



Piling and Excavation

Foundation piling and excavation will be undertaken extensively in the Bowen Hills, Lutwyche, Kedron and Toombul areas as part of construction for Airport Link, Northern Busway (Windsor to Kedron) and Airport Roundabout Upgrade.

What is piling and why do we do it?

Piling is used to form the foundations of structures and also provide a retaining wall system to allow deep excavation to occur safely.

Due to the large size and scope of the project, various foundation piling techniques are required. Each technique is carefully chosen to suit the existing ground conditions and soil types, safely carry the structural load, and also provide safe, secure and timely construction.

Piling and Foundation techniques

Four different types of ground support are being used for the project: **bored** piling; **sheet** piling; **secant** piling and **diaphragm** walls.

Bored piling is when a hollow steel tube is installed in the ground using either a piling rig or a vibration hammer. A piling rig then excavates the soil from inside the casing. Once excavated, a steel reinforcement cage is installed and the pile filled with concrete to create a strong foundation or retaining element.



Sheet piling (above) and bored piling (right)



Sheet piling involves driving thin interlocking panels of steel into the ground to create a wall. This form of piling is often used to create temporary retaining walls for support during excavation.

Secant pile walls are interlocking or overlapping bored piles – a ‘male’ pile bored in the middle of two adjacent ‘female’ piles – forming a continuous, near watertight wall. This method prevents water or soils leaching between the piles after excavation.

Diaphragm walling (or D-walling) is forming reinforced concrete walls underground. D-wall construction involves excavating a trench in sections or panels; stabilising the excavation by filling it with bentonite slurry to support the wall; lifting and placing a steel reinforcement cage into the panel; then pouring concrete into the panel in one continuous operation to form the diaphragm wall. This process is repeated until the entire retaining wall is completed.



Diaphragm walling: installation of steel reinforcement cage

How will the tunnels be excavated?

A combination of construction techniques will be used to excavate the Airport Link and Northern Busway tunnels:

- Tunnel Boring Machines (TBMs)
- Roadheader driven tunnelling
- Cut and cover construction

What to expect

- Piling rigs, cranes, excavators and other equipment operating on site
- Some construction noise from piling and excavation works
- Truck movements as spoil is loaded and removed from site
- Concrete trucks entering and exiting site

What is 'cut and cover' tunnelling?

A cut and cover tunnel is formed by excavating a trench from the surface, constructing a tunnel within it, then backfilling the trench on top of the structure. Surface works including the construction of road can then be carried out above the tunnel.

The amount of cut and cover construction has been reduced where possible along the project alignment to minimise disruption to traffic, the community and the environment.

What happens to soil after excavation?

The majority of excess rock and soil, known as spoil, will be removed by spoil haulage vehicles and transferred to designated fill sites across South-East Queensland.

In accordance with the Coordinator-General's spoil management and transport conditions, spoil haulage trucks will operate 24 hours, six days a week between 6.30am Mondays and 6.30pm Saturdays.

For more information refer to our fact sheet on 'Spoil Management'.

For further information about the projects:

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