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Kenya Power

11kV XLPE ALUMINIUM AERIAL BUNDLED CABLES (ABC) - SPECIFICATION

A Document of the Kenya Power & Lighting Co. Ltd
October 2017

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0.1 CIRCULATION LIST

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

REVISION OF KPLC STANDARDS

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.

0.2 AMENDMENT RECORD

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)
Issue 1 rev 1	2017-10-24	Changed format and GTP. Added documentation clause. Added conductor resistance and number of strands	John Ng'ang'a	Dr. Eng. Peter Kimemia

FOREWORD

This Specification has been prepared by the Standards Department of The Kenya Power and Lighting Company Limited (KPLC) and it lays down requirements for 11kV Aerial Bundled Cables (ABC). It is intended for use by KPLC in purchasing these items.

In preparation of this specification, reference was made to IEC 660228. A new format of writing specifications as guided by KEBS was also adopted.

The Specification is reviewed to capture the following:

- Resistance requirements
- Number of strands
- Add documentation clause
- Adopt the new format
- Improve GTP

This Specification stipulates the minimum requirements for ABC acceptable for use in the company and it shall be the responsibility of the supplier and manufacturer to ensure that the offered design is of the highest quality and guarantees excellent service to KPLC, good workmanship and good engineering practice in the manufacture of the ABC for KPLC.

Users of Kenya Power specifications are responsible for their correct interpretation and application.

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

Name	Division
John Ng'ang'a	Infrastructure Development

1. SCOPE

1.1. This specification covers requirements for 11kV Aerial Bundled Cables consisting of stranded aluminium conductors insulated with cross-linked polyethylene (XLPE) and a supporting catenary that consists of stranded, galvanized steel wires, PVC covered. The specification covers the following sizes:

a) 3 x 70 mm² Aluminium Phase Conductors, with Catenary size of 50 mm².

b) 3 x 95 mm² Aluminium Phase Conductors, with Catenary size of 50 mm².

c) 3 x 185 mm² Aluminium Phase Conductors, with Catenary size of 70 mm².

1.2. The specification stipulates minimum requirements, inspection and tests of the 11kV Aerial Bundled Cables as well as schedule of Guaranteed Technical Particulars.

2. NORMATIVE REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this specification. For dated editions the cited edition will apply; for undated editions the latest edition of the referenced document shall apply.

BS 6622	Electric cables. Armoured cables with thermosetting insulation for rated voltages from 3.8/6.6 kV to 19/33 kV. Requirements and test methods
IEC 60228	Conductors of insulated cables
IEC 60230	Impulse tests on cables and their accessories
IEC 60502-2	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um = 1,2 kV) up to 30 kV (Um = 36 kV) – Part 2: Cables for rated voltages from 6 kV (Um = 7,2 kV) up to 30 kV (Um = 36 kV)
IEC 60885-3	Electrical test methods for electric cables – Part 3: Test methods for partial discharge measurements on lengths of extruded power cables
IEC 60888:	Zinc-coated steel wires for stranded conductors.
SANS 1713:	Electric Cables – Medium-Voltage Aerial Bundled Conductors for Voltages from 3.8/6.6kV to 19/33kV (South African National Standard)

3. DEFINITIONS

For the purpose of this specification, the definitions given in the reference standards shall apply.

Supporting Catenary: It is a stranded galvanized steel conductor, with protective covering that is provided to support three laid-up cores.

4. REQUIREMENTS

4.1. SERVICE AND SYSTEM CONDITIONS

4.1.1 Operating Conditions

The 11kV Aerial Bundled Cables shall be suitable for continuous use outdoors in tropical areas and harsh climatic conditions including areas exposed to:

a) Altitudes of up to 2200m above sea level and humidity of up to 95%,

b) Average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C, in direct sunlight,

c) Humidity: up to 95%

d) Pollution: Design pollution level to be taken as "Heavy" (Pollution level III) for inland and "Very Heavy" (Pollution level IV) for coastal applications in accordance with IEC 60815.

e) Isokeraunic levels of up to 180 thunderstorm days per year.

f) Tropical sunshine conditions

4.1.2 System Characteristics

4.1.2.1 The Aerial Bundled Cables shall be suitable for use in 6.35/11(12)kV 50Hz 3-wire system, where a continuous conductor operating temperature of 90°C and a short-circuit temperature of 250°C are not exceeded.

4.1.2.2 The design system fault level for KPLC 11kV overhead lines is 25kA, 3 seconds.

4.2. MATERIALS AND CONSTRUCTION

4.2.1. General

Only compatible materials that are suitable for the specified service conditions shall be used in the construction of the cables.

4.2.2. Phase Cores

4.2.1.1 Each core of the aerial bundled cable shall be suitable for use in a system operating voltage of 11,000V 50Hz.

4.2.1.2 The conductor shall be made from hard drawn, circular, stranded and compacted plain aluminium conductor as per IEC 60228.

4.2.1.3 The conductor screen shall consist of an extruded layer of semi-conducting compound, applied to each conductor direct, in the same operation as the application of the dielectric and of the core screen. The outer surface of the conductor screen shall be in continuous adherent contact with the inner surface of the dielectric. The screen shall be readily removable from the conductor and it shall have a thickness of at least 0.5mm.

4.2.1.4 The insulation (dielectric) shall consist of an extruded sheath of cross-linked polyethylene (XLPE). The nominal thickness of the dielectric shall conform to Table 3 (the thickness of screening materials shall not be included in the measured dielectric thickness).

4.2.1.5 A dielectric screen consisting of a semi-conducting core screen, bedding tape and metallic screen shall be applied to each core.

a) The core screen shall consist of an extruded layer of semi-conducting compound, applied in intimate contact with the dielectric of each core, in the same operation as the application of the conductor screen and the dielectric. The layer shall be continuous and uniform in quality and shall be removable without causing damage to the dielectric. It shall have a thickness of at least 0.5mm.

b) A semi-conducting bedding tape shall be applied over the semi-conducting core screen.

c) The metallic screen shall consist of annealed copper tape helically applied over the bedding tape. The metallic screen shall be electrically continuous and any joints shall be made in an acceptable, good workmanship manner and so finished that no sharp edges or protrusions remain. The copper tape shall be applied with a minimum overlap of 15%.

d) The metallic screen shall be suitably water blocked.

4.2.1.6 The outer sheath shall be extruded PVC, black and ultra-violet protected for operation in direct sunlight.

4.2.3. **Marking of the Phase Cores**

4.2.3.1 The following shall be embossed legibly on one side of each core:

a) The core identification, using the numerals 1, 2 or 3.

b) The manufacturer's name.

c) The year of manufacture.

d) The standard of manufacture.

4.2.3.2 The following shall be embossed on the opposite side of the core:

a) The operating voltage 6.35/11kV for which the cable has been designed.

b) The conductor size.

c) The words "Property of **The Kenya Power & Lighting Co. Ltd.**"

4.2.3.3 The letters and numerals shall be upright characters of minimum height 5mm and of maximum height of 10mm. The gap between the end of one inscription and the beginning of the next shall be not greater than 150mm and the gap between each complete set of markings shall be not greater than 500mm.

4.2.3.4 An indelible marking shall also be given (on each core) at every one meter interval to assist field personal in cutting required length.

4.2.4. **Supporting Catenary**

4.2.4.1 The supporting catenary shall consist of stranded galvanized steel wires. Galvanizing of the wires shall comply with the requirements of IEC 60888 for class 1.

4.2.4.2 The lay of the wires shall be right-hand (Z) with lay ratio not less than 10 and not more than 14.

4.2.4.3 The covering shall be PVC applied by forced extrusion to provide a smooth outer finish, and shall be ultra-violet protected for operation in direct sunlight.

Table 1: Supporting Catenary

Catenary Size, mm²		**50**	**70**
Number of Wires		7	7
Wire Size (diameter), mm		3.00	3.60
Minimum Tensile Strength of each Wire, kN		9.26	13.13
Elongation at break, minimum %		3.5	4
Thickness of protective covering	Nominal, mm	1.20	1.20
	Minimum at any point, mm	0.96	0.96

4.3. ELECTRICAL AND MECHANICAL CHARACTERISTICS

The Aerial Bundled Cables shall comply with the requirements below:

4.3.1. Electrical properties

Table 2: Electrical properties

Conductor size, mm²	70	95	185
Voltage designation, $U_o/U/U_m$, kV	6.35/11(12)		
Rated voltage, U_0/U, kV	6.35/11		
Short circuit current rating, kA/Sec	25kA for 3 sec		
Maximum continuous load at 30°C ambient temperature	Bidder to state	Bidder to state	Bidder to state
Maximum DC Resistance at 20°C, Ω/km	0.443	0.32	0.164
Power frequency withstand voltage (kV, rms)	28	28	28
Impulse withstand voltage test (kVp)	95	95	95

4.3.2. Mechanical characteristics

Table 3: Mechanical characteristics

Conductor size, mm²		70	95	185
Material of conductor		Aluminium	Aluminium	Aluminium
Diameter over conductor, nominal, mm		9.3-10.2	11.6	16.4
No. of wires per conductor, minimum		12	15	30
Thickness of conductor screen, minimum, mm		0.5	0.5	0.5
Diameter over semi-conducting core screen Nominal, mm		18.1-19	23.3	27.9
Dielectric/insulation		XLPE	XLPE	XLPE
Thickness of dielectric	Nominal, mm	3.4	3.4	3.4
	Minimum at a point, mm	2.96	2.96	2.96
Diameter over insulation, Nominal, mm		16.1-17.0	21.3	25.9
Semi-conducting core screen	Material	Semi-conducting compound		
	Thickness, mm	0.5	0.5	0.5
Thickness of copper tape, Nominal, mm		0.15	0.15	0.15
Thickness of sheath	Minimum, mm	1.8	1.8	1.9
Catenary size, mm²		50	50	70
Overall diameter of bundle, approximate, mm		Bidder to state	67.8	79.2
Nominal mass, kg/m		Bidder to state	3.25	4.65

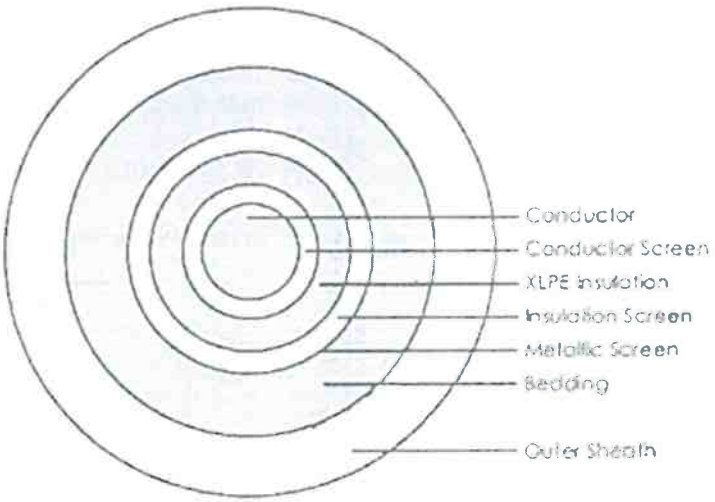

Fig. 1: Typical cable construction as per IEC 60502-1 and BS 6622

5. TESTS REQUIREMENTS

The Aerial Bundled Cables shall be inspected and tested in accordance with the requirements of IEC 60228, SANS 1713 and provisions of this specification.

6. MARKING, LABELLING AND PACKING

6.1. The finished cable shall be wound on wooden drums such as to prevent damage during transportation and handling. The drums shall be made from treated timber resistant to termite attack.

6.2. The actual length of cable shall not be less than the length indicated on the drum.

6.3. Both ends of every drum length of cable shall have been sealed to prevent the ingress of water during transportation, storage, handling and installation. The sealing shall enclose the oversheath (each core) and shall be by close fitting plastic caps. Both ends of the cable shall be secured to the drum to prevent mechanical damage.

6.4. The following information shall be marked legibly and in a permanent manner on the flange of the drum:

a) The manufacturer's name;

b) The type and rating of cable;

c) The conductor and catenary cross-sectional area in mm^2;

d) The length of the cable, in metres;

e) The year of manufacture;

f) The gross mass and net mass, in kilograms;

g) The instructions for handling and use (in English Language);

h) The words **"Property of The Kenya Power & Lighting Co. Ltd."**

Note: Individual Cores shall have been marked in accordance with clause 4.2.3

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APPENDICES

A. TESTS AND INSPECTION (Normative)

A.1 It shall be the responsibility of the manufacturer to perform or to have performed all the tests specified. Tenderers shall confirm the manufacturer's capabilities in this regard when submitting tenders. Any limitations shall be clearly specified.

A.2 Copies of Type Test Certificates and Type Test Reports issued by a third party testing laboratory that is accredited to ISO/IEC 17025 shall be submitted with the tender for the purpose of technical evaluation. A copy of the accreditation certificate to ISO/IEC 17025 for the testing laboratory shall also be submitted. Any translations of certificates and test reports into English language shall be signed and stamped by the Testing Laboratory that carried out the tests.

A.3 The cables shall be subject to acceptance tests at the manufacturer's works before dispatch. Acceptance tests shall be witnessed by two Engineers appointed by The Kenya Power and Lighting Company Limited (KPLC).

A.4 Test reports for each cable shall be submitted to The Kenya Power and Lighting Company for approval before shipment. These shall include:

Material tests as per BS 6622, IEC 60502 – 1 and IEC 60811-1-1

a) Conductor screen resistivity
b) Insulation material grade test
c) Insulation screen resistivity
d) Insulation screen cold stripability
e) Semiconductor lapped inner covering resistivity
f) Separation (bedding) sheath material
g) Oversheath material grade test:
   - Material
   - Shrinkage
h) Compatibility test
i) Test under fire conditions

Electrical tests as per BS 6622, IEC 60502 – 1, IEC 60230 and IEC 60885-3

a) Partial discharge test
b) Bending test
c) Tan δ in relation to voltage
d) Tan δ in relation to temperature
e) Resistance
f) Heating cycle test
g) Impulse voltage test

h) Four hour voltage test
i) Adherence of screens in short circuit temperature

Tests for the supporting catenary

A.5 During delivery of the cables, KPLC will inspect them and may perform or have performed any of the relevant tests in order to verify compliance with the specification. The supplier shall replace/rectify without charge to KPLC, cables which upon examination, test or use fail to meet any or all of the requirements in the specification.

B. QUALITY MANAGEMENT SYSTEM (Normative)

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

B.2 The Manufacturer's Declaration of Conformity to applicable 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 the cables, manufacturer's monthly and annual production capacity and experience in the production of the type of cables being offered. A detailed list and contact addresses (including e-mail) of the manufacturer's previous customers outside the country of manufacture for exact or similar rating of cables sold in the last five years shall be submitted with the tender for evaluation.

C. DOCUMENTATION (Normative)

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

a) Fully filled clause by clause Guaranteed Technical Particulars (GTP) signed by the manufacturer,
b) Copies of the manufacturer's catalogues, brochures, drawings and technical data,
c) Sales records for the last five years and at least four customer reference letters, three outside the country of manufacture,
d) Details of manufacturing capacity and the manufacturer's experience. The amount of cables sold over a period of five years shall not be less than 5,000 kms.

e) Copies of required type test certificates and type test reports by a third party testing laboratory accredited to ISO/IEC 17025,

f) Copy of accreditation certificate to ISO/IEC 17025 for the third party testing laboratory,

g) Manufacturer's warranty and guarantee; subject to 18 months from date of delivery to KPLC stores,

h) Manufacturer's letter of authorization, copy of the manufacturer's ISO 9001:2008 certificate, ISO 17025(2005) certificate.

i) Operating instructions

C.2 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 (GTP) signed by the manufacturer,

b) Design drawings and technical details,

c) Operation manuals and brochures for the cable type,

d) 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 or later,

e) Detailed test program to be used during factory testing,

f) Marking details and method to be used in marking the cables,

g) Manufacturer's undertaking to ensure adequacy of the design, good engineering practice, adherence to the specification and applicable standards and regulations as well as ensuring good workmanship in the manufacture of the cables for The Kenya Power & Lighting Company,

h) Packaging details (including packaging materials and marking and identification of batches).

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D. GUARANTEED TECHNICAL PARTICULARS (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)

Tender No. .....

Bidder's name and Address.....

Clause number	KPLC requirement	Bidder's offer
Manufacturer's Name and address		Specify
Country of Manufacture		Specify
Bidder's Name and address		Specify
1.	**Scope**	Specify
1.1-1.2		
2.	Applicable Standards	Specify
3.	Terms & Definitions	Specify
4.	**Requirements**	
4.1	**Service and System Conditions**	Specify
4.1.1	Operating conditions	Specify
4.1.2	System characteristics	Specify
4.2	**Materials and construction**	
4.2.1	**General**	Specify
	Only compatible materials that are suitable for the specified service conditions shall be used in the construction of the cables.	Specify
4.2.2	**Phase Cores**	Specify
4.2.1.1	Each core of the aerial bundled cable shall be suitable for use in a system operating voltage of 11,000V 50Hz.	Specify
4.2.1.2	The conductor shall be made from hard drawn, circular, stranded and compacted plain aluminium conductor as per IEC 60228.	Specify
4.2.1.3	The conductor screen shall consist of an extruded layer of semi-conducting compound, applied to each conductor direct, in the same operation as the application of the dielectric and of the core screen.	Specify
	The outer surface of the conductor screen shall be in continuous adherent contact with the inner surface of the dielectric.	Specify
	The screen shall be readily removable from the conductor and it shall	Specify

Clause number	KPLC requirement	Bidder's offer
	have a thickness of at least 0.5mm	
4.2.1.4	The insulation (dielectric) shall consist of an extruded sheath of cross-linked polyethylene (XLPE). The nominal thickness of the dielectric shall conform to Table 3 (the thickness of screening materials shall not be included in the measured dielectric thickness).	Specify
4.2.1.5	A dielectric screen consisting of a semi-conducting core screen, bedding tape and metallic screen shall be applied to each core	Specify
a	The core screen shall consist of an extruded layer of semi-conducting compound, applied in intimate contact with the dielectric of each core, in the same operation as the application of the conductor screen and the dielectric. The layer shall be continuous and uniform in quality and shall be removable without causing damage to the dielectric. It shall have a thickness of at least 0.5mm.	Specify
b	A semi-conducting bedding tape shall be applied over the semi-conducting core screen	Specify
c	The metallic screen shall consist of annealed copper tape helically applied over the bedding tape. The metallic screen shall be electrically continuous and any joints shall be made in an acceptable, workmanlike manner and so finished that no sharp edges or protrusions remain. The copper tape shall be applied with a minimum overlap of 15%.	Specify
d	The metallic screen shall be suitably water blocked.	Specify
4.2.1.6	The outer sheath shall be extruded PVC, black and ultra-violet protected for operation in direct sunlight.	Specify
4.2.3	**Marking of the Phase Cores**	Specify
4.2.3.1	The following shall be embossed legibly on one side of each core:	Specify
	The core identification, using the numerals 1, 2 or 3.	Specify
	The manufacturer's name.	Specify
	The year of manufacture.	Specify
	The standard of manufacture.	Specify
4.2.3.2	The following shall be embossed on the opposite side of the core:	Specify
	The operating voltage 6.35/11kV for which the cable has been designed.	Specify
	The conductor size.	Specify
	The words "Property of **The Kenya Power & Lighting Co. Ltd.**"	Specify

Clause number	KPLC requirement	Bidder's offer
4.2.3.3	The letters and numerals shall be upright characters of minimum height 5mm and of maximum height of 10mm. The gap between the end of one inscription and the beginning of the next shall be not greater than 150mm and the gap between each complete set of markings shall be not greater than 500mm.	Specify
4.2.3.4	An indelible marking shall also be given (on each core) at every one meter interval to assist field personal in cutting required length.	Specify
4.2.4	**Supporting Catenary**	Specify
4.2.4.1	The supporting catenary shall consist of stranded galvanized steel wires. Galvanizing of the wires shall comply with the requirements of IEC 60888 for class 1.	Specify
4.2.4.2	The lay of the wires shall be right-hand (Z) with lay ratio not less than 10 and not more than 14.	Specify
4.2.4.3	The covering shall be PVC applied by forced extrusion to provide a smooth outer finish, and shall be ultra-violet protected for operation in direct sunlight.	Specify

Table 1

Catenary Size, mm²		**50**	**70**
Number of Wires		7	7
Wire Size (diameter), mm		3.00	3.60
Minimum Tensile Strength of each Wire, kN		9.26	13.13
Elongation at break, minimum %		3.5	4
Thickness of protective covering	Nominal, mm	1.20	1.20
	Minimum at any point, mm	0.96	0.96

Bidder's offer: Specify

4.3	**ELECTRICAL AND MECHANICAL CHARACTERISTICS**				Specify

Table 2

Conductor size, mm²	**70**	**95**	**185**	Specify
Voltage designation, $U_o/U/U_m$, kV	6.35/11(12)			Specify
Rated voltage, U_o/U, kV	6.35/11			Specify
Short circuit current rating, kA/Sec	25kA for 3 sec			Specify
Maximum continuous load at 30°C ambient temperature				
Maximum DC Resistance at 20°C, Ω/km	0.443	0.32	0.164	Specify
Power frequency withstand voltage (kV, rms)	28	28	28	Specify
Impulse withstand voltage test (kVp)	95	95	95	Specify

Clause number	KPLC requirement					Bidder's offer
Table 3	**Conductor size, mm²**		**70**	**95**	**185**	Specify
	Material of conductor		Aluminium	Aluminium	Aluminium	Specify
	Diameter over conductor, nominal, mm		9.3-10.2	11.6	16.4	Specify
	No. of wires per conductor, minimum		12	15	30	Specify
	Thickness of conductor screen, minimum, mm		0.5	0.5	0.5	Specify
	Diameter over semi-conducting core screen Nominal, mm		18.1-19	23.3	27.9	Specify
	Dielectric		XLPE	XLPE	XLPE	Specify
	Thickness of dielectric	Nominal, mm	3.4	3.4	3.4	Specify
		Minimum at a point, mm	2.96	2.96	2.96	Specify
	Diameter over insulation Nominal, mm		16.1-17.0	21.3	25.9	Specify
	Semi-conducting core screen	Material	Semi Conducting compound			Specify
		Thickness, mm	0.5	0.5	0.5	Specify
	Thickness of copper tape Nominal, mm		0.15	0.15	0.15	Specify
	Thickness of sheath	Minimum, mm	1.8	1.8	1.9	Specify
	Catenary size, mm²		50	50	70	Specify
	Overall diameter of bundle, approximate, mm		Bidder to state	67.8	79.2	Specify
	Nominal mass, kg/m		Bidder to state	3.25	4.65	Specify
5	Test requirements					State
6	Marking labelling and packing					Specify
6.1	The finished cable shall be wound on wooden drums such as to prevent damage during transportation and handling. The drums shall be made from treated timber resistant to termite attack.					Specify
6.2	The actual length of cable shall not be less than the length indicated on the drum.					Specify
6.3	Both ends of every drum length of cable shall have been sealed to prevent the ingress of water during transportation, storage, handling					Specify

Clause number	KPLC requirement	Bidder's offer
	and installation. The sealing shall enclose the oversheath (each core) and shall be by close fitting plastic caps. Both ends of the cable shall be secured to the drum to prevent mechanical damage.	
6.4	The following information shall be marked legibly and in a permanent manner on the flange of the drum:	Specify
	The manufacturer's name;	
	The type and rating of cable;	
	The conductor and catenary cross-sectional area in mm^2;	
	The length of the cable, in metres;	
	The year of manufacture;	
	The gross mass and net mass, in kilograms;	
	The instructions for handling and use (in English Language);	
	The words "PROPERTY OF The Kenya Power & Lighting Co. Ltd"	
	Note: Individual Cores shall have been marked in accordance with clause 4.2.3	
A	**Tests and Inspection**	
A.1	Responsibility of carrying out tests	State
A.2	Copies of Type Test Reports submitted with tender	State
A.3	Acceptance tests to be witnessed by KPLC at factory before shipment	State
A.4	Test reports to be submitted by supplier to KPLC for approval before shipment	State
A.5	Inspection at the stores and replacement of rejected current transformers	State compliance
B	**Quality Management System**	
B.1	Quality Assurance Plan	Provide
B.2	Copy of ISO 9001:2008 Certificate	Provide
B.3	Manufacturer's experience	Provide
	Manufacturing Capacity (units per month)	Provide
	List of previous customers	Provide
	Customer reference letters	Provide
C	**Documentation and demonstration**	
C.1	Documents submitted with tender	Provide
C.2	Documents to be submitted by supplier to KPLC for approval before manufacture	Provide

Clause number	KPLC requirement	Bidder's offer
	Statement of compliance to specification	Provide

.....

Manufacturer's Name, Signature, Stamp and Date