

NEW ZEALAND



Name of Association: New Zealand Tunnelling Society
Type of Structure: Incorporated non-profit society
Number of Members: 151 individual members, 9 sponsors

ASSOCIATION ACTIVITIES DURING 2023 AND TO DATE

The highlight of 2023 for the New Zealand Tunnelling Society was hosting the incredibly successful 18th Australasian Tunnelling Conference in Auckland. This event brought together a large and engaged group of tunnelling enthusiasts from across New Zealand, Australia and beyond to share knowledge, to network and to celebrate the merits of underground space. The technical programme of the conference was of a very high standard, with a broad range of topics covered in the more than 100 papers presented. This was complimented by the thought-provoking keynote speakers, which included Arnold Dix, ITA President, interactive plenary sessions and some great social events.

The society also held its inaugural Golf Day in 2023 along with a number of seminars and presentations for members. The NZTS also focussed on actively building closer ties with other national tunnelling societies in the Asia Pacific region.

CURRENT TUNNELLING ACTIVITIES

Current tunnelling activity in New Zealand is primarily centred around two major project; The City Rail Link and the Central Interceptor. These projects are in different stages with the Central Interceptor presently tunnelling on a number of faces and the City Rail Link progressed to track laying, fit out and commissioning.

There are numerous smaller tunnelling project also underway. These are primarily in the three waters space and consisting of shaft construction and microtunnelling or direct pipe.

A selection of the current live projects are summarised as follows:

The Central Interceptor

A lot was achieved on Watercare Services Limited Central Interceptor project over the last year and there is another busy year ahead in 2024.

The main TBM, Hiwa-i-te-Rangi,



Central Interceptor

continues her journey north and is making great progress having successfully passed through the Walmsley Park site and now being just 1km away from her next milestone: Haverstock Road, Sandringham. Hiwa-i-te-Rangi has covered a distance of more than 8.8km, with the installation of 5,500 segment rings.

The smaller micro-Tunnel Boring Machine (mTBM), Domenica, is working her way along the Link Sewer

B. Domenica will be launched from Rawalpindi Reserve in Mt Albert soon to tunnel her final drive of 300m to the Norgrove Avenue site. The Link Sewer B tunnel runs from Mt Albert War Memorial Reserve to Rawalpindi Reserve and has an internal diameter of 2.4m and a length of 1.1km.

All 16 of the construction sites on the project are open and there are significant construction activities underway at the majority of them.

Te Whatu Ora | Te Toka Tumai Auckland Hospital Central Plant and Tunnel project

The Auckland Hospital Central Plant and Tunnel project entails construction of a 250m long tunnel that will connect the central plant building to other main buildings. The tunnel runs at up to 20m deep with a width of 3.5 – 4m all constructed by cut and cover. Works have been progressing well with 19,000m³ of excavation up to depths of 20m below existing ground, along with the application of 650m³ of shotcrete inside the 240m tunnel completed last month.

Warkworth to Snells pipeline

This project includes three tunnelling drives constructed using direct pipe techniques. The TBM (Piper) has already successfully tunnelled the first 1,360m drive, taking roughly four months to complete this first phase of her work on the pipeline. Drives 2 and 3 comprise a further 3,411m combined.

City Rail Link

Tunnelling on Auckland’s first metro was



City Rail Link



Waitemata Crossings

completed in 2023 but there are still significant works remaining. The project has just completed installation of the second and final railway line below the central city.

The newly laid 3.4 km of track will carry trains underground north from Maungawhau Station at Eden Terrace and connect with the two new central city ones – Karanga-a-Hape and Te Waihorotiu – and downtown’s Waitematā Station (Britomart).

The focus is shifting now to train testing and finishing the fit out of the stations and tunnels, alongside landscaping and urban realm enhancements. The fit-out programme includes the installation of lifts, escalators, security systems, CCTV, electricity, signalling and communications.

FUTURE TUNNELLING ACTIVITIES

With a recent change of Government in New Zealand there has been a significant shift in focus and prioritisation of infrastructure projects. This has seen a number of tunnelling projects discontinued in favour of other projects. Some of the future tunnel projects which are being progressed currently are listed below.

Waitemata Crossings

A second crossing of the Auckland Harbour is supported by both main political parties in New Zealand with agreement that construction needs to start this decade. A crossing of some description is essential to enable the reliable functioning of the Auckland Transport network moving into the future. The previous Labour government preferred an option comprising two three-lane tunnels for vehicles and a 21km light rail tunnel between the CBD and Albany that was priced at \$56bn. This option is not supported by the current government who are currently commissioning their own reports on the various options and will select a preferred option to support.

Victoria Tunnel

The National government have confirmed that they will prioritise a second Victoria tunnel and an upgrade of the Basin Reserve in Wellington, estimated to cost \$2.2bn. The tunnel would provide two lanes for traffic going towards the airport and the two lanes of the existing tunnel would provide a route into the city. The current tunnel was built in 1931 and services 37,000 vehicles per day - it is long overdue an upgrade.

Kaimai Tunnel

A road tunnel passing under the Kaimai ranges as part of an improved connection between Hamilton and Tauranga is currently being considered by the National Government. Options for this tunnel range from 1.2km in length upwards.

3 Waters

The significant focus on three waters infrastructure upgrades and capacity increase in New Zealand will include the procurement of a number of tunnel projects. The projects currently planned for the next three years are up to \$120M in value and are primarily located in Auckland and Wellington.

Warkworth to Wellsford

The extension of the four lane motorway heading north of Auckland is being prioritised by the current government who have indicated that they would like construction to commence within three years. Within this scheme there is likely to be at least one significant set of tunnels.

STATISTICS

Length or volume excavated - % mechanized / % conventional during 2023

1. 13.7km (95% mechanised, 5% conventional)
2. Amount (USD or EUR) of tunnelling / underground space facilities awarded in 2023 - \$68m
3. **List of tunnels completed**
Clinker Stormwater Upgrade, Barber Grove to Seaview Pipe Duplication, Ports of Auckland Outfall, Stanmore to Fife SW Upgrade
4. **List of tunnels under construction**
Central Interceptor, Mt Messenger Bypass, Hills Stormwater Upgrade, Wellpark Avenue Stormwater Upgrade, Auckland Hospital Service Trench, Warkworth to Snells Pipeline, City Rail Link.

EDUCATION ON TUNNELLING IN THE COUNTRY

- Three universities in New Zealand offer Civil Engineering Degrees with Geotechnical specialisation – University of Canterbury, University of Auckland and University of Waikato.
- A one day Sprayed Concrete in Tunnelling shortcourse was held by the NZTS/ATS/AUSS in 2023.
- A Tunnelling Short course will be held by the NZTS in 2024.