



Baypark to Bayfair Link Project

PART 2

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.

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.

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.

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