

TIMBER POLE GROUND IMPROVEMENT



New residential dwelling, St Albans, Christchurch, NZ

A Timber Pole Ground Improvement solution was installed to provide the foundation for a concrete waffle slab for a new residential dwelling in earthquake-affected Christchurch.

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Project background: new residential dwelling, St Albans, Christchurch, NZ

- A new dwelling was to be constructed on a residential site.
- The site was in an area that had been affected by the devastating Christchurch earthquakes.
- The project was completed in 2017.

Project challenge:

- The dwelling needed to be able to withstand any future earthquakes.
- It required a foundation solution that could support a concrete waffle slab.
- The ground conditions were very soft, silty, liquefiable ground.
- Site access was very restricted.
- Piles had to be installed close to adjacent dwellings, but installation was not allowed to impact on these neighbouring properties.
- Installation needed to be rapid.
- Unloading and handling needed to be easy.
- H5 treated Radiata Pine timber piles were determined as the best solution.

The NZ Ground Control solution:

- MultiPole Uglie poles, 4.8m x 300mm, 160 pieces, were identified as being able to satisfy the stringent design specifications.
- MultiPoles are incredibly versatile timber poles with a unique hollow core.
- MultiPole Uglie poles are similar to SED poles but are debarked rather than peeled. They offer greater skin friction when used as piles and are stronger than SED poles.
- The unique hollow core of the MultiPole allowed for fast installation via high-frequency vibration. This method of installation resulted in minimal disturbance to the neighbouring properties and no pre-drilling was required.
- The piles were installed at 1.4m centres, and all 160 pieces were installed in one day.
- The design was in accordance with MBIE guidelines with a replacement ratio of 5%.
- A 200mm thick gravel raft was placed on top of the piles. Then a standard TC2 waffle slab was installed.
- Piles were designed to mitigate liquefaction and transfer loads to a deeper layer.

