TIMBER POLE
DEEP PILE FOUNDATION

Avon River Precinct, Christchurch, NZ

A Deep Pile Foundation was installed for the Convention Centre Punt Stop and River Wall as part of the Avon River Precinct development, in earthquake-affected Christchurch.

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Project background:
Avon River Precinct, Christchurch, NZ

- The Avon River Precinct was developed as part of Christchurch's regeneration following the devastating Christchurch earthquakes.
- A punt stop and river wall was required alongside the Avon River.

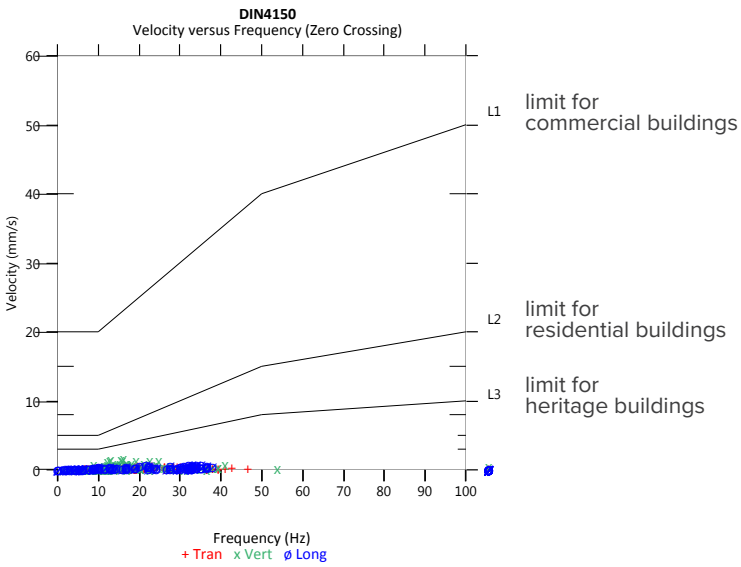
Project challenge:

- A Category 1 heritage building "Our City O-Tautahi" was located 10m away, and there were concerns that pile driving vibrations would cause damage to this structure.
- Vibration monitoring of the heritage building, using professional, independently calibrated equipment, needed to be carried out for the full duration of the piling.
- There was a tight timeline for the overall project so it had to be started and completed within a quick timeframe.
- The site was located in central Christchurch so disturbance to the public had to be minimised.
- The poles needed to reach the target depth for engineer sign-off (there had already been sections of the river project installed by other piling contractors which had not met the depth requirements and/or had exceeded vibration limits).
- The site had limited space, and hazards such as traffic, pedestrians, and the Avon River were present.
- Even though the piles were to be installed into the river a small dam needed to be set up to keep water out of the site during piling.

The NZ Ground Control solution:

- River Wall – SED poles, 4.8m x 250mm and Uglie poles, 4.2m x 250mm were used
- Punt Stop – SED poles, 4.8m x 250mm and 4.8m x 175mm were used
- High frequency vibration equipment allowed the poles to be quickly and easily installed into the founding layer through dense intermediate layers.
- The front row of piles for the river wall was essentially a retaining wall, so these would be visible and had to line up to make the wall aesthetically pleasing.
- The small footprint of the installation equipment allowed for ease of access onto the tight site.
- No pre-drilling was required to pitch/stand piles, which in turn minimised disturbed ground in and near the river.
- The recorded vibrations were evaluated against DIN4150 to confirm the piling did not reduce the serviceability of the heritage building.
- A comprehensive compliance report was produced at the completion of the piling, and a summary of the results is shown in Figure 1.
- The subcontractor, Markovina Pile Driving South Island was able to install the poles in close proximity to the heritage building with no adverse effect.
- The piles were trimmed to height after piling ready for the rest of the structure to be built around them.
- Installation of the 49 piles took less than a day.

Figure 1



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