

Power poles



Poles passed ready for transport

Electrical transmission poles are amongst the highest value timber product; although it is the larger sizes above 12.5 m that are the most valuable

The size of a pole varies from the minimum 9.5 m in length with diameter under bark 2 m from the butt end (D-line) of 225 mm with a small end diameter of 150 mm. The pole length standards are in 1.5 m increments. Hardwood poles are categorised into three strength groups (kN). The strength rating is the allowable pole top load under maximum wind conditions.

Queensland electricity distribution networks are extensive with a total line length of approximately 150,000 kilometers, which have 1 million power poles in use.

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Pole specifications: (limiting factors)

- Critical zone of a pole which is the 1.6 m length measured from a point 1m above the nominal ground line to 0.6 m below the nominal ground line.
- No two faults per metre above critical zone, max of 6 faults (encased bark must be drained)
- Poles must be of sound wood free from active termite attack.
- Pipe which is not associated with any decay will be tolerated at the butt end of the pole provided that the diameter of the pipe does not exceed 20 percent of the diameter of the pole at the butt.
- Mechanical damage (not allowed in critical zone). Elsewhere, width not exceeding 10 percent of the circumference of the pole and not extending into the heartwood. Length shall not exceed 1 metre.
- Straightness of a pole is affected by sweep, crooks or kinks. Sweep is a curvature of large radius. Crook is a curvature of small radius in a pole, does not affect alignment. Kink is a sharp offset in a section of a pole.
- Unsound knots (knots with rot associated with it, not solid across face) must be drained, nosed out with chainsaw, width must not exceed 10% of the circumference of the pole, depth must not exceed 5% of the circumference.
- End splits in the butt of the pole shall not exceed 500 mm in length and 5 mm in width and 200 mm in length at the head of a pole.
- Axe marks in critical zone are not allowed, axe marks must not exceed 5 mm (depth) across the grain, and 5mm parallel with the grain, along the rest of pole.

Minimum pole dimensions (mm)

Length (m)	Strength rating (kN)	Strength group 2 m from butt	S1 At head	Strength group 2 m from butt	S2 At head	Strength group 2 m from butt	S3 At head
9.5	5	210	135	225	150	240	160
9.5	8	250	170	265	185	280	195
11.0	5	225	135	240	150	255	160
11.0	8	265	170	280	185	295	195
11.0	12	300	200	320	220	335	230
12.5	5	235	140	250	150	265	160
12.5	8	275	170	295	185	310	195
12.5	12	315	200	335	215	355	235
14.0	5	250	145	265	165	280	165
14.0	8	290	170	305	185	325	200
14.0	12	330	205	350	215	370	235
15.5	5	260	155	275	165	290	175
15.5	8	300	180	320	195	335	205
15.5	12	345	210	365	230	385	245
15.5	20	410	255	435	285	455	300
17.0	5	265	160	285	170	300	180
17.0	8	310	190	330	200	350	215
17.0	12	355	220	380	235	400	250
17.0	20	420	265	450	285	475	305
18.5	5	275	165	290	175	310	185
18.5	8	320	195	340	210	360	220
18.5	12	370	225	390	240	410	255
18.5	20	435	270	465	290	490	310

Top of poles
gang-nailed to
avoid splitting



Borers

All timbers susceptible to bores, especially Spotted gum, are to be treated with a suitable insecticide as soon as practicable after cutting to prevent infestation during seasoning. Poles with borer holes may not be accepted by the buyer.

Power poles are treated by Copper Chromium Arsenate (CCA) which is used to protect poles against decay, termites, and wood boring insects. CCA is restricted from human contact such as decking, playgrounds, hand rails and outdoor furniture, treated timber must not be burnt and sawdust avoided.

Approved timbers

Trade name	Botanical name	Strength group	Durability rating	Lyctid susceptible	Minimum sapwood thickness
Grey ironbark	E.drepanophylla	S1 highest	1 highest	Resistant	12 mm
Gum topped box	E.moluccana	S2	1	Susceptible	12 mm
Gympie messmate	E.cloeziana	S2	3	Resistant	16 mm
Spotted gum	Corymbia citriodora	S2	2	Susceptible	12 mm
Narrow leaf red ironbark	E. crebra	S2	1	Resistant	12 mm
Forest red gum	E.tereticornis	S3	2	Resistant	12 mm