



ENERGY FIJI LIMITED

**TECHNICAL SPECIFICATION FOR SUPPLY
OF COPPER BOLTED LUGS BY PREFERRED
SUPPLIER**

MR 388/2018

Revision History & Document Control

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1	Prepared	Darrel Lal		30/11/17
2	Reviewed		Rajiv Singh	25/10/18

Next Scheduled Revision

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1.0 Introduction

Energy Fiji Limited [EFL] is responsible for generation, transmission and distribution of electricity in Viti Levu, Vanua Levu, Ovalau and Taveuni in Fiji. By the end of 2017, EFL had 182,439 customers. This includes residential, commercial and institutional customers.

EFL is requesting proposal for the Preferred Supplier to supply item listed below for EFL's consumption to carryout repair, Construction and maintenance of Power line Network in Fiji.

The preferred Supplier arrangement will be for a period of 3 (three) years from the date of signing of the contract. The award of this Tender may be split and awarded to more than one successful bidder.

This document outlines the technical requirements for copper bolted lugs for use in EFL's distribution network.

The items covered under this specification are tabulated below.

No.	Stock Code	Item Description
1	I02541	NO 3 CU BOLTED CABLE LUG
2	I02542	NO 4 CU BOLTED CABLE LUG
3	I02543	NO 5 CU BOLTED CABLE LUG
4	I02544	NO 6 CU BOLTED CABLE LUG
5	I02545	NO 7 CU BOLTED CABLE LUG
6	I02546	NO 8 CU BOLTED CABLE LUG

This Specification covers the general requirements of design, manufacture, testing, supply and delivery of copper bolted lugs for overhead distribution systems.

2.0 References

2.1 Applicable Standards

The item shall be designed, manufactured and tested in accordance with the latest edition of the Standards specified below and all amendments issued prior to the date of closing of tenders except where varied by this specification.

AS 1100	Drawing Practice Scales - Part 7
AS/ NZS 1580	Paints and related materials - method of test
AS 1154	Insulator and conductor fittings for overhead power lines
AST 1154.1	Electrical test requirements
AS/NZS 4325.1	Compression and mechanical connectors for power cables with copper or aluminium conductors
IEC 61238-1	Compression and Mechanical Connectors for Power Cables for Rated Voltages up to 30kV (Um = 36kV) - Part 1: Test methods and Requirements
AS 1275	ISO Metric screw threads for fasteners
AS 1567	Copper and copper alloys - Wrought rods, bars and sections
AS/NZS 9001	Quality System Model for Quality Assurance in Design, Development, Production, Installation and Servicing.

Should inconsistencies be identified between standards and/or this specification, the tenderer shall immediately refer such inconsistencies to EFL for resolution.

3.0 System Conditions

3.1 Environmental Conditions

The copper bolted lugs shall be suitable for installation outdoors and shall be designed to withstand the following service conditions.

Description		Conditions
Atmosphere Pollution Level	:	Very heavy (IEC 815), corrosive and dusty
Ambient Temperature	:	Peak: 40°C 24 Hour Average: 30°C Annual Average: 22°C Minimum: 10°C
Relative Humidity (Average)	:	85%
Rainfall	:	Annual Average: 2663mm
Isokeraunic (Thunder day) level	:	60 thunder days per year
Seismic	:	To a maximum of 7 on the open-ended Richter Scale

Note: Fiji is situated in a region where cyclones are experienced frequently. All plant and equipment shall be designed and constructed to withstand these extreme conditions.

3.2 Service Conditions

Nominal Voltage	240V/ 415V	11kV
System Highest Voltage	660V	12kV
System Frequency	50Hz	50Hz
Number of Phases	1 or 3	3
System Earthing	Effectively Earthed	Effectively Earthed
Impulse Withstand Voltage (peak)	-	95kV
Short Duration Power Frequency Withstand Voltage (rms)	15kV	28kV

4.0 Design and Construction

Equipment offered by the bidders will need to conform to this Specification.

4.1 Design

Energy Fiji Limited, in its distribution network employs Copper (Cu) Bolted Lugs for the use of connecting in transformer terminations, cable connections and isolator connections for its overhead 415V and 11kV network.

The copper bolted lugs shall have the following features:

- The Copper (Cu) bolted lugs shall be used for quick and easy termination and be reusable.
- The Copper (Cu) bolted lugs palms shall be machined flat and parallel for maximum conductivity.
- It shall have a copper alloy and ensure permanent electrical conductivity maintained.
- The lugs for overhead bare conductors shall satisfy the electrical test requirements of AS 1154.1
- Lug palms of copper lugs where specified in the item description, must be fully sealed to prevent ingress of moisture into the cable after installation.
- Copper lugs and links shall have a tinned finish.

5.0 Quality Assurance

The manufacture shall submit evidence that the design and manufacture of Copper Bolted Lugs is in accordance with AS/NZS ISO 9001 and shall include the Capability Statement associated with the Quality System Certification.

6.0 Performance and Testing

6.1 Type Tests

The Copper bolted lugs supplied shall be type tested in accordance with AS 1145.1 and/or other relevant Australia and New Zealand Standards (NOTE: If there are standards used apart from AS/NZS then Energy Fiji Limited reserves the right to deem these standards of testing certificates). Type test certificates are to be submitted with the offer with the following:

- a) Verification of the dimensions
- b) Wet-power frequency withstand voltage test
- c) Mechanical failing load test

The type test shall clearly indicate the name of the manufacturer and the technical parameters of the lugs and hardware components of the bolted lugs set tested.

6.2 Batch and Routine Tests

Routine test are intended to eliminate defective units and shall be carried out during the manufacture of copper bolted lugs.

Copper bolted lugs shall be routine tested in accordance with AS 1154 and AS/NZS 4325.

6.3 Witnessing of Tests

The EFL reserves the right to witness all testing. The Supplier shall give FEA reasonable notice of when testing will be carried out and one (1) EFL engineers to be invited to witness the testing.

6.4 Compliance

The Supplier shall state in writing that their offer complies with the relevant Standards and this specification. If the Supplier is offering equipment manufactured to an equivalent standard, full details of that standard must be given including a copy written in English.

7.0 Additional Requirements

7.1 Marking

Identification details as indicated below shall be permanently marked on the lugs and shall be weatherproof. The hardware fitting shall also be marked with the same except for year of manufacture and shall be corrosion proof.

1. Manufacture's Identification.
2. Minimum failing load in kN.
3. Year of manufacture.

7.2 Packaging

The supplied items shall be appropriate packaged to avoid damage during transportations and storage and fit for use. Pre-greased items shall be individually packed in sealed plastic bags. The vendor shall be responsible for nominating standard pack quantities and standard packs shall be clearly marked with the following:

1. Manufacturer's name
2. Purchase Order Number, Contract Number and EFL Stock Number
3. Compliance standards
4. Item description
5. Package weight

7.3 Storage

The equipment shall be capable of being stored without deterioration within the temperature range of 10°C to 40°C for no less than 24 months.

8.0 Technical Information to be supplied

The following information shall be supplied with the offer:

- a) List showing similar equipment supplied to or on order for other utilities for at least the past 3-5 years
- b) Completed schedule as provided in Appendix
- c) Catalogue describing the items and indicating the model number
- d) Constructional features and material used for components
- e) Electronic drawings of item to be supplied in AutoCAD format
- f) End of service life disposal method
- g) Origin of materials used in manufacture of connectors
- h) Quality assurance certificate as per clause 5.0
- i) Type and routine test certificates as per clauses 6.1 and 6.2

Offers of vendors who fail to furnish above particulars shall be rejected.

9.0 Stock Availability

The bidder is required to show the size of his/her stock holding and the ability to meet the required estimate quantity per annum. The movement of the non-tension bolted connectors will depend on EFL's project works and for operation and maintenance purposes. An estimate movement of the item are outlined in the table below but it will not be purchase as a lump sum quantity at once. Hence, the successful bidder will be required to carry a consignment / safety stock at times to meet EFL's demand within the three year contract period.

No.	Stock Code	Item Description	Approximate 3 Year Stock Movement
1	I02541	NO 3 CU BOLTED CABLE LUG	2564
2	I02542	NO 4 CU BOLTED CABLE LUG	2492
3	I02543	NO 5 CU BOLTED CABLE LUG	608
4	I02544	NO 6 CU BOLTED CABLE LUG	784
5	I02545	NO 7 CU BOLTED CABLE LUG	1
6	I02546	NO 8 CU BOLTED CABLE LUG	1

10.0 Product Warranty Period

The bidder is required to provide the warranty period as part of the proposal. A minimum warranty period of twenty-four (24) months from time of dispatch from factory shall be provided.

11.0 Environmental Considerations

Suppliers are required to comment on the environmental soundness of the design and the materials used in the manufacture of the items tendered. In particular, comments should address such issues as recycling and disposal at the end of service life.

12.0 Reliability

Suppliers are required to comment on the reliability of the equipment and the performance of the materials tendered for a service life of 35 years under the specified system and environmental conditions.

13.0 Samples

13.1 Production Samples

Samples of items may be required during the tender assessment period. Samples would normally be required from tenderers who have previously not supplied the items to EFL.

13.2 Sample Delivery

When samples are required, production samples shall be delivered freight free (Delivery Duty Paid (DDP)), suitably packaged and labelled including reference to the Tender Number.

Samples shall be supplied within 7 days of official request.

14.0 Training

Training material in the form of drawings, instructions and/or audio visuals shall be provided for the items accepted under the offer.

This material shall include but is not limited to the following topics:

- Handling
- Storage
- Application
- Installation
- Maintenance
- Environmental performance
- Electrical performance
- Mechanical performance
- Disposal

15.0 Appendix

15.1 Price Schedule

All tenderers are required to complete and submit a copy of the price schedule form with their bid submissions.

No.	Stock Code	Item Description	Price
1	I02541	NO 3 CU BOLTED CABLE LUG	
2	I02542	NO 4 CU BOLTED CABLE LUG	
3	I02543	NO 5 CU BOLTED CABLE LUG	
4	I02544	NO 6 CU BOLTED CABLE LUG	
5	I02545	NO 7 CU BOLTED CABLE LUG	
6	I02546	NO 8 CU BOLTED CABLE LUG	

15.2 Technical Data - Non-tension Bolted Connectors

All tenderers are required to complete and submit a copy of this form with their bid submissions.

Particulars	Units	Requirements	Bidders Response					
			NO 3	NO 4	NO 5	NO 6	NO 7	NO 8
			Lug - I02541	Lug - I02542	Lug - I02543	Lug - I02544	Lug - I02545	Lug - I02546
1. Name of manufacture								
2. Address of manufacture								
3. Place/ country of manufacture								
4. Origin of materials used for manufacturing								
5. Complete Lugs details								
i. Lug material								
ii. Rated Voltage	kV	0.415/11						
iii. Rated Frequency	Hz	50						
iv. Stud Size								
a. NO 3 Lug		M10						
b. NO 4 Lug		M12						
c. NO 5 Lug		M12						
d. NO 6 Lug		M16						
e. NO 7 Lug		M16						
f. NO 8 Lug		M20						

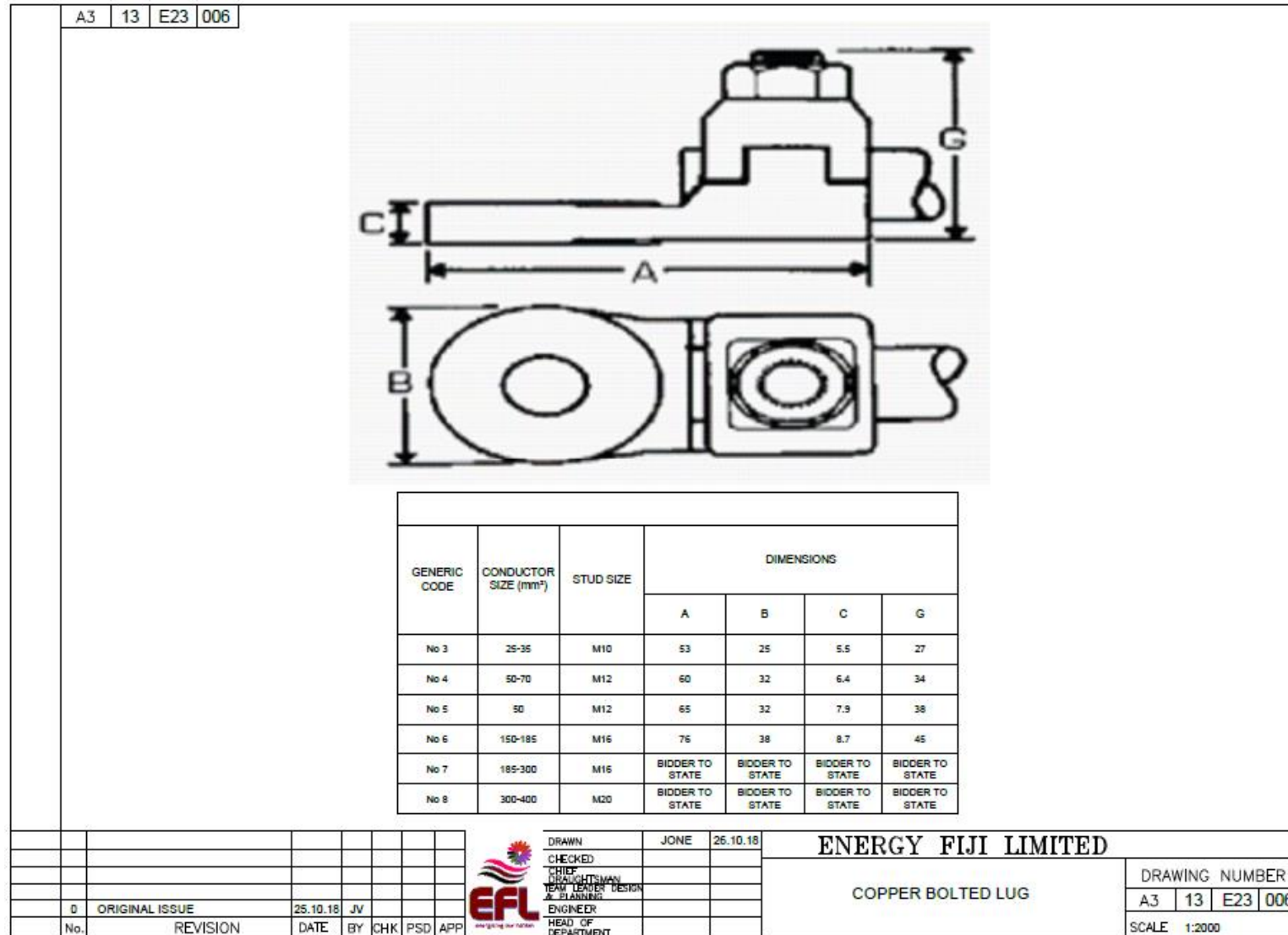
6. Max Area Size	mm ²	Bidder to state						
a. NO 3 Lug	mm ²	25-35						
b. NO 4 Lug	mm ²	50-70						
c. NO 5 Lug	mm ²	95						
d. NO 6 Lug	mm ²	150-185						
e. NO 7 Lug	mm ²	185-300						
f. NO 5 Lug	mm ²	300-400						
7. Radio interference noise level at standard test voltage	dB	Bidder to state						
8. Non Flexible Conductor Sizes								
a. NO 3 Lug		7/2.14, 19/1.53						
b. NO 4 Lug		19/1.78, 19/2.14						
c. NO 5 Lug		37/1.78						
d. NO 6 Lug		37/2.25, 37/2.52						
e. NO 7 Lug		Bidder to state						
f. NO 8 Lug		61/2.52, 61/2.85						
9. Color of product		Bidder to state						
10. Max. Breaking force	kN	Bidder to state						
11. Total weight	kg	Bidder to state						

Name of Tenderer: _____

Signature of Tenderer: _____

Date: _____

15.3 Typical Drawing - Copper Bolted Lugs



15.4 Submission Requirements

All tenderers are required to complete and submit a copy of the submission requirements with their bid submissions.

Requirements	Response from Bidders
Completed technical details (Clause 15.1) (Yes/No)	
Witnessing included as part of bid. (Yes/No)	
Validity of bid (180 days required) (Yes/No)	
Payment conditions.	
Delivery Term. (CIF preferred)	
Price review period after award of tender. (months)	
Bidders company profile outlining financial, technical and production capabilities.	
Detailed reference list of customers already using equipment offered during the last 5 years with particular emphasis on units of similar design and rating.	
Quality management system used in the production of lugs, attached certificate.	
Health, Safety and Environmental plans.	
Minimum warranty period from time of acceptance of item.	
Typical installation manual for lugs.	
Disposal method after service life.	
Complete dimensional drawing.	
List of Type test certificates provided. (As per Clause 6.1)	
Sample routine test certificates.	

Name of Tenderer: _____

Signature of Tenderer: _____

Date: _____

15.5 Tender Submission - Instruction to Bidders

The Energy Fiji Limited (EFL) ("The Employer") is requesting proposal for the Preferred Supplier for Tender No. **MR388/2018** for EFL's consumption to carryout repair, maintenance and Construction of Power line Network in Fiji.

The bidder shall seal the original hard copy of the technical proposal, the original hard copy of the financial proposal and each copy of the technical proposal and each copy of the financial proposal in **separate envelopes** clearly marking each one as: "ORIGINAL ", "COPY NO. 1 "etc. as appropriate.

The bidder shall seal the original bids and each copy of the bids in an inner and an outer envelope, duly marking the envelopes as "ORIGINAL" and "COPY".

The inner and outer envelopes shall be addressed to the Employer at the following address:

Tuvitu Delairewa
General Manager Corporate Services
2 Marlow Street, Suva, FIJI.
Phone: 679 3224 185
Facsimile: 679 331 1882
Email: TDelairewa@efl.com.fj

The envelopes shall bear the following identification:

- Bid for: **MR388/2018: Preferred Supplier for Copper Bolted Lugs**
- DO NOT OPEN BEFORE **1600hrs 28th November 2018**
- Address and contract details of bidder **on the reverse of the envelope**

It is mandatory for Bidders to upload a copy of their bid in the TENDER LINK Electronic Tender Box no later than 4:00pm, on Wednesday **28th November, 2018**. The uploaded tender bids shall be in two (2) separate files clearly labelled as Technical Proposal and Financial Proposal respectively.

Bids shall remain valid for a period of **180 days** after the date of opening of technical and financial proposals.

To register your interest and tender a response, view 'Current Tenders' at: <https://www.tenderlink.com/efl>

For further information contact The Secretary Tender Committee, by e-mail TDelairewa@efl.com.fj

Hard copies of the Tender bid will also be accepted after the closing date and time provided a soft copy is uploaded in the e-Tender Box and hard copy is dispatched to courier before the closing date and time. Please note courier submission date should be forwarded to EFL with your bid.

Tenders received after 4:00pm on the closing date of Wednesday 28th November, 2018:

- Will not be considered.
- Lowest bid will not necessarily be accepted as successful bid
- It is the responsibility of the bidder to pay courier chargers and all other cost associated with the delivery of the hard copy of the Tender submission including any Duties/Taxes. Hard copies of the Tender submission via Post Box will not be considered.