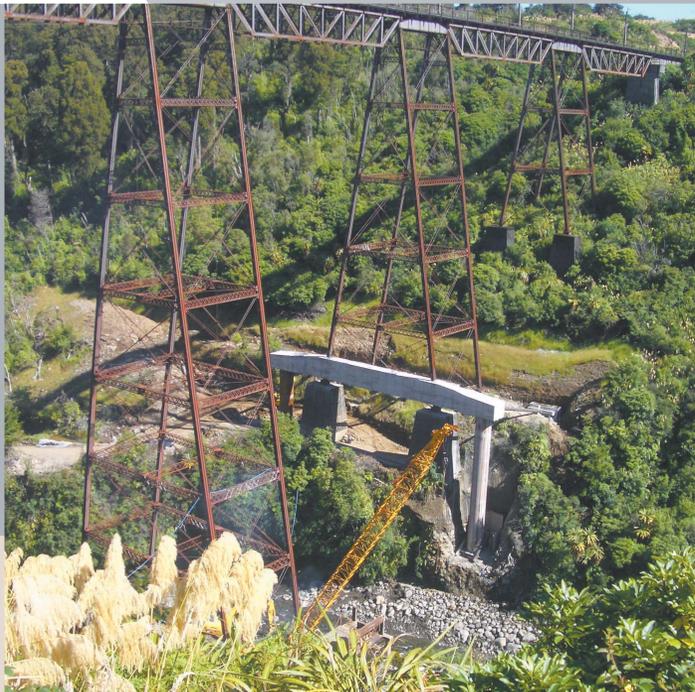


# Makatote Viaduct Tower Pier Underpinning



April 2006 to February 2007

Project management and engineering design undertaken by ONTRACK. Contractor, Fulton Hogan Civil.

ONTRACK acknowledges the contribution of Horizons Regional Council, Department of Conservation, Fish & Game New Zealand, Ngati Rangī Trust and adjacent landowners.



## Construction a test of ingenuity and endurance

The distinctive Makatote railway viaduct stands almost 80 metres above the Makatote riverbed on the North Island Main Trunk Line. Built in 1908, it is New Zealand's third highest railway viaduct.



Construction was a test of ingenuity and endurance. Dense bush confronted the construction gangs when work began in 1905.

Steel and materials were shipped from the contracting firm Andersons in Christchurch to Wanganui and barged up the Wanganui River to Pipiriki. From there they were taken by bullock or horse teams, and later traction engine to the Makatote site.

During the winter months, transport would literally get bogged down in mud for days on end. There were manpower shortages and floods to contend with as well as problems finding suitable foundation rock for one of the central piers.

The project was also notable for the use of an overhead cableway and an on-site workshop where steel was fabricated.

The Makatote workshop served another purpose as the cafeteria where passengers coaching between the two railheads at Ohakune and National Park, stopped for lunch.



## Makatote Viaduct on a sounder footing

In early 2006 ONTRACK took action to counter scouring around the footing of one of the central piers. This involved building two piles beside the existing concrete footing and installing a 38 metre steel cross beam.

Each pile was created by sinking a casing into the riverbed and filling it with concrete and steel reinforcing. ONTRACK was responsible for project management and design engineering while contractors Fulton Hogan Civil carried out the work.

The project involved working in extreme weather through the winter of 2006 to build roads and temporary bridges to provide access to the site.

The contractors also had to ensure that the viaduct remained in use to keep the North Island Main Trunk Line open. Critical to this was limiting vibration to prevent damage to the viaduct tower.

A huge hydraulic oscillator was used to 'twist' the two-metre casing for the piles 25 metres into the ground.

The project was successfully completed on time in February 2007 at a cost of just over \$4 million.

## Bird and fish habitats protected during construction

The reinforcement of the piles on the Makatote Viaduct was achieved by working around the needs of a rare breed of duck and the breeding habits of trout.

The Whio or Blue Duck is both unique to New Zealand and among other waterfowl. Between 2,000 and 4,000 ducks make their home in New Zealand's mountain streams.

They gain the name because they are blue-grey in colour, apart from dark chestnut spots on their breast. They're also known as the Torrent or Whistling Duck and they're considered endangered because numbers have been slowly declining.

The bird is strongly territorial. Pairs remain together for life and live in the same patch of stream. They nest in the spring under bushes close to the stream bank.

Blue ducks need crystal clear water to supply them with the larvae and aquatic insects which form their diet. An elaborate system of silt traps was installed around the Makatote construction site to protect their habitat.

The Makatote River is also home to a healthy number of brown and rainbow trout. Construction work was arranged to minimise disruption to their breeding season.

