FIJI ELECTRICITY AUTHORITY

Transmission Unit

2 Marlow Street, Suva

TENDER DOCUMENT AND SPECIFICATIONS

The Fiji Electricity Authority invites sealed tenders from reputable companies with the relevant experience, for the supply of Tower Bolts with Nuts and washers for the purpose of replacement of existing bolts on FEA's various 132kV Transmission Towers.

TECHNICAL SPECIFICATIONS FOR TOWER BOLTS

1) Standards Applicable to this Tender

The Tower bolts shall be designed, manufactured and tested in accordance with the requirements of the latest published edition of the following unless otherwise noted.

AS/NZS 1559	Fasteners – bolts, nuts and washers for tower construction
AS/NZS 1112	ISO metric hexagon nuts, including thin nuts, slotted nuts and castle nuts
AS/NZS 1650	Hot Dipped Galvanized Coatings on Ferrous Articles
AS/NZS 4911:2003	General conditions of contract for the supply of equipment without installation.

Note: Bidders shall demonstrate/submit proof of ownership and possession of aforementioned standards.

2) Manufacturer's Qualification

The manufacturer shall be ISO 9001-2000 and ISO 14001-2004 certified and shall maintain a development and engineering department to provide a technical after sales service and information related to the Tower Bolts.

Manufacturer shall have sufficient supply and manufacturing experience of Tower Bolts for at least ten (10) years. As proof, the manufacturer shall submit a supply-list indicating type of tower bolts, quantity supplied, name of client, type of towers and year of delivery. Certificates from customers with satisfactory usage shall be provided with the supply record. Tower Bolts shall be considered, for which a minimum 5 years manufacturing and successful service experience is available, without change of basic design and material. The qualified manufacturer shall have designed, manufactured, tested and supplied at least 10,000 units of similar tower bolts.

3) Design and Material Requirements

a. The Tower bolts should be High Strength bolts made of carbon steel as per ***AS/NZS 1559: "Fasteners – bolts, nuts and washers for tower construction"***.

All bolts shall be of property class 5.6 and nits shall be of property class 5.0 HRH and shall conform to the requirements of AS/NZS1559. Galvanizing quality shall be as per AS/NZS 1650. All bolts and nuts when tested in accordance with AS/NZS 1559 shall have the following properties:

Mechanical Property	**Normal temperature application**
Tensile strength minimum	480MPa
Stress under proof load (S_P)	320MPa
Yield Stress (min)	340MPa

CHEMICAL COMPOSITION LIMITS OF TOWER BOLTS

Chemical limits (%)		
Carbon	**Phosphorous**	**Sulphur**
0.55 (max)	0.035 (max)	0.035 (max)

Tower bolts should be Hot-dip galvanised with an average thickness of 0.002in: Over 30 years in coastal locations.

b. The designation of the tower bolts shall be composed of the following:

i. General product description
ii. The Standard according to which it has been manufactured
iii. The letter 'M' indicating that the product has a metric coarse pitch series thread followed by the nominal size (thread diameter), in millimetres.
iv. The nominal length in millimetres

c. Markings on the Bolts

i. Bolts for normal temperature application……**.T**
ii. The trade mark of the manufacturer embossed or indented on top of the head.

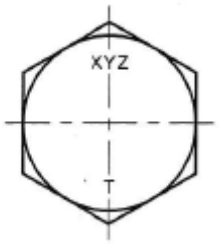

Figure 1: Marking on top of the head

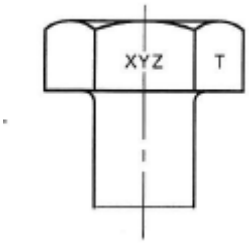

Figure 2: Marking on the hexagon flat

The shape and dimensions of washers shall be in accordance to the figure shown below. The dimensions apply before hot – dip galvanizing:

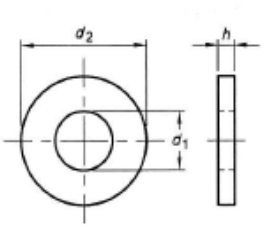

Figure 3: Tower Bolt Washers

Nominal bolt diameter	Inside diameter (d_1)		Outside diameter (d_2)		Thickness (h)	
	Min	Max	Min	Max	Min	Max
12	14	14.43	22.7	24	4.73	5.27
16	18	18.43	28.7	30		
20	22	22.52	35.4	37		

22	24	24.52	39.4	41		
24	26	26.52	42.4	44		
30	33	33.52	54.1	56		

d. Markings on Washers

i. General product description
ii. The standard according to which it has been manufactured
iii. The nominal size (nominal bolt diameter), in millimetres

Tower bolts washers shall be hot – dip galvanized in accordance with AS/NZS 1650, with a minimum average coating mass of 600g/m^2.

e. Tower bolts shall be manufactured by:

i. Hot or cold forging with or without secondary machining; or
ii. Machining from bar stock

f. Shape and Dimensions

millimetres

Thread	Pitch	Shank diameter		Width across flats		Width across corners		Washer face dia.		Depth of washer face		Fillet details			Height of head		Symmetry of head to body (see Note 1)	Concentricity tolerance (see Note 2)	Squareness of bearing face to shank
												Transition dia.	Radius under head	Fillet length					
	(p)	(d_s)		(s)		(e)		(d_w)		(c)		(d_a)	(r)	(l_f)	(k)				
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	(max.)	(min.)	(max.)	Max.	Min.	(max.)	(max.)	(max.)
M12	1.75	12.70	11.30	18.00	17.57	20.70	19.85	Actual size across flats	16.5	0.6	0.15	14.7	0.6	3.0	7.95	7.05	0.84	1.40	0.54
M16	2.0	16.70	15.30	24.00	23.16	27.70	26.17		22.0	0.8	0.20	18.7	0.6	3.0	10.75	9.25	0.84	1.40	0.68
M20	2.5	20.84	19.16	30.00	29.16	34.60	32.95		27.7	0.8	0.2	24.4	0.8	4.0	13.40	11.60	0.84	1.68	0.84
M22	2.5	22.84	21.16	34.00	33.0	39.30	37.29		31.35	0.8	0.2	26.4	0.8	4.0	14.9	13.1	1.00	1.68	0.84
M24	3.0	24.84	23.16	36.00	35.00	41.60	39.55		33.2	0.8	0.2	28.4	0.8	4.0	15.90	14.10	1.00	1.68	1.00
M30	3.5	30.84	29.16	46.00	45.00	53.10	50.85		42.7	0.8	0.2	35.4	1.0	5.0	19.75	17.65	1.00	1.68	1.28

NOTES:

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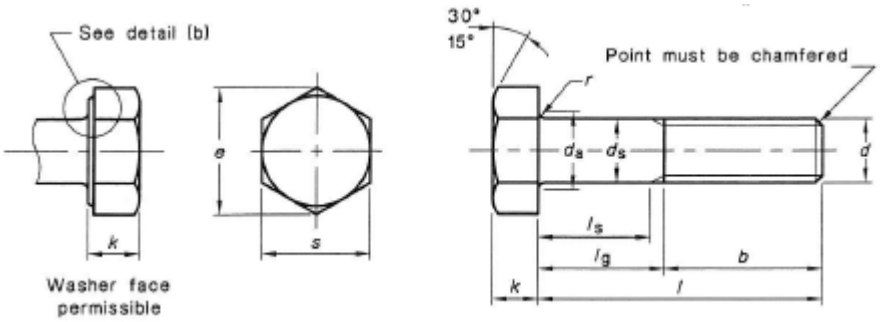

Figure 4: Tower Bolts

LENGTHS OF TOWER BOLTS—SINGLE-NUT TYPE

millimetres

Length (l)			Thread											
			M12		M16		M20		M22		M24		M30	
			Grip length (l_g) and unthreaded shank length (l_s)											
Nom.	Max.	Min.	l_g (max.)	l_s (min.)	l_g (max.)	l_s (min.)	l_g (max.)	l_s (min.)	l_g (max.)	l_s (min.)	l_g (max.)	l_s (min.)	l_g (max.)	l_s (min.)
35	36.25	33.75	14	8.75	10	4.0	—	—	—	—	—	—	—	—
40	41.25	38.75	19	13.75	15	9.0	12	4.5	9	1.5	—	—	—	—
45	46.25	43.75	24	18.75	20	14.0	17	9.5	14	6.5	14	5.0	—	—
50	51.25	48.75	29	23.75	25	19.0	22	14.5	19	11.5	19	10.0	14	3.5
55	56.5	53.5	34	28.75	30	24.0	27	19.5	24	16.5	24	15.0	19	8.5
60	61.5	58.5	39	33.75	35	29.0	32	24.5	29	21.5	29	20.0	24	13.5
65	66.5	63.5	44	38.75	40	34.0	37	29.5	34	26.5	34	25.0	29	18.5
70	71.5	68.5	49	43.75	45	39.0	42	34.5	39	31.5	39	30.0	34	23.5
75	76.5	73.5	54	48.75	50	44.0	47	39.5	44	36.5	44	35.0	39	28.5
80	81.5	78.5	59	53.75	55	49.0	52	44.5	49	41.5	49	40.0	44	33.5
85	86.75	83.25	64	58.75	60	54.0	57	49.5	54	46.5	54	45.0	49	38.5
90	91.75	88.25	69	63.75	65	59.0	62	54.5	59	51.5	59	50.0	54	43.5
95	96.75	93.25	74	68.75	70	64.0	67	59.5	64	56.5	64	55.0	59	48.5
100	101.75	98.25	79	73.75	75	69.0	72	64.5	69	61.5	69	60.0	64	53.5
105	106.75	103.25	84	78.75	80	74.0	77	69.5	74	66.5	74	65.0	69	58.5
110	111.75	108.25	89	83.75	85	79.0	82	74.5	79	71.5	79	70.0	74	63.5
115	116.75	113.25	94	88.75	90	84.0	87	79.5	84	76.5	84	75.0	79	68.5
120	121.75	118.25	99	93.75	95	89.0	92	84.5	89	81.5	89	80.0	84	73.5
125	127	123.0	104	98.75	100	94.0	97	89.5	94	86.5	94	85.0	89	78.5
130	132	128.0	109	103.75	105	99.0	102	94.5	99	91.5	99	90.0	94	83.5

Length (l)			Thread											
			M12		M16		M20		M22		M24		M30	
			Grip length (l_g) and unthreaded shank length (l_s)											
Nom.	Max.	Min.	l_g (max.)	l_s (min.)	l_g (max.)	l_s (min.)	l_g (max.)	l_s (min.)	l_g (max.)	l_s (min.)	l_g (max.)	l_s (min.)	l_g (max.)	l_s (min.)
135	137	133.0	114	108.75	110	104.0	107	99.5	104	96.5	104	95.0	99	88.5
140	142	138.0	119	113.75	115	109.0	112	104.5	109	101.5	109	100.0	104	93.5
145	147	143.0	124	118.75	120	114.0	117	109.5	114	106.5	114	105.0	109	98.5
150	152	148.0	129	123.75	125	119.0	122	114.5	119	111.5	119	110.0	114	103.5
155	157	153.0	134	128.75	130	124.0	127	119.5	124	116.5	124	115.0	119	108.5
160	162	158.0	139	133.75	135	129.0	132	124.5	129	121.5	129	120.0	124	113.5

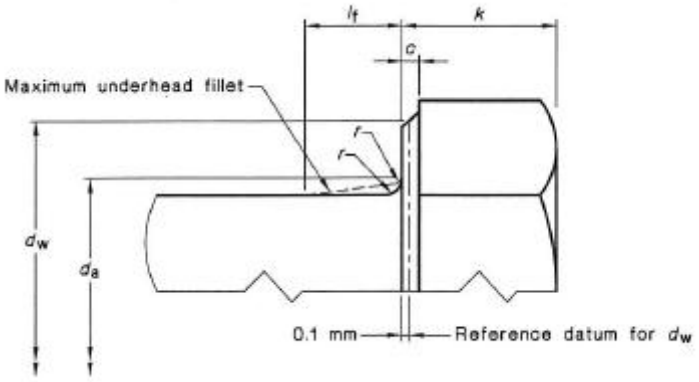

Figure 5: (b) Enlarged detail of the fillet

NOTES

1. $l_g = l-b$

   Where,

   l_g = maximum grip length, in millimetres
   l = nominal bolt length, in millimetres
   b = nominal thread length, in millimetres

1. $l_s = l_g - 3p$
   Where,

   l_s = minimum unthreaded shank length, in millimetres

l_g = maximum grip length, in millimetres

p = pitch of thread, in millimetres

LENGTHS OF TOWER BOLTS—DOUBLE-NUT TYPE

millimetres

Length (l)			Thread											
			M12		M16		M20		M22		M24		M30	
			Grip length (l_g) and unthreaded shank length (l_s)											
Nom.	Max.	Min.	l_g (max.)	l_s (min.)	l_g (max.)	l_s (min.)	l_g (max.)	l_s (min.)	l_g (max.)	l_s (min.)	l_g (max.)	l_s (min.)	l_g (max.)	l_s (min.)
50	51.25	48.75	19.4	14.15	11.2	5.2	—	—	—	—	—	—	—	—
55	56.5	53.5	24.4	19.15	16.2	10.2	—	—	—	—	—	—	—	—
60	61.5	58.5	29.4	24.15	21.2	15.2	14.0	6.5	—	—	—	—	—	—
65	66.5	63.5	34.4	29.15	26.2	20.2	19.0	11.5	12.4	4.9	10.8	1.8	—	—
70	71.5	68.5	39.4	34.15	31.2	25.2	24.0	16.5	17.4	9.9	15.8	6.8	—	—
75	76.5	73.5	44.4	39.15	36.2	30.2	29.0	21.5	22.4	14.9	20.8	11.8	13.0	2.5
80	81.5	78.5	49.4	44.15	41.2	35.2	34.0	26.5	27.4	19.9	25.8	16.8	18.0	7.5
85	86.75	83.25	54.4	49.15	46.2	40.2	39.0	31.5	32.4	24.9	30.8	21.8	23.0	12.5
90	91.75	88.25	59.4	54.15	51.2	45.2	44.0	36.5	37.4	29.9	35.8	26.8	28.0	17.5
95	96.75	93.25	64.4	59.15	56.2	50.2	49.0	41.5	42.4	34.9	40.8	31.8	33.0	22.5
100	101.75	98.25	69.4	64.15	61.2	55.2	54.0	46.5	47.4	39.9	45.8	36.8	38.0	27.5
105	106.75	103.25	74.4	69.15	66.2	60.2	59.0	51.5	52.4	44.9	50.8	41.8	43.0	32.5
110	111.75	108.25	79.4	74.15	71.2	65.2	64.0	56.5	57.4	49.9	55.8	46.8	48.0	37.5
115	116.75	113.25	84.4	79.15	76.2	70.2	69.0	61.5	62.4	54.9	60.8	51.8	53.0	42.5
120	121.75	118.25	89.4	84.15	81.2	75.2	74.0	66.5	67.4	59.9	65.8	56.8	58.0	47.5
125	127.0	123.0	94.4	89.15	86.2	80.2	79.0	71.5	72.4	64.9	70.8	61.8	63.0	52.5

NOTES

2. $l_g = l-b$

   Where,

   l_g = maximum grip length, in millimetres
   l = nominal bolt length, in millimetres
   b = nominal thread length, in millimetres

3. $l_s = l_g - 3p$

   Where,

   l_s = minimum unthreaded shank length, in millimetres
   l_g = maximum grip length, in millimetres
   p = pitch of thread, in millimetres

g. Thread Length

Single – Nut bolts

M12, M16, M22	Thread length = d + 9
M20	Thread length = d + 8
M24	Thread length = d + 7
M30	Thread length = d + 6

Double – Nut bolts

M12	Thread length = 1.8d + 9
M16 and M20	Thread length = 1.8d + 10
M22	Thread length = 1.8d + 13
M24	Thread length = 1.8d + 11
M30	Thread length = 1.8d + 8

WHERE,

b = Nominal diameter of thread in millimetres

4) Experience Evaluation

For evaluation of manufacturer's qualifications, manufacturer should submit a reference list showing supply experience for silicone rubber polymer insulators. In addition, if any in-service failures due to the quality of silicone rubber insulators have been experienced, the manufacturer should submit the information on the failures including cause of the failures and the countermeasures taken.

5) Packaging

The tower bolts shall be securely and effectively packaged in prefabricated packaging that has sufficient strength for normal handling and durability for short-term outdoor storage.

6) Duration Of Production And Delivery

The FEA requires at least all tower bolt types to be delivered by the **March 11th, 2016**. Bidders shall clearly indicate duration of production and shipping (both for sea freight and air freight).

7) Payment Terms

FEA's Standard 30 days payment policy upon delivery of goods and services applies. Bidder's to explicitly note all exceptions and/or reservations to the same, if any.

8) Liquidated Damages

Liquidated damages of 0.25% per calendar day, up to a maximum of 10%, shall apply on late delivery.

9) Defect Liability

Items offered shall be guaranteed against defect in material and workmanship for a period of 12 months after delivery to port in Fiji.

10) Contractual Terms and Conditions

The supply of Goods and Services, within the scope of this tender shall be governed by Australian/New Zealand Standard, AS/NZS 4911:2003: General Conditions of Contract for the Supply of Equipment without Installation, with any/all exceptions noted within this tender document. Upon the award of this tender to the successful bidder(s) the FEA shall furnish a formal contract for signing if deemed necessary.

11) Prices and Quantities Required

Prices shall be quoted in AUD, NZD, FJD, or USD Currency, **exclusive of:** all taxes, customs clearance charges, and duties payable in Fiji. (Incoterm - 2010: DAT). All import duties/taxes/customs costs in Fiji, are to be borne by FEA. **Note:** Goods and Services Tax (GST) or Value Added Tax (VAT) from bidder's country are not applicable.

Applicable Sea Ports in Fiji are:

a. Port of Lautoka
b. Port of Suva

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Applicable Air Ports in Fiji are:

a. Nadi International Airport (IATA Code: NAN, ICAO Code: NFFN)
b. Nausori International Airport (IATA Code: SUV, ICAO Code: NFNA)

Prices shall be quoted both for sea freight and air freight.

Prices shall be valid for at least 90 calendar days, from the closing date of this tender.

Item	Quantity Required by FEA (may be rounded up as per manufacturer's packaging)	Bidder's Price (Sea Freight) VEP / DDU / CIF Currency: ???	Bidder's Price (Air Freight) VEP / DDU / CIF Currency: ???	Bidder's Notes/ Remarks
M12X40	142			
M16X30	243			
M16X35	5073			
M16X40	3894			
M16X45	2994			
M16X50	2471			
M16X55	688			
M16X60	570			
M16X65	307			
M16X70	390			
M16X75	199			
M20X40	119			
M20X45	261			
M20X50	1055			
M20X55	277			
M22X60	352			
M20X70	383			
M20X80	160			
M24X60	933			
M24X65	437			

M24X70	**405**			
M24X75	**672**			
M24X85	**792**			
TOTAL BID PRICE:				

Bidder's to utilize the above table to submit prices.

SUBMISSION OF BID DOCUMENTS

Two (2) hard copies of the tender bids in sealed envelope shall be deposited / couriered to the tender box located at the Supply Chain Office at the FEA Head Office, 2 Marlow Street, Suva, Fiji. **Courier charges for delivery of Tender Document must be paid by the bidders.**

AND

Electronic Copies or Tender Bids should also be timely uploaded in the e-Tender Box.

This tender closes at 4:00pm, on Wednesday 16th of December, 2015.

Each tender shall be sealed in an envelope with:

The envelope bearing only the following marking:

Tender - MR 191/2015 – Supply of Tower Bolts for 132kV Transmission Towers.
The Secretary, Tender Committee
Fiji Electricity Authority
Supply Chain Office
Private Mail Bag, Suva

It must also indicate the name and address of the tenderer on the reverse of the envelope.

All late tenders, unmarked Envelopes and envelopes without bidder's name and address on the reverse of the envelope will be returned to the Tenderers.

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

For further information or clarification please contact our Supply Chain Office on phone **(+679) 3224360 or (+679) 9991587.**

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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 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:_____