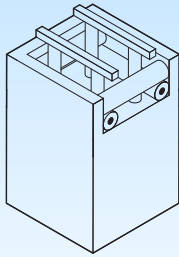
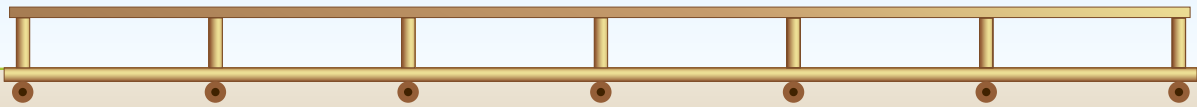


TIMBER POLE RAFT FOUNDATION



Raft Foundations are designed to be an economic alternative to the TC3 surface structures outlined in MBIE Technical Guidance 2012



The system

Foundations

Raft Foundations are comprised of transverse and longitudinal MultiPole UniLog beams, typically 275mm in diameter and spaced 1.0-4.0m apart. These are placed in a shallow excavation pit so that their tops are at or below ground level.

Using lightweight MultiPole UniLog beams as the primary structural components reduces the weight of the foundation, which reduces the ground loading imposed by the foundation. This in turn reduces the required Ultimate Bearing Capacity (UBC) of the ground to 100kPa or less, with specific design.

Floor

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 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

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 of a Raft Foundation is typically very rapid. 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.



TIMBER POLE RAFT FOUNDATION

Engineering design, testing and sign off

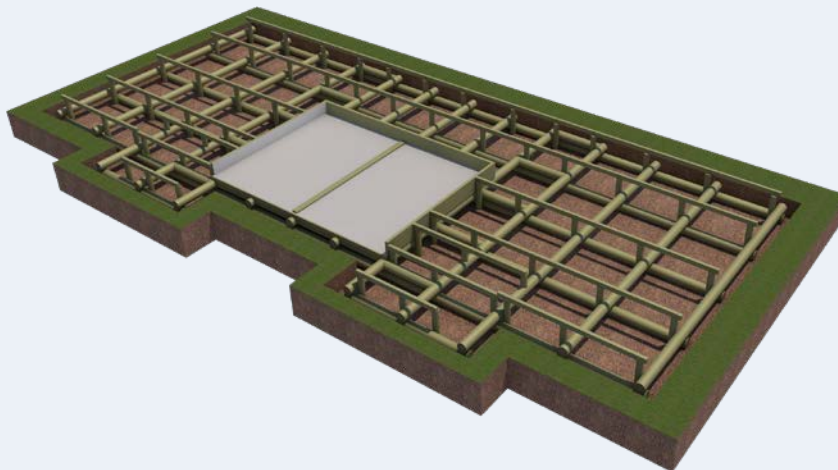
Our geotechnical and structural engineers will be able to complete site-specific engineering design for the Raft Foundation based on the geotechnical report for the site and house plans provided by the architect. The design includes calculations, design drawings, Producer Statement PS1 – Design, and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

With specific design work sites with exceptionally poor ground conditions, such as SLS Index settlements greater than 200mm, ground with larger than 500mm lateral stretch, or 30kPa ground, can still utilise a Raft Foundation. Raft Foundations can be combined with additional foundation solutions, such as Ground Improvement or Deep Piles, to provide a site specific foundation solution.

Raft Foundation typical construction detail



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 for beams and 180mm for jack studs	To suit house dimensions	1.0–4.0m	5 tonne excavator
Commercial foundations	TC1, 2 & 3	UniLog	275mm for beams and 180mm for jack studs	To suit building dimensions	1.0–4.0m	5 tonne excavator
Road foundations	TC1, 2 & 3	UniLog	275mm for beams and 180mm for jack studs	To suit building dimensions	1.0–4.0m	5 tonne excavator