



The Kenya Power & Lighting
Co. Ltd.

TITLE:
**SPECIFICATION FOR TUBULAR
STAY RODS AND TURNBUCKLES**

Doc. No.	KPLC1/3GB/TSP/03/022
Issue No.	1
Revision No.	1
Date of Issue	2009-08-24
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Issued by: Head of Section, Technical Stds & Specs

Authorized by: Head of Department, R&D

Signed:

[Signature]

Signed:

[Signature]

Date:

2009-08-24

Date:

2009-08-26



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0.1 Circulation List

COPY NO.	COPY HOLDER
1	Research & Development Manager
2	Procurement Manager
3	Stores & Transport Manager
4	Design & Construction Manager
5	Operations and Maintenance Manager
6	Deputy Manager, Technical Audit

0.2 Amendment Record

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)
1	2009-08-24	Included drawings for stay rods (TSP/03/022/01 & 02)	S. Kimiti <i>S. Kimiti</i> 2009-08-24	G. Gathige <i>G. Gathige</i>

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S. Kimiti

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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 Tubular Stay Rods and Turnbuckles. It is intended for use by KPLC in purchasing the items.

The manufacturer shall submit information which confirms satisfactory service experience with products which fall within the scope of this specification.

1. SCOPE

1.1 This specification covers Tubular Stay Rods and Turnbuckles for use on stays and for similar purposes on overhead power lines.

1.2 This specification covers the following sizes:

1.2.1 Tubular Stay Rods:

- a) 6ft x $\frac{5}{8}$ "
- b) 8ft x $\frac{3}{4}$ "
- c) 9ft x 1"

1.2.2 Turnbuckle Double Eye Bolt:

- a) 10" x $\frac{5}{8}$ "
- b) 12" x $\frac{3}{4}$ "

The specification also covers inspection and test of the Tubular Stay Rods and Turnbuckles as well as schedule of Guaranteed Technical Particulars to be filled, signed by the manufacturer and submitted for tender evaluation.

The specification stipulates the minimum requirements for Tubular Stay Rods and Turnbuckles acceptable for use in the company (KPLC) and it shall be the responsibility of the Manufacturer to ensure adequacy of the design, good workmanship and good engineering practice in the manufacture of the Tubular Stay Rods and Turnbuckles for KPLC.

The specification does not purport to include all the necessary provisions of a contract.

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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.

ISO 1461: Metallic Coatings – Hot dip galvanized coatings on fabricated ferrous products – Requirements.

ISO 1460: Metallic Coatings – Hot dip galvanized coatings on fabricated ferrous metals – Determination of mass per unit area – Gravimetric method.

BS 464: Specification for thimble for wire ropes.

BS 1387: Specification for screwed and socketed steel tubes and tubulars and for plain and steel tubes suitable for welding or screwing to BS 21 pipe threads.

BS 3643: ISO metric screw threads.

BS 4360: Specification for weldable structural steels.

3. TERMS AND DEFINITIONS

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

4. REQUIREMENTS

4.1 SERVICE CONDITIONS

The Tubular Stay Rods and Turnbuckles shall be suitable for continuous use outdoors in tropical areas at humidity of up to 90%, average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C and heavy saline conditions along the coast. The level of galvanizing for all ferrous parts shall be suitable for these conditions.

4.2. MATERIALS

4.2.1. Tubular Stay Rods

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4.2.1.1 The tubular turnbuckle (the tube portion of the adjustable rod) shall be manufactured from heavy gauge steel tube as specified in BS 1387.

4.2.1.2 The threads shall be to BS 3643, coarse pitch, tolerance class 7H/8g (free fit).

4.2.1.3 The screw-in stay anchor and the adjustable head shall be manufactured from Grade 43A steel as specified in BS 4360.

4.2.1.4 The thimble shall be manufactured from standard crescent shaped steel bar as used for thimbles to BS 464.

4.2.2. Turnbuckles, Double Eyebolt

4.2.2.1 The turnbuckle shall be manufactured from Grade 43A steel as specified in BS 4360. The Threads shall be to BS 3643, course pitch tolerance class 7H/8g (free fit).

4.3. CONSTRUCTION

4.3.1 Tubular Stay Rods

4.3.1.1 The tubular turnbuckle shall have hexagon head (consisting of a forged hex ended plug welded in the tube and tapped right hand). It shall have provision for greasing.

4.3.1.2 The stay anchor and the adjustable head shall have hexagon lock nuts of the same size as the hexagon head of the tubular turnbuckle.

4.3.1.3 The lower end of the stay anchor shall be forged square to fit square plate.

The stay rod shall be complete with a square plate for securing the rod to a concrete stay block. The dimensions of the square plate shall be 100x100x6mm and 100x100x12mm as indicated on the drawings for each size of stay rod.

4.3.1.4 The stay adjustable head shall have a forged eye with a thimble suitable for the specified stay wire sizes.

4.3.1.5 The stay rod assembly shall be galvanized to ISO 1461.

4.3.1.5 The complete stay rod assembly shall have the minimum failing load as stated in clause 4.4 and shall be in accordance with Drawings No. TSP/03/022/01 & 02.

4.3.2 Turnbuckles, Double Eyebolt

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4.3.2.1 The turnbuckle shall have a forged eye bolt at each end and shall be supplied complete with hexagon lock nuts and thimble on each side suitable for the specified stay wire size.

4.3.2.2 The turnbuckle shall be double screw threaded in opposite directions to achieve simultaneous adjustment/tightening.

4.3.2.3 The complete turnbuckle assembly shall be galvanized to ISO 1461 and have the minimum failing load as stated in clause 4.4.

4.4. STANDARD SIZES

4.4.1 The standard sizes for the Tubular Stay Rods shall be as follows:

SIZE	MINIMUM FAILING LOAD	SIZE OF STAY WIRE (Stay wire to BS183)
6ft x $\frac{5}{8}$ "	52 kN	4/8 stay wire
8ft. x $\frac{3}{4}$ "	71.3 kN	7/8 stay wire
9ft. x 1"	145 kN	19/10 stay wire

4.4.2 The standard sizes for the Turnbuckles (double eye bolt) shall be as follows:

SIZE	MINIMUM FAILING LOAD	SIZE OF STAY WIRE (Stay wire to BS183)
10" x $\frac{5}{8}$ "	52 kN	4/8 stay wire
12" x $\frac{3}{4}$ "	71.3 kN	7/8 stay wire
10" x $\frac{7}{8}$ "	145 kN	19/10 stay wire

5. TESTS AND INSPECTION

5.1 Tests shall be done in accordance with the requirements of BS 4360, BS 464, BS 1387, BS 3643, ISO 1461, ISO 1460 and the requirements of this specification. It shall be the responsibility of the manufacturer to perform or to have performed all the tests specified.

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5.2 Certified true copies of previous test reports by the relevant National Testing/Standards Authority of the country of manufacture (or ISO/IEC 17025 accredited laboratory) shall be submitted with the offer for evaluation (all in English Language). A copy of Accreditation Certificate for the laboratory shall be submitted to support the test reports.

5.3 The stay rods and turnbuckles 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).

5.4 Test reports for the stay rods and turnbuckles to be supplied shall be submitted to KPLC for approval before shipment/delivery of the goods.

6. MARKING AND LABELLING

6.1 The following information shall be marked legibly and indelibly on the stay rod/turnbuckle:.

- i) Manufacturer's Name or Trademark;
- ii) Manufacturer's Type Designation;
- iii) Minimum Failing Load and Dimensions.

.....THIS SPACE LEFT BLANK.....

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ANNEX A: Guaranteed Technical Particulars and Statement of Compliance (to be filled and signed by the Manufacturer and submitted together with copies of Manufacturer's catalogues, brochures, drawings, technical data, sales records, copy of accreditation certificate for test laboratory and certified true copies of test reports for tender evaluation)

	Description	Bidder's Offer (indicate supporting documents submitted)
1	Manufacturer's name & country of manufacture of item offered	
2	Manufacturer's type reference number for the item	
3	Manufacturer's drawing number	
4	Type & size	
5	Materials: a) Tubular part	
	b) Stay anchor & adjustable head	
	c) Thimble	
6	Construction: a) Tubular turnbuckle	
	b) Lower end	
	c). Adjustable head	
	d) Threads	
	e) Galvanizing	
	f) Minimum failing load for complete assembly	
7	List copies of test reports submitted as required	
8	List copies of catalogues, brochures and technical data submitted to support offer	
9	List sales records submitted to support offer	
10	Copy of accreditation certificate for laboratory	
11	List tests to be witnessed by KPLC at factory	
12	Indicate markings to be applied on item	
13	Statement of compliance to tender specifications (indicate deviations if any)	

NB: - This schedule shall be used during tender evaluation and must be supported by Manufacturer's catalogues, brochures, drawings, technical data, sales records, copy of accreditation certificate for test laboratory and certified true copies of test reports.

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

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Authorized by: Head of Department, R&D

Signed:

[Signature]

Signed:

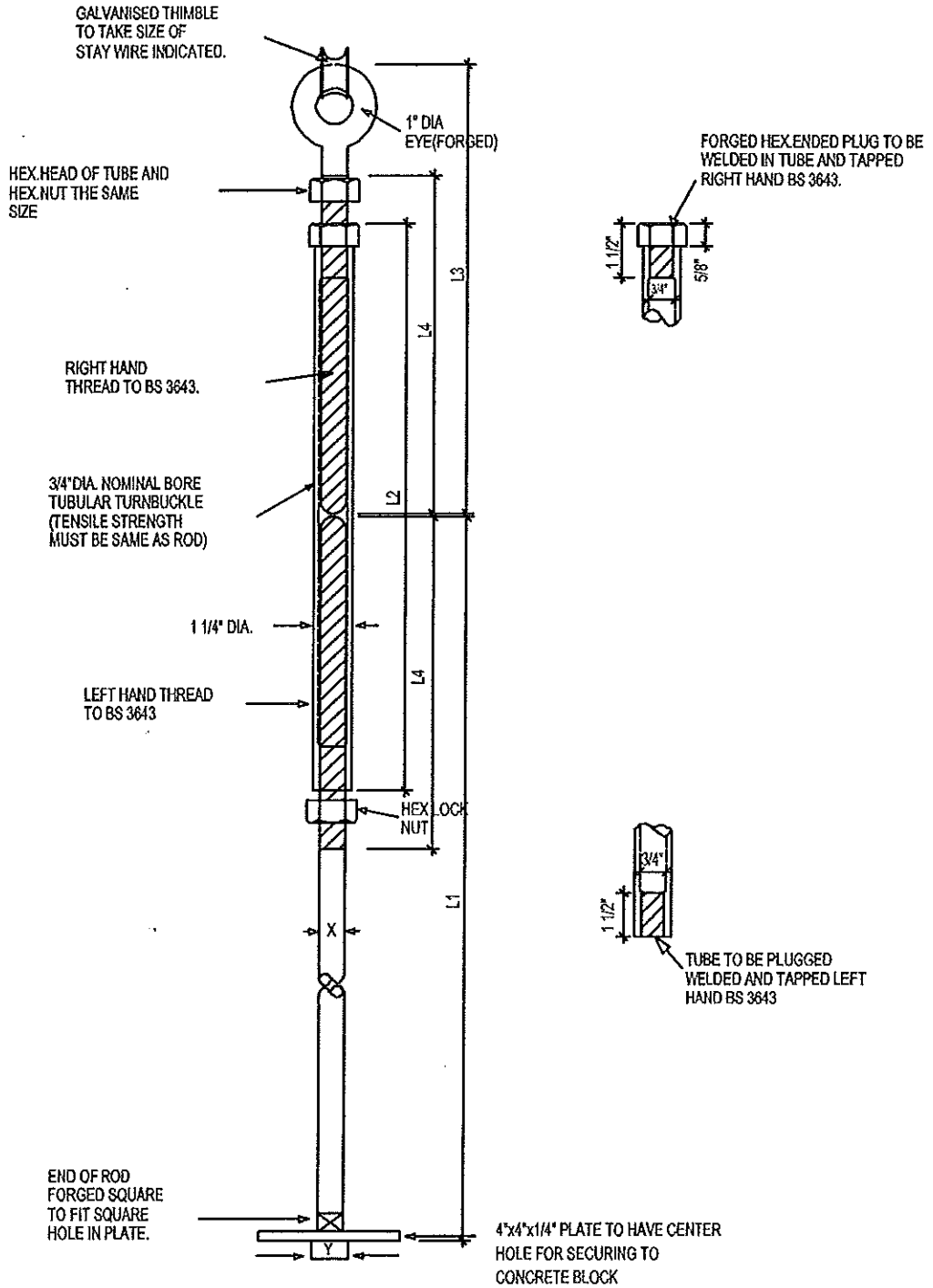
[Signature]

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2009-08-24

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2009-08-26



NOTE:
 THE THREADS OF THE ROD AND EYEBOLT MUST BE CUT BEFORE GALVANIZING, AND WHEN ASSEMBLED SHOULD BE A HAND FIT IN THE TUBULAR TURNBUCKLE.

DIM	X	Y	L1	L2	L3	L4	MFL	SIZE OF STAY WIRE (TO BS183)
5/8"x6FT	5/8"	3/8"x5/8"	6FT	16"	12"	9"	52 KN	7/8 SWG

Dimensions in inches or in nearest metric equivalent

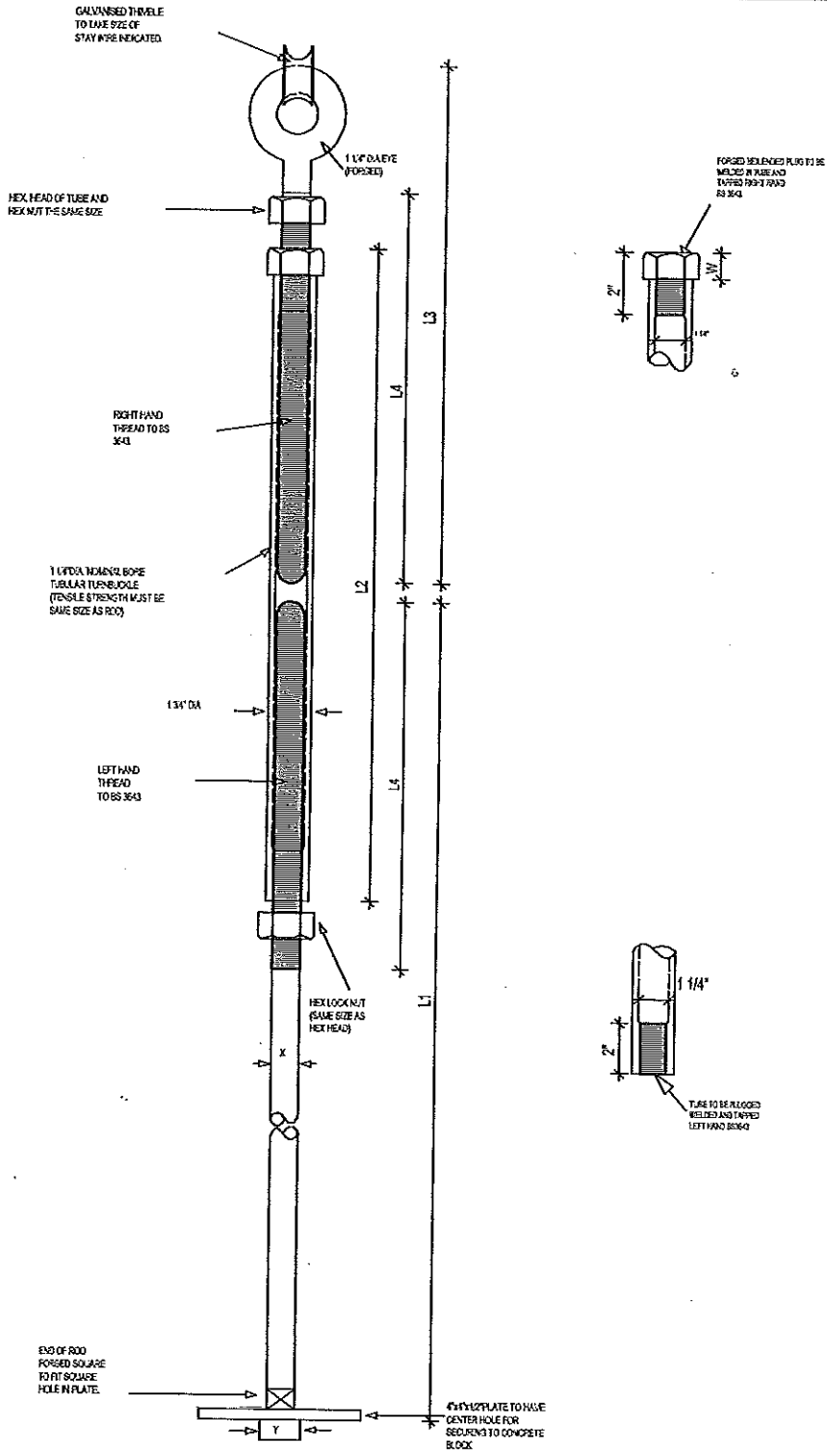
**MATERIAL: HDG STEEL
 GALVANIZING ISO 1461**

DATE	BY	CHK	APP	REASON	DATE	BY	CHK	APP	DATE
24/11/03	S. H.								
24/11/03	H.M.								
24/11/03	M.A.R.								

STAY ROD 5/8"x6FT

K.P.&L. CO. Ltd

Dwg.No.Tsp/03/022/01



NOTE:
THE THREADS OF THE ROD AND EYEBOLT MUST BE CUT BEFORE GALVANIZING AND WHEN ASSEMBLED SHOULD BE A HAND FIT IN THE TUBULAR TURNBUCKLE.

DM	X	Y	L1	L2	L3	L4	MFL	W	SIZE OF STAY WIRE TO BS 153
1"x8FT	1	2x1"	8FT	15"	13"	8"	145KN	1"	15/13 SWG
3/4"x8FT	3/4"	1 1/2x3/4"	8FT	15"	13"	8"	71.5KN	3/4"	7/8 SWG

Dimensions in inches or in nearest metric equivalent

MATERIAL: HDG STEEL
GALVANIZING ISO 1461

APPROV	CHK	CHK	CHK	CHK	CHK	CHK	CHK	CHK
DESIGN	28/1/18	S.L.	28/1/18					
CHECK	28/1/18	H.M.	28/1/18					
DATE	28/1/18	H.M.	28/1/18					
NOV								

STAY ROD 1"x9FT AND 3/4"x8FT

K.P.&L CO. Ltd

Dr. No.Tsp/13/22/22