

1 Mangamuka Gorge slip repairs



Slip details

There are now 15 critical slips throughout the gorge and a further 23 that need repairs. Some of the slip sites are still showing signs of movement and need to be stabilised before they can be repaired.

Project timeline



August 2022

15 major and complex slips resulted in State Highway 1 (SH1) through Mangamuka Gorge closing.



August - November 2022

Geotechnical investigations were carried out to give us a better understanding of clearer picture of the full extent of the damage and ground conditions within the gorge.



December 2022

\$100m of funding was secured to restore the state highway to its original condition.



Jan - late March 2023

Investigations, planning and design work is refined to understand the damage and how we will repair this challenging transport corridor.



February 2023 - late 2024

Slip repair work has begun and we've mobilised a full team to get started on site.

We are here



Late 2024

SH1 Mangamuka Gorge planned to reopen.

Current Slip Repair Updates

The permanent works are underway at both ends of the Mangamuka Gorge.

The crews are operating in a challenging environment due to the complex geology of the Maungataniwha ranges and the constrained environment, with large and heavy machinery required onsite to complete the repairs.

Physical works are being undertaken on 8 of the 15 critical slip sites. The remaining sites are currently still being investigated and appropriate designs are being developed.



Slips A1 and A2

Enabling works - Complete.

Permanent works - 40x 6m pile casings have been installed in preparation for the return of the main piling rig from Slip A5. Once in place, the piling rig uses the casing as a guide to drill down to solid rock. It will then be filled with re-enforced concrete which forms the pile

Slip A3

Enabling works - Complete.

Permanent works - Pile casings are currently being spliced. Splicing of casings in piling operations refers to the process of joining together two or more sections of cylindrical casing that forms the external sleeve of the pile.



Slip A5

Enabling works - Complete.

Permanent works - Teams on site are currently finishing installing 25x 1050mm diameter piles and are scheduled for completion in late September.

Slip A6

Enabling works - The team are currently installing the enabling piles which consist of a series of 800mm diameter piles, encompassing both reinforced (hard) and non-reinforced (soft) piles. This proactive approach aims to ensure that, once heavy machinery are established on the slip, the ground remains sufficiently stable and any potential for further movement is minimised.

In addition, the teams have installed two slot drain pads, addressed rock spalls, completed drainage installations, and established enabling work platforms.

Permanent works - Due to begin in late October.





Slip A9

Enabling works - The team is nearing completion with the capping beam complete and stormwater management controls are being re-installed.

Permanent works - Due to begin in late September.

Slips A12 and A13

Enabling works - Teams are continuing with lagging, which is building the retaining wall behind the piles, as well as work platforms in preparation for the staged mobilisation across Slips A12 and A13.


Permanent works - Installation of 39x1050mm diameter piles on A12 are underway and are progressing on schedule. Due to the access requirements and overall fragility of this section, work will proceed onto A13 once the work on A12 is complete.



Site Facts and Figures

 **119,527** total hours worked up to September and climbing

 **140** people currently working on site (daily average)

 **567** people inducted on-site

419 locals working on the project (74%)

Team members upskilled



70 SiteSafe Foundation

23 Mobile elevated work platform

20 CPR /First Aid

11 Wheels tracks and rollers

10 Heights and harness

0 Lost time incidents



747 enabling piles

242 permanent piles **scheduled to be installed** (currently)

3467m³ concrete used to date

more than **100km** rebar required (enough to get from Mangamuka to Whangarei)

14km Total distance of rebar used to date (140 rugby pitches)



1712mm

Historical average annual rainfall

1701.6mm

Total rainfall since March 2023

May

Wettest month to date **542.2mm**

Safety Around a Moving Whenua

While we have been onsite, we have continued to experience ongoing weather events and a year's worth of rain in under 6 months. The wet weather has meant that at times it has been unsafe to be onsite, with several new slips occurring during this period.

We have a complex network of sensors onsite that are working non-stop to keep the construction site safe. These gadgets are constantly checking ground movement, helping geotechnical engineers know what's happening keeping the teams on site safe as they do the hard mahi fixing the slips.

The sensors monitor ground movement, check how wet the soil is, and measure how much rain has fallen. Every day, these sensors send data to a special plan that figures out how risky the ground movement is. This plan is called a Trigger Action Response Plan, or TARP. The TARP level is shown throughout the site with lights placed at slip entry points.

If it rains a lot (50mm or more in a day), or if the ground gets wet because it's been raining for a long time, the TARP level goes up automatically. If a sensor notices that the ground has moved sustainably since the last reading, alarms will go off and the crews are moved away from the site until it safe to return.

Sending data out from the gorge is tough because there's no cellphone coverage and power is limited. But the sensor system that keeps our teams safe uses advanced wireless technology to make this possible.

These smart sensors do an important job keeping everyone safe on site. They watch the ground and tell the engineers and workers if anything's not right, even if it's happening slowly or they can't see it right away.



Stormwater Management

As part of our environmental controls we are continuing to take steps to ensure that wildlife and the land that they are on around the works sites are protected.

As part of this commitment, we are utilising innovative and effective ideas around managing water runoff to prevent contaminants from flowing off the worksite onto the whenua and awa below.

Water runoff is diverted into a series of clean industrial bins where dirt and other contaminants are allowed to settle, before overflowing into another bin. The remaining contaminants are also able to settle before being pumped out and removed offsite for further settlement and safe disposal.



Keep up to date

To receive progress updates direct to your inbox, visit our website www.nzta.govt.nz/mangamuka or scan the QR code.

