# ENERGY FIJI LIMITED

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

# MR 191/2024

## Revision History & Document Control

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| 1 | Prepared | Rajiv Singh | | 18/01/19 |
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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 January 2023, the EFL had 215,515 customers. This included 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 three (3) 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) |

# 1 INSTRUCTIONS TO BIDDERS

## 1.1 Eligible Bidders

This invitation is open to all Bidders who have sound Financial Background, and have previous experience in design, manufacture, testing and supply of such pole-mounted and platform-mounted transformers.

Bidders shall provide such evidence of their continued eligibility satisfactory to EFL as EFL shall reasonably request. Bidders who are not manufacturers of such transformers shall provide evidence of agency.

Bidders shall not be under a declaration of ineligibility for corrupt or fraudulent practice.

## 1.2 Eligible Materials, Equipment and Services

The materials, equipment, and services to be supplied under the Contract shall have their origin from reputable companies (as specified by EFL where relevant) and from various countries and all expenditures made under the Contract will be limited to such materials, equipment, and services. Upon request, bidders may be required to provide evidence of the origin of materials, equipment, and services.

For purposes of this Contract, "services" means the works and all related services including design services.

For purposes of this Contract, “origin" means the place where the materials and equipment are mined, grown, produced or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing or substantial or major assembling of components, a commercial recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.

The materials, equipment and services to be supplied under the Contract shall not infringe or violate any industrial property or intellectual property rights or claim of any third party.

## 1.3 One Bid per Bidder

Each bidder shall submit only one bid. A bidder who submits or participates in more than one bid will cause all those bids to be rejected.

## 1.4 Cost of Bidding

The bidder shall bear all costs associated with the preparation and submission of its bid and EFL will in no case be responsible or liable for those costs.

## 1.5 Site Visits

Bidders can visit existing EFL networks by making arrangements to visit existing EFL installations. Bidders are required to familiarize themselves with the existing EFL installations so the solutions they offer does not require modification to existing poles and support infrastructure.

## 1.6 Contents of Bidding Documents

The bidder is expected to examine carefully the contents of this Bidding document. Failure to comply with the requirements of bid submission will be at the bidder's own risk. Bids which are not substantially responsive to the requirements of the bidding documents will be rejected.

## 1.7 Clarification of Bidding Documents

A prospective bidder requiring any clarification of the bidding documents may notify EFL in writing by email, addressed to:

Jitendra Reddy
Manager Procurement, Inventory & Supply Chain
2 Marlow Street,
Suva, Fiji
Phone: +679 331 3333 Ext 2320 or
Mobile: +679 999 2400
Email: JReddy@efl.com.fj

EFL will respond to any request for clarification which it receives earlier than 10 days prior to the deadline for submission of bids.

## 1.8 Amendment of Bidding Document

At any time prior to the deadline for submission of bids, EFL may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the bidding documents by issuing addenda.

## 1.9 Language of Bid

The bid, and all correspondence and documents related to the bid, exchanged between the bidder and the EFL shall be written in the English language.

## 1.10 Bid Prices

Unless specified otherwise, Bidders shall quote for the entire facilities on a “single responsibility" basis such that the total bid price covers all the Supplier’s obligations mentioned in or to be reasonably inferred from the bidding documents in respect of the design, manufacture, including procurement and subcontracting (if any), testing and delivery.

Bidders shall give a breakdown of the prices in the manner and detail called for in this bidding document, or any issued addenda.

Bids shall be given on CIF basis. The point of delivery shall be EFL’s Navutu Depot in Lautoka. The term CIF shall be governed by the rules prescribed in the current edition of Incoterms, published by the International Chamber of Commerce, Paris.

EFL has a marine insurance cover for items it is required for purchase for its project and operational works. Bidders are required to comment if the marine insurance component is covered in their bids.

## 1.11 Bid Currencies

Prices shall be quoted in a single currency only.

## 1.12 Bid Validity

Bids shall remain valid for a period of **120 days** from the date of Deadline for Submission of Bids specified in Sub-Clause 21.1.

## 1.13 Format and Signing of Bids

The bidder shall provide one electronic copy of the Technical and Financial proposals on EFL's electronic tender hosting website; https://www.tenderlink.com/efl

The bid shall contain no alterations, omissions or additions, except those to comply with instructions issued by EFL, or as necessary to correct errors made by the bidder, in which case such corrections shall be initialed by the person or persons signing the bid.

## 1.14 Sealing and Marking of Bids

Due to the Covid19 restrictions on movements, bidders are encouraged to bid via Tender link Portal.

## 1.15 Deadline for Submission of Bids

Bids must be received by EFL at the address specified above no later than **1600 hours (Fiji Time) 26th June 2024**.

EFL may, at its discretion, extend the deadline for submission of bids by issuing an addendum, in which case all rights and obligations of EFL and the bidders previously subject to the original deadline will thereafter be subject to the deadlines extended.

## 1.16 Late Bids

Any bid received by EFL after the deadline for submission of bids prescribed above will be rejected.

## 1.17 Modification and Withdrawal of Bids

The bidder may modify or withdraw its bid after bid submission, provided that written notice of the modification or withdrawal is received by EFL prior to the deadline for submission of bids. No bid may be modified by the bidder after the deadline for submission of bids.

## 1.18 Rejection of One or All Bids

EFL reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids, at any time prior to award of Contract, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders of the grounds for the rejection.

## 1.19 Process to be Confidential

2.19.1. Information relating to the examination, clarification, evaluation and comparison of bids and recommendations for the award of a contract shall not be disclosed to bidders or any other persons not officially concerned with such process.

2.19.2. Any effort by a bidder to influence EFL's processing of bids or award decisions may result in the rejection of the bidder's bid.

2.19.3. Lowest bid will not necessarily be accepted as successful bid.

## 1.20 Clarification of Bids

To assist in the examination, evaluation and comparison of bids, EFL may, at its discretion, ask any bidder for clarification of its bid. The request for clarification and the response shall be in writing, but no change in the price or substance of the bid shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by EFL in the evaluation of the bids.

## 1.21 Compliance with Specifications

The tender shall be based on the equipment and work specified and shall be in accordance with the Technical Specification. It should be noted that unless departures from specifications are detailed in Schedules of the Technical Specification, the tender would be taken as conforming to the Specification in its entirety. The Bidder shall tender for the whole of the Works included in the Specification.

# 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 for installation outdoors and shall be designed to withstand the following service conditions.

| **Description** | | **Conditions** |
|---|---|---|
| Atmosphere Pollution Level | : | Saliferous, Corrosive and Dusty |
| Ambient Temperature | : | Peak: 40$^{o}$C<br>24 Hour Average: 30$^{o}$C<br>Annual Average: 22$^{o}$C<br>Minimum: 10$^{o}$C |
| Relative Humidity (Average) | : | 90% |
| 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. All plant and equipment shall be rust proof, vermin proof and weather proof and designed to be suitable for a damp, tropical climate, which may be experienced simultaneously.

## 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 items 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 ($mm^2$) | 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 |

## 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 3.0. 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 3.0.

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 3.0.

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 3.0.

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 3.0.

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 |
| 13 | I05199 | Guy Lock for Sub-transmission Stay Wire | 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 two (2) EFL engineers to be invited to witness the testing. The return-air travel, accommodation, meals and other expense related to test witnessing shall be borne by the Bidder as a value adding service.

### 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. Any item showing evidence of failure to comply with the requirements of this specification and/or does not preform as required for its intended purpose will be liable to rejection and may result in cancellation of contract.

## 7.0 Additional Requirements

### 7.1 Packaging and Marking

The supplied items shall be appropriately 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 $10^{o}$C to $40^{o}$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 indicate the size of consignment stock it will hold and the ability to meet the required demand of the estimated quantity at any given time during the contract period. The movement of 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 items are outlined in the table below but the items will not be purchased 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.

Bidders must not base their price on EFL to buy the entire quantity mentioned below within the contract period.

| No. | Stock Code | Item Description | Approximate 3 Year Stock Movement |
|---|---|---|---|
| 1 | I05187 | Helium Deadend | 27570 |
| 2 | I05188 | Wasp Deadend | 1567 |
| 3 | I05184 | Earth Wire Deadends for 33kV | 793 |
| 4 | I05191 | Chafer/ Neon Deadend | 764 |
| 5 | I05359 | Deadend for Distribution Stay Wire (7/8 SWG) | 21742 |
| 6 | I05192 | Deadend for Sub-transmission Stay Wire | 1085 |
| 7 | I05099 | Helium Full Tension Crimp Joint | 4202 |
| 8 | I05102 | Wasp Full Tension Crimp Joint | 596 |
| 9 | I05103 | Gopher Full Tension Crimp Joint | 245 |
| 10 | I05123 | Chafer/ Neon Full Tension Crimp Joint | 114 |
| 11 | I05212 | Chafer/ Neon Armor Rod | 1017 |
| 12 | I05183 | Ferret Deadend | 358 |
| 13 | I05199 | Guy Lock for Sub-transmission Stay Wire | 434 |
| 14 | I05361 | Deadend for Distribution Stay Wire (7/10 SWG) | 106 |

# 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 each item offered will be required during the tender assessment period. Bidders are required to provide estimated time of delivery of the samples to EFL in tender submission for evaluation purpose.

## 13.2 Sample Delivery

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

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

# 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 and Guy Lock

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. Does the Guy Lock for Sub-transmission Stay Wire - 19/2.80 SC/GZ comply with AS 1154? | | | |
| 7. 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 | |
| 8. Guy Lock material: | | | |
| a. For 19/2.80 SC/GZ Conductors | | High strength galvanized steel | |
| 9. 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 | |
| 10. Holding load for Guy Lock: | | | |
| a. For 19/2.80 SC/GZ Conductors | KN | 168.9 | |
| 11. 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 | |
| | | | |
| 12. Number of strands and diameter of each | | | |

| | | | |
|---|---|---|---|
| strand in Guy Lock: | | | |
| a. For 19/2.80 SC/GZ Conductors | No./mm | Bidder to state | |
| 13. 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 | |
| 14. Color Code for Guy Lock: | | | |
| a. For 19/2.80 SC/GZ Conductors | | White | |
| 15. 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 | |

| | | | |
|---|---|---|---|
| 16. Guy Lock length: | | | |
| a. For 19/2.80 SC/GZ Conductors | Mm | Bidder to state | |
| 17. Can the deadend be used in all environment types? | | Yes/ No | |
| 18. Can the Guy Lock be used in all environment types? | | Yes/ No | |
| 19. Do the deadends have a glue and sand finish in the inner part which will be in contact with the conductor? | | Yes/ No | |
| 20. Do the Guy Lock have a glue and sand finish in the inner part which will be in contact with the conductor? | | Yes/ No | |
| **Packaging Details**: | | | |
| 21. Type of packaging for deadneds/ Guy Locks | | Cardboard Box | |
| 22. Highest weight of packed deadneds/ Guy Locks | | Bidder to state | |
| 23. Are type test reports provided for both deadneds/ Guy Locks? | | Yes/ No | |
| 24. Are batch test reports provided for both deadneds/ Guy Locks? | | 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 | |
| **Electrical Type Test Details:** | | | |
| 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 | |
| **Ageing Tests:** | | | |
| 15. Number of cycles | | Bidder to state | |

| | | | |
|---|---|---|---|
| 16. Maximum temperature of connector | **ºC** | Bidder to state | |
| 17. Maximum temperature of conductor | **ºC** | 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 | |
| **Packaging Details**: | | | |
| 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 | |
| **Packaging Details:** | | | |
| 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) | |
| Delivery Time. (number of weeks) | |
| 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 CHECKLIST**

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

Tender Number_____

Tender Name _____

1. Full Company / Business 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 (Mandatory)**

9. FNPF Employer Registration Number: _____ **(For Local Bidders only) (Mandatory)**
10. **Provide a copy of Valid FNPF Compliance Certificate (Mandatory- Local Bidders only)**
11. **Provide a copy of Valid FRCS (Tax) Compliance Certificate (Mandatory Local Bidders only)**
12. **Provide a copy of Valid FNU Compliance Certificate (Mandatory Local Bidders only)**
13. Contact Person: _____

I declare that all the above information is correct.

Name: _____

Position: _____

Sign: _____

Date: _____

## Tender submission

Bidders are requested to upload electronic copies via Tender Link by registering their interest at: https://www.tenderlink.com/efl

**EFL will not accept any hard copy submission to be dropped in the tender box at EFL Head Office in Suva.**

**This tender closes at 4.00pm (1600hrs) on Wednesday 26th June, 2024.**

For further information or clarification please contact our Supply Chain Office on phone **(+679) 3224360 or (+679) 9992400** or email us on tenders@efl.com.fj

**The bidders must ensure that their bid is inclusive of all Taxes payable under Fiji Income Tax Act. Bidders are to clearly state the percentage of VAT that is applicable to the bid prices.**

The lowest bid will not necessarily be accepted as the successful bid.

**The Tender Bids particularly the "Price" must be typed and not hand written.**

**Any request for the extension of the closing date must be addressed to EFL in writing three (3) working days prior to the tender closing date.**

**Tender Submission via email or fax will not be accepted.**