THE KENYA POWER AND LIGHTING CO. LTD.

SPECIFICATION

for

CONCRETE POLES

REVISION RECORD

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SPECIFICATION FOR CONCRETE POLES

FOREWORD

This specification has been prepared by the Research and Development Department on behalf of the Technical Committee of The Kenya Power and Lighting Company Limited (KPLC) and it lays down requirements for Concrete Poles used on overhead lines operating at voltages of up to 66kV 50Hz.

The specification has been approved by the Technical Committee for use by KPLC in purchasing Concrete Poles from manufacturers.

It shall be the responsibility of the manufacturer to ensure adequacy of the design and good engineering practice in the manufacture of the Concrete Poles for KPLC.

1 SCOPE

This specification is for concrete poles for use on overhead lines operating at voltages of up to 66kV 50Hz.

The specification covers poles for the following:

a) Overhead Lines
b) Pole Mounted Substations
c) Line Switchgear and Equipment

2 REFERENCES

The following documents were referred to during the preparation of this specification. In case of conflict, the provisions of this specification shall take precedence.

KS 1933: – Concrete Poles for Telephone, Power and Lighting Purposes – Specification

3 TERMS AND DEFINITIONS

For the purposes of this specifications Terms and Definitions given in the reference standards shall apply.

4 REQUIREMENTS

4.1 Service Conditions

The concrete poles shall be suitable for continuous outdoor use in tropical areas at altitudes of up to 2200m above sea level, humidities of up to 90% average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C and saline conditions with severe corrosive effect along the coast.

The required pole taper for the Prestressed Concrete Pole shall be at least 15mm per meter.

Poles shall be supplied complete with suitably designed fittings for conductor and stay wire characteristics as shown in Appendix B and as described in the requisition form in the tender document.

4.4 Marking

4.4.1 Each concrete pole shall be marked permanently by impressing on the pole (or by use of a permanently secured plate) at a position 1.5m above the pole Ground line with the following details:

- Manufacturer's name
- Date of manufacture (mm/yy)
- Length of pole (meters) and Tip dimensions (mm)
- Ultimate load/Working load/Strength Class
- Type of pole
- Weight of pole
- Standard to which the pole complies
- The words "PROPERTY OF KPLC"

Ground line reference mark as determined in 4.3.1 shall be conspicuous on the pole.

Where a plate is used it shall be made of stainless steel, securely affixed to the pole. In all cases the lettering shall be not less than 5mm high legibly impressed.

5 TESTS AND INSPECTION

5.1 The concrete poles shall be inspected and tested in accordance with the requirement of KS 1933 and this specification. It shall be the responsibility of the manufacturer to perform or to have performed all the tests specified.

5.2 Copies of previous test reports issued by the National Testing/ Standards Authority of the country of manufacture or its accredited testing laboratory shall be submitted with the tender for the purpose of technical evaluation, all in the English Language.

5.3 After manufacture, Sampling, Inspection and Methods of Test shall be in accordance with KS 1933 and this specification. The tests shall be done at the manufacturer's works in the presence of KPLC Engineers.

Complete test reports for the poles shall be submitted to KPLC for approval before delivery.

5.4 On receipt of the poles, KPLC shall inspect the poles for integrity and physical dimensions. The manufacturer shall replace without charge to KPLC, any poles which upon examination fail to meet any of the requirements in the specification.

APPENDIX B: CONDUCTOR, STAY WIRE CHARACTERISTICS AND CIRCUIT CONFIGURATIONS

Table B1: Conductor Characteristics

Conductor Type Size		Overall Diameter (mm)	Minimum Breaking Load (kN)	Weight per km (kg/km)
All Aluminium Conductors (0.6/1kV system)	50mm² Bare	9.3	8.28	145
	50mm² PVC Covered	11.7	8.28	200
	100mm² Bare	13.17	16.0	290
	100mm² PVC Covered	16.0	16.0	360
Aluminium Conductor Steel Reinforced (11kV & 33kV systems)	75mm² Bare	12.3	27.4	318
	75mm² PVC Covered	16.3	27.4	460
	150mm² Bare	18.13	69.2	726
All Aluminium Alloy Conductor (66kV system)	300mm² Bare	24.71	101.5	997

Note: All the conductors listed are stranded

Table B2: Stay Wire Characteristics

Size of Stay Wire	Breaking Load (kN)
4/4.00 Grade 700 BS 183	35.2
7/4.00 Grade 700 BS 183	61.6
19/3.55 Grade 700 BS 183	131.6

Table B3: Typical Circuit Configuration for use with Concrete Poles

Pole Size (m)	Circuits Configuration	Conductor Size (mm²)	Span (m)	Strength Class (SC)
10	1x3-Phase LV circuit & 1 wire street Lighting	100 & 50 AA	50	50
11	11kV Single circuit	150 ACSR	100	50
11	1x11kV circuit, 1x3-Phase LV circuit & 1 wire street lighting	150 ACRS and 100 & 50 AA	50	50
12	11kV Double circuit	150 ACSR	80	50
12	33kV Single Circuit	150 ACSR	100	50
12	33kV Single circuit & 1x3-Phase LV circuit	150 ACSR and 100 AA	50	50
13	1x33kV and 1x11kV circuits	150 ACSR	80	50
13	33kV Double circuit	150 ACSR	80	50
15	66kV Single circuit	300 AAA	100	50
15	66kV Double circuit on H-Pole	300 AAA	100	50

AA – All Aluminium Conductor -- These are considered pvc covered
AAA - All Aluminium Alloy Conductor
ACSR - Aluminium Conductor Steel Reinforced
NB: Spans may be adjusted according to circuit configurations, conductor sizes and