



TITLE:

**SPECIFICATION FOR
SAFETY POLE SIGNS &
ACCESSORIES**

Doc. No.

KP1/3CB/TSP/02/002

Issue No.

2

Revision No.

1

Date of Issue

2014-09-29

Page 1 of 17

TABLE OF CONTENTS

0.1 Circulation List

0.2 Amendment Record

FOREWORD

1. SCOPE
2. REFERENCES
3. TERMS AND DEFINITIONS
4. REQUIREMENTS
5. TESTS AND INSPECTION
6. MARKING, LABELLING AND PACKING

ANNEX A: *Guaranteed Technical Particulars (to be filled and signed by the Manufacturer 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 manufacturing capacity, the manufacturer's experience and copies of test reports for tender evaluation, all in English Language)*

ANNEX B: Drawings

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Authorized by: Chief Engineer, Tech Stds & Specs

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TITLE:
**SPECIFICATION FOR
SAFETY POLE SIGNS &
ACCESSORIES**

| | |
|---------------|--------------------|
| Doc. No. | KP1/BCB/TSP/02/002 |
| Issue No. | 2 |
| Revision No. | 1 |
| Date of Issue | 2014-09-29 |
| Page 2 of 17 | |

0.1 Circulation List

| COPY NO. | COPY HOLDER |
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| 1 | Head of Department Standards |
| 2 | Head of Department Procurement |
| 3 | Regional Manager Coast |

Electronic copy (pdf) on KPLC server currently: <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) |
|---------|----------------------|---|-----------------------------------|-----------------------------------|
| Rev 0 | 2014-03-31 | Issue No. 2, cancels and replaces issue no. 1. | Michael Apudo | Eng. Simon Kimitei |
| Rev. 1 | 2014-09-29 | Introduced Danger-Live Apparatus Plate and Caution Notice Plate | Michael Apudo | Eng. Simon Kimitei |
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Date: 2014-09-29



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**SPECIFICATION FOR
SAFETY POLE SIGNS &
ACCESSORIES**

| | |
|---------------|--------------------|
| Doc. No. | KPI/3CB/TSP/02/002 |
| Issue No. | 2 |
| Revision No. | 1 |
| Date of Issue | 2014-09-29 |
| Page 3 of 17 | |

FOREWORD

This specification has been prepared by the Research and Development Department of The Kenya Power and Lighting Company Limited (KPLC) and it lays down requirements for Safety Pole Signs and Accessories. It is intended for use by KPLC in procurement of the items.

1. SCOPE

- 1.1 This specification is for Safety Pole Signs and Accessories for use on overhead power lines, substations and switching rooms.
- 1.2 The specification covers the following items:
 - a) Protective Multiple Earthing Plate
 - b) Pole Number Plate
 - c) DANGER HATARI Plate for Power Poles
 - d) DANGER HATARI Plates for Substations
 - e) Substation Number Plate
 - f) Danger Voltage Plates
 - g) Danger Plate for Live Apparatus
 - h) Caution Notice Plates
- 1.3 The specification stipulates the minimum requirements for Safety Pole Signs and Accessories, for use in the company and it shall be the responsibility of the supplier 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 items for The Kenya Power & Lighting Company.
- 1.4 The specification does not purport to include all the necessary provisions of a contract.

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.

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**SPECIFICATION FOR
SAFETY POLE SIGNS &
ACCESSORIES**

| | |
|---------------|--------------------|
| Doc. No. | KP1/3CB/TSP/02/002 |
| Issue No. | 2 |
| Revision No. | 1 |
| Date of Issue | 2014-09-29 |
| Page 4 of 17 | |

- HSE L64: The Health and Safety (Safety Signs and Signals) Guidance on Regulations 2009
- ENA TS 43-90 Issue 5 -2008: Anti Climbing Measures and Safety Signs for High Voltage Overhead Lines
- ESQCR: 2009: The Electricity Safety, Quality and Continuity Regulations 2009
- ISO 1461: Hot dip galvanized coatings on fabricated iron and steel articles -- Specifications and test methods
- ASTM C538-83: Standard test method for color retention of red, orange, and yellow porcelain enamels
- BS 381C: Specification for colours for identification, coding and special purposes

3. TERMS AND DEFINITIONS

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

4. REQUIREMENTS

4.1. Environmental Operating Conditions for Signs

All safety pole signs and accessories shall be suitable for continuous use outdoors in following tropical operating conditions:-

- a) Located in direct sunlight
- b) Temperature range -10 °C to +40°C
- c) Mounted on creosote treated wood poles (where applicable).
- d) Altitudes of up to 2200m above sea level,
- e) Humidity of 95% and
- f) Saline conditions along the coast.

4.2. Design and Construction

4.2.1. The products described within this specification shall comply with the latest versions of the relevant International Standards, and all relevant Energy Networks Association Technical Specifications (ENATS) current at the time of supply.

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**SPECIFICATION FOR
SAFETY POLE SIGNS &
ACCESSORIES**

Doc. No. KP1/3CB/TSP/02/002

Issue No. 2

Revision No. 1

Date of Issue 2014-09-29

Page 5 of 17

4.2.2. All safety pole signs and plates shall be manufactured from suitable materials to provide colour fastness for a minimum period of 10 years in direct sunlight.

4.2.3. Material and finish

4.2.3.1. Protective Multiple Earth Plate, Pole Number Plate and Substation Number Plate shall be made of 1.5mm thick Aluminium, vitreous enameled in colours indicated. The back of the plates shall be enameled black at works.

4.2.3.2. The DANGER HATARI Plates and Voltage Plates, shall be made from mild steel sheet of at least 1.6 mm thick and vitreous enameled white, with letters, figures and the conventional skull and cross-bones in post office red colour (refer BS 381C) on the front side. The rear side of the plate shall also be enameled white.

4.2.3.3. Danger-Live Apparatus Notice Plates and Caution Notice Plates shall be made from mild steel sheet of at least 1.6 mm thick and vitreous enameled in the colours indicated in Fig. 6 & 7.

4.2.3.4. The mild steel sheet shall be protected against corrosion by hot dip galvanizing to ISO 1461 with a minimum coating thickness of 55 μm or average coating mass 390 g/m^2 . The galvanization shall be carried out before enameling.

4.2.3.5. Colours for symbols shall be to the following numbers as per BS 381C:

a) RED: Colour No. 538, Post Office Red

b) YELLOW: Colour No. 355, Lemon

4.2.4. Dimensions

4.2.4.1. Protective Multiple Earth Plate and Pole Number Plate design drawings shall be equivalent to those in Fig. 1 and 2. Dimensions shall be as per the drawings attached (all dimensions in mm).

4.2.4.2. The substation number plate shall be similar to pole number plate in design but of adequate width to accommodate four figures e.g. 0012 as per Fig. 2. In Annex B.

4.2.4.3. DANGER HATARI Plate design drawings and dimensions shall be given as per Fig. 3 in Annex B..

4.2.4.4. The two sizes of Danger Voltage Plates recommended shall be as follows:

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Date: 2014-09-29



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**SPECIFICATION FOR
SAFETY POLE SIGNS &
ACCESSORIES**

Doc. No. KP1/3CB/TSP/02/001

Issue No. 2

Revision No. 1

Date of Issue 2014-09-29

Page 6 of 17

- a) For display at 400 V installations - 200x150mm as per Fig. 5a in Annex B.
- b) For display at 11 kV (or higher voltages) installations - 250x200mm as per Fig. 5b in Annex B.

The corners of the plate shall be rounded off.

4.2.4.5. The location of fixing holes as shown in Figs. 1 to 5 a & b are provisional and can be modified to suit the requirements of KPLC.

4.2.4.6. Danger – Live Apparatus and Caution Notice Plates dimensions of 200 x 150 mm as per Fig. 6 & 7 in Annex B.

4.2.5. Lettering

4.2.5.1. All letterings shall be centrally spaced. The dimensions of the letters, figures and their respective position shall be as shown in Figs. 1 to 5. The size of letters in the words in each language and spacing between them shall be so chosen that these are uniformly written in the space earmarked for them.

4.2.5.2. Pole number plates shall be supplied in single digits from 0 to 9 as per tender requirement whereas the series of numbers required for substation number plates shall be given with the order.

4.2.5.3. The lettering, signs and background of the various plates shall be as Table 1:

Table 1: Lettering backgrounds

| Item | Signs and Letters | Background |
|--|-------------------|------------|
| DANGER HATARI Plate/ Danger Voltage Plates | RED | WHITE |
| Pole Number Plate | BLACK | WHITE |
| Substation Number Plate | BLACK | WHITE |
| Protective Multiple Earthing (PME) Plate | RED | YELLOW |
| Danger – Live Apparatus Plate | RED | WHITE |
| Caution Notice Plate | BLACK | YELLOW |

4.2.6. Languages

4.2.6.1. All the safety signs shall be clearly written in English language and if required in "Kiswahili" language as shall be advised by the purchaser (KPLC) during tender.

4.2.6.2. The owner of every medium, high and extra high voltage installation shall be required to affix permanently in a conspicuous position a danger notice in

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Date: 2014-09-29

Date: 2014-09-29



TITLE:

**SPECIFICATION FOR
SAFETY POLE SIGNS &
ACCESSORIES**

| | |
|---------------|--------------------|
| Doc. No. | KP1/3CB/TSP/02/002 |
| Issue No. | 2 |
| Revision No. | 1 |
| Date of Issue | 2014-09-29 |
| Page 7 of 17 | |

English language and, in addition, in the "Kiswahili" language, with the sign of skull and cross bones.

- 4.2.6.3. Adequate space shall be provided in the specimen danger voltage plates for having the letterings in "Kiswahili" language for the equivalent of 'Danger', '400', '11,000' and 'Volts'.

4.3. Quality Management System

- 4.3.1. The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the safety pole signs and accessories physical, tests and documentations, will fulfill the requirements stated in the contract documents, standards, specifications and regulations.
- 4.3.2. The Manufacturer's Declaration of Conformity to applicable standards and copies of quality management certifications shall be submitted with the tender for evaluation.
- 4.3.3. The bidder shall indicate the delivery time of the items, manufacturer's monthly & annual production capacity and experience in the production of the type and size of items being offered. A detailed list & contact addresses (including e-mail) of the manufacturer's previous customers for similar type of the safety pole signs and accessories sold in the last five years as well as reference letters from at least four of the customers shall be submitted with the tender for evaluation.

5. TESTS AND INSPECTION

- 5.1 The safety pole signs and accessories shall be inspected and tested in accordance with the requirements of 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 Type Tests 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. The accreditation certificate to ISO/IEC 17025 for the same third party testing laboratory used shall also be submitted with the tender document (all in English Language)
- 5.3 The safety pole signs and accessories shall be subject to acceptance tests at the suppliers' works before dispatch. Acceptance tests will be witnessed by two Engineers appointed by Kenya Power and Lighting Company Limited (KPLC).
- 5.4 Routine and sample test reports for the safety pole signs and accessories to be supplied shall be submitted to KPLC for approval before shipment/delivery of the goods. KPLC Engineers will witness tests at the factory before shipment.

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**SPECIFICATION FOR
SAFETY POLE SIGNS &
ACCESSORIES**

| | |
|----------------------|--------------------|
| Doc. No. | KP1/3CB/TSP/02/002 |
| Issue No. | 2 |
| Revision No. | 1 |
| Date of Issue | 2014-09-29 |
| Page 8 of 17 | |

- 5.5 Tests to be witnessed by KPLC Engineers at the factory before shipment shall be in accordance with the International Standards and this specification and shall include the following:
- a) Visual examinations and ,
 - b) Dimensional checks ,
 - c) Test for weatherproof ness as per ASTM C538-83 (or its latest version)

5.6 On receipt of the goods, KPLC will perform any of the tests specified in order to verify compliance with this specification. The supplier shall replace without charge to KPLC the safety pole signs and accessories, which upon examination, test or use; fail to meet any of the requirements in the specification.

6. MARKING ANG PACKING

6.1 Marking

In addition to markings required elsewhere in the specification, each item shall be marked with the following information:

- a) Name of manufacturer
- b) Type/Model reference number
- c) Batch number
- d) The letters 'KPLC'.



Note:
Maker's name and trade mark and the purchaser's name shall be marked in such a manner and position on the plates that it does not interfere with the other information.

6.2 Packing

The safety pole signs and accessories shall be packed in reinforced wooden crates suitable for rough handling and acceptable for rail/road transport.

7. DOCUMENTATION

7.1. The bidder shall submit its tender complete with technical documents required by Annex A (Guaranteed Technical Particulars) for tender evaluation. The technical

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TITLE:

**SPECIFICATION FOR
SAFETY POLE SIGNS &
ACCESSORIES**

| | |
|---------------|--------------------|
| Doc. No. | KP1/3CB/TSP/02/002 |
| Issue No. | 2 |
| Revision No. | 1 |
| Date of Issue | 2014-09-29 |
| Page 9 of 17 | |

documents to be submitted (all in English Language) for tender evaluation shall include the following:

- a) Guaranteed Technical Particulars 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;
- d) Details of manufacturing capacity and the manufacturer's experience;
- e) Copies of required 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) Manufacturers letter of authorization, and other technical documents required in the tender.

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

- a) Guaranteed Technical Particulars signed by the manufacturer;
- b) Design Drawings with details of safety pole signs and accessories to be manufactured for KPLC.
- 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.
- d) Detailed test program to be used during factory testing;
- e) 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 safety pole signs and accessories for The Kenya Power & Lighting Company;
- f) Packaging details (including packaging materials).

7.3 The supplier shall submit recommendations for use, care, storage and routine inspection/testing procedures, all in the English Language, during delivery of the safety pole signs and accessories to KPLC stores

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**SPECIFICATION FOR
SAFETY POLE SIGNS &
ACCESSORIES**

| | |
|---------------|--------------------|
| Doc. No. | KPI/3CB/TSP/02/002 |
| Issue No. | 2 |
| Revision No. | 1 |
| Date of Issue | 2014-09-29 |
| Page 10 of 17 | |

ANNEX A: Guaranteed Technical Particulars (to be filled and signed by the Manufacturer and submitted together with relevant copies of the Manufacturer's catalogues, brochures, drawings, technical data, sales records, four customer reference letters, details of manufacturing capacity, the manufacturer's experience and copies of test reports for tender evaluation, all in English Language)

Tender No.

| Clause number | Bidder's offer (indicate full details of the values offered) |
|---|--|
| Manufacturer's Name and address | |
| Country of Manufacture | |
| Bidder's Name and address | |
| 1. Scope | |
| 1.1-1.4 | |
| 2. Applicable Standards | |
| 3. Terms & Definitions | |
| 4. Requirements | |
| 4.1. Environmental Operating Conditions for Signs | |
| 4.2 Design and construction | |
| 4.2.1 – 4.2.2 | |
| 4.2.3 Material and finish | |
| 4.2.3.1 – 4.2.3.5 | |
| 4.2.4 Dimensions | |
| 4.2.4.1 - 4.2.4.5 | |
| 4.2.5. Lettering | |
| 4.2.5.1 – 4.2.5.3 | |
| 4.2.6. Languages | |
| 4.2.6.1 – 4.2.6.3 | |
| 4.3 Quality Management Systems | |
| 4.3.2 – 4.3.3 | |
| 5.0 Tests and Inspection | |
| 5.1 – 5.6 | |
| 6. Marking & Packaging | |
| 6.1. Marking | |
| 6.2 Packaging | |
| 7. Documentation | |
| 7.1 – 7.3 | |
| 8.0 Manufacturers Authorization and warranty | |
| 9.0 List catalogues, brochures, technical data and drawings | |

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TITLE:

**SPECIFICATION FOR
SAFETY POLE SIGNS &
ACCESSORIES**

| | |
|---------------|--------------------|
| Doc. No. | KP1/3CB/TSP/02/002 |
| Issue No. | 2 |
| Revision No. | 1 |
| Date of Issue | 2014-09-29 |
| Page 11 of 17 | |

| Clause number | Bidder's offer (indicate full details of the values offered) |
|---------------|--|
| | submitted to support the offer. |
| 10.0 | List customer sales records and customer reference letters submitted to support the offer. |
| 11.0 | List Test Certificates submitted with lender |
| 12.0 | List test reports of test to be submitted to KPLC for approval before shipment |
| 13.0 | Statement of compliance to specification (indicate deviations if any & supporting documents) |

.....
Manufacturer's Name, Signature, Stamp and Date

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Date: 2014-09-29



TITLE:
**SPECIFICATION FOR
SAFETY POLE SIGNS &
ACCESSORIES**

| | |
|---------------|--------------------|
| Doc. No. | KP1/3CB/TSP/02/002 |
| Issue No. | 2 |
| Revision No. | 1 |
| Date of Issue | 2014-09-29 |
| Page 12 of 17 | |

ANNEX B: Drawings

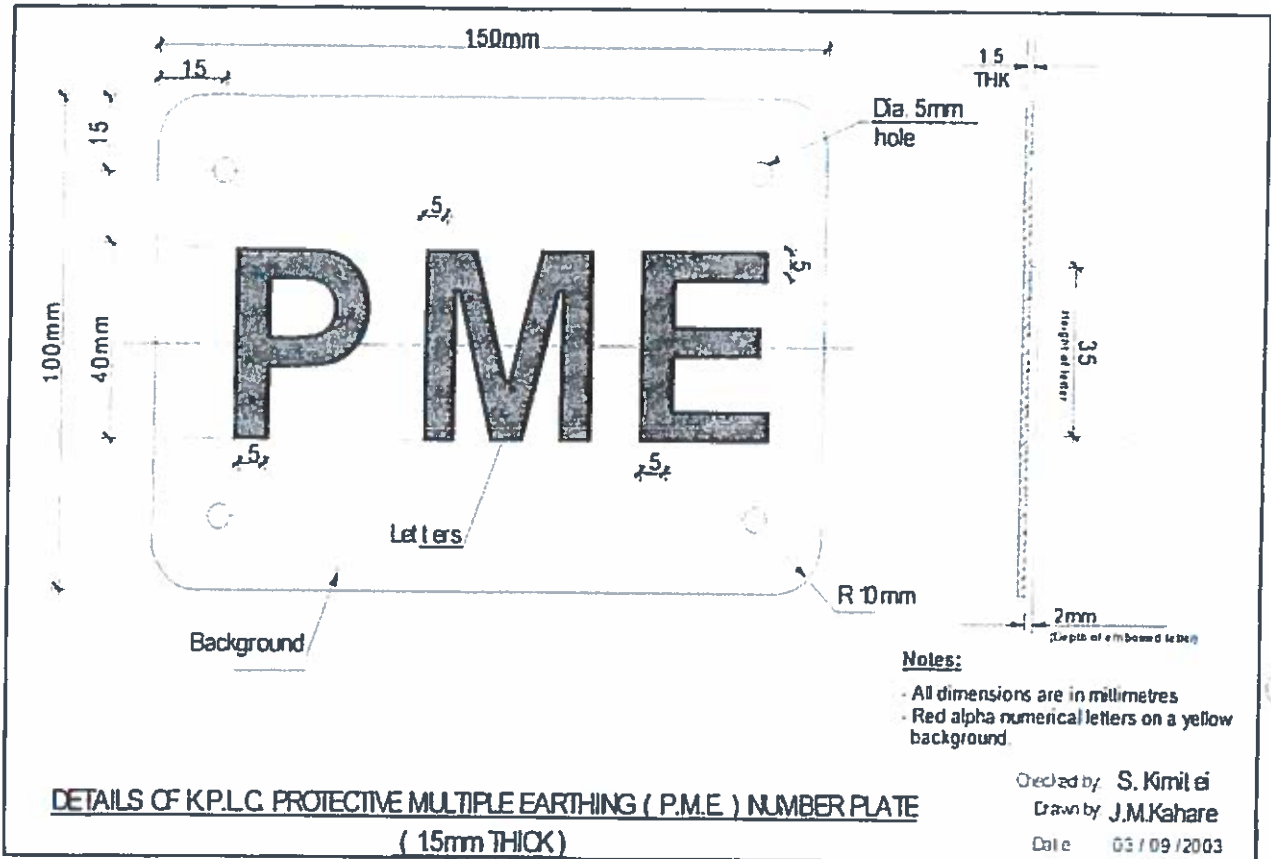


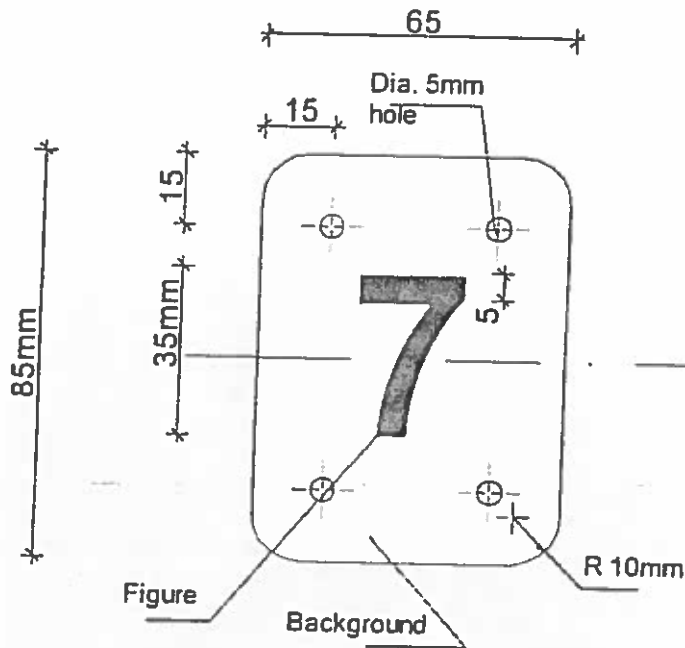
Fig 1: PME Plate

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TITLE:
**SPECIFICATION FOR
SAFETY POLE SIGNS &
ACCESSORIES**

| | |
|---------------|--------------------|
| Doc. No. | KP1/3CB/TSP/02/002 |
| Issue No. | 2 |
| Revision No. | 1 |
| Date of Issue | 2014-09-29 |
| Page 13 of 17 | |



DETAILS OF POLE NUMBER PLATE
(1.5mm THICK)

Drawn By J. Kahare

Date : 19/Jun / 2008

Fig 2: Pole Number Plate

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Date: 2014-09-29

Date: 2014-09-29



TITLE:
**SPECIFICATION FOR
SAFETY POLE SIGNS &
ACCESSORIES**

| | |
|----------------------|-------------------|
| Doc. No. | KP/3CB/TSP/02/002 |
| Issue No. | 2 |
| Revision No. | 1 |
| Date of Issue | 2014-09-29 |
| Page 14 of 17 | |

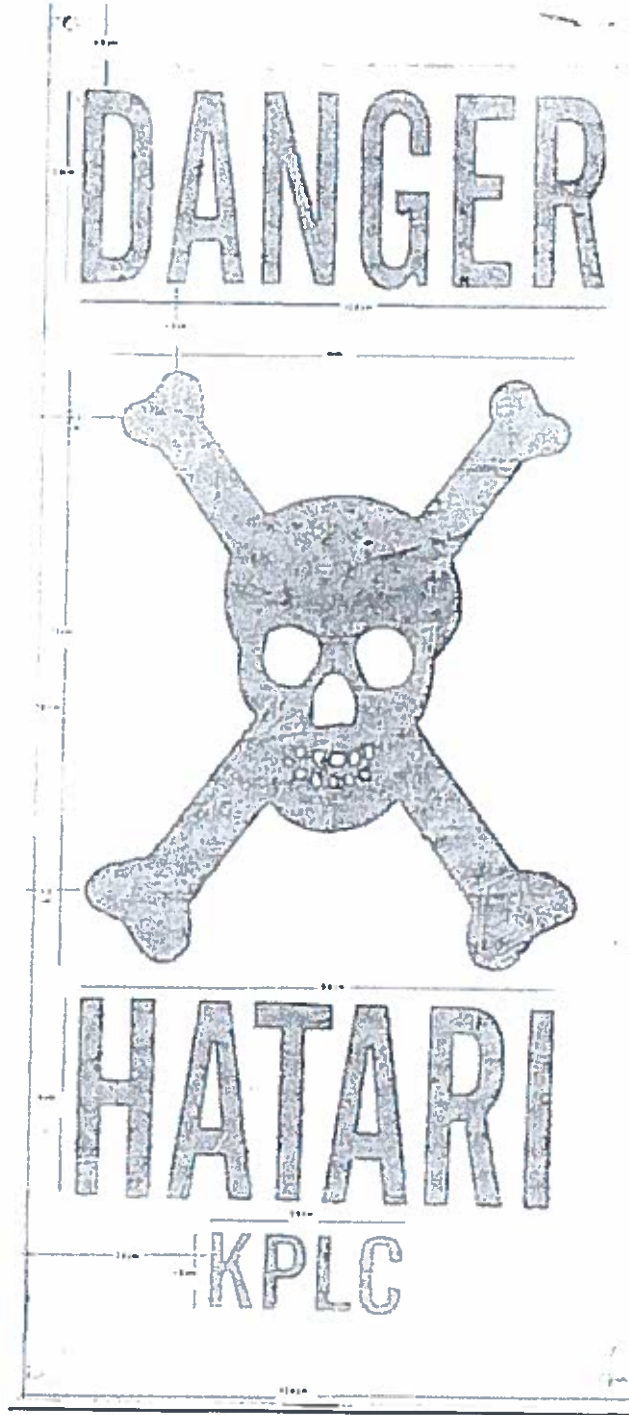

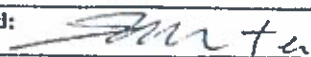
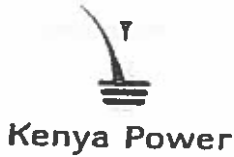


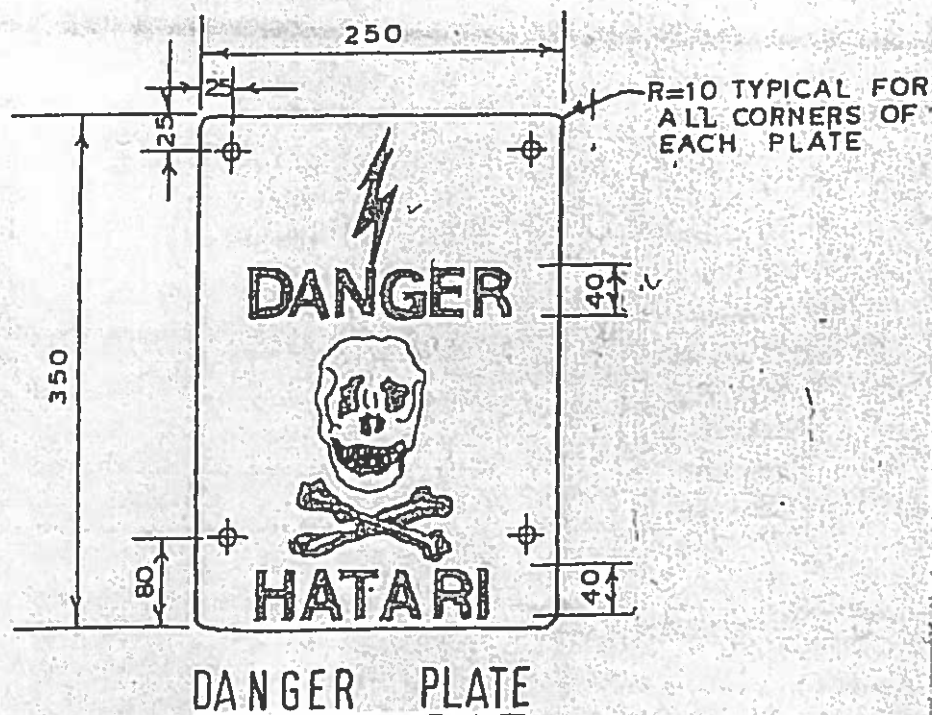
Fig 3: Danger/Hatari plate for power lines

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| Date: 2014-09-29 | Date: 2014-09-29 |



TITLE:
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SAFETY POLE SIGNS &
ACCESSORIES**

| | |
|---------------|--------------------|
| Doc. No. | KP1/3CB/TSP/02/002 |
| Issue No. | 2 |
| Revision No. | 1 |
| Date of Issue | 2014-09-29 |
| Page 15 of 17 | |



FINISH:-

FRONT:- SIGNS AND LETTERS SOLID RED
ON WHITE BACKGROUND

REAR:- BLACK

Fig. 4: Danger Hatari Plates for Substations – type 1

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Date: 2014-09-29

Date: 2014-09-29



TITLE:
**SPECIFICATION FOR
 SAFETY POLE SIGNS &
 ACCESSORIES**

| | |
|---------------|--------------------|
| Doc. No. | KP1/3CB/TSP/02/002 |
| Issue No. | 2 |
| Revision No. | 1 |
| Date of Issue | 2014-09-29 |
| Page 16 of 17 | |

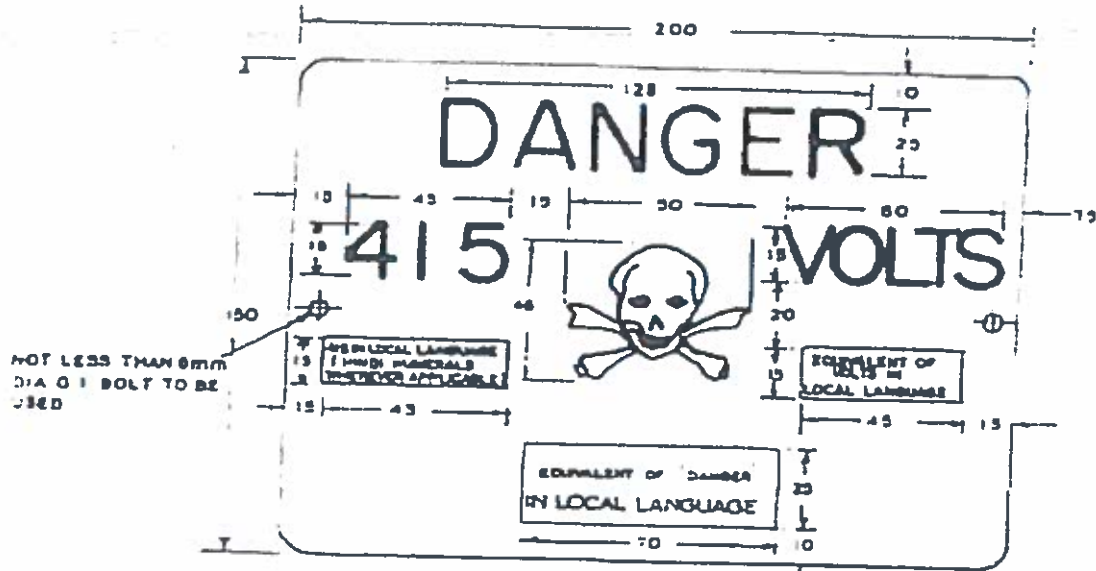


Fig. 5a: Voltage Plates for 415 Volts

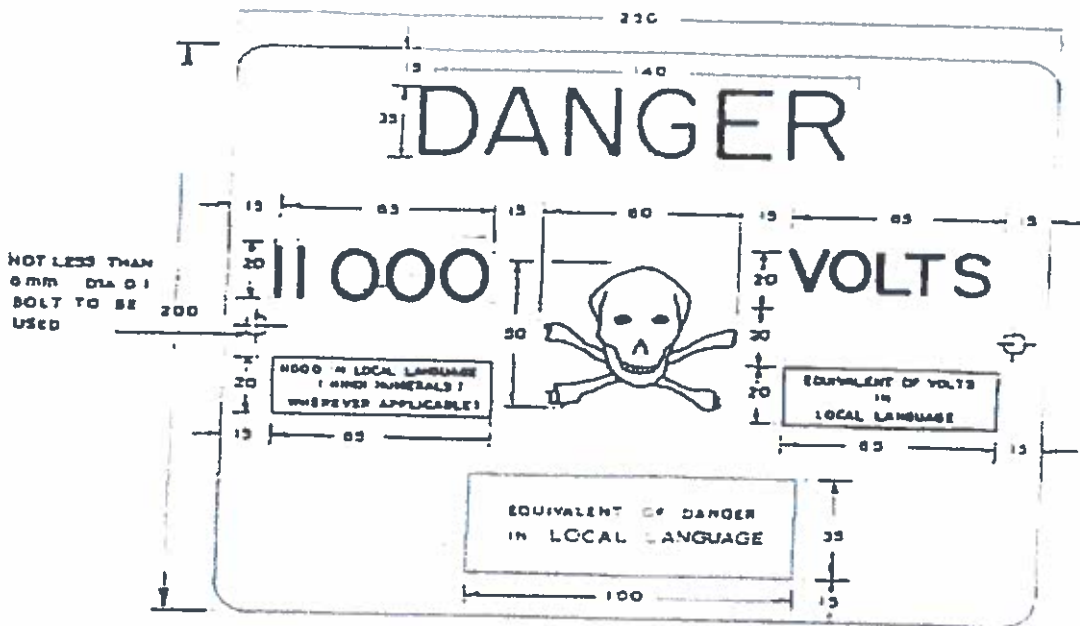


Fig. 5b: Voltage Plates for higher voltages

NOTE: The 415 shall be replaced with 400; 11,000 shall be replaced by 33,000, 66 000 etc. as required. All dimensions in mm

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TITLE:

**SPECIFICATION FOR
SAFETY POLE SIGNS &
ACCESSORIES**

Doc. No. KPI/3CB/TSP/02/002

Issue No. 2

Revision No. 1

Date of Issue 2014-09-29

Page 17 of 17

200MM

150MM

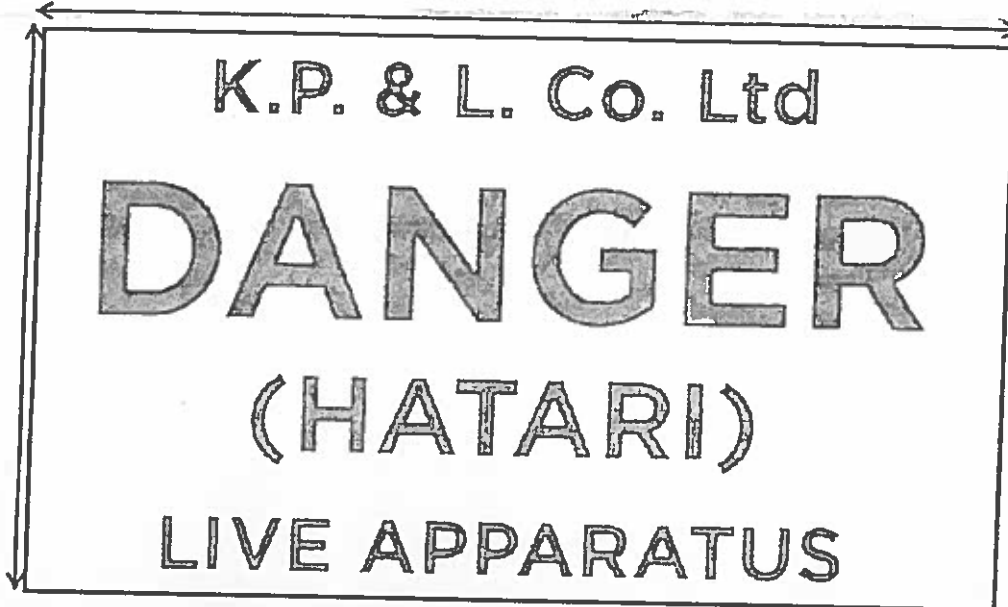


Fig. 6: Danger - Live Apparatus Notice Plate

200MM

150MM

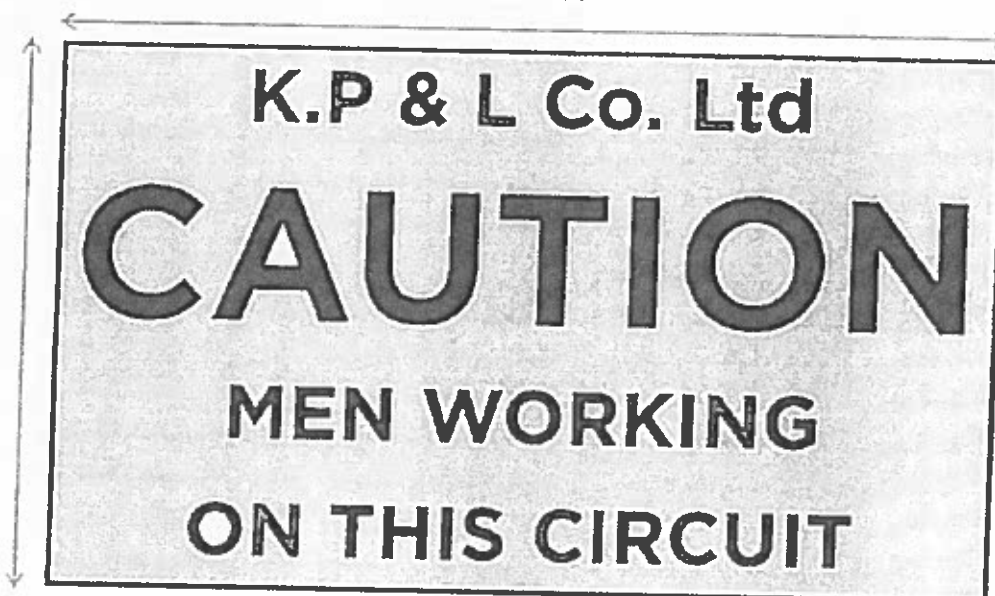


Fig. 7: Caution Notice Plate

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