Western Harbour Tunnel Stage 1

Construction information session – Balmain 2023

Hosted and presented by John Holland CPB Contractors Joint Venture



transport.nsw.gov.au



Acknowledgement of Country

The John Holland CPB Contractors Joint Venture and Transport for NSW pays respect to Elders past and present and recognises and celebrates the diversity of Aboriginal peoples and their ongoing cultures and connections to the lands and waters of NSW.

The Western Harbour tunnel is being delivered in two stages.

Stage 1 - the southern section of the tunnel, is being delivered by a joint venture between John Holland and CPB Contractors (JHCPB). It includes tunnel excavation only between Emily Street in Rozelle to Cove Street in Birchgrove. It does not include tunnel fit-out activities.

Stage 2 – the northern section of the tunnel, will be delivered by Acciona Construction Australia. It continues tunnelling underground from the end of Stage 1 at Cove Street, Birchgrove, tunnelling under Sydney Harbour and connects to the Warringah Freeway near North Sydney. It also includes the complete tunnel fit-out from Rozelle to North Sydney.

Topics covered today:

1. ENGINEERING

- Tunnel design and final alignment
- Tunnel depths
- Ground conditions and ground movement
- Excavation methodology

2. ENVIRONMENT

• Noise and vibration

3. PROPERTY

- Property Condition Surveys
- Property matters

4. KEEPING UPDATED





Engineering



Design & tunnel alignment

- The Environmental Impact Statement (EIS) was developed at planning stage and was indicative only.
- The final design shifted to take advantage of better ground conditions for tunnelling.

Types of tunnels:

- 1. Traffic tunnels
- 2. Ventilation tunnels
- 3. Temporary access tunnels
- 4. Cross passages
- 5. Substations



Western Harbour Tunnel alignment: Stage 1 final design and EIS concept design



Tunnel depths

- The tunnels are deep: range from 45 metres to 70+ metres
- Tunnels connect with Rozelle Interchange and WHT Stage 2
- Sydney Metro passes underneath





Ground conditions

- Combination Gymea and Hawkesbury sandstone
- Same ground conditions as the Rozelle Interchange





Ground movement

Types of ground movement

- Tunnel induced settlement
- Groundwater drawdown

Prior to construction

- Ground investigations
- Geotechnical model
- Inform tunnel design

During construction

• Monitoring regime





Tunnel excavation methodology

- Excavated using a roadheader 24/7
- Progress approximately 25 metre per week

1. Tunnel Roof

Construction Sequence

- 1 Excavation of tunnel in short advances using a roadheader
- 2 Geotechnical engineer checks tunnel face to determine appropriate ground support
- Insert Metal rods (rockbolts) to increase strenght of ground
- 4 Spray a concrete slurry (shortcrete) for additional support







2. Tunnel floor



Rock hammering



Shotcreting



Rock bolting



Deep bench excavation









Environment



Noise and Vibration

The deeper the tunnel the less likely you are to hear excavation

- roadheader excavation old refrigerator humming
- rock bolting temporary drilling noise
- rock hammering repetitive tapping sound

The project predicts noise impacts along the alignment and uses a model called 'Gatewave'.

No properties are predicted to exceed 45 decibels.

The project has an independent Acoustic Auditor to verify our model, predictions and noise management.



Note:

- A change of 1 dBA or 2 dBA in the level of a sound is difficult for most people to detect.
- A 3-5 dBA change corresponds to a small but noticeable change in loudness.
- A 10 dBA change corresponds to an approximate doubling or halving in loudness.

Vibration (structures)

Vibration from tunnelling is minimal

Vibration thresholds are based on the German DIN Standard for heritage structures and British Standard BS7385 for standard structures which is very conservative

- Cosmetic damage for heritage building threshold = 2.5mm/ sec
- Cosmetic damage for residential building threshold = 7.5mm/ sec

Highest level recorded with a roadheader on the Rozelle Interchange Project was less than 1.0 mm/ sec

Ground movement

- Ground movement can be caused by many different factors, such as seasonal climate variations, vegetation and a natural process known as shrink-swell.
- A certain amount of ground movement is allowed, with limits set by the Department of Planning and Environment (DPE)
- The project has an extensive ground monitoring program in the local area.



An underground monitor in a basement



Survey targets on the façade of a building



Prism marker



Adhesive marker

Survey markers installed on the surface along the tunnel alignment







Property



Property condition surveys (PCS)

- A PCS involves a photographic account of property's condition
- Properties within 50 metres of the tunnel alignment are eligible
- Pre-construction offers made 8-12 weeks before tunnelling starting
- Free for property owners
- Copy of the report provided



Property claim

- 1. Notify the project as soon as you notice changes at your property
- 2. All claims are unique and are treated as such
- 3. We take every claim very seriously, undertaking a thorough investigation :
 - Property condition survey
 - Visual inspection of the damage
 - Vibration reports
 - Ground monitoring data from the project
 - Satellite imagery data
 - Any prior or current development applications for the property
 - Construction work happening near the property at the time of the damage (project or non-project related)
 - In some instances, the project will engage a third party engineering specialist to undertake their own investigation

Property claim cont.

4. The project will provide a written determination including high-level summary of the reasons leading to the outcome

5. If you're unhappy with the determination, you will be encouraged to meet with the project team to have the basis for the determination explained in greater detail including any data relating to the decision

6. If you still do not agree with the determination and would like your claim escalated, you may request a review by the Independent Property Impact Assessment Panel (IPIAP) through Transport for NSW

Subsurface acquisition

- Subsurface acquisition is managed by Transport for NSW
- All properties that require subsurface acquisition for Stage 1 have received opening letters
- Everyone's circumstances are different, to ensure everyone is heard Transport can answer any questions you may have at the end of the presentation







Community communications

- Opt-in to weekly updates
- Interactive property search for tunnel depths
- Tunnelling dates and work activities
- FAQs
- Quarterly project updates

Stage 1 Tunnelling – Rozelle, Balmain and Birchgrove.

The Western Harbour Tunnel is being delivered in two stages. The southern section of the tunnel, Stage 1, is being delivered by John Holland CPB Contractors (IHCPB) and includes the excavation of 17km of the tunnel between Emily Street in Rozelle to Cove Street in Birchgrove. This stage is excavation only and does not include tunnel fit out activities.

Tunnelling started on 29 June 2022 underneath Emily Street, Rozelle and has now crossed under Victoria Road. Tunnelling will continue under the suburb of Balmain around mid-2023 and under Birchgrove in 2024.

If your property is located within 50 metres of the outer edge of the tunnels, you will be offered a **Property Condition Survey** (PCS) before any tunnelling starts near you. The survey is free of charge and will provide you with a clear record of your property's condition. Eligible residents will be sent an offer for a PCS about 8-12 weeks prior to tunnelling.

If you are curious about **how we manage noise and vibration**, we've developed a handy factsheet that provides some in depth information about ground movement and vibration, including what causes it, how we manage it and the claim process in the unlikely event of any property damage. Find out more **here**.

Project information sessions will be held again in 2023. We will have information session coming to Balmain in Q2 2023 where you will be able to speak to our experienced project team face to face. We'll continue to hold information sessions as we progress with excavation along the tunnel alignment and separate information sessions will be held for each suburb to ensure you get relevant information about timings, ground conditions and tunnel design for your area.

Click on any of the links below to access further information about Western Harbour Tunnel Stage 1 tunnelling.

here

Stage 2, which includes connections from Stage 1 at Cove Street, Birchgrove, to the Warringah Freeway near North Sydney, and complete tunnel fitout. More information on Stage 2 can be found here.

Tunnelling notification map

Tunnelling FAQs →

Read the Tunnelling Frequently Asked

Questions (FAQs) for answers to some

common questions people ask

To view our current tunnelling activities.

and the three month look ahead, click





Tunnel Tool (location and depth of tunnels) \rightarrow

View the final design and depth of the tunnel and where it is in relation to your property.



Property condition survey →

Surveys

Learn how we conduct Property Condition

Information sessions

Register and find out more about our

upcoming Balmain information sessions





Subscribe →

Subscribe here to receive project updates



The Western Harbour Tunnel is a major transport infrastructure project that will make it easier, faster and safer to get around Sydney. By creating a western bypass of the Sydney CBD, the Western Harbour Tunnel will take pressure off the Sydney Harbour Bridge, Sydney Harbour Tunnel, Anzac Bridge and Western Distributor corridors to improve transport capacity in and around Sydney Harbour.

Progress update

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Transport for NSW

Harbour Tunnel Community Updale January 2





Contact us

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





1800 931 189 (ask to speak to JHCPB-Stage 1 contractor)



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nswroads.work/whtportal

Scan the QR code to visit our online portal

