SECTION-I

TRIPURA STATE ELECTRICITY CORPORATION LIMITED
(INVITATION OF DOMESTIC COMPETITIVE BIDDING)

***Notice Inviting Tender for the Work*:-**

"Extension of 11 KV underground line and installation of 11/0.4 KV ,100 KVA pole mounted sub-station for power supply in the premises of Sheriff Fashions Pvt. Ltd.,RMS Madhya Para under the jurisdiction of ESD-II,Banamalipur,Agartala and Extension of HT UG line including installation of base mounted 11/0.4 KV, 200 KVA sub-station for providing power supply to Vivekananda commercial complex,TG Road under ESD-III,Pragati Road,Agartala."

1.0 SCOPE OF WORK:

Scope of work given above is only indicative. The detailed scope has been described in the **Schedule of Work / Price Schedule** attached with this bidding document.

► **Last date for Bid Submission : 10/10/2023 up to 2:00 p.m.**

►**Bid opening Date & time (Pre-qualification, Techno Commercial Bid & Price Bid) : 10/10/2023 at 4:00 p.m., if possible**

►**Cost of Bid document / Tender Fee : Rs. 1000.00**

►**Estimated Cost / Tender Value : Rs. 11,47,534.00 (Incl. GST)**

►**Earnest Money : Rs. 22,951.00**

►**Completion Period : 60 (Sixty) Days.**

2.0 QUALIFYING REQUIREMENTS FOR BIDDERS :

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

2.1 (a) The Bidder must have successfully executed and commissioned HT / LT underground line / over head line prior to submission of bid **OR**, (b) The Bidder must have successfully constructed and commissioned 11/0.433 KV Distribution sub-station prior to submission of bid.

2.2 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 / Tender Value.

2.3 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

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registered firms/companies/ proprietorship entity with two constituents only as one of the following.

2.3.1 A single firm of proprietorship entity or registered partnership firms or companies registered under Companies Act, which meets both the requirements, indicated in para 2.2, 2.3 above and 2.4 (**Mandatory).**

2.3.2 A joint venture of two registered firms/companies/ proprietorship entity, wherein both registered firm/company/ proprietorship entity shall meet both the requirements of para 2.2,2.3 & 2.4.

2.3.3 The figures of average annual turnover 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 2.3 above.

2.4 In case of joint ventures 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 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 power of attorney signed by legally authorized signatories of all the partners. All partners of Joint Venture 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 partners having such provision shall be submitted with the bid.

2.5 The Bidder shall be Enlisted Contractor Certified by the competent Authority.

2.6 Not withstanding anything contained here-in above, TSECL reserves the right to assess the "capacity and capability" of the bidder to execute the work eligibility."

2.7 The bidder shall furnish the followings as documentary evidence in support of qualifying requirement stipulated above.

(i) Photocopy of **GST Registration certificate** with latest paid challans / GST Return.

(ii) Photocopy of **PAN card of bidder** with latest IT Return acknowledgement / latest paid IT Return challan.

(iii) Photocopy of **Labor Registration Certificate**.

(iv) Photocopy of **Electrical Contractor license** issued by the appropriate Authority.

(v) Photocopy of **Electrical enlistment**.

(vi) **Annual Turnover certificate / Balance sheet** (for last **three** years)

(vii) Work order / Award letter / Agreement and corresponding Work experience / completion certificate, issued by not below the rank of the Executive Engineer / Dy. General Manager.

2.8 Photocopies of all documents furnished shall be self-authenticated and duly stamped.

2.8.1 TSECL reserves the right to check the originals, if required.

2.9 The bidder shall bear all **cost and expenses** associated with purchase and submission of its bid including post bid discussions, technical; & other presentation etc., and **TSECL** will in no case be responsible or liable for those cost, regardless of the conduct or outcome of the bidding process.

3.0 The bidder shall furnish documentary evidence in support of all the qualifying requirements stipulated above along with their bid**. Bid received without any one of the mentioned documents shall be summarily rejected.**

3.1 **(i) EARNEST MONEY(EMD) :** The bidder shall deposit earnest money as specified in clause no.1 (above)**,** in favor of **TRIPURA STATE ELECTRICITY CORPORATION LIMITED** to the below mentioned bank account details:

Bank Account No. 38313285901
Bank: SBI
Branch: TLA House, Agartala.
IFSC CODE: SBIN0005559

(ii) COST OF BID DOCUMENT / TENDER FEE: The bidder shall deposit cost of Bid document/ Tender fee as specified in clause no.1(above)**,** in favor of **TRIPURA STATE ELECTRICITY CORPORATION LIMITED** to the below mentioned bank account details:

Bank Account No. 31829890332
Bank: SBI
Branch: TLA House, Agartala.
IFSC CODE: SBIN0005559

4.0 (a) The bidder shall have to submit **bank deposit document / statement** as documentary evidence in respect of Earnest money and Tender fee deposit along with the Bid in a separate sealed envelopes.

Submission of Earnest Money and Tender fee along with the Bid by any other ways except bank deposit document / statement, **shall not be entertained and shall be declared informal.**

(b) Bid not accompanied with bank deposit document / statement as documentary evidence in respect of Earnest money and tender fee deposit in a separate sealed envelopes, **shall not be entertained and shall be declared informal.**

5.0 The bidding documents are not transferable and cost of bidding document is not refundable under any circumstances.

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The original bidding document shall be signed by the bidder (s) on all pages and will be enclosed with the COMMERCIAL / PRICE bidding schedule. All corrections to rates and items in the Bid(s) should be initialed by bidders. Every Page of the Schedule Price Bidding Shall is signed in full by the Bidder(s).

6.0 **The Bidder(s) shall have to give a DECLARATION** that **he/they have gone** through **the details of the Bidding Document(s) as per format appended with the Bidding Document (Annexure-I).**

7.0 **Address for Communication**.

Deputy General Manager, Electrical Division No-I,

Tripura State Electricity Corporation Limited

Banamalipur, Agartala – 799001, West Tripura.

8.0 SPECIAL TERMS & CONDITIONS WITH BIDDERS

1. **Quoted rates should be inclusive of all charges.**
2. **All the quoted rates should be inclusive of all taxes (GST also). Whatever the price quoted by the agency, it will be considered as inclusive of all taxes.**
3. The successful Agency shall have to enter into an agreement in TSECL format within **15 (Fifteen) days** from the date of issue of LOA. If the agency fails to carry out the agreement within the prescribed format, earnest money will be forfeited and action will be taken as per TSECL norms.
4. Rate should be inclusive of all taxes and duties and FOR destination.
5. Item(s) for which no rate or price has been entered by the authorized dealer/agency shall not be paid for and shall be deemed covered by other rates/prices in the contract.
6. When there is a difference between the rates in figures and in words, the rates in words by the contractor shall be considered as correct.
7. All corrections to rates and amount in the tender document shall be initiated by the contractor. Every page including the blank pages of the bid documents shall be signed by the contractor.
8. Payment will be made as per norms of TSECL.
9. Rate should be quoted for each item in Figure & Words inclusive of GST / other taxes and duties
10. **No articles as mentioned in the Bid Document will be received below standard quality in any shape.**
11. The TSECL reserves the right to reject the materials which will found below standard quality, if concerned Senior Manager Reports.
12. The TSECL reserves the right to cancel the LOA, if Bidder failed to complete the work with stipulated time without further Notice.
13. **All the supplied materials shall conform latest amended IS specifications and as per technical specifications as mentioned in Section-V.**
    However, GTP / drawings shall be submitted for approval before dispatch of materials from Manufacturer's work place.

Sign. of Bidder

DGM, ED-I, Banamalipur

SECTION-II

INSTRUCTION TO BIDDERS

1.0 GENERAL INSTRUCTIONS

"The bidders are to satisfy themselves by visiting to the 'site of work' as regards the prevailing condition of proposed site, its approaches, transportation facilities, availability of laborers and other availabilities 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 falls within the jurisdiction of ***Electrical Division No. I, Agartala, Tripura.***

2. 0 COST OF BIDDING

The Bidder shall bear all the costs and expenses associated with preparation and submission of its Bid including pre bid/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.

3.0 THE BIDDING DOCUMENT

3.1 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- II : Instructions to Bidders

Section- III: General Conditions of Contract

Section- IV: Erection Conditions of Contract

Section- V: Standard Technical Specifications.

Section- VI: Price Schedule.

3.2 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.

4.0 CLARIFICATIONS ON BIDDING DOCUMENTS

4.1 **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 theTender 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 seven (7) days prior to the deadline for submission of bids stipulated in tender notice. Written copies ofthe response (including an explanation of the query but without identifying it source) shall be sent to all prospective bidders who purchased the tender document.

4.2 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.

5.0 AMENDMENT TO BIDDING DOCUMENTS

5.1. 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).

5.2. The amendment shall be notified in writing or by Fax or Post or Email to all prospective Bidders, who have received the Bidding Documents at the address contained in the letter of request for issue of Bidding Documents from the Bidders. TSECL shall bear no responsibility or liability arising out of non-receipt of the same in time or otherwise.

5.3. In order to afford prospective bidders reasonable time to take the amendment into account in preparing their bids, TSECL may, at its discretion, extend the dead line for submission of bids.

5.4. Such amendments, 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.

6.0 ISSUANCE AND PREPARATION OF BID:

6.1 Intending Bidders desirous to participate in the tender have to download tender/ bid document from the official site of TSECL, **www.tsecl.in**. Bid document shall not be issued from the tendering authority Office.

6.2 The bidder shall have to bear all the costs associated with the preparation and submission of bid and in no case shall be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

6.3 The bid shall include all the information as per bid document.

6.4 The Bid prepared by the Bidders and all correspondence and documents relating there to, 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.

7.0 LOCAL CONDITIONS

7.1. 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 shall not entertain any request for clarification from bidders, regarding such local conditions**.

7.2. 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.

8.0 DOCUMENTS COMPRISING THE BID:

The Bids shall be submitted in 2(two) parts in separate sealed envelopes properly super scribing Tender No, Name of Work, and bid opening date as follows:

8.1 Part-I: Pre-qualification Bid Data and Techno Commercial Bid :

1. Containing copy of documentary evidence (bank deposit document/statement) of **Earnest money** deposit as per the stipulation of the Bid Document in a separate sealed envelope**.**

2. Containing copy of documentary evidence (bank deposit document/statement) of **Cost of Bid Document/Tender fee** deposit as per the stipulation of the Bid Document in a separate sealed envelope.

3. Containing copy of NIT, addendum /corrigendum, **Declaration (Annexure-I),** Documentary Evidence of the Bidder fulfilling the **Qualifying Requirements** stipulated in the **NIT / Bid Document**. The document to be submitted shall include copies of the **relevant work order** / **purchase order** /Award letters / Agreements etc. and corresponding completion

certificates issued by the concerned clients. The Bidder shall also furnish copies of the **audited balance sheet and Profit and Loss Accounts / Annual turnover** for the last **three financial** years (w.r.t. the bid opening date) In support of their meeting the financial qualifying requirement if required. The Bidder shall also submit **professional tax clearance** certificate & **sales tax clearance certificate** and all **such other documents** deemed necessary in support of their meeting the stipulated qualifying requirement and its credentials **if required**.

4. Containing Bidder's **Technical Proposal** , **drawings** etc. along with his **Commercial Terms, Payment Terms** in **conformity** with the Bid Documents.

8.2 Part-II: Price Bid:

The price schedule as per the format indicated in the Bid Price Schedule. **The price should be quoted in figures (in Rupees only)** . 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.

The Bidder **shall quote unit rates** and percentage of applicable GST in the appropriate schedule of the Bid Form / BOQ

9.0 SCOPE OF THE PROPOSAL

The scope of the proposal shall cover supply / erection / laying / commissioning of 3Cx70 sq mm,11 KV XLPE insulated Al conductor power cable, HDPE pipe, End Termination jointing Kits,11 KV incoming cum outgoing VCB panel etc. and construction of 11/0.433 KV S/S comprising of necessary accessories as specified under the accompanying Technical Specification / Bidding Schedule. It shall include the following:

9.1 (i) Detail design of 11 KV VCB panel and construction of 11/0.433 KV, Sub-station comprising

(ii) Supply/ laying/ commissioning of 11 KV VCB panel, UG power cable, HDPE Pipe, End Termination jointing Kits etc.

(iii) Packing and transportation from the Manufacturer's works to the Site

(iv) Receipt, storage, preservation and conservation of equipment and materials at Site.

(v) Pre-assembly, if any, Erection, Testing and Commissioning of all the equipment.

(vi) Reliability & Performance Test on completion & Commissioning of erected finished job

(vii) Providing **Guaranteed Technical Particulars of Equipments / Materials**.

9.2 Bids containing deviations from provisions relating to the following clauses shall be considered as 'non-responsive':

a) Price and Taxes & duties.:- Clause 11.0 & 12.0 ,section-II

b) Bid Guarantee: - Clause 16.0, Section-II

c) Contract Performance Guarantee:- Clause 36.0, Section-II

d) Liquidated Damages: Clause 13.0, Section-III

e) Guarantee: Clause 14.0, Section-III

f) Payment: Clause 33.0, Section-III.

10. 0 ALTERNATE PROPOSALS:

10.1 Bidder shall submit offers that comply with the requirements of the bidding documents, including the basic technical designs as indicated in the drawings / specifications. Alternatives will not be considered.

11. 0 PRICE BASIS:

The Bidder shall quote in the appropriate schedule of the Bid Form, with firm price "in Rupees only" for the entire Scope of Work (covered under the Bidding Documents) and also the unit rates of the goods it proposes to supply and the services to be rendered under the contract.

12.0 TAXES AND DUTIES:

12.1. GST and other levies payable by the bidders in respect of the transactions between the bidder and their vendors /sub suppliers while procuring any components, sub-assemblies, raw materials and equipment shall be included in the bid price and no claim on this behalf shall be entertained by TSECL .The bid price shall be **Inclusive of GST.**

12.2. As regards the Income Tax surcharge or Income Tax and other corporate taxes, the Bidder

shall be responsible for such payment to the concerned authorities.

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 requirement of completion schedule for the works is mentioned in Clause – 1 (Section – I) of this document.

13.3. The completion schedule as stated in Clause – 1 (Section – I) shall be one of the major factors in consideration of the Bids.

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

13.5. The successful Bidder shall be required to submit detailed BAR CHART and finalize the same with TSECL, as per the requirement of completion schedule.

14. 0 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.

15. 0 BRAND NAMES:

All the equipment's/ materials/ Transformers/Circuit Breakers/Insulators/Lightning Arrestors/ Steel Sections/Power Cable/ACSR/Control & Relay panel /Power cables / Hardware & Stay Sets / Spares shall be supplied out of the 'list of the makes / manufacturers' as stipulated in the attached technical specification. Any deviation in this regard shall not be entertained and bids having such deviation shall be rejected.

In case **brand names** are not **specified in the attached technical specification, standard equipment's /materials of reputed manufacturer acceptable to TSECL shall be supplied.**

16.0 BID GUARANTEE:

16.1. The Bidder shall furnish, as part of its Bid, **earnest money** for an amount as specified in the

Notice inviting Tender (NIT) , in favor of **Tripura State Electricity Corporation Limited** Agartala ,West Tripura.

16.2. The earnest money is required to protect TSECL against the risk of Bidder's conduct, which would warrant the **earnest money forfeiture pursuant to Para16.7.**

16.3. The earnest money shall be deposited in Indian rupees only.

16.4. Any bid not secured in accordance with para **16.1** and **16.3** above , shall be rejected by TSECL as non-responsive.

16.5. **The earnest money of the unsuccessful Bidders shall be discharged / returned as promptly as possible as but not later than 60 days after the expiration of the period of bid validity prescribed by the Owner**.

16.6. The earnest money of the successful Bidder will be released with the performance guarantee required to be furnished on receipt of award of contract / Letter of Award.

16.7. **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'**.

16.8. No interest shall be payable by TSECL on the above earnest money.

17.0 PERIOD OF VALIDITY OF BIDS:

17.1. 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**.

17.2. 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 3.1 of Section –** I, shall also be retained up to the extended period. No interest shall be payable by TSECL for retaining the earnest money up to the extended period. A Bidder may refuse the request without forfeiting the earnest money deposited by him. A Bidder granting the request shall

SUBMISSION OF BIDS

18.0 FORMAT OF BID:

18.1. The Bidder shall deposit hard copy of uploaded documents of the Bid to the tendering authority of TSECL during opening of Price Bid**.**

18.2. The hard copy of uploaded documents of the Bid shall be signed by the Bidder or a person or persons duly authorized by the bidder to sign the bidding document. The **letter of authorization** shall be indicated by written **power-of-attorney** accompanying the Bid. All pages of the Bid, except for un-amended printed literature, shall be initialed by the person or persons signing the Bid.

18.3. The Bid shall be uploaded / submitted **in two parts** as described in clause no. 8 of Section – II

19. 0 SIGNATURE OF BIDS:

19.1. The Bid must contain the name, residence and place of business of the person or persons making the Bid and shall be signed and sealed by the Bidder with his usual signature. The names of all persons signing shall also be typed or printed below the signature.

19.2. 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).

19.3. 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.

19.4. 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.

19.5. Satisfactory evidence of authority of the person signing on behalf of the Bidder shall be furnished with the Bid.

19.6. The Bidder's name stated on the proposal shall be exact legal name of the firm.

19.7. Bids not conforming to all the above requirements of **para 18.0** above , may be disqualified.

19.8. The original bidding document shall be signed by the bidder(s) on all pages and will be enclosed with the COMMERCIAL/PRICE bidding schedule and all corrections to rates and items in the bid(s) should be initials by the bidder(s). Every page of the schedule price bidding shall be signed in full by the bidder(s).

20.0 SEALING AND MARKING OF BIDS:

20.1. The Bidders shall sealed the "**Original**" and "**Copy of Bid**" in an inner and outer envelope, duly marking the envelopes as "Original" and "Copy".

20.2 The Inner and Outer envelope shall be:

a. **Address for Communication**.

Dy. General Manager, Electrical Division No-I,

Tripura State Electricity Corporation Limited

Banamalipur ,Agartala – 799001, West Tripura.

b. Bear (the NIT NO, Name of Work & Date of opening).

The Inner envelope shall indicate the name and address of the Bidder to enable the bid to be returned unopened in case it is declared "Late" or Rejected".

20.3 If the outer envelope is not sealed and marked as required under **para 20.2(b)** above, TSECL shall assume no responsibility for the bid's misplacement or premature opening.

20.4 The earnest money must be submitted in a separate sealed envelope.

21.0 DEADLINE FOR SUBMISSION OF BIDS:

21.1. The Bidders have to option of sending the bid by registered post or submitting Bid in person.**. Bids submitted by Telex/Telegram/Fax shall not be accepted**. No request from any Bidder to TSECL to collect the Bid from airlines, cargo agents etc. shall be entertained.

21.2. Bids shall be received by TSECL at the address specified under **para 20.2(a)** above, not later than the time & date mentioned in the Invitation to Bid.

21.3. 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.

22. 0 LATE BIDS:

22.1. Any Bid received by TSECL after the time & date fixed or extended for submission of Bids prescribed by TSECL, shall be rejected and /or return and opened to the Bidder.

23. 0 MODIFICATION AND WITHDRAWAL OF BIDS:

23.1. **The Bidder may modify or withdraw its Bid after the Bid's submission provided that written notice of the modification or withdrawal is received by TSECL prior to the deadline prescribed for submission of Bids.**

23.2. The Bidder's modification or withdrawal notice shall be prepared, sealed, marked and dispatched in accordance with the provisions of **clause 19.0 of section– II.**

23.3. No Bid shall be modified / withdrawn in the interval between the deadline for submission of Bids and the expiration of the period of Bid validity specified by the Bidder on the Bid Form. Withdrawal/modification of a Bid during this interval shall result forfeiture of the earnest money deposited by the bidder.

24.0 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. 0 OPENING OF BIDS BY TSECL:

25.1. First the cover containing Earnest money and Cost of Bid Documents as per clause 3.1 of Section – I, documents shall be opened and then documents of qualifying requirement as per clause 2.0 of Section-I shall be opened. Only those Bidders whose Bid contains Earnest money and documents of qualifying requirements as per the stipulations of Section - I shall be considered eligible for opening of T**echno Commercial** Bid which shall also be opened on the same day. The Price Bid **(Part-II)** of the eligible bidders on the **basis of evaluation of Part-I.** Bid shall be opened on a subsequent date. **The date of opening of the price Bid (Part-II) shall be notified in writing or by Fax to all qualified Bidders.**

In case the above schedule date of opening of Bid is declared holiday by the State / Central Govt. the Bid will be opened on the following working day keeping time unaltered.

25.2. The Bid and it's all parts shall be opened in the presence of Bidder's representatives (up to 2 persons) who choose to attend at the date and time for opening of bids indicated in the NIT or in case any extension has been given there to, on the extended bid opening date and time notified to all the Bidders, who have purchased the Bidding Documents. The Bidders' representatives who are present shall sign a register evidencing their attendance. No person / agent shall be allowed to be present during opening of Bid without valid authorization from the concerned bidder.

25.3. The Bidders names, bid prices, modifications, bid withdrawals and the presence or absence of the requisite earnest money and such other details as TSECL, at its discretion, may consider appropriate shall be announced at the opening.

25.4. No electronic recording devices shall be permitted during bid opening.

26.0 CLARIFICATION OF BIDS:

26.1. To assist in the examination, evaluation and comparison of Bids, TSECL may, at its discretion, ask the Bidder for a clarification of its Bid. The request for clarification and the response shall be in writing and no change in the price or substance of the Bid shall be sought, offered or permitted.

27. 0 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. Arithmetical errors shall be rectified on the following basis: If there is a discrepancy between **the unit price** and the **total price** that is obtained by multiplying the unit price and quantity, **the unit price shall prevail** and total price shall be corrected. If there is a discrepancy between words and figures, the **amount in words** shall prevail. If the Bidder does not accept the correction of the errors as above, his bid shall be rejected and the amount of earnest money shall be forfeited.

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 specified price schedules of the Bid Form, TSECL shall be entitled to consider the highest price of the tender for the purpose of evaluation and for the purpose of award of the Contract, 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. 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.

28.0 EVALUATION OF BID:

28.1 During bid evaluation, TSECL may ask the bidder for clarification of its bid. The request for clarification and the response shall be in writing, and no change in the price or substance of the bid shall be sought, offered or permitted.

28.2 The total evaluated prices shall be considered for comparison of prices of different bidders and the evaluation of the bids shall be done on total quoted price for the total Package as per PRICE SCHEDULE / SCHEDULE OF WORK. In case the bidder has not quoted for any of the items, the price of all such item(s) against which bidder has not quoted rates/amount (viz. items left blank or against which '-' is indicated) in the schedule, will be deemed to have been included in other item(s)/ Total quoted amount.

28.3 All applicable taxes, duties and levies shall be considered for the purpose of evaluation of bid

28.4 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.

29. 0 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 oral 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

32.0 AWARD CRITERIA:

32.1. 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.

32.2. 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.

33.0 OWNER'S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS:

33.1. 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.

34.0 NOTIFICATION OF AWARD:

34.1. 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.

34.2. The Notification of Award / Letter of Award shall constitute the formation of the Contract.

34.3. **Upon the successful Bidder's furnishing of Contract Performance Guarantee pursuant to Clause 36.0(Sec-II). TSECL shall promptly notify each unsuccessful Bidder and will discharge its bid guarantee, pursuant to Clause 16.0 (Section – II)**

35. 0 SIGNING OF CONTRACT:

35.1. 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.

35.2. **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**.

36. 0 CONTRACT PERFORMANCE GUARANTEE:

36.1. Within **15 (Fifteen) days** of receipt of letter of award , the successful bidder shall have to deposit a **Contract Performance Guaranty** equivalent to **@ 10% of the LOA Value** (excluding GST) as a contract performance security in the shape of **Demand Draft** in favor of **TRIPURA STATE ELECTRICITY CORPORATION LIMITED** from any schedule bank guaranteed by Reserve Bank of India payable at Agartala. The contract performance guarantee submitted shall be valid up to **12 (Twelve) months from the date of successful and satisfactory commissioning / completion of work.**

36.2. 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.

36.3. 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.

36.4. The Contract performance Guarantee submitted in the shape of demand draft shall be returned to the Contractor without any interest at the end Guarantee period. The Guarantee such deposited shall be discharged after expiry of Guarantee period.

36.5 **Additional Contract Performance Guarantee: -**

For bid up to 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 bided 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 Demand Draft from a Nationalized Bank/Scheduled Bank valid till the completion of the work in all respect.

36.6. **The contract performance Guarantee shall be forfeited: -**

a) If the contractor fails to start the work as per approved BAR CHART for reasons solely rest on him.

b) 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.

c) If the contractor left /suspends the work for reasons which are not acceptable to TSECL.

37.0 CORRUPT OR FRAUDULENT PRACTICES:

37.1. 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 incorrupt / 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 CORPORATIONLIMITED (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 as signs.

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 ofwork 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 timeto 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 ofContract/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.

1.18 A '**Week**' shall mean continuous period of seven (7) days.

1.19 "Writing" shall include any manuscript, type written or printed statement, under or over signature and/or seal as the case may be.

1.20 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 aroused, the approval, judgment, direction etc. is understood to be a function of TSECL.

1.21 **"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.

1.22 **'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.

1.23 **"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.

1.24 **'Trial Operation', Reliability Test', 'Trial Run', 'Completion Test'** shall mean the extended period of time after the startup 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.

1.25 **'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.

1.26 The term **'Final Acceptance / Taking Over'** shall mean written acceptance ofthe 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.

1.27 **"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 uptown including rated capacity**. Such declarations by TSECL, however, shall not relieve or prejudice the Contractor of any of his obligations under the Contract.

1.28 **'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.

1.29 **'Latent Defects'** shall mean such defects caused by faulty designs, material or workmanship which cannot be detected during inspection, testing etc, based onthe technology available for carrying out such tests.

1.30 **'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 DGM in charge of the work.

1.31 **"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.E. standards.

f) I.E.C. standards.

g) Other Internationally approved standards and / or Rules and **Regulations touching the subject matter of the Contract.**

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

1.33 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 Contact Act (1872**) and failing that in the **General Clauses Act (1897**) including amendments thereof if any.

1.34 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 'Contact 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 there to 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 seven (7) true copies of Agreement and one softcopy 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 there to or to exercise any option there in provided shall in no way be construed to be a waiver of such provisions, rights or options or in any way 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 inthe 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 programmed in line with the agreed Contract Bar Chart. Such manufacturing programmed shall be reviewed, updated and submitted to the owner's Engineer in charge of the work once in every month there after.

11.5 The above Bar Charts/manufacturing programme shall be compatible with TSECL computer environment and furnished to TSECL on such media as maybe 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 If the Contractor fails to successfully complete and commission the work, within the time fixed under the Contract, the Contractor shall pay to TSECL as liquidated damages and not as penalty a sum specified for each specified period of delays.

13.2 Equipment and materials will be deemed to have been delivered only when all its components, parts are also delivered. If certain components are not delivered in time, the equipment and materials will be considered as delayed until such time the missing parts are also delivered.

13.3 The **liquidated damages** for delay in successful completion & commissioning of work beyond the time / date stipulated under the contract , shall be levied @ **0.5 (Zero point five percent)** of the contract value, per week or part thereof subject to a maximum of **5% (Five Percent)** of the contract Value.

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 **Twelve (12) 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 **(Deputy General Manager / Senior Manager)** 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 Engineering 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 **Deputy General Manager /Senior Manager** 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 reasonable time, the **Deputy General Manager / Senior Manager** 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 **Deputy General Manager / Senior Manager** 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 programmer 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 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 update 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 in demnified 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 useof 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 herein after 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, 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 **Deputy General Manager / Senior Manager** 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 **Deputy General Manager** 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's 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 workfor 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 **(Deputy General Manager / Senior Manager)** 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 ±25%.**

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 31.0 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 cannot 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 **(Deputy General Manager / Senior Manager)** 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.

23.5 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 **(Deputy General Manager / Senior Manager)** 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.

24.0 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.

25.0 CERTIFICATE NOT TO AFFECT RIGHT OF TSECL AND LIABILITYOF 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 & 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 / representative on behalf of TSECL. Waiver of Inspection may be done by TSECL on special circumstances with deduction of Inspection cost @3% of the value of materials for which shall be done 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 equipments / materials the contractor shall give intimation to the owner's Engineer in Charge of the work for conducting inspection of equipments/ materials at manufacturer's works or at recognize testing Lab to be arranged by the contractor. The intimation shall be made at least **15 (Fifteen) days** before the equipments / materials become ready for dispatch.

27.3 Testing of equipments / materials as specified above shall be conducted at the risk and cost of the contractors. The contractor shall also bear the to and fro travelling, food and lodging charges of the inspecting officer / team of TSECL/ representative on behalf of TSECL.

28.0 EXTENSION OF TIME:

28.1 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/Agency:-

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 be made in prescribed Performa of TSECL by the contractor /Agency to the Senior Manager, ESD Concerned **, within maximum 07(sixty) days after occurrence of Hindrance attributable to TSECL or force majeure conditions(**clause no. 41.1**)** along with authenticated documentary evidences of such Hindrance attributable to TSECL or force majeure conditions which hindered the normal performance of the contract/agreement within the time as stipulated in the contract/agreement.

c) 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.

28. 2 **The Engineer-In- Charge(Deputy General Manager)** will have full power, 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.

28.3. The opinion of the **Engineer- in- charge (Deputy General Manager)**, 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 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 36.1 of Section -II** for the proper fulfillment of the Contract within **Fifteen (15) days** of "Notice of Award of Contract."

32.0 CONTRACT PRICE ADJUSTMENT:

"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 The payment to the Contractor for the performance of the Works under the Contract will be made by TSECL as per the guidelines and conditions specified herein. All payment made during the Contract shall be on account payments only. 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 progressive 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 / erection of Equipment & materials / services shall be made by the owner's Engineer in charge of the work through account payee Banker cheque.

34.2 TERMS OF PAYMENT

The terms of payments for various activities under the contract are as under.

34.2.1 Price of Supply and Erection

A) **Supply of Equipments / materials (except spares, tools & plants)**:-

i) **80%** of cost of Equipment / materials after:

a) Acknowledgement of Letter of Award.

b) Submission of contract performance guarantee as per clause 36.1 (Section – II)

c) Submission of a detailed Bar Chart based on the work schedule stipulated in the Bid document and its approval by TSECL.

d) Signing of contract agreement.

e). On production of dispatch documents including the material inspection clearance certificate (MICC) issued by the inspecting officer / team of TSECL / representative on behalf of TSECL.

f) Submission of **Invoice, LR Copy** of supply items.

g). Finally, on receipt of materials at site.

ii**) 10%** after successful erection at site.

iii) **Balance 10%** after successful commissioning.

B) Erection :-

i) **90%** on successful erection of Cable/ equipments / materials as per lay-out drawing / Erection Schedule submitted by the bidder and approved by TSECL. On establishing your office at site preparatory to mobilization of your erection establishment including posting of site engineer.

ii) **Balance 10 %** after successful commissioning.

C) Spares, tools and plants:

100% on receipt of the Spares and T& Plants in full and good condition.

34.2.2 All further payments under the Contract shall be made as stipulated in the Contract document after signing the Contract Agreement. The adjusted contract price as per relevant clauses of the contract document shall be made by TSECL or adjusted from the progressive bill of the contractor on submission of price adjustment invoices with supporting documents by the contractor and on final acceptance by TSECL.

34.2.3 **Price adjustment / Contract Variation**

Quoted Prices shall be FIRM. No variation of the quoted prices will be allowed within the Scheduled Completion period or within any extended period as approved by Engg. in Charge / TSECL authority

34.2.4 **Spares**

The Ex-works price components including packing and forwarding charges of spares shall be paid as indicated below: -

a) On receipt and storage at Site and on physical verification by the owner's Engineer in charge of the work.

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 and materials as specified under the clause entitled "**Insurance**" of this Section.

36.0 TRANSFER OF THE TITLE:

36.1 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.

36.2 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.

37.0 INSURANCE:

37.1 The Contractor **at his cost shall arrange, secure and maintain all insurance**s 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 underwrite rin 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.

37.2 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.

37.3 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 risksup to 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.

37.4 All costs on account of insurance liabilities covered under the Contract will beto 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.

37.5 The clause entitled '**Insurance' under the Section - III**, covers the additional insurance requirements for the **portion of the works to be performed at the Site.**

38.0 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.

39.0 DELAYS BY TSECL OR HIS AUTHORISED AGENTS :

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.

40.0 **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.

41.0 FORCE MAJEURE :

41.1 Force majeure shall mean Act of God & Nature like , Earthquake, Deluge, Flood, Epidemic, unexpected events like War, Strike, Curfew, Civil & Military Emergencies.

In Tripura State, routine and normal Gale, storm, hurricane, thundering etc. regularly lashing the state will not be considered as Force-majeure events.

41.2 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.

42.0 SUSPENSION OF WORK

42.1 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.

43.0 CONTRACTOR'S DEFAULT

43.1 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 there of 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 there of as a foresaid 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.

43.2 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.

44.0 TERMINATION OF CONTRACT ON OWNER'S INITIATIVE

44.1 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.

44.2 The Contractor upon receipt of such notice shall discontinue the work on the date and to the extent specified in the notice.

44.3 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

45.0 SETTLEMENT OF DISPUTES

45.1 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.

45.2 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. .

45.3 In the event the Contractor being dissatisfied with any such decision, the matters in dispute shall be referred to arbitration as hereinafter provided.

46.0 ARBITRATION

46.1 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.

46.1.1 The arbitration shall be conducted by an arbitrator, to be nominated by TSECL and he will be the sole arbitrator to conduct the arbitration.

46.1.2 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.

46.2 The arbitrators may, from time to time with the consent of all the parties enlarge the time for making the award.

46.3 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.

46.4 During settlement of disputes and arbitration proceedings, both parties shall be obliged to carry out their respective obligations under the Contract.

47.0 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.

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 WorkSite 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 **Wate**r

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, wharf age 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 authorized 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 Subcontractors 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 subcontractor'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 fire fighting 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 CODE REQUIREMENTS

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.

30.2.2 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.

30.3 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 smoothened 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.

30.4 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.

31.0 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.

32.0 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 Engineerin 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.

33.0 AVAILABILITY OF SHUTDOWN.

Installation & Commissioning of distribution sub-station / 11 KV Line may require Shut-Down (to be arranged by the Owner) in the proposed route . 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: STANDARD TECHNICAL SPECIFICATIONS:

A. EARTHING AND EARTHING G.I PIPE (40mm Dia):

1.0 SCOPE

GI earthing pipe should be made of 40 mm diameter ISI marked C- 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 C).

2.0 MANUFACTURE

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 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 TESTS 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 flattered 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 plate 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 grm/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

i. The medium class of tubes shall be distinguished by Blue colour bands which shall be applied before the tubes leaves the manufacturers' works.

ii. 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) On 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.

B. HEAT SHRINKABLE TYPE END TERMINATIONS FOR XLPE CABLES:

(I) Heat Shrinkable Type End Terminations For 11 KV Grade XLPE Cables

1.0 SCOPE:

This section covers the standard technical requirements of design, manufacturing, testing at works, and transportation to site, insurance, storage, erection and commissioning of heat shrinkable type terminations suitable for 11 KV 3-core XLPE insulated, screened, armored, with aluminum conductor cables suitable for earthed system and conforming to IS:7098 (Part-II)-1985 with latest amendment or the equivalent International Standards.

2.0 STANDARD:

The performance as well as type test requirements of all type of kits referred under scope shall conform to stipulations of IS:13573/1992 or the equivalent International Standards with latest amendments. All the electrical & physical parameters of terminations should also conform to the corresponding parameters of XLPE cables referred under 'SCOPE' of this specification, as per IS: 7098 (Part-II)-1985 (with latest amendments, if any) or equivalent international standards

3.0 CLIMATIC CONDITIONS:

Maximum ambient temperature in open air(°C)	: 50
b. Maximum ambient temperature in shade (°C)	: 45
c. Minimum temperature in shade(°C)	: 3
d. Relative humidity (%)	: 10 to 100
e. Maximum annual rainfall (mm)	: 1450
f. Maximum wind pressure (Kg/ Sqmtr.)	: 150
g. Maximum altitude above mean sea level (Mtrs)	: 1000
h. Isoceraunic level (days/year)	: 50
i. Seismic level (Horizontal acceleration)	: 0.3 g.
j. General nature of climate	Moderately hot and humid tropical climate, conducive to rust and fungus growth.

4.0 REQUIREMENT:

The heat shrinkable / push on type terminations offered shall be of proven design and make, which have already been extensively used and fully type tested.

5.0 GENERAL REQUIREMENT:

The purpose of this specification is to specify the performance requirements of termination kits for the use on 50 c/s 3 phase system with earthed neutral for working voltage of 11 kV up to 33kV. Earthing arrangement shall be as per relevant standard and details of earthing arrangement offered shall be submitted along with the inspection offer. The material to be used should be inert and capable of resisting degradation during the service of cable system. The kit shall be provided with protection against rodents and termite attack.

5.1 Heat Shrinkable Type (Terminations) :

The term heat shrinkable refers to extruded or moulded polymeric materials which are cross-linked to develop elastic memory and supplied in expanded or otherwise deformed size / shape, subsequently heated in an un-constrained state to a temperature above the shrink temperature resulting in the material recovering or shrinking to its original shape.

5.1.1 Since the sealant or adhesives (to be used for environment sealing) between the heat shrinkable materials and XLPE cables shall be exposed to high electrical stresses, they must be track resistant.

5.1.2 The heat shrinkable polymer materials being used for external leakage insulation between the high voltage of conductors and grounds should be weather resistant.

5.1.3 All cuts/nicks inadvertently occurred to XLPE insulation must be rendered discharge free by using suitable discharge suppression compound.

5.1.4 The heat shrinkable tubing may be either extruded or moulded type.

5.1.5 Higher thickness of heat shrinkable sleeves shall be preferable to counter erosion due to pollution.

5.2 Other Requirements:

5.2.1 Proper stress control, stress grading and non-tracking arrangement in the terminations shall be offered by means of proven methods, details of which shall be elaborated in the bid. Detailed sectional view of assemblies shall be submitted along with the bid.

5.2.2 The kits offered shall provide the total environment sealing, the details of which shall be offered along with the bid.

5.2.3 Provision for effective screening over each core be made and contractors shall categorically conform this aspect in their bid.

5.2.4 The material and components not specifically stated in the specification, but which are essential for satisfactory operation of the equipments shall be included without any extra cost.

5.2.5 The terminations shall be of good tracking resistant properties and fully reliable earthing system to maintain continuous contact with screening / armouring as the case may be.

5.2.6 The armour earthing arrangement shall form part of the termination.

5.2.7 Terminations shall have provision for shield connections and earthing.

5.2.8 The kits shall be suitable for storage without deterioration at a temperature up to 50oC for more than 5 years.

5.2.9 The fault level (as well as duration) withstand capability of terminations should be strictly matching with these parameters of cables for which the kits are intended to be used.

5.2.10 The words 'TSECL' along with trade name of manufacturer, month/year of manufacturer, size etc. shall be embossed/engraved or suitably marked with indelible ink/paint for the purpose of identification.

5.2.11 Suitable creepage extension/rain protection sheds for outdoor termination shall be provided.

5.2.12 The adequate provisions for eliminating the chances of entrapment of air at the steps formed by semicon screen shall be made.

5.2.13 The gripping tubing (termination boot) for the cable where trifurcation takes place, shall also be part of kit and covered under scope of supply of this specification.

5.2.14 Name of sub-supplier for the raw material and standard according to which their raw material are tested, must be furnished along with the bid.

5.2.15 Detailed kit contents, whether manufactured by the contractor or bought from outside (with name of sub Contractor) for each component must be indicated in the bid.

5.2.16 The terminations shall be supplied in kit forms. All insulating and sealing materials, consumable items, conductor fittings, earthing arrangements and lugs etc. shall be included in the individual kit.

5.2.17 An instruction manual in English indicating the complete method/procedure to be adopted for installation of kits, preferably with more and more diagrams/pictorial presentation shall be

supplied with each kit. Various items/ quantity thereof against each kit must be indicated in the instruction manual.

6.0 GUARANTEED TECHNICAL PARTICULARS:

The terminations shall have same electrical and thermal characteristics as those of cables with which these are intended to be used. The bidders must furnish the guaranteed technical particulars for each type/size of kit.

7. DRAWINGS: Complete detailed dimensional drawings showing all details of kit contents/bill of material for each size type.

8.0 TESTS :-

8.1 **Type tests:** The termination kits offered shall be fully type tested as per the standards certified by an accredited laboratory

8.2 **Acceptance Tests:**

Initially the following tests shall constitute as acceptance tests :-

i) Dimensional checking as per approved drawings.

ii) Volume resistivity test for various components.

iii) AC High voltage test after installation of terminations (as per IS : 13573/1992 or VDE-0278) on appropriate cable.

iv) Dielectric strength of major components.

v) D.C. High voltage test.

vi) Tracking resistance.

vii) Ultimate elongation.

The scope to include more type tests as acceptance tests shall be decided after processing the offers of various contractors/after knowing the details of testing facilities for type tests available with various bids

8.3 ROUTINE TESTS :-The following tests shall constitute routine test :

i) Dielectric strength.

ii) Density.

iii) Heat shock.

iv)Shrinkage ratio.

The contractor must specify the details of routine tests (being conducted at their works) along with the standard applicable, in their offer. The routine test certificates shall be furnished along with the inspection call for each offered lot.

9.0 INSPECTION:

Inspection shall be guided as per **Clause No. 27.0 , Section -III**

10.0 PACKING AND TRANSPORT: The supplier shall be responsible for suitable packing of all the kits of material and marking on the consignment, so as to avoid any damage during transport and storage and to ensure correct dispatch to the destination.

C. 11KV(E) XLPE HT POWER CABLE:

1.0 SCOPE:

This Section of the Specification covers design, manufacturing, testing, packing, supply & delivery, transportation at site, insurance and laying of 3Core, 11 kV, XLPE, FRLS, Dry gas cured insulated power cable for effectively earthed primary distribution system.

2.0 STANDARDS:

2.1 Unless otherwise specified, the cable shall conform in all respect to IS: 7098 (Part-II)-1985 with latest amendment thereof.

3.0 CLIMATIC CONDITIONS:

Moderately hot and humid tropical climate, conducive to rust and fungus growth.

4.0 PRINCIPAL PARAMETERS:

4.1 11 KV (E) Grade XLPE, 3-Core, power cable shall be of high conductivity, stranded compacted, H.D. aluminum circular shaped conductor with XLPE (cross linked Poly Ethylene) Dry/Gas cured insulation provided with shielding of extruded semi-conducting materials over conductor and XLPE insulation. Each insulated core shall have copper tape screen, laid together and provided with common covering of PVC Inner Sheath (Extruded). Overall galvanized steel strip armour and PVC outer sheath shall be provided. The specification for manufacture of cable shall be conforming to IS: 7098 (Part-II) 1985 (latest edition) for 11KV (E), 3-phase, 50 Hz. Earthed systems. Word "**FRLS" shall also be embossed on it at** every **5 (Five) meter** distance.

FRLS properties – All cable shall be Flame Retardant, Low Smoke (FRLS) type. Outer sheath shall have the following properties -

Oxygen Index – Min 29 (As per ASTMD 2863)

Acid Gas Generation	Max 20% (as per IEC 7541)
Smoke Density Rating	60% (as per ASTMD 2843)
Flammability Test –	As per Swedish chimney test F3 (as per SEN 4241475)
	As per IEC 332 Part-3 (Category-B)

Minimum bending radius shall be 15 D

Repaired cables shall not be acceptable

4.2 Outer sheath shall be designed to afford high degree of mechanical protection and shall also be heat, oil, chemical and weather resistant, Common acid, alkalis and sealing solution shall not have adverse effect on material of PVC sheath.

4.3 Cable shall be suitable for laying in covered trenches and / or buried under-ground in outdoor.

4.4 Cable Parameters :

(i) Voltage grade (Uo / U) kV : 6.35 / 11

(ii) Cores (Nos) : 3

(iii) Nominal system voltage kV : 11

(iv) Highest system voltage kV : 12

(v) System frequency Hz : 50

(vi) Variation in frequency % : ± 3

(vii) (a) Maximum allowable temp. of conductor during continuous normal operation at rated full load current. ºC : 90

(b) Maximum allowable temp. under short circuit condition ºC :250

(viii) 1.2/50 microsecond lightning impulse withstand voltage wave value. kVp : 75

(ix) 5 Min, Power frequency withstand voltage kV rms : 17

(x) System earthling : Effectively earthed.

5.0 GENERAL TECHNICAL REQUIREMENTS:

5.1 **Conductor:** The cable conductor shall be made from high conductivity stranded High Density aluminum to form compacted circular shaped conductor having resistance within limits specified in IS: 8130/1984 and any latest amendment to it.

5.2 **Conductor shield:** The conductor having semi-conducting screen shall ensure perfectly smooth profile & avoid concentration of stress. The conductor screen shall be extruded in the same operation as the insulation. The semi-conducting polymer shall be cross linked.

5.3 **Insulation:** The XLPE insulation shall be suitable for 11 kV system voltage and should be manufactured with Dry / Gas curing process. The bidder shall submit the description of dry / gas curing process, with the clear inclusion of equipments / parameters involved. The manufacturing process shall ensure that the insulation shall be free of voids. The insulation shall withstand mechanical and thermal stress under steady state and transient operating conditions. The extrusion method should give very smooth interface between semi-conducting screen and insulation. The insulation of the cable shall be of high standard quality generally conforming to IS: 7098 (Part – II) – 1985 and any latest amendment to it.

5.4 **Insulation shield:** Non-metallic semi-conducting shield shall be provided over the insulation to confine electrical field to the insulation. The insulation shield shall be extruded in the same operation as the conductor shield and the insulation by suitable extrusion process. The XLPE insulation shield shall be of tended type. The copper metallic overlapped tape shield shall be provided.

5.5 **Filler and Inner-Sheath:** The sheath shall be suitable to withstand the site conditions and the desired temperature. It shall be of adequate thickness, consistent quality and free from all defects. The PVC sheath shall be extruded. The material of fillers and inner-sheath shall be compatible with the temperature ratings of the cable and shall have no deterious effect on any other component of the cable. Central PVC filler shall also, be provided with other peripheral PVC fillers to have proper circular section.

5.6 **Armour:** Armouring of galvanized steel strip shall be provided. The dimensions of steel strips shall be as per latest edition of IS: 3975 – 1979.

5.7 **Outer-Sheath:** Extruded type ST-2 PVC outer-sheath, conforming to IS: 5831- (1984) (latest edition) over armouring with suitable additives (to prevent attack by redents & termites), shall be provided.

5.8 Construction:

5.8.1 The cable shall have suitable PVC fillers laid up with insulation cores to have subsequently circular cross-section before the inner sheath is applied. The fillers shall be suitable for operating temperature of the cable.

5.8.2 All materials used in manufacturing of cable shall be new, unused and of finest quality. All materials should comply with the requirements / tests as per applicable IS / IEC specification, Indian Electricity Rules and any other statutory provision of rules & regulations.

5.8.3 The PVC material used in the manufacture of cable shall be of reputed manufacturer. No recycling of PVC is permitted. The Owner reserves the right to ask for documentary evidence of the purchase of various materials, (to be used for the manufacture of cable) as per checking of quality control.

5.9 Current Ratings:

5.9.1 The value of Normal current carrying capacities of the various sizes of the cables are given below:

Sl. No	**Size of 3 Core Cable (Sq.mm)**	**Current Carrying Capacity in Amp**		
		In Ground	In Duct	In Air
1	50	130	115	150
2	**70**	**160**	**140**	**190**
3	95	190	165	230
4	120	220	190	260
5	150	245	210	295
6	185	275	240	335
7	240	315	275	395
8	300	355	310	450

5.9.2 Short circuit ratings of various sizes of 3 core cable calculated for duration of 1(one) second are given below:

Sl. No	Size of 3 Core Cable (Sq.mm)	Conductor short circuit rating in kA (rms)
1	50	4.70

2	**70**	**6.58**
3	95	8.93
4	120	11.28
5	150	14.10
6	185	17.39
7	240	22.56
8	300	28.20

5.9.3 The current rating shall be based on maximum permissible temperature of 90 degree C for XLPE insulation with ambient site condition specified for continuous operation at the rated current.

5.10 Operation :

5.10.1 Cable shall be suitable for operation under frequency variation of +3% and voltage variation of +10% to -15% and combined frequency - voltage variation of 10% (absolute sum).

5.10.2 Cable shall be suitable for laying in duct or buried underground.

5.10.3 Cable shall have heat & moisture resistance properties. These shall be of type & design with proven record on distribution network service.

5.10.4 Length: The cable shall be supplied in standard drum length of 500 mtrs. 5% tolerance

for all the sizes of cable except for 3 C x 240 mm² and 3 C x 300 mm² size cable. The drum length for 3 C x 240 mm² and 3C x 300 mm² cable shall be 250 mtrs. Over all tolerance in total quantity of ordered cables shall be + 2%.

5.10.5 Identification Mark :

(i) The cable drum shall be printed with information as per cl. 21; 2 of IS and ISI Certification mark. Bidder shall submit xerox copy of valid ISI Licenses with technical bid.

(ii) For identification of cores, colored strip of Red, Yellow and Blue colors shall be used for identification of phases.

Following details of identification shall be embossed at intervals of length of one meter of cable outer sheath.

(iii) (a) Name of manufacturer (b) year of manufacture (c) voltage grade (d) Name of Owner "TSECL".

6.0 TESTS:

6.1(A) Type Tests:

All the cable sizes i.e. items offered should have been fully type tested as per the relevant standards at any Govt. recognized Laboratory. The bidder shall furnish three sets of type test reports along with the offer. The Type test reports shall not be older than FIVE years and shall be valid upto the expiry of validity of offer.

For any change in design/type, already type tested and the design / type offered against this specification, the Owner reserves the right to demand reputation of type tests without any extra cost.

The Owner also reserves the right to have tests carried out at his own cost by an independent agency, whenever there is a dispute regarding the quality of supply.

6.1(B) The following type test reports shall be furnished with the offer:

(a) Tests on conductor :

(i) Tensile test:

(ii) Resistance test:

(b) Tests for armouring strips / wires. :

(c) Tests for thickness of insulation and sheath. :

(d) Physical tests for insulation. :

(i) Tensile strength and elongation at break:

(ii) Ageing in air oven:

(iii) Hot set:

(iv) Shrinkage test:

(v) Water absorption:

(e) Physical tests on outer seath :

(i) Tensile strength and elongation at break:

(ii) Ageing in air oven:

(iii) Shrinkage test:

(iv) Hot deformation:

(v) Bleeding and blooming test:

(f) Partial discharge test:

(g) Bending test:

(h) Dielectric power factor test:

i) as a function of voltage:

ii) as a function of temperature:

(i) Insulation resistance test (volume resistivity):

(j) Heating cycle test:

(k) Impulse withstand test:

(l) High voltage test:

(m) Flammability test:

6.2 Acceptance Test:

6.2.1 The selection of sample pieces for acceptance test shall be from 10% drums of each lot offered for inspection or part thereof. The minimum shall be one drum.

6.2.2 The following acceptance tests shall be carried cut on the selected samples as per IS: 7098 (Part-II) – 1985.

(a) Annealing test (for copper)

(b) Tensile test (for aluminum)

(c) Wrapping test (for aluminum)

(d) Conductor resistance test.

(e) Test for thickness of insulation and sheath

(f) Hot set test for insulation

(g) Tensile strength and elongation at break test for insulation and sheath.

(h) Partial discharge test (for screened cables only)

(i) High voltage test for 4 hours (as per cl. No. 19.7.1)

(j) Insulation resistance (volume resistivity) test.

6.2.3 All the acceptance tests shall be carried out by the contractor, in the presence of Owner's representative at their works. The contractor shall give atleast 15 days' advance notice to the Owner to enable him to depute the engineer for witnessing the tests. The test certificates for acceptance tests witnessed by inspecting officer/ engineer shall be submitted for approval before dispatch of material.

6.3 Tests:

6.3.1 The bidder shall have to submit, well in advance, the test certificates for the following routine test for approval prior to inspection of the materials for the complete lot offered for inspection at a time.

(a) Conductor resistance test

(b) Partial discharge test

(c) High-voltage test for 5 minutes [as per Clause 19.7.2 of IS: 7098 (Part-II) –1985].

7.0 INSPECTION:

Inspection shall be guided as per **Clause No. 27.0 , Section -III**

8.0 DOCUMENTATION:

8.1 The bidder shall furnish following documents along with his offer.

8.1.1 Sectional view, showing the General constructional feature with conductor / conductor screen / insulation / armouring / inner and outer sheath etc.

8.1.2 Drawing of cable drums with details of material dimension and paint etc shall be submitted.

8.1.3 All the required type test reports for offered items tested at any Government recognized Laboratory.

8.1.4 Literature, pamphlets for the record items.

9.0 PACKING AND FORWARDING:

9.1 The cable shall be wound on wooden drums as per IS: 10418 – 1972 and packed in drums suitable for vertical / horizontal transport, as the case may be and shall be suitable to withstand rough handling during transport and outer storage. The outer surface of the drum shall be painted with white aluminum pint. Similarly, the inside surface of drum shall have the protective layer of varnish / paint to protect it from white ants.

9.2 The wooden drums shall be reinforced with steel bends and strips for better protection.

9.3 The ends of the cable shall be sealed by means of non-hygroscopic sealing materials.

9.4 The following information may be stenciled on the drum with either water proof ink or oil paint:

i. Reference of IS / IEC standard.

ii. Manufacturer's name or trademark.

iii. Type of cable and voltage grade.

iv. No. of cores.

v. Nominal cross-sectional area of conductor.

vi. Cable code.

vii. Length of cable on the drum

viii. No. of lengths on the drum (if more than one)

ix. Direction of rotation of drum (by means of an arrow)

x. Position of outer end of cable

xi. Gross weight

xii. Country of manufacture

xiii. Year of manufacture

xiv. Reference of A/T No. & date

xv. Property of TSECL

xvi. Name of consignee and the destination.

The drum may also be marked with ISI Certification Mark. Over and above, name plate of aluminum of suitable size and thickness, containing all the above information, shall be fixed on the drum in addition to the painting.

9.5 The contractor shall be responsible for any damage to the cables during transit due to improper and inadequate packing. Wherever necessary, proper arrangement for lifting, such as lifting hooks, shall be provided. Any cable found short inside the packing cases shall be supplied by the contractor, without any extra cost.

9.6 Each consignment shall be accompanied by a detailed packing list, containing the following information:

(a) Name of consignee

(b) Details of consignment

(c) Destination

(d) Total weight of consignment

(e) Handling and unpacking instruction

(f) Bill of materials, indicating contents of each package.

D. HDPE PIPE:

STANDARD: -

A. TYPE

(i)The HDPE pipe shall be of PE-100 Grade, PN-8(SDR17) of standard make suitable for laying 3-core, XLPE insulated power cable.

(ii)The HDPE pipe shall be ISI marked and complying to technical requirement of IS 4984 / IS 14333.

(a). Size: -

The HDPE pipe shall be of following size:

Sl. No.	Outer diameter	Wall thickness	Standard length
1	63 mm	minimum- **3.7 mm** and maximum- **4.2 mm**	6 m
2	110 mm	minimum- **6.5 mm** and maximum- **7.3 mm**	6 m

(b.) Non-flame propagating properties.

The HDPE pipe shall be of non-flame propagating type

E. MILD STEEL STRUCTURE:

1.0 SCOPE

The materials shall conform, in all respect, to the high standard of design and workmanship and shall be capable of performing duties specified herein. Materials offered shall be complete in all respect. The size of the channel and flat normally used for Distribution transformers structures & 11 KV line structures are as follows;

i) Channel:100x50x50x6 mm, 75x40x40x6 mm and Angle: 65x65x6 mm,50x50x6 mm

ii) Flat a) 50x6 mm

b) 50x8 mm

The above list is merely indicative and not comprehensive.

2.0 STANDARDS

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

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

Name of Item	**Type to be used as per IS**
For channel 100x50 mm &75x40 mm	ISMC 100 Grade A and ISMC 75 Grade A
For Angle 65x65x6 mm & 50x50x6 mm	ISA 6565 Grade A and ISA 5050 Grade A

3.0 ACCEPTANCE OF OTHER AUTHORITATIVE STANDARDS

All relevant Indian standards specifications have been mentioned. However, the material meeting any other authoritative international standards, which ensures equal or better quality than the standards, mentioned shall also be acceptable. Material for which Indian Standards are not available, the relevant British standards and IEC recommendations will be applicable. The bidder is required to attach photocopy of all such standards according to which the materials have been offered.

4.0 RAW MATERIAL

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

5.0 TEST

Steel Sections shall be tested in IS approved Laboratory or standard Laboratory of the Bidder country having all facilities available for conducting all the tests as prescribed in relevant IS or IEC or to any equivalent International Standard or from any recognized and reputable International laboratory or Institutions.

The Bidders are required to specifically indicate that;

(i) They hold valid IS (or equivalent IEC) License.

(ii) Steel Sections offered are bearing requisite IS certification or equivalent IEC marks. The Bidders are required to submit a copy of the valid IS (or equivalent IEC) License clearly indicating size and range of product against respective ISS or any equivalent International Standards along with their offer.

6.0 CHEMICAL COMPOSITION AND PHYSICAL PROPERTIES OF M.S. ANGLES, M.S. CHANNELS AND M.S. FLAT CONFORMING TO IS: 2062/84

A. Chemical composition:

Sl No	CHEMICAL COMPOSITION	FOR Fe 410 WA GRADE	
1	**C**	**0.23%**	**Max.**
2	**Mn**	**1.5%**	**Max.**
3	**S**	**0.050%**	**Max.**
4	**P**	**0.050%**	**Max.**
5	**SI**	**0.40%**	**Max.**
6	**CE(Carbon Equivalent)**	**0.42%**	**Max.**

B. Mechanical properties:

(i) Tensile strength Kfg/mm² – 42, N/Min, : 410

(ii) Yield stress Min. for thickness/diameter

< 20 mm	26 kgf/m2 OR 250 N/mm2
20 – 40 mm	24 Kgf/mm2 OR 240 N/mm2
> 40 mm	23 kgf/mm2 OR 230 N/mm2

(iii) Elongation % : 23%

(iv) Bend Test (Internal Dia) : Min-3t

(t – is the thickness of the material)

7.0 TOLERANCE

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

8.0 MARKING

It is desirable that the Bidder should put his identification marks on the finished materials. The mark shall be in "legible English letters" given with marking dies of minimum 18 mm size.

9.0 INSPECTION

Inspection shall be guided as per **Clause No. 27.0 , Section –III**

F. 11 KV,800 A, 20 KA, Indoor type incoming cum ougoing VCB panel

1. SCOPE

1.1. The section covers the specification of metal clad indoor vacuum type switchgear unit with horizontal draw out circuit breaker as per IS 13118 [1991] / IEC 62271-100/ IEC 62271- 200 or latest amendment thereof. The equipment offered shall be of high quality, sturdy, robust and of good design and workmanship complete in all respects and capable of performing continuous and satisfactory operations in the actual service conditions at site and shall have sufficiently long life in service as per statutory requirements

1.2. All equipment shall be suitable for satisfactory operation in tropical climates and hot and humid atmosphere prevailing in the location where it shall be used against the Contract. The equipment shall be able to withstand a wide range of temperature variations in the required location.

1.3. The equipment offered shall be complete with all parts necessary for their effective and trouble-free operation. Such parts shall be deemed to be within the scope of the supply irrespective of whether they are specifically indicated in the commercial order or not.

1.4. All the plant / apparatus / equipment supplied shall comply in all respect with the requirement of Indian Electricity Act 2003 and Indian Electricity Rule 2003/IS and latest amendment thereof during the execution of contract where-ever applicable.

1.5. The Tenderer/supplier shall bind himself to abide by these considerations to the entire satisfaction of the purchaser and will be required to adjust such details at no extra cost to the purchaser over and above the tendered rates and prices.

2. SYSTEM CONDITIONS

2.1. The switchboard shall be metal enclosed, floor mounting, single front self supporting cubical type suitable for indoor. The switchgear shall be easily extendable in future.

2.2. The switchgear assembly shall be designed for the power system having the following parameters.

a) Nominal system voltage: 11KV

b) Highest system voltage: 12KV

c) Number of phases: 3

d) Frequency: 50 Hz + 3%.

e) System earthing : Solidly earthed neutral

f) Short Current Rating: 20 KA

4. STANDARDS:

The circuit Breaker shall confirm to the latest revision with amendment available ofrelevant standards, rules, and code. Some of which are listed herein for ready reference.

Sl. No.	Standard	Item
1	IEC- 62271-100/200 / IS-13118(1991)	High Voltage Alternative current circuit breaker.
2	IS-2705 (1992)	Current Transformer
3	IS-3156 (1992)	Voltage Transformer
4	IS-3231 (1987)/IEC 60255 (All parts) IEC 61850 Ed-II	Numerical Relays
5	IS-1248	Ammeter & Voltmeter
6	IS-375	Arrangement of Breakers Bus Bars main connection and auxiliary wiring.
7	IEC-60687/CBIP REPORT NO-88(JULY) 1996)	Tri vector meter

5. GENERAL TECHNICAL/CONSTRUCTIONAL REQUIREMENTS

General Requirements

The switchgear shall be of CRCA steel / corrosion proof aluminium-zinc construction with sheet not less than 3 mm thickness for load bearing section and not less than 2 mm thickness for non-

load bearing and shall totally dust and vermin proof. However, if vendor has standardized the thickness of enclosure other than above mentioned and it meets the performance requirements and the design has been established through type test, the same shall be accepted. The panels shall be rigid without using any external bracings. The switchboard panels should comply with relevant IS / IEC and revision thereof and shall be designed for easy operation maintenance and further extension. Each circuit shall have a separate vertical panel with distinct compartments. Bus bar, metering, circuit breaker chamber, cables and cable box chamber should have proper access for maintenance and proper interlocks should be provided. All instruments shall be safe guard in every respect from damages and provided with mechanical indicator of connection and disconnection position. The switchgear shall be completed with all necessary wiring, fuses, auxiliary contacts, terminal boards etc.

a) The switchgear boards shall have a single front, single tier, fully compartmentalized, metal enclosed construction, comprising of row of freestanding floor mounted panels. The adjacent panels shall be completely separated by steel sheets except in busbar compartments where insulated barriers shall be provided to segregate adjacent panels. The switchgear assembly shall be dust, moisture, rodent and vermin proof, with the truck in any position SERVICE, ISOLATED, TEST or removed, and all doors and covers closed. All doors, removable covers and glass windows shall be gasketted all round with synthetic rubber or neoprene gaskets.

a) The arcing contacts and bus bar should be rated for **20 KA** faults for 3 seconds for 11kV system. Bus bars shall be capable of connecting one switchgear panel to other through proper insulated arrangement. The panels shall be modular in design.

b) The switchgear will be installed in a separate switchgear room, but the controls under normal conditions will be from the 11 kV remote supervisory control desk installed in the main control room.

a) The breakers should be able to be drawn out in horizontal position at ground level [with vertical/horizontal isolation. When breaker is drawn out in horizontal position none of the live components inside the 11KV switchgear panel should be accessible. The safety shutters shall be robust and shall automatically cover the live components when the breaker is drawn out. The switchgear shall have complete interlocking arrangements at the fully inserted and fully drawn out and test positions. Withdrawal of the breaker should not be possible in ON position, it should not be possible to close the circuit breaker in service unless the entire auxiliary and control circuit are connected.

b) Circuit breaker shall be vacuum draw out type housed in a separate cubicle of the switchboard and shall be enclosed from all sides. A sheet steel hinged lockable door shall be at the front. It shall be possible to withdraw the circuit breaker to 'Test' and "Isolated' position with the door closed. Door interlock shall be provided such that the door can only be opened after withdrawing the breaker to 'Isolated' position and the breaker cannot be racked into the 'Service' position unless the door is closed. A visual indication as to show when the breaker is in 'Service', 'Test' or 'Isolated' position shall be provided in front of the door.

c) Switchgear construction shall have a bushing or other sealing arrangement between the circuit breaker compartment and the busbar / cable compartments, so that there is no air communication around the isolating contacts in the shutter area with the truck in service position.

d) The breaker and the auxiliary compartments provided on the front side shall have strong hinged doors, busbar and cabling compartments provided on the rear side have bolted compartment covers with self retaining bolts. Breaker compartment doors shall have locking facility.

e) Built-in / separate trolley mounted earth switches for incomer (busbar earth) and outgoing (feeder cable earth) shall be provided.

f) All the high voltage compartments must have pressure discharge flap for the exit of gas due to internal arc to insure operator safety. All the HV compartment design shall ensure conformity to IEC-60298 and must be type tested at 26.3 kA for 1 second for IAC classification and duration as per IEC As per IEC 62271-200 clause A. 4.5 (AFLR).

g) Two separate earthing terminals shall be provided in each panel and shall be connected to the earth bus within the panel. The earth bus shall be of copper and shall have adequate cross sectional area.

h) The bus PT/relay compartments shall have degree of protection not less than IP:52 in accordance with IS:2147. However, remaining compartments can have a degree of protection of IP:42. All louvers if provided shall have very fine brass or GI mesh screen, IPH-2 degree of protection as per IS: 3427 to all live parts shall (whether isolated or removed from panel) even when the breaker compartment door is open. Tight fitting garments / gaskets are to be provided at all openings in relay compartment.

i) Total height of the switchgear panels shall not exceed **2500** mm. The height of switches, pushbuttons and other hand-operated devices shall not exceed **1800 mm** and shall not be less than **700mm**.

j) Suitable base frames made out of steel channels shall be supplied along with necessary anchor bolts and other hardware, for mounting of the switchgear panels. These shall be dispatched in advance so that they may be installed and levelled when the flooring is being done, welding of base frame to the insert plates shall be as per approvedinstallation drawings.

k) The switchboard shall have the facility of extension on the both sides of Adapter panels and dummy panels required to meet the Busbar.

BUS BARS AND CONNECTORS

a) Bus bars and all other electrical connection between various components shall be made of electrolytic copper of rectangular / tubular cross sections, as per the type tested and ratified design. The bus bars section should have ample capacity to carrythe rated current of minimum 800 Amps in panel current rating at an ambient temperature of 40 deg C, continuously without excessive heating and for adequately meeting

the thermal and dynamic stresses in the case of short circuit in the system upto full STC rating of 20 kA for 3 sec. The Current density of 1.6Amps / sq. mm shall be considered for the bus bars.

b) All bus bars connections shall be firmly and rigidly mounted / supported on non hygroscopic, non carbonizing, corrosion resistant , epoxy resin cast insulators to withstand short circuit stresses and vibrations..

c) All fasteners (Nuts Bolts) used for bus bar connections shall be of non-magnetic stainless steel. Only belleville type washers shall be provided for each nut bolt. If the fasteners used are not of stainless steel the bidder shall state in their offer the material used and confirm that the same is non-magnetic and is superior to stainless steel.

d) Adequate clearance between 11 kV point and earth and between phase shall be provided to ensure safety as per provision in Indian Electricity Rule 2003 and its amendment thereof and also in accordance with the relevant Indian standard specification and the same shall be capable of withstanding the specified high voltage tests as per IEC 62271-200 / IS 13118 and amendment thereof.

e) Sharp edges and bends either in the bus bars or bus bar connections shall be avoided as far as possible. Wherever such bends or edges are un-avoidable, suitable compound or any other insulation shall be supplied to prevent local ionization and consequent flashover.

f) The bus bars alongwith their supporting insulators etc. shall have a short time current rating of 25 KA for 3 sec. Test certificate of bus bar for rated STC rating shall be submitted, alongwith the bid. This shall be confirmed by the tenderers in their technical offer. These insulators shall be of solid core porcelain or epoxy resin cast, with suitable petticoat design. Insulators shall have a cantilever strength of not less than 1200 KgF.

g) The Bus Bar should be isulated with heat shrinkable HT sleeves.

CIRCUIT BREAKER :

a) The vacuum circuit breaker shall be draw out type suitable for installation in the switchgear cubicles (indoor). The breaker shall comply with IEC 62271-100 / IS- 13118 (1991) for circuit breaker and IEC 62271-200 for the switch gear and latest amendment thereof. Construction of breaker shall be such that the points, which require frequent maintenance, shall be easily accessible.

b) The circuit breakers shall be spring operated, motor/manually charging of the spring feature, manually released. VCB shall have spring closing mechanism for 3 pole simultaneous operation. The speed of closing operation shall be independent of the speed of hand operating level. The indication device shall show the OPEN and CLOSE position of breaker visible from the front of cubical.

c) The circuit breakers shall be **type tested as per IEC 62271 for compliance with the following requirements :**

i) E2 class: The circuit breakers shall not require maintenance of the interruptingpart of the main circuit during its expected operating life;

ii) C2 class: The circuit breakers shall have very low probability of restrike during capacitive current breaking.

ii) M2 class: The circuit breaker should require very limited maintenance and should be tested for endurance for 10,000 close – open operations.

d) The breakers shall be capable of making and breaking the short time current in accordance with the requirement of IEC 62271-100 / IS 13118 (1991) and latest amendment thereof and shall have three phase rupturing capacity of 20 KA for 3 second at 11 KV. The continuous current rating of all current carrying parts of breaker shall be 800 Amps for all items. The total break / make time shall be not more than 4 cycles for break and 6 cycles for make time for all breakers.

e) Circuit breaker shall be suitable for rapid reclosing cycle i.e. **O-0.3 sec.-CO-30 sec.-CO.**

f) The spring release coil for VCB close and VCB trip coil shall both be rated for continuous energization at the rated close / trip voltage. Trip and close coil shall be suitable for 110 V DC.

g) The vacuum circuit breakers shall ensure high speed extinction and adequate control of pressure during breaking of current and also designed to limit excessive over voltages.

h) Comprehensive interlocking system to prevent any dangerous or inadvertent operation shall be provided. Isolation of circuit breaker from bus bar or insertion into bus bar shall only be possible when the breaker is in the open position.

i) Vacuum Circuit Breaker shall have completely sealed interrupting units for interruption of arc inside the vacuum. The vacuum interrupter sealed for life.

j) Vacuum interrupter should have an expected life of 30000 operations at rated current and should be capable for operating at least 100 times at rated short circuit current.

k) Vacuum interrupter technical data sheets & outline drawing particularly provided by the manufacturer should also be provided with Bid.

l) The circuit breaker shall be provided with motor for spring charging operation. Spring charging motor shall be suitable for 240V, 50 Hz, single phase AC and 110 V DC Supply. Suitable rating starter/fuse shall be provided for Motor protection. Provision shall be available for charging the springs manually as well, and to close CB mechanically.

m) All circuit breakers shall have mechanical ON/OFF indicator and spring charge indicator. These shall be visible from the front without opening the panel door. Also there shall be provision for mechanical (manual) tripping and also for manual charging of the springs.

CURRENT TRANSFORMERS :

a) The requirement of ratio, VA capacity, class or accuracy, limit factor etc. for resin cast CTs installed in different type of units are tabulated below :

Item	Core / CT	Ratio	VA Burden	Knee point Voltage	ALF / ISF	Class of accuracy
CT	Metering	200-100/5A	15	--------	ISF < 2.5	1.0
	Protection	200-100 /5A	15	--------	ALF = 10	5P

a) Primaries shall be wound or bar or window type, rigid, high conductivity grade copper conductor. Unavoidable joints on the primary conductor shall be welded type, preferably lap type. The current density at any point shall not exceed 1.6 A/sq. mm.

b) The Insulation level of all the CTs shall be : 12/28/75 kV and the Class of Insulation shall be "E".

c) Short time current rating of CTs shall correspond to 20 KA faults for 3 seconds of 11kv system. CTs shall be triple / double core and dual ratio. Instrument safety factor for metering core shall not exceed 2.5.

d) The designed accuracy should be available even at the lowest ratios.

e) The secondary terminal of the current transformers shall be such that effective and firm wire terminations are possible. Shorting links of adequate capacity shall be provided at the terminal blocks for sorting of the leads from secondary terminals of current transformers. The secondary terminal of the CTs shall be earthed at one point.

f) CTs shall confirm to IS 2705 with latest amendment and relevant IEC standard, if any in all respect and will be subjected to all routine and type test specified in the IS/IEC.

g) The CTs shall be resin/epoxy cast. Contact tips on primary terminals shall be silver plated. Correct polarity shall be invariably marked on each primary and secondary terminals.

h) Secondary terminal studs shall be provided with at least three nuts, two plain and two spring washers for fixing leads. The stud, nut and washer shall be of brass, duly nickel plated. The minimum outside diameter of the studs shall be 6 mm. The length of at least 15 mm shall be available on the studs for inserting the leads. The space clearance between nuts on adjacent studs when fitted shall be atleast 10 mm.

POTENTIAL TRANSFORMERS

a) 3 Nos. 1 phase resin cast, draw out type, **bus bar connected**, potential transformer **of 3-limb construction**, ratio 11000/110 volts, class 1.0 accuracy at 100 VA per phase, with

Sign. of Bidder DGM, ED-I, Banamalipur

monitoring contacts on PT LV circuit. **Primary and secondary neutrals of the PT must be brought out and earthed. If required, the busbar connected P.T. may be housed in a separate cubicle.** PT mounted on top of the panel will not be acceptable

b) H.V side shall be connected in star formation and L.V. side in star/open delta formation.

c) PT may be provided in a separate compartment. The primary and secondary contacts (moving & fixed type) shall have firm grip while in service. Service position locking mechanism shall be provided and indicated by bidder in relevant drawing. Rigidity of primary stud point with earth bus in service position shall be confirmed.

d) Contact tips of primary/secondary contacts shall be silver plated. Correct polarity shall be distinctly marked on primary and secondary terminal

e) Secondary terminal studs shall be provided with at least three nuts, two plain and two spring washers for fixing leads. The stud, nut and washer shall be of brass, duly nickel plated. The minimum outside diameter of the studs shall be 6 mm. The length of at least 15 mm shall be available on the studs for inserting the leads. The space clearance between nuts on adjacent studs when fitted shall be at least 10 mm.

f) Details of PTs

i) IS: 3156 and relevant IEC standard.

ii) Ratio : 11KV/√3/110V/√3

iii) No. Of phases: 3 Phases / star - star connected.

iv) Insulation level : 12/28/75 kV

v) Class of Insulation : Class E

vi) Rated voltage factor: 1.2 continuous & 1.5 for 30 Sec.

vii) Rated Burden : 100 VA per phase

viii) Class of accuracy: 1

ix) Purpose : Metering

x) PTs shall be protected by suitable Fuse links

PROTECTION RELAYS :

a) All relays shall conform to the requirements of IS: 3231 / IEC-60255/ IEC 61850. Relays shall be suitable for flush or semi-flush mounting on the front with connections from the rear.. The relays shall be **numerical protective & communicable** type. MiCOM Composite relay

unit having O/C, E/F & directional element etc. shall be preferred. Relays should have USB / ethernet communication port and RS485 / RS232 serial communication port for communication through IEC 61850 Ed II (with high-speed GOOSE communication and certified by KEMA/CPRI certificate level A for IEC 61850 compliance). Licensed version of the relay software should be provided as per user's requirement.

MEASURING INSTRUMENTS

a) All instruments shall be switchboard type, back connected, suitable for flush mounting and shall comply with the requirements of latent issues of relevant Indian Standards. The instrument cases shall be dust proof, water tight, vermin proof and specially constructed to adequately protect the instruments against damage or deterioration due to high ambient temperature and humidity.

b) All instruments shall be access adjustable and calibrated before dispatch and shall have means for calibration check and adjustment at site.

c) All ammeters shall be digital type with direct reading scales. The scale value of ammeters shall be as per the primary current ratings of the associated current transformers. The rated current of ammeter elements shall be 5 Amperes and Accuracy class 1.0 as per IS: 1248.

All voltmeters shall be of digital type with direct reading scales. The maximum scale value of voltmeters shall be 50% in access of the primary voltage of associated PT. The rated voltage of the voltmeters shall be 110 volts A.C. and accuracy class shall be 1.0 as per IS: 1248.

d) Indicating wattmeters shall be of digital type of accuracy class 1.

e) Static digital tri-vector energy meter suitable for 3-phase 4-wire un-balanced load and CT, PT, ratio mentioned above, 1.0 accuracy class with load, survey and TOD/Tariff and MRI facility (with DLMS protocol compliant – CAT A) . The detailed specification of the tri-vector meter shall be as per the latest technical specification for HT Tri- vector meters (Cat A) (Refer standard technical specification uploaded in the official website).

Circuit Breakers Control Switch:

a) Circuit Breakers Control Switches should have finger touch proof terminals. For the convenience of maintenance, screw driver guide should be from top/bottom of the switch and not from the side. Terminal wire should be inserted from the side of the switch terminal.

b) Terminal screws must be captive to avoid misplace during maintenance.

c) Switch shall be with 48 mm x 48 mm escutcheon plate marked with Trip & Close.

d) Circuit Breakers control switch shall be non- discrepancy type

e) Trip-neutral-close, with pistol grip handle must be pushed in to spring return to either trip or close position from Neutral position for safety and not just turn to trip.

f) One contact to close in each position of Trip and Close. Contact not required inNeutral position. Contact rating shall be 12A at 110V DC

CUBICLE

a) The switchgear cubicle (panel) shall be free standing floor mounting indoor type. There shall be sufficient reinforcement to have level surfaces resistance to vibration and rigidity during transportation & installation.

b) Design & construction of the switchgear panel shall be of the highest order. All sheet steel work shall be treated as per the seven (7) tank process before applying primary coating. For the final coat (stowed) epoxy paint color shade of light admiral grey to shade No.697 as per IS:5 shall be used. Alternatively powder coating may also be accepted. The panels after final painting shall present an aesthetically pleasing appearance, free of any dent or uneven surface.

c) Power cable compartment shall be provided at the rear of the switchgear panels and shall be suitable for cable entry from the bottom cable trenches. Rear bottom plates of the cable compartment shall be fitted with removable gland plates of adequate size for fixing the cable glands.

d) Cable compartments for the incoming and outgoing shall be suitable for terminating upto 3x400 sq.mm XLPE cables. Copper terminator strip of suitable size shall be provided for termination of cables and shall have adequate height inside to accommodate the heat shrinkable type indoor cable termination. Cable compartment shall be robust enough & self-supporting. The design shall be such that the weight of the power cable within the compartment shall not cause direct pressure on the C.T. studs. Suitable clamping arrangement shall be provided at the bottom of the cable compartment. Each power cable shall be terminated independently.

CABLE GLANDS AND CLAMPING ARRANGMENT FOR HOLDING SUITABLE CABLE BOXES

a) Two nos., brass, wiping glands for each incomer and one no. Brass wiping gland for incoming cum outgoing panel of adequate dimension for XLPE cable of 3 cores up to 400 sq. mm size shall be supplied along with panels. For bus coupler no cable glands should be provided.

b) Suitable cable boxes as per requirement of cable shall be arranged by the purchaser at his end. The panel shall however provide a flat of size 50X6 mm^2 with suitable clamp made of 50X6 mm^2 flat along with Nuts Bolts and Washers for holding the cable boxes. The flat should be fitted at a suitable height with allotted arrangement for adjustment of height from 300mm to 500mm at site. The clamp and flat shall have suitable stud type arrangement for earthing cable and cable box.

c) All control cable / wire entries shall be by means of suitable cable glands, such glands shall be of brass and tinned.

AUXILIARY/CONTROL WIRING :

a) All the secondary wiring in the panel shall be 1100 volts grade single core, multi- strand flexible tinned copper wires have high quality PVC insulation and the same shall have conductor size of not less than 2.5 mm^2 of copper. Colours of the secondary/auxiliary wiring should confirm to IS 375/1963 and latest amendment thereof if any. All wiring shall be neatly run and group of wiring shall be securely fixed by clips so that wiring can be checked without necessity of removing the clamps. Wiring between fixed and moving portion of the panel shall be run in flexible tubes and the same shall be so mounted to avoid any damage to them due to mechanical movements. Ferrules with number shall be provided on both end of the wiring.

b) All front mounted as well as internally mounted items including MCBs shall be provided with individual identification labels. Labels shall be mounted directly below the respective equipment and shall clearly indicate the equipment designation.

c) Terminal blocks shall be of screw type design made out of non-trackable insulating material of 1100 V grade. All terminals shall have all current carrying and live parts made of tinned plated brass. The washers, nuts, etc. used for terminal connectors shall also be of tinned plated brass.

d) At least 20% spare terminals shall be provided. All terminals shall be provided with ferrules indelibly marked or numbered and identification shall correspond to the designations on the relevant wiring diagrams. The terminals shall be rated for adequate capacity which shall not be less than 10 Amps for control circuit. For power circuit it shall not be less than 15 Amps.

e) All fuses used shall be of HRC type. The fuse base and carrier shall be plug-in type moulded case kitkat of backelite/DMC. All current carrying and live parts shall be of tinned/nickel plated copper. No fuse shall be provided on DC negatives and AC neutrals. Tinned copper links shall, however, be provided on DC negatives and AC neutrals.

f) All MCBs as per IS:8828/2006 (amended upto date) of adequate rating shall be used.

g) Auxiliary supplies available at the various sub-stations are as follows:-

Rating:

i	A. C. Supply	240 volts with ± 10% variation
ii	D.C. Supply	110 V DC with +10% to – 15% variation
iii	Frequency 50 Hz	with ± 3% variation

MARKING OF PARTS :

For facilitating the erection, the several parts of the plant and equipment shall be suitably marked.

NAME PLATE AND DIAGRAM PLATES :

All equipment shall have weather proof and non corrosive metal plates fixed in suitable position with full particulars engraved thereon with white letters against black background. The firm shall affix a name plate on each Switchgear panel having following information:

1. Manufacturer's name and trade mark.
2. Serial No.
3. Type of Panel.
4. CT Ratio.
5. Rated Voltage.
6. Rated Insulation Level
7. Rated Frequency
8. Rated Normal Current
9. Rated Short Circuit Breaking Current.
10. Weight
11. Specification No.
12. Order No. and Date
13. Year of supply.
14. Property of TSECL

PAINTING :

All metallic surface [except corrosion resistant aluminium-zinc material and enamelled and bright parts] exposed to weather shall be given suitable primer coat and two coats of first quality paint of approved colour. The supplier shall also supply adequate quantities of paints, varnish etc. for use of finished cost and for use of patching up any scratches received during transport, handling erection testing and commissioning.

Instead of above proper powder coating after proper pre treatment is acceptable and in that case earlier condition will not applicable.

DETAILED FITTING AND MOUNTING :

Detailed fittings and mountings of equipment in various switchgear panel shall be as follows

a) INCOMING CUM OUGOING PANEL RATING; 800 AMP WITH CT RATIO 200-100/5-5A

Each unit shall have the fittings and equipment as follows:

- 1 No totally enclosed, fully interlocked, indoor industrial pattern, metal clad, horizontal draw out, vertical/horizontal isolation floor mounting switch unit complete with transportation truck having integral mechanism and all necessary supports each equipped as under :

(i) 1 No Fabricated sheet steel / corrosion proof aluminium-zinc housing.

(ii) 1 No. Complete set of mechanical interlocks.

(iii) 1 set of 800 Amps rated bus bars.

(iv) 1 No. Set of isolating plugs and sockets [6 nos. rated for 800 Amps with automatic safety shutters and pad locking arrangements. Facilities shall be provided for proper opening of the safety shutter for cleaning,

(v) 1 No. 800 Amp triple pole VCB fitted with isolating sockets, spring operated, manually as well motor charged, manually / electrically released spring closing mechanism with mechanical ON/OFF indicators suitable for a rupturing capacity of 20 KA at 11 kV for 3 seconds and fitted with one set of direct acting trip coils suitable for operation with AC series trip relays.

(vi) 1 No. Auxiliary switch with minimum four normally closed and four normally open contacts. The contact terminals shall be brought out and terminated at Terminal Board irrespective of whether terminals are used or not.

- 3 Nos. 200-100/5-5 A ratio ratio, dual core resin cast current transformer of required Accuracy, for metering, protection and differential protection.

- 1 No. digital ammeter, case size 96mm. x 96mm, flush mounting type, with suitable range as per CT ratio.

- 1 No. 3 way and off ammeter selector switch for selecting the currents in all 3 phases.

- 3 Nos. 1 phase resin cast, draw out type, **bus bar connected**, potential transformer

- 1 No. digital voltmeter, case size 96mm. x 96mm., flush mounting type, with range 0-15 kV.

- 1 No. 6 way and off voltmeter selector switch for reading the phase-phase and phase- neutral

voltage between any two phases on the voltmeter.

- 1 no. digital frequency meter, case size 96mm. x 96mm., flush mounting type.

- 1 no. digital power factor meter, case size 96mm. x 96mm., flush mounting type, for measurement of power factors of each phase and average power factor.

- 1 No. static digital tri-vector energy meter suitable for 3-phase 4-wire un-balanced load and CT, PT, ratio mentioned above, 1s accuracy class with load, survey and TOD/Tariff and MRI facility (with DLMS protocol compliant – CAT A) . TVM shall be strictly as per specification

- 1 No. numeric IEC 61850 Ed II compliant relay

- 1 No. 12-window (big windows) annunciator with separate push buttons for test / accept / mute / reset and with hooter for fault annunciation.

- 1 set of LED indicating lamps with low voltage glow protection (L.V.G.P.) circuit and surge protection circuit for On (red) / Off (green) / Trip circuit healthy (white) / Auto-trip (amber) / Spring charged (blue) / PT supply phases (red-yellow-blue) / dc failure (amber)/ ac failure (yellow) / VCB 'test' position (white) / VCB 'service' position (red) indications.

b) All LEDs shall be suitable for operation on 24 to 240 volts, ac or dc supply.

- 1 No. 80 watts continuously rated tubular / strip type heater with manual ON/OFF switch working on 230 volts AC single phase supply.

- 1 set of copper bus bars of 800 Amps continuous rating.

- 1 No. multi way plug box for secondary wiring between the fix and moving glands.

- 1 No. set of independently operated automatic shutters for bus bar, cable and voltage transformers orifices, which shall be clearly labelled and individually pad-locked.

- 1 No. instruments panel mounted on the front of the unit with hinged access doors andtotally enclosed wiring terminals mounted there.

- 1 No. Complete set of self-contained inter connectors, foundation bolts, fine Wiring, wiring terminals board, sundries to complete the unit.

c) BUS SECTIONALIZER PANEL :

The fittings and mountings shall be similar to item no. 1 above except the following :

- The voltage transformers, voltmeter, voltmeter selector switch, frequency meter, power factor meter and PT supply phase indication lamps shall be deleted.

NOTE: Separate spring charging handle and rack-in / rack-out handles shall be provided and supplied with each switchgear.

ANNUNCIATION SYSTEM :

Alarm annunciation system shall be provided in the control board by means of visual and audible alarm in order to draw the attention of the operator to the abnormal operating conditions or the operation of some protective devices. The annunciation equipment shall be suitable for operation on the voltages specified in this specification i.e. 110 volts dc for new substation or as existing dc supply system of the utility (this shall be verified by the successful bidder before submission of the drawing for approval).

Audible annunciation for the failure of dc supply to the annunciation system shall be provided and this annunciation shall operate on 240 Volts ac supply. On failure of the dc supply to the annunciation system, a bell shall immediately sound. A separate push button shall be provided for the cancellation of this audible alarm alone but the LED lamp shall remain steadily lit till the supply to annunciation system is restored.

A separate dc supply operated relay shall be provided to monitor the failure of supply 240V ac supply to the scheme mentioned in Clause above. In case of failure of ac supply, this relay shall initiate visual and audible annunciation. This annunciation shall operate on annunciator DC and buzzer shall sound.

SPECIFICATIONS & BILL OF MATERIAL:

Sl. No.	Description	Rating	Qty
1	**11 KV 800 A VCB, Draw out type with following accessories:** • 220 V AC spring charging motor • 24 VDC closing coil • 24 VDC shunt Trip coil • Aux. contacts • Operating counter • Mechanical ON/OFF push buttons • Indicators for ON/OFF • Spring charged / Discharged • Manual spring charging device	800 A, TP, 20KA for 3 sec	01
2	**Protection Relays & accessories**		
a	3 O/C + 1 earth fault numerical Relay	24 V DC, CTR/5A	01

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b	Master Trip	24 VDC	01
c	Trip ckt. Supervision Relay	24 VDC	01
d	Aux. Relay 3 element for protection	24 VDC	02
e	PLA Relay with base for anti pumping	24 V DC, 2C/0	01
3	**Instrument Transformer**		
a	11 KV Dual core ,Dual Ratio Current Transformer ,Resin cast Type	Ratio: 200-100 / 5-5A Core I: 15 VA, CL 1 Core II:15 VA, CL:5P10	03
b	Potential Transformer, single phase, Resin cast and Draw out Type	Ratio: 11KV/110V, 100 VA,CL-1.0	03
4	**FUSE**		
d	12 KV, 3.15 A PT, Fuse links	3.15 A, 11 KV	03
5	**Meters**		
a	Digital Ammeter with ASS flush type,96 sqmm	CTR/5A, CL-1.0, AUX 110 V AC	01
b	Digital Voltmeter with VSS flush type,96 sqmm	PTR 11KV/110 V AC CL-1.0, AUX 110 V AC	01
c	Digital KWH meter flush type,96 sqmm	CTR/5A, CL-1.0, AUX 110 V AC	01
d	Trivector meter	PTR 11KV/110 V AC CTR 100/5 A,CL-1.0 EMF=2 for 200/5 A	01

6. TESTS :

The equipment offered should have been successfully type tested at NABL accredited laboratories for following tests in line with the relevant standard and technical specification, within the last 5 (five) years from the date of offer.

The design of circuit breaker shall be proven through all the routine and in accordance with IEC 62271-100 / 200 / IS 13118: 1991 and any amendment thereof. Photocopy of all the test reports must be enclosed with the tender. Type test report earlier than 5 years from the date of tender opening shall not be acceptable. The bidder shall be required to submit complete set of the following type test reports alongwith the offer

7. INSPECTION: Inspection shall be guided as per **Clause No. 27.0 , Section –III**

8. DRAWINGS & DOCUMENTATION

The successful tenderer shall submit 3 sets of complete drawings alongwith detailed bill of materials for approval. If any modifications are required on these, the same will be conveyed to the supplier who shall modify the drawings accordingly and furnish final drawings for approval. **No delivery extension shall be granted for any delay in drawing submission.**

a) List of drawings to be submitted alongwith the offer are as under:

i. GA of indoor 11 panel Switchgear.

ii. Typical single line diagram for 11 panel Switchgear.

iii. Sectional view of incomer, bus coupler & feeder panels.

iv. GA of Circuit Breaker truck.

v. GA of Current Transformer

vi. GA of Potential Transformer.

vii. G. A. Drawing for Control Desk.

viii. Bill of material for complete switchgear.

ix. Technical particulars of Switchgears.

b) Successful tenderer shall furnish all above drawings and following additional drawings for approval before commencement of supply.

i. Foundation details.

ii. Equipment door layout for incomer, bus coupler & feeder panels.

iii. Schematic Diagram for incomer bus coupler & feeder section of Switchgear

iv. Protection Circuit for incomer bus coupler & feeder section of Switchgear

v. DC control circuit for incomer, bus coupler & feeder section.

vi. Metering circuit for incomers, bus coupler & feeder section.

vii. Annunciator and Alarm scheme.

viii. P.T. supply change over scheme.

ix. Terminal block details for incomer, bus coupler & feeder section.

x. Cross section view for CTs.

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xi. Name Plate & Connection diagram for CTs.

xii. Cross section view for PTs.

xiii. Name Plate & Connection diagram for PTs.

xiv. Schematic Diagram for Control Desk.

xv. G. A. Drawing for Chair.

xvi. G. A. Drawing for Sliding Door Unit.

The manufacturing of the equipment shall be strictly in accordance with the approved drawings and no deviation will be permitted without the written approval of the TSECL. All manufacturing and fabrication work in connection with the equipment prior to the approval of the drawings shall be at the suppliers risk.

After approval of the drawings and bills of materials, the Tenderer shall submit detailed packing lists for approval. After approval, copies of these packing lists shall be forwarded to the respective consignees.

Six set of final drawings, bill of materials, wiring schedules, technical literature and commissioning manuals shall invariably be forwarded to the consignee alongwith the panel consignment, and shall be listed out in the packing list when submitted for approval. All drawings shall preferably be of A3 size. In case the Tenderer / supplier fails to furnish contractual drawings and manuals even at the time of supply of equipment, the date of furnishing of drawings/manuals will be considered as the date of supply of equipment for the purpose of computing penalties for late delivery

LIST OF APPROVED MAKES/MANUFACTURERS

Sl. No.	EQUIPMENT	MAKES / MANUFACTURERS
1	XLPE INSULATED, HV & MV POWER CABLE	KEC-RPG / UNIVERSAL CABLE / POLYCAB / KEI / HAVELLS
2	HDPE PIPE	JAIN PIPES / SUPREME / SUDHAKAR / SREE NARAYANI
3	G.I PIPE	TATA / JINDAL
4	CABLE TERMINATION KITS (HEAT SHRINKABLE TYPE)	RAYCHEM / 3M / JOINT MASK
5	STEEL STRUCTURES	SAIL / TISCO / ESSAR / BHUSAN / SRMB
6	VCB PANEL	CGL/ ABB

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ANNEXURE-I

DECLARATION

I / We hereby declare that I/We have personally gone through the Bid- Document containing general terms and conditions incorporated in the Notice Inviting Competitive Bidding for the works /supply and I/We do agree to abide by all the rules and regulation of TSECL, Agartala, Tripura.

SIGNATURE OF THE TENDERER / BIDDER

Sign. of Bidder

DGM, ED-I, Banamalipur

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**

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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.

Sign. of Bidder

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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 recommender

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

Sign. of Bidder

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ANNEXURE -III

(N.J. Stamp)

BEFORE THE NOTARY
TRIPURA.

INDEMNITY BOND

THIS INDEMNITY BOND IS EXECUTED ON THE_____ DAY OF_____ _____ 20___ 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
_____
_____

I 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 thein 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.

Witnesses 1. 2. Identified by me _____ Advocate	_____ Full Signature of Contractor (INDEMNIFIER)

Address:-……

Sign. of Bidder

DGM, ED-I, Banamalipur

Sign. of Bidder

DGM, ED-I, Banamalipur