



New residential building, Christchurch, NZ

A TTT Suspended Floor Foundation system was installed with a TTT Deep Pile Foundation to provide a solution for a raised floor in a flood-prone area of earthquake-affected Christchurch, NZ



DEEP PILE



GROUND IMPROVEMENT



SUSPENDED FLOOR



RAFT



UNDER HOUSE



BRIDGES

TTT Suspended Floor Foundations with Deep Pile Foundations

Project background: New Residential Building, Papanui, Christchurch, NZ

- A new residential building was required on a cleared, previously occupied site.
- The site was in a low-lying coastal area that had been affected by the devastating Christchurch earthquakes.
- The project was completed in 2014.

Project challenge:

- The residential building needed to be able to withstand any future earthquakes.
- It required a foundation solution that could meet the regulatory requirements in terms of flood management.
- The foundation also needed the functionality to be re-levelled following a future earthquake event.
- H5 treated Radiata Pine timber piles were determined as the best solution to be installed down to the founding layer, approximately 9.0m deep.
- A raised foundation was determined as the best solution to be installed on top of the piles.
- There were multiple dense intermediate layers that had to be driven through.
- The site was down a domestic right-of-way with multiple neighbouring properties.
- Installation was not allowed to have any impact on these neighbouring properties.
- Installation needed to be rapid, and equipment needed to have a small footprint.
- Access was difficult, so unloading and handling needed to be easy.

The TTT MultiPole solution:

- TTT MultiPoles, 9.0m x 250mm SED, were identified as being able to satisfy the stringent design specifications needed for the Deep Pile Foundation.
- The TTT Suspended Floor Foundation system, made up of TTT MultiPole piles and TTT MultiPole UniLog bearers, was identified as being able to satisfy the regulatory and design requirements for flood management areas, and future earthquake resistance.

- The unique hollow core of the TTT MultiPole allowed for fast installation via high-frequency vibration.
- TTT MultiPoles were installed through the dense intermediate layers until the founding layer was reached.
- Pile tops were cut level, then scalloped on site to receive the TTT MultiPole UniLog bearers.
- The TTT MultiPole UniLog bearers were profiled prior to delivery on site and were simply lifted into place onto the scalloped piles and secured.
- A proprietary concrete floor was then installed over the TTT Suspended Floor Foundation system.
- Installation was successfully carried out without disturbing the neighbouring properties.
- The subcontractor, Markovina Pile Driving South Island, was able to install the TTT MultiPoles in close proximity to adjacent structures using equipment with a small onsite footprint in just a matter of days.



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