

Project: Gisborne to Napier Passing Lane SH2 Waihua Hill
Date: Sept - Dec 2013
Client: NZTA
Location: Wairoa



Gabions

SH2 from Napier to Gisborne is a long windy road, with numerous hills and very few places in which to pass slow traffic. Logging trucks are increasing in volumes on these roads, the railway line is now closed so SH2 is the only option. The section at Waihua Hill was 2 lanes, it was designated as an area that required a passing lane, with the completion of the new **Terramesh Gabion** wall, it's now a 4 lane section of highway.

A lot of money was spent on site investigation before choosing **Terramesh Gabions** (used for stabilising steep to near vertical slopes) as the most appropriate method of a Mass Gravity wall. Terramesh reinforcement is oriented perpendicular to the front face. The site was very wet, and is prone to movement in wet periods. The first layer of gabions was embedded to a 1m depth in the ground.

Gabions do not impede the flow of water with its large void openings due to the grading of the rock used, using a non woven geotextile behind to minimise disruption to the flow of water, yet keeping a separation layer. Rock was sourced locally, and dropped off close to the site. During construction, the traffic was down to one lane with stop lights to minimise risk to the excavated areas required for drainage and reinforcement. Construction details, and the method of excavation are critical and constant communications between the contractor and client are required.

The use of **Terramesh** panels for each layer as primary reinforcement also meant the **gabions** could be tied back underneath the road, which was further reinforced with the use of Anchors grouted into solid material (to an ultimate tensile strength of 150kN requirement and minimal length of 12m) behind the gabions at the 3rd and 7th layers. Pull out testing of the anchors was required prior to the continuation of the gabion construction. A Telecom fibre optic cable was also in the middle of the existing lanes, this was decommissioned and relocated to the middle of the new lanes during construction. This system provides a flexible mass gravity wall that is designed for seismic activity, while also being cost effective.



Preparation and work in progress



Installation of gabions



Completed Terramesh Wall in use



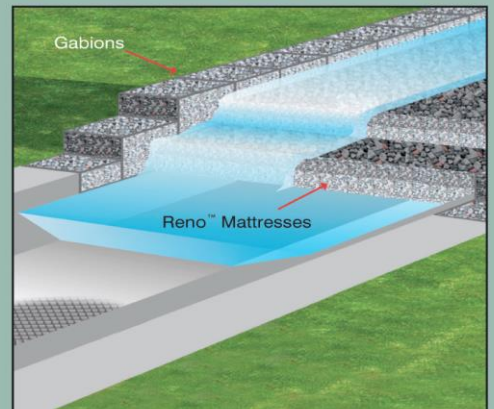
Gabion frames were used during the construction of the wall, these are mobile shutters to assist with the stone filling. A 25 tonne and 12 tonne Excavator, 6 tonne sheepfoot roller (used well back from the gabion face for compaction), a 4 m³ tracked dumper, a light plate compactor and 6 staff completed the project in 3 months. Due to the height of the near vertical wall, a cherry picker was also involved, safety of workers at this height is paramount and must be considered before construction.

How Gabions and Reno™ Mattresses work

Gabions and Reno™ Mattresses are a trusted and technically sound way to retain earth and combat soil erosion. They have been used in Australia for the past 50 years, in locations ranging from remote mine sites to urban parklands. They both have a steel wire structure designed for maximum long-term durability, and are supported by a range of design software and installation tools.

Gabions are rectangular woven wire mesh baskets filled with rock to create flexible, permeable structures such as retaining walls for mining, industrial and road projects. They are also used for erosion control, bank stabilisation, architectural and urban design features, and weirs.

Reno™ Mattresses are thinner flexible cages made from double twisted woven wire mesh, filled with rock and divided into cells to limit movement of the rock fill during high-flow conditions. Because of their flexibility **Reno™ Mattresses** are used mainly for hydraulic applications such as weirs, scour protection along riverbanks, and embankment stability in channel linings. **Reno™ Mattresses** can handle water flows in excess of 6 m/sec for long durations.



Gabions and Reno™ Mattresses Installation

The information contained herein is general in nature. In particular, the content herein does not take account of specific conditions that may be present at your site. Site conditions may alter the performance and longevity of the product. Actual dimensions and performance may vary. This document should not be used for construction purposes and in all cases, we recommend that advice be obtained from a suitably qualified consulting engineer or industry specialist before proceeding with installation. © Copyright held by Geofabrics New Zealand Ltd. All rights are reserved and no part of this publication may be copied without prior permission.

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