



The Bulletin Kaikōura earthquake update

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CORRIDOR MILESTONES

A final push is underway along the Kaikōura coast with 24 hour access to State Highway

1 (SH1) just weeks away. Since SH1 reopened in December last year the road has had restricted hours for travellers and has been closed every night for essential work to be carried out. Now, four months after the road opening, some travelling restrictions are about to be lifted with road users being able to drive the route 24 hours a day from the end of April.

More than a thousand people have been working along earthquake-damaged sites north and south of Kaikōura in the lead up to this major milestone. While work will continue over the next year, the opening signals the wind down of some core-recovery work.

For the more than 100 abseilers who have been working south of Kaikōura, their work to stabilise the coastal mountainside is nearly complete.

Project engineer Melissa Sheridan says crews have been working on more than 30 slips, bringing down loose boulders and material as well as installing 2600 rock bolts and more than 30,000 square metres of steel mesh to lock the once-fragile hillsides in place.

'It's been a massive job, teams of abseilers have been working for up to 10 hours a day on the ropes to get it done.'

Progress is being made along the Main North Line railway with repairs being completed at many sites since the line reopened. Trains are completing the trip between Picton and Christchurch more quickly and it is expected there will be fewer instances of the line needing to be closed on a precautionary basis because of heavy rainfall.

Work undertaken has improved services significantly for KiwiRail's customers and KiwiRail expects the return of the passenger Coastal Pacific rail journey in time for the peak summer season towards the end of the year.

A short closure of SH1 south of Kaikōura is planned for Wednesday, 18 April so essential work can be undertaken to prepare the road for its 24 hour opening. Travellers will still be able to use the Inland Route (Route 70) to access Kaikōura and the alternate route via Lewis Pass between Picton and Christchurch remains open.

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To all the communities we have been working alongside to get the road open 24/7 - thank you to all for your patience and support

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.





FAQS FOR STATE HIGHWAY 1 OPENING 24/7

Q: Will there be any future closures once the road opens 24/7?

A: Crews will continue to monitor State Highway 1 (SH1) at all times and in the event of persistent heavy rainfall we may close the road as a precautionary measure – this can happen day or night.

Q: Does this mean the closure points will disappear all together?

A: Yes, however if there is adverse weather, which means we have to close the road, it is likely we will use closure points at Mangamaunu and Clarence in the north and at Leader Rd/SH1 and at Peketa in the south.

Q: Can you stop and camp along the route?

A: When SH1 reopens at night there will continue to be no stopping or camping allowed in the two most earthquake-damaged areas just north and south of Kaikōura – stopping is only allowed where signposted as a 'safe stopping' zone. Also, the multiple sections where traffic moves to a single lane will be controlled by traffic lights at night rather than current stop/go controls.

Q: How can I find out if SH1 has been closed?

A: Drivers need to allow plenty of time for their trip and can stay up-to-date on real-time travel information through www.nzta.govt.nz/p2c or by calling **0800 4 HIGHWAYS** (0800 44 44 49). We recommend checking at least two hours before travel and at key decision points on the route.

Q: What do I need to be aware of as a driver along this route?

A: Please drive to the conditions taking in to account the weather, speed restrictions, the road you are on, the vehicle you are in, other drivers around you and your driving experience. Drivers should also continue to take care at level crossings as trains and other rail vehicles can run at any time and from either direction on the line between Picton and Christchurch. Trains travel faster than they appear and cannot stop quickly. Drivers should always check both ways at level crossings before proceeding.

Q: Will there still be one-way sections along the route and how will these be controlled?

A: Yes there will still be some one-way sections along the route, which will be controlled by mainly traffic lights and occasionally stop/go controls.

Q: Will I continue to experience delays during the day and night?

A: Yes, work is continuing along SH1 north and south of Kaikōura so there will be some delays.

Q: What are the expected journey times?

A: We recommend you allow a minimum of 5.5 hours for the journey between Picton and Christchurch along SH1 and a minimal allowance of 6.5 hours along the alternate route via Lewis Pass. You can stay up-to-date on real-time travel information through www.nzta.govt.nz/p2c or by calling **0800 4 HIGHWAYS** (0800 44 44 49). We recommend checking at least two hours before travel and at key decision points on the route.

**SH1 south of
Kaikōura will be closed
on **Wednesday, 18 April**
to undertake work to
prepare the road for
opening 24/7.***

Be prepared for extra traffic on State Highway 1 this weekend between Christchurch and Blenheim as the Forrest GrapeRide event is taking place. Please take care and drive safely.

*This work relies on good weather. If there is adverse weather on 18 April we will instead close the road and do the work on Thursday, 19 April. We will confirm this at the beginning of that week.



COMMITMENT TO MINIMISING EFFECTS ON THE ENVIRONMENT

In early March, a minor amendment to existing consents at Mangamaunu, Okiwi Bay and Half Moon Bay was lodged under the Hurunui/Kaikōura Earthquakes Recovery (Coastal Route and Other Matters) Order 2016 (OIC). The vast majority of restoration works along the coastal corridor had already been consented under the Order in Council in July 2017. That includes the overall consent 'footprint' in the corridor, and the proposed amenity area and shared path at Mangamaunu.

Minor amendment in March sought greater room alongside the new road and rail corridor alignments to provide the proposed amenity area and safety improvements, and enhance access and safety to the nationally-significant surf break at Mangamaunu. At Half Moon Bay and Okiwi Bay South consent amendments addressed the need for more space to improve safety for drivers around corners.

As part of the proposed amendment detailed ecological assessments into the possible environmental effects on the area - including the surf break - were carried out. While there has been some speculation that the work on this coastal area will damage the surf break - the ecological assessments do not make that conclusion. The full reports can be read here: <https://www.ecan.govt.nz/do-it-online/resource-consents/notifications-and-submissions/current-consent-projects/>

Great care will continue to be taken by the NZ Transport Agency and KiwiRail team to build safe and resilient road and rail networks, balanced with minimising the impact on the environment, cultural landscape, and important wildlife along the coastal route.



UP TO HEIGHT AT ŌHAU POINT

The site 6 seawall around Ōhau Point is up to full height, as of 15 March 2018 - a massive achievement for everyone involved. Work on this seawall began in June 2017, and the footings at this site were the most challenging of all the seawalls.

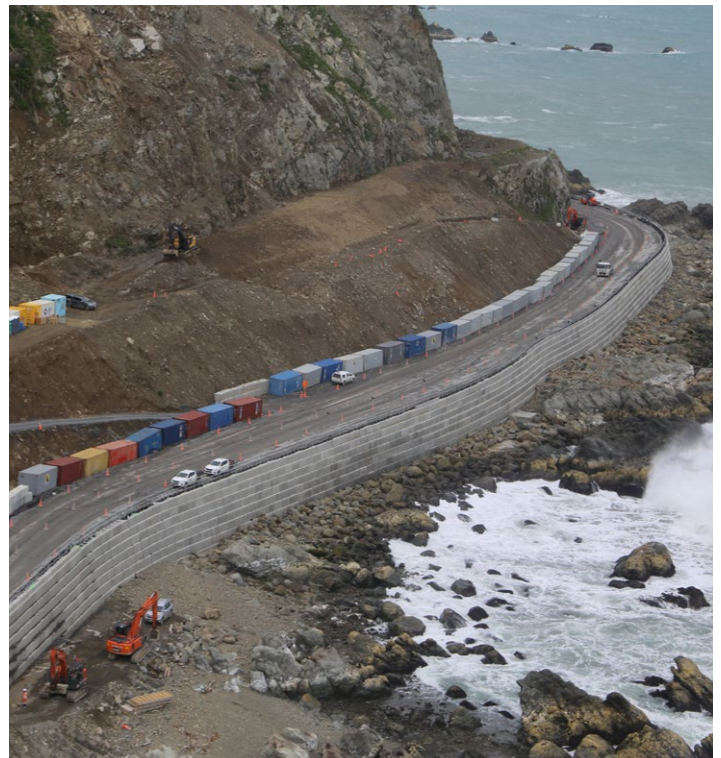
When the alignment was dug for the seawall, the bedrock was found to have very uneven ridges throughout it. 'We needed to get it level and to a certain height for our foundations,' says project manager Clark Butcher. 'The uneven bedrock meant that pours for each 12 metres length of footing ranged from 160 metres cubed to 800 metres cubed.'

Another major obstacle was the footings, which were located right on the tideline in places - so the works were constantly being flooded with seawater, even while the crews were working between tides. The job had to be done though, and the team proved they were up to the challenge. 'The full blocks are all in and we are now placing facing panels on top of the seawall,' Clark explains.

A facing panel is a narrow concrete block, which is connected along the entire wall length by pouring a reinforced concrete beam on the back of it. This allows the team to secure the capping beam on top, which locks it on to the wall with reinforcing steel. 'Getting the seawall up to height was a significant milestone, there was a real sense of achievement, the crew felt they'd finally achieved what they had worked so hard for,' says Clark.

There is still a lot of work to be completed at site 6. Along with the capping system, the road has to come up about 700 millimetres and a protection fence needs to be installed around Ōhau Point between the road and the slope.

'It was good feelings all around,' says Clark, 'and in achieving this hurdle and feeling good, the crews are now energised to push on and finish off well.'





Rail is critical to New Zealand's transport infrastructure moving freight and people across our diverse landscapes. Before the earthquake KiwiRail

moved about 1 million tonnes of freight along the Main North Line between Picton and Christchurch – equating to nearly 70,000 truck journeys – each year. The November 2016 earthquake disrupted the railway with landslides and damaged infrastructure. The freight rail network began running in September 2017 after months of hard work to get it back operating. Work continues to complete permanent repairs of bridges, tracks and tunnels to get the network operating at its pre-earthquake reliability.

For 2018, the focus for the Main North Line is to reduce journey times so trains arrive in Christchurch earlier in the morning, a return to 24/7 rail operations, making sure the network is more reliable in adverse weather, and having the Coastal Pacific passenger train operating again along the spectacular coastal journey through Hurunui, Kaikōura and Marlborough.

SAFETY ON THE RAIL

Health and Safety for those working on the rebuild has been a top priority for KiwiRail, the NZ Transport Agency and NCTIR. We have employed a well-developed safety programme throughout the project to make sure everyone goes home safe at the end of each day. Rail protection rules are in place to keep staff working on or next to the railway safe from trains or rail vehicles. The 'lock on and lock off' process is a system, which accounts for any person working within four metres of the rail. We also use safety barriers called Vortok fences, which are quickly installed and clipped alongside the rail line. These protect our crews working alongside the rail as trains can still pass safely by.



Trains are fast, surprisingly quiet, take a long time to stop and cannot swerve. **Drivers and pedestrians need to expect trains at any time, from either direction.**

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WHAT'S IN A CONTAINER?

Rail freight containers carry everyday items we all use from our spuds to barbeques and groceries, carpet, and building materials – just to name a few. Freight trains connect with our ports and logistic centres to move these goods around New Zealand delivering them as part of regional and national economic activity and growth. The return of freight by rail on 15 September last year, even in a limited capacity, took about 2000 trucks off the road each week, between Picton and Christchurch via the Lewis Pass. The return of the cost-effective service also meant fewer emissions as every tonne of freight moved by rail delivers a 66 percent reduction in emissions for New Zealand

WHAT IT TOOK

To get the Main North Line operating again temporary repairs were undertaken with permanent repairs still underway. As these are completed the rail continues to become more resilient, operating at a more efficient level. Since reopening on 15 September, KiwiRail has moved more than 180,000 tonnes of freight on the Main North Line, meaning at least 13,000 fewer truck journeys.



Three rail bridges needed to be replaced with two being completed, three brand new bridges have been designed and built, and about 40 bridges needed repair with 50 percent of these repairs complete.



Twenty rail tunnels along the route needed repairing from earthquake damage. We have repaired 15 of these and are continuing to work on the final five.



We're protecting the rail network by installing rockfall protection to stop rock or other material falling onto the tracks. We have installed in some areas detection fences, which automatically let train control know if any material has fallen on the track so we can respond as quickly as possible.



As the rail line became functional again, it was used to assist the road rebuild moving supplies and equipment – including five-tonne seawall blocks to site. KiwiRail has only been running trains at night so road and rail works can be done quicker.



The final weld reconnecting the Main North Line between Picton and Christchurch on 8 August 2017 near Half Moon Bay was an emotional moment for the NCTIR and KiwiRail teams, as it signified the hard work, sweat and tears to get the route reopened and operating within a target timeframe.



We celebrated the first freight train coming into Kaikōura in September last year alongside the community. It was a highlight of 2017 and we could not have completed the work reconnecting New Zealand's supply chains without the patience and support of our local communities.



TECH SAVVY CONSTRUCTION

The NCTIR visualisation team has recently trialled a new app to assist construction teams with pre-planning and visualisation. The augmented reality app has been used for a tunnel-widening project at Raramai South, a road tunnel on State Highway 1 south of Kaikōura. The tunnel is being enlarged to improve clearance and safety for compliant vehicles.

Digital visualisation lead Kat Salm says 'the visualisation tool is another way technology can support the engineered designs'. 'It can help with context and project discussions and for briefing crew. The app brings designs to life in front of clients or other interested people, without the need to be on-site. 'It's an actively engaging, simple to use app and can be viewed on iPads.'

This innovative tool is a great example of 'safety in design' as teams can plan works in more detail well before getting to site. The risks can be fully outlined and tweaks of design can be made having all the methodologies sorted beforehand. 'We hope this also means a quicker, more efficient and better value project as the team can understand the risks fully before being on site,' says Kat. It was created using information from surveying, design and analysis. A heat map is then formed from the analysis.



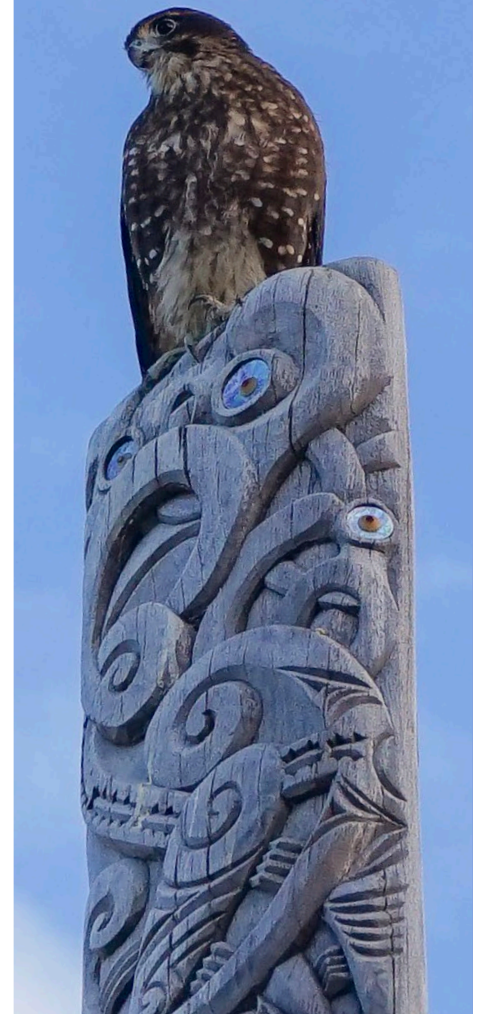
Pictured is Chris Souter, viewing the app in the Raramai South tunnel. The colours represent the amount of material, which needs to be removed from the existing tunnel surface to reach the desired 'new' designed dimensions (ranging from no colour, which is already wide enough, through a range all the way to red - which is more than a metre to remove).



ON WATCH

Working next to the coastline alongside mountains our crews get to observe some spectacular scenery and wildlife. Engineering geologist, Sarah Jones spotted a Kārearea at Rakautara last week. This New Zealand falcon is classified by the Department of Conservation as At Risk. Falcons breed in a wide variety of habitats from the coast to above the tree line, including native podocarp and beech forest, tussocklands, roughly grazed hill country and pine forest. Sarah reported the sighting and photo to the Wingspan Birds of Prey Trust, which reported it was a female Kārearea.

If you sight a Kārearea please let the NCTIR ecology team know via Leigh.Bull@nctir.com or 027 643 2185.





GETTING ACCREDITED

In 2017 as State Highway 1 was taking shape and getting ready to open to the public, the Road Science laboratory in Kaikōura was facing its own deadline in the form of an audit by the International Accreditation New Zealand body.

The audit assessed the laboratory's ability to perform field and laboratory testing for NCTIR in accordance with the International Organisation for Standardisation requirements. Previously the Kaikōura team had been operating under the accreditation of the Christchurch Laboratory. In January this year accreditation of the laboratory was formalised and put into effect. This meant faster turnaround times for test results and the usual high level of confidence in the results. 'It's important for laboratories to achieve and maintain their own accreditation status as it gives our clients confidence in the test results we produce - as well as confirming we operate to the highest international industry standards,' said Road Science laboratory manager, Richard Carter.



Road Science has been working for NCTIR in Kaikōura since April 2017 providing a construction materials testing facility responsible for carrying out field-testing, quarry quality assurance testing, and concrete testing. The accreditation of the Kaikōura mobile facility compliments Road Science's four accredited base laboratories and other mobile facilities operating around New Zealand and the South Pacific.

The testing of construction materials is important as it ensures compliance with the NZ Transport Agency's road building specifications, allowing engineers to produce more accurate designs and ensuring a higher quality end product for all involved.



UNDER THE MOONLIGHT

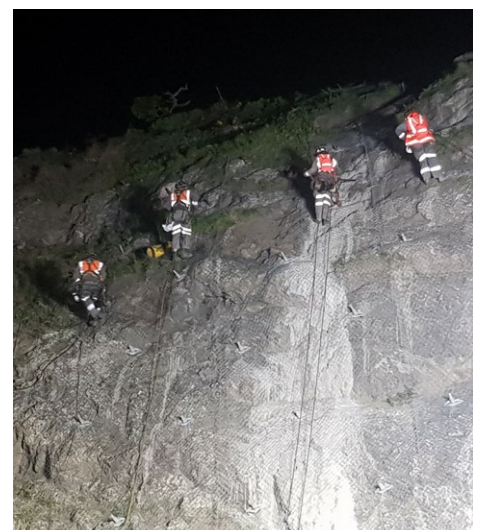
While the coastal road has been closed at night, crews have been taking advantage of the closure to carry out essential work. Recently an abseiling team also took the opportunity to carry out work directly over the road, which would normally be too dangerous during the day due to vehicles travelling below. Geovert abseiling supervisor, Chris Black says his team of 12 were working above the Parititahi road tunnels for around four months before the road re-opened in December.

The 70 high and 30 metre wide site originally came down during the 2016 earthquake and has required strengthening. 'A lot of work was completed last year; we installed more than 300 rock bolts into the hillside and secured steel mesh to the rock face,' he says.

With the road now open during the day, seven days a week, the only time the crew could access the cliff face to carry out final work was at night. 'It would have been impracticable to work during the day with a live lane of traffic running. We would have had to stop work every five minutes to let vehicles through and it would have taken weeks to get the job finished,' says Chris.

The alternative was to get clearance to work at night. With strict health and safety conditions met, the crew recently spent two nights working 40 metres above the road. 'Working at night was only possible because of the huge amount of work we had already put in strengthening the site,' says Chris.

The crew worked under floodlights to carry out final pieces of work on the site, checking the last 70 rock bolts, which had recently been installed. 'It's relaxing working at night - you don't need to worry about traffic movements, other contractors or helicopters. It's just you, your gear and the ocean,' Chris explains. 'And, it's soothing hearing the sounds of the ocean as you go about your work.'





WHERE TO EXPECT DELAYS ALONG THE CORRIDOR

In the red on the map below are delay hotspots along State Highway 1. Please drive safely through these areas - some of which are single lane. The closure point for 7.30pm to 7.30am in the south will remain at Leader Road/State Highway 1 as repair work continues in the Hundalee Hills because of damage caused by ex-cyclone Gita.



Thank you for your patience.

For further updates on the condition of State Highway 1 both north and south of Kaikōura please visit here www.nzta.govt.nz/p2c or call 0800 44 44 49.

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