



Kenya Power

TITLE:

**SPECIFICATION FOR STEEL
STRUCTURES FOR OVERHEAD
LINES**

Doc. No.

KP1/6C/13/TSP/03/003

Issue No.

2

Revision
No.

0

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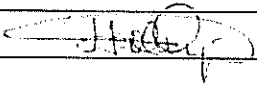
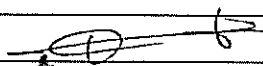
0.2 Amendment Record

FOREWORD

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

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 complete type test certificates and type test reports for tender evaluation, all in English Language)*

ANNEX B: DRAWINGS

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- a) The tensile strength shall be 410 to 560MPa;
- b) The yield strength shall be 275MPa,
- c) Minimum percentage elongation after fracture ($L_0 = 5.65 \sqrt{S_0}$) shall be 23% ;
- d) Impact strength of minimum energy shall be 27 J at a temperature of 20°C;
- e) Chemical composition of the ladle analysis for flat and long products of this steel grade shall be as per Table 1:

Table 1: Ladle analysis

Properties	Requirement
Designation	S.275JR
Method of de-oxidation	FN
C in % max. for nominal product thickness in mm	0.21
Si % max.	-
P % max.	1.50
S % max.	0.035
N % max.	0.035
Cu % max.	0.012
Other % max.	0.55
FN = rimming steels not permitted; FF = fully killed steel (see clause 6.2.2 of BS EN 10025-2).	

- 4.2.3. Equal and unequal angle sections shall conform to BS EN 10056 Part 1. Channel sections shall conform to BS 4, Part 1 and KS 02-572. Flat sections shall comply with BS 6722.
- 4.2.4. Bending of flat straps shall be carried out cold then stress-relieved at 600°C minimum or alternatively hot bent.
- 4.2.5. All ferrous materials shall be hot dip galvanized in accordance with ISO 1461 after fabrication and as per clause 4.3.6.
- 4.2.6. Welding shall be carried out in accordance with BS EN 1011 Part 1. After welding and before galvanizing, welds shall be thoroughly cleaned to remove slag and splatter, particular attention being paid to the toes of the welds and to the prevention of entrapment of slag and splatter. The preferred method of cleaning welds before galvanizing is by sandblasting.

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4.3.6.3. The zinc coating shall be uniform, clean, smooth and as free from spangle as possible.

4.3.6.4. Where specifically requested by KPLC, galvanized steel structures shall be treated after galvanizing with Sodium Dichromate Solution.

Table 1: Zinc coating thickness

	Steel Structures for Inland installations	Steel Structures for installation along the coast
Minimum average coating thickness	85µm	110µm
Post-treatment (chromating)	See Tender Requirements	See Tender Requirements

5. TESTS AND INSPECTION

5.1. The steel structures for overhead lines shall be inspected and tested in accordance with the requirements of BS EN 10025-3:2004, ISO 1461:2009, BS EN 1011 Part 1, applicable Kenyan standards and all the provisions of this specification. It shall be the responsibility of the supplier to perform or to have performed the tests specified and whatever other tests he normally performs at works.

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). The type tests shall include:

- a) Steelwork shall be inspected and tested in accordance with BS EN 10025 – 3: 2004 Type S.275JR. The shall include:
 - (i) Classification and designation – clause 4.0
 - (ii) Manufacturing process – clause 6.0
 - (iii) General requirements – clause 7.1
 - (iv) Chemical composition – clause 7.2
 - (v) Mechanical properties – clause 7.3
 - (vi) Technological properties – clause 7.4
 - (vii) Surface properties – clause 7.5
 - (viii) Internal soundness – clause 7.6
 - (ix) Inspection – clause 8.0

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d) The mark of the external inspection representative (where applicable).

NOTE: This depends on the type of inspection document (see clause 8.2 of BS EN 10025-1).

6.1.2. Marking shall be at a position close to one end of each product or on the end cut face at the manufacturer's discretion, but shall be so positioned as to avoid confusion with regulatory marking. Where regulatory marking also meets the requirements for this clause, this Clause will be deemed to have been satisfied without repetition of the information provided with the regulatory marking.

6.2. Packaging

6.2.1. The supplier shall ensure that each item is suitably packaged ensuring it is "fit for service" prior to installation taking account of the potential for an outdoor storage environment. All packaging shall be sufficiently durable giving regard to the function, reasonable use and contents of the packaging. Where steelwork sets are required they shall be supplied securely packaged together.

6.2.2. Palletised goods shall be supplied on standard 1200mm x 1000mm pallets.

6.2.3. Clearly legible, easily identifiable, durable and unambiguous labelling shall be applied to each individual and where relevant multiple package of like products. Where product packages tendered are made up of sub packages, each sub package shall be marked. As a minimum requirement the following shall be included.

- a) Manufacturer's trademark or name
- b) Supplier's trademark or name
- c) Description of item
- d) Date of packaging and/or batch number
- e) KPLC product code
- f) Weight

6.2.4. Each assembly and package of items associated with this specification shall be suitably marked with reference to KPLC Stores Code.

6.2.5. Where an item includes a number of components to form a complete assembly, all component parts shall be included in one composite package which shall be firmly strapped or bound together.

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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 & calculations, sales records for past five years, four customer reference letters, details of manufacturing capacity, the manufacturer's experience, copies of complete type test reports and accreditation certificate to ISO/IEC 17025 for the third party testing laboratory for tender evaluation, all in English Language).

BIDDERS NAME & ADDRESS

TENDER NO.

Description		Bidders offer	
	Name of Manufacturer & Country of manufacture of the	State	
	Type/Model Reference Number	State	
1.	Scope		
	Type and Size		
	Steel cross arms of different configurations for use on power poles	State	
	Supporting steelworks for distribution transformers, fuses, isolating links and other line equipment.	State	
	Steelworks for supporting and terminating HV and MV/LV overhead lines and services.	State	
2.	Standards of manufacture	State	
3.	Terms and definitions	State	
4.	Requirements	State	
4.1	Service Conditions	State	
4.3	Items shall be as per ENA TS 43- 95, Issue 5	State the offered values as per the test reports, catalogues, brochures, and or drawings for each item offered.	
	Physical characteristics		Grade of steel
			Standard of manufacture
			Tensile strength, MPa
			Yield Strength, MPa
			Min, % elongation after fracture($L_0=5.65 \cdot S^{1/2}$)
	Chemical composition of steel		Impact strength (J)
			Designation
			Method of de-oxidation
			C in % max. for nominal product thickness in mm
		Si % max.	

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5.3	Acceptance tests to be witnessed by KPLC at factory before shipment	provide
5.4	Test reports to be submitted by supplier to KPLC for approval before shipment	provide
5.5	Replacement of rejected steel structures	provide
6.1	Marking	provide
6.2	Packing	provide
7.1	Documents submitted with tender	provide
7.2	Documents to be submitted by supplier to KPLC for approval before manufacture	provide
8.0	Manufacturer's Guarantee and Warranty	provide
9.0	List catalogues, brochures, technical data and drawings submitted to support the offer	provide
10.0	List customer sales records and reference letters submitted to support the offer	provide
11.0	List Test Certificates submitted with tender	provide
12.0	List test reports of the surge arresters to be submitted to KPLC for approval before shipment	provide
13.0	Statement of compliance to specification (indicate deviations if any & supporting documents)	provide

NOTE:

- 1) Bidders shall give full details of the offered values for the items on order as per Annex A. The details provided shall conform to the test reports and their certificates as required by clause 5.2., well labeled drawings complete with dimensions, catalogues and/or brochures for the purpose of tender evaluation. Bidders who shall have not complied by this requirement shall be automatically disqualified from bidding this item.*
- 2) The schedule in Annex A does not in any way substitute for detailed information required elsewhere in the specification.*

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

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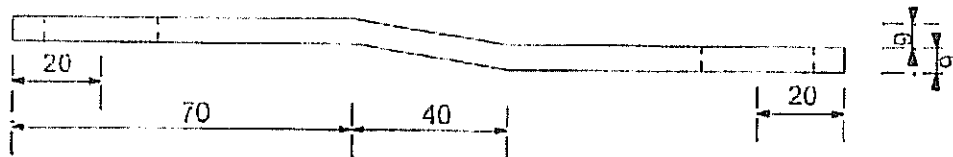
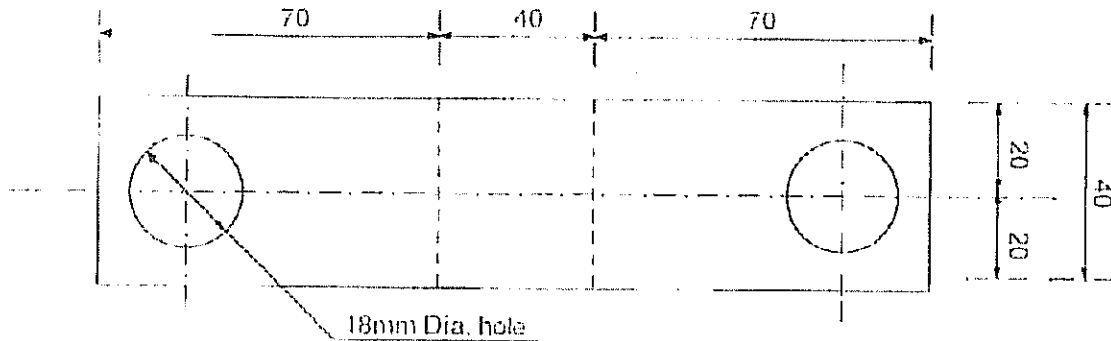


FIG. 2: SHACKLE STRAP (LV Extension Strap): KPLC CODE 188104 (180mm x 40mm x 6mm structural steel, galvanized)

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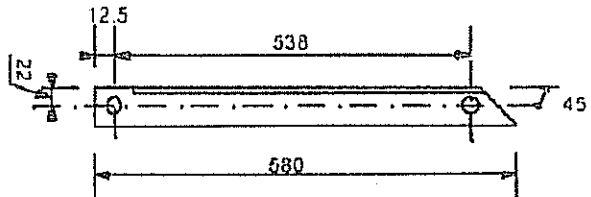
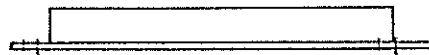
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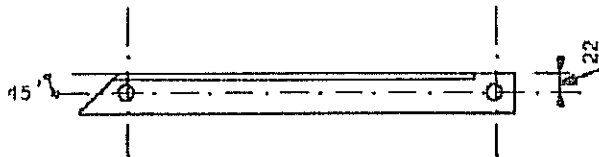
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1 - OFF R - HAND



1 - OFF L - HAND

68 x 68 x 6.25mm MS ANGLE

FIG. 3B: 11KV ANGLE TIE STRAP: KPLC CODE 188111 (580mm x 68mm x 68mm x 6.25mm structural steel angle, galvanized)

NOTE: To be supplied in pairs, application similar to that shown in Fig. 17.

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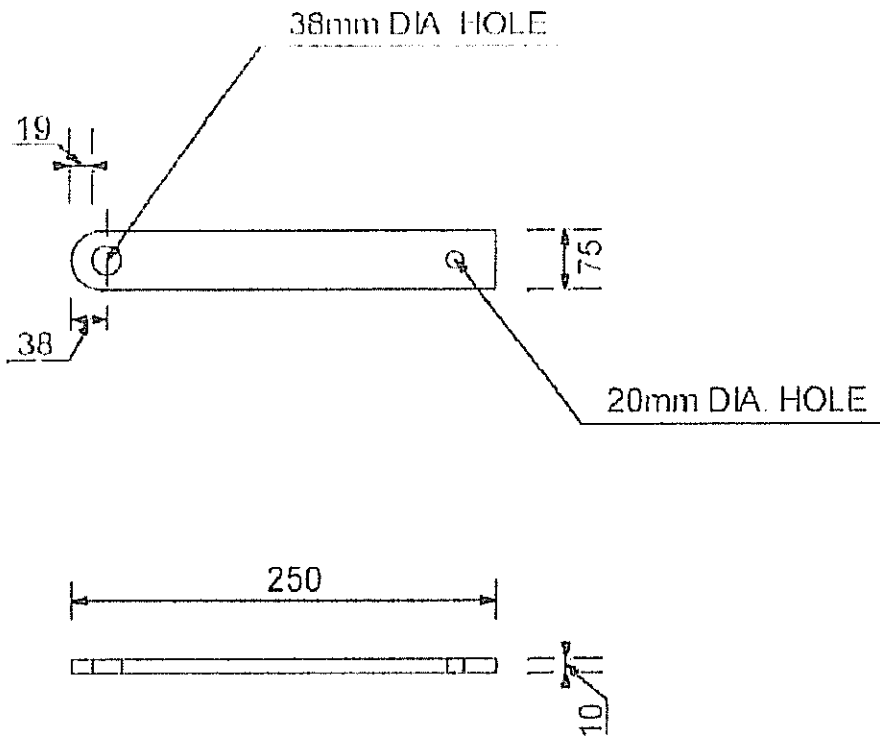


FIG. 5: 11KV TERMINAL STRAP: KPLC CODE 188107 (250mm x 75mm x 10mm structural steel flat, galvanized)

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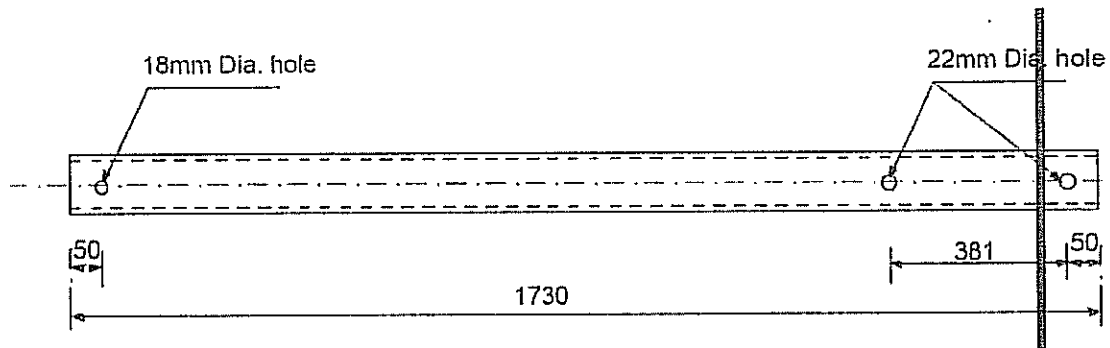


FIG. 7: EARTH STOCK: KPLC CODE 186928 ('U' Channel 1730mm x 100mm x 50mm x 6mm structural steel, galvanization.

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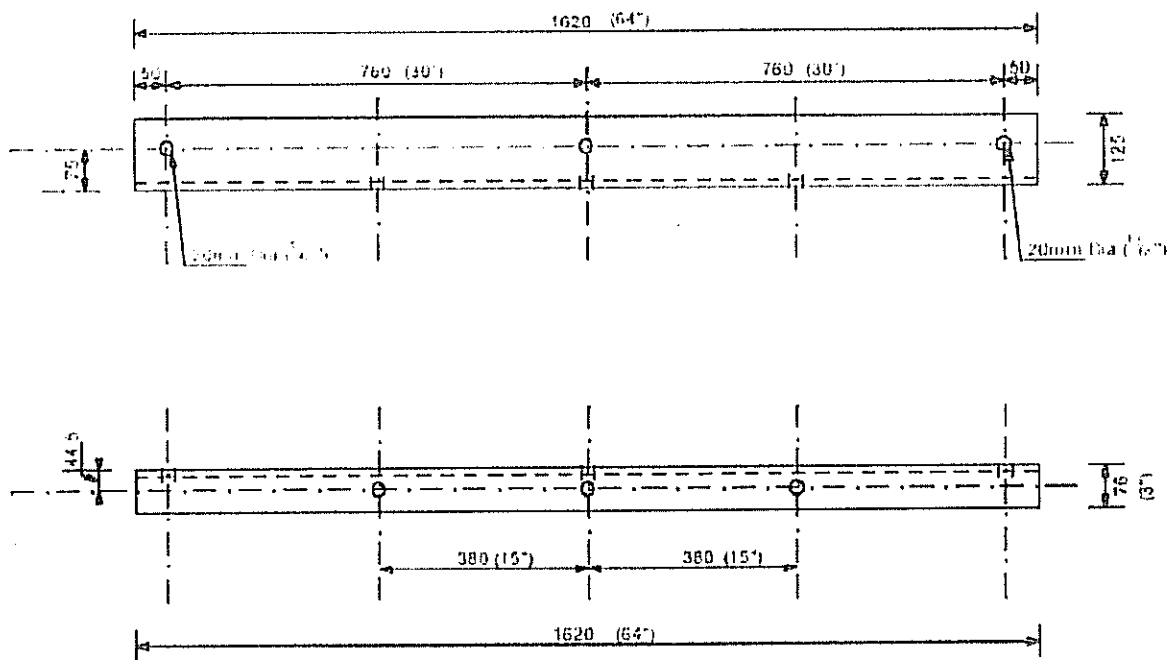


FIG. 8B: 11kV TERMINAL CROSS ARM: KPLC CODE 182914 (L1620mm x 125mm x 76mm x 9.5mm structural steel angle, galvanized)

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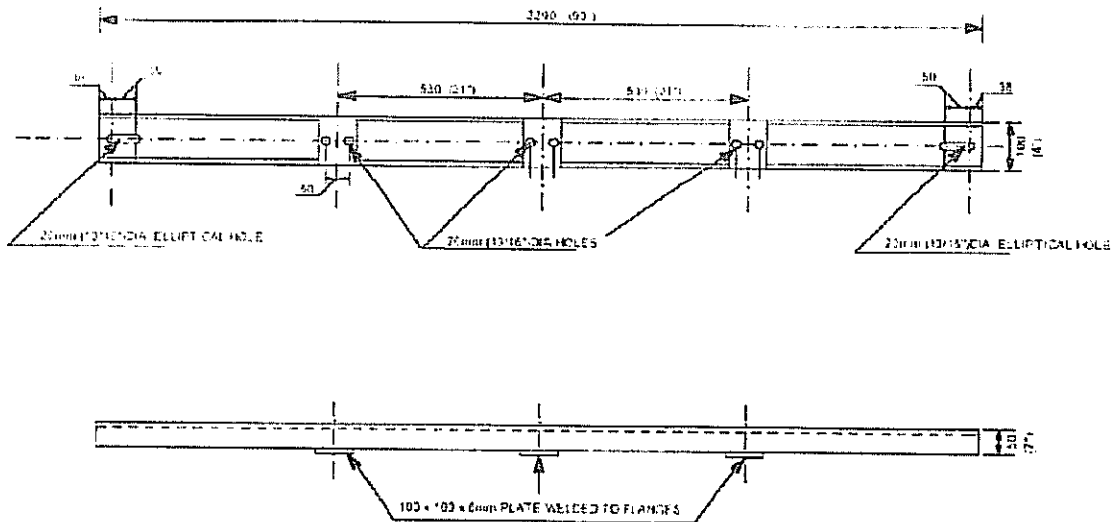


FIG. 10: FUSE/SOLID LINK CROSS MEMBER CHANNEL: KPLC CODE 186925 - (U2290 x 100 x 50x6mm structural steel, galvanized) KPLC CODE 186926 - (U2290 x 125 x 64x6mm structural steel, galvanized)

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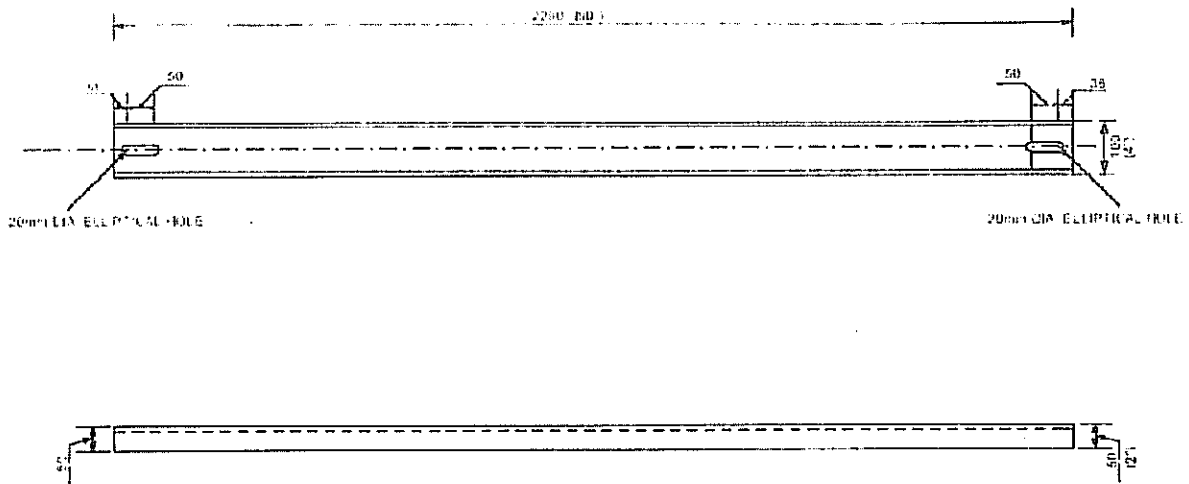


FIG. 12: TRANSFORMER PLATFORM UP TO 200 KVA KPLC CODE 186923: (U2290mm x100mm x 50mm x 6mm structural steel, galvanized)

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