

# CASE STUDY

Double Twist Mesh

Project: Clive River Stopbank Protection Work  
Date: May- September 2006  
Client: Hawkes Bay Regional Council  
Location: Clive, Hawkes Bay



## Gabions

The Clive River acts as the main outlet for two other rivers on the Heretaunga, which under flooding conditions backs up from the sea. Residential properties along the saline sections of the Clive River were at risk from flooding.

**Maccaferri Galfan + PVC coated gabions** and **Reno mattresses** were chosen as the most environmentally friendly and cost effective option. The contractors involved also had previous experience with this system being a recognised installer of the Maccaferri mesh products. Constructed parallel to river, **gabion** and **Reno mattress** structures correct and control the flow of water helping to prevent flooding of property, and preventing erosion of stream beds and edges of banks.

**Reno mattresses** were assembled on the stop bank and lifted into place using Maccaferri's Reno frame onto the soft marine silt. A layer of **bidim**® geotextile was placed on the underside of the **gabion** and **Reno mattress** units to act as a filter preventing sediment loss through the stone infill. Once the **Renos** were installed, the stepped **gabion** wall was then constructed on top with the first layer using **Maccaferri's gabion** lifting frame.

The use of **gabion** and **Reno mattress** lifting frames offers contractors the ability to rapidly construct gabion walls and revetments in difficult terrain with poor access. A crane with lifting capacity to support approximately 4.5 tonne with sufficient reach is required for these applications. This method of construction has been used in New Zealand and worldwide and has been well documented in various Maccaferri brochures.

**Gabion** and **Reno mattresses** offer environmentally enhanced retaining and revetment structures, a fact supported by the World Wild Life Fund research and publications on various stream and river protection system.

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Installation of Reno mattresses



Gabion installation in process



Completed project with vegetation

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The use of fresh concrete structures in waterway protection is to be discouraged and has shown to raise local pH concentration to a pH of 10 or more, which is very detrimental to local species that habitate the waterway. The voids in the stone infill of gabions and Reno mattresses or purpose made recesses in the wall itself that maybe designed and constructed, provide a safe habitat for the various marine species that live in these waterways. Gabions structures can also allow water to re-oxygenate and this helps improve water quality and biodiversity in the waterway.

In addition, vegetation is able to regrow within sediment deposits that accumulate or soil and plants may be deliberately included in the gabion works. The mesh allows plants to entangle and become one with the structure and provides additional resistance to damage during flooding. The use of Galmac + PVC coating (a Zinc / Aluminum 5% alloy Mischmetal) on the units provides enhanced erosion resistance of three to four fold over normal galvanised wire, providing optimum longevity to the structure.



Landscape of Completed Project