



GEOFABRICS CASE STUDY



GEOSYNTHETICS REMEDIATE WATERLOGGED PAVEMENT SUBGRADE

PRODUCTS USED

Geoweb® Cellular Confinement Geocell System

- Made from robust UV resistant high-density polyethylene (HDPE), the system contains a network of interconnected cells that confine and compact soil
- Quick installation using a patented ATRA clip connection system or high strength tendons, reducing installation time and costs
- Eco-friendly soil stabilisation solution that blends into the natural environment
- Reduces the thickness of structural support elements by 50% or more

MIRAFI® H2Rx Multifunctional Woven Geotextile

- Made from high tenacity polypropylene yarn, combining separation, mechanical stabilisation and advanced moisture management in a single solution
- Advanced patented wicking technology quickens moisture removal and drains moisture to prevent pavement cracks, potholes and frost boils
- Separates and prevents the intermixing of subgrade soil and structural gravel layers
- Equalises moisture content in expansive clay subgrades, reducing differential heaving and shrinkage that cause pavement stress

MIRAFI® is a registered trademark of Solmax.

PROJECT DESCRIPTION

The project site in New South Wales was located in a low-lying, swampy area with soft, water-saturated soils, which made construction challenging. The subgrade exhibited very weak conditions, with an estimated California Bearing Ratio (CBR) of approximately 2%, and even light foot traffic caused noticeable movement, creating a waterbed effect, even in dry conditions. Test pitting revealed an odour indicative of organic matter, further confirming the presence of unstable, moisture-rich soils.

Traditional remediation would have required the excavation and replacement of large volumes of poor-quality soil with high-quality aggregate, along with the installation of a thick subgrade improvement layer. This approach would have made the project both costly and time-consuming.

Geofabrics was requested to provide a geosynthetic solution that could stabilise the subgrade, address the waterbed effect, and reduce the need for extensive excavation and material replacement.

OUR SOLUTION

Geofabrics proposed a combination of MIRAFI H2Rx multifunctional woven geotextile and Geoweb cellular confinement geocell to manage the waterbed effect while achieving a stable pavement structure. The solution reduced the total pavement thickness, including the subgrade improvement layer, minimising the need for over-excavation and replacement with high-quality aggregate.

Installation began with H2Rx geotextile laid directly on the subgrade, in accordance with the manufacturer's recommendations. A layer of aggregate was placed on top with Geoweb geocell installed closer to the surface. Once the full pavement structure was in place, a proof roll confirmed the stability of the surface on pavement with no further movement observed.

For the 90m pavement section, Geoweb geocell systems, H2Rx, and Megaflo Green socked slotted drain pipe were incorporated into the design. The combined use of the Geoweb and H2Rx geotextile effectively remediated the waterbed effect, resulting in a stable, durable pavement without the need for extensive excavation or subgrade replacement.

The client confirmed that the solution performed exactly as intended, commenting, "This job site was worst-case scenario with water bedding on swampy ground, and the solution worked perfectly, just as it said it would. After the first layer was laid, I could feel it firm."



Pavement
thickness
reduced

Waterbed
effect
controlled



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