



# The Bulletin Kaikoura earthquake update

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## THE COMMUNITY RECONNECTED WITH THEIR HARBOUR

The sea bed at the harbour rose almost two metres in last November's devastating earthquake. One year on, 30,000 person hours and 880 truck loads of material later, the Kaikoura harbour was handed back to the community. The harbour is a place that is unique, special and at the heart of Kaikoura.

Since work started on the harbour in January it has been a true partnership between NCTIR and harbour users to provide a facility for both now and the future. The challenges were coming up with a design and construction methodology to build it more resilient than before while keeping as much of it operational as possible.

On Tuesday 14 November, the harbour was officially re-opened to the Kaikoura community with a karakia and mihi from Te Rūnanga o Kaikōura. More than 200 people gathered together to celebrate at the dawn ceremony and then the official opening at midday.

As part of the celebration, Te Rūnanga o Kaikōura created a memorial at the harbour from sperm whale ribs that had emerged at Jimmy Armers beach during the earthquake. Evoking Papatuanuku, Tangaroa and Ruamoko (the earth, land and quake), a rib each represents Joanne Mackinnon, Louis Edgar (who both sadly lost their lives in the quake) and the people of Kaikoura.



This weekly bulletin provides the latest information about the rebuild of road and rail networks damaged by the Kaikoura 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.





## ONE YEAR ON - THANK YOU FROM NCTIR

Tuesday marked one year on from the 14 November 2016 earthquake. A day very personal to so many who were affected.

For our NCTIR team it was also a chance to reflect on the incredibly warm welcome we've received from the community, allowing us to achieve so much in partnership. From small beginnings, NCTIR now has an 'orange army' of about 1700, many of whom are working and living in every town between Christchurch and Blenheim.

Our mission to reconnect communities in this stunning but challenging environment is a big one. Throughout the wet winter and spring, some days it felt like one step forward and two steps back. But our people have persisted and local residents have continued to be so patient and

supportive to help us towards our vision to 'move mountains to reconnect communities'. On behalf of the NCTIR team we thank you for this support and cooperation.

August was a very proud month with the reopening of KiwiRail's Main North Line. This week was another proud milestone with the reopening of the Kaikoura Harbour. And next month will top it off with the reopening of SH1 between Blenheim and Christchurch on 15 December. While it will be some time before the road is completely finished, it will be open, and communities will once again be reconnected with each other along this coastal corridor.

We know our work impacts on people - the noise, dust, and huge volumes of traffic with massive amounts of construction materials from all over the country (and world) daily moving up and down roads between sites 24/7. But it is paying off.

I'm really proud of what the NCTIR team has achieved, but also very humbled that we have so many local people in the NCTIR family - whether designing the works in the first place, construction on sites, feeding our hungry workers, or managing the 'back office' systems to keep the NCTIR machine moving.

Long after the job is done and NCTIR has gone, I hope there will be many residents who, when reflecting on the earthquake in coming years, will be equally proud to say 'I was part of rebuilding our community'.

Thank you again, Kia kaha

**David Loe**

NCTIR Project Director





# HARBOUR RE-OPENING CELEBRATION

## HARBOUR

### MARINA REOPEN TO THE PUBLIC ON 14 NOVEMBER

22,000<sup>M3</sup> OF MATERIAL DREDGED FROM KAIKOURA HARBOUR



130 PILES INSTALLED THE LENGTH OF 7 RUGBY FIELDS



50M OF CAPPING BEAMS INSTALLED

880 TRUCK-LOADS OF MATERIAL USED TO FORM A WORK PLATFORM ABOVE WATER



# ONE YEAR ON NOVEMBER 2016 - NOVEMBER 2017

## Kaikoura Earthquake magnitude 7.8

NOVEMBER 2016

1200 people evacuated by air and 900 by sea on the HMNZS Canterbury  
Initial assessment of road and rail by NZTA and KiwiRail  
NZ Defence Force establishes **land access** to Kaikoura  
The Hurunui/Kaikoura Earthquakes **Recovery Bills** are passed under urgency in Parliament  
**Permit only access** to Kaikoura established via Inland Road (Route 70) where there were 25 slips

More than **100 volunteers** from the New Zealand Motor Caravan Association have put in 10 hour days driving stranded rental vehicles from Kaikoura to Christchurch  
The earthquake recovery legislation receives royal assent (becoming an Act of Parliament)  
First **community meeting** held at **Rakautara** - Christmas hams and groceries delivered  
**Unrestricted access** to Kaikoura established via Inland Road (Route 70)  
**NCTIR Alliance established** - including NZTA, KiwiRail, Fulton Hogan, Downer, HEB Construction, Higgins and SH1 South of Kaikoura is reopened during daylight hours

DECEMBER 2016

**Helicopter sluicing** operation begins  
More than **3300** separate road and rail items identified for repair  
**First freight train** leaves Blenheim heading south to Lake Grassmere  
First **community meeting** with **Kekerengu** north of Kaikoura residents  
Traffic volumes on the alternate Picton to Christchurch Route increases four fold

Government publically commits to reopen SH1 by **Christmas 2017**  
**100** designers from around the world work on design solutions  
**5000m<sup>3</sup>** of material dredged from Kaikoura harbour  
Work on the Inland Road (Route 70) begins in earnest  
**Two** Bailey bridges open on alternate Picton to Christchurch route  
**100** of **709** Main North Line rail sites repaired  
Trapped train carriages moved to safety  
**Parikawa airstrip** opens  
**Seal-proof fencing** trial begins to protect seals from the worksites

JANUARY 2017

**10,000m<sup>3</sup>** dredged from main channel of Kaikoura harbour  
Access road around **Site 2** (Irongate) completed  
**\$60 million** safety improvement package for the alternate Picton to Christchurch Route announced  
All material from **Site 1a** (Mangamaunu, north of Kaikoura) cleared  
**First bridge demolition:** Bridge 90 at Ferniehurst south of Kaikoura  
Access roads completed around **7** of the **9** major slips north of Kaikoura

FEBRUARY 2017

Heli-hyro seeding trial begins on **2** hectares of cleared slip faces near Half Moon Bay north of Kaikoura  
**60%** of all material removed from north of Kaikoura  
**12,000m<sup>3</sup>** of fill to raise surface of rocky beach at Rosy Morn south of Kaikoura  
**100,000m<sup>3</sup>** of material sluiced using **14** excavators and **30** trucks moving material  
Wandle River Bridge demolished on the Inland Road (Route 70)  
First of the **temporary accommodation village** units arrive in Kaikoura  
Stranded train north of Kaikoura recovered and **23** carriages returned to Christchurch

**50%** of seawall foundations completed for the **700m-long** section at Irongate north of Kaikoura  
**Mobile testing labs** are set up to quality control road building material in real time  
Night works begin at **Railway Bridge 107** north of Kaikoura  
**5** of the **10** major slips north of Kaikoura cleared  
**200** seedlings from **6** rare rock daisies propagated in Nelson to be returned to Kaikoura  
**First work train** arrives into Kaikoura from the south  
Parnassus overbridge south of Kaikoura reopened to the public

APRIL 2017

**Road repairs and retaining walls reconstruction** start at the **Sandpit** north of Kaikoura  
**First work train** passes over the 480m Clarence River Bridge carrying **1000 tonnes** of ballast  
**First work trains** pass through the Pines in the north  
**\$231m** resilience package for **improvements** to SH1 announced  
**300m** temporary road realignment completed ahead of schedule at **Slip 29a** south of Kaikoura  
Coastguard ramp at Kaikoura harbour is handed back

MAY 2017

First **380m** of **2500m** of kerb and channel laid at **Site 1**  
**7000m<sup>3</sup>** of unstable rock and debris removed by helicopter sluicing and excavations  
**Final rock mesh** placed at Ohau Point  
First of **4500** seawall blocks laid at Ohau Point  
**First freight train** runs full length of the Main North Line railway between Picton and Christchurch  
**One million m<sup>3</sup>** of material removed from all slips  
**66,000m<sup>3</sup>** of protective mesh (120 pieces) laid on cliff faces  
**First piles** for Irongate Bridge north of Kaikoura completed

JUNE 2017

Cyclones Cook and Debbie make landfall on the east coast creating more damage  
**Earthworks** begin at Tar Barrel north of Kaikoura  
Slope **stabilisation, remediation** and rock fall **mitigation work** underway on the Inland Road (Route 70)  
**4** out of **20** damaged rail tunnels repaired

JULY 2017

**85%** of material cleared from slips on SH1 north of Kaikoura  
**Final weld** on the Main North Line railway  
Completion of tender jetty designs for the Kaikoura marina  
First vehicles travel over Oaro Bridge  
Northern earthworks at the Pines complete  
**Construction access platform** around Ohau Point is complete  
**300** people living in the temporary accommodation village  
**10,000m<sup>3</sup>** of material dredged from Kaikoura marina

AUGUST 2017

**22,000m<sup>3</sup>** dredged from Kaikoura marina; construction complete  
Construction of **3 debris bridges** north of Kaikoura ahead of schedule  
**First of 90 deck beams** placed on the new Irongate Bridge north of Kaikoura  
**Chipseal** going down on the new road at the Pines north of Kaikoura  
**SH1 Road open date:** 15 December 2017 announced by NZTA  
**135 bridge beams** have been delivered to Kaikoura

SEPTEMBER 2017

**4500** seals professionally removed from work sites  
**84** of the **140 bridge beams** (21m long each) for work north of Kaikoura delivered to holding yard  
**Boating ramp** and **berth piles** installed at the Kaikoura harbour  
**90%** of Kaikoura marina work complete  
Whale Watch welcomed home: **2 of 4 berths** completed at the Kaikoura marina  
**800th** seawall block laid  
**150** tonne boulder blasted from Site 7 at Paparoa South  
**130** piles installed supporting Kaikoura marina construction  
All **10** major slips north of Kaikoura cleared

OCTOBER 2017

NOVEMBER 2017



## PROGRESSING THE SEAWALL BLOCKS AROUND OHAU POINT

Ohau Point is one of four sections of the SH1 road that is being shifted away from dangerous landslides and closer to the sea, with a new road being carved out of the seabed.

There are 4500 seawall blocks being laid around Ohau Point and at Site 7, the seawall is now up to full height (nine metres high) with the first 70 metres complete. There is another 80 metres awaiting its last block to reach full height.

Next week the team will be laying 5000m<sup>3</sup> of 'no-fines concrete'. This is the backfill material being laid behind the wall that will be under the new road you will soon be driving on!



## CRITICAL PATH PROJECT FOR ROAD OPENING

Tirohanga is a 'critical path' project for re-opening the road in December. Work includes the construction of a 42 metre rail bridge consisting of three 14 metre spans, a 21 metre-long single span, hollowcore concrete road bridge and a new wetland sarea which has been formed in the low-lying area because of the Kekerengu fault movement.

When NCTIR contracted Downer to erect a Bailey Bridge at Tirohanga Stream, they decided to partner with the NZ Army for the first time. These pre-fabricated truss bridges known as Bailey Bridges were developed during World War II and were designed to be able to be put together entirely by hand in any environment.

Paul Cunniffe, Downer's Construction Manager for Marlborough says that since the original design, reinforcing has been added. 'Which helps to keep them securely attached and makes the structure stronger.'

In order to prepare the ground for embankment construction, Health and Safety Advisor for Structures Team, Michael Weyland says, 'A filter fabric is laid on the exposed subgrade to eliminate the possibility of soil migration into the above layers. The embankment (including the Bailey Bridge abutment foundation) is built up using river run, crushed aggregate and geogrid reinforcing. Geogrid in soil acts in a similar way to mesh in concrete in that it reinforces and strengthens the parent material. This prepares the ground so it is suitable for the temporary bridge loads'.

Paul says working with the Army has been great, 'They're helpful, and we all learn from each other.'

'We are building two permanent bridges at this site,' Site Engineer Miki Schmidt says. 'One on the state highway and one on the Main North Line. The proposed bridge decks will be elevated about 3.5 metres above the original structure to prevent flooding over these vital routes.' This has been necessitated by the land movement through the Kekerengu fault-line during the earthquake. The area to the north of the fault-line has dropped significantly increasing the possibility of flooding. Putting the Bailey Bridge in place is temporary work that allows unimpeded access along SH1 while the raising of the permanent road continues.





## RAIL MOVING BLOCKS FOR THE ROAD

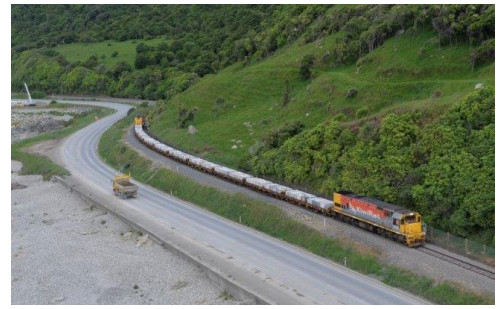
KiwiRail is helping with the State Highway 1 rebuild efforts by moving concrete blocks by train.

Twenty wagons, each carrying 40 tonnes of concrete blocks were recently transported on a freight train on its journey from Christchurch to Blenheim. The freight train then stopped off in Kaikoura, to leave the block wagons. The following morning a work train collected these and travelled along the coast to the final delivery destination at the Pines, near Waipapa Bay. From here the NCTIR crew unloaded and moved these to site where they are being used to build a temporary retaining wall.

Peter Dautermann, NCTIR Rail Engineering Manager, managed this huge process involving a lot of planning, testing and risk analysis.

'Reopening the railway line early, even with limits on its operation, has meant we are able to help with the road rebuild by transporting critical construction materials directly to where they are needed. This means a shorter journey, reducing the need for trucks on the alternate route and through this busy construction site,' he says.

KiwiRail has adapted 20 wagons with specialised frames to carry the blocks.



## FROM HAIRDRESSING TO TRAFFIC MANAGEMENT



One of the smiling faces on the alternate Picton to Christchurch route is managing busy traffic. Renee Nettleton, the former hairdresser has switched hair dye for hi-viz, 'I've gone from one extreme to the next,' she says.

Three months in, she's enjoying the job and after a cold winter is appreciating the recent warmer weather. 'I sometimes miss hairdressing when it does rain; this job definitely isn't as glamorous.

'I used to be all glammed up with makeup, and now I'm wearing fluoro with steel caps. When my old clients see me at the supermarket their eyes just about pop out of their head,' she says.

But her job isn't all about the latest hi-viz fashion. With a focus on safety she says drivers on the alternate route need to slow down and pay attention. 'There are dozens of work sites along this route, but every week people aren't paying attention and drive past my stop sign before hitting the brakes,' says Renee. 'I'm holding my sign out for a reason; the worksite is down to one lane and traffic is coming towards us, so vehicles do need to stop,' she says.

As the frontline for the rebuild work, the stop/go men and women often field questions from the public, such as: 'what are you doing?' 'It can be a bit of a social role, people always want to know what we are doing and how we are fixing the road, I don't mind it at all.'

## OPEN/CLOSED SCHEDULE FOR SH1 SOUTH OF KAIKOURA

**Reminder: Next closure SH1 south of Kaikoura between Peketa and Goose Bay:**

**Monday 20 November to Friday 24 November 2017**

- There will be local only drive-throughs each day, at 7am and between 6pm and 8pm
- Inland Route 70 remains open for travel 24/7

**Upcoming: Additional closure SH1 south of Kaikoura between Peketa and Goose Bay:**

**Monday 27 November to Friday 1 December 2017**

- There will be local only drive throughs each day, at 7am and between 6pm and 8pm
- Inland Route 70 remains open for travel 24/7

The upcoming closures are needed for the critical work to be done before the road opens on 15 December. This means our crews can progress the extra work clearing slips and rockfalls because of the heavy rain in September and October. These works are only possible with a full road closure to enable the crew to work safely and efficiently in the tight corridor.

We are on the countdown to opening - thank you for your on-going patience. We couldn't have done this without your support!

## The current schedule\* for SH1 South of Kaikoura between Peketa and Goose Bay is:

DATE	OPEN HOURS	STATUS
Thursday 16 November	Closed to the public (local-only convoys) - use the Inland Road for travel.	Normal schedule
Friday 17, Saturday 18, Sunday 19 November	Open to the public 7am-8pm (closed overnight).	Normal schedule
Monday 20 November - Friday 24 November	Closed for the public. Local convoys at 7am and between 6 to 8pm each day. Closed overnight.	Scheduled closure week
Saturday 25 and Sunday 26 November	Open 7am to 8pm for public. Closed overnight.	Normal schedule
Monday 27 November - Friday 1 December	Closed for the public. Local convoys at 7am and between 6 to 8pm each day.	Scheduled closure week
Saturday 2, Sunday 3 and Monday 4 December	Open 7am to 8pm for public. Closed overnight.	Normal schedule

\*Note this schedule can change at any time due to weather, seismic or other conditions. The Inland Road (Route 70) is open 24/7 for travel.

## NORTHBOUND CANTABRIANS, PLAN YOUR LONG WEEKEND TRAVEL

Cantabrians travelling north over this long weekend should check their planned routes and allow enough time for travel. NZ Transport Agency Journey Manager, Tresca Forrester, says with Friday 17 November being Canterbury Anniversary day, roads in the area will be extra busy. 'Please drive courteously and to the conditions to help everyone get to their destinations safely'.

### Getting to Kaikoura - two options

Motorists can either take the Inland Road (Route 70) via Waiau or SH1 from the south. Due to the volume of gabion wall rebuild work through the Hundalee area on SH1 with multiple stop/go delays, both routes take around three hours.

While the Inland Road is open 24/7, SH1 south of Kaikoura between Goose Bay and Peketa has a road open or closed schedule (see above). This section of narrow coastal corridor has extensive earthquake repair and resilience work underway as part of reopening SH1 in December, and the high impact work means it is not always possible to have traffic moving through this site:

### Getting to Hanmer Springs

SH7a across Waiau Ferry Bluff in and out of Hanmer Springs will be down to one lane over the weekend with manual stop/go control to help traffic move as efficiently as possible. Following the earthquake, extensive cliff resilience work has been completed, with a rebuild of the gabion walls which support the road now underway. Expect a short delay.

### Taking the alternate Picton to Christchurch route via SH7, SH65, SH6 and SH63

Allow plenty of time to get to your destination - particularly if connecting with a ferry or another deadline. There are multiple worksites and stop/go on this route as part of the post-winter ramp-up on repairs and maintenance, as well as ongoing safety and resilience works for the \$60m improvement programme.

For further information visit [www.nzta.govt.nz/traffic](http://www.nzta.govt.nz/traffic) or phone **0800 4 HIGHWAYS** (0800 44 44 49).

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