MAGNUMSTONE™

# TE UREWERA NATIONAL PARK BRIDGE REPAIR

CIRTEX® GAIN MORE GROUND™

## ADVANCED GEOSYNTHETIC SOLUTIONS

### PROJECT INFORMATION

Ruatahuna Road is the main access road leading from Rotorua into Te Urewera National Park. It winds its way through native New Zealand forest to Ruatahuna and is part of a forest road that links the two sides of SH38, continuing beyond the remote settlement toward Lake Waikaremoana and onward to Wairoa on the East Coast. 5km shy of Ruatahuna, the road crosses a rivulet where it joins the Whakatane River. The old bridge spanning the river was worn out and due for replacement. This project required new bridge abutments incorporating a steel-reinforced solution.

MagnumStone was selected for its flexible design capability, enabling integration of the specified steel reinforcement, along with its efficient installation and strong local stock holdings.

### DESIGN

Thanks to the versatility of MagnumStone and because the blocks are manufactured in New Zealand by Cirtex, an alternative block design was created that allowed for the use of steel reinforcement ladders instead of StrataGrid. With a concept in mind, Cirtex worked closely with WSP to create the ladder design, which was then incorporated into the custom-made mould for the MagnumStone blocks. This allowed the original 5m wide MagnumStone MSE abutment design to remain relatively unchanged.

### INSTALLATION

For ease of construction and to reduce the need for cutting concrete on-site, the blocks were installed vertically instead of utilising MagnumStone's standard 87.6° batter design. Notches were created within each block, allowing the looped end of each steel ladder to slide through. The steel ladders crossed over in the middle, creating a link between both wall faces, giving extra strength to the design. Cirtex delivered blocks to a holding depot close to the remote site.

Once the level foundation was built, lightweight machinery was used to lift each block into place. Drainage aggregate was placed within MagnumStone's hollow core, with 600mm lifts of compacted GAP65 placed up to the level where each steel ladder would be placed. The bridge structure was placed on top of the concrete bridge support, with the MSE abutment raised around it to support the road.

The strength of the steel ladder reinforcement also allowed the blocks to be placed directly on top of each other instead of the standard staggered design. This allowed for the installation of the crash barrier deep into the hollow core, which was tied in with concrete.

The selected solution aligned with the project's environmental objectives, supporting long-term stability while preserving the integrity of the surrounding landscape.

### The MagnumStone system provided the following benefits to the project:

- Versatile design allows MagnumStone to adapt to variable conditions
- Manufactured in New Zealand, allowing a steady and immediate supply
- Ideal for creating walls and abutments in remote or difficult to access sites