



TITLE:

**SPECIFICATION FOR FASTENERS  
AND WASHERS FOR OVERHEAD  
LINES.**

Part 3: Metal Anchors for Use in  
concrete (Rawl Bolts)

Doc. No.	KP1/3CB/TSP/02/003-3
Issue No.	2
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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, sales records, four customer reference letters, details of manufacturing capacity, the manufacturer's experience and copies of complete type test reports for tender evaluation, all in English Language)*

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**0.1 Circulation List**

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**0.2 Amendment Record**

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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 Metal Anchors for use in Concrete (Rawl Bolts). It is intended for use by KPLC in purchasing the items.

## 1. SCOPE

- 1.1. This specification covers the listed different types of Metal Anchors (Rawl Bolts) for fixing into concrete, brick and stone to secure steelwork and equipment used in transmission and distribution of electricity. These includes:
  - a) Rawl bolt Shield Anchor Loose Bolt
  - b) Rawl bolt Shield Anchor Bolt Projecting
  - c) Rawl bolt Shield Anchor Hook Bolt
  - d) Rawl bolt Shield Anchor Eye Bolt
- 1.2. The specification also covers inspection and test of the rawl bolts as well as schedule of Guaranteed Technical Particulars to be filled, signed by the manufacturer and submitted for tender evaluation.
- 1.3. The specification stipulates the minimum requirements rawl bolts; acceptable 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 rawl bolts 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 edition of the referenced documents (including any amendments) applies.

ISO 898: Mechanical properties of fasteners made of carbon steel and alloy steel - Part 1: Bolts, screws and studs with specified property classes - Coarse thread and fine pitch thread.

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Part 2: Nuts with specified property classes -- Coarse thread and fine pitch.

- ISO 887: Plain washers for metric bolts, screws and nuts for general purposes -- General plan
- ISO 262: ISO general purpose Metric Screw Threads --Selected sizes for screws, bolts and nuts.
- ISO 68-1: ISO general purpose screw threads — Part 1: Basic profile
- ISO 965-1&2: ISO general purpose metric screw threads – Tolerances.  
Part 1: Principles and basic data;  
Part 2: Limits of sizes for general purpose external and internal screw threads — Medium quality
- ISO 6157-1: Fasteners -- Surface discontinuities -- Part 1: Bolts, screws and studs for general requirements
- ISO 1461: Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods
- ISO 2859-1: Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection

EATG 001-1 & 3: Metal Anchors for use in Concrete

**3. TERMS AND DEFINITIONS**

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

**3.2. Abbreviations**

- a) EATG – European Technical Approval Guideline.
- b) HV – Vickers Hardness

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## 4. REQUIREMENTS

### 4.1. Service Condition

The rawl bolts shall be suitable for continuous use outdoors in tropical areas at;

- a) Altitudes of up to 2200m above sea level,
- b) Humidity of up to 90%,
- c) Average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C and
- d) Heavy saline conditions along the coast.

### 4.2. Design and construction

- 4.2.1. The metal anchors shall be shell type torque-controlled expansion anchors with one expansion sleeve cone as specified in ETAG 001 Parts 1 & 3 standard.
- 4.2.2. They shall be designed to offer a high performance steel expansion anchor, suitable for exceptional tension, shear and combined load performance in concrete.
- 4.2.3. They shall have a high degree of reliability and shall sustain all actions and influences likely to occur during execution and use (ultimate limit state).
- 4.2.4. They shall also not deform to an inadmissible degree (serviceability limit state) and shall remain fit for the use for which they are required (durability).
- 4.2.5. They shall not be damaged by accidental events to an extent disproportional to the original cause. The design working life shall not be less than that of the fixture (e.g. concrete). The safety factors for resistance and durability in this case shall be based on a nominal working life of at least 50 years for the fastening.
- 4.2.6. All the body parts shall be hot dip galvanized by centrifuging process. The coating shall conform to a minimum thickness of 40µm or 285g/m<sup>2</sup> as per the requirements of ISO 1461:2009.
- 4.2.7. The surface finish shall have a shiny iridescent yellow appearance - zinc plate gold (ZPG), which is thicker and gives marginally better protection; this shall be enhanced by a chemical chromate passivation conversion which applies a harder surface film in accordance with ISO 6157-1.
- 4.2.8. The Metal Anchors commonly known as rawl bolts shall be complete with the following components:

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**4.2.8.1. Bolts**

4.2.8.1.1. The bolts shall be designed from grade 8.8 bolts, with mechanical properties as shown in Table 1, conforming to ISO 898-1, with triangular ISO thread in accordance with ISO 68-1; diameter/pitch combinations in accordance with ISO 262 and thread tolerances as specified in ISO 965-1 & 2.

4.2.8.1.2. They shall be manufactured from quenched and tempered carbon steel with chemical composition as shown in table 2; through a cold forming process to ensure high dimensional accuracy, surface quality and increased strength properties through strain hardening with a metric thread pitch made from carbon steel quenched and tempered.

**Table 1: Mechanical properties of bolts as per ISO 898-1**

No	Mechanical property		Property class – Grade 8.8	
			d≤12mm	d>12mm
1	Thread diameter			
2	Minimum tensile strength Rm, N/mm <sup>2</sup>	min.	800	830
3	Vickers hardness HV F≥98N	min.	250	255
		max.	320	335
4	Surface hardness	max.	*)	
5	Stress at 0.2% non-proportional elongation Rp0.2; N/mm <sup>2</sup>	min.	640	660
6	Stress under proof load Sp, N/mm <sup>2</sup>		580	600
	Reduction area after fracture Z, %	min	52	52
7	Elongation after fracture A, %	min.	12	12
8	Hardness after tempering	Reduction of hardness 20HV maximum		
9	Surface integrity	As per ISO 6157-1 requirements		

\*) Surface hardness shall not be more than 30 Vickers points above measured core hardness on product when readings of both surface and core are carried out at HV 0.3

**Table 2: Steel and Chemical Analysis as per ISO 898-1**

Property Class	Material and treatment	Chemical composition (check analysis), %				Tempering temperature
		Carbon	Phosphorus	Sulphur	Boron	
8.8	Carbon steels with additives (e.g. B, Mn or Cr) quenched and tempered	min.	max.	max.	max.	min. °C
		0.15	0.40	0.035	0.035	0.003

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**4.2.8.2. Nuts**

4.2.8.2.1. Nuts shall be designed and manufactured from grade 8 nuts with mechanical properties shown in table 3 conforming to ISO 898-2, with triangular ISO threads in accordance with ISO 68-1; diameter/pitch combinations in according to ISO 261 (coarse thread, thread tolerance 6H according to ISO 965-1 & 2 and widths across flats as specified in ISO 272.

4.2.8.2.2. The nuts shall be manufactured from medium carbon steel, with chemical composition as specified in Table 4.

**Table 3: Mechanical properties of nuts, class 8 as per ISO 898-2**

Sr. No.	Property class 8 nuts	Diameter, mm	
		10≤x<16	16≤x≤39
1	Stress under proof load Sp, N/mm <sup>2</sup>	880	920
2	Vickers hardness HV	min.	302
		max.	353
3	State	Not quenched but tempered	

**Table 4: Limits of Chemical Composition as per ISO 898-2**

Sr. No.	Property Class	Chemical composition (check analysis), %			
		Carbon	Manganese	Phosphorus	Sulphur
1	8	max.	min.	max.	max.
		0.58	0.25	0.060	0.150

**4.2.8.3. Washers**

4.2.8.3.1. Washers shall be designed and manufactured as per ISO 887 and shall be flat round type.

4.2.8.3.2. The thickness shall not be less than 3.0mm and the diameter of centre hole corresponding to the respective bolt sizes (of different diameter sizes) to pass through after galvanizing.

**4.2.8.4. Anchors Shield (Sleeve)**

4.2.8.4.1. Concrete anchor shields shall be designed and manufactured from medium carbon steel as per requirements of ETAG 001: Parts 1 & 3 and Table 1.

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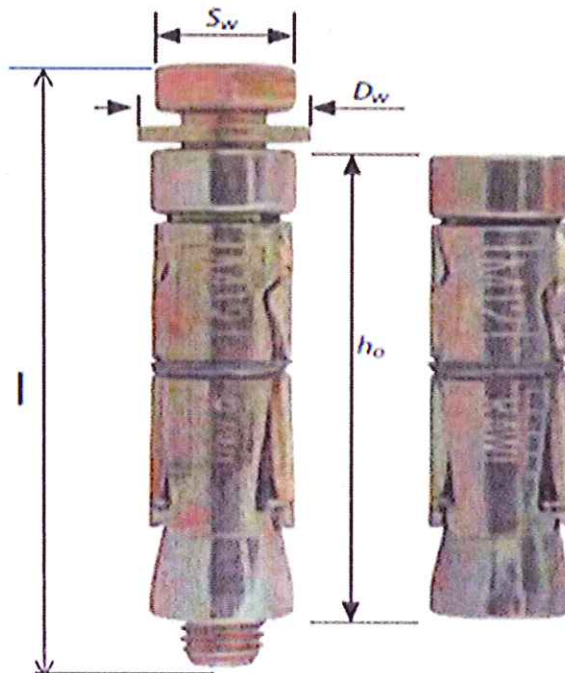
4.2.8.4.2. Sleeve anchors shall work by inserting them into a hole drilled into concrete. Turning the bolt head or the nut on the bolt shall pull the working end of the sleeve anchor up through the sleeve, expanding and anchoring itself securely in the concrete, brick or block.

### 4.3. Specific Requirements

#### 4.3.1. Rawl bolt Shield Anchor Loose Bolt

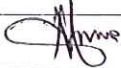
The loose type rawl bolt shall possess the following features with dimensional and physical characteristics as per Table 5 and its design as illustrated in Fig. 1:

- a) It shall have an integral controlled collapse and anti-rotation feature to ensure that the fixture is firmly secured.
- b) The collapsible ferrule ensures positive clamping force is transmitted to the fixture.
- c) It shall possess a unique zig-zag feature to provide a balanced expansion ensuring secure setting and maximum load carrying capacity.
- d) Shall be designed with a case-hardened nut with optimum angle taper for maximum expansion.



**Fig. 1: Loose Bolt with anchor shield**

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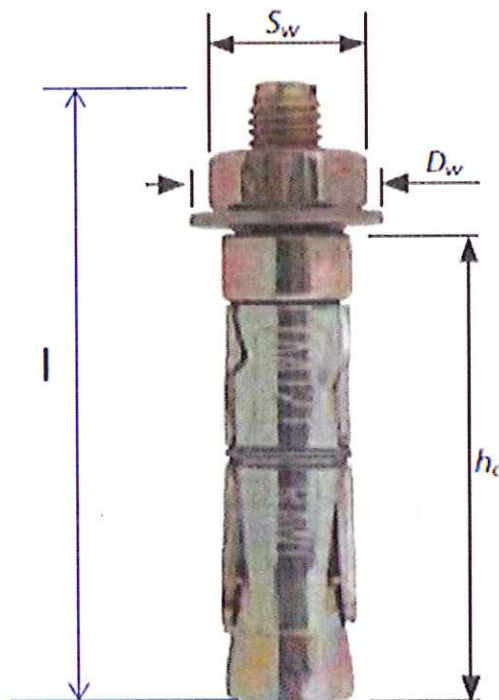


**4.3.2. Rawl bolt Shield Anchor Bolt Projecting**

4.3.2.1. This bolt shall be suitable for use in structural steel, masonry support, cladding restraints, road signs, racking systems and safety barriers.

4.3.2.2. It shall have the following features with dimensional and physical characteristics as per Table 5 and its design as illustrated in Fig. 2.

- a) A stud with a slot for final adjustment and a sleeve (anchor shield) that provides maximum shear load performance.
- b) An integral controlled collapse and anti-rotation feature to ensure that the fixture is firmly secured.
- c) A collapsible ferrule that ensures positive clamping force is transmitted to the fixture.
- d) A unique zig-zag feature to provide a balanced expansion; ensuring secure setting and maximum load carrying capacity.
- e) A case-hardened nut with optimum angle taper for maximum expansion.
- f) A nut and washer as specified in clauses 4.2.8.2 and 4.2.8.3 that allows for the fixture to be easily removed and relocated.



**Fig. 2: Bolt projecting with anchor shield**

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**Table 5: Dimensional characteristics of Loose bolt and Bolt Projecting**

Bolt Size in metric (d)	Bolt Length (mm) (l)	Bolt Head Diameter (mm) (AF) (S <sub>w</sub> )	Washer Diameter (mm) (D <sub>w</sub> )	Shield length (mm) (h <sub>o</sub> /h <sub>c</sub> )	Recommended Torque (N/m)	
					30N/mm <sup>2</sup> concrete	20.5N/mm <sup>2</sup> Brickwork
M12	120	19	30	75	50	23
	150					
M16	145	24	40	115	120	-
	170					
M20	195	30	50	130	230	-
	235					
M24	255	36	50	150	400	-
	300					

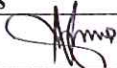
**4.3.3. Rawl bolt Shield Anchor Hook Bolt**

- 4.3.3.1. Shall be designed to suit temporary or permanent anchorage in bricks, stones and concrete structures and shall be supplied complete with shield, washer and hex nut.
- 4.3.3.2. It shall have the following features with dimensional and physical characteristics as per Table 6 with its design as illustrated in Fig. 3.
- An eye designed & manufactured for maximum performance and an anchor shield marked with a hole diameter to ensure correct installation.
  - Pressed steel segments ensure consistent dimensional accuracy.
  - Optimum geometry taper angle for maximum expansion in all substrates.
  - Shall be suitable for supporting guy ropes, stays & cables and supporting ladder restraints.

**Table 6: Dimensional characteristics of Hook Bolt**

Bolt size (d)	Shield Length (mm) (h <sub>a</sub> )	Overall length (mm) (l)	Approximate Diameter in eye (mm) (H)	Recommended Torque (N/m)	
				30N/mm <sup>2</sup> concrete	20.5 N/mm <sup>2</sup> Brickwork
M10	60	120	12	27	13
M12	75	145	16	50	23

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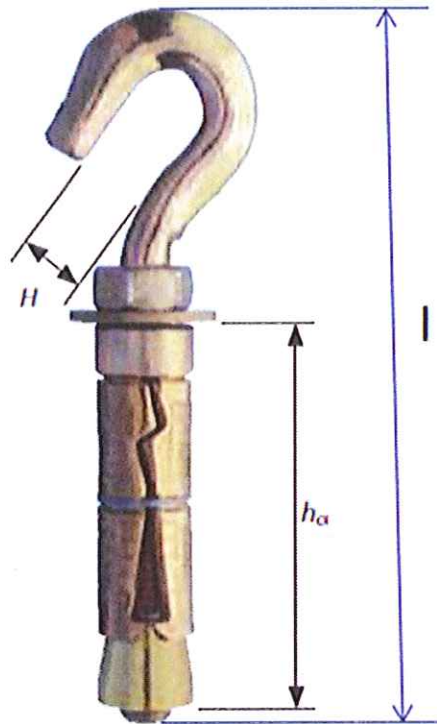
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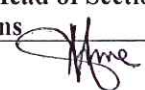
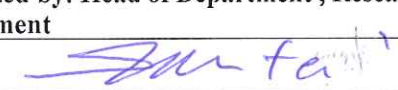
**Fig. 3: Hook Bolt with anchor shield**

**4.3.4. Rawl bolt Shield Anchor Hook Bolt**

4.3.4.1. Shall be designed to suit for temporary or permanent anchorage in bricks, stones and concrete structures and shall be supplied complete with shield, washer and hex nut.

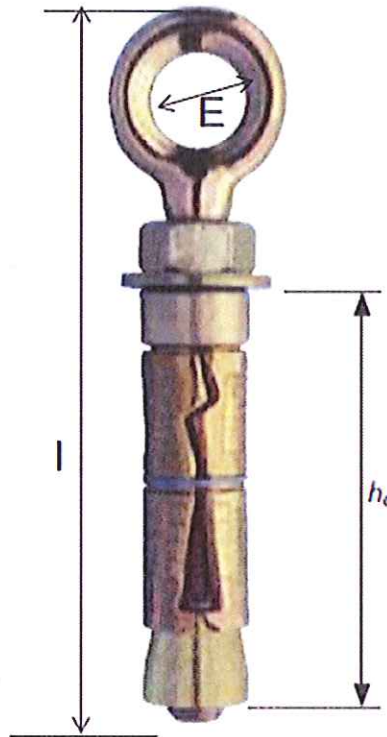
4.3.4.2. It shall have the following features with dimensional and physical characteristics as per Table 7 with its design as illustrated in Fig. 4.

- a) An eye designed & manufactured for maximum performance and an anchor shield marked with a hole diameter to ensure correct installation.
- b) Pressed steel segments ensure consistent dimensional accuracy.
- c) Optimum geometry taper angle for maximum expansion in all substrates.
- d) Shall be suitable for supporting guy ropes, stays & cables and supporting ladder restraints.

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**Table 7: Dimensional characteristics of Eye Bolt**

Bolt size (d)	Shield Length (mm) (h <sub>i</sub> )	Overall length (mm) (l)	Approximate Diameter in eye (mm) (E)	Recommended Torque (N/m)	
				30N/mm <sup>2</sup> concrete	20.5 N/mm <sup>2</sup> Brickwork
M10	60	108	14	27	13
M12	75	130	17	50	23



**Fig. 4: Eye Bolt with anchor shield**

**4.4. Sampling**

4.4.1. Test specimens shall be selected at random from each inspection lot (or articles) in accordance with ISO 2859-1.

4.4.2. The number of samples selected from each lot shall comply with Table 8 of this specification.

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**Table 8: Number of test samples**

Lot size	Sample size	Lot size	Sample size
25 or less	5	501 to 1,200	80
26 to 50	8	1,201 to 3,200	125
51 to 90	13	3,201 to 10,000	200
91 to 150	20	10,000 to 35,000	315
151 to 280	32	35,001 to over	500
281 to 500	50		

**4.5. Quality Management System**

- 4.5.1. 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 of the metal anchors for use in concrete, will fulfill the requirements stated in the contract documents, standards, specifications and regulations.
- 4.5.2. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001:2008.
- 4.5.3. 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.
- 4.5.4. The bidder shall indicate the delivery time of the metal anchors for use in concrete, manufacturer's monthly & annual production capacity and experience in the production of the type and size of items being offered.

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## 5.0. TESTS AND INSPECTION

- 5.1. The Metal Anchors for use in concrete shall be inspected and tested in accordance with the requirements of ISO 898: Parts 1,2 &7, ISO 887, ISO 262, ISO 68-1, ISO 965: Parts 1&2, ISO 6157-1, ISO 1461 and ETAG 001: Parts 1 & 3 standards. 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)
- 5.3. Copies of type test reports to be submitted with the tender (by bidder) for evaluation shall be as stated below:
- a) Tension Tests
  - b) Shear Tests
  - c) Chemical composition of steel – Check Analysis
  - d) Hardness Test
  - e) Elongation Tests
- 5.4. Routine and sample test reports for the Metal Anchors for use in concrete 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.
- 5.5. Tests to be witnessed by KPLC Engineers at the factory before shipment shall be in accordance with of ISO 898: Parts 1,2 &7, ISO 887, ISO 262, ISO 68-1, ISO 965: Parts 1&2, ISO 6157-1, ISO 1461 and ETAG 001: Parts 1 & 3 standards and this specification and shall include the following:
- a) Tension Tests
  - b) Shear Tests
  - c) Chemical composition of steel – Check Analysis
  - d) Hardness Test
  - e) Elongation Tests
  - f) Impact test
  - g) Retempering test
- 5.6. On receipt of the goods KPLC may perform any of the tests specified in order to verify compliance with this specification. The supplier shall replace without charge to

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KPLC the metal anchors, which upon examination, test or use; fail to meet any of the requirements in the specification.

## 6.0. MARKING AND PACKAGING

### 6.1. MARKING

Each Metal Anchor for use in Concrete shall be marked in a permanent manner with the following information (in English Language):

- The manufacturer's identification
- The property class of the product as per ISO 898-1 clause 9.1 to 9.6
- The standard of manufacture (ISO 898-1, ETAG: Parts 1 & 3)
- The packages shall be marked with manufacturer's identification and property class and the words "**PROPERTY OF KPLC**" shall be on the.

### 6.2. PACKAGING

6.2.1. The supplier shall provide packaging of every 50 or part thereof in a stout wooden box with metallic reinforcements at the corners and shall be covered with a waterproof plastic/nylon package.

6.2.2. The packaging shall be sufficient to withstand, without limitation, rough handling during transportation and the exposure to extreme temperatures, salt and precipitation for the long period of storage.

6.2.3. On the packing crates, shall have a non-detachable name plate attached on it with an indelible markings of the designation and dimension of product, gross weight, the name and trade mark of manufacturer etc. The characters shall be English capital roman letters numeral characters. The size of characters shall not be less than 4mm.

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**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 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 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) Manufacturers letter of authorization, ISO 9001:2008 certificate 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 Metal Anchors for use in Concrete 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. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001:2008
- d) Detailed test program to be used during factory testing;
- e) Marking details and method to be used in marking of the Metal Anchors;
- f) 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 Metal Anchors for The Kenya Power & Lighting Company;
- g) 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 Metal Anchors to KPLC stores.

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TITLE:

**SPECIFICATION FOR FASTENERS AND WASHERS FOR OVERHEAD LINES.**

Part 3: Metal Anchors for Use in concrete (Rawl Bolts)

Doc. No.	KP1/3CB/TSP/02/003-3
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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, sales records, four customer reference letters, details of manufacturing capacity, the manufacturer's experience and copies of complete type test reports for tender evaluation, all in English Language)

Tender No. ....

Clause number	KPLC Requirements	Bidder's offer (indicate full details of the values offered)	
Manufacturer's Name and address	Specify		
Country of Manufacture	Specify		
Bidder's Name and address	Specify		
1. Scope			
1.1-1.4	Specify		
2. Applicable Standards	Specify		
3. Terms & Definitions	Specify		
3.1-3.2	Specify		
4. Requirements			
4.2 Design and construction			
4.2.1 – 4.2.8	Specify		
4.2.8 Components of metal anchors	Specify		
<b>4.2.8.1 Bolts</b>			
<b>Mechanical property</b>	<b>Property class – Grade 8.8</b>		
Thread diameter	d≤12mm	d>12mm	
Minimum tensile strength Rm, N/mm <sup>2</sup>	min. 800	830	Specify
Vickers hardness HV F≥98N	min. 250	255	Specify
	max 320	335	
Surface hardness	.max	*)	Specify
Stress at 0.2% non-proportional elongation Rp0.2; N/mm <sup>2</sup>	min. 640	660	Specify
Stress under proof load Sp, N/mm <sup>2</sup>	580	600	Specify
Reduction area after fracture Z, %	min. 52		Specify
Elongation after fracture A, %	min. 12	12	Specify
Hardness after tempering	Reduction of hardness 20HV maximum		Specify

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Clause number	KPLC Requirements		Bidder's offer (indicate full details of the values offered)	
Surface integrity	As per ISO 6157-1 requirements		Specify	
Type of steel	Carbon steels with additives (e.g. B, Mn or Cr) quenched and tempered		Specify	
<b>Chemical composition</b>				
	Carbon	min max	0.15 % 0.45%	Specify
	Phosphorus	max	0.035%	Specify
	Sulphur,	max	0.035%	Specify
	Boron,	max	0.003%	Specify
Tempering temperature		425 <sup>o</sup> C	Specify	
<b>4.2.8.2 Nuts</b>				
<b>Mechanical Property class 8 nuts</b>		<b>Diameter, mm</b>		
		10≤x≤16	16≤x≤39	
Stress under proof load Sp, N/mm <sup>2</sup>		880	920	Specify
Vickers hardness HV	min.	200	302	Specify
	max.	233	353	Specify
State		Not quenched and tempered		Specify
<b>Chemical composition</b>				
	Carbon	max.	0.58%	Specify
	Manganese	min.	0.25%	Specify
	Phosphorus	max.	0.060%	Specify
	Sulphur	max.	0.150%	Specify
<b>4.2.8.3 Washers</b>				
4.2.8.3.1 - 4.2.8.3.2			Specify	
<b>4.2.7.4 Anchor Shield (Sleeves)</b>				
4.2.8.4.1 - 4.2.8.4.2			Specify	
<b>4.3 Specific Requirements</b>				
4.3.1 Loose Bolt			Specify	
4.3.2 Bolt Projecting				
4.3.2.1 – 4.3.2.2			Specify	
Dimensional Characteristics			Specify	
<b>4.3.3 Hook Bolt</b>				
4.3.3.1 - 4.3.3.2			Specify	
Dimensional characteristics			Specify	
<b>4.3.3 Eye Bolt</b>				

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Clause number	KPLC Requirements	Bidder's offer (indicate full details of the values offered)
4.3.3.1 - 4.3.3.2		Specify
Dimensional characteristics		Specify
<b>4.4 Sampling</b>		
4.4.1 – 4.4.2		
<b>4.5 Quality Management Systems</b>		
4.5.2 – 4.5.5		Specify
<b>5.0 Tests and Inspection</b>		
5.1 – 5.6		Specify
<b>6. Marking &amp; Packaging</b>		
6.1. Marking		Specify
6.2 Packaging		Specify
6.2.1 – 6.2.3		Specify
<b>7. Documentation</b>		
7.1 – 7.3		Specify
8.0	Manufacturer's Guarantee and Warranty	Specify
9.0	List catalogues, brochures, technical data and drawings submitted to support the offer.	Specify
10.0	List customer sales records submitted to support the offer.	Specify
11.0	List Test Certificates submitted with tender	Specify
12.0	List test & calibration reports to be submitted to KPLC for approval before shipment	Specify
13.0	Statement of compliance to specification (indicate deviations if any & supporting documents)	Specify

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

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