



GEOFABRICS CASE STUDY



GEOSYNTHETICS STABILISES STEEP SLOPES AT HISTORIC MONMOUTH REDOUBT

PRODUCTS USED

Geoweb® cellular confinement geocell

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

Bidim® Green non-woven geotextile

- A strong three-dimensional structure with high elongation and equal biaxial strength properties in both directions
- Made with a combination of recycled PET and virgin plastic materials
- Provides excellent filtration, separation, drainage and protection performance
- Reduced need for quarried fill materials and reduced construction times

PROJECT DESCRIPTION

The historic Monmouth Redoubt in Tauranga, Bay of Plenty in New Zealand is a culturally significant heritage site overlooking the harbour. Over time, the original slopes and embankments at the site had failed due to inadequate performance of the previous slope stabilisation method. Traditional retaining solutions, including timber structures and natural reinforcements, proved insufficient in maintaining slope stability.

The resulting ground movement and erosion led to the closure of the public walkway and viewing areas, as the slopes had become unstable and posed a risk of collapse. The project required a long-term stabilisation solution that would restore safe public access while respecting the site's cultural heritage.

OUR SOLUTION

The consulting engineer designed a comprehensive slope reinstatement and stabilisation system using geosynthetic solutions supplied by Geofabrics. The design considered the site's specific conditions, including soil type, slope angle, up to 72 degrees, drainage requirements, and the need for long-term durability and performance.

To achieve the desired outcome, Geofabrics supplied several complementary products which were installed by Walkway Solutions. Bidim Green non-woven A19 geotextile was used for separation and filtration beneath the reinforced zones, ensuring stability and effective drainage. Turf reinforcement mats, in both green and black, were applied to provide erosion control and surface stabilisation across the exposed slopes. Geoweb was incorporated to deliver geocell confinement and slope reinforcement, while biaxial geogrid offered additional soil reinforcement and load distribution.

Throughout the project, Geofabrics' technical engineering team played an active role by providing design input and on-site training. The Geofabrics sales engineer guided the installation team on the correct methods for positioning and securing the turf reinforcement mat and demonstrated the proper assembly of Geoweb tendon clips along with the precise tie-knot technique required to maintain structural integrity.

In total, the installation covered approximately 400 square metres of Bidim Green A19, 200 square metres of turf reinforcement mats, five panels of Geoweb, and 285 square metres of biaxial geogrid. The works were completed efficiently through close collaboration between Walkway Solutions, Geofabrics, and Tonkin & Taylor, resulting in a technically sound and long-lasting solution for the Monmouth Redoubt site.

Upon completion, the slopes now exhibit enhanced structural stability and effective surface erosion control, with the reinstated grass cover integrating naturally with the landscape. The upgraded site is safe, visually appealing, and once again open to the public.

This project marked the use of Geoweb on a slope exceeding 70 degrees within New Zealand, demonstrating the system's capability in steep, high-demand environments. Additionally, the system enabled a simplified and efficient construction process, which reduced both labour requirements and overall installation time.

**Geoweb used
on slope over**

70°

**Heritage site
requiring
sensitive
excavation**



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