



 **MultiPole**
UNIQUE HOLLOW CORE POLES

The MultiPole advantage

TTT Products Limited are leading manufacturers of Radiata Pine poles. Our pole range encompasses SED Poles, Uglies, UniLogs, and now the MultiPole.

The TTT MultiPole is an incredibly versatile pole due to its unique hollow core. The MultiPole is a multifunctional pole suitable for structural applications both above and below ground, and can be manufactured from TTT SED, Uglies, or UniLogs.

Most of the heartwood core is removed via a special process developed by TTT Products – a first for NZ and possibly the world! This leaves a centre hole that runs the full length of the pole. Removing only the heartwood does not weaken the strength of the TTT MultiPole as the strength is retained in the outer sapwood layers. The heartwood removal results in greatly reduced pole checking and splitting as the pole dries out. Further processing or preservative treatment is then carried out. Full penetration of the preservative can be achieved as the preservative is able to be impregnated from both the internal and external faces.

MultiPoles – below ground

As a response to the geotechnical and structural problems encountered after the Christchurch earthquakes various foundation systems using TTT MultiPoles were developed by NZ Ground Control Limited. The foundation systems provide a variety of solutions for difficult ground conditions, in particular TC2 and TC3 land in Canterbury, but also suitable for most sites throughout New Zealand and overseas. These systems are:

- Timber Pole Deep Pile Foundations – designed for sites where a competent bearing stratum, at least 3.0m thick, is identified below ground. Deep Pile Foundations use specifically designed TTT MultiPole SED piles.
- Timber Pole Ground Improvement – designed to improve ground using timber piles. Ground Improvement uses specifically designed TTT MultiPole Uglie piles spaced closely together at shallow depths.
- Timber Pole Raft Foundations – designed to be an economic alternative to the TC3 Type 2A and Type 2B surface structures outlined in MBIE Guidance 2012. Raft Foundations are comprised of primary and secondary TTT MultiPole UniLog beams.

Refer to www.nzgc.co.nz for more information.

MultiPoles – above ground

TTT MultiPoles have a number of uses above ground both structural and decorative. This is because they are less likely to split, twist, or crack, and are lighter to handle as a result of the hollow core. Use TTT MultiPoles for:

- Structural building components – such as columns, beams, rafters
- Retaining walls – MultiPoles are particularly suitable to be installed into sandy ground conditions
- Utility poles – cables can be inserted through the hollow core

- Hard to access sites – smaller lengths can be joined on site; lightweight handling.

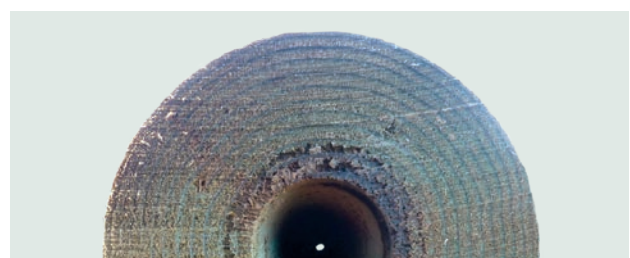
Why use MultiPoles

The unique hollow core of the TTT MultiPole allows for:

- Joining – with the TTT MultiPole Connector (simple pin connector):
 - Separate TTT MultiPole sections can be joined on site if the installation area is restricted for operational space, or if the poles need to be installed to a greater depth than previously allowed for.
 - Joining is fast so poles don't 'set' making re-drive easy.
 - Untreated MultiPoles can be joined to treated MultiPoles if the untreated section is installed below the water table.
- Insertion - the insertion of reinforcing bar, cabling/ducting, and services via the hollow core:
 - Reid bar can be inserted and grouted for large tension loads.
 - Earth cables for utility poles to prevent theft.
 - Insertion of grout via high pressure hose to create a grout bulb at the base of the pile to increase bearing capacity.
 - Post tension rods can be inserted through the core which makes connection details easier.
- Easy Installation:
 - The hollow core reduces pore water pressure during installation which makes for easier installation especially during Ground Improvement where piles are installed at close spacing intervals.
 - Installation via Pile Driving or Drilling & Concreting.
 - Installation via high-frequency vibration which is particularly beneficial in sandy ground conditions.
 - Water jetting via the hollow core is possible during installation.
 - Quick installation means large numbers of TTT MultiPoles can be installed per day.

The removal of the hollow core means that:

- TTT MultiPoles dry quicker resulting in poles that are lighter (when compared to solid timber poles or steel or concrete products) to handle and transport.
- Full penetration of the preservative can be achieved as it is able to be impregnated from both the internal and external faces.
- MultiPoles are less likely to form cracks and splits.
- MultiPoles are less likely to twist as they dry out.



Which TTT MultiPole?



TTT SED MultiPole

Naturally tapered (6mm/m), machine-peeled poles typically used in construction, retaining walls, and foundations.



TTT Uglie MultiPole

Naturally tapered (8mm/m), debarked poles typically used in foundations and ground stabilisation where the poles are unseen. The rougher finish of the TTT Uglie MultiPole results in greater skin friction when installing.



UniLog MultiPole

Machined, uniform diameter poles typically used for structural building components and retaining walls.

TTT Tested Pole proof-testing

TTT MultiPoles can be individually proof-tested (for stiffness and bending stress) on our Certified Pole Tester for 38MPa normal density poles or 52MPa high density poles. Poles are proof-tested as per NZS 3605:2001 and/or ISO 15206:2010 using The Four-Point Proof-Test Method, The Three-Point Proof-Test Method or The Three-Point Ground Line Proof-Test Method with Ultimate Top Load. Each TTT MultiPole that passes testing is individually tagged and numbered. A Certificate of Proof-Testing can be supplied for each pole or a Proof-Test Summary for a batch of poles tested. See TTT Tested Brochure.

TTT Protect Sleeved Poles

To extend the performance of MultiPoles in marine and other harsh environments, we press a TTT Protect polyethylene PE100 Sleeve onto the pole. This Sleeve can extend the whole length of the pole (UniLog MultiPole) or partially sleeve a machined section of the pole (SED MultiPole, Uglie MultiPole). The Sleeve can also be used in conjunction with the TTT MultiPole Connector during installation.

Timber preservation

TTT SED, Uglies, or UniLog MultiPoles are graded as per NZS 3605:2001 Timber Piles and Poles for use in Building and treated as per NZS 3640:2003 Chemical Preservation of Round and Sawn Timber. TTT Products Limited is a registered CCA Oxide Preservation Plant. TTT MultiPoles can be CCA treated to Hazard Classes H4, H5 and H6. ACQ/MCQ treatment can also be carried out. Also refer Osmose Lifewood CCA 50 Year Limited Guarantee H1-H5 (NZ).

TTT MultiPole length

The minimum length is 1.8m.
The maximum length is 18.0m.

Hollow core diameter

Generally the diameter of the drilled hollow core is 1/3 of the pole diameter.

TTT MultiPole Hollow Core Chart

MultiPole Diameter (mm)	Hollow core size (mm)					
	50	63	76	93	118	146
150-175	○					
200-225	○	○				
250-275	○	○	○			
300-350	○	○	○	○		
375-425	○	○	○	○	○	
450-500	○	○	○	○	○	○

The TTT MultiPole Connector

Separate sections of TTT MultiPoles can be connected using our proprietary MultiPole Connector. There are five sizes, thin or thick walled, to suit hollow core diameters. Available in black steel or HDG. The MultiPole Connector is hollow.

TTT MultiPole Connector Chart

Code	Tube OD ø mm	Length mm L/H
MPC63L/H	60	600/650
MPC76L/H	73	700/850
MPC93L/H	89	800/950
MPC118L/H	114	1,000/1,150
MPC146L/H	141	1,100/1,350

L = Thin wall TTT MultiPole Connector
H = Thick wall TTT MultiPole Connector
Also refer TTT Technical Guideline MP001

Installation

Installation of TTT MultiPoles can be achieved via pile driving, drilling and concrete encasing, or vibrated into the ground. They are lightweight, compared to steel or concrete products, which means they are easily transported and handled on site. TTT MultiPoles can be joined on site. Large numbers of TTT MultiPoles can be installed per day. An authorised installer may be recommended for particular sites.



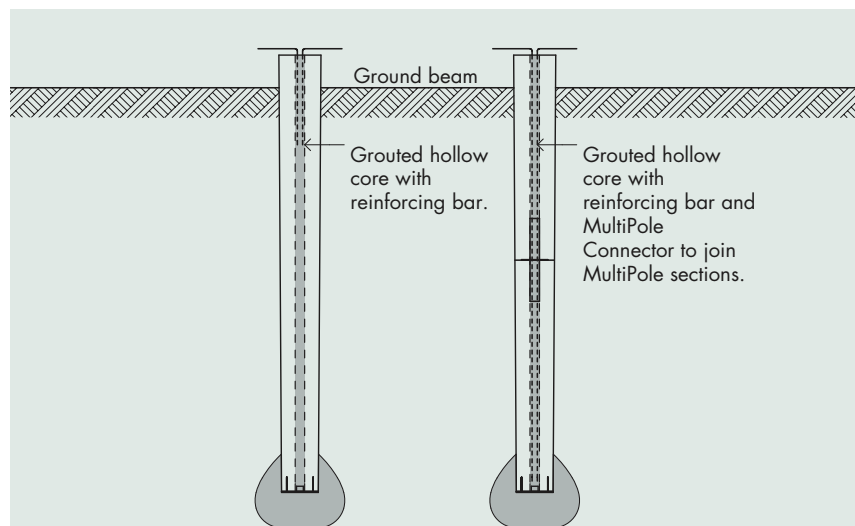
MultiPole Connector



MultiPole with Connector



TTT UniLog MultiPoles used in a structural shear wall



Typical TTT MultiPole installation diagrams



TTT UniLog MultiPoles used in the construction of a photovoltaic structure



TTT Uglie MultiPoles partially Sleeved to assist joining during installation on a tight site

SED / Ugliers MultiPole volume chart m³ per pole

		Diameter (mm)													
		175-199	200-224	225-249	250-274	275-299	300-324	325-349	350-374	375-399	400-424	425-449	450-474	475-499	500-524
Length (m)	1.8	0.054	0.069	0.085	0.103	0.123	0.145	0.168	0.194	0.221	0.250	0.280	0.313	0.347	0.383
	2.4	0.074	0.093	0.116	0.140	0.167	0.196	0.228	0.262	0.298	0.337	0.378	0.421	0.467	0.515
	2.7	0.084	0.106	0.131	0.159	0.189	0.222	0.258	0.296	0.337	0.381	0.427	0.476	0.528	0.582
	3.0	0.094	0.119	0.147	0.178	0.212	0.249	0.289	0.331	0.377	0.426	0.477	0.532	0.589	0.649
	3.6	0.116	0.146	0.180	0.218	0.259	0.303	0.351	0.403	0.458	0.516	0.579	0.644	0.714	0.786
	4.2	0.138	0.174	0.214	0.258	0.306	0.359	0.415	0.476	0.541	0.609	0.682	0.759	0.841	0.926
	4.8	0.162	0.203	0.249	0.300	0.356	0.416	0.481	0.551	0.625	0.704	0.788	0.877	0.970	1.068
	5.4	0.186	0.233	0.286	0.344	0.407	0.475	0.548	0.627	0.712	0.801	0.896	0.996	1.101	1.212
	6.0	0.212	0.265	0.323	0.388	0.459	0.535	0.618	0.706	0.800	0.900	1.006	1.118	1.235	1.359
	7.0	0.257	0.319	0.389	0.466	0.549	0.639	0.736	0.841	0.951	1.069	1.194	1.325	1.464	1.609
	8.0	0.304	0.377	0.458	0.547	0.643	0.748	0.860	0.980	1.108	1.244	1.388	1.540	1.699	1.866
	9.0	0.355	0.438	0.531	0.632	0.742	0.861	0.989	1.125	1.271	1.425	1.588	1.760	1.941	2.130
	10.0	0.408	0.503	0.607	0.721	0.845	0.979	1.122	1.276	1.439	1.612	1.795	1.987	2.190	2.402
	11.0	0.465	0.571	0.687	0.814	0.952	1.101	1.261	1.431	1.612	1.804	2.007	2.221	2.445	2.680
	12.0	0.525	0.642	0.771	0.912	1.064	1.228	1.404	1.592	1.792	2.003	2.226	2.461	2.708	2.966
	13.0	0.588	0.717	0.859	1.013	1.180	1.360	1.553	1.758	1.977	2.208	2.451	2.708	2.977	3.259
	14.0	0.655	0.796	0.950	1.119	1.301	1.497	1.707	1.930	2.168	2.419	2.683	2.962	3.254	3.560
	15.0	0.725	0.878	1.046	1.229	1.427	1.639	1.866	2.108	2.364	2.636	2.922	3.222	3.538	3.868
16.0	0.798	0.964	1.146	1.344	1.557	1.786	2.031	2.291	2.567	2.859	3.167	3.490	3.829	4.184	
17.0	0.875	1.054	1.250	1.463	1.692	1.938	2.201	2.480	2.776	3.089	3.419	3.765	4.128	4.507	
18.0	0.956	1.148	1.359	1.587	1.832	2.095	2.376	2.675	2.991	3.325	3.677	4.046	4.433	4.838	

SED / Ugliers MultiPole weight chart kg per pole

		Diameter (mm)													
		175-199	200-224	225-249	250-274	275-299	300-324	325-349	350-374	375-399	400-424	425-449	450-474	475-499	500-524
Length (m)	1.8	37.7	48.0	59.5	72.2	86.2	101.5	117.9	135.6	154.6	174.7	196.1	218.8	242.7	267.8
	2.4	51.5	65.4	80.9	98.1	116.9	137.3	159.4	183.2	208.6	235.6	264.3	294.7	326.7	360.4
	2.7	58.7	74.3	91.9	111.3	132.5	155.6	180.6	207.4	236.1	266.6	299.0	333.2	369.3	407.3
	3.0	66.0	83.5	103.1	124.7	148.4	174.2	202.0	231.9	263.9	297.9	334.0	372.1	412.3	454.6
	3.6	81.1	102.3	126.1	152.3	181.0	212.2	245.8	281.9	320.5	361.5	405.1	451.1	499.6	550.5
	4.2	96.8	121.9	149.9	180.8	214.5	251.2	290.7	333.1	378.4	426.6	477.6	531.6	588.4	648.1
	4.8	113.3	142.3	174.6	210.2	249.0	291.2	336.7	385.5	437.6	492.9	551.6	613.6	678.9	747.4
	5.4	130.4	163.4	200.1	240.5	284.6	332.4	383.9	439.1	498.1	560.7	627.1	697.2	771.0	848.5
	6.0	148.3	185.3	226.4	271.7	321.1	374.6	432.3	494.0	559.9	629.9	704.1	782.3	864.7	951.2
	7.0	179.6	223.5	272.3	325.9	384.3	447.5	515.5	588.4	666.0	748.5	835.7	927.8	1024.7	1126.4
	8.0	212.9	264.0	320.6	382.8	450.4	523.5	602.1	686.2	775.8	871.0	971.6	1077.7	1189.3	1306.4
	9.0	248.3	306.8	371.5	442.4	519.4	602.7	692.1	787.7	889.5	997.5	1111.7	1232.1	1358.6	1491.3
	10.0	285.8	351.9	424.9	504.7	591.5	685.1	785.5	892.9	1007.1	1128.2	1256.2	1391.0	1532.7	1681.3
	11.0	325.5	399.4	480.9	570.0	666.6	770.8	882.5	1001.8	1128.6	1263.0	1405.0	1554.5	1711.6	1876.3
	12.0	367.4	449.4	539.6	638.1	744.8	859.8	983.0	1114.4	1254.1	1402.1	1558.3	1722.7	1895.4	2076.3
	13.0	411.7	501.9	601.1	709.2	826.2	952.2	1087.1	1230.9	1383.7	1545.4	1716.0	1895.6	2084.1	2281.5
	14.0	458.2	557.0	665.3	783.2	910.8	1048.0	1194.8	1351.3	1517.3	1693.0	1878.3	2073.2	2277.8	2492.0
	15.0	507.2	614.6	732.3	860.4	998.7	1147.4	1306.3	1475.6	1655.1	1845.0	2045.2	2255.7	2476.5	2707.6
16.0	558.6	674.9	802.3	940.6	1089.9	1250.2	1421.5	1603.8	1797.2	2001.4	2216.7	2443.0	2680.3	2928.6	
17.0	612.5	738.0	875.1	1024.0	1184.5	1356.7	1540.6	1736.2	1943.4	2162.4	2393.0	2635.3	2889.3	3154.9	
18.0	669.0	803.8	951.0	1110.6	1282.5	1466.8	1663.5	1872.6	2094.0	2327.8	2574.0	2832.5	3103.4	3386.7	

Weight (kg) is approximate.

UniLog MultiPole volume chart m³ per pole

Length (m)	Diameter (mm)					
	160	185	210	230	255	300
1.8	0.036	0.048	0.062	0.075	0.092	0.107
2.4	0.048	0.065	0.083	0.100	0.123	0.170
2.7	0.054	0.073	0.094	0.112	0.138	0.191
3.0	0.060	0.081	0.104	0.125	0.153	0.212
3.6	0.072	0.097	0.125	0.150	0.184	0.254
4.2	0.084	0.113	0.145	0.174	0.214	0.297
4.8	0.097	0.129	0.166	0.199	0.245	0.339
5.4	0.109	0.145	0.187	0.224	0.276	0.382
6.0	0.121	0.161	0.208	0.249	0.306	0.424
7.0	0.141	0.188	0.242	0.291	0.357	0.495
8.0	0.161	0.215	0.277	0.332	0.409	0.565
9.0	0.181	0.242	0.312	0.374	0.460	0.636
10.0	0.201	0.269	0.346	0.415	0.511	0.707
11.0	0.221	0.296	0.381	0.457	0.562	0.778
12.0	0.241	0.323	0.416	0.499	0.613	0.848



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UniLog MultiPole weight chart kg per pole

Length (m)	Diameter (mm)					
	160	185	210	230	255	300
1.8	29.0	38.7	49.9	59.8	73.5	101.8
2.4	38.6	51.6	66.5	79.8	98.1	135.7
2.7	43.4	58.1	74.8	89.7	110.3	152.7
3.0	48.3	64.5	83.1	99.7	122.6	169.6
3.6	57.9	77.4	99.8	119.7	147.1	203.6
4.2	67.6	90.3	116.4	139.6	171.6	237.5
4.8	77.2	103.2	133.0	159.5	196.1	271.4
5.4	86.9	116.1	149.6	179.5	220.6	305.4
6.0	96.5	129.0	166.3	199.4	245.1	339.3
7.0	112.6	150.5	194.0	232.7	286.0	395.8
8.0	128.7	172.0	221.7	265.9	326.9	452.4
9.0	144.8	193.5	249.4	299.1	367.7	508.9
10.0	160.8	215.0	277.1	332.4	408.6	565.5
11.0	176.9	236.5	304.8	365.6	449.4	622.0
12.0	193.0	258.1	332.5	398.9	490.3	678.6

Weight (kg) is approximate.

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