



The Bulletin Kaikōura earthquake update

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THE HUNDALEE HILLS

The Hundalee Hills are a hot spot for one-lane sections along State Highway 1 (SH1) south of Kaikōura as the road and its structural foundations are being rebuilt.

This rebuild has three aspects: constructing the final three structural walls damaged by the 2016 earthquake, rebuilding four sections washed out by ex-cyclone Gita, and road maintenance and improvements.

Work continues on the walls and washed out sections resulting in four one-way sections between the Leader Road/SH1 intersection and Oaro.

'As anyone who has driven the route will know, it is winding, narrow and carved out of steep hillsides,' says zone manager for existing infrastructure Keith Larson.

'To even bring in the equipment where we need to do this work in we have to do a lot of preparation work to safely fit our cranes, machinery and workers on the road while also allowing traffic to continue to flow.'

'The good news is the delays drivers are experiencing are for a relatively short timeframe when compared with the

design plan for the road as we have incorporated where possible, vertical and horizontal alignment improvements enabling an improvement in travelling enjoyment and safety.'

Construction has begun on two of the Gita wash-out areas, while work for the other two sites are in the design phase, but fixing these areas is complicated by the topography of the landscape.

'The one positive from Gita was that the areas of the Hundalee Hills where we had completed work held up perfectly in the extreme weather event,' says Keith.

The three structural walls needing to be built are also complex because of the winding, steepness and narrowness of the road, but once completed will ensure a road better built to withstand future natural disasters.

'We are trying to find the best fit for what is a tricky route, to provide for a safer and more enjoyable drive over the Hundalee Hills on the stunning Picton to Christchurch journey,' says Keith.

SH1 over the Hundalee Hills has undergone an upgrade

This bulletin provides the latest information about the rebuild of road and rail networks damaged by the Kaikōura earthquake in November 2016. The bulletin is produced by the North Canterbury Transport Infrastructure Recovery (NCTIR) - an alliance representing the NZ Transport Agency and KiwiRail, on behalf of Government.



over the past 17 months with better road alignment, more guardrails, the height of the road being lifted in places for an improved driving experience, and new road seal.

During the next six months, while drivers are sharing the road with work sites, it is critical to drive to the speed restrictions and follow all instructions given by our crew and road signs.

'As always, we remind drivers to plan ahead for their journey by checking www.nzta.govt.nz/p2c or calling **0800 4 HIGHWAYS (0800 44 44 49)**,' says Network Operations Manager Tresca Forrester.

'And we thank everyone for their patience as they share the road with our crews undertaking the rebuild work.'



OUR COMMITMENT TO A BETTER TRANSPORT NETWORK.

There have always been two clear goals for those restoring State Highway 1 (SH1) and the rail way line through Kaikōura.

The first, and most immediate priority, was reconnecting communities by reopening the transport networks as quickly as possible. That has been achieved.

The second is to leave behind something that is better than what was there before the devastating earthquake.

While work continues to finish restoring the road and rail line, we are also focussing on delivering the Government's \$200+million safety and amenity improvements package for SH1 users between Clarence and Oaro.

The package of improvements will help the economic recovery of the region by supporting tourism growth. The planned changes include wider

shoulders, more safety barriers and passing opportunities, and improved stopping areas – all contributing to safer and more reliable travel along the Kaikōura coast.

A shared pedestrian and cycle path is planned from Okiwi Bay to Mangamaunu to allow people to safely enjoy the iconic coastline at a more leisurely pace. There will be improved parking and access as well as public toilets for those who want to stop and linger at some of the key attractions.

One of these proposed areas is at Mangamaunu where the railway line runs between the road and the beach.

Currently beach goers and surfers use an 'informal' parking area at the southern end of Mangamaunu. They cross both SH1 and the Main North Line railway to view the surf and get to the beach. This poses significant safety risks and the proposed new shared path and amenity area on the

seaward side of SH1 and the railway are intended to provide safer access options.

Kaikōura's special environment and natural resources, and people's enjoyment of them, is of utmost priority and has underpinned our approach throughout all of the recovery and reinstatement work.

As with rebuilding the road and rail networks, great care will be taken to build these public assets in a way that minimises the impact on the environment, cultural landscape, and important wildlife along the coastal route. At Mangamaunu we are looking for the least intrusive way to achieve the necessary outcomes of safety and amenity.

Residents can find out more about the improvements works and let us know what is important to them at an information evening planned for June. We will advertise this details of this event, once they are confirmed.

In the meantime, to find out more about the rebuild, visit: nzta.govt.nz/Kaikōura-earthquake-response

What is the proposed design for Mangamaunu?

The design is still a work in progress. The broad footprint was consented by Kaikōura District Council and Environment Canterbury Regional Council in July 2017. An amendment in March 2018, was a result of design refinement of possible works and included the provision of coastal protection (ie sea defences) adjacent to the proposed shared path.



How will the community be involved in the design?

In January 2017, NCTIR, the NZ Transport Agency and KiwiRail established the Restoration Liaison Group to provide a forum to inform the design, management and monitoring of all works. The group has been meeting for over a year and is made up of representatives from Te Runanga o Ngai Tahu, Te Runanga o Kaikōura, Department of Conservation, Kaikōura Marine Guardians, Heritage New Zealand, Kaikōura District Council, Hurunui District Council, Marlborough Council, Environment Canterbury, the Transport Agency and KiwiRail.

This group has been briefed on the improvements package and associated consenting.

The next step is to work with key stakeholders who visit this spot regularly to get their insights to

help develop a detailed design of what might work to enhance this area. In order to achieve this a focus group is planned this month. It will include representatives from the Te Runanga o Kaikōura, Kaikōura Board Riders Association and the Surfbreak Protection Society and will work through the challenges and priorities at Mangamaunu.

Why was the emergency legislation used for the Mangamaunu shared path/amenity area?

In simple terms, the Hurunui/Kaikōura Earthquakes Recovery Act wasn't a piece of legislation just about reinstatement of what existed prior to the earthquake, but also allowed for something better to be left behind.

The consents are consistent with the intent of the emergency legislation, and consistent with the approach to consenting throughout 2017.

Are you building a seawall?

A seawall, generally a vertical structure, is not being considered. The advice from NCTIR's coastal processes experts is that a sloped protection structure will have less potential impacts on the surf break than a vertical seawall by mitigating wave refraction.

Will there be any effects on the surf break?

We are committed to undertaking a surf break assessment. In the first instance, this assessment will investigate how the nature of the surf break has changed as a consequence of the earthquake (and any coastal uplift) and any changes that may have occurred. The surf break assessment can then assist the designers in ensuring that any effects of the works on the break area are avoided.



TEMPORARY TO PERMANENT – BRIDGE 90

The Main North Line (MNL) railway is getting a permanent upgrade at Bridge 90 south of the Hundalee Hills.

The earthquake-damaged bridge at this site was demolished in March 2017 with a temporary bridge installed using KiwiRail emergency bridge spans so the MNL could start running again.

'The temporary bridge meant we could get the rail system up and running again quickly. The permanent bridge will mean trains can run through this area at higher speeds and is another important step towards rail operating 24/7,' says project manager – rail, Sam Powrie.

Construction on the bridge will begin in late May.

The new build will include constructing embankments, putting in piles, installing abutments to hold the bridge at each end, and fitting four 30m-long beams across the bridge.

'It's a pretty standard rail bridge' says project engineer James Kelly. 'Our biggest challenge will be getting the materials to site as it is quite remote. The 50 tonne beams in particular will require a high level of planning



and preparation before they can actually make it to site to be installed. Coming into winter, the weather will also play a part. The area is prone to flooding in heavy rain so conditions will need to be constantly monitored, and the works progressed around this.'

The rail line will be moved onto the new bridge before the temporary bridge is deconstructed.

James, who has worked on the project since its inception, is looking forward to being there for the completion of the bridge.

'It's great to be returning to one of the first sites we worked on after the earthquake back in February 2017, and seeing it through to the end,' he says.



PUTTING IN PERMANENT PROTECTION

A permanent design for one of the more challenging landslides south of Kaikōura is underway.

Site 29A didn't fail in the original Kaikōura Earthquake, however ex-cyclones Debbie and Cook brought down 232 mm of rain on top of the slope over 10 days in 2017, causing it to slump 12 metres into the transport corridor.

The road was blocked for more than a week while crews attempted to stabilise the 90-metre-long slip. Fifteen thousand cubic metres of material were removed in the process.

To avoid removing the toe of the slump and risk de-stabilising the slope further, the rail and road were rebuilt further out towards the foreshore, curving around the toe of the slip.

When this year's ex-cyclone Gita hit in February, 300 mm of rain fell at this site in just one day. This saturated and reactivated the remaining slump material causing a 30,000 cubic metre landslide to bury the rail line and State Highway 1.

The failure exposed the rockface behind the material which meant it was considered safe to remove the remainder of the original slump material.

Geotechnical engineer William Marshall says right now both the rail and road are protected from any further loose material.

'Without vegetation cover there is a risk of rock fall and minor debris avalanches from the exposed slope, so we have constructed a 4m-high bund at the base of the slope to protect the road and rail,' explains William.

Ex-cyclone Gita had the same effect on the site as a large scale sluicing operation. Now the displaced material has been removed, the design team can consider improvements to the transport corridor alignment as part of the permanent design.

'In an ideal world we would like road and rail to be as straight as possible, but to achieve this we need to shift the transport corridor closer to the slope.

We need to build a rock fall protection barrier for this to happen and the design for this has just begun,' explains William.

While the design of the alignment and slope protection will be finalised over the next few months, the barrier is likely to resemble the structure at the base neighbouring Rosy Morn slip. At 29A, a 5.5m-high barrier is being built which includes a 3.5-metre-high gabion wall with a 2m-high debris fence on top.

Construction will start later this year.



Slip 29A not long after ex-cyclones Debbie and Cook in 2017



Site 29A with the road realigned



NCTIR archaeologists Tristan Wadsworth shows Barry Dunnett, Murray Darling, Sue Jarvie and Jenny Dunnett an artefact previously sourced from the area.



SHARING HISTORIES

PEOPLE
Kaikōura TOWNSHIP

Kaikōura residents and visitors of all ages got a chance to step back through time at the Kaikōura museum this week as part of the annual New Zealand Archaeology Week.

NCTIR archaeologists joined forces with Kaikōura Museum to present two events delving into the distinctive archaeological history of the coastal area for the nationwide archaeological week organised by the New Zealand Archaeological Association.

‘The archaeology of the area represents the enduring connections local communities have with the past, and the coast is considered by archaeologists to be among the richest and most interesting parts of the country,’ says NCTIR archaeologist Cathleen Hauman.

On Wednesday 2 May sixty people gathered to learn about the cultural settlement of Kaikōura, what archaeology is, how NCTIR is managing the impact of its work on local heritage and a brief history of whaling in the area from NCTIR archaeologists Tristan Wadsworth,

Jeremy Habberfield-Short and Kathy Davidson.

Kaikōura resident, Barry Dunnett, says the evening was ‘very informative’ and helped him feel more connected to the local history of their home town and its surrounds.

‘It was of great interest to us locals and we’re very much looking forward to the next instalment!’

On Saturday 28 April the next generation of archaeologists aged 6 to 13 were taken on a learning journey by NCTIR archaeologist Jean Spinks through what happens with archaeological materials once the excavations are complete.

‘National archaeology week is a chance to kindle interest in a fascinating subject while helping connect us all to our histories, to the landscape, and here, to the coast and to the people who went before us,’ says Cathleen.

The NCTIR project has had an archaeological team since its inception and is committed to increasing our knowledge and understanding of this incredible area and its people.



SITE 9 THEN AND NOW

Check out Waipapa Bay at this time last year and how it looks today. The crew at Site 9 are well underway completing the road and rail realignment.

Eighty thousand cubic metres of recycled slip material has been laid to build up the base of the new site. Right now crews are building up the rail embankment. In just over a week, rail crews will begin laying new track here. Once the rail is complete, the crew will begin building a Terramesh rock fall protection wall and the new road.



Site 9 then



Site 9 now



MAKING THE MOST OF A ROAD CLOSURE

State Highway 1 south of Kaikōura was closed on Wednesday 18 April to undertake necessary work to complete the final preparations for re-opening the highway to 24/7 traffic. We had to keep the road closed until 3pm on Thursday 19 April because high winds on the Wednesday prevented us from completing our work. During the two-day closure we managed to remove loose rock from seven sites in the south and install guardrails to improve safety. Our crews also took advantage of the road closure to undertake other work, which required there being no traffic on the highway. Thank you to everyone affected for their patience as we undertook this work.



OPEN 24/7

It's happened! On Monday, 30 April at 7.30am State Highway 1 north and south of Kaikōura was opened to 24/7 traffic. Thank you to everyone who helped make this happen and to all the local communities for their patience as we got the road to the point where we could safely open it to around-the-clock traffic.





FIRST SECTION OF THE SHARED ACCESS PATH COMPLETE

One of NCTIR's hard working teams chalked up a milestone last week - they finished laying the first 560m section of the shared walk and cycle path at Irongate Stream north of Kaikōura.

This part of the shared path is being constructed as part of the seawall structure built to realign SH1 seaward and away from the landslide. Once handrails are added, this section of the path will be one small part of the rebuild job that's finished, offering a glimpse of what SH1 will look like in the future.

The 'final pour' was also special for the team because some of the crew, led by foreman Vili Takai, had built the foundations of the same seawall a year ago. They have worked together on seawalls at various sites along the coast - often in cold, wet conditions.

Site engineer Wendy Heynen says the crew started concreting the path on 5 April. They lost a week because of bad weather but made up the time, even pouring 96 metres in one day.

'I'm so proud of what they've achieved,' Wendy says. 'This type of work is often done by specialist crews but the guys wanted to do it and I knew they could. We set up a test site and they nailed it.'

The concrete is 50mPa, a super strong structural concrete, and has a micra silica additive to prevent the steel reinforcement from corroding in the marine environment. This makes it a challenging product to work with as it sets very fast.



ROAD SAFETY WEEK

Keeping people safe while travelling on New Zealand roads - including State Highway 1 north and south of Kaikōura, on the alternate route via Lewis Pass and on Route 70 (the Inland Road) is a priority for all communities.

Road Safety Week is an opportunity for communities to get involved in promoting road safety. It will be held 7 to 13 May this year and is coordinated by Brake, a road safety charity.

Road Safety Week is organised to inspire communities to take action on road safety and promote life-saving messages. Schools, organisations and communities who would like to get involved can visit www.roadsafetyweek.org.nz to learn how they can participate.

Everyone who registers will receive a downloadable action pack containing guidance and resources.

Road Safety Week





Mounted Rifle Sentries silhouetted on the beach



PEOPLE



Kaikōura
TOWNSHIP

KAIKŌURA ANZAC DAY CONNECTIONS

NCTIR was honoured to be invited to participate in this year's ANZAC Day dawn parade in Kaikōura.

Marc Parsons laid a wreath on behalf of the team during the ceremony, which was held at the Garden of Memories Memorial on the waterfront. 'It was dropped on me out of the blue and was quite unexpected. I was honoured to take part in such moving occasion,' he says.

Local farmer Marc, whose father Geoff fought at the Battle of Guadalcanal in the Pacific during World War II, came out of retirement to help with the transport rebuild. He's spent the past year refuelling trucks, machinery and helicopters.

'It's often seven days a week, starting and finishing in the dark during winter. I'm happy to help out for as long it's needed.'



Above: Railway men Frank Flynn, a former ganger, and Barry Butcher, who drove steam engines, at the community breakfast in the Memorial Hall supper room after the ceremony.



Below: NCTIR's Marc Parsons laid a wreath on the team's behalf.

