

# OLD MĀNGERE BRIDGE REPLACEMENT PROJECT



*Māngere Mountain is majestic behind the replacement bridge works*

Since our last project newsletter, there have been many changes to our community as we learn to adjust to new ways of living which reduce the risk of COVID-19. We acknowledge that this is a difficult and uncertain time as a new 'normal' sets in.

Waka Kotahi NZ Transport Agency has been working closely with our construction partner McConnell Dowell and Construction Health and Safety NZ to keep you and our team on site safe. This includes the implementation of best practice health and safety requirements as we have moved through the different alert levels.

Although work on site stopped during Alert Level 4, a majority of the team were working from home, busy planning for the return to site and the changes we would need to implement in the months ahead.

The announcement that New Zealand would enter Alert Level 1 meant that a lot of the restrictions in place could be eased and we are now working alongside each other 'bubble free'. Some of the Alert Level 3 initiatives have remained and so everyone still needs to sign in, wear appropriate personal protective equipment and follow stricter hygiene practices. We have also continued to clean the site more frequently and keep additional hygiene stations too.

# Demolition and construction progress

## Demolition

Demolition of the Old Māngere Bridge continues, and even larger sections of the structure are now being removed. So far, the team managing the demolition have removed beams, spans, abutments and headstocks which have ranged in weight between 28 to 43 tonnes each.

At the end of June 2020, approximately 30 metres of the old bridge has been

deconstructed along with two of the 17 headstock sections. A headstock is the section between the deck and the piers known as the 'transverse beam' as it extends across the width of the bridge and supports the main longitudinal beams on the bridge pier.

Each headstock is 15.3m long and 1.2m high and their function is to transfer the load from the superstructure of the bridge to the piers,

providing a stable base for the beams. As they are so large, the first one was removed in three separate sections.

To remove the headstock, the demolition team had to cut through concrete almost half a metre thick. Large wire saws were used to cut each section while a 20-tonne excavator mounted on a barge was used to shear the connection to the piles underneath.



A headstock section being removed



Girder section removed off the old bridge

## Construction

The team managing the construction of the new bridge is also busy and if you're travelling near site then you may have seen the two temporary platforms extending out into the harbour from both the north and south side. The combined length is approximately 240 metres and another 80 metres still needs to be built.

Each week, the temporary platforms reach further and further into the centre of the harbour and when this task is complete, the staging will form two arcs. There will be a smaller arc from the north side and a larger arc from the south and these will overlap slightly.

There are also new structures which appear to stick out from these temporary platforms. Known as *finger staging* or *fingers*, as the name suggests, they branch out from the platforms like fingers from your hand. The finger staging is being built to provide access for the team to construct the remaining piles of the project. These piles will reach up to 26m below the seabed and will support the large feature arch which weighs over 400 tonnes.



Piling underway on the northern site





# What happened on site during Alert Level 4?

As all Waka Kotahi non-essential maintenance and capital project work stopped during Alert Level 4, the Old Māngere Bridge Replacement project site was closed.

However, in the first week we were also notified that 550 tonnes of 20m long sheet piles needed for the project had arrived at the Ports of Auckland. The sheet piles took

up a lot of space and had to be removed quickly so that essential goods for New Zealand could be unloaded and stored at the Port terminal instead.

A team of eight were given special permission to work over three days to complete this task. In preparation, a plan was developed to ensure the team could carry out the work safely. Physical distancing

restrictions were in place and each person was provided a letter to confirm they were completing 'essential work'.

Waka Kotahi and McConnell Dowell are very grateful to these team members for their work during lockdown to help move these materials and free up space needed for essential goods to be delivered at the port.

## Exclusion zone in the Manukau Harbour

Demolition of the old bridge and construction of the new bridge was planned so that access to the Upper Māngere Inlet could be maintained during the project. However, due to the deteriorated condition of the old bridge, it has been deemed there is a high health and safety risk should access under the old bridge remain open.

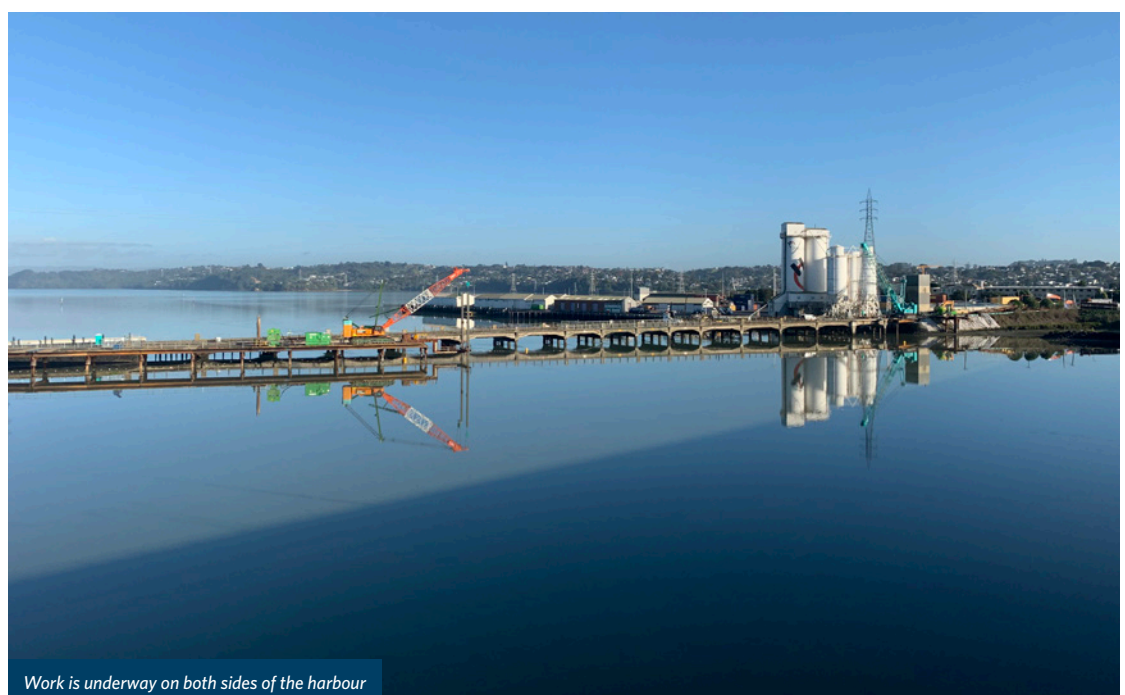
Safety is a priority for Waka Kotahi and McConnell Dowell. As a result of the high safety risk, a 24/7 exclusion zone was put in place in mid-June place around the work area.

While the boat ramp at the end of Coronation Road will remain open, the exclusion zone means it will not be possible to access the Upper Māngere Inlet from pontoons and boat ramps located west of the Old Māngere Bridge.

Waka, kayak and small craft that are launched within the Upper Māngere Inlet can still enjoy this waterway but access under the old bridge and through the construction area into the Manukau Harbour will be closed.

A five-knot speed limit is also in place around the exclusion zone. We ask for you to stay at least 50 metres away from the area wherever possible and take extra care when using the boat ramp at the end of Coronation Road. Buoys will mark the exclusion zone but for safety reasons they will be removed when the team is working.

We will update you as soon as we are able to safely reopen access through the area.



# How do you build a bridge across water?

Bridges which cross water are more challenging to build compared to those which cross land and work is taking place behind the scenes as we plan for some of the complex structures that will enable us to safely build in the middle of the Manukau Harbour.

*Cofferdams* or *coffers* are temporary structures which create a small 'dam' around an area so water can be pumped out to create a dry work environment - that's where the 'dam' part of the name comes from. Cofferdams enable people to work safely and keep concrete dry so it can set. They also protect the surrounding environment from the impacts of construction.

The team need to build nine steel cofferdams in the Manukau Harbour, so the 'V' shaped piers which will support the large arch on the new bridge can be constructed inside.

Four large and five small cofferdams are needed for this project. Over 54 sheet piles will make up each large cofferdam which will be 25m long and 12.5m wide and smaller cofferdams will be 13.5m wide and 6.5m long and take 26 sheet piles to construct. They will be arranged in a way which forms a watertight box, and the water inside pumped out so work on the bridge substructure can start.



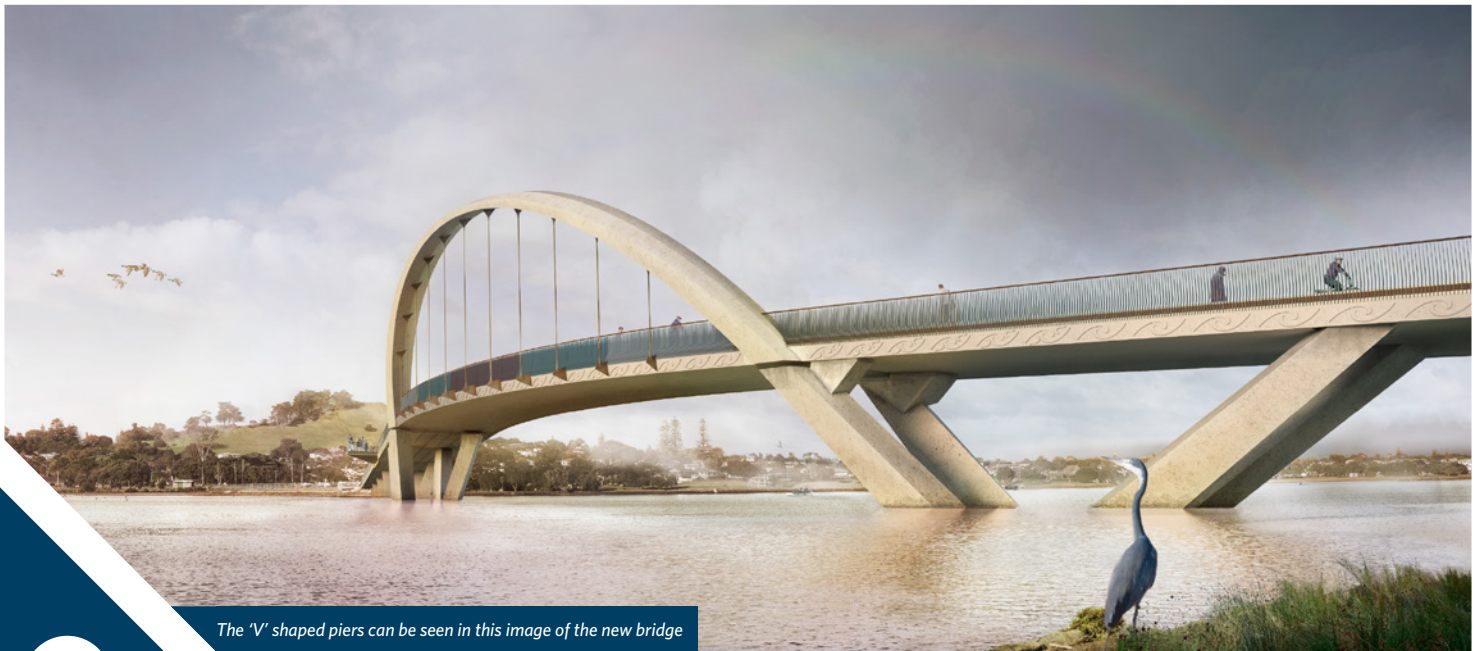
An example of how cofferdams were built in the ancient world



A relief carving celebrating Roman construction skills

## DID YOU KNOW?

We have been building bridges for thousands of years and still use some of the same methods for construction today.



The 'V' shaped piers can be seen in this image of the new bridge



For more information on the project or to sign up to newsletter updates, please scan the QR code or visit [www.nzta.govt.nz/omb](http://www.nzta.govt.nz/omb)

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