



# The Bulletin Kaikōura earthquake update

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## Two-years on from ex-cyclone Gita



NCTIR crews are close to wrapping up resilience works on Gita-affected sites as the two-year anniversary of the event was recently marked.

On 20 February 2018 ex-cyclone Gita wreaked havoc on an already earthquake-affected coast, bringing down 60 slips along the Kaikōura corridor from the Hundalees to just south of Clarence. Over 300,000 cubic metres of material needed to be cleared from the road and rail in order to get the transport networks up and running.

Our earthworks, geology and engineering teams worked swiftly to restore access north and south of Kaikōura, with the material moved in less than two weeks, and road and rail back on track by 5 March.

“It was a big shock when Gita hit,” says NCTIR North & South Construction Manager Gary Ikin. “Crews were well on their way to clearing material from the earthquake, and then suddenly these mild little streams were bringing down even more debris from the hillsides - it was a pretty huge setback.”

While engineers were pleased with how the existing infrastructure handled the extreme rainfall, Gita exposed additional erosion paths where significant volumes of natural debris remain in the hillsides, and will continue to wash down in heavy rain events.

At major Gita-affected sites engineers have focussed on increasing the capacity of infrastructure to create easy -access, low-maintenance design solutions. The newly widened debris flow bridges, culverts and strengthened retaining walls aim to reduce the necessity of road and rail closures in future.

These solutions should stand the Kaikōura corridor in good stead after NCTIR has gone and the road has been handed back to Waka Kotahi NZ Transport Agency's maintenance contractor to maintain over time.

See the map on page 2 for a full overview of all major Gita work.



Severe damage at Raramai caused by ex-Cyclone Gita

# SH1 Kaikōura: Major Gita resilience works



## Rock Steps

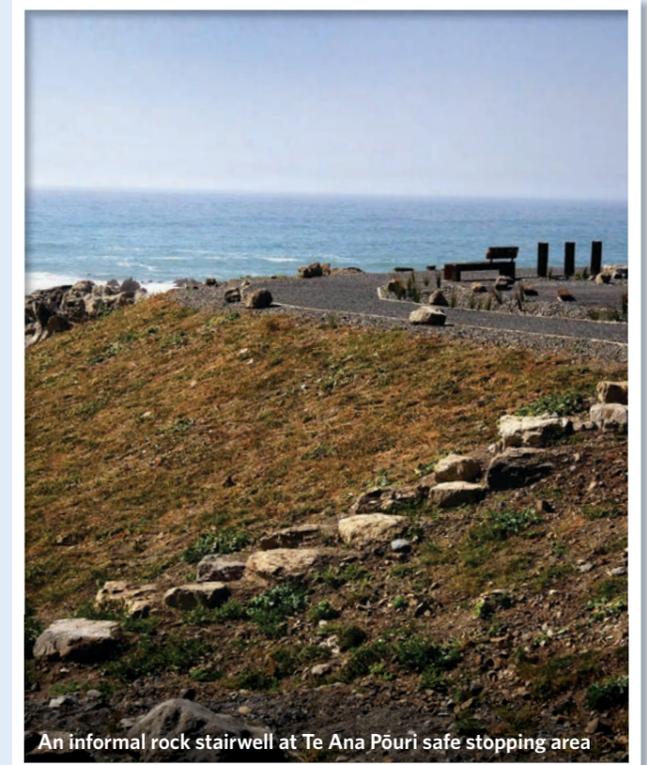


NCTIR Landscape Architect Lawrence Elliott says the rock stairwells installed around Paparoa Point and Te Ana Pōuri safe stopping areas are the result of collaboration with the Restoration Liaison Group (RLG)\*.

'NCTIR's initial design was to have formal concrete and timber stairwells leading down the revetment to the beach,' Lawrence explains.

'But after discussions with the RLG this design was modified to a more subtle, informal stairwell made from recycled slip rock, which blends with the natural environment. This will blend in even more once the areas have been planted.'

\*The RLG was established in 2017 to provide a forum for the NCTIR alliance to collaborate with key stakeholders including iwi, central and local government, and local community groups.



An informal rock stairwell at Te Ana Pōuri safe stopping area

## NCTIR first in NZ to use new barrier arms



Earlier this year Kennards Hire gave NCTIR's traffic team the opportunity to trial one of their PORTABOOM portable barrier arms.

This device was recently approved for use on the New Zealand roading network, and NCTIR is the first in the country to use it to manage live traffic. Two of the arms were installed at the 30B slope repair site, just north of Raramai tunnel.

The device is remote-controlled, and can be operated from up to 75 metres away. This allows Traffic Controllers to stand safely outside of the direct line of traffic, and will reduce incidents associated with fatigue and manual handling.

Only one traffic controller is required on short worksites with a view of both barrier arms.

NCTIR South Zone Traffic Manager Stephanie Ambler thinks it's great that this technology has been approved for use. "We're really excited to see these units in action and the traffic controllers are absolutely loving them! After three years of reports of paddle-runners and research into solutions, it's a great feeling to have finally found something that works and is already compliant. Having a physical barrier arm just adds that extra level of protection for our traffic and site crews."



New barrier arms in use at Slip 30B, near Raramai Tunnel

### REMINDER

Please stick to speed limits around work sites for the safety of traffic teams, site crews, & other road users.

## Ask an engineer: Tunnel resilience



NCTIR Project Engineer Marion Guerreiro explains how her crew is improving the resilience of Tunnel 19, north of Half Moon Bay, for the safety of rail and road. Work began at the site in August 2019 and is expected to be completed in June 2020.

### Why did you need to extend the tunnel structure?

After the area was red-zoned following the 2016 earthquake, a temporary steel shelter was installed so rail freight services could resume, work could begin safely on the site, and crews could use the tunnel to access Ōhau Point. As steel is susceptible to rust and impact damage, this shelter was only ever designed as a temporary solution. The rock face behind the tunnel is still very active, so to ensure permanent rail protection from rockfall a 40-metre long concrete extension to the original tunnel has been installed.

### How will the concrete extension be anchored to the hillside?

The concrete structure will be anchored to the rock face with hot dipped galvanised steel bars once the temporary steel structure is removed. The 28 hollow bar rock anchors are each 9 metres long and 73 millimetres in outer diameter. These will be drilled through pre-cast anchor beams at the top of the tunnel and 20MPa concrete before being anchored to the rock face.

### How will you help to avoid rocks bouncing from the tunnel roof on to the road?

A one-metre impact layer made up of fine gravel will be placed on the roof of the tunnel extension and the concrete fill between the extension and the rock face. This will create a large catchment area and, together with a protection railing on the seaward side of the tunnel, will help avoid falling rocks rolling from the roof on to the road.



Marion Guerreiro came to work on the rebuild from France in April 2017

## Protecting against rockfall



The rain on Saturday 22 February was a welcome relief from dry conditions, but also a reminder of the fragility of some sections of State Highway 1 and the importance of resilience work.

Rockfall between Peketa and the Parititahi Tunnels was triggered by the rain, and the highway was closed to traffic overnight. The section will remain reduced to a single lane for safety reasons while NCTIR works towards a solution. Rockfall is an ongoing issue at this location, with 72 recorded rockfall incidents there since the 2016 earthquake.



Recent rockfall south of Kaikōura

## KiwiRail realignment work at Tunnel 21



Just south of Ward at Tar Barrel, KiwiRail is undertaking some impressive work at Tunnel 21 to realign the rail and install a new over-bridge for SH1.



Tunnel 21



## NCTIR at the A&P Show



The team from NCTIR enjoyed their day out at this year's Kaikōura A&P Show, taking home the ribbon for Best Trade Stall for the second year running.

The stall included a building challenge allowing people to construct a tower and then test its strength on a platform provided by Quake Centre, which simulates earthquakes.

We also ran a jellybean counting competition as part of our stall, in the form of a cone full of jellybeans. We would like to congratulate the winner, 10-year-old Jaxon Reid, who had the closest guess of 1,215 jellybeans (actual number being 1,293). Jaxon's grandmother has calculated that if Jaxon and his two sisters each have five jellybeans per day, the supply should last them several months.



The winner, 10-year-old Jaxon Reid!



Young ones enjoying the 'quake table' at NCTIR's A&P Show stall

## Connect with NCTIR sessions

Going forward our **Connect with NCTIR** drop-in sessions at the library will be held fortnightly on a Thursday from 12-2pm. The next session will be **Thursday 5 March, then 19 March**, and so on. If you have a question but are unable to make one of these sessions, please come and visit us at the NCTIR office on Beach Road or call our freephone: **0800 NCTIR EQ** (0800 628 4737) or email us: [info@nctir.com](mailto:info@nctir.com)

## New Wandle Bridge completed in four months



The new Wandle Bridge north of Waiau on the Inland Road (Route 70) officially opened to traffic last month, after a full replacement of the original earthquake-damaged bridge.

The opening was marked with a ceremony attended by Hurunui District Council (HDC) staff and the NCTIR crew who delivered the new build, which began in September last year.

The new bridge was completed in approximately four months using a total of 290 cubic metres of concrete, 10 bridge beams, and piles drilled to a depth of up to 24 metres.

HDC staff and councillors went on a tour of the NCTIR project sites between Waiau and Kaikōura in December 2019. "The road itself is, generally, in better condition than it was before the earthquake. We're happy with the work that NCTIR's done on it," says HDC Chief Executive Officer Hamish Dobbie.

The temporary Bailey bridge that provided traffic access since 2017 has now been dismantled, with parts being used on the Waiau Bridge while repairs are underway there.



The completed bridge at Wandle River, north of Waiau



Hurunui District Councillor Ross Barnes formally opening the bridge

## Shared Use Path FAQs

**How will the decision not to proceed with the shared use path affect the length of the works programme and staff?**

The works programme will continue throughout 2020 and will be completed with seasonal works in late Spring. NCTIR's priority is its staff, and we are working through (on a project by project basis) what this decision means for them regarding the remaining time on the project.

**Are the seawalls and other structures needed now if there will be no shared use path?**

The main objective of the NCTIR programme is to provide a more resilient and safer road and rail network. The sea wall structures were constructed because it was the only option where the existing road was significantly affected, and it was too dangerous to try and use the old road. As part of the safety improvements project, very early in the recovery phase, a shared use path was designed as part of the wall capping system. While there will now be no continuous off-road shared path, these structures will provide 3kms of new amenity area, which will complement the six new safe stopping areas being delivered across the Kaikōura coast. We are working with Te Rūnanga o Kaikōura's Natural Resources Manager to ensure the finish across the corridor is as natural as possible. This will involve softening the look of roadside structures wherever possible.

**Why wasn't the wider community consulted on the shared use path?**

Due to the emergency nature of the works following the 14 November 2016 earthquake an Order in Council (OIC) was established by the Government to enable accelerated works to proceed. Part of the condition of the OIC was the formation of the Restoration Liaison Group (RLG) to ensure that environmental, ecological and cultural issues were appropriately addressed during the rebuild of the coastal corridor. The RLG includes representatives from local councils, the Department of Conservation, Heritage New Zealand Pouhere Taonga, Kaikōura Marine Guardians and Te Rūnanga o Ngāi Tahu as the recognised Treaty Partner. In order to make quick progress and open the road and rail safely the OIC required quick decision-making (using the RLG) meaning that there was no ability to consult with the wider public. Often design and delivery were happening at the same time, including the design of the sea walls.

**Does this mean the Shared Use Path will never be built?**

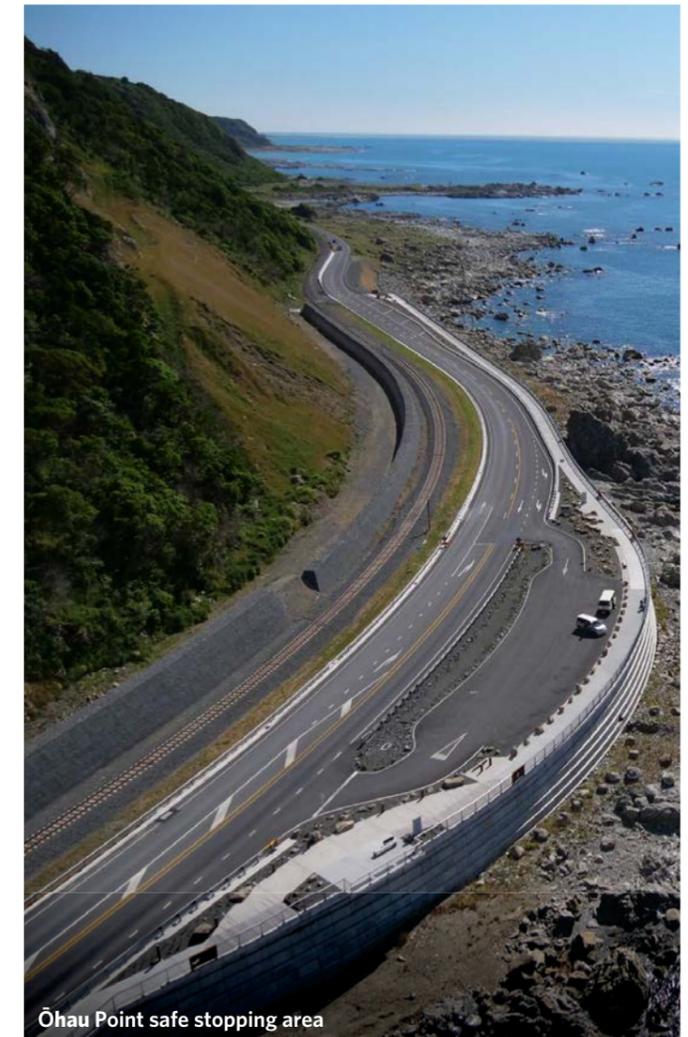
The Shared Use Path had been designed to make use of essential structures and road widening, with a plan to run from Ōkiwi Bay to Irongate Bridge. Any intention to build a trail is now outside NCTIR's scope and will sit instead with other agencies and/or interest groups, who will need to follow the normal RMA process for development if they wish to proceed.

**Will you be removing handrails as a result of this decision?**

No, handrails are there to protect people from falls, and we will continue to use them where needed.

**Will there still be areas to park where the pathways begin and end?**

Yes, the pathways will be accessible either from safe stopping areas or easily egressed/accessed from the highway.



Ōhau Point safe stopping area

