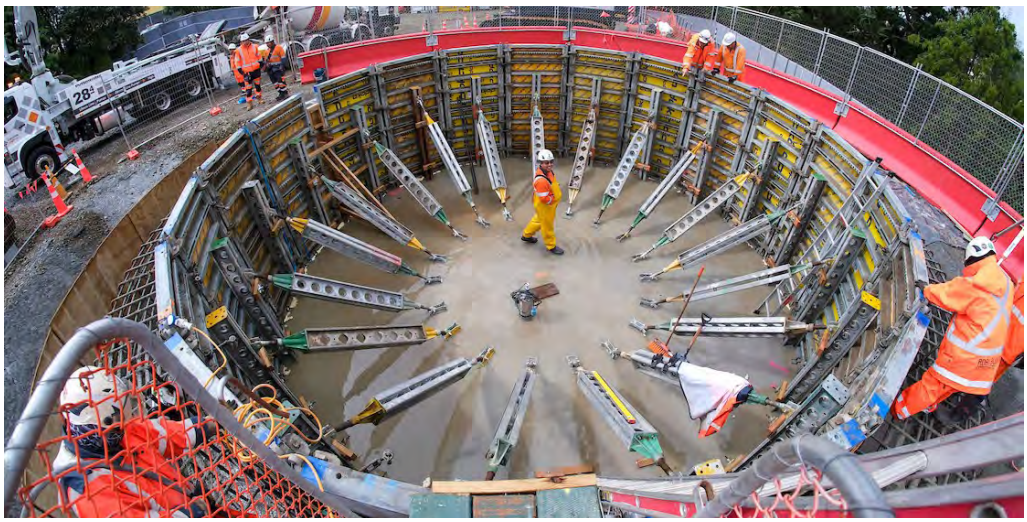
Building the

# CENTRAL INTERCEPTOR

Project newsletter - issue 8
February 2023



*Concrete pour, Lyon Ave site*

## 2022: a year of many milestones

With a few last turns of the cutterhead, Hiwa-i-te-Rangi, our Tunnel Boring Machine (TBM) make landfall - and history – as she arrived at our PS23 site in Hillsborough on 6 December. After a dawn blessing from Mana Whenua, she had left the southern shore of the Manukau in September and completed the 1500m stretch under the harbour in just 11 weeks.

It was an exciting moment for the project team as the 5.4m diameter cutterhead bored into our 25m deep shaft at our wastewater pump station (#23) overlooking the harbour. Tunnelling took place at 15-20m below the seabed, with a maximum of 15 crew working 24/7 underground at a time. Undersea tunnelling is rare in New Zealand and achieving this milestone is a huge credit to the whole CI team.

With the breakthrough just before Christmas, the tunnelling team enjoyed a well-earned holiday break. Over the new year period, we inspected the cutterhead and made some repairs and adjustments. Hiwa-i-te-Rangi has now begun tunnelling the two kilometres to our Keith Hay Park site in Mount Roskill.

Meanwhile, work on building Link Sewer C (from May Rd, Mt Roskill, to Avondale) is progressing well. Our micro-TBM called Domenica achieved her third breakthrough, arriving at Miranda Reserve in November. She's now boring another 300m under the Reserve to complete Link Sewer C at our PS25 site. Then she'll be refurbished ahead of being moved to start on Link Sewer B, in Mt Albert.

*Hiwa-i-te-Rangi farewelled under the Manukau Harbour*

## In this issue:



# A round-up of our construction sites

*(from south to north)*

**Māngere Pump Station:** In the main pump station shaft, building works are underway with first floor construction and precast wall panel installation. In the confluence chamber, the Eastern and Southwestern Interceptor supports are in place, with settlement monitoring ongoing. The diversion chamber base slab reinforcing is being installed. The rising main stormwater pipe installation is complete, reinstatement of Odour Bed 3 south continues as does backfilling of the rising main underneath the bed.

**PS23, Hillsborough:** We have completed GRP (glass-reinforced plastic) shaft lining installation and commenced temporary works for the diversion chamber construction. Works also continue along Frederick St towards Hoskins Ave.

**Keith Hay Park:** Physical works have recommenced at Frost Road, with sheet piles installed for manhole #05, which will be used to launch the horizontal directional drill beneath SH-20.

**May Road:** On shaft A, excavation to 70m is completed and the mine site is re-opened, with services continuing to be removed in preparation for permanent works. On shaft B, 73m deep, excavation is completed and the base slab poured.

**Walmsley Park:** The shaft has been excavated to 63m, GRP (glass-reinforced plastic) liners have been installed and concrete backfill on the shaft is completed.

**Haycock Avenue:** Two major chambers have been constructed. The road outside the site is now closed for construction of the chamber to connect to the Western Interceptor.

**Dundale Avenue:** Stripping services and cleaning of the drive 3 pipe are underway, with CPL welding commenced.

**Miranda Reserve/PS25:** Shaft reconfiguration is nearing completion with the micro-TBM assembly begun. At PS25, shaft excavation plus HV cable, sewer and stormwater diversions are completed, with blinding poured and base slab reinforcing placed in preparation for concrete pours.

**Haverstock Road:** Shaft excavation is ongoing with 34m out of 51m completed to date. The Camden Rd accessway is in use for exiting site traffic.

**Lyon Avenue:** Shaft excavation has commenced as has caisson shaft construction. Installation of steel reinforcement for Lift 3 has commenced.

**Mt Albert War Memorial Reserve:** All 28 rings Caisson segments have been installed and grouting is underway.

**Norgrove Reserve:** Site preparation continues, the crane pad has been constructed and we are currently undergrounding the overhead powerlines.

**Rawalpindi Reserve:** Site preparations continue and temporary shaft construction (secant piling) works have commenced.

**Western Springs:** Site establishment is largely complete and shaft temporary works and the capping beam construction have begun.

**Tawariki St, Grey Lynn:** The final site on the current tunnel alignment will open this March.


*Domenica breaks through at Miranda Reserve*

## Extending the Central Interceptor tunnel to Pt Erin

Watercare proposes extending the tunnel from its current end-point, at Tawariki St in Grey Lynn. Our aim is to bore a further 1.6km to a new construction sites in Point Erin Park. We will build a new drop shaft by the pool and a control chamber and sewer connections in the south-west corner of the park.

Watercare recently lodged an application with Auckland Council for resource consents for the works. We are currently engaging with the local community on our plans.

Unfortunately, we have had to defer an existing St Mary's and Herne Bay wastewater separation programme. The project was heavily impacted by design issues and escalating costs, doubling the original budget forecast.

We are committed to separation in the longer term but extending the CI tunnel will enable us to deliver cleaner waterways by 2028 in the area, with less community disruption.

*Health & safety*

# Colour coding for safety

When we think of safety colours, at traffic lights for example, we have green, orange and red in mind. However, we've attempted to be more colourful in our main CI tunnel.

In our tunnel we have two tracks for our electric locomotives, as they bring empty skips in and then take them out full of spoil. For the locos to change tracks we use a 'California' switch, with sliding and tapered end rails that ride on main-line rails. To enable safe efficient track changes, our contractor came up with an ingenious and colourful safety system.

As you see in the image, a set of Christmas lights has been strung from floor to ceiling. Each colour represents a different stopping point for the driver, depending on the size of the load they are towing. This is a more visible way to alert them to the slowing down and stopping points on their journeys.

*Colour coding the tunnel for safety*

# Schools enjoy lessons on construction and safety

There are 26 schools and kindies located along our tunnel route, all close to our 16 Central Interceptor sites. Educational institutions are an important part of our community and nearby schools may be impacted by our construction activities.

When we engage with a school or kindy, we like to start with a presentation about the project, the sites nearest to them, and our tunnel boring machines. Time lapse footage of our shafts is very popular and many ooohhs and aaahhs later everyone knows a little bit more about the Central Interceptor project.

Our contractor also has a truck safety programme for schools where they share safety tips, explain road signs, and show how difficult it can be for truckdrivers to see children.


*May Road School pupils learning how to be safe around trucks*

The Central Interceptor will make Auckland waterways cleaner. So it makes perfect sense that one of our neighbouring schools has produced artwork about family activities near streams, lakes and the ocean. These beautiful portraits are used on the hoardings around our sites.


*Artwork from local schools helps make our site hoardings more colourful*

Focusing on safety is important for all ages. Our contractor has developed a fun session that they run with kindergartens and day care centres, explaining what PPE is and why our teams wear it. One of our neighbouring kindies now has PPE in its dress-up box.

*Kindy kids all kitted out in PPE*

# The Central Interceptor is much more than a tunnel

## Fossil finds unlock secrets of the past

In 2019-20, the Central Interceptor excavated two enormous shafts at our Māngere Pump Station site, where Hiwa-i-te-Rangi was launched from in 2021. While digging the main shaft, excavators came across a 5m-thick layer of marine shells, at approximately 35m below the surface. This was an immensely and exciting discovery as the layer turned out to be thousands of fossils around three million years old.

The fossils are mostly molluscs, a large grouping of animals which includes snails, clams, squid and octopus. Similar fossils, at least 60 new species, were found in the 1940s in Ōtāhuhu during a well excavation. The number of species from Māngere is already more than 200, including two fossil flax snail species, and many are more complete and better preserved than the 1940s finds.

When Watercare made the discovery, we immediately contacted Auckland Museum, and we are now partnering with the museum, Mana Whenua and specialist palaeontologists to document and preserve these taonga. This Māngere material presents a unique opportunity to substantially enhance our knowledge of the fauna that inhabited the seas and lived in forests in the Auckland region around three million years ago.

Leading New Zealand scientists believe that the diversity of species shows the shells were deposited in a shallow near-shore environment. The first-ever discovery of fossil flax snails indicates that there was forested land nearby. There would also have been sandy open ocean beaches, as shown by the presence of fossil tuatua, and rocky shores, as shown by the presence of species such as limpets and cats' eyes.

The landscape would have looked much like we have around Auckland today, but with one big difference: three million years ago the Firth of Thames and the Hauraki Plains did not exist, so rivers flowing from the Coromandel Ranges would have reached Auckland and brought down much of the sediment that was deposited in this region. This would also have been the source of the fossil flax snails. The presence of a cone shell and other subtropical species suggests a very warm temperature at the time of deposition.

Watercare funded Auckland Museum to employ two part-time specialists who carried out further field work, helped with species identifications and catalogued all our discoveries. Those discoveries are now housed at Auckland Museum and are already the subject of further research by Museum teams and the wider scientific community. In this way, we are gaining as much knowledge as possible from this rare discovery.

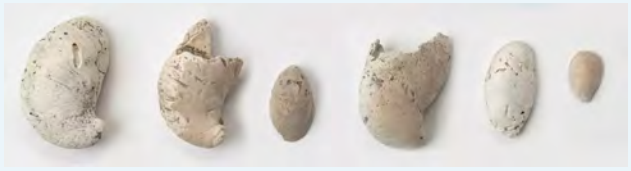
The fossils are now also part of three new Dinosaurs and Fossils learning programmes. With Watercare's sponsorship the Museum's learning team is able to offer these programmes free to schools and early learning centres (ECEs), onsite, offsite and on-line. In 'ECE - Dino Discovery/ Ngaa Mokonui a Papa', story-telling elements speak to the process of fossilisation. Tupa is a story about a scallop that lived 3.5 million years ago and became a fossil at Māngere.

For years 1-4, 'Colossal Fossil/Te Ara Mokonui' is a programme comparing fossils to modern day animals. For years 5-8, 'Palaeontology/ Toenga Mokonui' focuses on taxonomy and whakapapa, comparing different constructs of classification of animals and fossil records and incorporating the CI fossils.

For more information, go to www.aucklandmuseum.com and search 'mangere kaawa formation fossils'. With grateful acknowledgement to the museum's Wilma Blom, Curator, Marine Invertebrates.

*Magnificent 3.5 million year-old finds*

*Shells categorised by species*



*Slipper limpet shells from juvenile to adult – largest is 5cm long*

*Searching the Central Interceptor spoil heap for treasures*