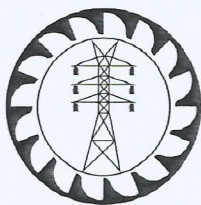


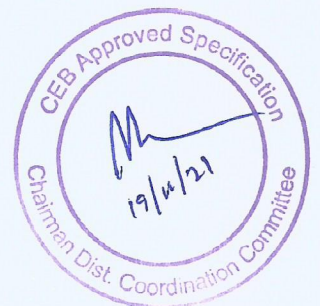
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CEB
SPECIFICATION

**ROPE-OPERATED
EXTENDING FIBRE LADDERS**



**CEYLON ELECTRICITY BOARD
SRI LANKA**



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SPECIFICATION FOR ROPE OPERATED EXTENDING FIBRE LADDERS

1 SCOPE

This specification covers the general requirements of the design, manufacturing and testing of Rope Operated Extending Fibre Ladders.

- a) Rope operated extending fibre ladders of 2x10ft
- b) Rope operated extending fibre ladders of 2x12ft
- c) Rope operated extending fibre ladders of 2x14ft
- d) Rope operated extending fibre ladders of 2x16ft
- e) Rope operated extending fibre ladders of 2x20ft

2 SYSTEM PARAMETERS

(a)	Nominal voltage (U)	400 V	11 kV	33 kV
(b)	System highest voltage (U_m)	440 V	12 kV	36 kV
(c)	System frequency	50 Hz	50 Hz	50 Hz
(d)	Method of earthing	Effectively earthed	Effectively earthed/ Resistive earthed	Effectively earthed
(e)	System fault level	14 kA (below 400kVA transformers)	12.5 kA	16 kA
(f)	Fault duration	1s	1s	1s

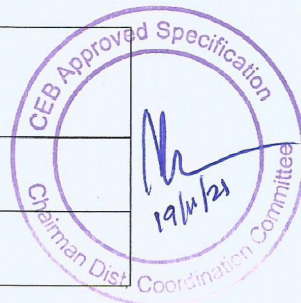
3 SERVICE CONDITIONS

(a)	Annual average ambient temperature	30 °C
(b)	Maximum ambient temperature	40 °C
(c)	Maximum relative humidity	90%
(d)	Environmental conditions	Humid tropical climate with heavily polluted atmosphere
(e)	Operational altitude	From M.S.L. to 1900 m above M.S.L.
(f)	Isokeraunic (Thunder days) level	100 days
(g)	Solar Radiation	4.5 kWh/m ² /day

4 APPLICABLE STANDARDS

The equipment and components supplied shall be in accordance with the latest editions of the standards specified below and amendments thereof.

(a)	BS EN 131-1:2015	Ladders Part 1: Terms, types, functional sizes
(b)	BS EN 131-2:2010+A2:2017	Ladders Part 2: Requirements, testing, marking
(c)	BS EN 131-3:2018	Ladders Part 3: Marking and user instructions



Material conforming to other International Standards which are not less stringent than the Standards stipulated above may be offered. When such alternative Standards are used,

reference to such Standards shall be quoted and English language copies of such Standards shall be provided with the offer.

However, in the event of discrepancy, details given in this CEB specification supersede above standards.

5 BASIC FEATURES

5.1 General

The ladder shall be able to bear a maximum total load of 1471N (150kg).

5.2 Materials

The stiles of ladder shall be made of glass-fibre reinforced plastics. Glass-fibre reinforced plastic shall be protected against penetration of water, dirt, Ultraviolet radiation, and heat. The surface shall be smooth. The fibres shall be embedded. The Barcol hardness according to EN 59 shall be at least 35.

The minimum thickness for load-bearing elements is 2 mm.

5.3 Design

The ladder shall comprise of two parts where upper part shall be extendable by a rope (i.e. two piece rope operated extending ladder).

The design shall seek to minimize the existence of shearing and squeeze points and where they do exist to minimize the shearing and squeezing the effects as far as practicable.

All connections should be durable and have a strength corresponding to the strain. The connection should be design in a manner that arising notch tensions remain low. The ladder should not bend under heat.

Screws and nuts should be secured against loosing e.g. by means of self-locking or mechanically locked safety devices.

Nails are allowed only if their function is related to the production process, e.g. fixation during the drying of glues.

Welding of joints is permitted if it is as per EN ISO 14731 and EN ISO 3834-1 to EN ISO 3834-4.

5.4 Surface Finish

In order to avoid injuries, accessible edges, corners and protruding parts shall be free of burrs, for example chamfered or rounded.

Metal parts susceptible to corrosions shall be protected by means of a paint coating or other coating. Under normal conditions aluminium alloys are not susceptible to corrosion. The coating shall be as per BS EN 131-2.

Wooden parts are not allowed.



5.5 Rungs

Rungs shall be made of aluminium/aluminium alloy or reinforced UV stabilized plastics and shall have a textured surface on the working face to reduce slipping. The contact surface of the coverings shall adhere firmly to the rungs. Rungs shall be firmly and durably connected to the stiles.

Wooden rungs are not allowed.

Rungs shall have a standing surface from front to back of less than 80 mm and at least 20 mm. The angle of the rung related to the stile shall be 65° to 90°.

5.6 Ladder feet and anti-skid devices

Bottom ends of ladder shall be slip resistant.

5.7 Rung locking devices

The extension ladders shall be secured from unintentional closing and separation in the position of use.

All extending ladders shall be fitted with a locking device to keep the ladder hooks engaged on the rung during use.

Locking devices on rope-operated extending ladders shall reliably ensure a safe catch.

The rung hooks of rope-operated extension ladders shall be designed in such a way that the upper ladder part cannot fall down by more than one rung if the rope loosens or breaks. This safety requirement shall apply both when the ladder is vertical and in the position of use.

During use of the ladder the rungs overlapping one another shall be in the same plane perpendicular to the stiles or in one horizontal plane or in any other plane between these.

5.8 Ropes

Ropes for extending ladders shall have a minimum strength of 4,000 N. Ropes shall have a minimum diameter of 8 mm. Synthetic ropes shall be stabilized against ultra-violet light.

6 REQUIREMENTS FOR SELECTION

6.1 Quality Assurance

The manufacturer shall possess ISO 9001:2015 or latest Quality Assurance Certification valid throughout the delivery period of this bid, for the manufacture of Fibre Ladders for the plant where manufacturing is being done. The Bidder shall furnish a copy of the ISO certificate certified as true copy of the original by the manufacturer, along with the offer.

6.2 Manufacturing Experience

The manufacturer shall have minimum of eight (8) years of experience in manufacturing Fibre Ladders. In addition, minimum of five (5) years of experience shall be in manufacturing for orders from outside the country of the manufacturer. The product offered shall have been used in service utilities over past 5 years.



Manufacturer shall furnish a list of purchasers with year & quantity of the product offered and details of contact person with the offer to prove his manufacturing experience.

6.3 Tests

Test Certificates conforming to BS EN 131-2:2010+A2:2017 standard or any other international standard which is not less stringent, issued by:

Either

- (a) an accredited independent testing laboratory acceptable to the CEB or
- (b) an accredited or independent testing laboratory acceptable to the CEB where the tests have been witnessed by CEB or a reputed independent body acceptable to CEB

shall be furnished with the offer. Test Certificates shall clearly indicate the relevant standard, items concerned, showing the manufacturers identity, type No. /catalogue No. and basic technical parameters. In case if the submitted type tests are according to any other international standard which is not less stringent than the specified, then the copy of the used standard in English shall be submitted with offer.

Proof of accreditation and accredited scope by a national/ international authority shall be forwarded with the offer. Test certificates shall be complete including all the pages as issued by the testing authority. Test certificates shall be in English language. Parts of test certificates shall not be acceptable.

If Fibre Ladders tested for other standards are offered, such Fibre Ladders will be accepted with a condition that the tests which are not covered or less stringent than BS EN 131-2:2010+A2:2017 shall be performed at pre-shipment inspection as acceptance criteria. In case if any standard other than BS EN 131-2:2010+A2:2017 is followed for testing full test procedure of that standard shall be furnished with the offer.

Following Test Certificates conforming BS EN 131-2:2010+A2:2017 for the offered item shall be furnished with offer.

- (a) Strength test for all ladders
- (b) Bending test of the stiles
- (c) Lateral deflection test of the ladder
- (d) Bottom stile ends test
- (e) Vertical load on rungs
- (f) Torsion test of rungs
- (g) Test for ladder rung hooks
- (h) Feet pull test
- (i) Maximum extension of ladder
- (j) Shock test
- (k) Bending test
- (l) Dielectric test



7 INFORMATION TO BE FURNISHED WITH THE OFFER

The following shall be furnished with the offer.

- (a) A comprehensive catalogue on the types and sizes of ladders offered. It shall necessarily include details about construction of the ladder, mechanical properties of the ladder (And material used).
- (b) Test Certificates in accordance with the clause 6.3.
- (c) Duly filled and signed 'Annex - A: Schedule of Technical Requirements and Guaranteed Technical Particulars'.
- (d) Documents to prove manufacturer's experience in accordance with Clause 6.2.
- (e) ISO 9001:2015 or latest Quality Assurance Certificate in accordance with clause 6.1.

8 PACKING AND LABELING

8.1 Packing

Each product shall be packaged in an individual container or package of sufficient strength to properly protect the product from mechanical damage before use.

The type of packaging suitable for transport shall be defined by the manufacturer.

At the request of the customer or according to government specifications any additional or amended instructions shall be included in the package.

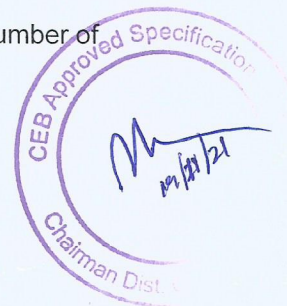
8.2 Identification and Labeling

Basic marking information may be given in the form of safety signs or text. The marking shall include:

- (a) Identify and address of the producer and/or distributor including website address for information about the ladder
- (b) Type of ladder and possible modes of use (description of the type, number and length of the parts, maximum length of ladder in use, maximum standing height measured in position of use according to the recommendation of the manufacturer)
- (c) Classification of use "professional" or "non-professional" in EN 131-2
- (d) Number of the general standard EN 131 or if a dedicated standard exists the number of this standard
- (e) Month and year of production and/or serial number.
- (f) Weight of the ladder (in kg) and maximal total load (in kg)
- (g) Insulation if any.

9 INSPECTION AND TESTING

The Successful bidder shall make necessary arrangements for inspection by an Engineer appointed by the CEB and also to carry out in his presence necessary Acceptance tests on ladders. CEB may waive off the inspection with the condition of witnessing the acceptance tests by an independent authority acceptable to CEB. In such a situation a notice of waive off will be issued in advance to the supplier.



10 ANNEXES

- Annex – A : Schedule of Technical Requirements and Guaranteed Technical Particulars
- Annex – B : Non-Compliance Schedule



Annex - A

SCHEDULE OF TECHNICAL REQUIREMENTS AND GURANTEED TECHNICAL PARTICULARS
(CEB Requirements shall be filled by the procurement entity and information of the offer shall be filled by the manufacturer)

		CEB Requirement	Offered
1.	Name of the Manufacturer		
2.	Country of Origin		
3.	Brand Name / Model No.		
4.	Applicable Standards	BS EN 131	
5.	Maximum Total Load	150 kg	
6.	Length (2x10ft, 2x12ft, 2x14ft, 2x16ft, 2x20ft)	As per the price schedule	
7.	Material of the stile	Glass-fibre reinforced plastics	
8.	Whether material withstand for UV and heat?	As per service conditions, clause 3.0	
9.	Material of the rung and the coating		
10.	Rung shape	"D" Shaped	
11.	Rung surface	Anti-slip surface	
12.	Distance between two adjacent rungs	mm	250-300
13.	Ladder Feet	Slip resistant swivel shoe	
14.	Locking Device provided	Yes, as per clause 5.7	
15.	Pulley provided	Yes	
16.	Ladder Rope		
	(a) Diameter	8 mm	
	(b) Minimum Strength	4000 N	
17.	Insulation between rungs	As per BS EN 131-2	
18.	Whether a certified copy of ISO 9001:2015 or latest furnished with the offer?	As per clause 6.1	
19.	Whether the entire Test Certificates in accordance with clause 6.3 furnished with the offer?	As per clause 6.3	

.....
Signature of the Manufacturer and seal

.....
Date

I/We certify that the above data are true and correct

.....
Signature of the Bidder and seal

.....
Date



Annex – B

Non-Compliance Schedule

On this schedule the bidder shall provide a list of non-compliances with this specification, documenting the effects that such non-compliance is likely to have on the equipment life and operating characteristics. Each non-compliance shall be referred to the relevant specification clause.

Clause No.	Non-Compliance

.....
Signature of the Manufacturer and seal

.....
Date

I/We certify that the above data are true and correct

.....
Signature of the Bidder and seal

.....
Date

