

**BID SPECIFICATION
FOR**

**“SUPPLY OF TOWER SUPERSTRUCTURE,
INSULATORS, HARDWARE FITTINGS &
TOWER LINE ACCESSORIES FOR
132 KV TRANSMISSION LINE”**

BID IDENTIFICATION NO:

AEGCL/MD/ TL-82(Pt-III)/2017(Supply-A)

AEGCL/MD/ TL-82(Pt-III)/2017(Supply-B)

AEGCL/MD/ TL-82(Pt-III)/2017(Supply-C)

ASSAM ELECTRICITY GRID CORPORATION LTD.

PRICE: Rs.2, 000/-

SECTION - 1

INSTRUCTION TO BIDDER

1.1.0 Scope of Bid:

ASSAM ELECTRICITY GRID CORPORATION LTD, herein after referred to as AEGCL or purchaser will receive e-tender for supply of the following:

Scope of Works:-

Bid Identification No: AEGCL/MD/ TL-82(Pt-III)/2017 (Supply-A)

Package-A: Manufacture, testing at manufacture's works, supply and delivery of 132 Kv Lattice tower superstructure including hangers, gussets, strain plate. Quantity as per Annexure I & Manufacture, testing at manufacture's works, supply and delivery of G I Nuts & Bolts. Quantity as per Annexure II.

Bid Identification No: AEGCL/MD/ TL-82(Pt-III)/2017 (Supply-B)

Package- B: Manufacture, testing at manufacture's works, supply and delivery of 132 Kv Porcelain Long Rod Insulator. Quantity as per Annexure III.

Bid Identification No: AEGCL/MD/ TL-82(Pt-III)/2017 (Supply-C)

Package-C: Manufacture, testing at manufacture's works, supply and delivery of Hardware materials suitable for AAAC Panther conductor with tower line accessories (viz- Phase Plate, Number Plate, Anti-Climbing Device etc etc). Quantity as per Annexure IV.

AEGCL reserves the right to place the order to a single firm or split the same in the interest of the work

The scope of work does not include erection and commissioning

1.2.0 Qualification of the Bidder:

To be qualified for award of Contract, bidders:

- (A) Shall submit a written power of attorney authorizing the signatory of the bid to commit the bidder;
- (B) Must be a manufacturer and should have their own factory with testing facility.

EXPERIENCE AND FINANCIAL CAPABILITY:

- i. The tenderer should have manufacturing experience of at least 3 years on the date of tender. (Documentary evidence to be furnished)
- ii. Average Annual turn over of last three years should be minimum of Rs 90 Lakhs for package-A, Rs 17 Lakhs for package-B and Rs 2 Lakhs for package-C respectively. Documentary evidence should be furnished along with the bid
- iii. The Bidder's offer shall include and substantiate data on qualifying requirements such as:

- a) *Copies of original documents defining the constitution or legal status, place of registration and principal place of business, written power of attorney of the signatory of the Bid to commit the Bidder.*
- b) *Copies of valid License issued by competent authority where the bidder's business is registered.*
- c) *Total monetary value of similar work performed by the bidder in each of the last five years.*
- d) *Evidence of adequacy of working capital for this contract (access to line (s) of credit and availability of other financial resources).*
- e) ***Information regarding any litigation, current or during the last five years, in which the Bidder is involved, the parties concerned, and disputed amount.***

1.3.0 Time Schedule:

The successful bidder will be expected to complete the supplies within 50(Fifty) Days

1.4.0 Bidding:

Each bidder should upload online the following information with sufficient details to enable the purchaser to make an appraisal of the quality and suitability of the material offered.

- a) **Complete information required in the Technical bidding Schedule- Section III of this specification.**
- b) **Manufacturer littérature, brochures, catalogues etc.**
- c) **List of customers to whom such supply has been made along with performance report.**

1.5.0 Cost of Bidding:

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

1.6.0 Language of Bid:

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

1.7.0 Bid Prices:

Bidders shall give a breakup of the prices in the manner and detail called for in the **Schedules of Prices.**

1.8.0 Bid Validity:

Bids shall remain valid for a period of **180 (One hundred and eighty)** days after the date of opening of Bids.

1.8.1 Bid Security (Earnest Money):

- The Bidder must upload scanned copy as part of its bid with the Technical Proposal, a bid security :
Package A: Rs 400000.00 (Rupees Four Lakhs) only
Package B: Rs 75000.00 (Rupees Seventy five thousand) only
Package C: Rs 15000.00 (Rupees Fifteen thousand) only

- The bid security shall be in the form of an irrevocable Bank Guarantee issued by a Nationalized Bank in favour of “**Managing Director, Assam Electricity Grid Corporation Limited, Bijulee Bhawan, Paltanbazar, Guwahati-781001**”. The bid security shall remain valid for 30 days beyond the original validity period for the bid, and beyond any period of extension subsequently requested.
- Any bid not accompanied by an acceptable Bid Security shall be rejected as non-responsive.
- Hard Copy of the Bid Security/Earnest Money must be submitted before 1 hrs of the tender (Technical Proposal) opening time.

1.9.0 The bid security may be forfeited:

- (a) if the bidder withdraws its bid, except as provided in Clause-
- (b) in the case of a successful bidder, if it fails within the specified time limit to
 - (i) sign the Contract Agreement,
 - (ii) furnish the required performance security.

1.10.0 Format and Signing of Bid:

A “Single Stage Two Envelope” bidding procedure will be adopted. The bidder shall upload simultaneously two bid online, one containing the technical proposal and the other containing the price proposal.

The price proposals of only those Bidders, whose technical proposal are found responsive to the requirement of the bidding document shall only be opened.

Deadline for Submission of Bids:

Bids must be uploaded online by the tenderer as per time specified by AEGCL in their web portal/NIT published in print media.

1.11.0 Late Bids:

Any bid received by AEGCL after the deadline for submission of bids prescribed in Clause 14.0 will be rejected .

1.12.0 Withdrawal/Edit of Bids:

The bidder may withdraw/Edit its bid after bid submission till the stipulated time of opening of the bids.

1.13.0 Opening of Bids:

AEGCL will open the technical Bids, in the presence of bidders' representatives who choose to attend; at **15.00 hours on 31.03.17** at the following location:

**Office of The Managing Director.
Assam Electricity Grid Corporation Limited,
Bijulee Bhawan, Paltanbazar, Guwahati-781001**

1.14.0 Process to Be Confidential:

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.

1.15.0 Clarification of Bid Proposals and Contacting AEGCL

To assist in the examination, evaluation and comparison of Bids, AEGCL may, at its discretion, ask any bidder for clarification of its bid. The request for clarification and the response shall be in writing or by FAX, 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 detected by AEGCL in the evaluation of the bids in accordance with Clause-20.0

1.16.0 Evaluation and Comparison of Bid Proposals:

Bids, which are substantially responsive and in accordance with all Clauses of the specification shall only be evaluated. The Comparison shall be on all components and raw material including the cost of transportation, local taxes and duties.

1.17.0 Award:

AEGCL will award the Contract to the bidder whose bid has been determined to

be substantially responsive to the bidding documents and who has offered the Lowest Evaluated Bid Price, provided that such bidder has been determined to be qualified in accordance with the provisions of Clauses of the specification.

1.18.0 Employer's Right to Accept any Bid and to Reject any or all Bids:

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

1.19.0 Notification of Award:

Prior to expiry of the bid validity period, AEGCL in writing will notify the successful bidder that its bid has been accepted. This letter shall mention the amount; AEGCL will pay in consideration of the supply and other terms and conditions.

1.20.0 Performance Security & Contract Agreement:

1.21.0 An amount equal to ten percent (10%) of the total contract price shall be deducted from your bill against performance guarantee and will be retained till completion of guarantee period.

SECTION-2

GENERAL CONDITION OF CONTRACT

2.1.0 Introduction

This General Conditions of Contract is supplementary to AEGCL's "**General Conditions of Supply and Erection**". *However, in case of any contradiction, stipulations made in this Bidding Document shall prevail.*

2.2.0 Contractor to Inform Himself Fully

The contractor should admit that he has examined the general condition of contract, specifications and schedule and has satisfied as to all the conditions and circumstances affecting the contract prices and fixed his price according to his own views on these matters and acknowledge that no additional allowances except as otherwise provided therein will be levied. The purchaser shall not be responsible for any misunderstanding or incorrect information obtained by the contractor other than information given to the contractor in writing by the purchaser.

2.3.0 Extension of Time

If the completion of the work is delayed due to reason beyond the control of the contractor, the contractor should without delay give notice to AEGCL in writing of his claim for an extension of time. AEGCL may extend the completion date as may be reasonable but without prejudice to other terms and conditions of the contract.

2.4.0 Variations, Additions and Omissions

2.4.1. The contractor shall not modify any of the terms and conditions except as directed in writing by AEGCL.

2.4.2. AEGCL shall have the right during the contract to amend, alter, omit or otherwise vary any of the items by notice in writings. The contractor shall carry out such variations although the said variations shall not exceed (+/-)15% of the contract price. The amount of such variations shall be determined in accordance with rates specified in the contract and where such rates are not available this will be mutually agreed between the purchaser and the contractor.

2.4.3. Terms of Payment

The terms of payment for the works shall be as follows:

- a) No advance payment shall be made in this contract.
- b) No claim for interest shall be entertained by AEGCL
- c) Two nos running bills shall be entertained after completion of 40% and 80% of the supply to the extent of 80%. 10% retention shall be made in addition to the 10% performance guarantee.
- d) Balance amount including the retention money of 10% shall be paid after satisfactory completion of work.
- (e) Performance guarantee will be retained till the completion of warrantee period
- f) The price is firm and no price variation shall be applicable.

2.5.0 ISI certification:

The supply will strictly conform to the relevant IS specification and shall bear ISI certification mark..

2.6.0 Test and test certificate:

Type test certificates and results for recent manufactured hardware as per relevant Indian standards and offered for supply shall be furnished by the bidder along with the tender.

2.7.0 Raw Materials:

Raw material that may be required for manufacture of the entire quantity shall have to be arranged by the tenderer and AEGCL shall have no responsibility in any way what so ever in the arrangement. However proof of procurement of raw materials in the shape of invoice, challan must invariably be produced prior to inspection offer of the finished product.

2.8.0 Inspection:

Type tests shall be carried out in presence of the purchaser's representatives if so desired and the successful tenderer shall give at least 15(fifteen) days notice of the date, when the test shall be carried out.

2.9.0 Freight & Insurance:

The successful tenderer at their cost shall dispatch the materials to the final destination duly insured through their underwriter for any loss/damage during transit.

2.10.0 Guarantee

The materials shall be guaranteed for their satisfactory performance for a period of 18 (eighteen) months from the date supply or 12 (twelve) months from the date commissioning , whichever is earlier and will be subject to free replacement for any manufacturing defects.

2.11.0 Taxes and duty:

2.12.0 The details of applicable taxes and duties shall be indicated clearly in the offer.

SECTION – 3

TECHNICAL SPECIFICATIONS

3.1.0 Intent of Specification

This Section of the specification covers Design, manufacture, testing before dispatch, supply and delivery of required hardware fittings and accessories suitable for AAA Zebra conductor (37/4.00 mm)

3.2.0 General

- The details specifications given below are intended for general description of quality, workmanship etc for the items given in Annexure I but may not cover the minutes details of the work. In the absence of relevance details in the specifications the equipment and materials shall be manufactured as per latest IS code for the same
- The contractor shall get clarified any doubts, if the code referred to in this specification do not correspond to the latest revision.

3.3.0 Quality

Manufacture and test made upon the hardware fittings to be supplied under this specification shall comply in all respect with the requirement with the relevant Indian Standard Specification..

3.4.0 Test certificates and drawings

The supplier shall furnish test certificates from Govt approved testing Laboratory for all the items and also the drawings with detail specification. They will also furnish the list of testing equipment in their works.. The purchaser shall have the right to carry out Acceptance test

3.5.0 Marking

Each hardware fittings shall be legibly and indelibly marked to show the following :

- a) Name and trademark of the manufacturer
- b) Month and year of manufacture
- c) Standard certification marks, if any

3.4 Insulator String Hardware

3.4.1 HARDWARE

Each insulator string assembly shall generally include the following hardware: Anchor shackle for attachment of suspension string assembly to the tower hanger and tension string assembly to the tower strain plate. Suitable top and bottom yoke assemblies with the arrangement of fixing a set of arcing horns.

- Set of arcing horns
- Suspension or tension clamp
- Bolts, nuts, washers, split pins etc.
- Other fittings necessary to make the strings complete such as ball clevis, socket clevis, chain links etc.

The tenderer shall be responsible and satisfy himself that all the hardware included in strings are entirely suitable for the conductor offered.

3.4.2 SUSPENSION CLAMP

The suspension clamps shall be made of malleable iron or aluminium alloy, hot dip galvanised and shall be suitable to accommodate the conductor together with one set of preformed armour rods. Suitable sheet aluminium liners shall be provided. The suspension clamps shall be designed to avoid any possibility of deforming or damaging the conductor. The lips shall be rounded off and the seating and the bell mouths shall be smooth to avoid corona and radio interference noises. The suspension clamps shall be suitable to carry the bottom part of the arcing horn and to receive the fittings of the insulator string. The suspension clamps shall be such that the conductor should not slip at a load of 25% of the breaking load of the conductor. The ultimate strength of the clamp for vertical load shall not be less than the failing load of the Disc Insulators.

3.4.3 STRAIN CLAMP

The bolted strain clamps shall also be made of malleable iron or aluminium alloy; hot dip galvanised, lined with sheet aluminium liners and shall be suitable to accommodate the conductor with necessary binding tapes etc. The lips shall be rounded off carefully and conductor seating and the ball mouth shall be smooth to avoid corona and radio interference noises. Suitable attachment for receiving one side of arcing horns and for connecting to the insulator strings shall be provided.

The strain clamps shall be such that the conductor should not slip at a load of 90% of the breaking load of the conductor. The ultimate strength of the clamp for horizontal load shall not be less than the ultimate strength of the conductor.

3.4.4 ARCING HORN

Arcing horns of approved size and dimensions shall be provided for every string of insulators. The performance data for arcing horns to be supplied shall be made available to the Employer.

3.4.5 OTHER INSULATOR STRING HARDWARE

The strength of other string hardware namely anchor shackle, yoke plates, socket-clevis etc. shall be co-ordinated with insulator disc strength.

3.4.6 Interchangeability

The hardware together with ball and socket fittings shall be of standard design, so that this hardware are interchangeable with each other and suitable for use with disc insulators of any make conforming to relevant Indian/International Standard

3.4.7 Arcing Horn for EHV Strings

The arcing horn shall be provided on tower side of the hardware fittings. The same shall be either ball ended rod type or tubular type.

The spark gap shall be so adjusted to ensure effective operation under actual field conditions.

3.4.8 Suspension Assembly

The suspension assembly shall be designed, manufactured and finished to give it a suitable shape, so as to avoid any possibility of hammering between

suspension assembly and conductor due to vibration. The suspension assembly shall be smooth and without any cuts, grooves, abrasions, projections, ridges or excrescence which might damage the conductor.

The suspension assembly/clamp shall be so designed so that it minimises the static and dynamic stress developed in the conductor under various loading conditions as well as during wind induced conductor vibrations. It shall also withstand power arcs and have required level of Corona/AIV performance.

3.4.9 Standard Preformed Armour Rod Set

The Preformed Armour Rod Set suitable for Conductor shall be used to minimise the stress developed in the sub-conductor due to different static and dynamic loads because of vibration due to wind, slipping of conductor from the suspension clamp as a result of unbalanced conductor tension in adjacent spans and broken wire condition. It shall also withstand power arcs, chafing and abrasion from suspension clamp and localised heating effect due to magnetic power losses from suspension clamps as well as resistance losses of the conductor.

The preformed armour rods set shall have right hand lay and the inside diameter of the helices shall be less than the outside diameter of the conductor in order to gently but permanently grip the conductor. The surface of the armour rod when fitted on the conductor shall be smooth and free from projections, cuts and abrasions, etc.

The pitch length of the rods shall be determined by the Bidder but shall be less than that of the outer layer of conductor and the same shall be accurately controlled to maintain uniformity and consistently reproducible characteristic wholly independent of the skill of linemen.

The conductivity of each rod of the set shall not be less than 40% of the conductivity of the International Annealed Copper Standard (IACS).

3.4.10 Dead End Assembly

The dead end assembly shall be suitable for Conductor as detailed in the document.

The dead end assembly shall be compression type with provision for comprising the jumper terminal at one end. The angle of the jumper terminal to be mounted should be 300 with respect to the vertical line. The area of bearing surface on all the connections shall be sufficient to ensure positive electrical and mechanical contact. The resistance of the clamp when compressed on Conductor shall not be more than 75% of the resistance of equivalent length of Conductor.

The assembly shall not permit slipping of, damage to, or failure of the complete conductor or any part there of at a load less than 95% of the ultimate tensile strength of the conductor.

3.4.11 Fasteners, Bolts, Nuts and Washers

All bolts and nuts shall conform to IS: 6639. All bolts and nuts shall be galvanised as per IS-1367 - (Part 13)/IS-2629. All bolts and nuts shall have hexagonal heads, the heads being forged out of solid truly concentric, and square with the shank, which must be perfectly straight.

Bolts up to M16 and having length up to 10 times the diameter of the bolt should be manufactured by cold forging and thread rolling process to obtain good and reliable mechanical properties and effective dimensional control. The shear strength of bolt for 5.6 grade should be 310 MPa minimum as per IS-

12427. Bolts should be provided with washer face in accordance with IS: 1363 Part-1 to ensure proper bearing.

Nuts should be double chamfered as per the requirement of IS: 1363 Part-III. It should be ensured by the manufacturer that nuts should not be over tapped beyond 0.4 mm oversize on effective diameter for size up to M16

Fully threaded bolts shall not be used. The length of the bolt shall be such that the threaded portion shall not extend into the place of contact of the component parts.

All bolts shall be threaded to take the full depth of the nuts and threaded enough to permit the firm gripping of the component parts but no further .it shall be ensured that the threaded portion of the bolt protrudes not less than 3 mm and not more than 8 mm when fully tightened. All nuts shall fit and tight to the point where shank of the bolt connects to the head.

Flat washers and spring washers shall be provided wherever necessary and shall be of positive lock type. Spring washers shall be electro-galvanized. The thickness of washers shall conform to IS: 2016.

The Bidder shall furnish bolt schedules giving thickness of components connected. the nut and the washer and the length of shank and the threaded portion of bolts and size of holes and any other special details of this nature.

To obviate bending stress in bolt, it shall not connect aggregate thickness more than three time its diameter.

Bolts at the joints shall be so staggered that nuts may be tightened with spanners without fouling.

Fasteners of grade higher than 8.8 are not to be used.

3.4.12 Materials

The materials of the various components shall be as specified hereunder. The Bidders shall indicate the material proposed to be used for each and every component of hardware fittings stating clearly the class, grade or alloy designation of the material, manufacturing process & heat treatment details and the reference standards.

3.4.13 Workmanship

All the equipment shall be of the latest design and conform to the best modern practices adopted in the Extra High Voltage field. The Bidder shall offer only such equipment as guaranteed by him to be satisfactory and suitable for rated voltage of transmission lines and will give continued good performance.

The design, manufacturing process and quality control of all the materials shall be such as to give the specified mechanical rating, highest mobility, elimination of sharp edges and comers to limit corona and radio-interference, best resistance to corrosion and a good finish.

All ferrous parts including fasteners shall be hot dip galvanized, after all machining has been completed. Nuts may, however, be tapped (threaded) after galvanizing and the threads oiled. Spring washers shall be electro galvanized. The bolt threads shall be undercut to take care of the increase in diameter due to galvanizing. Galvanizing shall be done in accordance with IS: 2629/1985/ IS-1367 (Part 13) and shall satisfy the tests mentioned in IS: 2633-1986. Fasteners shall withstand four dips while spring washers shall withstand three dips of one-minute duration in the standard Preece test. Other galvanized materials shall have a minimum average coating of zinc equivalent to 610 gm / sqm shall be guaranteed to withstand at least six successive dips each lasting one (1) minute under the standard price test for galvanizing.

Before ball fittings are galvanized, all die flashing on the shank and on the

bearing surface of the ball shall be carefully removed without reducing the dimensions below the design requirements.

The zinc coating shall be perfectly adherent of uniform thickness, smooth, reasonably bright. Continuous and free from imperfections such as flux, ash, rust, stains, bulky white deposits and blisters. The zinc used for galvanizing shall be grade Zn 99.95 as per IS: 209.

Socket ends, before galvanizing, shall be of uniform contour. The bearing surface of socket ends shall be uniform about the entire circumference without depressions, of high spots. The internal contours of socket ends shall be concentric with the axis of the fittings as per IS: 2486/IEC: 120.

The axis of the bearing surfaces of socket ends shall be coaxial with the axis of the fittings. There shall be no noticeable tilting of the bearing surfaces with the axis of the fittings.

In case of casting, the same shall be free from all internal defects like shrinkage, inclusion, blow holes, etc. Pressure die casting shall not be used for casting of components with thickness more than 5 mm

All current carrying parts shall be so designed and manufactured that contact resistance is reduced to minimum.

No equipment shall have sharp ends or edges, abrasions or projections and cause any damage to the inductor in any way during erection or during continuous operation which would product high electrical and mechanical stresses in normal working. The design of adjacent metal parts and mating surfaces shall be such as to prevent corrosion of the contact surface and to maintain good electrical contact under service conditions.

All the holes shall be cylindrical, clean cut and perpendicular to the plane of the material. The periphery of the holes shall be free from burrs.

All fasteners shall have suitable corona free locking arrangement to guard against Vibration loosening.

3.5 fittings and Accessories for Conductors

- 3.5.1 The accessories for conductors shall conform to IS: 2121 and 2486 (Latest version) in all respects.
- 3.5.2 The tension joints and repaired sleeves in the conductors shall be of compression type. The joints shall be such that in electrical resistance of the joints measured between two points just beyond the fittings shall not exceed 75% of that of an equivalent length of the conductor without joint and shall be capable to withstand a load of 95% of the breaking load of the conductor itself.
- 3.5.3 The non tension joints such as the parallel groove clamps shall conform to IS 2121 and should be able to withstand a load of 10% of the breaking load of conductor without any slip.
- 3.5.4 Preformed type armoured rods shall be provided for the conductors at all suspension points. Vibration dampers of stockbridge type shall be used for power conductors.

3.6 Fittings and Accessories for Ground Wires

- 3.6.1 The accessories for conductors shall conform to IS: 2121 and 2486 (Latest version) in all respects.
- 3.6.2 The tension joints and repaired sleeves in the conductors shall be of compression type. The joints shall be capable to withstand a load of 95% of the breaking load of the ground wire itself.
- 3.6.3 The non tension joints such as the parallel groove clamps shall conform to IS 2121 and should be able to withstand a load of 10% of the breaking load of conductor without any slip.
- 3.6.4 Suspension clamps used with ground wires shall be capable of holding the ground wire without slipping under tension of 25% of the breaking load of the ground wire. Each clamp will be capable of supporting a weight not less than 70 kN.
- 3.6.5 Bolted type dead end connector assemblies for use with ground wires shall be provided at the tension points and shall be capable of carrying a load up to 90% of the ultimate breaking load of the ground wire before slipping. Minimum failing of the complete fittings shall not be less than 90 KN. Both the suspension clamps and the dead end connectors shall be provided with an elongated bolt with a washer and a nut to take care of the flexible copper earth bonds.

3.7 Long rod porcelain Insulators

- 3.7.1 The insulators of the strings shall consist of standard long rod insulators with normal sheds for a three phase, 50 Hz, effectively earthed 132 kV transmission system in a lightly polluted atmosphere. Insulators shall be long rod type with Ball and socket connections.
- 3.7.2 Insulators shall have normal sheds/alternate sheds with good self-cleaning properties. Insulator shed profile, spacing projection etc. shall be strictly in accordance with the recommendation of IEC-815.
- 3.7.3 Supplier quoting for long rod insulators made of electro porcelain shall also supply intermediate ball pins and intermediate arcing horns along with long rod insulators. The price of these items shall be considered as including in the price of long rod insulators.

3.7.4 The size of long rod insulator, minimum creepage distance, the number to be used in different type of strings, their electromechanical strength and mechanical strength of insulator string alongwith hardware fittings shall be as follows :

Description of long rod insulator string (equivalent to standard disc insulator)

Ball and Socket Designation

The dimensions of the balls and socket shall be of following designation for different for long rod insulators in accordance with the standard dimensions stated in IS 2486-(Part-II)/IEC:120:-

Sl. No.	Rating of Insulators	Designation of Ball & socket as per IEC: 120
i)	70 KN	16 mm, AltB
ii)	90 KN	16 mm, AltB
iii)	120 KN	20 mm
iv)	160 KN	20 mm

Dimensional Tolerance

The tolerance on all dimensions e.g. diameter, length and creepage distance shall be allowed as follows :

$\pm (0.04 d + 1.5)$ mm when $d < 300$ mm.

$\pm (0.025d + 6)$ mm when $d > 300$ mm

Where d being the dimensions in millimeters for diameter, length or creepage distance as the case may be.

However, no negative tolerance shall be applicable to creepage distance.

3.7.5 Intermediate Ball Pin Designation

The dimensions of the intermediate ball pin shall be in accordance with the standard dimension stated in IEC:471.

3.7.6 Intermediate Arching Horn

For Insulator strings with long rod insulators besides the arcing horn on tower side of hardware fittings, intermediate arcing horns along with fixtures and fasteners as shown in the specification shall also be provided.

The total effective arcing distance shall be 3050 mm for 400 kV line, 1800 mm for 220 kV line and 1200 for 132 kV line under nominal dimensions of insulator.

The spark gap shall be so adjusted to ensure effective operation under actual field coordination.

3.7.7 Inter Changeability

The long rod insulators with ball and socket connection shall be of standard design suitable for use with the hardware fittings of any make conforming to relevant IEC standards.

3.7.8 Corona and RI Performance

All surfaces shall be clean, smooth, without cuts, abrasions or projections. No part shall be subjected to excessive localised pressure. The insulator and metal parts shall be so designed and manufactured that it shall avoid local corona formation and not generate any radio interference beyond specified limit under the operating conditions.

3.7.9 **Maintenance**

The long rod insulators offered shall be suitable for employment of hot line maintenance techniques so that usual hot line operations can be carried out with ease, speed and safety.

All insulators shall be designed to facilitate cleaning and insulators shall have the minimum practical number of sheds and grooves. All grooves shall be so proportioned that any dust deposit can be removed without difficulty either by wiping with a cloth or by remote washing under live line condition.

3.7.10 **Materials**

Porcelain

The porcelain used in the manufacture of long rods shall be alumina type. It shall be sound, free from defects and thoroughly vitrified and smoothly glazed.

The Bidder shall furnish full description and illustration of the material offered.

The Bidder shall furnish along with the bid the outline drawing (6 copies) of each insulator unit including a cross sectional view of the insulator shell. The drawing shall include but not limited to the following information:

- (a) Shell diameter and ball to ball spacing with manufacturing tolerances
- (b) Minimum Creepage distance with positive tolerance
- (c) Protected creepage distance
- (d) Eccentricity of the disc
 - (i) Axial run out
 - (ii) Radial run out
- (e) Unit mechanical and electrical characteristics
- (f) Size and weight of ball and socket parts
- (g) Weight of unit insulator disc/long rod units
- (h) Materials
- (i) Identification mark
- (j) Manufacturer's catalogue number

3.8.0 Guaranteed Technical particulars

The tenderer (Manufacturer) shall furnish the guaranteed technical particulars with drawings and other data along with the tender for all the listed hardware materials. Without the GTP the Bid will be termed as non responsive

ANNEXURE – I

**Provisional Price Schedule for Supply of Lattice Steel Tower Super structure
(Quantities indicated may change as per requirement of work but will be
considered for evaluation of tenders)**

Sl No	Item Description	Unit	Quantity	Rate In RS	F&I	ED	CST/VAT	Entry tax	Any Other Taxes (If any)	(RS)
1	2	3	4	5	6	7	8	9	10	11
1	Lattice steel tower super structure (132 KV Shyama Power Design)	MT	295							
2	Grand total									

Note : Assam Govt. Entry tax or any other applicable tax may be indicated in your tender separately. Otherwise it shall be assumed as inclusive

ANNEXURE – II

Price Schedule for Provisional Supply of Nuts & Bolts

(Quantities indicated may change as per requirement of work but will be considered for evaluation of tenders)

Sl No	Item Description	Unit	Quantity	Rate In RS	F&I	ED	CST/VAT	Entry tax	Any Other Taxes (If any)	(RS)
1	2	3	4	5	6	7	8	9	10	11
1	G.I. Nuts & Bolts	MT	16.5							
2	Grand Total									

Note : Assam Govt. Entry tax or any other applicable tax may be indicated in your tender separately. Otherwise it shall be assumed as inclusive

ANNEXURE – III

Provisional Schedule for Supply of Porcelain Long Rod Insulators

(Quantities indicated may change as per requirement of work but will be considered for evaluation of tenders)

SI	Item description	Unit	Qty	Rate in	F&I	E.D.	CST/VAT	Amount in
1	2	3	4	5	6	7	8	9
1	11KV, 70 KN Porcelain Disc	No	27					
2	11KV, 90 KN Porcelain	No	1800					
3	11KV, 180 KN Porcelain Disc	No	480					

Note : Assam Govt. Entry tax or any other applicable tax may be indicated in your tender separately. Otherwise it shall be assumed as inclusive

ANNEXURE – IV

Provisional Schedule for Supply of Hardware fittings & Tower Line accessories

(Quantities indicated may change as per requirement of work but will be considered for evaluation of tenders)

SI No	Item description	Unit	Qty	Rate in Rs	F&I in Rs	E.D.	CST/VAT	Amount in Rs
1	2	3	4	5	6	7	8	9
1	Supply fo Danger Plate	Nos	35					
2	Supply of phase plate	Set	35					
3	Supply of No Plate	No	35					
4	Supply of Bird Guard	No	3					
5	Supply of Anti-Climbing Device	Set	35					
6	Mid span compressor joint for AAAC Panther conductor	No	6					
7	Stock Bridge type Vibration damper for AAAC Panther	No	210					
8	P.A. rod for AAAC Panther conductor	No	6					
9	Strain clamp for ground wire	No	68					
10	Suspension clamp for ground wire	No	1					
11	Copper earth bond 68	No	69					
12	Single suspension hardware fitting for AAAC Panther conductor complete	No	5					
13	Single tension hardware fitting for AAAC Panther conductor complete	No	180					
14	Double tension hardware fitting for AAAC Panther conductor complete	No	24					

Note : Assam Govt. Entry tax or any other applicable tax may be indicated in your tender separately. Otherwise it shall be assumed as inclusive

Section – 4

**BID SUBMISSION SHEET, BID FORMS AND
SCHEDULES**

1 Bid Submission Sheet

Name of Contract:

To:

The Managing Director,
Assam Electricity Grid Corporation Ltd,
Bijulee Bhawan, Paltanbazar, Guwahati-781001

Sir:

We have examined the General Conditions of Contract, Technical Specification, Schedules, and Addenda Nos _____(if any). We have understood and checked these documents and have not found any errors in them. We accordingly offer to execute and complete the said Works and remedy any defects fit for purpose in conformity with these documents and the enclosed Proposal (Offer), for the fixed sum of Rupees *(insert total quoted total price in figures and words)*.

We accept your suggestions for the appointment of the Dispute Adjudication Board, as set out in the Bidding Document.

We agree to abide by this Bid until _____ and it shall remain binding upon us and may be accepted at any time before that date.

If our bid is accepted, we will provide the specified performance security, commence the Works as soon as reasonably possible after receiving the notice to commence, and complete the Works in accordance with the above-named documents within the time stated in the Bidding Document.

Unless and until a formal Agreement is prepared and executed this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.

We understand that you are not bound to accept the lowest or any bid you may receive.

Commissions or gratuities, if any, paid or to be paid by us to agents relating to this Bid, and to contract execution if we are awarded the contract, are listed below:

Yours faithfully

Signature _____ in the capacity of _____ duly authorized to sign bids for and on behalf of

Address _____

2. Form of Bid Security (Bank Guarantee)

WHEREAS, _____ [Name of Bidder] (hereinafter called "the Bidder") has submitted his bid dated _____ [Date] for the construction of _____ [Name of Contract] (hereinafter called "the Bid").

KNOW ALL MEN by these presents that We _____ [Name of Bank] of _____ [Name of Country] having our registered office at _____ (hereinafter called "the Bank") are bound unto _____ [Name of Employer] (hereinafter called "the Employer") in the sum of _____ for which payment well and truly to be made to the said Employer the Bank binds himself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this ____ day of _____ 20____.

THE CONDITIONS of this obligation are:

- (1) If the bidder withdraws his Bid during the period of bid validity specified in the Form of Bid: Or
- (2) If the Bidder refuses to accept the correction of errors in his Bid; Or
- (3) if the Bidder, having been notified of the acceptance of his Bid by the Employer during the period of Bid validity;
 - (a) fails or refuses to execute the Form of Contract Agreement in accordance with the Instructions to Bidders, if required; or
 - (b) fails or refuses to furnish the Performance Security, in accordance with the Instructions to Bidders;

we undertake to pay to the Employer up to the above amount upon receipt of its first written demand, without the Employer having to substantiate its demand, provided that in its demand the Employer will note that the amount claimed by it is due to it owing to the occurrence of one or all of the three conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date 210 days after the deadline for submission of bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

DATE _____ SIGNATURE OF THE BANK _____

WITNESS _____ SEAL _____

(Signature, Name, and Address)

3. Schedule of Technical Deviations

The following are the Technical Deviations and Variations from and Exceptions to the specifications and documents for the subject package. These deviations and variations are exhaustive. Except these deviations, the entire work shall be performed as per your specifications and documents.

Vol./Clause	Ref./Page No.	As specified in the specification	Technical deviation and variations to the specification
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Date: (Signature).....
Place: (Printed Name).....
(Designation).....
(Common Seal).....

5. Guarantee Declaration

We declare that the ratings, specifications and performance figures of the various plants and equipments furnished by us in the Bid are guaranteed. We further declare that in the event of any deficiencies in meeting the guarantees in respect of the characteristics mentioned in Guaranteed Technical Particulars, of Technical Bid as established after conducting the factory test, you may at your discretion, reject or accept the equipment after assessing the liquidated damages as specified in relevant clause of Bid Document.

Date: (Signature).....

Place: (Printed Name).....

(Designation).....

(Common Seal).....

6. Work Completion Schedule

We hereby declare that the following Work Completion Schedule shall be followed by us in executing the works covered under the Scope of this Bid.

Sl. No.	Description of Work	Period in Months (from the date of LOA)
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Date : (Signature)

Place : (Printed Name)

(Designation).....

(Common

Seal).....
