

**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 |
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# **Next Scheduled Revision**

This technical specification is due for review in December 2021.

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# **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.

# **References**

## **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.

# **System Conditions**

## **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: 40oC  24 Hour Average: 30oC  Annual Average: 22oC  Minimum: 10oC |
| 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.

## **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 |

# **Design and Construction**

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

## **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 (mm2)** | **Approximate Mass (Kg/Km)** | **Breaking Load (kN)** |
| **Bare Overhead Conductors** | | | | | | |
| 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 |
| **Stay Wires** | | | | | | |
| 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 |
| **Earth Wire** | | | | | | |
| 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 |
| **Earth Wire** |  |  |  |
| Earth Wire – SC/GZ | SC/GZ | I05184 | Earth Wire Deadends for 33kV |

## **Deadends**

### **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.

### **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.

### **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.

## **Full Tension Crimp Joints**

### **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.

### **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 stands 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.

### **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

## **Armor Rods**

### **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.

## **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.

## **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.

## **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 |

# **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.

# **Performance and Testing**

## **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.

## **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.

1. Verification of dimensions.
2. Mechanical tests as per clause 4.4.2 of AS 1154.1 with testing carried out at dimensional tolerances.
3. 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).
4. Galvanizing test.
5. The test certificates shall be submitted to the purchaser prior to the delivery of the corresponding batch.

## **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.

## **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.

# **Additional Requirements**

## **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

## **Storage**

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

# **Technical Information to be supplied**

The following information shall be supplied with the offer:

1. Completed schedule as provided in Appendix
2. Catalogue describing the items and indicating the model number
3. Constructional features and material used for components
4. Complete dimensional drawings
5. End of service life disposal method
6. Origin of materials used in manufacture of items
7. Quality assurance certificate as per clause 5.0
8. 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.**

# **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 |

# **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.

# **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.

# **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.

# **Samples**

## **Production Samples**

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

## **Sample Delivery**

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

# **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

# **Appendix**

## **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) |  |

## **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 |  |  |  |
| 1. Address of Manufacturer |  |  |  |
| 1. Place/country of manufacture |  |  |  |
| 1. Origin of materials used for manufacturing |  |  |  |
| 1. Does the Deadends comply with AS 1154? |  | Yes/ No |  |
| 1. Deadend material: |  |  |  |
| * 1. For AAC & AAAC Conductors |  | High strength, corrosion resistant Aluminium Alloy |  |
| * 1. For SC/GZ Conductors |  | High strength galvanized steel |  |
| * 1. For ACSR Conductors |  | High strength galvanized steel for “inner” fitting and High strength, corrosion resistant Aluminium Alloy for “outer” fitting |  |
| 1. Holding load for Deadends: |  |  |  |
| * 1. For AAC & AAAC Conductors |  |  |  |
| * + 1. Helium Deadend | kN | 17.6 |  |
| * + 1. Wasp Deadend | kN | 16.9 |  |
| * + 1. Chafer/ Neon Deadend | kN | 47.8 |  |
| * 1. For SC/GZ Conductors |  |  |  |
| * + 1. Earth wire deadend for 33kV | kN | 49.0 |  |
| * + 1. Deadend for Distribution stay wire (7/8 SWG) | kN | 88.9 |  |
| * + 1. Deadend for Distribution stay wire (7/10 SWG) | kN | 72.3 |  |
| * + 1. Deadend for Sub-transmission stay wire | kN | 168.9 |  |
| * 1. For ACSR Conductors |  |  |  |
| * + 1. Ferret Deadend | kN | 15.2 |  |
| 1. Number of strands and diameter of each strand in Deadends: |  |  |  |
| * 1. For AAC & AAAC Conductors |  |  |  |
| * + 1. Helium Deadend | No./mm | Bidder to state |  |
| * + 1. Wasp Deadend | No./mm | Bidder to state |  |
| * + 1. Chafer/ Neon Deadend | No./mm | Bidder to state |  |
| * 1. For SC/GZ Conductors |  |  |  |
| * + 1. Earth wire deadend for 33kV | No./mm | Bidder to state |  |
| * + 1. Deadend for Distribution stay wire (7/8 SWG) | No./mm | Bidder to state |  |
| * + 1. Deadend for Distribution stay wire (7/10 SWG) | No./mm | Bidder to state |  |
| * + 1. Deadend for Sub-transmission stay wire | No./mm | Bidder to state |  |
| * 1. For ACSR Conductors |  |  |  |
| * + 1. Ferret Deadend | No./mm | Bidder to state |  |
| 1. Color Codes for Deadends: |  |  |  |
| * 1. For AAC & AAAC Conductors |  |  |  |
| * + 1. Helium Deadend |  | Black |  |
| * + 1. Wasp Deadend |  | Green |  |
| * + 1. Chafer/ Neon Deadend |  | Black |  |
| * 1. For SC/GZ Conductors |  |  |  |
| * + 1. Earth wire deadend for 33kV |  | White |  |
| * + 1. Deadend for Distribution stay wire (7/8 SWG) |  | Yellow |  |
| * + 1. Deadend for Distribution stay wire (7/10 SWG) |  | Yellow and Orange |  |
| * + 1. Deadend for Sub-transmission stay wire |  | White |  |
| * 1. For ACSR Conductors |  |  |  |
| * + 1. Ferret Deadend |  | White |  |
| 1. Deadends length: |  |  |  |
| * 1. For AAC & AAAC Conductors |  |  |  |
| * + 1. Helium Deadend | mm | Bidder to state |  |
| * + 1. Wasp Deadend | mm | Bidder to state |  |
| * + 1. Chafer/ Neon Deadend | mm | Bidder to state |  |
| * 1. For SC/GZ Conductors |  |  |  |
| * + 1. Earth wire deadend for 33kV | mm | Bidder to state |  |
| * + 1. Deadend for Distribution stay wire (7/8 SWG) | mm | Bidder to state |  |
| * + 1. Deadend for Distribution stay wire (7/10 SWG) | mm | Bidder to state |  |
| * + 1. Deadend for Sub-transmission stay wire | mm | Bidder to state |  |
| * 1. For ACSR Conductors |  |  |  |
| * + 1. Ferret Deadend | mm | Bidder to state |  |
| 1. Can the deadend be used in all environment types? |  | Yes/ No |  |
| 1. Do the deadends have a glue and sand finish in the inner part which will be in contact with the conductor? |  | Yes/ No |  |
| **Packaging Details**: |  |  |  |
| 1. Type of packaging |  | Cardboard Box |  |
| 1. Highest weight of packed deadends and box |  |  |  |
| 1. Are type test reports provided? |  | Yes/ No |  |
| 1. Are batch test reports provided? |  | Yes/ No |  |

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

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

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

## **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 |  |  |  |
| 1. Address of Manufacturer |  |  |  |
| 1. Place/country of manufacture |  |  |  |
| 1. Origin of materials used for manufacturing |  |  |  |
| 1. Does the Full Tension Crimp Joints comply with AS 1154 & AS/NZS 4325? |  | Yes/ No |  |
| 1. Crimp joint material: |  |  |  |
| * 1. For AAC & AAAC Conductors |  | High strength, corrosion resistant Aluminium Alloy |  |
| * 1. For ACSR Conductors |  | High strength galvanized steel |  |
| 1. Breaking load for crimp joints: |  |  |  |
| * 1. For AAC & AAAC Conductors |  |  |  |
| * + 1. Helium Full Tension Crimp Joint | kN | 17.6 |  |
| * + 1. Wasp Full Tension Crimp Joint | kN | 16.9 |  |
| * + 1. Chafer/ Neon Full Tension Crimp Joint | kN | 47.8 |  |
| * 1. For ACSR Conductors |  |  |  |
| * + 1. Gopher Full Tension Crimp Joint | kN | 10.5 |  |
| 1. Crimp joint lengths: |  |  |  |
| * 1. For AAC & AAAC Conductors |  |  |  |
| * + 1. Helium Full Tension Crimp Joint | mm | Bidder to state |  |
| * + 1. Wasp Full Tension Crimp Joint | mm | Bidder to state |  |
| * + 1. Chafer/ Neon Full Tension Crimp Joint | mm | Bidder to state |  |
| * 1. For ACSR Conductors |  |  |  |
| * + 1. Gopher Full Tension Crimp Joint | mm | Bidder to state |  |
| 1. Crimp joint internal and external diameters: |  |  |  |
| * 1. For AAC & AAAC Conductors |  |  |  |
| * + 1. Helium Full Tension Crimp Joint | mm | Bidder to state |  |
| * + 1. Wasp Full Tension Crimp Joint | mm | Bidder to state |  |
| * + 1. Chafer/ Neon Full Tension Crimp Joint | mm | Bidder to state |  |
| * 1. For ACSR Conductors |  |  |  |
| * + 1. Gopher Full Tension Crimp Joint | mm | Bidder to state |  |
| 1. Crimp joint recommended die size: |  |  |  |
| * 1. For AAC & AAAC Conductors |  |  |  |
| * + 1. Helium Full Tension Crimp Joint |  | Bidder to state |  |
| * + 1. Wasp Full Tension Crimp Joint |  | Bidder to state |  |
| * + 1. Chafer/ Neon Full Tension Crimp Joint |  | Bidder to state |  |
| * 1. For ACSR Conductors |  |  |  |
| * + 1. Gopher Full Tension Crimp Joint |  | Bidder to state |  |
| 1. Can the crimp joints be used in all environment types? |  | Yes/ No |  |
| 1. Grease details provided with the bid? |  | Yes/ No |  |
| **Electrical Type Test Details:** |  |  |  |
| 1. Standard for type test |  | Bidder to state |  |
| 1. Heat cycle and contact resistance tests: |  |  |  |
| * 1. Voltage drop across connector | µV | Bidder to state |  |
| * 1. Voltage drop across equivalent length of conductor | µV | Bidder to state |  |
| **Ageing Tests:** |  |  |  |
| 1. Number of cycles |  | Bidder to state |  |
| 1. Maximum temperature of connector | **oC** | Bidder to state |  |
| 1. Maximum temperature of conductor | **oC** | Bidder to state |  |
| 1. Initial resistance | Ω | Bidder to state |  |
| 1. Final resistance | Ω | Bidder to state |  |
| Short Circuit Current Tests: |  |  |  |
| 1. Maximum short circuit current | kA | Bidder to state |  |
| 1. Duration of maximum short circuit current | Seconds | Bidder to state |  |
| **Packaging Details**: |  |  |  |
| 1. Type of packaging |  | Cardboard Box |  |
| 1. Highest weight of packed crimp joints and box |  | Bidder to state |  |
| 1. Are type test reports provided? |  | Yes/ No |  |
| 1. Are batch test reports provided? |  | Yes/ No |  |

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

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

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

## **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 |  |  |  |
| 1. Address of Manufacturer |  |  |  |
| 1. Place/country of manufacture |  |  |  |
| 1. Origin of materials used for manufacturing |  |  |  |
| 1. Does the Armor Rods comply with AS 1154? |  | Yes/ No |  |
| 1. Armor rod material: |  |  |  |
| * 1. For AAC & AAAC Conductors |  | High strength, corrosion resistant Aluminium Alloy |  |
| 1. Diameter of each rod and number of rods per conductor: |  |  |  |
| * 1. For AAC & AAAC Conductors |  |  |  |
| * + 1. Chafer/ Neon Armor Rod | mm/No. | Bidder to state |  |
| 1. Color Code for Armor Rod: |  |  |  |
| * 1. For AAC & AAAC Conductors |  |  |  |
| * + 1. Chafer/ Neon Armor Rod |  | Yellow |  |
| 1. Armor Rod length: |  |  |  |
| * 1. For AAC & AAAC Conductors |  |  |  |
| * + 1. Chafer/ Neon Armor Rod |  | Bidder to state |  |
| 1. Can the armor rod be used in all environment types? |  | Yes/ No |  |
| 1. Are specific information on minor damage repair works provided?(As per Clause 4.4.1) |  | Yes/ No |  |
| **Packaging Details:** |  |  |  |
| 1. Type of packaging |  | Cardboard Box |  |
| 1. Highest weight of packed armor rod and pallet |  | Bidder to state |  |
| 1. Are type test reports provided? |  | Yes/ No |  |
| 1. Are batch test reports provided? |  | Yes/ No |  |

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

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

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

## **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:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## **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. I “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 envelops 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 13th 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 **13th 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 13th 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)**

1. Director/Owner(s): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Postal Address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Phone Contact: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Fax Number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Email address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Office Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. TIN Number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

1. Company Registration Number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(Attach copy of the Business License)**

1. FNPF Employer Registration Number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(For Local Bidders only)**

1. Contact Person: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

I declare that all the above information is correct. Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Position: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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