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Kenya Power

POLE CLIMBERS *Part 2:* CONCRETE POLES CLIMBERS — SPECIFICATION

A Document of the Kenya Power & Lighting Co. Ltd

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REVISION OF KPLC STANDARDS

In order to keep abreast of progress in the industry, KPLC standards shall be regularly reviewed. Suggestions for improvements to approved standards, addressed to the Manager, Standards department, are welcome.

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0.1 Circulation List

COPY NO.	COPY HOLDER
1	Manager, Standards
Electronic copy (pdf) on Kenya Power server (http://172.16.1.40/dms/browse.php?fFolderId=23)	

0.2 Amendment Record

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)
0	2010-02-04	New	G. Gathige	S. Kimitei
1	2016-12-16	Replaces Issue 1 Rev 0	Rotich Benard	Dr. Eng. P. Kimemia

FOREWORD

This specification has been prepared by the Standards Department in collaboration with O&M Department, both of The Kenya Power and Lighting Company Limited (KPLC) and it lays down requirements for concrete poles climbers, herein called 'climbers', for use by linesmen and others in ascending and descending concrete poles.

The specification stipulates the minimum requirements for the climbers acceptable for use in the company and it shall be the responsibility of the supplier & manufacturer to ensure that the offered design is of the highest quality and guarantees highest safety standards to KPLC staff, good workmanship and good engineering practice in the manufacture of the climbers for KPLC. The supplier shall submit information which confirms satisfactory service experience with products which fall within the scope of this specification.

Kenya Power specification TSP/09/001 consists of the following parts, under the general title *Pole Climbers*:

Part 1: Wood Poles Climbers
Part 2: Concrete poles Climbers

The following are members of the team that developed this specification:

Name	Division
Rotich Benard	Infrastructure Development
Richard Kioko	Infrastructure Development

1. SCOPE

This specification is for climbers for use by Linesmen in climbing concrete poles along power lines.

The climber shall be used together with safety belt for positioning and support of the wearer at a height when working on concrete poles.

2. REFERENCES

The following standards contain provisions which, through reference in this text constitute provisions of this specification. Unless otherwise stated, the latest editions (including amendments) apply:

ASTM F887- 13:	Standard Specifications for Personal Climbing Equipment
ISO 2081:	Metallic and other inorganic coatings - Electroplated coatings of zinc with supplementary treatments on iron or steel
BS EN 10083-2:	Steels for quenching and tempering. Technical delivery conditions for non-alloy steels

3. TERMS AND DEFINITIONS

For the purpose of this specification the definitions given in the reference standards shall apply. In addition, the following definitions apply:

4. REQUIREMENTS

4.1 SERVICE CONDITIONS

The climbers shall be suitable for continuous use outdoors in tropical areas with the following climatic conditions:

a) Altitudes of up to 2200m above sea level;
b) Humidity of up to 95%;
c) Average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C
d) Pollution: Design pollution level to be taken as "Heavy" (Pollution level III) and "Very Heavy" (Pollution level IV) for coastal applications in accordance with IEC 60815.

4.2 DESIGN AND CONSTRUCTION

4.2.1. General Requirements

4.2.1.1. The climber shall be designed for use by linesmen required to climb concrete poles to work at heights in a supported position.

4.2.1.2. It shall be suitable for attachment to the shoes by straps to allow the wearer to work on concrete poles for prolonged period.

4.2.1.3. The climbers shall be supplied in pairs (Left and Right). Each complete pair shall weigh no more than 3.5kg. The two pairs shall be the same size.

4.2.1.4. The climbers shall be suitable for concrete poles of top diameters of 190mm with taper of 13mm per meter, and lengths of 10-15m.

4.2.1.5. The climbers shall be of sizes capable of being fitted on boots of sizes 8, 10 and 12.

4.2.1.6. The climbers shall be of Type A - fixed length, non-adjustable, with permanently attached horseshoe vulcanized rubber as per ASTM F887-13. The climbers shall have no moving part.

4.2.1.7. The climbers shall be in accordance with the general arrangement drawing below:

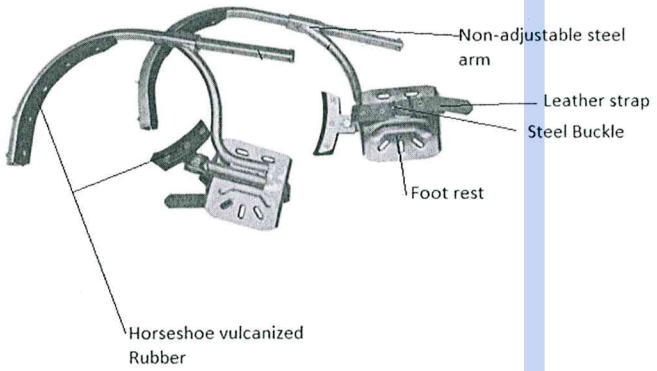


Figure 1: Concrete Pole Climbers

Note: The figures in the specification are for illustration purposes

4.2.2. Footrest and Arms

4.2.2.1. The Climbers footrest and arms shall be manufactured from C45 Steel as per BS EN 10083-2.

4.2.2.2. The arms shall be covered by horseshoe rubber, vulcanized and rifled on the peripheral surface, in contact with the pole, for a better adherence against the pole.

4.2.2.3. The horseshoe rubber shall be permanently attached to the steel arms.

4.2.2.4. All metal parts shall be free of surface cracks and seams and shall be smoothly finished with a rust-resistant coating as per ISO 2081.

4.2.2.5. The arms shall be permanently attached to the footrest.

4.2.3. Strapping

4.2.3.1. The straps of the climbers shall be top grain cowhide leather and shall have a breaking strength of not less than 79kN/m of width, with buckle holes as per ASTM F887. Straps in synthetic materials will be accepted only if supported by test certificates confirming equivalent or superior characteristics and suitability for service conditions specified.

4.2.3.2. Straps shall be of a minimum of 25.4mm (1") in width and 3.18mm (1/8 ") in thickness.

4.2.3.3. The leather shall show no cracking on the grain side when bent slowly over a 12.7mm diameter mandrel, grain side out, through an angle of 180°. The leather shall not show piping or wrinkling of the grain side when bent over a mandrel 25.4mm in diameter with the grain side in, through an angle of 180°. These tests shall be as per ASTM F887.

4.2.3.4. The strapping shall be so designed and constructed that an involuntary release of the work position is prevented.

4.2.3.5. The system used to fix the shoe to the climber shall consist of a leather heel-strap and a leather boot-strap.

4.2.3.6. In order to reduce the probability of involuntary opening, buckles shall be capable of being opened only by at least two consecutive deliberate actions.

4.2.3.7. Buckle frames shall be of forged galvanized steel construction. Tongues shall be of an adequate gauge wire to meet the strength requirements in 4.2.3.9.

4.2.3.8. Buckle holes in the straps shall not exceed 4.76mm (3/16") in diameter. Straps shall be riveted to the buckles by at least two rivets with the strap keeper centered between the rivets. The rivets shall be made of steel electroplated according to ISO 2081.

4.2.3.9. The buckle holding strength of leather shall be not less than 90kg static load when tested in accordance with ASTM F887.

5. TESTS REQUIREMENTS

The climbers shall be inspected and tested in accordance with the requirements of this specification and the applicable standards. It shall be the responsibility of the manufacturer to perform or to have performed all relevant tests.

6. MARKING, LABELLING AND PACKING

6.1 Each item shall be supplied completely assembled.

6.2 All items shall be packed in such a manner as to protect them from damage during transportation, handling and storage.

6.3 The following information shall be marked indelibly and legibly on the climbers.

i) Manufacturer's Name & Logo;
ii) Year of Manufacture;
iii) Size (Pole diameter range)
iv) Standards to which the item complies
v) The words "**Property of KPLC**" on the footrest

6.4 Instructions for storage, care and use shall be included in each package, all in English language.

6.5 Each pair shall be supplied in a moisture proof package.

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APPENDIX A: **TESTS AND INSPECTION (Normative)**

A.1. Copies of previous test certificates and test reports for the climbers by the relevant International or National Testing/Standards Authority of the country of manufacture (or ISO/IEC 17025 accredited independent laboratory) shall be submitted with the offer for evaluation. A copy of accreditation certificate for the laboratory shall also be submitted (all in English Language).

A.2. Routine and sample test reports for the climbers to be supplied shall be submitted to KPLC for approval before shipment/delivery of the goods.

A.3. During delivery of the climbers, KPLC shall inspect them and may perform any of the relevant tests in order to verify compliance with the specification. The supplier shall replace/rectify without charge to KPLC, climbers, which upon examination, test or use fail to meet any or all of the requirements in the specification.

APPENDIX B: **QUALITY MANAGEMENT SYSTEM**

B.1. The Supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the design, material, workmanship, tests, service capability, maintenance and documentation, will fulfill the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001:2008.

B.2. The Manufacturer's Declaration of Conformity to reference standards and copies of quality management certifications including copy of valid and relevant ISO 9001: 2008 certificate shall be submitted with the tender for evaluation.

B.3. The bidder shall indicate the delivery time of the climbers, manufacturer's monthly and annual production capacity and experience in the production of the items for KPLC.

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APPENDIX C: **TECHNICAL DOCUMENTATION (NORMATIVE)**

C.1. The bidder shall submit its tender complete with technical documents for tender evaluation. The technical documents to be submitted (all in English language) for tender evaluation shall include the following:

a) Fully filled clause by clause guaranteed technical particulars (GTPs) signed by the manufacturer;
b) Copies of the Manufacturer's catalogues, brochures, drawings and technical data;

C.2. A sample of the climbers offered shall be submitted for evaluation. The sample (pair) shall be accompanied with details on application and instructions for use, all in English Language. It shall be demonstrated that the climbers offered is suitable for use on concrete poles having taper of 13mm per meter.

C.3. The successful bidder (supplier) shall submit the following documents/details to The Kenya Power & Lighting Company for approval before manufacture:

a) Fully filled clause by clause Guaranteed Technical Particulars (GTPs) stamped and signed by the manufacturer (**these are not the ones submitted with the tender**);

b) Authentic manufacturing drawings, stamped and signed by the manufacturer, with details of items including material details of the climber's metallic part and foot strap.

c) Quality assurance plan (QAP) that will be used to ensure that the design, material; workmanship, tests, service capability, maintenance and documentation will fulfill the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001:2008.

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APPENDIX D: GUARANTEED TECHNICAL PARTICULARS (GTPS) — NORMATIVE

(to be filled and signed by the Supplier and submitted together with relevant copies of the Manufacturer's catalogues, brochures, drawings, technical data, sales records for previous five years, four customer reference letters, details of suppliers' capacity and experience; and copies of complete type test certificates and test reports for tender evaluation, all in English Language)

Description		**Bidder's offer**
1. Manufacturer's Name & Country of manufacture		State
2. Type Reference/Model Number of items offered		State
3. List of components to be supplied (for one installation)		Specify
Clause	**Description**	**Bidders offer**
4.1	Service conditions	Specify
4.2.1.1	Use of climbers on concrete poles	State
4.2.1.2	Suitable for attachment to the shoes by straps	State
4.2.1.3	Weight of the climbers per pair	Specify
4.2.1.4	Concrete poles diameter range used with the climbers	Specify
4.2.1.5	Boot sizes capable of being fitted with the climbers	Specify
4.2.1.6	Climber shall be non-adjustable with no moving part	Specify
4.2.1.7	Climbers shall be in accordance with Fig 1	State
4.2.2.1	Grade of steel for the footrest and arms	Specify
4.2.2.2	Material and shape for covering the arms' periphery for strong adherence to the pole	Specify
4.2.2.3	Horseshoe rubber permanently attached to the arms	Specify
4.2.2.4	All metal parts smoothly finished and galvanized as per ISO 2081	Specify
4.2.2.5	Arms permanently attached to the footrest	Specify
4.2.3.1	Material for the strap and its breaking strength	Specify
4.2.3.2	Cross-sectional dimensions of the strap	State

4.2.3.3	Performance tests of the strap conforms to ASTM F887	State
4.2.3.4	Involuntary release by the strapping on the work position is impossible	State
4.2.3.5	System used to fix the shoe to the clamp climber	Specify
4.2.3.6	Buckles shall be capable of being opened only by at least two consecutive deliberate actions to prevent involuntary opening	Specify
4.2.3.7	Material for Buckle frames and tongue strength	Specify
4.2.3.8	Buckle holes dimensions and rivets arrangement	Specify
4.2.3.9	BBuckle holding strength of the leather under static load	Specify
5.	Climbers shall comply with the specification test requirements.	State
6.1	Items supplied completely assembled	Specify
6.2	Packing to protect from damage during transport, handling & storage	Specify
6.3	Labeling and Marking by engraving as per specification	Specify
6.4	Each package to include instructions (in the English Language) for storage & use	State
6.5	Each pair supplied in moisture proof package	State
A1	Copies of test certificates and routine test reports submitted with offer	State
A2	Routine and sample test reports to be submitted for approval before shipment4	State
A3	Supplier shall replace without charge to KPLC items that don't meet specification	State
B1	QAP and ISO 9001:2008	State
B2	Copies of quality management certifications attached	State
B3	Delivery time, Production capacity & experience of the manufacturer	State
C1	Submitted fully filled GTP,	State

	Submitted manufacturer's catalogues ,manufacturing drawings, technical data	State
C2	Sample submitted with tender	State
C3	Design and fabrication drawings to KPLC for approval before manufacturing Fully Filled GTPs (**not the ones submitted with the tender)**	state
	Authentic manufacturing drawings, signed & stamped by the manufacturer with details of items including material details of the climber's metallic part and foot strap	Specify
	QAP	State

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