



Baypark to Bayfair Link Project



Beams being installed on the SH2 bridge at Te Maunga in July

Southern bridges take shape

Beams on the second of Bay Link's three bridges were successfully installed in July.

To enable construction of the new bridge at Te Maunga, State Highway 2 (SH2) was closed between Bayfair roundabout and the Te Maunga intersection during a weekend in July. During the closure, 10 reinforced concrete beams (each 26 metres long and weighing 47 tonnes) were placed across SH2 by a 350 tonne crane positioned in the middle of the state highway.

With the project team working day and night, placement of the bridge beams was completed ahead of schedule, allowing the early re-opening of the state highway and minimising the impact of the closure on motorists' weekend travel.

Following placement of the beams, the concrete deck has since been poured. This involved 17 trucks carrying 100m³ of concrete, and 35 tonnes of reinforcing steel.

The SH2 bridge area will now lay dormant until the majority of expected earth settlement has occurred – a process which is anticipated to take around three months.

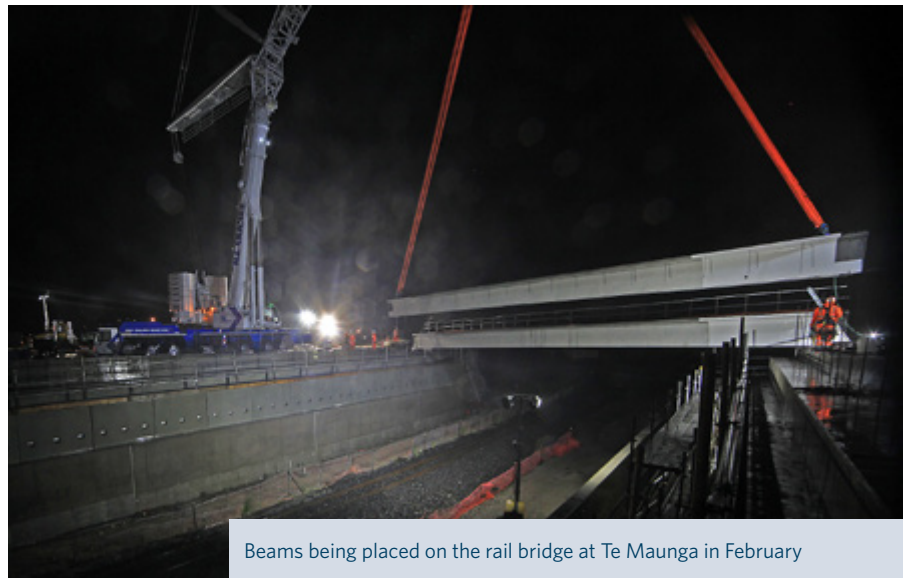
This is the second bridge to be constructed on the project in the last six months after the first bridge, spanning the East Coast Main Trunk railway line, was constructed in February. Constructing the rail bridge involved a 450 tonne crane installing 12 concrete beams, each weighing 55 tonnes, 2.4 metres wide and 29 metres long. Completing the rail bridge's concrete deck involved 22 trucks carrying 130m³ of concrete, and 40 tonnes of reinforcing steel. The settlement period in this area is nearing completion, meaning work (on the final sections of the deck, kerbing, footpaths and barriers) will soon resume.

The entire interchange at Te Maunga (comprised of the SH2 bridge and the rail bridge) is anticipated to open this summer under temporary traffic management. The temporary signals currently located at Te Maunga will be decommissioned at this time.

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Once operational, the interchange will carry all SH29A traffic to and from SH2, removing the need for motorists to cross the railway line at grade and improving traffic flow onto the Tauranga Eastern Link. When the project is completed, the finished interchange will transform the intersection of the two state highways and improve safety for all road users. A third bridge (the Bayfair flyover) will span the Bayfair roundabout at the project's northern end.



Beams being placed on the rail bridge at Te Maunga in February

View timelapse footage of the construction of Bay Link's first two bridges on the Bay Link website at nzta.govt.nz/baylink-videos

New underpass progresses



Artist's impression of the cycling and pedestrian underpass. View of the open-air trench

Construction of the new pedestrian and cyclist underpass is progressing following the completion of ground improvements near Bayfair Shopping Centre earlier this year.

The new underpass, which is being built in the same location as the former underpass, will have two separate reinforced concrete entrance portals and closed box sections located on the Bayfair and Matapihi sides of SH2. These will be connected by an open-air trench located under the new flyover bridge.

The Bayfair and Matapihi portals and box sections are nearing completion, after which the focus will

turn to the construction of the entrance ways, stairs and ramps. The underpass entrance portals are approximately 3 metres wide and 2.5 metres high – similar dimensions to the former underpass. The Bayfair side of the underpass is approximately 18 metres long and the Matapihi side is approximately 12 metres.

To accommodate the underpass, the Bayfair flyover requires an additional bridge span, taking it from a three to a four-span bridge. The open-air trench, located beneath the new bridge span, will be approximately 4 metres wide and 50-60 metres long with sloping sides.

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Once construction of the underpass entrances is completed later this year, traffic will be switched onto permanent lanes over the top of the box sections. This will allow for construction of the open-air trench and the northern ramp of the Bayfair flyover in the middle of SH2.

Progressing construction of the underpass is a significant step for the project, as we recognise the importance the community places on having a crossing under the state highway. The underpass is recognised as a key link in Tauranga's cycling network and is regularly used by residents and school children walking and cycling between Tauranga City, Matapihi and the Bayfair and Arataki areas.

Preparatory works have been underway since August 2020, when the previous underpass was closed for demolition. At that time, the temporary signalised crossing was introduced, allowing pedestrians and cyclists to cross SH2 in a single movement.

As part of the planning for the new underpass design, a balanced approach towards safety and usage was required. A key consideration for the new underpass is providing safe shared use for both pedestrians and cyclists, alongside the need for personal safety for all users.

The new underpass is scheduled to open for use on completion of the project.



Artist's impression of the cycling and pedestrian underpass. View from the Bayfair end



Artist's impression of the cycling and pedestrian underpass. View from the Matapihi end

First Bayfair flyover pier constructed

The first stage of the Bayfair flyover got underway in April with construction of the flyover's first pier.

At completion, the Bayfair flyover will be supported by three piers and two abutments. It will take SH2 over the Bayfair roundabout, separating state highway and local traffic.

Construction of the first pier involved:

- › Four steel cages – each 8 metres long and weighing approximately 3 tonne – which provided the structure for the pier columns. Each cage sits approximately 3 metres below ground on a footing, which in turn is located on top of the completed lattice pile ground improvements.



The first Bayfair flyover pier under construction

- › Around 30 tonnes of reinforcing steel in the footing.
- › A further 10 tonnes of reinforcing steel in the pier head, which was poured on top of the vertical columns.

This pier, containing approximately 50 tonnes of steel in total, will support the beams for the Bayfair flyover once all other bridge supports are complete.

To align with construction sequencing, the next two Bayfair flyover piers are anticipated to get underway early next year.

Ground improvements complete

The lattice pile ground improvements in and around the Bayfair roundabout were completed earlier this year, enabling construction of the new underpass and Bayfair flyover to get underway.

More than 1200 lattice piles were installed to support the Bayfair flyover. The purpose of the ground improvements is to mitigate the effects of liquefaction beneath the bridge abutments and piers in the event of an earthquake.

Ground strengthening work has been a major focus of the project given the sandy soils, sub-surface material and high-water table in the area. Around 5700 stone columns have already been installed throughout the site to help densify the ground and limit potential liquefaction during an earthquake.

The original plan for ground densification under the Bayfair flyover included stone columns. An alternative approach was required when testing in late 2019 indicated a variable layer of pumice was not responding as anticipated to stone columns.

The subsequent lattice pile approach involved constructing a network of overlapping concrete columns in a square lattice. The primary piles were augered (drilled) into the earth. Concrete was then pumped through the auger and the auger slowly extracted, replacing the displaced ground with



Aerial view of the ground improvement works underway earlier this year

concrete. At completion of the primary piles, secondary piles were then installed which overlapped the two adjacent piles to create a sealed wall.

Construction of the lattice piles involved:

- › two continuous flight auger drilling rigs, each weighing approximately 72 tonnes and up to 25 metres high, working in the middle of SH2 alongside live traffic
- › more than 1500 concrete truck deliveries, pouring an estimated 9500m³ of concrete
- › a further 1700 truck movements to remove around 8500m³ of material.

Mechanically stabilised earth walls



A mechanically stabilised earth wall under construction using concrete blocks and steel reinforcing ladders

The Bay Link project features 16 permanent mechanically stabilised earth (MSE) walls which help stabilise and retain soil on steep slopes, and form the sides of the bridge abutments and embankments.

Three different techniques are being used, depending on the load-bearing requirements of the wall:

1. Geotextile-wrapped soil layering with reinforced high-density plastic geogrid.
2. Galvanised steel baskets with a compacted pumice mix encased in geotextiles and restrained with geogrid.
3. Concrete blocks with steel reinforcing ladders.

Near the Te Maunga intersection, concrete blocks and steel ladders have been used on the two retaining walls that support the abutments for the SH2 interchange. Concrete blocks have been stacked and strengthened by high-grade steel reinforcing ladders fitted horizontally behind the wall face. These ladders are between six and 11 metres long and help anchor the MSE wall.

The load on each layer of blocks increases as the wall grows in height, which can cause settlement. While settlement may lead to small gaps in the wall's face, the structural blocks are subsequently covered by precast concrete fascia panels which are fixed to the front of the abutment walls. These fascia panels will feature cultural elements designed by our iwi partners.

Elsewhere, the MSE walls supporting the rail bridge are protected by rail impact walls. Constructed between the retaining walls and the railway line, these concrete walls are designed to ensure the bridge does not collapse in the event of a train derailment.

With construction of the southern ramp of the Bayfair flyover now underway in the middle of SH2 immediately south of the Bayfair roundabout, the project team are again constructing retaining walls. The load-bearing wall which will support the southern abutment of the Bayfair flyover bridge is being built using concrete blocks and steel ladders while the walls which will form the sides of the embankment utilise steel baskets and compacted pumice.

Stay informed about the project

We want to ensure the community is kept informed about the Bay Link project. Previously, we distributed project notifications and updates via letterbox drops to our project neighbours. In an effort to be more sustainable, we are moving towards an electronic distribution system.

If you would like to continue receiving newsletters and general updates about the project, visit the Bay Link website at nzta.govt.nz/baylink and enter your name and email address to subscribe to updates.

If you would like to continue receiving notifications about specific project activity, including night work in your area, please email baylinkproject@cpbcon.co.nz with your name, email address and street address.

If you don't have regular access to the internet or email and wish to remain informed about the project, please call the Bay Link project line on **0508 222 4636**.

You can also keep in touch with the Bay Link project via our website: nzta.govt.nz/baylink or Facebook page: facebook.com/NZTAWaikatoBoP

Out and about in the community

The project team have been out in the community in recent months providing updates on the Bay Link project to a range of stakeholders including Civil Contractors, Engineering New Zealand, Tauranga City Council, Pacific Coast Village, Greenwood Park, Rotary and Toi Ohomai. Waka Kotahi Principal Project Manager (BoP) John McCarthy and Bay Link Project Manager Paul Willey provide an overview of milestones, challenges and what's coming up for the project. If your organisation is interested in having the Bay Link team along to provide a project update, please contact baylink@nzta.govt.nz

FAQ: Why aren't we working 24/7?

There are many reasons we don't operate a 24-hour work schedule on the Bay Link project, including the level of noise and vibration associated with construction work.

Bay Link is taking place alongside a mixture of residential, iwi, commercial and industrial land. Construction is occurring on land with existing infrastructure next to established communities, making it significantly more complex than a project on an undeveloped, greenfields site.

Projects in urban environments are generally more challenging because work is carried out around live traffic lanes, businesses and homes, and existing services. We complete night works where we can, however it's also important that residents adjacent to works are treated considerately.

The costs associated with running a 24-hour project can increase with staffing, traffic management and floodlights required to create safe work zones and daylight conditions to work within.

COVID-19 alert level impact

Under COVID-19 Alert Level 4, major project work, including construction on Bay Link, was recently paused as it was not considered essential. At the time of printing, planning is underway for a return to work under Alert Level 3. This will require all construction activities to adhere to strict updated health and safety protocols for workers and road users.

The impact of COVID-19 Alert Levels 3 and 4 on project delivery is still being worked through. Waka Kotahi will provide an update when we have more details.



Keeping you up to date

For more information on the Bay Link project: visit our website nzta.govt.nz/baylink
Phone **0508 222 4636**
Email baylink@nzta.govt.nz
Facebook [NZTAWaikatoBoP](https://facebook.com/NZTAWaikatoBoP)

To see our weekly traffic notices, project overview and to sign up to receive our regular newsletters, go to nzta.govt.nz/baylink