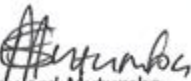
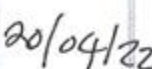
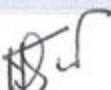
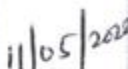
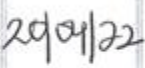
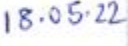
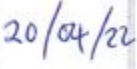
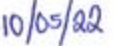


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1.0 SCOPE

This specification stipulates the minimum requirements for treated wooden poles of eucalyptus timber preserved with creosote and intended to be used as upright supports for power transmission and distribution lines.

The specification also covers inspection and test of the poles as well as schedule of guaranteed technical particulars to be filled for 12 m Eucalyptus Poles.

It shall be the responsibility of the supplier to ensure good workmanship, good engineering practice and adherence to applicable standards, regulations and specifications in the processing of the treated wooden poles.

2.0 SYSTEM PARAMETERS

Unless otherwise specified in the schedule of requirements, the poles will be used on the ZESCO distribution system.

3.0 ENVIRONMENTAL PARAMETERS

The Eucalyptus Pole shall be capable of operating under the following environmental conditions:

- a) At an altitude of 1,400m above sea level;
- b) Ambient air temperature not exceeding a maximum of +45°C or below - 1°C with a daily maximum average of 35°C;
- c) Relative humidity of 85%;
- d) Exposed to direct tropical sun;
- e) Frequent and severe lightning storms occurring during summer months (isokeraunic level taken to be 86 days/year); and
- f) Exposure to dust which is prevalent for long periods in the year

4.0 DETAILED REQUIREMENTS

Eucalyptus trees to be used for poles shall be de-barked immediately after felling. The bark shall be removed completely and no strands of inner bark shall be left on the stem.

Poles with incisions made by axes, de-barking and other cutting tools, that are deeper than 15 mm and longer than 50 mm shall be rejected.

The Technical parameters shall be as specified in Technical Schedule A

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4.1 Defects

The poles shall be of sound wood, free from decay, insect attack, rot pockets and any damages caused by handling and processing that would affect the strength of the pole.

4.2 Pole Name Plate Marking

The following information shall be marked on the pole name plate in letters of at least 5 mm high:

- a) Name of manufacturer;
- b) Identification mark of the plant at which the pole was treated;
- c) The month and the four digits of the year during which the pole was treated e.g. 04/2022;
- d) Hazard class and the Species e.g. H4, E1;
- e) Strength class e.g. 55MPa or 63MPa;
- f) The length of the pole, in metres; and
- g) Batch number.

4.3 Type Tests

The following type tests shall be performed on the poles:

- a) Strength tests;
- b) Sapwood test;
- c) Creosote retention test; and
- d) Modulus of Elasticity test.

4.4 Routine Tests

The following routine tests shall be performed on the poles:

- a) Freedom from defects;
- b) Dimensions;
- c) Cut off ends; and
- d) Moisture content.

4.5 Hole Drilling

Every pole shall be supplied drilled with holes for insulators according to the specifications below and shall be drilled before the pole is treated with the preservative.

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Diameter of holes to be drilled	Number of holes to be drilled per pole	Distance of the centre of the first hole from the top of the pole	Distance between the centre of the holes
18 mm	4	150 mm	300 mm

Securing of Nail Plates

1. Each nail plate shall be embedded in the pole end and no nail shall be bent
2. A nail plate shall be so positioned in the middle of the cut end that its edges do not protrude over the round face of the timber.
3. No wire binding of poles.

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5.0 TECHNICAL SCHEDULES (SCHEDULE A & B)

SCHEDULE A: MINIMUM ZESCO REQUIREMENTS

S/N	Description	Unit	Data
1.	Type		Flat top cut 12m eucalyptus pole
2.	Pole length	m	12
3.	Top diameter	mm	160 – 180
4.	Poles shall be strength tested for a fibre stress of 55Mpa and/or 63Mpa		Required
5.	Force required to cause a fibre stress of 55MPa	Cantilever loading	KN
		Midpoint loading	KN
6.	Force required to cause a fibre stress of 63MPa	Cantilever loading	KN
		Midpoint loading	KN
7.	Average moisture content of poles at the time of treatment shall not exceed 250 g/kg but no individual pole, shall have a moisture content that exceeds 280 g/kg		Required
8.	Preservative		Creosote
9.	Minimum retention of creosote per batch	kg/m ³	115
10.	Nail plate		Zinc coated steel
11.	Hazard class		H4
12.	Nail plate thickness	mm	1.2
13.	Minimum nail plate coverage of the applicable pole ends (tip and butt ends)	%	50
14.	Minimum punched nail length	mm	14
15.	Pole name plate marking as per clause 4.2 of this specification		Required
16.	Name plate position	m	3,5 ± 0.050 from the butt
Environmental Conditions			
17.	Ambient Temperature range	°C	-1 to 45
18.	Relative Humidity	%	85
19.	Altitude above sea level	m	1400
Other Requirements			
20.	Previous type test results/certification from a recognized third party testing facility to be provided with bid for at least one of the following: 9m, 10m and/or 12m pole(s).		Required
21.	Quality assurance certification to be provided with bid		Required
22.	Detailed drawings showing dimensions, hole positions and tolerances to be provided with bid		Required
23.	Strength test results on samples to be provided on delivery		Required
24.	Applicable standard (s)		SANS 754

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SCHEDULE B: TO BE FULLY COMPLETED BY SUPPLIER

S/N	Description	Unit	Bidders Technical Guarantees
1.	Type		
2.	Pole length	m	
3.	Top diameter	mm	
4.	Have poles been strength tested for a fibre stress of either 55Mpa and/or 63Mpa?	Yes/No	
5.	Force required to cause a fibre stress of 55MPa	Cantilever loading	KN
		Midpoint loading	KN
6.	Force required to cause a fibre stress of 63MPa	Cantilever loading	KN
		Midpoint loading	KN
7.	Is average moisture content of poles at the time of treatment not exceeding 250 g/kg and no individual pole, has a moisture content that exceeds 280 g/kg?	Yes/No	
8.	Preservative		
9.	Minimum retention of creosote per batch	kg/m ³	
10.	Nail plate		
11.	Hazard class		
12.	Nail plate thickness	mm	
13.	Minimum nail plate coverage of the applicable pole ends (tip and butt ends)	%	
14.	Minimum punched nail length	mm	
15.	Is the pole name plate marking as per clause 4.2 of this specification?	Yes/No	
16.	Name plate position	m	
Environmental Conditions			
17.	Ambient temperature range	°C	
18.	Relative humidity	%	
19.	Altitude above sea level	m	
Other Requirements			
20.	Have previous type test results/certification from a recognized third party testing facility been provided with bid for at least one of the following: 9m, 10m and/or 12m pole(s)?	Yes/No	
21.	Has quality assurance certification been provided with bid?	Yes/No	
22.	Have detailed drawings showing dimensions, hole positions and tolerances been provided with bid?	Yes/No	
23.	Will strength test results on samples be provided on delivery?	Yes/No	
24.	Applicable standard (s)		