



**ENERGY FIJI LIMITED**

**TECHNICAL SPECIFICATIONS FOR  
DEADENDS, ARMOR RODS & FULL  
TENSION CRIMP JOINTS**

**MR 17/2019**

## Revision History & Document Control

Rev no.	Notes	Prepared By	Reviewed By	Date of Issue
1	Prepared	Rajiv Singh		18/01/19
2	Reviewed		Basant Kumar	22/01/19

### Next Scheduled Revision

This technical specification is due for review in December 2021.

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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 deadends, armor rods and full tension crimp joints for use in EFL's distribution and sub-transmission networks.

The items covered under this specification are tabulated below.

No.	Stock Code	Item Description
1	I05187	Helium Deadend
2	I05188	Wasp Deadend
3	I05184	Earth Wire Deadends for 33kV
4	I05191	Chafer/ Neon Deadend
5	I05359	Deadend for Distribution Stay Wire (7/8 SWG)
6	I05192	Deadend for Sub-transmission Stay Wire
7	I05099	Helium Full Tension Crimp Joint
8	I05102	Wasp Full Tension Crimp Joint
9	I05103	Gopher Full Tension Crimp Joint
10	I05123	Chafer/ Neon Full Tension Crimp Joint
11	I05212	Chafer/ Neon Armor Rod
12	I05183	Ferret Deadend
13	I05199	Guy Lock for Sub-transmission Stay Wire
14	I05361	Deadend for Distribution Stay Wire (7/10 SWG)

This technical specification covers the general requirements of design, manufacture, testing, supply and delivery of such elbow connectors/termination kits for use in ring-main units provided in pad-mounted distribution transformers.

## 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 1154.1	Insulator and conductor fittings for overhead power lines; Part 1: Performance, material, general requirements and dimensions
AS 1154.2	Insulator and conductor fittings for overhead power lines; Part 2: Dimensions
AS 1154.3	Insulator and conductor fittings for overhead power lines; Part 3: Performance and general requirements for helical fittings
AS 1531	Conductors - Bare overhead - Aluminium and aluminium alloy
AS 1222	Steel conductors and stays - Bare overhead
AS 3607	Conductors - Bare overhead, aluminium and aluminium alloy - Steel reinforced
AS/NZS 4325	Compression and mechanical connectors for power cables with copper or aluminium conductors
IEC 61284	Overhead lines - Requirements and tests for fittings
AS 4068	Flat pallet for material handling
AS / NZS ISO 9001	Quality management systems - Requirements

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 items shall be suitable for installation indoors and shall be designed to withstand the following service conditions.

Description		Conditions
Atmosphere Pollution Level	:	Very heavy (IEC 815)
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
Wind Speed	:	Sustained: 55 m/s Gusts: 70 - 110 m/s
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	33kV
System Highest Voltage	660V	12kV	36kV
System Frequency	50Hz	50Hz	50Hz
Number of Phases	1 or 3	3	3
System Earthing	Effectively Earthed	Effectively Earthed	Effectively Earthed
Impulse Withstand Voltage (peak)	-	95kV	200kV
Short Duration Power Frequency Withstand Voltage (rms)	15kV	28kV	70kV

## 4.0 Design and Construction

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

### 4.1 General

The materials as listed in clause 1.0 will be used in the following type of conductors:

Conductor Name	Conductor Type	Stranding & Wire Diameter (mm)	Nominal Overall Diameter (mm)	Cross Sectional Area (mm <sup>2</sup> )	Approximate Mass (Kg/Km)	Breaking Load (kN)
<b>Bare Overhead Conductors</b>						
Helium	AAAC	7/3.76	11.3	77.3	211	17.6
Wasp	AAC	7/4.5	13.5	111	304	16.9
Gopher	ACSR	6/1/2.5	7.5	34.4	119	10.5
Ferret	ACSR	6/1/3.0	9.0	49.5	172	15.2
Neon	AAAC	19/3.75	18.8	210	576	47.8
Chafer	AAC	19/3.75	18.8	210	576	31.9
<b>Stay Wires</b>						
Stay Wire - Distribution (7/8 SWG)	SC/GZ	7/4	12	87.96	700	88.9
Stay Wire - Distribution (7/10 SWG) (Note: this is not part of EFL stock)	SC/GZ	7/3.25	9.75	58.1	460	72.3
Stay Wire - Sub-transmission	SC/GZ	19/2.80	14	117	935	168.9
<b>Earth Wire</b>						
Earth Wire - SC/GZ	SC/GZ	7/2.75	8.3	41.6	328	49.0

Conductor Name	Conductor Type	Used For	
Bare Overhead Conductors		Stock Code	Name
Helium	AAAC	I05187	Helium Deadend
		I05099	Helium Full Tension Crimp Joint
Wasp	AAC	I05188	Wasp Deadend
		I05102	Wasp Full Tension Crimp Joint
Gopher	ACSR	I05103	Gopher Full Tension Crimp Joint
Ferret	ACSR	I05183	Ferret Deadend
Neon	AAAC	I05191	Chafer/ Neon Deadend
		I05123	Chafer/ Neon Full Tension Crimp Joint
		I05212	Chafer/ Neon Armor Rod
Chafer	AAC	I05191	Chafer/ Neon Deadend
		I05123	Chafer/ Neon Full Tension Crimp Joint
		I05212	Chafer/ Neon Armor Rod
Stay Wires			
Stay Wire - Distribution (7/8 SWG)	SC/GZ	I05359	Deadend for Distribution Stay Wire (7/8 SWG)



Stay Wire - Distribution (7/10 SWG) (Note: this is not part of EFL stock)	SC/GZ	I05361	Deadend for Distribution Stay Wire (7/10 SWG)
Stay Wire - Sub-transmission	SC/GZ	I05192	Deadend for Sub-transmission Stay Wire
		I05199	Guy Lock for Sub-transmission Stay Wire
<b>Earth Wire</b>			
Earth Wire - SC/GZ	SC/GZ	I05184	Earth Wire Deadends for 33kV

## 4.2 Deadends

### 4.2.1 Deadends for AAC and AAAC Conductors

The deadends for AAC and AAAC conductors shall be manufactured in accordance with AS 1154.3 and using high strength, corrosion resistant aluminium alloy wire. The deadends shall be suitable to be used in all environment types particularly as per Clause 3.1 and 3.2. All aluminium deadends shall be cable looped.

The deadends shall be designed to hold the full rated strength/breaking load of AAC and AAAC conductors as specified in Clause 4.1.

The inner part of the deadend that will be in contact with the conductor shall contain a glue and sand grip to hold the full rate strength/breaking load of the conductor.

### 4.2.2 Deadends for SC/GZ Conductors

The deadends for SC/GZ conductors shall be manufactured in accordance with AS 1154.3 and using high strength galvanized steel wire. The deadends shall be suitable to be used in all environment types particularly as per Clause 3.1 and 3.2.

The deadends shall be designed to hold the full rated strength/breaking load of SC/GZ conductors as specified in Clause 4.1.

The inner part of the deadend that will be in contact with the conductor shall contain a glue and sand grip to hold the full rate strength/breaking load of the conductor.

### 4.2.3 Deadends for ACSR Conductors

The deadends for ACSR conductors shall be manufactured in accordance with AS 1154.3 and using high strength galvanized steel wire for the “inner” fitting and high strength, corrosion resistant aluminium alloy wire for the “outer” fitting. The deadends shall be suitable to be used in all environment types particularly as per Clause 3.1 and 3.2.

The deadends shall be designed to hold the full rated strength/breaking load of ACSR conductors as specified in Clause 4.1.

The inner part of the deadend that will be in contact with the conductor shall contain a glue and sand grip to hold the full rate strength/breaking load of the conductor.

## **4.3 Full Tension Crimp Joints**

### **4.3.1 Full Tension Crimp for AAC, AAAC and ACSR Conductors**

Full tension crimp joints shall be suitable for use with bare aluminium, aluminium alloy and steel reinforced aluminium (AAC, AAAC and ACSR) conductors as specified in Clause 4.1.

Aluminium alloy sleeves shall be used for the compression (full tension crimp joints) jointing sleeves tendered for the aluminium based conductors.

Galvanized steel sleeves shall be used for the compression (full tension crimp joints) jointing sleeves tendered for the steel core of ACSR conductors.

The dimensions of the full-tension compression sleeves should generally be in accordance with Appendix E of AS 1154.1. The manufacturer shall ensure fittings are appropriately designed to meet the performance and test requirements of AS 1154.1.

### **4.3.2 Full Tension Compression Sleeves**

The full-tension fittings for ACSR conductors shall comprise of multiple piece fittings incorporating two separate sleeves. The inner sleeve to be applied to the galvanized steel conductor core shall be manufactured from galvanized steel with the outer sleeve for compression over the aluminium strands shall be manufactured from aluminium alloy.

It is desirable if all compression sleeves are provided with a barrier located centrally inside the sleeve to ensure that the conductors are inserted to the correct length. The sleeves shall be supplied with an anti-oxidant grease contained within the sleeve by hand-tight removable end caps.

### **4.3.3 Markings**

The following shall be stamped on the body of the fittings:

1. The manufacturers name or trademark
2. Year of manufacture
3. Conductor stranding and type of alloy
4. Type of sleeve - FT (Full tension sleeve)
5. Recommended compressions die size
6. Lines marking die position, the number of compression and the sequence required

## **4.4 Armor Rods**

### **4.4.1 Armor Rods for AAC and AAAC Conductors**

The armor rods for AAC and AAAC conductors shall be manufactured in accordance with AS 1154.3 and using high strength, corrosion resistant aluminium alloy wire. The armor rods shall be suitable to be used in all environment types particularly as per Clause 3.1 and 3.2.

The armor rods shall be designed to prevent damage to conductors caused by bending, high clamping stresses, abrasion at support points and damage caused by arcing. Armor rods shall also be used to repair minor damage to the outer strands of the conductors. Bidders are required to provide specific information on damage repair works as part of the bid.

## 4.5 Guy Lock

The guy locks for SC/GZ conductors shall be manufactured in accordance with AS 1154.3 and using high strength galvanized steel wire. The guy locks shall be suitable to be used in all environment types particularly as per Clause 3.1 and 3.2.

The guy locks shall be designed to hold the full rated strength/breaking load of SC/GZ conductors as specified in Clause 4.1.

The inner part of the guy lock that will be in contact with the conductor shall contain a glue and sand grip to hold the full rate strength/breaking load of the conductor.

## 4.6 Surface Finish

End openings of all sleeves, deadends and armor rods shall be chamfered and rounded so that the fitting ends will not, during installation or service, score or damage the conductor rendering it susceptible to failure due to fatigue. The fittings shall be designed, manufactured and finished so as to avoid sharp radii of curvature, ridges and other imperfections that may cause radio interference or harmful corona discharge or employee injury, when installed in accordance with recommended procedure.

## 4.7 Color Coding

The following items shall be color coded in accordance with AS 1154.

No.	Stock Code	Item Description	Color Code
1	I05187	Helium Deadend	Black
2	I05188	Wasp Deadend	Green
3	I05184	Earth Wire Deadends for 33kV	White
4	I05191	Chafer/ Neon Deadend	Black
5	I05359	Deadend for Distribution Stay Wire (7/8 SWG)	Yellow
6	I05192	Deadend for Sub-transmission Stay Wire	White
11	I05212	Chafer/ Neon Armor Rod	Yellow
12	I05183	Ferret Deadend	White
14	I05361	Deadend for Distribution Stay Wire (7/10 SWG)	Yellow and Orange

## 5.0 Quality Assurance

The supplier shall submit evidence that the design and manufacture of deadends, armor rods and full tension crimp joints are in accordance with AS/NZS ISO 9001 and shall include the Capability Statement associated with the Quality System Certification.

Where the bidder is an agent of the manufacturer, it shall provide a letter of authorization from the manufacturer to verify that it has the nominated agency.

## **6.0 Performance and Testing**

### **6.1 Type Tests**

Type test reports as specified for Class A Type test reports carried out in accordance with AS 1154 (All parts) shall be submitted with the tender for all items offered. The type tests reports submitted shall be in accordance with AS 1154 (All parts) and IEC 61284.

In addition a Short -Time Current Test shall be carried out. The short time current for the test shall be the two second short time current rating of the highest rated conductor associated with the fitting.

### **6.2 Batch Tests**

The following batch tests shall be carried out prior to the delivery of fittings. The samples for the tests shall be selected in accordance with Table 1.1 of AS 1154-2009 Part 1.

- a) Verification of dimensions.
- b) Mechanical tests as per clause 4.4.2 of AS 1154.1 with testing carried out at dimensional tolerances.
- c) Hardness tests for aluminium or aluminium alloy used in the manufacture of full tension fittings. (A certificate of compliance to the material hardness ranges nominated in the Appendix D of AS 1154.2 will be acceptable in lieu of the batch tests).
- d) Galvanizing test.
- e) The test certificates shall be submitted to the purchaser prior to the delivery of the corresponding batch.

### **6.3 Witnessing of Tests**

The EFL reserves the right to witness all testing. The Supplier shall give EFL reasonable notice of when testing will be carried out and one (2) 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 Packaging and Marking**

The supplied items shall be appropriate packaged to avoid damage during transportations and storage and fit for use. 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

## 7.2 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) Completed schedule as provided in Appendix
- b) Catalogue describing the items and indicating the model number
- c) Constructional features and material used for components
- d) Complete dimensional drawings
- e) End of service life disposal method
- f) Origin of materials used in manufacture of items
- g) Quality assurance certificate as per clause 5.0
- h) Type and batch 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 deadends, armor rods and full tension crimp joints 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	I05187	Helium Deadend	56238
2	I05188	Wasp Deadend	2635
3	I05184	Earth Wire Deadends for 33kV	964
4	I05191	Chafer/ Neon Deadend	1388
5	I05359	Deadend for Distribution Stay Wire (7/8 SWG)	32177
6	I05192	Deadend for Sub-transmission Stay Wire	1123
7	I05099	Helium Full Tension Crimp Joint	11973
8	I05102	Wasp Full Tension Crimp Joint	1380
9	I05103	Gopher Full Tension Crimp Joint	676
10	I05123	Chafer/ Neon Full Tension Crimp Joint	339
11	I05212	Chafer/ Neon Armor Rod	2248
12	I05183	Ferret Deadend	415
13	I05199	Guy Lock for Sub-transmission Stay Wire	455
14	I05361	Deadend for Distribution Stay Wire (7/10 SWG)	3554

## **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**

One sample of items offered will be required during the tender assessment period.

### **13.2 Sample Delivery**

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

## **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 with their bid submissions. The bidders shall provide the prices in CIF basis.

No.	Stock Code	Item Description	Price (CIF)
1	I05187	Helium Deadend	
2	I05188	Wasp Deadend	
3	I05184	Earth Wire Deadends for 33kV	
4	I05191	Chafer/ Neon Deadend	
5	I05359	Deadend for Distribution Stay Wire (7/8 SWG)	
6	I05192	Deadend for Sub-transmission Stay Wire	
7	I05099	Helium Full Tension Crimp Joint	
8	I05102	Wasp Full Tension Crimp Joint	
9	I05103	Gopher Full Tension Crimp Joint	
10	I05123	Chafer/ Neon Full Tension Crimp Joint	
11	I05212	Chafer/ Neon Armor Rod	
12	I05183	Ferret Deadend	
13	I05199	Guy Lock for Sub-transmission Stay Wire	
14	I05361	Deadend for Distribution Stay Wire (7/10 SWG)	

### 15.2 Technical Data - Deadends

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

Particulars	Units	Requirements	Response from Bidder
1. Name of Manufacturer			
2. Address of Manufacturer			
3. Place/country of manufacture			
4. Origin of materials used for manufacturing			
5. Does the Deadends comply with AS 1154?		Yes/ No	
6. Deadend material:			
a. For AAC & AAAC Conductors		High strength, corrosion resistant Aluminium Alloy	
b. For SC/GZ Conductors		High strength galvanized steel	
c. For ACSR Conductors		High strength galvanized steel for "inner" fitting and High strength,	

		corrosion resistant Aluminium Alloy for “outer” fitting	
7. Holding load for Deadends:			
a. For AAC & AAAC Conductors			
i. Helium Deadend	kN	17.6	
ii. Wasp Deadend	kN	16.9	
iii. Chafer/ Neon Deadend	kN	47.8	
b. For SC/GZ Conductors			
i. Earth wire deadend for 33kV	kN	49.0	
ii. Deadend for Distribution stay wire (7/8 SWG)	kN	88.9	
iii. Deadend for Distribution stay wire (7/10 SWG)	kN	72.3	
iv. Deadend for Sub- transmission stay wire	kN	168.9	
c. For ACSR Conductors			
i. Ferret Deadend	kN	15.2	
8. Number of strands and diameter of each strand in Deadends:			
a. For AAC & AAAC Conductors			
i. Helium Deadend	No./mm	Bidder to state	
ii. Wasp Deadend	No./mm	Bidder to state	
iii. Chafer/ Neon Deadend	No./mm	Bidder to state	
b. For SC/GZ Conductors			
i. Earth wire deadend for 33kV	No./mm	Bidder to state	
ii. Deadend for Distribution stay wire (7/8 SWG)	No./mm	Bidder to state	
iii. Deadend for Distribution stay wire (7/10 SWG)	No./mm	Bidder to state	
iv. Deadend for Sub- transmission stay wire	No./mm	Bidder to state	
c. For ACSR Conductors			
i. Ferret Deadend	No./mm	Bidder to state	



9. Color Codes for Deadends:			
a. For AAC & AAAC Conductors			
i. Helium Deadend		Black	
ii. Wasp Deadend		Green	
iii. Chafer/ Neon Deadend		Black	
b. For SC/GZ Conductors			
i. Earth wire deadend for 33kV		White	
ii. Deadend for Distribution stay wire (7/8 SWG)		Yellow	
iii. Deadend for Distribution stay wire (7/10 SWG)		Yellow and Orange	
iv. Deadend for Sub-transmission stay wire		White	
c. For ACSR Conductors			
i. Ferret Deadend		White	
10. Deadends length:			
a. For AAC & AAAC Conductors			
i. Helium Deadend	mm	Bidder to state	
ii. Wasp Deadend	mm	Bidder to state	
iii. Chafer/ Neon Deadend	mm	Bidder to state	
b. For SC/GZ Conductors			
i. Earth wire deadend for 33kV	mm	Bidder to state	
ii. Deadend for Distribution stay wire (7/8 SWG)	mm	Bidder to state	
iii. Deadend for Distribution stay wire (7/10 SWG)	mm	Bidder to state	
iv. Deadend for Sub-transmission stay wire	mm	Bidder to state	
c. For ACSR Conductors			
i. Ferret Deadend	mm	Bidder to state	
11. Can the deadend be used in all environment types?		Yes/ No	
12. Do the deadends have a glue and sand finish in the inner part which will be in		Yes/ No	

contact with the conductor?			
<b>Packaging Details:</b>			
13. Type of packaging		Cardboard Box	
14. Highest weight of packed deadends and box			
15. Are type test reports provided?		Yes/ No	
16. Are batch test reports provided?		Yes/ No	

Name of Tenderer: \_\_\_\_\_

Signature of Tenderer: \_\_\_\_\_

Date: \_\_\_\_\_

### 15.3 Technical Data - Full Tension Crimp Joints

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

Particulars	Units	Requirements	Response from Bidder
1. Name of Manufacturer			
2. Address of Manufacturer			
3. Place/country of manufacture			
4. Origin of materials used for manufacturing			
5. Does the Full Tension Crimp Joints comply with AS 1154 & AS/NZS 4325?		Yes/ No	
6. Crimp joint material:			
a. For AAC & AAAC Conductors		High strength, corrosion resistant Aluminium Alloy	
b. For ACSR Conductors		High strength galvanized steel	
7. Breaking load for crimp joints:			
a. For AAC & AAAC Conductors			
i. Helium Full Tension Crimp Joint	kN	17.6	
ii. Wasp Full Tension Crimp Joint	kN	16.9	
iii. Chafer/ Neon Full Tension Crimp Joint	kN	47.8	
b. For ACSR Conductors			
i. Gopher Full Tension Crimp Joint	kN	10.5	
8. Crimp joint lengths:			
a. For AAC & AAAC Conductors			
i. Helium Full Tension Crimp Joint	mm	Bidder to state	
ii. Wasp Full Tension Crimp Joint	mm	Bidder to state	
iii. Chafer/ Neon Full Tension Crimp Joint	mm	Bidder to state	

b. For ACSR Conductors			
i. Gopher Full Tension Crimp Joint	mm	Bidder to state	
9. Crimp joint internal and external diameters:			
a. For AAC & AAAC Conductors			
i. Helium Full Tension Crimp Joint	mm	Bidder to state	
ii. Wasp Full Tension Crimp Joint	mm	Bidder to state	
iii. Chafer/ Neon Full Tension Crimp Joint	mm	Bidder to state	
b. For ACSR Conductors			
i. Gopher Full Tension Crimp Joint	mm	Bidder to state	
10. Crimp joint recommended die size:			
a. For AAC & AAAC Conductors			
i. Helium Full Tension Crimp Joint		Bidder to state	
ii. Wasp Full Tension Crimp Joint		Bidder to state	
iii. Chafer/ Neon Full Tension Crimp Joint		Bidder to state	
b. For ACSR Conductors			
i. Gopher Full Tension Crimp Joint		Bidder to state	
11. Can the crimp joints be used in all environment types?		Yes/ No	
12. Grease details provided with the bid?		Yes/ No	
<b>Electrical Type Test Details:</b>			
13. Standard for type test		Bidder to state	
14. Heat cycle and contact resistance tests:			
a. Voltage drop across connector	µV	Bidder to state	
b. Voltage drop across equivalent length of conductor	µV	Bidder to state	
<b>Ageing Tests:</b>			

15. Number of cycles		Bidder to state	
16. Maximum temperature of connector	°C	Bidder to state	
17. Maximum temperature of conductor	°C	Bidder to state	
18. Initial resistance	Ω	Bidder to state	
19. Final resistance	Ω	Bidder to state	
Short Circuit Current Tests:			
20. Maximum short circuit current	kA	Bidder to state	
21. Duration of maximum short circuit current	Seconds	Bidder to state	
<b>Packaging Details:</b>			
22. Type of packaging		Cardboard Box	
23. Highest weight of packed crimp joints and box		Bidder to state	
24. Are type test reports provided?		Yes/ No	
25. Are batch test reports provided?		Yes/ No	

Name of Tenderer: \_\_\_\_\_

Signature of Tenderer: \_\_\_\_\_

Date: \_\_\_\_\_

## 15.4 Technical Data - Armor Rods

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

Particulars	Units	Requirements	Response from Bidder
1. Name of Manufacturer			
2. Address of Manufacturer			
3. Place/country of manufacture			
4. Origin of materials used for manufacturing			
5. Does the Armor Rods comply with AS 1154?		Yes/ No	
6. Armor rod material:			
a. For AAC & AAAC Conductors		High strength, corrosion resistant Aluminium Alloy	
7. Diameter of each rod and number of rods per conductor:			
a. For AAC & AAAC Conductors			
i. Chafer/ Neon Armor Rod	mm/No.	Bidder to state	
8. Color Code for Armor Rod:			
a. For AAC & AAAC Conductors			
i. Chafer/ Neon Armor Rod		Yellow	
9. Armor Rod length:			
a. For AAC & AAAC Conductors			
i. Chafer/ Neon Armor Rod		Bidder to state	
10. Can the armor rod be used in all environment types?		Yes/ No	
11. Are specific information on minor damage repair works provided?(As per Clause 4.4.1)		Yes/ No	
<b>Packaging Details:</b>			
12. Type of packaging		Cardboard Box	
13. Highest weight of packed armor rod and pallet		Bidder to state	
14. Are type test reports provided?		Yes/ No	
15. Are batch test reports provided?		Yes/ No	

Name of Tenderer: \_\_\_\_\_

Signature of Tenderer: \_\_\_\_\_

Date: \_\_\_\_\_

### 15.5 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 schedules (Clause 15.1 & 15.2) (Yes/No)	
Validity of bid (180 days required) (Yes/No)	
Is witnessing included as part of Bid (Yes/No)	
Payment conditions.	
Delivery Term. (CIF preferred)	
Price review period after award of tender. (months)	
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 deadends, armor rods and full tension crimp joints, attached certificate.	
Minimum warranty period from time of acceptance of item.	
Typical installation manual for deadends, armor rods and full tension crimp joints.	
Disposal method after service life.	
Complete dimensional drawing for all items	
List of Type test certificates provided. (As per Clause 6.1)	
List of Batch test certificates provided. (As per Clause 6.2)	

Name of Tenderer: \_\_\_\_\_

Signature of Tenderer: \_\_\_\_\_

Date: \_\_\_\_\_



## 15.6 Tender Submission - Instruction to Bidders

The Energy Fiji Limited (EFL) ("The Employer") is requesting proposal for the Preferred Supplier for Tender No. **MR17/2019** 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](mailto:TDelairewa@efl.com.fj)

The envelopes shall bear the following identification:

- Bid for: **MR17/2019: Preferred Supplier for Deadends, Armor Rods and Full Tension Crimp Joints**
- **DO NOT OPEN BEFORE 1600hrs 13<sup>th</sup> February 2019**
- 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 **13<sup>th</sup> February, 2019**. 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](mailto: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 13<sup>th</sup> February, 2019:**

- 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 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: \_\_\_\_\_