TENDER DOCUMENTS

FOR

Construction of 11KV line, installation of 100KVA, 11/.4KV double pole mounted S/s and construction of LT line for providing power supply to LT individually supply to the Bajaranga Vihar near Ashok Vatika, Mouza - Botanda, Sundarapada, Bhubaneswar as applied by Dy.Director, D.P.M.U, Khordha under Dhauli Electrical Section, BED, BBSR in 100% deposit scheme

CENTRAL ELECTRICITY SUPPLY UTILITY OF ODISHA

OFFICE OF THE SUPERINTENDING ENGINEER (ELECT), ELECTRICAL CIRCLE No.1
POWERHOUSE, UNIT-VIII, BHUBANESWAR – 751012
Phone: 2392742, 2395273, Fax: 0674-2392742, E-mail: sebbsr1@cescoOdisha.com

Tender Call Notice No. PUR./TEND/05/2019-20 Dated 11.03.2020 of S.E, E.C-I, Bhubaneswar.

Head Office: IDCO TOWERS, 2nd Floor, Janpath, Bhubaneswar-751022
TELEPHONE: (0674) - 2542895, 2545681, 2541727
FAX: 0674 – 2543125

Volume – I

COMMERCIAL BID

BIDDING DOCUMENTS

CONTENTS

TENDER CALL NOTICE NO.PUR/TEND/ 05/2019-20

Tender Notification No. **Dt:**

Central Electricity Supply Utility of Odisha (CESU) invites bids from reputed firms / Electrical Contractors with required HT license to be engaged as an executant on Partly turnkey basis in two-part bidding system for the following works.

Brief Description of Work	Estimated Cost (in Rs)	Earnest Money Deposit (in Rs)	Last date/time for submission of bids	Date and time of opening of bid	Non refundable Cost of Bid document in Rs
1	2	3	4	5	6
Construction of 11KV line, installation of 100KVA, 11/.4KV double pole mounted S/s and construction of LT line for providing power supply to LT individually supply to the Bajaranga Vihar near Ashok Vatika, Mouza - Botanda, Sundarapada, Bhubaneswar as applied by Dy.Director, D.P.M.U, Khordha under Dhauli Electrical Section in partly turnkey basis.	**6,56,623.00**	**6566.23**	**18.03.2020 3.00 PM**	**18.03.2020 4.00 PM**	**4000.00 + 12% GST**

Sale and downloading of tender documents starts from: **12.03.2020**

The EMD & cost of Bid document is to be deposited in shape of D.D only. Pre-bid meeting will be held on Date **16.03.2020 at 3.00 P.M** at Office of G.M (Elect.), Electrical Circle No-I, Power House, Unit-8, Bhubaneswar.

For details please visit our website: www. cescoodisha.com/ www.cesuodisha.com on or after **12.03.2020,** and **t**he prospective bidders are requested to follow the above CESU website time to time for any Clarification/ Corrigendum/ Addendum against the referred Tender.

The authority reserves the right to accept or reject any or whole of the offers without assigning any reason thereof.

-sd-

General Manager (Elect.)
Electrical Circle No-I, Bhubaneswar.

SECTION – I
INVITATION FOR BIDS (IFB)
Tender Notice No.PUR./TEND/05/2019-20 Dated 11.03.2020 of S.E, E.C-I, Bhubaneswar

1.0 CESU invites sealed tenders from reputed Electrical Contractors with required HT license, either in individual capacity or as part of a joint venture agreement / consortium for carrying out various Electrical Installation works on 'Partly Turnkey' basis in the jurisdiction of their respective licensed area under deposit work. The bidder must fulfill all the qualifying requirements as specified in clause 2.0 stated below. The sealed envelopes shall be duly super scribed with "**TENDER NOTICE No: 05/2019-20" dtd 11.03.2020 & the due date of opening is 18.03.2020 at 4.00 P.M.**

Brief Description of Work	Estimated Cost (in Rs)	Earnest Money Deposit (in Rs)	Last date/time for submission of bids	Date and time of opening of bid	Non refundable Cost of Bid document in Rs
1	2	3	4	5	6
Construction of 11KV line, installation of 100KVA, 11/.4KV double pole mounted S/s and construction of LT line for providing power supply to LT individually supply to the Bajaranga Vihar near Ashok Vatika, Mouza - Botanda, Sundarapada, Bhubaneswar as applied by Dy.Director, D.P.M.U, Khordha under Dhauli Electrical Section in in partly turnkey basis.	**6,56,623.00**	**6566.23**	**18.03.2020 3.00 PM**	**18.03.2020 4.00 PM**	**4000.00 + 12% GST**

2.0 The eligible Bidders should meet the following qualifications;

a) Bidder must quote for a complete bid.

b) Bidder should have installed and commissioned **at least following quantum of works** as specified under the bid for which the bidder is submitting his bid during the last three financial years preceding to the year of tender notification**.** Bidder must enclose copies of the relevant Work Orders along with Client Certified copies of Final Invoices and/or Performance Certificates duly signed by the competent authority of the client and/or Final Inspection Certificate issued by Electrical Inspector in support of proof of having executed the desired quantum of works during the last three financial years.

i. Must have Installed 100 KVA, 11/.4 KV pole mounted sub-station or higher size =1No
ii. Construction of LT Overhead line (AB Cable) 3ph 4W /5W = 200 mtr.

c) **Average Annual Turnover during the last three financial years preceding to the year of tender notification should be equal to or more than the estimated cost of the bid** for which the bidder has submitted his bid. The bidder shall furnish audited accounts for the last three years i.e. FY 2016-2017, FY 2017-2018, FY 2018-2019 evidencing their turnover requirement.

d) Bidder shall be financially sound and stable having liquid assets as stated in the enclosed format and/or access to credit facility of **not less than one fifth of the estimated cost of the Bid(s)** for

which he has submitted the bid. Bidder shall furnish the documentary evidence to establish the financial soundness.

e) Two or more like minded contractor(s) and/or manufacturer(s) of electrical items, and /or firms having the experience as mentioned above in Para-2 and as per this tender specification, may form a joint venture/ consortium, may Tie up and make agreement amongst themselves and apply against this tender specification, provided they qualify the criteria. The sample format of joint venture / consortium agreement is enclosed at Section – IV of this tender specification as Annexure - VI.

f) If the bidder is a joint venture / consortium/ Tie-up, they shall comply the qualifying criteria as follows:

i. At least one partner shall have the stipulated previous works experience for similar quantity of completed works as stated in the qualifying criteria.

ii. If the work experience of one partner is not meeting the entire qualifying criteria, the item wise field experience of the other partner(s) specified in the scope of work shall be added for qualifying the bid in total. However item wise fractional work experience shall not be summed up for consideration for any single item of the scope.

iii. However, the annual turnover and liquidity figures of all partners shall be added together to determine, if the joint venture / consortium is meeting the Annual Average Turnover criteria as stated in the qualifying criteria. For tie-up cases the turnover shall be evaluated on the lead partner basis.

g) One of the partners shall be nominated as Lead Partner and the lead partner shall be authorized to incur liabilities and receive instructions for and on behalf of all partners of the joint venture / consortium and entire execution of the contract including receipt of payments shall be done exclusively through the lead partner. This authorization shall be evidenced by submitting by a Power of Attorney signed by legally authorized signatories of all partners.

h) All partners of joint venture / consortium shall be liable jointly and severally for the execution of contract in accordance with the contract terms and a copy of the agreement entered into by the joint venture / consortium partners having such a provision shall be submitted with the Bid. A statement to this effect shall be included in the authorization mentioned as above as well as in the Bid form and in Contract form (in case of a successful bid).

i) In addition to above the bidder should submit the following documents in part-I bid as qualifying terms.

- **i. Valid electrical (HT) license for electrical works.**
- **ii. EPF & ESI registration**
- **iii. PAN & TIN No.**
- **iv. GST Registration**
- **v. Labour License**

j) The bidders who have earlier failed to execute the work order(s) of the CESU shall not be eligible to participate in this tender.

k) CESU reserves the right to waive minor deviation, if they do not materially affect the capacity of the bidder to perform the contract.

3.0 Bids specification document can be obtained from the office of the undersigned on payment of Rs. 4000/- towards non-refundable cost of bid documents plus 12% GST (Total Rs.4480/-) through

Bank DD drawn in favour of purchaser payable on Bhubaneswar, during office hours till 1.00 PM of 18.03.2020.

4.0 The tender documents can also be downloaded from CESU websites **www.cesuodisha.com_/ www.cescoOdishaa.com** In case tender papers are downloaded from these websites, then the bidder has to enclose a Demand Draft, (As mentioned in the above Para) drawn on any scheduled bank, payable at Bhubaneswar, covering the cost of bid documents as stated above in a separate envelope with suitable superscription **"Cost of Bid Documents : Short Tender Call Notice Ref : PUR/TEND/05/2019-20 "**. This envelope should accompany the Bid Documents.

5.0 The Bids shall be **submitted and received** in the office of the undersigned on all office working days **up to 3.00 PM of 18.03.2020.** In the event the date of opening is a holiday, the next working day shall be treated as the date of opening. **A pre-bid meeting** will be held **on Date 16.03.2020 at 03.00 P.M** in the Office of the Dy. G.M (Elect.), EC-I, BBSR for giving clarifications, if any, on the bid documents to the prospective bidders who may choose to attend the meeting as detailed in the Bid document.

6.0 **Part-I of the bid (Technical Bid) will be opened on Dated 18.03.2020 at 4.00 P.M** as indicated above, in the presence of the bidder or authorized representatives of the Bidders. Bidders shall depute only one representative to attend pre bid meeting and tender opening if they wish to be represented. The undersigned reserves the right to reject any or all tenders if the situations so warrants.

7.0 All correspondence with regard to the above shall be made to the following address:

General Manager (Elect.)
Electrical Circle No-I,Bhubaneswar
POWERHOUSE, UNIT-VIII, BHUBANESWAR – 751012
Phone: 2392742, 2395273, Fax: 0674-2392742,
E-mail: sebbsr1@cescoOdisha.com

SECTION – II

GENERAL CONDITIONS OF CONTRACT (GCC)

Tender Call Notice No.PUR./TEND/05/2019-20 Dated 11.03.2020 of S.E, E.C-I, Bhubaneswar.

1.0 GENERAL: -

CESU hereinafter referred to as the "Purchaser" are desirous of taking up the work "**Construction of 11KV line, installation of 100KVA, 11/.4KV double pole mounted S/s and construction of LT line for providing power supply to LT individually supply to the Bajaranga Vihar near Ashok Vatika, Mouza - Botanda, Sundarapada, Bhubaneswar as applied by Dy. Director, D.P.M.U, Khordha under Dhauli Electrical Section in partly turnkey basis.".**

The above works including partly supply of Equipments/Materials, Erection, Testing and Commissioning as per the Scope detailed in the Bid Documents.

2.0 SCOPE OF WORK: -

The scope shall include supply and installation of all materials & equipments to complete the works.

a) Detailed survey of the proposed area and routes.
b) Complete manufacture, including shop testing & supply of all materials / equipments from the approved vendor or from his manufacturing units.
c) Providing Engineering drawing, data, operational manual, etc for the Purchaser's approval;
d) Receipt, storage, preservation and conservation of equipment at the site.
e) Reliability tests and performance and guarantee tests on completion of commissioning.
f) Loading, unloading and transportation as required.
g) Installation of 100KVA, 11/0.4 KV pole mounted S/s using 10mtr. Long 116x100 mm RS Joist with 5 nos. earthing LT distribution box and boundary wall arrangement with provision of wire mesh angle etc. = 1No.
h) Construction of 3Q3W 11 KV line using 116x100 10 mtr. Long RS Joist & 55mm2 AAAC with provision of polymer disc insulator at tension point = 0.25 KM (5span).
i) Construction of 3Q5W LT line by 8mtr. Long 200Kg PSC pole & 3x50+1x35+1x16mm2 ABC = 0.16 Km (4 span)
j) Installation of 100 KVA, 11/0.4 KV pole mounted Sub-Station = 1No.
k) Construction of all civil works.
   a. Earthing complete with supply of earthing device, GI flat, Charcoal, salt – 8 nos.
   b. Construction of barbed fencing with retaining wall around sub-station with spreading of metal and filling of sand inside sub-station premises with fixing of MS grill gate – 1 no.
   c. Concreting, padding & cooping of all supports.
l) **Getting the total work inspected by Electrical Inspector after its completion.**
m) **Transportation of all above required materials (OSM) from Purchaser's nearest store (Bhubaneswar, Choudwar) to site and all other required materials (to be supplied by bidder) from supplier's premises to work site, construction of new electrical / civil structures, dismantling of existing electrical structures / equipments and return of these dismantled items at the purchaser's stores, safe custody of the items and return of unused purchaser supplied materials to the purchaser's stores**.

Note: For details, the technical specification, price schedule & BOQ specified in separate Section may be referred to.

3.0 DEFINITION OF TERMS

i. The '**Contract** 'means the agreement entered into between the Purchaser and the Contractor as per the Contract Agreement signed by the parties, including all attachments and appendices there to and all documents incorporated by reference therein.

ii. '**Purchaser**' shall mean CESU and shall include its legal representatives, successors and designated officers/Engineers.

iii. **"General Manager (Elect) / Superintending Engineer (Elect)** is the In-Charge of Circle No. I, CESU BBSR "

iv. '**Contracto**r' shall mean the Bidder whose bid will be accepted by the Purchaser for the award of the Works and shall include such successful Bidder's legal representatives, successors and permitted assigns.

v. '**Sub-Contractor**' shall mean the person named in the Contract for any part of the works or any person to whom any part of the Contract has been sublet by the contractor with the consent in writing of the Engineer and will include the legal representatives, successors and permitted assigns of such person.

vi. '**Engineer in Charge**' shall mean the officer appointed in writing by the Purchaser to act as Engineer from time to time for the purpose of the Contract.

vii. 'S**pecifications**' shall mean the specifications and Bidding Document forming a part of the Contract and such other schedules and drawings as may be mutually agreed upon.

viii. '**Site**' shall mean and include the land and other places on, into or through which the works and the related facilities are to be erected or installed and any adjacent land, paths, street or reservoir which may be allocated or used by the Purchaser or Contractor in the performance of the Contract.

ix. '**Inspector**' shall mean the Purchaser or any person nominated by the Purchaser from time to time, to inspect the equipment; stores or Works under the Contract and/or the duly authorized representative of the Purchaser.

x. '**Notice of Award of Contract**'/ 'Letter of Award' shall mean the official notice issued by the Purchaser notifying the Contractor that his bid has been accepted.

xi. '**Date of Contract**' shall mean the date on which notice of Award of Contract/ Letter of Award has been issued.

xii. '**Performance and Guarantee Tests'**, shall mean all operational checks and tests required to determine and demonstrate capacity, efficiency, and operating characteristics as specified in the Contract Documents.

xiii. The term '**Final Acceptance'/ 'Taking Over**' shall mean the Purchaser's written acceptance of the works performed under the Contract, after successful commissioning/ completion of Performance and Guarantee Tests, as specified in the accompanying Technical Specifications or otherwise agreed in the contract.

xiv. '**Commercial Operation**' shall mean the condition of operation in which the complete equipment covered under the Contract is officially declared by the Purchaser to be available for continuous operation at different loads up to and including rated capacity. Such declaration by the Purchaser, however, shall not relieve or prejudice the Contractor of any of his obligations under the Contract.

xv. Words imparting '**Person**' shall include firms, companies, corporations and associations or bodies of individuals, whether incorporated or not.

xvi. Terms and expressions not herein defined shall have the same meaning as are assigned to them in the Indian Sale of goods Act (1930), failing that in the Indian Contract Act (1872) and failing that in the General Clauses Act (1897) including amendments thereof, if any.

xvii. In addition to the above the following definition shall also apply

a) 'All equipment and materials' to be supplied shall also mean 'Goods'
b) 'Constructed' shall also mean erected and installed.
c) 'Contract Performance Guarantee' shall also mean 'Contract Performance Security'.
d) **OSM** shall mean CESU/ Owner's supplied materials.

4.0 SUBMISSION OF TENDER: -

4.01 Sealed tenders in Two parts each in duplicate, each complete in all respects in the manner hereinafter specified are to be submitted to **General Manager (Elect.), Electrical Circle No-I, Power House, Unit-8, Bhubaneswar-751012** on or before the date and time specified in the notice inviting the tenders. Bids shall be submitted as per format provided in Section – III & IV. Each copy of the bids (original and duplicate) shall be submitted in separate double sealed envelopes superscripted on each of the covers the tender specification number and the due date of opening of the bids on the right hand top side of the envelope.

4.02 The tenders are required to be submitted in Two Parts each in separate double sealed covers**.**

a) Part - I : Superscribed as "Technical and commercial bid " shall contain EMD (for each bid separately) Proof of payment of Bid Documents cost and Techno commercial documents.

b) Part - II, Superscribed as "Price Bid". The Part - II should contain only Price bid in duplicate in separate envelope.

4.03 Fax and Telegraphic tenders shall not be accepted.

4.04 Receipt of bids/ revised bids after the cut off time and date as specified in the Tender specification shall not be permitted and such bids shall be rejected outright. The Purchaser shall not be responsible for any delay in transit in post / courier etc. in this regard.

5.0 VALIDITY :-

The offer shall be valid for a period not less than **180 days from the date of bid opening**.

6.0 PRICE: -

Bidders are required to quote firm price as per the prescribed format enclosed in **Volume-III**, **Part-B** Bid Proposal Sheets. The quoted price shall be firm and inclusive of all taxes, duties, freight & insurance and other levies, if any. CESU shall not be liable to pay anything extra over and above the quoted price.

7.0 RECEIPT AND OPENING OF THE BID: -

7.01 Bids in duplicate as described under clause 4.0 shall be received in the office of the Purchaser and shall be opened on the scheduled date and time. The Purchaser's authorized representatives shall open bids in the presence of Bidders' representatives on the date and time for opening of bids as specified in the Invitation to Bid or in case any extension has been given thereto, on the extended bid opening date and time notified.

7.02 Maximum one representative for each bidder shall be allowed to witness the opening of bids. The representative must produce suitable authorization in this regard to be eligible to witness the bid opening on behalf of the bidder. Bidders' representatives who are present shall sign in a register evidencing their attendance.

7.03 The Bidders' names, bid prices, modifications, bid withdrawals and the presence or absence of the requisite bid guarantee and such other details as the Purchaser, at its discretion, may consider appropriate will be announced at the opening. No electronic recording devices will be permitted during bid opening.

7.04 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. Any effort by a Bidder to influence the Purchaser's processing of Bids or award decisions may result in the rejection of the Bidder's Bid.

8.0 EVALUATION OF BIDS & AWARD OF CONTRACT:

8.01 To assist in the examination, evaluation and comparison of Bids, the Purchaser may, at its discretion, ask the Bidder for a clarification of its Bid. All responses to requests for clarification

shall be in writing and no change in the price or substance of the Bid shall be sought, offered or permitted.

8.02 Purchaser will examine the Bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the Bids are generally in order.

8.03 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price per item that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price per item will be corrected. If there is a discrepancy between the Total Amount and the sum of the total price per item, the sum of the total price per item shall prevail and the Total Amount will be corrected.

8.04 Prior to the detailed evaluation, Purchaser will determine the substantial responsiveness of each Bid to the Bidding Documents including production capability and acceptable quality of the Goods offered. A substantially responsive Bid is one, which conforms to all the terms and conditions of the Bidding Documents without material deviation.

8.05 The Purchaser's evaluation of a Bid will take into account, in addition to the Bid price, the following factors, in the manner and to the extent indicated in this Clause:

a) Work Schedule
b) Deviations from Bidding Documents

8.06 The Purchaser will award the Contract to the successful Bidder whose Bid has been determined to be the lowest - evaluated responsive Bid based on the price quoted in the price bid in their offered BOQ and services. When the lowest bidders is not ready and/or capable to undertake the entire work envisaged, then the Purchaser may explore the possibility of the execution of works through other bidders if they are willing to execute at **L_1 rate**. Such exploration shall be carried out in a sequential order starting with **L_2** bidder then with **L_3** bidder and so on.

9.0 EARNEST MONEY DEPOSIT (EMD):-

9.01 The Tender must be accompanied by Earnest Money Deposit for the quoted price in shape of account payee Bank Draft drawn on any scheduled bank in favour of **CESU, Electrical Circle No-1, Bhubaneswar payable at Bhubaneswar**. EMD shall be, as mentioned in the tender notice of the bid for which the bidder has submitted the bid. Bids without EM deposit will be rejected out rightly.

9.02 No adjustment of any previous deposit or any amount payable from Purchaser shall be entertained for EMD. EMD amount so submitted shall not carry any interest payable to the bidder.

9.03 The Earnest Money so deposited shall be forfeited:

a) if the Bidder:
   i) Withdraws its bid during the period of bid validity specified by the Bidder in the Bid Form;

or

(a) The successful Bidder, Fails:
   i. to sign the Contract, or
   ii. to furnish the required Contract Performance Bank Guarantee.

9.04 The EMD of unsuccessful bidders shall be returned within 30 days from the date of finalization of the order.

10.0 PURCHASER'S RIGHT TO VARY QUANTITIES AT TIME OF AWARD:

While placing orders and / or during execution of contract, Purchaser reserve the right to increase or decrease the quantity of goods and services specified in the Schedule of Requirement upto 20% of the tender quantity without any change in price or other terms and conditions.

11.0 INSPECTION AND TESTING :-

The Engineer-in-charge shall be entitled at all reasonable times during manufacture / installation to inspect examine and test the materials at the contractor's premises / erection site about

workmanship of the materials to be supplied under this contract. If the said materials are being manufactured in other premises, the contractor shall provide unhindered clearance, giving full rights to the purchaser to inspect, examine and test as if the materials were being manufactured in his premises. Such inspection / examination and testing shall not relieve the contractor of his obligations to execute the contract by letter and spirit. The contractor shall give the purchaser advance notice in writing of the Date and the Place at which the materials will be ready for testing. The inspecting officer for the entire work shall be the (Respective Purchaser Authority) of the concerned site.

12.0 COMPLETION AND COMPLETENESS OF THE EQUIPMENT :-

12.01 Time being the essence of the contract; the work shall be completed within 30 **(Thirty) days from the date of issue of work order** including supply of all the materials, erection, Testing & commissioning.

12.02 The work shall be treated as complete item wise when one item shall be complete in all respects with all mountings, fixtures and standard accessories which are normally supplied even though not specifically detailed in the specification. No extra payment shall be payable for such mounting, fittings, fixtures and accessories which are needed for safe operations of the equipment as required by applicable code of the country though this might not have included in the contract.

12.03 All similar components and/or parts of similar equipment supplied shall be inter-changeable with one another. Various equipments supplied under this contract shall be subject to Purchaser's approval.

12.04 The Superintending Engineer (Elect), Electrical Circle No-I, CESU, BBSR however reserves the right to re-schedule the completion period, if required.

13.0 REJECTION OF MATERIALS : -

In the event of the materials supplied by the contractor and/or the installation works are found to be defective in quality and the workmanship is poor or otherwise not in conformity with the requirements of the contract specification as per **section-IV** (Technical specification), Purchaser shall reject such materials / services and ask the contractor in writing to replace / rectify the defects. The contractor on receipt of such notification shall either rectify or replace the defective materials and/or re-install the work already executed, free of cost to the Purchaser. If the contactor fails to do so the Purchaser may at his option take the following actions which could be on concurrent basis.

a) Replace or rectify such defective materials and recover the extra cost so involved plus 25% from the Contractor.

b) Terminate the contract for balance supply and erection with enforcement of penalty as per contract.

c) Acquire the defective materials at reduced price considered acceptable under the circumstances.

d) Forfeit the Contract Performance Bank Guarantee.

14.0 EXPERIENCE OF BIDDERS : -

The bidders are required to furnish information regarding their experience on the following aspects as per format provided in **Section – IV, Annexure VII (A) & (B) :**

a) Description of similar type of work executed during the last three years with the name(s) of the party(s) to whom / where supplies / erection were made.

b) Testing facilities available at manufacturer's works site along with the list of testing equipments.

c) Purchase / work orders details (P.O / W.O No. and date only) executed (construction work) during the last three years along with Electrical inspection report copies and copies of user's performance certificates.

Bids may not be considered if the past performance is found to be un-satisfactory.

15.0 DEVIATION FROM SPECIFICATION: -

The bidders are requested to study the specification and the attached drawings thoroughly before tendering so that if they make any deviations, the same are prominently brought on a separate sheet under the headings "Deviations" as per formats provided under **Section IV, Annexure – VIII & IX**. All such deviations to the technical & commercial terms of the specification shall be indicated in a separate list as indicated above. In absence of such deviation schedule, it will be presumed that the bidder has accepted all the conditions stipulated in the tender specification, not withstanding any deviations mentioned elsewhere in the Bid. However the acceptance of deviation is not binding on the Purchaser.

16.0 CONTRACTOR TO INFORM HIMSELF FULLY: -

The contractor shall examine the instructions, general conditions of the contract, specifications and the schedule of quantity and delivery to satisfy himself as to all the terms and conditions and circumstances affecting the contract price. He shall quote prices according to his own judgment and shall understand that no additional cost except as quoted shall only be considered.

17.0 PATENT RIGHT: -

The contractor shall indemnify the purchaser against all claims, actions, suits and proceedings for the alleged infringement of any patent design or copy right protected either in country of origin or in India by the use of any equipment supplied by the contractor but such indemnity shall not cover any use of the equipment other than for the purpose indicated by or reasonable to be informed from the specification.

18.0 GUARANTEE PERIOD: -

18.01 The materials to be supplied by the contractor shall be guaranteed for satisfactory operation against defects in design and workmanship for a period of **24 months** from the date of handing over the completed installations.

18.02 The above guarantee certificate shall be furnished in triplicate to the Purchaser for his approval. Any defects noticed during the above period should be rectified by the Contractor free of cost to the Utility provided such defects are due to faulty design, bad workmanship or bad materials used on receipt of written notice from the Purchaser.

19.0 PENALTY FOR DELAY IN COMPLETION OF CONTRACT: -

19.01 If the contractor fails to complete the works by the scheduled period or any extension granted thereby, the contractor shall be liable for payment of penalty amounting to **0.5% (half percent)** of the contract price per week of un-finished works subject to the maximum of 5% (five percent) of the total contract price and subject to force majeure conditions.

19.02 Penalty amount can be realized from the proceeds of the Contract Performance Bank Guarantee, if the situation so warrants.

19.03 Extension of delivery period / completion of the work could be with / without levy of penalty with the discretion of S.E, E.C-I, CESU, BBSR.

20.0 CONTRACTOR'S DEFAULT :

20.01 If the Contractor neglects to execute the works with due diligence and expedition or refuses or neglects to comply with any reasonable order given to him, in writing by the Engineer in connection with the works or contravenes the provisions or the contract, the Purchaser may give

notice in writing to the Contractor to make good the failure, neglect or contravention complained of. Should the Contractor fail to comply with the notice within thirty (30) days from the date of serving of the notice, the Purchaser shall be at liberty to employ other workmen and forthwith execute such part of the works as the contractor may have neglected to do or if the Purchaser thinks fit, without prejudice to any other right, he may have under the Contract to take the work wholly or in part out of the Contractor's hands and re-contract with any other person or persons to complete the works or any part thereof and in that event the Purchaser shall have free use of all Contractor's equipment that may have been at the time on the Site in connection with the works without being responsible to the Contractor for fair wear and tear thereof and to the exclusion of any right of the Contractor over the same, and the Purchaser shall be entitled to retain any balance which may otherwise be due on the Contract by him to the Contractor, or such part thereof as may be necessary, to the payment of the cost of executing the said part of works or of completing the works as the case may be. If the cost of completing of works or executing part thereof as aforesaid shall exceed the balance due to the Contractor, the Contractor shall pay such excess. Such payment of excess amount shall be independent of the liquidated damages for delay which the Contractor shall have to pay if the completion of works is delayed.

20.02 In addition, such action by the Purchaser as aforesaid shall not relieve the Contractor of his liability to pay liquidated damages for delay in completion of works.

20.03 Such action by the Purchaser as aforesaid the termination of the Contract under this clause shall not entitle the Contractor to reduce the value of the Contract Performance Guarantee nor the time thereof. The Contract Performance Guarantee shall be valid for the full value and for the full period of the Contract including guarantee.

21.0 TERMINATION OF CONTRACT ON PURCHASER'S INITIATIVE :

21.01 Purchaser reserves the right to terminate the Contract either in part or in full due to reasons other than those mentioned under clause entitled 'Contractor's Default'. The Purchaser shall in such an event give fifteen (7) days notice in writing to the Contractor of his decision to do so.

21.02 The Contractor upon receipt of such notice shall discontinue the work on the date and to the extent specified in the notice, make all reasonable efforts to obtain cancellation of all orders and Contracts to the extent they related to the work terminated and terms satisfactory or the Purchaser, stop all further sub-contracting or purchasing activity related to the work terminated, and assist Purchaser in maintenance, protection, and disposition of the works acquired under the Contract by the Purchaser. In the event of such a termination the Contractor shall be paid compensation, equitable and reasonable, dictated by the circumstance prevalent at the time of termination.

21.03 If the Contractor is an individual or a proprietary concern and the individual or the proprietor dies and if the Contractor is a partnership concern and one of the partners dies then unless the Purchaser is satisfied that the legal representatives of the individual Contractor or of the proprietor of the propriety concern and in the case of partnership, the surviving partners, are capable of carrying out and completing the Contract the Purchaser shall be entitled to cancel the Contract as to its in completed part without being in any way liable to payment of any compensation to the estate of deceased Contractor and /or to the surviving partners of the Contractor's firm on account of the cancellation of the contract. The decision of the Purchaser that the legal representatives of the deceased Contractor or surviving partners of the Contractor's firm cannot carry out and complete the contract shall be final and binding on the parties. In the event of such cancellation the Purchaser shall not hold the estate of the deceased Contractor and/ or the surviving partners of the Contractor's firm liable to damages for not completing the Contract.

22.0 FORCE MAJEURE: -

The Contractor shall not be liable for any penalty for delay or for failure to perform the contract for reasons of Force Majeure such as "acts of God, acts of the Public enemy, acts of Govt., Fires, Flood, Epidemics, Quarantine restrictions, Strikes, Freight Embargos and provided that the Contractor shall within ten (10) days from the beginning of such delay notify the Purchaser in writing of the cause of delay. The Purchaser shall verify the facts and grant extension as facts justify.

23.0 EXTENSION OF TIME: -

If the delivery of the equipments / materials or execution of the work is delayed due to reasons beyond the control of the Contractor, the Contractor shall immediately inform the S.E. E.C-I, CESU, BBSR in writing of his claim for an extension of time. The S.E, E.C-I on receipt of such notice may agree to extend the contract period as may be reasonable but without prejudice to other terms & conditions of the contract.

24.0 SAFETY PRECAUTIONS:-

The agency shall observe all applicable regulations regarding safety at the Site. Any compensation due on account of accident at site shall be to the contractor's account. The contractor should follows various safety provisions as provided under Regulation-3, Regulation-4 & Regulation-7 of CEA (Measures relating to safety & electric supply) Regulation- 2010 and Regulation-7 of CEA (Safety requirements for construction, operation and maintenance of electrical plants and electrical lines) Regulation-2011. The detail is annexed at Annexure- XVII.

25.0 STORE :-

Storing of materials from supply to erection shall be arranged by the contractor at his own cost. No compensation shall be made by the Purchaser for any damage or loss of materials during storing, transit transportation and at the time of erection.

26.0 INSURANCE: -

a) Contractor shall arrange adequate Transit-cum-storage-cum-erection policy and shall submit the copy of the same to the Purchaser. The policy shall initially remain valid for a period of sixty days over & above the contractual guarantee period and shall be extended as required till handing over. Contractor shall be responsible for lodging of claim with the insurer as well as for all required follow up with the insurer for settlement of claim in case of loss/damage/theft of material during transit/storage/erection till the completed works is handed over to the Purchaser and is accepted by the authorized representative of the Purchaser in writing.

b) Contractor shall also arrange adequate cover for his employees / labourers engaged in the works as well as arrange third party insurance cover to indemnify any possible damages to public at large not connected with the works process. Any claim(s) pertaining to this shall be the responsibility of the Contractor.

c) The contractor shall undertake free replacement of the materials damaged or lost during transit, which will be intimated by the Consignee within 30 days of receipt of the materials at purchaser's stores.

27.0 ENGINEER IN CHARGE :-

Concerned Divisional Head of Electrical division **BED, Bhubaneswar shall be the Engineer in charge for the work.**

28.0 CONTRACT PERFORMANCE BANK GUARANTEE:-

28.01 Within 7 days of issue of the Work Order, the Contractor shall submit Contract Performance Bank Guarantee issued by a scheduled Bank, in favour of the Purchaser, covering 10% of the total value of the work order.

28.02 In case of Joint Venture/ Consortium, performance bank guarantee shall be in the name of lead partner @ of 10% of the contract price and additional @ 1% each by the Joint venture partner(s) separately (or) single Bank Guarantee for (Lead partner @ 10 % and each JV partner @ 1%) mentioning the name and address of the Lead & JV partner, to be submitted by lead partner.

28.03 The said Bank Guarantee shall be prepared in the prescribed proforma as attached in Section IV, Annexure - III. The Bank Guarantee furnished shall be executed on Non-judicial Stamp paper worth of Rs 100/- (Rupees Hundred only), purchased in the name of the issuing bank, as per the prevalent rules. The Bank Guarantee so provided shall be en-cashable on the Bhubaneswar branch of the issuing Bank.

28.04 The Contract Performance Bank Guarantee shall remain valid for a period not less than 90 days over and above the guarantee period, basing on stipulated completion period in the W.O. towards security i.e. 28 months from the date of issue of the work order and acceptance thereof, failing which the work orders (W.O) will be liable for cancellation without any further notice with forfeiture of E.M.D.

28.05 No interest shall be allowed by the Purchaser on the above Performance Security Deposit submitted by the Bidder.

28.06 The Contract Performance Bank Guarantee may be extended for the delay period of completion of work, if any.

29.0 TERMS OF PAYMENT:

29.1 An advance of 10% (ten percent) of total lump sum contract price shall be paid as Mobilization Advance, subject to the following.

a) Submission of Invoice for payment of advance.

b) Receipt and acceptance of unconditional irrevocable Contract Performance Bank Guarantee in favour of Purchaser as mentioned in clause 28.00.

c) Receipt and acceptance of unconditional and irrevocable Advance Payment Bank Guarantee in favour of Purchaser for an amount equivalent to the amount of advance as per the prescribed format as provided in Section IV, Annexure - IV. The Bank Guarantee so provided should be en-cashable on the Bhubaneswar branch of the issuing Bank. Advance bank guarantee shall be submitted for a period of 90 days over and above the schedule date of completion **i.e.** total for 4 (Four) months from date of issue of WO. The advance bank guarantee may be extended further for a period of 3 months each occasion, if the advance amount is not recovered fully.

d) Establishment of contractor site office and certification by the engineer that satisfactory mobilization for erection exists (at least single/ part of the completed item of work).

e) All advance payment shall be interest bearing and recovery of advance along with the interest component on the advance amount shall be as under:

(i) The said mobilization Advance will be recovered/ adjusted towards payment of first running bill while releasing 80% (Eighty percent) payment.

(ii) If any amount payable under the first running bill is not sufficient to cover the 10% mobilization advance, the balance outstanding shall be recovered from the next payment immediately falling due.

(iii) The amount of interest to be recovered from a particular bill shall be calculated @10% per annum on the value of advance corresponding to the percentage of total progressive payment being released. The period for which the interest is to be calculated shall be reckoned from the date of release of the advance payment to the actual date of release of the said progressive payment or the expiry of the stipulated time frame for release of such progressive payment. If any amount payable under any interim bill is not sufficient to cover all deduction to be made for

interest on the advance payment and other sums deductible there from, the balance outstanding shall be recovered from the next payments immediately falling due.

29.2 80% (Eighty percent) of contract price on pro-rata basis along with taxes and duties shall be paid progressively for each portion of proportionally completed items (Supply and erection at site only) of work as per the agreed Bill of Materials within 30 days of submission of claim subject to certification by Purchaser's Engineer-in-charge on the basis of check points involved in such items of work. **However, contractor shall raise R/A bill with a copy of the comprehensive insurance policy as per the Clause-26 on completion of at least 20 % of the total contract value failing which bill shall not be processed subject to maximum of 3 nos. of R/A bills.**

29.3 Balance 20% (twenty percent) of contract price shall be paid after completion of all works, envisaged under this package including any additions and alterations, testing & commissioning, return of dismantled materials/ un-used free supply material, taking over certificate and entire stretch is fully ready for commercial operation. The payments shall be subjected to clearance from electrical inspectorate.

Note : In case of joint venture/consortium all BG.s shall be in the name of joint venture/ consortium covering all the partners including the Lead Partner. The amount shall be 10% for lead partner and additional 1% for each of the J.V partners separately or single BG (Lead partner @ 10 % and JV partner @ 1%) mentioning the name and address of lead and JV partner to be submitted by lead partner.

30 PAYING-CUM-NODAL OFFICER:

"General Manager (Elect), Electrical Circle No.1, CESU, BBSR shall be the paying officer for the work.

31 PURCHASER'S RIGHTS: -

The Purchaser reserves the right to accept any bid or reject any or all bids or cancel / withdraw invitation of bid or to vary the quantity for placement of order without assigning any reason to such decision. Such decision by the Purchaser shall bear no liability.

32 DISPUTE RESOLUTION AND JURISDICTION : -

a) Any Disputes arising out of this contract shall be referred to the **CEO, CESU** who shall decide the case as "**sole Arbitrator"**.

b) For the purpose of dispute resolution, this agreement shall be governed by the provision of Arbitration and Conciliation Act,1996.

c) All disputes shall be subjected to exclusive jurisdiction of the Courts at Bhubaneswar and the writ jurisdiction of Hon'ble High Court of Odisha at Cuttack.

33 TRANSFER AND SUB-LETTING:-

The Contractor shall not sublet, transfer, assign or otherwise part with the Contract or any part thereof, either directly or indirectly, without prior written permission of the Purchaser.

34 FREE ISSUE OF MATERIALS:-

No free issues.

35 SUBMITTALS REQUIRED AFTER AWARD OF CONTRACT:-

35.01 Within 7 days of the effective date of contract the contractor shall provide three copies of an outline program of production, inspection, testing, delivery, survey, erection, pre-commissioning and commissioning in chart form. Included in the program will be the detailed schedule of drawing to be submitted.

35.02 The bar chart & pert chart for each item of the work so as to complete both the work in scheduled period of, 6 months shall be furnished by the contractor/Successful Bidder.

35.03 The periodic progress report as required by the purchaser shall be submitted by the contractor as per the format prescribed by the Engineer in Charge.

36 TAKING OVER

36.1 Upon successful completion of all the tests to be performed at site on equipment / materials supplied and erected by the contractor, the supply engineer shall issue to the contractor a taking over certificate as a proof of the final acceptance of the equipment / materials. Such certificate shall not be un-reasonably withheld nor will the engineer delay the issuance thereof on account of minor omission or defects, which do not affect the commercial operation and / or cause any serious to the equipment/material. Such certificate shall, however, not relieve the contractor of any of his obligations which otherwise survive by the terms & conditions of the contract after issuance of such certificate.

36.2 For the satisfaction of purchaser about quality, the purchaser shall have unreserved right for arrangement of testing of equipment/ materials and the complete system independently by self or any other agency chosen by the purchaser. The contractor is expected to agree and extend necessary help during such test if necessary.

37 LATENT DEFECT WARRANTY

The period of latent defect warranty in terms of this bidding documents, shall be limited to five (05) years from the date of completion of Guarantee period.

38.0 Any other terms not covered in this specification shall be dealt with relevant OPWD / CPWD / CVC codes / guide lines.

SECTION - III

ANNEXURE – I

BID PROPOSAL LETTER

Electrical Installation of Works under CENTRAL ELECTRICITY SUPPLY UTILITY OF ODISHA

Bidder's Name and Address:

Bid Proposal Reference:

Person to be contacted:

Designation:

Telephone No. : E-mail : Fax No. :

To, Fax No:-

Name & Address of the Purchaser's designated Officer

Dear Sir,

We the undersigned bidder have read and examined the detailed specification and bidding documents for execution of various electrical installation works and do herewith submit our bid for the following package:

Sl. No.	Name of the Purchaser	Name of the Division	Package Code Reference

We declare the following:

1.0 PRICES AND VALIDITY :

1.01 All the prices and price components stated in our bid proposal are firm and not subject to any price adjustment, in line with the bidding documents. All the prices and other terms and conditions of this proposal will remain valid during the period **till 180 days** effective from the date of opening of the bids. We further declare that prices stated in our proposal are in accordance with "Instructions to Bidders" of bidding documents.

1.02 We do hereby confirm that our bid prices as quoted in attached Schedules include all import duties and levies including license fees lawfully payable by us on imported items and other taxes, duties and levies applicable on bought – out components, materials, equipment and other items and confirm that any such taxes, duties and levies additionally payable shall be to our account.

1.03 We confirm that the Sales tax on Works Contract, Turnover Tax or any other similar taxes under the Sales Tax Act, as applicable, are included in our quoted bid price and there shall not be any liability on this account to the Purchasers. We understand that

Purchasers shall, deduct such taxes at source as per the rules and issue TDS Certificate to us.

1.04 We confirm that, in our Bid Price, we have considered service tax in line with lawful prevalent practice.

1.05 Price components of various items are indicated in the B.O.Q. for the respective works.

1.06 We further declare that while quoting the price, the due credit under MODVAT scheme, re-christened as CENVAT scheme, as per relevant Government policies wherever applicable, have been taken into account.

1.07 We, having studied the bidding document in three volumes relating to taxes & duties and hereby, declare that if any income tax, charge on income tax or any other corporate tax is attracted under the law, we agree to pay the same.

1.08 We are aware that the Price schedules do not generally give a full description of the supplies to be made and work to be performed under each item and we shall be deemed to have read the Technical Specifications and other bidding documents and drawings to ascertain the full scope of work included in each item while filling in the related and prices. We agree that the entered rates and prices shall be deemed to include the full scope as aforesaid, including overheads and profits.

1.09 We understand that in the price schedule, if there is discrepancy between the unit price and total price, the same shall be corrected as per relevant provisions.

1.10 We declare that prices for items left blank in the schedules will be deemed to have been included in other items. The TOTAL for each schedule and the TOTAL of Grand summary shall be deemed to be the total price for executing the facilities and sections thereof in complete accordance with the contract, whether or not each item has been priced

2.0 CONSTRUCTION OF THE CONTRACT

2.01 We declare that we are making the offer on the basis of indivisible Supply-cum- Erection contract on a single source responsibility basis.

3.0 BID SECURITY(EMD)

We are enclosing DD no. dtd. Amounting to Rs. (Rupees only) issued by bank branch, payable at Bhubaneswar towards Bid Security against our above Bid. The Bid Security amount has been computed by adding the Estimated Cost for which we are submitting our bid.

4.0 EQUIPMENT PERFORMANCE GURANTEE

We declare that the ratings and performance figures of the equipment to be furnished and erected by us are guaranteed. The Guaranteed particulars of different equipments are enclosed along with our bid.

5.0 BID PRICING

We further declare that the prices stated in our proposal are in accordance with your 'Instruction to Bidders of Conditions of Contract, Volume-1 of the bid documents.

6.0 PRICE ADJUSTMENT

We declare that all the prices and price components stated in our offer are on FIRM price basis.

7.0 QUALIFICATION

We confirm having submitted the Qualification Data in original plus one copy, as required by you under clause 2.0 'Invitation for Bids'. Further we have filled in the information for qualification requirements. In case you require any further information in this regard, we agree to furnished the same in time

8.0 DEVIATIONS

8.01 We declare that the contract shall be executed strictly in a accordance with the specifications and documents except for the variations and deviations all of which have been detailed out exhaustively in the following schedules, irrespective of whatever has been stated to be contrary anywhere else in our proposal.

a) Commercial Deviations Schedule

b) Cost of withdrawal of Deviations on Critical

c) Technical Deviation Schedule

8.02 We confirm that specified stipulation of following critical clauses are acceptable to us and no deviations/exceptions are taken on any account whatsoever in the following clauses :

(a) Payment Terms :

(b) Bid Guarantee :

(c) Contract Performance Guarantee:

(d) Liquidated Damages for delay :

(e) Prices and Price Adjustment :

(f) Guarantee / Warrantees :

8.03 Further, we agree that the additional conditions, deviations, if any, found in our bid proposal documents other than those stated in attached Deviation Schedules, save that pertaining to any rebates offered, shall not be given effect to.

9.0 ADDITIONAL INFORMATION

We have included with this proposal additional information listed. We further confirm that such additional information does not imply any additional deviation beyond those covered in appropriate schedules and in case of any contradiction between these additional information and other provisions of Bid, the latter prevail.

10.0 GURANTEE DECLARATION

We guarantee that the equipment offered shall meet the rating and performance requirements stipulated in this specification. The Guarantee Declaration which shall attract levy of liquidated damages for non-performance are indicated in the relevant schedule.

11.0 BOUGHT-OUT AND SUB-CONTRACTED ITEM

We are furnishing herewith at appropriate Schedule, the detail of all major item of supply amounting to more than 10% of our Bid Price, which we propose subletting giving detail of the name of sub-contractor/sub-vendor and quantity for each item.

12.0 WORK SCHEDULE

If this proposal is accepted by you, we agree to submit engineering data, provide services and complete the entire work from time to time, in accordance with schedule indicated in the proposal. We fully understand that the time schedule stipulated in this proposal is the essence of the contract, if awarded. The completion schedule of the various major key phases of the work is indicated in the designated schedule.

13.0 CONTRACT PERFORMANCE GUARANTEE

We further agree that if our Bid is accepted we shall provide an irrevocable Bank guarantee towards Contract Performance Guarantee, of value equivalent to ten percent (10%) of the Contract Price initially valid up to the end of ninety (90) days after the end of the contract warranty period in the form of Bank Guarantee in your favour within 15 (fifteen) days from the date of 'Notice of Award of Contract' and enter into a formal agreement with you immediately thereafter.

14.0 CHECK LIST

We have included a check list duly filled in Schedule. We understand that only this checklist, commercial and technical deviation will be read out during the part-I bid opening before the bidders present.

ANNEXURE – I (A)

U N D E R T A K I N G

Under the scope of the tender specification No_____, We M/s _____ do hereby undertake to execute the Project covered under the above specification on Complete turnkey basis (Supply and Erection) excluding some Owner supply materials and there shall be no deviation in any manner both for commercial & technical requirement as stipulated in bid documents. We understand that our price offer shall not be considered if we are found unsuitable in the minimum qualifying criteria.

,
(To be made in the company letter head)

Authorized Signatory and seal of the company

ANNEXURE – II

DECLARATION FORM

To

The General Manager (Elect.)
Electrical Circle No-I,
Power House, Unit-8, Bhubaneswar-12

Sir,

Having examined the above specifications together with the Tender terms and conditions referred to therein

1 – I / We the undersigned do hereby offer to supply the materials covered there on in complete shape in all respects as per the rules entered in the attached contract schedule of prices in the tender.

2 – I / We do hereby under take to have the materials delivered within the time specified in the tender.

3 – I / We do hereby guarantee the technical particulars given in the tender supported with necessary reports from concerned authorities.

4 – I / We do hereby certify to have purchased a copy of the tender specifications by remitting Cash / Demand draft & this has been duly acknowledged by you in your letter No……Dt……

5 – I / We do hereby agree to furnish the composite Bank Guarantee in the manner specified / acceptable CESU& for the sum as applicable to me / us as per clause No.29 of Section -II of this specification within fifteen days of issue of Letter of intent / Purchase Order , in the event of purchase order being decided in my / us favour , failing which I / We clearly understand that the said LOI / P.O. shall be liable to be withdrawn by the purchaser

Signed this…….Day of……20…

Yours faithfully

(Signature of Bidder with Seal of Company)

(This form should be duly filled up by the Bidder & submitted along with the original copy of the Tender)

ANNEXURE – III

PROFORMA FOR CONTRACT PERFORMANCE BANK GUARANTEE

(To be executed on Rs. 100/- Non-judicial Stamp Paper purchased in the name of the BG Issuing Bank)

This Guarantee Bond is executed this ____ day of _____ by us,

_____ Bank at _____

P.O._____ P.S. _____Dist _____ State _____

Whereas the **G.M (Elect), E.C-I, BBSR , Power House Unit-8, Bhubaneswar-12 a** Body corporate/ Company (CESU), constituted under the Electricity Act, 2003. (here in after called "Purchaser") has placed Work Order No._____ Dt._____ (hereinafter called "Agreement") with M/s_____(Lead partner) and M/s _____(JV Partner(s)) (hereinafter called "the Contractor") for supply and installation of _____ (description of the works) and whereas CESU has agreed (1) to exempt the Contractor from making payment of security deposit, (2) to release 100% payment of the cost of materials as per the said agreement and (3) to exempt from performance guarantee on furnishing by the Contractor to the CESU a composite Bank Guarantee of the value of 10% (ten percent) of the Contract price of the said Agreement.

1. Now, therefore, in consideration of the Purchaser having agreed (1) to exempt the Contractor for making payment of security deposit, (2) to release 100% payment to the Contractor and (3) to exempt from furnishing performance guarantee in terms of the said Agreement as aforesaid, we the _____ Bank, Address _____ (code No. _____) (hereinafter referred to as "the Bank") do hereby undertake to pay to the Purchaser an amount not exceeding Rs._____ (Rupees _____) only against any loss or damage caused to or suffered by the Purchaser by reason of any breach by the said Contractor(s) of any of the terms or conditions contained in the said Agreement.

2. We, the _____ Bank do hereby undertake to pay the amounts due and payable under the guarantee without any demur, merely on a demand from the Purchaser stating that the amount claimed is due by way of loss or damage caused to or suffered by Purchaser by reason of any breach by the said Contractor(s) of any of the terms or conditions contained in the said Agreement or by the reason of any breach by the said Contractor's failure to perform the said Agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability

under this guarantee shall be restricted to an amount not exceeding Rs._____ (Rupees _____) only.

3. We, the _____ Bank also undertake to pay to the Purchaser any money so demanded not withstanding any dispute or dispute raised by the Contractor(s) in any suit or proceeding instituted/ pending before any court or Tribunal relating thereto our liability under this Agreement being absolute and irrevocable. The payment so made by us under this bond shall be valid discharge of our liability for payment there under and the Contractor(s) shall have no claim against us for making such payment.

We, the _____ Bank further agree that the guarantee herein contain shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and it shall continue to remain in force endorsable till all the dues of the Purchaser under by virtue of the said Agreement have been fully paid and its claim satisfied or discharged or till Purchaser certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharge this guarantee and will not be revoked by us during the validity of the guarantee period.

Unless a demand or claim under this guarantee is made on us or with our Bhubaneswar branch at _____ (Name, address of the Bhubaneswar branch and code No.) in writing on or before _____ (date) we shall be discharged from all liability under this guarantee thereafter.

5. We, the _____ Bank further agree that the Purchaser shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time of performance by the said Contractor(s) and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor(s) or for any forbearance act or omission on part of the Purchaser or any indulgence by the Purchaser to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would but for this provisions have effect of so relieving us.

6. The Guarantee will not be discharged due to change in the name, style and constitution of the Bank and or Contractor(s).

7. We, the _____ Bank lastly undertake not to revoke this Guarantee during its currency except with the previous consent of the Purchaser in writing.

Dated _____ the _____ day of Two thousand _____ .

Not withstanding anything contained herein above.

Our liability under this Bank Guarantee shall not exceed Rs._____ (Rupees _____ _____) only.

The Bank Guarantee shall be valid up to _____ only.

Our ……. branch at Bhubaneswar (Name & Address of the Bhubaneswar branch) is liable to pay the guaranteed amount depending on the filing of claim and any part thereof under this Bank Guarantee only and only if you serve upon us at our Bhubaneswar branch a written claim or demand and received by us at our Bhubaneswar branch on or before Dt._____ otherwise bank shall be discharged of all liabilities under this guarantee thereafter.

For _____

(indicate the name of the Bank)

N.B.:

(1) Name of the Contractor:

(Mention the name of JV partner(s), if any)

(2) No. & date of the purchase order/ agreement:

(3) Amount of P.O. :

(4) Name of Materials:

(5) Name of the Bank:

(6) Amount of the Bank Guarantee:

(7) Name, Address and Code No. of the Bhubaneswar Branch of the Issuing Bank:

(8) Validity period or date up to which the agreement is valid:

(9) Signature of the Constituent Authority of the Bank with seal:

(10) Name & addresses of the Witnesses with signature:

(11) The Bank Guarantee shall be accepted only after getting confirmation from the respective Banks.

ANNEXURE – VII (A)

LETTER OF COMPLIANCE OF QUALIFYING REQUIREMENT
(In case of Bidder being a Single Firm)

To

The General Manager (Elect.)
Electrical Circle No-I,
Power House, Unit-8
Bhubaneswar-12

Dear Sir,

I/We ……. (Name of Bidder) are submitting the bid as a single firm. In support of our meeting the Qualifying requirements (QR) for bidders, stipulated in this tender specification, we furnish herewith the details/documents etc. as follows.

Table – A : Previous Works Experience :

Package Quoted for	Description of Proposed Works	Tender Qty	Qty Installed & Commissioned					
			Sl. No.	FY	Name of Client	WO Ref	Qty Installed	Documents provided in proof of having executed the works during the relevant FY.

Table – B : Average Annual Turnover :

Package Quoted for	Estimated Cost of the Package (Rs. in Lakh)	Annual Turnover Data (Rs. in Lakh)	
		Financial Year	Turnover (Rs. in Lakh)
		2016-17	
		2017-18	
		2018-19	
Total Estimated Cost of the packages quoted for		**Average Turnover**	

Table – C : Access to Credit Facility :

Package Quoted for	Estimated Cost of the Package (Rs. in Lakh)	Liquid Assets as on 29.02.2020		Credit Facility	
		Description	(Rs. in Lakh)	Description	(Rs. in Lakh)
		Cash in Hand		Un Utilized Cash Credit Balance	
		Cash at Bank		LC	
Total Estimated Cost of the packages quoted for		Short term Fixed Deposits		Others (Pl Specify)	
One fifth of the total Estimated Cost as above.		Total Liquid Assets		Total Credit Facility	

Note-1 : Continuation sheets, of like size and format, may be used as per Bidder's requirements and annexed to this Schedule.

Note- 2 : Bidder are required to furnish all the above data against their liquid assets from their concerned Bank as on 29.02.2020.

I/We declare that we are fulfilling the qualifying requirements as per clause no. 2.0 of Section – I, Invitation for Bids (IFB).

For & on behalf of …… (Name of the Bidder).

ANNEXURE – VII (B)

LETTER OF COMPLIANCE OF QUALIFYING REQUIREMENT
(In case of Bidder being a Joint Venture / Consortium Firm)

To

The General Manager (Elect.)
Electrical Circle No-I,
Power House, Unit-8
Bhubaneswar-12

Dear Sir,

I/We ……. (Name of Bidder) are submitting the bid as a single firm. In support of our meeting the Qualifying requirements (QR) for bidders, stipulated in this tender specification, we furnish herewith the details/documents etc. as follows.

Name of the members of the JV / Consortium

1.

2.

3.

Table – A : Previous Works Experience : Name of the Member (any one member only)

Package Quoted for	Description of Proposed Works	Tender Qty	Qty Installed & Commissioned					
			Sl. No.	FY	Name of Client	WO Ref	Qty Installed	Documents provided in proof of having executed the works during the relevant FY.

Table – B : Average Annual Turnover : (All the members of JV/Consortium taken together)

Package Quoted for	Estimated Cost of the Package (Rs. in Lakh)	Annual Turnover (Rs. in Lakh)		Annual Turnover (Rs. in Lakh)		Total Annual Turnover (Rs. in Lakh)	
		Name of Member	1	Name of Member	2	Name of Member	2
		Financial Year	Turnover (Rs. in Lakh)	Financial Year	Turnover (Rs. in Lakh)	Financial Year	Turnover (Rs. in Lakh)
		FY 2016 – 17		FY 2016 – 17		FY 2016 – 17	
		FY 2017 – 18		FY 2017 – 18		FY 2017 – 18	
		FY 2018 - 19		FY 2018 - 19		FY 2018 - 19	
		Total		**Total**		**Total**	
Total Estimated Cost of the packages quoted for						**Average Turnover**	

Table – C : Access to Credit Facility : (All the members of JV/Consortium taken together)

Package Quoted for	Estimated Cost of the Package (Rs. in Lakh)	Liquid Assets as on 29.02.2020		Credit Facility	
		Member	**1**	**Member**	**1**
		Description	**(Rs. In Lakh)**	**Description**	**(Rs. in Lakh)**
		Cash in Hand		**Un Utilized Cash Credit Balance**	
		Cash at Bank		**LC**	
		Short term Fixed Deposits		**Others (Pl Specify)**	
		Total Liquid Assets		**Total Credit Facility**	
		Liquid Assets as on 29.02.2020		**Credit Facility**	
		Member	**2**	**Member**	**2**

		Description	**(Rs. In Lakh)**	**Description**	**(Rs. in Lakh)**
		Cash in Hand		**Un Utilized Cash Credit Balance**	
		Cash at Bank		**LC**	
		Short term Fixed Deposits		**Others (Pl Specify)**	
		Total Liquid Assets		**Total Credit Facility**	
		Liquid Assets as on 29.02.2020		**Credit Facility**	
		Total for JV	**3**	**Total for JV**	**3**
		Description	**(Rs. In Lakh)**	**Description**	**(Rs. in Lakh)**
		Cash in Hand		**Un Utilized Cash Credit Balance**	
		Cash at Bank		**LC**	
Total Estimated Cost of the packages quoted for		**Short term Fixed Deposits**		**Others (Pl Specify)**	
One fifth of the total Estimated Cost as above.		**Total Liquid Assets**		**Total Credit Facility**	

Note-1: Continuation sheets, of like size and format, may be used as per Bidder's requirements and annexed to this Schedule.

Note- 2 : Bidder are required to furnish all the above data against their liquid assets from their concerned Bank as on 29.02.2020.

I/We declare that we are fulfilling the qualifying requirements as per clause no. 2.0 of Section – I, Invitation for Bids (IFB).

For & on behalf of …… (Name of the Bidder).

(All members of JV / Consortium should sign).

Details of qualification and experience of key personnel proposed for carrying out the works

Sl. No	Name of Personnel	Degree/ Diploma	Branch	Year of Passing	Past Experience				
					From	To	Name of Employer	Position Held	Responsibilities/ Relevant experience

Date: (Signature) ……..

Place: (Printed Name) …….

(Designation) ……..

(Common Seal) ……

Note: 1**.** Continuation sheets, of like size and format, may be used as per Bidder's requirements and annexed to this Schedule.
2. In case of Joint Venture, separate sheet for each partner of Joint Venture should be used.

Details for sub-contracting elements amounting to more than 10% of bid price

Sl. No	Item Description	Qty. proposed to be bought-out/ Sub-contracted	Source of Supply
1.			
2.			
3.			
4.			
5.			

Date: (Signature) ……..
Place: (Printed Name) …….
(Designation) ……..
(Common Seal) ……

ANNEXURE – VIII

DETAILS OF COMMERCIAL DEVIATIONS

Bidder's Name & Address

To

The General Manager (Elect.)
Electrical Circle No-I,
Power House, Unit-8, Bhubaneswar-12

Sub: **Commercial Deviation for "Construction of 11 KV line , Installation of 100 KVA 11/0.4 KV Sub Station & LT line to effect power supply 76KW load at 11 KV Supply with HT Single point metering in GPS tariff to the Chief Executive of Regional Pant Resource Centre (RPRC) at IRC Village, Nayapalli Bhubaneswar under Nayapalli Section in partly turnkey basis".**

Dear Sir,

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

Volume/Clause	Ref./Page No.	As specified in the Specification	Commercial deviation and variation to the specification

Date: (Signature) ……..

Place: (Printed Name) …….

(Designation) ……..

(Common Seal) ……

Note: 1. **Continuation** sheets, of like size and format, may be used as per Bidder's requirements and annexed to this Schedule.

2. This will be read out opening of Part-I Bid.

ANNEXURE – IX

DETAILS TECHNICAL DEVIATIONS

Bidder's Name & Address

To

The Dy. General Manager (Elect.)
Electrical Circle No-I,
Power House, Unit-8, Bhubaneswar-12

Sub: **Technical Deviation for** "Construction of 11KV line, installation of 100KVA, 11/.4KV double pole mounted S/s and construction of LT line for providing power supply to LT individually supply to the Bajaranga Vihar near Ashok Vatika, Mouza - Botanda, Sundarapada, Bhubaneswar as applied by Dy.Director, D.P.M.U, Khordha under Dhauli Electrical Section, BED, BBSR in 100% deposit scheme**".**

Dear Sir,

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 for these deviations, the entire work shall be performed as per your specifications and documents

Volume/Clause	**Ref./Page No.**	**As specified in the Specification / Relevant ISS**	**Technical deviation and variation to the specification**

Date: (Signature) ……..

Place: (Printed Name) …….

(Designation) ……..

(Common Seal) ……

Note: 1. Continuation sheets, of like size and format, may be used as per Bidder's requirements and annexed to this Schedule.

2. The deviations and variations, if any, shall be brought out separately for each of the equipment.

3. This will be read out during opening of Part – I bid.

ANNEXURE – X

ADDITIONAL INFORMATION

Bidder's Name & Address

To

The General Manager (Elect.)
Electrical Circle No-I,
Power House, Unit-8, Bhubaneswar-12

Dear Sirs,

We have enclosed with our proposal the following additional information for the subject, package.

Sl. No	Brief description of Information	Ref.& Page No.

Date: (Signature) ……..

Place: (Printed Name) …….

(Designation) ……..

(Common Seal) ……

Note: Continuation sheets, of like size and format, may be used as per Bidder's requirements and annexed to this Schedule.

ANNEXURE – XI

BOUGHT OUT & SUB CONTRACTED ITEMS

To

The General Manager (Elect.)
Electrical Circle No-I,
Power House, Unit-8, Bhubaneswar-12

Dear Sir,

We hereby furnish the details of the items/sub-assemblies amounting to more than 10% of our bid price, we propose to buy for the purpose of subject package

Sl No	Item Description	Quantity	Source of supply
1			
2			
3			
4			
5			
6			
7			

Date: (Signature of Bidder)

Place:

ANNEXURE – XII

WORK COMPLETION SCHEDULE

To

The General Manager (Elect.)
Electrical Circle No-I,
Power House, Unit-8, Bhubaneswar-12

Dear Sir,

We hereby declare that, the work shall **be completed within 30 days from date of award of contract** as per the following Work Completion Schedule and shall be followed by us

Sl. No	Description of Work	Period in Months(from the date of WO)
1	Completion of detailed engineering	
2	Procurement of raw materials	
3	Establishment of site office	
4	Erection	
	(a) Commencement	
	(b) Completion	
5	Testing & Pre-commissioning	
	(a) Commencement	
	(b) Completion	
6	Commissioning	

Date: (Signature of bidder) ……..

Place:

ANNEXURE – XIII

CHECK LIST

To

The General Manager (Elect.)
Electrical Circle No-I,
Power House, Unit-8, Bhubaneswar-12

Dear Sir,

Sl. No.	Item Description	Status of the Submission of data	Remarks
1	2	3	4
1.	Bid Guarantee	Yes /No	If yes please give details No, amount, validity & date of issue.
2.	Qualifying Data	Yes /No	
3.	Commercial Deviation	Yes /No	
4.	Technical Deviation	Yes /No	
5.	Cost of withdrawn of deviations	Yes /No	
6.	Bid validity	Yes /No	If yes state here the period.
7.	Period of completion	Yes/No	If, yes please state here the period of completion.
8.	Additional information offered by bidder		State here briefly

N.B.:- The contents of this schedule will be read out during opening of Part-I Bid.

……
Signature of Bidder
Date & Seal:

N.B :-

1. The bid guarantee one original and one copy shall be furnished in two separate sealed envelope appropriately super scribed thereon.
2. All Schedules pertaining to prices (originals) shall be furnished in a sealed envelope duly super scribed thereon. Similarly one set of copies of such schedules shall be given in a separate sealed envelope (these are not to be opened during opening of Part –I).
3. All other schedules, one set original and another copy shall be submitted in two separate sealed envelope (these are to be opened during Part –I bid opening)

Date: (Signature) ……..

Place:

ANNEXURE – XIV

PROFORMA OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR THE EQUIPMENT HANDED OVER BY <PURCHASER> FOR PERFORMANCE OF ITS CONTRACT

(Entire Equipment consignment in one lot)

(On non-Judicial stamp paper of appropriate Value)

INDEMNITY BOND

THIS INDEMNITY BOND is made this ..... day of .....20 ..... by ..... a Company registered under the Companies Act, 1956/ Partnership Firm / Proprietary Concern having its Registered Office at .....(hereinafter called as 'Contractor' or "Obligor" which expression shall include its successors and permitted assigns) in favour of <Purchaser>, a <Company/ Body Corporate> incorporated under the <Companies Act, 1956 / Electricity Act-2003> having its <Registered Office/ Head Office> at < Address> and its project at .... (hereinafter called "<Purchaser>"Which expression shall include its successors and assigns) :

WHEREAS <Purchaser> has awarded to the Contractor a Contract for ..... vide its Letter of Award / Contract No..... dated ..... and its Amendment No. ..... and Amendment No..... (Applicable when amendments have been issued) hereinafter called the "Contract") in terms of which <Purchaser> is required to handover various equipment to the Contractor for execution of the Contract.

And WHERAS by virtue of Clause No..... of the said Contract, the Contractor is required to executive an Indemnity Bond in favour of <Purchaser> for the Equipment handed over to it by <Purchaser> for the purpose of performance of the Contract / Erection portion of the Contract (hereinafter called the "Equipment")

NOW THEREFORE, This Indemnity Bond witness as follows :

1. That in consideration of various equipment as mentioned in the Contract, valued at Rs... ... (Rupees ……..) handed over to the Contractor for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep <Purchaser> indemnified, for the full value of the Equipment. The Contractor hereby acknowledges receipt of the Equipment as per dispatch title documents handed over to the Contractor duly endorsed in their favour and detailed in the Schedule appended hereto. It is expressly understood by the Contractor that handing over of the dispatch title documents in respect of the said Equipment duly endorsed by <Purchaser> in favour of the Contractor shall be construed as handing over of the Equipment purported to be covered by such title documents and the Contractor shall hold such Equipment is trust as a Trustee for and on behalf of <PURCHASER> .

2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit / protection and custody of the Equipment at <PURCHASER> project Site against all risks, whatsoever, till the Equipment are duly used / erected in accordance with the terms of the

Contract and the Plant / Package duly erected and commissioned in accordance with the terms of the Contract, is taken over by <PURCHASER> . The Contractor undertakes to keep <Purchaser> harmless against any loss or damage that may be caused to the Equipment.

3. The Contractor undertakes that the Equipment shall be used exclusively for the performance/ execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilized for any other work or purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal / penal consequences .

4. That <PURCHASER> is and shall remain the exclusive Owner of the Equipment free from all encumbrances, charges or liens of any kind, whatsoever. The Equipment shall at all the times be open to inspection and checking by Engineer0in Charge / Engineer or other employees/agents authorized by him in this regard. Further, <Purchaser> shall always be free at all times to take possession of the Equipment in whatever form the Equipment may be, if in its opinion the Equipment are likely to be endangered, mis-utilised or converted to uses other than those specified in the Contract, by any acts of omission or commission on the part of the Contractor binds himself and undertakes to comply with the direction of demand of <Purchaser> to return the Equipment without any demur or reservation.

5. That this indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is misutilized in any manner whatsoever, then the Contractor hereby agrees that the decision of the Engineer-in-Charge/Engineer of <Purchaser> as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipment at its own cost and/or shall pay the amount of loss of <Purchaser> without demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to <Purchaser> against the Contractor under the Contract and under this Indemnity Bond.

6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with terms and conditions of this Bond to the satisfaction of <Purchaser>, THEN, the above Bond shall be void, but otherwise, it shall remain in full force and virtue.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorized representative under the common seal of the Company, the day, month and year first above mentioned.

SCHEDULE

Particulars of the Equipment	Quantity	Particulars of Dispatch Title Documents	Value of the Equipment	Signature of Attorney

handed over		**RR / GR / No. / Date of Bill of Landing**	**Carrier**		**(authorized representative as a token of receipt**

For an on behalf of

M/s.....

WITNESS

1. 1. Signature ..... Signature .....

2. Name ..... Name .....

3. Address..... Designation .....

Authorised representative *

2. 1. Signature .....

2. Name ..... (Common Seal in case of Company)

3. Address .....

---

* Indemnity Bonds are to be executed by the authorised person and (i) in case of Contracting Company under common seal of the Company or (ii) having the Power of Attorney issued under common seal of the company with authority to execute Indemnity Bonds, (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a Photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond.

ANNEXURE – XV

PROFORMA OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR THE EQUIPMENT HANDED OVER IN INSTALMENTS BY <PURCHASER> FOR PERFORMANCE OF ITS CONTRACT

(On non-Judicial stamp paper of appropriate Value)

INDEMNITY BOND

THIS INDEMNITY BOND is made this ..... day of .....20 ..... by ..... a Company registered under the Companies Act, 1956/ Partnership Firm / Proprietary Concern having its Registered Office at .....(hereinafter called as 'Contractor' or "Obligor" which expression shall include its successors and permitted assigns) in favour of <Purchaser>, a <Company/ Body Corporate> incorporated under the <Companies Act, 1956/ Electricity Act-2003> having its <Registered Office/ Head Office> at <Address> and its project at .... (hereinafter called "<PURCHASER> "Which expression shall include its successors and assigns) :

WHEREAS <PURCHASER> has awarded to the Contractor a Contract for ..... vide its Letter of Award / Contract No..... dated ..... and its Amendment No. ..... and Amendment No..... (applicable when amendments have been issued) hereinafter called the "Contract") in terms of which <PURCHASER> is required to handover various equipment to the Contractor for execution of the Contract.

And WHERAS by virtue of Clause No..... of the said Contract, the Contractor is required to executive an Indemnity Bond in favour of <PURCHASER> for the Equipment handed over to it by <PURCHASER> for the purpose of performance of the Contract / Erection portion of the Contract (hereinafter called the "Equipment")

NOW THEREFORE, This Indemnity Bond witness as follows :

1. That in consideration of various equipments as mentioned in the Contract, valued at Rs... ..... (Rupees .....) handed over to the Contractor for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep <PURCHASER> indemnified, for the full value of the Equipment. The Contractor hereby acknowledges receipt of the Equipment as per dispatch title documents handed over to the Contractor duly endorsed in their favour and detailed in the Schedule appended hereto. It is expressly understood by the Contractor that handing over of the dispatch title documents in respect of the said Equipment duly endorsed by <PURCHASER> in favour of the Contractor shall be construed as handing over of the Equipment purported to be covered by such title documents and the Contractor shall hold such Equipment is trust as a Trustee for and on behalf of <PURCHASER> .
2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit / protection and custody of the Equipment at <PURCHASER> project Site against all risks, whatsoever, till the Plant / Package duly erected and commissioned in accordance with the terms of the Contract, is taken over by <PURCHASER> . The Contractor undertakes to keep <PURCHASER> harmless against any loss or damage that may be caused to the Equipment.
3. The Contractor undertakes that the Equipment shall be used exclusively for the performance / execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilised for any other work or purpose, whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal / penal consequences.
4. That <PURCHASER> is and shall remain the exclusive Owner of the Equipment free from all encumbrances, charges or liens of any kind, whatsoever. The Equipment shall at all time be open to inspection and checking by Engineer-in-Charge / Engineer or other employees / agents authorized by him in this regard. Further , <PURCHASER> shall always be free at all times to

take possession of the Equipment in whatever from the Equipment may be, if in its opinion the Equipment are likely to be endangered, mis-utilised or converted to use other than those specified in the Contract, by any acts of omission or commission on the part of the Contractor or any other person or on account of any reason, whatsoever, and the Contractor binds himself and undertakes to comply with the directions of demand of <PURCHASER> to return the equipment without any demur or reservation.

5. That this Indemnity Bond in irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is mis-utilized in any manner whatsoever, then the Contractor hereby agrees that the decision of the Engineer-in-Charge / Engineer of <PURCHASER> as to assessment of loss or damage to the Equipment shall be final and binding on the contractor. The Contractor binds itself and undertakes to replace the lost and / or damaged Equipment as its own cost and / or shall pay the amount of loss to <PURCHASER> without any demur, reservation or protest. This is without prejudice to any other right to remedy that may be available to <PURCHASER> against the Contractor under the Contract and under this Indemnity Bond.
6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with the terms and conditions of this Bond to the satisfaction of <PURCHASER> , then above Bond shall be void, but otherwise, it shall remain in full force and virtue.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorized representative under the common seal of the Company, the day, month and year first above mentioned.

SCHEDULE No. 1

Particulars of the Equipment handed over	Quantity	Particulars of Dispatch Title Documents		Value of the Equipment	Signature of Attorney (authorized representative as a token of receipt
		RR / GR / No. / Date of Bill of Lading	Carrier		
(Please	number	subsequent	schedules)		

For an on behalf of M/s.....

WITNESS

1. 1. Signature ..... Signature .....

.

2. Name ..... Name .....
3. Address..... Designation .....

ANNEXURE – XVI

SELF DECLARATION FORM

Name Of The Purchaser :……

Tender No :…….

Sir,

1. I/We the undersigned do hereby declare that, I/We have never been blacklisted and/or there were no debarring actions against us for any default in supply of material/ equipments or in the performance of the contract entrusted to us in any of the electricity utilities of India.

2. In the event of any such information pertaining to the aforesaid matter found at any given point of time either during the course of the contract or at the bidding stage, false/ incorrect bid/ contract shall be liable for truncation/ cancellation /termination without any notice at the sole discretion of the purchaser.

Place :

Date :

Yours faithfully,

Signature of the bidder with seal.
(This form shall be duly filled-up and signed by the bidder and submitted along with the original copy of the bid).

ANNEXURE – XVII

CENTRAL ELECTRICITY AUTHORITY

F.NoCEA/TETD/MP/R/02/2011:- In exercise of the powers conferred by section 177 read with clause (C) of Section 73 of the Electricity Act,2003 (36 of 2003), the Central Electricity Authority hereby makes the following regulations, namely:-

1 Short title and commencement:- (1) These regulations may be called the Central Electricity Authority (Safety Requirements for Construction, Operation and Maintenance of Electrical Plants and Electric Lines) Regulations,2010

(2) They shall come into force on the date of their publication in the Official Gazette

Definition:- (1) In these regulations, unless the context otherwise requires:-

(a) " Act" means the Electricity Act,2003:

(b) " Contractor" means a person or an agency who undertake to produce a given result, not merely supply of goods or articles of manufacture but including civil works or erection of equipment or testing and commissioning of equipment or operation and maintenance of equipment and includes a sub-contractor:

(c) Owner" means a company or body corporate or association or body of individuals, whether incorporated or not, or artificial juridical person, which owns or operates or maintains electrical plants or electric lines and includes:-

(i) "Occupier" as defined in the Factories Act, 1948 (63 of 1948; Provided that where number of employees, including contract workers is two hundred and fifty or less, the safety committee shall be constituted by the Owner for a group of electrical plants or electric lines, as the case may be.

(b) The safety committee shall promote co-operation between the workers and the management for maintaining proper safety and health at our place

(c) The safety committee shall meet at least once in a month during construction stage and once in three months during operation and maintenance of electrical plants and electric lines and the decisions and recommendations of the safety committee shall be complied with by the Owner within the time limit as decided by the safety committee

7 Safety provisions relating to contractor :-

(1) The Owner shall incorporate the safety provisions in the contract document which are required to be complied by the contractor's employees during execution of the contract to facilitate safe working during execution of the work.

(2) The Contractor shall observe safety requirements as laid down in the contract and in case of sub-contract, it shall be the responsibility of main contractor that all safety requirements are followed by the employees and staff of the sub-contractor.

(3) The contractor employing tow hundred employees or more, including contract worker, shall have a safety co-ordination in order to ensure the implementation of safety requirements of the contract and a contractor with lesser number of employees to act as safety co-ordinator, who shall liaise with the safety officer on matters relating to safety and his name shall be displayed on the notice board at a prominent place at the work site.

(4) The contractor shall be responsible for non-compliance of the safety measures, implications, injuries, fatalities and compensation arising out of such situations or incidents.

(5) In case of any accident, the contractor shall immediately submit a statement of the same to the Owner and the safety officer, containing the details of the accident, any injury or casualties , extent of property damage and remedial action taken to prevent recurrence and a addition, the contractor shall submit a monthly statement of the accidents to the Owner at the end of each month.

CENTRAL ELECTRICITY AUTHORITY

NOTIFICATION

New Delhi, the 20th September,2010

No.CEI/1/59/CEA/El.:- In exercise of the powers conferred by section 177 of the Electricity Act,2003 (36 of 2003); the Central Electricity Authority hereby makes the following regulations for measures relating to Safety and Electric Supply namely:-

Chapter-I

(1) Short title and Commencement:- (1) These regulations may be called the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations,2010

(2) They shall come into force on the date of their final publication in the official Gazette

(2) Definitions:- (1) In these regulations, unless the context otherwise requires,

(a) "Act" means the Electricity Act,2003

(b) "accessible" means within physical reach without the use of any appliance or special effort;

(c) "Ampere" means a unit of electric current and is a constant current which flowing in two parallel straight conductors of infinite length of negligible cross section and placed at a distance of one meter apart in a vacuum will produce a force of 2×10^{-7} . Newton per meter length between the conductors;

(d) "apparatus" means electrical apparatus and includes all machines, fittings, accessories and appliances in which conductors are used;

(e) "bare" means not covered with insulating materials;

(f) " cable" means a length of insulated single conductor (solid or standard) or of two or more such conductors each provided with its own insulation, which are laid up together. Such insulated conductor or conductors may or may not be provided with an overall mechanical protective covering;

(g) " circuit" means an arrangement of conductor or conductors for the purpose of conveying electricity and forming a system or a branch of a system;

(h) "circuit breaker" means a device, capable of making and breaking the circuit under all conditions, and unless otherwise specified, so designed as to break the current automatically under abnormal conditions;

(i) " concentric cable" means a composite cable comprising an inner conductor which is insulated and one or more outer conductors which are

Chapter-II

(3) Designating person(s) to operate and carry out the work on electrical lines and apparatus:- (1) A supplier or a consumer, or the owner, agent or manager of a name, or the agent of any company operating I an oil-field or the owner of a drilled well in an oil field or a contractor who has entered into a contract with a supplier or a consumer to carry out duties incidental to the generation, transformation, transmission, conversion, distribution or use of electricity shall designate persons for the purpose operation and maintenance of Electrical lines and apparatus.

(2) The Supplier or consumer or the owner, agent or manager of a mine or the agent of any company operating in an oil-field or the owner of a drilled well in an oil field or a contractor referred to on sub-regulation(1) shall maintain a register where in the names of the designated persons and the purpose for which they are engaged shall be entered.

(3) No person shall be designated under sub-regulation(1) unless:-

(i) He possesses a certificate of competency or electrical work permit, issued by the Appropriate Government.

(ii) His name is entered in the register referred to in sub-regulation(2)

(4) Inspection of designated officers and other safety measures:-

(1) The register maintained under sub-regulation(2) of regulation 3 shall be produced before the Electrical Inspector when required by him.

(2) of If on inspection, the Electrical Inspector finds that the designated person does not fulfill the required qualification, he shall recommend the removal of the name of such persons from the register.

(5) Electrical Safety Officer:- (1) All suppliers of electricity including generating companied, transmission companies and distribution companies shall designate an Electrical Safety Officer for ensuring observation of safety measures specified under these regulation in their organization for construction, operation and maintenance of power stations, sub-stations, transmission and distribution lines.

(2) The electrical Safety Officer shall be an Electrical Engineering degree holder with at least ten years of experience in operation and maintenance of electricity plants or an Electrical Engineering Diploma holder with at least fifteen years of experience in operation and maintenance of electric plant.

(3) The Electrical Safety Officer designated under sub-regulation(1) shall ensure periodic inspection of such installations, get them tested and keep a record thereof and such records shall be made available to the Electrical Inspector if and when required.

(4) For every factory registered under Factory Act,1948, where more than 63 KW of electrical load is connected, the management of the factory shall designate a person having qualification specified in sub-regulation(2) for ensuring the person having qualification specified in sub-regulation(2) for ensuring the observation of the safety provisions laid under the Act and the regulations made there under, who shall periodically inspect such installation, get them tested and keep a record thereof and such records shall be made available to the Electrical Inspector if and when required.

6 Safety measures for operation and maintenance of electric plants:-

(1) Engineers and supervisions appointed to operate aor undertake maintenance of any part or whole of a thermal power generating station and a hydro power plant together with the associated sub-station shall hold diploma in Engineering from a recognized institute, or a degree in Engineering from a university.

(2) The Technicians to assist engineers or supervisors shall possess a certificate in appropriate trade, preferably with a tow years course from a Industrial Training Institute recognized by the Central Government or the State Government.

(3) Engineers, supervisors and Technicians engaged for operator and maintenance of electric plants should have successfully undergone the type of training as specified in Schedule-I

Provided that the existing employees shall have to undergo the training mentioned in sub-regulation(3) within three years from the date of coming into force of these regulations.

(4) The owner of every thermal power generating station and hydro power plant together with their associated sub-station shall arrange for training of personnel engaged in the operation and maintenance of his generating station along with associated sub-station in his own institute or any other institute recognized by the Central Government or the State Government.

Provided that separate training shall be given to the person engaged in operation and maintenance of thermal power stations and hydro power stations including associated sub-stations.

7 Safety measures for operation and maintenance of transmission, distribution systems:-

(1) Engineers or supervisors engaged in operation and maintenance of transmission and distribution systems shall hold diploma in electrical, mechanical, electronics and instrumentation Engineering from a recognized institute or university.

(2) The Technician to assist engineers or supervisors shall posses a certificate in appropriate trade, preferably with a two year course from a Industrial Training Institute recognized by the Central Government or State Government.

(3) Engineers, supervisors and Technicians engaged for operation and maintenance of transmission and distribution systems electric plants should have successfully undergone the type of training as specified in Schedule-II.

Provided that the existing employees shall have no undergo the training mentioned in sub-regulation(3) within three years from the date of coming into force of these regulations.

(4) Owner of every transmission or distribution system shall arrange for training of their personnel engaged in the operation and maintenance of transmission and distribution system in his institute or any other institute recognized by the Central Government or State Government.

8 Keeping of records and inspection thereof:-

(1) The generating company or licensee shall maintain records of the maps, plans and sections relating to supply of transmission of electricity and submit the same to the Electrical Inspector fir inspection as and when required by him.

(2) The Electrical Inspector shall supply a copy of report of Inspection referred to in Sub-regulation (1) to the generating company or Licensee as the case may be.

9 Deposit of Maps

When Licensee has been granted two set of maps showing as regards such Licensee the particulars specified in application for Licensee shall be signed and dated to correspond with date of notification of grant of the Licensee by an officer designated by the appropriate commission in this behalf, one set of such map shall be retained by the said officer and the other one shall be furnished to Licensee.

10 Deposit of printed copies:-

(1) Every person who granted a Licensee shall within 30 days of the grant thereof, have copies of the Licensee and maps showing the areas of supply as specified in the Licensee to exhibit I same for public inspection at all reasonable times at his head office, his local office, if any, and at the office of the every local authorities within the area of supply.

(2) Every such licensee shall, within the aforesaid period of third days, supply free of charge one copy of the license along with the relevant maps to every local authority within the area of supply and shall also make necessary arrangement for sale of printed copied of the licensee and map to all persons applying for same, at a price to be notified by the appropriate Govt. from time to time.

11 Plan for area of supply to be made and kept open for inspection

(1) The licensee shall after commencing to supply electricity forthwith cause a plan to be made in electronic form, of the area of supply and shall cause to be mart thereon the alignment and the case of underground works the approximate depth below the surface of all the existing electric supply lines street distributing boxes and other was and shall once in every year cause that plan to be duly corrected so as to show the electric supply lines street distributing boxes and other works further time is being in position and shall also if so required by an Electrical Inspector caused to be made section showing the approximate level of all his existing underground works other than service lines.

(2) Every plan shall be drawn to such horizontal and vertical scale as the Appropriate Commission may enquire.

Provided that no scale shall be required unless maps of the locality on that scale are for the time being available to the public.

(3) Every plan and section so made or corrected, or a copy thereof, marked with the date when it was made or corrected, shall be kept by the licensee at his

Volume – II

Technical Bid

Tender Specification No PUR/TEND/05/2019-20 Dated 11.03.2020 of S.E, E.C-I, Bhubaneswar

CENTRAL ELECTRICITY SUPPLY UTILITY OF ODISHA

OFFICE OF THE DY. GENERAL MANAGER (ELECT), ELECTRICAL CIRCLE No.1

POWERHOUSE, UNIT-VIII, BHUBANESWAR – 751012

Phone: 2392742, 2395273, Fax: 0674-2392742, E-mail: **sebbsr1@cescoOdisha.com**

Section-I
General

1.0. INTRODUCTION:

The **CENTRAL ELECTRICITY SUPPLY UTILITY OF ODISHA, hereinafter called CESU/OWNER** is inviting Bids in respect of partly Turnkey **Package "Construction of 11KV line, installation of 100KVA, 11/.4KV double pole mounted S/s and construction of LT line for providing power supply to LT individually supply to the Bajaranga Vihar near Ashok Vatika, Mouza - Botanda, Sundarapada, Bhubaneswar as applied by Dy.Director, D.P.M.U, Khordha under Dhauli Electrical Section in partly turnkey basis ".** Testing and Commissioning as per the Scope detailed in the Bid Documents.

2.0. NATURE OF WORK:

The work covered by this Specification as specified herein and in the attached Schedules. The total work will form a part of the CESU's distribution System.

3.0. **SCOPE OF WORK: -**

The scope shall include supply and installation of all materials & equipments to complete the works.

n) Detailed survey of the proposed area and routes.
o) Complete manufacture, including shop testing & supply of all materials / equipments from the approved vendor or from his manufacturing units.
p) Providing Engineering drawing, data, operational manual, etc for the Purchaser's approval;
q) Receipt, storage, preservation and conservation of equipment at the site.
r) Reliability tests and performance and guarantee tests on completion of commissioning.
s) Loading, unloading and transportation as required.
t) Installation of 100KVA, 11/0.4 KV pole mounted S/s using 10mtr. Long 116x100 mm RS Joist with 5 nos. earthing LT distribution box and boundary wall arrangement with provision of wire mesh angle etc. = 1No.
u) Construction of 3Q3W 11 KV line using 116x100 10 mtr. Long RS Joist & 55mm2 AAAC with provision of polymer disc insulator at tension point = 0.25 KM (5span).
v) Construction of 3Q5W LT line by 8mtr. Long 200Kg PSC pole & 3x50+1x35+1x16mm2 ABC = 0.16 Km (4 span)
w) Installation of 100 KVA, 11/0.4 KV pole mounted Sub-Station = 1No.
x) Construction of all civil works.
   a. Earthing complete with supply of earthing device, GI flat, Charcoal, salt – 8 nos.
   b. Construction of barbed fencing with retaining wall around sub-station with spreading of metal and filling of sand inside sub-station premises with fixing of MS grill gate – 1 no.
   c. Concreting, padding & cooping of all supports.
y) **Getting the total work inspected by Electrical Inspector after its completion.**
z) **Transportation of all above required materials (OSM) from Purchaser's nearest store**

(Bhubaneswar, Choudwar) to site and all other required materials (to be supplied by bidder) from supplier's premises to work site, construction of new electrical / civil structures, dismantling of existing electrical structures / equipments and return of these dismantled items at the purchaser's stores, safe custody of the items and return of unused purchaser supplied materials to the purchaser's stores.

Note: For details, the technical specification, price schedule & BOQ specified in separate Section may be referred to.

3.1 Bill of Quantities (BOQ):

A. Materials to be supplied by the firm / contractor			
SL No.	**Description of materials**	**Unit**	**Qty**
1	100KVA, 11/0.4KV transformer	No	1
2	L.T. Distribution box including Kit Kat fuse with MCCB for 100KVA S/S (As pre CESU specification)	No.	1
3	3 1/2 x150mm2 PVC Cable for 100KVA TFR.	Mtr.	25
4	100x116 mm RS Joist 9mtr long	No/Kg	(2/414)
5	100x116mm RS Joist 10mtr long	No/Kg	(4/920)
6	100 x 50 x6mm MS channel	K.g.	259.04
7	75x40x6 mm MS channel	K.g.	89.76
8	50x50x6 mm MS Angel	K.g.	81
9	11KV AB Switch 3 Pole (400 Amp.)	Set	1
10	11KV HG Fuse 3 Pole (400 Amp.)	No.	1
11	11 KV L.A. 12KV-10KA	No.	3
12	GI Pipe Earthing 40 Dia Medium gage 3mtr Long	No.	5
13	No.6 GI Wire	K.g.	20
14	40x6mm GI Flat for nutral	K.g.	20
15	HT Stay Set Complete	Set	4
16	HT Stay insulator	No.	4
17	HT stay clamp (1.95Kg/ Pair)	Pair	4
18	7/10 Stay Wire	Kg	40
19	Red Oxide paint	Ltr	14
20	All. Paint	Ltr	14
21	Black Paint	Ltr	7
22	Ms Washer	K.g.	1
23	25x3mm GI flat	Kg	60
24	M.S Nut & Bolt	Kg	66
25	Danger Board	No	6
26	DT meter with accessories	No	1
27	11 KV straight Cross Arm	No	1
28	11 KV 'V' Cross Arm (10.2 kg each)	No	3
29	Top Bracket	No.	3
30	Back Clamp for "V" X arm (1.7kg)	No	3

31	11 KV Disc Insulator (Polymer)	No.	9
32	11 KV H/W Fittings (Polymer)	No.	9
33	11 KV GI Pin insulator (Polymer)	No.	12
34	11 KV GI Pin (Polymer)	No.	12
35	55mm2 AAAC	Km	0.825
36	Earthing Coil Type	No	8
37	Barbed wire	Kg	8
38	200 kg 8mtr long PSC Pole	No.	4
39	LT stay set complete	Set	3
40	7/12 SWG stay wire.	Kg	30
41	Clamp for LT Stay	Pair	3
42	L.T. Stay insulator	No	3
43	Suspension clamp with I hook	No	2
44	Dead end clamp with I hook	No	2
45	(3x50+1x35+1x16)mm^2 A.B.Cable) Make- (a) Genus Elctrotech, Gandhidham, Gujurat.(b). Allied Engineer works, Badali Industrial Estate, Delhi, (c). Premier Cables, Khurda	Km	0.16
46	Strain fittings	No	2
47	Guy Grip dead end	No	2
48	Insulated piercing connector	No	4

B. Materials to be supplied by the owner (OSM)

SL No.	Description of materials	Unit	Qty
1	100KVA, 11/0.4KV transformer	No	1

4.0. Technical specifications for supply of materials:

The supply partly required materials on TURN KEY is in the scope of the contractor. The technical specifications for the major materials are mentioned in different sections of this volume and the other required materials as per the scope of work should be of appropriate standard and update IS specification.

5.0 GENERAL CONDITIONS OF CONTRACT

- **Responsibility of the Contractor**

  The Contractor shall be responsible for the complete design and engineering, overall co-ordination with internal and external agencies, project management, training of Employer's manpower, loading, unloading, storage at site, inventory management including OSM materials at site during construction, dismantling, re-erection of installations as per Engineer. in charge (Divisional Engineer.)'s advice, handling, moving to final destination, obtaining statutory clearances for successful erection, testing and commissioning of the substation.

- **Limit of contract**

  The scope of work shall also include all work incidentals for successful operation and commissioning and handing over of works whether specifically mentioned or not. In general, works are to be carried out by the Contractor in accordance with the stipulations in Conditions of Contract.

- **Quantity variation**

  The Employer reserves the right to order and delete such works which may be necessary for him within the quantity variation option laid down in the conditions of the contract. This shall

include but not limited to the manufacture, supply, testing, and delivery to site, erection and commissioning as may be required in accordance with the Conditions of Contract at the prices stated in the Schedules.

The Employer shall also be at liberty to delete **Any Items** from the Contractor's scope of supply at any time before commencement of supply of works under the detailed scope of work.

6.0 Guarantees Technical particulars

The Contract Works shall comply with the guaranteed technical particulars specified or quoted in the bid. All plant and apparatus supplied under this Contract shall be to the approval of the Engg In-charge (Divisional Engr.).

All plant and equipment supplied under this contract must have been type tested and have been on satisfactory service at identical ratings for at least preceding three years. The bidder shall furnish in his bid the necessary supporting data in this regard in specified formats for consideration during bid evaluation. If during evaluation non compliance is identified, the successful Contractor shall be bound to supply the equipment from manufacturers complying with the stipulated requirements under CESU"s approval

The Contractor shall be responsible for any discrepancies, errors or omissions in the particulars and guarantees.

The Bidder for his own interest, shall establish the technical responsiveness of his bid, shall provide all data in appropriate technical data sheets, general/ technical information, literature, and leaflets etc. along with the bid.

6.1 Compliance with Specification

All apparatus should comply with this Specification. Any departures from the requirements of this Specification shall be stated with reasons in the relevant Bid Proposal Schedules Bid will be considered for evaluation if reasons shown are apparently justified. Unless brought out clearly in the technical schedules, it will be presumed that the equipment is deemed to comply with the technical specification.

In the event of there being any inconsistency between the provisions of the conditions of contract and the provisions of this Specification, in respect of commercial requirements, the provisions of the conditions of contract shall take precedence for commercial matters and the provisions of this Specification shall take precedence in respect of technical matters.

In case of inconsistency between technical specification (TS) & bid proposal sheet, (BPS) quantities of various items as specified in the bid proposal sheet shall be considered for quoting. However the work shall be executed as specified in the technical specification. Only brief description is given in the BPS & the work shall be executed in line with the requirement given in the TS.

The manufacturer and places of manufacture, testing and inspection of the various portions of the Contract Works shall be stated in the relevant Bid Proposal Schedules.

7.0 Methodology:

The complete procedures for the execution of the project are explained herewith in details.

7.1 INSTALLATION OF DTS ON NEW PLINTHS, ALONG WITH ALL EQUIPMENT.

7.1.1 Design , Engineering, supply, survey, erection, testing and commissioning of 3 phase 11 / 0.433 KV Distribution transformer of capacities 100 KVA 11/.4KV as the case may be as per the direction of Engineer-in-charge .The supply (Except OSM) and erection of new DP structures are also included in the Contractor's Scope of work. Supply (Except OSM) and installation of all associated equipment/ materials, accessories are included in the Scope of Work. The Contractor shall carry out all related activities like guying, earthing, concreting, cooping, boundary of sub-station etc. to make the Distribution Sub-Station / line complete in all respect so as to conform to relevant standard / this specification.

7.1.2 **CONSTRUCTION OF LT LINES ON PSC POLES WITH AB CONDUCTORS.**

Design , Engineering, Supply of all materials, survey, erection, testing and commissioning of new 3 phase, 4 wire LV lines complete in all respect to conform to relevant standards/ specification and as per the direction of Engineer-in-charge. The work also covers survey of the route, route alignment etc. before construction of the lines.

Concrete foundation & cooping is to be made for all type of poles.

Earthing of all the equipment shall be in the scope of the contract.

Erection shall include AAAC & AB Cable, DTs, Line supports and cross arm, LV ACDB, GOAB, HG Fuse, L.As, Insulators, Hardwire Fittings, earthing and all other sundry items required for completion of the package in all respect.

8.0 QUALIFYING REQUIREMENTS OF THE EQUIPMENT TO BE SUPPLIED.

All the key equipment/materials (As per the BOQ), which are to be supplied under the contract are be supplied from the manufactures who must have designed, type tested, manufactured, and supplied the respective equipment of similar or above voltage class, which are in successful operation for at least two years from the date of handing over.

9.0 TYPE TESTING OF EQUIPMENT / MATERIALS

The bidder shall offer type tested equipment for the project. The type test shall cover the entire type test specified in this volume of the document. The contractor shall submit type test reports for the equipment offered in the bid for approval of the owner. In case, any equipment is not type tested or partially type tested, as per TS in the laboratories acceptable to the owner, the bidder shall carry out type tests at his own cost.

10.0 STANDARDS

10.1 The codes and or standards referred to in the specifications shall govern, in all cases wherever such references are made. In case of a conflict between such codes and /or standards and the specifications, latter shall govern. Such codes and/or standards, referred to shall mean the latest revisions, amendments/changes adopted and published by the relevant agencies unless otherwise indicated. Other internationally accepted standards which ensure equal or better performance than those specified shall also be accepted, subject to prior approval by the Purchaser.

In case no reference is given for any item in these specifications, latest REC specification & Construction Standards shall be referred to.

10.2 The manufacturing, fabrication, galvanizing, testing, erection procedure and materials used for manufacture shall conform to the relevant Indian Standards(IS) / International Standards which shall mean latest revisions with amendments/changes adopted and published, unless specifically stated otherwise in the specification. In the event of supply of material conforming to Standards other than specified, the Bidder shall confirm in his bid that these standards are equivalent to those specified. In case of award, salient features of comparison between the Standards proposed by the Bidder and those specified in this document will be provided by the Contractor to establish their equivalent.

10.3 The material and services covered under these specifications shall be performed as per requirements of the relevant standard code referred hereinafter against each set of equipment and services. Other Internationally acceptable standards which ensure equal or higher performance than those specified shall also be accepted.

11.0 Ambient Condition

The Equipment supplied against this specification shall be suitable for satisfactory continuous operation under the following tropical conditions:

Max. Ambient temp.(deg C):	**50**
Relative Humidity	**10-100%**
AV. Annual Rainfall (mm)	**1500 mm**
Max. Wind Pressure (Kg/Sq.Mt.)	**94.3**
Max. Altitude above MSL(Mtr.)	**1000**
Isocreaunic Level (days/Year)	**70**

12.0 SYSTEM CONDITIONS

The equipment shall be suitable for installation in supply systems of the following characteristics :

• Frequency		50 Hz
• Nominal system voltages		33 KV
		11 KV
		433/230 V
• Maximum system voltages :	33 KV System	36.3 KV
	11KV System	12 KV
	LV System	476 V
• Minimum LV voltage		340 V
• Nominal short circuit levels : (Basing on apparent power)	33 KV System	25 KA
	11 KV System	12.5 KA
• Insulation levels : 1.2/50 micro second impulse withstand (positive and negative polarity):	33 KV System	170 KVP
	11 KV System	75 KVP
• Power frequency one minute withstand (wet and dry)	33 KV System	70 KV
	11 KV System	28 KV
	LV System	2 KV
• Nominal earthing arrangements:	33 KV System	Solidly earthed
	11 KV System	Solidly earthed
	LV System	Solidly earthed

Environmentally, the region where the work will take place includes coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions for outdoor insulators.

Therefore, outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive and humid coastal atmosphere.

Indoor material and equipment shall be designed and protected for use in buildings, which occasionally may be wet and damp.

13.0 PAINTING

13.1 All sheet steel work shall be degreased, pickled, phosphate in accordance with the IS-6005 “Code of practice for phosphating iron and sheet”. All surfaces, which will not be easily accessible after shop assembly, shall beforehand be treated and protected for the life of the equipment. The surfaces, which are to be finished painted after installation or require corrosion protection until installation, shall be shop painted with at least two coats of primer. Oil, grease, dirt and swaf shall be thoroughly removed by emulsion cleaning. Rust and scale shall be removed by pickling with dilute acid followed by washing with running water, rinsing with slightly alkaline hot water and drying.

13.2 After phosphating, thorough rinsing shall be carried out with clean water followed by final rinsing with dilute dichromate solution and oven drying. The phosphate coating shall be sealed with, application of two coats of ready mixed, stoving type zinc chromate primer. The first coat may be “flash dried” while the second coat shall be stoved.

13.3 After application of the primer, two coats of finishing synthetic enamel paint shall be applied, each coat followed by stoving. The second finishing coat shall be applied after inspection of first coat of painting.

13.4 The exterior colour of the paint shall be as per shade no: 697 of IS-5 and inside shall be glossy white for all equipment, marshalling boxes, junction boxes, control cabinets, panels etc. unless specifically mentioned under respective sections of the equipment. Each coat of primer and finishing paint shall be of slightly different shade to enable inspection of the painting. A small quantity of finishing paint shall be supplied for minor touching up required at site after installation of the equipment.

13.5 In case the Bidder proposes to follow his own standard surface finish and protection procedures or any other established painting procedures, like electrostatic painting etc., the procedure shall be submitted along with the Bids for Employer’s review & approval.

13.6 The rail/joist poles shall be painted following above procedure at the work site, as per the direction of Engineer-in-charge.

14.0 CONSTRUCTION OF FOUNDATION FOR PSC POLES

14.01 ERECTION OF POLE, CONCRETING OF POLES AND COMPACTION OF SOIL

Drawing for the excavation of pits, Foundation of both wet and Black cotton soil is enclosed which are to be adopted. If better design with less volume approved or tested by any other distribution agencies will also be acceptable.

14.02 Following arrangement shall be adopted for proper erection of poles wherever necessary and properly compacting of the soil around the base / foot of the poles, under this package.

(a) Excavation has to done as per the drawing to the required depth and size. After final excavation the pit should be dressed properly so that uneven portion and loose soil should be removed before PCC (**M-7.5**) of thickness 75 mm is laid. The base footing of the pole concreting RCC (M-15) has to be done by proper alignment and verticality.

(b) The verticality and leveling of pole/structure should be done by the help of plum bob or with theodolite and leveling instrument.

(c) In case of of PSC pole RCC Pre –cast slab of size (500 x 500 x 100) mm has to be provided over the Lean concrete.

i. CEMENT CONCRETE (PLAIN OR REINFORCED), STUB SETTING GROUNDING AND BACK FILLING etc.

A) Materials

All materials whether to be consumed in the work or used temporarily shall conform to relevant IS specification, unless stated otherwise, and shall be of the best approved quality.

B) Cement

Cement to be used in the work under the contract shall generally conform to IS:269/455-1989. Cement bags shall be stored by the contractor in a water tight well ventilated store sheds on raised wooden platform (raised at least 150 mm above ground level) in such a manner as to prevent deterioration due to moisture or intrusion of foreign matter. Cements to be used within three months from the date of manufacture. Sub-standard or partly set cement shall not be used and shall be removed from the site by the contractor at his cost .

C) Coarse Aggregates i.e Stone chips or stone ballast. For M15 concrete (mix 1:2:4) the aggregate will be in the ranges from 12mm to 20mm.size and for M7.5 concrete (mix 1:4:8) these will be from 25mm to 40mm size.

D) Pole erection

1. **After proper alignment**, checking of verticality and leveling, the pole or structure should be properly tied before placing of base concrete of required height. Again the verticality and leveling should be checked.
2. **The RCC pedestal concrete** (M-15) is to be done by providing good quality of shutters, so that there will no leakage of cement slurry during concreting. The cooping height should be **450** mm/750 mm above the existing ground level in urban area and in cultivated lands respectively. The top portion of the cooping should be made tapered.
3. **Above** the cooping 450 mm of pole or structure should be painted with double layer of Black Bituminus paints.

4. **All the bolted joints** should be tightened properly by providing suitable size GI Bolt Nuts and Spring washers. After completion of erection works all the bolts should be spot welded in order to avoid theft of members.
5. **The back filling** of locations should be done by using the excavated soil only in layers (each layer should not be more than 500 mm) by putting water and ramming by using wooden rammers. In no case stone of size more than 75mm used for back filling. Back-filling has to be done 75mm above ground level or as specified
6. **Curing of concrete** should be done for 28 day continuously. Curing should not be done within 24 Hours of concreting.
7. **All the excess** excavated materials and other unused materials from the concreting site should be disposed of to a suitable site by the contractor.

a) Mixer (Running time-2 min.)
b) **In case of** hand mixing, 10% extra cement has to be provided. Hand mixing should be done on GI sheet platform only.
c) **Poking rod** may be used for compacting in locations at PSC poles only
d) **Use of vibrator** for compacting is mandatory.
e) **Clean water** (free from saline and alkaline) should be used for concreting.
f) **Aggregates** (both coarse and fine) used should be free from foreign materials.
g) **Shutters** used should not be removed before 24hrs. of casting.
h) **In case of** black cotton soil borrowed earth (morum soil mixed with sand is preferable) may be used for back filling.
i) **Sufficient qty. of water** should be sprinkled over backfilled earth and chimney kept wet by using wet gunny bags.

14.03 **All the persons** working on tower shall wear safety helmet, safety belt and safety shoes, Similarly all the persons working on ground shall wear safety helmet and safety shoes.

14.04 **If there is any LT/HT** power line near the vicinity of tower erection, necessary shutdown of the power line shall be obtained in writing from the concerned Agency in order to avoid electrical hazards caused by accidental touching of stay/Guy ropes with power line.

14.05 **Safety precaution** Safety shall be given utmost importance during stringing. The following need to be ensured.

14.06 **Safe working** conditions shall be provided at the stringing site.

SECTION –II

TECHNICAL SPECIFICATION FOR ERECTION OF LINES AND INSTALLATION, TESTING & COMMISSIONING OF DISTRIBUTION SUB-STATIONS

1.0 This specification covers Construction of new 11 KV lines, Distribution sub-Stations. The scope of work for these activities is as below.

1.1 **Construction of 11 KV & LT Lines**

Following is included in the scope of erection of 11 KV & L.T New Lines for 11/0.4 KV new substation.

Survey

i) Route Survey including route alignment, pole spotting, optimization of pole locations, ground profile, sag charts and 3 copies of drawing for the above works alongwith sketches and bill of materials shall be furnished in a report form to the Engineering in charge for approval.

ii) **Supply of all materials except the Owner Supplied Materials (OSM) as per the Bill Of Quantity (BOQ) stated in Part-B of Volume- III of this tender specification.**

iii) Design and selection type of foundation for different type of poles and casting of foundation as per approved drawing.

iv) Erection of poles, stay set, earthing, fixing of insulators, Mid span compression joint, repair sleeves, stringing of conductors along with all necessary line accessories.

v) Testing and commissioning of the erected lines.

vi) All other items/ activities which are required to be supplied/ done for successful completion of work shall be deemed to be included in the scope of contractor

1.2 Following is included in the scope for restringing of 11KV and LT lines.

Survey

i) Route Survey including route alignment, pole spotting, optimization of pole locations, ground profile, sag charts and 3 copies of drawing for the above works alongwith sketches and bill of materials shall be furnished in a report form to the Engineering in charge for approval.

ii) The dismantled conductor are to be rewound in the wooden drums(which are to be arranged by the contractor at his own cost) with proper care and returned to the store of CESU as per the direction of the Engineer-in-charge with transit insurance and proper accounting details. Similarly, the Joist poles which are dismantled, shall also be returned to the store of CESU as per the direction of the Engineer-in-Charge with transit insurance and proper accounting details. All other materials, like PSC poles, cross-arms and other structural materials, insulators, GI wire, earthing set, stay set etc., which are dismantled, shall be returned to store by the contractor . The bidder shall appropriately consider this aspect while pricing their bid and no adjustment in price, whatsoever, shall be done during execution of the contract or in future.

1.3 The empty conductor drums, available after laying of conductor, shall be disposed of by the contractor at his cost. These drums may be used for rewinding of old conductor removed from the line at the later stage of reconductoring work.

1.4 Bifurcation of the existing line included breaking of the line and connecting the rest portion with new link line, providing switching arrangement at the break-up point, if required. **Any other work not mentioned above exclusively but required for accomplishing desired bifurcation will be in the scope of the bidder/contractor.**

1.5 For all above activities, shut down will be provided for the line by CESU authorities. Restoring the disturbance/damage caused by above activities to the existing infrastructure i.e. road, water/ sewerage pipes, telecommunication lines etc will be the scope of the bidder /contractor.

1.6 While Repairing & Replacing the equipment, if any equipment gets damaged due to negligent handling of the Contractor the same shall be replaced by the Contractor, at his cost, to the owner/employer's satisfaction.

1.7 The various items of work are described very briefly in the Bid Form, Price Schedule. The various

(a) items of the Schedule shall be read in conjunction with the corresponding sections in the Technical Specifications including amendments and, additions, if any,. The Bidder's rates shall be based on the description of activities in the Bid form, Price and other Schedule as well as necessary operation detailed in these Technical Specification.

(b) **The unit rates quoted shall include minor details which are obviously and fairly intended, and which may not have been included in these documents but are essential for the satisfactory completion of the various works.**

(c) The unit rate quoted shall be inclusive of deployment of all plant, equipment, men, material, skilled & unskilled labour etc. essential for satisfactory completion of various works.

(d) All measurements for payment shall be in S.I. units. Lengths shall be measured in meters corrected to two decimal places. Areas shall be computed in square meters & volume in cubic meters, rounded off to two decimals.

(e) Provision has been made for supply of treated steel and shall be used for fabrication of straight

cross arm, structures, clamps and brackets and any other materials required for completion of installation.

1.8 Detailed scope of work and technical specification of the major equipment/materials are specified in this volume. In case the requirement of any equipment/materials required in completion of the work is not specified in this volume, relevant IS specification shall be applicable for the same. Construction procedure of lines including route survey, pole spotting, foundation and erection of poles, stringing of conductor, erection and commissioning of lines are given in this Volume.

1.9 The BOQ of the items required to be supplied are given in the Bid Proposal Sheets. The items and their quantities indicated therein are only provisional. The bids shall be evaluated based on these provisional quantities. However, the Contractor shall supply all the items required as per the detailed engineering/actual site requirement as per the BOQ and except the OSM, and payment shall be made for the actual quantities supplied/executed based on the unit rates of the contract.

1.10 The Contractor shall be responsible for the overall co-ordination with CESU, internal / external agencies, project management, training of owner's manpower, loading, unloading of both OSM & the materials supplied by the executant, insurance (storage and transit), handling, moving the required equipment and materials including the OSM, to final destination for successful erection, testing and Commissioning.

1.11 Before proceeding with the submission of bids/ construction work, the contractor shall fully familiarize himself with the site conditions and general arrangements and scheme etc. It shall be the responsibility of the contractor to arrange all the inputs required for bid preparation, detailed engineering and execution. Though the Employer shall endeavor to provide the information, it shall not be binding for the owner to provide the same. The bidders are advised to visit the site and acquaint themselves with the topography, infrastructure and also the design philosophy. The bidder shall be fully responsible for providing all equipment, materials, system and services specified or otherwise which are required to complete the construction and successful commissioning, operation and maintenance of the job in all respect.

1.12 All materials required for the civil and construction/installation work shall be supplied by the contractor. The cement and steel shall also be supplied by the Contractor.

1.13 Development of all the design, drawings, route profiling, erection diagram, electrical & physical clearance diagrams etc. and getting approval of the same form the Employer are included in the scope of work.

1.14 All ferrous parts used for conductor and insulator hardware shall be hot dipped galvanized as per standard technical specification enclosed with this specifications.

1.15 All the item i.e nuts, bolts etc. which are not detailed in this specification, shall be as per relevant IS. All the nuts and bolts shall be galvanized conforming to ISI 367(Part-II)

1.16 The bidder shall offer type tested equipment for the project. The type test shall cover the entire type test specified in this volume of the document. The contractor shall submit type test reports for the equipments offered in the bid for approval of the owner.

1.17 **Span**

The span should be as near as possible to the basic design span indicated below:

11 KV on AAAC	:	60 mts
LV	:	40 mts

1.18 **Road Crossing:**

At all important road crossings, the poles shall be fitted with strain type insulators. The ground clearance from the road surfaces under maximum sag condition shall not be less than 5.8 meters. All Road crossing shall be as per IE Rule 1956

1.19 Power Line Crossings

Where the line is to cross over another line of the same voltage or lower voltage, provisions to prevent the possibility of their coming into contact with each other shall be made in accordance with the Indian Electricity Rules,1956 as amended from time to time. All the works related to the above proposal shall be deemed to be included in the scope of the contractor.

1.20 Telecommunication Line Crossing

The angle of crossing shall be as near to 90 degree as possible. However, deviation to the extent of 30 degree may be permitted under exceptionally difficult situations. However, in all such cases the matter shall be referred to the authority in-charge of the telecommunication system. On request form the contractor, the permission of the telecommunication authority may be obtained by the employer. Also, in the Crossing span power line support shall be as near the telecommunication line as possible, to obtain requisite veritical clearance between the two lines. All telecommunication line crossing shall be as per latest IE Rule 1956.

1.21 Details Enroute

All topographical detail, permanent feature, such as trees, building etc. 5.5 mtr on either side of the alignment shall be detailed on the route plan for 11KV feeders.

All poles used for above crossing shall be tension poles i.e. disc type insulators shall be used on these poles. At all the crossing described above the contractor shall use protective guarding as per REC construction standard A-1 to fulfill statutory requirements.

Clearance from ground, buildings, trees and telephone lines shall be provided in conformity with the Indian Electricity Rules, 1956 as amended up to date. The Contractor shall select height (out of 8/9 mtrs) of the poles such that the prescribed electrical clearances are achieved. The contractor may propose Joist/PSC poles of 10 mtrs height for various road, rail and river and drain crossings etc, if required, in order to maintain the required ground clearance.

1.22 Final Schedule-

The final Schedule indicating location of poles, angle of deviation, road crossing BOM of proposed lines and substation and any other details shall be submitted for the approval of the Employer. In case of upgrading of substation and reconductroing of line the contractor shall furnish detail present status existing equipment / materials along with BOM in addition to above. After approval, the contractor shall submit 6 more sets of the approved documents along with one set in reproducible form to employer for record purpose.

1.23 **Details of Line Routes:-** For further details, Contractor is advised to contact the Engineer-in-Charge.

2.0 Excavation of Pits

2.1 The pole pit of size as per clause 3.0 shall be excavated by the contractor.

2.2.2 Excavation cost for pits shall be included by the contractor in the cost for pole erection for all types soils including hard rock, if encountered, inclusive of dewatering of pits and shoring and shuttering wherever necessary.

No separate claim for excavation , dewatering during excavation ,shoring and shuttering shall be entertained.

2.2.3 For all type of soils, including hard rock, erection cost of poles shall include back filling the pits with excavated soil or borrowed soil (if required) properly rammed. For soil covered by hard rock variety, the erection cost shall include back filling with excavated rock bits and borrowed earth duly rammed after laying the designed rock foundation. The quoted rate shall cover all contingencies which might

be envisaged during process of excavation. For any reason, whatsoever, no extra claim shall be accepted by the Employer

2.2.4 For hard rock locations, hole of diameter 20% in excess of the longest dimension of the bottom most portion of PSC/ joist pole shall be excavated. The pole shall be grouted in the pit with 1:1. 5:3 nominal concrete mix at the time of pole erection.

2.2.5 The above clauses shall be read in conjunction with Foundation & pole Erection clause given below.

3.0 Erection and Foundation of Poles.

The foundation of poles shall be of following types:

Concrete Foundation

The type of foundation to be adopted for individual poles shall be decided during detailed engineering. The pole erection rate shall include excavation inall types of soil/rock, concreting/backfilling of the foundation pit as specified, cost of all materials, labour etc.

The specification of the above type of foundation is given below:

The PCC foundation of the pole should be of size 75 cm x 75 mm x depth, where depth is equal to the 1/6 th of the height of the respective pole. The PCC shall be of 1:2:4 (M150 grade). Excavation size of the pit shall be commensurate with the foundation size of PCC stated above. A PCC (grade 1:2:4) muffing of size 500 mm dia and 200 mm height shall be provided above the ground level for the Joist pole only.

The pole is to be erected in alignment with utmost care and the excavated earth should be back filled properly by ramming or concreting

For foundation of Joist / PSC poles, a GI base plate shall be provided at the bottom of the pole. The joist pole shall be painted with one coat of red-oxide paint and two coats of aluminum paint at site, as per the direction of the Engineer-in-Charge. Proper cooping of poles are to be made as per the direction of Engineer–in-Charge.

4.0 Earthing of Poles

4.1 In HT & LT line, each pole shall be earthed with coil type earthing as per REC Construction Standards no.J-I with following exception

4.2 The poles on both sides of railway , telecommunication, road, drain & river crossing shall be earthed by pipe earthing as per REC construction Standards no J-2

4.3 All poles at locations where DT is installed shall be pipe earthed with 4 points .

5.0 Danger Board

The Contractor shall provide and install danger plates on all DP & four pole structures and at all poles where DT is installed. The danger plates shall conform to REC specification No.57/1993

6.0 Anti-climbing Devices

The Contractor shall provide and install Anti-climbing Devices on all DP & four pole structures and at all poles where DT is installed **.** This shall be done with G.I. Barbed wire. The barbed wire shall conform to IS-278 (Grade A1). The barbed wires shall be given chromating dip as per procedure laid down in IS:1340

7.0 CROSS ARM & CLAMPS, INSULATOR & HARDWARE FITTINGS.

7.1 For 11 KV Line

7.1.1 Cross Arm for 11KV line: The contractor shall supply and install " V" shape cross arm as per REC Construction Standard A-6

7.1.2 Back Clamp for " V" cross arm as per REC Construction Standard K-2 and use it to install the cross

arm

7.1.3 Pole Top Bracket: the contractor shall supply & install pole top Bracket as per REC Construction Standards A-7

7.1.4 Insulators & Insulator Fittings:- The Contractor shall supply & install disc and Pin insulators as per Insulator Specification & REC Construction Standards No-C- 1 to C 5

7.2 **For LV line on AB Cable.**

7.2.1 The contractor shall install AB conductor with all accessories as per REC Construction standard E-34 & E-36. All precaution shall be taken for stringing of AB Cable with all accessories such as suspension and strain fitting, insulating Piercing connector and LT neutral connector without damaging the AB Cable, Poles & other line fittings. Proper clearance shall be maintained from ground level and over road crossing, power line crossing and telecom line crossing as per I.E rule.

Heat shrinkable straight through joints shall be used for jointing of AB Cable

The dismantled materials from the L.V line shall be returned to nearest store of CESU with proper accounts as per direction of Engineer- in - charge.

7.3 Guy/Stay wire Clamp: The Contractor shall supply and install Guy/Stay Wire Clamp as per REC Specification Standard G-I

7.4 **STAY/GUY SETS**

7.4.1 The stay/Guys shall be used at the following pole locations and as per discretion of Engineer -in-charge

a) All the DP & Four pole structure
b) All single pole tension points
c) All single poles where Distribution Transformer is installed

7.4.2 The arrangement and number of stay sets to be installed on different pole structures shall be as per REC construction Standards A-23, A-27, G-5 & G-8

7.4.3 The stay set shall consist of the following items:

a) G.I. Stay wire
b) Stay Insulator
c) Turn Buckle
d) Clamps
e) Anchor rod & plate (Hot Dipped galvanized)

Complete stay set shall be as per REC Construction Standards No.G-I. The specification of the stay set is given in this volume.

7.4.4 **Erection of Stay Sets**

The Contractor shall install the stay set complete in all respect. This included excavation of pit size 0.75 x 0.5 x 1.6 meter in all kinds of soil including laterite/hard rocks. Stay plate and rod(leaving the top 10 cm) shall be embedded in the pit with PCC in the ratio 1:2:4. An angle between 30 to 45 degrees shall be maintained between stay wire and pole. The stay wire shall be used with a stay insulator at a height of 5 mts. above ground level with G.I turn buckle. MS Stay plate will be of size 450 mm x 450 mm x 12 mm.

8 Stringing and Installation of Line materials with Bare Conductors

8.1 **General**

i) The scope of erection work shall include the cost of all labour, tools & plants and all other incidental expenses in connection with erection and stringing work. The stringing equipment shall be of sufficient capacity to string AAAC Conductor of different sizes as mentioned in the BOQ.

ii) The Contractor shall be responsible for transportation to site of all the materials to be provided by

the Contractor as well as proper storage, insurance etc. at his own cost, till such time the erected line is taken over by the Employer.

iii) Contractor shall set up required number of stores along the line and the exact location of such stores shall be discussed and agreed upon with the Employer.

8.2 **Insulator fixing**

Pin insulator shall be used on all poles while strain insulators shall be used on all angle & dead end poles. Damaged insulators and fittings, if any, shall not be used. Prior to fixing, all insulators shall be cleaned in a manner that shall not spoil, injure or scratch the surface of the insulator, but in no case shall any oil be used for that purpose. Torque wrench shall be used for fixing various line materials and components, such as suspension clamp for conductor, whenever recommended by the manufacturer of the same.

8.3 **Running out of the conductors**

a) The contractor shall be entirely responsible for any damage to the pole or conductors during stringing. The conductors shall be run out of the drums from the top in order to avoid damage to conductor.

b) A suitable braking device shall be provided to avoid damaging, loose running out and kinking of the conductors. Care shall be taken to ensure that the conductor does not touch and rub against the ground or objects, which could scratch or damage the strands.

c) The sequence of running out shall be from the top to down i.e the top conductor shall be run out first, followed in succession by the side conductor. Unbalanced loads on the poles shall be avoided as far as possible. Wherever applicable, inner phase of line conductors shall be strung before the stringing of the outer phases is taken up.

d) When Lines being erected run parallel to existing energized power lines, the contractor shall take adequate safety precautions to protect personnel from the potentially dangerous voltage build up due to electromagnetic and Electrostatic coupling in the pulling where, conductors and earth wire during stringing operations

e) The Contractor shall also take adequate safety precaution to protect personnel from potentially dangerous voltage build up due to distant electrical storms or any other reasons.

8.4 **Crossings**

Derricks or other equivalent methods shall be used to ensure that normal services are not interrupted and any property is not damaged during stinging operations for roads, telecommunication lines, power lines and railway lines. However, shut down shall be obtained when working at crossings of overhead power lines. The contractor shall make specific request for the same to the owner.

8.5 **Stringing of Conductor**

a) The stringing of the conductor shall be done by the standard stringing method

b) The bidder shall submit complete details of the stringing method for owners' approval. Prior to stringing the contractor shall submit the Stringing chart for the conductor showing the initial; and final sags and tension at various temperature and spans, along with equivalent spans in the lines for the approval of the employer.

c) Conductors shall not be allowed to hang in the stringing blocks for more than 96 hors before being pulled to the specified sag.

d) Conductor creep are to be compensated by over tensioning the conductor at temperature of 26 degree C lower than the ambient temperature or by using the initial sag and tensions indicated in the tables.

8.6 **Jointing**

When approaching the end or a drum length at least three coils shall be left in place when the stringing operations are stopped. These coils are to be removed carefully, and if another length is required to be run out, a joint shall be made as per the recommendations of the accessories manufacturer.

a) Conductor's splices shall not crack or otherwise be susceptible to damage during stringing operations. The contractor shall use only such equipment/methods during conductor stringing which ensures complete compliance in this regard.

b) All the joint on the conductor shall be compression type, in accordance with the recommendations of the manufacturer for which all necessary tools and equipments like compressors, dies etc. shall be obtained by the Contractor. Each part of the joint shall be cleaned by wire brush till it is free of rust or dirt, etc. This shall be properly greased with anti-corrosive compound if recommended by the manufacturer, before the final compression is carried out with the compressors.

c) All the joints or splices shall be made at least 30 mts away from the pole. No joints or splices shall be made in spans crossing over main roads, railway line and small river spans. Nor more than one joint per conductor per span shall be allowed. The compression type fittings shall be of the self centering type or care shall be taken to mark the conductors to indicate when the fitting is centered properly. During compression or splicing operation,

d) The conductor shall be handled in such a manner as to prevent lateral or vertical bearing against these dies. After compressing the joint, the aluminum sleeves shall have all corner rounded burrs and sharp edges removed and smoothened.

e) To avoid any damage to the joint, the contractor shall use a suitable protector for mid span compression joints in case they are to be passed over pulley blocks/ aerial rollers. The pulley groove size shall be such that the joints along with protector can be passed over it smoothly.

8.7 Tensioning and Sagging Operations

a) The tensioning and sagging shall be done in accordance with the approved stringing charts or sag tables.

b) The sag shall be checked in the first and the last section span for sections up to eight spans and in one additional intermediate span for sections with more than eight spans.

c) Tensioning and sagging operations shall be carried out in clam weather when rapid changes in temperature are not likely to occur.

8.8 **Clipping in**

a) Clipping of the conductors into position shall be done in accordance with the manufacture's recommendations.
b) Jumpers at section and angle towers shall be formed to parabolic shape to ensure maximum clearance requirements. Pilot suspension insulator strings / pin insulator shall be used, if found necessary, to restrict jumper swing to design values.
c) Fasteners in all fittings and accessories shall be secured in position. The security clip shall be properly opened and sprung into position.

8.9 Fixing of Conductors Accessories

Conductor accessories supplied by the Contractor shall be installed by the contractor as per the design requirements and manufacturer's instructions. While installing the conductor accessories, proper care shall be taken to ensure that the surfaces are clean and smooth and that no damage occurs to any part of the accessories or of the conductor.

8.10 Replacement

If any replacements are to be effected after stringing and tensioning or during maintenance e.g. replacement of cross arms, the conductor shall be suitable tied to the pole at tension points or transferred to suitable roller pulleys at suspension points.

9.0 Final Checking, Testing and Commissioning:

9.1 After stringing have been done as approved by the engineer, to ensure that everything is complete in all respects, the works shall be thoroughly inspected keeping in view the following main points.

9.2 All the bolts and nuts should be of GI materials as per relevant IS.

9.3 The contractor shall submit a report to the above effect to the Engineer in Charge, who shall inspect and verify the correctness of the report. In case it is noticed that some or any of the above is not fulfilled, the engineer shall get such items rectified by the contractor not no extra cost to the owner.

9.3.1 After final checking, the line shall be tested for insulation resistance in accordance with IS 1255:1983. All arraignments for such testing or any other test desired by the Engineer in Charge, shall be done by the contractor and necessary labour, transport and equipment shall be provided by him. Any defect found out as result of such tests shall be rectified by the contractor, forthwith without any extra charges.

9.4 Sufficient backfilled earth covers each foundation pit and is adequately compacted

9.5 All poles are used strictly according to final approved drawing and are free of any defect or damage whatsoever.

9.6 The Stringing of the conductors has been done as per the approved sag and tension charts and desired clearances are clearly available

9.7 All conductor and messenger wire accessories are properly installed

9.8 All other requirements for completion of works such as fixing of danger plate and anti-climbing device have been fulfilled.

9.9 Wherever required, the proper revetment (erosion protection) is provided Proper earthling of the poles.

10.0 HT Road Crossing Guarding

The contractor shall provide the protective guarding at all crossings over road, rail, river, other power & telecommunication lines. The guarding shall as per REC Construction standard No. A-1.

11. Statutory Regulations.

The Contractor is required to follow local statutory regulations stipulated in Electricity (Supply) Act 1948/2003, Indian Electricity Rules 1956 as amended and other local rules and regulations referred in these specifications.

12. Reference Standards

The codes and/or standards referred to in the specifications shall govern, in all cases wherever such references are made. In case of a conflict between such codes and/or standards and the specifications, latter shall govern. Such codes and/or standards, referred to shall mean the latest revisions, amendments/changes adopted and published by the relevant agencies unless otherwise indicated. Other internationally accepted standards which ensure equal or better performance than those specified shall also be accepted, subject to prior approval by the Employer. In case no reference is given for any item in these specifications, latest REC specification & Construction Standards shall be referred to.

13. Drawings

The following is the general list of the documents and drawings that are to be submitted by contractor for Employer's approval:

i. Work schedule(Master Network) Plan.
ii. Detailed survey report showing ground clearance and pole location.

iii. Stringing procedure and stringing chart.
iv. Pole accessories drawings like cross arm, clamp, design plate, name plate, name plate etc.
v. Quality plan
vi. Sub-Contractors approval, etc.

14. ERECTION OF DISTRIBUTION TRANSFORMERS.

General:

10.1 The contractor's scope is to supply (Except OSM) and install 11 KV LA, 11 KV GOAB switch, Horn Gap fuse on HT side, LT Distribution Box of different ratings as per relevant IS specification on new DTs locations & Hand Guards, re-wirable fuses for each out-going LT feeders as specified in the BOQ with installation of transformer. All structures, earthings and all other items, not specifically mentioned but necessary for safe operation of the distribution transformer are included in the scope of work.

10.2 The contractor shall supply (Except OSM) & install the PVC LT cables from DT secondary to distribution box (DB) and from DB to the overhead LT feeders with suitable loops for flexibility of operation in future. Distribution box shall have proper locking arrangement.

10.3 The dismantled transformer either shall be transported with insurance to any prefixed location within the circle for reinstallation or to nearest CESU store as per direction of Engineer – in – charge.

10.4 The place for installation & capacity of DT shall be tentatively specified by the Employer during detailed engineering.

10.5 Contractor shall obtain the Employer's approval for final DT location.

15. Erection of Transformers:

15.1 Distribution transformers shall be installed on 11 KV D.P itself or on plinths as per instruction of Eng-in-Charge.

The Design, Engineering & Drawing for construction of new plinths or modification of existing plinth of different rating of transformer shall be submitted by the contractor prior to execution of work for approval of Eng-in-Charge (EE, BCDD-II, BBSR).

15.2 For renovation and improvement of distribution substation either new or old dismantled transformer shifted from other location shall be installed. The old dismantled transformers shall be painted, after surface treatment as per Technical Specification with minor repair such as replacement of damaged bushing stud, bushings, gaskets, breather, and sillicagel including filtration and topping of oil. The above work is included in the scope of work of contractor.

16.0 Electrical Connections:

16.1 The HT side connections shall be made with PVC Insulated 100mm^2 AAA conductor. LT side connections shall be used for all the cable entries in distribution box. Jumpering shall be done as per REC practices.

16.2 The contractor shall properly dress all the LT cables emanating from distribution box and terminate them at the respective overhead LT lines. The contractor shall provide all jointing material i.e. sleeves etc and carry out all jointing works.

17 Protection of DT:

17.1 HT side:

17.1.1 Lighting Arrestor: The contractor shall supply & install Metal Oxide LA to protect the transformer from any electrical surge and lightening strokes.

17.12 HG FUSE: The contractor shall supply & install HG fuse on HT side of DT for protection purpose .The contractor shall specify the rating of the fuse wire in the bid for each rating of transformer.

18.0 EARTHING OF 11/0.4 KV SUBSTATION

All non current carrying metal parts shall be earthed by two separate conductors of wires to earth system. Separate and distinct earthing arrangement shall be made for the transformer neutral and the metal parts of the substation. The earthing shall generally comply with Section 67 of Indian Electricity Rules 1959 and take into account the recommendations made IS : 3043 – Code of practice for earthing.

Each piece of equipment, such as the circuit breakers and the distribution boards to be supplied under this specification, shall be provided with two electroplated brass earth terminals of adequate size to carry the full earth fault current. Suitable identification mark for the earth terminals shall be provided adjacent to them.

Earthing shall be carried out by forming a network of galvanized steel flats all around the substation at a depth of one meter from any metal which can be touched by a person standing on the ground. All non current carrying metal parts of each equipment shall be connected at two places with the earth network.

The neutral points of the transformers shall be earthed to its own electrode at the substation using insulated conductors by not less than two separate and distinct connections with earth. The neutral earth electrode shall be separated from the substation earth electrodes by not less than 3 meters and wherever possible by 5 meters.

In case of each substation other than the single pole substation, at least four earth pits shall be constructed, two for the transformer neutral and two for the other parts of the substation. The earth pits shall be of sufficient depth to reach down to the water strata. GI plates or pipes shall be embedded in the pits and connection made with earth continuity conductor to the network using GI stay wires size 7/9 SWG.

In locations where water strata cannot be reached, artificial earth pits shall be made using salt and charcoal of sufficient quantity.

Earth continuity conductors shall have sufficient cross sectional area to afford a low resistance path for the full fault current envisaged. Earth conductors for the surge arresters shall be of sufficient cross section to carry the rated discharge currents.

The size of the earth continuity conductor shall be large enough to reduce the potential rise of the metal parts of the substation in the event of earth fault to minimum but in any case not more than 20 V. The size of the conductor shall also be adequate to restrict the temperature rise without causing any damage to the earth connection in the case of fault.

The earth resistance shall be measured before commissioning and generally it shall not be more than 2.0 Ohms.

18.01 **Earthing Device:** The Earthing pipe must be made out of 40 mm nominal Bore & 3.2 mm (Medium Gauge- No minus Tolerance allowed) wall thickness Hot Dip G.I. Pipe (as per IS ;- 1239,m Part-1, 1990 & REC construction Standard –J-2) , ISI marked of reputed Make & 3.0 mtrs length tapered finished at one end for a length of 75 mm & Clamp at the other end. Staggered drills hole of 12 mm Dia of interval of 150mm shall be made before galvanization. The GI Earthing Clamp/ Strip (C- Clamp Type) is to be of 50mm width, 6mm thickness & flange length of 65 mm in each side. The Clamp/ Strip & Earthing pipe after fabrication will be hot dip galvanized confirming to IS: 2629/85 with latest amendments. The clamp shall have two holes in both sides suitable for 5/8 x 2" Bolt & provided with two GI bolts& Nuts in each side of 5/8 x 2" long half threaded with spring washer as per IS: 3043/1982.The galvanization tests are to be conducted as per IS: 2633/72 & IS: 6745/72 & its latest amendments.

19.0 INSTALLATION OF 11/0.4 KV SUBSTATION

The contractor shall use modern time saving tools and plant for installation of the substation to ensure early completion of the job within the specified time schedule. The entire job shall be done systematically with good workmanship so that the final job gives a neat and clean appearance.

Installation of the transformers and switchgear shall take into account the recommendations made in IS : 10028-2 and IS : 10118 respectively.

In case of pole mounted sub-stations, the pole foundations shall be designed and poles installed to ensure stability of the structures under all service conditions. A suitable concrete plinth, formed from cement and sand mixture in the ratio of two to four, shall be provided for the pole base.

20.0 SURVEY (Detail & check, estimating of quantities & spotting of Poles).

Walk over survey, Theodolite survey, profile survey (if required) shall have to be carried out to establish the route alignment by the contractor for new 11 KV lines. If the line is passing by any Municipal/ NAC areas, permission from local bodies, NH authority and State high way authority has to be obtained prior to execution of work.

Technical Specification of Major materials

TECHNICAL SPECIFICATIONS FOR 11kV AB Switch

1.0 SCOPE:-

This specification provides for manufacture, testing at works and delivery For supply of 11KV AB switches. The 11KV AB switches shall conform to IS: 9920 (Part-I to IV)

2.0 AB SWITCHES:-

The 11KV Air Break Switches are required with two poles in each phase. The AB Switches shall be supplied complete with phase coupling shaft, operating rod and operating handle. It shall be manually gang operated and vertically break and horizontal mounting type.

2.0.1 The AB Switch shall be designed for a normal current rating of 400 Amps and for continuous service at the system voltage specified as under:

11 KV AB Switch: 11KV + 10% continuous 50 C/s solidly grounded earthed neutral system. The length of break in the air shall not be less than 400 mm for 11KV AB Switches.

2.0.2 The 11KV AB Switches are required with post insulators. The AB switches should be suitable for mounting on the structure. The mounting structure will be arranged by the purchaser separately. However, the AB Switches shall be supplied with base channel for mounting on the structure which will be provided by the purchaser. The phase to phase spacing shall be 750mm in case of 11KV AB Switches.

3.0 POST INSULATORS:-

The complete set of three phase AB Switches shall have post insulators.

11KV AB Switches : 11KV Post Insulators

The post insulators should conform to the latest applicable Indian standards IS: 2544 Specification for Porcelain Post insulator Polycon or of compact solid core or long rod insulators are also acceptable. Creepage distance should be adequate for highly polluted outdoor atmosphere in open atmosphere. The porcelain used for manufacture of AB Switches should be homogeneous free from flaws or imperfections that might affect the mechanical dielectric quality. They shall be thoroughly vitrified, tough and impervious to moisture. The glazing of the porcelain shall be of uniform brown in colour, free from blisters, burns and other similar defects. Insulators of the same rating and type shall be interchangeable.

The porcelain and metal parts shall be assembled in such a manner that any thermal expansion differential between the metal and porcelain parts through the range of temperature variation shall not loose the parts or create undue internal stresses which may affect the electrical or mechanical strength. Cap and base of the insulators shall be interchangeable with each other. The cap and base shall be properly cemented with insulators to give perfect grip. Excess cementing must be avoided.

<u>The tenderers shall in variably enclose with the offer, the type test certificate from NABL accredited testing laboratory and other relevant technical guaranteed particulars of insulators offered by them. Please note that AB Swiches without type test certificates will not be accepted.</u>

4.0 Each 11KV Post Insulators should have technical particulars as detailed below:

		11 KV
i	Nominal system voltage kV (rms)	11
ii	Highest system voltage kV (rms.)	12
iii	Dry Power Frequency one kV minute withstand voltage (rms) in	35
iv	Wet Power frequency one minute withstand voltage (rms) in KV	35
v	Power Frequency puncture kV (rms) voltage	1.3 times the actual dry flashover voltage
vi	Impulse withstand voltage kV (Peak)	75
vii	Visible discharge voltage kV (rms)	9
viii	Creepage distance in mm (minimum)	320

5.0 The rated insulation level of the AB Switches shall not be lower than the values specified below:-

Sl. No	Standard declared voltage	Rated Voltage of the AB Switches	Standard impulse with stand voltage (positive & negative polarity KV (Peak)		One Minute power frequency withstand voltage kV (rms)	
			Across the Isolating distance	To earth & between poles	Across the Isolating distance	To earth & between poles
i	11KV	12KV	85KV	75KV	32KV	28KV

6.0 TEMPERATURE RISE:-

The maximum temperature attained by any part of the equipment when in service at site under continuous full load conditions and exposed to the direct rays of Sun shall not exceed 45 degree above ambient.

7.0 MAIN CONTACTS:-

AB Switches shall have heavy duty self-aligning type contacts made of hard drawn electrolytic copper/brass. The various parts should be accordingly finished to ensure inter changeability of similar components. The moving contacts of the switch shall be made from hard drawn electrolytic copper brass. This contact shall have dimensions as per drawing attached so as to withstand safely the highest short-circuit currents and over voltage that may be encountered during service. The surface of the contact shall be rounded smooth and silver-plated. In nut shell the male and female contact assemblies shall ensure.

(i) Electro-dynamic withstands ability during short circuits without any risk of repulsion of contacts.

(ii) Thermal withstands ability during short circuits.

(iii) Constant contact pressure even when the lower parts of the insulator stacks are subjected to tensile stresses due to linear expansion of connected bus bar of flexible conductors either because of temperature variations or strong winds.

(iv) Wiping action during closing and opening.

(v) Fault alignment assuring closing of the switch without minute adjustments.

8.0 CONNECTORS:-

The connectors shall be made of hard drawn electrolytic copper or brass suitable for Raccoon/Dog ACSR conductor for both 11KV AB Switches. The connector should be 4 -bolt type.

9.0 OPERATING MECHANISM:-

All AB Switches shall have separate independent manual operation. They should be provided with ON/OFF indicators and padlocking arrangements for locking in both the end positions to avoid unintentional operation. The isolating distances should also be visible for the AB Switches.

The AB Switch will be supplied with following accessories:

Sr. No	Item	Size of 11KV AB Switch
i	Operating Rod (GI dia)	Length 5.50 meter dia 25 mm
ii	Phase coupling square rod (GI)	Length 1800 mm Size 25x25 mm
iii	Hot dip galvanized Operating handle (GI)	1 No.

The AB Switches shall be capable to resist any chance of opening out when in closed position. The operating Mechanism should be of robust constructions, easy to operate by single person and to be located conveniently for local operation in the switchyard. The GI pipe shall conform to ISS: 1239-68 and the vertical down rod should be provided with adequate joint in the mid section to avoid bending or buckling. Additional leverage should be provided to maintain mechanical force with minimum efforts.

All iron parts should be hot dip galvanized. All brass parts should be silver plated and all nuts and bolts should be hot dip galvanized.

10.0 ARCING HORNS:-

It shall be simple and replaceable type. They should be capable of interrupting line- charging current. They shall be of first make and after break type.

11.0 BUSH:-

The design and construction of bush shall embody all the features required to withstand climatic conditions specified so as to ensure dependable and effective operations specified even after long periods of inaction of these Air Break Switches. They shall be made from highly polished Bronze metal with adequate provision for periodic lubrication through nipples and vent.

12.0 DESIGN, MATERIALS AND WORKMANSHIP:-

The successful tenderers shall assume full responsibility for co-ordination and adequate design.

All materials used in the construction of the equipment shall be of the appropriate class, well finished and of approved design and material. All similar parts should be accurately finished and interchangeable.

Special attention shall be paid to tropical treatment to all the equipment, as it will be subjected during service to extremely severe exposure to atmospheric moisture and to long period of high ambient temperature. All current carrying parts shall be of non- ferrous metal or alloys and shall be designed to limit sharp points/edges and similar sharp faces.

The firm should submit the following type test certificate along with the certified copy of the drawing (from NABL Testing Lab). The type test should be from NABL accredited testing laboratory & should not be older than 5 years from the date of opening of tender.

1. Test to prove capability of rated peak short circuit current and the rated short time current. The rated short time current should correspond to minimum of 10K Amp and the peak short circuit current should correspond to minimum of 25K Amps.
2. Lightning impulse voltage test with positive & negative polarity.
3. Power Frequency voltage dry test and wet test
4. Temperature rise test
5. Mill volt drop tests

13.0 Dimension of 11KV AB Switches in (Max.) Tolerance 5%.

Sr.	Particulars	11KV AB Switch
i	Drawing No.	EB/P-6/MPSEB/7 (revised) dated 01.05.88
ii	MS Channel	450x75x40
iii	Creepage distance of Post Insulator	320mm (Min)
iv	Highest of Port shell	254 mm
v	Fixed contact assembly	
	i) Base	165x36x8
	ii) Contact	70x30x6

	iii) GI cover	110x44
	Spring	6 Nos.
vi	Moving contract assemble	
i	Base Assembly	135x25x8
ii	Moving	180x25x9
iii	Bush	Bronze Metal
iv	Thickness of Grooves	7

14.0 CONNECTORS:-

i	Connector (dimensions of each pad)	60x50x8 (Moving & fix both)	60x50x8 (Moving & fix both)

The bidder should provide AB Switches with terminal connectors, set of insulators, mechanical inter works and arcing horns sets. The base channel for the mounting of AB Switches shall also be included in the scope of AB Switches. The operating mechanisms together with down pipe operating handle etc. are also included in the scope of supply.

15.0 ROUTINE TEST CERTIFICATE : -

The Routine test certificate should invariably be submitted in duplicate of each lot offered for inspection as per ISS: 9920 (part-I to IV). The offers received without Routine test certificate shall not be entertained.

16.0 ACCEPTANCE TEST : -

At the time of inspection following test shall be carried out: -

a. Physical verification and measurement of dimension.
b. Power frequency high voltage test.
c. Temperature rise test.
d. Mechanical endurance test / operation test.
e. Milli volt drop test.
f. Galvanising test as per ISS: 2633.

17.0 NAME PLATE: -

The name plate in the following design shall be fixed on each AB Switch.

i) Name of supplier :
ii) Name of purchaser :
iii) Order No. and date :
iv) Rating :
v) serial number of unit :

The size of name plate shall be 2" x 1" for 11 kV AB Switch.

Technical Specifications LT Distribution Box

1. SCOPE

1.1 This specification covers design, manufacture, testing at manufacturer works before dispatch and supply of L.T. Distribution Cabinet suitable for outdoor installation in Pole mounted /Plinth Mounted distribution sub-stations of following capacity.

i) L.T. Distribution Cabinet 100KVA 11/0.433KV Transformer

1.2 The Technical Specification contained herein are for the guidance of the bidders, Any deviation from the Purchasers specification will be considered on their relative merits from the consideration of performance, efficiency, reliability and overall economy consists with the requirements stipulated herein.

2. **COMPLETENESS OF CONTRACT:**

All fittings or accessories no specifically mentioned herein but necessary or usual for similar equipment and their efficient working shall be provided by the contractor without extra charges.

3. **ATMOSPHERIC CONDITIONS:**

a)	Maximum temperature of air in shade	45^0C
b)	Minimum temperature of air in shade	0^0C
c)	Maximum temperature of air in sun	50^0C
d)	Maximum humidity	100%
e)	Average number of thunder storm days per annum	70days
f)	Average number of dust storm days per annum	20 days
g)	Maximum rainfall per annum	2000mm
h)	average rainfall per annum	1500mm
i)	Maximum ambient temperature daily average	45^0 C
j)	wind pressure	200Kg/M2
k)	Altitude	Less than 1000m

4. **DESCRIPTION OF MATERIALS**

The L.T. Distribution cabinets are meant for installation in the D.P. Structure plinth Mounted/Pole Mounted Distribution 11/433 KV substation of the ratings indicated above. These Distribution Cabinets are to be outdoor type and to be fabricated out of 2 mm CR sheet steel duly acid treated and finished with one coat anticorrosive primer and two coats of gray epoxy paint. The body of the boxes shall have sufficient reinforcement with suitable size of channels keeping a provision for fixing these boxes either on DP structure or plinths.

The Box shall have double door with locking arrangement and a door handle conforming to IS 8623/1977 .The roof of the box shall be slightly slanting both sides as per drawing with an over hang of 50mm to the front and back side. For maintenance point of view doors may be provided front side as per the requirement. The nuts, bolts , washers used in the box shall be galvanized to avoid rusting. The door hinges shall not be visible from outside. The box shall have a solid earthing point and arrangement for sufficient ventilation.

The boxes should confirm to IP 54 degree of protection. The bidders shall have to enclose type test certificate for degree of protection (P-54) after their product duly tested at CPRI failing which their bid is liable for rejection. Preference

The box shall have provision of bus bars of Electrolytic Cooper mounted on epoxy resin cast bus insulators fixed on suitable fixing arrangement. The bus bars shall be conveniently placed so as to provide adequate clearance from the body of the box conforming to I.E. Rules applicable for L.T. supply. There should be heat shrinkable bus bar insulation tubing on the busbars.

The arrangement and dimensions shall be as per the drawing enclosed.

The box shall consist of one incoming MCCB and 2 sets of Kit-kat fuse unit for out going feeders.

Suitable cable glands of heavy duty, double compression type shall be provided at the bottom of the box. One for incoming cable and two/three for outgoing cables, Detachable plates shall be provided for fixing of cable glands

Sl. No.	**Dimension**	**100 KVA Dist Box**
1	Height of Box	1000 mm
2	Length of Box	800 mm
3	Width of Box	500 mm
4	Ventilator Length	250mm
5	Ventilator Width	170mm
6	MCCB terminal suitable for	3x1/2x 95 mm^2 cable
7	Kit Kat terminal suitable for	3x1/2x 95 mm^2 cable
8	Bus Bar	40x6 mm
9	Bus Bar materials	Electrolytic Aluminium

A neutral Busbar similar to phase Busbar is to be provided.

KIT KAT FUSE UNIT : Shall be of reputed make as per IS-2086 (make- Anchor/Havells/ Ripcon)

The kit kats should have 500 V rating. All contact parts are plated and made of copper and brass with A class porcelain with extended terminal fitted with slots hex bolts with nuts.

The outgoing terminal of the cables is to be connected to the extended terminal of the kit kat by Bimetallic lugs, duly crimped with Die less crimping tools.

MCCB OF REPUTED MAKE : (Make must be specified in the bid)

THE MCCB SHOULD CONFORM TO THE FOLLOWING

TECHNICAL SPECIFICATION

i)	Standard	IS 13947 (Part-2) /1993 & IEC Pub -947 -2 (1989)
ii)	Rated voltage	415 vol. Ac
iii)	No. of poles	3
iv)	Utilisation category	A
v)	Rated service short circuit breaking capacity:	The percentage of rated service short circuit breaking capacity (I.Cs) to rated ultimate circuit breaking capacity (icu) shall be mentioned as per IS 13947 (Part-2) /1989.

TECHNICAL DATA SCHEDULES:

(To be filled up and submitted by the bidder along with the bid with signature and company seal)

GTP OF DISTRIBUTION BOX FOR DISTRIBUCTION TRANSFORMER OF CAPACITY 100 KVA 11/.4 KV (TECHNICAL PARTICULARS TO BE FURNISHED BY THE BIDDER)		
A	**LT DISTRIBUCTION BOX**	
1	Rated voltage & type	
2	Thickness of enclosure	
3	Size of bus bar	
4	Size of neutral bus bar	
5	Over all dimensions : X W X H	

6	Bus bar supporting insulator	
7	Degree of protection	
8	Standard followed	
9	Terminal capacity	
10	Gland size Inlet/outlet	
11	Separation barrier between kit kat fuse sets and MCCB	
12	Heat shrinkable insulation to bus bar	
B	**MCCB**	
1	Name of the Manufacturer and type	
2	Rated current	
3	No. of poles	
4	Standard followed	
5	Rated insulation level in voltage	
6	rated operational voltage & frequency	
7	Type of release provided	
8	Protection provided	
I	Overload setting	
ii	Short circuit	
a	trip setting	
b	Operating time	
iii	Earth fault	
1	Shunt release coil	
	rating	
	Pick up	
2	Relay	
	pickup	

	time delay	
3	CBCT	
	Saturation factor	
9	Rated service short circuit breaking capacity	
10	Rated ultimate short circuit breaking capacity	
11	Type of protection provided	
12	Extra preference if any	
C	**FUSE**	
1	Make & voltage	
2	Rating	
3	Terminal capacity	
D	**Wiring internal from bus bar to kit kat fuses & MCCB to bus bar**	

TECHNICAL SPECIFICATIONS OF MILD STEEL CHANNEL & ANGLE

1. **SCOPE**

This specification covers design, manufacture, testing and dispatch to owner's stores of M.S. Channe for use in structures in distribution system.

2. APPLICABLE STANDARD

Materials shall conform to the latest applicable Indian standards. In case bidders offer steel section and supports conforming to any other international specifications which shall be equivalent or better than IS, the same is also acceptable.

Sl.No.	Standard No.	Title
1	IS: 2062 Grade 'A'	Quality Specification for M.S.Angles, M.S.Channel
2	IS: 2062	Chemical and Physical composition of material
3	IS: 1852	Rolling and Cutting Tolerances for Hot Rolled Steel products

3. GENERAL REQUIREMENTS

I. Raw material

The Steel Sections shall be re-rolled from the BILLETS/INGOTS of tested quality as per latest version of IS:2830 or to any equivalent International Standard and shall be arranged by the bidder from their own sources.

The Chemical composition and Physical properties of the finished material shall be as per the equivalent standards.

Chemical Composition and Physical Properties of M.S. Angles, M.S. Channels, and M.S.Flat conforming to

IS: Conforming to IS:2062/84

II.Chemical Composition

Chemical composition For Fe 410 WA Grade

1 C - 0.23% MAX

2 Mn - 1.5% MAX

3 S - 0.050% MAX

4 P - 0.050% MAX

5 SI - 0.40% MAX6 CE

(Carbon Equivalent)- 0.42% MAX

III.Mechanical Properties

1. Tensile strength Kgf/mm²‾	- 410
2. Yield stress Min. for thickness/diameter	
< 20 mm	- 26 Kgf/mm² OR 250 N/ mm²
20-40 mm	- 24 Kgf/mm² OR 240 N/ mm²
> 40 mm	- 23 Kgf/mm² OR 230 N/ mm²
3. Elongation %	- 23%
4. Bend Test (Internal Dia)	- Min-3ţ
	(t–is the thickness of the
	material).

IV.Tolerance

Variation in ordered quantity for any destination and overall ordered quantity be only to the extent of ±2%.

Rolling and weight tolerances shall be as per version of IS: 1852 or to any equivalent International

Standard.

V.TEST

Steel Section shall be tested in IS approved Laboratory or Standard Laboratory the Bidder country having all facilities available for conducting all the test prescribed in relevant IS or IEC or to any equivalent International

Standard or any recognized and reputable International Laboratory or Institutions. The bidders are required to specifically indicate that;

They hold valid IS (or equivalent IEC) License.

Steel Section offered are bearing requisite IS certification or equivalent marks.

The bidders are required to submit a copy of the valid IS (or equivalent IEC) License clearly indicating size and range of product against respective ISS or any equivalent International Standards along with their offer.

VI.MARKING

It is desirable that the bidder should put his identification marks on the finished material. The mark shall be in “legible English letter” given with marking dies of minimum 18 mm size.

VII.INSPECTION AND TEST CERTIFICATES

The material to be supplied will be subject to inspection and approval by the purchaser’s representative before dispatch and/or on arrival at the destination. Inspection before dispatch shall not however, relieve the bidder

of his responsibility to supply the Steel Sections strictly in accordance with the specification.

The purchaser’s representative shall be entitled at all reasonable time during manufacture to inspect, examine and test at the bidder’s premises the materials and workmanship of the steel section to be supplied.

As soon as the steel Section are ready for testing, the bidder shall intimate the purchaser well in advance , so that action may be taken for getting the material inspected. The material shall not be dispatched unless waiver of inspection is obtained or inspected by the purchaser’s authorized representative.

Test certificates shall be in accordance with latest version of the relevant Indian Standards or any equivalent International Standard.

The acceptance of any batch/lot shall in no way relieve the bidder of any of his responsibilities for meeting all the requirements of the specification and shall not prevent subsequent rejection of any item if the same is later found defective.

TECHNICAL SPECIFICATION FOR 11 KV 400 AMP THREE POLE H.G. FUSE SETS.

(1) SCOPE:- This specification covers the manufacture, testing and supply of 11 KV, 400 Amps 3 pole ,H.G. Fuse Sets.

(2) (a) The 11 KV H.G. Fuses shall be suitable for out door operation under the climatic conditions specified. It shall be of the following ratings:-

1.	Number of Poles	3
2.	No. of insulator per pole	2 nos. 12 KV post insulators
3.	Nominal system voltage	11 KV
4.	Highest system voltage	12KV
5.	Rated frequency	50 Hz
6.	System Earthing	Effectively earthed
7.	Rated normal current	400 Amps
8.	Altitude of installation	Not exceeding 1000 M.

The post insulator used in the H.G. Fuse set shall have the following ratings:-

1.	Power frequency withstand voltage(dry)	35KV (RMS)
2.	Power frequency withstand voltage(wet)	35 KV (RMS)
3.	Impulse withstand voltage (dry)	75 KV (Peak)
4.	Power frequency puncture	1.3 times the actual dry

STANDARDS:-

The H.G. Fuse set shall conform to the following standards.

IS-9385-1980 (for high voltage expulsion fuses and similar fuses.).

IS-2544-1973 (for porecelain post insulators or its latest amendments if any.

IS-2633-1979 (For Galvanization of ferrous parts)

5.INSULATOR MAKE:-12 KV post insulator complete with pedestal cap duly cemented to be used in 11 KV H.G. Fuse sets confirming to IS-2544/1973

TECHNICAL DETAILS:- The H.G. Fuses shall have adjustable arcing horns made of solid copper rod having 7.62 mm dia. The horns shall be fitted with screwing devices with flynuts for fixing and tightening the fuse wire. It shall have robust terminal connector 5s of size 80mm x50 mm x 6 mm made of copper casting (95% minimum copper composition) duly silver plated with two numbers of 12mm dia brass bolts and double nuts with flat brass washers. The connector should be capable of connecting crimpable conductor up to 80 Sq.mm. size (ACSR/Alloy) with bimetallic solderless sockets .The H.G. Fuse Set shall suitable for horizontal mounting on sub-station structures. The minimum clearance between the adjacent phases of the fuse set shall be

760 mm and the centre to centre (distance between two post insulators of the same phase) shall be 410 mm. All metal (ferrous) parts shall be hot dip galvanized and polished. Only 12 KV post insulator (original cemented and not pin insulators shall be used for the H.G. Fuse Set.

CLIMATIC CONDITIONS: - The H.G. Fuse Set shall be suitable for operation under the following climatic conditions:-

1.	Maximum ambient air temperature.	45^0 C
2.	Maximum daily average air temperature	35^0 C
2.	Maximum yearly average ambient air temperature	30^0 C

3. Maximum temperature attainable by a body Exposed to the sun.	50 ^{0} C
5. Minimum ambient air temperature	o ^{0} C
6. Maximum relative humidity.	100%
7. Average number of thunderstorm days per annum	70 days
8. Average number of rainy days per annum	120
9. Average annual rain fall.	150 cm.
10. Number of months of tropical monsoon conditions	4
11. Maximum wind pressure.	260 Kg./ mm^2
12. Degree of exposure to atmospheric pollution.	Normally polluted atmosphere.

TESTS & TEST CERTIFICATE:- Certificate for the following type test conducted (within 5 years preceding to the date of opening of Tender) on a prototype set of H.G. Fuse set in a accredited Testing Laboratory preferably at CPRI, Bangalore shall have to be submitted for reference and Scrutiny.

- Dielectric test (impulse & one minute wet power frequency withstand voltage test.)
- Temperature rise test (for terminals).
- Mechanical strength test for the post insulator as per IS-2544/1973.
- Test for galvanization of metal (ferrous) parts.
- ROUTINE TESTS :- The following routine tests shall have to be conducted on each test and results are to be furnished for consideration for acceptance of deputing inspecting Officer for inspection & conducting testing of the materials.
  - Power frequency voltage dry test.
  - Dimension check
  - Galvanization test.

GUARANTEED TECHNICAL PARTICULARS :- The tenderers are required to furnish the guaranteed technical particulars along with the tender.

COMPLETENESS OF EQUIPMENT :- Any fittings accessories or apparatus which may not have been specifically mentioned in this specification but which are usually necessary in equipment of similar plant shall be deemed to be included in the specification and shall be supplied by the Tenderer without extra charge. All plant and equipment shall be complete in all details whether such details are mentioned in the specification or not.

INSPECTION:- Routine and acceptance test shall be conducted at the place of manufacturer. The tenderers are requested to furnish details of equipment which will be used for testing along with tender. The tenders of these manufacturers who do not have adequate testing facilities for conducting routine and acceptance test are liable for cancellation. The successful bidder has to furnish routine test certificate and guarantee certificate for each consignment of materials to be inspected at the time of offer of materials for inspection.

NATURE OF PRICE:- The nature of price shall be " FIRM " .

GUARANTEED TECHNICAL PARTICULARS

GTP NO-1 GUARANTEED TECHNICAL PARTICULARS FOR H.G. FUSE SET 11 KV 400 AMPS, 3 POLE

Sl.No	particulars	(Desired Value)	Values offered By the tender.
1	2	3	4
1.	Name of the manufacturer and country of origin.	To be specified by the By the tenderer.	-
2.	Operating voltage	11 KV	-
3.	Number of insulators per phase	2 nos.12 KV Post Insulator per phase	-
4.	Rated normal current and normal frequency.	400 Amps.50 Hz	
5.	Vertical clearance from top of insulator cap to mounting Channel	254 mm (minimum)	
6.	Height of the riser for carrying the horns.	150 mm from the cap (top) of insulator.	
5.	Post Insulator.		
(a)	Name of the manufacturer & country of origin	To be specified By the tenderer	-
(b)	Type of cemeting	To be quoted original cemented only.	
(c)	One minute power fre- Quency withstand voltage Dry	35 KV RMS.	-
(d)	One minute power fre- Quency withstand voltage Wet.	35 KV RMS.	-
(e)	Visible discharge voltage	9 KV (RMS)	
(f)	Dry Flashover Voltage	To be specified by the tenderer	-
(g)	Power frequency puncture withstand voltas	1.3 times of actual dry flash over volage.	
(h)	Creepage distance	230 mm minimum. (Actual creepage distance for which type test have been conducted is to be specified by the tenderer	
8	Impulse withstand voltage (1.2/50 micro second wave positive & negative polarity.		
(a)	Across the isolating distance.	85 KV (peak)	
(b)	To earth & between poles	75 KV (peak)	

9.	One minute power frequency withstand voltage		
(a)	Across the isolating distance	32 KV (RMS)	-
(b)	To earth and between poles	28 KV (RMS)	-
11.	Details of Arcing Horns	Solid Copper rod having 7.62 mm dia silver plated provided with screwing arrangement on the fuse carrier made of Copper casting for fixing fuse wire. (Total length 63 5mm). All the bolts, nuts and washers should be made out of brass.	
12.	Riser Unit (150 mm total height).	a) Riser cum connector made out of copper Casting (with minimum 95% copper composition) having riser size 50 mm height x 30mm width x 8 mm thickness and connector size 80x 50x 6 mm duly silver plated and machine finishing provided with 2 nos.12 mm dia brass bolts & brass double nuts with flat brass washer and 2 nos. solder less bimetallic sockets per each connector suitable up to 80 mm sq. Conductor. b) 100 mm height G.I. riser made of 19 mm nominal bore medium gauge G.I. pipe welded with 2 nos G.I. Flat of 30 x 5 mm at both ends fixed with 10 mm dia stainless steel, bolts and nuts with flat stainless steel spring washers.	
13.	Supporting Channels	75 x 40 x 6 mm M.S. Channel (galvanized)	
14.	Galvanization	All ferrous parts should be galvanized as per IS-2633/1972 & all non-ferrous parts should be duly electroplated with silver.	
15.	Weight of each pole complete).	To be specified by the tenderer.	

N.B. :- Certificate from a Govt. Approved Laboratory regarding composition of copper in electrolytic copper casting and galvanization as per ISS may be furnished during inspection of materials at the cost of tender.

GTP NO 2	**GTP OF 11 KV H/W Fittings**		
Sl No	**Description**	**Specified**	**Bidders Offer**
1	Manufacturer Name & Address	To be specified by Bidder	
2	Standard Specification to which Hard ware Fittings shall confirm.	IS: 2486 (Part-I,II &II)	
3	Ultimate strength	4500 Kg (min.)	
4	Dimensions in accordance with	IS: 2486(Part-II)	
5	Type of washer thickness		
6	a) Spring	G.I as per IS:1570	
7	b)Flat		
8	Type of Clamp size		

9	Galvanized conform to		
10	Weight of Fittings		
11	Tolerance in dimension if any		
12	Manufacturer trade mark to be embossed on the sets		
13	Specific drawing to be enclosed.		

GTP NO 3	**GTP OF HT Stay Sets**					
Sl No	**Description**	**Specified Parameters**				**Bidders Offer**
		Section Tolerances	**Fabrication Tolerances**	**Material**		
1	Anchor Plate	8mm thick +2.5%-5%	300x300mm+1%	GI Plate 8 mm thick	HT Stay Set	
2	Anchor Rod	20mm dia +3%-2%	Length 1800mm +0.5% Round Eye 40mm inside dia + 3%. Threading 40mm	GI Round 20mm dai GI Round 20mm dia	HT Stay Set	
3	Turn Buckle Bow	16mm dia +5%-3%	Length180mm +1% 50x50x6mm Channel length 200mm + 1%	GI Angle G I Channel 100x50x4.7mm	HT Stay Set	
4	Eye Bolt Rod	20mm dia + 3% -2%	40mm inside dia+3% Length450mm +1% Threading 300mm +1% Round Eye 40 mm inside dia +3%	GI Round 20mm dia	HT Stay Set	
5	Galvanization thickness				HT Stay Set	
A	Anchor Plate				HT Stay Set	
B	Anchor Rod				HT Stay Set	
C	Turn Buckle				HT Stay Set	
D	Eye Bolt Rod				HT Stay Set	
6	Weight of complete set				HT Stay Set	
7	Whether drawing submitted				HT Stay Set	

GTP NO 4	**GURANTEED TECHNICAL PARTICULARS OF STAY WIRE (7/10 SWG)**	
SL No.	**GENERAL TECHNICAL PARTICULARS**	7/10 SWG
1	Nominal diameter of wire	
2	Tolerance in diameter	
3	Sectional Area (In Sq. mm.)	

4	Tensile strength	
A	Min. N/mm²	
B	Max. N/mm²	
5	Minimum breaking load (KN)	
6	Type of coating Heavy/Medium/Light	
7	Variety Hard/Soft	
8	Weight of Zinc coating (Gms/Sq. Mtr.) Min.	
9	No. of dips the coating is able to withstand as	
	18 ± 20ºC	
10	Adhesion Test (Wrap Test at 1 turn per second	
	coiling while stress not exceeding % nominal	
	tensile strength)	
A	Min. complete turn of wrap	
B	Dia of mandrel on which wrapped	
11	Bend Test	
A	Angle	
B	Dia round a format to be bent	
12	Freedom from defect	
13	Chemical composition the MS Wire used shall not exceed	
A	Sulphur 0.060%	
B	Phosphorous 0.065%	

GUARANTEED TECHNICAL PARTICULARS FOR

3p4w 1A, 0.5s Class CT/PT Operated fully static AMR compatible DLMS Compliant HT Tri-Vector Energy Meter (Category-A) & 3p4w, 5A, 0.5s Class LTCT Operated DT Meter (Category-A) under R-APDRP Scheme of CESU (Conforming to ICS/IS 15959:2011)

(FOR METER UNDER ITEM-A, C, D, E, F & G)

Sl. No.	Item	Requirement
1	Make	M/s Secure Meters Ltd
2	Type	Model Premier 300 Type E3M 054 for HT & E3T 055 for LTCT
3	Country of origin	India
4	Application	3 phase 4 wire CT PT operated
5	Rated Voltage	110V/ √3 (Phase to Neutral) or 110V for Phase to Phase for CT Operated HTTV Meter & 240v. Phase to Neutral for LTCT DT Meter.
6	Rated Current (Basic current)	1A for HTTV Meter & 5A for LTCT DT Meter (For LTCT Meter CT Ratio will be configured as 100/5A, 200/5A, 400/5A, 800/5A & 1500/5A as per requirement to match with the line CT to make MF-1.0
7	Frequency	50 Hz ± 5 %
8	Overload capacity	200% of Ib
9	Minimum starting current in % of base current	As per IS 14697: 1999
10	Short Time Current	As per IS 14697: 1999
11	Loss in potential circuit	Less than 1.5 Watt & 8VA per phase
12	Loss in current circuit	Less than 1 VA
13	Power Factor	0.0 Lag -Unity- 0.0 Lead
14	Change in error due to	
a.	Variation in frequency	50 Hz +/- 5%
b.	Variation in temperature	As per IS 14697: 1999
c.	Variation in voltage	As per IS 14697: 1999
15	Accuracy Class	0.5 s

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16	Constructional Requirement/Meter Cover Sealing arrangement	1-The Meters should be designed and constructed in such a way as to avoid introducing any danger in use and under normal conditions so as to ensure specially - Personnel safety against electric shock - Personnel safety against effects of excessive temperature as per relevant standards - Protection against penetration of solid objects, dusts and water as per relevant standards - Protection against spread of fire as per relevant standards - Detection against fraud or pilferage. 2-All the materials used in the manufacture of the meters should be of highest quality. The entire design and construction should be capable of with standing stresses likely to occur in actual service and rough handling during transportation as per standards 3-All insulating materials used in the construction of meters should be non hygroscopic, non- aging and of tested quality and should conform to tests as specified in relevant standards. The meter should be designed on application specific integrated circuit and should be manufactured using SMT (Surface Mount Technology) components except a few PTH components 4-The terminal block, the terminal cover and the meter case should have reasonable safety against the spread of fire. They should not be ignited by thermo overload of live parts in contact with them. 5-The meter must conform to the degree of protection IP51 against ingress of dust moisture and vermin's 6-All the parts which are subjected to corrosion under normal working conditions should be protected effectively. A protective coating should not be liable to damage by ordinary handling or damage due to exposure of air under normal working conditions. 7- Meter should be wall mounted projected type, fitted with help of screws and should have handle at its top to facilitate carrying around 8- Meter Cover and extended terminal block cover (ETBC) shall be totally transparent & made of unbreakable high grade flame retardant & injection moulded in UV stabilized poly carbonate with minimum thickness of 2.0 mm on all sides and of good dielectric & mechanical strength 9- Meter cover should be fixed permanently seamless with ultrasonic welding with Meter Case and should not be removable without breakage of top cover. The meter cover should have two unidirectional sealing screws, each screw having two sealing holes. These screws should be made of brass and capable of being tightened from the front. The firm shall provide his seals on meter as Best quality poly carbonate seals. Paper seals or hologram seals with Sl. No., bar code, hologram etc. The quality of the paper seal should be such that it should not be detachable & if removed will be torn into pieces 10- The meter case should have at least three mounting holes. Two holes for mounting screws on terminal block sealed beneath the terminal cover and one for hanging screw on the top

17	Terminal Cover	1. The terminal cover should be transparent extended type, which can be sealed independently of the meter cover. No part of the meter or cables accessories should be accessible from the front of the meter 2. When the meter is mounted, no access to the terminals should be possible without breaking the seals of the meter terminal cover. The meter terminal cover should be fitted with the help of sealable screws 3. The terminal cover should have two sealing screws independent of each Other. The fixing screws used on the terminal cover for fixing and sealing should be kept captive in the terminal cover.
18	Terminal Arrangement	1. The terminals should be marked properly on terminal block for giving external connections. A sticker showing connections should be provided inside the extended cover of terminal block 2. The terminal cover should be of extended type such that when it is placed in position it is not possible to approach the connections or connecting wires.
19	Meter Case & Cover	The Meter Case & Cover shall polycarbonate & conform to IS 11731 (FH-1category) besides meeting the test requirement of heat deflection test as per ISO 75, glow wire test as per the IS 11000 (part 2/ SEC-1) 1984 OR IEC PUB. 60695-2-12, Ball pressure test as per IEC--60695-10-2 and Flammability Test as per UL 94 or as per IS 11731(Part-2) 1986.
20	Meter Case Opening Tamper Recording	The Meter shall have meter case opening detection mechanism & it will record the event as per table 37 with snapshot value as per table-39 of IS-15959:2011. The occurrence may be displayed in the meter.
21	Sealing of Meter	1. Proper sealing arrangement should be provided on the meter to make it tamper proof/ evident and avoid mishandling by unauthorized persons. 2. The meter cover should have provision for minimum 2 Nos. seals. 3. The terminal block cover should also be provided with two sealing arrangements. 4. Separate sealing arrangement for the communication ports for CMRI/ Modem should also be provided.
22	Connection Diagram	1. Every meter should be indelibly marked with connection diagram showing the phase sequence for which it is intended and should be attached to the inner side of the extended terminal block cover. 2. In case of any special precautions need to be taken at the time of testing the meter, the same should be indicated along with the circuit diagram.
23	Working environment & degree of protection.	1. As per IS 14697-1999 (reaffirmed 2004). Meter to perform satisfactorily under Non-Air Conditioned environment (within stipulations of IS) 2. Meter body will conform to IP51 degree of protection. For outdoor use meter will be installed in sealed enclosure conforming to IP 54/IP 55

		3 The meter shall be suitable designed for satisfactory operation under the hot and hazardous tropical climate conditions and shall be dust and vermin proof. All the parts and surface which are subject to corrosion shall either be made of such material or shall be provided with such protective finish which provides suitable protection to them from any injurious effect of excessive humidity.
24	Manufacturing Process assembly & Testing	Meters shall be manufactured using latest and state of the art technology and methods prevalent in electronics industry. The meter shall be made from high accuracy and reliable surface mount technology (SMT) components. All inward flow of major components and sub assembly parts (IC's, PCB, RTCs/Crystal, LCDs, LEDs, power circuit electronic components etc.) shall have batch and source identification. Multilayer PCB' assembly with 'PTH' (Plated through Hole) using surface mounted component shall have adequate track clearance for power circuits. SMT component shall be assembled using automatic 'pick-and-place machines. Reflow Soldering oven for stabilized setting of the components on PCB. For soldered PCBs, cleaning and washing of cards after wave soldering process is to be carried out as a standard practice. Assembly line of the manufacturing system shall have provision for testing of sub-assembled cards. Manual placing of components and soldering to be minimized to items which cannot be handled by automatic machine. Handling of PCB' with ICs/C-MOS components, to be restricted to bare minimum and precautions to prevent ESD failure to be provided. Complete assembled and soldered PCBs should undergo functional testing using computerized Automatic Test Equipment. Fully assembled and finished meter shall undergo burn-in test process for 12 hrs at 55 degree Celsius (Max. temperature not to exceed 60 degree Celsius) under base current (Ib) load condition. Test points should be provided to check the performance of each block/stage of the meter circuitry. RTC shall be synchronized with NPL time at the time of manufacture. Meters testing at intermediate and final stage shall be carried out with testing instruments, duly calibrated with reference standard with traceability of source and date.
25	Displays	The meter shall have 7 digits, parameter identifier backlit Liquid Crystal Display (LCD) of minimum 10 mm height and wide viewing angle. LCD shall be suitable for temperature withstand of 70 deg C.
26	Non Volatile Memory	The data stored in the meters shall not be lost in the event of power failure. The meter shall have Non Volatile Memory (NVM) which does not need any battery backup. The NVM shall have a minimum retention period of 10 years.
27	Battery Back up	In case of failure of power supply the meter could be powered up through an internal battery back up with a push button arrangement.
28	Performance under Influence Quantities	As per IS -14697/1999 (reaffirmed 2004)

29	Out Put Device	1. Energy Meter shall have test output, accessible from the front and be capable of being monitored with suitable testing equipment while in operation at site 2. The operation indicator must be visible from the front and test output device shall be provided in the form of LED. Resolution of the test output device shall be sufficient to enable the starting current test in less than 10 minutes
30	RTC	1. RTC shall be pre-programmed for 30 Years Daycode without any necessity for correction. The maximum drift shall not exceed +/- 300 Seconds per year 2. The clock day/date setting and synchronization shall only be possible through password/Key code command from one of the following i- Hand Held Unit (HHU) or Meter testing work bench and this shall need password enabling for meter ii- From remote server through suitable communication network or Sub-station data logger 'PC' 3. Time set can be done through transaction only
31	Quantities to be measured & displayed	The meter shall be capable of measuring and displaying the following electrical quantities within specified accuracy limits for poly phase balanced or unbalanced loads **INSTANTANEOUS PARAMETERS (For Display)** 1. Real Time Clock - Date and Time 2. Current – IR 3. Current – IY 4. Current – IB 5. Voltage – VRN 6. Voltage – VYN 7. Voltage – VBN 8. Signed Power Factor - R phase 9. Signed Power Factor - Y phase 10. Signed Power Factor - B phase 11. Three Phase Power Factor – PF 12. Frequency 13. Apparent Power – KVA 14. Signed Active Power - kW (+ Forward, - Reverse) 15. Signed Reactive Power - kvar (+ Lag, - Lead) 16. Cumulative Energy – kWh 17. Cumulative Energy - kvarh – Lag 18. Cumulative Energy - kvarh – Lead 19. Cumulative Energy – kVAh 20. Number of Power - failures 21. Cumulative Power-failure duration 22. Cumulative Tamper count 23. Cumulative Billing count 24. Cumulative programming count 25. Billing Date 26. Maximum Demand – kW

		27 Maximum Demand – kVA **BLOCK LOAD SURVEY PARAMETERS** 1. Real Time Clock - Date and Time 2 Current – IR 3. Current – IY 4. Current – IB 5 Voltage – VRN 6 Voltage – VYN 7 Voltage – VBN 8. Block Energy – kWh 9. Block Energy – kVArh – lag 10. Block Energy – kVArh – lead 11 Block Energy – kVAh 12 Demand (kW) 13 Demand (KVA) 14 Demand (KVAr Lg) 15. Demand (KVAr Ld) 16. Avg. Power Factor (signed) **BILLING PROFILE PARAMETERS** The list of parameters shown above in Instantaneous Parameters & Block Load Survey parameters shall be used for computing the daily accounting data at the HOST.
31-i	Instantaneous Parameter	As per Annex-C Table-22 of IS15959 2011
31-ii	Block Load Survey Parameter	As per Annex-C Table-23 of IS15959 2011
31-iii	Name plate details	**NAME PLATE DETAILS** - As per Annex-F (Table-30 of IS 15959 2011) & IS 14697/1999 (reaffirmed 2004) with following details Firmware Version of meter – Internal CT Ratio Internal VT Ratio Guarantee Period- Category of Meter- DLMS-A
31-iv	Programmable Parameters	PROGRAMMABLE PARAMETER - As per Annex-F (Table-31 of IS 15959 2011)
31-v	Event Conditions	EVENT CONDITIONS - As per Annex-G (Table-32 to Table-37 of IS 15959 2011)
31-vi	Logging parameter for each of the event condition(Capture parameter for event)	LOGGING PARAMETER FOR EACH OF THE EVENT CONDITIONS (Capture Parameter for event) - As per Annex-G (Table 39 of IS 15959 2011 Event Name/Description may be provided in place of event code
31-vii	Apparent Calculation	Lag+ Lead
32	Demand Integration Period	The maximum demand integration period should be Programmable with 15 min default
33	MD Reset	Auto reset at 24.00 hrs at the end of each billing cycle

34	Marking	1. The marking of meters shall be in accordance with IS 14697/1999 (reaffirmed 2004) & IS15959:2011 2. The meters shall bear marking "Property of CESU Odisha" "Purchased under R-APDRP scheme" 3. The meter shall also store name plate details as given in the table 30 of IS 15959 4. These shall be readable as a profile as and when required
35	Communication Capability	The meter shall be provided with two ports for communication of the measured/collected data as per IS 15959:2011. One a hardware port compatible with RS 232 or RS 485 specifications which shall be used for remote access through suitable Modem(GPRS/ GSM/ EDGE/ CDMA/ PSTN/ LPR) and an Optical port complying with hardware specifications detailed in IEC-62056-21. This shall be used for local data downloading through a DLMS compliant HHU. The RS 485 port shall be used at Substation suitable for multi-drop connections of the meter for exporting data to sub-station data logger/DCU/Computer and the remote end server. The RS 232 port shall be used at boundary points meters and Distribution Transformer meters capable to transfer and export data to the remote end server through suitable communication mediums (GPRS/ GSM/EDGE/ CDMA/ PSTN/ LPR). Both ports shall support the default and minimum baud rate of 9600 bps
36	HHU	To enable local reading of meters data a DLMS compliant HHU shall be used. The HHU shall be as per specification given in the IS 15959 shall be compatible to the DLMS compliant energy meters that are to be procured / supplied on the basis of this specification
37	Free supply of HHU	DLMS Compliant HHU (CMRI) shall be provided by the supplier to CESU free of cost one with each 100 (Hundred) nos HTTV Meter or part thereof & one with each 500 nos DT meter or part thereof for data down loading. It shall be compatible to the DLMS compliant energy meters that are to be procured/ supplied on the basis of this technical specification
38	Tamper & Fraud monitoring features	1. The meter shall work satisfactorily under presence of various influencing conditions like External Magnetic Field, Electromagnetic Field, Radio Frequency interference, harmonic Distortion, Voltage/Frequency Fluctuations and electromagnetic High Frequency Fields etc. 2. The meter will be immune to abnormal voltage/frequency generating devices and will record the occurrence and restoration of such tamper events along with parameters such as current, voltages, kWh, power factor, event code, date & time etc. (listed in Annex-G IS 15959:2011). All other tamper event shall be as per IS 15959:2011

GUARANTEED TECHNICAL PARTICULARS FOR
DT METER BOXE WITH FOUR CTs INSIDE THE BOX
(FOR BOX UNDER ITEM-C,D&E)

Sl. No.	Item	Requirement
1	Material of the Meter Box	Glass reinforced Polyester sheet molding compound (SMC) conforming to ISS. 13410 1992
2	Grade of material	SMC as per ISS: 13410 Grade S-1
3	Colour of the Box	Gray/OFF white
4	Dimension of the Box (L X W X H)	850 x 350 x 230 mm approx. up to 400/5A
5	Thickness of box	2.5 mm ± 0.5 mm
6	Clearance between meter and meter box	Adequate clearance to be maintained inside the box after installation of a meter & a modem
7	Hinges provided	
a	For Meter chamber door	Concealed Hinge
b	For CTs chamber door	Concealed Hinge
8	Viewing Window	
a	Material	Toughened Glass 4mm thick approx / transparent Polycarbonate sheet 2mm thick approx.
b	Dimensions	170mm x 85mm (approx.)
9	Sealing arrangement	Holes for wire seal to be provided
10	Whether inlet and outlet arrangement for service cable provided	Suitable number of holes **(04 Nos.)** should be provided on both sides of C.T. chamber for cable entry and exit for 100/5A, 200/5A & 400/5A as per the CT Ratio fitted in the box. The size of the holes shall be depends on current rating. High resistant PVC / HDPE, high grade, cable glands shall be provided on both sides of the box.
11	CT Fixing Arrangement	Mounting plate / clamp
12	Earthing Provision	Not required as SMC (Non Metal Box)
13	IP Class of Meter Box	IP- 54

14	Space for Modem	Suitable space to mount GSM Modem shall be available inside the meter mounting chamber. The meter mounting base plate should cover the total base of the meter box so that meter & modem mounting arrangement can be done on that plate.
15	Name Plate	Following information shall be available on each meter box 1.Name of Manufacturer 2.Year of manufacturing 3.PO No- & date 4.C.T. Ratio 5.Property of CESU, Odisha, "Purchased under R-APDRP Scheme"

GUARANTEED TECHNCIAL PARTICULARS FOR
LT CT FOR USE INSIDE THE BOX
(FOR CTs UNDER ITEM-C,D & E)

Sl. No.	Item	Requirement
1.0	**Capacity or Rating**	100/5A, 200/5A & 400/5A
a)	Rated Voltage	415 Volts 50Hz
b)	No of Cores	One
c)	Primary Current / Ratio	100/5A, 200/5A & 400/5A
d)	Rated Output Burden	5VA
e)	Rated Continuous Thermal current temperature rise over ambient	As per IS 2705
f)	Continuous Primary Current	1.2. times of rated current
g)	One Minute withstand Power Frequency Voltage for Primary & secondary winding	As per IS 2705
h)	ISF	Less than 5
i)	Rated Short Time Current	5 KA for 1 sec
2.0	**Class of Accuracy (0.5)**	0.5
3.0	**Material**	
i.	Core	High-grade non-ageing electrical low loss core
ii.	Conductor	Super enameled copper wire of requisite diameter
iii.	Insulation	Resin cast
4.0	**Type**	Resin cast Ring type LT CTs
5.0	**Primary & secondary Terminals**	
i.	Primary	Primary Conductor (Cable) will pass through Ring type CT. Proper marking will be provided for current direction identification. Inner diameter (I.D.) of CT will be minimum 45mm for 400/5A CT & will increase as per the current rating of CTs.
ii.	Secondary terminal	Secondary Terminals S1 & S2 will be clearly marked

6.0	Name Plate & marking	Following shall be printed/ engraved on the name plate of CTs. i- Sl.No. ii- CT ratio iii- VA burden iv- Class of accuracy v- Name of manufacturer vi- Year of manufacturing vii- PO No. & Date viii- "Property of CESU, Odisha". "Purchased under R-APDRP Scheme" ix- Polarity should be marked on the body of the offered LT CTs.

GUARANTEED TECHNICAL PARTICULARS FOR
METER BOX TO HOLD ONE 3PH LTCT DT METER & ONE MODEM FOR DT METERING
(FOR BOX UNDER ITEM-F & G)

Sl. No.	Item	Requirement
1	Make	Manufacturer-M/s Sintex Industries Limited Supplier- M/s Secure Meters ltd.
2	Material of meter box	SMC
3	Roof tapering	The meter box shall have roof tapering down to both the sides for easy flow of rainwater.
4	Thickness of Meter box	Minimum :. 2 mm
5	Dimensions of box (L x W x H)	400 x300x200 mm approx
6	Hinges fixing arrangement	The box cover shall be fixed with concealed hinge. It would be open by at least 120 degrees.
7	Provision of gasket	Soft rubber gasket shall be provided all around the periphery of box for protection against ingress of dust and water inside the box
8	IP Protection	Meter Box shall comply IP protection class with IP - 54.
9	Handel Provision	Handle shall be provided on the box door for ease door opening.
10	Holding & sealing of door	For holding and sealing the door, 2 Nos U-shaped clamps shall be provide. These clamps/latches would hold the box cover with base.
11	Protection against corrosion	All metallic parts would be well protected against corrosion.
12	Provision to mount Meter & Modem	Provision should be available to mount one LTCT DT Meter & a modem. The meter mounting base plate should cover the total base of the meter box so that meter & modem mounting arrangement can be done on that plate
13	Colour of Box	Off White/ Gray colour
14	Meter Box fixing arrangement	Box shall have 4 nos. holes of 6 mm diameter for fixing the meter box on wall / wooden board/pole etc.
15	Cable Entry	Suitable provision shall be provide at the bottom side of the meter box bottom for control cables same shall be capable of accommodating cable of 22- 26 mm diameter, engineering plastic cable gland shall be provided

16	Name Plate	Printed metallic name plate shall have following details. 1. Name of Manufacturer 2. Year of manufacturing 3. PO No- & date 4. "Property of CESU,Odisha". "Purchased under R-APDRP Scheme" It shall be fixed with rivet such that it cannot be removed easily.
17	Communication cable	Communication cable from optical port to D-port shall be provided
18	Sealing Arrangement	Proper sealing arrangement shall be provided for box & communication port.
19	Earthing Provision	Not required as SMC (Non Metal Box)

TECHINICAL SPECIFICATIONS
LT XLPE AB CABLE

1. SCOPE:

This specification covers the design, manufacturing, testing, supply, delivery and performance requirements of LV overhead **ISI marked 3Ph 5 wire XLPE insulated Aerial Bunched Cable (ABC)**

The materials offered should have been successfully type tested at any NABL Accredited Testing Laboratory within a period of five years on the date of bid opening. Compliance shall be demonstrated by submitting with the bid (i) authenticated copies of the type test reports and (ii) performance certificates from the users.

The Aerial Bunched Cable shall conform in all respects to highest standards of engineering, design, workmanship, this specification and the latest revisions of relevant standards at the time of offer and the Purchaser shall have the power to reject any work or material, which, in his judgment is not in full accordance therewith.

2. STANDARDS:

Except where modified by this specification, the Aerial Bunched Cable shall be designed, manufactured and tested in accordance with the latest editions of the following standards.

IES/ISO	Indian Standard	Material
IEC: 1089	IS: 398/1994	Round wire concentric lay Overhead electrical Stranded Conductors.
	IS: 398(Part-4)/1994	All Aluminum Alloy Conductors, Quality
ISO: 9000		Management Systems.
	IS: 8130/1984	Conductors for insulated Electric cables.
	IS: 10810/1984	Method of Tests for cables.
IEC: 502	IS:7098/1998	XLPE Insulated PVC. Sheathed power cables.
	IS:14255/1995	Aerial Bunched Cables for working voltage up to and including 1100 volts.

The Bidder may propose alternative standards, provided it is demonstrated that they give a degree of quality and performance equivalent to or better than the referenced standards. The purchaser shall adjudge whether to accept or reject any standards.

The Bidder shall furnish a copy of the alternative standard proposed along with his bid. If the alternative standard is in a language other than English, an English translation shall be submitted with the standard.

In case of conflict the order of the precedence shall be (1) IEC or ISO standards, (2) Indian Standards, (3) Other alternative standards. This list is not to be considered exhaustive and reference to a particular standard or recommendation in this specification does not relieve the Contractor or the necessity of providing the goods complying with other relevant standards or recommendation.

3.0 SERVICE CONDITIONS:

The service conditions shall be as follows:

- Maximum altitude above sea level 500m
- Maximum ambient air temperature 50^0C
- Maximum daily average ambient air temperature 35^0C
- Maximum ambient air temperature 5^0C
- Maximum temperature attainable by an object exposed to sun 60^0C
- Maximum yearly weighted average ambient temperature 32^0C
- Maximum relative humidity 100%
- Average number of thunderstorm days per annum 70
- Average number of rainy days per annum 120
- Average annual rainfall 150cm
- Wind pressure as per IS:5613(Part-I/Sec.I) 1985

Wind Zones IS:5613 Part-I/Sec-I	Light	Medium	Heavy
Terrain Category	100 Kg/m^2	150 Kg/m^2	200 Kg/m^2

Environmentally, the region where the work will take place includes coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions for outdoor insulators.

Therefore, outdoor material shall be designed and protected for use in exposed, heavily polluted salty corrosive and humid coastal atmosphere.

4. SYSTEM CONDITIONS:

The materials shall be suitable for installation in supply systems of the following characteristics.

- Frequency 50Hz
- Nominal System Voltage 400/230V

- Maximum System Voltage LV System 440/250 V
- Minimum LV Voltage 370 V
- Power frequency one minute withstand (set & dry) 2KV
- Neutral Earthing arrangement LV System Solidly earthed

5.0 GENERAL/ TECHNICAL

The design of Aerial Bunched Cable offered shall comprise a compacted, standard, hard drawn H2 / H4 grade aluminum phase conductor as applicable under IS-8130 / 84 with cross linked polyethylene (XLPE) insulation 0.65 to 1.1. KV class, having of **carbon black content 2.5% ± 0.5%.**

The sizes and number of cores required are: **3x50mm² + 1x35mm² +1x16 mm²**

The type of Bunched Cables shall be three phase insulated bundled. All Aluminum Conductors combined with a neutral and catenaries (bare) which shall be of heat treated aluminum magnesium silicon alloy wires containing approximately 0.5% each of magnesium and silicon respectively. The catenaries must have an ultimate tensile stress of not less than that specified in the table of technical requirements.

The Bidder shall specify the standard to which this bundle shall be manufactured.

The conductor bundle offered shall be designed to meet the requirements set out in this specification taking note of safety factors pertaining to conductor or catenary tensioning and NESCO specification: General Technical Requirements for LV overhead lines.

However, a bid of Aerial Bunched Cables shall not be considered, unless it is accompanied by a list of all special tools and equipments necessary to complete the installation.

6.0 CONDUCTORS:

(a) The phase conductors shall be of multi-stranded aluminum of compacted circular cross section. The aluminum shall comply with IS 8130:1984. The messenger conductor shall be of multi-stranded Aluminum Alloy conforming to IS 398 (Part 4) – 1994. In addition to meeting all requirement of relevant ISS the LT XLPE AB Cables supplied shall satisfy following general requirements.

(b) FOR PHASE CONDUCTORS:

Sl.No.	Specified Cross Section Area (mm2)	No. of strands	Min. Dia of each strand in mm	Min. overall dia. of conducting part	Maxm. D.C Resistance at 20 degree centigrade.(Ohm / Km)	Nominal Insulation thickness (mm)
1	16	7	1.75	5.25	As per ISS/GTP	1.2

	25	7	2.14	6.42	As per ISS/GTP	1.2
	35	7	2.54	7.6		1.2
	50	7	3.05	9.15		1.5
	70	19	2.18	10.9		1.5
	95	19	2.54	12.7		1.5

(c) FOR MESSANGER CONDUCTORS

Sl. No.	Phase conductor size of LT AB Cable in mm2	Specified Cross Section Area (mm2) of the Messenger conductor	No. of strands	Nominal dia. of each strand	Min overall dia. Of conducting part of the compacted conductor(mm)	Maxm. D.C Resistance of the messenger at 20 degree centigrade.(Ohm / Km)	Approx. Mass (Kg/Km) for the messenger
1	16	25	7	2.14	5.2	As per ISS/GTP	65
2	50	35	7	2.54	7.6		95
3	70	50	7	3.05	9.15		136
4	95	70	7	3.6	10.8		191.8

6.0 (b) The bidder must take required precaution to ensure that the average diameter of each strand of conductor shall be ascertained through physical measurement of dimensions of finished cables at ambient temperature during pre-dispatch inspection or / and verification at NESCO Utility Store by consignee and the value so obtained shall have a tolerance limit with reference to the nominal diameter of each strand of conductor as stated in the tables above.

7.0 TOLERANCES:

The measurement of strand diameter of the finished AB Cable shall not be less 0.03mm for strands up to and including 3.00mm diameter. For strands above that size, measurement of strand diameter shall not be less than 1% of the nominal strand diameter.

For the purpose of checking compliance with the above requirement, the diameter shall be determined by two measurements at right angles taken at the same cross section. The physical measurement of strands shall be conducted after opening the strands of a finished AB Cable offered for inspection.

8.0 SPLICES IN WIRES:

Splices in Wires shall generally comply with requirements of IEC 1089.

The aluminum alloy rods may be spliced by cold pressure but welding before drawing provided the manufacturer can guarantee that the splice can develop 90% of the tensile strength of the un

sliced rod. Wires which break during stranding may be sliced by cold pressure butt-welding provided that:

No two splices in the completed conductor occur within 15m of each other and no two splices in any individual wire are less than 150m apart.

The splice shall be done with high skilled workmanship. The finished splice shall be smooth and at no point shall the cross sectional area be less than that of the un sliced wire.

Splicing of the alloy wires on the stranding machine in order to utilize lengths of wires on reels shall not be permitted.

9.0 STRANDING AND CORE LAY:

The conductor cores shall be stranded and the direction of lay must be as defined in IEC: 1089.

10.0 INSULATION:

The Aerial Bunched Cables shall be insulated for a voltage class of 0.65/1.1 KV and shall be capable of operating permanently at 1.2KV.

The insulation wall thickness shall be determined in accordance with Table-4 (Clause-7.2 and Clause 7.3) of IS: 14255/1995.

The insulating material shall be black and suitable to resist ultra violet radiation, salt laden sprays, chemical pollution, ageing effects, abrasion and mechanical shocks and mechanical and electrical stress at temperature up to 90°C in normal operation and 250^0C under short circuit conditions per IEC: 502/1994.

The carbon black content in the XLPE insulation shall be **2.5% ± 0.5%**

11.0 PHASE IDENTIFICATION:

The individual insulated conductors within a bundle shall be identified by means of longitudinal projections.

The three phase conductors shall be marked by one, two or three longitudinal projections, indicating the R,Y,B phases respectively.

The projections shall have the following dimensions.

- The distance between the tips of two adjacent projections, where there is more than one, shall be between 1.0 and 1.5m.
- The width of the projection at the base shall be 1.0mm; and
- The height of the projections shall be 0.5mm.

12.0 INSULATION MARKINGS:

Each individual conductor comprising a bundle shall have the range of non-erasable distinct markings listed below legibly printed on the insulation surface at one meter intervals. The embossing should be very clear & easily visible to naked eye.

- ISI Mark, IS 14255-95, Manufacturer"s B.I.S License No. legibly embossed on the insulation.
- Name of the Purchaser.: CESU
- P.O No. & Date
- Manufacturer's trademark identification for example "UCXLPE50"
- Year of manufacture:
- Designation of conductor type
- Size: for example "3x50"
- Shape of conductor.
- Rated voltage class: 0.65/1.1KV
- Back up conductor identification: conductors with one, two and three projections shall be marked R, Y and B respectively. The conductor with no projection shall be marked N and
- The height of the printed lettering shall be not less than 20% of the overall diameter of the conductor

13.0 TWIST:

The direction of lay of the conductors comprising the bundle shall be left-handed and the lay ration shall comply with IEC: 1089.

With a bare catenaries configuration the insulated phase cables together shall be twisted round the neutral catenaries to form the ABC. This cable bundle is then strung directly onto the distribution poles supported by the catenaries with standard approved hardware.

14.0 CABLE DRUM LENGTH:

The cable shall be supplied in 500m or 1000 m Drum Lengths as the case may be for different sizes of LT XLPE AB Cable.

15.0 TESTS:

15.1 General

Where not specified, all tests and test results shall conform to the requirements of IEC 502/1994 or IS 7098 (Part-I) 1998, IS 10810/1984, IS: 398(Part-IV) and IS: 14255/1955.

Unless expressly stated otherwise, the ambient temperature for routine tests as well as voltage tests shall be 20 ± 15^0C and for all other tests be 20 ± 15^0C.

The frequency of the alternating test voltage shall be 49 Hz to 51Hz. The voltage wave form should be sinusoidal.

15.2 Type Tests

The test sample shall be 10m to 15m in length. All cores of the bundles shall be tested.

- Insulation resistance at ambient temperature.
- Insulation resistance at operating temperature.
- AC voltage test.

The insulation resistance test at ambient temperature shall be carried out in a water bath at ambient temperature.

The insulation resistance test at a operating temperature shall be conducted in a water bath at 90^0C.

The longitudinal projections used for phase identification shall be ignored. The results of this test shall be used to calculate the volume receptivity and the results conform to the requirements of IEC: 502/1994 or IS 10810 (Part-43).

The AC voltage test shall be carried out by applying 1.95KV ($3U_0$) for four hours to the sample, which shall be submerged in a water bath at ambient temperature, having been steeped for a period not less than one hour. The test shall only be deemed to have been passed if no breakdown occurs.

Furthermore, the following non-electrical type tests shall also be carried out:

- Insulation wall thickness: the longitudinal projections used for phase 1 identifications shall be ignored as per IS 10810 (Part-6);
- Ageing test, consisting of an evaluation of the retention of the mechanical properties of the insulation after ageing.
- Wrapping test: as per IS 10810 (Part-3);
- Tests for bleeding and blooming of pigment as per IS 10810 (Part-9)
- Thermal expansion of insulation.

- Measurement of carbon black content as per IS 10810 (Part-32).
- Water absorption by the XLPE insulation, shrinking of the XLPE insulation.
- Tensile test: adhesion between conductor and insulation.

The adhesion test requires a tensile testing machine. A sample of at least 300mm length shall be selected and straightened out. The insulation shall be removed for a length of 150mm. The insulated end shall be held in the upper grip head and the bare conductor on the lower grip head. Tension shall be applied at a speed of 500mm/ min until the conductor first begins to slide within the insulation. The test shall have been passed if the conductor and insulation combination can stand $75N/mm^2$ without slippage occurring.

The neutral conductor/catenaries shall be type tested in accordance with the requirements of IS 398 (Part-IV) 1994.

15.3 **Routine Tests**

The following measurement or tests shall be carried out on all drums and coils of Bunched cable:

- Conductor resistance
- Voltage test.

The conductor to be tested for conductor resistance shall be stored for at least 12 hours in a room at particular constant temperature. If it cannot be established that the conductors have reached the room temperature, the test should be postponed for a period of further 12 hours. Alternatively, the test can be carried out on short sample after remaining one hour in a temperature controlled water bath. The test shall be carried out and the conversion factors used to convert the resistance value to a base of 200^0C and one Km. The DC resistance of each conductor shall not exceed the appropriate maximum values specified in IEC:228/IS:6474.

The voltage test shall be conducted by applying to each core 3.5KV AC (2.5 U_0 plus 2 KV) or 8.4 KV DC for 5 minutes with the specimen lying in a water bath at ambient temperature. The conductor shall pass the test if no electrical breakdown occurs.

15.4 **Acceptance Tests**

The following sample check, measurements and test shall be carried out in addition to the Acceptance Tests as per IS 14255 – 1955, IS : 398 (Part – IV) 1994, IS 8130 / 1984

- Measurement of insulation wall thickness;
- Measurement of diameter of each strand, overall outside dia & Cross Sectional Area of the conducting Part out of the finished product during pre-dispatch inspection.
- Thermal expansion test;
- Check of physical characteristics

- Tensile strength of individual wires of conductor.
- High Voltage Test on drums immersed in water(apply voltage 3.5 KV AC for 5 min)

These tests should be carried out on one length form each production batch of the same sample.

The thickness of the insulation wall shall be measured on a piece removed from each end of the sample length. If either means or minimum values are not met, two further samples shall be removed at 0.5m form the end corresponding to the failed specimen. If these samples do not satisfy the mean and minimum thickness requirements, the test shall be deemed to have been failed.

The longitudinal projections used for phase identifications shall be ignored.
The thermal expansion test need only be carried out on one core.

In relation to the tensile test, the tensile strength of the aluminum wires before stranding and that of the finished conductor shall comply with IEC: 1089.

15.5 **Test on the Catenary (messenger) Conductor**

Breaking load, elongation and resistance tests shall be completed on the aluminum alloy catenaries conductor in accordance with the requirements of IS:398 (Part-IV)/1994 or IEC:1089.

15.6 **Bending Test on a complete cable**

This test shall be performed on a sample of completed cable. The sample shall be bent around a test mandrel at room temperature for at least on turn. It shall then be unwound and the process shall be repeated after turning the cable sample around its axis by 180^0. This process shall be repeated twice more. There shall be no signs of breaking or cracking of the cable insulation during this test.

The diameter of the mandrel shall be:

$$10\ (D+d)$$

Where D = Actual diameter of the cable (mm)

d = Actual diameter of the conductor (mm)

15.7 **Rejection and Retests**

Should any one of the test pieces first selected fail to pass the tests, two further samples from the same batch shall be selected for testing, one of which shall be from the length from which the original test sample was taken unless the length has been withdrawn by the supplier.

Should the test pieces from both of these additional samples satisfy the requirements of the tests, the batch represented by these samples shall be deemed to comply with the standard. Should the test pieces from either of the two additional samples fail, the batch represented shall be deemed to have failed.

16.0 COMPLIANCE WITH SPECIFICATION:

The Aerial Bunched Cable shall comply in all respects with the requirements of this specification. However, any minor departure from the provisions of the specification shall be disclosed at the time of bidding in the Non-compliance Schedule of this document.

17.0 COMPLIANCE WITH REGULATIONS:

All the cables shall comply in all respects with the Indian Regulations and Acts in force. The cables and connections shall be designed and arranged to minimize the risk of fire and any damage, which might be caused in the event of fire.

18.0 NON-CONFORMING PRODUCT:

The Purchaser reserves the right for decisions regarding acceptance, modification or rejection of non-conforming items.

19.0 INSPECTION AND TESTING:

The Purchaser or his authorized representative has free entry at all times, while work on the contract is being performed, to all parts of the manufacturer's works which concerns the processing of the cables ordered. The manufacturer shall afford the purchaser or his authorized representatives without charge, all reasonable facilities to ensure that the cable being furnished is in accordance with these specifications.

The cables shall successfully pass all the routine tests & acceptance Tests referred to in the section on tests and those listed in the most recent edition of the standards given in the specification.

The Purchaser reserves the right to reject any of the cables if the test results do not comply with the values specified or with the date given in the Technical data schedule.

Type Test Certificates for the tests conducted earlier shall be submitted with the bid for evaluation. The requirements of additional type tests will be at the discretion of the Purchaser

The Purchaser shall witness routine tests .In order to facilitate this, the contractor shall give the purchaser of 15days notice that the material is ready for inspection & testing. The supplier shall extend all assistance to the representative of the Purchaser during his inspection & testing of samples at his works. The materials shall be dispatched only after approval of such Test Reports and issue of Dispatch clearance by the Purchaser. **However the Purchaser reserves the right to retest the materials after delivery at any NABL Accredited Testing Laboratory in case of any disputes regarding size & quality of supplied materials at a later date during guarantee period. The cost of such retesting shall be borne by the supplier.**

All costs in connection with the testing, including any necessary retesting shall be borne by the Contractor, who shall provide the Purchaser with all the test shall have the right to select the samples for test and shall also have the right to ensure that the testing apparatus is correct. Measuring apparatus for routine tests shall be calibrated at the expense of the contractor at an approved laboratory and shall be approved by the purchaser before testing.
The Contractor shall be responsible for the proper testing of the materials supplied by sub-Contractor to the same extent as if the materials were completed or supplied by the contractor.

Any cost incurred by the Purchaser in connection with inspection or retesting as a result of failure of the equipment under test or damaged during transport or off loading shall be to the account of the Contractor.

The Contractor shall submit to the Purchaser three signed copies of the test Certificates, giving the results of the tests as required. No materials shall be dispatched until the Purchaser has received the test certificate and the contractor has been informed that they are acceptable.

The test certificate must show the actual values obtained from the tests, in the units used in this specification, and most merely confirm that the requirements have been met.

In the case of components for which specific type tests or routine tests are not given in this specification, the Contractor shall include a list of the tests normally required for these components. All materials used in the Contract shall withstand and shall be certified to have satisfactorily passed such tests.

No inspection or lack of inspection or passing by the Purchaser's representative of equipment or materials whether supplied by the Contractor or sub- Contractor, shall relieve the contractor from his liability to complete the contract works in accordance with contract or exonerate him from any of his guarantees.

20.0 GUARANTEE:

The contractor shall guarantee the following:

- Quality and strength of materials used.
- Satisfactory operation during the guarantee period of **24 months** from the date of commissioning
- Performance figures as supplied by the bidder in the technical data sheet.

21.0 PACKING AND SHIPPING:

The cable shall be wound on strong drums or reels capable of withstanding all normal transportation and handing.

Each length of cable shall be durably sealed before shipment to prevent ingress of moisture. The drums reels or coils shall be lagged or covered with suitable material to provide physical protection for the cable during transit or during storage and handling operations.

In the case of steel drums adequate precautions shall be taken to prevent damage being caused by direct contact between the cable sheath and the steel. These precautions hall be subject to the approval of the Purchaser.

If wooden drums are used then the wood shall be treated to prevent deterioration from attack by termites and fungi.
Each drum or reel shall carry or be marked with following information:

- Individual serial number
- Standard ISI Mark, 14255-95, Manufacturer''s B.I.S License No.
- Name of the Purchaser : CESU
- Destination
- Purchase Order No. & Date
- Manufacturer's name
- Year of manufacture
- Cable size and type
- Length of conductor (meters)
- Net and Gross mass of conductor (Kg)
- Scheme :
- All necessary slinging and stacking instructions
- Destination
- Country of origin

The direction of rolling as indicated by an arrow shall be marked on a flange.

22.0 STORAGE:

The site selected for the storage of cable drums shall be well drained and preferably have a concrete/ firm surface which will prevent the drums sinking into the ground or being subjected to excess water thus causing flange rot.

All drums shall stand on battens, in the upright position and in such a manner to allow sufficient space between them for adequate air circulation. During storage the drums shall be rotated 90^0 every three months. In no instances shall be the drums be stored "flat" on their flanges or one on top of each other.

23.0 SHIPPING:

The Contractor shall be responsible for the shipping of all cables, drums and reels supplied from abroad to the ports of entry and for the transport of all goods to various specified destinations including customs clearance, off loading, warehousing and insurance.

The Contractor shall inform himself fully as to all relevant transport facilities and requirements and loading gauges and ensure that the equipment as packed for transport shall conform to these limitations. The contractor shall also be responsible for verifying the access facilities specified.

The contractor shall be responsible for transportation of all the loads associated with the contract and shall take all reasonable steps to prevent damage of any highway or bridges by his vehicles by selecting routes, choosing proper vehicles for use and restricting and distributing loads to avoid the risk of damage. The Contractor shall immediately report to the Purchaser any claims made against the contractor arising out of alleged damage to a highway or bridge.

All items of equipments shall be securely clamped against movement to ensure safe transit from the manufacturer's facilities to the specified destinations.

24.0 HAZARDOUS SUBSTANCES:

The Contractor shall submit safety data sheets for all hazardous substance used with the equipment. The contractor shall give an assurance that there are no other substances classified as hazardous in the equipment supplied. He shall also take responsibility for the disposal of such hazardous substances that may be found for any injuries resulting from those substances.

25.0 SUBMITTALS:

The following shall be required in duplicate along with the bid:

- Completed technical data sheets;
- Descriptive literature giving full technical details of equipment offered.
- Outline dimension drawing for each type of conductor, for each bundle showing the conductor strand, composition and the bundle twist;
- Type test certificates, where available, and sample routine test reports;
- Detailed reference list of customers already using equipment offered during the last five years with particular emphasis on units of similar design and rating;
- Performance reports from the customers for the supplied LT XLPE AB Cables.

- Details of manufacturer's quality assurance standards and programme and ISO 9000 series or equivalent national certificates;
- Deviations from this specification to be submitted as per Non-Compliance. Only deviations approved in writing before award of contract shall be accepted;
- List of recommended spare parts for five years of operation with prices and spare parts catalogue with price list for future requirements.
- Any other documents to establish qualifying & credibility requirements as specified in this Tender Document.

GUARANTEED TECHNICAL PARTICULARS FOR 3X50+1X35+1X16 MM² LT XLPE AB CABLE.

Sl No	Description	Specified	Bidder's Offer
1	Ref. ISS / IEC followed	IS 14255/95, IS 398 Part IV	
2	Phase Conductor material / Insulation type	H2 / H4 E.C grade aluminium as per IS 8130/84 / XLPE insulation (IS	
3	Material of Neutral Catenary	Aluminum alloy as per IS 398 Pt -	
4	Voltage Class	0.65/1.1 KV	
	No. of Strands of Phase Conductor	7	
5	No. of strands/ Average /Minimum Strand Dia. In mm. (Finished Phase conductor.)	7/3.05	
6	Approximate Overall Dia. Of compacted phase conductor after removal of insulation.(in mm.)	9.15	
7	No. Of Strands / Average Strand Dia. In mm. (Neutral Catenary.)	7/2.54	
8	Minimum Overall Dia. of compacted Bare Neutral Caternary .(in mm.)	7.62	
9	No. of Strands / Average strand dia. / Overall dia./Nominal cross sectional area of conducting part In No / mm/mm2. St. Light Conductor)	7 /1.75/5.25 / 16mm2	
10	Minimum average thickness of insulation of phase Cond. (mm)	1.5	
11	Minimum thickness of insulation of Phase Cond. At any point (mm)	1.25	
12	Minimum thickness of insulation at any point in street light conductor (mm)	0.98	
13	Maximum DC resistance of Phase conductor at 20 °C ohmn/ KM	0.64	
14	Maximum DC resistance of street light conductor Ω /Km	1.91	
15	Maximum DC resistance of neutral cond. Ω / Km	0.986	
16	Ultimate tensile strength of neutral conductor (KN)	10.8	
17	Maximum temperature (Continuous)	90°C for phase and 75 °C for	
18	Embossing on insulation at each one meter interval	Distinct Non-erasable ISI Mark, IS 14255-95, Manufacturer"s B.I.S License No., Name of the Purchaser, Name of the manufacturer, Size of cable, voltage Grade along with sequential marking of length..	
19	Cable drum length	500 / 1000m	
20	Volume Resistivity of insulation at 27°C	$1X10^{13}\Omega$ - cm min.	
21	Volume Resistivity of insulation at 70°C	$1X10^{11}\Omega$ - cm min.	

N.B:

1) In case of discrepancies between values of ISS & GTP, better will prevail.

2) Average diameters of strands of each cable shall be ascertained by physical measurement after opening the strands of each phase of a finished AB Cable offered for inspection.

Signature of the bidder with Seal

Volume – III

BID PROPOSAL SHEETS

Tender Notice No.PUR./TEND/05/2019-20 Dated 11.03.2020 of S.E, E.C-I, Bhubaneswar.

CENTRAL ELECTRICITY SUPPLY UTILITY OF ODISHA

OFFICE OF THE DY. GENERAL MANAGER (ELECT), ELECTRICAL CIRCLE No.1
POWERHOUSE, UNIT-VIII, BHUBANESWAR – 751012
Phone: 2392742, 2395273, Fax: 0674-2392742, E-mail: **sebbsr1@cescoOdisha.com**

VOLUME- III

PART-A

BID PROPOSAL SHEET (PRICE BID)

Sl No	Description of Materials	Unit	Qty	Supply		Erection		Total
				Rate	Amount	Rate	Amount	
100KVA S/S								
1	100KVA, 11/0.4KV transformer	No	1	OSM	OSM			
2	L.T. Distribution box including Kit Kat fuse with MCCB for 100KVA S/S	No.	1					
3	3 1/2 x150mm2 PVC Cable for 100KVA TFR.	Mtr.	25					
4	100x116 mm RS Joist 9mtr long	Kg	414					
5	Pressure Channel 100 x 50 x6mm MS channel each 2.8 mtr. Long (9.2Kg per mtr)X2 Nos	K.g.	51.52					
6	Transformer mounting channel 100 x 50 x 6mm MS channel each 2.8 mtr. Long(9.2 Kg per mtr.)X2 Nos	K.g.	51.52					
7	AB Switch & HG Fuse, Mounting Channel 75x40x6 -2.8 mtr.long, 4 nos.(6.8K.g. per mtr.)	K.g.	76.16					
8	Cantilever channel for supporting AB Switch arm 75x40x6-1 mtr. Long, 2nos(6.8Kg per mtr.)	K.g.	13.6					
9	Cantilever channel for supporting HG Fuse 50x50x6 mm MS Angel (1.0 mtrs. Long 2 nos.)4.5K.g. per mtr	K.g.	9					
10	Angle for Cantilever arrangement for AB Switch & HG Fuse 50 x 50 x 6 -2 mtr .each 2 nos.(4.5 K.g. per mtr.)	K.g.	18					
11	Transformer belting Angel 50x50x6 mm-2.8 mtr. Long 2nos(4.5 Kg per mtr) with side angel (Total 7mtr)	K.g.	31.5					
12	Angle for mounting LT distribution Box 50 x 50 x 6 mm MS Angel -2.5 mtrs. each Long 2 nos.(4.5 K.g. per mtr.)	K.g.	22.5					
13	11KV AB Switch 3 Pole (400 Amp.)	Set	1					
14	11KV HG Fuse 3 Pole (400 Amp.)	No.	1					
15	11 KV L.A. 12KV-10KA	No.	3					
16	GI Pipe Earthing 40 Dia Medium gage 3mtr Long	No.	5					
17	No.6 GI Wire	K.g.	20					
18	40x6mm GI Flat for neutral	K.g.	20					
19	HT Stay Set Complete	Set	2					
20	HT Stay insulator	No.	2					
21	HT stay clamp (1.95Kg/ Pair)	Pair	2					
22	7/10 Stay Wire	Kg	20					

23	Fixing and concreting of stay set with 0.5Cum cement concrete foundation 1:3:6 size (900mmx600mmx900mm) using 40mm BHG metal with all labour and material except stay set , stay wire, stay insulator.	No.	2					
24	Concreting of support C.C-1:4:8 using 40mm BHG metal size-5'x2'x2' = 20CFT = 0.570Cum Padding 900x600x150mm = 0.081 0.651Cum @ 3071.25= 1999.38each	No	2					
25	Cooping of support section 15''x15'' (3.9Cft) height 2'-6' (1' - 6'' above G.L & 1' - 0' below G.L) in C.C 1:2:4 using 12mm BHG metal & curing for 5 days	No	2					
26	Materials for Machinery work for Earth Pit, Charcoal, Salt etc including construction of earthing chamber (Size: 2'x2') and RCC slab cover	No	5					
27	Red Oxide paint	Ltr	6					
28	All. Paint	Ltr	6					
29	Black Paint	Ltr	5					
30	Ms Nut , Bolt & Washer	K.g.	1					
31	25x3mm GI flat	Kg	60					
32	M.S Nut & Bolt	Kg	36					
33	Danger Board	No	2					
34	Barbed Fencing (size 15'x10')with construction of retaining wall ,erection of RCC fencing post, Sand filling and metal spreading, Fixing of Iron gril gate etc	No	1					
35	Sundries for survey , PVC tape, Ampere tape, Danger Board, small size nut & Bolt preparation of drawing Allu. Socket etc	LS	1					
36	Installation of DT meter with accessories	LS	1					
11KV line								
37	100x116mm RS Joist 10mtr long	Kg	920					
38	MS Channel 100x50x6 mm	Kg	156					
39	11 KV straight Cross Arm	No	1					
40	11 KV 'V' Cross Arm (10.2 kg each)	No	3					
41	Top Bracket	No.	3					
42	Back Clamp for "V" X arm (1.7kg)	No	3					
43	11 KV Disc Insulator (Polymer)	No.	9					
44	11 KV H/W Fittings (Polymer)	No.	9					
45	11 KV GI Pin insulator (Polymer)	No.	12					
46	11 KV GI Pin (Polymer)	No.	12					
47	55mm2 AAAC	Km	0.825					
48	Earthing Coil Type	No	4					
49	HT Stay set complete	No	2					
50	HT Stay insulator	No	2					
51	HT Stay clamp	No	2					
52	7/10 SWG GI Stay wire	k.g	20					

53	Concreting material for stay anchor plate	No.	2					
54	Concreting of support	No	4					
55	Cooping of support	Nos	4					
56	Red oxide paint	Ltr	8					
57	Aluminum paint	Ltr	8					
58	Black paint	Ltr	2					
59	Barbed wire	Kg	8					
60	Danger board	Kg	4					
61	M.S Nut & Bolt	Kg	20					
62	Sundries	L.S.	1					
LT line								
63	200 kg 8mtr long PSC Pole	No.	4					
64	LT stay set complete	Set	3					
65	7/12 SWG stay wire.	Kg	30					
66	Clamp for LT Stay	Pair	3					
67	L.T. Stay insulator	No	3					
68	Suspension clamp with I hook	No	2					
69	Dead end clamp with I hook	No	2					
70	(3x50+1x35+1x16)mm^2 A.B.Cable	Km	0.16					
71	Strain fittings	No	2					
72	Guy Grip dead end	No	2					
73	Fixing and concreting of stay set with 0.5Cum cement concrete foundation 1:3:6 size (900mmx600mmx900mm)using 40mm BHG metal with all labour and material except stay set, stay wire, stay insulator.	No	3					
74	Concrete slab for base plate size 2ftxx2ft x 2" thickness for each PSC pole	No	4					
75	Insulated piercing connector	No	4					
76	Earthing coil	No	4					
77	Pole numbering	No	4					
78	Nuts & Bolt	Kg	10					
79	Sundries	L.S	1					
80	Inspection	Inclusive						
	TOTAL							

(Rupees……) only

- **NB: Any other items which are not mentioned in the above price bid may be referred at the scope of work of General Condition of Contract (GCC), Technical BID and BOQ.**
- **Bidders are required to enter their item wise rates in individual sheet for which he wants to submit their total bid.**
- **Bidders will be permitted to only enter the item wise rates. No other modification shall be permitted. Bidders are required to sign each and every page and enclose the same in the Price Bid in Sealed Condition.**
- **The rate is inclusive of GST & other taxes and duties.**

- **The above tender cost is inclusive of all works & charges towards Electrical Inspection of the total work by Electrical Inspector, Govt. Getting the whole work inspected and certified by Electrical Inspection after completion of work is the responsibility of the bidder / contractor.**
- **Regarding less quoting of price bid w.r.t tender estimated cost as per amendment of OPWD code**:

Additional Performance Security shall be obtained from the successful bidder who has quoted less bid price/ rate than the estimated cost put to the tender. In such an event only the successful bidder who has quoted less bid price shall have to furnish the exact amount of differential cost i.e. estimated cost put to tender minus the quoted amount as Additional Performance Security in shape of Demand draft / Term Deposit Receipt pledged in favour of CESU with validity same as the validity of CPBG for this tender within 7 (Seven) days from issuance of letter on L1 bidder before placement of work order, otherwise the bid shall be cancelled and security deposit (EMD) shall be forfeited and other consequential action may be taken against the bidder.

This security amount shall be released only after expire of validity of CPBG as mentioned in Clause 29.04 of GCC. The aforesaid amount shall not carry any interest payable to the bidder.

(Signature of the Bidder with date & seal)

Note :

a) **Any column left bank shall be treated as nil/inclusive of.**
b) **In the event of multiple prices quoted for the same item the lowest quoted rate for the item shall be considered for evaluation.**

Part-B

A. Materials to be supplied by the firm / contractor			
SL No.	**Description of materials**	**Unit**	**Qty**
1	100KVA, 11/0.4KV transformer	No	1
2	L.T. Distribution box including Kit Kat fuse with MCCB for 100KVA S/S (As pre CESU specification)	No.	1
3	3 1/2 x150mm2 PVC Cable for 100KVA TFR.	Mtr.	25
4	100x116 mm RS Joist 9mtr long	No/Kg	(2/414)
5	100x116mm RS Joist 10mtr long	No/Kg	(4/920)
6	100 x 50 x6mm MS channel	K.g.	259.04
7	75x40x6 mm MS channel	K.g.	89.76
8	50x50x6 mm MS Angel	K.g.	81
9	11KV AB Switch 3 Pole (400 Amp.)	Set	1
10	11KV HG Fuse 3 Pole (400 Amp.)	No.	1
11	11 KV L.A. 12KV-10KA	No.	3
12	GI Pipe Earthing 40 Dia Medium gage 3mtr Long	No.	5
13	No.6 GI Wire	K.g.	20
14	40x6mm GI Flat for nutral	K.g.	20
15	HT Stay Set Complete	Set	4
16	HT Stay insulator	No.	4
17	HT stay clamp (1.95Kg/ Pair)	Pair	4
18	7/10 Stay Wire	Kg	40

19	Red Oxide paint	Ltr	14
20	All. Paint	Ltr	14
21	Black Paint	Ltr	7
22	Ms Washer	K.g.	1
23	25x3mm GI flat	Kg	60
24	M.S Nut & Bolt	Kg	66
25	Danger Board	No	6
26	DT meter with accessories	No	1
27	11 KV straight Cross Arm	No	1
28	11 KV 'V' Cross Arm (10.2 kg each)	No	3
29	Top Bracket	No.	3
30	Back Clamp for "V" X arm (1.7kg)	No	3
31	11 KV Disc Insulator (Polymer)	No.	9
32	11 KV H/W Fittings (Polymer)	No.	9
33	11 KV GI Pin insulator (Polymer)	No.	12
34	11 KV GI Pin (Polymer)	No.	12
35	55mm2 AAAC	Km	0.825
36	Earthing Coil Type	No	8
37	Barbed wire	Kg	8
38	200 kg 8mtr long PSC Pole	No.	4
39	LT stay set complete	Set	3
40	7/12 SWG stay wire.	Kg	30
41	Clamp for LT Stay	Pair	3
42	L.T. Stay insulator	No	3
43	Suspension clamp with I hook	No	2
44	Dead end clamp with I hook	No	2
45	(3x50+1x35+1x16)mm^2 A.B.Cable)	Km	0.16
46	Strain fittings	No	2
47	Guy Grip dead end	No	2
48	Insulated piercing connector	No	4
B. Materials to be supplied by the owner (OSM)			
SL No.	**Description of materials**	**Unit**	**Qty**
1	100KVA, 11/0.4KV transformer	No	1