



SECTION-I

NOTICE INVITING E-TENDER

NIT NO: DGM/ED-TLM/2023-24/ 03, Date: 15.09.2023

FUNDING: Deposit Work.

1.0 The Deputy General Manager, Electrical Division-Teliamura invites the tender on behalf of TSECL for the work of “Providing 154 (one hundred and fifty four) nos. 1-Phase service connections to un-electrified Households beyond 35 meters where service connections are extendable by single pole under ED-Teliamura.” Through **e-tendering** from eligible and resourceful contractors/firms having sufficient credential and financial capability for execution of works of similar nature on **Partial Turn-key basis** except Energy Meter.

Estimated Cost: ₹ 22,12,448.00

Earnest Money: ₹ 44,249.00

Tender Fee: ₹ 1,000.00

2.0 This NIT for the above work shall be appearing in Local News paper. This shall also be available on Tripura State Electricity Corporation Limited website at <http://www.tsecl.in> from **18.09.2023**. The complete Bidding Documents including tender drawings and technical specifications shall be available at Government e-procurement portal <http://tripuratenders.gov.in> from **18.09.2023**. Interested bidders can download the Bidding Documents and commence preparation of bids to gain time.

3.0 Eligible bidders shall participate in tender online through the government e-procurement portal at <http://tripuratenders.gov.in>. Tender shall be uploaded/submitted in a two-bid system:

(a) Bid Envelop-I (Technical bid)

(b) Bid Envelop-II (Financial bid)

4.0 Bidders willing to take part in the process of e-tendering are required to obtain a valid Class-2/Class-3 **Digital Signature certificate (DSC)**, from any of the of the certifying authorities, enlisted by Controller of Certifying Authorities (CCA) at <http://cca.gov.in>. After obtaining the Class 2/3 Digital Signature Certificate (DSC) from the approved CA, Bidders shall Enroll themselves in the Tripura Government e-procurement web site at '<http://tripuratenders.gov.in>' and obtain User ID and Password for the purpose of bidding.



5.0 Critical Dates:

1.	Completion period for the work:	04 (Four) Months
2.	Date of Publishing of Bid:	Date: 18.09.2023
3.	Bidding Documents Downloading Start Date:	Date: 18.09.2023
4.	Bidding Documents Downloading End Date:	Date: 03.10.2023
5.	Seeking Clarification Start Date:	Date: 18.09.2023
6.	Seeking Clarification End Date:	Date: 22.09.2023
7.	Date and Time of Pre-Bid Meeting:	Date: 25.09.2023 Time: 12:10 P.M.
8.	Place of Pre-Bid Conference/ Meeting:	O/o the Deputy General Manager, Electrical Division-Teliamura, Khowai District.
9.	Bid Submission Start Date:	Date: 26.09.2023 Time: 9:00 A.M.
10.	Bid Submission End Date and Time:	Date: 03.10.2023 Time: 5:00 P.M.
11.	Date and Time of Opening Technical Bid:	Date: 04.10.2023 Time: 11:30 A.M.
12.	Date and Time of Opening Financial Bid:	To be notified after Technical Bid Evaluation
13.	Place of Opening Bid:	O/o the Deputy General Manager, Electrical Division-Teliamura, Khowai District.
14.	Bid Validity:	6 (Six) Months from the date of opening of Technical Bid.
15.	Officer inviting Bid/ Tender Inviting Authority (TIA):	Deputy General Manager, Electrical Division-Teliamura, Mob: 60331 31838

Notes:-

1. All the above-mentioned **online activities should be done in the e-procurement portal <https://tripuratenders.gov.in>**
2. All the above-mentioned **date & time are as per server clock date & time of e-procurement portal <https://tripuratenders.gov.in>**

6.0 Scope of Work:

The scope of work under the subject package includes site survey, planning, design, engineering, assembly manufacturing, testing, supply, loading, transportation, unloading, insurance, delivery at site, handling, storage, installation, testing, commissioning and documentation of all items/material required to complete the **Construction of LT line for providing 154 (one hundred and fifty four) nos. 1-Phase service connections to un-electrified Households beyond 35 meters where service connections are extendable by single pole under ED-Teliamura on Partial Turn-Key basis.**



The above Scope of work is only indicative. The detailed scope has been described in the SBD and as per schedule of item(s)/BOQ.

Name of Consignee: - Senior Manager, ESD-I, Teliamura under ED-Teliamura.

7.0 QUALIFYING REQUIREMENTS FOR BIDDERS:

To be qualified to bid for the package, the bidder shall have to meet the following minimum criteria:

- 7.1 The bidder must have done construction and commissioning work of LT line or above voltage class of minimum 20% quantity of 11KV/LT line given in this tender in a single award on turnkey/partial turnkey basis during last 5 (Five) years which must be in satisfactory operation for at least 1 (One) year from last date of submission of present bid as per NIT. Performance certificate from reputed Indian Power Utility not below the rank of Executive Engineer / Deputy General Manager / Divisional Engineer or equivalent to be submitted along with technical bid. Experience as sub-contractor will not be considered in this case.**
- 7.2 The minimum average annual turnover of the bidder for the last three years shall be not less than 30% of the estimated cost put to tender.
- 7.3 Bids may be submitted by an individual firm (proprietorship entity) with relevant experience or registered partnership firm or companies registered under companies act or joint ventures of registered firms/companies/ proprietorship entity with two constituents only as one of the following.
 - 7.3.1 A single firm of proprietorship entity or registered partnership firms or companies registered under Companies Act, which meets anyone or both the requirements, indicated in para 7.1 above and 7.2 (Mandatory).
 - 7.3.2 A joint venture/consortium of two registered firms/companies/proprietorship entity, wherein each registered firm/company/proprietorship entity shall meet any one or both the requirements of para 7.1, 7.2. Out of two bidders one bidder must fulfill the requirement of Para 7.1
 - 7.3.3 The figures of average annual turnovers for each registered firm/company/proprietorship entity shall be added together to determine the bidder's compliance with the minimum average annual turnover requirement for the package as given at para 7.2 above.
- 7.4 In case of joint ventures /consortium, any of the registered firms/companies/ proprietorship entities shall be authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the joint venture/consortium and the entire execution of the contract including receipt of payment shall be done exclusively through him. This authorization shall be evidenced by submitting a registered power of attorney signed by legally authorized signatories of all the partners.
- 7.5 All partners of Joint Venture/consortium shall be liable jointly and individually / severally for the execution of the contract in accordance with the contract terms. A copy of the agreement of joint venture/consortium partners having such provision shall be submitted with the bid.
- 7.6 Notwithstanding anything contained herein above, TSECL reserves the right to assess the "capacity and capability" of the bidder to execute the work.
- 7.7 In addition to qualifying requirement mentioned above, the bidder's offer must include the following documents which to be submitted with technical bid.



- i. Copy of PAN Card and Photo Copy of Goods & Service Tax (GST) registration certificate.
- ii. Copy of EPF registration certificate & labour license certificate is to be submitted as per rule.
- iii. Copy Electrical Contractor license and supervisory certificate of competency for requisite parts.
- iv. Copy of balance sheet of the bidder (audited by Chartered Accountant) with auditor's certificate in support of annual turnover i/c IT Return Certificate for the last 3 (three) years of session 2020-21, 2021-22& 2022-23.
- v. **Any bidder who has been debarred / black listed by any Central (GOI) / State Govt. owned Power Utility, for works of similar type during last 3 years for whatever reasons and thereby shall stand disqualified automatically at the very pre-qualification stage. Therefore, the bidder submitting the tender documents is liable to enclose a "Declaration" to this effect with due certification by "NOTARY" depicting full name & designation. (As per Format, annexed in Bid document).**
- vi. Notwithstanding anything stated above, TSECL reserves the right to assess the Bidder's capability and capacity to perform the contract satisfactorily, should the circumstances warrant such assessment in the overall interest of TSECL.
- vii. The above stated requirements are minimum and the TSECL reserves the right to request for any additional information and also reserves the right to reject the proposal of any bidder, if in the opinion of the owner, the qualification data is incomplete or the bidder if found not qualified to satisfactorily perform the works.
- viii. Price bid of only those bidders shall be opened who qualify based on the specified qualifying requirements after Scrutiny of details / documents furnished by them and found to be techno- commercial responsive.

The bidder shall furnish documentary evidence in support of the qualifying requirements stipulated above along with their bid. Bid received without such documents shall be summarily rejected.

8.0 Earnest Money Deposit amounting to 2% (Two Percent) of the estimated cost put to tender.

Tender Fee and EMD are to be paid electronically using the Online Payment Facility provided in the Portal. For online payment of Tender Fee and EMD, please follow the following process-

- After initiating the Bid Submission Process from "My Tender" option, an "Online Payment" page will appear which will display the total Tender Fee & EMD amount.
- On submission of TF & EMD payment option, System will redirect to the SBI Bank MOPS window.
- SBI MOPS will have two option for Net Banking- "SBI" & "Other Banks". Bidder can choose any of the options as desired and can complete the Online Payment process.

The EMD amount shall be refunded to all the bidders including L1 (Selected) bidder in their respective Bank Account, after the Award of Contract (AoC) event is completed in the Tripura e-Procurement Portal, on receipt of Performance Bank Guarantee from the selected bidder.

EMD of the bidder may be forfeited if in any case found to have made in false Declaration or Claims.



9.0 Power of Attorney, if given to authorized signatory for signing the Contract Agreement, shall be made in an INDIA NON-JUDICIAL STAMP OF Rs.100.00 (Rupees one hundred) only.

10.0 On award of work the successful bidder shall have to deposit a **Contract Performance Guarantee (CPG)** equivalent to **10%** of the LOA value / Supply order value in the shape of Demand Draft in favour of DGM, ED-Teliamura, Electrical Division Teliamura, Deposit Work from any schedule Bank guaranteed by Reserve Bank of India, payable at Teliamura or in the shape of Bank Guarantee from a Public sector / scheduled Indian Bank guaranteed by Reserve Bank of India. The **CPG** within the definition of **clause 36.0 of section –II** of the bid document shall remain valid for actual completion period plus guarantee period against the item as per provision of **clause 14.0 of section-III** of the bid document. Extension of bank guarantee for performance of the contract shall be extended as & when asked by the Engineer in charge to keep the currency of the contract alive. In the event of failure on the part of agency to extend the bank guarantee before expiry of the bank guarantee submitted, the same shall be encashed without showing the reason thereof.

11.0 The acceptance of Price Bid (Financial Bid) shall be subjected to acceptance of Tender fee.

12.0 The Bidding Documents are meant for the exclusive purpose of bidding against this specification and shall not be transferred to any other party or reproduced or used otherwise for any purpose other than for which they are specifically issued.

13.0 Downloaded NIT, Bid Document are to be uploaded back and digitally signed as a part of technical bid, and as a proof of acceptance of all terms and conditions in NIT and Bid Document.

14.0 Submission of Bids:

Bids are to be submitted online through the website, and as, stated in Clause 1.0 and 2.0 and 3.0. All the Bidding documents (SBD, Scan copy of tender fee) uploaded by the TSECL form an integral part of the contract. Bidders are required to upload these bidding documents as asked for in the Bid, through the above website and within the stipulated date and time mentioned in the Tender.

Tenders are to be submitted in two folders at a time for each work, one for Technical Proposal and the other for Financial Proposal. The Bidder shall carefully go through the requirements and prepare the required documents to be uploaded.

In Technical Bid, Bidder shall have to submit the entire requisite document as specified in the SBD (SBD, details payment of tender fee and EMD, All forms/Amendments/Formats/Annexure with supporting documents/certificates, Technical Data Sheet/GTPs and drawings, Test Reports, Financial, Tax related document, machinery & manpower details specified in the Bid Document etc.

In Financial Bid, Bidder shall upload BOQ in the financial Bid.

The bidder shall scan all the documents before uploading and all scanned documents shall be of 100 dpi resolution in Portable Document Format (PDF). The scanned documents shall be uploaded in the designated locations of Technical Bid and Financial Bid, as prompted by the e-Procurement website.

The Bidder needs to fill up their name and rates for all the items and in the designated Cells of the downloaded BOQ for the related work, and upload the same in the designated location of Financial Bid. The



documents uploaded are virus scanned and digitally signed using the Digital Signature Certificate (DSC). Bidders shall specially take note of all the addendum/corrigendum related to the tender and upload the latest documents as part of the tender.

Bid - I (Technical Bid):

The Technical Bid should contain scanned copies and/or declarations in the following standardized formats.

A. My Document (Non-Statutory):

All the below-mentioned documents/certificates are to be uploaded with digital signature in the 'My Document' folder option available after login in the e-procurement portal <http://tripuratenders.gov.in>. Bidders are requested to scan the necessary documents in 100 dpi resolution into PDF. 'My Document' shall be populated prior to real time bidding and during real time bidding, uploaded documents/certificates in the 'My Document' are to be appropriately included (Checked) for incorporation in the Bid.

An indicative organization of 'My Document' folder and the related documents are indicated here under.

Sl.	Folder Name	Documents to be uploaded
1.	Mfg.lic.	Company Details: I. Registration of the firm/Partnership deed/ Articles of Association joint venture/Consortium.
2.	DNIT Documents	I. Corrigendum, if published
3.	Machinery Details	Machinery & Manpower in possession of the firm:
4.	Tax related document	I. GST Registration certificate II. IT PAN
5.	Financial details	I. Audited Balance Sheets of last five financial years with auditor's certificate regarding annual turnover i/c IT Return Certificate from contracting business in each year.
6.	Misc. document	I. Electrical Contractor License & supervisory certificate II. Valid Labour License III. EPF Registration Certificate IV. Any other important document.

B. Statutory Documents

After uploading the above mentioned non-statutory documents/certificates, Bidders shall submit the following, during real time bidding

1. NIT.
2. Bid Document.
3. All annexure/ formats/certificates i/c supporting documents/certificates in support of qualifying requirement other than mentioned in My Document specified in the Bid Document in single PDF.
4. Technical Data Sheet/GTPs, Guarantee/Test report etc. offered by the Original manufacturer and drawings specified in the Bid Document

Note-1: Failure of submission of any one of the above mentioned documents shall render the tender to summarily rejection.

Note-2: If the company was set up less than three years ago, audited balance sheet for the no of years since inception is to be submitted.



Note-3: Bidders are requested to scan the necessary documents/certificates in **100 dpi** resolution into PDF.

Bid - II (Financial Bid):

Documents to be submitted in the Financial Bid are:

1. BOQ (Bill of quantity/Price schedule).

Note: Bill of Quantity (BOQ) i.e. Price schedule, which is the Rate quoting sheet in Ms-excel shall be downloaded, filled up properly and uploaded in the financial bid after digital signing. The Bidder shall always open the BOQ sheet with Macros Enabled. The Bidder shall quote rates in figures only, for all items in the Bill of Quantity (BOQ).

- 15.0 BOQ (Price Schedule) TAMPERING:** The provided BOQ (Price schedule) in the Tender is meant for downloading in the Bidders client machine, for entering the relevant fields meant for rates & bidder's particulars and finally uploading in the Financial Bid. The BOQ Excel Sheet is Macro enabled and working with the Sheet requires the Macro to be allowed/ enabled to run.

Bidders are hereby warned not to tamper the Excel Sheet, make copies and work in a copied Sheet or break through the default Work-Sheet Security. Such BOQs with stated violations will be treated as Tampered BOQs and Bids uploaded with Tampered BOQs will be summarily rejected.

- 16.0** Bidders are allowed to bid 24x7 till the time of Bid closing, with option for Re-Submission, wherein only their latest submitted Bid will be considered for evaluation. The e-Procurement website will not allow any Bidder to attempt bidding, after the scheduled date and time.
- 17.0** For any clarification related to NIT/Bid Document/e-procurement, bidder(s) are requested to contact:

Deputy General Manager
Electrical Division-Teliamura
Tripura State Electricity Corporation Limited
Mail id: dgm.teliamura@tsecl.in

18.0 Addendum/amendments/corrigendum:

Before the last date for submission of Tenders, the Tender Inviting Authority may modify any of the Contents of the Tender Notice, Tender documents by issuing Amendment / Addendum / Corrigendum.

Any addendum/amendments/corrigendum issued by the Tender Inviting Authority shall be part of the tender Document and it shall be published in the e-procurement portal at <http://www.tripuratenders.gov.in>. Registered Bidders shall be notified of the related Corrigendum(s) by e-mail. However, TSECL shall bear no responsibility or liability arising out of non-receipt of the same in time or otherwise. Bidders are requested to visit the site frequently to check whether there is any related Corrigendum(s) or not.



19.0 *Tender Inviting Authority reserves the right to cancel/withdraw this invitation for bids without assigning any reason and shall bear no liability whatsoever consequent upon such a decision.*

20.0 The bidder shall bear all **cost and expenses** associated with purchase and submission of its bid document and **TSECL** will not be responsible or liable in any case for those cost, regardless of the conduct or outcome of the bidding process.

Deputy General Manager
Electrical Division-Teliamura
Tripura State Electricity Corporation Limited
Mail id: dgm.teliamura@tsecl.in



SECTION-II INSTRUCTION TO BIDDERS

1. GENERAL INSTRUCTIONS

The bidders are to satisfy themselves by actual site visit to the site of work as regards the prevailing condition of approaches, transportation facilities, availability of labours and availability of materials etc. before submission of bid. No claim or excuse on this account will be entertained at any stage later on.

The location of the work is under the jurisdiction of **Electrical Division-Teliamura**.

COST OF BIDDING

The Bidder shall bear all the costs and expenses associated with preparation and submission of its Bid including post-bid discussions, technical and other presentation etc. and the TSECL shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

2. THE BIDDING DOCUMENT

a. CONTENTS OF BIDDING DOCUMENTS

The goods and services required, bidding procedures and contract terms are as prescribed in the Bidding Documents.

In addition to the Invitation for Bids, the Bidding Documents is a compilation of the following sections:

Section-I	Notice Inviting E-Tender
Section-II	Instructions to Bidders
Section-III	General Conditions of Contract
Section-IV	Erection Conditions of Contract
Section-V	Standard Technical Specification & Guaranteed Technical Particulars
Section-VI	Special instructions to bidder(s)
Section-VII	Price Schedule/BoQ

b. UNDERSTANDING OF BIDDING DOCUMENTS

A prospective Bidder is expected to examine all instructions, forms, terms and specifications in the Bidding Documents and fully inform himself as to all the conditions and matters which may in any way affect the scope of work or the cost thereof. Failure to furnish all information required by the Bidding Documents or submission of a Bid not substantially responsive to the Bidding Documents in every respect shall be at the Bidder's risk and may result in the rejection of its Bid.

3. CLARIFICATIONS ON BIDDING DOCUMENTS

- 3.1 If prospective Bidder finds discrepancies or omissions in the specifications and documents or is in doubt as to the true meaning of any part or requires any clarification on Bidding Documents should make the request / notify the **Tender inviting Authority** of TSECL in writing. The concerned authority of TSECL shall respond in writing to any request for such clarification of the Bidding Documents, which it receives not later than fifteen (15) days prior to the deadline for submission of bids stipulated in tender notice.



Written copies of the response (including an explanation of the query but without identifying its source) shall be sent to all prospective bidders who purchased the tender document.

- 3.2 Verbal clarification and information given from any offices of TSECL or its employee(s) or representative (s) shall not in any way be binding on TSECL.

4. CORRIGENDUM /AMENDMENT TO BIDDING DOCUMENTS

- 4.1 At any time prior to the deadline for submission of bids, TSECL may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the Bidding Documents by amendment (s).
- 4.2 The amendment(s) will be published in the e-Tender portal at <http://www.tripuratenders.gov.in>. Registered Bidders shall be notified of the related Corrigendum(s) by e-mail. However, TSECL shall bear no responsibility or liability arising out of non-receipt of the same in time or otherwise. Bidders are requested to visit the site frequently to check whether there is any related Corrigendum or not.
- 4.3 In order to afford prospective bidders reasonable time to take the corrigendum/amendment into account in preparing their bids, TSECL may, at its discretion, extend the deadline for submission of bids.
- 4.4 Such corrigendum/amendment, clarifications, etc shall be binding on the bidders and shall be given due consideration by the bidders while they submit their bids and invariably enclose such documents as a part of the Bid.

5. PREPARATION OF BIDS

5.1. LANGUAGE OF BID

The Bid prepared by the Bidders and all correspondence and documents relating thereto, exchanged by the Bidder and TSECL, shall be written in English language, provided that any printed literature furnished by the bidder may be written in another language so long as accompanied by an English translation of its pertinent passages. Failure to comply with this may disqualify a bid. For purposes of interpretation of the bid, the English translation shall govern.

6. LOCAL CONDITIONS

- 6.1. It shall be imperative on each bidder to fully inform him of all local conditions and factors, which may have any effects on the execution of the contract covered under these documents and specifications. The Owner (TSECL) shall not entertain any request for clarification from bidders, regarding such local conditions.
- 6.2. It must be **understood and agreed that such factors as above have properly been investigated and considered while submitting the proposals**. No claim for financial adjustment to the Contract awarded under these specifications and documents shall be entertained by TSECL. Neither any change in the time schedule of the Contract nor any financial adjustments arising thereof shall be permitted by TSECL.

7. DOCUMENTS COMPRISING THE BID

The Bid shall be submitted in 2(Two) parts, post registration in the <http://www.tripuratenders.gov.in>, as under:



Part - I (Technical Bid):

1. Containing Tender Fee & Earnest Money as per the stipulations described under the title "Notice Inviting E-Tender" of Section 1 in this Bid Document. No financial aspect will be entertained in technical bid
2. Containing Documentary Evidence of the Bidder fulfilling the Qualifying Requirements stipulated in the NIT / Bid Document along with other necessary documents. The document to be submitted shall include copies of the relevant work order / purchase order / Award letters / Agreements etc. and corresponding completion and performance certificates issued by the concerned clients.
3. Containing Bidders Technical Proposal, GTPs, drawings, etc. along with his Commercial Terms, Payment Terms in conformity with the Bid Documents.

Part - II (Price Bid):

Only the successfully qualified Technical bidders shall be considered for opening of Price bid.

The Price Bid shall be consisting of the following documents:

Bill of Quantity (BOQ) i.e. the Price Bidding Schedule - to be downloaded.

Regarding **Bill of Quantity** mentioned as above (BOQ), the Bidder shall download the BOQ file in XLS format from the Tender document. All cells of the XLS document will be protected except the field (Bidder's Name and Rates only in figures), the Bidder is expected to fill in. The BOQ XLS document shall contain bundled Macros which shall have to be enabled for automatic calculations and "figure to word conversions".

8. SCOPE OF THE PROPOSAL

- 8.1. The scope of the proposal shall cover site survey, supply, erection, testing, commissioning & extension of LT Line & New service connection to Un-electrified households specified under the accompanying Technical Specification and requirement.

The above Scope of work is only indicative. The detailed scope has been described as per schedule of item(s)/BOQ.

- 8.2. Bids containing deviations from provisions relating to the following clauses shall be considered as '**non-responsive**':
 - a) Price Basis and Payments & Price Adjustment: Clause 12.0 (Section-II,) 32.0& 33.0 (Section-III,)
 - b) Bid Guarantee: Clause 8.0, Section-I
 - c) Contract Performance Guarantee: Clause 11.0, Section-I
 - d) Liquidated Damages: Clause 13.0, General Condition of Contract (Section-III)
 - e) Guarantee: Clause 14.0, Section-III
 - f) Payment: Clause 33.0, Section-III

The determination of a Bid's responsiveness will be based on the contents of the Bid itself without recourse to extrinsic evidence.



8.3. Bids not covering the above entire Scope of Work shall be treated as incomplete and hence rejected.

9. BID PRICE

9.1 The Bidder shall quote unit rates as per the downloaded **BOQ XLS** file and upload the same in Financial Part of the Tender.

10. ALTERNATE PROPOSALS

10.1. Bidder shall submit offers that comply with the requirements of the bidding documents, **including** the basic technical design as indicated in the drawing and specifications. Alternatives will not be considered.

11. PRICE BASIS AND PAYMENTS

11.1. The bidders shall quote in their proposal price for the entire Scope of Supply covered under the Technical Specification as required in the "How to Quote Price" in this Section followed by BOQ.

11.2. Bidder shall indicate Bid prices in Indian Rupees only

12. TAXES AND DUTIES

12.1. Price Shall be quoted in Rupees only, in the BoQ uploaded in the portal. **Quoted Prices shall be FIRM and inclusive of all cost of labour, insurance, EPF charges, spares, T&Ps, all consumables & materials and all applicable tax and duties.**

12.2. **Goods and Services Tax (GST)** as applicable on twenty eight (28) days prior to deadline for submission of bids, shall be mentioned in the BoQ/Price Bid.

12.3. **Applicable GST shall be reimbursed by TSECL on submission of actual documentary proof based on tax invoices raised by the contractor.**

12.4. **Statutory** variation in Taxes & duties after twenty eight (28) days prior to deadline for submission of bids and during the scheduled completion period will be adjusted / reimbursed against production of documentary evidence.

12.5. **Income** Tax as admissible will be deducted at source for which necessary TDS certificate will be issued"

13. TIME SCHEDULE

13.1. The basic consideration and the essence of the Contract shall be strict adherence to the time schedule for performing the specified works.

13.2. The completion schedule as stated in ITB 14.3 shall be one of the major factors in consideration of the Bids.

13.3. **TSECL reserves the right to request for a change in the work schedule during post-bid discussion with successful bidder.**

14. CONTRACT QUALITY ASSURANCE

14.1. The Bidder shall include in his proposal, the quality assurance programme containing the overall quality management and procedures which he proposed to follow in the performance of the works during various phases, as detailed in relevant clause of the General Technical Conditions.

14.2. At the time of award of Contract, the detailed quality assurance programme to be followed for the execution of the contract shall be mutually discussed and agreed to and such agreed programme shall form part of the contract.



15. INSURANCE

The bidder's insurance liabilities pertaining to the Scope of Work is detailed out in clauses titled insurance in General Terms & Conditions of Contract and in Erection Conditions of Contract. Bidder's attention is specifically invited to these clauses. The bid price shall include all the cost in pursuance of fulfilling all the insurance liabilities under the Contract.

16. BRAND NAMES

All the equipment / materials / PCC Pole / Insulators / Steel Sections / ACSR / Hardware & Stay Sets/Spares etc shall be supplied as per the attached technical specification. Any deviation in this regard shall not be entertained. In case brand names are not specified in the attached technical specification, standard equipment / materials of reputed manufacturer acceptable to TSECL shall be supplied.

17. BID GUARANTEE

- 17.1. The Bidder shall furnish, as part of its Bid, earnest money for an amount as specified in the Notice Inviting Tender (NIT) in the shape of demand draft only in favour of DGM, ED-Teliamura, Tripura State Electricity Corporation Limited payable **at SBI, Teliamura Branch.**
- 17.2. The earnest money is required to protect TSECL against the risk of Bidder's conduct, which would warrant the earnest money forfeiture pursuant to Para 18.7.
- 17.3. The earnest money shall be deposited in Indian rupees only.
- 17.4. Any bid not secured in accordance with para 18.1 and 18.3 above shall be rejected by TSECL as non-responsive.
- 17.5. The earnest money of the unsuccessful Bidders shall be discharged /returned as per clause 8.0 of Section – I.
- 17.6. **The earnest money shall be forfeited:**
 - a. If a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the bid form; or
 - b. In case of a successful Bidder fails:
 - i) to sign the contract; or
 - ii) to furnish the 'Contract Performance Guarantee'.
- 17.7. No interest shall be payable by TSECL on the above earnest money.

18. PERIOD OF VALIDITY OF BIDS

- 18.1. Bids shall remain valid for **6 (Six) calendar months** after the date of bid opening prescribed by TSECL, unless otherwise specified in the accompanying Special Conditions of Contract. A Bid valid for a shorter period shall be rejected by TSECL as non-responsive.



- 18.2. In exceptional circumstances, TSECL may solicit the Bidder's consent to an extension of the period of Bid validity. The request and the response thereto shall be made in writing (including cable or fax). The Earnest money provided under Clause 6.0 of Section- I shall also be retained up to the extended period. No interest shall be payable by TSECL for retaining the earnest money upto the extended period. A Bidder may refuse the request without forfeiting the earnest money deposited by him. A Bidder granting the request shall not be required or permitted to modify his Bid.

SUBMISSION OF BIDS

19. FORMAT OF BID

- 19.1. Bids are to be submitted online through the website, and as, stated in Clause 1.0 and 2.0 and 3.0. All the Bidding documents (SBD, Scan copy of tender fee) uploaded by the TSECL form an integral part of the contract. Bidders are required to upload these bidding documents as asked for in the Bid, through the above website and within the stipulated date and time mentioned in the Tender.

Tenders are to be submitted in two folders at a time for each work, one for Technical Proposal and the other for Financial Proposal. The Bidder shall carefully go through the requirements and prepare the required documents to be uploaded.

In Technical Bid, Bidder shall have to submit the entire requisite document as specified in the SBD(SBD, Scan copy of tender fee and EMD ,All forms/Amendments/Formats/Annexure with supporting documents/certificates, Technical Data Sheet/GTPs and drawings, Test Reports, Financial, Tax related document, machinery & manpower details specified in the Bid Document etc.

In, Financial Bid Bidder shall upload BoQ in the financial Bid.

The bidder shall scan all the documents before uploading and all scanned documents shall be of 100 dpi resolution in Portable Document Format (PDF).The scanned documents shall be uploaded in the designated locations of Technical Bid and Financial Bid, as prompted by the e-Procurement website.

The Bidder needs to fill up their name and rates for all the items and in the designated Cells of the downloaded BOQ for the related work, and upload the same in the designated location of Financial Bid. The documents uploaded are virus scanned and digitally signed using the Digital Signature Certificate (DSC). Bidders shall specially take note of all the addendum/corrigendum related to the tender and upload the latest documents as part of the tender.

Bid -I (Technical Bid):

The Technical Bid/Bid Envelop-I should contain scanned copies and/or declarations in the following standardized formats.

A. My Document (Non-Statutory):

All the below-mentioned documents/certificates are to be uploaded with digital signature in the 'My Document' folder option available after login in the e-procurement portal <http://tripuratenders.gov.in>. Bidders are requested to scan the necessary documents in 100 dpi resolution into PDF. 'My Document' shall be populated prior to real time bidding and during real time bidding, uploaded documents/certificates in the 'My Document' are to be appropriately included (Checked) for incorporation in the Bid.



An indicative organization of 'My Document' folder and the related documents are indicated here under.

Sl.	Folder Name	Documents to be uploaded
1.	Mfglic	Company Details: i) Registration of the firm/Partnership deed/Articles of Association/Joint Venture/consortium.
2.	DNIT Documents	i) Corrigendum, if published
3.	Machinery Details	i) Machinery & Manpower in possession of the firm:
4.	Tax related document	i) GST Registration certificate ii) IT PAN
5.	Financial details	Audited Balance Sheets of last three financial years with auditor's certificate regarding annual turnover i/c IT Return Certificate from contracting business in each year.
6.	Misc. document	i) Electrical Contractor License & supervisory certificate ii) Valid Labour License iii) Any other important document.

B. Statutory Documents:

After uploading the above mentioned non-statutory documents/certificates, Bidders shall submit the following, during real time bidding

1. NIT.
2. Bid Document.
3. All annexure/ formats/certificates i/c supporting documents/certificates in support of qualifying requirement other than mentioned in My Document specified in the Bid Document in single PDF.
4. Technical Data Sheet/GTPs, Guarantee/Test report etc. offered by the Original manufacturer and drawings specified in the Bid Document

Note-1: Failure of submission of any one of the above mentioned documents shall render the tender to summarily rejection.

Note-2: If the company was set up less than three years ago, audited balance sheet for the no of years since inception is to be submitted.

Note-3: Bidders are requested to scan the necessary documents/certificates in **100 dpi** resolution into PDF.

Bid -II (Financial Bid):

Documents to be submitted in the Financial Bid are:

1. BOQ (Bill of quantity/Price schedule).

Note: Bill of Quantity (BOQ) i.e. Price schedule, which is the Rate quoting sheet in Ms-excel shall be downloaded, filled up properly and uploaded in the financial bid after digital signing. The Bidder shall always open the BOQ sheet with Macros Enabled. The Bidder shall quote rates in figures only, for all items in the Bill of Quantity (BOQ).



- 19.2. **BOQ (Price Schedule) TAMPERING:** The provided BOQ (Price schedule) in the Tender is meant for downloading in the Bidders client machine, for entering the relevant fields meant for rates & bidder's particulars and finally uploading in the Financial Bid. The BOQ Excel Sheet is Macro enabled and working with the Sheet requires the Macro to be allowed/ enabled to run.
- 19.3. Bidders are hereby warned not to tamper the Excel Sheet, make copies and work in a copied Sheet or break through the default Work-Sheet Security. Such BOQs with stated violations will be treated as Tampered BOQs and Bids uploaded with Tampered BOQs will be summarily rejected.
- 19.4. Bidders are allowed to bid 24x7 till the time of Bid closing, with option for Re-Submission, wherein only their latest submitted Bid will be considered for evaluation. The e-Procurement website will not allow any Bidder to attempt bidding, after the scheduled date and time.
- 19.5. For any clarification related to NIT/SBD/e-procurement, bidder(s) are requested to contact:

**Deputy General Manager
Electrical Division-Teliamura
TSECL, Khowai District.**

20. SIGNATURE OF BIDS

- 20.1. Bid by a partnership must be furnished with full names of all partners and be signed with the partnership name, followed by the signature(s) and designation(s) of the authorized partner(s) or other authorized representative(s) and as per Section I & II of the BID.
- 20.2. Bids by Corporation / Company must be signed with the **legal name of the Corporation/Company** by the President, Managing Director or by the Secretary or other person or persons authorized to Bid on behalf of such Corporation / Company in the matter.
- 20.3. A Bid by a person who affixes to his signature the word 'President', 'Managing Director', 'Secretary', 'Agent', or other designation without disclosing his principal shall be rejected.
- 20.4. Satisfactory evidence of authority of the person signing on behalf of the Bidder shall be furnished with the Bid.
- 20.5. The Bidder's name stated on the proposal shall be exact legal name of the firm.
- 20.6. Bids not conforming to all the above requirements of **para 21.0** above may be disqualified.
- 20.7. The original tender document shall be **digitally signed** by the bidder and will be uploaded during the e-Bid as part of the financial bid.

21. SEALING AND MARKING OF BIDS

22. DEADLINE FOR SUBMISSION OF BIDS

- 22.1. TSECL may, at its discretion, extend this deadline for the submission of Bids, in which case all rights and obligations of TSECL and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.

23. MODIFICATION AND WITHDRAWAL OF BIDS

- 23.1. Withdrawal of Bid is not permitted.
- 23.2. The Bidder may Revise (modify) his Bid as many number of times he wants, till the point of Tender Closing. In such case, only his last modified Bid would be considered for evaluation.



24. INFORMATION REQUIRED WITH THE PROPOSAL

- 24.1. The Bids must clearly indicate the name of the manufacturer, the type of model of each principal item of equipment proposed to be furnished and erected. The Bid shall also contain drawings and descriptive materials indicating general dimensions, principles of operation, the extent of pre-assembly involved, major construction equipment proposed to be deployed, method of erection and the proposed erection organizational structure.
- 24.2. **The above information shall be provided by the Bidder in the form of separate sheets, drawings, catalogues, etc. in five copies.**
- 24.3. Any bid not containing sufficient descriptive material to describe accurately the equipment proposed, shall be treated as incomplete and hence rejected. Such descriptive materials and drawings submitted by the Bidder shall be retained by TSECL. Any major departure from these drawings and descriptive material submitted shall not be permitted during the execution of the Contract without specific written permission of TSECL.
- 24.4. Oral statements made by the Bidder at any time regarding quality, quantity or arrangement of the equipment or any other matter shall not be considered.
- 24.5. Standard catalogue pages and other documents of the Bidder may be used in the Bid to provide additional information and data as deemed necessary by the Bidder.
- 24.6. **In case the proposal information contradicts specification requirements; the specification requirements shall govern, unless otherwise brought out clearly in the technical / commercial deviation schedule.**

BID OPENING AND EVALUATION

25. OPENING OF BIDS BY TSECL

- 25.1. The Employer will designate Tender Opening Authority for each and every Bid separately, and the Technical bids will be opened online by them at the time and date, as specified in the NIT/ Standard Bid Documents.
- 25.2. All the Statements, Documents, Certificates, Demand Draft / Bank Guarantee etc. submitted/uploaded by the Bidders will be verified for technical evaluation. The clarifications and particulars, if any, required from the bidders, will be obtained by addressing the bidders directly. The technical bids will be evaluated against the specified parameters/ criteria mentioned in the BID, and in the same process as done in the case of conventional tenders. The technically qualified bidders will be identified and considered for their Financial Bid opening. The result of Technical Bids evaluation shall be displayed in the e-procurement portal and all the Bidders who have participated in the Tender will be able to access the same.
- 25.3. The Bidders or their authorized representatives may remain present at the time of opening of the tenders. Either the Bidder himself or one of his representative with proper authorization only will be allowed at the time of tender opening. If any of the Bidders is not present at the time of opening of tenders, the tender opening authority will, on opening the tender of the absentee Bidder, read out and record the deficiencies if any, and this will be binding on the Bidder.



- 25.4. The Minutes of the Technical bid opening shall be recorded and signed by the Tender Opening Authority as well as Bidders or their Authorized Representatives present and the same shall be uploaded and can be accessed in the e-procurement portal.
- 25.5. The Price bids (Financial bids) of all the technically qualified bidders will be opened by the concerned Tender Opening Authority at the specified date and time. The same can be tracked through the e-procurement portal by all the technically qualified bidders who participated in the tender. However, Qualified Bidders or their authorized representatives may remain present at the Price Bid (Financial bid) opening.
- 25.6. The Financial Bid's Item-wise Rates and total amount shall be read out, Minutes of the Bid opening shall be recorded and the Bidder's signatures will be taken in the minutes. The result of financial bids (Price bids) evaluation shall be displayed in the e-procurement portal and Bidders can access the same
- 25.7. The 'BOQ comparative chart' generated & displayed from the e-procurement portal, after the opening of financial Bid (which will be displayed as 'BOQ comparative chart' at financial bid opening summary page), will not be final.
- 25.8. Employer will prepare comparative Statement as per the decision of the Financial Bid Evaluation Committee in the Employer, which will be appropriately displayed in the e-procurement portal (this will be displayed at financial bid opening summary page).
- 25.9. The Price Bid (Financial Bid) of the Unqualified Bidders will not be opened.

26. CLARIFICATION OF BIDS

- 26.1. During in the examination, evaluation and comparison of Bids, TSECL may, at its discretion, ask the Bidder for a clarification in writing before opening of Price bid Once Price bid is opened no clarification will be done.

27. PRELIMINARY EXAMINATION

- 27.1. TSECL shall 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.
- 27.2. The Bidder shall ensure that the prices furnished by him are complete. In the case of not quoting of rates of any item (supply/erection) in the downloaded BOQ XLS file, TSECL shall be entitled to consider the highest price of the tender for the purpose of evaluation and for the purpose of evaluation and for the purpose of award of the Contact, use the lowest prices of the tender.
- 27.3. Prior to the detailed evaluation, TSECL shall determine the substantial responsiveness of each Bid w.r.t. Bidding Documents. For purpose of these Clauses, a substantially responsive Bid is one which conforms to all the terms and conditions of the Bidding Documents without material deviations. A material deviation is one which affects in any way the prices, quality, quantity or delivery period of the equipment or which limits in any way the responsibilities or liabilities of the Bidder or any right of TSECL as required in these specifications and documents. TSECL determination of a Bid's responsiveness shall be based on the contents of the Bid itself without recourse to extrinsic evidence.
- 27.4. A Bid determined as not substantially responsive shall be rejected by TSECL and may not subsequently be made responsive by the Bidder by correction of the non-conformity.
- 27.5. TSECL may waive any minor non-conformity or irregularity in a Bid which does not constitute a material deviation, provided such waiver does not prejudice or affect the relative ranking of any Bidder.



28. DEFINITIONS AND MEANINGS

- 28.1. For the purpose of the evaluation and comparison of bids, the following meanings and definition shall apply: -
- 'Bid Price'** shall mean the base price quoted by each Bidder in his proposal for the complete scope of works.
 - "Cost Compensation for Deviations"** shall mean the Rupee value of deviations from the Bidding Documents, as determined from the Bidder's proposal.
 - "Evaluated Bid Price"** shall be the summation of 'Bid Price', 'Differential Price' and 'Cost Compensation for Deviations'.
- 28.2. Calculation of Differential Price & Cost Compensation for Deviations.
- 28.3. **Deviations from the Bidding Documents in so far as practicable shall be converted to a Rupee value and added to the Bid Price to compensate for the deviation from the Bidding Documents while evaluating the Bids. In determining the Rupee value of the deviations, TSECL shall use parameters consistent with those specified in the specifications and documents and/or other information as necessary and available to TSECL.**

29. COMPARISON OF BIDS

- 29.1. For comparison purposes all the evaluated bid prices shall be in Indian Rupee as under:-
- $$W = M + D$$
- Where,
- W = Total Comparison Price
- M = Bid Price including ex-works value of equipment/ materials and other taxes & duties including local taxes, freight and insurance charges, cost of erection /services including works contract tax and other components of bid price, if any.
- D = Cost compensation for deviations calculated according to **Para 29.3.** above.
- 29.2. Evaluated bid prices of all the bidders shall be compared among themselves to determine the lowest evaluated Bid and, as a result of this comparison, the lowest Bid shall be selected for consideration of award of the Contract.

30. CONTACTING THE OWNER

Bids shall be deemed to be under consideration immediately after they are opened and until such time official intimation of award/rejection is made by TSECL to the Bidders. While the bids are under consideration, Bidders and/or their representatives or other interested parties are advised to refrain from contacting by any means, the Owner and/or his employees/representatives on matters relating to the bids under consideration. TSECL, if necessary, shall obtain clarifications on the bids by requesting for such information from any or all the Bidders, either in writing or through personal contacts as may be necessary. Bidders shall not be permitted to change the substance of the bids after the bids have been opened.



AWARD OF CONTRACT

31. AWARD CRITERIA

- 31.1. TSECL shall award the Contract to the successful Bidder whose bid has been determined to be substantially responsive and has been determined as technically acceptable and lowest evaluated Bid, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily. TSECL shall be the sole judge in this regard.
- 31.2. Further, TSECL reserves the right to award separate Contracts to two or more parties in line with the terms and conditions specified in the accompanying Technical Specifications.

32. OWNER'S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS

- 32.1. TSECL reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to award of contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for such action.

33. NOTIFICATION OF AWARD

- 33.1. Prior to the expiration of the period of bid validity and extended validity period, if any, TSECL shall notify the successful Bidder in writing by registered letter or by telex or FAX, to be confirmed in writing by registered letter, that his Bid has been accepted.
- 33.2. The Notification of Award/Letter of Award shall constitute the formation of the Contract.
- 33.3. **Upon the successful Bidder's furnishing of Contract Performance Guarantee pursuant to Clause 11.0 of Section – I. TSECL shall promptly notify each unsuccessful Bidder and will discharge its bid guarantee, pursuant to Clause 8 (Section – II)**

34. SIGNING OF CONTRACT

- 34.1. At the same time as TSECL notifies the successful Bidder that its bid has been accepted, TSECL shall send the Bidder the detailed Letter of Award.
Within 15(fifteen) days of receipt of the detailed Letter of Award, the successful Bidder shall convey in writing unconditional acceptance of the Letter of Award and shall attend the respective office of TSECL for signing the contract agreement.

35. CONTRACT PERFORMANCE GUARANTEE

- 35.1. On award of work the successful bidder shall have to deposit a contract performance guarantee (CPG) equivalent to 10% of the LOA value / Supply order value in the shape of Demand Draft in favour of DGM, ED-Teliamura, Tripura State Electricity Corporation Limited from any schedule Bank guaranteed by Reserve Bank of India, payable at SBI, Teliamura Branch or in the shape of Bank Guarantee from a Public sector / scheduled Indian Bank guaranteed by Reserve Bank of India. The CPG shall remain valid for actual delivery period plus guarantee period against the item (CPG is to be extended further subject to actual delivery period).
- 35.2. Earnest Money (EM) deposited will be merged / adjusted towards Contract Performance Guarantee (CPG) in the shape of **Demand Draft/Banker Cheque** in favour of DGM, ED-Teliamura, **TRIPURA STATE ELECTRICITY CORPORATION LIMITED** from any schedule bank guaranteed by Reserve Bank of India payable at SBI, Teliamura Branch or in the shape of **Bank guarantee** from a **Public Sector / Scheduled Indian Bank guaranteed by Reserve Bank of India** (the latest annual report of the Bank should support compliance of capital adequacy ratio requirement) in the form attached as



Annexure – I in favour of TRIPURA STATE ELECTRICITY CORPORATION LIMITED. The guarantee amount shall be equal to ten percent (10%) of the Contract Price and it shall guarantee the faithful performance of the Contract in accordance with the terms and conditions specified in these documents and specifications. The earnest money deposited at the time of tender shall be adjusted with the contract performance guarantee.

The contract performance guarantee submitted in the shape of Bank guarantee shall be valid for actual execution period of the contract and up to guarantee period as per Clause – 14 of section – III. The performance security of a joint venture/consortium shall be in the name of Lead Partner of the joint venture.

- 35.3. The Performance Guarantee shall cover additionally the following guarantees to TSECL:
- a. The successful Bidder guarantees the successful and satisfactory operation of the equipment supplied and erected under the Contract, as per the specifications and documents.
 - b. The successful Bidder further guarantees that the equipment provided and installed by him shall be free from all defects in design, material and workmanship and shall upon written notice from TSECL fully remedy free of expenses to TSECL such defects as developed under the normal use of the said equipment within the period of guarantee specified in the relevant clause of the General Terms and conditions.
- 35.4. The Contract Performance Guarantee is intended to secure the performance of the entire contract. However, it is not to be construed as limiting the damages under clause entitled "Equipment Performance Guarantee" in Technical Specifications and damages stipulated in other clauses in the Bidding Documents.
- 35.5. The Contract performance Guarantee submitted in the shape of demand draft shall be returned to the Contractor without any interest at the end of successful completion and commissioning of the work against a Bank Guarantee of equivalent amount from any Public Sector / scheduled Indian Bank valid up to the Guarantee period. The Bank Guarantee such deposited shall be discharged after expiry of Guarantee period.

Additional Contract Performance Guarantee: -

For bid upto 15% less than the estimated value of work, no additional security deposit is required. But for bid less than 15% of the estimated value of work, the difference between the quoted amount and 85% of the estimated value of work, shall be paid by the successful bidder at the time of concluding the agreement as an additional security to fulfill the contract through Bank Guarantee or Demand Draft on a Nationalized Bank/Scheduled Bank in the prescribed Format valid till the completion of the work in all respect.

- 35.6. **The contract performance Guarantee shall be forfeited:**
- a) **If the contractor left / suspends the work without prior written intimation to the owner's Engineer in charge of the work stating the reasons for such suspension of work.**
 - b) **If the contractor left / suspends the work for reasons which are not acceptable to TSECL.**



36. CORRUPT OR FRAUDULENT PRACTICES

- 36.1. TSECL expects the bidders / suppliers / contractors to observe the highest standards of ethics during the procurement and execution of such contracts. In pursuance of this policy, TSECL
- a. defines, for the purpose of this provision, the terms set forth below as follows;
 - I. "Corrupt practice" means offering, giving, receiving or soliciting of anything of value to influence the action of a official in the procurement process or in contract execution, and
 - II. "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the owner, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the owner from the benefits of free and open competition.
 - b. Will reject a proposal for award if it determines the bidder recommended for award has engaged a corrupt or fraudulent practice in competing for the contract in question.
 - c. Will declare a firm ineligible, either indefinitely or for a stated period of time, if TSECL at any time determines that the firm has engaged in corrupt / fraudulent practices in competing for, or in executing the contract.



SECTION-III
GENERAL TERMS & CONDITIONS OF CONTRACT

A. INTRODUCTION

1.0 DEFINITION OF TERMS

- 1.1** 'The Contract' means the agreement entered into between Tripura State Electricity Corporation Limited and Contractor as per the Contract Agreement signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.
- 1.2** 'Owner' shall mean **TRIPURA STATE ELECTRICITY CORPORATION LIMITED (TSECL)** and shall include their legal representatives, successors and assigns.
- 1.3** '**Contractor**' or '**Manufacturer**' shall mean the Bidder whose bid shall be accepted by TSECL for award of the Works and shall include such successful Bidder's legal representatives, successors and permitted assigns.
- 1.4** '**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 owner's Engineer in charge of the work and shall include the legal representatives, successors and permitted assigns of such person.
- 1.5** '**Consulting Engineer**'/'**Consultant**' shall mean Power Grid Corporation of India Ltd. or any firm or person duly appointed as such from time to time by TSECL ..
- 1.6** The terms '**Equipment**', '**Stores**' and '**Materials**' shall mean and include equipment, stores and materials to be provided by the Contractor under the Contract.
- 1.7** '**Works**' shall mean and include the furnishing of equipment, labour and services, as per the Specifications and complete erection, testing and putting into satisfactory operation including all transportation, handling, unloading and storage at the Site as defined in the Contract.
- 1.8** '**Specifications**' shall mean the Specifications and Bidding Documents forming a part of the Contract and such other schedules and drawings as may be mutually agreed upon.
- 1.9** '**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 TSECL or Contractor in the performance of the Contract.
- 1.10** The term '**Contract Price**' shall mean the item wise price / lump-sum price quoted by the Contractor in his bid with additions and/or deletions as may be agreed and incorporated in the Letter of Award, for the entire scope of the works.
- 1.11** The term '**Equipment Portion**' of the Contract price shall mean the ex-works value of the equipment.
- 1.12** The term '**Erection Portion**' of the Contract price shall mean the value of field activities of the works including erection, testing and putting into satisfactory operation including successful completion of performance and guarantee tests to be performed at Site by the Contractor including cost of insurances.
- 1.13** '**Manufacturer's Works**' or '**Contractor's Works**', shall mean the place of work used by the manufacturer, the Contractor, their collaborators/associate or sub-contractors for the performance of the Contract.
- 1.14** '**Inspector**' shall mean TSECL or any person nominated by TSECL from time to time, to inspect the equipment; stores or Works under the Contract and/or the duly authorized representative of TSECL.



- 1.15 **'Notification of Award of Contract'/Letter of Award'/Telex of Award'** shall mean the official notice issued by TSECL notifying the Contractor that his bid has been accepted.
- 1.16 **'Date of Contract'** shall mean the date on which Notification of Award of Contract/Letter of Award/Telex of Award has been issued.
- 1.17 **'Month'** shall mean the calendar month. 'Day or 'Days', unless herein otherwise expressly defined, shall mean calendar day or days of 24 hours each.
A **'Week'** shall mean continuous period of seven (7) days.
- 1.18 "Writing" shall include any manuscript, type written or printed statement, under or over signature and/or seal as the case may be.
- 1.19 When the words 'Approved', 'Subject to Approval', 'Satisfactory', 'Equal to', 'Proper', 'Requested', 'As Directed', 'Where Directed', 'When 'Determined by', 'Accepted', 'Permitted', or words and phrases of like importance are used, the approval, judgment, direction etc. is understood to be a function of TSECL.
- 1.20 **"Test on Completion"** shall mean such tests as prescribed in the Contract to be performed by the Contractor before the work is Taken Over by TSECL.
- 1.21 **'Start Up'** shall mean the time period required to bring the equipment covered under the Contract from an inactive condition, when construction is essentially complete, to the state ready for trial operation. The startup period shall include preliminary inspection and checkout of equipment and supporting sub-system, initial operation of the complete equipment covered under the Contract to obtain necessary pre-trial operation data, perform calibration and corrective action, shut down, inspection and adjustment prior to the trial operation period.
- 1.22 **"Initial Operation"** shall mean the first integral operation of the complete equipment covered under the Contract with the sub-system and supporting equipment in service or available for service.
- 1.23 **'Trial Operation', 'Reliability Test', 'Trial Run', 'Completion Test'** shall mean the extended period of time after the start up period. During this trial operation period, the unit shall be operated over the full load range. The length of Trial Operation shall be as determined by the Engineer of TSECL unless otherwise specified elsewhere in the Contract.
- 1.24 **'Performance and Guarantee Test'** shall mean all operational checks and tests required to determine and demonstrate capacity, efficiency and operating characteristics as specified in the Contract Documents.
- 1.25 The term **'Final Acceptance/Taking Over'** shall mean written acceptance of the Works performed under the Contract by TSECL, after successful commissioning/completion of Performance and Guarantee Tests, as specified in the accompanying Technical Specification or otherwise agreed in the Contract.
- 1.26 **"Commercial Operation"** shall mean the Conditions of Operation in which the complete equipment covered under the Contract is officially declared by TSECL to be available for continuous operation at different loads upto and including rated capacity. Such declaration by TSECL, however, shall not relieve or prejudice the Contractor of any of his obligations under the Contract.
- 1.27 **'Guarantee period'/'Maintenance Period'** shall mean the period during which the Contractor shall remain liable for repair or replacement of any defective part of the works performed under the contract.
- 1.28 **'Latent Defects'** shall mean such defects caused by faulty designs, material or workmanship which cannot be detected during inspection, testing etc, based on the technology available for carrying out such tests.



1.29 'Drawings', 'Plans' shall mean all:

- a) Drawing furnished by TSECL as a basis for Bid Proposals.
- b) Supplementary drawings furnished by TSECL to clarify and define in greater detail the intent of the Contract.
- c) Drawings submitted by the Contractor with his Bid provided such drawings are acceptable to TSECL.
- d) Drawings furnished by TSECL to the Contractor during the progress of the Work; and
- e) Engineering data and drawings submitted by the Contractor during the progress of the Work provided such drawings are acceptable to the Engineer in charge of the work.

1.30 "Codes" shall mean the following including the latest amendments and / or replacement, if any:

- a) A.S.M.E. Test Codes.
- b) A.I.E.E. Test Codes.
- c) American Society of Testing Materials Codes.
- d) Standards of the Indian Standards Institutions.
- e) I.E.E. standards.
- f) I.E.C. standards.
- g) Other Internationally approved standards and / or Rules and **Regulations touching the subject matter of the Contract.**

1.31 Words imparting 'Person' shall include firms, companies, corporation and association or bodies of individuals.

1.32 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.

1.33 In addition to the above the following definitions 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'

2.0 APPLICATION

These General Conditions shall apply to the extent that they are not **superseded by provisions in other parts of the Contract.**

3.0 STANDARDS

The Goods supplied under this Contract shall conform to the standards mentioned in the Various Technical Specifications and when no applicable standard is mentioned to the authoritative standard appropriate to the Goods and such standards shall be the latest issued by the concerned institution.



4.0 LANGUAGE AND MEASURES

All documents pertaining to the Contract including specification, Schedules, notices, correspondence, operating and maintenance instructions, drawings or any other writing shall be written in English language. The Metric System of measurement shall be used exclusively in the Contract.

5.0 CONTRACT DOCUMENTS

5.1 The term "Contract Documents" shall mean and include the following which shall be deemed to form an integral part of the Contract:

- a) Invitation of Bid including letter forwarding the Bidding Documents, Instructions to Bidders, General Terms and Conditions of Contract, Erection Conditions of Contract and all other documents included under the Special Conditions of Contract and various other sections.
- b) Specifications of the equipment to be furnished and erected under the Contract as brought out in the accompanying Technical Specification.
- c) Contractor's Bid proposal and the documents attached there-to including the letter of clarifications thereto between the Contractor and TSECL prior to the Award of Contract.
- d) All the materials, literature, data and information of any sort given by the Contractor along with his bid, subject to the approval of TSECL.
- e) Letter of Award and any agreed variations of the conditions of the documents and special terms and conditions of contract if any.

6.0 USE OF THE CONTRACT DOCUMENTS AND INFORMATION

The Contractor shall not communicate or use in advertising, publicity, sales releases or in any other medium, photographs or other reproduction of the Works under this contract, or descriptions of the site, dimensions, quantity, quality, or other information, concerning the Works unless prior written permission has been obtained from TSECL.

7.0 JURISDICTION OF CONTRACT

The laws applicable to the Contract shall be the laws in force in India. The Courts of **Agartala** shall have exclusive jurisdiction in all matters arising **under this Contract**.

8.0 MANNER OF EXECUTION OF CONTRACT

8.1 The contractor should attend the concerned office of TSECL within 15(fifteen) days from the date of issue of the Letter of Award to the Contractor for signing the contract agreement.

The Contractor shall provide for signing of the Contract, Performance Guarantee, appropriate power of attorney and other requisite materials.

8.2 The Agreement shall be signed in two originals and the Contractor shall be provided with one signed original and the rest shall be retained by TSECL.



8.3 The Contractor shall provide free of cost to TSECL all the engineering data, drawings, and descriptive materials submitted with the Bid, in at least six (6) copies to form a part of the contract immediately after issue of Letter of Award.

8.4 Subsequent to signing of the Contract, the Contractor, at his own cost, shall provide TSECL with at least five (5) true copies of Agreement and one soft copy including 3(three) hard copies of the approved drawings within fifteen (15) days after the signing of the Contract.

9.0 ENFORCEMENT OF TERMS

9.1 The failure of either party to enforce at any time any of the provisions of this Contract or any rights in respect thereto or to exercise any option therein provided, shall in no way be construed to be a waiver of such provisions, rights or options or in anyway to affect the validity of the Contract. The exercise by either party of any of its rights herein shall not prejudice either party from exercising the same or any other right it may have under the **Contract**.

10.0 COMPLETION OF CONTRACT

10.1 Unless otherwise terminated under the provisions of any other relevant clause, this Contract shall be deemed to have been completed on the date stipulated in the NIT.

GUARANTEE & LIABILITIES

11.0 TIME – THE ESSENCE OF CONTRACT

11.1 The time and the date of completion of the Contract as stipulated in the Contract by TSECL without or with modifications, if any, and so incorporated in the Letter of Award, shall be deemed to be the essence of the Contract. The Contractor shall so organize his resources and perform his Work as to complete it not later than the date agreed to.

11.2 The Contractor shall submit a detailed **BAR CHART / PERT NETWORK** consisting of adequate number of activities covering various key phases of the Work such as design, procurement, manufacturing, shipment and field erection activities within fifteen (15) days of the date of Notice of Award of Contract. This Bar Chart shall also indicate the interface facilities to be provided by TSECL and the dates by which such facilities are needed. The Contractor shall discuss with TSECL for finalization and approval of the Bar Chart by TSECL. The agreed Bar Chart shall form part of the contract documents. During the performance of the Contract, if in the opinion of the owner's Engineer in charge of the work, proper progress is not maintained, suitable changes shall be made in the Contractor's operations to ensure proper progress without any cost implication to TSECL. The interface facilities to be provided by TSECL in accordance with the agreed Bar Chart shall also be reviewed while reviewing the progress of the Contractor.

11.3 Based on the agreed Bar Chart fortnightly reports shall be submitted by the Contractor as directed by the owner's Engineer in charge of the work.



11.4 Subsequent to the finalization of the Bar Chart, the Contractor shall make available to the owner's Engineer in charge of the work a detailed manufacturing programme in line with the agreed Contract Bar Chart. Such manufacturing programme shall be reviewed, updated and submitted to the owner's Engineer in charge of the work once in every month thereafter.

11.5 The above Bar Charts/manufacturing programme shall be compatible with TSECL computer environment and furnished to TSECL on such media as may be desired by TSECL.

12.0 EFFECTIVENESS OF CONTRACT

The Contract shall be considered as having come into force from the date of the Notification of Award, unless otherwise provided in the Notification of Award.

13.0 LIQUIDATED DAMAGES

13.1 In case the materials are not delivered within the time stipulated in the order or delay in achieving the milestones defined under Section II, clause 14, time schedule or in case of un-performed services, the supplier/contractor shall have to pay at the discretion of the competent authority of purchaser, the liquidated damages to be determined by the purchaser as 1 % of the delivered price of the delayed goods or un-performed work/ services for per week or part thereof of delay until actual delivery or performance subject to a maximum deduction of 5% of the delayed goods/work /services price. Due consideration may be given in the levy of damages for reasons absolutely beyond the control of the supplier for which documentary evidence shall be provided to the satisfaction of the competent delayed supplies

14.0 GUARANTEE

14.1 The Contractor shall warrant that the equipment shall be new, unused and in accordance with the contract documents and free from defects in material and workmanship for a period of Thirty (30) calendar months commencing immediately upon the satisfactory commissioning. The Contractor's liability shall be limited to the replacement of any defective parts in the equipment of his own manufacture or those of his sub-contractors under normal use and arising solely from faulty design, materials and/or workmanship provided always that such defective parts are repairable at the site and are not in the meantime essential in the commercial use of the equipment. Such replaced/defective parts shall be returned to the Contractor unless otherwise arranged. No repairs or replacement shall normally be carried out by owner's Engineer in charge of the work when the equipment is under the supervision of the Contractor's supervisory engineer.

14.2 In the event of any emergency, where in the judgment of the owner's Engineer in Charge of work, delay would cause serious loss or damages, repairs or adjustment may be made by him or a third party chosen by him without advance notice to the Contractor and the cost of such work shall be paid by the Contractor. In the event such action is taken by the Engineer in Charge of work, the Contractor shall be notified promptly and he shall assist wherever possible in making necessary corrections. This shall not relieve the Contractor of his liabilities under the terms and conditions of the Contract.



- 14.3 If it becomes necessary for the Contractor to replace or renew any defective portions of the Works, the provision of this clause shall apply to portion of the Works so replaced or renewed until the expiry of Twelve (12) months from the date of such replacement or renewal. If any defects are not remedied within a reasonable time, the Engineer in Charge of work may proceed to do the work at the Contractor's risk and cost, but without prejudice to any other rights which TSECL may have against the Contractor in respect of such defects.
- 14.4 The repaired or new parts shall be furnished and erected free of cost by the Contractor. If any repair is carried out on his behalf at the site, the Contractor shall bear the cost of such repairs.
- 14.5 The cost of any special or general overhaul rendered necessary during the maintenance period due to defects in the equipment or defective work carried out by the Contractor shall be borne by the Contractor.
- 14.6 The acceptance of the equipment by the Engineer in Charge of work shall in no way relieve the Contractor of his obligation under this clause.
- 14.7 In the case of those defective parts, which are not repairable at site but are essential for the commercial operation of the equipment, the Contractor and the Owner's Engineer in Charge of work shall mutually agree to a programme of replacement or renewal, which shall minimize interruption to the maximum extent in the operation of the equipment.
- 14.8 At the end of the guarantee period, the Contractor's liability ceases except for latent defects. For latent defects, the Contractor's liability as mentioned in clause nos. 14.1 through 14.7 above shall remain till the end of 5 years from the date of commissioning.
- In respect of goods supplied by sub-contractors to the Contractor, where a longer guarantee (more than 12 months) is provided by such sub-contractor, TSECL shall be entitled to the benefits of such longer guarantee.
- 14.9 The provisions contained in this clause shall not be applicable:
- a) If TSECL has not used the equipment according to the generally approved industrial practice and in accordance with the conditions of operations specified and in accordance with operating manuals, if any.
 - b) In cases of normal wear and tear of the parts to be specifically mentioned by the Contractor in the offer.

15.0 TAXES, PERMITS & LICENCES

The Contractor shall be liable and pay all non-Indian taxes, duties, levies lawfully assessed against TSECL or the Contractor in pursuance of the Contract. In addition, the Contractor shall be responsible for payment of all Indian duties, levies and taxes lawfully assessed against this contract.

16.0 REPLACEMENT OF DEFECTIVE PARTS AND MATERIALS

- 16.1 If during the performance of the Contract, owner's Engineer in charge of the work shall decide and inform in writing to the Contractor that the Contractor has manufactured any equipment, material or part of equipment unsound and imperfect or has furnished any equipment inferior to the quality specified, the Contractor on receiving details of such defects or deficiencies shall at his own expense within Seven (7) days of his receiving the notice, or otherwise, within



such time as may be reasonably necessary for making it good, proceed to alter, reconstruct or remove such works and furnish fresh equipment/materials upto the standards of the specifications. In case, the Contractor fails to do so, the Owner's Engineer in charge of the work may on giving the Contractor Seven (7) days notice in writing of his intentions to do so, proceed to remove the portion of the works so complained of and at the cost of the Contractor perform all such work or furnish all such equipment/materials.

- 16.2 The Contractor's full and extreme liability under this clause shall be satisfied by the payment to TSECL of the extra cost, of such replacement procured including erection as provided for in the Contract, such extra cost being the ascertained difference between the price paid by TSECL for such replacements and the Contract Price by portion for such defective equipment/materials/works and repayments of any sum paid by TSECL to the Contractor in respect of such defective equipment/material. Should TSECL not so replace the defective equipment/materials, the Contractor's extreme liability under this clause shall be limited to repayment of all sums paid by TSECL under the Contract for such defective equipment/materials.

17.0 PATENT RIGHTS AND ROYALTIES

Royalties and fees for patents covering materials, articles, apparatus, devices, equipment or processes used in the Works shall be deemed to have been included in the Contract Price. The Contractor shall satisfy all demands that may be made at any time for such royalties or fees and he alone shall be liable for any damages or claims for patent infringements and shall keep TSECL indemnified in that regard. The Contractor shall, at his own cost and expense, defend all suits or proceedings that may be instituted for alleged infringement of any patents involved in the Works, and, in case of an award of damages, the Contractor shall pay for such award. In the event of any suit or other proceedings instituted against TSECL, the same shall be defended at the cost and expense of the Contractor who shall also satisfy/comply with any decree, order or award made against TSECL. But it shall be understood that no such machine, plant, work, material or thing has been used by TSECL for any purpose or any manner other than that for which they have been furnished and installed by the Contractor and specified under these specifications. Final payment to the Contractor by TSECL shall not be made while any such suit or claim remains unsettled. In the event any apparatus or equipment, or any part thereof furnished by the Contractor, is in such suit or proceedings held to constitute infringement, and its use is enjoined, the Contractor shall at his option and at his own expense, either procure for TSECL, the right to continue the use of said apparatus, equipment or part thereof, replace it with non-infringing apparatus or equipment or modify it, so it becomes non-infringing.

18.0 DEFENCE OF SUITS

If any action in court is brought against TSECL for the failure, omission or neglect on the part of the Contractor to perform any acts, matters, or things under the Contract, or for damage or injury caused by the alleged omission or negligence on the part of the Contractor, his agents, representatives or his Sub-Contractors, or in connection with any claim based on lawful demands of Sub-Contractors, workmen, suppliers or employees, the Contractor shall in all such cases indemnify and keep TSECL, from all losses, damages, expenses or **decrees arising of such action.**



19.0 LIMITATION OF LIABILITIES

The final payment by TSECL in pursuance of the Contract shall mean the release of the Contractor from all his liabilities under the Contract. Such final payment shall be made only at the end of the Guarantee/Warranty Period, and till such time as the contractual liabilities and responsibilities of the Contractor, shall prevail. All other payments made under the Contract shall be treated as on-account payments.

20.0 POWER TO VARY OR OMIT WORK

- 20.1 No alterations, amendments, omissions, suspensions or variations of the Works (hereinafter referred to as 'variation') under the Contract as detailed in the Contract Documents, shall be made by the Contractor except as directed in writing by owner's Engineer in charge of the work, but he shall have full powers subject to the provisions hereinafter contained, from time to time during the execution of the Contract, by notice in writing to instruct the Contractor to make such variation without prejudice to the Contract. The Contractor shall carry out such variation and be bound by the same conditions as far as applicable as though the said variations occurred in the Contract Documents. If any suggested variations would, in the opinion of the Contractor, if carried out, prevent him from fulfilling any of his obligations or guarantees under the Contract, he shall notify the Engineer thereof in writing and the Engineer shall decide forthwith whether or not, the same shall be carried out and if the Engineer confirm his instructions, the Contractor's obligations and guarantees shall be modified to such an extent as may be mutually agreed. Any agreed difference in cost occasioned by any such variation shall be added to or deduced from the Contract Price as the case may be.
- 20.2 In the event of the Engineer requiring any variation, a reasonable and proper notice shall be given to the Contractor to enable him to work his arrangement accordingly, and in cases where goods or materials are already prepared or any design, drawings or pattern made or work done requires to be altered, a reasonable and agreed sum in respect thereof shall be paid to the Contractor.
- 20.3 In any case in which the Contractor has received instructions from the Engineer-in-charge of the work as to the requirement of carrying out the alterations or additional or substituted work which either then or later on, shall in the opinion of the Contractor, involve a claim for additional payment, the Contractor shall immediately and in no case later than Thirty (30) days, after receipt of the instructions aforesaid and before carrying out the instructions, advise the Owner's Engineer in charge of the work to that effect. But the Owner's Engineer in charge of the work shall not become liable for the payment of any charges in respect of any such variations, unless the instructions for the performance of the same shall be confirmed in writing by the Engineer in charge of the work.
- 20.4 If any variation in the Works results in reduction of Contract Price, the parties shall agree, in writing, to the extent of any change in the price, before the Contractor proceeds with the change.
- 20.5 In all the above cases, in the event of a disagreement as to the reasonableness of the said sum, the decision of owner's Engineer in charge of the work shall prevail.
- 20.6 Notwithstanding anything stated above in this clause, owner's Engineer in charge of the work shall have the full power to instruct the Contractor, in writing, during the execution of the Contract to vary the quantities of the items or groups of items in accordance with the provisions of clause entitled 'Change of Quantity in Section – III'. The Contractor shall carry



out such variations and be bound by the same conditions as though the said variations occurred in the Contract Documents.

21.0 ASSIGNMENT AND SUB-LETTING OF CONTRACT

21.1 The Contractor may, after informing owner's Engineer in charge of the work and getting his written approval, assign or sub-let the Contract or any part thereof other than supply of main equipment and any part of the plant for which makes are identified in the Contract. Suppliers of the equipment not identified in the Contract or any change in the identified suppliers shall be subjected to approval by the owner's Engineer in charge of the work. The experience list of equipment vendors under consideration by the Contractor for this Contract shall be furnished to the owner's Engineer in charge of the work for approval, prior to procurement of all such items/equipment. Such assignment/sub-letting shall not relieve the Contractor of any obligation, duty or responsibility under the Contract. Any assignment as above, without prior written approval of the owner's Engineer in charge of the work, shall be void.

21.2 For components/equipment procured by the Contractor for the purposes of the Contract, after obtaining the written approval of TSECL, the Contractor's purchase specifications and enquiries shall call for quality plan to be submitted by the suppliers along with their proposals. The quality plans called for from the Vendors shall set out, during the various stages of manufacture and installation, the quality practices and procedures followed by the Vendors quality control organization, the relevant reference document/standard used, acceptance level, inspection documentation raised, etc. Such quality plans of the successful vendors shall be discussed and finalized in consultation with the owner's Engineer in charge of the work and shall form part of the purchase order/contract between the Contractor and the Vendor. Within three weeks of the release of the purchase orders/contracts for such bought out items/components, a copy of the same without price details but together with detailed purchase specifications, quality plans and delivery conditions shall be furnished to the owner's Engineer in charge of the work by the Contractor.

22.0 CHANGE OF QUANTITY

22.1 During the execution of the Contract, TSECL reserves the right to increase or decrease the quantities of items under the Contract but without any change in unit price or other terms & conditions. Such variations shall not be subjected to any limitation for the individual items but the total variations in all such items including items not covered under the Contract shall be limited to $\pm 25\%$ of contract value.

22.2 The Contract price shall accordingly be adjusted based on the unit rates available in the Contract for the change in quantities as above. The base unit rates, as identified in the Contract shall however remain constant during the currency of the Contract, except as provided for in clause 32.0 below. In case, the unit rates are not available in the contract, the same shall be worked out as below: -

- i) If the rates for the additional, altered or substituted work are specified in the contract, the contractor is bound to carry the additional, altered or substituted work at the same rates as are specified in the contract.
- ii) If the rates for the additional, altered or substituted work are not specifically provided in the contract, the rates will be derived from a similar class of work as are specified in the contract.



- iii) If the rates for the additional, altered or substituted work includes any work for which no rate is specified in the contract / cannot be derived from the similar class of work in the contract, then such work shall be carried out at the rates which will be determined on the basis of current schedule of rate of TSECL above minus / plus the percentage which the total contract amount bears to the estimated cost put to tender. Provided always if the rate for particular part or parts of the item is not available in the schedule of rates the rate of such part or parts will be determined by TSECL of the work on the basis of the prevailing market rate when the work was done.
- iv) If the rates for the additional, altered or substituted work can not be determined in the manner specified in sub-clause i, ii & iii above, then the contractor shall within 7(Seven) days of receipt of order to carry out the order, inform the owner's Engineer in charge of the work of rate which it is his intention to charge for such class of work, supported by analysis of rate or rates claimed, and TSECL shall determine the rate or rates claimed with mutual settlement with the contractor.
- v) The deviation limit referred to above is the net effect (algebraically sum) of all additions and deductions ordered.
- vi) Time for the completion for the work shall be extended in the proportion that the altered, additional or substituted work bears to the original contract of the work and the certificate of the owner's Engineer in charge of the **work shall be conclusive for approval of the time extension by TSECL.**

23.0 PAKCING, FORWARDING AND SHIPMENT

- 23.1 The Contractor, wherever applicable, shall after proper painting, pack and crate all equipment in such a manner as to protect them from deterioration and damage during rail and road transportation to the site and storage at the site till the time of erection. The Contractor shall be held responsible for all damages due to improper package.
- 23.2 The Contractor shall notify the owner's Engineer in charge of the work of the date of each shipment from his works, and the expected date of arrival at the site.
- 23.3 The Contractor shall also give all shipping information concerning the weight, size and content of each packing including any other information the owner's Engineer in charge of the work may require.
- 23.4 The Contractor shall prepare detailed packing list of all packages and containers, bundles and loose materials forming each and every consignment dispatch to Site.

The Contractor shall further be responsible for making all necessary arrangements for loading, unloading and other handling, right from his works up to the Site and also till the equipment is erected, tested and commissioned. He shall be solely responsible for proper storage and safe custody of all equipment.

24.0 CO-OPERATION WITH OTHER CONTRACTORS AND CONSULTING ENGINEERS

The Contractor shall agree to cooperate with the TSECL's Consulting Engineers and freely exchange with them such technical information, as is necessary to obtain the most efficient and economical design and to avoid unnecessary duplication of efforts. The owner's



Engineer in charge of the work shall be provided with three copies of all correspondence addressed by the Contractor to the consulting Engineers of TSECL in respect of such exchange of technical information.

25.0 NO WAIVER OF RIGHTS

Neither the inspection by TSECL nor any order by TSECL for payment of money or any payment for or acceptance of, the whole or any part of the Works by the owner's Engineer in charge of the work, nor any extension of time, nor any possession taken by the owner's Engineer in charge of the work shall operate as a waiver of any provision of the Contract, or of any power herein reserved to TSECL or any right to damages herein provided nor shall any waiver of any breach in the Contract be held to be a waiver of any other or subsequent breach.

26.0 CERTIFICATE NOT TO AFFECT RIGHT OF TSECL AND LIABILITY OF CONTRACTOR.

No interim payment certificate of the owner's Engineer in charge of the work, nor any sum paid on account by TSECL, nor any extension of time for execution of the Works granted by TSECL shall affect or prejudice the rights of TSECL against the Contractor or relieve the Contractor of his obligation for the due performance of the Contractor, or be interpreted as approval of the Works done or of the equipment furnished and no certificate shall create liability for TSECL to pay for alterations, amendments, variations or additional works not ordered, in writing, by the owner's Engineer in charge of the work or discharge the liability of the Contractor for the payment of damages whether due, ascertained or certified or not or any sum against the payment of which he is bound to indemnify TSECL, nor shall any such certificate nor the acceptance by him of any sum paid on account or otherwise affect or prejudice the rights of TSECL against the Contractor.

27.0 INSPECTION AND TESTING OF EQUIPMENTS / MATERIALS

27.1 **All equipments / materials shall be dispatched by the contractor only after issuance of 'Materials Inspection Clearance Certificate (MICC)' by the inspecting officer / team of TSECL, Waiver of inspection may be done by TSECL special circumstances with deduction of inspection cost @5.00% of material for which inspection to be waived. In that case bidder should submit the routine test certificate of manufacturers which shall be on the basis for acceptance of such materials by TSECL. No such materials will be accepted without test certificate.**

27.2 After manufacturing or at the stage of dispatch of equipment / materials the contractor shall give intimation to the owner's Engineer in charge of the work for conducting inspection of equipment / materials at manufacture's works or at recognized testing laboratories to be arranged by the contractor. **The intimation shall be made at least 15 (Fifteen) days before the equipment / materials become ready for dispatch.**

27.3. Testing of equipment / materials as specified above shall be conducted at the risk and cost of the contractor. **The contractor shall also bear expenses of inspection cost of the inspecting officer (ERDA) / team of TSECL.**



28.0 PROGRESS REPORTS AND PHOTOGRAPHS

During the various stages of the Work in the pursuance of the Contract, the Contractor shall at his own cost submit periodic progress reports as may be reasonably required by the owner's Engineer in charge of the work with such materials as, charts, Bar Charts, photographs, test certificates, etc. Such progress reports shall be in the form and size as may be required by the owner's Engineer in charge of the work and shall be submitted in at least Three (3) copies.

29.0 EXTENSION OF TIME

29.1 TSECL may consider granting **time extension** for completion of the work if it is felt absolutely essential on fulfillment of following conditions by the Contractor:-

- a) The contractor must apply to the Engineer-In-charge in writing for extension of time so required justifying the necessity.
- b) Such application must state **the grounds** which hindered the contractor in the execution of the work within the time as stipulated in the contract document.
- c) Such application must be made within 30 days of the date on which such hindrance had arisen.
- d) The **Engineer-in charge** must be of the opinion that the grounds shown for the extension of time are reasonable and without extension of such time completion of the work is practically impossible.

29.2 **The Engineer-In- Charge** will have full powers, but the orders on the application of the Contractor accepted by the Authorities higher than the Engineer-In-Charge shall be issued by him only after written approval from the concerned authority higher than Engineer-In-Charge.

29.3 The opinion of the **Engineer- in- charge**, whether the grounds shown for the **time are or are not reasonable, is final. If the Engineer- in- charge is of the** opinion that the grounds shown by the supplier/ contractor are not reasonable and declines to grant extension to time, the supplier/contractor cannot challenge.

30.0 TAKING OVER

Upon successful completion of all the tests to be performed at Site on equipment furnished and erected by the Contractor, the owner's Engineer in charge of the work shall issue to the Contractor a **Taking over Certificate** as a proof of the final acceptance of the equipment. Such certificate shall not unreasonably be withheld.



CONTRACT SECURITY AND PAYMENTS

31.0 CONTRACT PERFORMANCE GUARANTEE

The Contractor shall furnish **Contract Performance Guarantee** as specified in Clause 6.0 of Section - I for the proper fulfillment of the Contract within Fifteen (15) days of “**Notice of Award of Contract.**”

32.0 CONTRACT PRICE ADJUSTMENT

32.1 **All prices / price components of the contract shall remain firm and no adjustment of price, whatsoever, shall be applicable during the currency of contract**

33.0 PAYMENT

33.1 For tenderer(s) payment will be made through Banker Cheque/RTGS by submission of invoice in complete shape along with required documents / certificates.

Payment will be made in accordance with Payment Schedule in mentioned herein after.
Any terms of advance payments i.e. payments against dispatch documents/Bank documents will not be acceptable.

In no circumstances, claim of interest on payment shall be entertained.

The final payment will be made on completion of all Works and on completion of **Warranty / Guaranty Period** including fulfillment by the Contractor of all his liabilities under the Contract.

33.2 Currency of Payment

All payments under the Contract shall be in Indian Rupees only.

33.3 Due Dates for Payments

TSECL will make payment as and when the payment is due as per the terms of payment set forth as herein after.

34.0 Mode of Payment

34.1 Payment due on supply materials / services shall be made by the owner's Engineer-in-charge of the work through Banker Cheque/RTGS.

34.2 Payment Schedule

The terms of payments for work under the contract are as under:



PAYMENT SCHEDULE

Sr. No.	Milestone	Percentage (%) Contract Amount Reference	Document to be provided with each bill submission
1	Providing 154 (one hundred and fifty four) nos. 1-Phase service connections to un-electrified Households beyond 35 meters where service connections are extendable by single pole under ED-Teliamura.	Corresponding contract amount of 70% of the total quantity given in the tender document/BoQ after completion of 80% work.	<ol style="list-style-type: none">1) Submission of contract performance guarantee as per tender document.2) Submission of a detailed Bar Chart based on the work schedule stipulated in the Bid document and its approval by TSECL.3) On production of dispatch documents including the material inspection clearance certificate (MICC) issued by the inspecting officer / team of TSECL.4) Joint Measurement certificate of actual work done by the authorizing representative of Contractor and Engineer-in Charge of the work.5) Work completion Certificate.6) Photograph / Consumer ID of each consumer.

34..3 Inland Transportation & Insurance

Inland transportation (including port handling) and inland insurance charges shall be borne by the contractor and TSECL in no way shall be liable for the inland transportation and insurance charges.

35.0 DEDUCTION FROM CONTRACT PRICE

All costs, damages or expenses which TSECL may have paid, for which under the Contract, the Contractor is liable, will be deducted from the progressive bill of the contractor.

36.0 SPARES

36.1 All the spares for the equipment under the Contract will, strictly, conform to the specification and documents and will be identical to the corresponding main equipment / components supplied under the Contract and shall be fully interchangeable.

36.2 All the mandatory spares covered under the Contract shall be produced along with the main equipment as a continuous operation and the delivery of the spares will be affected along with the main equipment in a phased manner and the delivery would be completed by the respective dates for the various categories of equipment as per the agreed Bar chart. In case of recommended spares, the above will be applicable provided the order for the



recommended spares has been placed with the Contractor prior to commencement of manufacture of the main equipment

36.3 The quality plan and the inspection requirement finalized for the main equipment will also be applicable for the corresponding spares.

36.4 The Contractor will provide TSECL with the manufacturing drawings, catalogues, assembly drawings and any other documents required by TSECL so as to enable the Owner to identify the recommended spares. Such details will be furnished to TSECL as soon as they are prepared but in any case not later than six months prior to commencement of manufacture of the corresponding main equipment.

36.5 The Contractor will provide TSECL with all the addresses and particulars of his sub-suppliers while placing the order on vendors for items/components/equipment covered under the Contract and will further ensure with his vendors that TSECL, if so desires, will have the right to place order (s) for spares directly on them on mutually agreed terms based on offers of such vendors.

36.6 WARRANTIES FOR SPARES

The Contractor shall warrant that all spares supplied will be new and in accordance with Contract Documents and will be free from defects in design, materials and workmanship and shall further guarantee as under:

36.6.1 for 3 years operational spares (both mandatory and recommended)

a. For any item of spares ordered or to be ordered by TSECL for 3 years operational requirement of the plant which is manufactured as a continuous operation together with the corresponding main equipment/component, the warranty will be 12 months from the scheduled date of commercial operation of the last unit of main equipment under the Contract. In case of any failure in the original component/equipment due to faulty designs, materials and workmanship, the corresponding spare parts, if any, supplied will be replaced without any extra cost to TSECL unless a joint examination and analysis by TSECL and the Contractor of such spare parts prove that the defect found in the original part that failed, can safely be assumed not to be present in spare parts. Such replaced spare parts will have the same warranty as applicable to the replacement made for the defective original part/component provided that such replacement for the original equipment and the spare replaced are again manufactured together. The discarded spare parts will become the property of the Contractor as soon as they have been replaced by the Contractor.

b. For the item of spares ordered/to be ordered by TSECL for 3 years operational requirement of the equipment, which with the written approval of the Owner, are not manufactured as a continuous operation together with the manufacture of the corresponding main equipment/component, will be warranted for 6000 hrs of trouble free operation, if used within a period of 18 months (reckoned from the date of delivery at Site). However, if such spare parts are put to use after 18 months of the delivery at site then the guarantee of such spares will stand valid till the expiry of 36 months from the scheduled date of the completion of commissioning of the last unit of equipment or 6000 hrs of trouble free operation after such spares are put in service, whichever is earlier.

c. For long Term Requirement.

For items of spares that may be ordered by TSECL to cover requirements beyond 3 years of initial operation of the plant, the warranty will be till the expiry of 6000 hrs of trouble free



operation if used within a period of 18 months from the date of delivery at Site. For items of spares that may be used after 18 months from the date of delivery at Site, the warranty period will be 12 months from the date they are put to use or 6000 hrs of trouble free operation, whichever is earlier.

- 36.6.2 The warranty of spares that are not used within 18 months from the respective dates of the delivery at Site covered in Para (b) & (c) above will, however, be subject to the condition that all such spares have been stored/maintained/preserved in accordance with Contractor's standard recommended practice, if any, and the same have been furnished to TSECL.
- 36.6.3 To enable TSECL to finalize the requirement of recommended spares which are ordered subsequent to placement of order for main equipment in addition to necessary technical details, catalogue and such other information brought-out here-in-above, the Contractor will also provide a justification in support of reasonableness of the quoted prices of spares which will, inter-alia, include documentary evidence that the prices quoted by the Contractor are not higher than those charged by them from other customers in the same period.
- 36.6.4 In addition to the spares recommended by the Contractor, if TSECL further identifies certain particular items of spares, the Contractor will submit the prices and delivery quotations for such spares within 30 days of receipt of such request with validity period for 6 months for consideration of placement of order for additional spares, if TSECL so desires
- 36.6.5 The Contractor shall guarantee the long-term availability of spares to TSECL for the full life of the equipment covered under the Contract. The Contractor shall guarantee that before going out of production of spare parts of the equipment, he shall give at least twelve (12) months advance notice so that the latter may order his bulk requirement of spares, if he so desires. The same provision will also be applicable to Sub-Contractor of any spares by the Contractor or his Sub-Contractors. Further, in case of discontinuance of manufacture of any spares by the Contractor or his Sub-Contractors, the Contractor will provide TSECL, two years in advance, full manufacturing drawings, material specifications and technical information required by TSECL for the purpose of manufacture of such items.
- 36.6.6 Further in case of discontinuance of supply of spares by the Contractor or his Sub-contractors, the Contractor will provide TSECL with full information for replacement of such spares with other equivalent makes, if so required by TSECL.
- 36.6.7 The prices of all future requirements of items of spares beyond 3 years operational requirement will be derived from the corresponding ex-works price at which the order for such spares have been placed by TSECL as part of mandatory spares or recommended spares. Ex-works order price of future spares shall be computed in accordance with the price adjustment provisions covered under the main Contract excepting that 'the base indices will be counted from the scheduled date of successful completion of trial operation of the last equipment under the main project and there will be no ceiling on the amount of narration in the prices. The above option for procuring future long term requirement of spares by TSECL shall remain valid for a period of 5 years from successful completion of commissioning of the last unit of equipment.
- 36.6.8 The Contractor will indicate in advance the delivery period of the items of spares, which TSECL may procure in accordance with above Sub-clause. In case of emergency requirements of spares, the Contractor would make every effort to expedite the manufacture and delivery of such spares on the basis of mutually agreed time schedule.
- 36.6.9 In case the Contractor fails to supply the mandatory, recommended or long term spares in accordance with the terms stipulated above, TSECL shall be entitled to purchase the same



from alternate sources at the risk and the cost of the Contractor and recover from the Contractor, the excess amount paid by TSECL over the rates worked out on the above basis. In the event of such risk purchase by TSECL, the purchases will be as per the works and procurement policy of TSECL prevalent at the time of such purchases and at his option, may include a representative of the Contractor in finalizing the purchases.

36.6.10 It is expressly understood that the final settlement between the parties in terms of the relevant clauses of the Bidding Documents shall not relieve the Contractor of any his obligations under the provision of long term availability of spares unless otherwise discharged in writing by TSECL.

37.0 TRANSFER OF THE TITLE

37.1 This Transfer of Title of equipments / materials shall not be construed to mean the acceptance and the consequent "Taking Over" of equipment and materials. The Contractor shall continue to be responsible for the quality and performance of such equipment and materials and for their compliance with the specifications until "**Taking Over**" and the fulfillment of guarantee provisions of this Contract.

37.2 This Transfer of Title shall not relieve the Contractor from the responsibility for all **risks of loss or damage to** the equipment and materials as specified under the clause entitled "Insurance" of this Section.

38.0 INSURANCE

38.1 The Contractor at his cost shall arrange, secure and maintain all insurance as may be pertinent to the Works and obligatory in terms of law to protect his interest and interests of TSECL against all perils detailed herein. The form and the limit of such insurance as defined herein together with the under-writer in each case shall be acceptable to TSECL. However, irrespective of such acceptance, the responsibility to maintain adequate insurance coverage at all times during the period of Contract shall be of the Contractor alone. The Contractor's failure in this regard shall not relieve him of any of his contractual responsibilities and obligations. The insurance covers to be taken by the Contractor shall be in a joint name of TSECL and the Contractor. The Contractor shall, however, be authorized to deal directly with Insurance Company or Companies and shall be responsible in regard to maintenance of all insurance covers. Further the insurance should be in freely convertible currency.

38.2 Any loss or damage to the equipment during handling, transportation, storage, erection, putting into satisfactory operation and all activities to be performed till the successful completion of commissioning of the equipment shall be to the account of the Contractor. The Contractor shall be responsible for preference of all claims and make good the damages or loss by way of repairs and/or replacement of the equipment, damaged or lost. The transfer of title shall not in any way relieve the Contractor of the above responsibilities during the period of Contract. The Contractor shall provide TSECL with copy of all insurance policies and documents taken out by him in pursuance of the Contract. Such copies of documents shall be submitted to TSECL immediately after such insurance coverage. The Contractor shall also inform TSECL in writing at least Sixty (60) Days in advance regarding the expiry/cancellation and/or change in any of such documents and ensure revalidation, renewal etc., as may be necessary well in time.



- 38.3 The perils required to be covered under the insurance shall include, but not be limited to fire and allied risks, miscellaneous accidents (erection risks) workman compensation risks, loss or damage in transit, theft, pilferage, riot, strikes, social unrest and malicious damages, civil commotion, weather conditions, accidents of all kinds, etc. The scope of such insurance shall be adequate to cover the replacement/reinstatement cost of the equipment for all risks upto and including delivery of goods and other costs till the equipment is delivered at Site. The insurance policies to be taken should be on replacement value basis and/or incorporating escalation clause. Notwithstanding the extent of insurance cover and the amount of claim available from the underwriters, the Contractor shall be liable to make good the full replacement/rectification value of all equipment/materials and to ensure their availability as per project requirements.
- 38.4 All costs on account of insurance liabilities covered under the Contract will be to Contractor's account and will be included in Contract Price, However, TSECL may from time to time, during the pendency of the Contract, ask the Contractor in writing to limit the insurance coverage, risks and in such a case, the parties to the Contract will agree for a mutual settlement, for reduction in Contract price to the extent of reduced premium amount. The Contractor, while arranging the insurance shall ensure to obtain all discounts on premium, which may be available for higher volume or for reason of financing arrangement of the project.
- 38.5 The clause entitled 'Insurance' under the Section - IV, covers the additional insurance requirements for the portion of the works to be performed at the site.

39.0 LIABILITY FOR ACCIDENTS AND DAMAGES

Under the Contract, the Contractor shall be responsible for loss or damage to the equipment until the successful completion of commissioning as defined else-where in the Bidding Documents.

40.0 DELAYS BY TSECL OR HIS AUTHORISED AGENTS

- 40.1 In case the Contractor's performance is delayed due to any act on the part of TSECL or his authorized agents, then the Contractor shall be given due extension of time for the completion of the Works, to the extent of such act on the part of TSECL has caused delay in the Contractor's performance of the Contract.

Regarding reasonableness or otherwise of the extension of time, the decision of the TSECL shall be final.

41.0 DEMURRAGE, WHARFAGE, ETC.

All demurrage, wharf age and other expenses incurred due to delayed clearance of the material or any other reason shall be to the account of the Contractor.

42.0 FORCE MAJEURE

- 42.1 Force majeure is herein defined as any cause which is beyond the control of the Contractor or TSECL as the case may be, which they could not foresee or with a reasonable amount of diligence could not have foreseen and which substantially affects the performance of the Contract, such as:

- a. Natural phenomena, including but not limited to floods, droughts, earthquakes and epidemics;



- b. Acts of any Government including but not limited to war, declared or undeclared, quarantines and embargoes.

Provided the contractor shall within Fifteen (15) days from the occurrence of such a cause notify TSECL in writing of such causes, acceptance of which will be given by TSECL after verification.

- 42.2 The Contractor or TSECL shall not be liable for delays in performing his obligations resulting from any force-majeure cause as referred to and/or defined above.

The date of completion will, subject to hereinafter provided, be extended by a reasonable time.

43.0 SUSPENSION OF WORK

- 43.1 TSECL reserves the right to suspend and reinstate execution of the whole or any part of the Works without invalidating the provisions of the Contract. Orders for Suspension or reinstatement of the Works will be issued by TSECL to the Contractor in writing. The time for completion of the works will be extended for a period equal duration of the suspension.

44.0 CONTRACTOR'S DEFAULT

- 44.1 If the Contractor shall neglect to execute the Works with due diligence and expertise or shall refuse or neglect to comply with any reasonable order given to him, in the Contract by the TSECL's Engineer in charge of the work in connection with the works or shall contravene the provisions of the Contract, TSECL 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 the notice, then and in such case TSECL 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 TSECL shall think 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 TSECL 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 TSECL shall be entitled to retain and apply 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 the Work or of completing the Works as the case may be. If the cost of completing of Works or executing a 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.

- 44.2 In addition, such action by TSECL as aforesaid shall not relieve the Contractor of his liability to pay liquidated damages for delay in completion of Works as defined in clause 13.0 of this Section. Such action by TSECL as aforesaid, the termination of the Contract under this clause shall neither 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 period.



45.0 TERMINATION OF CONTRACT ON OWNER'S INITIATIVE

- 45.1 TSECL reserves the right to terminate the Contract either in part or in full due to reasons stipulated in the clause entitled "Contractor's Default." TSECL shall in such an event give Fifteen (15) days notice in writing to the Contractor of his decision to do so.
- 45.2 The Contractor upon receipt of such notice shall discontinue the work on the date and to the extent specified in the notice.
- 45.3 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 TSECL is satisfied that the legal representatives of the individual contractor or of the proprietor of propriety concern and in the case of partnership, the surviving partners, are capable of carrying out and completing the Contract, TSECL shall be entitled to cancel the Contract as to its uncompleted 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 TSECL 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.

RESOLUTION OF DISPUTES

46.0 SETTLEMENT OF DISPUTES

- 46.1 Any dispute(s) or difference(s) arising out of or in connection with the Contract shall, to the extent possible, be settled amicably between the parties.
- 46.2 If any dispute or difference of any kind whatsoever shall arise between Deputy General Manager in charge of the work and the Contractor, arising out of the Contract for the performance of the Works whether during the progress of the Works or after its completion or whether before or after the termination, abandonment or breach of the Contract, it shall, in the first place, be referred to and settled by the Superintending Engineer of the concerned circle /Chief Engineer as the case may be, who, within a period of Thirty (30) days after being requested by either party to do so, shall give written notice of his decision to both the parties.
- 46.3 In the event the Contractor being dissatisfied with any such decision, the matters in dispute shall be referred to arbitration as hereinafter provided.

47.0 ARBITRATION

- 47.1 All disputes or differences in respect of which the decision, if any, of the Engineer has not become final or binding as aforesaid shall be settled by arbitration in the manner hereinafter provided.
- 47.1.1 The arbitration shall be conducted by an arbitrator, to be nominated by TSECL and he will be the sole arbitrator to conduct the arbitration.
- 47.1.2 The arbitration shall be conducted in accordance with the provisions of the Indian Arbitration & Reconciliation Act, 1996 or any statutory modification thereof. The venue of arbitration shall be at **Agartala**.



- 47.2 The arbitrators may, from time to time with the consent of all the parties enlarge the time for making the award.
- 47.3 The arbitrator shall have full powers to review and/or revise any, decision, opinion, direction, certification or valuation of the Engineer in accordance with the Contract and neither party shall be limited in the proceedings before such arbitrators to the condense or arguments out before the Engineer for the purpose of obtaining the said decision.
- 47.4 During settlement of disputes and arbitration proceedings, both parties shall be obliged to carry out their respective obligations under the Contract.

48.0 RECONCILIATION OF ACCOUNTS

The Contractor shall prepare and submit every six months, a statement covering payments claimed and the payments received vis-à-vis the works executed, for reconciliation of accounts with the owner's Engineer in charge of the work. The Contractor shall also prepare and submit a detailed account of Materials received from TSECL and utilized by him for reconciliation purpose.

49.0 TRAINING OF OWNER'S PERSONNEL

- 49.1 The Contractor shall undertake to train free of cost, two engineering personnel selected and sent by TSECL at the works of the manufacturer. The period and nature of training for the personnel shall be agreed upon mutually between the Contractor and TSECL. These engineering personnel shall be given special training in the shops, where the equipment shall be manufactured and/or in their Collaborator's works and where possible, in any other plant where equipment manufactured by the Contractor or his Collaborator is under installation, operation, or testing to enable those personnel to become familiar with the equipment being supplied by the Contractor.
- 49.2 All traveling and living expenses for the engineering personnel to be trained during the total period of training shall be borne by the Contractor. These engineering personnel, while undergoing training, shall be responsible to the Contractor for discipline.
- 49.3 TSECL shall not be entitled for any rebate, whatsoever on any account in the event of his failing to avail of the training facilities, for any reason.



SECTION-IV

ERECTION CONDITIONS OF CONTRACT

1.0 GENERAL

1.1 The following shall supplement the conditions already contained in the other parts of these specifications and document and shall govern the portion of the work of this Contract to be performed at Site.

1.2 The Contractor upon signing of the Contract shall, in addition to a Project Coordinator, nominate another responsible officer as his representative at Site suitably designated for the purpose of overall responsibility and co-ordination of the works to be performed at Site. Such person shall function from the Site Office of the Contractor.

2.0 REGULATION OF LOCAL AUTHORITIES

2.1 The Contractor shall comply with all the rules and regulations of local authorities during the performance of his field activities. He shall also comply with the Minimum Wages Act, 1948 and the Payment of Wages Act (both of the Government of India) and the rules made there-under in respect of any employee or workman employed or engaged by him or his Sub-Contractor.

2.2 All registration and statutory inspection fees, if any, in respect of his work pursuant to this Contract shall be to the account of the Contractor. However, any registration, statutory inspection fees lawfully payable under any statutory laws and its amendments from time to time during erection in respect of the equipment ultimately to be owned by the Owner, shall be to the account of TSECL. Should any such inspection or registration need to be re-arranged due to the fault of the Contractor or his Sub-Contractor, the additional fees to such inspection and/or registration shall be borne by the Contractor.

3.0 OWNER'S LIEN ON EQUIPMENT

TSECL shall have a lien on all equipment including those of the Contractor brought to the Site for the purpose **of erection, testing and commissioning** of the equipment to be supplied & erected under the Contract. TSECL shall continue to hold the lien on all such equipment throughout the period of Contract. No material brought to the Site shall be removed from the Site by the Contractor and/or his Sub-Contractors without the prior written approval of the Engineer.

4.0 INSPECTION, TESTING AND INSPECTION CERTIFICATES

The provisions of the clause entitled Inspection, Testing and Inspection Certificates under Technical Specification, General Terms & Conditions (GTC) shall also be applicable to the erection portion of the Works. The **Deputy General Manager in charge** of the work shall have the right to re-inspect any equipment though previously inspected at the Contractor's works, before and after the same are erected at Site. If by the above inspection, the **Deputy General Manager in charge** of the work rejects any equipment, the Contractor shall make good for such rejections either by replacement or modification / repairs as may be necessary to the satisfaction of TSECL. Such replacements shall also include the replacements or re-execution of such of those works of other Contractors and/or agencies, which might have got damaged or affected by the replacements or re-work done to the Contractor's work.



5.0 ACCESS TO SITE AND WORKS ON SITE

- 5.1 Suitable access to the Site shall be afforded to the Contractor by TSECL in reasonable time.
- 5.2 In the execution of the works, no person other than the Contractor or his duly appointed representative, Sub-Contractor and workmen, shall be allowed to do work on the Site, except by the special permission, in writing of the site Engineer of TSECL or his representative.

6.0 CONTRACTOR'S SITE OFFICE ESTABLISHMENT

The Contractor shall establish a Site Office at the Site and keep posted an authorized representative for the purpose of the Contract. Any written order or instruction of the Engineer in charge of the work or his duly authorized representative shall be communicated to the said authorized resident representative of the Contractor and the same shall be deemed to have been communicated to the Contractor at his legal address.

7.0 CO-OPERATION WITH OTHER CONTRACTORS

- 7.1 The Contractor shall co-operate with all other Contractors or tradesmen of TSECL, who may be performing other works on behalf of TSECL and the workmen who may be employed by TSECL and doing work in the vicinity of the Works under the Contract. The Contractor shall also so arrange to perform his work as to minimize, to the maximum extent possible, interference with the work of other Contractors and their workmen. Any injury or damage that may be sustained by the employees of the other Contractors and TSECL, due to the Contractor's work shall promptly be made good at the Contractor's own expense. The site Engineer of TSECL shall determine the resolution of any difference or conflict that may arise between the Contractor and other Contractors or between the Contractor and the workmen of TSECL in regard to their work. If the work of the Contractor is delayed because of any acts of omission of another Contractor, the Contractor shall have no claim against TSECL on that account other than an extension of time for completing his Works.
- 7.2 The Site Engineer of TSECL shall be notified promptly by the Contractor of any defects in the other Contractor's works that could affect the Contractor's Works. The Engineer shall determine the corrective measures if any required rectifying this situation after inspection of the works and such decisions by the Engineer shall be binding on the Contractor.

8.0 DISCIPLINE OF WORKMEN

The Contractor shall adhere to the disciplinary procedure set by the site Engineer of TSECL in respect of his employees and workmen at Site. The Engineer shall be at liberty to object to the presence of any representative or employee of the Contractor at the Site, if in the opinion of the Engineer such employee has misconduct himself or is incompetent or negligent or otherwise undesirable and then the Contractor shall remove such a person objected to and provide in his place a competent replacement.

9.0 CONTRACTOR'S FIELD OPERATION

- 9.1 The Contractor shall keep the site Engineer of TSECL informed in advance regarding his field activity plans and schedules for carrying-out each part of the works. Any review of such plan or schedule or method of work by the site Engineer of TSECL shall not relieve the Contractor of any of his responsibilities towards the field activities. Such reviews shall also not be considered as an assumption of any risk or liability by TSECL or any of his representatives and no claim of the Contractor shall be entertained because of the failure or inefficiency of any such plan or schedule or method of work reviewed. The Contractor shall be solely responsible for the safety, adequacy and efficiency of plant and equipment and his erection methods.



9.2 The Contractor shall have the complete responsibility for the conditions of the Work-Site including the safety of all persons employed by him or his Sub-Contractor and all the properties under his custody during the performance of the work. This requirement shall apply continuously till the completion of the Contract and shall not be limited to normal working hours. The construction review by the site Engineer of TSECL is not intended to include review of Contractor's safety measures in, on or near the work Site, and their adequacy or otherwise.

10.0 PHOTOGRAPHS AND PROGRESS REPORT

10.1 The Contractor shall furnish Three (3) prints each to the Site Engineer of progress photographs of the work done at Site. Photographs shall be taken as and when indicated by the Site Engineer of TSECL or his representative. Photographs shall be adequate in size and number to indicate various stages of erection. Each photograph shall contain the date, the name of the Contractor and the title of the photograph.

10.2 The above photographs shall accompany the monthly progress report detailing-out the progress achieved on all erection activities as compared to the schedules. The report shall also indicate the reasons for the variance between the scheduled and actual progress and the action proposed for corrective measures, wherever necessary.

11.0 MAN-POWER REPORT

11.1 The Contractor shall submit to the Site Engineer of TSECL, on the first day of every month, a man hour schedule for the month, detailing the man hours scheduled for the month, skill-wise and area-wise.

11.2 The Contractor shall also submit to the Site Engineer of TSECL, on the first day of every month, a man power report of the previous month detailing the number of persons scheduled to have been employed and actually employed, skill-wise and the areas of employment of such labour.

12.0 PROTECTION OF WORK

The Contractor shall have total responsibility for protecting his works till it is finally taken over by TSECL. No claim shall be entertained by TSECL for any damage or loss to the Contractor's works and the Contractor shall be responsible for complete restoration of the damaged works to original conditions to comply with the specification and drawings, should any such damage to the Contractor's works occur because of any other party not being under his supervision or control. The Contractor shall make his claim directly with the party concerned. If disagreement or conflict or dispute develops between the Contractor and the other party or parties concerned regarding the responsibility for damage to the contractor's works, the same shall be resolved as per the provisions of the Clause 7.0 above entitled "Cooperation with other Contractors". The Contractor shall not cause any delay in the repair of such damaged works because of any delay in the resolution of such dispute. The Contractor shall proceed to repair the Work immediately and no cause thereof will be assigned pending resolution of such disputes.

13.0 EMPLOYMENT OF LABOUR

13.1 The Contractor shall be expected to employ on the work only his regular skilled employees with experience of this particular work. No female labour shall be employed after darkness. No person below the age of eighteen years shall be employed.



- 13.2 All traveling expenses including provisions of all necessary transport to and from Site, lodging allowances and other payments to the Contractor's employees shall be the sole responsibility of the Contractor.
- 13.3 The hours of work on the Site shall be decided by the site Engineer of TSECL and the Contractor shall adhere to it. Working hours shall normally be Eight (8) hours per day – Monday through Saturday and may have to be extended in the interest of work.
- 13.4 The Contractor's employees shall wear identification badges while on work at Site.
- 13.5 In case TSECL becomes liable to pay any wages or dues to the labour or any Government agency under any of the provisions of the Minimum Wages Act, Workmen Compensation Act, Contract Labour Regulation Abolition Act or any other law due to act of omission of the Contractor, TSECL may make such payments and shall recover the same from the Contractor's bills.

14.0 FACILITIES TO BE PROVIDED

By the Contractor

14.1 Tools, tackles and scaffoldings

The Contractor shall provide all the construction equipment, tools, tackles and scaffoldings required for pre-assembly, erection, testing and commissioning of the equipment covered under the Contract. He shall submit a list of all such materials to the site Engineer of TSECL before the commencement of pre-assembly at Site. These tools and tackles shall not be removed from the Site without the written permission of the site Engineer.

14.2 First – aid

The Contractor shall provide necessary first-aid facilities for all his employees, representatives and workmen working at the Site. Enough number of Contractor's personnel shall be trained in administering first – aid.

14.3 Cleanliness

The Contractor shall be responsible for keeping the entire area allotted to him clean and free from rubbish, debris etc. during the period of Contract. The Contractor shall employ enough number of special personnel to thoroughly clean his work-area at least once in a day. All such rubbish and scrap material shall be stacked or disposed in a place to be identified by the site Engineer of TSECL. Materials and stores shall be so arranged to permit easy cleaning of the area. In areas where equipment might drip oil and cause damage to the floor surface, a suitable protective cover of a flame resistant, oil proof sheet shall be provided to protect the floor from such damage.

14.4 Communication

The contractor shall extend the telephone & telex facilities, if available at Site, for the purposes of interaction with the site office by him and TSECL.

By the Owner

14.5 Space

- a) Land for Contractor's Office, Store, and Workshop etc if available shall be provided by TSECL. Otherwise contractor has to arrange at his own cost and responsibilities the accommodation for his site office, store and workshop etc.



- b) The Site Engineer of TSECL shall at his discretion and for the duration of execution of the Contract make available at site, land for construction of Contractor's field office, workshop, stores, magazines for explosives in isolated locations, assembling yard, etc. required for execution of the Contract. Any construction of temporary roads, offices, workshop, etc. as approved by the site Engineer of TSECL shall be done by the Contractor at his cost.
- c) On completion of work, the Contractor shall hand over the land duly cleaned to the site Engineer of TSECL. Until and unless the Contractor has handed over the vacant possession of land allotted to him for the above purpose, the payment of his final bill shall not be made. The Contractor shall be made liable to pay for the use and occupation at the rates to be determined by the Engineer if the Contractor over stays in the land after the Contract is completed.

14.6 **Electricity – Power Supply**

Where power supply is available with TSECL for construction purpose, the same shall be provided at the job at one point of the distribution system as may be decided by site Engineer of TSECL. The charge for extension of service line and energy consumption charges shall be borne by the contractor. In case the contractor fails to pay the related charge of extension of service line and energy consumption within due date of the bill raised for the purpose, the amount will be deducted from the progressive bill of the contractor.

14.7 **Water**

Free supply of water shall be made available for the construction purpose whenever water is available and the same shall be given at an agreed single point at the Site. Any further distribution shall be the responsibility of the Contractor. Free drinking water if available shall also be provided at one agreed point in the Site. Further distribution either to his labour colony or his work Site or to his office shall be the responsibility of the Contractor.

15.0 **LINES AND GRADES**

All the works shall be performed on the lines, grades and elevations indicated on the drawings. The Contractor shall be responsible to locate and lay-out the works. Basic horizontal and vertical control points shall be established and marked by the Engineer at Site at suitable points. These points shall be used as datum for the works under the Contract. The Contractor shall inform the site Engineer of TSECL well in advance of the times and places at which he wishes to do work in the area allotted to him so that suitable datum points may be established and checked by the site Engineer to enable the Contractor to proceed with his works. Any work done without being properly located may be removed and/or dismantled at contractor expense.

16.0 **FIRE PROTECTION**

- 16.1 The work procedures that are to be used during the erection shall be those which minimize fire hazards to the extent practicable. Combustible materials, combustible waste and rubbish shall be collected and removed from the Site at least once each day. Fuels, oils and volatile or inflammable materials shall be stored away from the construction and equipment and materials storage areas in safe containers. Un-treated materials shall not at all be used at Site for any other purpose unless otherwise specified. If any such materials are received with the equipment at the Site, the same shall be removed and replaced with acceptable material before moving into the construction or storage area.



- 16.2 Similarly corrugated paper fabricated cartons etc. shall not be permitted in the construction area either for storage or for handling of materials. All such materials used shall be of water proof and flame resistant type. All the other materials such as working drawings, plans etc. which are combustible but are essential for the works to be executed shall be protected against combustion resulting from welding sparks, cutting flames and other similar fire sources.
- 16.3 All the Contractor's supervisory personnel and sufficient number of workers shall be trained for fire-fighting and shall be assigned specific fire protection duties. Enough of such trained personnel must be available at the Site during the entire period of the Contract.
- 16.4 The Contractor shall provide enough fire protection equipment of the types and number for the ware-houses, office, temporary structures, labour colony area etc. Access to such fire protection equipment shall be easy and kept open at all time.

17.0 SECURITY

The Contractor shall have total responsibility for all equipment and materials in his custody/stores, loose, semi-assembled and/or erected by him at Site. The contractor shall make suitable security arrangements including employment of security personnel to ensure the protection of all materials, equipment and works from theft, fire, pilferage and any other damages and loss. All materials of the Contractor shall enter and leave the project Site only with the written permission of site Engineer of TSECL in the prescribed manner.

18.0 CONTRACTOR'S AREA LIMITS

The site Engineer of TSECL shall mark-out the boundary limits of access roads, parking spaces, storage and construction areas for the Contractor and the Contractor shall not trespass the areas not so marked out for him. The Contractor shall be responsible to ensure that none of his personnel move out of the areas marked out for his operations. In case of such a need for the Contractor's personnel to work out of the areas marked out for him, the same shall be done only with the written permission of the site Engineer of TSECL.

19.0 CONTRACTOR'S CO-OPERATION

In case where the performance of the erection work by the Contractor affects the operation of the system facilities of TSECL, such erection work of the Contractor shall be scheduled to be performed only in the manner stipulated by the site Engineer and the same shall be acceptable at all times to the Contractor. The site Engineer may impose such restrictions on the facilities provided to the Contractor such as electricity, water etc. as he may think fit in the interest of TSECL and the Contractor shall strictly adhere to such restrictions and co-operate with the site Engineer of TSECL. It will be the responsibility of the Contractor to provide all necessary temporary instrumentation and other measuring devices required during start-up and operation of the equipment systems which are erected by him. The Contractor shall also be responsible for flushing and initial filling of all the oil and lubricants required for the equipment furnished and erected by him, so as to make such equipment ready for operation. The Contractor shall be responsible for supplying such flushing oil and other lubricants unless otherwise specified elsewhere in the document and specification.



20.0 MATERIALS HANDLING AND STORAGE

- 20.1 All the equipment furnished under the Contract and arriving at Site shall be promptly received, unloaded, transported and stored in the storage arrange by the contractor at his risk and cost.
- 20.2 The Contractor shall be responsible for examining all the shipment and notify the Site Engineer of TSECL immediately of any damage, shortage, discrepancy etc. for the purpose of information only. The Contractor shall submit to the site Engineer of TSECL every week a report detailing all the receipts during the week. However, the Contractor shall be solely responsible for any shortages or damage in transit, handling and/or in storage and erection of the equipment at Site. Any demurrage, wharfage and other such charges claimed by the transporters, railways etc. shall be to the account of the Contractor.
- 20.3 The Contractor shall maintain an accurate and exhaustive record detailing out the list of all equipment received by him for the purpose of erection and keep such record open for the inspection by the Site Engineers / Higher officials of TSECL.
- 20.4 All equipment shall be handled very carefully to prevent any damage or loss. No bare wire ropes, slings, etc. shall be used for unloading and/or handling of the equipment without the specific written permission of the Site Engineer. The equipment stored shall be properly protected to prevent damage either to the equipment or the floor where they are stored. The equipment from the store shall be moved to the actual location at the appropriate time so as to avoid damage of such equipment at Site.
- 20.5 All electrical panels, control gears, motors and such other devices shall be properly dried by heating before they are installed and energized. Motor bearings, slip rings, commutators and other exposed parts shall be protected against moisture ingress and corrosion during storage and periodically inspected.
- 20.6 All the electrical equipment such as motors, generators, etc. shall be tested for insulation resistance at least once in a month from the date of receipt till the date of commissioning and a record of such measured insulation values maintained by the Contractor. Such records shall be made available for inspection by the Site Engineers / Higher officials of TSECL.
- 20.7 The Contractor shall ensure that all the packing materials and protection devices used for the various equipments during transit and storage are removed before the equipment are installed.
- 20.8 The consumable and other supplies likely to deteriorate due to storage must be thoroughly protected and stored in a suitable manner to prevent damage or deterioration in quality by storage.
- 20.9 All the materials stored in the open or dusty location must be covered with suitable weather-proof and flame proof covering material wherever applicable.
- 20.10 If the materials belonging to the Contractor are stored in areas other than those earmarked for him, the Site Engineer shall have the right to get it moved to the area earmarked for the Contractor at the Contractor's cost.
- 20.11 The Contractor shall be responsible for making suitable indoor storage facilities to store all equipment which require indoor storage. Normally, all the electrical equipment such as motors, control gear, generators, exciters and consumables like electrodes, lubricants etc. shall be stored in the closed storage space. The site Engineer, in addition, may direct the Contractor to move certain other materials, which in his opinion shall require indoor storage, to indoor storage areas, which the Contractor shall strictly comply with.



21.0 CONSTRUCTION MANAGEMENT

- 21.1 The field activities of the Contractors working at Site shall be coordinated by the Site Engineer of TSECL and his decision shall be final in resolving any disputes or conflicts between the Contractor and other Contractors and tradesmen regarding scheduling and co-ordination of work. Such decision by Site Engineer of TSECL shall not be a cause for extra compensation or extension of time for the Contractor.
- 21.2 The Site Engineer of TSECL shall hold weekly meeting with the Site Engineer / Supervisor of the contractor. The Site Engineer / Supervisor of the contractor shall attend such meetings and take notes of the discussions during the meeting and the decision of the Site Engineer of TSECL and shall strictly adhere to those decisions in performing his works. In addition to the above weekly meeting, the Site Engineer / Higher officials of TSECL may call for other meeting with the Site Engineer / Supervisor / any other authorised representative of the contractor and in such a case the personnel of the contractor shall attend such meetings.
- 21.3 Time is the essence of the Contract and the Contractor shall be responsible for performance of his works in accordance with the specified construction schedule. If at any time, the Contractor is falling behind the schedule, he shall take necessary action to make good for such delays by increasing his work force or by working overtime or otherwise accelerate the progress of the work to comply with the schedule and shall communicate such actions in writing to the Site Engineer of TSECL, satisfying that his action shall compensate for the delay. The Contractor shall not be allowed any extra compensation for such action.
- 21.4 TSECL shall, however, not be responsible for provision of additional labour and/or materials or supply or any other services to the Contractor.

22.0 FIELD OFFICE RECORDS

The Contractor shall maintain at his Site office up-to-date copies of all drawings, specifications and other Contract Documents and any other supplementary data complete with all the latest revisions thereto. The Contractor shall also maintain in addition the continuous record of all changes to the above Contract Documents, drawings, specifications, supplementary data, etc. effected at the field and on completion of his total assignment under the Contract, shall incorporate all such changes on the drawings and other engineering data to indicate as installed conditions of the equipment furnished and erected under the Contract. Such drawings and engineering data shall be submitted to the Deputy General Manager in charge of the work in required number of copies.

23.0 CONTRACTOR'S MATERIALS BROUGHT ON TO SITE

- 23.1 The Contractor shall bring to Site all equipment, components, parts, materials, including construction equipment, tools and tackles for the purpose of the works under intimation to the Site Engineer. All such goods shall, from the time of their being brought vest in TSECL, but may be used for the purpose of the Works only and shall not on any account be removed or taken away by the Contractor without the written permission of the Site Engineer of TSECL. The Contractor shall nevertheless be solely liable and responsible for any loss or destruction thereof and damage thereto.
- 23.2 After the completion of the Works, the Contractor shall remove from the Site under the direction of the Site Engineer of TSECL the materials such as construction equipment, erection tools and tackles, scaffolding etc. with the written permission from him.



24.0 PROTECTION OF PROPERTY AND CONTRACTOR'S LIABILITY

24.1 The Contractor shall be responsible for any damage resulting from his operations. He shall also be responsible for protection of all persons including members of public and employees of TSECL and the employees of other Contractors and Sub-contractors and all public and private property including structures, building, other plants and equipment and utilities either above or below the ground.

24.2 The Contractor shall ensure provision of necessary safety equipment such as barriers, signboards, warning lights and alarms, etc. to provide adequate protection and safety to persons and property.

25.0 INSURANCE

25.1 In addition to the conditions covered under the Clause entitled "Insurance" in General Terms and conditions of Contract, the following provisions shall also apply to the portion of works to be done beyond the Contractor's own or his Sub-contractor's manufacturing Works.

25.2 Workmen's Compensation Insurance

This insurance shall protect the Contractor against all claims applicable under the Workmen's Compensation Act, 1948. This policy shall also cover the Contractor against claims for injury, disability, disease or death of his or his Sub-Contractor's employee, which for any reason are not covered under the Workmen's Compensation Act, 1948. The liabilities shall not be less than:

Workmen's Compensation : As per statutory Provisions.

Employee's liability : As per statutory Provisions.

25.3 Comprehensive Automobile Insurance

This insurance shall be in such a form to protect the Contractor against all claims for injuries, disability, disease and death to members of public including the employees of TSECL and damage to the property of other arising from the use of motor vehicles during on or off the Site operations, irrespective of the ownership of such vehicles.

25.4 Comprehensive General Liability Insurance

25.4.1 This insurance shall protect the Contractor against all claims arising from injuries, disabilities, disease or death of members of public or damage to property of others, due to any act or omission on the part of the Contractor, his agents his employees, his representatives and Sub-contractors or from riots, strikes and civil commotion. This insurance shall also cover all the liabilities of the Contractor arising out of the Clause stipulated in the General Terms and Conditions of Contract.

25.4.2 The hazards to be covered will pertain to all the works and areas where the Contractor, his Sub-contractors, his agents and his employees have to perform work pursuant to the Contract.

25.5 The above are only illustrative list of insurance covers normally required and it shall be the responsibility of the Contractors to maintain all necessary insurance coverage to the extent both in time and amount to take care of all his liabilities either direct or indirect, in pursuance of the Contract.



26.0 UNFAVOURABLE WORKING CONDITIONS

The Contractor shall confine all his field operations to those works which can be performed without subjecting the equipment and materials to adverse effects during inclement weather conditions, like monsoon, storms, etc. and during other unfavorable construction conditions. No field activities shall be performed by the Contractor under conditions which might adversely affect the quality and efficiency thereof, unless special precautions or measures are taken by the Contractor in a proper and satisfactory manner in the performance of such Works and with the concurrence of the Site Engineer of TSECL. Such unfavorable construction conditions shall in no way relieve the Contractor of his responsibility to perform the Works as per the Schedule.

27.0 WORK & SAFETY REGULATION

- 27.1 The Contractor shall ensure proper safety of all the workmen, materials plant and equipment belonging to him or to owner or to others, working at the Site. The Contractor shall also be responsible for provision of all safety notices and safety equipment required both by the relevant legislations and also by the Site Engineer as he may deem necessary.
- 27.2 The Contractor shall notify well in advance to the Site Engineer of his intention to bring to the Site any container filled with liquid or gaseous fuel or explosive or petroleum substance or such chemicals, which may involve hazards. The Site Engineer shall have the right to prescribe the conditions, under which such container is to be stored, handled and used during the performance of the works and the Contractor shall strictly adhere to and comply with such instructions. The Site Engineer shall have the right at his sole discretion to inspect any such container or such construction plant/equipment for which material in the container is required to be used and if in his opinion, its use is not safe, he may forbid its use. No claim due to such prohibition shall be entertained by TSECL.
- 27.3 Further, any such decision of the Site Engineer shall not, in any way, absolve the Contractor of his responsibilities and in case, use of such a container or entry thereof into the Site area is forbidden by the Site Engineer, the Contractor shall use alternative methods with the approval of the Deputy General Manager in charge of the work without any cost implication to TSECL or extension of work schedule.
- 27.4 Where it is necessary to provide and/or store petroleum products or petroleum mixtures and explosives, the Contractor shall be responsible for carrying-out such provision and/or storage in accordance with the rules and regulations laid down in the Petroleum Act 1934, Explosives Act, 1948, and Petroleum and Carbide of Calcium Manual published by the Chief Inspector of Explosives of India. All such storage shall have prior approval of the Site Engineer of TSECL. In case, any approvals are necessary from the Chief Inspector (Explosives) or any statutory authorities, the Contractor shall be responsible for obtaining the same.
- 27.5 All equipment used in construction and erection by Contractor shall meet Indian/International Standards and where such standards do not exist, the Contractor shall ensure these to be absolutely safe. All equipments shall be strictly operated and maintained by the Contractor in accordance with manufacturer's operation Manual and safety instructions and as per Guidelines/Rules of TSECL in this regard.
- 27.6 Periodical Examinations and all tests for all lifting/hoisting equipment & tackles shall be carried-out in accordance with the relevant provisions of Factories Act 1948, Indian Electricity Act 1910 and associated Laws/Rules in force from time to time. A register of such examinations and tests shall be properly maintained by the Contractor and shall be promptly



produced as and when desired by the Site Engineer of TSECL or by the person authorized by TSECL.

- 27.7 The Contractor shall be fully responsible for the safe storage of his and his sub-contractor's radio-active sources in accordance with BARC/DAE Rules and other applicable provisions. All precautionary measures stipulated by BARC/DAE in connection with use, storage and handling of such material shall be taken by Contractor.
- 27.8 The Contractor shall provide suitable safety equipment of prescribed standard to all employees and workmen according to the need, as may be directed by Site Engineer of TSECL who shall also have right to examine these safety equipment to determine their suitability, reliability, acceptability and adaptability.
- 27.9 Where explosives are to be used, the same shall be used under the direct control and supervision of an expert, experienced, qualified and competent person strictly in accordance with the Code of Practices/Rules framed under the Indian Explosives Act pertaining to handling, storage and use of explosives.
- 27.10 The Contractor shall provide safe working conditions to all workmen and employees at the Site including safe means of access, railings, stairs, ladders, scaffoldings, etc. The scaffoldings shall be erected under the control and supervision of an experienced and competent person. For erection, good and standard quality material only shall be used by the Contractor.
- 27.11 The Contractor shall not interfere or disturb electric fuses, wiring and other electrical equipment belonging to TSECL or other contractors under any circumstances, whatsoever, unless expressly permitted in writing by Site Engineer of TSECL to handle such fuses, wiring or electrical equipment.
- 27.12 Before the Contractor connects any electrical appliances to any plug or socket belonging to TSECL, he shall :
- a) Satisfy the Site Engineer of TSECL that the appliance is in good working condition :
 - b) Inform the site Engineer of the maximum current rating, voltage and phases of the appliances;
 - c) Obtain permission of the Site Engineer detailing the sockets to which the appliances may be connected.
- 27.13 The Site Engineer shall not grant permission to connect until he is satisfied that;
- a) The appliance is in good condition and is fitted with suitable plug;
 - b) The appliance is fitted with a suitable cable having two earth conductors, one of which shall be an earthed metal sheath surrounding the cores.
- 27.14 No electric cable in use by the Contractor/TSECL shall be disturbed without prior permission. No weight of any description shall be imposed on any cable and no ladder or similar equipment shall rest against or attached to it.
- 27.15 No repair work shall be carried out on any live equipment. The equipment must be declared safe by the Site Engineer before any repair work is carried out by the Contractor. While working on electric lines/equipment whether live or dead, suitable type and sufficient quantity of tools shall have to be provided by Contractor to electricians/workmen/officers.
- 27.16 The Contractors shall employ necessary number of qualified, full time electricians/Electrical Supervisors to maintain his temporary electrical installations.



- 27.17 In case any accident occurs during the construction/erection or other associated activities undertaken by the Contractor thereby causing any minor or major or fatal injury to his employees due to any reason, whatsoever, it shall be the responsibility of the Contractor to promptly inform the same to the Site Engineer of TSECL and also to all the authorities envisaged under the applicable laws.
- 27.18 The Site Engineer of TSECL shall have the right at his sole discretion to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and/or property, and/or equipment. In such cases, the Contractor shall be informed in writing about the nature of hazards and possible injury/accident and he shall comply to remove short-comings promptly. The Contractor after stopping the specific work can, if felt necessary, appeal against the order of stoppage of work to the Deputy General Manager in charge of the work within 3 days of such stoppage of work and the decision of the Deputy General Manager in charge of the work in this respect shall be conclusive and binding on the Contractor.
- 27.19 The Contractor shall not be entitled for any damages/compensation for stoppage of work due to safety reasons as provided in para 27.18 above and the period of such stoppage of work shall not be taken as an extension of time for completion of work and shall not be the ground for waiver of levy of liquidated damages.
- 27.20 It is mandatory for the Contractor to observe during the execution of the works, the requirements of safety rules which would generally include but not limited to the following :
- Safety Rules:**
- a) Each employee shall be provided with initial indoctrination regarding safety by the Contractor, so as to enable him to conduct his work in a safe manner.
 - b) No employee shall be given a new assignment of work unfamiliar to him without proper introduction as to the hazards incident thereto, both to himself and his fellow employees.
 - c) Under no circumstances shall an employee hurry or take unnecessary chance when working under hazardous conditions.
 - d) Employees must not leave naked fires unattended. Smoking shall not be permitted around fire prone areas and adequate firefighting equipment shall be provided at crucial locations.
 - e) Employees under the influence of any intoxicating beverage, even to the slightest degree shall not be permitted to remain at work.
 - f) There shall be a suitable arrangement at every work site for rendering prompt and sufficient first aid to the injured.
 - g) The staircases and passageways shall be adequately lighted.
 - h) The employees when working around moving machinery must not be permitted to wear loose garments. Safety shoes are recommended when working in shops or places where materials or tools are likely to fall. Only experienced workers shall be permitted to go behind guard rails or to clean around energized or moving equipment.
 - i) The employees must use the standard protection equipment intended for each job. Each piece of equipment shall be inspected before and after it is used.



- j) Requirements of ventilation in underwater working to licensed and experienced divers, use of gum boots for working in slushy or in inundated conditions are essential requirements to be fulfilled.
- k) In cases or rock excavation blasting shall invariably be done through licensed blasters and other precautions during blasting and storage/transport of charge material shall be observed strictly.

27.21 The Contractor shall follow and comply with all relevant Safety Rules, relevant provisions of applicable laws pertaining to the safety of workmen, employees, plant and equipment as may be prescribed from time to time without any demur, protest or contest or reservation. In case of any discrepancy between statutory requirement and relevant Safety Rules referred above, the later shall be binding on the Contractor unless the statutory provisions are more stringent.

27.22 If the Contractor does not take all safety precautions and/or fails to comply with the Safety Rules as prescribed by Consortium or under the applicable law for the safety of the equipment and plant and for the safety of personnel and the Contractor does not prevent hazardous conditions which cause injury to his own employees or employees of other contractors, or Employees of TSECL or any other person who are at Site or adjacent thereto, the Contractors shall be responsible for payment of compensation to Consortium members as per the compensation order issued by the appropriate authority of Government of Tripura / verdict issued by court.

The compensation mentioned above shall be in addition to the compensation payable to the workmen / employees under the relevant provisions of the Workmen's Compensation Act and rules framed there under or any other applicable laws as applicable from time to time. In case TSECL is made to pay such compensation then the amount of such compensation shall be deducted from the progressive bills / contract performance guaranty of the contractor.

28.0 **CODEREQUIREMENTS**

The erection requirements and procedures to be followed during the installation of the equipment shall be in accordance with the relevant Codes and accepted good engineering practice, the Engineering Drawings and other applicable Indian recognized codes and laws and regulations of the Government of India.

29.0 **FOUNDATION DRESSING & GROUTING**

- i. The surfaces of foundations shall be dressed to bring the top surface of the foundations to the required level, prior to placement of equipment / equipment bases on the foundations.
- ii. All the equipment bases and structural steel base plates shall be grouted and finished as per these specifications unless otherwise recommended by the equipment manufacturer.
- iii. The concrete foundation surfaces shall be properly prepared by chipping, grinding as required to bring the type of such foundation to the required level, to provide the necessary roughness for bondage and to assure enough bearing strength. All laitance and surface film shall be removed and cleaned.

30.0 **Grouting Mix**

30.1 The Grouting mixture shall be composed of Portland cement, sand and water. The Portland cement to be used shall conform to ISI No. 269 or equivalent. Sand shall conform to ISI No. 383/2386 or equivalent. All grouts shall be thoroughly, mixed for not less than five minutes in an approved mechanical mixer and shall be used immediately after mixing.



30.2 **Placing of Grout**

30.2.1 After the base has been prepared, its alignment and level has been checked and approved and before actually placing the grout a low dam shall be set around the base at a distance that shall permit pouring and manipulation of the grout. The height of such dam shall be at least 25 mm. above the bottom of the base. Suitable size and number of chains shall be introduced under the base before placing the grout, so that such chains can be moved back and forth to push the grout into every part of the space under the base.

30.1.2 The grout shall be poured either through grout holes provided or shall be poured at one side or at two adjacent sides giving it a pressure head to make the grout move in a solid mass under the base and out in the opposite side. Pouring shall be continued until the entire space below the base is thoroughly filled and the grout stands at least 25 mm. higher all around than the bottom of the base. Enough care should be taken to avoid any air or water pockets beneath the bases. Vibrator shall be used to avoid any air or water pockets.

30.2 **Finishing of the Edges of the Grout**

The poured grout should be allowed to stand undisturbed until it is well set. Immediately thereafter, the dam shall be removed and grout which extends beyond the edges of the structural or equipment base plates shall be cut off, flushed and removed. The edges of the grout shall then be pointed and finished with 1:6 cement mortar pressed firmly to bond with the body of the grout and smoothed with a tool to present a smooth vertical surface. The work shall be done in a clean and scientific manner and the adjacent floor spaces, exposed edges of the foundations, and structural steel and equipment base plates shall be thoroughly cleaned of any spillage of the grout.

30.3 **Checking of Equipment After Grouting**

After the grout is set and cured, the Contractor shall check and verify the alignment of equipments, alignment of shafts of rotating machinery, the slopes of all bearing pedestals, centering of rotors with respect to their sealing bores, couplings, etc. as applicable and the like items to ensure that no displacement has taken place during grouting. The values recorded prior to grouting shall be used during such post grouting checkup and verifications. Such pre and post grout records of alignment details shall be maintained by the Contractor in a manner acceptable to the site Engineer of TSECL.

31 **CHECK OUT OF CONTROL SYSTEMS**

After completion of wiring, cabling, the contractor shall check out the operation of all control systems for the equipment furnished and installed under these specifications and documents.

32 **CABLING**

32.1 All cables shall be supported by conduits or cable trays run in air or in cable channels. These shall be installed in exposed runs parallel or perpendicular to dominant surface with right angle turn made of symmetrical bends for fittings. When cables are run on cable trays, they shall be clamped at minimum intervals of 2000 mm. or otherwise as directed by the site Engineer.

32.2 Each cable, whether power or control, shall be provided with a metallic or plastic tag of an approved type, bearing a cable reference number indicated in the cable and conduit list (prepared by the contractor), at every 5 meter run or part thereof and at both ends of the cable adjacent to the terminations. Cable routing is to be done in such a way that cables are accessible for any maintenance and for easy identification.



- 32.3 Sharp bending and kinking of cables shall be avoided. Installation of cables high voltage, coaxial, screened, compensating, mineral insulated shall be in accordance with the cable manufacturer's recommendations. Wherever cables cross roads and water, oil, sewage or gas lines, special care should be taken for the protection of the cables in designing the cable channels.
- 32.4 In each cable run some extra length shall be kept at a suitable point to enable one or two straight through joints to be made, should the cable develop fault at a later date.
- 32.5 Control cable terminations shall be made in accordance with wiring diagrams, using identifying codes subject to approval of Engineering charge of the work. Multi-core control cable jackets shall be removed as required to train and terminate the conductors. The cable jacket shall be left on the cable, as far as possible, to the point of the first conductor branch. The insulated conductors from which the jacket is removed shall be neatly twined in bundles and terminated. The bundles shall be firmly but not tightly tied utilizing plastic or nylon ties or specifically treated fungus protected cord made for this purpose. Control cable conductor insulation shall be secure and even.
- 32.6 The connectors for control cables shall be covered with a transparent insulating sleeve so as to prevent accidental contact with ground or adjacent terminals and shall preferably be terminated at the connecting end of the equipments. The insulating sleeve shall be fire resistant and shall be long enough to over pass the conductor insulation. All control cables shall be fanned out and connection made to terminal blocks and test equipment for proper operation before cables are corded together.

33 AVAILABILITY OF SHUTDOWN.

Such shut down will be provided by the Owner as per Owner's convenience on receiving written requisition informing about his programme from the contractor at least **one week** before such requirement. The Contractor shall have to arrange during execution everything necessary for complete installation & Commissioning of all equipment and the entire requirement as specified in the work schedule.



SECTION – V
TECHNICAL SPECIFICATION

SI No	Particulars
A	PRE-STRESSED CONCRETE POLES' FOR OVERHEAD LINES.
B	ALUMINIUM CONDUCTOR STEEL REINFORCED (ACSR) CONDUCTORS ,WEASEL” , “RABBIT” and “DOG”“ ACSR
C	M.S STRUCTURAL STEEL SECTION
D	MILD STEEL, PAINTED,STAY SET
E	GI STAY WIRE SIZE 7/2.50 MM
F	8 S.W.G, M.S. HEAVY COATING GALVANISED IRON WIRE
G	EARTHING AND EARTHING PIPE.
H	DANGER NOTICE PLATE.
I	L.T.SHAKLE INSULATOR.
J	L.T STRAPS & BOLTS
K	ISI MARKED 2.5mm ² PVC Cable
L	LT & H.T STRAIN INSULATOR.
M	M.S BLACK BOLTS, NUTS AND WASHERS.



A. Pre-stressed concrete poles for Overhead Lines

- 1.1 **Scope of Work:-** Scopes of work covered under this package include Manufacturing, Inspection and testing at manufacturer's works and delivery and erection of the PCC poles as per the scope of the work & bearing the technical specification specified in the bid document.
- 1.2 **Clearance for delivery of the PCC poles** under the scope of work will be issued by Engg-in-charge after successful Testing of the poles at works as per the delivery schedule. The PCC poles to be properly stored stack wise according to their categories, inside the factory complex and would be under watch & ward of the manufacturer.
- 1.3 **Supplier of the PCC pole** must be a PCC Pole Manufacturer, registered under Directorate of Industries & Commerce, Govt. of Tripura and must have well equipped manufacturing, testing facilities & sufficient arrangement for lifting, loading/ un loading of poles. The manufacturing unit must have sufficient space inside the factory complex for storing of poles.

1.4 TECHNICAL SPECIFICATION.

- a) **Cement:** - The cement used in the manufacture of 'pre-stressed concrete poles' shall be ordinary or rapid hardening Portland cement conforming to **IS: 269-1976 or IS: 8041-E.1976.**
- b) **Aggregate:** - used for the manufacture of Pre-stressed concrete poles (PCC poles) shall conform to **IS 383-1970. The stone chips to be used shall invariably be brought from outside Tripura State like Assam.** The nominal maximum size of aggregate shall in no case exceed **10mm.**
- c) **Water** : - Water should be free from chlorides, sulphate, other salts and organic matter.
- d) **Admixtures:** - Admixtures should not contain calcium chloride or other chlorides and salts which are likely to promote corrosion of pre-stressing steel.
- e) **PRE-STRESSING STEEL (i.e. TENSION WIRE)** : - The pre-stressing steel for works should conform to **IS: 6003 of 1983.** The diameter of pre-stressing steel wire shall be 4mm. with a **minimum ultimate tensile strength of 175kg. / mm².**
- f) **CONCRETE MIX AND STRENGTH** : -

The concrete mixture shall be designed as per requirements below:

- I. **Minimum works cube strength of 28 days should be at least 250kg/cm².**
- II. **The concrete strength at transfer should be at least 125kg/cm².**
- III. The mixture should contain **380kg. to 510kg. of cement per cubic meter of concrete,** actual consumption will be determined by cube strength but the consumption in all cases will be based on 510 kg /cum.
- IV. The mixture should contain as low as water content as is constant with adequate workability.
- V. The concrete shall be compacted thoroughly by vibration, pressure, shock spinning or other means and shall have density of not less than 2.4 tones mm³. Hand compaction shall not be permitted and the required compaction shall be permissible by 'electric vibrator'.
- VI. The Concrete strength at transfer shall not be less than half the 28 days strength ensured in the design i.e. $250 \times 0.5 = 125 \text{kg/cm}^2$.



- g) **CURING:** - The concrete shall be covered with layer of soaking canvas, Hessian or similar absorbent materials and constantly wet up to the time when the strength of concrete is at least equal to the minimum strength of concrete at transfer of pre-stress. Thereafter, the pole may be removed from the mould and watered at intervals to prevent surface cracking of the unit. The intervals should depend on the atmospheric humidity and temperature.
- h) **The Pre-stressing wires shall be de-tensioned only after the concrete has attained the specified strength at transfer (i.e. 125kg/cm²).** The cube meant for the purpose of determining the strength at transfer (by cube test) should be cured, done for each incoming stock of cement as far as possible under conditions similar to those under which the poles are tested.
- i) **EYE-HOOK:** - Separate eye-hook shall be provided for handling and transportation, one each at a distance of 0.15 times the overall length from either end of the pole. Eye-hook should be properly anchored and should be on the face that has the shorter dimension of the cross-section. Stacking should be done in such a manner that the broad side of the pole is vertical. Each tier in the stack should be supported on timber sleepers located at 0.15 times the overall length measured from the end. The timber supports in the stack should be aligned in a vertical line.
- j) **EARTHING** : - Earthing shall be provided by having a length of 8-SWG, G.I. Wire embedded in concrete during manufacture and 150mm. ends of the wires should be left projecting from the pole at 250mm. from top and 150mm. below ground level. The earth wire shall not be allowed to come in contact with the pre-stressing wires.
- k) **SPECIAL TERMS & CONDITION.**
- The plans and Drawings connected with the work can be seen by the contractor before bidding for the job, which will be available in the O/O AGM(DP&C),Corporate Office, TSECL. The bidders are supposed to have acquainted themselves with the plan, design, drawing and specifications of the concerned work. No claim on this account will be entertained later on.
 - It is also impressed upon the contractor that they will have to produce good workmanship strictly according to the specifications and no plea will be heard that they are not able to get good workers.
 - It will be obligatory for the bidder to produce forest clearance certificate from the Divisional Forest Officer (DFO) having jurisdiction over the area in respect of extraction of any forest product for utilization in the works under this contract, before payment, and/or refund of security deposit, if the bidder fails to do so a sum of money towards the royalty, remaining paid by the contractor if any, as may be specified by the concerned Divisional Forest Officer will be set off from any of money including security deposit due and payable to the bidder under this contract.
 - Tools & Plants will not be issued by the corporation.

1.5 CALIBRATION OF TESTING INSTRUMENTS: The instruments/equipment required for Inspection & Testing should have valid calibration as per following guideline:

- Calibration Certificate issued by Laboratory accredited by NABL may be accepted unconditionally provided the certificate bears an Accreditation body Logo.
- For testing equipments, where NABL Accreditation is not available, Calibration Certificate from Educational Institutions like IIT's, NIT's, J.U., C.U., BHU only can be accepted provided they can demonstrate traceability.

Necessary confirmation regarding above is to be given along with inspection offer failing which the inspection offer will not be accepted. **If during inspection & testing, the suppliers fail to produce Calibration Certificate as indicated above the offered lot may be rejected.**



1.6 INSPECTION & TESTING

a) Before finalization of Tender:

After opening of Techno-Commercial part of the Tender, the tendering authority at its discretion may send their representative for inspection of the factory premises at any day within working hrs. to ensure participating tenderer's manufacturing capability & technical eligibility to combat with TSECL's requirement.

b) After finalization of Tender:

- I. Delivery of finished PCC pole from the contractor / manufacturer's works will only be permitted only after issuance of Materials Inspection Clearance Certificate (MICC) by the inspecting officer / team of TSECL unless otherwise waived by TSECL during execution of the contract in special circumstances.
- II. **After** manufacturing and curing of the PCC poles, the contractor shall give intimation to the owner's Engineer in charge of the work for conducting inspection of PCC Poles / materials at manufacture's works or at recognized testing laboratories to be arranged by the contractor. **The intimation shall be made at least 15(fifteen) days before the PCC Poles / materials become ready for dispatch.**
- III. TSECL may inspect the **manufacturing process any time**. The contractor shall give previous notice to the TSECL for the proposal / programme of testing. If considered necessary, the materials specially **H.T. wire** will be tested by **the inspecting officer / team of TSECL (Maximum two persons) at HT wire manufacturer's factory** before dispatch to the contractor's PCC Pole Manufacturing unit for which contractor will provide all sorts of arrangement for tests including to & fro travelling expenses, lodging charges etc for TSECL's representative at their cost. At least 2% of the total quantity shall be tested.
- IV. **Testing** of PCC Poles, H.T. Wire / materials as specified above shall be conducted at the risk and cost of the contractor. **The contractor shall also bear the to and fro traveling and lodging charges of the inspecting officer / team of TSECL.**

c) Acceptance test as per Technical Specification will be carried out at the works before delivery of the poles.

- I. All the poles shall be tested for overall length, cross-section and uprightness. The tolerance shall be **(+/-) 15mm. on overall length, (+/-) 3mm. on cross sectional dimension and 0.50 % up-rightness.**
- II. The number of poles to be tested for transfer strength test shall be **1(one) No. from each lot of 50 (fifty) Nos. Poles.**
- III. Planting height of the pole shall be marked by putting paint at a height of **1.25mtr, 1.30 mtr. & 1.50 mtr.** from the bottom for **7.50 m. long, 8.00 m. long & 9.00 m. long** PCC Poles respectively.
- IV. The poles shall be clearly indelibly marked with the following particulars during manufacture so as to easily read after erection position.
 - A) **Month and Year of Manufacture.**
 - B) **Transverse Strength of Pole in Kg.**
 - C) **Serial No. of pole & abbreviated name of firm.**
- V. **Responsibility of the contractor is in force till successful erection & commissioning of the PCC poles and any pole found defective during transportation of after erection & commissioning ,will have to be replaced at free of cost.**



1.7 Details Specification of 9.0 mtr /200 kg Pre-stressed Concrete pole

1. Factor of safety = 2.5
2. Concrete Grade = M-250
3. Diameter of pre-stressing wire = 4 mm.
4. Ultimate Tensile Strength of pre-stressing Wire..... = 17500 Kg./cm²
5. Number of Tensile Wire = 14
6. Number of Untensioned Wire..... = 2
7. Concrete Quantity per Pole..... = 0.203 m³
8. Steel Quantity per Pole = 13.30 Kg.
9. Weight of Pole = 490 Kg.
10. Clear cover to Wire = 20 mm.
11. Location of Holes: - As per REC Standard.
12. 'O' Denotes Tensioned Wire.
13. 'X' Denotes Un-tensioned Wire.
14. '+' possible position of Earth Wire.
15. All Dimensions are in mm.
16. Drawing not to Scale.

VI. NOTE: For holding part length un-tensioned wires in position, 4mm stirrups may be use suitable spacing.If any practical difficulty is experienced in using part length un-tensioned wires, full length wires may be used instead. But the tension in these wires should not exceed their ultimate tensile strength value. However, it may be noted that use of part un-tensioned wires will be more economical.

VII. Details Specification of 8.0 mtr, / 200 kg. Pre-stressed Concrete pole.

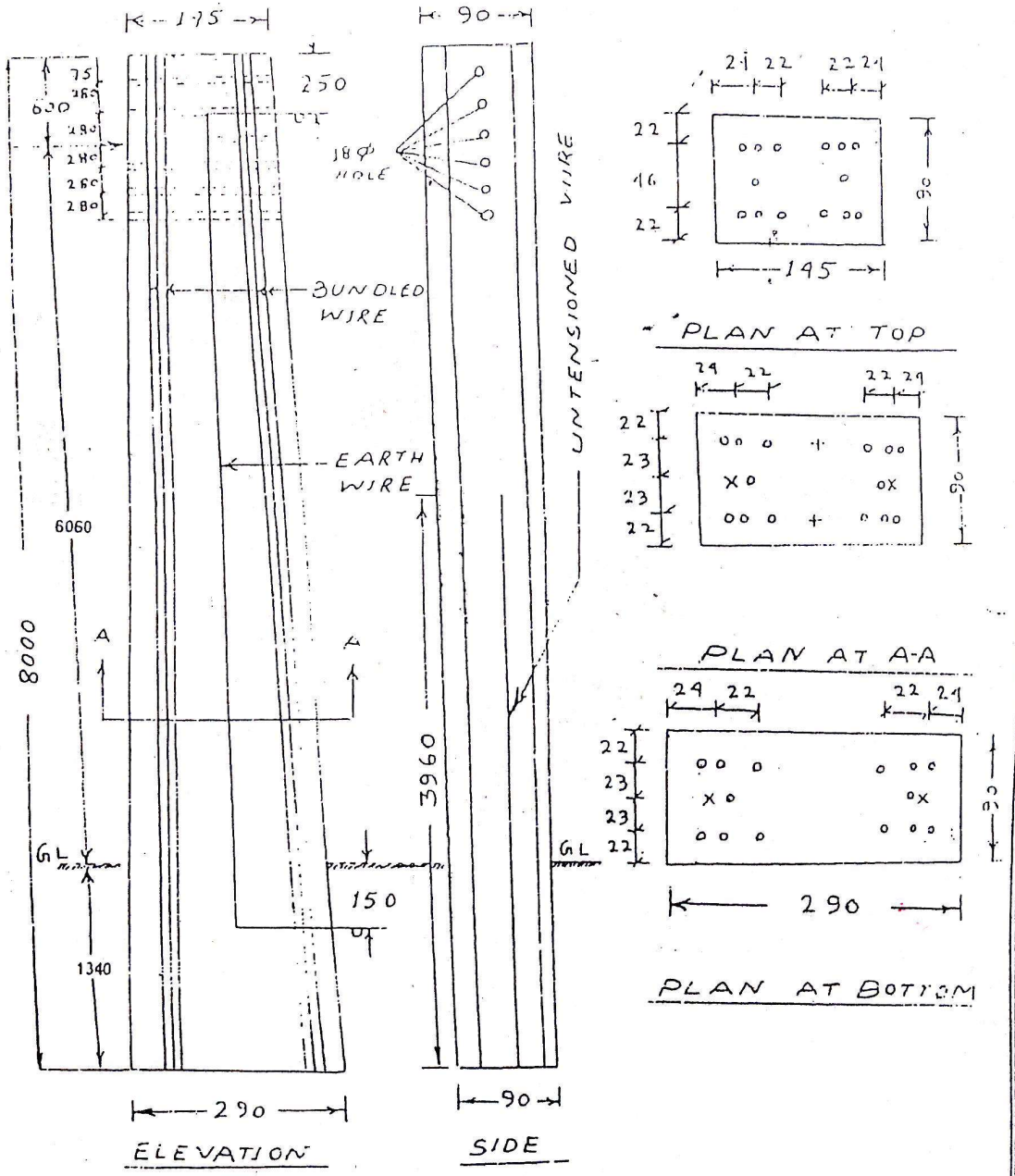
1. F actor of safety..... = 2.5
2. Concrete Grade = M-250
3. Diameter of pre-stressing wire..... = 4 mm.
4. Ultimate Tensile Strength of pre-stressing Wire..... = 17500 Kg/cm²
5. Number of Tensile Wire..... = 14
6. Number of Un tensioned Wire..... = 2
7. Concrete Quantity per Pole..... = 0.157 m
8. Steel Quantity per Pole..... = 11.82 Kg.
9. Weight of Pole..... = 380 Kg.
10. Clear cover to Wire..... = 20 mm.
11. Location of Holes..... = As per REC Standard.



12. 'O' Denotes Tensioned Wire. 13. 'X' Denotes Un-tensioned Wire.
13. 'X' Denotes Un-tensioned Wire.
14. '+' possible position of Earth Wire.
15. All Dimensions are in mm.
16. Drawing not to Scale.

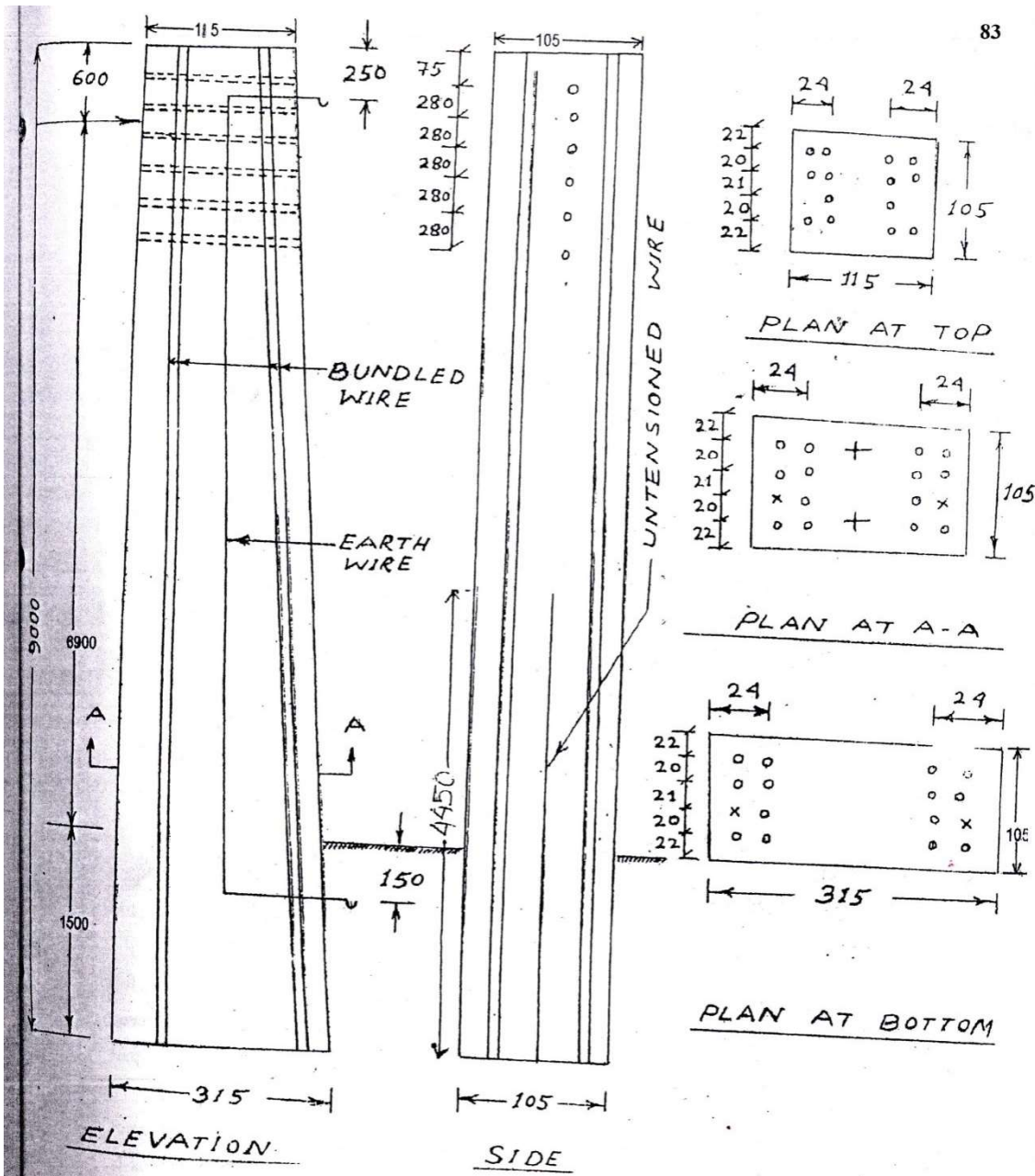
VIII. **NOTE:**

1. For holding part length un-tensioned wires in position, 4mm stirrups may be used with suitable spacing.
2. If any practical difficulty is experienced in using part length un-tensioned wires, full length wires may be used instead. But the tension in these wires should not exceed their ultimate tensile strength value. However, it may be noted that use of part un-tensioned wires will be more economical.
3. The alternative of using full length wires instead of part length un-tensioned wire is not feasible if the pole is to be used for L.T. lines with vertical configuration. This is because of non-availability of sufficient clearance between the extended full length wires and the holes to be provided in the pole for fixing Shackle Insulators.



REINFORCEMENT DETAILS OF 8'0 M/200K₉

PRESTRESSED CONCRETE POLE



REINFORCEMENT DETAILS OF 9.0M/200Kg

PRESTRESSED CONCRETE POLE



B. TECHNICAL SPECIFICATION OF ALUMINIUM CONDUCTOR STEEL REINFORCED (ACSR) CONDUCTORS, WEASEL", " RABBIT" and "DOG" " ACSR

1. **SCOPE:** -This section covers design, manufacture, testing before dispatch, packing, supply and delivery to destination of Kms of "WEASEL", "RABBIT", "DOG", ACSR of sizes, **6/1/2.59mm, 6/1/3.35mm, &(6/4.72mm + 7/1.57mm)respectively.**
2. **STANDARDS:** -The Conductor shall also comply in all respects with the IS: 398(Part-II)-1996 with latest amendments unless otherwise stipulated in this specification or any other International Standards which ensure equal or higher quality material.

The ACSR Conductor shall also conform to the following standards.

Sl. No.	Indian Standards	Title	International
1	IS:209-1979	Specification for Zinc	BS-3436-1961
2	IS:398-1996	Specification for aluminium conductors for overhead transmission purposes.	
		Part-II	
		Aluminium conductors	IEC-209-1966
		Galvanized steel reinforced	BS-215(Part-II)
3	IS:1521-1972	Method of Tensile Testing of Steel wire	ISO/R89-1959
4	IS:1778-1980	Reels and Drums for Bare conductors	BS-1559-1949
5	IS:1841-1978	E.C. Grade Aluminium rod produced by rolling	
6	IS:2629-1966	Recommended practice for Hot Dip Galvanizing of iron and steel	
7	IS:2633-1986	Method of testing uniformity of coating of zinc coated articles.	
8	IS:4826-1968	Galvanized coatings on round steel wires.	ASTM A472-729
9	IS:5484-1978	E.C. Grade Aluminium rod produced by continuous casting and rolling.	
10	IS:6745-1972	Methods of determination of weight of zinc-coating of zinc coated iron and steel articles	BS-443-1969

standards other than IS-398 shall be accompanied by the English version of relevant standards in support of the guaranteed technical particulars to be furnished as per format enclosed.

3. **GENERAL TECHNICAL REQUIREMENTS:-**The General Technical Requirements are given in Section-II. The Conductor shall conform to these technical requirements.

The Bidder shall furnish Guaranteed Technical Particulars in Section-III.

3.1. MATERIALS/WORKMANSHIP

- 3.1.1. The material offered shall be of best quality and workmanship. The steel cored aluminum conductor strands shall consist of hard drawn aluminum wire manufactured from not less than 99.5% pure electrolytic aluminum rods of E.C. grade and copper content not exceeding 0.04%. They shall have the same properties and characteristics as prescribed in IEC: 889-1987. The steel wire shall be made from material produced either by the acid or basic open hearth process or by electric furnace process or basic oxygen process. Steel wire drawn from Bessemer process shall not be used.



3.1.2. The steel wires shall be evenly and uniformly coated with electrolytic high grade, 99.95% purity zinc complying with the latest issue of IS-209 for zinc. The uniformity of zinc coating and the weight of coating shall be in accordance with Section-II and shall be tested and determined according to the latest IS-2633 or any other authoritative standard.

3.1.3. The steel strands shall be hot dip galvanized and shall have a minimum zinc coating of 250 gm/sq. m after stranding. The coating shall be smooth, continuous, and of uniform thickness, free from imperfections and shall withstand minimum three dips after stranding in standard piece test. The steel strands shall be preformed and post formed in order to prevent spreading of strands in the event of cutting of composite core wire. The properties and characteristics of finished strands and individual wires shall be as prescribed in IS:398-1996

4. **CONDUCTOR PARAMETERS:-**The Parameters of individual strands and composite steel core aluminium conductor shall be in accordance with the values given in this Section.

Creep in a conductor is attributed partly due to settlement of strands and partly due to non-elastic elongation of metal when subjected to load. The manufacturer of conductor shall furnish the amount of creep which will take place in 10, 20, 30, 40 and 50 years along with the supporting calculations. The calculations should be based on everyday temperature of 32 °C and everyday tension of 25% of UTS of conductor of 11/33 KV Feeders.

5. **TOLERANCES:** - The following tolerances shall be permitted:

- (a) Tolerance on nominal diameter of aluminium wires: ± 1 (one) percent.
- (b) Tolerance on nominal diameter of galvanized steel wires: ± 2 (two) percent.

6. **SURFACE CONDITIONS:** -All aluminium and steel strands shall be smooth, and free from all imperfections, spills/and splits. The finished conductor shall be smooth, compact, uniform and free from all imperfections including spills and splits, die marks, scratches, abrasions, scuff marks, kinks (protrusion of wires), dents, pressmarks, cut marks, wire cross-over, over-riding looseness, pressure and/or unusual bangle noise on tapping, material inclusions, white rust, powder formation or black spots (on account of reaction with trapped rain water etc.), dirt, grit, etc. The surface of conductor shall be free from points, sharp edges, abrasions or other departures from smoothness or uniformity of surface contour that would increase radio interference and corona losses. When subjected to tension upto 50% of the ultimate strength of the conductor, the surface shall not depart from the cylindrical form nor any part of the component parts or strands move relative to each other in such a way as to get out of place and disturb the longitudinal smoothness of the conductor.

7. **JOINTS IN WIRES**

7.1. **Aluminum wires:** -During stranding, no aluminium wire welds shall be made for the purpose of achieving the required conductor length.

No joint shall be permitted in the individual aluminium wires in the outer most layer of the finished Conductor. However, joints in the 12 wire & 18 wire inner layer of the conductor are permitted but these joints shall be made by the cold pressure butt welding and shall be such that no two such joints shall be within 15 meters of each other in the complete stranded conductor.



- 7.2. **Steel wires:** -There shall be no joints in finished steel wires forming the core of the steel reinforced aluminium conductor.
8. **STRANDING:** -The wires used in construction of the stranded conductor, shall, before stranding, satisfy all requirements of IS-398 (Part-II) 1996.
In all constructions, the successive layers shall be stranded in opposite directions. The wires in each layer shall be evenly and closely stranded round the underlying wire or wires. The outer most layer of wires shall have a right hand lay. The lay ratio of the different layers shall be within the limits given under Section-II.
9. **PACKING**
- 9.1. The conductor shall be supplied in non-returnable strong wooden drums provided with lagging of adequate strength constructed to protect the conductor against any damage and displacement during transit, storage and subsequent handling and stringing operations in the field. The drums shall generally conform to IS-1778-1980 and latest version except as otherwise specified hereinafter. The conductor drums shall be adequate to wind one standard length of 2,500 meters of WEASEL/RABBIT/DOG, ACSR.
- 9.2. The drums shall be suitable for wheel mounting and for letting off the conductor under a minimum controlled tension of the order of 5KN. The conductor drums shall be provided with necessary clamping arrangements so as to be suitable for tension stringing of power conductor.
- 9.3. The bidders should submit their drawings of the conductor drums along with the bid. After placement of letter of intent the Manufacturer shall submit four copies of fully dimensioned drawing of the drum for Employer's approval. After getting approval from the Employer, Manufacturer shall submit 30 more copies of the approved drawings for further distribution and field use.
- 9.4. All wooden components shall be manufactured out of seasoned soft wood free from defects that may materially weaken the component parts of the drums. Preservative treatment for anti-termite/anti fungus shall be applied to the entire drum with preservatives of a quality which is not harmful to the conductor.
- 9.5. All flanges shall be 2-ply construction with 64 mm thickness. Each ply shall be nailed and clenched together at approximately 90 degrees. Nails shall be driven from the inside face of the flange, punched and then clenched on the outer face. Flange boards shall not be less than the nominal thickness by more than 2 mm. There shall not be less than 2 nails per board in each circle.
- 9.6. The wooden battens used for making the barrel of the conductor shall be of segmental type. These shall be nailed to the barrel supports with at least two nails. The battens shall be closely butted and shall provide a round barrel with smooth external surface. The edges of the battens shall be rounded or chamfered to avoid damage to the conductor.
- 9.7. Barrel studs shall be used for construction of drums. The flanges shall be holed and the barrel supports slotted to receive them. The barrel studs shall be threaded over a length on either end, sufficient to accommodate washers, spindle plates and nuts for fixing flanges at the required spacing.
- 9.8. Normally, the nuts on the studs shall stand protruded of the flanges. All the nails used on the inner surface of the flanges and the drum barrel shall be countersunk. The ends of the barrel shall generally be flushed with the top of the nuts.
- 9.9. The inner cheek of the flanges and drum barrel surface shall be painted with bitumen based paint.
- 9.10. Before reeling, card board or double corrugated or thick bituminized waterproof bamboo paper shall



be secured to the drum barrel and inside of flanges of the drum by means of a suitable commercial adhesive material. The paper should be dried before use. Medium grade craft paper shall be used in between the layers of the conductor. After reeling the conductor the exposed surface of the outer layer of conductor shall be wrapped with thin polythene sheet across the flanges to preserve the conductor from dirt, grit and damage during transportation and handling and also to prevent ingress of rain water during storage/transport.

- 9.11. A minimum space of 75 mm shall be provided between the inner surface of the external protective lagging and outer layer of the conductor. Outside the protective lagging, there shall be minimum of two binders consisting of hoop iron/ galvanized steel wire. Each protective lagging shall have two recesses to accommodate the binders.
- 9.12. Each batten shall be securely nailed across grains as far as possible to the flange edges with at least 2 nails per end. The length of the nails shall not be less than twice the thickness of the battens. The nail shall not protrude above the general surface and shall not have exposed sharp edges or allow the battens to be released due to corrosion.
- 9.13. The conductor ends shall be properly sealed and secured with the help of U-nails on one side of the flanges.
- 9.14. Only one standard length of conductor shall be wound on each drum. The method of lagging to be employed shall be clearly stated in the tender.
- 9.15. As an alternative to wooden drum Bidder may also supply the conductors in non-returnable painted steel drums. The painting shall conform to IS: 9954-1981, reaffirmed in 1992. Wooden/ steel drum will be treated at par for evaluation purpose and accordingly the Bidder should quote the package.
- 10. LABELLING AND MARKING:-**The drum number shall be branded or gauged or stencilled into the flange. An arrow shall be marked on the sides of the drum, together with the words "Roll this way". Each drum shall have the following information provided on the outside of the flange stencilled with indelible ink.

- i) Manufacturer's name and address.
- ii) Contract/Specification number.
- iii) Size and type of conductor.
- iv) Net weight of the conductor.
- v) Gross weight of the conductor and drum.
- vi) Length of the conductor.
- vii) Position of the conductor end.
- viii) Drum and lot number.
- ix) Name and address of the consignee.
- x) Month and year of manufacture.
- xi) The drum may also be marked with standard specification as per which the conductor is manufactured.

11. STANDARD LENGTHS

- 11.1. The standard length of the conductor shall be 2,500 meters to 7,000 meters. Bidder shall indicate the standard length of the conductor to be offered by them. A tolerance of plus or minus 5% on the standard length offered by the bidder shall be permitted. All lengths outside this limit of tolerance shall be treated as random lengths.



- 11.2. Random lengths will be accepted provided no length is less than 70% of the standard length and total quantity of such random length shall not be more than 10% of the total quantity order. When one number random length has been manufactured at any time, five (5) more individual lengths, each equivalent to the above random length with a tolerance of +/-5% shall also be manufactured and all above six random lengths shall be dispatched in the same shipment. At any point, the cumulative quantity supplied including such random lengths shall not be more than 12.5% of the total cumulative quantity supplied including such random lengths. However, the last 20% of the quantity ordered shall be supplied only in standard length as specified.
- 11.3. Bidder shall also indicate the maximum single length, above the standard length, he can manufacture in the guaranteed technical particulars of offer. This is required for special stretches like river crossing etc. The Employer reserves the right to place orders for the above lengths on the same terms and conditions applicable for the standard lengths during the pendency of the Contract.
- 12. QUALITY ASSURANCE PLAN:-**A Quality Assurance Plan including customer hold points covering the manufacturing activities of the material shall be required to be submitted by the bidder to the Employer along with the tender. The Quality Assurance Plan after the same is found acceptable will be approved by the Employer.
The contractor shall follow the approved Quality Assurance Plan in true spirit. If desired by the Employer, he shall give access to all the documents and materials to satisfy the Employer that the Quality Assurance Plan is being properly followed.
- 13. TEST CERTIFICATE: - The bidder must submit the notarized copy of the Type test certificate of the material offered conducted from a NABL accredited Lab. The type test reports shall not be older than FIVE years and shall be valid up to expiry of validity of offer.**
- 14. TESTS: -** The following tests shall be carried out on sample/samples of conductor.
- 14.1 Type Tests**
- (i) Visual examination
 - (ii) Measurement of diameters of individual aluminium and steel wires.
 - (iii) Measurement of lay ratio of each layer
 - (iv) Breaking load test
 - (v) Ductility test
 - (vi) Wrapping test
 - (vii) Resistance test on aluminium wires.
 - (viii) DC resistance Test on Composite Conductor.
 - (ix) Galvanizing test
 - (x) Surface condition test
 - (xi) Stress Strain test
 - (xii) Procedure qualification test on welded joint of Aluminium Strands.
- 14.2 Acceptance tests and Routine tests**
- (i) Visual and dimensional check on drum.
 - (ii) Visual examination
 - (iii) Measurement of diameters of individual aluminium and steel wires.



- (iv) Measurement of lay ratio of each layer
- (v) Breaking load test
- (vi) Ductility test
- (vii) Wrapping test
- (viii) Resistance test on aluminium wires.
- (ix) DC resistance Test on Composite Conductor.
- (x) Galvanizing test

14.3 Visual examination: - The conductor shall be examined visually for good workmanship and general surface finish of the conductor. The conductor drums shall be rewound in the presence of Inspecting Officer. The Inspector will initially check for Scratches, Joints etc., and that the conductor shall generally conform to the requirements of the specifications/IS 398(Part-II)-1996.

14.4 Measurement of diameters of individual Aluminum and Steel Wires:-The diameters of individual Aluminium and Steel Wires shall be checked to ensure that they conform to the requirements of this specification.

14.5 Measurement of lay-ratios:- The lay-ratios of each layer of the conductor shall be measured and checked to ensure that they conform to the requirements of this specification and IS:398 (Part-II)-1996.

14.6 Breaking load test

a) Breaking load test on complete conductor.

Circles perpendicular to the axis of the conductor shall be marked at two places on a sample of conductor of minimum 5m length between fixing arrangement suitably fixed on a tensile testing machine. The load shall be increased at a steady rate upto 50% of minimum specified UTS and held for one minute. The circles drawn shall not be distorted due to relative movement of strands. Thereafter the load shall be increased at steady rate to 100% of UTS and held for one minute. The Conductor sample shall not fail during this period. The applied load shall then be increased until the failing load is reached and the value recorded.

b) Breaking load test on individual Aluminum and Galvanized steel wires.

This test shall be conducted on both Aluminium and Galvanized steel wires. The breaking load of one specimen cut from each of the samples taken shall be determined by means of suitable tensile testing machine. The load shall be applied gradually and the rate of separation of the jaws of the testing machine shall be not less than 25 mm/min. and not greater than 100 mm. / min. The ultimate breaking load of the specimens shall be not less than the values specified in the Section-II.

14.7 Ductility Test:-For the purpose of this test both torsion and elongation tests shall be carried out on galvanized steel wires only.

14.8 Torsion Test

One specimen cut from each of the samples taken shall be gripped in two vices exactly 15 cm apart. One of the vices shall be made to revolve at a speed not exceeding one revolution per second and the other shall be capable of moving longitudinally to allow for contraction or expansion during testing. A small tensile load not exceeding 2 (two) percent of the breaking load of the wire shall be applied to the samples during testing. The test shall be continued until fracture occurs and the fracture shall show a smooth surface at right angles to the axis of the wire. After fracture, the specimen shall be free from helical splits. The sample shall withstand a number of



twists equivalent to not less than 18 on length equal to 100 times the diameter. When twisted after stranding the number of complete twists before fracture occurs shall be not less than 16 on a length equal to 100 times the diameter of the wire. In case test sample length is less or more than 100 times the stranded diameter of the strand, the minimum number of twists will be proportioned to the length and if number comes in the fraction then it will be rounded off to the next higher whole number. The fracture shall show a smooth surface at right angles to the axis of the wire.

14.9 Elongation Test

The elongation of one specimen cut from each of the samples taken shall be determined. The specimen shall be straightened by hand and an original gauge length of 200 mm. shall be marked on the wire. A tensile load shall be applied as described in 1.1.4.6.2.1 and the elongation shall be measured after the fractured ends have been fitted together. If the fracture occurs outside the gauge marks, or within 25 mm. of either mark or the required elongation is not obtained, the test shall be disregarded and another test conducted. When tested before stranding, the elongation shall be not less than 4 percent and when tested after stranding, the elongation shall be not less than 3.5 percent.

14.10 Wrapping Test

This test shall be conducted on both Aluminium and Galvanized steel wires.

14.11.1 Aluminum wires

One specimen cut from each of the samples of aluminium wires shall be wrapped round a wire of its own diameter to form a close helix of 8 turns. Six turns shall then be unwrapped and closely wrapped in the same direction as before. The wire shall not break or show any crack.

14.11.2 Galvanized steel wires

One specimen cut from each of the samples of galvanized steel wire taken shall be wrapped round a mandrel of diameter equal to 4 times the wire diameter to form a close helix of 8 turns. Six turns shall then be unwrapped and again closely wrapped in the same direction as before. The wire shall not break.

14.11 Resistance Test

This test shall be conducted on aluminium wires only, conforming to procedure as per IEC: 889. The electrical resistance of one specimen of aluminium wire cut from each of the samples taken shall be measured at ambient temperature. The measured resistance shall be corrected to the value corresponding to 20°C. by means of following formula.

$$R_{20} = R_T [1 / \{(1 + \alpha (T - 20))\}]$$

Where,

R_{20} = Resistance corrected at 20°C.

R_T = Resistance measured at T°C.

α = Constant mass temperature coefficient of resistance, 0.004.

T = Ambient temperature during measurement.

This resistance R_{20} shall be not more than the maximum value specified in the relevant Indian Standards.

14.12 Galvanizing Test:-This test shall be conducted on galvanized steel wires only. The uniformity of Zinc coating and the weight of coating shall be in accordance with IS 4826-1979.

14.13 Surface Condition Test:- A sample of the finished conductor for use in 11/33 KV system having a minimum length of 5 meters with compression type dead end clamps compressed on both ends in such manner as to permit the conductor to take its normal straight line shape, shall be subjected to



a tension of 50 percent of the UTS of the conductor. The surface shall not depart from its cylindrical shape nor shall the strands move relative to each other so as to get out of place or disturb the longitudinal smoothness of conductor. The measured diameter at any place shall be not less than the sum of the minimum specified diameters of the individual aluminium and steel strands as indicated in Section-II.

- 14.14 Stress-Strain Test:** - The test is contemplated only to collect the creep data of the conductor from the manufacturer. A sample of conductor of minimum 10 meters length shall be suitably compressed with dead end clamps.
- 15. TEST SET-UP.**
- 15.1. The test sample shall be supported in a trough over its full length and the trough adjusted so that the conductor will not be lifted by more than 10mm under tension. This shall be ascertained by actual measurement.
- 15.2. The distance between the clamp and the sleeve mouth shall be monitored with calipers during the test to ensure that, after the test, it does not change by more than 1mm + 0.1mm from the value before the test.
- 15.3. The conductor strain shall be evaluated from the measured displacements at the two ends of the gauge length of the sample. The gauge reference targets shall be attached to the clamps which lock the steel and aluminum wires together. Target plates may be used with dial gauges or displacement transducers and care shall be taken to position the plates perpendicular to the conductor. Twisting the conductor, lifting it and moving it from side-to-side by the maximum amounts expected during the test should introduce no more than 0.3mm error in the reading.
- 16. TEST LOADS FOR COMPLETE CONDUCTOR**
- The loading conditions for repeated stress-strain tests for complete conductor shall be as follows:
- 16.1. 1KN load shall be applied initially to straighten the conductor. The load shall be removed after straightening and then the strain gauges are to be set At zero tension.
- 16.2. For non-continuous stress-strain data, the strain readings at 1KN intervals at lower tensions and 5 KN intervals above 30% of UTS shall be recorded.
- 16.3. The sample shall be reloaded to 30% of UTS and held for 1 hour. Readings are to be noted after 5, 10, 15, 30, 45 and 60 minutes during the hold period. The load shall be released then after the hold period.
- 16.4. The sample shall be reloaded to 50% of UTS and held for 1 hour. Readings are to be noted after 5, 10, 15, 30, 45 and 60 minutes during the hold period. The load shall be released then after the hold period.
- 16.5. Reloading upto 70% of UTS shall be done and held for 1 hour. Readings are to be noted after 5, 10, 15, 30, 45 and 60 minutes. The load shall be released.
- 16.6. Reloading upto 85% of UTS shall be done and held for 1 hour. Readings are to be noted after 5, 10, 15, 30, 45 and 60 minutes and the load shall be released then.



- 16.7. Tension shall be applied again and shall be increased uniformly until the actual breaking strength is reached. Simultaneous readings of tension and elongation shall be recorded upto 90% of UTS at the intervals described under Clause 16.6.

17. TEST LOADS FOR STEEL CORE ONLY

The loading conditions for repeated stress-strain tests for the steel core of ACSR shall be as follows:

- 17.1. The test shall consist of successive applications of load applied in a manner similar to that for the complete conductor at 30%, 50%, 70% and 85% of UTS.
- 17.2. The steel core shall be loaded until the elongation at the beginning of each hold period corresponds to that obtained on the complete conductor at 30%, 50%, 70% and 85% of UTS respectively.

18. STRESS-STRAIN CURVES

The design stress-strain curve shall be obtained by drawing a smooth curve through the 0.5 and 1 hour points at 30%, 50% and 70% of UTS loadings. The presence of any aluminium slack that can be related to any observed extrusion entering the span from the compression dead ends shall be removed from the lower ends of the design curves. Both the laboratory and standard stress-strain curves shall be submitted to the Employer along with test results. The stress-strain data obtained during the test shall be corrected to the standard temperature i.e. 20 deg. C.

19. DC RESISTANCE TEST ON COMPOSITE CONDUCTOR

On a conductor sample of minimum 5m length, two contact clamps shall be fixed with a pre-determined bolt torque. The resistance of the sample shall be measured by a Kelvin double bridge by placing the clamps initially zero meter and subsequently one meter apart. The test shall be repeated at least five times and the average value recorded. The value obtained shall be corrected to the value at 20 deg. C as per clause no. 12.8 of IS:398 (Part-II)-1982/1996. The corrected resistance value at 20 deg. C shall conform to the requirements of this specification.

20. PROCEDURE QUALIFICATION TEST ON WELDED ALUMINUM STRANDS.

Two Aluminium wires shall be welded as per the approved quality plan and shall be subjected to tensile load. The breaking strength of the welded joint of the wire shall not be less than the guaranteed breaking strength of individual strands.

21. CHEMICAL ANALYSIS OF ALUMINUM AND STEEL

Samples taken from the Aluminium and Steel ingots / coils/ strands shall be chemically/ spectrographically analyzed. The same shall be in conformity with the requirements stated in this specification.

- 22. CHEMICAL ANALYSIS OF ZINC:** - Samples taken from the zinc ingots shall be chemically / spectrographically analyzed. The same shall be in conformity with the requirements stated in this specification.

23. VISUAL AND DIMENSIONAL CHECK ON DRUMS

The drums shall be visually and dimensionally checked to ensure that they conform to the requirements of this specification.



24. REJECTION AND RETEST

- 24.1. In case of failure in any type test, the Manufacturer is either required to manufacture fresh sample lot and repeat all the tests successfully once or repeat that particular type test three times successfully on the sample selected from the already manufactured lot at his own expenses. In case a fresh lot is manufactured for testing then the lot already manufactured shall be rejected.
- 24.2. If samples are taken for test after stranding and if any selected reel fails in the retest, the manufacturer may test each and every reel and submit them for further inspection. All rejected material shall be suitably marked and segregated.

25. CHECKING AND VERIFICATION OF LENGTH OF CONDUCTOR

The contractor should arrange for inspection by the representative of the Employer specially authorized for this purpose. At least 50% of the total number of drums of conductor subject to minimum of two taken at random should be checked to ascertain the length of conductor. Arrangements should be made available in the works of the manufacturer for transferring the conductor from one reel to another at the same time measuring the length of the conductor so transferred by means of a meter.

26. ADDITIONAL TESTS

The Employer reserves the right of having at his own expenses any other test(s) of reasonable nature carried out at Bidder's premises, at site, or in any other standard Laboratory in addition to the aforesaid type, acceptance and routine tests to satisfy himself that the materials comply with the specifications.

27. TESTING EXPENSES

- 27.1. The breakup of the testing charges for the type tests specified shall be indicated separately.
- 27.2. Bidder shall indicate the laboratories in which they propose to conduct the type test. They shall ensure that adequate facilities are available in the laboratories and the tests can be completed in these laboratories within the time schedule guaranteed by them.
- 27.3. The entire cost of testing for the acceptance and routine tests and tests during manufacture specified herein shall be treated as included in the quoted unit price of the conductor, except for the expenses of the inspector/Employer's representative.
- 27.4. In case of failure in any type test, if repeat type tests are required to be conducted then all the expenses for deputation of Inspector/Employer's representative shall be deducted from the contract price. Also if on receipt of the Manufacturer's notice of testing, the Employer's representative does not find 'plant' to be ready for testing, the expenses incurred by the Employer for redeputation shall be deducted from contract price.

28. TEST REPORTS

- 28.1. Copies of type test reports shall be furnished in at least six copies along with one original. One copy will be returned duly certified by the Employer only after which the commercial production of the material shall start.
- 28.2. Record of Routine test reports shall be maintained by the Manufacturer at his works for periodic inspection by the Employer's representative.



28.3. Test certificates of Tests during manufacture shall be maintained by the Manufacturer. These shall be produced for verification as and when desired by the Employer.

29. TEST FACILITIES

The following additional test facilities shall be available at the Manufacturer's works:

- (i) Calibration of various testing and measuring equipment including tensile testing machine, resistance measurement facilities, burette, thermometer, barometer, etc.
- (ii) Standard resistance for calibration of resistance bridges.
- (iii) Finished Conductor shall be checked for length verification and surface finish on separate rewinding machine at reduced speed (variable from 8 to 16 meters per minute). The rewinding facilities shall have appropriate clutch system and be free of vibrations, jerks etc with traverse laying facilities.

30. INSPECTION

30.1. The Employer's representative shall, at all times, be entitled to have access to the works and all places of manufacture where conductor shall be manufactured and the representative shall have full facilities for unrestricted inspection of the Bidder's works, raw materials and process of manufacture and conducting necessary tests as detailed herein.

30.2. The Bidder shall keep the Employer informed in advance of the time of starting and of the progress of manufacture of conductor in its various stages so that arrangements can be made for inspection.

30.3. The contractor will intimate the Employer about carrying out of the tests at least 45 days in advance of the scheduled date of tests during which the Employer will arrange to depute his representative/s to be present at the time of carrying out of the tests. Six (6) copies of the test reports shall be submitted.

30.4. **No material shall be dispatched from its point of manufacture before it has been satisfactorily inspected and tested, unless the inspection is waived off by the employer in writing. In the later case also, the conductor shall be dispatched only after satisfactory testing for all tests specified herein has been completed and approved by the employer.**

30.5. The acceptance of any quantity of material shall in no way relieve the Bidder of any of his responsibilities for meeting all requirements of the specification, and shall not prevent subsequent rejection if such material is later found to be defective.

30.6. At least 50% of the total number of drums subject to minimum of two in any lot put up for inspection, shall be selected at random to ascertain the length of conductor by the following method:
"At the works of the manufacturer of the conductor, the conductor shall be transferred from one drum to another at the same time measuring its length with the help of a graduated pulley and Cyclometer. The difference in the average length thus obtained and as declared by the Bidder in the packing list shall be applied to all the drums if the conductor is found short during checking".



31. Chemical composition of high carbon steel wire:

Element	% Composition
i) Carbon	0.5 to 0.85
ii) Manganese	0.5 to 1.10
iii) Phosphorus	Not more than 0.035
iv) Sulphur	Not more than 0.045
v) Silicon	0.10 to 0.35

32. GUARANTEED TECHNICAL PARTICULARS OF ACSR

GUARANTEED TECHNICAL PARTICULARS OF ACSR DOG, RABBIT & WEASEL CONDUCTOR						
(To be furnished by the bidder along with Part-I bid)						
Sl No.	Description					Confirmation
1.	ACSR Conductor shall be manufactured and supplied conforming to Indian Standard Specification IS: 398 (Part I & II) of 1996 with latest amendments and specification contained in the bid document.					
2	Conductor drum shall bear ISI mark					
3	ACSR conductor confirms to size -					
	Name of Conductor	Stranding & wire dia. In mm	Aluminium Area, mm ²	Steel Area, mm ²	Total Area, mm ²	Total mass in Kg/Km
	WEASEL	6/1/2.59	31.61	5.27	36.88	129
	RABBIT	6/1/3.35	52.88	8.81	61.70	214
	DOG	6/4.72+7/1.57	104.98	13.55	118.5	394
4	Whether following parameters confirm to IS:- 398 (Part II)					
a)	Minimum breaking load of Aluminium wire, after stranding (kN)					
b)	Minimum breaking load of Steel wire (kN)					
c)	Minimum breaking load of completed conductor (kN)					
d)	Mass of conductor (kg / km)					
e)	Resistance of Al. wire at 200C (ohm/km)					
f)	Resistance of conductor at 200 C(ohm/km)					
g)	Modulus of elasticity of conductor (GN/m ²)					
h)	Co-efficient of linear expansion(per degree c)					
5	Uniformity of galvanizing and mass of Zinc coating confirms to Tests as per IS : 4826 /1979					
6	Standard length of conductor shall be as per this specification					
7	Non-standard length shall not be less than 80%, up to 10% of ordered quantity					
8	Wooden packing drums shall confirm toIS:1778					
9	Wooden drums shall have markings as per this specification					



C. TECHNICAL SPECIFICATION OF M.S. STRUCTURAL STEEL SECTION

1.1 SCOPE: - This specification covers the supply/ delivery & transportation of **ISI** marked M.S. Structural Steel Sections (i.e. M.S. Angles & M.S. Channels) conforming to IS: 808/1989 & IS: 2062/2006 and as amended latest.

1.2 STANDARDS:-The M.S. Structural Steel Sections (i.e. M.S. Angles & M.S. Channels) shall conform in all respect to the relevant Indian/International Standard Specifications with latest amendments.

1.3 SPECIFICATIONS FOR M.S. STRUCTURAL STEEL SECTION (i.e. M.S. ANGLES & M.S. CHANNELS) AS PER IS:808/1989 & IS:2062/2006 AND AS AMENDED LATEST.

- a) Type of Steel Sections: -i) M.S. Angles of sizes (50x50x6)mm & (65x65x6)mm.
ii) M.S. Channels of Designations MC 75 & MC 100
- b) Grade of Steel section: - Grade A
- c) Dimensions: - (i) M.S. Angle (50x50x6)mm.
(ii) M.S. Angle (65x65x6)mm.
(iii) M.S. Channel (75x40x40x6)mm.
(iv) M.S. Channel (100x50x50x6)mm.
- d) Tolerance in Dimension (Thickness, Width):- As per IS: 1852/1967 and as amended latest.
- e) Chemical Composition: - Carbon (Maximum) :- 0.230%
Sulphur (Maximum) :- 0.045%
Phosphorus (Maximum) :- 0.045%
Manganese (Maximum) :- 1.500%
Silicon (Maximum) :- 0.400%
- f) Tensile Strength :- 42 - 54 Kgf /mm²
- g) Yield stress (Minimum) :- 26.0 Kgf /mm²
- h) Length of each section: - 5.0 – 6.0 m
- i) Weight of section: - (i) M.S. Angle (50x50x6)mm = 4.5 Kg/m
(ii) M.S. Angle (65x65x6)mm = 5.8 Kg/m
(iii) M.S. Channel, MC 75 = 7.14 Kg/m
(iv) M.S. Channel, MC 100 = 9.56 Kg/m
- j) Elongation (Minimum) :- 23%
- k) Tolerances(in Weights) :- As per IS:226/1975.



1.4 SERVICE CONDITIONS: - The M.S. Structural Steel Sections (i.e. M.S. Angles & M.S. Channels) which are to be supplied for those Specifications shall be suitable for satisfactory continuous operation under the following climatic conditions as per IS: 808/1989 & IS: 2062/2006 or as amended latest.

i. Location	:At various locations in Tripura.
ii. Max. Ambient airtemperature (Deg. C)	: 45
iii. Min. Ambient air temperature (Deg. C)	: 4
iv. Max. Average daily ambient airtemperature (Deg. C)	: 40
v. Max yearly weighted averageambient temperature (Deg. C)	: 32
vi. Max. Altitude above mean sea level (Meters)	: 1000 M.

1.5 TEST CERTIFICATE: - The bidder shall furnish the type test / the routine test certificates as part of the condition for supply of M.S. Structural Steel Sections (i.e. M.S. Angles & M.S. Channels) from a NABL accredited lab. **The type test reports shall not be older than FIVE years and shall be valid up to expiry of validity of offer.**

Acceptance Tests:

- (a) Tensile strength test,
- (b) Dimension test along with surface condition.

Routine Tests:

- (a) Tensile strength test,
- (b) Dimension test along with surface condition,
- (c) Chemical Composition test.

Sample at random will be selected from the offered lot for the above testing and the lot will be accepted subject to permissible limit of failure as per IS.

Note: Purchaser reserves the right to get all or any type test carried out on one sample of steel section of all sizes each at the cost of supplier from any recognized laboratory / government test house if there arises any dispute regarding the quality of the materials.

1.6 INSPECTION:- All tests and inspection shall be made at the place of manufacture unless otherwise especially agreed upon by the manufacturer and purchaser at the time of purchase. The manufacturer shall afford the inspector representing the purchaser all reasonable facilities without charge to satisfy him that the material is being furnished in accordance with the specifications. The purchaser reserves the right to have the tests carried out at the cost of the supplier by an independent agency whenever there arises any dispute regarding the quality of materials.

1.7 PACKING: - The M.S. Structural Steel Sections (i.e. M.S. Angles & M.S. Channels) shall be loaded as convenient to the supplier. All Steel Sections (i.e. M.S. Angles & M.S. Channels) shall comply with the dimensions specified. The Steel Sections (i.e. M.S. Angles & M.S. Channels) shall be sound, free from splits, surface flaws, rough jagged and imperfect edges and other harmful surface defects.

The M.S. Structural Steel Sections (i.e. M.S. Angles & M.S. Channels) shall be so supplied that the Steel Sections are adequately protected against damage in ordinary handling and transit. To avoid damage of the Steel Sections transshipment in between the road transportation must be avoided i.e. each consignment should be transported from the factory to worksite/store through a single carrier.



1.8 MARKING :- Each Steel Section will bear the following information embossed/metal-tagged on the inner surface of each section:

- a) Manufacturers' name
- b) Manufacturers' Trade mark
- c) Size of section
- d) ISI certification mark

1.9 GUARANTEED TECHNICAL PARTICULARS:-The Guaranteed Technical Particulars of the M.S. Structural Steel Sections (i.e. M.S. Angles & M.S. Channels) offered shall be given by the bidder along with the tender document.

1.10 Guaranteed Technical Particulars for M.S. Structural Steel Sections
(To be furnished by the Manufacturer)

Sl. No.	Descriptions
1.	Name of Manufacturer: -
2.	Place of Manufacture: -
3.	Type of Steel Sections: -
4.	Grade of Steel Sections; -
5.	Dimensions (mm): -
6.	Tolerance in Dimensions (Thickness, Width & Weight): -
7.	Chemical Compositions: -
8.	Tensile Strength(Kgf/mm ²): -
9.	Yield stress (Minimum): -
10.	Length of each section(mm): -
11.	Weight of sections(Per Metre): -
12.	Elongation (Minimum): -
13.	Reference IS code: -
14.	ISI mark, : -
15.	Marking as per Clause No.5.2 of section-IV: -
16.	Type Tests certified enclosed:-

Name of Firm.
Name & Signature
of the authorized signatory
Designation
Date



D. TECHNICAL SPECIFICATION OF MILD STEEL, PAINTED, STAY SET

1.1 SCOPE

This specification covers design, engineering, manufacture, assembly, inspection, testing at manufacturer's workshop before dispatch, packing, supply, delivery and transportation upto destination of Painted Stay Set for H.T./L.T. line conforming to relevant ISS and Tolerance in the dimensions as per IS:1852/1985 or as amended latest.

1.2 STANDARDS

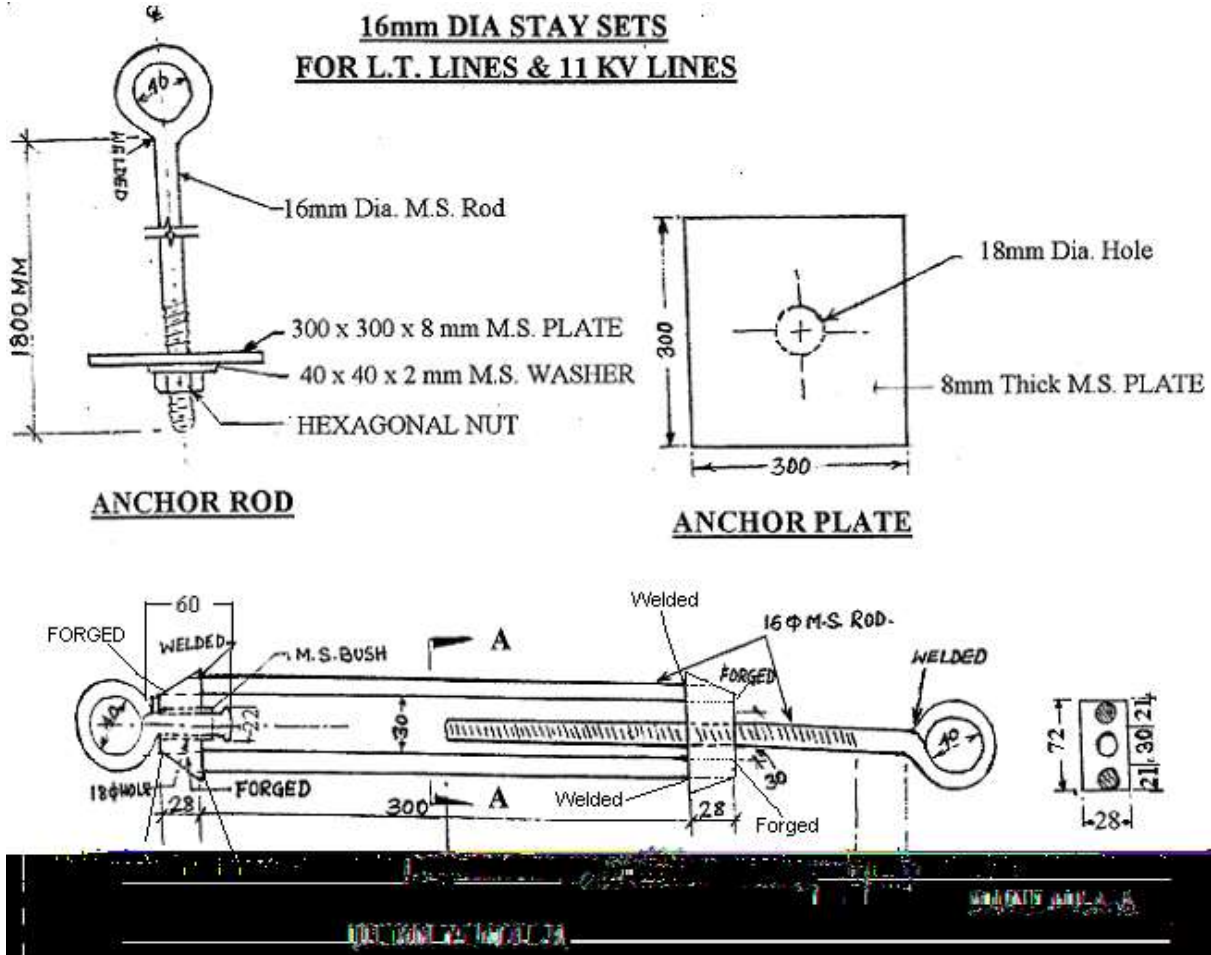
The Painted Stay Set for H.T./L.T. line shall conform in all respect to the relevant Indian/ International Standard Specification, with latest amendments.

SPECIFICATION FOR PAINTED STAY SET FOR H.T./L.T.LINE:

- 1) Type of Stay Set: -16mm.dia Painted Stay Set for H.T. /L.T. line.
- 2) Standard: -IS: 1852/1985 or as amended latest in respect of tolerance in dimensions.
- 3) Anchor Rod:
 - a. Size: - 16mm ϕ .
 - b. Length: - 1800mm.exclusive of circular point.
 - c. Thread length: - 50mm.
 - d. Nut:-Hexagonal nut 12mm thick to match the thread of anchor rod.
 - e. Washer: - 40x40x2mm M.S. washer.
 - f. Circular Point: - 40mm ϕ .
- 4) Anchor Plate:
 - a. Dimension: - 300x300x8mm M.S.Plate.
 - b. The hole at the centre of the M.S. Plate:-18mm ϕ .
5. Turn Buckle:
 - a. Number of M.S. Rods including Strain rod:-3(three).
 - b. Diameter of Each rod:- 16mm.dia.
 - c. Length of each rod:- 300mm.exclusive of circular point in case of strain rod and excluding the portion to be driven into the solid trapezoidal Caps on both the sides for having forged in case of other two rods.
 - d. Thread length of Strain Rod:-250mm.
 - e. Diameter of each circular points: - 40mm ϕ .
 - f. Number of solid trapezoidal Cap made from Square bar:- 2(two).
 - g. Dimension of each Square bar (cap):
 - i). Length of large side:- 72mm.
 - ii). Length of small side:- 30mm.
 - iii).Height:- 28mm.
 - h. Inner distance between the two parallel rods:- 30mm.
 - i. Diameter of hole in the Cap opposite to the Cap holding Strain rod:- 18mm. including bush.
 - j. Diameter of Rivet: - 22mm.
 - k. Dimension of M.S. Bush: - 20mm outer dia. X (10mm -11mm) width.
6. Material: - Mild Steel.
7. Painting:-Two coatings of Red Oxide Paint after brushing, scrubbing, Cleaning etc.
8. Dimensions as per Drawing (shown below):-



1.3 Diagram of Painted Stay Set



NOTE:- All dimensions are in mm.



E. TECHNICAL SPECIFICATION FOR GI STAY WIRE SIZE 7/2.50 MM

- 1.1 SCOPE:-** This specification covers design, engineering, manufacture, assembly, inspection, testing at manufacturer's workshop before dispatch, packing, supply, delivery and transportation upto destination of the 7/2.50mm Stranded wire.
- 1.2 STANDARDS :-**The G.I. Stranded wires shall comply with the specific requirement of IS-2141/1992, IS-4826/1979.
- 1.3 MATERIAL :-** The wires shall be drawn from steel made by the open hearth basic oxygen or electric furnace process and of such quality that when drawn to the size of wire specified and coated with zinc, the finished strand and the individual wires shall be of uniform quality and have the properties and characteristics as specified in this specification. The wires shall not contain Sulphur and Phosphorus exceeding 0.060 percent each.
- 1.4 TENSILE GRADE :-** The wires shall be grade 4 having minimum tensile strength of 700 N/mm² Confirming to IS-2141/1992.
- 1.5 GENERAL REQUIREMENT :-**The lay length of wire strands shall be 12 to 18 times the strand diameter.
- 1.6 MINIMUM BREAKING LOAD :-** The minimum breaking load of the wires before and after stranding shall be as follows.

No. of wires and Const.	Wire Dia (mm)	Min. breaking load of Single Wire before Stranding (KN)	Min. breaking load of the stranded wire (KN).
7 (6/1)	2.50mm	3.44	22.86

- 1.7 CONSTRUCTION.**
- The stay wire shall be of 7 wire construction. The wires shall be so stranded together that when an even distributed pull is applied at the end of completed stand, each wire shall take an equal share of the pull.
 - Joints are permitted in the individual wires during stranding but such joints shall not be less than 15 meters part in the finished strands.
 - The wire shall be circular and free from scale, irregularities, imperfection, flows, splits and other defect. The zinc coating shall confirm to IS: 4826/1979.
- 1.8 TOLERANCE :** -A tolerance of + or - 2.5 % on the diameter of wires before stranding shall be permitted.
- 1.9 SAMPLING CRITERIA :**The sampling criteria shall be in accordance with Table-3 Annexure-A IS: 2141/1992.



1.10 TESTS ON WIRES BEFORE MANUFACTURE:

The wire shall be subjected to the following tests in accordance with Is : 2141/1992.

- (1) Ductility test.
- (2) Tolerance on wire diameter.

1.11 TESTS ON COMPLETED STRAND: The samples shall be tested for the following tests in accordance with IS: 2141/1992 in addition to other acceptance tests.

- a) Tensile and Elongation test.

The percentage elongation of the stranded wire shall not be less than 6 % (Grade-4D)

- b) Chemical Analysis:

The manufacturer shall have to submit test certificate with every lot for the chemical composition of the steel rods from which the wires are drawn.

- c) Galvanizing test.

The zinc coating shall confirm to "heavy coating" as laid down in IS 4826/1979.

1.12 PACKING. :

The G. I. Stay wire shall be supplied in coils. Each coil should be weighing 50 to 70 Kgs. Each coil shall be wrapped in hessian to avoid surface damage to wire during transport and for protection against pollution. Each coil shall be supplied with a metallic tag with on the following particulars shall be printed with water-proof ink/itched.

- 1) Name of Manufacturer.
- 2) Size of G. I. Stay wire.
- 3) Coil Serial No.
- 4) Weight of Coil (approx.)
- 5) Tensile designation.
- 6) Coating.
- 7) A/T No. & Date.
- 8) ISI Mark if any.

1.13 SEALING.:-The manufacturer shall keep all the coils ready with seal wire and lead seal so as to enable the Company's inspectors to seal the inspected material immediately. Coils shall then be wrapped with hessian before dispatch.

1.14 GUARANTEED TECHNICAL PARTICULAR (G.T.P.)The bidders shall submit guaranteed Technical particulars along with the offer as per enclosed format.

1.15 DEVIATION FROM SPECIFICATION :No. deviation in the above specification shall be allowed.



1.16 GUARANTEED TECHNICAL PARTICULAR:- Technical information and guaranteed technical particulars for supply of G. I. Stay wire 7/2.5mm size.

PART - 'A': Bidder has to conform following important requirements:

<u>Sl.No.</u>	<u>Particulars.</u>	<u>Confirmation.</u>
1.	The G. I. Stay wire 7/2.50mm shall confirm to IS:2141/1992 and 4826/1979 and Company's Specification.	
2.	Quality of Wire shall be hard.	
3.	The wire shall not contain Sulphur and phosphorous exceeding 0.060 % each.	
4.	The wire shall be of Grade-4 having minimum tensile strength 700 N/MM ²	
5.	The wire shall be of 2.50mm diameter qirt + or - 2.5 % tolerance.	
6.	The wire shall be circular and free from scale, irregularities, imperfection, flows, splits and other defect.	
7.	Minimum breaking load of Single wire shall be 3.44 KN.	
8.	Minimum breaking load of the stranded wire shall be 22.86 KN.	
9.	Lay Ratio shall be 12 to 18 (RHS)	
10.	The percentage elongation of the stranded wire shall be 6 % minimum(Grade-4)	
11.	The wire shall be heavily zinc coated	
12.	The wire shall be hot dip galvanized as per IS:4826/79	
13.	The mass of zinc coating shall be 218.5 Gms/m ² (Minimum)	
14.	2 Nos. of 1 minutes dips guaranteed for uniformity test.	
15.	Weight of each coil shall be from 50 Kg. to 70 Kg.	
16.	Each coil shall be wrapped in hessian to avoid surface damage.	
17.	Each coil shall be supplied with a metallic tag with following particular shall be printed with water proof ink/itched.	
	a) Name of Manufacturer.	
	b) Size of G. I. Stay wire.	
	c) Coil Serial No.	
	d) Weight of Coil (approx.)	
	e) Tensile designation.	
	f) Coating.	
	g) A/T No. & Date.	
	h) ISI Mark if any.	



F. Technical specification for 8 S.W.G, M.S. Heavy coating Galvanised Iron Wire conforming to IS:280 / 2006 as amended latest, Type of zinc coating Heavily coated wire (soft) galvanization shall conform to IS : 4826 / 1979as amended latest

- 1.0 SCOPE:-** This specification covers the design, manufacture, testing at works, supply / delivery/transportation of 8 SWG M.S. heavy coating galvanized Iron Wire conforming to IS:280 / 2006 and as amended latest. Type of zinc coating, heavily coated wire (soft) galvanization shall conform to IS: 4826 / 1979 and as amended latest.
- 2.0 STANDARDS**
- 2.1 The 8 SWG M.S. heavy coating galvanized Iron Wire shall conform in all respect to the relevant Indian / International Standard Specification, with latest amendments.

The standards listed below contain provisions, which through reference in this text constitute provisions of this standard. At the-time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

I. S.	Title.
228 (All parts)	Methods for chemical analysis of steels.
1387:1993	General requirements for the supply of metallurgical materials (second revision).
1608:2005	Metallic materials — Tensile testing at ambient temperature (third revision).
1755:1983	Method for wrapping test for metallic wire (First revision).
1956 (Part 5): 1975	Glossary of terms relating to iron and steel: Part 5 Bright steel bar and steel wire.
4826:1979	Hot-dipped galvanized coatings on round steel wires (First revision).
4905:1968	Methods for random sampling.
7887:1992	Mild steel wire rods for general engineering purposes (First revision).
12753:1989	Electro galvanized coatings on round steel wire.

SPECIFICATION FOR 8 SWG M.S. HEAVY COATING GALVANIZED IRON Wire AS PER IS:280/1978 AND IS: 4826 / 1979 AS AMENDED LATEST.

1	Type of Wire	:	8 SWG M.S. heavy coating galvanized Iron Wire.
2	Diameter	:	8 SWG (4.06 mm).
3	Tolerance in Diameter	:	± 2.5%.
4	Chemical Composition	:	(i) Carbon % =0.08 to 0.13 , (ii) Mn % = 0.30 to 0.60, (iii) S % = 0.05 and (iv) Phosphorus % = 0.05. (As per IS: 7887 / 1992 and as amended latest).
5	Tensile Strength	:	8 SWG = 45 - 55 Kgf /mm ² .
6	Mass of Coating	:	8 SWG = 290 g/ m ² (minimum).
7	Number of dips	:	1minute, 3dips / ½ minute, 1dip.
8	Weight of wire in each coil	:	50 Kg to 70 Kg.
9	Number of wire in each coil	:	Single continuous length.



3.0 SERVICE CONDITIONS:- The 8 SWG M.S. heavy coating galvanized Iron Wire to be supplied against this Specification shall be suitable for satisfactory continuous operation under the following climatic conditions as per ISS:280/1978 and as amended latest.

i. Location: At various locations in Tripura.

ii. Max. ambient air temperature (Deg⁰ C): 45

iii. Min.ambient air temperature (Deg⁰ C): 4

iv. Max yearly daily ambient air temperature (Deg⁰ C): 40

v. Max average weighed average ambient temperature (Deg⁰ C): 32

vi. Max. Altitude above mean sea level (Meters): 1000 M.

a. TEST AND INSPECTION

4.1 Following tests shall be carried out at the works of the manufacturer as per relevant ISS before delivery of each lot in presence of the representative of purchaser:

Type Tests:Type test shall be carried out as per ISS:280/2006 and as amended latest.

A. Acceptance Tests:

- (a) Tensile test,
- (b) Hot-Dipped Galvanized Coating Test,
- (c) Wrapping test,
- (d) Dimension test along with surface condition.

B. Routine Tests:

- (a) Tensile test,
- (b) Hot-Dipped Galvanized Coating Test,
- (c) Wrapping test,
- (d) Dimension test along with surface condition.
- (e) Chemical Composition test.

Sample at random will be selected from the offered lot for the above testing and the lot will be accepted subject to permissible limit of failure as per IS.

Note : Purchaser reserves the right to get all or any type test carried out on one sample per 400 coils of SWG M.S. heavy coating galvanized Iron Wire at the cost of supplier from any recognized laboratory / government test house.



- a. The supplier shall furnish **the type test / the routine test** certificates as part of the condition for supply of M.S. heavy coating galvanized Iron Wire in bulk quantity at the discretion of the purchaser.

4.3.0 INSPECTION

- 4.3.1 All tests and inspection shall be made at the place of manufacture unless otherwise especially agreed upon by the manufacturer and purchaser at the time of purchase. The manufacturer shall afford the inspector representing the purchaser all reasonable facilities without charge to satisfy him that the material is being furnished in accordance with specification.
- 4.3.2 The purchaser reserves the right to have the tests carried out at the cost of the supplier by an independent agency whenever there is dispute regarding the quality of supply.

5.0 PACKING & MARKING

- 5.1 **PACKING:-**The SWG M.S. heavy coating galvanized Iron Wire shall be supplied in Coils. Each coil of wire shall be suitably bounded and fastened compactly and shall be protected by suitable wrapping with jute cloths. All wires shall be well and cleanly drawn to the dimension specified. The wire shall be sound, free from splits, surface flaws, rough jagged and imperfect edges and other harmful surface defects.

The SWG M.S. heavy coating galvanized Iron Wire coil shall be so packed that the wires are adequately protected against damage in ordinary handling and transit. To avoid damage of the wire transshipment in between the road transportation must be avoided i.e. each consignment should be transported from factory to work site through a single carrier.

- 5.2 **MARKING :-**Each coil will bear the following information with a label fixed firmly on the inner part of the coil:

- a) Manufacturers' name
- b) Manufacturers' Trade mark
- c) Coil or identification number
- d) Size of Wire
- e) Length of Wire
- f) Net weight of each coil
- g) ISI certification mark if any
- h) Year of manufacture TSECL/MMD/2016-17

- 6.0 **GUARANTEED TECHNICAL PARTICULARS: -** The guaranteed technical particulars of the 8 SWG M.S. heavy coating galvanized Iron Wire offered shall be given by the bidder along with the tender.



Guaranteed & other technical particulars for 8 SWG M.S. heavy coating galvanized iron wire
(To be furnished by the Manufacturer)

Sl. No.	Description	NIT requirement	Bidder's offer
1.	Make & Manufacturer		
2.	Place of Manufacturer		
3.	Type of Wire	8 SWG M.S. heavy coating galvanized Iron Wire.	
4.	Diameter (Also in mm)	8 SWG (4.06 mm).	
5.	Tolerance in Diameter	± 2.5%.	
6.	Chemical Composition	(i) Carbon % =0.08 to 0.13 , (ii) Mn % = 0.30 to 0.60, (iii) S % = 0.05 and (iv) Phosphorus % = 0.05. (As per IS: 7887 / 1992 and as amended latest).	
7.	Tensile Strength	45 - 55 Kgf / mm ² .	
8.	Mass of Coating	8 SWG = 290 g/ m ² (minimum).	
9.	Number of dips	1minute, 3dips / ½ minute, 1dip.	
10.	Weight of wire in each coil	50 Kg to 70 Kg.	
11.	Number of piece of wire in each coil	Single continuous length.	
12.	Marking as per clause No.5.2 of section-IV	a) Manufacturers' name b) Manufacturers' Trade mark c) Coil or identification number d) Size of Wire e) Length of Wire f) Net weight of each coil g) ISI certification mark if any h) Year of manufacture TSECL/MMD/2016-17	
13.	Reference IS code		

Signature of Authorized
Signatory of the firm
Seal of the firm



G. EARTHING AND EARTHING G.I PIPE

1.0 Scope:-GI earthing pipe should be made of **40 mm diameter** ISI marked heavy duty A class GI Pipe. **12 mm dia suitable holes** on its circumference shall be made as per approved drawing. The pipe should be in one piece. No joints or welding would be allowed on its length. Clamps made of 50x6mm GI flat duly drilled with 12 mm size holes should be welded at the top end for connection of earth conductor. Pipe used shall be 40mm NB diameter, ISI marked Galvanized Mild Steel Tubes continuously welded Electric Resistance Welded ERW/High Frequency Induction welded (HFIW)/Hot finished welded (HFW) type, conforming to IS-554-1985 with latest amendment of Heavy duty quality (Class B).

2.0 MANUFACTURE:- Earthing pipe should be made of 40 mm diameter ISI marked B class GI Pipe. 12 mm dia suitable holes on its circumference shall be made as per approved drawing. The pipe should be in one piece. No joints or welding would be allowed on its length. Clamps made of 50x6mm GI flat duly drilled with 12 mm sizeholes should be welded at the top end for connection of earth conductor.

GI earth pipe (**40 mm diameter & 2.5 meter long**) shall be made of tubes which shall be made from tested quality steel manufactured by any approved process as follows:

- a) Electric Resistance Welded (ERW).
- b) High Frequency Induction Welded (HFIW) and
- c) Hot finished Welded (HFW).

Tubes made by manual welding are not acceptable.

3.0 DIMENSIONS

The dimensions and weights of tubes shall be in accordance with Table-I and Table-II of IS: 1239 (Part-I)/1990 with latest amendments, subject to tolerance permitted therein. Necessary 12 mm diameter holes across the circumference shall be provided as per approved drawing. Drawings shall be approved by the owner before start of the manufacturing work. The tube, earthing pipe shall be provided with **50x6mm GS** clamps on one end, one clamp is to be welded with the pipe and another is removable to enable measurement of earth resistance of the pit. Other end of the earth pipe should be cut half in slop to make it a sharp.

4.0 GALVANIZING

Tubes shall be galvanized in accordance with IS-4736-1986 with latest amendment for not (hot) dip zinc coating of Mild Steel Tubes. The minimum mass of zinc coating on the tubes shall be in accordance with clause 5.1 of IS-4736-1986 (specification for hot dip zinc) and when determined on a 100mm long test piece in accordance with IS: 6745:1972 shall be 400 g/m². The zinc coating shall be uniform adherent reasonably smooth and free from such imperfections as flux, ash and dross inclusions, bare patches, black spots, pimples, lumpiness, rust, stains, bulky white deposits and blisters.



5.0 HYDRAULIC TEST

(Before applying holes) Each tube shall withstand a test pressure of 5 M Pa maintained for at least 3 seconds without showing defects of any kind. The pressure shall be applied by approved means and maintained sufficiently long for proof and inspection. The testing apparatus shall be fitted with an accurate pressure indicator.

6.0 TEST ON FINISHED TUBES AND SOCKETS

The following tests shall be conducted by the manufacturer of finished tubes and sockets.

- i. The tensile strength of length of strip cut from selected tubes when tested in accordance with IS-1894-1972, (Method for tensile testing of steel tubes), shall be at least 320N/mm².
- ii. The elongation percentage on a gauge length of 5.65/so (where so is the original cross sectional area of test specimen) shall not be less than 20%.
- iii. When tested in accordance with IS-2329-1985 (Method for Bend test on Metallic tubes) the finished tube shall be capable of withstanding the bend test without showing any sign of fracture or failure. Welded tubes shall be bent with the weld at 90 degree to the plane of bending. The tubes shall not be filled for this test.
- iv. Galvanized tubes shall be capable of being bent cold without cracking of the steel, through 90 degree round a former having a radius at the bottom of the groove equal to 8 times the outside diameter of tube.
- v. Flattening Test on Tubes above 50 mm Nominal Bore: Rings not less than 40 mm in length cut from the ends of selected tubes shall be flattened between parallel plates with the weld, if any, at 90 degree (point of maximum bending) in accordance with IS-2328- 1983. No opening should occur by fracture in the weld unless the distance between the plates is less than 75 percent of the original outside diameter of the pipe and no cracks or breaks in the metal elsewhere than in the weld shall occur, unless the distance between the plates is less than 60% of the original outside diameter. The test rings may have the inner and outer edges rounded.

7.0 GALVANIZING TEST

- i. Weight of zinc Coating: For tubes thickness upto 6 mm the minimum weight of zinc coating, when determined on a 100 mm long test piece in accordance with IS-4736-1986 shall be 400 gm/m².
- ii. The weight of the coating expressed in gram/m² shall be calculated by dividing the total weight of the zinc (inside plus outside) by the total area (inside plus outside) of the coated surface.
- iii. Test specimen for this test shall be cut approximately 100 mm in length from opposite ends of the length of tubes selected for testing. Before cutting the test specimen, 50 mm from both ends of the samples shall be discarded.
- iv. Free Bore Test: A rod 230mm long and of appropriate diameter shall be passed through relevant nominal bore of the sample tubes to ensure a free bore.
- v. Uniformity of Galvanized Coating: The galvanized coating when determined on a 100 mm long test piece [see V (a) (iii)] in accordance with IS-2633-1986 (Method for testing uniformity of coating on zinc coated articles) shall with stand 4 one minute dips.



8.0 WORKMANSHIP:-The tubes shall be cleanly finished and reasonably free from injurious defects. They shall be reasonably straight, free from cracks, surface flaws, laminations, and other defects, both internally and externally. The screw tubes and sockets shall be clean and well-cut. The ends shall be cut cleanly and square with the axis of tube.

9.0 MARKING:-The medium class of tubes shall be distinguished by Blue color bands which shall be applied before the tubes leaves the manufacturers' works. Tubes shall be marked with the standard mark.

10.0 EARTHING ARRANGEMENT OF DISTRIBUTION TRANSFORMERS

10.1 The earth pits should be located as per REC Construction Standard F-5 (Annexure VI).

10.2 Pipe earth electrodes should be provided in each earth pit as per REC construction standard J-1 and J-2 (Annexure VII & VIII).

10.3 4 mm (8 S.W.G), G.I. wire should be used for earth leads.

10.4 One of the earth electrodes on either side of D.P. structure should be connected with;

(a) One direct connection from the L.T. Lightning arresters and cross-arm.

(b) One direct connection with Lightning arrester on H.T. side (11KV) and cross-arm.

10.5 To each of the remaining two earth electrodes, the following should be connected:-

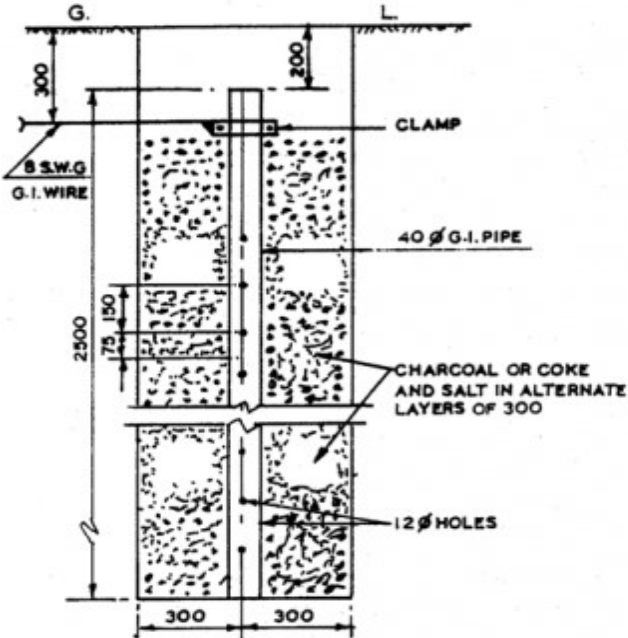
(a) One separate connection from the neutral (on medium voltage side) of the transformer.

(b) One separate connection from the transformer body and the handle of 11KV A.B. switch.

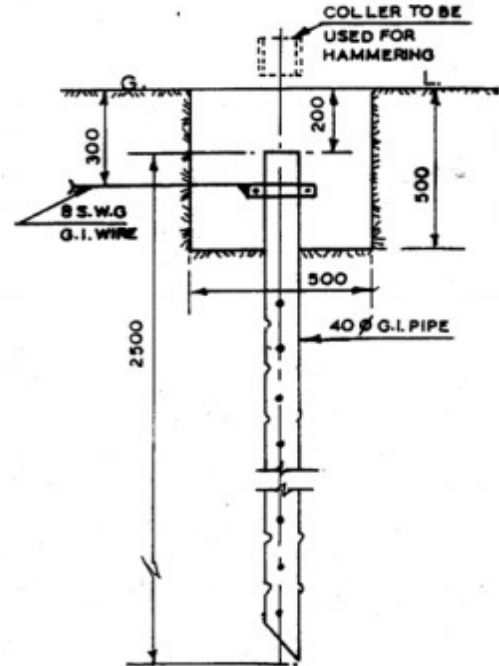
(c) One separate connection from the earthing terminal of the poles.



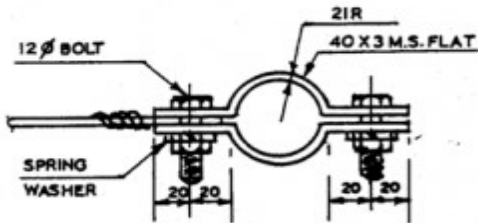
CONSTRUCTION STANDARD



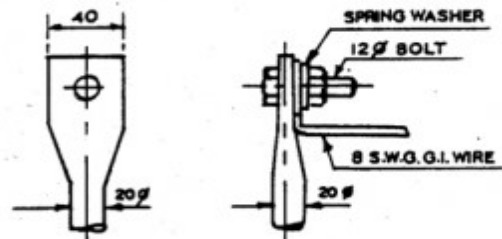
**EARTHING FOR HARD, STIFF
OR MEDIUM CLAY**



**EARTHING FOR ORDINARY SOIL
WHERE PIPE COULD BE HAMMERED IN**



**TYPICAL DETAIL OF CLAMP
FOR PIPE EARTH**



**TYPICAL DETAIL OF CONNECTION
FOR ROD EARTH**

NOTES:-

1. ALTERNATIVELY 20 ϕ G.I. ROD MAY BE USED INSTEAD OF PIPE.
2. WATER TO BE Poured INTO SUMP TO KEEP THE SOIL SURROUNDING THE EARTH PIPE/ROD MOIST.
3. FOR COIL EARTHING REFER CONSTRUCTION STANDARD. J-1.

ALL DIMENSIONS ARE IN mm.

PIPE / ROD EARTHING	
SCALE:- N.T.S	SEPT, - 1972



H. Danger Notice Plate

1.0 SCOPE:-This Specification covers manufacture, supply at site and erection of Danger Notice Plates to be displayed in accordance with rule **No. 35 of Indian Electricity Rules, 1956.**

2.0 APPLICABLE STANDARDS

Unless otherwise modified in this specification, the Danger Notice Plates shall comply with **IS: 2551-1982** or the latest version thereof.

3.0 DIMENSIONS

- (i) Two sizes of Danger Notice Plates as follows are recommended:
 - a) For display at 415 V installations - **200x150mm**
 - b) For display at 11 KV (or higher voltages) installations - **250x200mm**
- (ii) The corners of the plate shall be rounded off.
- (iii) The location of fixing holes as shown in Figs. 1 to 4 is provisional and can be modified to suit the requirements of the owner.

4.0 LETTERINGS

All letterings shall be centrally spaced. The dimensions of the letters, figures and their respective position shall be as shown in figs. 1 to 4. The size of letters in the words in each language and spacing between them shall be so chosen that these are uniformly written in the space earmarked for them.

5.0 LANGUAGES

A. Under Rule No. 35 of Indian Electricity Rules, 1956, the Employer of every medium, high and extra high voltage installation is required to affix permanently in a conspicuous position a danger notice in Hindi or English and, in addition, in the local language, with the sign of skull and bones.

B. The type and size of lettering to be done in Hindi is indicated in the specimen danger notice plates shown in Fig. 2 and 4 and those in English are shown in Figs. 1 and 3.

C. Adequate space has been provided in the specimen danger notice plates for having the letterings in local language for the equivalent of '**Danger**', '**415**' '**11000**' and '**Volts**'.

6.0 MATERIAL AND FINISH

The plate shall be made from mild steel sheet of at least **1.6mm** thick and vitreous enameled white, with letters, figures and the conventional skull and cross-bones in signal red color (refer IS:5-1978) on the front side. The rear side of the plate shall also be enameled.

7.0 TESTS

The following tests shall be carried out:

- i) Visual examination as per IS: 2551-1982
- ii) Dimensional check as per IS: 2551-1982
- iii) Test for weatherproofness as per IS:8709-1977 (or its latest version)

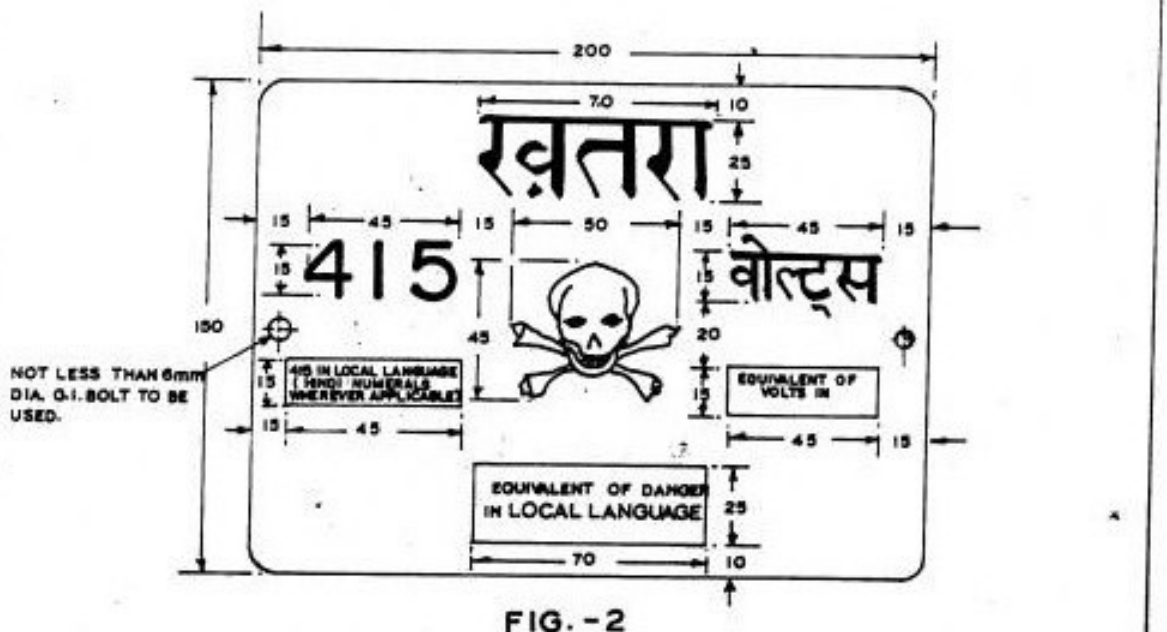
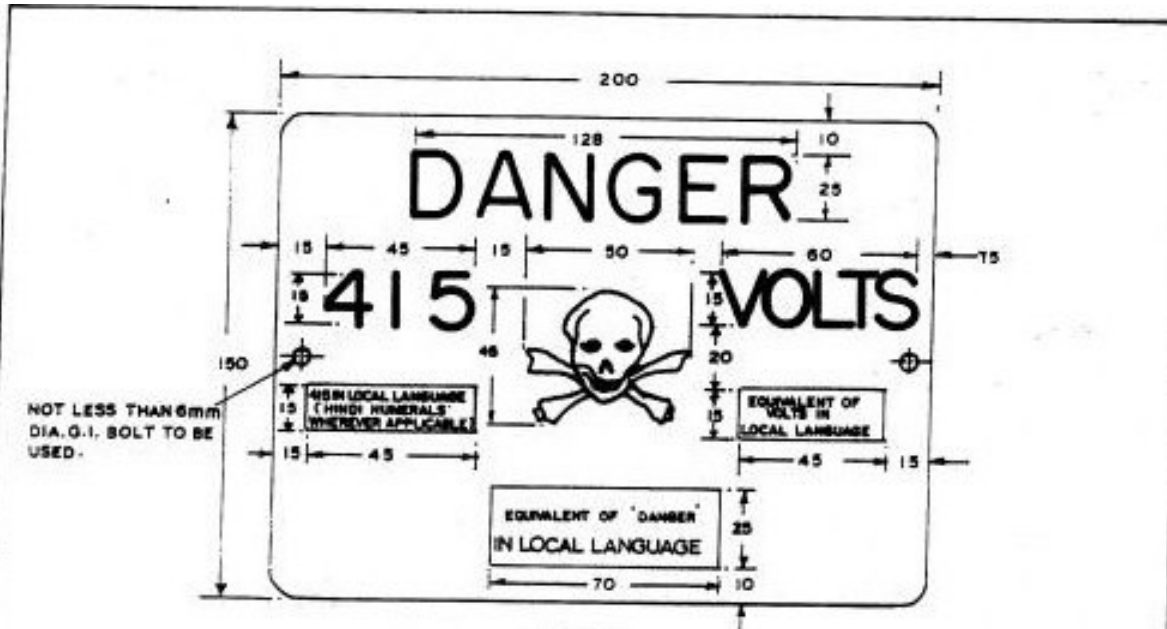
8.0 MARKING

Maker's name and trade mark and the owner's name shall be marked in such a manner and position on the plates that it does not interfere with the other information.



9.0 PACKING

The plates shall be packed in wooden crates suitable for rough handling and acceptable for rail/road transport.



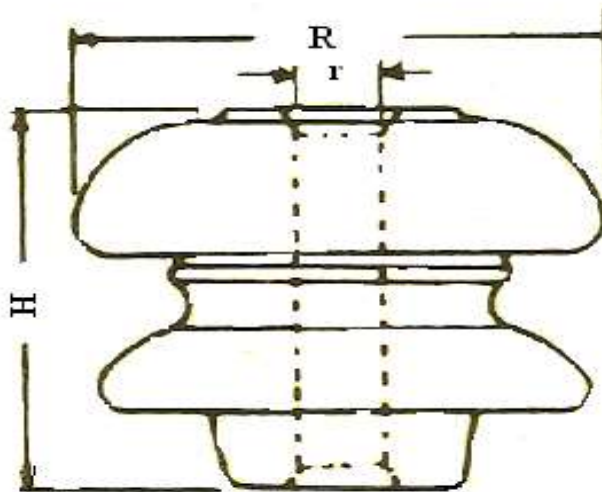
ALL DIMENSIONS ARE IN MM.

I. TECHNICAL SPECIFICATION FOR L. T. SHACKLE INSULATOR

- 1.0 SCOPE:- This specification covers the design, manufacture, testing at works, supply/ delivery & transportation of L.T. shackle insulator conforming to IS: 1445/1977 or as amended latest.
- 2.0 STANDARDS
- 2.1 The L.T. shackle insulator shall conform in all respect to the relevant Indian/ International Standard Specification, with latest amendments.

SPECIFICATION FOR L. T. SHACKLE INSULATOR AS PER IS: 1445/1977

- 1) Type of Insulator: - Brown Glazed Porcelain Low Tension Shackle Insulator.
- 2) Standard: - IS:1445/1977
- 3) Leakage distance in mm: - 63mm
- 4) Working voltage: - Up to 1000V
- 5) Power frequency withstand voltage in Kv: - i) Dry in Kv - 23Kv
ii) Wet in Kv - 10Kv
- 6) Power frequency puncture voltage in Kv:- 40 Kv (1.3 x the actual dry flashover voltage)
- 7) Mechanical Strength in KN:- 11.5 KN
- 8) Net weight (approx.) in Kg. : - 0.5 Kg.
- 9) Colour: - Brown Glazed
- 10) Materials of Insulator: - Porcelain.
- 11) Content of each package:- 40 pieces.
- 12) Dimensions as per Drawing(shown below):- H = 75mm, R = 90mm & r = 15mm



L. T. Shackle Insulator

3.0 SERVICE CONDITIONS

The L.T. shackle insulator to be supplied against this Specification shall be suitable for satisfactory continuous operation under the following climatic conditions as per IS: 1445-1977 or latest revision.

- | | |
|--|--|
| i. Location: | At various locations in Tripura. |
| ii. Max. ambient air temperature (Deg0 C): | 500C |
| iii) Maximum relative humidity | 95% (Sometime approaches Saturation point) |
| vi. Max. Altitude above mean sealevel(Meters): | 1000 M. |



4.0 TEST AND INSPECTION

4.1 Following tests shall be carried out at the works of the manufacturer as per relevant ISS before delivery of each lot in presence of the representative of purchaser:

A. Type Tests:

- (a) Visual examination,
- (b) Verification of dimensions,
- (c) Dry power frequency voltage withstand test,
- (d) Wet power frequency voltage withstand test,
- (e) Temperature cycle test,
- (f) Mechanical failing load test,
- (g) Power-frequency puncture withstand test,
- (h) Porosity test.

B. Acceptance Tests:

- (a) Verification of dimensions,
- (b) Temperature cycle test,
- (c) Mechanical failing load test,
- (d) Porosity test,
- (e) Check for weight,

C. Routine Tests:

- (a) Visual examination,
- (b) Verification of dimensions,
- (c) Temperature cycle test,
- (d) Mechanical failing load test.
- (e) Porosity test,
- (f) Check for weight.

Sample at random will be selected from the offered lot for the above testing as per IS.

Note : Purchaser reserves the right to get all or any type test carried out on one sample per 1000 insulator at the cost of supplier from any recognized laboratory / government test house.

4.2 The supplier shall furnish the type test / the routine test certificates as part of the condition for supply of L.T. shackle insulator in bulk quantity at the discretion of the purchaser.

4.3.0 INSPECTION

4.3.1 All tests and inspection shall be made at the place of manufacture unless otherwise especially agreed upon by the manufacturer and purchaser at the time of purchase. The manufacturer shall afford the inspector representing the purchaser all reasonable facilities without charge to satisfy him that the material is being furnished in accordance with specification.

4.3.2 The purchaser reserves the right to have the tests carried out at the cost of the supplier by an independent agency whenever there is dispute regarding the quality of supply.



5.0 PACKING & MARKING

5.1 PACKING:- The L.T. Shackle insulator shall be so packed that the L.T. Shackle insulator are adequately protected against breakage and damage in ordinary handling and transit. To avoid damage of the L.T. Shackle insulator transshipment in between the road transportation must be avoided i.e. each consignment should be transported from factory to **work site Store yard**.

5.2 MARKING :- The following information shall be marked on each Insulator:

Manufacturers' Trade mark
The Manufacturers' name
Visible marking 'TSECL/2022-23'.
ISI certification mark, if any

6.0 GUARANTEED TECHNICAL PARTICULARS

The guaranteed technical particulars of the L.T. Shackle insulator offered shall be given by the bidder along with the tender.

7.0 **Guaranteed & other technical particulars for L.T. shackle insulator** (To be furnished by the Manufacturer)

SL. No. Description

- 1) Name of Manufacturer:-
- 2) Place of Manufacture:-
- 3) Type of Insulator:-

- 4) Working Voltage: -
- 5) Standard: -
- 6) Leakage distance in mm: -
- 7) Power frequency withstand voltage in Kv: - i) Dry in Kv -
ii) Wet in Kv -
- 8) Power frequency puncture voltage in Kv:-
- 9) Mechanical Strength in KN:-
- 10) Net weight (approx.) in Kg. :-
- 11) Colour: -
- 12) Dimension of insulator:-
- 13) Materials of Insulator: -
- 14) Content of each package:-
- 15) Marking as per clause No.5.2 of section-IV
- 16) ISI Certification Mark if any:-

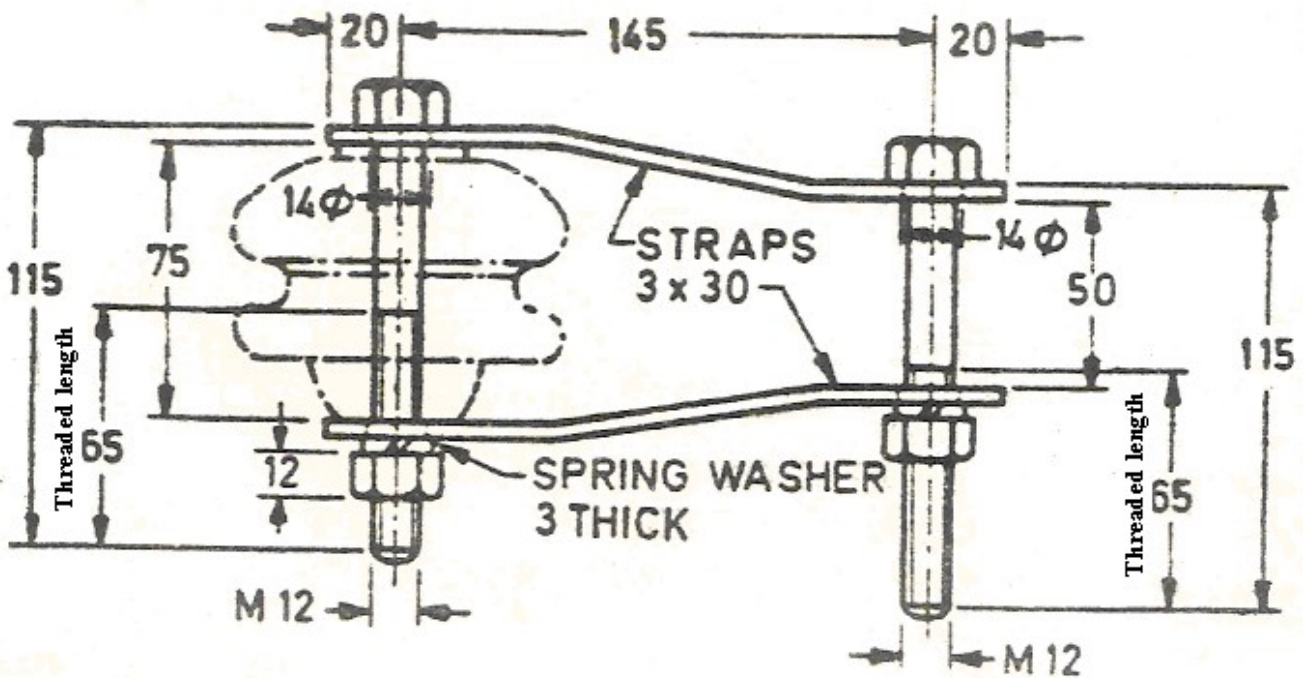
Signature of Authorised
Signatory of the firm
Seal of the firm

J. TECHNICAL SPECIFICATION FOR L.T STRAPS & BOLTS

- 1.1 SCOPE:-This specification covers the design, manufacture, testing at works, supply/ delivery & transportation of L.T. Straps & Bolts conforming to IS: 7935/1975 or latest amendments inclusive of Hot dip Galvanization/ Electroplating of L.T. Straps, Nuts & Bolts and washers etc. as per relevant IS(S).
- 1.2 STANDARDS :-The L.T. Straps & Bolts shall conform in all respect to the relevant Indian/ International Standard Specification, with latest amendments.

SPECIFICATION FOR L.T STRAPS & BOLTS AS PER IS: 7935/1975.

- 1) Type of Straps & Bolts: - G.I.Straps & Bolts for flexibly attaching a shackle insulator. (A pair of mild steel straps, two number of mild steel bolts with hexagonal head, two number of mild steel nuts with hexagonal head to suit bolts, two numbers of spring washer).
- 2) Standards: -7935/1975 and 1363/1967 or latest version
- 3) Dimensions: -
 - (i) Straps:-185mm x 30mm x 3mm,
 - (ii) Bolts:-12mm dia,115mm Long, 12mm thick Nut
 - (iii) Washer:- 3mm thick Spring washer
- 4) Materials of Straps and Bolts: - Mild Steel Galvanized
- 5) Dimension of Nuts & Bolts: - As per IS:1363/1967
- 6) Galvanization:- (i) Straps & Bolts and other metal parts to be Hot dip galvanized
(ii) Nuts & washers to be electroplated.
- 7) Gross mass of each package:- Maximum 50Kg
- 8) Other dimensions would be in compliance with the Fig.1.



NOTE:- All dimensions are in mm.

Fig- L.T.STRAPS & BOLTS



3.0 SERVICE CONDITIONS:-The L.T. Straps & Bolts to be supplied against this Specification shall be suitable for satisfactory continuous operation under the following climatic conditions as per IS:7935/1975 or latest revision.

i. Location	:	At various locations in Tripura
ii. Max. ambient air temperature (Deg0 C)	:	45
iii. Min. ambient air temperature (Deg0 C)	:	4
iv. Max yearly daily ambient air temperature (Deg0 C)	:	40
v. Max average weighed average ambient temperature (Deg0 C)	:	32
vi. Max. Altitude above mean sea level(Meters)	:	1000 M.

4.0 TEST AND INSPECTION

4.1 Following tests shall be carried out at the works of the manufacturer as per relevant ISS before delivery of each lot in presence of the representative of purchaser:

A. Type Tests:

- (a) Visual examination,
- (b) Verification of dimensions,
- (c) Checking of threads on heads,
- (d) Galvanizing / Electroplating test,

B. Acceptance Tests:

- (a) Checking of threads on heads,
- (b) Galvanizing / Electroplating test,
- (c) Verification of dimensions,

C. Routine Tests:

- (a) Visual examination,
- (b) Dimension Test.

Sample at random will be selected from the offered lot for the above testing as per IS.

Note : Purchaser reserves the right to get all or any type test carried out on one sample per 500 Straps & Bolts at the cost of supplier from any recognized laboratory / government test house.

4.2 The supplier shall furnish the type test / the routine test certificates as part of the condition for supply of Straps & Bolts in bulk quantity at the discretion of the purchaser.

4.3.0 INSPECTION

4.3.1 All tests and inspection shall be made at the place of manufacture unless otherwise especially agreed upon by the manufacturer and purchaser at the time of purchase. The manufacturer shall afford the inspector representing the purchaser all reasonable facilities without charge to satisfy him that the material is being furnished in accordance with specification.



4.3.2 The purchaser reserves the right to have the tests carried out at the cost of the supplier by an independent agency whenever there is dispute regarding the quality of supply.

5.0 PACKING & MARKING

5.1 PACKING:- The L. T. Straps & Bolts shall be so packed in double gunny bags that the Straps & Bolts are adequately protected against breakage and damage in ordinary handling and transit. To avoid damage of the Straps & Bolts transshipment in between the road transportation must be avoided i.e. each consignment should be transported from factory to **work site Store yard**.

5.2 MARKING :-The following information shall be marked on each case:

- a) Manufacturers' name
- b) Manufacturers' Trade mark
- c) Visible marking 'TSECL/2008-09'
- d) ISI certification mark if any

6.0 GUARANTEED TECHNICAL PARTICULARS:-The guaranteed technical particulars of the L. T. Straps & Bolts offered shall be given by the bidder along with the tender.

7.0 Guaranteed & other technical particulars for L.T. Straps & Bolts. (To be furnished by the Manufacturer)

<u>Sl. No.</u>	<u>Description</u>
1)	Name of Manufacturer :-
2)	Place of Manufacture :-
3)	Type of Straps & Bolts :-
4)	Standards :-
5)	Dimensions
(i)	Straps :-
(ii)	Bolts :-
(iii)	Washer :-
6)	Materials of Straps and Bolts :-
7)	Dimension of Nuts & Bolts :-
8)	Galvanization :-
9)	Gross mass of each package :-
10)	ISI Certification Mark if any :-

Signature of Authorised
Signatory of the firm
Seal of the firm



K. TECHNICAL SPECIFICATION FOR 4mm² PVC Cable

1.0 SCOPE:-This specification covers the design, manufacture, testing at works, supply/ delivery & transportation of Single core, 4mm² PVC insulated, PVC sheathed cable(heavy duty) with stranded Aluminium conductor, 1100 Volts grade conforming to ISS:1554(P-I)/1988(3rd revision).

2.0 STANDARDS :-The 4mm² PVC cable shall conform in all respect to the relevant Indian/ International Standard Specification, with latest amendments.

SPECIFICATION FOR 4mm² PVC CABLE AS PER IS: 1554(P-I)/1988(3rd revision)

- 1) Type of Cable: - PVC insulated, PVC sheathed cable (heavy duty) with Stranded Aluminium conductor (Unarmoured)
- 2) Voltage Grade: -1100V
- 3) Core: - Single Core
- 4) Nominal cross-sectional area of the conductor: - 4mm²
- 5) Maximum Resistance of conductor at 20°C:- 7.41 Ω/Km
- 6) Colour of insulation of Core: - Red
- 7) Nominal thickness of
 - i) Insulation :- 1.0mm
 - ii) Outer sheath :- 1.8mm
- 8) Grade of Aluminium Conductor: - H2
- 9) Class of Aluminium Conductor: - Class-2
- 10) Tensile Strength of Aluminium Wire:-Above 100 N/mm² to 150 N/mm²
- 11) Elongation at break of Aluminium Wire: - 12%
- 12) Type of insulation:- 'C'
- 13) Tensile Strength of Insulation (Minimum):- 12.5 N/mm²
- 14) Elongation at break of Insulation (Minimum):- 125%
- 15) Type of outer sheath :- ST2
- 16) Tensile Strength of outer sheath (Minimum):- 12.5 N/mm²
- 17) Elongation at break of outer sheath (Minimum):- 150%
- 18) Tolerance for thickness as per IS:1554(P-I)-1988
- 19) Colour of outer sheath: - Black
- 20) Number of wires in conductor: - 3Nos.
- 21) Length of the cable on each drum: - 500Mtr. (±10%)
- 22) Length on each drum: - Single length
- 23) Cable code: - The following code shall be used for designating the cable:

<u>Constituent</u>	<u>Code Letter</u>
--------------------	--------------------

Aluminium conductor	A
PVC Insulation	Y
PVC Outer sheath	Y

Profile of material contents, minimum per Km of 4mm² PVC Cable:-

Size of cable	Content in Kg /Km (minimum)			Total weight
	Aluminium	PVC Insulation	PVC outer sheath	
4mm ²	11	18	55	84



3.0 SERVICE CONDITIONS:- The 4mm² PVC cable to be supplied against this Specification shall be suitable for satisfactory continuous operation under the following climatic conditions as per IS: 1554 (PI-I)/1988(3rd revision) or latest revision

- | | |
|--|----------------------------------|
| i. Location: | At various locations in Tripura. |
| ii. Max. ambient air temperature (Deg0 C): | 500C |
| iii. Maximum relative humidity Saturation point) | 95% (sometime approaches |
| vi. Max. Altitude above mean sea level(Meters): | 1000 M. |

4.0 TEST AND INSPECTION

4.1 Following tests shall be carried out at the works of the manufacturer as per relevant ISS before delivery of each lot in presence of the representative of purchaser:

A. Type Tests :-

- Tensile test,
- Conductor resistance test,
- Wrapping test
- Test for thickness of insulation and sheath,
- Tensile strength and elongation at break of insulation and sheath,
- Insulation resistance test,
- High voltage test (water immersion test) for type test only,
- High voltage test at room temperature.
- Flammability Test,
- Thermal Stability Test.

B. Routine Tests:

- Conductor resistance test,
- High voltage test at room temperature

C. Acceptance Tests:

- Tensile test,
- Conductor resistance test,
- Wrapping test
- Test for thickness of insulation and sheath,
- Tensile strength and elongation at break of insulation and sheath,
- Insulation resistance test,
- High voltage test (water immersion test),
- High voltage test at room temperature
- Flammability Test,
- Thermal Stability Test.

Sample at random will be selected from the offered lot for the above testing and the lot will be accepted subject to permissible limit of failure as per IS.

Note :Purchaser reserves the right to get all or any type test carried out on one sample per 200 drums of PVC cable at the cost of supplier from any recognized laboratory / government test house.



4.2 The supplier shall furnish the type test / the routine test certificates as part of the condition for supply of PVC cable in bulk quantity with the delivery of the material.

4.3.0 INSPECTION

4.3.1 All tests and inspection shall be made at the place of manufacture unless otherwise especially agreed upon by the manufacturer and purchaser at the time of purchase. The manufacturer shall afford the inspector representing the purchaser all reasonable facilities without charge to satisfy him that the material is being furnished in accordance with specification.

4.3.2 The purchaser reserves the right to have the tests carried out at the cost of the supplier by an independent agency whenever there is dispute regarding the quality of supply.

5.0 PACKING & MARKING

1.1 PACKING

The PVC cable shall be supplied in drums conforming to IS: 10418-1972. The ends of the cable shall be sealed by means of non-hygroscopic sealing materials. The drums shall be suitable for wheel mounting. All wooden components shall be manufactured out of seasoned soft wood free from defects that may materially weaken the component parts of the drums. Preservative treatment shall be applied to the entire drum with preservatives of a quality, which is not harmful to the PVC cable.

The PVC cable drum shall be so packed that the PVC cable are adequately protected against damage in ordinary handling and transit. To avoid damage of the PVC cable transshipment in between the road transportation must be avoided i.e. each consignment should be transported from factory to **work site**.

1.2 MARKING :-

A. The following information shall be marked on each drum:

- Manufacturers' name
- Manufacturers' Trade mark
- Drum or identification number
- Size of cable and voltage grade
- Length of cable
- Gross weight of the package
- Net weight of cable
- ISI certification mark if any
- Running end of cable
- Direction of rotation of drum (By means of an arrow)
- Year of manufacture

B. The following information shall be marked permanently throughout the length of the cable at an interval of 1(one) meter either by printing with indelible white ink/colour or by embossing on the outer sheath:

- a) Manufacturer's Trade mark
- b) Voltage grade (1100 volt)
- c) TSECL-2009-10



**6.0. Guaranteed & other technical particulars for 4mm² PVC cable
(To be furnished by the Manufacturer)**

Sl. No.	Description															
1.	Make & Manufacturer															
2.	Place of Manufacturer															
3.	Type of Cable															
4.	Voltage Grade															
5.	Core															
6.	Nominal cross-sectional area of the conductor															
7.	Colour of Core															
8.	Nominal thickness of															
	i) Insulation															
	ii) Outer sheath															
9.	Grade of Aluminium Conductor															
10.	Class of Aluminium Conductor															
11.	Tensile Strength of Aluminium Wire															
12.	Elongation at break of Aluminium Wire															
13.	Type of insulation															
14.	Tensile Strength of Insulation (Minimum)															
15.	Elongation at break of Insulation (Minimum)															
16.	Type of outer sheath															
17.	Tensile Strength of outer sheath (Minimum)															
18.	Elongation at break of outer sheath (Minimum)															
19.	Tolerance for thickness															
20.	Colour of outer sheath															
21.	Length of the cable in each drum															
22.	Number of length in each drum															
23.	Maximum Resistance of Conductor at 20oC:															
24.	Number of wire in Conductor															
25.	Marking as per Clause – 5.2. of section-IV															
26.	Reference IS code															
27.	Profile of material contents, minimum per Km of 4mm ² PVC Cable:															
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Size of cable</th> <th colspan="3" style="text-align: center;">Content in Kg /Km (minimum)</th> <th style="width: 20%;">Total weight</th> </tr> <tr> <td></td> <th style="width: 30%;">Aluminium</th> <th style="width: 30%;">PVC Insulation</th> <th style="width: 20%;">PVC outer</th> <td></td> </tr> </thead> <tbody> <tr> <td style="text-align: center;">4mm²</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Size of cable	Content in Kg /Km (minimum)			Total weight		Aluminium	PVC Insulation	PVC outer		4mm ²				
Size of cable	Content in Kg /Km (minimum)			Total weight												
	Aluminium	PVC Insulation	PVC outer													
4mm ²																

Signature of Authorised
Signatory of the firm
Seal of the firm



L. TECHNICAL SPECIFICATION OF GUY INSILATOR TO BE USED FOR L.T AND H.T OVERHEAD LINE

1.0 SCOPE:- This specification covers design, engineering, manufacture, assembly, inspection, testing at manufacturer's workshop before dispatch, packing, supply, delivery & transportation upto destination of porcelain guy strain insulators.

2.0 CLIMATIC CONDITIONS:- As mentioned in the General Climatic Conditions in clause 1 of Sec-III.

3.0 APPLICABLE STANDARDS

Except when they conflict with the specific requirements of this specification, the insulators shall comply with IS: 5300-1969 or the latest version thereof.

4.0 GENERAL REQUIREMENTS

4.1 The porcelain shall be sound, free from defects, thoroughly vitrified and smoothly glazed.

4.2 The design of the insulators shall be such that the stresses due to expansion and contraction in any part of the insulator shall not lead to its deterioration.

4.3 The glaze shall be white in colour for designation A insulators & brown in colour for designation C insulators. The glaze shall cover the entire porcelain surface parts except those areas that serve as supports during firing.

5.0 TYPE OF INSULATORS:- The standard guy strain insulators shall be of designation 'A' and 'C' as per IS: 5300/1969 or its latest revision. The recommended type of guy strain insulators for use on guy wires of overhead lines of different voltage levels are as follows:

Power line voltage	Designation of insulators
450 v	A
11000V	C

6.0 INSULATED CHARACTERISTICS:

The dimensions of guy strain insulators, basic insulated level, minimum creepage distance & mechanical strength etc. shall be as follows.

SI No	Parameters	Designation of Insulators	
		A	C
1	Nominal System voltage- V (rms)	415/240V	11000V
2	Length (mm)	90	140
3	Diameter (mm)	65	85
4	Cable hole Dia (mm)	16 ±1.5	25 ±1.5
5	Min. failing load (kN)	44	88
6	Min. creepage distance (mm)	41	57
7	Dry one min. Power Frequency Withstand voltage kV(rms)	18	27
8	Wet one min. Power Frequency Withstand voltage kV(rms)	8	13



7.0 TESTS

The insulators shall comply with the following routine, type and acceptance tests as per IS: 5300.

7.1 Type tests

- a) Visual examination
- b) Verification of dimensions
- c) Temperature cycle test
- d) Dry one minute power frequency withstand test
- e) Wet one minute power frequency withstand test
- f) Mechanical strength test
- g) Porosity test

7.2 Acceptance test

(To be conducted in the following order):

7.2.1 The insulators, after having withstood the routine test shall be subjected to the following acceptance tests in the order given below:

- a) Verification of Dimensions.
- b) Temperature cycle test
- c) Mechanical strength test
- d) Porosity test

7.2.2 The number of insulators to be selected at random from the lot shall be in accordance with the table 2 of IS : 5300/1969 which is reproduced bellow:

Lot size	First Sample Size
Up to 500	20
501 to 1000	30
1000 to 2500	50

7.2.3 The insulators selected in accordance with 7.2.2 above shall be divided upto two equal parts and subjected to the tests indicated as below:

Tests	Part of sample
a) & b)	Both parts
c)	First part
d)	Second part

If more than one insulator fails to comply with any of the acceptance tests, the lot shall be rejected.

If one insulator fails to comply with any of the tests, a fresh quantity equal to twice the first quantity shall be subjected to retesting. The retesting shall comprise the test in which the failure occurred preceded by those test which may be considered to have influenced the results of the original tests. If no failure occurs in the re-test, the lot shall be accepted.



7.3 Routine tests

- i) Visual examination

8.0 TESTING FACILITIES

8.1 The tenderer must clearly indicate what testing facilities are available in the works of the manufacturer and whether the facilities, are adequate to carry out all the routine as well as type tests. These facilities should be made available to T.S.E.C.L.'s Engineers if deputed to carry out or witness the tests. If any tests cannot be carried out at the manufacturer's works, the reasons should be clearly stated in the tender.

8.2 The tenderer shall furnish detailed type test reports of the offered L.T. Stay Insulators as per clause 7.1 of this specification. All the above Type Tests shall be carried out at laboratories, which are accredited, by the National Accreditation Board of Testing and Calibration Laboratories (NABL) of Government of India to prove that the insulators offered meet the requirements of the specification. These Type Tests should have been carried out within five years prior to the date of opening of this tender. However, the tenderer who have supplied the L.T. Stay Insulators to the TSECL against order from Central Purchase Agency of TSECL shall be exempted from submission of Type Test Report against this tender provided.

i) There offered L.T. Stay Insulators are already fully Type Tested at Laboratories accredited by the National Accreditation Board of Testing and Calibration Laboratories (NABL) within five years prior to the date of opening of the tender.

ii) There is no change in the design of Type tested L.T. Stay Insulators and those offers against this tender.

The detailed Type Test Reports along with the relevant oscillograms/certified drawings etc. or undertaking seeking exemption from their submission in the format schedule "F" is to be submitted along with the offer.

The successful tenderer shall take approval/waival of Type Test from Owner prior to the commencement of supply.

The Owner reserves the right to demand repetition of some or all the Type test in presence of Owner's representative at Owner's cost. For this purpose, the tenderer shall quote unit rates for carrying out each Type Test. However, such unit rates will not be considered for evaluation of the offer. In case the unit fails in the Type Tests, the complete supply shall be rejected.

8.3 The successful tenderer shall submit a separate test certificate for each batch of insulators manufactured or consignment or part thereof supplied. The test certificate should clearly indicate the results of the routine, and sample tests carried out and the name of laboratory in which the tests were carried out with date of test etc. The certificate issued by recognized testing laboratory, or from their own works will be only accepted.

8.4 If required, the TSECL shall subject the consignment of insulators supplied to the aforementioned test. The testing under this clause will be carried out in any laboratory including T.S.E.C.L.'s own laboratory. Notice of such tests will be given by the TSECL to the contractor by ordinary post. However, the date of testing will not be postponed or altered at the request of the contractor. The contractor is at liberty to be present during this test.



9.0 MARKING

9.1 Each insulator shall be legibly and indelibly marked to show the following:

- Name or trade mark of the manufacturer
- Year of manufacturer
- ISI certificate, mark, if any.
- Marking on porcelain shall be applied before firing.

10.0 **PACKING:**-All insulators shall be packed in suitable double gunny bags and shall be transported by road.

11.0 INSPECTION:

The TSECL may depute an Engineer to witness the routine and sample tests at their manufacturer's works for which advance intimation shall be given the manufacturers whenever a lot is ready for dispatch. All reasonable facilities, should be made available without any charge to the inspector (representing the Owner), to satisfy him that the material, is being supplied in accordance with this specification.

12.0 GUARANTEED & OTHER TECHNICAL PARTICULARS:

The tenderer shall submit **GUARANTEED & OTHER TECHNICAL PARTICULARS** along with the bid, which is part of the tender specification and offer. If are not submitted duly filled in with the offer, the offer shall be liable for rejection.

GUARANTEED TECHNICAL PARTICULARS. L.T. /H.T. GUY STRAIN INSULATORS:

SI No	Parameters Name	Parameters Type
1	Type of guy strain insulator L.T.(designation A) / H.T (designation C)	Text
2	Are insulators manufactured as per IS : 5300/1969 or latest revisions thereof.	Boolean
3	Type of material used in manufacture of the insulator	Text
4	Colour of the guy strain insulator shall be white for designation A and Brown for designation C	Text
5	Porcelain used in the manufacture is sound, free from defects, thoroughly vitrified and smoothly glazed.	Text
6	The dimensions of the insulators are as per specified drawings of the specification.	Text
7	Designation of insulator as per IS :5300/1969 (A or C)	Text
8	Minimum failing load of Guy Strain insulator (44 KN / 88 KN)	Text
9	Creepage distance (Min.) for Guy Strain insulator (41mm / 57mm)	Text
10	Cable hole diameter (16mm / 25 mm)	Text
11	Insulator suitable for use with Power line voltage V (rms)	Numeric
12	Dry One Minute Power frequency withstand voltage KV (rms)	Numeric
13	Wet One Minute Power frequency withstand voltage KV (rms)	Numeric
14	Marking on the insulator is as per specification	Text
15	Weight of insulator (Kg)	Numeric
16	Insulators are type tested for the type tests as per specifications & relevant IS and Type Test Reports enclosed.	Boolean
17	Any other particulars which the bidder may like to give	File

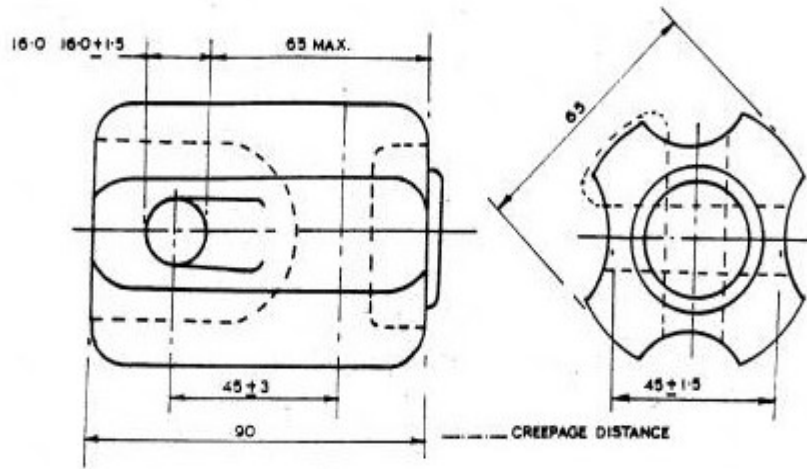


FIG. 1. GUY STRAIN INSULATOR (DESIGNATION - A)

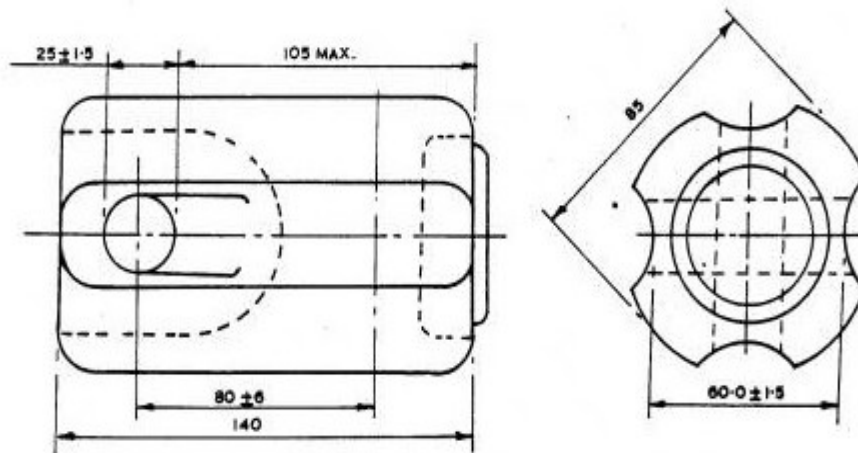


FIG. 2. GUY STRAIN INSULATOR (DESIGNATION - C)



M. COMMON TECHNICAL SPECIFICATIONS FOR M.S. BOLTS AND NUTS

1. **REQUIREMENT:** -M.S. Bolts Black Hexagonal Head Round Neck with Hexagonal Nuts with two washers is conforming to IS: 1363/2002 with latest amendments if any. The bolts and nuts shall be ISI marked and Washers shall conform to IS: 2016/1967 with latest amendments if any.
2. **PACKING:** The bolts and nuts with two washers duly assembled shall be packed in new sound, double jute / woven polythene bags and each pack shall contain maximum 50 Kgs. Net weight.
3. **BIS LICENSE:** Notarized Xerox copy of valid license for I.S. marking shall be submitted with the tender.
4. **TYPE TEST CERTIFICATE:** The Bidders have to submit notarized copy of all type test certificate as per IS: 1363/2002 with latest amendments time to time if any, along with Offer.
5. **GUARANTEED TECHNICAL PARTICULARS FOR SUPPLY OF VARIOUS SIZE M.S. BLACK BOLTS AND NUTS**

(Bidder has to confirm following important requirement)

Sl.No.	Particulars	Confirmation Please tick YES or NO
1	M.S.Bolts Black hexagonal head round neck with hexagonal nuts with two washers shall be manufactured and supplied conforming to IS: 1363/2002 and Washers shall conform to IS: 2016/1967 with latest amendments if any and DGVCL's specifications	YES / NO
2	M.S.Bolts Nuts with two washers shall bear ISI mark (Wherever applicable).	YES / NO
3	ISI license shall remain valid till order is completed.	YES / NO
4	Size of M.S. Bolts and Nuts with washers conforming the IS: 2016 - 1967	
5	II. 180mm x 16mm (Length x Diameter) (51 mm thread) (Washers-3.15mm thick, O.D.-30mm, I.D.-18mm)	YES / NO
	III. 65mm x 16mm (Length x Diameter) (38mm thread) (Washers-3.15mm thick, O.D.-30mm, I.D.-18mm)	YES / NO
	IV. 65mm x 12mm (Length x Diameter) (38mm thread) (Washers-3.15mm thick, O.D.-30mm, I.D.-14mm)	YES / NO
6	Packing shall be in new double jute / woven polythene bags and each pack shall contain maximum 50 Kgs. Net weight of Bolts & Nuts with 2 washers duly assembled.	YES / NO



SECTION – VI

SPECIAL INSTRUCTIONS TO BIDDER(S)

- i) The Bidder(s), before submitting of Bid(s), are advised to invariably visit the site of the work and satisfy himself about physical volume of works to be carried out, acquaint him with the environment, take into consideration details of all **minor & major Technical requirements so as to** ensure successful completion of the work with ease & comfort on award.
- ii) The work is a **Turnkey assignment** in Nature. The Contractor shall be fully responsible for total commissioning of all **Equipment & associated controls** as per standard & requirement of TSECL. Therefore the Contractor shall give due importance to each & every details of the work. He shall be liable to take care of and arrange for even any petty but integral component (**not considered in the scope of the work**) for total completion of the work.
- iii) The Bidder(s) shall have to furnish "**Guaranteed Technical Particulars**" of **each item** of **Equipments / Switchgears / Spares / others** as per "**Technical Particulars**" sought in **FORMAT(s)** appended in the Bidding Document. Furnishing of "**Technical Particulars**" of such item(s), which have not been sought through formal **FORMAT** in the Document, shall be the responsibility of the Bidder(s) as per guaranteed particulars of the related Manufacturer(s).
- iv) The Bidder(s) shall have to furnish Manufacturer's "**Literature on product Specification**" of all **Major equipment** with Bidding Document.
- v) The Bidder(s) shall also furnish "**Technical Particulars**" of all sub-item(s) of Main Item, **for example, "Tri-vector" Energy meter of Control & relay Panel.**
- vi) **List of MAKE for Equipments / Switchgears and all other items** have been furnished in the **Bidding Document**. The Bidder(s) shall have to supply item of such **MAKE acceptable as Standard Product** and to be authenticated by supporting Document as to utilization by any State Electricity board / Power utility / Power corporation of the Country.
- vii) The Successful Bidder shall have to submit "Design, drawing and dimensional details" of all equipments, Switchgears, Structures, Construction Standards and **Bill of materials** etc. within 15 days from the date of issue of Letter of Award (LOA) for approval of the Owner. The work shall be based strictly on such approved drawing.
- viii) The Spares and Tools & Plants as specified in the Schedule shall be of the particular MAKE. All such spares and T & P shall be supplied along with related Literature / Manual / Catalogue of concerned Manufacturer.
- ix) Specification of All Civil Works shall be guided by the Standards of TRIPURA PWD (Public Works Department). The Successful Bidder shall have to submit "Design and drawing of Sub-station layout, Foundation of Equipments and Structures, Cable Trench Details, Repair to Boundary Wall and Internal wiring of Control Room Building etc." within 15 days from the date of issue of LOA for approval of the Owner. The work shall be based strictly on such approved drawing.



TECHNICAL SPECIFICATIONS

1. This document shall be read in conjunction with the other tendering Documents.
2. The work shall be carried according to the description of the Item(s) in the Bill of quantities attached in Part – I. The building work shall generally conform to specifications for works in “The Tripura PWD Specification 1972 Building Work” where Tripura PWD specifications for building work is silent, CPWD specifications or provisions contained in “National Building Code” (Latest Edition) shall be followed.
3. “Specification for Road & Bridge Works (Latest Revision)” published by the Ministry of Shipping, Road Transport & Highways (MoRTH, Specification for Rural Roads, MoRD) shall be followed, and where the said specification is silent or items which are not covered, the Tripura PWD Specification, 1972/the specification of CPWD/CPHEEO/CWC/BIS or relevant IRC Standard Specifications as amended till date as determined by the Deputy General Manager, in that order should be followed.

SPECIAL CONDITION

1. Specification of Cement

- a) OPC CEMENT OF ISI Marked 43 grade containing 50 Kg each bag, conforming to IS: 8112 only to be used of current manufacturing date not before 90 days to reach in at work site.
 - b) Cement will be of in machine stitched polythene bag of preferable manufacturer (i) Valley Strong (ii) Star (iii) Crown etc.
 - c) Cement is to be purchased from the authorized dealer having Tripura sale tax registration. Prior to procurement approval from authority to be obtained. Cement shall be brought at site in bulk supply as desires by the Engineer-in-charge.
 - d) Before use of cement in the work, the original cash memo /voucher is to be produced before the Sr. Manager / Manager. The Sr. Manager should maintain a cement register separately in respect of procuring cement by the contractor.
2. Specification of steel reinforcement arranged by the agency shall confirm to relevant IS codes / BIS codes procured from TATA ISCON (TMTSD) / SAILTMT (EQR) / SRMB TMT / ELEGANT TMT.
 3. Necessary test certificate from Government recognized lab from cement ,steel, concrete, sand, bricks etc. shall have to be produced by the contractor as an when asked by the TSECL at agency's cost . Test certificate shall be confirm to the relevant IS as well as BIS codes.
 4. Stone aggregate (Assam Stone) must be of well graded machine crushed matching with the relevant specification and IS code of the work. Necessary T.P of carriage up to works side to be submitted to TSECL. Documentary proof (T.P) issued by the concerned authority (forest Department) to be furnished prior to execution.
 5. Before submitting the tender, the tenderer's are to satisfied themselves by actual visit to site, regarding availability of the labour and materials and site condition and any claim of the tenderer submitting tenders shall not be entertained afterword in respect of non-availability of labour, materials and site conditions . Any roads and paths, if required for the work will have to be made by the contractor at his own cost and nothing extra will be paid.



6. During the period, prior to the handing over of the work complete in all respects to the Deputy General Manager, demurrages to the work, if any, is to be made good by the contractor at his own cost and noting extra will be paid.
7. Concrete mixture machine, Vibrator to be used for any kind of C.C and R.C.C work (Full bag 10/7 capacity Mixture machine with hopper).
8. Weight machine to be kept at work site to verify the weight / mass of the material contained.
9. Sand shall be of relevant IS code preferably from Chechrimile, Charilam quarry.
10. Traffic on the road should be maintained if required during working period and the contractor will have to take precaution for his workers. If necessary, he will have to provide diversion at his own cost.
11. The contractor shall be responsible for the true and perfect setting out of the work and correctness of the position, level, and dimensions of all parts of the work. If at any time during the progress of the work shall any error arise in the position, level, or dimensions of any part of the work, fitting or fixing etc. the contractor shall be liable to rectify or change as directed by the Deputy General Manager at his own cost and risk.
12. The work, which does not conform to specification, must be struck down and rejected materials removed from the site of works as directed by the Deputy General Manager.
13. Contractor must take arrangement to dump disposable / excavated earth outside the project periphery at his own cost and risk. No charge / payment in this regard will be entertained. No plea about dumping of earth will be tenable.
14. The Department / Corporation will not take any responsibility regarding any permit. Contractor shall arrange permit if required at his risk and cost for collecting any materials from outside Tripura state. They are requested to get themselves apprised of GST rules.
15. Only ply shuttering to be used (Mix 12mm thick) in this work for all R.C.C. Unserviceable / defective ply / form box will not be allowed in, any case.
16. Green ply / kit ply to be used ads flash door shutter.
17. All PVC pipes, fittings must be made of prince / oriplast.
18. Vitrified tiles, or other glazed tiles must be made of Kazaria, Johnson, Vermora, make.
19. C.P bibcock, stopcock, pillar tape, basin tape must be made of Royal / Pushp / Mare Jaquan make. Heavy GI fittings to be used for internal water supply net work including conceel line if any. All sanitary fitting like European commode, Indian OT pan, Urinal pan etc. must be made of Hind ware / Pary ware make.
20. Door locks, latches, handles, door closures etc. must be make at Godrej / link.



PRICE BREAK-UP

PRICE BREAK-UP FOR SUPPLY:

- | | | |
|--|-----|------------|
| a) Basic price | : - | Rs. |
| b) Road Transport charges, including Loading at dispatch point, unloading inclusive of comprehensive insurance and other charges | : - | Rs. |
| c) Total | : - | Rs. |
| d) GST rate | : - | |
| e) GST amount | : - | Rs. |
| f) Discount if any on Rs..... | : - | Rs. |
| g) Bidder should declare any other Taxes / duties not covered above and Amount, if applicable | : - | Rs. |
| h) Grand total | : - | Rs. |

PRICE BREAK-UP FOR CIVIL & ERECTION WORK:

- | | | |
|---|-----|------------|
| a) Basic price | : - | Rs. |
| b) GST rate | : - | |
| c) GST amount | : - | Rs. |
| d) Discount if any on Rs..... | : - | Rs. |
| e) Bidder should declare any other Taxes / duties not covered above and Amount, if applicable | : - | Rs. |
| f) Grand total | : - | Rs. |

Signature of the Tenderer / Bidder



MAKERS LIST OF MATERIALS

Sl. No.	Items	Manufacturer
1.	Power Transformer	BHEL / ALSTOM / CGL / Siemens / Bharat Bijlee / ABB / Transformers & Rectifiers (India) Ltd./ Volt Amp / Prolec GE.
2.	132 KV SF ₆ Breaker	Alstom / CGL / Siemens / ABB / BHEL
3.	33 KV SF ₆ Breaker	CGL / ABB / Schneider
4.	132 KV Isolator	Siemens / ABB / CGL / Alstom / Hivelm / M/s Raychem RPG Pvt. Ltd., / GR Power / Project Electricals (PEI)
5.	33 KV Isolator	Switchgear & Control Pvt. Ltd. / JK Electricals / Bharat Electrical Industries / Hivelm / Project Electricals (PEI) / Siemens / GR Power / Electrolities (Power) Pvt. Ltd.
6.	132 KV CT	Alstom / CGL / Siemens / ABB / Vidyut Control System Pvt. Ltd.
7.	33 KV CT	Vidyut Control System Pvt. Ltd. / Switchgear & Control Pvt. Ltd. / Schneider / CGL / ABB
8.	132 KV PT	Alstom / CGL / Siemens / ABB
9.	33 KV PT	Vidyut Control System Pvt. Ltd. / Switchgear & Control Pvt. Ltd. / Schneider / CGL / ABB
10.	LA	Alstom / CGL / Oblum / Raychem RPG / Lamco Ltd.
11.	CVT	Alstom / CGL / BHEL / ABB / Siemens
12.	Hardware Fittings / Clamps, Connectors etc	EMI / Rashtraudyog Ltd. / Electromech&Transtech / EMC LTD / IAC / Klemmen / Megha / IPS / TLP / TM POWER.
13.	Power cable	Havells / Polycab / KEI / Gloster / Torrent / GEMSCAB / CCI
14.	Control Cable	Havells / Polycab / KEI / Gloster / Torrent / GEMSCAB / CCI
15.	Relay & Control Panel	Siemens / ABB / ALSTOM / L & T / Schneider Electric / PASCAL SWITCHGEAR / AMARARAJA
16.	Nuts & Bolts and other hardwares	Reputed manufacturer having credentials of supplying to different Central / State power utilities.
17.	Relays	SIEMENS / ABB / GE ALSTOM



Sl. No.	Items	Manufacturer
18.	11 KV VCB	Crompton Greaves / Siemens / ABB / L & T / PASCAL
19.	Energy Meter	L & T (ER 300P)
20.	Battery & Battery Charger	Exide / Amara Raja / Chabbi Electricals Pvt. Ltd. / Caldyne
21.	Oil Filter Plant	John Fowler (NIRMAL BRAND) / CEE DEE Vacuum / AR ENGINEERING.
23.	Sub-Station Lighting Equipments	Philips / Havells / CGL / Bajaj.
24.	Marshaling Kiosk / box, Junction box.	Electro Allied Products / VikasEngg. Associates / Bose Corporation / Control & Switchgear / Maktel.
25.	Structural Steel	Re-rollers shall purchase Billets from SAIL / TISCO / RINL / ISCO / VIZAG / Other reputed manufacturer having credentials of supplying to different Central / State power utilities.
26.	Nuts & bolts and other hardwares	Reputed manufacturer having credentials of supplying to different Central / State power utilities.
27.	ACSR PANTHER conductor of size 30/7/3.0 mm	APAR Industries / Saravathi Conductor / Sterlite Industries / Smita Conductor / Cabcon India Pvt. Ltd./ Lumino Industries Ltd / Reputed manufacturer having credentials of supplying to different Central / State power utilities.
28.	7/3.15 mm galvanized Steel Stranded Wire of Gr. – III conforming to ISS: 2141 of 1979 of as amended latest	Reputed manufacturer having credentials of supplying to different Central / State power utilities.
29.	Hardware fittings	EMI / Rashtraudyog Ltd. / Electromech&Transtech / EMC LTD / IAC / Klemmen / Megha / IPS / TLP
30.	Disc Insulator (11 KV Disc Insulator of size 255 mm X 145 mm Ball & Socket type EMS 120 KN)	Aditya Birla Insulators Ltd. / BHEL / IEC / WSI / Reputed manufacturer having credentials of supplying to different Central / State power utilities.
31.	40 mm dia G.I. Pipe	TATA / BANSAL / BMW / JINDAL.

All materials should be embossed/engraved with **TSECL-IPDS** for identification.



ANNEXURE-I

**PROFORMA OF BANK GUARANTEE FOR
CONTRACT PERFORMANCE**

(To be stamped in accordance with stamp Act)

Ref.

Bank Guarantee No.

Date

To
The Deputy General Manager,
Electrical Division-Teliamura, TSECL
Khowai District, Tripura.

Dear Sir,

In consideration of **Tripura State Electricity Corporation Limited** (hereinafter referred to as the 'Owner', which expression shall unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to M/s with its registered / Head office at(hereinafter referred to as 'Contractor' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns), a Contract by issued of Owner's Letter of Award No.....dated.....and the same having been acknowledged by the Contractor, resulting in a Contract bearing No.datedvalued atfor(scope of contract) and the Contractor having agreed to provide a Contract Performance Guarantee for the faithful performance of the entire Contract equivalent tobeing .(%) per cent) of the said value of the Contract to the Owner.

We, (Name & Address) having its Head Office at.....(hereinafter referred to as the 'Bank', which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Owner, on demand any or all monies payable by the Contractor to the extent ofas aforesaid at any time up to ** (see in note below) (days/month/year) without any demur, reservation, contest, recourse or protest and/or without any reference to the Contractor.

Any such demand made by the Owner on the bank shall be conclusive and binding notwithstanding any difference between the Owner and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. The Bank undertakes not to revoke this guarantee during its currency without previous consent of the Owner and further agrees that the guarantee herein contained shall continue to be enforceable till the Owner discharges this guarantee.

The Owner shall have the fullest liberty without affecting in any way the liability of the Bank under the guarantee, from time to time to extend the time for performance or the Contract by the Contractor. The Owner shall have the fullest liberty, without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor, and to exercise the same at any time in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Owner and the Contractor or any other course or remedy or security available to



the Owner. The Bank shall not be released to its obligations under these presents by any exercise by the Owner of its liberty with reference to the matters aforesaid or any of them or by reason of any other act of omission or commission on the part of the Owner or any other indulgences shown by the Owner or by any other matter or thing what so ever which under law would, but for this provision have the effect of relieving the Bank.

The bank also agrees that the Owner at its option shall be entitled to enforce this guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and not withstanding any security or other guarantee the Owner may have in relation to the Contactor's liabilities.

Notwithstanding anything contained herein above our liability under this guarantee is restricted toand it shall remain in force upto and includingand shall be extended from time to time for such period (not exceeding one year), as may be desired M/son whose behalf this guarantee has been given.

Dated this day of20..... At

WITNESS

.....
(Signature) (Signature)

.....
(Name) (Name)

.....
(Official Address) (Official Address)

Attorney as per Power
Of Attorney No.

Date

NOTES:

- This sum shall be 'ten per cent (10 %)' of the Contact Price.
- ** The date will be ninety (90) days after the end of date of 'Warranty Period' as specified in the Contract.

1. The Stamp Papers of appropriate value shall be purchased in the name of issuing Bank.



ANNEXURE-II

APPLICATION FOR EXTENSION OF TIME

(Part – I)

1. Name of Contractor _____
2. Name of work (as given in the contract) _____

3. Agreement no. _____
4. Contract amount _____
5. Date of Commencement of work as per agreement _____
6. Period allowed for completion of work (as per agreement) _____
7. Date of completion stipulated in the agreement _____
8. Actual date of completion _____
9. Period for which extension of time has been given previously if any _____
 - a) 1st extension vide No. _____
 - b) 2nd extension vide No. _____
 - c) 3rd extension vide No. _____
 - d) 4th extension vide No. _____
10. Period for which extension have been previously given (Copies of the previous application should be attached).
11. Hindrances on account of which extension is applied for with date on which hindrances occurred.

Sl. No.	Nature of hindrances	Date of occurrence	Period of which hindrances is likely to last	Extension of time applied for by the contractor	Overlapping period, if any, giving reference to items which overlap	Period for which extension is applied for.	Remarks as to why the hindrances occurred and justification for extension of time

12. Total period for which extension is now applied for on account of hindrances mentioned above.
13. Extension of time required for extra work: - _____ Months. _____ days.
14. Detailed for extra work and the amount involved: -
15.
 - a) Total value of extra work: -
 - b) Proportionate period of extension of time based on estimated amount put to tender on account of extra work: -
16. Total extension of time required for 11 & 12: -

Signature of Contractor



APPLICATION FOR EXTENSION OF TIME

(Part – II)

(To be filled in by TSECL)

1. Date of receipt of application from _____ contractor for the work of _____
_____ in the Sub-Divisional _____.

2. Acknowledgement issued by the Sr. Manager, vide his No. _____
_____ Dated _____.

3. Recommendation of Sr. Manager, In-charge of the Sub-Division is to whether the reasons given by the Contractor are correct and what extension, if any, recommended by him, if he does not recommended the extension, reasons for rejection should be given

Dated

Signature of the Sr. Manager, In-charge of Sub-Division



APPLICATION FOR EXTENSION OF TIME

(Part – III)

(To be filled in by TSECL)

1. Date of receipt in the Divisional office: _____
2. Report of DGM, In-charge of the Division regarding hindrances mentioned by the contractor

Sl. No.	Nature of hindrances	Date of occurrence	Period for which hindrances is likely to last	Extension of time applied for by the contractor	Overlapping period, if any, giving reference to items which overlap	Net extension applied for	Remarks as to why the hindrances occurred and justification for extension recommended

3. Recommendation / Approval of the DGM, in-charge of the Division: -
(The present progress of work should be stated and whether the work is likely to be completed by the date upto which extension is applied for, if extension of time is not recommended, what compensation is proposed to be levied under clause 13 of section - III.)

Signature of DGM

4. Recommendation / Approval of the AGM, in-charge of the Circle: -

Signature of AGM

5. Recommendation / Approval of the GM (Technical): -

Signature of GM (Technical)

6. Recommendation / Approval of the CMD: -

Signature of CMD



ANNEXURE – III

DECLARATION BY BIDDER

I/We hereby declare that I/we have personally gone through the Bid- Document of Contract, Technical Specifications, other instructions/ Special instructions etc. incorporated in the Bidding Document for the works/ Supply and I/We do agree to abide by all the rules and regulations of TSECL, Agartala, Tripura.

Date:-

Place:-

Authorized signatory
of Firm/Agency
SEAL



ANNEXURE – IV

(N.J. Stamp of Rs.30/-)
BEFORE THE NOTARY
_____ : TRIPURA.

INDEMNITY BOND

THIS INDEMNITY BOND IS EXECUTED ON THE _____ DAY OF _____ 2022
A.D. By Shri _____,
S/o. Shri / Late _____, Vill. _____ P.S. _____,
District _____, aged about _____ years, a citizen of India (Here-in-after
called the Contractor indemnifier) in favour of Tripura State Electricity Corporation Ltd. (TSECL) (Here-
in-after called the Corporation) under the terms and conditions here-in-after mentioned : -

WHEREAS, I am a Class __ Government Contractor and the Corporation awarded me to execute the
work namely _____ agree to
indemnify the corporation that in the event of any accident of any workman, arising out of and in course
of employment, during execution of the work I shall be liable to pay full compensation to the workmen
employed by me for execution of the work.

I also agree to indemnify and save harmless the corporation that, the lives & bodies of my workmen(s),
employed by me for execution of this work, are duly insured with the
_____ Insurance

Company _____
Branch under Act / Scheme.

I further agree to indemnify and save harmless the corporation that the corporation or any of its Director
(s) or Officer(s) or Manager(s) shall not be made liable to pay any compensation to any workmen in the
event of death or bodily injury, arising out of their course of employment under me, employed by me for
execution of the work namely _____

IN WITNESS WHERE OF I SIGN THIS INDEMNITY BOND TODAY, THE DAY, MONTH, YEAR FIRST
ABOVE WRITTEN IN PRESENCE OF FOLLOWING WITNESSES.

<p>Witnesses</p> <p>1. _____</p> <p>2. _____</p> <p style="text-align: center;">Identified by me</p> <p>_____</p> <p style="text-align: center;">Advocate</p>	<p>_____</p> <p>Full Signature of Contractor (INDEMNIFIER)</p>
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ANNEXURE – V

ACCEPTANCE LETTER AFTER DUE ATTESTION BY NOTARY
(TO BE SUBMITTED IN TECHNICAL BID)

Refer NIT No. _____ Date _____

To
The Deputy General Manager
Electrical Division-Teliamura, TSECL
Khowai District, Tripura

Sir,

Acceptance of TSECL'S NIT Clause No. 7.7(v) of Section –I

1. I/We hereby declare that I/We have gone through the NIT Clause No. 7.7(V) of Section –I of this NIT.
2. I/We hereby declare the acceptance of the aforesaid mentioned clause.
3. I/We hereby on behalf of (the name of the Vendor/Firm.....) declare that we are not "De-barred/Black listed" by any Central (GOI)/State Govt. owned Power Utility, for supply of similar materials during last 3 years for whatever reasons.

Date:.....

Yours faithfully,

(Signature of the Tenderer)

With rubber Stamp

Attestation Signature of Notary
With Rubber Stamp

Date:



ANNEXURE -VI

Bidder's Financial Capabilities

The Details may be submitted in the following format
Bidder's Legal Name : _____
Date : _____

Information from Balance Sheet					
Sr. No.	Particulars	FY 2019-20 (Amount in INR)	FY 2020-21 (Amount in INR)	FY2021-22 (Amount in INR)	Enclose Documents
1	Total Assets				
2	Total Liabilities				
3	Net Worth (1-2)				
Information from Profit & Loss Statement					
7	Total Turnover (in INR)				
8	Average Turnover for 3 years				
Note: Attached are copies of financial statement (Balance Sheet including all related notes, and income statements) for the years required above, complying with the following conditions: <ul style="list-style-type: none">• All such documents reflect the financial information of the bidder and not sister or parent companies• Historic financial statement must be audited by the Statutory Auditor• Historic financial statement must be complete, including notes to the financial statement.• Historic financial statement must correspond to accounting periods already completed and audited (no statement for partial period shall be requested or accepted)					
Seal & Sign of Statutory Auditor or Chartered Accountant					
Name of the Audit Firm:					
Firm Reg. Number.					
Date: (Signature, name and designation of the authorised signatory)					



ANNEXURE -VII

Price Schedule/BoQ

Sl. No.	Item Description	Qty	Unit	Rate (Rs.)	Amount (Rs.)
1	Schedule				
2	8 meter long P.C.C. pole	154	No		
3	M.S. Stay set	186	Set		
4	Stay insulator	186	No		
5	Stay wire (7/4 mm)	930	Kg		
6	ACSR (6/1/2.59mm)	15.4	Km		
7	8 SWG G.I. wire	862	Kg		
8	M.S. Angle (50x50x6mm)	900.9	Kg		
9	LT shackle insulator 3"x3.5"	616	No		
10	Straps with N/B	616	Pair		
11	Nuts & Bolts (assorted sizes)	154	Kg		
12	4 sq. mm PVC Cable	9.24	Km		
13	Rewirable porcelain cut-out 32 Amps	154	No		
14	LT Spacer	308	No		
15	Danger Plate (LT)	154	No		
16	Reel insulator (4-10 sq. mm)	3696	No		
17	10 SWG G.I. wire	462	Kg		
18	Supply of fabricated bracket clamps of assorted size of 50X6 mm MS Flat i/c. holes as per requirement by Drill Machine.	308	No		
19	Supply of fabricated stay clamp i/c Nuts & Bolts etc as required	186	Pair		
20	Supply and erection of wooden meter board (12x15) inch.	154	No		
21	Erection of 8.0 mtr. Long PCC Pole direct in earth including excavation, refilling and ramming etc. as required complete (1/6 th of the length of the pole to be embedded in earth).	154	No		
22	Erection of painted Stay Set complete direct in earth with 16 mm. dia. 1.8 mtr. long painted stay rod, anchor plate of size 300 X 300 X 8 mm. thick, turn buckle of length 356 mm. with 300 mm. long threaded adjustable 16 mm. dia. MS rod, thimble, guy insulator as per IS specification, hot dip (heavy duty) galvanized stay stranded wire of size 7/2.5 mm. fastened with stay clamps as required. (including supply of MS clamp & Nuts & Bolts as reqd) and Grouting of stay set with CC of ratio 1 :2:4 (1 cement: 2 river sand: 4 jhama brick aggregate of 20 mm. nominal size) ilc supply of cement, sand and brick aggregate complete with excavation, refilling of earth, ramming along with centering and shuttering as required (@ 0.119 Cum per stay set as per TSECL Specification)	186	Set		



23	Laying, hoisting & stringing of ACSR (6/1/2.59 mm) Weasel Conductor including binding, jumpering, etc. as required & as per direction of the Engineer-in-Charge.	15.4	Km		
24	Laying, hoisting & stringing of 8 SWG G.I. wire as per ISS : 280/1978 amended latest with heavy coating as per ISS : 4826 I 1968 of tensile strength 55 to 95 Kg/mm i/c fastening with cross arm & metallic parts for earth continuity wire and metal parts to earth electrode as per direction of the Engineer-in-Charge.	7.7	Km		
25	Erection of 0.55 mtr long made of 50x50x6mm. MS Angle for 2-wire LT bracket. as per direction of the Engineer-In-Charge.	308	No		
26	Erection of Porcelain Shackle Insulator (90X75mm) for LT system with mechanical strength of 5 KN conforming to ISS:731/1971 with hot dip galvanized M.S G.I Straps with bolts in complete (suitable for Rabbit/DOG conductor) as per direction of the Engineer-in-Charge	616	No		
27	Drawing of 1-phase service line by PVC insulated Aluminium conductor with GI Wire and Reel insulator i/c. fixing and commissioning of 1-phase Energy Meter & meter cut outs etc. as required.	154	Job		
28	Fabrication of cross arm by MS Channel/Angle as per Specification by Drill Machine.	900.90	Kg		
29	Erection of LT spacer as per direction of the Engineer-in-Charge	308	No		
30	Erection of DANGER PLATE on OH lines (11 KV/415 Volts)	154	No		
31	Numbering of erected Pole with black Japper paint after applying priming coats by red oxide primer followed by a painting 2 or more coats with synthetic enamel paint (Yellow Colour) of approved quality within a area of 8"X14" on pole /DT as required as per direction of the Engineer-in-Charge.	154	No		
32	Cutting, clearing & disposal of jungle/tree of any girth from 3 (three) meter either side of HT/LT line of providing required vertical and horizontal clearances as per provision of I.E. Rule.	8.7	Km		
				Total:	
				Say:	