nonwoven geotextile and buried in the permeable soils found at this site. The Rainsmart infiltration system helps to recharge the ground water aquifers and provide moisture for surrounding vegetation. Infiltration systems are EPA recognized storm water best management practice.

To minimise installation time Global Synthetics constructed the individual Rainsmart modules "in house" prior to shipment to site. Having the modules supplied already constructed allowed the contractor to prepare the site prior to modules arriving, allowing for a quick and easy installation of the infiltration tank.

The Rainsmart under ground modular infiltration tank, with an approximate 75,000 litre capacity, was installed within two days.

The area above the infiltration tank is now fully landscaped providing a visually attractive area while below ground the tank provides positive ground water recharge.

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ArmorMax® makes its debut in Australia

A series of complex geotechnical issues faced the engineer at an eco-friendly resort in Queensland. The owners were worried that the slope on which the central reception/dining area was built was unstable.

The challenge was to ensure that surface erosion was minimised and at the same time rectify a number of shallow slip failures evident within the slope.

The ArmorMax® system was selected because it uniquely blends the engineering characteristics of a High Performance Turf Reinforcement Mat, Pyramat, to protect the slope from future erosion issues with a system of percussive soil anchors that will effectively intersect shallow failure planes within the slope.

Once tensioned the anchors create a "frustum cone" of super-compressed soil that increases slope stability.

The ArmorMax® system was installed by Groundwork Services Pty Ltd, one of Global Synthetics specialist partner companies.

For more information contact
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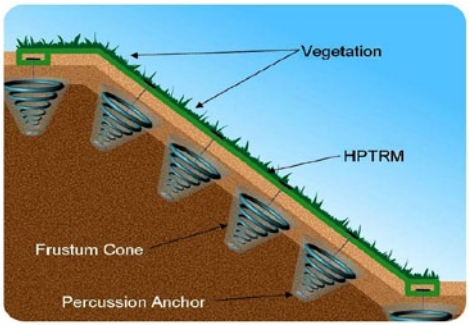

Exhibitions

Global Synthetics was proud to have recently participated in the **IPWEA 2010 WA Conference**.

The aim of this annual conference is to build knowledge and participation in the development of public works engineering.

The conference theme was '***How public works engineers lead, inspire, communicate in building better communities***'.

Over 250 delegates attended the two-day conference and Global Synthetics presented two technical papers:

- ***Modular Stormwater Tanks – Infiltration and Storage***
- ***Soft Armour Erosion Control – Engineered Turf Reinforcement Matting***

For copies of these papers, or for any further information you may require, please contact steve@globalsynthetics.com.au

Global Synthetics will be exhibiting at the following upcoming events. Come and meet your Global representative.

- **Enviro 2010 Conference & Exhibition** – 21-23 July 2010 at the Melbourne Convention and Exhibition Centre.
- **Stormwater 10 – Stormwater Industry Association National Conference** – 8-12 November 2010 at Star City Hotel and Casino, Sydney.

www.globalsynthetics.com.au

For a comprehensive product catalogue, please email ***info@globalsynthetics.com.au***

Call our Geosynthetic experts on:

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