



TBM Kathleen makes history, completing twin metro tunnels beneath Sydney Harbour

## History making under-harbour metro tunnels complete

Tunnelling on Australia's biggest public transport project, the Sydney Metro City & Southwest, is now complete after specialised tunnel boring machine (TBM) Kathleen completed twin railway tunnels deep beneath Sydney Harbour.

The TBM's history-making arrival at Blues Point comes just months after TBM Mum Shirl broke through at her final destination at Barangaroo in January after tunnelling deep beneath the Sydney CBD.

It took two months to build the second tunnel – one month faster than the first, due to lessons learned like modifying the giant cutter head and tunnelling process to better deal with the hard clay material at the bottom of the harbour.

The specialised under-harbour machine completed the first of the twin tunnels in October last year, before being retrieved from Blues Point and sent back to Barangaroo, reassembled and re-launched in January to carve out the second tunnel.

Approximately 174,800 tonnes of sandstone, clay and marine sediments were removed to build the tunnels. The tunnels are approximately 40 metres below ground at their deepest point.

A large gantry crane inside the acoustic shed at Blues Point will now be used to lift out each of the TBM's pieces. TBM Kathleen will then be sent back to the manufacturer for future tunnelling projects.

Sydney Metro is Australia's biggest public transport project. It will transform Sydney, delivering more trains and faster services for customers across the network.

Sydney Metro City & Southwest extends the new metro network from the end of Sydney Metro Northwest at Chatswood, under Sydney Harbour, through the CBD, and west to Bankstown.

John Holland CPB Ghella (JHCPBG) is building the 15.5 kilometre long twin railway tunnels between Chatswood and Sydenham and excavating six new metro stations.

### Three-month look ahead

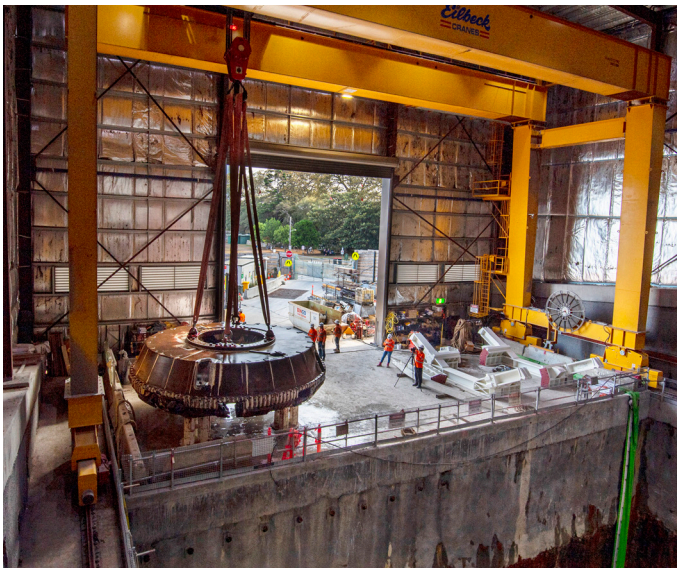
Activity (subject to change)	March	April	May
Retrieval and disassembly of TBM Kathleen	●	●	●
Barge movements	●	●	●
Installation of concrete tunnel lining and cross passage construction	●	●	●
Deliveries of material, plant and equipment	●	●	●



## Northern TBM retrieval complete

After completing the northern section of tunnelling from Chatswood to Blues Point late last year, both tunnel boring machines (TBMs) Wendy and Mabel have now been retrieved from the Blues Point temporary retrieval shaft and loaded onto a ship back to the manufacturer.

A large gantry crane inside the acoustic shed at Blues Point was used to lift each tunnel borer's cutterhead and two front shields about 30 metres up to the surface.



TBMs being retrieved from Blues Point

Each cutterhead consists of 38 cutters, which were changed regularly during periods of maintenance while the machine was boring.

Meanwhile, retrieval of the southern TBMs is also underway at Barangaroo after Nancy and Mum Shirl completed tunnelling in December and January respectively. A 330-tonne tower crane is being used to lift both tunnel borers out in pieces.



Lifting TBM pieces from Barangaroo

## Finishing the tunnels

Work is now underway to complete the concrete lining for cross passages, as well as form a flat surface in the bottom of the tunnels between North Sydney and Blues Point for future track installation.



Excavation of a cross passage

Cross passages are connecting tunnels between the Sydney Metro twin tunnels and are located at approximately 240 metre intervals along the tunnel alignment. They are an important safety feature and allow people to move from one tunnel to another in case of an emergency.







To line the cross passages, concrete is delivered to the acoustic shed at the Blues Point temporary retrieval site, where it is lowered underground and pumped through a series of pipes to the work area nearby. There are times when concrete is required to be delivered to the retrieval site outside of standard construction hours. The community will be updated regularly about these concreting activities, which are expected to continue until mid-2020, site conditions permitting.

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## Contact us

For more information, enquiries or complaints please contact us at:

-  **1800 171 386** 24-hour community information line
-  [tunnels@transport.nsw.gov.au](mailto:tunnels@transport.nsw.gov.au)
-  [sydneymetro.info](http://sydneymetro.info)
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