



Ground improvement can be achieved by installing driven or vibrated, treated Radiata Pine poles at close centres. The above TTT H5 SED Ø300 x 9.0m Uglies were installed by pre-drilling 2.0m deep holes in both clay and silt, then standing the poles vertical and simply driving to ground level.

Economical ground improvement can be achieved by the installation of treated TTT Poles at close centres. The distance between the poles varies and depends on the ground conditions. Usually the distance is calculated as five times the pole diameter. Post CPT (Cone Penetration Test) testing is required between poles to verify results for the designed foundation.

Ø300 SED TTT Poles have been generally proven to be the most economically viable diameter for ground improvement.

### Recent examples of ground improvement projects using TTT Poles

#### Mainfreight site in Wellington

Poles were driven at 1.5m centres using an economical pole diameter of Ø300 SED to achieve ground improvement and prevent lateral drift.

#### Edgecumbe SH2 Bridge abutments

Ground improvement was designed using TTT Poles for the bridge abutments to prevent lateral movement under earthquake loading. H6 poles were used for an expected durability of 100 years\*.

\* "CCA Treated Wood, Will It Last 100 Years" by Dave Page and Tripti Singh from Scion (NZ Forest Research Institute) December 2012.

### Installing TTT Poles

Installation is by pile driving or high frequency vibration. In Christchurch the preferred option is to high-frequency vibrate the purpose designed TTT MultiPoles due to the dense, silty to sandy soil conditions. There is minimal vibration felt in surrounding areas. The equipment used has a small footprint (usually a 25 tonne digger). Refer to [www.ttproducts.co.nz](http://www.ttproducts.co.nz) for more information.



Installation by *Markovina* PILE DRIVING

TTT Products Limited has used all reasonable endeavours to ensure the accuracy and reliability of the information contained in this document. However, TTT Products Limited assumes no responsibility or liability for any inaccuracies, omissions or errors in this information nor for any actions taken in reliance on this information. All content remains the property of TTT Products Limited, and is subject to change.

TTT, MultiPole, Uglies and UniLog are trademarks of Fellrock Developments Limited.

© TTT Products Limited June 2018

2 of 2

### TTT Pole types

TTT Products Ltd manufacture a range of quality Radiata Pine poles. Suitable TTT Poles for ground improvement are:

- TTT SED Poles (naturally tapered, machine peeled poles)
- TTT Uglies (naturally tapered, debarked poles). The rougher finish of TTT Uglies results in greater skin friction when installing.
- TTT MultiPoles are an incredibly versatile pole due to a unique hollow core. Manufactured from TTT SEDs or Uglies.

For more product information see our website.

### Recently completed ground improvement projects using TTT Poles

Site	Engineer	Pole length (m)	H Class	Pieces per project
Frucor (Auckland)	Coffeys	9.0	H5	3,260
Manui Street (Auckland)	T & T	11.0 & 12.0	H5	2,286
Mainfreight (Wellington)	T & T	7.0	H5	1,000
Wellington Airport	Coffeys	6.0–9.0	H5	550
Waikato Mail Centre	T & T	11.0 & 12.0	H5	1,224
Favona Road (Auckland)	T & T	6.0–9.0	H5	1,216
Edgecumbe SH2 Bridge Abutments	HEB	12.0	H6	382

### Revolutionary timber pole solutions

TTT Products Limited  
 P 0800 UNILOG (864 564)  
 P +64 9 236 8880  
 F +64 9 236 8663

[www.unilog.co.nz](http://www.unilog.co.nz)  
 TTT Products Limited  
 Bollard Rd, PO Box 99  
 Tuakau 2342, New Zealand



SED Poles, Uglies, MultiPoles, Utility Poles, Marine Poles, Proof Tested Poles

Uniform diameter machined poles