

CASE STUDY:

ROSEBERY TAILINGS DAM

ROSEBERY, TASMANIA, AUSTRALIA

CLIENT: MMG

CONTRACTOR: HAZELL BROS

Teranap TP

Teranap TP is a geomembrane manufactured from SBS elastomeric bitumen reinforced with a non-woven polyester geotextile.

The Siplast elastomeric bitumen membranes combine the advantages of traditional materials like bituminous binders with the advantages of modern materials, in particular, polymers and geotextiles.

The reinforcement withstands mechanical stresses such as the tensile forces induced by movements and any cracks in the wearing course, along with any elongation induced by phenomena of thermal origin or circumscribed forces generated by the traffic.

The binder ensures waterproofing: its considerable elasticity enables it to go along with the movements of the reinforcement without losing its properties. Moreover, its elastic spring back enables it to accommodate the alternating movements of concrete cracks.

SIPLAST TERANAP 531 TP bituminous geomembranes were selected for Rosebery Mine in Tasmania, Australia.

As part of long term planning to extend the life of the mine at the Rosebery site, MMG engaged ATC Williams, to engineer a way to stop seepage into the Stitt River, increase capacity and dam safety, and extend the life of the old 2/5 tailings dam in the town of Rosebery.

The mine mainly produces lead, zinc, and copper, as well as gold and silver, and has been operating continually for 82 years.

MMG awarded the contract to Tasmanian firm Hazell Bros, who then engaged two major sub-contractors;

Geotas to supply and install the Teranap Bituminous liner and Geofabrics Australasia Bidim A64 cushion geotextile and Keller to install the cement/bentonite cut-off wall and grout curtain.

The scope in general terms, was to install approximately 2 km of cement/bentonite slurry in a deep trench around the perimeter of the existing dam, to create a waterproof seal down to bedrock. The Teranap Bituminous liner was then anchored into the cut-off wall, and laid over the surface where crushed material was used to construct the new dam walls. The liner was then installed up the face of the new walls, and secured in an anchor trench.

> Tailings Dam



Geotas installed 190,000 m² net area of the Teranap 531 liner and 250,000 m² of upper and lower bidim cushioning geotextile.



This bank of 6,000 m² took one day to install.



Teranap was chosen for this project for its weldability and flexibility to conform to irregular shapes and surface conditions.

Hazell Bros drilled, blasted, excavated, crushed, and moved over 1 million cubic metres of material during the construction, and Geotas installed 190,000 m² net area of the Teranap 531 liner and 250,000 m² of upper and lower cushioning geotextile.

Conditions during construction were very challenging, with over 1 metre of rain during the first month alone, high wind events, and snow.

Geotas, with the help of Aeramix Pty Ltd, developed efficient methodology for the deployment of the liner, including a specially constructed hydraulic spreader bar attached to a 36 tonne excavator, which was used to pick up the 1,800 kg rolls, and accurately place the liner with a 200 mm overlap. This enabled Aeramix to install over 6,000 m² per day, when conditions allowed.

As the liner was being placed over Bidim A64 geotextile, a flame retardant material Siplast Verecran, was laid under the 200 mm overlaps to protect the geotextile from damage during the torch welding. At times, installation was required on quite steep slopes, approaching 1:1, and the use of harnessing of the crew, safely enabled the process to continue manually, without issues.

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CQA on site was refined with the assistance of ATC Williams, and included trial weld shear testing, visual and air lance testing of every seam, and trowelling of the molten material at welding. Vacuum box testing was also performed on all three way overlaps. In every instance on site where the liner was placed under tension for various reasons, there was no observed failure of any welded seam, which provided great comfort to all that the process was extremely robust.