Two tunnel boring machines prepare for the start of their 2.3 kilometre journey from The Bays to Hunter Street.

Building the Sydney Metro West tunnels

The NSW Government is delivering Sydney Metro West – a new underground metro railway which will double rail capacity between Parramatta and the Sydney CBD, link new communities to rail services and support employment growth and housing supply.

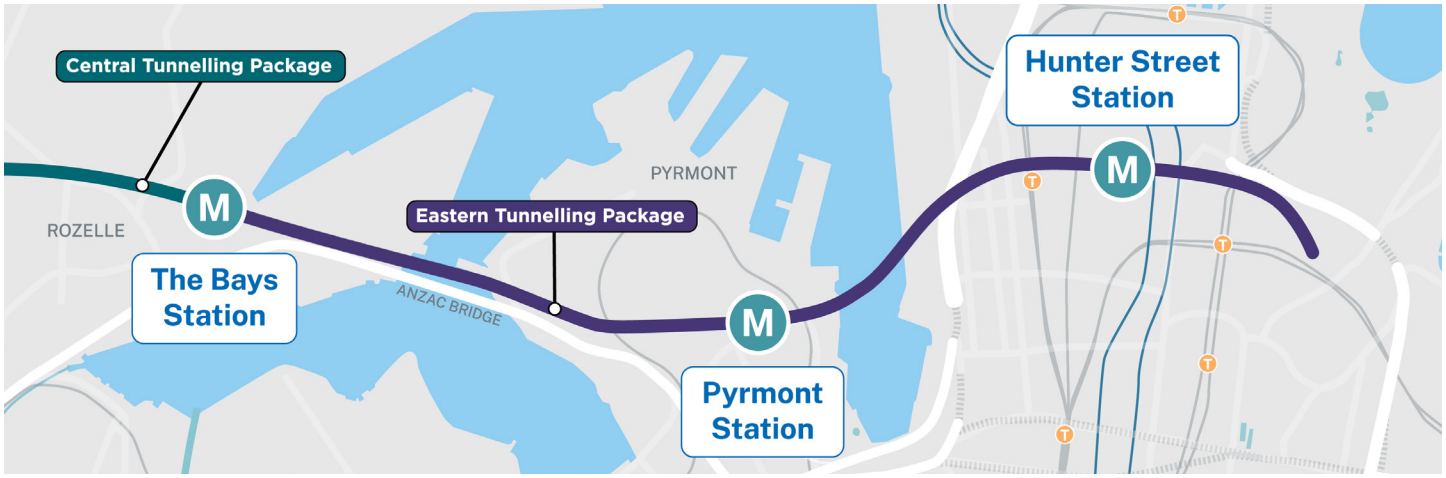
Sydney Metro West stations have been confirmed at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Hunter Street in the Sydney CBD.

Two potential station locations are being investigated west of Sydney Olympic Park, including one at Rosehill Gardens which could support a significant increase in housing.

John Holland CPB Contractors Ghella Joint Venture (JCG) has been awarded the contract to deliver 3.5 kilometres of twin metro rail tunnels between The Bays and Hunter Street and excavate the Pyrmont and Hunter Street metro stations.

NSW GOVERNMENT

sydney METRO



How will you build the tunnels?

Two mixed shield (slurry) tunnel boring machines (TBM) will be used to excavate the 2.3-kilometre metro rail tunnels between The Bays in Rozelle and Hunter Street in the Sydney CBD.

What is a tunnel boring machine?

A TBM is used to excavate and construct tunnels. It has a cutting head that grinds through the ground, and at the same time, the machine has a mechanical system which lifts and installs the permanent concrete lining segments to make the tunnels waterproof as the machine progresses along the route.

Mixed shield TBMs are specifically designed to excavate in the highly pressurised conditions that are expected under Sydney Harbour. These TBMs use 'slurry' technology to balance the pressure inside and outside of the machine, as it moves through different ground conditions.

This will be the second under harbour crossing undertaken by Sydney Metro, following the successful crossing between Blues Point and Barangaroo as part of the City & Southwest project.

How long will tunnelling activities take?

Tunnelling will begin in mid-2024 and continue until late 2025. The TBMs are expected to travel at an average of 90 metres per week.

How deep are the tunnels?

On average, the tunnels are 37 metres deep. The maximum tunnel depth below the surface is 50 metres and there are shallower sections approaching the station entry and exits.

What are the ground conditions?

Extensive geological surveys and test drilling have been undertaken. The tunnels between The Bays and Hunter Street are within Hawkesbury Sandstone, which is an ideal tunnelling material due to its coarse consistency and strength.

How are the tunnels lined?

Concrete segments are used to line the tunnels. Segments are loaded into the TBM and as the machine excavates a section of tunnel, it lifts each 4 tonne piece on to the tunnel's circular wall to form a ring of six segments. The rings are designed to fit together to create a waterproof permanent lining. Grout is then pumped around the segments to secure them into place.

A concrete precast facility in Eastern Creek will produce about 16,536 segments needed to fully line the tunnels.

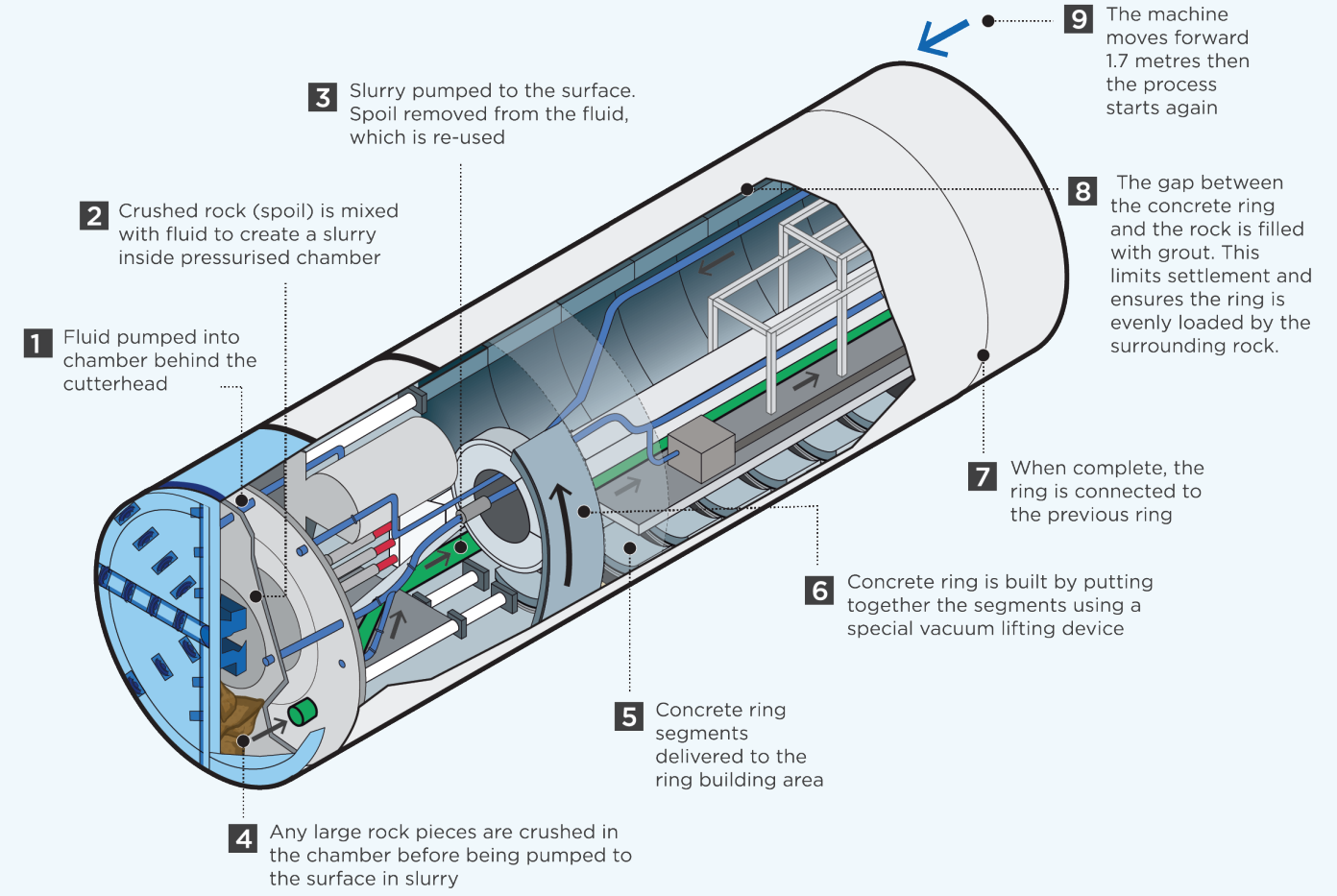
What is a cross passage?

A cross passage is a connection between the two main tunnels. There will be 12 underground cross passages constructed along the Sydney Metro West Eastern Tunnelling Package alignment, located about every 150-200m along the tunnels. Cross passages are created after the TBM has passed through the area. These passages are an important safety feature and allow people to move from one tunnel to another in case of an emergency.

A completed cross passage on the Sydney Metro City and Southwest line.

How a TBM works

Mixed shield TBM



What are the tunnelling work hours?

TBM tunnelling and cross passage construction work will occur 24 hours a day, seven days a week. Reduced hours may apply for high-impact cross passage excavation activities, depending on location.

All activities will be managed in line with the Construction Noise and Vibration Management Plan and meet our Environmental Protection Authority licence conditions.

Will there be any impacts?

Residents and businesses along the tunnel alignment will experience some vibration and ground-borne noise during tunnelling. The impact will vary depending on the geology of the area, depth of the tunnel and the type of buildings above.

People will feel the vibration and hear the sound of the TBM change in intensity as the machine moves towards, underneath and away from their property. Affected property owners and tenants will be notified before tunnelling work begins near their homes or businesses.

What is ground-borne noise?

Ground-borne noise in buildings comes from ground vibrations rather than through the air. Ground-borne noise is usually less disruptive for building occupants during the day due to higher background noise levels. At night when surrounding noise levels are lower, residents may notice it more.

What mitigation measures will be in place?

A Construction Noise and Vibration Management Plan that sets out how noise and vibration will be managed for the Sydney Metro West Eastern Tunnelling Package has been prepared. This plan is available online at **jcgjv.com.au**.

A range of measures will be used to minimise noise impacts from tunnelling and other activities. These include acoustic sheds, noise barriers, restricted work hours and quiet work practices.

There will be extensive consultation with residents and businesses along the tunnel alignment to identify and address specific concerns or potential impacts.

Will there be monitoring?

Extensive noise and vibration modelling has been carried out for the tunnel alignment to predict likely impacts. Regular monitoring will continue throughout the project to ensure noise and vibration is within the expected levels.

Survey monitoring of ground conditions is also being carried out throughout construction. Devices will measure even the smallest changes in ground levels that cannot be seen on the surface.

What is a property condition survey?

While property damage is very unlikely to occur, eligible properties located within 15 metres from the outer edge of the two tunnels will receive an independent property condition survey before tunnelling starts and again after construction is completed.

Our community team

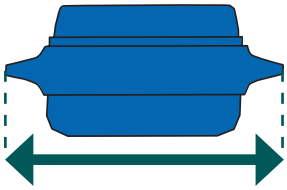
JCG has a team committed to working with the community as it delivers the project. The team will play an active role in getting to know and understand the local community to ensure that impacts on residents and local businesses are minimised.

Please contact the JCG community team on **1800 612 173** if you have any questions or would like to provide feedback about ETP works.

If you would prefer to receive updates by email, please send a request to **MetroTunnelsJCGJV@transport.nsw.gov.au** and you will be added to the distribution list.

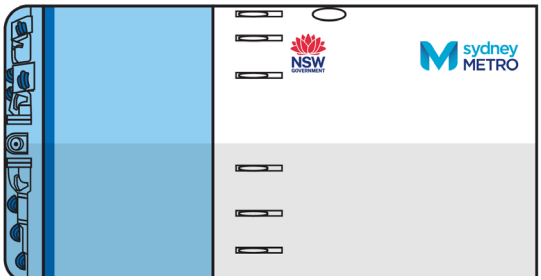
TBM fast facts

15 workers per shift operate each TBM

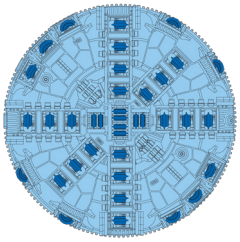


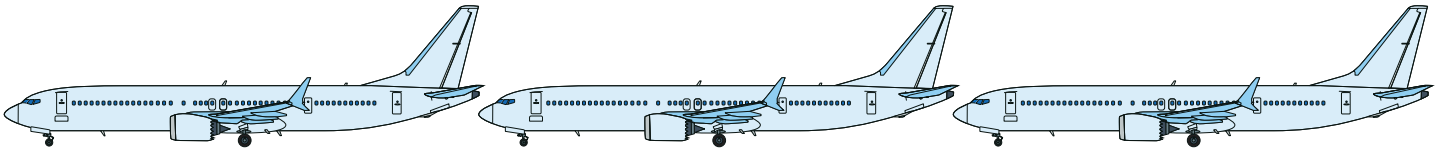
Each disc is aproximately **51 centimetres** in diametre

Each TBM weighs about **1,100 tonnes**



38 Disc cutters per cutterhead





125 metres long

More than the length of 3 x Boeing 737s

Contact us
If you have any questions or would like more information please contact our project team:

1800 612 173 Community infoline open 24 hours

sydneymetrowest@transport.nsw.gov.au

Sydney Metro West
PO Box K659, Haymarket NSW 1240

Translating and interpreting service
If you need help understanding this information, please contact the Translating and Interpreting Service on **131 450** and ask them to call us on **1800 612 173**.

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