



Tunnelling – Cammeray to Waverton

Western Harbour Tunnel Stage 2

April 2024



We acknowledge the Traditional Custodians of the Country on which Western Harbour Tunnel Stage 2 is being constructed, including the Gadigal, Cammeraygal, and Wangal peoples, as well as the Aboriginal peoples of Emu Plains, and we pay respect to Elders past and present.



This fact sheet provides information about tunnelling for the Western Harbour Tunnel Stage 2 project.

Western Harbour Tunnel is a major transport infrastructure project that will make it easier, faster and safer to get around Sydney. The project has now reached another milestone with the start of roadheader tunnel excavation from the Ridge Street temporary construction site starting in May 2024.



How we excavate the tunnel

Tunnelling is a safe and commonly used construction technique that significantly reduces impacts on local properties, while enabling major infrastructure to be delivered in built-up residential areas. Strict safety and environmental requirements will be adhered to in the design, construction and operation of the tunnels and every effort will be made to minimise the impacts to local residents.

Western Harbour Tunnel has been granted approval by the Department of Planning, Housing and Infrastructure to tunnel 24-hours a day, seven days a week. The impact on properties above the tunnel, such as noise and vibration, is expected to be minimal.

Stage 2 proposes to use two types of tunnelling equipment: roadheaders, between Cammeray and Waverton; and Tunnel Boring Machines (TBMs) under the harbour from Birchgrove to Waverton.

Roadheaders

Roadheaders are specialised machines designed to excavate tunnels by cutting through hard rock. They are fitted with large rotating cutting heads, with metal picks designed to break and excavate rock, and have bulldozer-style tracks that allow them to move across different ground surfaces as they excavate.

Roadheaders offer several benefits including:



Precision and control

Roadheaders are highly manoeuvrable and fitted out with advanced technology which allows for precise excavation



Safety

Roadheader tunnelling is considered very safe



Efficiency

Roadheaders can work continuously, reducing the time required to excavate.



Roadheader excavation from the Cammeray site.



ACCIONA worker with a roadheader at the Cammeray site.

Constructing a road tunnel with a roadheader

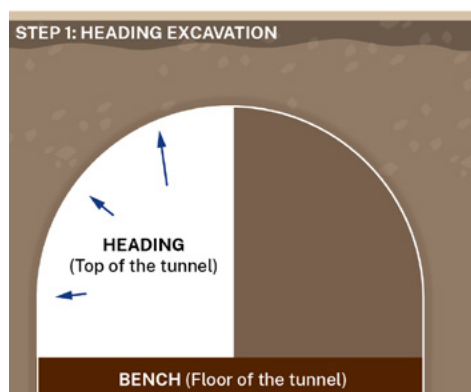
We will excavate the mainline traffic tunnels using a split heading methodology to excavate the roof and the floor of the tunnel. A split heading methodology means the roadheader will excavate half of the width of the tunnel and once it has progressed far enough, return to excavate the remaining half.

Roadheader tunnel excavation is done in three steps:

STEP 1:

Excavation of tunnel roof

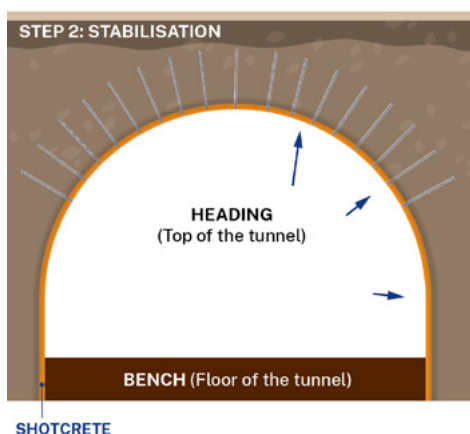
The first phase involves excavation of the tunnel roof using a roadheader. The crew excavate between 1–5 metres at a time (depending on the design), before installing support. We generally excavate around 20–25 metres of rock per week.



STEP 2:

Stabilisation

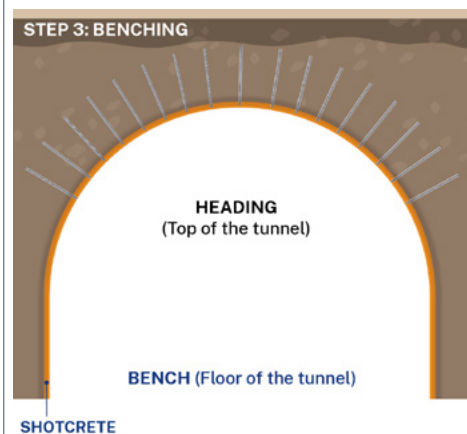
As the roadheader progresses with excavation, the tunnel will be stabilised with rockbolts (metal rods) and shotcrete (sprayed concrete).



STEP 3:

Excavation of tunnel floor

The roadheader will then reposition to excavate the floor of the tunnel. On some occasions, we will need to use a rock hammer to excavate the floor or drainage channels.



Types of tunnels we will be excavating

Traffic tunnels – a roadheader is used to excavate the arched shape caverns and tunnels, also referred to as mainline tunnels, needed to accommodate road users.

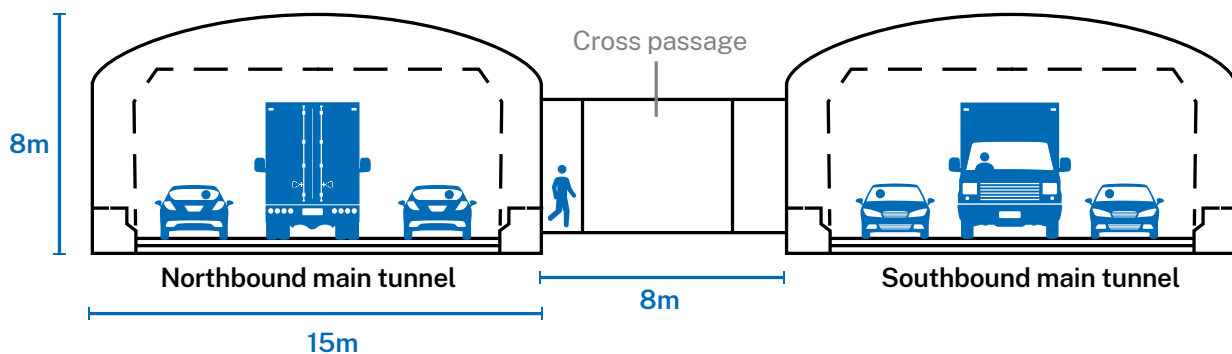
Ventilation tunnels – to facilitate air flow through traffic tunnels and are generally smaller than traffic tunnels.

Temporary access tunnels – to provide workers with efficient access into the tunnels and are backfilled at the end of the project.

Cross passages – small access passages placed at regular intervals along the entire alignment that connect the mainline traffic tunnels together to provide emergency access and contain electrical equipment.

Substation tunnels – three underground substations will be excavated and fitted out to house electrical switchboards required for powering the tunnel.

Roadheader tunnel cross section



Acoustic sheds

To minimise the impact on the community, we have installed an acoustic shed at our temporary construction site in Cammeray and are in the process of constructing one at our Ridge Street site. Acoustic sheds help us manage noise, dust and light impacts from our tunnelling work. The acoustic shed will also be used to store the tunnel spoil before it is loaded on to trucks and removed from site.

For further information about acoustic sheds and the management of noise, dust and light spill during our tunnelling activities visit nswroads.work/whtportal



Acoustic shed at the Cammeray site.

Managing noise and vibration from tunnelling

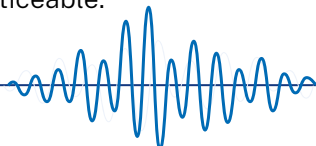
Noise from underground excavation and tunnelling transfers through the ground into a built structure, resulting in audible noise levels. This is referred to as 'ground-borne noise'.

Noise and vibration are most noticeable when we are tunnelling closest to a property, increasing on approach and reducing as we move away.

While we are tunnelling, we will monitor noise and vibration to make sure we are not exceeding our allowable limits.

Roadheader excavation sounds like an old air conditioner humming.

Rock bolting creates a temporary drilling noise. As it stops and starts, it may be more noticeable.



We have a fact sheet with more information on noise and vibration, please visit nswroads.work/whportal

Your property during tunnelling

Buildings naturally undergo ground movement due to environmental changes such as seasonal climate variations, vegetation (like tree roots), structural effects (different building types or age of construction) or ground effects (reactivity to soil). We understand there may be concern about the potential for vibration and settlement impacts from tunnelling works, however, ground movement typically does not lead to property damage, in fact it is highly unlikely.

Properties above the final tunnel alignment (and within 50 metres of the alignment, in line with planning approvals) will be offered a Property Condition Survey. Even though it is highly unlikely for any damage to occur from our tunnelling, Transport for NSW encourages anyone who is eligible for a Property Condition Survey to take up this offer following confirmation of the final alignment.

Our team will contact eligible properties via a letter prior to tunnelling commencing nearby.

Find out more on our website: nswroads.work/whportal



Register
for updates!

If you would like to register for updates, please scan the QR code. You can sign up to receive relevant notifications, construction updates and information right to your email.



Contact us



Project Infoline **1800 931 189**
(ask for Western Harbour Tunnel Stage 2)



whtbl@transport.nsw.gov.au



Western Harbour Tunnel Stage 2
PO Box 537, North Sydney,
New South Wales 2059, Australia



Visit our website at
nswroads.work/whportal



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