

TTT Raft Foundations are designed to be an economic alternative to the TC3 Type 2A and Type 2B surface structures outlined in MBIE Guidance 2012, section 15.4.4, p. 15.38.



The system

Foundations

TTT Raft Foundations are comprised of primary and secondary TTT MultiPole UniLog beams, typically 275mm in diameter and spaced 2.0–2.4m apart. These are placed in a shallow excavation so that their tops are at or below ground level.

Using lightweight TTT MultiPole UniLogs as the primary structural component reduces the weight of the foundation, which reduces the ground loading imposed by the foundations. This in turn reduces the required ultimate bearing capacity of the ground to 100kPa or less, with specific design

Floor

TTT Raft Foundations can be designed to support either a timber floor, concrete floor, or a combination of both (such as a timber floor with attached internal garage).

To support timber bearers designed to NZS 3604, pre-scalloped TTT MultiPole UniLog jack studs, typically 180mm in diameter, are fixed to the intersections of the beams. Suitable excavated fill is then placed back between the beams and compacted. For a timber floor, this helps to prevent water pooling below the subfloor. For a concrete floor, this provides a working platform to construct the slab on.

The timber or concrete floor is able to be re-leveled following a future seismic event. With a concrete floor, this is done by using cast-in jacking screws.

Design features

TTT Raft Foundations are specifically designed to resist 500mm lateral stretch during an ultimate limit state (ULS) seismic event and 200mm vertical land settlement during a serviceability limit state (SLS) seismic event. They are also designed to withstand a 4.0m internal span from loss of ground support without exceeding 1:400 curvature, and withstand a 2.0m cantilever at the edge from loss of ground support without exceeding 1:200 curvature.

Installation

Installation typically takes 5 days. Equipment is kept to a minimum – normally a 5 tonne excavator and small compactor are the only machines required. By placing excavated material back between the beams of the raft, dump trucks are not required to remove material and/or import extra hardfill. Combined with quick installation, this minimises disturbance to neighbouring properties.

Site requirements

Access to the building area is generally required to be a flat, level, straight path that is 3.1m wide with 4.0m vertical clearance for delivery of materials and equipment to site. There should be a stockpiling area suitable to store poles, excavated material and construction equipment for the duration of the foundation construction.



DEEP PILE



GROUND IMPROVEMENT



SUSPENDED FLOOR



RAFT



UNDER HOUSE



BRIDGES

TTT Raft Foundations

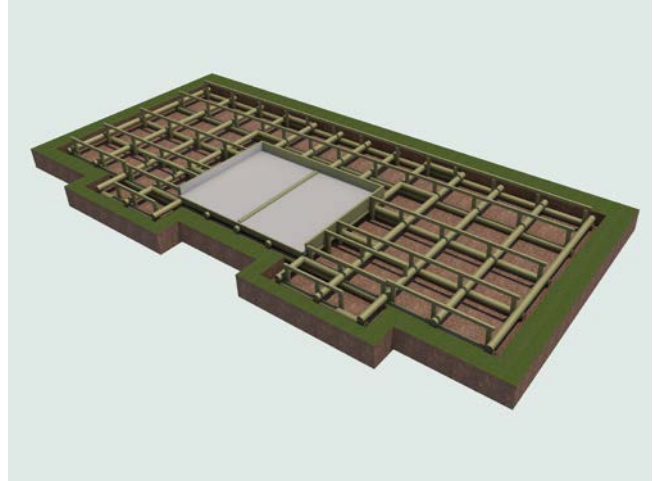
Engineering design, testing and sign off

Our geotechnical and structural engineers will be able to complete site-specific engineering design for the TTT Raft Foundation based on the geotechnical report for the site and house plans provided by the architect. The design includes calculations, design drawings, Producer Statement PS1 – Design, and accompanying design report able to be used to support the consent application.

During construction, the geotechnical and structural engineers will verify bearing capacity of the ground and observe the installation of the TTT Raft Foundation to their satisfaction. Combined with a Producer Statement PS3 – Construction from the contractor, this will enable the engineer to sign off a Producer Statement PS4 – Construction Review.

Additional design options

For sites with exceptionally poor ground conditions, such as SLS Index settlements greater than 200mm, TTT Ground Improvement can be added to improve the ground under the TTT Raft Foundations.



Quick reference information

	Technical Category	Type of MultiPole used	Typical pole diameter	Typical pole length	Typical pole spacing	Typical installation method
Residential foundations	TC2 & TC3	UniLog	275mm	To suit house dimensions	2.0–2.4m	5 tonne excavator

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