

Fact Sheet

Piling and ground retention

Construction of the Cross River Rail Tunnel & Stations includes methods such as piling to build solid foundations for the new underground tunnel and stations .

Ground stabilisation and retention methods, such as piling, will reinforce existing structures and stabilise the ground before deep excavation work starts.

Different types of piling will be used depending on the type of structure to be built, work to be completed, ground conditions or depth of support required.

Types of piling

Bored piling – This involves drilling a circular hole into the ground, installing a steel lining into the hole and filling the lining with concrete to form a ‘pile’. Boring is carried out to the required depth by means of a crane-mounted rotary bore or a purpose-built hydraulic drilling machine. This method is used most commonly on the project, as it reduces community and environmental impact.

Bored secant piling – Secant pile walls are constructed by installing overlapping reinforced concrete piles with non-reinforced concrete piles around the perimeter of the excavation to retain the surrounding ground forming a continuous impervious structure.

Driven piles – This method will not be widely used on the project, but involves use of a specialised machine called a piling rig to use impact and vibration to ‘drive’ a prefabricated pile to a desired depth. Prefabricated piles can be made from timber, steel or concrete.

Sheet piling – Sheet piling is a ground stabilising method to reinforce existing structures. It involves using vibration to install metal sheets into the ground to form a barrier. This method is often used when construction activities are close to existing structures, as the process results in minimal disturbance to the ground and does not require any material to be removed as it enters into the targeted ground to form support much like a retaining wall.

Image: Bored piling process



Ground stabilisation

Rock anchoring – This ground stabilising method can be installed permanently or as a temporary measure. A drilling rig is used to pre-drill a hole, known as the anchor hole, into the wall of a trench or tunnel. To reinforce the wall, a steel rod is inserted into the anchor hole and the hole is grouted.

Where stress anchors are required in certain ground conditions, a bolt is fixed to the top of the rod and adjusted to the required strength. The wall is then sprayed with concrete ('shotcrete') to form a wall providing an additional layer of bracing. The trench or tunnel can then be dug out further and the next level of anchoring can begin.

Piling work to construct new underground stations

Station	Piling type	Pile installation
Boggo Road	Bored, and sheet piling	Approximately 160 bored piles will be used to form a perimeter around the station shaft excavation. The piles will form a retaining wall to allow for major excavation down to the underground station platform. Sheet piling will be used for stabilisation works associated with the existing freight flyover.
Woolloongabba	Bored piling	More than 300 bored piles will be installed around the perimeter of the station excavation and construction access ramp. Once the piles are installed, excavation of the station box will commence, then shotcrete walls will be constructed between the piles to retain the ground.
Albert Street	Bored, secant piling and rock anchoring	Bored secant piling will be used. These piles will be used as a temporary measure during construction, and do not form part of the final structure. Rock anchors will also be installed around the perimeter of each of the excavation areas.
Roma Street	Bored piling and rock anchoring	A mixture of bored piling and rock anchoring will be undertaken at the Roma Street Station site and the tunnel shaft located at Gallipoli Park. The mixture of piling and anchoring will be used to cater for the two shafts and station structure excavation.

Impacts during piling activities

Noise – Noise can be generated from the motor of the machinery and equipment, and machinery movements. During bored piling, nearby residents may hear the noise of the machine clearing its drilling auger of dirt at the end of each bore movement – a 'clanging' noise. Sometimes jack hammer tools are used to break away the top of the piles to prepare for further concrete pours.

Dust – Dust can be experienced during boring where dirt is removed from the pile hole or when the piling pad is constructed using excavation machinery. A piling pad is a compacted area from which the piling rig works. Dust is reduced by wetting down areas during activities.

Vibration – Vibration may be felt during the construction of the piling pad, where the earth is compacted to withstand the weight of the piling rig. Vibration may also be present during piling work when the rig is boring out materials.

Working with you

Our community engagement team is regularly consulting with nearby residents and businesses about upcoming construction activities and the potential impacts. To find out more, please visit the website or contact the Tunnel & Stations team on **1800 010 875**.

Project information

The Cross River Rail Tunnel & Stations contractor, CBGU D&C JV, will deliver the underground tunnel and four new underground stations at Boggo Road, Woolloongabba, Albert Street, Roma Street and an upgrade to the Dutton Park station.

Subscribing to receive Project Updates and information on construction works is a convenient way to keep up to date with the project and work happening in your area. To subscribe, simply visit the Cross River Rail website and look for the subscription area at the bottom of every page.

☎ 1800 010 875

✉ crossriverrail@cbgujv.com.au

🌐 crossriverrail.qld.gov.au



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