CASE STUDY:

# GREEN TERRAMESH BRIDGE ABUTMENT

**HAUMOANA, HASTINGS, HAWKES BAY**
**NEW ZEALAND**
**JUNE 2019**

## GREEN TERRAMESH®

Maccaferri Terramesh is a versatile, modular system for reinforced slope systems and mechanically stabilised earth walls that can be a more cost-effective solution than a mass gravity Gabion wall because of the speed of installation and reduced rock fill requirements.

For mechanically stabilised earth slopes and embankments that require vegetation, the front face of Maccaferri Green Terramesh can be filled with soil and planted, creating a green slope.

Green Terramesh soil reinforced slope structures can exceed 50m in height and can be used in a wide range of engineered soil types. Green Terramesh structures allow for geogrid (when required) to be terminated at the face minimising the risk of exposure of the geogrid to UV, fire or vandalism.

The Green Terramesh® main unit is fabricated from heavily galvanized GalMac® and polymer coated steel wire.

GEOFABRICS®
Smarter Infrastructure

Bridge abutments suffer typical erosion issues, whether through flood events, backfill, undermining or even grazing stock. Hawkes Bay is renowned for its complex cycleway trails. This site was on one of the routes between Haumoana and Clive, where the cycleway was between the stop bank and river and grazing cattle were creating issues with the abutments of the bridge.

Gabion rock is increasingly hard to get and expensive on the East Coast of the Lower North Island. Green Terramesh has the benefits of being able to use on site material if free draining and meeting compaction requirements. It can also be a vegetated or rock fill front face option.

A presentation on Green Terramesh (GTM) had been done earlier to the consultant along with the client for Hastings and other sites in the district including Central Hawkes Bay where GTM is being used for flood repairs. The GTM was a suggested option for this Haumoana site, and the contractor Downer was invited to do the work by the client. Training was provided via the presentation, along with any questions answered. Information including the presentation was left with the contractor. Two visits to the site were made during the construction.

Green Terramesh is a modular system with a standard 70-degree fixed front face, the individual units are joined by stainless steel rings, and under 3 m height structures the units can be used on their own without secondary reinforcement.

Eroding Bridge Abutment before the Green Terramesh installation.


During installation.

Completed Green Terramesh structure with both vegetation and rock face.

Its front face is reinforced with an 8 mm welded galvanised mesh woven into the Galmac PVC double twist mesh. The galvanised mesh is there for temporary support during construction, the Galmac PVC double twist mesh gives the system greater than a 100-year design life and has the option of a vegetated or rock filled front face. The 0.6 m vertical height of each GTM unit worked in very well with the low clearance under the abutment.

Due to the limited height under the bridge abutment, a 2-tonne digger was used. Two GTM lifts were installed with a 750 mm clearance for placing rock, topsoil and backfill. Further down another two layers of GTM were installed at the base beside the cycleway. A 10-tonne digger could have been used on the base layer, due to availability at the time this was done by a 16-tonne digger.

This job was unique as the contractor decided to do both the vegetated front face (wingwalls and outside edges of the base) and rock filled front face (directly under the bridge). This was due to the bridge directly above; vegetation is difficult to grow due to the lack of light and moisture. This ended up adding to the visual impact of the structure.

63 Green Terramesh units were installed in total, Miragrid GX was also used as secondary reinforcement in the wingwalls. With a four-man crew, a total of 212 hours was required to complete this structure. The contractor found the product easy to work with, and for difficult corners they were able to cut the Galvanised square mesh where required. The Galmac PVC double twist mesh was then folded and joined to create tidy corners in difficult areas. The client, Hastings District Council found that the product installation exceeded their expectations.