

Building the

# CENTRAL INTERCEPTOR

PROJECT NEWSLETTER - ISSUE 4  
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Hiwa-i-te-Rangi is unveiled as special guest Professor Dr Rangi Mataamua of Waikato University explains the significance of the star

## Our tamariki name and decorate our Tunnel Boring Machine

Watercare's Tunnel Boring Machine (TBM), Hiwa-i-te-Rangi, is on the cusp of her five-year journey to build New Zealand's longest wastewater tunnel, from Māngere to Grey Lynn. Before that journey begins, the first two sections of this 190-metre long machine and its 5.4m-diameter cutterhead were unveiled at Watercare's Māngere Pump Station construction site. This is the launch site for the \$1.2 billion Central Interceptor project.

Auckland Mayor Phil Goff officially unveiled Hiwa-i-te-Rangi on Monday 14 December. He was joined by Chair of the Watercare Board, Margaret Devlin, representatives of mana whenua, Watercare Acting CEO, Marlon Bridge, the Italian Ambassador to New Zealand. Also attending were Auckland Councillors and members of local boards, representatives of industry and consulting partners, local school children and project management and staff.

'Hiwa-i-te-Rangi' is the star in the Matariki constellation connected to the promise of a prosperous season. "Hiwa" means "vigorous of

growth". It is to Hiwa-i-te-rangi that Māori would send their dreams and desires for the coming year.

In tunnelling culture, TBMs are given female names so we asked schools along the tunnel route to decide on a name by voting on a shortlist of five female Matariki stars. Pupils from five primary schools voted for who they thought best represented the aspirations of the project and its improvements to the natural environment.

Hiwa-i-te-Rangi was the winning name by more than 100 votes.

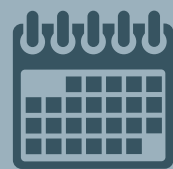


Matariki artwork from two of the primary schools along the tunnel route

Three of the schools created amazing artwork for the TBM and for hoardings around our construction sites. The unveiling of the first two sections of the machine revealed artwork from students at Mt Roskill Primary, May Road Primary and Hay Park Primary School. Their pictures adorn the front sections of the TBM.

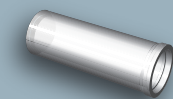
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- Main Tunnel Boring Machine named
- Highlights and challenges of 2020
- A busy 2021 ahead
- Meet the team driving the TBM
- Visitor 'Discovery Centre' launched
- Leaving a lasting community legacy

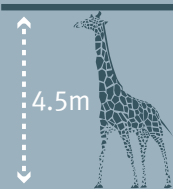


Project build  
**2019**  
to  
**2025**

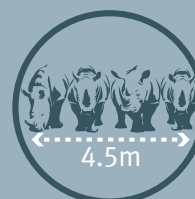
14.7 kilometres



**longest**  
wastewater  
tunnel in  
NZ



**high**  
enough  
to fit a  
giraffe



**wide**  
enough  
to fit four  
rhino side  
by side



# 2020 brought highlights and unique challenges

**When we began the year, we had started at two sites at Māngere and May Road. In 2020, five more sites started construction along the tunnel route, at Keith Hay Park, Haycock Avenue, Dundale Avenue, Miranda Reserve and Walmsley Park.**

We had a full-on year in 2020 with incredible achievements. Go online to see a snapshot of the full year in review at: <https://vimeo.com/493695164>. Notable events included:

## Project recovers well from four-week COVID-19 lockdown

Along with the rest of the country, all construction work on our sites was suspended at Level 4 in March. Despite the four-week delay, the contractor has been able to keep the overall project on time to meet our planned 2025 completion date.

The GJV was able to change start dates for

all our sites in 2020 (some earlier, some delayed). This has helped us better manage the disruptions to our supply chain for both materials and for specialist personnel coming from overseas. The ripple effect of COVID will continue through 2021 but we will update you on changes regularly.

## Training TBM name honours a pioneer of New Zealand education

Our full-size training TBM arrived and we were pleased to be able to name it after a distinguished educator. Kate Edger was the first woman to earn a University degree in New Zealand, awarded to her on 11 July 1877. Throughout her life Kate was very active in women's education and social issues including the female suffrage movement.

With members of the charitable educational trust and three generations of Kate's family attending, the TBM with Kate's name was unveiled (along with an information plaque) at our training centre at a ceremony on 17 July.

## Completion of main site shafts prepares project for tunnelling

Towards the end of 2020, our project contractor, the Ghella Abergeldie JV, completed construction of the diaphragm walls ('D-walls') at our Māngere Pump Station main site. This work then enabled us to begin the shaft excavate work which was completed in September.

The shafts are huge: at Māngere two interconnected shafts are 14m and 28m in diameter and 38 metres deep. A 2m-thick solid concrete floor has been constructed onto which the TBM will be lowered; construction of the 1m thick concrete walls inside the shafts is proceeding apace.

At May Road, the two shafts have been built using secant piling, alternating piles where every second pile partially cuts into each side of a primary pile in order to keep the walls watertight. This keeps out ground water and provide ground support as we dig out the material from the shafts.



Late night concrete pour 42m down in the Māngere main shaft just before Christmas.

By the end of last year, we had dug out 70% of the material from the main shaft, 'Shaft A'. When excavation is completed, this shaft will be ready for the launch of our 'micro' TBM, named Domenica. 'We say 'micro' but she is still half the diameter of the main TBM. In April she will begin boring our two sewer links, as on the map below. This TBM which will bore the two 2.4m diameter sewer links beginning in March 2021. (See map below.)

The second shaft at May Road, Shaft B, will be excavated over the next few months. It will be used for the main TBM, Hiwa-i-te-Rangi, to bore the northern section of the CI tunnel as well as the final connection to the existing sewer. (See main story.)

## International players combine to deliver our TBM

The project's main tunnel boring machine, Hiwa-i-te-Rangi, was manufactured over 10 months in the Herrenknecht AG factory in Germany. She was originally planned to be assembled closer to us, in China, but when COVID-19 struck GJV moved fast to shift all operations to Germany.

Hiwa-i-te-Rangi arrived at the Port of Auckland last November. Piece by huge piece, she was transported to Māngere Pump Station, mostly during the wee small hours over several nights when traffic was light. Due to her size – 190 metres in length – she will not be fully assembled by the contractor until she is lowered into the shaft. As she bores forward, sections are lowered into the shaft and connected until she reaches her full length.



Hiwa-i-te-Rangi on the road to Māngere

## More construction sites opening in 2021

The next phase for the project is to start constructing underground chambers and links into existing local wastewater networks. Our 'micro-TBM' (still a good size at 2.4m in diameter!) has arrived in the country and will begin boring the link sewers from May Road, Mt Roskill next month.

This TBM's role is to bore the two link sewers, short sections which jut out from the main line (see the map). These are nearly half the size of the main tunnel. Link sewer C, which runs westwards from May Road to Miranda Reserve in Blockhouse Bay will be the first section of the project we will commission. This section needs to be operational as soon as possible so that the current Western Interceptor across Manukau Harbour to the Māngere Treatment Plant can be overhauled and serviced.

The last two sites on this section will be opening later this year so they are ready for the arrival of the micro TBM. In total we will open six sites in 2021, joining the existing seven sites. Before we begin work at our new sites in 2021 (see the map), we'll send more details to local residents, businesses and community groups via our project bulletins.

We will invite you to our 'Meet the Contractor' events to find out more about our new sites as they open. At these events, we'll also have our new state of the art Discovery Centre on site (see back page).

**We encourage you to sign up to our site bulletins so you know what's happening throughout the project – go to [www.centralinterceptor.co.nz](http://www.centralinterceptor.co.nz) to sign up.**



## Meet the team building the TBM

With the arrival and official naming of our main TBM (Hiwa-i-te-Rangi), a team of international experts is now preparing her for her journey.

With more than 30 years' TBM experience Michele (pronounced Mick-ale-li) Invernizzi is the mechanical superintendent for the TBM. He is responsible for assembling, installing and maintaining the TBM and all its supporting plant and equipment, such as the rails and trains.

This is no small job as, at 190 metres long, the TBM has many moving parts and a massive support crew of plant and equipment on the surface. As much as possible the various components are pre-assembled on the surface, due to the limited space at the bottom of the shaft.

Excavation begins with only the TBM's cutter head and its front and middle shields. These weigh between 20t to 120t, so we have a 450t crane to lower them into position. Auxiliary gantries remain on the surface, connected via 'umbilicals' (hydraulic lines, water, compressed air and cables.) As the TBM bores forward, sections are lowered down and connected as space in the shaft becomes available.

Michele trained as a TBM mechanic in 1991 and has worked on TBM's all over the world on various projects. His last position was in France on a high-speed train project, building a 57 km tunnel under the Alps.

Michele is no stranger to this country as he worked here in the late 90's building the Mercury Vector tunnel in Auckland. He has already settled back into the city and in his free time is outdoors enjoying water sports or paragliding, a favourite past time.

For Michele the opportunity to travel and to find technical solutions for complex technical challenges is what he enjoys most about his job. We're very fortunate to have this experienced and skilled tunneller on our CI team.





## Introducing our new state-of-the-art Discovery Centre

With so much of the Central Interceptor project underground and behind safety barriers, we are engaging with our communities in a more visible way. Watercare has supported an innovative idea that our main contractor, Ghella Abergeldie JV, included in their winning tender.

Together, we have developed a vibrant and inviting Discovery Centre to show how we're building the CI, with all the benefits it will bring. Fully mobile and seven metres long, the Centre features a virtual reality ride, fun touch-screen games and augmented reality experiences, all hosted by loveable Wai Mā, the long-fin eel/tuna.

*The Discovery Centre will be on-site at an event near you soon: look out for flyers in your letterbox.*



*The latest digital technology highlights how CI will clean up central Auckland's waterways*



*It's not all digital at the Discovery Centre: there are fun, hands-on activities too*

## Leaving a legacy in our communities



*Pink hats ready for our TBM naming ceremony visitors to wear. This one event raised more than \$600 for the Breast Cancer Foundation*

At the Central Interceptor, we see the communities we are working in as our neighbours. The project spans multiple, very diverse neighbourhoods. Our workforce, too, represents a wide range of people and cultures. This is all in the forefront in us being a good neighbour and good employer.

Our project's vision is "One family building a better future for Tāmaki Makarau". As the project touches multiple communities along the tunnel route, we want to deliver a lasting legacy that will benefit these neighbourhoods and our own workforce.

To help us achieve a wide range of social outcomes, we have a team which works closely with mana whenua, marae, schools, community organisations and social enterprises. Along with the GAJV stakeholder team, they have initiated several innovative projects including:

### Raising awareness of breast cancer

Each year almost 3000 New Zealand women and 25 men are diagnosed with breast cancer, with more than 650 deaths. As our project whānau makes up a good portion of this at-risk community, CI is supporting the Breast Cancer Foundation for the duration of the project. We do so by raising funds and awareness with our very visible 'Pink Hard Hat Programme'.

All visitors to site need to wear a hard hat and we give them a pink one to wear: for every pink hard hat, the project donates \$10 to the Foundation. We estimate there will be about 500 visitors to our 17 sites each year and so we hope to raise more than \$22,000 over the course of the project.

Our visitors range from politicians and industry partners staff to school children and our suppliers. All have asked the question: "Why the pink hats"?

The hats are a visual reminder that we need to look out for our visitors. They are also a great conversation starter about breast cancer and we encourage our teams to talk about the cause.

With our financial support, and our education and awareness programme, we want to play a part in reducing the impact of breast cancer on our communities. We support a range of social initiatives, keep an eye out for more information on these in future newsletters.