Why use sheet piles?

Most areas on site are not particularly sensitive to lowering ground water levels. The excavation in these areas will be retained with horizontal timber poles lodged between steel posts (referred to as king posts).

The ground between the Carillon and the Tasman Gardens Apartments is sensitive to settlement through loss of ground water pressure, so in this area sheet piles will be used. Interlocking steel sheets (sheet piles) form a barrier to ground water loss. The sheet piles will be installed prior to excavation for construction of the underpass.

Installing sheet piles

In developing the plan for installing the sheet piles we have considered many issues including:

- The presence of underground services such as water, electricity and sewers
- Ground water levels outside the excavation
- Noise and vibration effects upon people and buildings
- Vibration effects upon the old Tory St Sewer
- Disruption to pedestrian and vehicle traffic flow
**Method**

- First underground services are diverted from the path of the retaining wall.
- Trials determine the best machinery for installing the sheets in the ground; noise levels and vibration levels are measured and assessed in order to establish the best methodology.
- Holes will be drilled to 12m depth for every alternate sheet installed (this will reduce the amount of noise and vibration during installation).
- An A-frame pile guide will be placed above the holes to guide the sheets into position and keep them vertical. The A-frame is 8m long, 4m high and spans 2m either side of the sheet wall.
- The wall will be placed in 6m long sections. Each section will be partially driven into the ground - commencing at the Carillon end of the site. These sheets will be left sticking 5m above ground, just above the A-frame pile guide.
- The pile guide and first crane will then be moved along to start the next 6m section of wall.
- A second crane will drive the first section of sheets all the way into the ground - using a team of two cranes will reduce the overall time it takes to install the wall.
- The completed length of the wall will be 90m.

**Working around the sewer**

- The sheet wall will be 40m long before it reaches the Tory Street Interceptor Sewer.
- The sewer is an egg-shaped brick structure which is more than 100 years old and is 8m below ground.
- Monitoring equipment will be installed in the sewer manhole to measure any effects on the sewer.
Sheet Pile Installation 3

Traffic management

- Traffic management will isolate traffic and pedestrians from the A-frame sheet piling operation.
- The picture below indicates that there is sufficient room for an articulated truck to pass by the works under supervision.
- Traffic will be controlled manually with Stop/Go boards during the day and signs or signals at night.

Noise and vibration monitoring

- Noise and vibration monitoring will be carried out from the start of the work. This will keep the team informed and allow review of methods if guideline limits are in danger of being breached.
- Once a section of sheets is at final depth, the holes will be backfilled with a mixture of stone and cement grout.
- Ground water levels outside the excavated area will be monitored during the work. A drop in levels will be quickly addressed by topping up the stone filled holes with water.