



ENERGY FIJI LIMITED

**TECHNICAL SPECIFICATION FOR
MECHANICAL SHEAR BOLT CONNECTORS**

MR 98/2020

Revision History & Document Control

Rev No.	Notes	Prepared By	Reviewed & Approved By	Date of Issue
1	Prepared by	Rajiv Singh		24/02/20

Next Scheduled Revision

This technical specification is due for review in January 2023.

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1. INTRODUCTION AND SCOPE OF WORK

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 2019, EFL had 199,020 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.

This document outlines the technical requirements for mechanical shear bolt connectors for use in EFL’s distribution and sub-transmission networks.

The items covered by this specification are listed below:

No.	Stock Code	Item Description	Cable Range
1	I02494	Mechanical Shear Bolt Connector	16 - 70mm
2	I02493	Mechanical Shear Bolt Connector	120 - 300mm

Table 1.1: Items Covered Under this Specification

This Specification covers the general requirements of design, manufacture, testing, supply and delivery of mechanical shear bolt connectors to be used in EFLs distribution and sub-transmission networks.

2. REFERENCES

2.1. Applicable Standard

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.

IEC 61238-1	Compression and mechanical connectors for power cables for rated voltages up to 30 kV (U _m = 36 kV) - Part 1: Test methods and requirements
AS/NZS 4325.1	Compression and mechanical connectors for power cables with copper or aluminum conductors - Test methods and requirements
AS ISO/IEC 17025	General requirements for the competence of testing and calibration laboratories
AS/NZS ISO:9001	Quality Management Systems - 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 the EFL for resolution.

3. SERVICE CONDITIONS

3.1. Environmental Conditions

The connectors shall be suitable for using outdoors and shall be designed to withstand the following service conditions.

Description		Conditions
Atmosphere Pollution Level	:	Very heavy (IEC 60815)
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. System Conditions

Nominal Voltage	11kV	33kV
System Highest Voltage	12kV	36kV
System Frequency	50Hz	50Hz
Number of Phases	3	3
System Earthing	Effectively Earthed	Effectively Earthed
Impulse Withstand Voltage (peak)	95kV	200kV
Power Frequency Withstand Voltage	38kV (rms)	95kV

4. DESIGN AND CONSTRUCTION

4.1. General

The mechanical shear bolt connectors shall be designed for use in low and medium voltage applications as required.

The connectors shall consist of a tin-plated body with shear heads and inserts for small conductor sizes.

4.2. Mechanical Connector - Body

The mechanical connector body shall be made from high-tensile, tin plated aluminum alloy. The internal surface of the conductor holes shall be grooved for firm grip. The connectors shall be chamfered at the edges.

4.3. Mechanical Connector - Contact Bolts

The mechanical connector contact bolts shall be made of a special aluminum alloy that has double shear head bolts with hexagon heads. The bolts shall be treated with a highly lubricating agent and equipped with a special contact ring.

4.4. Mechanical Connector - Inserts

The mechanical connector inserts shall be provided where required. The inserts shall be lengthwise striations and shall have a positioning guide.

5. PERFORMANCE AND TESTING

5.1. Testing

The mechanical shear bolt connectors shall be type tested in accordance with AS/NZS 4325.1 and IEC 61238-1. All relevant type and routine test reports shall be finished with the bid for verification by EFL.

5.2. Acceptance Tests

The EFL may carry out acceptance test on product to prove it conforms to the requirements of this Specification. Any product showing evidence of failure to comply with the requirements of this specification will be liable to rejection.

5.3. Compliance

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

6. RELIABILITY

6.1. Service Life

Bidders are required to comment on the reliability of the product and the performance of the materials offered for a service life of 35 years under the specified system and environmental conditions in clause 3.

6.2. Evidence in Support of Reliability

Where the specified guaranteed service life is less than 35 years Suppliers are required to provide comment and submit evidence in support of the reliability and performance claimed including detailed information on Failure Mode and Effect Analysis.

7. ENVIRONMENTAL/ HSE CONSIDERATIONS

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

Bidders are required to provide the Material Safety Datasheet (MSDS) of the product.

8. PACKAGING AND MARKING

8.1 Packaging

The packaging of items by the bidder must ensure that they are capable of being delivered undamaged giving due consideration to the quantity, distance of transportation and the preferred method of handling at each location.

Each packaged lot shall be marked with the following information:

- Manufactures Name
- Purchase Order Number

- Contact No.
- EFL Stock Code
- Item Description
- Applicable standards
- Pack Size
- Pack Weight

9. QUALITY REQUIREMENTS

Tenderers are required to submit evidence that the design and manufacture of the mechanical shear bolt connectors are in accordance with AS/NZS ISO 9001 and shall include the Capability Statement associated with the Quality System Certification.

If the Tenderer is a non-manufacturing supplier, the documentary evidence shall include the quality system certifications of both the supplier and the manufacturer.

10. 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 mechanical shear bolt connectors will depend on the 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	Cable Range	Approximate 3 Year Stock Movement
1	I02494	Mechanical Shear Bolt Connector	16 - 70mm	272
2	I02493	Mechanical Shear Bolt Connector	120 - 300mm	697

11. PRODUCT WARRANTY PERIOD

The bidders are required to provide the warranty period as part of the proposal. A minimum warranty period of 24 months from time of dispatch from factory will be preferred.

12. INFORMATION TO BE SUPPLIED BY THE BIDDER

12.1. Documentation to be supplied with the tender

To enable the EFL to fully evaluate the mechanical shear bolt connectors offered, (in addition to the completed Specification Requirement and Guaranteed Performance schedule) the bidder shall submit the following information with their tender: **(Note these are mandatory requirements)**

- List showing similar product supplied to or on order for other utilities in Australia or New Zealand or the Oceania region for the past 5 years
- Test certificates as per Clause 5.1
- End of service life disposal methods
- Evidence of Quality Management Systems used in the manufacturing process
- Evidence of Health, Safety and Environmental plans
- Evidence of financial ability to provide the level of service and support
- Origin of materials used in manufacture of the mechanical shear bolt connectors

- Names and resumes of key team members who will be assigned to work with EFL upon successful award of the three-year supply contract (if bidder is successful)
- All required documents as per clause 4.3

Bidders may be asked to provide additional information during tender assessment period or following award of contract.

12.2. Samples

When requested, production samples of each item shall be submitted with the offer.

Each sample shall be delivered freight free (Delivery Duty Paid (DDP)), suitably packaged and labelled with the following information:

- Name of supplier and this contact number
- Tender number
- Any supporting data on features or characteristics

12.3. Training

Training material in the form of drawings, instructions and/or audio visuals (in CD format) are required to be provided for the items accepted under the tender. The Tenderers shall allow the cost of production and delivery of training material in the tendered prices.

The training materials should include but not be limited to the following topics:

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

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

13. APPENDIX

13.1. Price Schedule

Bidders are required to complete the following price schedule and submit with the offer. EFL requires the bidding prices to be in CIF incoterms.

No.	Stock Code	Item Description	Cable Range	Unit Price (CIF)	Currency of bid
1	I02494	Mechanical Shear Bolt Connector	16 - 70mm		
2	I02493	Mechanical Shear Bolt Connector	120 - 300mm		
3		Factory Acceptance Testing (FAT) for 2 EFL Engineers.			

Bidders are to clearly indicate the currency of bid.

13.2. Technical Details - Mechanical Shear Bolt Connectors

This schedule shall be completed and submitted with the offer. A separate schedule shall be provided for each item offered: **(Note these are mandatory requirements)**

Particulars	Requirements	Bidders Response
Name of Manufacturer		
Country/place of manufacture		
Origin of materials used for manufacturing		
Type Test Certificate No.		
Is the product manufactured and tested to AS/NZS 4325.1 and IEC 61238-1		
Please provide the accreditation of the test lab (Note this is a mandatory requirements)		
Product material		
General		
Designed for use in 11kV and 33kV voltage systems	Yes/No	
Mechanical shear bolt connector body	High-tensile, tin plated aluminium alloy	
The internal surface of the conductor holes shall be grooved for firm grip	Required	
Is the connectors chamfered at the edges.	Yes/No	
Mechanical connector bolt	Special aluminium alloy that has double shear head bolts with hexagon heads	
Are the bolts treated with a highly lubricating agent and equipped with a special contact ring.	Required	
The mechanical shear bolt connector shall be provided with inserts for small conductor sizes	Required	
Are the inserts lengthwise striations and have a positioning guide	Required	
Packaging		
Packaging	Cardboard Boxes	
Weight of each box	To be stated by bidder	

Name of Tenderer: _____

Signature of Tenderer: _____

Date: _____

13.3. Tender Submission - Mandatory Requirement

All tenderers are required to complete and submit a copy of the submission requirements with their bid submissions. **(Note these are mandatory requirements)**

Requirements	Response from Bidders
Validity of bid (180 days required) (Yes/No)	
List of test reports/certificates provided. (As per Clause 5)	
Minimum warranty period offered for this product	
Completed price and technical schedules (Clause 13.1 and 13.2) (Yes/No)	
The bidding pricing to be in CIF incoterm.	
Currency of bid.	
Lead time of delivery after tender award.	
Bidders company profile outlining financial, technical and production capabilities.	
Disposal method after service life.	
Quality management system used in the production of mechanical shear bolt connectors, attached certificate.	
Material safety datasheet to be provided for all items	
The bidder to include the following as part of the bid:	
Company profile	
Company registration details	
Company financial capability statement	
Reference list of customers the same product is supplied to and contact details for reference check	
If the bidder is the manufacturer, the ISO certification shall be provided	
If the bidder is only the supplier of the product, then both the manufacturer and supplier ISO certifications shall be provided	

Name of Tenderer: _____

Signature of Tenderer: _____

Date: _____

Complete the following schedule as part of the bid: (Note these are mandatory requirements)

Stock Codes	Items	Country of Manufacture	Manufacturer of product	Brand Offered	Manufactured to standards	ISO Certification of Manufacturer	Lead Time of Delivery
102494	Mechanical Shear Bolt Connector 16-70mm						
102493	Mechanical Shear Bolt Connector 120-300mm						

Name of Tenderer: _____

Signature of Tenderer: _____

Date: _____

TENDER SUBMISSION CHECK LIST

The Bidders must ensure that the details and documentation mention below must submitted as part of their tender Bid

Tender Number _____

Tender Name _____

1. Full Company Name: _____

(Attach copy of Registration Certificate)

2. Director/Owner(s): _____

3. Postal Address: _____

4. Phone Contact: _____

5. Fax Number: _____

6. Email address: _____

7. Office Location: _____

8. TIN Number: _____

(Attach copy of the VAT/TIN Registration Certificate - Local Bidders Only)

9. Company Registration Number: _____

(Attach copy of the Business License)

10. FNPF Employer Registration Number: _____

(For Local Bidders only)

11. Contact Person: _____

I declare that all the above information is

correct. Name: _____

Position: _____

Sign: _____ Date: _____

13.4. Tender Submission - Instruction to Bidders

The Energy Fiji Limited (EFL) (“The Employer”) is requesting proposal for the Preferred Supplier for Tender No. **MR 98/2020** 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:

Abdul Nasim
Unit Leader Strategic Procurement, Inventories and Properties
2 Marlow Street, Suva, FIJI.
Phone: 679 3224 360/9991587
Facsimile: 679 331 1882
Email: Abduln@efl.com.fj

The envelopes shall bear the following identification:

- Bid for: **MR 98/2020: Preferred Supplier for the Supply of Shear Bolt Connectors**
- DO NOT OPEN BEFORE 1600hrs **22nd April, 2020**
- 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 **22nd April, 2020**. 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 Abduln@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 22nd April, 2020**:

- 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.**

Extension of tender closing date: Bidders are to note that if they require extension on the tender closing date, they are required to request for an extension 3 working days prior to the initial tender closing date.

Tender Submission via email or fax will not be accepted.