OIL INDIA LIMITED
(A Govt. of India Enterprise)
P.O. DULIAJAN, DIST - DIBRUGARH
ASSAM, INDIA, PIN-786 602

CONTRACTS DEPARTMENT
TEL: (91) 374-2800548
E-mail: *contracts@oilindia.in*
Website: www.oil-india.com
FAX: (91)374-2803549

FORWARDING LETTER

M/s. _____
_____
_____

Sub: IFB No. CDI7408P18 – Design and construction of 03 Nos. of substation building and 01 No. of Switch room including supply, installation, testing and commissioning of electrical equipment of 03 Nos. 11KV/415V substation and 01 No. of 11KV/415V Switch room at Duliajan on LSTK basis.

Dear Sir(s),

1.0 OIL INDIA LIMITED (OIL), a "Navaratna" Category, Government of India Enterprise, is a premier oil Company engaged in exploration, production and transportation of crude oil & natural gas with its Headquarters at Duliajan, Assam. Duliajan is well connected by Air with nearest Airport being at Dibrugarh, 45 km away.

2.0 In connection with its operations, OIL invites Local Competitive Bids (LCB) from competent and experienced Contractors through OIL's e-procurement Portal: https://etender.srm.oilindia.in/irj/portal for **"Design and construction of 03 Nos. of substation building and 01 No. of Switch room including supply, installation, testing and commissioning of electrical equipment of 03 Nos. 11KV/415V substation and 01 No. of 11KV/415V Switch room at Duliajan on LSTK basis."** One complete set of Bid Document covering OIL's IFB for hiring of above services is uploaded in OIL's e-procurement portal. You are invited to submit your most competitive bid on or before the scheduled bid closing date and time through OIL's e-procurement portal. For your ready reference, few salient points of the IFB (covered in detail in the Bid Document) are highlighted below:

(i)	IFB No. /E-Tender No.	:	CDI7408P18
(ii)	Type of Bidding	:	Online – Single-Stage Two-Bid System
(iii)	Tender Fee	:	**Rs. 2000.00** (Tender fee should be paid ***only*** through the payment gateway available on OIL's e-Tender Portal. No other mode of payment shall be accepted. Bidders claiming waiver of tender fees shall apply to Contracts Department, Oil India Limited, Duliajan with documentary evidence as mentioned in Para. 6.0 (A) below, before 07 (seven) days of bid closing date.
(iv)	Period of Sale	:	14.03.2018 to 24.04.2018
(v)	Bid Closing Date & Time	:	01.05.2018 at 11:00 a.m.
(vi)	Technical Bid Opening Date & Time	:	01.05.2018 at 02:00 p.m.

(vii)	Price Bid Opening Date & Time	:	Will be intimated only to the eligible/qualified Bidders nearer the time.
(viii)	Bid Submission Mode	:	Bids must be uploaded online in OIL's E-procurement portal
(ix)	Bid Opening Place	:	Office of CGM-Contracts Contracts Department, Oil India Limited, Duliajan-786602, Assam, India.
(x)	Bid Validity	:	120 days from actual date of Bid Closing
(xi)	Mobilization Time	:	01 (one) month from the date of issue of LOA.
(xii)	Bid Security Amount	:	**Rs. 21,43,000.00** Note: a. The Bid Security should be submitted only in the form of Bank Guarantee (in specified format) issued by Nationalized/Scheduled Bank. b. Alternately, Bid Security can also be paid through the online payment gateway against this tender. c. In case of Bidder(s) submitting Bid Security in the form of Bank Guarantee, the original hard copy of Bid Security should reach the office of CGM-CONTRACTS on or before **12.45 p.m. (IST)** on the bid closing/opening date otherwise bid will be rejected. d. A scanned copy of Bid Security document should also be uploaded along with the Unpriced Techno-Commercial Bid documents. No other mode of payment will be accepted by the Company. The Bid Security shall not earn any interest to the bidder from the Company. **Notes:** Bidders claiming waiver of Bid Security shall apply to Contracts Department, Oil India Limited, Duliajan with documentary evidence as mentioned in Para. No. 6.0 (B) below before 07 (seven) days of bid closing date. Any offer not accompanied with the Bid Security shall be treated as invalid and summarily rejected. Any subsequent deposit of Bid Security after the bid closing date shall not be permitted. Also, adjustment of Bid Security due against the instant tender, against dues from the Company or on any account shall not be permitted.)
(xiii)	Bid Security Validity	:	27.09.2018
(xiv)	Original Bid Security to be submitted	:	Office of CGM-CONTRACTS, CONTRACTS DEPARTMENT, OIL INDIA LIMITED, DULIAJAN, ASSAM-786 602, INDIA

(xv)	Amount of Performance Security	:	10% of contract value
(xvi)	Validity of Performance Security	:	Up to 15 months from date of completion of contract period/duration
(xvii)	Duration of the Contract	:	02 (Two) years from commencement of the Contract i.e. after completion of mobilization.
(xviii)	Quantum of Liquidated Damage for Default in Timely Mobilization	:	Refer General Conditions of Contract
(xix)	Integrity Pact	:	Must be digitally signed & uploaded along with the Techno-commercial Bid. / ~~Not Applicable.~~
(xx)	Bids to be addressed to	:	CGM-Contracts, Contracts Department, Oil India Limited, Duliajan-786602, Assam, India.
(xxi)	Pre-Bid conference	:	To be held on **28.03.2018** at Duliajan, Assam
(xxii)	Last Date of receipt of Queries	:	**23.03.2018** up to 03:30 p.m.

3.0 **Integrity Pact*:*** The Integrity Pact must be uploaded in OIL's E-procurement portal along with the Technical Bid digitally signed by the same signatory who signed the Bid i.e. who is duly authorized to sign the Bid. If any bidder refuses to sign Integrity Pact or declines to submit the Integrity Pact, their bid shall be rejected straightway. Uploading the Integrity Pact with digital signature will be construed that all pages of the Integrity Pact has been signed by the bidder's authorized signatory who signs the Bid.

(Note: OIL has appointed Shri Rajiv Mathur, IPS (Retd.), Shri Satyananda Mishra, IAS (Retd.) and Shri Jagmohan Garg, Ex-Vigilance Commissioner as Independent Monitors (IEM) for a period of 03 (three) years to oversee implementation of Integrity Pact in OIL. Bidders may contact the Independent External Monitors for any matter relating to the IFB at the following addresses:

a. Shri Rajiv Mathur, IPS (Retd.), Former Director, IB, Govt. of India
E-mail: rajivmathur23@gmail.com

b. Shri Satyananda Mishra, IAS (Retd.), Former Chief Information Commissioner of India & Ex-Secretary, DOPT, Govt. of India
E-mail: satyanandamishra@hotmail.com

c. Shri Jagmohan Garg, Ex-Vigilance Commissioner, CVC
E-Mail id: jagmohan.garg@gmail.com

4.0 **A. Bid Security**: Bidders can submit Bid Security either on on-line mode through OIL's electronic Payment Gateway or submission of Bank Guarantee from any Scheduled Indian Bank **as per BG format enclosed herewith (Proforma-VII).**

B. Performance Security: Bidders can submit performance Security in the form of Bank Guarantee from any Scheduled Indian Bank **as per BG format enclosed herewith (Proforma-VI)**.

Note:

The Bank Guarantee issuing bank branch must ensure the following:

The Bank Guarantee issued by the bank must be routed through SFMS platform as per the following details:

i) "MT 760 / MT 760 COV for issuance of bank guarantee.
ii) "MT 760 / MT 767 COV for amendment of bank guarantee.

The above message/intimation shall be sent through SFMS by the BG issuing bank branch to Axis Bank, Duliajan Branch, IFS Code – UTIB0001129, Branch address – AXIS Bank Ltd., Duliajan Branch, Daily Bazar, Jyotinagar, Duliajan, District Dibrugarh, PIN – 786602.

5.0 GUIDELINES FOR PARTICIPATING IN OIL'S E-PROCUREMENT:

5.1 In order to bid for OIL e-tenders all the bidders are required to obtain a 1egally valid Digital Certificate Class 3 [Organization] along with Encryption Certificate as per Indian IT Act from the licensed Certifying Authorities (CA) operating under the Root Certifying Authority of India (RCAI), Controller of Certifying Authorities (CCA) of India. Digital Signature Certificate comes in a pair of Signing/verification and Encryption/decryption certificate. Bidder should have both the Signing/verification and Encryption/decryption certificate for Signing and encryption, decryption purpose respectively. The driver needs to be installed once, without which the DSC will not be recognized. While participating on e-Tendering the DSC token should be connected to your system.

Encryption certificate is mandatorily required for submission of bid. In case bidder created response with one certificate (using encryption key) and bidder change his Digital Signature Certificate then old certificate (used for encryption) is required in order to decrypt his encrypted response for getting the edit mode of the response. Once decryption is done, bidder may use new DSC certificate for uploading and submission of their offer. It is the sole responsibility of the bidder to keep their DSC certificate properly. In case of loss of the certificate, OIL INDIA LTD is not responsible.

The authenticity of above digital signature shall be verified through authorized CA after bid opening. If the digital signature used for signing is not of "Class - 3" with Organizations name, the bid will be rejected.

Digital Signature Certificates having "**Organization Name**" field other than **Bidder's Name** are not acceptable. However, aforesaid Digital Signature Certificates having Bidder's Name in the "Organization Name" field are acceptable.

Bidder is responsible for ensuring the validity of digital signature and its proper usage by their employee.

The bid including all uploaded documents shall be digitally signed by duly authorized representative of the bidding company.

5.2 Bidders must have a valid User ID to access OIL e-Procurement site for submission of bid. Vendors having User ID & password can purchase bid documents **on-line through OIL's electronic Payment Gateway**. New vendor shall obtain User ID & password through online vendor registration system in e-portal and can purchase bid documents subsequently in the similar manner.

5.3 Parties, who do not have a User ID, can click on **Guest** login button in the E-portal to view and download the tender. **The detailed guidelines are available in OIL's e-procurement site (Help Documentation).** For any clarification in this regard, bidders may contact E-Tender Support Cell at Duliajan at erp_mm@oilindia.in, Ph.: 0374- 2807178/4903.

5.4 The link to OIL's E-Procurement portal has been provided through OIL's web site (www.oil-india.com).

6.0 A. **EXEMPTION OF TENDER FEE:**

1. The Central Govt. Departments and Central Public Sector Undertakings will be exempted from the payment of tender fee.

2. Parties registered with DGS&D, having valid certificates will be exempted from payment of tender fee.

~~3. MSEs registered with District Industry Centres or Khadi and Village Industries Commission or Khadi and village industries board or coir board or national small industries corporation or directorate of handicraft and handloom or any other body specified by ministry of MSME provided they are registered for the tendered item.~~

~~4. In case bidding MSE is owned by Schedule Caste or Schedule Tribe entrepreneur, valid documentary evidence issued by the agency who has registered the bidder as MSE owned by SC/ST entrepreneur should also be enclosed.~~

5. Bidders claiming waiver of tender fees shall apply to Contracts Department, OIL, Duliajan with documentary evidence before **07 days** of bid closing date.

B. **EXEMPTION OF BID SECURITY:**

1. Central Govt. department and Central Public Sector undertakings are exempted from submitting Bid Security.

2. Parties registered with DGS&D, having valid certificates will be exempted from payment of bid security.

~~3. MSEs registered with District Industry Centres or Khadi and Village Industries Commission or Khadi and village industries board or coir board or national small industries corporation or directorate of handicraft and handloom or any other body specified by ministry of MSME provided they are registered for the tendered item.~~

~~4. In case bidding MSE is owned by Schedule Caste or Schedule Tribe entrepreneur, valid documentary evidence issued by the agency who has registered the bidder as MSE owned by SC/ST entrepreneur should also be enclosed.~~

7.0 PRE-BID CONFERENCE:

7.1 A Pre-Bid Conference is planned to be held on 28.03.2018 at Duliajan, Assam to explain the requirements of Company in details to the interested prospective Bidders and to understand bidders' perspective including exchange of views/clarifications, if any, on the Scope of Work, Bid Rejection/Bid Evaluation Criteria and other terms & conditions of the Tender. The parties who purchase the bid documents shall be allowed to participate in the Pre-Bid conference. For details of the venue, bidders may contact CGM-Contracts, Oil India Ltd., P.O. Duliajan-786602, Phone: +91 374-2808664/2808665, E-mail: contracts@oilindia.in.

7.2 Maximum 02 (two) representatives from each prospective Bidder, who purchased the tender document, shall be allowed to participate in the pre-bid conference. All costs associated to attend the pre-bid conference by their representatives shall be borne by the interested Bidders.

7.3 The prospective bidders shall submit their queries/clarifications against the tender through E-mail / Courier addressed to CGM-Contracts, Oil India Ltd., Duliajan-786602, Assam and such queries must reach OIL's office at Duliajan latest by **23.03.2018 up to 03:30 p.m. IST**. OIL shall provide clarifications to only those queries received within this date. Queries / Clarifications against the tender received beyond **23.03.2018** will not be entertained and replied. OIL will not be responsible for non-receipt or late receipt of any bidder's query in OIL's office

7.4 However, clarifications/exceptions/deviations, if required any, should be brought out by the bidder prior to or during the Pre-Bid Conference only. After processing these suggestions, as a sequel to the pre-bid conference, Company may communicate the changes in this regard, if agreed any, through an addendum to tender document to the prospective bidders who purchased the tender document. Company will not accept any exception/deviation to tender conditions/specifications once the same are frozen after the pre-bid conference and the non-compliant bid(s) shall be rejected outright against this tender.

IMPORTANT NOTES:

Bidders shall take note of the following important points while participating in OIL's e-procurement tender:

i) The bid along with all supporting documents must be submitted through OIL's e-procurement site only except 'Original Bid Security' (if submitted in the form of BG) which shall be submitted manually by the bidder in a sealed envelope super-scribed with OIL's IFB No./E-Tender No., Bid Closing date and marked as "Original Bid Security" and addressed to CGM-Contracts, Contracts Department, Oil India Limited, Duliajan-786602, Assam (India), **failing which the bid shall be rejected**.

Additionally, following documents are to be submitted in hard form:

a) Power of Attorney for signing the bid.
b) Printed catalogue and Literature, if called for in the tender.
c) Any other document required to be submitted in original as per tender requirement.

The above documents including the Original bid security, must be received at OIL's CGM-Contract's office at Duliajan on or before 12.45 p.m. (IST) on the technical bid closing date. A scanned copy of the Bid Security shall also be uploaded by the bidder along with their Technical Bid in OIL's E-procurement site.

ii) Bid should be submitted online in OIL's E-procurement site up to 11.00 a.m. (IST) (Server Time) on the date as mentioned and will be opened on the same day at 2.00 p.m. (IST) at the office of the CGM-Contracts in presence of the authorized representatives of the bidders.

iii) If the digital signature used for signing is not of "Class - 3" with Organizations name, the bid will be rejected.

iv) The Company reserves the right to reject any or all the tenders or accept any tender without assigning any reason.

v) (a) No Bidder can withdraw his bid within the validity or extended validity of the bid. Withdrawal of any bid within validity period will lead to forfeiture of his / her / their Bid Security Deposit in full and debar from participation in future tenders, at the sole discretion of the company

(b) Once a bid is withdrawn, the offer will be treated as withdrawn and no further claim / correspondence will be entertained in this regard.

vi) Conditional bids are liable to be rejected at the discretion of the Company.

vii) The work may be split up amongst more than one contractor at the sole discretion of the Company.

viii) The bidders are required to furnish the composition and status of ownership of the firm in whose name bid documents have been purchased / issued along with one or more of the following documentary evidences (which are applicable to the bidder) in support of the same and scanned copies of the same should be uploaded along with the Technical Bid.

A. In case of Sole Proprietorship Firm, Copies of Telephone/Electricity/Mobile Bill, PAN card, latest Income Tax Return form indicating therein the name, business and residential address, E-mail and telephone numbers of the owner and copy of GST Registration Certificate.

B. In case of HUF, Copies of Telephone/Electricity/Mobile Bill, PAN card, latest Income Tax Return form, Family Arrangement indicating therein the name, residential address, E-mail and telephone numbers of the owners in general and Karta in particular and copy of GST Registration Certificate.

C. In case of Partnership Firm, Copies of Telephone/Electricity/Mobile Bill, PAN card, latest Income Tax Return form indicating therein the name, residential address, E-mail and telephone numbers of all the partners (including the Managing Partner), registered partnership agreement/deed and copy of GST Registration Certificate.

D. In case of Co-Operative Societies, Copies of Telephone/Electricity/Mobile Bill, PAN card, latest Income Tax Return form indicating therein the name, residential address, E-mail and telephone numbers of all the Directors or persons who are at the helm of affairs, registration certificate from Registrar of Co-Operative Societies and copy of GST Registration Certificate.

E. In case of Societies registered under the Societies Registration Act, Copies of Telephone/Electricity/Mobile Bill, PAN card, latest Income Tax Return form indicating therein the name, residential address, E-mail and telephone numbers of all the Directors or persons who are at the helm of affairs, registration certificate from the Registrar of the state and copy of GST Registration Certificate.

F. In case of Joint Stock Companies registered under the Indian Companies Act, Copies of Telephone/Electricity/Mobile Bill, PAN card, latest Income Tax Return form indicating therein the name, residential address, E-mail and telephone numbers of all the Directors or persons who are at the helm of affairs, Certificate of Incorporation from the Registrar of Companies, Memorandum and Articles and copy of GST Registration Certificate.

G. In case of Trusts registered under the Indian Trust Act, Copies of Telephone/Electricity/Mobile Bill, PAN card, latest Income Tax Return form indicating therein the name, residential address, E-mail and telephone numbers of all the Trustee or persons who are at the helm of affairs, registration certificate from the Registrar of the state, Trust Deed and copy of GST Registration Certificate.

ix) The selected bidder will be required to enter into a formal contract, which will be based on their bid and O.I.L.'s Standard Form of Contract.

x) The Bid Security / Performance Security Money shall not earn any interest.

xi) Time will be regarded as the essence of the Contract and the failure on the part of the Contractor to complete the work within the stipulated time shall entitle the Company to recover liquidate damages and / or penalty from the Contractor as per terms of the tender /contract.

xii) The contractor will be required to allow OIL officials to inspect the work site and documents in respect of the workers' payment.

xiii) **BACKING OUT BY BIDDER:** In case any bidder withdraws their bid within the bid validity period, Bid Security will be forfeited and the party will be put on Holiday as per the Banning Policy (available in OIL's website) of Company.

xiv) **BACKING OUT BY L-1 BIDDER AFTER ISSUE OF LOA:** In case LOA issued is not accepted by the L1 bidder or the Performance Security is not submitted as per the terms of the contract within the time specified in the Bid Document, the Bid Security shall be forfeited and the bidder shall be dealt as per the Banning Policy (available in OIL's website) of Company.

xv) **FURNISHING FRAUDULENT INFORMATION/DOCUMENT**: The information and documents furnish by the bidder/ contractor in respect of the subject tender/contract are accepted to be true and genuine. However, if it is detected during technical scrutiny or after award of the contract or after expiry of the contract, that the bidder had submitted any fake/fraudulent document or furnished false statement, the offer/contract shall be rejected/ cancelled, as the case may be and the bidder (if fake document/false statement pertains to such bidder) shall be dealt as per the Banning Policy (available in OIL's website) of Company.

xvi) **ERRING / DEFAULTING AGENCIES:** Erring and defaulting agencies like bidder, contractor, supplier, vendor, service provider will be dealt as per OIL's Banning Policy dated 6th January, 2017 available in OIL's website: www.oil-india.com.

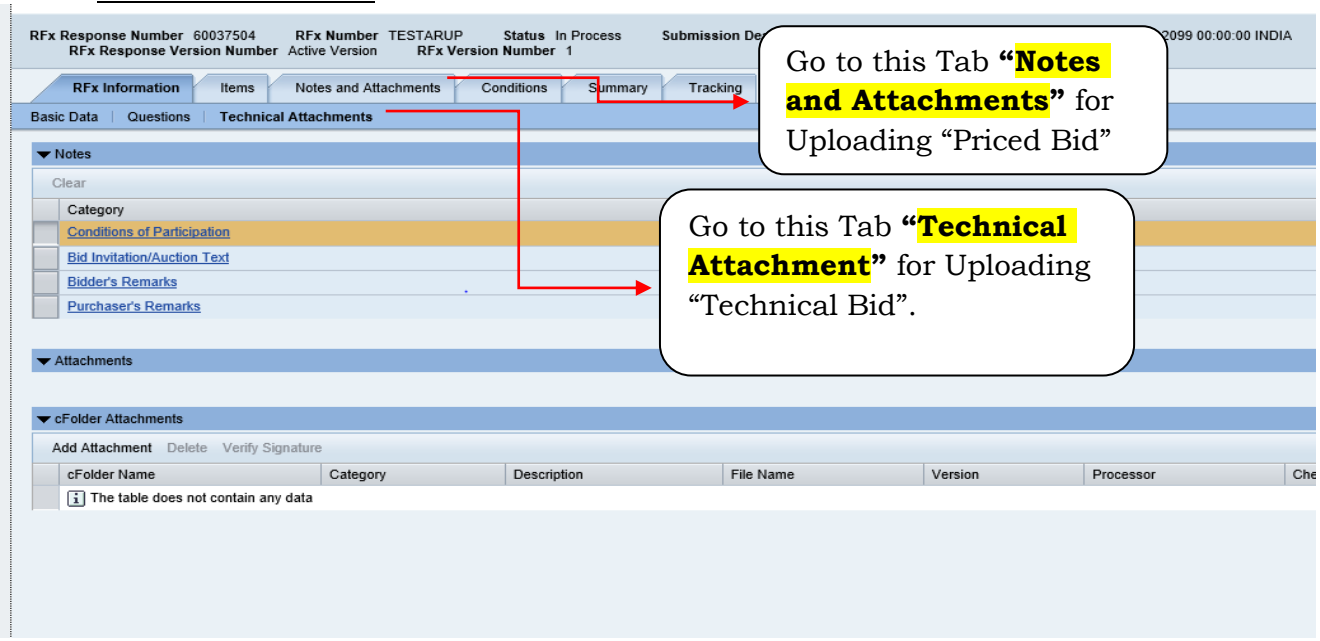
xvii) **The tender will be governed by:**

Forwarding Letter
Instruction to Bidders
BEC-BRC- Bid Evaluation Criteria & Bid Rejection Criteria.
Part-I - General Conditions of Contract (GCC)
Part-II - Schedule of Work, Unit and Quantity (SOQ)
Part-III - Special Conditions of Contract (SCC) along with Annexures
Part-IV - Schedule of company's Plants, Materials and Equipments - **Not Applicable**
Part-V - Safety Measures (SM)
Part-VI - Integrity Pact
Price Bidding Format & PP-LC Format
Proformas

xviii) **Bidders are requested to examine all instructions, forms, terms and specifications in the bid. Failure to furnish all information required as per the bid or submission of offers not substantially responsive to the bid in every respect will be at the bidder's risk and may result in the rejection of its offer without seeking any clarifications. Offers sent without the requisite value of prescribed bid security (if called for in the bid) in original will be ignored straightway.**

xix) The tender is invited under SINGLE-STAGE TWO-BID SYSTEM. The bidders shall submit both the "TECHNICAL" and "PRICED" bids through electronic form in the OIL's e-Procurement portal within the Bid Closing Date and Time stipulated in the E-Tender. The Technical Bid should be submitted as per Scope of Work & Technical Specifications along with all technical documents related to the tender and uploaded under **"Technical Attachment" Tab only**. **Bidders to note that no price details should be uploaded in "Technical Attachment" Tab Page. Details of prices as per Price Bid format/Priced bid to be uploaded under "Notes and Attachment" Tab. A screen shot in this regard is shown below. Offer not complying with above submission procedure will be rejected as per Bid Rejection Criteria.**

SCREEN SHOTS:



On "EDIT" Mode, bidders are advised to upload "Technical Bid" and "Priced Bid" in the respective places as indicated above.

Note:

- The "Technical Bid" shall contain all techno-commercial details **except the prices**.
- The "Priced bid" must contain the price schedule and the bidder's commercial terms and conditions, if any. For uploading Priced Bid, first click on Add Attachment, a browser window will open, select the file from the PC and name the file under Description, Assigned to General Data and click on OK to digitally sign and upload the File. Please click on Save Button of the Response to Save the uploaded files.

8.0 OIL now looks forward to your active participation in the IFB.

Thanking you.

Yours faithfully,
OIL INDIA LIMITED

(RITUPARNA SHARMA)
MANAGER - CONTRACTS
For **CGM - CONTRACTS**
For **RESIDENT CHIEF EXECUTIVE**

OIL INDIA LIMITED
(A GOVT. OF INDIA ENTERPRISE)
CONTRACTS DEPARTMENT, DULIAJAN
DISTRICT: DIBRUGARH (ASSAM), PIN-786602

IFB NO. CDI7408P18
INSTRUCTION TO BIDDERS

1.0 Bidder shall bear all costs associated with the preparation and submission of bid. Oil India Limited, hereinafter referred to as 'Company', will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

2.0 BIDDING DOCUMENTS:

2.1 The services required, bidding procedures and contract terms are prescribed in the Bidding Documents. This Bidding Document includes the following:

a) A forwarding letter highlighting the following points
   (i) Company's IFB No.
   (ii) Description of Service
   (iii) Bid closing date and time
   (iv) Bid opening date, time and place
   (v) Bid submission place
   (vi) The amount of Performance Guarantee
b) Instructions to Bidders
c) BEC/BRC
d) General Conditions of Contract (GCC): **Part-I**
e) Schedule of Work, Unit, Quantities (SOQ): **Part- II**
f) Special Conditions of Contract (SCC) along with annexures: **Part-III**
g) Schedule of Company's Plants, Materials and Equipments (SCPME): **Part-IV** [Not applicable for this Tender]
h) Safety Measures (SM): **Part-V**
i) Integrity Pact: **Part-VI**
j) Price Bidding Format & PP-LC Format (Attached under "**Notes and Attachments**" tab in the main bidding engine of OIL's e-Tender portal).
k) Proformas

2.2 The bidder is expected to examine all instructions, forms, terms and specifications in the Bid document. Failure to furnish all information required in the Bidding Documents or submission of a bid not substantially responsive to the Bidding Documents in every respect will be at the Bidder's risk & responsibility and may result in the rejection of its bid without seeking any clarifications.

3.0 TRANSFERABILITY OF BID DOCUMENTS:

3.1 Bid Documents are non-transferable. Bid can be submitted only in the name of the bidder in whose name the Bid Document has been issued.

3.2 Unsolicited offers will not be considered and will be rejected straightway.

4.0 AMENDMENT OF BIDDING DOCUMENTS:

4.1 At any time prior to the deadline for submission of bids, the company 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 issuance of an Addendum.

4.2 The Addendum will be uploaded in OIL's E-Tender Portal in the Tab "Technical RFx" and External Area – "Amendments" folder. The company may, at its discretion,

extend the deadline for bid submission. Bidders are expected to take the Addendum into account in preparation and submission of their bid. **Bidders are to check from time to time the E-Tender portal ["Technical RFx" Tab and under the folder "Amendments"] for any amendments to the bid documents before submission of their bids. No separate intimation shall be sent to the Bidders.**

5.0 PREPARATION OF BIDS

5.1 LANGUAGE OF BIDS: The bid as well as all correspondence and documents relating to the bid exchanged between the Bidder and the Company shall be in English language, except that any printed literature may be in another language provided it is accompanied by an official and notarized English translated version, which shall govern for the purpose of bid interpretation.

5.2 DOCUMENTS COMPRISING THE BID:

(A) UN-PRICED TECHNO-COMMERCIAL BID:

(i) Bid Documents duly filled up as indicated.
(ii) Complete technical details / specifications of the equipment with catalogue, etc. as per tender requirement.
(iii) Documentary evidence established in accordance with BEC / BRC part.
(iv) Statement of Non-Compliance (if any).
(v) Bid Security (scanned copy). Hard copy of original Bid Security (Only in case of bidder(s) submitting bid security in the form of Bank Guarantee) should be sent separately to reach **on or before 12.45 p.m. (IST) on the bid closing date failing which the bid shall be rejected.**
(Bidders can submit bid security on-line through OIL's electronic Payment Gateway)
(vi) Any other document as per tender requirement (scanned copy). Hard copy(s) of the same, if called for in the tender, should be sent separately to reach on or before **12.45 p.m. (IST) on the bid closing date failing which the bid shall be rejected.**
(vii) Integrity Pact

Note: Please note that no price details should be uploaded in UN-PRICED TECHNO-COMMERCIAL BID under "Technical Attachment" Tab.

(B) PRICED BID:

The Priced Bid shall contain the rates / prices along with the currency and any other commercial information pertaining to the rates / prices. Bidder shall quote their rates / prices in the "PRICE BIDDING FORMAT" attached under **"Notes and Attachments"** tab in the main bidding engine of OIL's e-Tender portal. The bidder must quote their price as per the attached "PRICE BIDDING FORMAT" under **"Notes and Attachments"** tab. Any other format will not be considered for evaluation.

Bidder must include all liabilities except GST in their quoted rates and indicate the applicable GST percentage separately as per the "PRICE BIDDING FORMAT". The rates shall be fixed and firm for the entire tenure of the contract and shall be binding on both the parties. No changes in these rates shall be allowed under any circumstances during the tenure of this service agreement except as mentioned in the Bid Document.

6.0 PERIOD OF VALIDITY OF BIDS:

6.1 The Bid must be valid for **120 (One Hundred Twenty) days** from the actual date of bid closing.

6.2 In exceptional circumstances, OIL may solicit the Bidder's consent to an extension of the period of validity. The request and the response thereto shall be made in writing (or by Fax). A Bidder granting the request will neither be required nor permitted to modify their bid.

7.0 FORMAT AND SIGNING OF BID:

7.1 The original and all copies of the bid shall be typed or written in indelible inks and shall be signed digitally by the Bidder to bind the Bidder to the contract.

8.0 SUBMISSION OF BIDS:

8.1 The tender is processed under Single-Stage Two-Bid System. Bidder shall submit the Technical bid and Priced bid along with all the Annexures and Proformas (wherever applicable) and copies of documents in electronic form through OIL's e-procurement portal within the Bid Closing Date & Time stipulated in the e-tender. For submission of Bids online at OIL's E-Tender Portal, detailed instructions are available in "User Manual" available in OIL's E-Tender Portal. Guidelines for bid submission are also provided in the "Forwarding Letter". The Technical Bid is to be submitted as per Terms of Reference/Technical Specifications of the bid document and Priced Bid as per the Price Schedule. The Technical Bid should be uploaded in the "Technical Attachment" Tab only. Prices to be quoted as per Price Bid Format should be uploaded as attachment in the Attachment link under "Notes & Attachments" Tab under General Data in the e-portal. No price should be given in the "Technical Attachment", otherwise bid shall be rejected. The priced bid should not be submitted in physical form which shall not be considered.

8.2 Any person signing the Bid or any other document in respect of this Bid Document or other relevant documents on behalf of the Bidder without disclosing his authority to do so shall be deemed to have the authority to bind the Bidder. If it is discovered at any time that the person so signing has no authority to do so, the Company (OIL) may, without prejudice to any other right or remedy, cancel his Bid or Contract and hold the Bidder liable to the Company (OIL) for all costs and damages arising from the cancellation of the Bid or Contract including any loss which the Company (OIL) may sustain on account thereof.

8.3 Timely submission of the bids is the responsibility of the Bidder and Bids should be submitted before the bid closing date and time. Company shall not be responsible for any delay.

8.4 Physical Bid/ E-mail/ Fax /Telephonic offers will not be accepted.

8.5 Bidder shall submit the Bid, duly completed in terms of the Bid Document.

8.6 Before submission of Bids, Bidders are requested to make themselves fully conversant with all Conditions of the Bid Document and other relevant information related to the works to be executed under this contract.

9.0 DEADLINE FOR SUBMISSION OF BIDS:

9.1 Bids should be submitted on-line up to **11.00 a.m. (IST) (Server Time) on the Bid Closing date** mentioned in the Forwarding Letter. Bidders will be permitted by System to make any changes in their bid after the bid has been uploaded by the bidder

prior to the Bid Closing date and time as mentioned in the bid except in condition mentioned in clause 12.1 below. But no changes would be allowed by the system once the due date and time for submission of bids has been reached and bids are opened.

9.2 No bid can be submitted after the submission deadline is reached. The system time displayed on the e-procurement web page shall decide the submission deadline.

9.3 The documents in physical form must be received by Company at the address specified in the "Forwarding Letter" on or before **12:45 p.m. (IST) on the bid closing date**. Timely delivery of the same at the address mentioned in the Forwarding Letter is the responsibility of the Bidders.

10.0 LATE BIDS:

10.1 Bidders are advised in their own interest to ensure that their bids are uploaded in system before the closing date and time of the bid. Any Bid received by the Company after the Bid Closing Date & Time stipulated by the Company shall be rejected.

11.0 MODIFICATION AND WITHDRAWAL OF BIDS:

11.1 Bidders will be permitted by System to withdraw their bid or make any changes in their bid after the bid has been uploaded by the bidder prior to the Bid Closing date and time as mentioned in the bid. But no changes or withdrawal would be allowed by the system once the due date and time for submission of bids has been reached and bids are opened.

11.2 No bid can be modified / withdrawn subsequent to the deadline for submission of bids.

11.3 No bid may be withdrawn in the interval between the deadline for submission of bids and the expiry of the period of bid validity. Withdrawal of any bid within validity period will lead to forfeiture of his / her / their Bid Security Deposit in full and debar from participation in future tenders, at the sole discretion of the company.

12.0 EXTENSION OF BID SUBMISSION DATE:

12.1 Normally no request for extension of Bid Closing Date & Time will be entertained. However, OIL at its discretion, may extend the Bid Closing Date and / or Time due to any reasons.

13.0 BID OPENING AND EVALUATION:

13.1.1 The Technical bid will be opened on scheduled Bid opening date & time in the presence of any attending Bidder(s) or their Authorized Representative, if any. However, an authorized letter (format given in Proforma Section) from the Bidder must be produced by Bidder's representative at the time of opening of Tender, without which such representative won't be allowed to attend the opening of Tenders. Only one representative against each Bid will be allowed to attend the bid opening. Attending Bidder(s) & Authorized Representative(s) will have to sign a register evidencing their presence.

13.1.2 In case of two bid system, after the evaluation of the Technical Bids, the Price Bids of only the techno-commercially acceptable Bidders will be opened. The opening Date and Time will be intimated to the techno-commercially qualified Bidders in due course. Price bids will be opened in the same procedure as mentioned in Para 13.1.1 above.

13.2 In case it happens to be a bundh / holiday, the tender will be opened on the next working day (except Saturday). Accordingly, Bid Closing Date / time will get extended up to the next working day and time (except Saturday).

13.3 Bids which have been withdrawn pursuant to Clause 11.0 will not be allowed to be opened by the system. OIL shall examine bids to determine whether they are complete, whether requisite Bid Securities have been furnished, whether documents have been properly signed and whether the bids are generally in order.

13.4 OIL shall prepare, for its own records, minutes of bid opening including the information disclosed to those present in accordance with the sub-clause 13.3.

13.5 To assist in the examination, evaluation and comparison of bids, normally no clarifications shall be sought from the Bidders. However, for assisting in the evaluation of the bids especially on the issues where the Bidder confirms compliance in the evaluation and contradiction exists on the same issues due to lack of required supporting documents in the Bid (i.e. document is deficient or missing), or due to some statement at other place of the Bid (i.e. reconfirmation of confirmation) or vice versa, clarifications may be sought by OIL at its discretion. 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.

13.6 Prior to the detailed evaluation, OIL will determine the substantial responsiveness of each bid to the requirement of the Bidding Documents. For purpose of these paragraphs, a substantially responsive bid is one, which conforms to all the terms and conditions of the Bidding Document without material deviations or reservation. A material deviation or reservation is one which affects in any substantial way the scope, quality, or performance of work, or which limits in any substantial way, in-consistent way with the bidding documents, the Company's right or the bidder's obligations under the contract, and the rectification of which deviation or reservation would affect unfairly the competitive position of other bidders presenting substantial responsive bids. OIL's determination of bid's responsiveness is to be based on the contents of the Bid itself without recourse to extrinsic evidence.

13.7 A Bid determined as not substantially responsive will be rejected by the Company and may not subsequently be made responsive by the Bidder by correction of the non-conformity.

13.8 The Company may waive minor informality or nonconformity 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.

14.0 EVALUATION AND COMPARISON OF BIDS:

14.1 OIL will evaluate and compare the bids as per Bid Evaluation Criteria (BEC) of the bidding documents.

14.2 To ascertain the inter-se-ranking, the comparison of the responsive bids will be made on the basis of Net Total amount* quoted as per Price Bid Format.

*Note: The rate quoted (exclusive of GST) against Line Item No. 90 of the SOQ (Part-II) of tender document will be deducted from the Total amount quoted (inclusive of all liabilities and GST) against Line Item Nos. 10 to 80 of the SOQ (Part-II) of tender document to obtain the Net Total amount.

14.3 DISCOUNTS / REBATES: Unconditional discounts / rebates, if any, given in the bid or along with the bid will be considered for evaluation.

14.4 Post bid or conditional discounts / rebates offered by any bidder shall not be considered for evaluation of bids. However, if the lowest bidder happens to be the final acceptable bidder for award of contract, and if they have offered any discounts / rebates, the contract shall be awarded after taking into account such discounts / rebates.

14.5 Conditional bids are liable to be rejected at the discretion of the Company.

15.0 CONTACTING THE COMPANY:

15.1 Except as otherwise provided in Clause 14.0 above, no Bidder shall contact OIL on any matter relating to its bid, from the time of the bid opening to the time the Contract is awarded except as required by OIL vide sub-clause 13.5.

15.2 An effort by a Bidder to influence OIL in the bid evaluation, bid comparison or Contract award decisions may result in the rejection of their bid.

16.0 AWARD CRITERIA:

16.1 OIL will award the Contract to the successful Bidder whose bid has been determined to be substantially responsive and has been determined as the lowest evaluated bid, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.

17.0 OIL' S RIGHT TO ACCEPT OR REJECT ANY BID:

17.1 OIL reserves the right to accept or reject any or all bids 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 of the grounds for OIL's action.

18.0 NOTIFICATION OF AWARD:

18.1 Prior to the expiry of the period of bid validity or extended validity, OIL will notify the successful Bidder in writing by registered letter or by cable or telex or fax or e-mail (to be confirmed in writing by registered / couriered letter) that its bid has been accepted.

19.0 SIGNING OF CONTRACT:

19.1 The successful bidders(s) shall be notified by the Company of its intention to enter into an Agreement with him/her/them on the basis of his/her/their acceptance of the offer. Such notification shall be treated as a "Letter of Award (LOA)".

19.2 Within 02 Weeks from the date of issue of Letter of Award (LOA), the successful Bidder(s) will be required to pay an interest fee Performance Security by way of Demand Draft / Banker's Cheque / Bank Guarantee (in specified format) favouring "OIL INDIA LIMITED" payable at "DULIAJAN" from any Nationalized Bank. Upon furnishing of the Performance Security, the successful Bidder(s) will be required to enter into a formal Service Agreement based on the instant tender on the OIL Standard forms of agreement.

19.3 This Performance Security must be valid for **15 months** after the date of expiry of the tenure of the contract. In the event of contract being extended within the provisions of the contract agreement, the contractor will have to extend suitably the validity of the "Security Deposit" for the extended period.

19.4 The "Performance Security" will be refunded to the contractor after **15 months** of satisfactory completion of works under the contract (including extension, if any), but part or whole of which shall be used by the Company in realization of liquidated damages or claims, if any or for adjustment of compensation or loss due to the Company for any reason.

19.5 Failure of the successful bidders to comply with the conditions as specified in Para 19.2 above would render him liable for rejection and in turn forfeiture of Bid Security apart from any other actions the Company may take against him at its sole discretion. The bidder shall be dealt as per the Banning Policy (available in OIL's website) of Company.

20.0 Purchase preference policy (linked with Local Content) (PP-LC) notified vide letter no. O-27011/44/2015-ONG/II/FP dated 25.04.2017 of MoPNG.

(available in http://oil-india.com/PDF/Circular%20dt%2027062017-PPLC.pdf or http://petroleum.nic.in/policy-provide-purchase-preference-linked-local-content-pp-lc-all-psus)

20.1 In case a bidder is eligible to seek benefits under PP-LC policy as well as Public Procurement Policy for MSEs - Order 2012, then the bidders should categorically seek benefits against only **one of the two policies** i.e. either PP-LC or MSE policy. If a bidder seeks free of cost tender document under the MSE policy, then it shall be considered that the bidder has sought benefit against the MSE policy and this option once exercised cannot be modified subsequently.

20.2 Bidders seeking Purchase preference (linked with local content) (PP-LC) shall be required to meet / exceed the target of Local Content (LC) of **30%**

20.2.1 Such bidders shall furnish following undertaking on its letter head along with their techno-commercial bid. The undertaking shall become a part of the contract

"We _____ (Name of the bidder) undertake that we meet the mandatory minimum Local Content (LC) requirement i.e. .... % (to be filled as notified at Enclosure I of the policy) for claiming purchase preference linked with Local Contents under the Govt. policy against under Tender No. CDIXXXXP18."

20.2.2 Above undertaking shall be supported by the following certificate from Statutory Auditor engaged by the bidder, on the letter head of such Statutory Auditor.

"We _____ the statutory auditor of M/s. _____ (name of the bidder) hereby certify that M/s_____ (name of the bidder) meet the mandatory Local Content requirements of the Services i.e. .... % (to be filled by the work center as notified at Enclosure I of the policy) quoted vide offer No._____ dated _____ against OIL tender No. CDIXXXXP18. by M/s. _____ (Name of the bidder)."

Note: In case of bidder(s) for whom Statutory Auditor is not required as per law required certificates shall be provided by a practicing Chartered Accountant.

20.2.3 At the bidding stage the bidder shall provide Break-up of "Local Component" and "Imported Component" in the prescribed format enclosed as Proforma-BB (PP-LC) of the policy and shall be uploaded by the bidders along with their price bid in the e-procurement portal under **"Notes and Attachment"** Tab.

20.3 Eligible (techno-commercially qualified) LC bidder shall be granted a purchase preference to 10% i.e. where the evaluated price is with 10% of the evaluated lowest price of Non Local Content (NLC) bidder, other things being equal. Accordingly, purchase preference shall be granted to the eligible (techno-commercially qualified) LC bidder concerned, at the lowest valid i.e. NLC price bid.

20.3.1 Only those LC bidders whose bids are within 10% of the NLC L1 bid would be allowed an opportunity to match L1 bid. All the eligible LC bidders shall be asked to submit their confirmation to match their price in sealed envelopes. Envelopes of the bidders shall be opened and award for the prescribed quantity shall be made to the lowest evaluated TA/CA bidder among the eligible LC bidders. In case the lowest eligible LC bidder fails to match L1 price, the next eligible LC bidder will be awarded the prescribed quantity and so on. In case none of the eligible LC bidders matches the L1 bid, the actual bidder holding L1 price will secure the order.

20.4 Order for supply of 50% of the tendered quantity would be awarded to the lowest techno-commercially qualified LC bidder, subject to matching with valid NLC L1 price. The remaining will be awarded to L1 (i.e. NLC bidder). Prescribed 50% tendered quantity for LC bidders shall not be further sub-divided among eligible LC bidders.

20.4.1 However, if L1 bidder happens to be a LC bidder, the entire procurement value shall be awarded to such bidder.

20.4.2 When the tendered goods/services cannot be divided in the exact ratio of 50% / 50% then OIL reserve the right to award on lowest eligible PP-LC bidder for quantity not less than 50%, as may be dividable.

For example
In case tendered quantity is 3 (not divisible in the ratio of 50:50), PP-LC bidder shall get order for 2 nos. only and the rest will go to L-1 (NLC bidder).

20.5 The tendered quantity is not split able / non-dividable / cannot be procured from multiple sources. Hence, the entire procurement value shall be awarded to the lowest techno-commercially qualified LC bidder subject to matching with valid NLC L1 rates.

20.6 For the purpose of this policy, all terms used vide aforesaid policy shall be governed by the definitions specified at para 2 of the policy document notified by MoPNG vide letter No. O-27011/44/2015-ONG/II/FP dated 25.04.2017.

20.7 The successful bidder shall be obliged to fulfill the requirements of quality and delivery time in accordance with the provisions of the Purchase order/contract.

20.8 OIL shall have the right to satisfy itself of the production capability and product quality of the manufacturer.

20.9 Determination of LC:

20.9.1 LC of Services shall be calculated on the basis of the ratio of service cost of domestic component in service to the total cost of services.

20.9.2 The total cost of service shall be constituted of the cost spent for rendering of service, covering:

a) Cost of component (material), which is used.
b) Manpower and consultant cost, cost of working equipment/facility, and
c) General Service cost, excluding profit, company overhead cost, taxes and duties.

20.9.3 The criteria for determination of cost of local content in the service shall be as under:

a) In the case of material being used to help the provision of service, based on country of origin.
b) In the case of manpower and consultant based on INR component of the services contract.
c) In the case of working equipment/facility, based on country of origin and
d) In the case of general service cost, based on the criteria as mentioned in clauses a, b and c above.
e) Indian flag vessels in operation as on date.

20.9.4 Determination of Local Content: The determination of local content of the working equipment/facility shall be based on the following provision.

Working equipment produced in the country is valued as 100% (one hundred percent) local content, working equipment produced abroad is valued as much as nil (0% percent) local content.

20.10 Calculation of LC and Reporting:

20.10.1 LC shall be calculated on the basis of verifiable data. In the case of data used in the calculation of LC being not verifiable, the value of LC of the said component shall be treated as Nil.

20.10.2 Formats for the calculation of LC of services may be seen at Enclosure-III of the policy document. (Available in http://oil-india.com/PDF/Circular%20dt%2027062017-PPLC.pdf).

20.11 Certification and Verification:

20.11.1 Bidder seeking Purchase Preference under the policy, shall be obliged to verify the LC of goods as follows:

20.11.2 At bidding stage:

a) Price Break-up

(i) The bidder shall provide break-up of "Local Component" and "Imported Component" along with the price bid as per provisions under clause **20.2.3.**

(ii) Bidder must have LC in excess of the specified requirement.

b) Undertaking by the bidder

i. The bidder shall submit undertaking along with the techno-commercial bid as per Clause No. **20.2**, such undertaking shall become a part of the contract.

ii. Bidder shall also submit the list of items / services to be procured from Indian manufacturers / service providers.

c) Statutory Auditor's Certificate

The Undertaking submitted by the bidder shall be supported by a certificate from Statutory Auditor as per clause **20.2.2**.

20.11.3 After Contract Award

a) In the case of procurement cases with the value less than Rs. 5 crore (Rupees Five Crore), the LC content may be calculated (self-assessment) by the contractor and certified by the Director/Authorized Representative of the Company.

b) The verification of the procurement cases with the value Rupees Five Crore and above shall be carried out by a Statutory Auditor engaged by the bidder.

20.12 Each supplier shall provide the necessary local content documentation to the statutory auditor, which shall review and determine the local content requirements have been met and issue of local content certificate to that effect on behalf of OIL, stating the percentage of local content in the good or service measured. The Auditor shall keep all necessary information obtained from suppliers for measurement of Local Content confidential.

20.13 The Local Content certificate shall be submitted along with each invoice raised. However, the % of local content may vary with invoice while maintaining the overall % of Local Content for the total work/purchase of the pro-rata Local Content requirement. In case, it is not satisfied cumulatively in the invoices raised up to that stage, the supplier shall indicate how the local content requirement would be met in the subsequent stages.

20.14 Where currency quoted by the bidder is other than Indian Rupee then the bidder claiming benefits under PP-LC shall consider exchange rate prevailing on the date of notice inviting tender (NIT) for the calculation of Local Content.

20.15 OIL shall have the authority to audit as well as witness production processes to certify the achievement of the requisite local content.

20.16 Sanctions:

20.16.1 OIL shall impose sanction on bidder not fulfilling LC of goods/services in accordance with the value mentioned in certificate of LC.

20.16.2 If the bidder does not fulfill his obligation after the expiration of the period specified in such warning, OIL shall initiate action for blacklisting such bidder/ successful bidder.

20.16.3 A bidder who has been awarded the contract after availing Purchase Preference is found to have violated the LC provision, in the execution of the procurement contract of goods and/or services shall be subject to financial penalty over and above the PBG value prescribed in the contract and shall not be more than an amount equal to 10% of the Contract Price.

20.16.4 In pursuance of the Clause No. **20.16.3** above, towards fulfillment of conditions pertaining to Local Contents in accordance with the value mentioned in the certificate of LC, the bidder shall have to submit additional Bank Guarantee (As per Proforma-VIII) equivalent to the amount of PBG.

1.0 BID EVALUATION CRITERIA:

The bid shall conform to the specifications and terms and conditions given in the Bidding Documents. Bids will be rejected in case material and services offered do not conform to the required parameters stipulated in the technical specifications. Notwithstanding the general conformity of the bid to the stipulated specifications, the following requirements will have to be particularly met by the Bidders without which the same will be considered as non-responsive and will not be considered for evaluation. All the documents related to BEC shall be submitted along with the Technical Bid.

1.1 Technical Criteria:

1.1.1 Bidder must have experience of at least one **SIMILAR work** of value **6,30,75,716.00 (Rupees Six Crore Thirty Lakh Seventy-Five Thousand Seven Hundred Sixteen)** only in previous 07 (seven) years reckoned from the original bid closing date with PSUs / Central Government / State Government Organization / Public Limited Company.

OR

Bidder must have successfully completed at least 02 (two) Nos. of **SIMILAR Work** in previous 07 (seven) years as reckoned from the original bid closing date with PSUs / Central Government / State Government Organization / Public Limited Company.

1.1.2 Bidder must have experience of successful completion of civil construction of office building or residential building or substation building in previous 07 (seven) years reckoned from the original bid closing date with PSUs / Central Government / State Government Organization / Public Limited Company.

1.1.3 Bidder must have experience of supply, installation and commissioning of 11 kV substation or of a higher system voltage in previous 07 (seven) years reckoned from the original bid closing date with PSUs / Central Government / State Government Organization/Public Limited Company involving:

a. Minimum 01 (one) No. of Transformer of rating 11 kV, 500 kVA and above.
b. Minimum 06 (six) Nos. 11 kV, VCB Panels.
c. Minimum 01 (one) No. PCC/ PMCC/ LT Switchboards comprising of Air Circuit Breakers/MCCBs.
d. Minimum 3000 m, 3/4 core XLPE, HT/LT cables or 3 km, 11 kV or higher voltage overhead lines with ACSR conductor.

1.1.4 The Bidder must have an Electrical Contractors' License issued or recognized by the Electrical Licensing Board, Government of Assam. This Electrical Contractor's license shall be valid as on original bid closing date. Bidder must submit a copy of valid Electrical Contractors' License in support of above.

OR

Bidder having valid Electrical Contractors' License issued by any State Government Electrical Licensing Board of India other than that of Assam have to provide an undertaking stating that on award of contract to them they will submit either a valid Electrical Contractors' License issued by Electrical Licensing Board, Government of Assam in their name or get their Electrical Contractors' License recognized / endorsed by Electrical Licensing Board, Government of Assam for executing the job at Assam within 30 days from date of award of the contract and the same will be subsequently renewed till the completion of the contract.

Notes to BEC Clause No. 1.1:

1. "**SIMILAR work**" mentioned in Clause No. 1.1.1 above means "Experience in successful completion of job of voltage level 11 kV and above for substation and its associated transmission and distribution overhead lines / cables."

2. If the prospective bidder is executing **SIMILAR work** which is still running and the value of **SIMILAR work** executed prior to due date of bid submission is equal to or more than the minimum prescribed value / quantity in the BEC, such experience will also be taken in to consideration provided that the bidder has submitted satisfactory work execution certificate/last certificate of payment showing gross value of work done along with Contract documents / Work Order of the running contract.

3. In case the start date of the **SIMILAR work** is prior to the prescribed 07 (Seven) years reckoned from the original bid closing date but completion is within the prescribed 07 (Seven) years reckoned from the original bid closing date then such experience will also be taken into consideration provided that the bidder has submitted a certificate issued by a practicing Chartered / Cost Accountant Firm (with Membership Number & Firm Registration Number) indicating the contract value / quantity executed under **SIMILAR work** within the prescribed period of 07 (seven) years reckoned from the original bid closing date.

4. If the prospective bidder has executed contract(s) in which **works mentioned under technical criteria** are a component, then such experience will also be taken into consideration provided that the bidder submits the breakup of value/quantity of work executed and certified by the end user.

5. For proof of requisite experience of **SIMILAR work** (mentioned in **Clause No. 1.1.1**) and **Clause Nos. 1.1.2 & 1.1.3**, **self-attested** photocopies of following documents must be submitted along with the bid: Contract documents / Purchase Order / Work order showing details of works supported with Completion Certificate issued by PSUs/Govt. organisation/Public limited companies for the **SIMILAR work** (mentioned in **Clause No. 1.1.1**) and **Clause Nos. 1.1.2 & 1.1.3** above confirming the following:

    a. Gross value - if the bidder quotes on the strength of "value of work done"

    OR

    Quantum of the job - if the bidder quotes on the strength of "quantum of work done".

    b. Nature of Job done.
    c. Contract period / Contract start and completion date.

6. **Works mentioned under technical criteria** executed by a bidder for its own organization / subsidiary will not be considered as experience for the purpose of meeting BEC.

1.2 Financial Criteria:

(i) Annual Financial Turnover of the bidder in any of preceding 03 (three) financial / accounting years, reckoned from the original bid closing date should be at least **Rs. 3,15,37,900.00 (Rupees Three Crore Fifteen Lakh Thirty-Seven Thousand Nine Hundred)** only.

(ii) In case of Consortium of companies, the Annual Financial Turnover of at least one member of the consortium in any of preceding 03 (three) financial / accounting years, reckoned from the original bid closing date should be at least **Rs. 3,15,37,900.00 (Rupees Three Crore Fifteen Lakh Thirty-Seven**

Thousand Nine Hundred) only and the other members of consortium should have Annual Financial Turnover of at least **Rs. 1,57,69,000.00 (Rupees One Crore Fifty-Seven Lakh Sixty-Nine Thousand)** only in any of preceding 03 (three) financial / accounting years, reckoned from the original bid closing date.

(iii) Net worth of bidder must be positive for preceding financial / accounting year.

Notes to BEC Clause No. 1.2:

A. For proof of Annual Turnover & Net worth any one of the following document must be submitted along with the bid:

(i) A certificate issued by a practicing Chartered /Cost Accountant* (with Membership Number and Firm Registration Number), certifying the Annual turnover & Net worth as per format prescribed in **PROFORMA- I.**

OR

(ii) Audited Balance Sheet along with Profit & Loss account.
*In case the bidder is a Central Govt. organization / PSU /State Govt. organization / Semi-State Govt. Organization or any other Central / State Govt. Undertaking, where the auditor is appointed only after the approval of Comptroller and Auditor General of India and the Central Government, their certificates may be accepted even though FRN is not available. However, bidder to provide documentary evidences for the same.

B. Considering the time required for preparation of Financial Statements, if the last date of preceding financial / accounting year falls within the preceding six months reckoned from the original bid closing date and the Financial Statements of the preceding financial / accounting year are not available with the bidder, then the financial turnover of the previous three financial / accounting years excluding the preceding financial / accounting year will be considered. In such cases, the Net worth of the previous financial / accounting year excluding the preceding financial / accounting year will be considered. However, the bidder has to submit an affidavit/undertaking certifying that 'the balance sheet/Financial Statement for the financial year ..... has actually not been audited so far'.

1.3 BID FROM CONSORTIUM OF COMPANIES:

Bids can be submitted by an individual Firm / Company or by a Consortium of Firms / Companies. In case the bidder is a Consortium of Firms / Companies, then the bidder must comply by the following criteria for participating in the bidding process:

(i) A consortium may comprise of a maximum of 03 (three) Nos. of firms / companies as partner meeting the following requirements:

a) The Leader of the Consortium must satisfy at least Clause Nos. 1.1.1 & 1.1.4. The remaining clauses under technical criteria i.e. Clause Nos. 1.1.2 & 1.1.3 may be satisfied by the other members of the consortium. Supporting documents must be submitted as per Point No. 5 under **Notes to BEC Clause No. 1.1**.

b) Also, **the consortium** shall have to meet the financial criteria as per Clause Nos. 1.2 (ii) & (iii)*. Supporting documents must be submitted as per **Notes to BEC Clause No. 1.2**.

*Note: **Net worth** of all the members of the consortium must be positive for preceding financial / accounting year.

(ii) Consortium bids shall have to be submitted along with '**Memorandum of Understanding (MoU)**' between the consortium members duly signed by the authorized representative of the consortium members clearly defining the role / scope of work of each partner / member and identifying the Leader of consortium. The MoU must state that all the members of the consortium shall be jointly and severally responsible for discharging all obligations under the Contract. MoU should be addressed to the Company, clearly stating that it shall be applicable to this Tender and shall remain valid for the entire contract period, including extensions, if any. Also, the MoU should be duly Notarized by Notary person. The consortium MoU and notarisation thereof shall be executed before the original bid closing date.

However, the Leader of the Consortium must submit an undertaking along with the technical bid towards Unconditional acceptance of full responsibility for executing the "Scope of Work" of this tender document.

The following provisions should also be incorporated in the MOU executed by the members of the Consortium:

a) Only the Leader of the consortium shall buy the bid document and submit bid on behalf of the consortium. The other members of the Consortium shall ratify all the acts and decisions of the Leader of Consortium, which are taken in connection with and/or during the evaluation of the tender and execution of the contract.

b) The Bid Security shall be in the name of the Leader of the consortium on behalf of consortium with specific reference to consortium bid and name & address of consortium members. Similarly, the Performance Security shall be in the name of the Leader on behalf of the consortium.

c) The leader of the consortium on behalf of the consortium shall coordinate with OIL during the period the bid is under evaluation as well as during the execution of works in the event contract is awarded and he shall also be responsible for resolving dispute / misunderstanding / undefined activities, if any, amongst all the consortium members.

d) Any correspondence exchanged with the leader of consortium shall be binding on all the consortium members.

e) Payment shall be made by OIL only to the leader of the consortium towards fulfilment of contract obligations.

f) Consortium bid shall be digitally signed by the leader of Consortium. The Power of Attorney from each member authorising the leader for signing and submission of Bid on behalf of individual member must accompany the Bid offer.

g) Members of the consortium are not allowed to quote separately / independently against this tender. All the bids received in such case will be summarily rejected.

h) **Signing of Contract**: In the event of award of contract to the consortium, the contract shall be signed by all the members of the consortium and the liability of each one of them shall be jointly and severally.

1.4 Prices shall be opened in respect of only the techno-commercially acceptable bidders whose bids have been found to be substantially responsive. A substantially responsive bid is one that meets the terms and conditions of the Tender and / or the acceptance of which bid will not result in indeterminate liability on OIL.

1.5 Bidders are required to quote for all the items as per Price Bid Format; otherwise the offer of the bidder will be straightway rejected.

1.6 If there is any discrepancy between the unit price and the total price, the unit price will prevail and the total price shall be corrected. Similarly, if there is any discrepancy between words and figure, the amounts in words shall prevail and will be adopted for evaluation.

1.7 The quantities shown against each item in the "Price Bid Format" shall be considered for the purpose of Bid Evaluation. It is, however, to be clearly understood that the assumptions made in respect of the quantities for various operations are only for the purpose of evaluation of the bid and the Contractor will be paid on the basis of the actual number of days/parameter, as the case may be.

1.8 Price Bids will be evaluated on overall lowest cost basis (L-1 offer) i.e. considering the Net Total amount* as per Price Bid Format.

***Note:** The rate quoted (exclusive of GST) against Line Item No. 90 of the SOQ (Part-II) of tender document will be deducted from the Total amount quoted (inclusive of all liabilities and GST) against Line Item Nos. 10 to 80 of the SOQ (Part-II) of tender document to obtain the Net Total amount.

1.9 Based on the evaluation of techno-commercially qualified bidders, the job will be awarded to L-1 bidder.

1.10 The bidders are advised not to offer any discount/rebate separately and to offer their prices in the Price Bid Format after considering discount/rebate, if any.

1.11 Conditional and unsolicited discount will not be considered in evaluation. However, if such bidder happens to be the lowest recommended bidder, unsolicited discount without any condition will be considered for computing the contract price.

1.12 In case of identical overall lowest offered rate by more than 01 (one) bidder, the selection will be made by draw of lot between the parties offering the same overall lowest price.

1.13 PURCHASE PREFERENCE POLICY (LINKED WITH LOCAL CONTENT) (PP-LC):

1.13.1 Purchase preference policy-linked with Local Content (PP - LC) notified vide Letter No. O-27011/44/2015-ONG-II/FP dated 25.04.2017 of MoP&NG shall be applicable in this tender. (http://petroleum.nic.in/policy-provide-purchase-preference-linked-local-content-pp-lc-all-psus).

1.13.2 Bidders seeking benefits, under Purchase Preference Policy (linked with Local Content) (PP-LC) shall have to comply with all the provisions specified all clauses under Clause No. 20 of ITB and shall have to submit all undertakings / documents applicable for this policy.

2.0 BID REJECTION CRITERIA (BRC):

2.1 The bids are to be submitted in **Single-Stage Two-Bid system** i.e. Un-priced Techno-Commercial Bid and Price Bid together. Only the Price Bid should contain the quoted price.

2.2 The price quoted by the successful bidder must be firm during the performance of the contract and not subject to variation on any account except as mentioned in the bid document. Any bid submitted with adjustable price quotation other than the above will be treated as non-responsive and rejected.

2.3 Bid security shall be furnished as a part of the Techno Commercial Un-priced Bid. The amount of bid security should be as specified in the forwarding letter. Any bid not accompanied by a proper bid security will be rejected.

Note: In case the Bidder submits Bid security in the form of Bank Guarantee (BG); the BG must be valid for minimum **150 days** from the date of Technical bid opening.

2.4 Bid Documents / User Id & Password for OIL's E-Tender portal are not transferable. Bid made by parties who have not submitted the requisite tender fees will be rejected.

2.5 Any bid received in the form of Physical document/Telex/Cable/Fax/E-mail will not be accepted.

2.6 Bids shall be typed or written in indelible ink. The bidder or his authorized representative shall sign the bid digitally, failing which the bid will be rejected.

2.7 Bids shall contain no interlineations, erasures or overwriting except as necessary to correct errors made by bidder, in which case such corrections shall be initiated by the persons(s) signing (digitally) the bid. However, white fluid should not be used for making corrections. Any bid not meeting this requirement shall be rejected.

2.8 Any bid containing false statement will be rejected and action will be taken by Company as per Bid Document.

2.9 Bids are invited under Single-Stage Two-Bid System. Bidders must submit both "Technical" and "Price" Bids in electronic form through online OIL's e-Tender portal accordingly within the Bid Closing Date and time stipulated in the e-Tender. The Technical Bid is to be submitted as per Scope of Work & Technical Specifications of the tender under "Technical Attachment" Tab and the Priced Bid as per the **PRICE BID FORMAT attached** under "Notes and Attachments".

2.10 Bidder must accept and comply with the following provisions as given in the Tender Document in toto, failing which offer will be rejected:

- **(i)** Firm price
- **(ii)** Period of validity of Bid
- **(iii)** Price Schedule
- **(iv)** Performance Bank Guarantee / Security deposit
- **(v)** Delivery / Completion Schedule
- **(vi)** Scope of work
- **(vii)** Guarantee of material / work
- **(viii)** Liquidated Damages clause
- **(ix)** Tax liabilities
- **(x)** Arbitration / Resolution of Dispute Clause

(xi) Force Majeure
(xii) Applicable Laws
(xiii) Specifications
(xiv) Integrity Pact

2.11 There should not be any indication of price in the Un-priced Techno-Commercial Bid. A bid will be straightway rejected if this is given in the Un-priced Techno-Commercial Bid.

2.12 Bid received with validity of offer less than **120 (One Hundred Twenty) days** from the date of Technical Bid opening will be rejected.

2.13 The Integrity Pact is applicable against this tender. OIL shall be entering into an Integrity Pact with the bidders as per format enclosed vide **Part-VI** of the tender document. This Integrity Pact Proforma has been duly signed digitally by OIL's competent signatory. The Proforma has to be returned by the bidder (along with the Un-priced Techno-Commercial Bid) duly signed (digitally) by the same signatory who signed the bid, i.e., who is duly authorized to sign the bid. Uploading the Integrity Pact with digital signature will be construed that all pages of the Integrity Pact has been signed by the bidder's authorized signatory who sign the Bid.

3.0 GENERAL:

3.1 In case bidder takes exception to any clause of bidding document not covered under BEC/BRC, then the Company has the discretion to load or reject the offer on account of such exception if the bidder does not withdraw / modify the deviation when / as advised by company. The loading so done by the company will be final and binding on the bidders. No deviation will however be accepted in the clauses covered under BRC.

3.2 To ascertain the substantial responsiveness of the bid the Company reserves the right to ask the bidder for clarification in respect of clauses covered under BEC/BRC also and such clarifications fulfilling the BEC/BRC clauses in toto must be received or before the deadline given by the company, failing which the offer will be will be evaluated based on the submission. However, mere submission of such clarification shall not make the offer responsive, unless company is satisfied with the substantial responsiveness of the offer.

3.3 If any of the clauses in the BRC contradict with other clauses of bidding document elsewhere, the clauses in the BRC shall prevail.

3.4 Bidder(s) must note that requisite information(s)/financial values etc. as required in the BEC/BRC & Tender are clearly understandable from the supporting documents submitted by the Bidder(s); otherwise Bids shall be rejected.

3.5 OIL will not be responsible for delay, loss or non-receipt of applications for participating in the bid sent by mail and will not entertain any correspondence in this regard.

3.6 The originals of such documents [furnished by bidder(s)] shall have to be produced by bidder(s) to OIL as and when asked for.

OIL INDIA LIMITED
(A GOVT. OF INDIA ENTERPRISE)
CONTRACTS DEPARTMENT, DULIAJAN
DISTRICT: DIBRUGARH (ASSAM), PIN-786602
TEL: (91) 374-2800548, FAX: (91) 374-2803549
Website: www.oil-india.com

DESCRIPTION OF WORK/SERVICES:
Design and construction of 03 Nos. of substation building and 01 No. of Switch room including supply, installation, testing and commissioning of electrical equipment of 03 Nos. 11KV/415V substation and 01 No. of 11KV/415V Switch room at Duliajan on LSTK basis.

GENERAL CONDITIONS OF CONTRACT (GCC)

A. DEFINITIONS:

In the contract, the following terms shall be interpreted as indicated:

(a) "**The Contract**" means agreement entered into between Company and Contractor, as recorded in the contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein;

(b) "**The Contract Price**" means the price payable to Contractor under the contract for the full and proper performance of its contractual obligations;

(c) "**The Work**" means each and every activity required for the successful performance of the services described in Section II, the Terms of Reference.

(d) "**Company**" or "**OIL**" means Oil India Limited;

(e) "**Contractor**" means the Contractor performing the work under this Contract.

(f) "**Contractor's Personnel**" means the personnel to be provided by the Contractor to provide services as per the contract.

(g) "**Company's Personnel**" means the personnel to be provided by OIL or OIL's Contractor (other than the Contractor executing the Contract). The Company representatives of OIL are also included in the Company's personnel.

(h) "**Gross Negligence**" means any act or failure to act (whether sole, joint or concurrent) by a person or entity which was intended to cause, or which was in reckless disregard of or wanton indifference to, avoidable and harmful consequences such person or entity knew, or should have known, would result from such act or failure to act. Notwithstanding the foregoing, Gross negligence shall not include any action taken in good faith for the safeguard of life or property.

(i) "**Wilful Misconduct**" means intentional disregard of good and prudent standards of performance or proper conduct under the Contract with knowledge that it is

likely to result in any injury to any person or persons or loss or damage of property.

WITNESSETH:

1.0 a) The contractor hereby agrees to carry out the work set down in the Schedule of work which forms part-II of this Contract in accordance with the 1968 General Conditions of Contract of Oil India Limited and General Specifications read in conjunction with any drawings and Particular Specifications & instructions which forms Part-III of the contract utilizing any materials/services as offered by the Company as per Part-IV of the contract in **Electrical Department, Oil India Limited**.

b) In this Contract all words and expressions shall have the same meaning as are respectively assigned to them in the 1968 General Conditions of Contract of Oil India Limited which the Contractor has perused and is fully conversant with before entering into this Contract.

c) The clauses of this contract and of the specifications set out hereunder shall be paramount and in the event of anything herein contained being inconsistent with any term or terms of the 1968 General Conditions of Contract of Oil India Limited, the said term or terms of the 1968 General conditions of Contract to the extent of such inconsistency, and no further, shall not be binding on the parties hereto.

2.0 The contractor shall provide all labour, supervision and transport and such specified materials described in part-II of the Contract including tools and plants as necessary for the work and shall be responsible for all royalties and other levies and his rates shall include for these. The work executed and materials supplied shall be to the satisfaction of the Company's Engineer and Contractor's rates shall include for all incidental and contingent work which although not specifically mentioned in this contract are necessary for its completion in a sound and workman like manner.

3.0 The Company's Engineer shall have power to:

a) Reduce the rates at which payments shall be made if the quality of work although acceptable is not up to the required standard set forth in the OIL Standard Specifications which have been perused and fully understood by the Contractor.

b) Order the Contractor to remove any inferior material from the site and to demolish or rectify any work of inferior workmanship, failing which the Company's Engineer may arrange for any such work to be demolished or rectified by any other means at the Contractor's expenses.

c) Order the Contractor to remove or replace any workman who he (The Engineer) considers incompetent or unsuitable; the Engineer's opinion as to the competence and suitability of any workman engaged by the Contractor shall be final and binding on the Contractor.

d) Issue to the Contractor from time to time during the progress of the work such further drawings and instructions as shall be necessary for the purpose of proper and adequate execution and maintenance of the works and the Contractor shall carry out and be bound by the same.

e) Order deviations in Part II and III of this Contract. All such deviation orders shall be in writing and shall show the financial effect, if any, of such deviation and whether any extra time is to be allowed.

4.0 The Contractor shall have no claim against the company in respect of any work which may be withdrawn but only for work actually completed under this contract. The contractor shall have no objection to carry out work in excess of the quantities stipulated in Part-II if so ordered by the company at the same rates, terms and conditions.

5.0 The Company reserves the right to cancel this Contract at any time upon full payment of work done and the value of the materials collected by the contractor for permanent incorporation in the work under this contract particularly for execution of this contract up to the date of cancellation of the Contract. The valuation of the work done and the materials collected shall be estimated by the company's Engineer in presence of the contractor. The Contractor shall have no claim to any further payment whatsoever. The valuation would be carried out exparte if Contractor fails to turn up despite reasonable notice which will be binding on the Contractor.

6.0 The Contractor hereby undertakes to indemnify the Company against all claims which may arise under the under noted Acts:

i) The Mines Act.
ii) The Minimum Wages Act, 1948.
iii) The Workman's Compensation Act, 1923.
iv) The Payment of wages Act, 1936.
v) The Payment of Bonus Act, 1965.
vi) The Contract Labour (Regulation & Abolition) Act, 1970 and the rules framed there under.
vii) Employees' Pension Scheme, 1995.
viii) Inter-State Migrant (Regulation of Employment and Condition of Service) Act. 1979.
ix) The Employees Provident Fund and Miscellaneous Provisions Act, 1952.
x) GST Act.

or any other Acts or Statute not here in above specifically mentioned having bearing over engagement of workers directly or indirectly for execution of work. The Contractor shall not make the Company liable to reimburse the Contractor for the statutory increase in the wage rates of the Contract Labour appointed by the Contractor. Such Statutory increase in the wage rates of Contract Labour shall be borne by the contractor.

7.0 The Contractor shall clear away all rubbish and surplus material from the site on completion of work and shall leave the site clean and tidy.

8.0 The duration of the contract shall be initially for a period of **02 (two)** years from commencement of the Contract i.e. after completion of mobilization. The Contractor must complete the work as mentioned in PART – III (SPECIAL CONDITIONS OF CONTRACT: SCC) within the contract period. In the event of there being undue delay in execution of the Contract, the Company reserves the right to cancel the Contract and/or levy such additional damages as it deems fit based on the actual loss suffered by the company attributable to such delay. The company's decision in this regard shall be final.

9.0 In order to promote, safeguard and facilitate the general operational economic in the interest of the Company during the continuance of this contract the Contractor hereby agrees and undertakes not to take any direct or indirect interest and or support, assist, maintain or help any person or persons engaged in antisocial activities, demonstration,

riots, or in any agitation prejudicial to the Company's interest and any such even taking shape or form at any place of the Company's works or and its neighborhood.

10.0 The tendered price inclusive of all liabilities and GST (i.e. the Contract price) is Rs. _____ *(**Not to be filled up by bidder while submitting the offer in c-Folder. This figure will be filled up by OIL at the time of award of the contract to the successful bidder**)* (_____ only) but the Company shall pay the Contract or only for actual work done at the all-inclusive rates set down in the Schedule of work Part II of this Contract.

Payment may be made, not often than monthly, up to **100%** of the value of work done wherein retention money is not involved. Final payment will be made only after satisfactory completion of the work. Such final payment shall be based on the work actually done allowing for deviations and any deductions and the measurement shall be checked and certified correct by the Company's Engineer before any such final payment is made.

11.0 The contractor employing **20 (twenty)** or more workmen on any day preceding 12 months shall be required to obtain requisite license at his cost from the appropriate Licensing Officer before undertaking any Contract work. The Contractor shall also observe the rules & regulations framed under the Contract Labour (Regulation & Abolition) Act.

12.0 The Contractor will not be allowed to construct any structure (for storage/housing purpose) with thatch, bamboo or any other inflammable materials within any company's fenced area.

13.0 The Contractor shall ensure that all men engaged by him/her are provided with appropriate protective clothing and safety wear in accordance with regulation 89(a) and 89(b) in the Oil Mines Regulations 1984. The Company's representative shall not allow/accept those men who are not provided with the same.

14.0 The Contractor shall deploy local persons in all works.

15.0 The Contractor shall not engage minor labour below 18 (eighteen) years of age under any circumstances.

16.0 The Contractor and his/her workmen shall strictly observe the rules and regulations as per Mines Act (Latest editions).

17.0 GENERAL OBLIGATIONS OF COMPANY:

COMPANY shall, in accordance with and subject to the terms and conditions of this contract:

i) Pay the Contractors in accordance with terms and conditions of the contract.
ii) Allow access to Contractors and their personnel, subject to normal security and safety procedures, to all areas as required for orderly performance of the work.

18.0 SPECIAL CONDITIONS:

~~a) The amount of retention money shall be released after 6 (six) months from the date of issue of completion certificate from concerned department.~~

b) The contractor will be required to allow OIL Officials to inspect the work site and documents in respect of the workers' payment.

c) Contractor(s) whosoever is liable to be covered under the P.F. Act and contract cost is inclusive of P.F., must ensure strict compliance of provisions of Provident Fund and Miscellaneous Provisions Act, 1952 in addition to the various Acts mentioned elsewhere in this contract. Any contractor found violating these provisions will render themselves disqualified from any future tendering. As per terms of the contract, if applicable, the Contractor must deposit Provident Fund Contribution (covering Employee's & Employer's share) with the competent authority monthly under their direct code. The Contractor shall be required to submit documentary evidence of deposit of P.F. Contribution to the Company. In case of failure to provide such documentary evidence, the Company reserves the right to withhold the amount equivalent to applicable P.F. Contribution.

19.0 ARBITRATION:

19.1 ARBITRATION (APPLICABLE FOR SUPPLIERS/CONTRACTORS OTHER THAN PSU)

Except as otherwise provided elsewhere in the contract, if any dispute, difference, question or disagreement arises between the parties hereto or their respective representatives or assignees, in connection with construction, meaning, operation, effect, interpretation of the contract or breach thereof which parties are unable to settle mutually, the same shall be referred to Arbitration as provided hereunder:

a) A party wishing to commence arbitration proceeding shall invoke Arbitration Clause by giving 30 days' notice to the other party. The notice invoking arbitration shall specify all the points of dispute with details of the amount claimed to be referred to arbitration at the time of invocation of arbitration and not thereafter. If the claim is in foreign currency, the claimant shall indicate its value in Indian Rupee for the purpose of constitution of the arbitral tribunal.

b) The number of arbitrators and the appointing authority will be as under:

Claim amount (excluding claim for interest and counter claim, if any)	Number of Arbitrator	Appointing Authority
Up to Rs. 5 Crore	Sole Arbitrator	OIL
Above Rs. 5 Crore	3 Arbitrators	One Arbitrator by each party and the 3rd Arbitrator, who shall be the presiding Arbitrator, by the two Arbitrators.

c) The parties agree that they shall appoint only those persons as arbitrators who accept the conditions of the arbitration clause. No person shall be appointed as Arbitrator or Presiding Arbitrator who does not accept the conditions of the arbitration clause.

d) Parties agree that there will be no objection if the Arbitrator appointed holds equity shares of OIL and/or is a retired officer of OIL/any PSU. However, neither party shall appoint its serving employees as arbitrator.

e) If any of the Arbitrators so appointed dies, resigns, becomes incapacitated or withdraws for any reason from the proceedings, it shall be lawful for the concerned party/arbitrators to appoint another person in his place in the same manner as aforesaid. Such person shall proceed with the reference from the stage where his predecessor had left if both parties consent for the same; otherwise, he shall proceed de novo.

f) Parties agree that neither shall be entitled for any pre-reference or pendente-lite interest on its claims. Parties agree that any claim for such interest made by any party shall be void.

g) The arbitral tribunal shall make and publish the award within time stipulated as under:

Amount of Claims and counter claims(excluding interest)	Period for making and publishing of the award (counted from the date of first meeting of the Arbitrators)
Up to Rs. 5 Crore	Within 8 months
Above Rs. 5 Crore	Within 12 months

The above time limit can be extended by Arbitrator, for reasons to be recorded in writing, with the consent of the other parties.

h) If after commencement of the arbitration proceedings, the parties agree to settle the dispute mutually or refer the dispute to conciliation, the arbitrators shall put the proceedings in abeyance until such period as requested by the parties.

i) Each party shall be responsible to make arrangements for the travel and stay etc. of the arbitrator pointed by it. Claimant shall also be responsible for making arrangements for travel/stay arrangements of the Presiding Arbitrator and the expenses incurred shall be shared equally by the parties.
In case of sole arbitrator, OIL shall make all necessary arrangements for his travel, stay and the expenses incurred shall be shared equally by the parties.

j) The Arbitration shall be held at **Duliajan, Assam**. However, parties to the contract can agree for a different place for the convenience of all concerned.

k) The Arbitrator(s) shall give reasoned and speaking award and it shall be final and binding on the parties.

l) Subject to aforesaid, provisions of the Arbitration and Conciliation Act, 1996 and any statutory modifications or re-enactment thereof shall apply to the arbitration proceedings under this clause.

19.2 ARBITRATION (APPLICABLE IN CASE OF CONTRACT AWARDED ON PUBLIC SECTOR ENTERPRISE):

In the event of any dispute or difference relating to, arising from or connected with the Contract, such dispute or difference shall be referred by either party to the arbitration of one of the Arbitrators in the Department of Public Enterprises, to be nominated by the Secretary to the Government of India, In-Charge of the Bureau of Public Enterprises. The Arbitration and Conciliation Act 1996 shall not be applicable to the Arbitration under this clause. The award of the Arbitrator shall be binding upon the parties to the dispute, provided however, any party aggrieved by such award may make a further reference for setting aside or revision of the award to the Law Secretary, Deptt. of Legal Affairs, Ministry of Law and Justice, Government of India. Upon such reference, the dispute shall be decided by the Law Secretary or the Special Secretary/Additional Secretary, whose decision shall bind the parties finally and conclusively. The parties in the dispute will share equally the cost of the arbitration as intimated by the Arbitrator.

The venue of all arbitrations under both 19.1 & 19.2 will be **Duliajan, Assam**. The award made in pursuance thereof shall be binding on the parties.

20.0 FORCE MAJEURE:

20.1 In the event of either party being rendered unable by 'Force majeure' to perform any obligations required to be performed by them under the contract the relative obligations of the party affected by such 'Force Majeure' shall upon notification to the other party be suspended for the period during which force majeure event lasts. The cost and loss sustained by the either party shall be borne by the respective parties.

The term 'Force Majeure' as employed herein shall mean acts of God, earthquake, war (declared/undeclared) revolts, riots, fires, floods, rebellions, explosions, hurricane, sabotage, civil commotions, and acts and regulations of respective Govt. of the two parties, namely the Company and the contractor.

20.2 Upon the occurrence of such cause(s) and upon its termination, the party alleging that it has been rendered unable as aforesaid thereby, shall notify the other party in writing immediately but not later than 72 (Seventy-two) hours of the alleged beginning and ending thereof giving full particulars and satisfactory evidence in support of its claim.

Time for performance of the relative obligations suspended by the force majeure shall then extended by the period for which such cause lasts.

20.3 Should 'force majeure' condition as stated above occurs and should the same be notified within Seventy-Two (72) hours after its occurrence the 'force majeure' rate shall apply for the first fifteen days. Parties will have the right to terminate the Contract if such 'force majeure' conditions continue beyond fifteen (15) days with prior written notice. Should either party decide not to terminate the Contract even under such condition, no payment would apply after expiry of fifteen (15) days force majeure period unless otherwise agreed to.

21.0 TERMINATION:

21.1 TERMINATION ON EXPIRY OF THE TERMS (DURATION): The contract shall be deemed to have been automatically terminated on the expiry of duration of the Contract or the extension period, if exercised by Company under the provision of the Contract.

21.2 TERMINATION ON ACCOUNT OF FORCE MAJEURE: Either party shall have the right to terminate this Contract on account of Force Majeure as set forth in Article 20.0 above.

21.3 TERMINATION ON ACCOUNT OF INSOLVENCY: In the event that the Contractor or its collaborator at any time during the term of the Contract, becomes insolvent or makes a voluntary assignment of its assets for the benefit of creditors or is adjudged bankrupt, then the Company shall, by a notice in writing have the right to terminate the Contract and all the Contractor's rights and privileges hereunder, shall stand terminated forthwith.

21.4 TERMINATION FOR UNSATISFACTORY PERFORMANCE: If the Company considers that, the performance of the Contractor is unsatisfactory, or not up to the expected standard, the Company shall notify the Contractor in writing and specify in details the cause of the dissatisfaction. The Company shall have the option to terminate the Contract by giving 15 days' notice in writing to the Contractor, if Contractor fails to comply with the requisitions contained in the said written notice issued by the Company.

21.5 TERMINATION DUE TO CHANGE OF OWNERSHIP & ASSIGNMENT: In case the Contractor's rights and/or obligations under this Contract and/or the Contractor's rights, title and interest to the equipment/material, are transferred or assigned without the Company's consent, the Company may at its absolute discretion, terminate this Contract.

21.6 If at any time during the term of this Contract, breakdown of Contractor's equipment results in Contractors being unable to perform their obligations hereunder for a period of 15 successive days, Company at its option, may terminate this Contract in its entirely without any further right or obligation on the part of the Company, except for the payment of money then due. No notice shall be served by the Company under the condition stated above.

21.7 Notwithstanding any provisions herein to the contrary, the Contract may be terminated at any time by the Company on giving 30 (thirty) days written notice to the Contractor due to any other reason not covered under the above clause from 21.1 to 21.6 and in the event of such termination the Company shall not be liable to pay any cost or damage to the Contractor except for payment for services as per the Contract upto the date of termination including the De-mob cost, if any.

22.0 CONSEQUENCES OF TERMINATION: In all cases of termination herein set forth, the relative obligations of the parties to the Contract shall be limited to the period up to the date of termination. Notwithstanding the termination of this Contract, the parties shall continue to be bound by the provisions of this Contract that reasonably require some action or forbearance after such termination.

22.1 Upon termination of this Contract, Contractor shall return to Company all of Company's items, which are at the time in Contractor's possession.

22.2 In the event of termination of contract, Company will issue Notice of termination of the contract with date or event after which the contract will be terminated. The contract shall then stand terminated and the Contractor shall demobilize their personnel & materials.

23.0 I.B. VERIFICATION REPORT AND SECURITY REVIEW:

Contractor will be required to submit the verification report to ascertain character and antecedents from the Civil Administration towards the persons engaged under this contract to the Head of the user Department before engagement.

24.0 In case of any doubt or dispute as to the interpretation of any clause herein contained, the decision of the Company's Engineer shall be final and binding on the contractor.

25.0 SET OFF CLAUSE:

"Any sum of money due and payable to the contractor (including Security Deposit refundable to them) under this or any other contract may be appropriated by Oil India Limited and set off against any claim of Oil India Limited (or such other person or persons contracting through Oil India Limited) for payment of a sum of money arising out of this contract or under any other contract made by the contractor with Oil India Limited (or such other person or persons contracting through Oil India Limited)."

26.0 FURNISHING FRAUDULENT INFORMATION/DOCUMENT:

The information and documents furnished by the bidder/contractor in respect of the subject tender/contract are expected to be true and genuine. However, if it is detected during technical scrutiny or after award of the contract or after expiry of the contract, that the bidder had submitted any fake/fraudulent document or furnished false statement, the offer/contract shall be rejected/cancelled, as the case may be and the bidder (if fake document/false statement pertains to such bidder) shall be dealt as per the Banning Policy (available in OIL's website) of Company.

27.0 PROVISION FOR ACTION IN CASE OF ERRING/DEFAULTING AGENCIES:

Action against erring and defaulting agencies like bidder, contractor, supplier, vendor, service provider will be as per OIL's Banning Policy dated 6th January, 2017 available in OIL's website www.oil-india.com.

28.0 LIQUIDATED DAMAGES FOR DELAY IN MOBILIZATION/COMPLETION OF WORKS AND SERVICES:

In the event of the Contractor's default in timely mobilization/completion within the stipulated period, the Contractor shall be liable to pay liquidated damages @ 0.5% of contract value, per week or part thereof of delay subject to maximum ceiling of 7.5% of contract value.

29.0 SUBCONTRACTING:

CONTRACTORS shall not subcontract or assign, in whole or in part, their obligations to perform under this contract, except with COMPANY'S prior written consent.

30.0 MISCELLANEOUS PROVISIONS:

Contractors shall conform in all respects with the provisions of any Statute, Ordinance of Law and the regulations or bye-law of any local or other duly constituted authority which may be applicable to the services and with such rules and regulation public bodies and Companies as aforesaid and shall keep OIL indemnified against all penalties and liability of every kind for breach of any such Statute, Ordinance or Law, regulation or byelaw.

31.0 LIABILITY:

31.1 Except as otherwise expressly provided, neither Company nor its servants, agents, nominees, Contractors, or sub-contractors shall have any liability or responsibility whatsoever to whomsoever for loss of or damage to the equipment and/or loss of or damage to the property of the Contractor and/or their Contractors or sub-contractors, irrespective of how such loss or damage is caused and even if caused by the negligence of Company and/or its servants, agent, nominees, assignees, contractors and sub-contractors. The Contractor shall protect, defend, indemnify and hold harmless Company from and against such loss or damage and any suit, claim or expense resulting there from.

31.2 Neither Company nor its servants, agents, nominees, assignees, Contractors, sub-contractors shall have any liability or responsibility whatsoever for injury to, illness, or death of any employee of the Contractor and/or of its contractors or sub-contractor irrespective of how such injury, illness or death is caused and even if caused by the negligence of Company and/or its servants, agents nominees, assignees, Contractors and sub-contractors. Contractor shall protect, defend, indemnify and hold harmless Company from and against such liabilities and any suit, claim or expense resulting there from.

31.3 The Contractor hereby agrees to waive its right to recourse and further agrees to cause their underwriters to waive their right of subrogation against Company and/or its underwrites, servants, agents, nominees, assignees, Contractors and sub-contractors for loss or damage to the equipment of the Contractor and/or its sub-contractors when such loss or damage or liabilities arises out of or in connection with the performance of the contract.

31.4 The Contractor hereby further agrees to waive its right of recourse and agrees to cause its underwriters to waive their right of subrogation against Company and/or its underwriters, servants, agents, nominees, assignees, Contractors and sub-contractors for injury to, illness or death of any employee of the Contractor and of its contractors, sub-contractors and/or their employees when such injury, illness or death arises out of or in connection with the performance of the contract.

31.5 Except as otherwise expressly provided, neither Contractor nor its servants, agents, nominees, Contractors or sub-contractors shall have any liability or responsibility whatsoever to whomsoever for loss of or damage to the equipment and/or loss or damage to the property of the Company and/or their Contractors or sub-contractors, irrespective of how such loss or damage is caused and even if caused by the negligence of Contractor

and/or its servants, agents, nominees, assignees, Contractors and sub-contractors. The Company shall protect, defend, indemnify and hold harmless Contractor from and against such loss or damage and any suit, claim or expense resulting therefrom.

31.6 Neither Contractor nor its servants, agents, nominees, assignees, Contractors, sub-contractors shall have any liability or responsibility whatsoever to whomsoever or injury or illness, or death of any employee of the Company and/or of its contractors or sub-contractors irrespective of how such injury, illness or death is caused and even if caused by the negligence of Contractor and/or its servants, agents, nominees, assignees, contractors and sub-contractors. Company shall protect, defend indemnify and hold harmless Contractor from and against such liabilities and any suit, claim or expense resulting there from.

31.7 The Company agrees to waive its right of recourse and further agrees to cause its underwriters to waive their right of subrogation against Contractor and/or its underwriters, servants, agents, nominees, assignees, Contractors and sub-contractors for loss or damage to the equipment of Company and/or its contractors or sub-contractors when such loss or damage or liabilities arises out of or in connection with the performance of the contract.

31.8 The Company hereby further agrees to waive its right of recourse and agrees to cause it underwriters to waive their right of subrogation against Contractor and/or its underwriters, servants, agents, nominees, assignees, Contractors and sub-contractors for injury to, illness or death of any employee of the Company and of its Contractors, sub-contractors and/or their employees when such injury, illness or death arises out of or in connection with the performance of the Contract.

31.9 LIMITATION OF LIABILITY

Notwithstanding any other provisions except only in cases of willful misconduct and/or criminal acts,

(a) Neither the Contractor nor the Company (OIL) shall be liable to the other, whether in Contract, tort, or otherwise, for any consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs.

(b) Notwithstanding any other provisions incorporated elsewhere in the contract, the aggregate liability of the Contractor in respect of this contract, whether under Contract, in tort or otherwise, shall not exceed 100% of the Contract price, provided however that this limitation shall not apply to the cost of repairing or replacing defective equipment by the Contractor, or to any obligation of the Contractor to indemnify the Company with respect to Intellectual Property Rights.

Company shall indemnify and keep indemnified Contractor harmless from and against any and all claims, costs, losses and liabilities in excess of the aggregate liability amount in terms of clause (b) above.

32.0 CONSEQUENTIAL DAMAGE:

Except as otherwise expressly provided, neither party shall be liable to the other for special, indirect or consequential damages resulting from or arising out of the contract,

including but without limitation, to loss or profit or business interruptions, howsoever caused and regardless of whether such loss or damage was caused by the negligence (either sole or concurrent) of either party, its employees, agents or sub-contractors.

33.0 INDEMNITY AGREEMENT:

33.1 Except as provided hereof Contractor agrees to protect, defend, indemnify and hold Company harmless from and against all claims, suits, demands and causes of action, liabilities, expenses, cost, liens and judgments of every kind and character, without limit, which may arise in favour of Contractor's employees, agents, Contractors and subcontractors or their employees on account of bodily injury or death, or damage to personnel/property as a result of the operations contemplated hereby, regardless of whether or not said claims, demands or causes of action arise out of the negligence or otherwise, in whole or in part or other faults.

33.2 Except as provided hereof Company agrees to protect, defend, indemnify and hold Contractor harmless from and against all claims, suits, demands and causes of action, liabilities, expenses, cost, liens and judgments of every kind and character, without limit, which may arise in favour of Company's employees, agents, Contractor and subcontractors or their employees on account of bodily injury or death, or damage to personnel/property as a result of the operations contemplated hereby, regardless of whether or not said claims, demands or causes of action arise out of the negligence or otherwise, in whole or in part or other faults.

34.0 APPLICABLE LAW:

34.1 This Contract shall be deemed to be a Contract made under, governed by and construed in accordance with the laws of India for the time being in force and shall be subject to the exclusive jurisdiction of Courts situated at Dibrugarh in Assam.

34.2 The Bidders shall ensure full compliance of various Indian Laws and Statutory Regulations, to the extent applicable for performing under this Contract.

35.0 TAXES:

35.1 Tax levied as per the provisions of Indian Income Tax Act and any other enactment/rules on income derived/payments received under the contract will be on Contractor’s account.

36.0 SUBSEQUENTLY ENACTED LAWS:

36.1 In the event of introduction of any new legislation or any change or amendment or enforcement of any Act or Law, rules or regulations of Government of India or State Government(s) or Public Body which becomes effective after the date of submission of Price Bid or revised price bid, if any, for this CONTRACT and which results in increased/decreased cost of the works under the CONTRACT through increased/decreased liability of taxes, (other than personnel and Corporate taxes), duties, the Parties shall agree to a revision in pricing to reflect such change subject to the production of documentary proof to the satisfaction of the COMPANY/CONTRACTOR as applicable to the extent which directly is attributable to such introduction of new legislation or change or amendment as mentioned above and adjudication by the

competent authority (applicable when disputed by COMPANY) & the courts wherever levy of such taxes/duties are disputed by COMPANY/CONTRACTOR.

36.2 Any increase in net amount of the duties and taxes (i.e. the amount of taxes/duties payable minus eligible credit of taxes/duties paid on input services/inputs) after the contractual completion/mobilization date during the extended period will be to the contractor's account, where delay in completion /mobilization period is attributable to the CONTRACTOR. However, any decrease in net amount of the duties and taxes (i.e. the amount of taxes/duties payable minus eligible credit of taxes / duties paid on input services/inputs) after the contractual completion/mobilization date will be to COMPANY's account.

36.3 The Contract Price and other prices given in the Schedule of Prices are based on the applicable tariff as indicated by the CONTRACTOR in the Schedule of Prices. In case this information subsequently proves to be wrong, incorrect or misleading, COMPANY will have no liability to reimburse/pay to the CONTRACTOR the excess duties, taxes, fees, if any finally levied/imposed by the concerned authorities. However, in such an event, COMPANY will have the right to recover the difference in case the rate of duty/tax finally assessed is on the lower side.

36.4 Notwithstanding the provision contained in clause 28.1 to 28.2 above, the COMPANY shall not bear any liability in respect of:

i. Personal taxes on the personnel deployed by CONTRACTOR, his sub-contractor / sub-sub-contractors and Agents etc.
ii. Corporate taxes and Fringe benefit tax in respect of contractor and all of their sub-contractors, agents etc.
iii. Other taxes & duties including Customs Duty, Excise Duty and Service Tax in addition to new taxes etc. in respect of sub-contractors, vendors, agents etc. of the CONTRACTOR.

36.5 In order to ascertain the net impact of the revisions/enactment of various provisions of taxes / duties, the CONTRACTOR is liable to provide following disclosure to COMPANY:

i. Details of each of the input services used in relation to providing service to COMPANY including estimated monthly value of input service and service tax amount.

ii. Details of Inputs (material/consumable) used/required for providing service to Company including estimated monthly value of input and excise duty/CVD paid/payable on purchase of inputs.

37.0 GOODS AND SERVICES TAX:

37.1 GENERAL REMARKS ON TAXES & DUTIES:

In view of **GST** Implementation from 1st July 2017, all taxes and duties including Excise Duty, CST/VAT, Service tax, Entry Tax and other indirect taxes and duties have been submerged in **GST**. Accordingly reference of Excise Duty, Service Tax, VAT, Sales Tax,

Entry Tax or any other form of indirect tax except of **GST** mentioned in the bidding document shall be ignored.

37.2 Bidders are required to submit copy of the GST Registration Certificate while submitting the bids wherever **GST** (CGST & SGST/UTGST or IGST) is applicable.

37.3 "**GST**" shall mean Goods and Services Tax charged on the supply of material(s) and services. The term "**GST**" shall be construed to include the Integrated Goods and Services Tax (hereinafter referred to as "IGST") or Central Goods and Services Tax (hereinafter referred to as "CGST") or State Goods and Services Tax (hereinafter referred to as "SGST") or Union Territory Goods and Services Tax (hereinafter referred to as "UTGST") depending upon the import / interstate or intrastate supplies, as the case may be. It shall also mean GST compensation Cess, if applicable.

37.4 Quoted price/rate(s) should be inclusive of all taxes and duties, except **GST (i.e. IGST or CGST and SGST/UTGST applicable in case of interstate supply or intra state supply respectively and cess on GST if applicable) on the final service**. However, GST rate (including cess) to be provided in the respective places in the Price Bid. Please note that the responsibility of payment of GST (CGST & SGST or IGST or UTGST) lies with the Supplier of Goods /Services (Service Provider) only. Supplier of Goods / Services (Service Provider) providing taxable service shall issue an Invoice/ Bill, as the case may be as per rules/ regulation of **GST**. Further, returns and details required to be filled under GST laws & rules should be timely filed by Supplier of Goods / Services (Service Provider) with requisite details.

37.4.1 Bidder should also mention the **Harmonised System of Nomenclature** (HSN) and **Service Accounting Codes (SAC)** at the designated place in SOR.

37.5 Where the OIL is entitled to avail the input tax credit of GST:

37.5.1 OIL will reimburse the **GST** to the Supplier of Goods / Services (Service Provider) at actuals against submission of Invoices as per format specified in rules/ regulation of GST to enable OIL to claim input tax credit of **GST** paid. In case of any variation in the executed quantities, the amount on which the **GST** is applicable shall be modified in same proportion. Returns and details required to be filled under GST laws & rules should be timely filed by supplier with requisite details.

37.5.2 The input tax credit of **GST** quoted shall be considered for evaluation of bids, as per evaluation criteria of tender document.

37.6 Where the OIL is not entitled to avail/take the full Input Tax Credit of GST:

37.6.1 OIL will reimburse **GST** to the Supplier of Goods / Services (Service Provider) at actuals against submission of Invoices as per format specified in rules/ regulation of **GST** subject to the ceiling amount of **GST** as quoted by the bidder. In case of any variation in the executed quantities (If directed and/or certified by the In-Charge) the ceiling amount on which **GST** is applicable will be modified on pro-rata basis.

37.6.2 The bids will be evaluated based on total price including **GST**.

37.7 Payments to Service Provider for claiming **GST** amount will be made provided the above formalities are fulfilled. Further, OIL may seek copies of challan and certificate from Chartered Accountant for deposit of **GST** collected from OIL.

37.8 Contractor/vendor shall be required to issue tax invoice in accordance with GST Act and/or Rules so that input credit can be availed by OIL. In the event that the contractor / vendor fails to provide the invoice in the form and manner prescribed under the GST Act read with GST Invoicing Rules thereunder, OIL shall not be liable to make any payment on account of **GST** against such invoice.

37.9 GST shall be paid against receipt of tax invoice and proof of payment of **GST** to government. In case of non-receipt of tax invoice or non-payment of **GST** by the contractor/vendor, OIL shall withhold the payment of **GST**.

37.10 GST payable under reverse charge mechanism for specified services or goods under GST act or rules, if any, shall not be paid to the contractor/vendor but will be directly deposited to the government by OIL.

37.11 Where OIL has the obligation to discharge **GST** liability under reverse charge mechanism and OIL has paid or is /liable to pay **GST** to the Government on which interest or penalties becomes payable as per GST laws for any reason which is not attributable to OIL or ITC with respect to such payments is not available to OIL for any reason which is not attributable to OIL, then OIL shall be entitled to deduct/ setoff / recover such amounts against any amounts paid or payable by OIL to Contractor / Supplier.

37.12 Notwithstanding anything contained anywhere in the Agreement, in the event that the input tax credit of the **GST** charged by the Contractor / Vendor is denied by the tax authorities to OIL for reasons attributable to Contractor / Vendor, OIL shall be entitled to recover such amount from the Contractor / Vendor by way of adjustment from the next invoice. In addition to the amount of **GST**, OIL shall also be entitled to recover interest at the rate prescribed under GST Act and penalty, in case any penalty is imposed by the tax authorities on OIL.

37.13 TDS under GST, if applicable, shall be deducted from contractor's/vendor's bill at applicable rate and a certificate as per rules for tax so deducted shall be provided to the contractor/vendor.

37.14 The Contractor will be under obligation for charging correct rate of tax as prescribed under the respective tax laws. Further the Contractor shall avail and pass on benefits of all exemptions/concessions available under tax laws. Any error of interpretation of applicability of taxes/ duties by the contractor shall be to contractor's account.

37.15 It is the responsibility of the bidder to quote the correct GST rate. The classification of goods/services as per GST (Goods & Service Tax) Act should be correctly done by the contractor to ensure that input tax credit on GST (Goods & Service Tax) is not lost to the OIL on account of any error on the part of the contractor.

37.16 In case, the quoted information related to various taxes, duties & levies subsequently proves wrong, incorrect or misleading, OIL will have no liability to reimburse the difference in the duty/ tax, if the finally assessed amount is on the higher side and

OIL will have to right to recover the difference ~~and~~ in case the rate of duty/ taxes finally assessed is on the lower side.

37.17 Notwithstanding anything mentioned elsewhere in the Bidding Document the aggregate liability of OIL towards Payment of GST shall be limited to the volume of GST declared by the bidder in its bid & nothing shall be payable extra except for the statutory variation in GST.

37.18 Further, it is the responsibility of the bidders to make all possible efforts to make their accounting / IT system GST compliant in order to ensure availability of Input Tax Credit (ITC) to Oil India Ltd.

37.19 GST liability, if any on account of supply of free samples against any tender shall be to bidder's account.

37.20 In case of statutory variation in **GST,** other than due to change in turnover, payable on the contract value during contract period, the Supplier of Goods / Services (Service Provider) shall submit a copy of the 'Government Notification' to substantiate the rate as applicable on the Bid due date and on the date of revision.

Beyond the contract period, in case OIL is not entitled for input tax credit of **GST**, then any increase in the rate of **GST** beyond the contractual delivery period shall be to Service provider's account whereas any decrease in the rate **GST** shall be passed on to the OIL.

Beyond the contract period, in case OIL is entitled for input tax credit of **GST**, then statutory variation in applicable **GST** on supply and on incidental services, shall be to OIL's account.

Claim for payment of **GST**/ Statutory variation, should be raised within two [02] months from the date of issue of 'Government Notification' for payment of differential (in %) **GST**, otherwise claim in respect of above shall not be entertained for payment of arrears.

The base date for the purpose of applying statutory variation shall be the Bid Opening Date.

37.21 The contractor will be liable to ensure to have registered with the respective tax authorities, wherever applicable and to submit self-attested copy of such registration certificate(s) and the Contractor will be responsible for procurement of material in its own registration (GSTIN) and also to issue its own Road Permit/ E-way Bill, if applicable etc.

37.22 In case the bidder is covered under Composition Scheme under GST laws, then bidder should quote the price inclusive of the GST (CGST & SGST/UTGST or IGST). Further, such bidder should mention "Cover under composition system" in column for GST (CGST & SGST/UTGST or IGST) of price schedule.

37.23 OIL will prefer to deal with registered supplier of goods/ services under GST. Therefore, bidders are requested to get themselves registered under GST, if not registered yet. However, in case any unregistered bidder is submitting their bid, their prices will be loaded with applicable GST while evaluation of bid. Where OIL is entitled for input credit of GST, the same will be considered for evaluation of bid as per evaluation methodology of tender document.

37.24 Procurement of Specific Goods: Earlier, there is no tax incidence in case of import of specified goods (i.e. the goods covered under List-34 of Customs Notification no. 12/2012-Cus dated. 17.03.2012 as amended). Customs duty is not payable as per the policy. However, under GST regime, IGST Plus GST compensation cess (if applicable) would be liveable on such imports. Bidders should quote GST as inclusive considering IGST component for the imported Materials portion while quoting their prices on destination basis. However, GST rate to be specified in the price bid format.

37.25 Documentation requirement for GST:

The vendor will be under the obligation for invoicing correct tax rate of tax/duties as prescribed under the GST law to OIL, and pass on the benefits, if any, after availing input tax credit.
Any invoice issued shall contain the following particulars:

a) Name, address and GSTIN of the supplier;
b) Serial number of the invoice;
c) Date of issue;
d) Name, address and GSTIN or UIN, if registered of the recipient;
e) Name and address of the recipient and the address of the delivery, along with the State and its code,
f) HSN code of goods or Accounting Code of services[SAC];
g) Description of goods or services;
h) Quantity in case of goods and unit or Unique Quantity Code thereof;
i) Total value of supply of goods or services or both;
j) Taxable value of supply of goods or services or both taking into discount or abatement if any;
k) Rate of tax (IGST, CGST, SGST/ UTGST, cess);
l) Amount of tax charged in respect of taxable goods or services (IGST, CGST, SGST/UTGST, cess);
m) Place of supply along with the name of State, in case of supply in the course of interstate trade or commerce;
n) Address of the delivery where the same is different from the place of supply and
o) Signature or digital signature of the supplier or his authorised representative.
GST invoice shall be prepared in triplicate, in case of supply of goods, in the following manner
a) The original copy being marked as ORIGINAL FOR RECIPIENT;
b) The duplicate copy being marked as DUPLICATE FOR TRANSPORTER and
c) The triplicate copy being marked as TRIPLICATE FOR SUPPLIER.

In case of any advance given against any supplies contract, the supplier of the goods shall issue Receipt Voucher containing the details of details of advance taken along with particulars as mentioned in clause no. (a), (b), (c), (d), (g), (k), (l), (m) & (o) above.

37.26 ANTI-PROFITEERING CLAUSE:

As per Clause 171 of GST Act it is mandatory to pass on the benefit due to reduction in rate of tax or from input tax credit to the consumer by way of commensurate reduction in prices. The Supplier of Goods / Services may note the above and quote their prices accordingly.

37.26.1 In case the GST rating of vendor on the GST portal / Govt. official website is negative / black listed, then the bids may be rejected by OIL. Further, in case rating of bidder is negative / black listed after award of work for supply of goods / services, then OIL shall not be obligated or liable to pay or reimburse GST to such vendor and shall also be entitled to deduct / recover such GST along with all penalties / interest, if any, incurred by OIL.

38.0 WITHHOLDING:

Company may withhold or nullify the whole or any part of the amount due to Contractor, after informing the Contractor of the reasons in writing, on account of subsequently discovered evidence in order to protect Company from loss on account of:

a) For non-completion of jobs.
b) Contractor's indebtedness arising out of execution of this Contract.
c) Defective work not remedied by Contractor.
d) Claims by sub-Contractor of Contractor or others filed or on the basis of reasonable evidence indicating probable filing of such claims against Contractor.
e) Failure of Contractor to pay or provide for the payment of salaries/ wages, contributions, unemployment compensation, taxes or enforced savings with-held from wages etc.
f) Failure of Contractor to pay the cost of removal of unnecessary debris, materials, tools, or machinery.
g) Damage to another Contractor of Company.
h) All claims against Contractor for damages and injuries, and/or for non-payment of bills etc.
i) Any failure by Contractor to fully reimburse Company under any of the indemnification provisions of this Contract. If, during the progress of the work Contractor shall allow any indebtedness to accrue for which Company, under any circumstances in the opinion of Company may be primarily or contingently liable or ultimately responsible and Contractor shall, within five days after demand is made by Company, fail to pay and discharge such indebtedness, then Company may during the period for which such indebtedness shall remain unpaid, with-hold from the amounts due to Contractor, a sum equal to the amount of such unpaid indebtedness.

Withholding will also be effected on account of the following:

i) Order issued by a Court of Law in India.
ii) Income-tax deductible at source according to law prevalent from time to time in the country.
iii) Any obligation of Contractor which by any law prevalent from time to time to be discharged by Company in the event of Contractor's failure to adhere to such laws.
iv) Any payment due from Contractor in respect of unauthorized imports.

When all the above grounds for withholding payments shall be removed, payment shall thereafter be made for amounts so with-hold.

Notwithstanding the foregoing, the right of Company to withhold shall be limited to damages, claims and failure on the part of Contractor, which is directly/indirectly related to some negligent act or omission on the part of Contractor.

39.0 PERFORMANCE SECURITY: The Contractor has furnished to Company a Bank Guarantee No. _____ dated _____ issued by _____ for Rs. _____ (being 10% of Contract value) with validity of 15 (fifteen) months beyond the contract period. The performance security shall be payable to Company as compensation for any loss resulting from Contractor's failure to fulfil their obligations under the Contract. In the event of extension of the Contract period, the validity of the bank guarantee shall be suitably extended by the Contractor. The bank guarantee will be discharged by Company not later than 30 days following its expiry.

OIL INDIA LIMITED

(A Government of India Enterprise)

Duliajan, Assam

DESCRIPTION OF WORK/ SERVICE: Design and construction of 03 Nos. of substation building and 01 No. of Switch room including supply, installation, testing and commissioning of electrical equipment of 03 Nos. 11 kV/415 V substation and 01 No. of 11 kV/415 V Switch room at Duliajan on LSTK basis.

(SOQ) Schedule of Work, Unit and Quantity

Item No.	Description of Services	UOM	Quantity
10	Supply, Installation & Commissioning of Electrical Equipment of Substation - 21 near DD	AU	1.00
20	Construction of Substation - 21 near DD	AU	1.00
30	Supply, Installation & Commissioning of Electrical Equipment of Substation - Bijulibari	AU	1.00
40	Construction of Substation - Bijulibari	AU	1.00
50	Supply, Installation & Commissioning of Electrical Equipment of Switch Room - 3	AU	1.00
60	Construction of Switch Room - 3	AU	1.00
70	Supply, Installation & Commissioning of Electrical Equipment of Substation - Tingri	AU	1.00
80	Construction of Substation - Tingri	AU	1.00
90	Buyback (Old equipments of 04 Nos. of Sub-stations)	LSM	1.00

1. The rates shall be quoted per unit as specified in the “PRICE BIDDING FORMAT” attached under “Notes and Attachments” tab.
2. Tenure of Agreement: 02 (Two) years from commencement of the Contract i.e. after completion of mobilization.
3. Mobilisation Period: 01 (one) month from the date of issue of LOA.
4. The quantity mentioned is purely for evaluation purpose only. However, payment shall be made on actuals.
5. Schedule of Works, Civil Layout drawing and Electrical SLD of each sub-station are attached below for reference. Refer to SCC for details.

SCHEDULE OF WORK: 11 KV ELECTRICAL SUB-STATION – 21 near DD Equipment: HT Panel, Transformers, LT panel)			
Sl. No.	**Item Description**	**Quantity**	**Unit**
1.	**HT Panel** Supply, Installation, Testing and Commissioning of 11 kV VCB 11 kV Switchgear Panel comprising of 6 nos. of indoor type VCB panels, suitable for solidly grounded system, fully factory built and assembled for direct installation. The panels should be designed, manufactured and tested in accordance with relevant IS / IEC with latest amendment. 1. Construction The VCB (cubicle and circuit breaker) panel should be made of steel clad, free standing, floor mounting, dust and vermin proof and horizontal isolation horizontal draw out, compartmentalized type, indoor switch board in standard execution with VCB. The draw out type circuit breaker cubicles should be fabricated using high quality CRCA sheet steel of minimum thickness 2.5 mm for load bearing members and 2.0 mm for other sheet work. The sheet metal should be given minimum ten-tank anti corrosion treatment & then powder coated to colour- SIEMENS GREY. The totally metal enclosed panel shall be compartmentalized with internal positioning by insulated material of epoxy-reinforced fibreglass to constitute the following: a) Bus bar compartment b) Circuit Breaker Compartment. c) CT and Cable compartment. d) Relay & metering compartment (LT compartment). 2. Each incomer and outgoing Panel shall have - (I) Circuit breaker and CT Compartment The circuit breaker should be totally enclosed & fully interlocked, front open type, horizontal draw-out, horizontal isolation type four pole breaker (as per IS: 13118 as amended up to date), single break, trip free mechanism, electrically and manually charged and auto/manually closing	1	SET

	breaker suitable for use on 11 KV, 3 Phase, 50Hz A.C. supply with short circuit fault level of 31.5 kA for 3 sec. complete with self-contained, fully interlocked, rack in and rack out mechanism. Panel shall be complete with plugs and sockets, mechanical inter-locks and safety shutter. The circuit breaker panel shall have minimum of 6NO+6NC auxiliary contacts directly operated by the breaker. The circuit breaker drive mechanism shall be provided with facility for pad locking at any position namely 'SERVICE', 'TEST' and 'ISOLATED'. The front door shall have view glass to facilitate observation of mechanical ON/OFF indication and operation counter. The CT and the incoming and outgoing feeder cable compartment shall be in the rear. The LT control cable terminal arrangement shall be provided in the rear side in a separate box so as to have isolation from high voltage terminals. All the cable entry plates shall have removable gland plates. The CT required for metering and protection shall be as per IS-2705 (as amended up to date) & IS-4201 (as amended up to date) and shall be of adequate size and its insulation will be epoxy cast resin type. (II) Relays & Metering Compartment (LT Compartment) The LT chamber of suitable height shall be positioned on the top of the panel & at the front. Protective relay, measuring equipment and auxiliary controls along with the switches and indications are to be accommodated in the LT Chamber. Three nos. of bright steel hinges shall be used on front door with door opening limited to 135 Degree (approx). All devices in the LT box are to be marked with permanent labels. Panel rating plate shall be provided on the door. Control wiring and CT wiring shall be done using single core, PVC insulated, FRLS, stranded copper cable of 1100V grade and 2.5sqmm size. All cables and wires shall be numbered with suitable ferrules. Suitable lugs shall be used for control wiring and ring type lugs shall be used for CT wiring. All wires shall terminate on suitable Terminal Blocks. All TBs shall have 10% spare terminals. TBs shall be marked. Reinforced flexible conduit shall be used for wiring and PVC spiral shall be provided on exposed wires near the door hinge in LT box. Colour coding of control cables shall be followed as required by relevant IS. Control cables shall be as per IS-694 (as amended up to date). (III) Panel Metering and Indication Equipment Microprocessor based flush type digital multifunction energy meter with accuracy class 0.5 and with RS485 port with MODBUS protocol for data logging/downloading shall be provided for all VCB panels. The meter shall be of size 96mmx96mm and shall measure the following electrical parameters: frequency, voltage, current, power factor, KVA, KVAr, KWh and harmonic components. The multifunction meter shall have inbuilt selector switch and memory to store data for minimum 75 days.		

	The following indications shall be available: a) Breaker ON, OFF and Close switch b) Trip circuit healthy push button c) LED type Indication lamp for each panel for: (i) CB Close, (ii) CB open, (iii) Trip on fault, (iv) Trip circuit healthy (v) Spring charged (vi) Breaker in service position (vii) Breaker in test position All LEDs shall be LVGP (low voltage glow protection) & industrial type. (IV) Closing and Tripping Breakers should be able to be operated i) Manually: Spring charging, closing and tripping. ii) Electrically: Motorised Spring charging, closing and shunt tripping. iii) Shunt Trip coil :24 V DC (V) Panel Space Heaters The panel shall be provided with 2nos, 80 W space heaters in each cubicle and adjustable thermostats of suitable rating for heater temperature monitoring along with protective HRC fuses and ON/OFF switch. (VI) Operation Indication / Operation Counter The front door of each breaker panel shall have glass window / windows to facilitate observation of the following: - Spring Charged / Discharged indication, - Mechanical ON/OFF indication and - Operation counter. (VII) Cubicle Illumination 02 (Two) Nos. cubicle lamps (LED) in each cubicle shall be provided along with switch.		

(VIII) Safety Interlock

The following minimum safety devices shall be provided to ensure the safety of operating personnel:

a) Individual explosion vents for Bus bars/Breaker/Cable and CT chambers on the top/Side of the panel to let out the gases under pressure generated during unlikely event of a fault inside the panel.
b) Cubicle with front door/panel pressure tested for arc faults.
c) CB and metal enclosure earthed in accordance with relevant IS / IEC (as amended up to date).
d) Self-operating shutters, shielding live fixed contacts, shall be provided which closes automatically when truck is withdrawn to test position. Locking arrangement should be provided for the shutters.
e) Breaker shall not be moved in ON condition from service to test position & vice versa.
f) The CB cannot be switched ÓN' when the truck is in any position between test and service.
g) All nut & bolts used inside the panel should be of high tensile, bright zinc plated, hexagonal headed, metric size, manufacture to DIN-931 of steel, tensile strength minimum 80kgf/SQ.MM, coarse threaded with two nos. bright zinc plated flat and spring washers.
h) Lifting hooks shall be provided for the panels.

(IX) Panel Markings

The switchgear panel shall have the following identification markings in a permanent manner:

a) Panel name both in front and rear side.
b) Caution boards conforming to IS-2551 (as amended up to date) both in front and rear sides.
c) CT specification name plate on CT and at panel cover at rear.
d) Incoming & outgoing cable box.

The markings and identifications of conductors, apparatus terminals shall be as per IS-5578 (as amended up to date) & IS-11353 (as amended up to date).

(X) Cable Terminal Box

HT cable boxes with termination links for termination of incoming and outgoing HT cables should be provided in the rear side of the unit. Rear incoming cable box should be of suitable size for safe

	entry of two nos. of incoming cables and should have suitable terminal links for safe termination of both the incoming cables for loop in/ loop out connection as is done in case of ring main unit. The termination arrangement should be such that it should be possible to disconnect one cable in the event of fault in that cable and power-up the unit with the other incoming cable. Link rating shall be 600 amp (min). Panel shall have incomer connections suitable for 2 x 3 x 240 sq. mm. XLPE 11KV cable (cable entry from bottom side) with outdoor kit, indoor kit, end termination with heat shrinkable jointing kit etc. as required. (XI) Bus bar Compartment Bus bar shall be rectangular in cross section and made from electrolytic grade electro tinned copper having 99.99% high conductivity. Heat shrinkable sleeve insulation of 11KV voltage grade should be provided on bus bar, its risers & connections and shall be marked in different colour codes for identification of three different phases (R, Y, B). Thickness of bus-bar sleeve shall be 3 mm and shall be made of Raychem RPG 11 kV grade or similar type. Cast epoxy insulators supports for bus-bar & cable termination links designed to withstand full short circuit current at specified fault level for 3 seconds shall be provided. Bus-bar arrangement should be such that in future similar cubicles can be connected with this cubicle. 3. Incoming feeders: 2 Nos. 1250 Amp, 12 KV VCB with short circuit fault level of 31.5KA for 3 Sec Each Incoming feeder shall have - (a) Microprocessor based directional, numerical relay with O/L, E/F and S/C protection for each incomer. (b) Cast resin of dual core 3 CTs, 400-200/5A of 15VA burden and accuracy Class – 0.5 for metering and class 5P10 for protection. 4. Outgoing feeders: 3 Nos., 800A, 12KV, VCB with short circuit fault level of 31.5 KA, 3 Sec Each outgoing feeder shall have		

	(a) Microprocessor based non directional, numerical relay with O/L, E/F and S/C protection for each outgoing feeder. (b) Cast resin of dual core 3 CTs 100- 50/5 A of 15VA burden and accuracy Class-0.5 for metering and class 5P10 for protection. 5. Bus coupler: 1 No. 1250 Amp, 12KV VCB with short circuit fault level of 31.5KA for 3 Sec Bus Coupler panel shall have (a) 3 Nos. LED showing R, Y, & B voltage, Breaker 'ON, OFF, Trip' indicating light, breaker in service / test position and 16 Amp TNC switch for ON / OFF/ Close VCB required. Suitable nos. and appropriate rating of HRC fuses/ MCB required for protection of LED, multifunction meter and auxiliary power supply, control circuit for closing, tripping and indication circuit and numerical relay etc. on bus coupler feeder. (b) Cast resin of dual core 3 CTs, 400-200/5 A of 15VA, burden and accuracy Class – 0.5 for metering and class 5P10 for protection. (c) 1No. Microprocessor based non directional, numerical relay with O/L, E/F and S/C protection for bus-coupler feeder with synchronising check facility. 6. Bus-bar: 3 Nos. 1250 Amps Copper bus-bar.		
2.	**Earth Truck** Supply, installation, testing and commissioning of earthing trucks suitable for 11 kV, 31.5 kA, 1250A (I/C) /800A (O/G) switchgear as follows: (i) The separate earthing trucks shall be provided for bus-bar side earthing and feeder earthing purposes. (ii) The bus bar earthing trucks shall enter only into the incomer panels and feeder earthing trucks shall enter only into outgoing panels. Suitable mechanical interlock shall be provided for the same.	1	SET

	(iii) The earthing trucks shall have built in provision, such that it shall not be possible to earth the live circuit on feeder or bus bar side. (iv) The earthing truck shall be of permissive advance contact type construction by virtue of which the feeder or the bus bar side shall be sensed by providing suitable 1 phase voltage transformer, preferably on the Y phase. The advance contact type arrangement shall be such that while insertion of the earthing truck into the respective cubical, shall facilitate the sensing of the voltage by the 1 phase, VT prior to earthing. (v) The further racking for final earth position shall be blocked by suitable solenoid interlock with audio visual alarm to avoid the earthing of the live bus bar or feeder side. (vi) The isolating contact fitted on the earthing truck and the current carrying part shall be suitable for 31.5 kA current carrying capacity for 1 sec.		
3.	**Battery Bank and Charger** Supply, installation, testing & commissioning of sealed maintenance free (SMF) lead acid battery with charger required for supply of continuous 24 Volt DC output voltage for closing/ tripping/indication circuit of 6 nos. 12KV, VCB panel board. Battery with charger consists of 12 Nos. 2.0 Volts basic cell in modular design, maintenance free batteries of 200 AH each and charging unit of 20 Amps. rating of rectifier with input voltage 200 to 250V AC, 50HZ, and output rated DC voltage 24Volt, 20amps. Incomer to battery charger shall have single phase supply with 20 Amps DP MCB with overload, short circuit protection along with a digital Ammeter & Voltmeter required for showing output voltage and current. Suitable rating of FRLS insulated copper conductor cable shall be used for wiring. The above arrangement is to be fixed in self stackable MS trays with insulated shoe. The battery charger shall have float and boost charger facility. This includes supply and laying of 3 core, 16 sqmm, armoured, PVC insulated, PVC sheathed, aluminium conductor, 1.1KV grade cable to laid in pucca trench from LT panel to Battery charger panel – 25mtrs	1	SET

4.	**Transformer** Supply, Installation, testing and commissioning of 2 Nos. of Cast Resin Dry Type, 750 KVA, 11/0.415 KV, 3 Phase, 50Hz, Dyn11, indoor type, copper wound transformer with OFF load tap changing arrangement on HV side ± 5% in steps of 2.5%, having cable end boxes on HV side suitable for 3x1Cx240 Sqmm XLPE, copper cable of 11KV grade on HT side and 4x4Cx 240sqmm XLPE, 1.1KV, Cu cable on LV side complete with all accessories. Neutral of transformer shall be earthed with 2 nos. earth electrodes and body shall be earthed with minimum 2 nos. Earth electrode. Transformer shall be mounted on suitable size of channel which is to be fixed by grouting 4nos. of bolts.The winding material should be high conductivity electrolytic grade copper. The insulation should be Cast Resin type, Class-F. Conductor should have thermally upgraded paper insulation reinforced with fibreglass. The coil assembly is to be impregnated & cast under vacuum with epoxy resin for achieving non-hygroscopic, acid & alkali resistant insulation. The complete winding should have smooth cylindrical finish after impregnation to ensure high mechanical strength. The thickness of resin should be uniform. The insulation should be self- extinguishing type. Winding temperature scanner connected with three nos. RTDs, one each for each LV winding should be provided in a metallic enclosure that is mounted on the main enclosure. The scanner should provide indication, alarm & trip contacts. Winding temperature indicator should show maximum temperature attained. The RTDs should be properly wired upto the scanner terminals. Suitable hole with gland is required for control cable connecting scanner alarm/ trip contacts to HT Breaker.	2	Number

5.	**LT Panel** Supply, installation, testing & commissioning of cubicle type LT panel suitable for 415V, 3 Phase, 4 Wire 50 Hz Ac supply system. 1. Construction The PCC shall be floor mounted, freestanding, totally enclosed and extensible type. The PCC shall be dust & vermin proof and shall include all provisions for safety of operation and maintenance personnel. The general construction shall conform to relevant IS / IEC with latest amendment for factory assembled switchboard. The PCC Panel shall be fabricated in compartmentalized design from CRCA sheet steel of 2mm thick for frame work with angle iron/ channel and covers, 3mm thick for gland plates. The panel shall be treated with minimum 10 tank process for powder coating in approved shade. Panel shall have TPN copper bus bars of high conductivity with short circuit withstand capacity of 50KA for 1 Sec; bottom base channel of MS section not less than 100 mm x 50 mm x 5mm thick, fabrication shall be done in transportable sections, entire panel shall have a common GI earth bar of size 40mm x 5mm at the rear with 2 Nos. earth stud, solid connections from main bus bar to switch gears with required size of copper bus bars and control wiring with 2.5 sq. mm PVC insulated copper conductor FRLS cable, cable alleys and cable gland plates. The bus chamber shall be sheet steel clad having front and rear bolted covers and shall consist of 1 set TP & N electrolytic grade, high conductivity Copper Bus Bars, conforming to BIS. Current rating of bus bar sections shall be 2200 amps suitable for 415 V AC, 50 Hz system. Neutral bar shall be of same size as phase bus. The bus-bar shall be insulated with heat shrinkable PVC sleeves and shall be supported at required intervals with non- hygroscopic, non-deteriorating, and non-inflammable SMC / FRP supports having adequate mechanical strength and a high tracking resistance, to withstand short circuit fault levels up to 50 kA for 1 sec. All risers and connections from bus bar shall be done with same material as the main bus bars of current rating as per	1	SET

	rating of individual cubicle switch. To suit the stringent site conditions, the bus bar system shall be designed with generous clearance between phases than specified in the standards. Adequate non-hygroscopic insulating sheet barriers between the bus chambers and feeders shall be provided. 2. Incoming Feeder: (I) 2 Nos. Incomer, 1600 Amps four pole horizontal draw-out type air circuit breaker of fault breaking capacity 50KA for 1 sec with manually operated, motorised / manual spring charge fitted with interlocked door, automatic safety shutters, mechanical ON/OFF and service/test/isolated position indicators and frame earthing contact conforming to IS - 60947 - 2 as amended up to date. (II) Each incomer shall consist of 4nos. cast resin type current transformer of 1600/ 5A with suitable rating of brought out terminal for connecting 4 nos. single core 240sqmm, 1.1KV grade copper conductor XLPE cable. (III) Microprocessor release (EMI & EMC certified) for over current, earth fault & short circuit protection (IV) Microprocessor based flush type digital multifunction meter with accuracy class 0.5 and with RS485 port with MODBUS protocol for data logging/downloading shall be provided for all panels. The meter shall be of size 96mmx96mm and shall measure the following electrical parameters: Frequency, Voltage, current, power factor, KVA, KVAr, KW, KWh and harmonic components. The multifunction meter shall have inbuilt selector switch and memory to store data for minimum 75 days. (V) 3 Nos. LED showing R, Y, & B voltage, Breaker 'ON, OFF, Trip' indicating light and 16 Amp TNC switch for ON / OFF/ Close ACB required. Suitable nos. and appropriate rating of HRC fuses/ MCB required for protection of LED, multifunction meter and auxiliary power supply, control circuit for closing, tripping and indication circuit and numerical relay etc. (VI) Tripping method shall have Shunt trip coil of 230V A.C. 3. Bus Coupler 1 No. 1600 Amps horizontal four pole draw out type, air circuit breakers of fault breaking capacity 50 KA for 1 sec.		

	(I) Breaker shall have manually operated /motorised / manual spring charge fitted with interlocked door, automatic safety shutters, mechanical ON/OFF and service/test/isolated position indicators and frame earthing contact conforming to IS - 60947- 2 as amended up to date. (II) Cast resin type current transformer of ratio 1600/5 A for metering and protection (III) 3 Nos. LED showing R, Y, & B voltage and 16 Amp TNC switch for ON / OFF/ Close ACB required. Suitable nos. and appropriate rating of HRC fuses/ MCB required for protection of LED and auxiliary power supply, control circuit for closing, tripping and indication circuit and numerical relay etc. 4. TPN copper bus bars of minimum of 2200 Amps capacity. 5. Interlocking Electrical through advance contacts in MCCB/ ACB's (incomers & Bus couplers) and mechanical castle key interlocking should be provided to ensure that only one supply is available at a time on each section of bus and to eliminate any possible of accidentally approaching two supplies at one bus section. 6. Outgoing feeder (A) 1 No. 1600 Amp, 4 Pole horizontal draw-out type air circuit breaker of fault breaking capacity 50KA for 1 sec. (I) Breaker shall be manually operated, motorised / manual spring charge fitted with interlocked door, automatic safety shutters, mechanical ON/OFF and service/test/isolated position indicators and frame earthing contact, conforming to IS - 60947 - 2 as amended up-to-date. (II) Each outgoing shall consist of 3nos. cast resin type current transformer of 1600/ 5A with suitable rating of brought terminal for connecting single core 240sqmm, copper conductor, 1.1KV grade, XLPE cable. (III) Each breaker shall have microprocessor type release for O/C, S/C and earth fault protection. (IV) Flush type digital multifunction meter with accuracy class 0.5 and with RS485 port provided for all panels. The meter shall be of size 96mmx96mm and shall measure the		

	following electrical parameters: Frequency, Voltage, current, power factor, KVA, KVAr, pf, KW, KWH and harmonic components. The multifunction meter shall have inbuilt selector switch and memory to store data for minimum 75 days. (B) 1 No. 1000Amp, 4 Pole horizontal draw-out type air circuit breaker of fault breaking capacity 50KA for 1 sec. (I) Breaker shall be manually operated, motorised / manual spring charge fitted with interlocked door, automatic safety shutters, mechanical ON/OFF and service/test/isolated position indicators and frame earthing contact, conforming to IS-60947- 2 as amended up-to-date. (II) Each outgoing shall consist of 3nos. cast resin type current transformer of 1000/ 5A with suitable rating of brought terminal for connecting single core 240sqmm, copper conductor, 1.1KV grade, XLPE cable. (III) Flush type digital multifunction meter with accuracy class 0.5 and with RS485 port provided for all panels. The meter shall be of size 96mmx96mm and shall measure the following electrical parameters: Frequency, Voltage, current, power factor, KVA, KVAr, KW, KWH and harmonic components. The multifunction meter shall have inbuilt selector switch and memory to store data for minimum 75 days. 3 Nos. 630 Amp, 4 Pole MCCB with fault level of 36KA with microprocessor type release for O/C, S/C and E/F protection. 5 Nos. 400Amp, 4Pole MCCB with fault level of 36KA with microprocessor type release for O/C, S/C & E/F protection 2 nos. 100Amps, 4pole MCCB with fault level of 25KA with microprocessor type release for O/C, S/C & E/F protection with electronic timer and contactor, HRC fuses for street lighting feeders Each outgoing feeder with MCCB shall consist of (I) 3 nos. cast resin type current transformer of a) 600/5 Amps, (b) 400/5 Amps, & (c) 100/5 Amps set with suitable rating of brought out terminal for connecting Single core 240sqmm, Aluminium conductor, 1.1KV grade, XLPE cable. (II) Each breaker shall have adjustable OL protection, Short Circuit protection & EF protection through inbuilt electronic trip unit in MCCB.		

	(III) Three phase digital ammeter (with inbuilt selector switch) of required range, SIF-96, class of accuracy 1.0, CT operated with CT ratio 600/5,400/5 and 100/5 respectively (of burden 10VA) and Qty: As per circuit requirement. (IV) HRC Instrument Fuse Holders fused 4 Amps and Qty: As per circuit requirement. (V) LED type Indication Lamps for 'Feeder ON', 'Feeder OFF' and 'Trip' indication, Qty: 3 nos. (VI) Auxiliary power supply of digital ammeter shall be 230V and shall be connected with separate HRC fuse and link system.		
6	**Cable** (I) Supply and laying of 11KV (UE), armoured, XLPE power cable of 11KV grade confirming to IS 7098 (Part II) amended up to date as per the following size in kaccha trench with 0.75cm width and 1.2mtrs depth with sand cushioning of 12cm in 2 layers and covered with first class bricks placed on width wise throughout the cable trench. (a) Supply and laying of 11KV (UE), 3x240Sqmm, Aluminium conductor, XLPE cable as above 200mtrs required from OH to Substation (b) Supply and laying of 1x240Sqmm, (UE), 11KV, copper conductor, armoured cable to be laid in pucca trench inside the substation where trench shall be filled with sand. This cable shall be used from HT panel to HT side of transformer.	200 100	mtrs mtrs
	(II) Supply and laying 4core, 240sqmm, XLPE insulated, armoured, aluminium conductor, power cable of grade 1.1KV shall be laid by excavation, sand cushioning & protective covering and refilling the trench 0.45mtrx 0.75mtr. This cable shall be used from 4 nos. of outgoing feeders from substation to overhead lines and for interconnection with existing Substation 21 LT Panel.	1000	Mtrs
	(III) Supply and laying 4core, 240sqmm. XLPE insulated, armoured, copper conductor, power cable of grade exceeding 1.1 KV. This cable shall be laid in pucca trench inside the substation where sand shall be filled in the trench. This cable shall be used for connection of LT side of transformer to LT panel.	200	Mtrs
	(IV) Laying of 1 No. Additional XLPE Al power cable of 1.1 KV grade of size 4 x 240Sqmm direct in ground in the same trench in one tier horizontal formation, I/c excavation, sand cushioning & protective covering and refilling the trench etc. as required.	As required	

	(V) Excavation of the trench in hard rock not exceeding 200 Mtrs in length and 1.0 mtr depth and 1mtr width mtr getting out the excavated soil and disposal of excavated soil as directed within a reach of 100 mtrs.	200	mtrs
	(VI) Supplying and making end termination with brass compression gland and Al. lugs for following size of PVC insulated and PVC sheathed/XLPE Al. Conductor cable of 1.1 KV grade as required.	As required	
	(VII) Supplying and making indoor & outdoor cable termination and cable end termination with heat shrinkable jointing kit complete with all accessories I/c lugs suitable for following sizes of 240sqmm 3core XLPE Al conductor, armoured cable of 11KV grade and heat shrinkable jointing kit complete with all accessories I/c lugs suitable for 240sqmm 4core XLPE AI Conductor, armoured cable of 1.1KV grade	11	Nos.
	(VIII) Supplying of Sand and filling in the existing substation trench/Open masonry duct as required. 25 cubic mtr	25	Cubic meter
7.	**Electrification of substation Building** 1. The wiring of substation building is required to be carried out by PVC insulated, PVC sheathed, armoured, copper conductor, fire retardant, low smoke, 1.1 KV grade cable for different sizes with all accessories as given below: (i) 3 core, 2.5 sqmm cable 250 mtrs (12 light points + 4 ex fan points + 2 extra point wiring) (ii) 3 core, 4 sqmm cable - 100mtrs (4 nos. 10/15 amps socket points wiring) (iii) 4 core, 4 sqmm cable - 25mtrs (3phase, 2 nos. 15 amp socket points wiring for relay testing) (iv) 3 core, 2.5 sqmm cable - 25 mtrs (2nos. emergency light points for 24DC power supply) (v) Supply and laying in pucca trench, 4core 16 sqmm, PVC insulated, PVC sheathed, armoured, aluminium conductor, 1.1 KV grade cable from LT panel 4 pole, 100 amps MCCB to MCB DB - 25mtrs		
	2. Supply and fixing of electrical fixture for electrification: (i) 1 x 18/20 watt LED light fittings - 12 nos.		

	(ii) 4 pole, 63amps MCCB with O/C, S/C & E/F protection with spreader – 1 no. (iii) 3 phase 6 way MCB DB with 63 Amps RCBO as isolator and 10 amps, 16 Amps MCB – 1 set (iv) Metallic/PVC frame, 3 blade 300 mm, 60watt Exhaust fan with shutter (v) 3 Phase, Metallic socket box with 15 Amps MCB with accessories - 2Nos. (vi) 3 Pin, single phase, 10/15 amps metallic socket box with all accessories- 4nos. (vii) 2 Nos. 6watt, 24 V DC LED light fitting (viii) 20 Nos, 5amps Modular switches with Fixing plate with accessories. (ix) 150 watt, 4nos. LED with area light control panel including pole for fixing near substation building for area illumination.		
8.	**Earthing** (i) Supply and burying of heavy duty, Chemical electrode with suitable chemical for soil treatment and providing masonry enclosure size 600mmx 600mm x600mm with RCC cover plate having 2 nos. metallic hooks for lifting cover and funnel type arrangement for watering pipe etc. complete as required – Minimum no. - 10Nos. The no. of earth electrodes may be more. The value of earth resistance to be maintained for each substation when connected all the earth electrodes together > 1 Ohm.	1	Set
	(ii) Extra chemical for filling soil earthing electrode as required.	As required	
	(iii) Supplying and laying 100 mm dia GI pipe medium class ISI marked round from earth electrode to building entry as required.	As required	
	(iv) Providing and fixing earth bus of 50mm x 6 mm G.I strip on surface for connection etc. as required	As required	mtrs
	(v) Providing and laying of single core 120sqmm, PVC insulated, aluminium conductor for connection from earth electrode as required.	As required	mtrs
	(vi) Providing and laying of single core 120sqmm, PVC insulated, aluminium conductor as earth wire to be used along with power cable as continuity conductor	2500	Mtrs

9.	**Safety Equipment** (i) Providing & fixing danger plates made of mild steel at least 2mm thick & vitreous enamelled white on both sides & with inscriptions in signal red colour on front side as read in triangular languages a. High Voltage- size 250 mm x 200mm b. Medium Voltage – size 200mm x 150mm	 10 10	 Nos. Nos.
	(ii) Providing and fixing carbon dioxide (CO2) type fire extinguishers confirming to IS 2878-1976 (as amended up to date) and cylinders fully charged of following capacity. (a) 4.5KG	2	Nos.
	(iii) Providing of set of 4 Nos. 9.5 Litre capacity GI bucket painted in post office red colour with prior coat of red oxide paint and written with white paint 'FIRE' and mounted on MS angle iron frame with bracket of appropriate size & capacity I/c filling sand etc.	1	Set
	(iv) Providing First Aid Box as approved by St. John Ambulance Brigade/Indian Red Cross conforming to relevant IS with latest amendment.	1	Nos.
	(v) Supply & fixing shock treatment chart duly mounted on a wooden frame with 5mm thick glass as reqd. (approximate front area 1.20 sq. metre)	2	Nos.
	(vi) Providing of insulating mats 1 mtr. wide and 3mm thick suitable for 11KV working voltage as per IS 15652-2006 (with latest amendment)	8	mtrs
	(vii) Providing of insulating mats 1 mtr. wide and 2mm thick suitable for 1000V working voltage as per IS 15652-2006 (with latest amendment)	8	Mtrs
	(viii) Provision for Lock out Tag out in all the VCBs, ACBs and MCCBs	As required	
10.	**Civil part for substation building and area development of substation** (1) Construct a RCC building, for electrical substation, including supply of all materials except cement. The size of RCC substation building is as per Panel size provided that there should be sufficient clearance as per safety norms from building wall Height 3.8mtrs. The cable trench for LT panel, HT panel and 2nos. transformers along with foundation of transformers is also part of	1	No.

	the substation building. The construction work shall be carried out by the bidder as per approved drawing and technical specification given in civil part.		
	(2) For area development of substation building is as per technical specification given in civil part	1	No.

For Buy back of Electrical equipment like Transformer, HT panel, LT panel, Bidder has to quote against the items are given below: The total amount quoted for buy back of equipment shall be deducted from total amount quoted for schedule of works and shall be treated as total amount for schedule of work.

1	11 KV/400 V, AC 500KVA transformer, type – oil cooled, copper winding with all accessories. Make – Crompton Greaves, year of manufacture-1976	1	No.
2	LT Panel: 415 V, AC, LT Panel with TPN fuse as Incomer and 8 outgoing feeder Make: English Electric	1	Set
	Total of buy back = Total (i) + (ii)		

Gross schedule of works = Total of schedule of works

SCHEDULE OF WORK
11 KV ELECTRICAL SUB-STATION - BIJULIBARI
Equipment: HT Panel, Transformers, LT panel)

Sl. No.	Item Description	Quantity	Unit
1.	**HT Panel** Supply, Installation, Testing and Commissioning of 11 kV VCB Panel 11 kV Switchgear Panel comprising of 6 nos. of indoor type VCB panels, suitable for solidly grounded system, fully factory built and assembled for direct installation. The panels should be designed, manufactured and tested in accordance with relevant IS / IEC with latest amendment. 1. Construction The VCB (cubicle and circuit breaker) panel should be made of steel clad, free standing, floor mounting, dust and vermin proof and horizontal isolation horizontal draw out, compartmentalized type, indoor switch board in standard execution with VCB. The draw out type circuit breaker cubicles should be fabricated using high quality CRCA sheet steel of minimum thickness 2.5 mm for load bearing members and 2.0 mm for other sheet work. The sheet metal should be given minimum ten-tank anti corrosion treatment & then powder coated to colour- SIEMENS GREY. The totally metal enclosed panel shall be compartmentalized with internal positioning by insulated material of epoxy-reinforced fibreglass to constitute the following: a) Bus bar compartment b) Circuit Breaker Compartment. c) CT and Cable compartment. d) Relay & metering compartment (LT compartment). 2. Each incoming and outgoing Panel shall have (I) Circuit breaker and CT Compartment The circuit breaker should be totally enclosed & fully interlocked, front open type, horizontal draw-out, horizontal isolation type four pole breaker (as per IS-13118 as amended up to date), single break, trip free mechanism, electrically and manually charged and auto/manually closing	1	SET

	breaker suitable for use on 11 KV, 3 Phase, 50Hz AC supply with short circuit fault level of 31.5 kA for 3 sec. complete with self-contained, fully interlocked, rack in and rack out mechanism. Panels shall be complete with plugs and sockets, mechanical inter-locks and safety shutter. The circuit breaker panel shall have minimum of 6NO+6NC auxiliary contacts directly operated by the breaker. The circuit breaker drive mechanism shall be provided with facility for pad locking at any position namely 'SERVICE', 'TEST' and 'ISOLATED'. The front door shall have view glass to facilitate observation of mechanical ON/OFF indication and operation counter. The CT and the incoming and outgoing feeder cable compartment shall be in the rear. The LT control cable terminal arrangement shall be provided in the rear side in a separate box so as to have isolation from high voltage terminals. All the cable entry plates shall have removable gland plates. The CT required for metering and protection shall be as per IS-2705 (as amended up to date) & IS 4201 (as amended up to date) and shall be of adequate size and its insulation will be epoxy cast resin type. (II) Relays & Metering Compartment (LT Compartment) The LT chamber of suitable height shall be positioned on the top of the panel & at the front. Protective relay, measuring equipment and auxiliary controls along with the switches and indications are to be accommodated in the LT Chamber. Three nos. of bright steel hinges shall be used on front door with door opening limited to 135 Degree (approx.). All devices in the LT box are to be marked with permanent labels. Panel rating plate shall be provided on the door. Control wiring and CT wiring shall be done using single core, PVC insulated, FRLS, stranded copper cable of 1100V grade and 2.5sqmm size. All cables and wires shall be numbered with suitable ferrules. Suitable lugs shall be used for control wiring and ring type lugs shall be used for CT wiring. All wires shall terminate on suitable Terminal Blocks. All TBs shall have 10% spare terminals. TBs shall be marked. Reinforced flexible conduit shall be used for wiring and PVC spiral shall be provided on exposed wires near the door hinge in LT box. Colour coding of control cables shall be followed as required by relevant IS. Control cables shall be as per IS-694 (as amended up to date). (III) Panel Metering and Indication Equipment: Microprocessor based flush type digital multifunction meter with accuracy class 0.5 and with RS485 port with MODBUS protocol for data logging/downloading shall be provided for all VCB panels. The meter shall be of size 96mmx96mm and shall measure the following electrical parameters: frequency, voltage, current, power factor, KVA, KVAr, KWh and harmonic components. The multifunction meter shall have inbuilt selector switch and memory to store data for minimum 75 days.		

	The following indications shall be available: a) Breaker ON, OFF and Close switch b) Trip circuit healthy push button c) LED type Indication lamp for each panel for: (i) CB Close, (ii) CB open, (iii) Trip on fault, (iv) Trip circuit healthy (v) Spring charged (vi) Breaker in service position (vii) Breaker in test position All LEDs shall be LVGP (low voltage glow protection) & industrial type. (IV) Closing and Tripping**:** Breakers should be able to be operated i) Manually: Spring charging, closing and tripping. ii) Electrically: Motorised Spring charging, closing and shunt tripping. iii) Shunt Trip coil:24 V DC (V) Panel Space Heaters The panel shall be provided with 2nos. 80 W space heaters in each cubicle and adjustable thermostats of suitable rating for heater temperature monitoring along with protective HRC fuses and ON/OFF switch. (VI) Operation Indication / Operation Counter The front door of each breaker panel shall have glass window / windows to facilitate observation of the following: - Spring Charged / Discharged indication, - Mechanical ON/OFF indication and - Operation counter. (VII) Cubicle Illumination Two Nos. cubicle lamps (LED) in each cubicle shall be provided along with switch.		

	(VIII) Safety Interlock The following minimum safety devices shall be provided to ensure the safety of operating personnel: a) Individual explosion vents for Bus bars/Breaker/Cable and CT chambers on the top/Side of the panel to let out the gases under pressure generated during unlikely event of a fault inside the panel. b) Cubicle with front door/panel pressure tested for arc faults. c) CB and metal enclosure earthed in accordance with relevant IS / IEC with latest amendment. d) Self-operating shutters, shielding live fixed contacts, shall be provided which closes automatically when truck is withdrawn to test position. Locking arrangement should be provided for the shutters. e) Breaker shall not be moved in ON condition from service to test position & vice versa. f) The CB cannot be switched ÓN' when the truck is in any position between test and service. g) All nut & bolts used inside the panel should be of high tensile, bright zinc plated, hexagonal headed, metric size, manufacture to DIN 931 of steel, tensile strength minimum 80kgf/SQ.MM, coarse threaded with two nos. bright zinc plated flat and spring washers. h) Lifting hooks shall be provided for the panels. (IX) Panel Markings The switchgear panel shall have the following identification markings in a permanent manner: a) Panel name both in front and rear side. b) Caution boards conforming to IS-2551 with latest amendment both in front and rear sides. c) CT specification name plate on CT and at panel cover at rear. d) Incoming & outgoing cable box. The markings and identifications of conductors, apparatus terminals shall be as per IS-5578 with latest amendment & IS-11353 with latest amendment. (X) Cable Terminal Box HT cable boxes with termination links for termination of incoming and outgoing HT cables should be provided in the rear side of the unit. Rear incoming cable box should be of suitable size for safe entry of two nos. of incoming cables and should have suitable terminal links for safe		

	termination of both the incoming cables for loop in/ loop out connection as is done in case of ring main unit. The termination arrangement should be such that it should be possible to disconnect one cable in the event of fault in that cable and power-up the unit with the other incoming cable. Link rating shall be 600amp (min). Panel shall have incomer connections suitable for 2 x 3 x 240 sq. mm. XLPE 11KV Al cable (cable entry from bottom side) with outdoor kit, indoor kit, end termination with heat shrinkable jointing kit etc. as required. (XI) Bus bar Compartment Bus bar shall be rectangular in cross section and made from electrolytic grade electro tinned copper having 99.99% high conductivity. Heat shrinkable sleeve insulation of 11KV voltage grade should be provided on bus bar, its risers & connections and shall be marked in different colour codes for identification of three different phases (R, Y, B). Thickness of bus-bar sleeve shall be 3 mm and shall be made of Raychem RPG 11 kV grade or similar type. Cast epoxy insulators supports for bus-bar & cable termination links designed to withstand full short circuit current at specified fault level for 3 seconds shall be provided. Bus-bar arrangement should be such that in future similar cubicles can be connected with this cubicle. 3. Incoming feeders: 2 Nos. 1250 Amp VCB with short circuit fault level of 31.5KA for 3 Sec Each Incoming feeder shall have (a) Microprocessor based directional, numerical relay with O/L, E/F and S/C protection for each incomer. (b) Cast resin of dual core 3 CTs, 400-200/5 A of 15VA burden and accuracy Class – 0.5 for metering and class 5P10 for protection. 4. Outgoing feeders – 3 Nos., 800A VCB with short circuit fault level of 31.5KA, 3 Sec Each outgoing feeder shall have (a) Microprocessor based non directional, numerical relay with O/L, E/F and S/C protection for each outgoing feeder. (b) Cast resin of dual core 3 CTs 100-50/5 A of 15VA burden and accuracy Class-0.5 for metering and class 5P10 for protection.		

	5. Bus coupler – 1 No., 1250 Amp VCB with short circuit fault level of 31.5KA for 3 Sec Bus Coupler panel shall have (a) 3 Nos. LED showing R, Y, & B voltage, Breaker 'ON, OFF, Trip' indicating light, Breaker in service/test position and 16 Amp TNC switch for ON / OFF/ Close of VCB required. Suitable nos. and appropriate rating of HRC fuses/ MCB required for protection of LED, multifunction meter and auxiliary power supply, control circuit for closing, tripping and indication circuit and numerical relay etc. on bus coupler feeder. (b) Cast resin of dual core CTs, 400-200/5A of 15VA, burden and accuracy Class – 0.5 for metering and class 5P10 for protection. (c) 1No. Microprocessor based non directional, numerical relay with O/L, E/F and S/C protection for bus-coupler feeder with synchronising check facility. 6. Bus-bar – 3Nos., 1250Amps Copper bus-bar.		
2.	**EARTH TRUCK** Supply, installation, testing and commissioning of earthing trucks suitable for 11kV, 31.5 kA, 1250A (I/C) /800A (O/G) switchgear as follows: (i) The separate earthing trucks shall be provided for bus-bar side earthing and feeder earthing purposes. (ii) The bus bar earthing trucks shall enter only into the incomer panels and feeder earthing trucks shall enter only into outgoing panels. Suitable mechanical interlock shall be provided for the same. (iii) The earthing trucks shall have built in provision, such that it shall not be possible to earth the live circuit on feeder or bus bar side. (iv) The earthing truck shall be of permissive advance contact type construction by virtue of which the feeder or the bus bar side shall be sensed by providing suitable 1 phase voltage transformer, preferably on the Y phase. The advance contact type arrangement shall be such that while insertion of the earthing truck into the respective cubical, shall facilitate the sensing of the voltage by the 1 phase, VT prior to earthing. (v) The further racking for final earth position shall be blocked by suitable solenoid interlock with	1	SET

	audio visual alarm to avoid the earthing of the live bus bar or feeder side. (vi) The isolating contact fitted on the earthing truck and the current carrying part shall be suitable for 31.5 kA current carrying capacity for 1 sec.		
3.	**BATTERY BANK AND CHARGER** Supply, installation, testing & commissioning of sealed maintenance free (SMF) lead acid battery with charger required for supply of continuous 24 Volt DC output voltage for closing/ tripping/indication circuit of 6 nos. 12KV, VCB panel board. Battery with charger consists of 12 nos. 2.0 Volts basic cell in modular design, maintenance free batteries of 200 AH each and charging unit of 20 Amps rating of rectifier with input voltage 200 to 250V AC, 50HZ, and output rated DC voltage 24Volt, 20amps. Incomer to battery charger shall have single phase supply with 20 Amps DP MCB with overload, short circuit protection along with a digital Ammeter & Voltmeter required for showing output voltage and current. Suitable rating of FRLS insulated copper conductor cable shall be used for wiring. The above arrangement is to be fixed in self stackable MS trays with insulated shoe. The battery charger shall have float and boost charger facility. This includes supply and laying of 3 core, 16sqmm., armoured, PVC insulated, PVC sheathed, aluminium conductor, 1.1KV grade cable to laid in pucca trench from LT panel to Battery charger panel – 25 mtrs.	1	SET
4.	**TRANSFORMER** Supply, installation, testing and commissioning of 2 nos. of Cast Resin Dry Type, 750 KVA, 11/0.415 KV, 3 Phase, 50Hz, Dyn11, indoor type, copper wound transformer with OFF load tap changing arrangement on HV side ± 5% in steps of 2.5%, having cable end boxes on HV side suitable for 3x1Cx240 Sqmm XLPE, copper cable of 11KV grade on HT side and 4x4Cx 240sqmm XLPE, 1.1KV, Cu cable on LV side complete with all accessories. Neutral of transformer shall be earthed with 2 nos. earth electrodes and body shall be earthed with minimum 2 nos. Earth electrode. Transformer shall be mounted on suitable size of channel which is to be fixed by grouting 4nos. of bolts. The winding material should be high conductivity electrolytic grade copper. The insulation should be Cast Resin type, Class-F. Conductor should have thermally upgraded paper insulation reinforced with fibreglass. The coil assembly is to be impregnated & cast under vacuum with epoxy resin for achieving non-hygroscopic, acid & alkali resistant insulation. The complete winding should have smooth cylindrical finish after impregnation to ensure high mechanical strength. The thickness of resin should be uniform. The insulation should be self- extinguishing type.	2	NUMBER

	Winding temperature scanner connected with three nos. RTDs, one each for each LV winding should be provided in a metallic enclosure that is mounted on the main enclosure. The scanner should provide indication, alarm & trip contacts. Winding temperature indicator should show maximum temperature attained. The RTDs should be properly wired up to the scanner terminals. Suitable hole with gland is required for control cable connecting scanner alarm/ trip contacts to HT Breaker.		

5.	**LT PANEL** Supply, installation, testing & commissioning of cubicle type LT panel suitable for 415V, 3 Phase, 4 Wire 50 Hz Ac supply system. 1. Construction The PCC shall be floor mounted, freestanding, totally enclosed and extensible type. The PCC shall be dust & vermin proof and shall include all provisions for safety of operation and maintenance personnel. The general construction shall conform to relevant IS/IEC with latest amendment for factory assembled switchboard. The PCC Panel shall be fabricated in compartmentalized design from CRCA sheet steel of 2mm thick for frame work with angle iron/ channel and covers, 3mm thick for gland plates. The panel shall be treated with minimum 10 tank process for powder coating in approved shade. Panel shall have TPN copper bus bars of high conductivity with short circuit withstand capacity of 50KA for 1 Sec; bottom base channel of MS section not less than 100mmx 50mm x 5mm thick, fabrication shall be done in transportable sections, entire panel shall have a common GI earth bar of size 50mm x 6mm at the rear with 2 Nos. earth stud, solid connections from main bus bar to switch gears with required size of copper bus bars and control wiring with 2.5 sq. mm PVC insulated copper conductor FRLS cable, cable alleys and cable gland plates. The bus chamber shall be sheet steel clad having front and rear bolted covers and shall consist of 1 set TP & N electrolytic grade, high conductivity Copper Bus Bars, conforming to BIS. Current rating of bus bar sections shall be 2200 amps suitable for 415 V AC, 50 Hz system. Neutral bar shall be of same size as phase bus. The bus-bar shall be insulated with heat shrinkable PVC sleeves and shall be supported at required intervals with non- hygroscopic, non-deteriorating, and non-inflammable SMC / FRP supports having adequate mechanical strength and a high tracking resistance, to withstand short circuit fault levels up to 50 kA for 1 sec. All risers and connections from bus bar shall be done with same material as the main bus bars of current rating as per rating of individual cubicle switch. To suit the stringent site conditions, the bus bar system shall be designed with generous clearance between phases than specified in the standards. Adequate non-hygroscopic insulating sheet barriers between the bus chambers and feeders shall be provided. 2. Incoming Feeder: (I) 2 Nos. Incomer, 1600 Amps four pole horizontal draw-out type air circuit breaker of fault breaking capacity 50KA for 1 sec with manually operated, motorised / manual	1	SET

	spring charge fitted with interlocked door, automatic safety shutters, mechanical ON/OFF and service/test/isolated position indicators and frame earthing contact conforming to IS-60947- 2 as amended up to date. (II) Each incomer shall consist of 4nos. cast resin type current transformer of 1600/ 5A with suitable rating of brought out terminal for connecting 4nos. single core 240sqmm, copper conductor, 1.1KV grade, XLPE cable. (III) Microprocessor release (EMI & EMC certified) for over current, earth fault & short circuit protection (IV) Microprocessor based flush type digital multifunction meter with accuracy class 0.5 and with RS485 port with MODBUS protocol for data logging/downloading shall be provided for all panels. The meter shall be of size 96mmx96mm and shall measure the following electrical parameters: Frequency, Voltage, current, power factor, KVA, KVAr, KW, KWh and harmonic components. The multifunction meter shall have inbuilt selector switch and memory to store data for minimum 75 days. (V) 3 Nos. LED showing R, Y, & B voltage, Breaker 'ON, OFF, Trip' indicating light and 16 Amp TNC switch for ON / OFF / Close ACB required. Suitable nos. and appropriate rating of HRC fuses/ MCB required for protection of LED, multifunction meter and auxiliary power supply, control circuit for closing, tripping and indication circuit and numerical relay etc. (VI) Tripping method shall have Shunt trip coil of 230 V A.C. 3. Bus Coupler: 1 No. 1600 Amps horizontal four pole draw out type, air circuit breakers of fault breaking capacity 50 KA for 1 sec.		

	(I) Breaker shall have manually operated /motorised / manual spring charge fitted with interlocked door, automatic safety shutters, mechanical ON/OFF and service/test/isolated position indicators and frame earthing contact conforming to IS-60947- 2 as amended up to date. (II) Cast resin type current transformer of ratio 1600/5 A for metering and protection (III) 3Nos. LED showing R, Y, & B voltage, Breaker 'ON, OFF, Trip' indicating light and 16 Amp TNC switch for ON / OFF/ Close ACB required. Suitable nos. and appropriate rating of HRC fuses/ MCB required for protection of LED and auxiliary power supply, control circuit for closing, tripping and indication circuit and numerical relay etc. 4. Bus-bar TPN copper bus bars of minimum of 2200 Amps capacity. 5. Interlocking Electrical interlocking through advance contacts in MCCB/ ACB's (incomers & Bus couplers) and mechanical castle key interlocking should be provided to ensure that only one supply is available at a time on each section of bus and to eliminate any possibility of accidentally approaching two supplies at one bus section. 6. Outgoing feeder (A) 1 No. 1600Amp, 4 Pole horizontal draw-out type air circuit breaker of fault breaking capacity 50KA for 1 sec. (I) Breaker shall be manually operated, motorised / manual spring charge fitted with interlocked door, automatic safety shutters, mechanical ON/OFF and service/test/isolated position indicators and frame earthing contact, conforming to IS-60947- 2 as amended up-to-date. (II) Each outgoing shall consist of 3nos. cast resin type current transformer of 1600/ 5A with suitable rating of brought out terminal for connecting 3 no. single core 240sqmm, copper conductor, 1.1KV grade, XLPE cable. (III) Each breaker shall have microprocessor type release for O/C, S/C and earth fault protection.		

	(IV) Flush type digital multifunction meter with accuracy class 0.5 and with RS485 port provided for all panels. The meter shall be of size 96mmx96mm and shall measure the following electrical parameters: Frequency, Voltage, current, power factor, KVA, KVAr, KW, KWH and harmonic components. The multifunction meter shall have inbuilt selector switch and memory to store data for minimum 75 days. (B) 2 Nos. 630 Amp, 4 Pole MCCB with fault level of 36KA with microprocessor type release for O/C, S/C and E/F protection. (C) 6 Nos. 400 Amp, 4 Pole MCCB with fault level of 36KA with microprocessor type release for O/C, S/C & E/F protection. (D) 3 Nos. 100 Amps, 4 pole MCCB with fault level of 25KA with microprocessor type release for O/C, S/C & E/F protection with electronic timer and contactor, HRC fuses for street lighting feeders. Each outgoing feeder with MCCB shall consist of: (I) 3 nos. cast resin type current transformer of (a) 600/5Amps, (b) 400/5Amps, & (c) 100/5Amps set with suitable rating of brought out terminal for connecting single core 240sqmm, Aluminium conductor, 1.1KV grade, XLPE cable. (II) Each breaker shall have adjustable OL protection, Short Circuit protection & EF protection through inbuilt electronic trip unit in MCCB. (III) Three phase digital ammeter (with inbuilt selector switch) of required range, SIF-96, class of accuracy 1.0, CT operated with CT ratio 600/5, 400/5 and 100/5 respectively (of burden 10VA) and Qty: As per circuit requirement. (IV) HRC Instrument Fuse Holders fused 4 Amps and Qty: As per circuit requirement. (V) LED type Indication Lamps for 'Feeder ON' indication, 'Feeder OFF' indication and 'TRIP' indication and Qty: 3 nos. (VI) Auxiliary power supply of digital ammeter shall be 230V and shall be connected with separate HRC fuse and link system.		

6.	**CABLE** (I). Supply and laying of 11KV (UE), armoured, XLPE power cable of 11KV grade confirming to IS 7098 (Part II) amended up to date as per the following size in kaccha trench with 0.75cm width and 1.2mtrs depth with sand cushioning of 12cm in 2 layers and covered with first class bricks placed on width wise throughout the cable trench.		
	(a) Supply and laying of 11KV (UE), 3x240Sqmm, Aluminium conductor, XLPE cable as above 200mtrs. required from OH to Substation and 400 mtrs. for Switch Room 3 interconnection underground feeder.	600	METER
	(b) Supply and laying of 1x240Sqmm, (UE), 11KV, copper conductor, armoured cable to be laid in pucca trench inside the substation where trench shall be filled with sand. This cable shall be used from HT panel to HT side of transformer.	120	METER
	(II). Supply and laying 4core, 240sqmm., XLPE insulated, armoured, aluminium conductor, power cable of grade 1.1KV shall be laid by excavation, sand cushioning & protective covering and refilling the trench 0.45mtrx 0.75mtr. This cable shall be used from 4 nos. of outgoing feeders from substation to overhead lines, to existing LT panel and to UG to Feeder Pillar.	1600	METER
	(III). Supply and laying 4core, 240sqmm. XLPE insulated, armoured, copper conductor, power cable of grade exceeding 1.1 KV. This cable shall be laid in pucca trench inside the substation where sand shall be filled in the trench. This cable shall be used for connection of LT side of transformer to LT panel.	200	METER
	(IV). Laying of 1 No. Additional XLPE Al power cable of 1.1 KV grade of size 4 x 240Sqmm direct in ground in the same trench in one tier horizontal formation, I/c excavation, sand cushioning & protective Covering and refilling the trench etc. as required.	As required	
	(V). Excavation of the trench in hard rock not exceeding 200 Mtrs in length and 1.0 mtr depth and 1 mtr width mtr getting out the excavated soil and disposal of excavated soil as directed within a reach of 100 mtrs.	200	METER
	(VI). Supplying and making end termination with brass compression gland and Al. lugs for following size of PVC insulated and PVC sheathed/XLPE Al. Conductor cable of 1.1 KV grade as required.	As required	
	(VII). Supplying and making indoor & outdoor cable termination and cable end termination with heat shrinkable jointing kit complete with all accessories I/c lugs suitable for following sizes of 3core XLPE Al conductor, armoured cable of 11KV grade as required for 240sqmm and heat	13	NUMBER

	shrinkable jointing kit complete with all accessories I/c lugs suitable for 240sq. mm. 4core XLPE AI Conductor, armoured cable of 1.1 KV grade. (VIII). Supplying of Sand and filling in the existing substation trench/Open masonry duct as required. 25 cubic mtr.	25	CUBIC METER
7.	**ELECTRIFICATION OF SUBSTATION BUILDING** (1) The wiring of substation building is required to be carried out by PVC insulated, PVC sheathed, armoured, copper conductor, fire retardant, low smoke, 1.1 KV grade cable for different sizes with all accessories as given below: (i) 3 core, 2.5 sqmm cable 250 mtrs (12 light points + 4 ex fan points + 2 extra point wiring) (ii) 3 core, 4 sqmm cable - 100mtrs (4 nos. 10/15 amps socket points wiring) (iii) 4 core, 4 sqmm cable - 25mtrs (3 phase, 2 nos. 15 amp socket points wiring for relay testing) (iv) 3 core, 2.5 sqmm cable - 25 mtrs (2nos. emergency light points for 24DC power supply) (v) Supply and laying in pucca trench, 4core 16sqmm, PVC insulated, PVC sheathed, armoured, aluminium conductor, 1.1 KV grade cable from LT panel 4 pole, 100 amps MCCB to MCB DB – 25 mtrs		
	(2) Supply and fixing of electrical fixture for electrification: (i) 1 x 18/20 watt LED light fittings -12 nos. (ii) 4 pole, 63amps MCCB with O/C, S/C & E/F protection with spreader – 1 no. (iii) 3 phase 6 way MCB DB with 63 Amps RCBO as isolator and 10 amps, 16 Amps MCB - 1set (iv) Metallic/PVC frame ,3 blade 300 mm, 60watt Exhaust fan with shutter (v) 3 Phase, Metallic socket box with 15Amps MCB with accessories - 2Nos. (vi) 3 Pin, single phase, 10/15 amps metallic socket box with all accessories- 4nos. (vii) 2 nos. 6 watt, 24 V DC LED light fitting (viii) 20 nos. 5amps Modular switches with Fixing plate with accessories. (ix) 150 watt, 4 nos. LED with area light control panel including pole for fixing near substation building for area illumination.		

8	**Earthing** (i) Supply and burying heavy duty Chemical electrode with suitable chemical for soil treatment and providing masonry enclosure size 600mmx 600mm x600mm with RCC cover plate having 2nos. metallic hooks for lifting cover and funnel type arrangement for watering pipe etc. complete as required – Minimum no.-10Nos. The no. of earth electrodes may be more. The value of earth resistance to be maintained for each substation when connected all the earth electrodes together > 1 Ohm.	1	set
	(ii) Extra chemical for filling soil earthing electrode as required.	As required	
	(iii) Supplying and laying 100 mm dia GI pipe medium class ISI marked round from earth electrode to building entry as required.	As required	
	(iv) Providing and fixing earth bus of 50mm x 6 mm G.I strip on surface for connection etc. As required	As required	mtrs
	(v) Providing and laying of single core 120sqmm, PVC insulated, aluminium conductor for connection from earth electrode as required.	As required	mtrs
	(vi) Providing and laying of single core 120sqmm, PVC insulated, aluminium conductor as earth wire to be used along with power cable as continuity conductor	2400	mtrs
9	**Safety Equipment** (i) Providing & fixing danger plates made of mild steel at least 2mm thick & vitreous enamelled white on both sides & with inscriptions in signal red colour on front side as read in triangular languages a. High Voltage- size 250mm x 200mm b. Medium Voltage – size 200mm x 150mm	 10 10	 Nos. Nos.
	(ii) Providing and fixing carbon dioxide (CO2) type fire extinguishers confirming to IS 2878-1976 (with latest amendment) and cylinders fully charged of following capacity. (a) 4.5 KG	 2	 Nos.
	(iii) Providing of set of 4 Nos. 9.5 Litre capacity GI bucket painted in post office red colour with	1	set

	prior coat of red oxide paint and written with white paint 'FIRE' and mounted on MS angle iron frame with bracket of appropriate size & capacity I/c filling sand etc.		
	(iv) Providing First Aid Box as approved by St. John Ambulance Brigade/Indian Red Cross conforming to relevant IS/IEC with latest amendment.	1	Nos.
	(v) Supply & fixing shock treatment chart duly mounted on a wooden frame with 5mm thick glass as reqd. (approximate front area 1.20 sq. metre)	2	Nos.
	(vi) Providing of insulating mats 1 mtr. wide and 3mm thick suitable for 11KV working voltage as per IS 15652-2006 (with latest amendment)	8	mtrs
	(iii) Providing of insulating mats 1 mtr. wide and 2mm thick suitable for 1000V working voltage as per IS 15652-2006 (with latest amendment)	8	mtrs
	(iv) Provision for Lock out Tag out for all VCBs, ACBs and MCCBs	As required	
10	**Civil part for substation building and area development of substation:** (i) Construct a RCC building, for electrical substation, including supply of all materials except cement. The size of RCC substation building is as per Panel size provided that there should be sufficient clearance as per safety norms from building wall Height 3.8mtrs. The cable trench for LT panel, HT panel and 2nos. transformers along with foundation of transformers is also part of the substation building. The construction work shall be carried out by the bidder as per approved drawing and technical specification given in civil part. – 1 No.	1	No.
	(ii) For area development of substation building is as per technical specification given in Scope of civil work	1	No.

For Buy back of Electrical equipment like Transformer, HT panel, LT panel, Bidder has to quote against the items are given below: The total amount quoted for buy back of equipment shall be deducted from total amount quoted for schedule of works and shall be treated as total amount for schedule of work.

1	11KV/400 V, AC 500KVA Delta/ star transformer, type – oil cooled, copper winding with all accessories Make – East India Electricals, year of manufacture-1976	1	No.
2	415 V, AC, LT Panel with 2 nos. M-pact ACB in the Incomer. CTR 800/5 Make: Assam Electricals	1	Set
3	HT Panel 11 KV, 630 Amps UNIVAC, 12VE12 Indoor type breaker. Make-Crompton Greaves. Year of manufacture Nov, 2010	1	No.
	Total of buy back = Total (i) + (ii) + (iii)		

Gross schedule of works = Total of schedule of works

SCHEDULE OF WORK
11 KV ELECTRICAL SUB-STATION - SWITCH-ROOM 3
Equipment: HT Panel, Transformers, LT panel)

Sl. No.	Item Description	Quantity	UNIT
1.	**HT Panel** Supply, Installation, Testing and Commissioning of 11 kV VCB 11 kV Switchgear Panel comprising of 7 nos. of indoor type VCB panels, suitable for solidly grounded system, fully factory built and assembled for direct installation. The panels should be designed, manufactured and tested in accordance with relevant IS / IEC with latest amendment. 1. Construction The VCB (cubicle and circuit breaker) panel should be made of steel clad, free standing, floor mounting, dust and vermin proof and horizontal isolation horizontal draw out, compartmentalized type, indoor switch board in standard execution with VCB. The draw out type circuit breaker cubicles should be fabricated using high quality CRCA sheet steel of minimum thickness 2.5 mm for load bearing members and 2.0 mm for other sheet work. The sheet metal should be given minimum ten-tank anti corrosion treatment & then powder coated to colour- SIEMENS GREY. The totally metal enclosed panel shall be compartmentalized with internal positioning by insulated material of epoxy-reinforced fibreglass to constitute the following: a) Bus bar compartment b) Circuit Breaker Compartment. c) CT and Cable compartment. d) Relay & metering compartment (LT compartment). The Circuit Breaker & LT compartment shall be of front open type.	1	SET

	2. Each incomer and outgoing Panel shall have (I) Circuit breaker and CT Compartment The circuit breaker should be totally enclosed & fully interlocked, front open type, horizontal draw-out, horizontal isolation four pole type breaker (as per IS-13118 as amended up to date), single break, trip free mechanism, electrically and manually charged and auto/manually closing breaker suitable for use on 11 KV, 3 Phase, 50Hz A.C. supply with short circuit fault level of 31.5 kA for 3 sec complete with self-contained, fully interlocked, rack in and rack out mechanism. Panel shall be complete with plugs and sockets, mechanical inter-locks and safety shutter. The circuit breaker panel shall have minimum of 6NO+6NC auxiliary contacts directly operated by the breaker. The circuit breaker drive mechanism shall be provided with facility for pad locking at any position namely 'SERVICE', 'TEST' and 'ISOLATED'. The front door shall have view glass to facilitate observation of mechanical ON/OFF indication and operation counter. The CT and the incoming and outgoing feeder cable compartment shall be in the rear. The LT control cable terminal arrangement shall be provided in the rear side in a separate box so as to have isolation from high voltage terminals. All the cable entry plates shall have removable gland plates. The CT required for metering and protection shall be as per IS-2705 (as amended up to date) & IS 4201 (as amended up to date) and shall be of adequate size and its insulation will be epoxy cast resin type. (II) Relays & Metering Compartment (LT Compartment) The LT chamber of suitable height shall be positioned on the top of the panel & at the front. Protective relay, measuring equipment and auxiliary controls along with the switches and indications are to be accommodated in the LT Chamber. Three nos. of bright steel hinges shall be used on front door with door opening limited to 135 Degree (approx). All devices in the LT box are to be marked with permanent labels. Panel rating plate shall be provided on the door. Control wiring and CT wiring shall be done using single core, PVC insulated, FRLS, stranded copper cable of 1100V grade and 2.5 sqmm size. All cables and wires shall be numbered with suitable ferrules. Suitable lugs shall be used for control wiring and ring type lugs shall be used for CT wiring. All wires shall terminate on suitable Terminal Blocks. All TBs shall have 10% spare terminals. TBs shall be marked. Reinforced flexible conduit shall be used for wiring and PVC spiral shall be provided on exposed wires near the door hinge in LT box. Colour coding of control cables shall be followed as required by relevant IS. Control cables shall be as per IS-694 (as amended up to date).		

	(III) Panel Metering and Indication Equipment: Microprocessor based flush type digital multifunction energy meter with accuracy class 0.5 and with RS485 port with MODBUS protocol for data logging/downloading shall be provided for all panels. The meter shall be of size 96mmx96mm and shall measure the following electrical parameters: frequency, voltage, current, power factor, KVA, KVAr, KWh and harmonic components. The multifunction meter shall have inbuilt selector switch and memory to store data for minimum 75 days. The following indications shall be available: a) Breaker ON, OFF and Close switch b) Trip circuit healthy push button c) LED type Indication lamp for each panel for: (i) CB Close, (ii) CB open, (iii) Trip on fault (iv) Trip circuit healthy (v) Spring charged (vi) Breaker in service position (vii) Breaker in test position All LEDs shall be LVGP (low voltage glow protection) & industrial type. (IV) Closing and Tripping Breakers should be able to be operated i) Manually: Spring charging, closing and tripping. ii) Electrically: Motorised Spring charging, closing and shunt tripping. iii) Shunt Trip coil :24 V DC (V) Panel Space Heaters The panel shall be provided with 2nos, 80 W space heaters in each cubicle and adjustable thermostats of suitable rating for heater temperature monitoring along with protective HRC fuses and ON/OFF switch.		

	(VI) Operation Indication / Operation Counter The front door of each breaker panel shall have glass window / windows to facilitate observation of the following: - Spring Charged / Discharged indication, - Mechanical ON/OFF indication and - Operation counter. (VII) Cubicle Illumination: Two nos. cubicle lamps (LED) in each cubicle shall be provided along with switch. (VIII) Safety Interlock The following minimum safety devices shall be provided to ensure the safety of operating personnel: a) Individual explosion vents for Bus bars/Breaker/Cable and CT chambers on the top/Side of the panel to let out the gases under pressure generated during unlikely event of a fault inside the panel. b) Cubicle with front door/panel pressure tested for arc faults. c) CB and metal enclosure earthed in accordance with relevant IS/IEC with latest amendment d) Self-operating shutters, shielding live fixed contacts, shall be provided which closes automatically when truck is withdrawn to test position. Locking arrangement should be provided for the shutters. e) Breaker shall not be moved in ON condition from service to test position & vice versa. f) The CB cannot be switched ÓN' when the truck is in any position between test and service. g) All nut & bolts used inside the panel should be of high tensile, bright zinc plated, hexagonal headed, metric size, manufacture to DIN-931 of steel, tensile strength minimum 80kgf/SQ.MM, coarse threaded with two nos. bright zinc plated flat and spring washers.		

	h) Lifting hooks shall be provided for the panels. (IX) Panel Markings The switchgear panel shall have the following identification markings in a permanent manner: a) Panel name both in front and rear side. b) Caution boards conforming to IS-2551 (with latest amendment) both in front and rear sides. c) CT specification name plate on CT and at panel cover at rear. d) Incoming & outgoing cable box. The markings and identifications of conductors, apparatus terminals shall be as per IS-5578 (with latest amendment) & IS-11353 (with latest amendment). (X) Cable Terminal Box HT cable boxes with termination links for termination of incoming and outgoing HT cables should be provided in the rear side of the unit. Rear incoming cable box should be of suitable size for safe entry of two nos. of incoming cables and should have suitable terminal links for safe termination of both the incoming cables for loop in/ loop out connection as is done in case of ring main unit. The termination arrangement should be such that it should be possible to disconnect one cable in the event of fault in that cable and power-up the unit with the other incoming cable. Link rating shall be 600 amp (min). Panel shall have incomer connections suitable for 2 x 3 x 240 sq. mm. XLPE 11KV cable (cable entry from bottom side) with outdoor kit, indoor kit, end termination with heat shrinkable jointing kit etc. as required. (XI) Bus bar Compartment Bus bar shall be rectangular in cross section and made from electrolytic grade electro tinned copper having 99.99% high conductivity. Heat shrinkable sleeve insulation of 11KV voltage grade should be provided on bus bar, its risers & connections and shall be marked in different colour codes for identification of three different phases (R, Y, B). Thickness of bus-bar sleeve shall be 3 mm and shall be made of Raychem RPG 11 kV grade or similar type. Cast epoxy insulators supports for bus-bar & cable termination links designed to withstand full short circuit current at specified fault level for 3 seconds shall be provided. Bus-bar arrangement should be such that in future similar cubicles can be connected with this cubicle.		

	3. Incoming feeders: 2 Nos. 1250 Amp, 12KV VCB with short circuit fault level of 31.5KA for 3 Sec Each Incoming feeder shall have (a) Microprocessor based directional, numerical relay with O/L, E/F and S/C protection for each incomer. (b) Cast resin of dual core 3 CTs, 400-200/5A of 15VA burden and accuracy Class – 0.5 for metering and class 5P10 for protection. 4. Outgoing feeders – 4 Nos. 800A, 12KV VCB with short circuit fault level of 31.5KA, 3 Sec Each outgoing feeder shall have (a) Microprocessor based non directional, numerical relay with O/L, E/F and S/C protection for each outgoing feeder. (b) Cast resin of dual core 3 CTs 100- 50/5A of 15VA burden and accuracy Class-0.5for metering and class 5P10 for protection. 5. Bus coupler -1No. 1250 Amp, 12KV VCB with short circuit fault level of 31.5KA for 3 Sec Bus Coupler panel shall have (a) 3 nos. LED showing R, Y, & B voltage, Breaker 'ON, OFF, Trip' indicating light, Breaker in service/test position and 16 Amp TNC switch for ON / OFF/ Close of VCB required. Suitable nos. and appropriate rating of HRC fuses/ MCB required for protection of LED, multifunction meter and auxiliary power supply, control circuit for closing, tripping and indication circuit and numerical relay etc. on bus coupler feeder. (b) Cast resin of dual core 3 CTs, 400-200/5 A of 15VA, burden and accuracy Class – 0.5 for metering and class 5P10 for protection. (c) 1No. Microprocessor based non directional, numerical relay with O/L, E/F and S/C protection for bus-coupler feeder with synchronising check facility. 6. Bus-bar- 3Nos. 1250 Amps Copper bus-bar		

2.	**Earth Truck** Supply, installation, testing and commissioning of earthing trucks suitable for 11kV, 31.5 kA, 1250A (I/C) /800A (O/G) switchgear as follows: (i) The separate earthing trucks shall be provided for bus-bar side earthing and feeder earthing purposes. (ii) The bus bar earthing trucks shall enter only into the incomer panels and feeder earthing trucks shall enter only into outgoing panels. Suitable mechanical interlock shall be provided for the same. (iii) The earthing trucks shall have built in provision, such that it shall not be possible to earth the live circuit on feeder or bus bar side. (iv) The earthing truck shall be of permissive advance contact type construction by virtue of which the feeder or the bus bar side shall be sensed by providing suitable 1 phase voltage transformer, preferably on the Y phase. The advance contact type arrangement shall be such that while insertion of the earthing truck into the respective cubical, shall facilitate the sensing of the voltage by the 1 phase, VT prior to earthing. (v) The further racking for final earth position shall be blocked by suitable solenoid interlock with audio visual alarm to avoid the earthing of the live bus bar or feeder side. (vi) The isolating contact fitted on the earthing truck and the current carrying part shall be suitable for 31.5 kA current carrying capacity for 1 sec. – 1 set	1	SET
3.	**Battery bank and charger** Supply, installation, testing & commissioning of sealed maintenance free (SMF) lead acid battery with charger required for supply of continuous 24 Volt DC output voltage for closing/ tripping/indication circuit of 6 nos. 12KV, VCB panel board. Battery with charger consists of 12 Nos. 2.0 Volts basic cell in modular design, maintenance free batteries of 200 AH each and charging unit of 20 Amps rating of rectifier with input voltage 200 to 250V AC, 50HZ, and output rated DC voltage 24 Volt, 20amps. Incomer to battery charger shall have single phase supply with 20 Amps DP MCB with overload, short circuit protection along with a digital Ammeter & Voltmeter required for showing output voltage and current. Suitable rating of FRLS insulated copper conductor cable shall be used for wiring.	1	SET

	The above arrangement is to be fixed in self stackable MS trays with insulated shoe. The battery charger shall have float and boost charger facility. This includes supply and laying of 3 core, 16sqmm, armoured, PVC insulated, PVC sheathed, aluminium conductor, 1.1KV grade cable to laid in pucca trench from LT panel to Battery charger panel – 25 mtrs		
4.	**Transformer** Supply, Installation, testing and commissioning of 2 Nos. of Cast Resin Dry Type, 1500 KVA, 11/0.415 KV, 3 Phase, 50Hz, Dyn11, indoor type, copper wound transformer with OFF load tap changing arrangement on HV side ± 5% in steps of 2.5%, having cable end boxes on HV side suitable for 3x1Cx240 Sqmm XLPE, copper cable of 11KV grade on HT side and 6x4Cx 240sqmm XLPE, 1.1KV, cable on LV side complete with all accessories. Neutral of transformer shall be earthed with 2 nos. earth electrodes and body shall be earthed with minimum 2 nos. Earth electrode. Transformer shall be mounted on suitable size of channel which is to be fixed by grouting 4nos. of bolts. The winding material should be high conductivity electrolytic grade copper. The insulation should be Cast Resin type, Class-F. Conductor should have thermally upgraded paper insulation reinforced with fibreglass. The coil assembly is to be impregnated & cast under vacuum with epoxy resin for achieving non-hygroscopic, acid & alkali resistant insulation. The complete winding should have smooth cylindrical finish after impregnation to ensure high mechanical strength. The thickness of resin should be uniform. The insulation should be self- extinguishing type. Winding temperature scanner connected with three nos. RTDs, one each for each LV winding should be provided in a metallic enclosure that is mounted on the main enclosure. The scanner should provide indication, alarm & trip contacts. Winding temperature indicator should show maximum temperature attained. The RTDs should be properly wired up to the scanner terminals. Suitable hole with gland is required for control cable connecting scanner alarm/ trip contacts to HT Breaker.	2	Number

5.	**LT Panel** Supply, installation, testing & commissioning of cubicle type LT panel suitable for 415V, 3 Phase, 4 Wire 50 Hz Ac supply system. 1. Construction The PCC shall be floor mounted, freestanding, totally enclosed and extensible type. The PCC shall be dust & vermin proof and shall include all provisions for safety of operation and maintenance personnel. The general construction shall conform to relevant IS/IEC with latest amendment for factory assembled switchboard. The PCC Panel shall be fabricated in compartmentalized design from CRCA sheet steel of 2mm thick for frame work with angle iron/ channel and covers, 3mm thick for gland plates. The panel shall be treated with minimum 10 tank process for powder coating in approved shade. Panel shall have TPN copper bus bars of high conductivity with short circuit withstand capacity of 50KA for 1 Sec; bottom base channel of MS section not less than 100mmx 50mm x 5mm thick, fabrication shall be done in transportable sections, entire panel shall have a common GI earth bar of size 40mm x 5mm at the rear with 2 Nos. earth stud, solid connections from main bus bar to switch gears with required size of copper bus bars and control wiring with 2.5 sq. mm PVC insulated copper conductor FRLS cable, cable alleys and cable gland plates. The bus chamber shall be sheet steel clad having front and rear bolted covers and shall consist of 1 set TP & N electrolytic grade, high conductivity Copper Bus Bars, conforming to BIS. Current rating of bus bar sections shall be 3000 amps suitable for 415 V AC, 50 Hz system. Neutral bar shall be of same size as phase bus. The bus-bar shall be insulated with heat shrinkable PVC sleeves and shall be supported at required intervals with non-hygroscopic, non-deteriorating, and non-inflammable SMC / FRP supports having adequate mechanical strength and a high tracking resistance, to withstand short circuit fault levels up to 50 kA for 1 sec. All risers and connections from bus bar shall be done with same material as the main bus bars of current rating as per rating of individual cubicle switch. To suit the stringent site conditions, the bus bar system shall be designed with generous clearance between phases than specified in the standards. Adequate non-hygroscopic insulating sheet barriers between the bus chambers and feeders shall be provided. 2. Incoming Feeder: (I) 3 Nos. (2+1 Spare) Incomer, 2500 Amps four pole horizontal draw-out type air	1	SET

	circuit breaker of fault breaking capacity 50KA for 1 sec with manually operated, motorised / manual spring charge fitted with interlocked door, automatic safety shutters, mechanical ON/OFF and service/test/isolated position indicators and frame earthing contact conforming to IS-60947- 2 as amended up to date. (II) Each incomer shall consist of 4nos. cast resin type current transformer of 2500/ 5A with suitable rating of brought terminal for connecting 6 nos. single core 240sqmm, 1.1KV grade copper conductor XLPE cable. (III) Microprocessor release (EMI & EMC certified) for over current, earth fault & short circuit protection (IV) Microprocessor based flush type digital multifunction meter with accuracy class 0.5 and with RS485 port with MODBUS protocol for data logging/downloading shall be provided for all panels. The meter shall be of size 96mmx96mm and shall measure the following electrical parameters: Frequency, Voltage, current, power factor, KVA, KVAr, KW, KWh and harmonic components. The multifunction meter shall have inbuilt selector switch and memory to store data for minimum 75 days. (V) 3Nos. LED showing R, Y, & B voltage, Breaker 'ON, OFF, Trip' indicating light and 16 Amp TNC switch for ON / OFF/ Close ACB required. Suitable nos. and appropriate rating of HRC fuses/ MCB required for protection of LED, multifunction meter and auxiliary power supply, control circuit for closing, tripping and indication circuit and numerical relay etc. (VI) Tripping method shall have Shunt trip coil of 230V A.C 3. Bus Coupler 1 No. 2500 Amps horizontal four pole draw out type, air circuit breakers of fault breaking capacity 50 KA for 1 sec.		

	(I) Breaker shall have manually operated /motorised / manual spring charge fitted with interlocked door, automatic safety shutters, mechanical ON/OFF and service/test/isolated position indicators and frame earthing contact conforming to IS-60947- 2 as amended up to date. (II) Cast resin type current transformer of ratio 2500/5 A for metering and protection (III) 3 Nos. LED showing R, Y, & B voltage, Breaker 'ON, OFF, Trip' indicating light and 16 Amp TNC switch for ON / OFF/ Close ACB required. Suitable nos. and appropriate rating of HRC fuses / MCB required for protection of LED, multifunction meter and auxiliary power supply, control circuit for closing, tripping and indication circuit and numerical relay etc. 4. Busbar TPN copper bus bars of minimum of 3000 Amps capacity. 5. Interlocking Electrical through advance contacts in MCCB/ ACB's (incomers & Bus couplers) and mechanical castle key interlocking should be provided to ensure that only one supply is available at a time on each section of bus and to eliminate any possible of accidentally approaching two supplies at one bus section. 6. Outgoing feeder (A) 3 No. 1000Amp, 4 Pole horizontal draw-out type air circuit breaker of fault breaking capacity 50KA for 1 sec. (I) Breaker shall be manually operated, motorised / manual spring charge fitted with interlocked door, automatic safety shutters, mechanical ON/OFF and service/test/isolated position indicators and frame earthing contact, conforming to IS-60947- 2 as amended up-to-date. (II) Each outgoing shall consist of 3nos. cast resin type current transformer of 1000/ 5A with suitable rating of brought out terminal for connecting core 3 no. 240sqmm, copper conductor, 1.1KV grade, XLPE cable. (III) Each breaker shall have microprocessor based protection release for O/C, S/C and earth fault protection.		

	(IV) Flush type digital multifunction meter with accuracy class 0.5 and with RS485 port provided for all panels. The meter shall be of size 96mmx96mm and shall measure the following electrical parameters: Frequency, Voltage, current, power factor, KVA, KVAr, KW, KWH and harmonic components. The multifunction meter shall have inbuilt selector switch and memory to store data for minimum 75 days. (B) 9 Nos. 630.Amp, 4 Pole MCCB with fault level of 36KA with microprocessor type release for O/C, S/C and E/F protection. (C) 4 Nos. 400Amp, 4Pole MCCB with fault level of 36KA with microprocessor type release for O/C, S/C & E/F protection (D) 2 Nos. 100Amps, 4pole MCCB with fault level of 25KA with microprocessor type release for O/C, S/C & E/F protection with electronic timer and contactor, HRC fuses for street lighting feeders Each outgoing feeder with MCCB shall consist of (I) 3 nos. cast resin type current transformer of a) 600/5Amps, (b) 400/5Amps, & (c) 100/5 Amps set with suitable rating of brought out terminal for connecting Single core 240sqmm, Aluminium conductor, 1.1KV grade, XLPE cable. (II) Each breaker shall have adjustable OL protection, Short Circuit protection & EF protection through inbuilt electronic trip unit in MCCB. (III) Three phase digital ammeter (with inbuilt selector switch) of required range, SIF-96, class of accuracy 1.0, CT operated with CT ratio 600/5,400/5 and 100/5 respectively (of burden 10VA) and Qty: As per circuit requirement. (IV) HRC Instrument Fuse Holders fused 4 Amps and Qty: As per circuit requirement. (V) LED type Indication Lamps for 'Feeder ON', 'Feeder OFF' and 'TRIP' indication, Qty: 3 nos. (VI) Auxiliary power supply of digital ammeter shall be 230V and shall be connected with separate HRC fuse and link system.		

6.	**CABLE** (I) Supply and laying of 11KV (UE), armoured, XLPE power cable of 11KV grade confirming to IS 7098 (Part II) amended up to date as per the following size in kaccha trench with 0.75cm width and 1.2mtrs depth with sand cushioning of 12cm in 2 layers and covered with first class bricks placed on width wise throughout the cable trench. (a) Supply and laying of 11KV (UE), 3x240Sqmm, Aluminium conductor, XLPE cable as above required for 1Run cable from OH at DX, 2Run cable from Switch Room#2 (4000m) and to Tingri OH feeder & to Bijlibari OH feeder (1900m) (b) Supply and laying of 1x240Sqmm, (UE), 11KV, copper conductor, armoured cable to be laid in pucca trench inside the substation where trench shall be filled with sand. This cable shall be used from HT panel to HT side of transformer.	5900 120	mtrs mtrs
	(II) Supply and laying 4core, 240sqmm, XLPE insulated, armoured, aluminium conductor, power cable of grade 1.1KV shall be laid by excavation, sand cushioning & protective covering and refilling the trench 0.45mtrx 0.75mtr. This cable shall be used from outgoing feeders from substation to overhead lines and through joint to Feeder Pillar cables.	2000	Mtrs
	(III) Supply and laying 4core, 240sqmm. XLPE insulated, armoured, copper conductor, power cable of grade exceeding 1.1 KV. This cable shall be laid in pucca trench inside the substation where sand shall be filled in the trench. This cable shall be used for connection of LT side of transformer to LT panel.	240	Mtrs
	(IV) Laying of 1 No. Additional XLPE Al power cable of 1.1 KV grade of size 4 x 240 Sqmm direct in ground in the same trench in one tier horizontal formation I/c excavation, sand cushioning & protective Covering and refilling the trench etc. as required.	As required	
	(V) Excavation of the trench in hard rock not exceeding 200Mtrs in length and 1.0 mtr depth and 1mtr width mtr getting out the excavated soil and disposal of excavated soil as directed within a reach of 100.mtrs.	200	mtrs
	(VI) Supplying and making end termination with brass compression gland and Al. lugs for following size of PVC insulated and PVC sheathed/XLPE Al. Conductor cable of 1.1 KV grade as required.	As required	

	(VII) Supplying and making indoor & outdoor cable termination and cable end termination with heat shrinkable jointing kit (3) complete with all accessories I/c lugs suitable for following sizes of 3core XLPE Al Conductor, armoured cable of 11KV grade as required for 240sqmm and heat shrinkable jointing kit complete with all accessories I/c lugs suitable for following sizes of 240sqmm 4core XLPE Al Conductor, armoured cable of 1.1KV grade.	17	Number
	(VIII) Supplying of Sand and filling in the existing substation trench / Open masonry duct as required. 25 cubic mtr	25	Cubic meter
7.	**Electrification of substation Building** (1) The wiring of substation building is required to be carried out by PVC insulated, PVC sheathed, armoured, copper conductor, fire retardant, low smoke, 1.1 KV grade cable for different sizes with all accessories as given below: (i) 3 core, 2.5sqmm cable 250 mtrs (12 light points + 4 ex fan points + 2 extra point wiring) (ii) 3 core, 4sqmm cable -100mtrs (4 nos. 10/15 amps socket points wiring) (iii) 4 core, 4sqmm cable -25mtrs (3 phase, 2 nos. 15-amp socket points wiring for relay testing) (iv) 3 core, 2.5sqmm cable -25 mtrs (2nos. emergency light points for 24 DC power supply) (v) Supply and laying in pucca trench, 4core 16sqmm, PVC insulated, PVC sheathed, armoured, aluminium conductor, 1.1 KV grade cable from LT panel 4pole, 100 amps MCCB to MCB DB-25mtrs (2) Supply and fixing of electrical fixture for electrification: (i) 1x 18/20 watt LED light fittings -12 nos. (ii) 4 pole, 63 amps MCCB with O/C, S/C & E/F protection with spreader -1 no. (iii) 3phase 6 way MCB DB with 63 Amps RCBO as isolator and 10amps, 16Amps MCB - 1set (iv) Metallic/PVC frame ,3 blade 300mm, 60watt Exhaust fan with shutter (v) 3 Phase, Metallic socket box with 15Amps MCB with accessories - 2Nos. (vi) 3Pin, single phase, 10/15 amps metallic socket box with all accessories- 4nos. (vii) 2Nos. 6watt, 24 V DC LED light fitting (viii) 20Nos, 5amps Modular switches with Fixing plate with accessories. (ix) 150 watt, 4nos. LED with area light control panel including pole for fixing near substation building for area illumination.		

8.	**Earthing** (i) Supply and burying a heavy duty, Chemical electrode with suitable chemical for soil treatment. and providing masonry enclosure size 600mmx 600mm x600mm with RCC cover plate having 2nos. metallic hooks for lifting cover and funnel type arrangement for watering pipe etc. complete as required – Minimum no.-10Nos. The no. of earth electrodes may be more. The value of earth resistance to be maintained for each substation when connected all the earth electrodes together > 1 Ohm.	1	SET
	(ii) Extra chemical for filling soil earthing electrode as required.	As required	
	(iii) Supplying and laying 100 mm dia GI pipe medium class ISI marked round from earth electrode to building entry as required.	As required	
	(iv) Providing and fixing earth bus of 50mm x 6 mm G.I strip on surface for connection etc. As required	As required	Mtrs
	(v) Providing and laying of single core 120sqmm, PVC insulated, aluminium conductor for connection from earth electrode as required.	As required	Mtrs
	(vi) Providing and laying of single core 120sqmm, PVC insulated, aluminium conductor as earth wire to be used along with power cable as continuity conductor	6400	Mtrs
9.	**Safety Equipment** (i) Providing & fixing danger plates made of mild steel at least 2mm thick & vitreous enamelled white on both sides & with inscriptions in signal red colour on front side as read in triangular languages a. High Voltage- size 250mm x 200mm b. Medium Voltage – size 200mm x 150mm	 10 10	 Nos. Nos.
	(ii) Providing and fixing carbon dioxide (CO_2) type fire extinguishers confirming to IS 2878-1976 (with latest amendment) and cylinders fully charged of following capacity. (a) 4.5KG	2	Nos.

	(iii) Providing of set of 4 Nos. 9.5 Litre capacity GI bucket painted in post office red colour with prior coat of red oxide paint and written with white paint 'FIRE' and mounted on MS angle iron frame with bracket of appropriate size & capacity I/c filling sand etc.	1	Set
	(iv) Providing First Aid Box as approved by St. John Ambulance Brigade/Indian Red Cross conforming to relevant IS/IEC with latest amendment.	1	No.
	(v) Supply & fixing shock treatment chart duly mounted on a wooden frame with 5mm thick glass as reqd. (approximate front area 1.20 sq.metre)	2	Nos.
	(vi) Providing of insulating mats 1 mtr. wide and 3mm thick suitable for 11KV working voltage as per IS 15652-2006 with latest amendment	8	mtrs
	(vii) Providing of insulating mats 1 mtr. wide and 2mm thick suitable for 1000V working voltage as per IS 15652-2006 with latest amendment	8	Mtrs
	(viii) Provision for Lock out Tag out for VCBs, ACBs and MCCBs	As required	
10.	**Civil part for substation building and area development of substation:** (i) Construct a RCC building, for electrical substation, including supply of all materials except cement. The size of RCC substation building is as per Panel size provided that there should be sufficient clearance as per safety norms from building wall Height 3.8mtrs. The cable trench for LT panel, HT panel and 2nos. transformers along with foundation of transformers is also part of the substation building. The construction work shall be carried out by the bidder as per approved drawing and technical specification given in civil part. - 1 No.	1	No.
	(ii) For area development of substation building is as per technical specification given in civil part-1	1	No.

For Buy back of Electrical equipment like Transformer, HT panel, LT panel, Bidder has to quote against the items are given below: The total amount quoted for buy back of equipment shall be deducted from total amount quoted for schedule of works and shall be treated as total amount for schedule of work.

1	11KV/400 V, AC 500KVA transformer, type – oil cooled, copper winding with all accessories, make- Bharat bijlee, year of manufacture- 1985 11KV/433 V, AC 500KVA transformer, type – oil cooled, copper winding with all accessories, make- Crompton Greaves	2	No.
2	415 V, AC, LT switch board comprises of the following: i. M-pact ACB with 01 no. Incomer, CTR 800/5 Feeder quantity- 11 ii. M-pact ACB with 02 nos. Incomer, CTR 800/5 Feeder quantity- 6	2	Set
3	11kV, 630 Amps VMX enclosure breaker Make - Alstom year of manufacture 2003	2	No.
	Total of buy back = Total (i) + (ii) + (iii)		

Gross schedule of works = Total of schedule of works

SCHEDULE OF WORK **11 KV ELECTRICAL SUBSTATION - TINGRI** **Equipment : HT Panel, Transformers , LT panel)**			
Sl. No.	**Item Description**	**Quantity**	**Unit**
1.	**HT Panel** Supply, Installation, Testing and Commissioning of 11 kV VCB Panel 11 kV Switchgear Panel comprising of 6 nos. of indoor type VCB panels, suitable for solidly grounded system, fully factory built and assembled for direct installation. The panels should be designed, manufactured and tested in accordance with relevant IS/IEC with latest amendment. 1. Construction The VCB (cubicle and circuit breaker) panel should be made of steel clad, free standing, floor mounting, dust and vermin proof and horizontal isolation horizontal draw out, compartmentalized type, indoor switch board in standard execution with VCB. The draw out type circuit breaker cubicles should be fabricated using high quality CRCA sheet steel of minimum thickness 2.5 mm for load bearing members and 2.0 mm for other sheet work. The sheet metal should be given minimum ten-tank anti corrosion treatment & then powder coated to colour- SIEMENS GREY. The totally metal enclosed panel shall be compartmentalized with internal positioning by insulated material of epoxy-reinforced fibreglass to constitute the following: a) Bus bar compartment b) Circuit Breaker Compartment. c) CT and Cable compartment. d) Relay & metering compartment (LT compartment). The Circuit Breaker & LT compartment shall be of front open type.	1	SET

	2. Each incomer and outgoing Panel shall have (I) Circuit breaker and CT Compartment The circuit breaker should be totally enclosed & fully interlocked, front open type, horizontal draw-out, horizontal isolation type four pole breaker (as per IS: 13118 as amended up to date), single break, trip free mechanism, electrically and manually charged and auto/manually closing breaker suitable for use on 11 KV, 3 Phase, 50Hz A.C. supply with short circuit fault level of 31.5 kA for 3 sec complete with self-contained, fully interlocked, rack in and rack out mechanism. Panel shall be complete with plugs and sockets, mechanical inter-locks and safety shutter. The circuit breaker panel shall have minimum of 6NO+6NC auxiliary contacts directly operated by the breaker. The circuit breaker drive mechanism shall be provided with facility for pad locking at any position namely 'SERVICE', 'TEST' and 'ISOLATED'. The front door shall have view glass to facilitate observation of mechanical ON/OFF indication and operation counter. The CT and the incoming and outgoing feeder cable compartment shall be in the rear. The LT control cable terminal arrangement shall be provided in the rear side in a separate box so as to have isolation from high voltage terminals. All the cable entry plates shall have removable gland plates. The CT required for metering and protection shall be as per IS-2705 (as amended up to date) & IS 4201 (as amended up to date) and shall be of adequate size and its insulation will be epoxy cast resin type. (II) Relays & Metering Compartment (LT Compartment) The LT chamber of suitable height shall be positioned on the top of the panel &at the front. Protective relay, measuring equipment and auxiliary controls along with the switches and indications are to be accommodated in the LT Chamber. Three nos. of bright steel hinges shall be used on front door with door opening limited to 135 Degree (approx). All devices in the LT box are to be marked with permanent labels. Panel rating plate shall be provided on the door. Control wiring and CT wiring shall be done using single core, PVC insulated, FRLS, stranded copper cable of 1100V grade and 2.5sqmm size. All cables and wires shall be numbered with suitable ferrules. Suitable lugs shall be used for control wiring and ring type lugs shall be used for CT wiring. All wires shall terminate on suitable Terminal Blocks. All TBs shall have 10% spare terminals. TBs shall be marked. Reinforced flexible conduit shall be used for wiring and PVC spiral shall be provided on exposed wires near the door hinge in LT box. Colour coding of control cables shall be followed as required by relevant IS. Control cables shall be as per IS-694 (as amended up to date).		

	(III) Panel Metering and Indication Equipment: Microprocessor based flush type digital multifunction energy meter with accuracy class 0.5 and with RS485 port with MODBUS protocol for data logging/downloading shall be provided for all VCB panels. The meter shall be of size 96mmx96mm and shall measure the following electrical parameters: frequency, voltage, current, power factor, KVA, KVAr, KWh and harmonic components. The multifunction meter shall have inbuilt selector switch and memory to store data for minimum 75 days. The following indications shall be available: a) Breaker ON, OFF and Close switch b) Trip circuit healthy push button c) LED type Indication lamp for each panel for: (i) CB Close, (ii) CB open, (iii) Trip on fault (iv) Trip circuit healthy (v) Spring charged (vi) Breaker in service position (vii) Breaker in test position All LEDs shall be LVGP (low voltage glow protection) & industrial type. (IV) Closing and Tripping Breakers should be able to be operated i) Manually: Spring charging, closing and tripping. ii) Electrically: Motorised Spring charging, closing and shunt tripping. iii) Shunt Trip: 24 V DC (V) Panel Space Heater The panel shall be provided with 2nos, 80 W space heaters in each cubicle and adjustable thermostats of suitable rating for heater temperature monitoring along with protective HRC fuses and ON/OFF switch.		

	(VI) Operation Indication / Operation Counter The front door of each breaker panel shall have glass window / windows to facilitate observation of the following: - Spring Charged / Discharged indication, - Mechanical ON/OFF indication and - Operation counter. (VII) Cubicle Illumination Two nos. cubicle lamps (LED) in each cubicle shall be provided along with switch. (VIII) Safety Interlock The following minimum safety devices shall be provided to ensure the safety of operating personnel: a) Individual explosion vents for Bus bars/Breaker/Cable and CT chambers on the top/Side of the panel to let out the gases under pressure generated during unlikely event of a fault inside the panel. b) Cubicle with front door/panel pressure tested for arc faults. c) CB and metal enclosure earthed in accordance with relevant IS / IEC (as amended up to date) d) Self-operating shutters, shielding live fixed contacts, shall be provided which closes automatically when truck is withdrawn to test position. Locking arrangement should be provided for the shutters. e) Breaker shall not be moved in ON condition from service to test position & vice versa. f) The CB cannot be switched ÓN' when the truck is in any position between test and service. g) All nut & bolts used inside the panel should be of high tensile, bright zinc plated, hexagonal headed, metric size, manufacture to DIN-931 of steel, tensile strength minimum 80kgf/SQ.MM, coarse threaded with two nos. bright zinc plated flat and spring washers.		

h) Lifting hooks shall be provided for the panels.

(XI) Panel Markings:

The switchgear panel shall have the following identification markings in a permanent manner:

a) Panel name both in front and rear side.
b) Caution boards conforming to IS-2551 with latest amendment both in front and rear sides.
c) CT specification name plate on CT and at panel cover at rear.
d) Incoming & outgoing cable box.

The markings and identifications of conductors, apparatus terminals shall be as per IS-5578 with latest amendment & IS-11353 with latest amendment.

(X) Cable Terminal Box

HT cable boxes with termination links for termination of incoming and outgoing HT cables should be provided in the rear side of the unit. Rear incoming cable box should be of suitable size for safe entry of two nos. of incoming cables and should have suitable terminal links for safe termination of both the incoming cables for loop in/ loop out connection as is done in case of ring main unit. The termination arrangement should be such that it should be possible to disconnect one cable in the event of fault in that cable and power-up the unit with the other incoming cable. Link rating shall be 600amp (min).

Panel shall have incomer connections suitable for 2 x 3 x 240 sq. mm. XLPE 11KV cable (cable entry from bottom side) with outdoor kit, indoor kit, end termination with heat shrinkable jointing kit etc. as required.

(XI) Bus bar Compartment

Bus bar shall be rectangular in cross section and made from electrolytic grade electro tinned copper having 99.99% high conductivity. Heat shrinkable sleeve insulation of 11KV voltage grade should be provided on bus bar, its risers & connections and shall be marked in different colour codes for identification of three different phases (R, Y, B). Thickness of bus-bar sleeve shall be 3 mm and shall be made of Raychem RPG 11 kV grade or similar type.
Cast epoxy insulators supports for bus-bar & cable termination links designed to withstand full short circuit current at specified fault level for 3 seconds shall be provided.
Bus-bar arrangement should be such that in future similar cubicles can be connected with this cubicle.

	3. Incoming feeders: 2 Nos. 1250 Amp, 12 KV VCB with short circuit fault level of 31.5KA for 3 Sec Each Incoming feeder shall have - (a) Microprocessor based directional, numerical relay with O/L, E/F and S/C protection for each incomer. (b) Cast resin of dual core 3 CTs, 400-200/5A of 15VA burden and accuracy Class – 0.5 for metering and class 5P10 for protection. 4. Outgoing feeders –3Nos, 800A, 12KV, VCB with short circuit fault level of 31.5KA, 3 Sec Each outgoing feeder shall have (a) Microprocessor based non directional, numerical relay with O/L, E/F and S/C protection for each outgoing feeder. (b) Cast resin of dual core 3 CTs 100- 50/5 A of 15VA burden and accuracy Class-0.5 for metering and class 5P10 for protection. 5. Bus coupler -1No. 1250 Amp, 12KV VCB with short circuit fault level of 31.5KA for 3 Sec Bus Coupler panel shall have (a) 3 Nos. LED showing R, Y, & B voltage, Breaker 'ON, OFF, Trip' indicating light, Breaker in service/test position and 16 Amp TNC switch for ON / OFF/ Close VCB required. Suitable nos. and appropriate rating of HRC fuses/ MCB required for protection of LED, multifunction meter and auxiliary power supply, control circuit for closing, tripping and indication circuit and numerical relay etc. on bus coupler feeder. (b) Cast resin of dual core 3 CTs, 400-200/5A of 15VA, burden and accuracy Class – 0.5 for metering and class 5P10 for protection. (c) 1 No. Microprocessor based non directional, numerical relay with O/L, E/F and S/C protection for bus-coupler feeder with synchronising check facility. 6. Bus-bar- 3Nos. 1250 Amps Copper bus-bar		

2.	**Earth Truck** Supply, installation, testing and commissioning of earthing trucks suitable for 11kV, 31.5 kA, 1250A (I/C) /800A (O/G) switchgear as follows: (i) The separate earthing trucks shall be provided for bus-bar side earthing and feeder earthing purposes. (ii) The bus bar earthing trucks shall enter only into the incomer panels and feeder earthing trucks shall enter only into outgoing panels. Suitable mechanical interlock shall be provided for the same. (iii) The earthing trucks shall have built in provision, such that it shall not be possible to earth the live circuit on feeder or bus bar side. (iv) The earthing truck shall be of permissive advance contact type construction by virtue of the feeder or the bus bar side shall be sensed by providing suitable 1 phase voltage transformer, preferably on the Y phase. The advance contact type arrangement shall be such that while insertion of the earthing truck into the respective cubical, shall facilitate the sensing of the voltage by the 1 phase, VT prior to earthing. (v) The further racking for final earth position shall be blocked by suitable solenoid interlock with audio visual alarm to avoid the earthing of the live bus bar or feeder side. (vi) The isolating contact fitted on the earthing truck and the current carrying part shall be suitable for 31.5 kA current carrying capacity for 1 sec. – 1 set	1	SET
3.	**Battery bank and charger** Supply, installation, testing & commissioning of sealed maintenance free (SMF) lead acid battery with charger required for supply of continuous 24 Volt DC output voltage for closing/ tripping/indication circuit of 6 nos. 12KV, VCB panel board. Battery with charger consists of 12 Nos. 2.0 Volts basic cell in modular design, maintenance free batteries of 200 AH each and charging unit of 20 Amps rating of rectifier with input voltage 200 to 250V AC, 50HZ, and output rated DC voltage 24 Volt, 20amps. Incomer to battery charger shall have single phase supply with 20 Amps DP MCB with overload, short circuit protection along with a digital Ammeter & Voltmeter required for showing output voltage and current. Suitable rating of FRLS insulated copper conductor cable shall be used for wiring. The above arrangement is to be fixed in self stackable MS trays with insulated shoe. The battery	1	SET

	charger shall have float and boost charger facility. This includes supply and laying of 3 core, 16sqmm, armoured, PVC insulated, PVC sheathed, aluminium conductor, 1.1KV grade cable to laid in pucca trench from LT panel to Battery charger panel – 25mtrs		
4.	**Transformer** Supply, Installation, testing and commissioning of 2 Nos. of Cast Resin Dry Type, 750 KVA, 11/0.415 KV, 3 Phase, 50Hz, Dyn11, indoor type, copper wound transformer with OFF load tap changing arrangement on HV side ± 5% in steps of 2.5%, having cable end boxes on HV side suitable for 3x1Cx240 Sqmm XLPE, copper cable of 11KV grade on HT side and 4x4Cx 240sqmm XLPE, 1.1KV, cable on LV side complete with all accessories. Neutral of transformer shall be earthed with minimum 2 nos. earth electrodes and body shall be earthed with minimum 2 nos. Earth electrode. Transformer shall be mounted on suitable size of channel which is to be fixed by grouting 4nos. of bolts. The winding material should be high conductivity electrolytic grade copper. The insulation should be Cast Resin type, Class-F. Conductor should have thermally upgraded paper insulation reinforced with fibreglass. The coil assembly is to be impregnated & cast under vacuum with epoxy resin for achieving non-hygroscopic, acid & alkali resistant insulation. The complete winding should have smooth cylindrical finish after impregnation to ensure high mechanical strength. The thickness of resin should be uniform. The insulation should be self- extinguishing type. Winding temperature scanner connected with three nos. RTDs, one each for each LV winding should be provided in a metallic enclosure that is mounted on the main enclosure. The scanner should provide indication, alarm & trip contacts. Winding temperature indicator should show maximum temperature attained. The RTDs should be properly wired up to the scanner terminals. Suitable hole with gland is required for control cable connecting scanner alarm/ trip contacts to HT Breaker.	2	Number

5.	**LT Panel** Supply, installation, testing & commissioning of cubicle type LT panel suitable for 415V, 3 Phase, 4 Wire 50 Hz Ac supply system. 1. Construction The PCC shall be floor mounted, freestanding, totally enclosed and extensible type. The PCC shall be dust & vermin proof and shall include all provisions for safety of operation and maintenance personnel. The general construction shall conform to relevant IS/IEC with latest amendment for factory assembled switchboard. The PCC Panel shall be fabricated in compartmentalized design from CRCA sheet steel of 2mm thick for frame work with angle iron/ channel and covers, 3mm thick for gland plates. The panel shall be treated with minimum 10 tank process for powder coating in approved shade. Panel shall have TPN copper bus bars of high conductivity with short circuit withstand capacity of 50KA for 1 Sec; bottom base channel of MS section not less than 100mmx 50mm x 5mm thick, fabrication shall be done in transportable sections, entire panel shall have a common GI earth bar of size 40mm x 5mm at the rear with 2 Nos. earth stud, solid connections from main bus bar to switch gears with required size of copper bus bars and control wiring with 2.5 sq. mm PVC insulated copper conductor FRLS cable, cable alleys and cable gland plates. The bus chamber shall be sheet steel clad having front and rear bolted covers and shall consist of 1 set TP & N electrolytic grade, high conductivity Copper Bus Bars, conforming to BIS. Current rating of bus bar sections shall be 2200 amps suitable for 415 V AC, 50 Hz system. Neutral bar shall be of same size as phase bus. The bus-bar shall be insulated with heat shrinkable PVC sleeves and shall be supported at required intervals with non- hygroscopic, non-deteriorating, and non-inflammable SMC / FRP supports having adequate mechanical strength and a high tracking resistance, to withstand short circuit fault levels up to 50 kA for 1 sec. All risers and connections from bus bar shall be done with same material as the main bus bars of current rating as per rating of individual cubicle switch. To suit the stringent site conditions, the bus bar system shall be designed with generous clearance between phases than specified in the standards. Adequate non-hygroscopic insulating sheet barriers between the bus chambers and feeders shall be provided. 2. Incoming Feeder: (I) 3 (2+1 spare) Nos. Incomer, 1600 Amps four pole horizontal draw-out type air circuit breaker of fault breaking capacity 50KA for 1 sec with manually operated, motorised / manual spring charge fitted with interlocked door, automatic safety shutters, mechanical	1	SET

	ON/OFF and service/test/isolated position indicators and frame earthing contact conforming to IS-60947- 2 as amended up to date. (II) Each incomer shall consist of 4nos. cast resin type current transformer of 1600/ 5A with suitable rating of brought terminal for connecting 4 nos. single core 240sqmm, 1.1KV grade copper conductor XLPE cable. (III) Microprocessor release (EMI & EMC certified) for over current, earth fault & short circuit protection. (IV) Microprocessor based flush type digital multifunction meter with accuracy class 0.5 and with RS485 port with MODBUS protocol for data logging/downloading shall be provided for all panels. The meter shall be of size 96mmx96mm and shall measure the following electrical parameters: Frequency, Voltage, current, power factor, KVA, KVAr, KW, KWh and harmonic components. The multifunction meter shall have inbuilt selector switch and memory to store data for minimum 75 days. (V) 3 Nos. LED showing R, Y, & B voltage, Breaker 'ON, OFF, Trip' indicating light and 16 Amp TNC switch for ON / OFF/ Close ACB required. Suitable nos. and appropriate rating of HRC fuses/ MCB required for protection of LED, multifunction meter and auxiliary power supply, control circuit for closing, tripping and indication circuit and numerical relay etc. (VI) Tripping method shall have Shunt trip coil of 230V A.C 3. Bus Coupler 1No. 1600 Amps horizontal four pole draw out type, air circuit breakers of fault breaking capacity 50 KA for 1 sec. (I) Breaker shall have manually operated /motorised / manual spring charge fitted with interlocked door, automatic safety shutters, mechanical ON/OFF and service/test/isolated position indicators and frame earthing contact conforming to IS-60947- 2 as amended up to date. (II) Cast resin type current transformer of ratio 1600/5 A for metering and protection (III) 3Nos. LED showing R, Y, & B voltage, Breaker 'ON, OFF, Trip' indicating light and 16 Amp TNC switch for ON / OFF/ Close ACB required. Suitable nos. and appropriate rating of HRC fuses/ MCB required for protection of LED and auxiliary power supply, control circuit for closing, tripping and indication circuit and numerical relay etc.		

4. Busbar

TPN copper bus bars of minimum of 2200 Amps capacity.

5. Interlocking

Electrical through advance contacts in MCCB/ ACB's (incomers & Bus couplers) and mechanical castle key interlocking should be provided to ensure that only one supply is available at a time on each section of bus and to eliminate any possible of accidentally approaching two supplies at one bus section.

6. Outgoing feeder:

(A) 6 Nos. 630Amp, 4 Pole MCCB with fault level of 36KA with microprocessor type release for O/C, S/C and E/F protection.

(B) 4 Nos. 400Amp, 4Pole MCCB with fault level of 36KA with microprocessor type release for O/C, S/C & E/F protection.

(C) 2 nos. 100 Amps, 4pole MCCB with fault level of 25KA with microprocessor type release for O/C, S/C & E/F protection with electronic timer and contactor, HRC fuses for street lighting feeders

(I) Each outgoing shall consist of 3 nos. cast resin type current transformer of (a) 600/5 Amps, (b) 400/5 Amps, & (c) 100/5 Amps set with suitable rating of brought out terminal for connecting Single core 240sqmm, Aluminium conductor, 1.1KV grade, XLPE cable.

(II) Each breaker shall have adjustable OL protection, Short Circuit protection & EF protection through inbuilt electronic trip unit in MCCB.

(III) Three phase digital ammeter (with inbuilt selector switch) of required range, SIF-96, class of accuracy 1.0, CT operated with CT ratio 600/5, 400/5 and 100/5 respectively (of burden 10VA) and Qty: As per circuit requirement.

(IV) HRC Instrument Fuse Holders fused 4 Amps and Qty: As per circuit requirement.

(V) LED type Indication Lamps for 'Feeder ON' 'Feeder OFF' and 'TRIP' indication, Qty: 3 nos.

(VI) Auxiliary power supply of digital ammeter shall be 230V and shall be connected with separate HRC fuse and link system.

6.	**Cable** (I) Supply and laying of 11KV (UE), armoured, XLPE power cable of 11KV grade confirming to IS 7098 (Part II) amended up to date as per the following size in kaccha trench with 0.75cm width and 1.2mtrs depth with sand cushioning of 12cm in 2 layers and covered with first class bricks placed on width wise throughout the cable trench. (a) Supply and laying of 11KV (UE), 3x240Sqmm, Aluminium conductor, XLPE cable as above 200mtrs required from OH to Substation to OH (2x100) (b) Supply and laying of 1x240Sqmm, (UE), 11KV, copper conductor, armoured cable to be laid in pucca trench inside the substation where trench shall be filled with sand. This cable shall be used from HT panel to HT side of transformer.	200 120	mtrs mtrs
	(II) Supply and laying 4core, 240sqmm, XLPE insulated, armoured, aluminium conductor, power cable of grade 1.1KV shall be laid by excavation, sand cushioning & protective covering and refilling the trench 0.45mtrx 0.75mtr. This cable shall be used from 5 nos. of outgoing feeders from substation to overhead lines.	1000	Mtrs
	(III) Supply and laying 4core, 240sqmm. XLPE insulated, armoured, copper conductor, power cable of grade exceeding 1.1 KV. This cable shall be laid in pucca trench inside the substation where sand shall be filled in the trench. This cable shall be used for connection of LT side of transformer to LT panel.	200	Mtrs
	(IV) Laying of 1 No. Additional XLPE Al power cable of 1.1 KV grade of size 4 x 240Sqmm direct in ground in the same trench in one tier horizontal formation I/c excavation, sand cushioning & protective covering and refilling the trench etc. as required.	As required	
	(V) Excavation of the trench in hard rock not exceeding 200Mtrs in length and 1.0 mtr depth and 1mtr width mtr getting out the excavated soil and disposal of excavated soil as directed within a reach of 100 mtrs.	200	mtrs
	(VI) Supplying and making end termination with brass compression gland and Al. lugs for following size of PVC insulated and PVC sheathed/XLPE Al. Conductor cable of 1.1 KV grade as required.	As required	
	(VII) Supplying and making indoor (7) & outdoor (2) cable termination and cable end termination with heat shrinkable jointing kit (1) complete with all accessories I/c lugs suitable for following sizes of 240 sqmm 3core XLPE Al. Conductor, armoured cable of 11KV grade.	10	Nos

	(VIII) Supplying of Sand and filling in the existing substation trench/Open masonry duct as required. 25 cubic mtr	25	Cubic meter
7.	**ELECTRIFICATION OF SUBSTATION BUILDING** (1) The wiring of substation building is required to be carried out by PVC insulated, PVC sheathed, armoured, copper conductor, fire retardant, low smoke, 1.1 KV grade cable for different sizes with all accessories as given below: (i) 3core, 2.5sqmm cable 250 mtrs (12 light points + 4 ex fan points + 2 extra point wiring) (ii) 3core, 4sqmm cable -100mtrs (4 nos. 10/15 amps socket points wiring) (iii) 4core, 4sqmm cable -25mtrs (3phase, 2 nos. 15 amp socket points wiring for relay testing) (iv) 3core, 2.5sqmm cable -25 mtrs (2nos. emergency light points for 24DC power supply) (v) Supply and laying in pucca trench, 4core 16sqmm, PVC insulated, PVC sheathed, armoured, aluminium conductor, 1.1 KV grade cable from LT panel 4 pole, 100 amps MCCB to MCB DB-25mtrs		
	(2) Supply and fixing of electrical fixture for electrification: (i) 1x 18/20 watt LED light fittings -12 nos. (ii) 4pole, 63amps MCCB with O/C, S/C & E/F protection with spreader -1no (iii) 3phase 6 way MCB DB with 63 Amps RCBO as isolator and 10amps, 16Amps MCB - 1set (iv) Metallic/PVC frame ,3 blade 300 mm, 60watt Exhaust fan with shutter (v) 3 Phase, Metallic socket box with 15Amps MCB with accessories - 2Nos. (vi) 3Pin, single phase, 10/15 amps metallic socket box with all accessories- 4nos. (vii) 2Nos. 6 watt, 24 V DC LED light fitting (viii) 20Nos, 5amps Modular switches with Fixing plate with accessories. (ix) 150 watt, 4nos. LED with area light control panel including pole for fixing near substation building for area illumination.		
8.	**Earthing** (i) Supply and burying a heavy duty, Chemical electrode with suitable chemical for soil treatment. and providing masonry enclosure size 600mmx 600mm x600mm with RCC cover plate having 2nos. metallic hooks for lifting cover and funnel type arrangement for watering pipe etc. complete as required – Minimum no.-10Nos. The no. of earth electrodes may be more. The value of earth resistance to be maintained for each	1	set

	substation when connected all the earth electrodes together > 1 Ohm.		
	(ii) Extra chemical for filling soil earthing electrode as required.	As required	
	(iii) Supplying and laying 100 mm dia GI pipe medium class ISI marked round from earth electrode to building entry as required.	As required	
	(iv) Providing and fixing earth bus of 50mm x 6mm G.I strip on surface for connection etc. As required	As required	mtrs
	(v) Providing and laying of single core 120sqmm, PVC insulated, aluminium conductor for connection from earth electrode as required.	As required	mtrs
	(vi) Providing and laying of single core 120sqmm, PVC insulated, aluminium conductor as earth wire to be used along with power cable as continuity conductor	1500	Mtrs
9.	**Safety Equipment** (i) Providing & fixing danger plates made of mild steel at least 2mm thick & vitreous enamelled white on both sides & with inscriptions in signal red colour on front side as read in triangular languages a. High Voltage- size 250mm x 200mm b. Medium Voltage – size 200mm x 150mm	 10 10	 Nos. Nos.
	(ii) Providing and fixing carbon dioxide (CO2) type fire extinguishers confirming to IS 2878-1976 (with latest amendment) and cylinders fully charged of following capacity. (a) 4.5KG	 2	 Nos.
	(iii) Providing of set of 4 Nos. 9.5 Litre capacity GI bucket painted in post office red colour with prior coat of red oxide paint and written with white paint 'FIRE' and mounted on MS angle iron frame with bracket of appropriate size & capacity I/c filling sand etc.	1	Set
	(iv) Providing First Aid Box as approved by St. John Ambulance Brigade/Indian Red Cross conforming to relevant IS/IEC with latest amendment.	1	Nos.
	(v) Supply & fixing shock treatment chart duly mounted on a wooden frame with 5 mm thick glass as reqd. (approximate front area 1.20 sq. metre) - 2 nos.	2	Nos.
	(vi) Providing of insulating mats 1 mtr. wide and 3mm thick suitable for 11KV working voltage as per IS 15652-2006 (with latest amendment)	8	mtrs

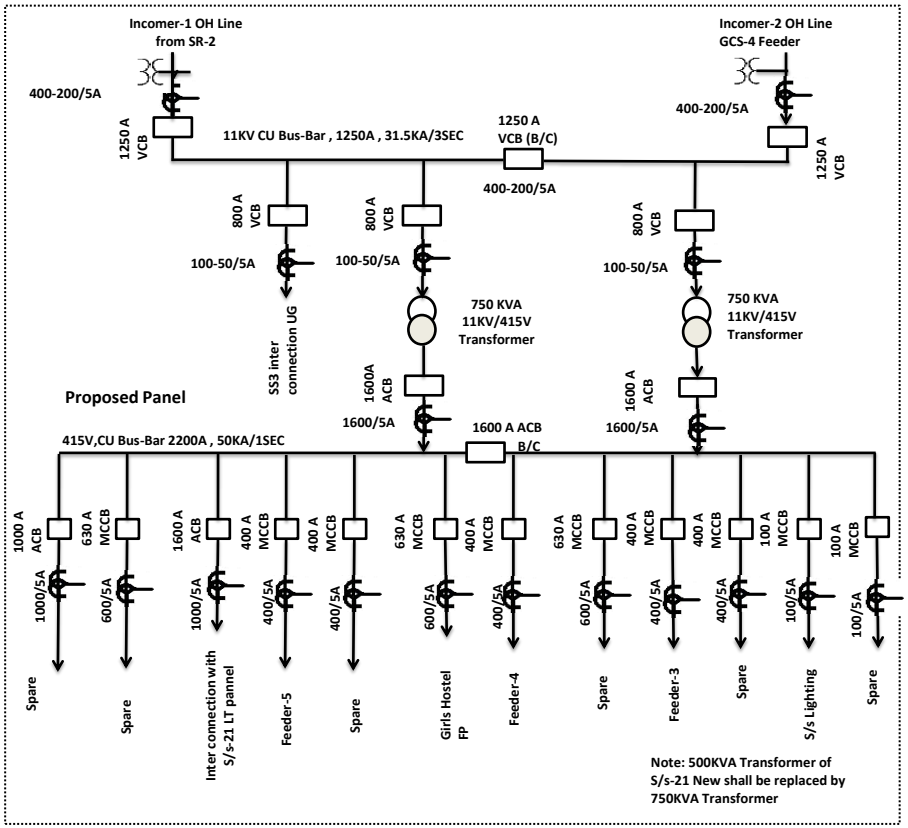
	(vii) Providing of insulating mats 1 mtr. wide and 2mm thick suitable for 1000V working voltage as per IS 15652-2006 (with latest amendment)	8	Mtrs
	(viii) Provision for Lock out Tag for all VCBs, ACBs and MCCBs	As required	
10.	**Civil part for substation building and area development of substation:**		
	(i) Construct a RCC building, for electrical substation, including supply of all materials except cement. The size of RCC substation building is as per Panel size provided that there should be sufficient clearance as per safety norms from building wall Height 3.8mtrs. The cable trench for LT panel, HT panel and 2nos. transformers along with foundation of transformers is also part of the substation building. The construction work shall be carried out by the bidder as per approved drawing and technical specification given in civil part.	1	No.
	(ii) For area development of substation building is as per technical specification given in civil part	1	No.

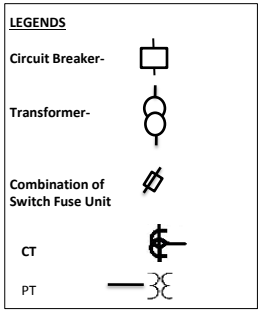
For Buy back of Electrical equipment like Transformer, HT panel, LT panel, Bidder has to quote against the items are given below: The total amount quoted for buy back of equipment shall be deducted from total amount quoted for schedule of works and shall be treated as total amount for schedule of work.

1	Transformer 11KV/433 V, AC 500KVA transformer, type – oil cooled, copper winding with all accessories Make – Crompton Greaves, year of manufacture – 2006	1	No.
2	LT Panel 415 V, AC, LT Panel with 2 nos. of M-Pact ACB as incomer with 9 outgoing feeder. Make Assam Electrical	1	Set
3	HT Panel 11KV, 630 Amps VMX type breaker Make Alstom, Year of Manufacture – 2003	1	No.
	Total of buy back = Total (i) + (ii) + (iii)		

Gross schedule of works = Total of schedule of works

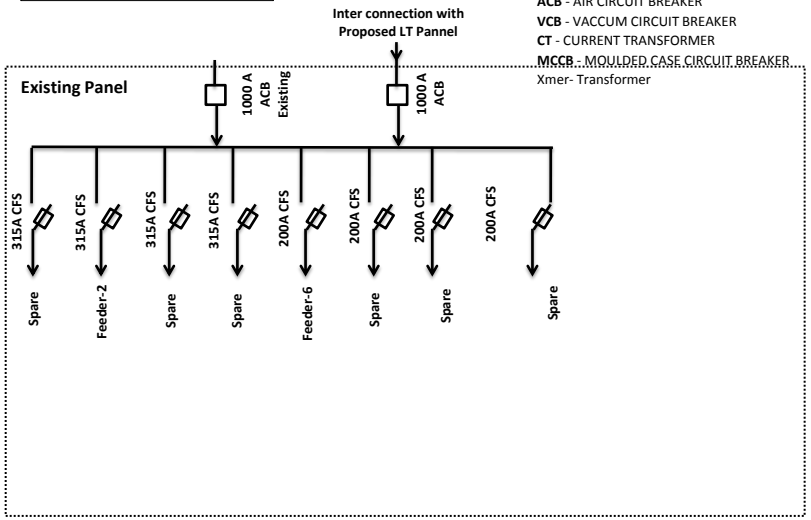
Proposed Single Line Diagram for Substation- 21 near DD





SL NO	ITEM	RATING	QTY
1	HT VCB	1250A	3
2	HT VCB	800A	3
3	LT ACB	1600A	4
4	LT ACB	1000A	1
5	LT MCCB	630A	3
6	LT MCCB	400A	5
7	LT MCCB	100A	2
8	Xmer	750 kVA	2
9	HT-CT	400-200/5A	3
10	HT-CT	100-50/5A	3
11	LT-CT	1600/5A	4
12	LT-CT	1000/5A	1
13	LT-CT	600/5A	3
14	LT-CT	400/5A	5
15	LT-CT	100/5A	2

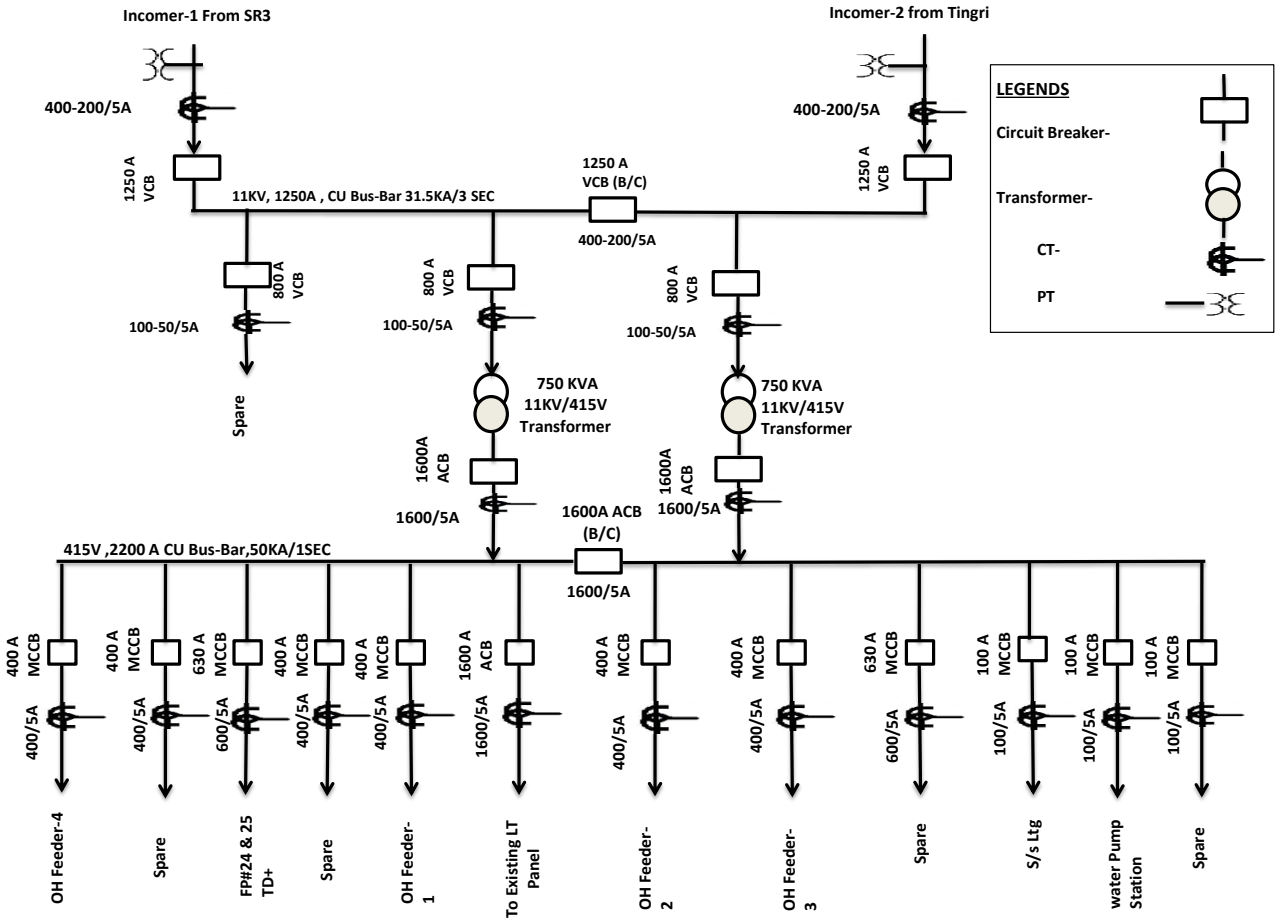
LT - LOW TENSION
HT - HIGH TENSION
ACB - AIR CIRCUIT BREAKER
VCB - VACCUM CIRCUIT BREAKER
CT - CURRENT TRANSFORMER
MCCB - MOULDED CASE CIRCUIT BREAKER
Xmer- Transformer



Note: Single line diagram is indicative diagram, party has to furnish the single line diagram along with bid considering SOQ

11KV/415 V SUBSTATION-21	
Drawn by	S. Buragohain
checked by	M.Tangu

Proposed Single Line Diagram for Bijulibari Substation



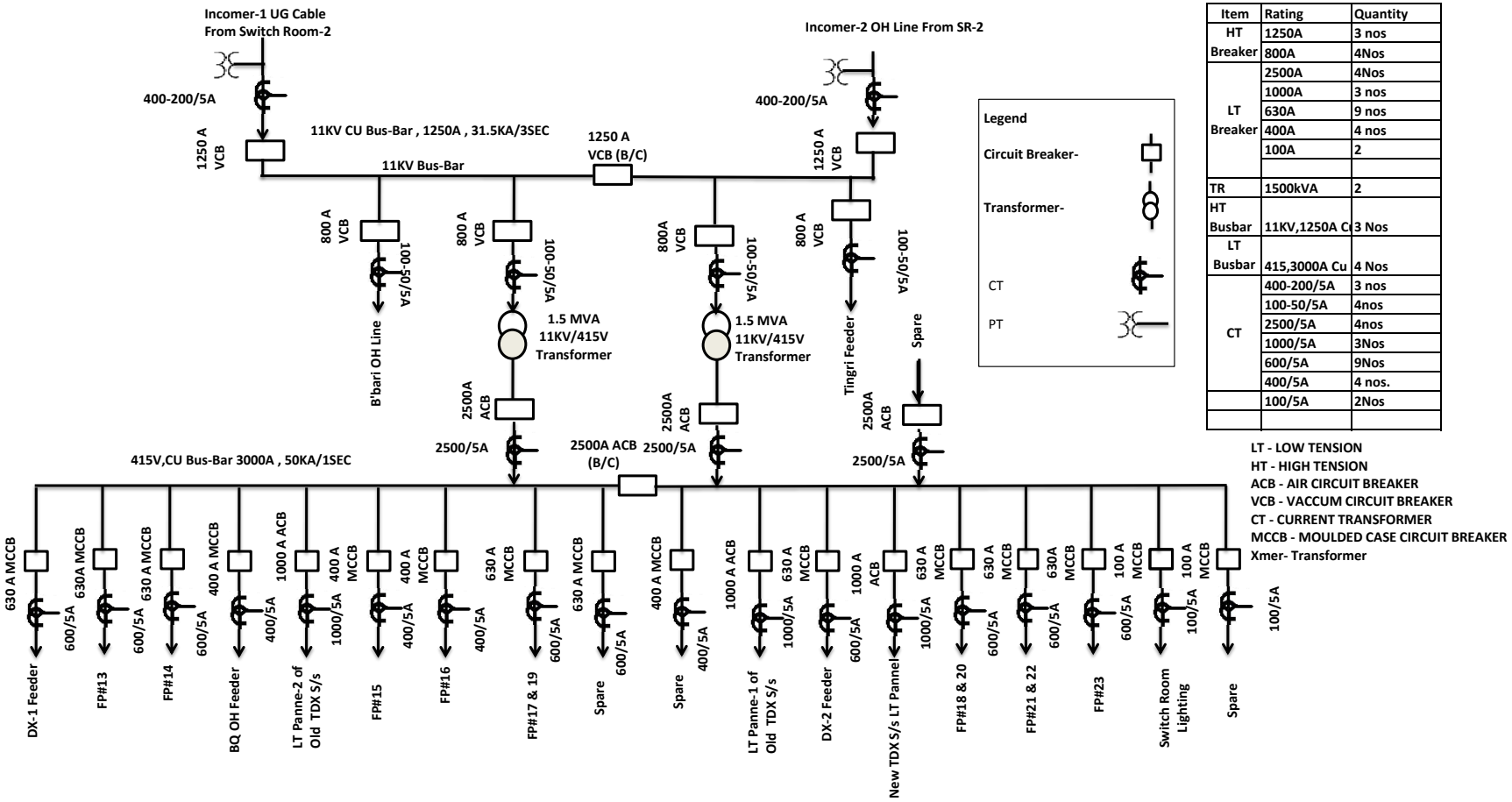
SL NO	ITEM	RATING	QTY
1	HT VCB	1250A	3
2	HT VCB	800A	3
3	LT ACB	1600A	4
4	LT ACB	1000A	0
5	LT MCCB	630A	2
6	LT MCCB	400A	6
7	LT MCCB	100A	3
8	Xmer	11/0.415	2
9	HT-CT	400-200/5A	3
10	HT-CT	100-50/5A	3
11	LT-CT	1600/5A	4
12	LT-CT	1000/5A	0
13	LT-CT	600/5A	2
14	LT-CT	400/5A	6
15	LT-CT	100/5A	3

LT - LOW TENSION
HT - HIGH TENSION
ACB - AIR CIRCUIT BREAKER
VCB - VACCUM CIRCUIT BREAKER
CT - CURRENT TRANSFORMER
MCCB - MOULDED CASE CIRCUIT BREAKER
Xmer - TRANSFORMER

Note: Single line diagram is indicative diagram, party has to furnish the single line diagram along with bid considering SOQ

11KV/415 V Bijulibari Substation	
Drawn by	S.Buragohain
checked by	M.Tangu

Proposed Single Line Diagram for Switch Room-3



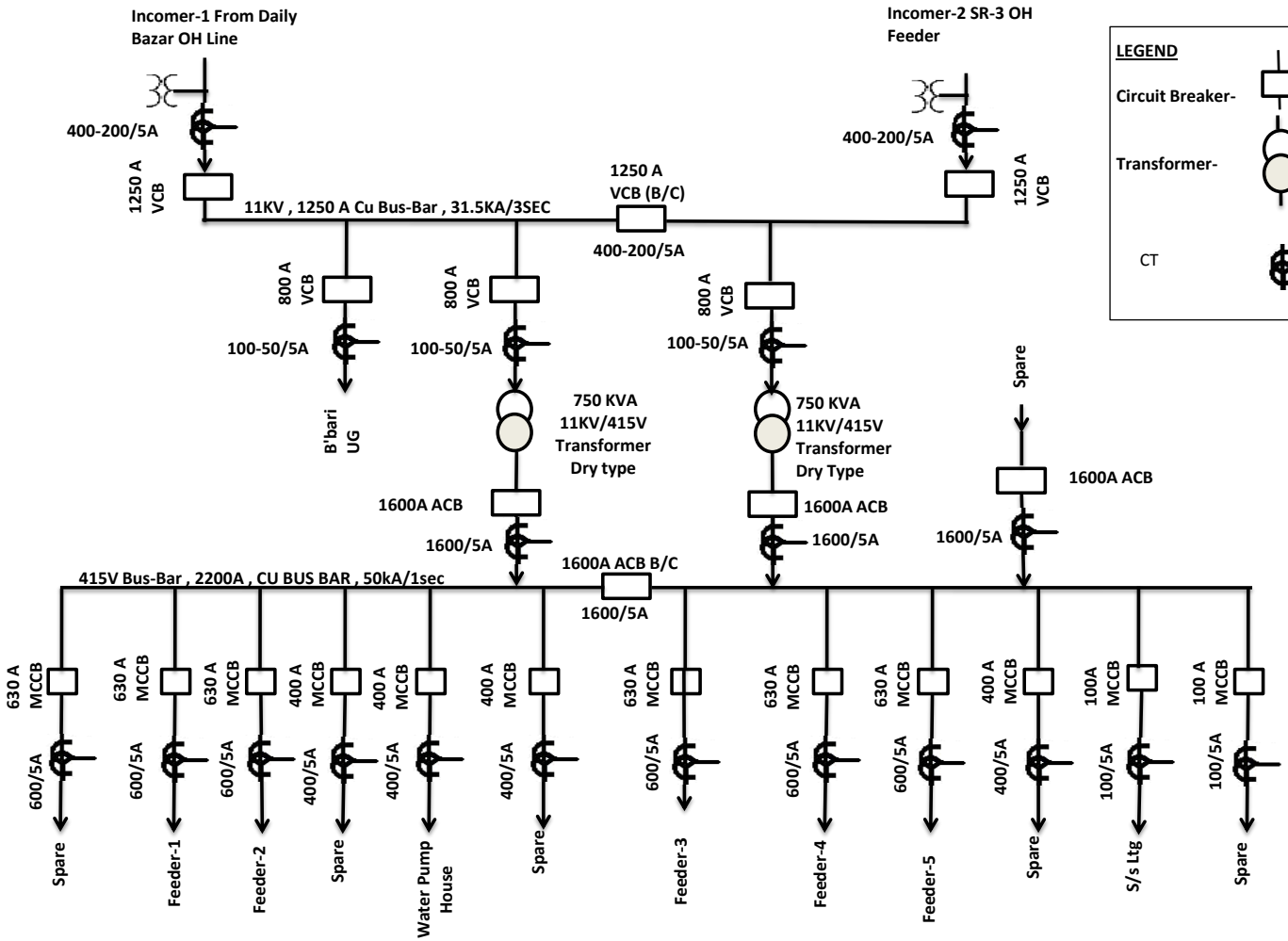
Item	Rating	Quantity
HT Breaker	1250A	3 nos
	800A	4Nos
LT Breaker	2500A	4Nos
	1000A	3 nos
	630A	9 nos
	400A	4 nos
	100A	2
TR	1500kVA	2
HT Busbar	11KV,1250A Cu	3 Nos
LT Busbar	415,3000A Cu	4 Nos
CT	400-200/5A	3 nos
	100-50/5A	4nos
	2500/5A	4nos
	1000/5A	3Nos
	600/5A	9Nos
	400/5A	4 nos.
	100/5A	2Nos

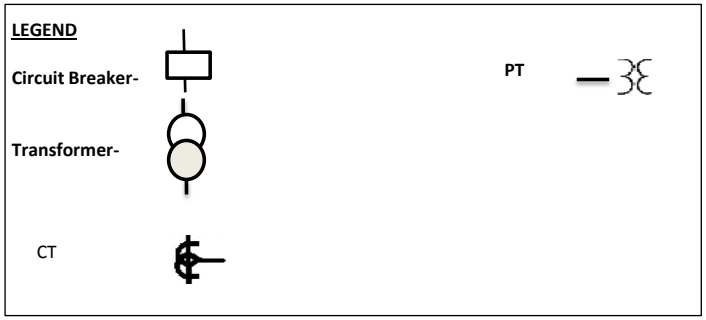
LT - LOW TENSION
HT - HIGH TENSION
ACB - AIR CIRCUIT BREAKER
VCB - VACCUM CIRCUIT BREAKER
CT - CURRENT TRANSFORMER
MCCB - MOULDED CASE CIRCUIT BREAKER
Xmer- Transformer

Note: Single line diagram is indicative diagram, party has to furnish the single line diagram along with bid considering SOQ

11KV/415 V SwitchRoom-3	
Drawn by	S. Buragohain
checked by	M.Tangu

Proposed Single Line Diagram for Tingri Substation





SL NO	ITEM	RATING	QTY
1	HT VCB	1250A	3
2	HT VCB	800A	3
3	LT ACB	1600A	4
4	LT ACB	1000A	0
5	LT MCCB	630A	6
6	LT MCCB	400A	4
7	LT MCCB	100A	2
8	Xmer	750 kVA	2
9	HT-CT	400-200/5A	3
10	HT-CT	100-50/5A	3
11	LT-CT	1600/5A	4
12	LT-CT	1000/5A	0
13	LT-CT	600/5A	6
14	LT-CT	400/5A	4
15	LT-CT	100/5A	2

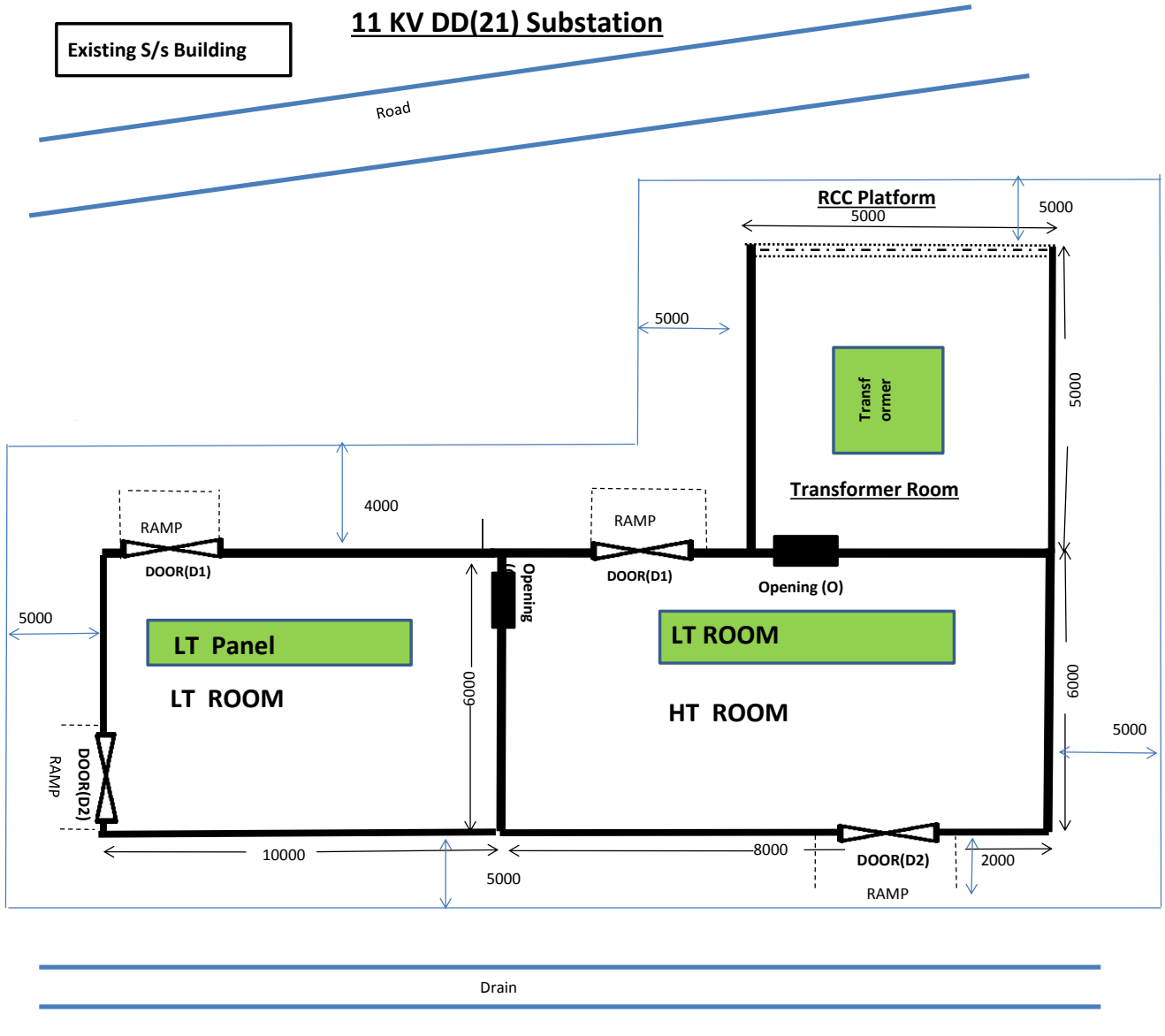
LT - LOW TENSION
HT - HIGH TENSION
ACB - AIR CIRCUIT BREAKER
VCB - VACCUM CIRCUIT BREAKER
CT - CURRENT TRANSFORMER
MCCB - MOULDED CASE CIRCUIT BREAKER
Xmer - TRANSFORMER

Note: Single line diagram is indicative diagram, party has to furnish the single line diagram along with bid considering SOQ

11KV/415 V SUBSTATION-Tingri	
Drawn by	S. Buragohain
checked by	M.Tangu

CIVIL LAYOUT

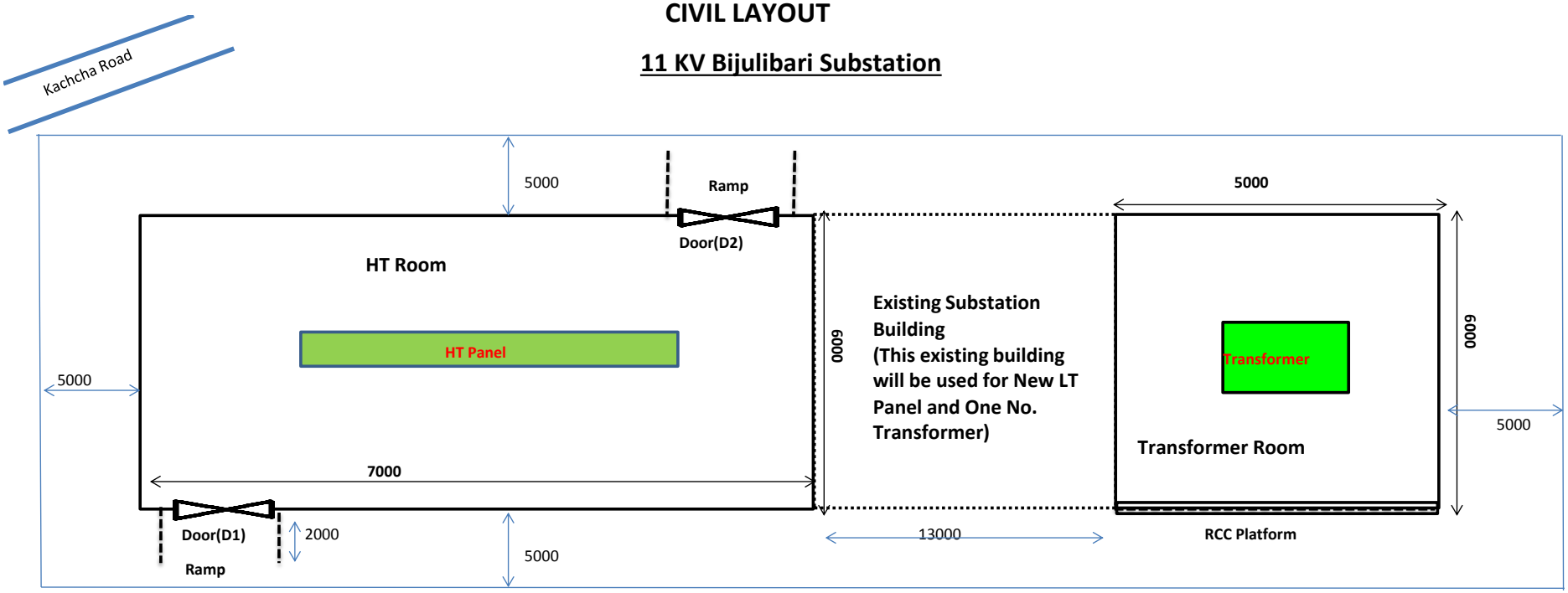
11 KV DD(21) Substation



All dimensions are in mm
Note: boundary distance may differ subjected to availability of area

CIVIL LAYOUT

11 KV Bijulibari Substation

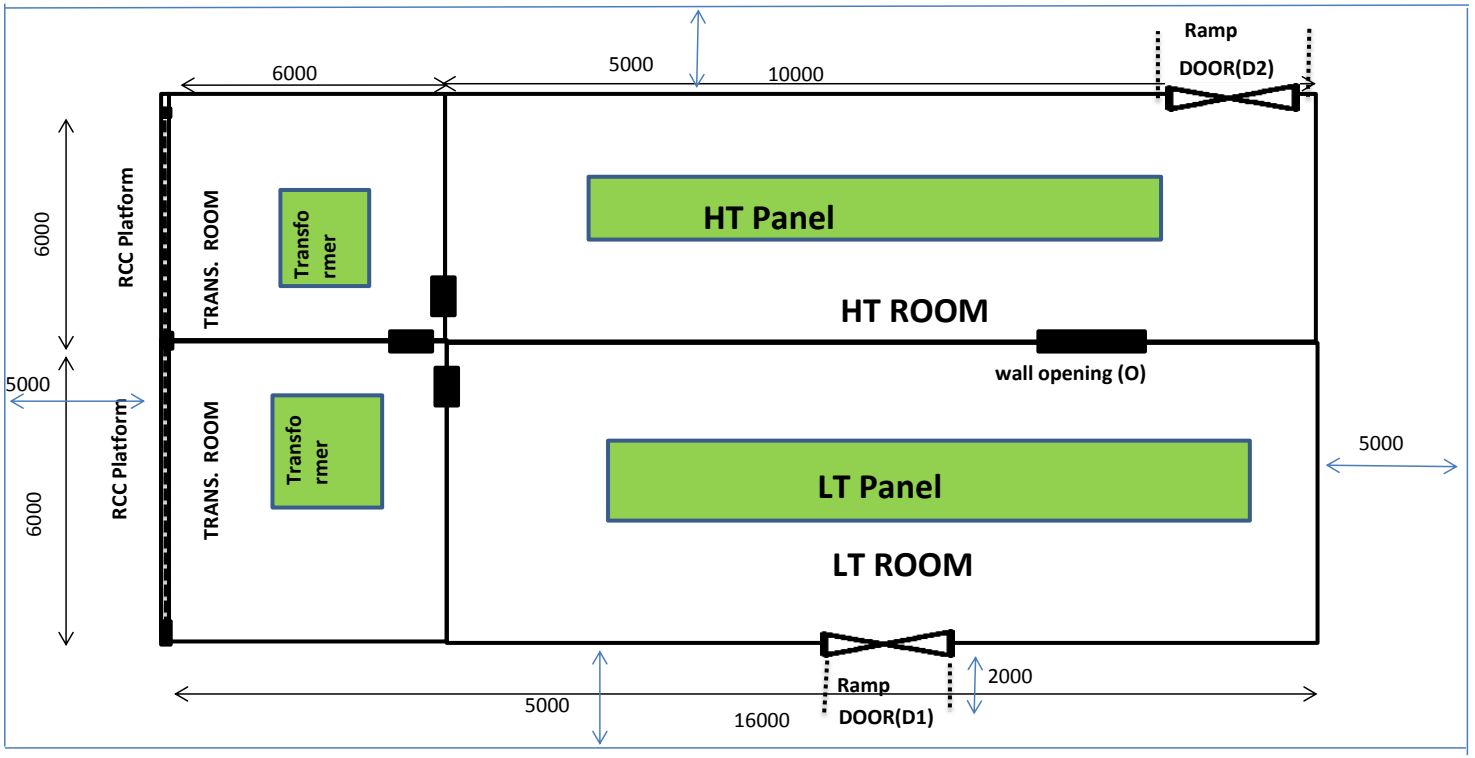


All dimensions are in mm

Note: boundary distance may differ subject to availability of area

CIVIL LAYOUT

11 KV Swicth Room-3



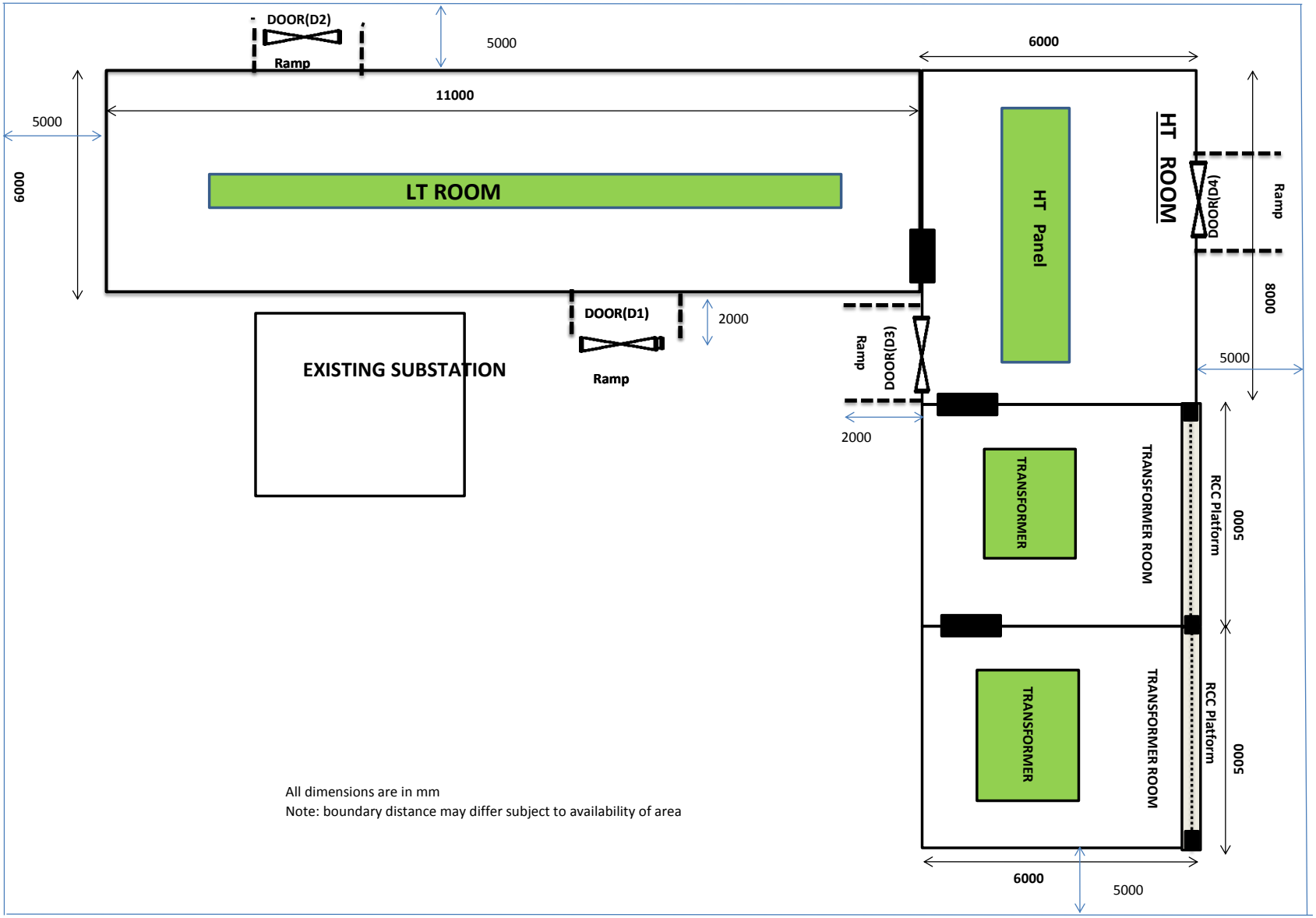
All dimensions are in mm

Note: boundary distance may differ subject to availability of area

Road

CIVIL LAYOUT

11 KV Tingri Bari Substation



Description: Design and construction of 03 Nos. of substation building and 01 No. of Switch room including supply, installation, testing and commissioning of electrical equipment of 03 Nos. 11KV/415V substation and 01 No. of 11KV/415V Switch room at Duliajan on LSTK basis.

GENERAL

Description:

These general specifications cover the details for construction of substation building and Substation Equipment (Transformers, HT Panels, LT panels, HT and LT cables, Cable termination kits, other related items, Chemical earth electrodes, Cable marking etc.) to be supplied, inspection as may be necessary before dispatch, delivery at site, installation, testing, commissioning, putting into operation and handing over in working condition of the equipment for substations for working voltage of 11000/415 volts.

Related Documents:

This technical specification shall be read in conjunction with the standard conditions of the contract with correction slips, as are relevant for commercial aspects, as well as schedules and drawings and requirements under these specifications.

In the event of any discrepancy between these specifications and inter connected documents, the technical requirements as per the contract specifications shall be followed and deemed to be having over -riding value.

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CIVIL PART

(A) SCOPE OF WORK

The scope of work includes detail planning of RCC building, structural analysis, designing and site preparation, construction of substation building, foundation for equipments & panels, internal trench including trench cover for cables, approach road, site development including procurement & supply of all materials, fabrication along with all associated works necessary for completion of the work pertaining to Sub Station in all respect.

1.1 Substation building:

I. Detail planning and modelling/preparation of the layout plan and preparation of preliminary drawings of the substations.

II. Detail structural analysis and design of Substation conforming to relevant BIS codes (Latest revision) preferably STAAD PRO software. All related calculations (both hard & soft copies) are to be submitted.

III. Preparation of working drawings showing detail of structural components in AutoCAD Software. Three sets of hard copies are to be submitted and copies of working drawings as required during execution of the work.

IV. Construction, including supply of all materials, equipment, system and services to complete & commissioning of the work in all respect, as per the approved detail working drawings including preliminary site development works.

V. Quality control and quality assurances. This includes furnishing all statutory certificates/documents related to quality/specification of the various components installed/commissioned in the project. Acquiring the statutory certificates/documents from the regulatory bodies/suppliers is the responsibility of the contractor.

VI. Undertake full responsibility for the engineering design prepared by them with respect to adequacy and technical soundness for the structure. They shall be responsible for the structural and/or any defects due to faulty design.

1.2 Area development surrounding Substations:

Construction of security fence cum wall on the periphery of all substations building (shall be constructed approximately 5 m away or as per site condition from the substation building exterior wall subjected to availability of area) for prevention of trespassing to substation premises. The details scope of works includes,

I. Security fence cum wall around the substation shall be of 1meter high (from finished GL), 115 mm thick brick wall and 2 meters high XPM above the brick wall. Foundation for wall shall be as per design requirement.

II. Erection & fixing of 2.0 meters wide double leaf steel plated gate with locking facility.

III. Construction of approach road of width 4.00 m (minimum) by providing 60 mm CC paver Block over 50 mm sand layer and150 mm gravel road over 150 mm Granular Sub-base including necessary earth work at embankment and sub-grade. The detail specifications of work are as follows:

a) Embankment:

Construction of embankment with approved material obtained from borrow pits with all lifts and leads, transporting to site, spreading, grading to required slope and compacting to meet requirement of Tables 300.1 and 300.2 (Ref. to MoRTH) with a lead up to 1000 m as per Technical Specification Clause 301.5 (Ref. to MoRTH) (Road roller cost included).

b) Sub grade:

Preparation and consolidation of sub grade with power road roller of 8 to 12 tonne capacity after excavating earth to an average of 22.5 cm depth, dressing to camber and consolidating with road roller including making good the undulations etc. and re-rolling the sub grade and disposal of surplus earth with lead up to 50 metres.

c) Granular Sub-Base:

Construction of 150mm (Consolidated) Granular Sub-Base consolidated by dry rolling to proper grade including providing well compacted berms with earth on either side 1.2m wide levelled with finished road surface, dressing sub-grade including cutting surface up to 75 mm deep to required level and as per Clause 401 (Ref. to MoRTH).

d) Gravel Road:

Construction of 150 mm Thick (Consolidated) Gravelled Road including providing well compacted side berms with earth on either sides, one-metre-wide and 50mm thick above final level of gravelled road, dressing sub-grade (including cutting of earth up to 75mm deep) to required level, spreading gravel in two layers with bindage of dry earth and dry

rolling each layer separately until fully compacted and finally spreading sand shingles uniformly to 25mm thick and re-rolled as directed.(Ref. to MoRTH Spec.401)

e) Paver block:

Providing and laying 60mm thick factory made cement concrete interlocking paver block of M-30 grade made by block making machine with strong vibratory compaction, of approved size, design & shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand, filling the joints with fine sand etc. including construction of CC (1:2:4) guard wall of size 200 mm (width) and 450 mm (Depth) along the edge of the paved area for necessary confinement; all complete as per the direction of Engineer-in-charge.

f) The finished level of the approach road:
The finished level of the approach road shall be at par with the nearby main road level.

IV. All the area between the fencing and substation building shall be CC (75 mm thick & prop 1:3:6) over properly compacted /prepared sub grade.

V. Painting of the wall shall be done by approved distemper shade & fencing shall be done with red oxide and aluminium paint.

1.3 Brief Minimum Specification of Architectural and Structural works:

To be adopted while planning, structural analysis, designing and preparation of working drawing and execution.

I. Foundation: Cement Concrete (1:2:4) for brick wall and 75thk flat brick soling (1:7) below RCC column footing and tie beams.

II. DPC: 40mm thick DPC (1:1$\frac{1}{2}$:3) cement concrete mixed with 3% CICO.

III. Skirting: 18mm thick X 150 mm high skirting (1:3) to all inside walls.

IV. Flooring: 100 thick granolithic flooring-25mm thick granolithic topping (1:1:1.5) over 75 mm thick cc (1:2:4).

V. Brick Work: All brick work in (1:4) cement mortar with 1st class local bricks.

VI. RCC Work: All RCC works (1:1.5:3) in accordance with IS 456 -2000.

VII. Reinforcements:
(i) MS Bar Grade - 1 in accordance with IS: 432 (Part - I).
(ii) Tor Steel Grade Fe415 conforming to IS: 1786.

VIII. Steel Works:
(i) All structural steel works shall conform to IS 800
(ii) Flat steel conforming to IS: 1731.

IX. Plastering:
(i) 6mm thick plaster (1:3) to all exposed RCC works.
(ii) 12mm thick plaster (1:6) to all inside and outside faces of brick walls. But outside faces of brick wall plaster shall be with water proofing compound.
(iii) 12 mm thick cement plaster (1:3) in all exposed front plinth walls (from MGL to FFL).

X. Rendering:

(i) 2 coats of distemper to all inside plastered surfaces of brick walls over one coat of primer.

(ii) 2 coats of exterior emulsion paint to all outside plastered surfaces over one coat of primer.

(iii) 2 coats of dark grey paints to be provided to all steel structures over one coat of red oxide primer.

XI. Grill Work: XPM sheet conforming to IS 412, to be provided to all ventilators.

XII. Cable Trench Cover: Removable FRP Cover.

XIII. RCC Roof: Average 50mm thick grading concrete (1:4:8) and 13mm thick smooth Terracing plaster (1:3) with a floating coat of cement to be provided over RCC roof slab with proper sloping.

XIV. Drain: Standard surface drain to be provided all around the substation.

XV. Drain Side Gap: 50mm thick drain side gap - 37 mm thick cc (1:4:8) and 13mm thick cement plaster (1:3) on top.

1.4 General Note:

I. The contractor shall fully familiarize himself with the site conditions and general arrangements and scheme etc. before preparing conceptual lay out plan of the substation building including the locations of equipment. The contractors are advised to visit the substation site and acquaint themselves with the topography, infrastructure and also the design philosophy.

II. The contractor based on conceptual layout plan shall do the complete work of design and detailed engineering.

III. The construction of substation building shall be started simultaneously more than one location at a time and completed in stipulated time so that installation of Electrical equipment can be started and completed in scheduled time.

IV. Substations shall be designed to the required service conditions/loads as specified in Specification or implied as per National/International Standards. All civil works shall be carried out as per applicable Indian Laws, Standards and Codes. All materials shall be of best quality conforming to relevant Indian Standards and Codes.

V. The Contractor shall furnish/provide all temporary works, transportation and all other incidental items not shown or specified but as may be required for complete performance of the Works in accordance with approved drawings, specifications.

VI. The substation buildings shall be constructed at 04 (Four) different locations and bidder should quote their rates against individual substation building.

1.5 Design Loading:

I. All structural will be designed for most critical combinations of dead loads, imposed loads, equipment loads, wind loads, seismic loads and temperature loads. In addition, loads and forces developed due to differential settlements will also be considered as per Indian Codal provisions.

a) Dead loads will consist of self-weight of the structure complete with finishes, fixtures, wall, partitions etc. Dead loads will be determined using unit weights from IS: 875 Part - I. While calculating dead load of structure, total thickness of floor finish will be considered as 50mm.

b) For consideration of imposed loads on structures, IS: 875 - "Code of practice for structural safety of buildings" will be followed.

c) Equipment loads are self-weight of permanent or semi-permanent equipment acting on the structure. Such loads will be as per supplier of equipment manufacturer.

d) Structure will be designed for seismic forces in accordance with IS: 1893 - 2002, "Criteria for Earthquake Resistant Design Structure". Since the structure is in Zone-V, a high seismic zone, ductile detailing as per IS: 13920 and IS: 4326 shall be followed.

e) The total temperature variation will be considered 2/3 of the average maximum annual variation in temperature. The structure will be designed to withstanding stresses due to 50% of the total temperature variation.

II. In addition to the general requirements & civil design criteria stipulated for individual building, following clauses are applicable and shall strictly complied with for any structure as a whole or in part for safety and serviceability.

All RCC design shall be either limit state method or working stress method following the recommendations of IS - 456 (latest).

III. All structural steel work shall be designed either by allowable stress method following recommendations by IS: 800.

IV. Miscellaneous Requirements

a) In general FGL of the site shall be 300 mm above the nearest road level.

b) The FFL of the substation building shall be 600mm above made up ground level.

c) The ramps for building entrance shall be cast in situ CC work. Minimum thickness of slab shall be 150 mm.

1.6 Document Submission:

I. Preparation of preliminary drawings, preliminary structural analysis & design, preparation of preliminary structural drawing (in Auto CAD) to be submitted along with the technical bid.

II. Final Design and Construction documents including architectural drawings & finish schedule pertaining to all Architectural work shall be required to be submitted to Company (OIL) for approval within 60 days from the date of receipt of LOA along with all related calculations (both hard & soft copies) are to be submitted. 3 (Three) sets of approved drawings shall be required to be submitted to Company (OIL). Approval of these by Company (OIL) shall not relieve the contractor of his responsibility for any error and fulfilment of Contract requirements. All drawings shall be prepared in AutoCAD latest version.

III. As-built drawings shall be prepared by the Contractor after completion of construction/erection, incorporating the changes, if any, done on Engineer's

instruction/approval. Ammonia Prints of As-built drawings - 3 Set and soft copy containing all As-built drawings, design analysis, construction document need to be submitted.

(B) GENERAL CONDITIONS

The contractor shall perform all service in accordance with BIS standards and codes and good engineering practices.

(1) The contractor shall provide all labours, supervisions, transport and such specified materials, required for executing the work including tools and plants as necessary for the work and shall be responsible for all royalties and other levies and his rates shall include for these. The work executed and materials supplied shall be to the satisfaction of the Company's Engineer and Contractor's rates shall include for all incidental and contingent work which although not specifically mentioned in this contract are necessary for its completion in a sound and workman like manner.

(2) Contractor shall have to produce necessary cash memo/FRCC towards forest produce used against the contract from the authorities prior to processing of final payment. In absence of cash memo, the final bill shall not be processed.

(3) The Company's Engineer shall have power to:

(i) Reduce payments if the quality of work although acceptable is not up to the required standard set forth in the Particular Specifications which have been perused and fully understood by the Contractor.

(ii) Order the Contractor to remove any inferior material from the site and to demolish or rectify any work of inferior workmanship, failing which the Company's Engineer may arrange for any such work to be demolished or rectified by any other means at the Contractor's expenses.

(iii) Order the Contractor to remove or replace any workman who he (The Engineer) considers incompetent or unsuitable; the Engineer's opinion as to the competence and suitability of any workman engaged by the Contractor shall be final and binding on the Contractor.

(iv) Order the Contractor from time to time during the progress of the work further drawings necessary for the purpose of proper and adequate execution and maintenance of the works and the Contractor shall carry out and be bound by the same.

(v) Order deviations of this Contract arising due to non-availability in working drawings, change in specification of materials/works shall be in writing and financial effect, if any, of such deviation shall be worked out on the basis of the rates appearing in Company's Schedule of Rate in force on the date of issue of such Deviation Order.

(vi) The contractor shall have no claim against the Company in respect of any work which may be withdrawn but only for work actually completed under this contract. The Contractor shall have no claim to any further payment whatsoever. The valuation would be carried out exparte if Contractor fails to turn up despite responsible notice which will be binding on the Contractor.

(4) The Contractor shall clear away all rubbish and surplus material from the site on completion of work and shall leave the site clean and tidy.

(5) In order to promote, safeguard and facilitate the general operational economic in the interest of the Company during the continuance of this contract the Contractor hereby agrees and undertakes not to take any direct or indirect interest and or support, assist, maintain or help any person or persons engaged in antisocial activities, demonstration, riots, or in any agitation prejudicial to the Company's interest and any such event taking shape or form at any place of the Company's work or and its neighbourhood.

(6) The Contractor will arrange at his own cost cleaning and grass removing of area allotted, construction of temporary office/stores, cement go down, fabrication yards etc. and also the watch & ward of all the above. However, contractor shall not be allowed to construct any structure (for storage /housing purpose) with thatch, bamboo or any other inflammable materials within any Company's fenced area.

(7) The Contractor shall ensure that all men engaged by him/her are provided with appropriate protective clothing and safety wear in accordance with regulation 89(a) and 89(b) in the OIL mines Regulations 1984. The Company's representative shall not allow/accept those men who are not provided with the same.

(8) The Contractor and his/her workmen shall strictly observe the rules and regulations as per Mines Act (latest edition).

(C) SPECIAL CONDITIONS

(1) The Contractor will be required to allow OIL Officials to inspect the work site and documents in respect of the workers' payment.

(2) All safety precautions to be maintained by the Contractor at his own cost as per safety rules and regulations.

(3) The Contractor shall use pump if needed for dewatering of pit while excavation for which no extra payment will be made.

(4) Watch and ward, loss or damage to Company property, theft and other incidental charges shall be Contractor's responsibility.

(5) Efficient workmen to be engaged by the Contractor.

(6) Materials if rejected should be removed from site within 48 (forty-eight) hours of rejection, failing which the Company reserves the right to get the rejected materials removed at the risk and cost of the Contractor.

(7) Water that may accumulate on the site during progress of the works or in trenches and excavations from other than accepted risks shall be removed from the site to entire satisfaction of the Engineer-in-Charge and at the Contractor's expense.

(8) The Contractor shall be in a position to execute more than 01 (One) locations simultaneously.

(9) If required, the Contractor shall have to work in two shifts for which no extra payment will be admissible to him/them.

(10) If needed water and electricity will have to be arranged by the Contractor at his own cost.

(11) The Contractor and his workmen shall strictly observe the safety precautionary rules as per Mines Act (latest edition) while executing the work.

(12) In case of any doubt or dispute as to the interpretation of any clause herein contained, the decision of the Company's Engineer shall be final and binding on the contractor.

(D) PARTICULAR SPECIFICATIONS & INSTRUCTIONS

1.0 GENERAL:

All materials used in the work shall conform to the latest revision of the relevant Indian Standard Specifications to the extent practicable. Where no such specifications exist they shall be of the best quality available in the market. Wherever ISI certified materials and products are available these alone shall be used. All materials shall be stored at site in accordance with IS-4082-1996.

Unless specially provided for in the contract the tendered rates shall include the cost of carriage, transport, loading, unloading and stacking as directed for all materials required on the work. Where a tender provides a rate for transport of materials, it includes for all loading, unloading and stacking on the site in such position and manner as directed. Any materials found not conforming to specification must be removed from site within 48 hours.

2.0 SITE CLEARANCE:

Before the earthwork is started, the area coming under cutting and/refilling shall be cleared of shrubs, vegetation, grass, uprooting of tree stumps and such others, and rubbish removed up to a distance of 50 metres outside the periphery of the area under clearance. After completion of work, any temporary structure, go down etc. including cleaning of site like debris etc. to be carried out by the contractor immediately for which no additional payment will be made.

3.0 STORAGE:

Materials shall be transported, handled and stored at site carefully to the approval of Engineer so as to prevent any damage of any kind to be kept at his own risk and cost.

Cement shall be stored in a weather proof shed, the floor of which shall be raised 300 mm clear from the ground and 600 mm away from the wall all round in order to protect from rain and moisture. Empty cement bag shall have to be returned to the Company in good condition.

4.0 EARTHWORK:

Earthwork shall be done manually/mechanical means including getting out the excavated soil, dewatering and providing and then returning the soil, as required, in layers not exceeding 20cm in depth including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, within a lead of 50 m.

5.0 SAND FILLING:

Sand filling of shall be done manually including dry/wet ramming, dressing including carriage complete.

6.0 CEMENT CONCRETE/ REINFORCED CEMENT CONCRETE WORK:

All C.C. work, unless otherwise specified or directed by Engineer In-charge, shall be done with 18 mm graded down broken stone. Broken stone shall be properly screened before use. All reinforced cement concrete work to be done in prop. 1:1.5:3 unless otherwise specified - 18mm down to 12mm graded down broken stone as per related drawings and instructions of site Engineer to be followed in case of any discrepancies. Proper vibration to be done as per IS recommendation. Floor panelling to be done in the line of expansion joint or as directed by Engineer In-charge.

Fine Aggregate - Fine aggregate shall be hard, durable, clean and free from adherent coating and organic matter. It shall not contain harmful impurities such as pyrites, coal, lignite, mica, shale or similar laminated material, clay, alkali, soft fragments, sea shells and organic impurities in such quality as to affect the strength or durability of the concrete. Fine aggregate to be used for reinforced concrete shall not contain any material liable to attack the steel reinforcement. Fine aggregate which is chemically reactive with alkalis of cement is harmful as cracking of concrete may take place.

Coarse Aggregate - Coarse aggregate shall be obtained from natural sources such as stone, gravel, etc. crushed or un-crushed or a continuation thereof from approved quarries. This shall consist of coarse material most of which is retained on 4.75mm sieve. Aggregate shall be hard, strong, dense, durable, clean and free from veins and adherent coatings. It shall be free from soft, feeble, thin, elongated or laminated pieces and shall be roughly cubical in shape. It shall be clear and free from dirt and any other deleterious matter.

Reinforcement bars - The following types of steel for reinforcement shall be used in reinforced concrete construction and these shall conform to Indian Standards or as revised from time to time mentioned against each

a) Mild steel and medium tensile steel bars and hard drawn steel wire - IS: 432.
b) HYSD bars - IS: 1786.

Bending & Placing steel reinforcement in position-Bending shall be carried out as per relevant IS specification and direction of the Engineer-in-charge. All reinforcement bars shall be accurately placed in position with spacing and cover as shown in the drawing or as specified and firmly held so during the placing and vibrating and setting of concrete. Bars shall be thoroughly cleared of rust, seals, grease, oil and any other foreign matter before placing them in position. The overlap jointing shall be staggered. The bars shall be fixed with 22G binding wire. Precast cover blocks 1:2 (1 cement: 2sand) cement mortar 40 mm square and necessary thickness shall be used to keep the reinforcement bars in proper position (no extra payment shall be made for preparation of blocks). Wire required for binding shall not be measured separately. Tack welding shall also be permitted in lieu of building with steel wire.
Proportioning of mix - Proportioning shall be done by volume. Boxes of suitable size shall be used for measuring sand and aggregates. The size of the boxes (internal) shall be 35 x 25cm and 40cm deep. The unit of measurement for cement shall be a bag of cement weighting 50 Kg and this shall be taken as 0.035 cubic metre. While measuring the aggregate and sand the boxes shall be filled without shaking, ramming or hammering. The proportioning of sand shall be on the basis of its dry volume and in case of damp sand allowances for bulkage shall be made.

Mixing - Mixing of reinforced cement concrete shall, as a rule be done in a mechanical mixer. However, the Engineer-in-charge may permit hand mixing in specific cases where in his opinion it is not practicable to resort to mechanical mixing, either on account of the quality of cement concrete required is small or for any other reason. In such cases, it should be ensured

that the inferior quality of concrete produced by hand mixing will not adversely affect the structure.

Consistency - In general the quantity of water to be used for each batch containing 50 Kg of cement, to give the required consistency shall not be more than 34 litres for 1:3:6, mix 32 litres for 1:2:4 mix, 30 litres for 1:1.5:3 mix and 27 litres for 1:1:2 mix. The quantity of water shall be regulated by carrying out regular Slump Test. In case of design concrete quantity of water to be guided as per design mix and relevant IS codes.

Placing of concrete - Before placing the concrete the sub-base/form work shall be cleared of all injurious or foreign matter, watered and well consolidated. Formwork shall be clean and free from all foreign material. It is necessary that the time between mixing and placing of concrete does not exceed the initial setting process. Mixed concrete that has been left standing shall not be used after the initial set has commenced the addition of water (or cement) to make such a mixture more workable shall not be allowed. In foundation trenches or such other situations, the entire concrete used in the work shall be laid gently (not thrown) in layers not exceeding 15cm. The concrete so deposited shall be thoroughly vibrated by means of mechanical vibrators till dense concrete is obtained.

Curing - Concrete shall be carefully protected during first stage of hardening from harmful effects or excessive heat, drying winds, rain or running water and shock. After the concrete has begun to harden i.e. about 1 to 2 hours after its laying it shall be protected from quick drying with moist gunny bags or any other material approved by the Engineer-in-charge. After 24 hours of laying of concrete the surface shall be cured by flooding water upto 25mm depth or by covering with wet adsorbent materials. The curing shall be done for a minimum period of 7 days from the date of pouring of concrete, unless otherwise specified.

Finishing - In case of roof slabs the top surface shall be finished even and smooth with wooden trowel, before the concrete beings to set. The surface of RCC slab on which the cement concrete or mosaic floor is to be laid shall be roughened with brushes while the concrete is green. This shall be done carefully without disturbing the concrete. Before laying the floor, the laitance shall be removed, the surface of slab hacked and a coat of cement slurry at 2.75 Kg of cement per square metre shall be applied, so as to get a good bond between RCC and concrete floor. The exposed surface which is to receive plaster or where it is to be joined with brick masonry wall, shall be properly roughened immediately after the removal of form work, taking care to remove the laitance completely without disturbing the concrete. Before the surface is plastered, it shall be cleaned and wetted so as to give good bond between concrete and plaster.

7.0 FORM WORK:

The formwork shall be rigid and so corrected as to retain the shape and dimensions of the member being cast. Form work for concrete shall be seasoned timber or other approved materials as per directions of the Engineer. It shall be sufficiently tightened to prevent loss of cement slurry and all holes and joints shall be chalked with putty. It shall have sufficient strength and rigidity to withstand the load of concrete, and vibrations, movement of men, materials and plants and any other incidental loads without excessive deflection beyond permissible limits. The formwork shall be so constructed as to be removable in sections by inscribing or otherwise loosing - them without hammering or levering with force. Only wedges, clamps, bolts or screws etc. shall be used in preference to nails or spikes. All side pieces shall be easily removable without disturbing the bottom pieces. Where however, use of nails and spikes become unavoidable, these shall be left projecting so that they can easily be withdrawn.

Surface treatment for shuttering - Forms shall be cleaned of all dust, wood shavings, dirt and other matter by washing with water. This process is facilitated by providing draining holes in the shuttering. The surface shall then be coated with form release agent of approved manufacturer before concreting is done. Care shall be taken that such approved composition is kept out of contact with the reinforcement.

In normal circumstances and where ordinary Portland cement is used, form may generally be removed after the expiry of the following periods:

a) Walls, columns and vertical face of all structural members as may be decided by the Site Engineer: 24 to 48 hours.
b) Slabs side (props left under): 3 days
c) Beam soffits (props. left under):14 days
d) Removal of props under slabs
   i) Spanning up to 4.5 m: 14 days
   ii) Spanning over 4.5 m: 21 days
e) Removal of props under beams:
   i) Spanning up to 6 m: 21 days
   ii) Spanning above 6 m: 28 days

In no circumstances shall forms be struck until the concrete reaches a strength of at least twice the stress to which concrete may be subjected at the time of removal of form work. All form works shall be removed without such shock or vibration as would damage the concrete. Form work for long span deep beams to be supported by MS props or Bhaluka Bamboo props as required based on the design for the formwork to take care the massive load of the green concrete.

8.0 DAMP PROOFING COURSE:

It shall consist of 1:1.5:3 plain cement concrete with approved water proofing materials such as cico, impermo etc. of specified thickness. Edges of DPC shall be straight, even and vertical side shuttering shall consist of wooden or steel forms and shall be strong and properly fixed so that it is not disturbed during compaction and mortar or cement slurry does not leak through. When forms are struck, the surface should be smooth without any honeycombing. The surface shall be kept wet for seven days. Before commencing the superstructure work, the top of concrete course shall be dried and cleaned of all materials. Blown type bitumen shall then be applied uniformly on the surface and the side of the concrete coming in contract with flooring on the inside shall also be painted with bitumen.

9.0 BRICKWORK:

a) All bricks shall be of 75 class designation quality locally available as approved by the Site Engineer.

b) Bricks shall be of size as specified in the item of work or of nominal size where no particular size is mentioned.

c) Bricks shall be well burnt, sound, hard with sharp edges of uniform size and shape free from cracks, stones or particles of lime and other defects, shall be kiln burnt and satisfy the following requirement:

i) They shall give a clear metallic sound when struck
ii) They shall be of uniform colour and size
iii) They shall not be cracked, stratified or under or over burnt

iv) The tolerance in dimensions shall be +/- 12mm in length, 6mm in width and 3mm in height.
v) Keys or frogs shall be formed on one of the larger size, except in the case of machine extruded bricks where no frogs are required
vi) The increase in weight when soaked in water for 24 hours shall not be more than 20% of the dry weight of the bricks.

d) If required by the Site Engineer, necessary test shall be conducted at the contractor's expense to ensure quality. In general, the bricks shall be the best quality locally available.

Bricks used for masonry in cement mortar or composite mortar shall be thoroughly soaked in clean water for at least an hour immediately before use (The absence of bubbling when the soaked brick is immersed in water is the test for thorough soaking). The soaked bricks shall be kept on a platform free from dirt, mud or any foreign element. Bricks shall be laid in English bond unless otherwise specified. Care must be taken that the bricks are perfectly clean and free from lime, moss or dirt of any kind. If necessary, they must be scrubbed before use. Half or cut bricks shall be not used except for closures which may be required to complete the bond. It shall be ensured that all horizontal and vertical joints are completely filled with mortars without any void in brickwork. Brickwork shall be raised truly plum (or true to required better where so specified). All courses shall be laid truly horizontal. Vertical joints shall be truly vertical and those in alternate courses shall be in the same vertical line. The thickness of brick courses shall be uniform. Great care must be taken to masonry in progress of construction damp. When work is left off for the day troughs shall be formed, by means of fillets of mortar 51mm high all round the unfinished work and shall be kept filled with water. Vertical or inclined surfaces must be frequently watered from a rose headed can. Water should not be dashed with violence against new work as this washes out the mortar. Should the work be delayed owing to holidays or for other reason, the contractor must make adequate arrangements for keeping the work wetted, and shall continue to do so for at least ten days or such longer time as directed, after the brickwork has been completed.

i) Brick work in cement mortar with 75 designation brick including racking out joints and curing complete as directed, in sub structure and superstructure in mortar of specified proportion.

ii) 115mm thick 75 designation brick nogged wall in cement mortar embedded with protruding M.S. rod 6mm dia. in column including racking out joint and curing complete as directed in super structure above plinth in proportion as specified.

10.0 CEMENT MORTAR:

i) Must be freshly mixed: Cement mortar will only be mixed in such quantities as can be used up on the work within half an hour of mixing. Mortar which has been mixed longer or which has taken its initial set will on no account be used on the work or remixed with fresh mortar. It must be immediately removed from the site or work.

ii) Method of mixing: The cement and sand will be mixed dry in the specified proportions, by turning over at least three times on the mixing platform. Only sufficient water will then be added, thorough a rose of a watering can, to produce a workable mixture. The wet mortar will be thoroughly worked or mixed by repeatedly turning over, not less than three times on the mixing board.

iii) Size of mixing platform and precaution against list: All mixing of mortar must be done on platforms of angle size and workman bringing the material to and from the platform must not be permitted to walk about on it, thereby bringing mud or dirt to the place, where the mortar

is being mixed. The platform must be clean and level and all joints closed or filled so that the cement is not washed out.

iv) Proportion of cement and sand: Where not otherwise specified, cement mortar for plaster will consist of one part of cement to two parts of sand. For mortar for brick or stone masonry work the proportion unless otherwise specified, will be one part of cement to three parts sand

11.0 PLASTER WORK:

i) Preparation of surface: All putlog holes in brick work and junction between concrete and brick work shall be properly filled in advance. Joints in brick work shall be raked about 10mm and concrete surface hacked to provide grip to the plaster. Projecting burrs of mortar formed due to gaps at joints in shuttering shall be removed. The surface shall be scrubbed clean with wire brush/coil brush to remove dirt, dust etc. and the surface thoroughly washed with clean water to remove efflorescence, grease and oil etc. and shall be kept wet for a minimum of six hours before application of plaster.

ii) Proportion: The cement plaster shall be in specified proportion of cement and sand.

iii) Mixing: The cement and sand should be thoroughly mixed in dry condition. After dry mixing, the materials shall be wetted with just sufficient water to bring the mortar to proper consistency of thick paste. Mortar should be used immediately after mixing and arrangements shall be made so that not more than 30 minutes elapse between the cement first coming in contact with the moisture and laying. In all exterior plaster works waterproofing compound to be added to the mortar as per the specification of the manufacturer, if not indicated in the item rate quoted should be inclusive of the same.

iv) Placing: Plaster shall be laid over the prepared surface in one coat to the specified thickness and rubbed with "PATAS" and trowel and shall be smooth, free from waviness and trowel marks.

v) Sequence of operations: For external plaster, the plastering operations shall be started from the top floor and carried downwards. For internal plaster, the plastering operations may be started wherever the building frame and cladding work are ready and the temporary supports of the ceiling resting on the wall or the floor have been removed.

vi) Curing: Each coat shall be kept damp continuously till the next coat is applied or for a minimum period of 7 days. Moistening shall commence as soon as plaster is hardened sufficiently. Soaking of walls shall be avoided and only as much water as can be readily absorbed shall be used.

12.0 STEEL DOORS, WINDOWS AND VENTILATORS:

The type, over all sizes, side opening position of steel doors, windows and ventilators shall be specified as per details given in IS: 1038, specification for steel doors, windows & ventilators and as per drawings. Both the fixed and opening frames shall be constructed of sections, which have been cut to length and mitred. The corners of fixed and opening frames shall be electrically flash butt welded to form a solid and true right angle and all frames shall be square and flat.

Side-hung shutter windows - Window shutters shall be hung on projecting type hinges (not less than 65mm and not more than 75mm wide). One leaf of the hinge shall be welded into a slot in the outer frame and the other leaf of the hinge riveted to the opening shutters. Friction hinges may be provided for side-hung shutter windows in which case peg-stay may not be

required. In cases where non-friction type hinges are provided, the windows shall be fitted with peg-stays, which shall be either of hot pressed brass, cast brass, aluminium or steel protected against rusting and shall be 300mm long with steel peg and locking bracket. The peg stay shall have three holes to open the side hung casements in three different angles.

Top Hung Ventilators - The steel butt hinges for top hung ventilators shall be riveted to the fixed frame or welded to it after cutting a slot in it. Hinges to the opening frame shall be riveted or welded and cleaned off. Top hung casements shall be provided with a peg stay three holes which when closed shall be held tightly by the locking bracket. The locking bracket shall either be fitted to the fixed frames or to the window.

Glazing of metal doors, windows and ventilators - Doors and windows shall normally be glazed with glazing clip & putty on unless otherwise specified. Putty shall be applied between glass panes and glazing bars. Putty shall be applied over the glass panes, which shall stop 2 to 3mm from the sight line of the back rebate to enable the painting to be done upto the sight line, to seal the edge of the putty to the glass. The oozed out back putty shall be cleaned and cut to straight line.

13.0 PLINTH PROTECTION AND STORM WATER DRAIN:

Plinth protection and storm water drain shall, unless otherwise specified or as directed by Engineer In-charge, shall be provided along the outer periphery of the building as per drawing and with PCC (1:3:6) over bricks flat laid in CM 1:4 and finished with 15mm thick cement plaster in prop. 1:2 with floating coat of neat cement finish.

14.0 SYNTHETIC ENAMEL PAINT:

Preparation of surface: The surfaces before painting shall be cleaned of all rust, scale, dirt and other foreign matter sticking to it with wire brushes, steel wool in case of steel surfaces and sand papering in case of wooden surfaces. Thereafter, one coat approved primer paint will be applied on the surface. Synthetic enamel paint (Superior quality as approved) shall be applied - two or more coats to give an even shade.

15.0 ANTI-TERMITE TREATMENT (IS 6313):

Injecting chemical emulsion of Chlorpyriphos ZOEC (IS - 8944) emulsifiable concentrates 20% with 1% concentration for pre-construction anti-termite treatment and creating a continuous chemical barrier under and all round the column pits, trenches, top surface of plinth filling, junction of walls and floor along the external perimeter of building expansion joints, surroundings of pipes and conduits etc. complete as per specification (plinth area of the building at ground floor only shall be measured for payment) and to be executed by reputed party.

16.0 MANDATORY TESTS:

The various mandatory tests shall be carried out by the contractor and no separate payment shall be made unless otherwise specified in the schedule of rates. Following tests /test certificate to be produced by the contractor at his own cost.
i) Water for construction and curing to be tested before use ('pH' value should not be less than 6).
ii) Bricks as per IS: 1077
iii) Coarse and fine aggregates as per IS:383
iv)Cube test for Compressive strength test of RCC to be done as per relevant code of practice IS 456-2000.

v) Test certificate for Steel materials, Reinforcements shall be as per relevant IS Codes (latest edition).
vi) Any other tests as per the direction of Engineer-in-charge.

17.0 MEASUREMENT & PAYMENT:

Payment for all works done shall be made on the basis of actual work done as per the schedule of payment. For all extra work done on the advice of the Company's Engineer and which is not included in the scope of work, deviation order for the same shall be made per decision & power of the Company's Engineer.

18.0 SAFETY MEASURE:

Safety measure as per OIL regulations shall be strictly adhered to by the Contractor. Safety belts and other measure taken by the Contractors shall be borne by the Contractor. If any loss or damage caused to life during the erection and execution, the contractor shall be fully responsible for the loss.

19.0 RECORD KEEPING:

(i) A site order book will be maintained at site which will be in the custody of the Engineer-in-charge or his representative and all instructions given to the Contractor will be recorded in the site order book and the same has to be signed by the contractor to comply with the instruction given therein.

(ii) During construction, contractor shall be responsible for submitting 10(Ten) colour digital photograph/slides/per location each month (not less than 20 per week) of the works during progress.

(E) MATERIAL, TOOLS AND PLANTS

(i) High Strength Deformed Steel Bars conforming to IS: 1786
(ii) Steel Sections, Plates & Sheets conforming to latest edition of IS codes
(iii)Tentative list of T&P to be deployed by the contractor for successful and timely completion of work is detailed below. These T&P are not to be shared with any other work/job during execution of the work. It may be noted that the list is not exhaustive and is only for general guidance.

Sl. No.	**Description**	**Number**	**Mobilisation**
1	Concrete mixing machine	02	As per requirement
2	Concrete Vibrator with needle	06	As per requirement
3	Curing/dewatering pump -1.5 /2 HP (pump for curing at heights)	02	As per requirement
4	Concrete cube moulds	18	As per requirement
5	Dumper / Truck	01	As per requirement
6	Safety Gadgets	For Individual Location	As per requirement

(F) PAYMENT SCHEDULE

For individual Sub Station

(i) No advance payment is admissible

(ii) Pending completion of the whole work provisional progressive payments for the part of the work executed by the contractor shall be made on the basis of work completed and certified by Engineer-in Charge.

(iii) Non-compliance to Clause No. 19.0 (ii) under (D) PARTICULAR SPECIFICATIONS & INSTRUCTIONS, an amount of Rs. 5,000.00 per month shall be deducted from RA bill.

Sl. No.	Details	Payment Schedule
1	On completion of foundation work up to plinth level	15%
2	On completion of structural work (RCC including concrete & reinforcement in columns, beams, slabs, chajja,	35%
3	On completion of Brick Work in super structure	10%
4	On completion of flooring works including sand filling, trench, plinth protection work, surface drain	15%
5	On completion of finishing work including fixing of doors, windows etc. in all respect	15%
6	After completion and handing over of all work	10%

(G) MATERIAL TO BE SUPPLIED BY THE COMPANY

(i) Cement: OPC cement of Grade 43 conforming to IS: 8122

Note:
(a) Cement will be issued on chargeable basis at the rate prevailing during execution at Co's Stores at Duliajan.

(b) Total number of cement bags required for the job to the maximum of theoretical consumption as per the specification of CPWD. Additional and damaged cement requirement in excess of above shall be issued to the vendor on chargeable basis at a rate double the cost of company costing price. In case the consumption of cement is less than that the quantity issued to the contractor then the contractor shall arrange to return the excess quantity in good usable condition to the company at its stores.

(c) Empty Cement bag to be return to company in good condition failing which Rs. 8.00 (eight) per bag will be charged from contractor's payment.

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ELECTRICAL PART

A sub-station installation work shall generally comprise of supply, installation, testing and commissioning of the following:

a) HT Panels.
b) Step down Transformers complete with associated auxiliaries as specified.
c) High voltage cable for inter-connection between the H.V. panel and transformers including terminations of Overhead line
d) LT Panels
e) Earthing system.
f) Safety Equipment.
g) Miscellaneous items.

(A) CONFORMITY WITH STATUTORY ACTS, RULES, REGULATIONS, STANDARDS AND SAFETY CODES

i) Indian Electricity Act
ii) CEA (Measures relating to Safety & Electricity supply) Regulations, 2010
iii) Relevant Indian Standards
iv) Any other Act or Rules in force.

Safety Codes and Labour regulations

In respect of all labour employed directly or indirectly on the work, the bidder, hereinafter called the contractor, at his own expense will arrange for the safety provision outlined in safety requirement and specifications to comply with the statutory regulations, BIS recommendations and OIL's practices.

The contractor shall provide necessary barrier warning signals and other safety measures to avoid accidents. He shall also indemnify OIL against claims for compensation arising out of negligence in this respect.

Nothing in these specifications shall be construed to relieve the contractor of his responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with applicable statutory regulations and safety codes in force from the safety angle.

(B) DRAWING AND DOCUMENTS

1.0 SPECIFICATION

The tender specifications shall indicate for a particular job the reference drawings to help the contractor to work out the tender. The drawings shall also indicate the schematic of main connections and shall form part of the specifications. Single line diagram of substation is attached for knowing the scheme of HT panel, transformer and LT panel. The civil drawing is attached for cost estimation and other assessment purpose.

1.0.1 Drawings to be submitted with bid:

General arrangement drawing of the HT panel and LT Panel.

1.0.2 Drawings to be submitted for approval

The contractor shall submit the following drawings within 60 days of the award of the work or as specified in tender document which shall be approved by OIL:

(i) Civil drawings of the building to be submitted for approval.

(ii) Details of foundations for the equipment

(iii) General arrangement drawing of H.T Panel, Transformers, LT panels, Earthing, Cable route etc. including details of grouting of channels / bolts of various equipment.

(iv) All panels' schematics & wiring diagram including control wiring.
(v) Cable layout between HT panel boards, transformers & LT panel etc.

(vi) Bar-chart indicating general programme for:
a) Civil work
b) Electrical work plan for supply, installation, testing and commissioning and handing over.

(vii) Any other drawing or data that may be necessary for the job along with complete bill of material must be submitted to OIL for approval.

The manufacture of panel should start after approval of the drawings by OIL.

1.0.3 Drawings to be submitted while handing over installation

Three Sets of complete drawings comprising the following shall be submitted by the contractor while handing over the installation:

(i) Equipment layout drawing (s) giving complete details of the entire equipment.

(ii) Electrical drawings for the entire electrical equipment showing cable sizes, equipment capacities, switch-gear's ratings, control components, control wiring etc.

(iii) Schematic diagram of the entire sub-station installation.

2.0 DOCUMENTS TO BE SUBMITTED

2.0.1 The following documents are required to be submitted with the offer.

2.0.1.1 HT Panel

i) Detail as per technical specification mentioned in SOQ PART-II.

ii) Copy of Type test report done on similar panel & VCB at NABL accredited laboratories or STL approved laboratories as per relevant IS.

iii) An undertaking from the panel manufacturer stating that in the event of an order on the party the panel manufacturer will supply the panel through the party as per specifications of the tender and order.

2.0.1.2 LT Panel

i) Detail as per technical specification mentioned in SOQ PART-II.

ii) Copy of Type test report done on similar panel at NABL accredited laboratories or STL approved laboratories as per relevant IS.

iii) An undertaking from the panel manufacturer stating that in the event of an order on the party the panel manufacturer will supply the panel through the party as per specifications of the tender and order.

2.0.1.3 Transformer

i) Detail as per technical specification mentioned in SOQ PART-II.
ii) Copy of Type test report done on similar transformer at NABL accredited laboratories or STL approved laboratories as per relevant IS.

Deviation of offer from tender specifications with justification and backup documents from principal wherever required shall be submitted with offer. All deviations shall be subjected to acceptance by OIL in writing.

The successful bidder shall obtain approval for the following drawings, documents. All electrical details shall be submitted within 60 days of award of work. OIL shall require minimum 60 days' time for approval of drawings. The approval time may increase depending upon clarifications required from the bidders.

Recommended list of spares with part no. & price for maintenance of panels shall be provided with the supply (not considered for evaluation).

2.0.2 Documents to be submitted with supply

2.0.2.1 HT Panel

a. Four sets of installation, testing and commissioning & operation manual of the Panel and Vacuum Circuit Breaker (VCB).

b. Four sets of literature of main components like protection & auxiliary relays.

c. Four copies of as built general arrangement, schematic diagram and wiring diagrams.

d. Two copies of foundation drawings.

e. Four sets of test report containing result of tests done at manufacture's work during inspection as per relevant IS.

f. Recommended list of spares with part no. & price for maintenance of panel (not considered for evaluation).

2.0.2.2 LT Panel

a. Four sets of installation, testing and commissioning & operation manual of the Panel and Air Circuit Breaker (ACB) and MCCB.

b. Four sets of literature of main components like protection & auxiliary relays.

c. Four copies of as built general arrangement, schematic diagram and wiring diagrams.

d. Two copies of foundation drawings.

e. Four sets of test report containing result of tests done at manufacture's work during inspection as per relevant IS.

f. Recommended list of spares with part no. & price for maintenance of panel (not considered for evaluation).

2.0.2.3 Transformer

a. Four sets of Manufacture's test certificates for all the components & assemblies as required by IS-11171 with latest amendments should be submitted to OIL along with dispatch of the materials.
b. Four sets of General arrangement drawing of all the components & assemblies and wiring drawing.
c. Four sets of Instruction manual for installation, operation, maintenance repairs and circuit diagram.
d. Recommended list of spares with part no. & price for maintenance of transformer (not for evaluation).

2.0.2.4 Type test certificate for dry type Voltage transformer & cast resin type current transformer from NABL accredited laboratories or STL approved laboratories as per relevant IS shall be submitted with the supply.

2.0.3 Documents to be submitted during handing over of Substations:

After completion, while handing over the sub stations to OIL, the bidder shall hand over 3 sets of the operating and maintenance manual of all the equipment installed & used in the sub stations, their drawings, test certificates, Copies of all documents for routine, acceptance and type test certificates of the equipment carried out at the manufacturers premise, type test certificate from NABL accredited laboratories or STL approved laboratories for design and performance of Circuit breaker and cubicle as per standards, guarantee certificates, operating spares as specified in the tender, spare parts list and any other relevant documents regarding installation, adjustments operation and maintenance including preventive maintenance & trouble shooting together with all relevant data sheets.

(C) SCHEDULE OF WORK

OIL shall supply an indicative single line diagram and a schedule of work as per SOQ PART-II detailing the equipment, materials required, type and anticipated quantity/numbers in respect of each item. However, detailed drawings shall be prepared by the contractor & submitted to OIL for its approval.

(D) WORKS TO BE DONE

In addition to supply, installation, testing and commissioning of all equipment as per schedule of work, following work shall be deemed to be included within the scope of work, to be executed by the contractor.

(i) All building works, such as equipment foundation if required cutting and making holes, grouting of channel belts as required.

(ii) Provision of supports / clamps for equipment, cables etc. wherever required.

(iii) Small wiring, inter-connection etc. inclusive of all materials and accessories, necessary to comply with the regulations as well as proper and trouble free operation of the equipment.

(iv) Closing of the cable entry points in sub-station against seepage of water, rodents etc.

(v) Tools and tackles required for handling and installation.

(vi) All necessary testing equipment for commissioning of the panel.

(vii) Watch and Ward of materials and/or installation and equipment till their handing over to OIL.

(E) INSPECTION OF SITE AND COLLECTION OF DATA

The contractor shall be deemed to have examined the tender documents, detailed specification, data etc. and to have visited the site or ascertained all relevant details for offering suitable equipment/installation.

(F) EXTENT OF WORK

The scope of work shall consist of cost of all materials, labour transportation & Handling/supervision, installation, calibration, adjustments as required for commissioning of the sub-station. The term complete installation shall mean not only major item of the plant and the equipment covered by these specifications, but also incidental sundry components necessary for complete execution and satisfactory performance of installation with all labour charges, whether or not specifically mentioned in the tender documents, which shall be provided by the contractor at no extra cost.

(G) COMPLETENESS OF TENDER

All fittings, unit assemblies' accessories, hardware foundation bolts, terminal blocks for connections, cable glands and miscellaneous materials and accessories of items of work which are useful and necessary for efficient assembly and working of the equipment shall be deemed to have been included within the scope of the work in the tender and within the overall details for complete item whether they have been specifically mentioned or not.

(H) QUALITY OF MATERIALS AND WORKMANSHIP

All parts of equipment shall be of such design, size and material so as to function satisfactorily under all rated conditions of loading and operation. All components of the equipment shall have adequate factors of safety. Materials/components which are not conforming to standards laid down by Bureau of Indian standards (BIS) shall be approved from OIL before use on the work.

The entire work of fabrication, assembly and installation shall conform to sound engineering practice. The mechanical parts subject to wear and tear shall be of easily replaceable type.

The construction shall be such as to facilitate ease of operation, inspection, maintenance and repairs. All apparatus shall also be designed to ensure satisfactory operation under working conditions as specified.

(I) INSPECTION, TESTING AT MANUFACTURERS WORKS

The contractor will be required to furnish such facilities as will be necessary for inspection of the equipment before dispatch at the manufacturer's works and also for witnessing routine/type tests at the works required by OIL. The contractor shall furnish information for this purpose and will give 30 days' notice regarding the dates proposed for such test to OIL for inspection.

(J) DISPATCH OF MATERIALS AND STORAGE

The contractor shall commence work as soon as the drawings submitted by him are approved. Safe custody of all machinery and equipment supplied by the contractor shall be his own responsibility till the final taking over by OIL.

(K) COORDINATION WITH OTHER AGENCIES

The contractor shall coordinate his work and cooperate with other agencies by exchange of all technical information like details of foundation if required, weight, overall dimensions, clearance and other technical data required for successful and proper completion of his portion of the work in relation to the work of others without any reservation. No remuneration should be claimed from the OIL for such technical cooperation. If any unreasonable hindrance is caused to other agencies and any completed portion of the works has to be dismantled and redone for want of cooperation and coordination by the contractor during the course of work, such expenditure incurred will be recovered from the contractor during the course of work, if the restoration work to the original condition of specification of the dismantled portion of the work was not under taken by the contractor.

(L) CARE OF BUILDINGS

Care shall be taken, while handling/installing the equipment to avoid damage to the building. On completion of the installation, the contractor shall arrange to repair all damages to the building caused during plant installation so as to bring to the original condition. He shall also arrange to remove all unwanted waste materials from substation room and other areas used by him.

(M) PAINTING AND PROTECTION

All damages to painting during transport and installation shall be set right to the satisfaction of OIL before handing over. All structural frame work for support of various items of equipment shall be given the final coat of paint of shade as per standard at site after erection is complete.

(N) TRAINING OF DEPARTMENTAL PERSONNEL

The operation and maintenance staff of OIL shall be associated with the contractor's personnel during the installation, testing and commissioning of the equipment.

(O) FINAL INSPECTION AND TESTING

When the installation is complete, the contractor shall arrange for inspection and testing of the installation. Test results obtained shall be recorded. The installation shall not be accepted unless it complies with the requirement of these Specifications. The Sub Station installation shall be inspected by the contractor from local licensee and/ CEA and their clearance taken before energizing the Sub Station. The responsibility of the contractor is to arrange inspection of substation by Central Electricity Authority (CEA), Shillong and their clearance will be taken before energizing of substation. All the observations/ deficiencies pointed out by the inspecting authorities shall be complied with by the contractor on priority. OIL shall render necessary help and reimburse mandatory fees paid to CEA by the contractor if any, in this regard against submission of receipt.

(P) DATE OF ACCEPTANCE

The contractor shall monitor the operation of the substation for a period of one month after it is energized. The date of acceptance by OIL shall be after successful completion of continuous trouble free operation of the substation for a period of 01 month. In case of unsatisfactory performance or break down due to defective design, manufacture or installation during this one-month trial run, the substation shall be accepted only on completion of one-month trouble free operation.

(Q) GUARANTEE

The contractor shall guarantee the entire sub-station installation as per specifications. All equipment shall be guaranteed for one year from the date of acceptance of the substation by OIL. The installation shall be covered by the conditions that whole installation or any part is found defective within one year from the date of acceptance shall be replaced or repaired by the contractor free of charge as decided by OIL. The warranty shall cover the following:

(a) Quality, strength and performance of materials used.

(b) Safe mechanical and Electrical stress on all parts under all specified conditions of operation.

(c) Satisfactory operation during the maintenance period.

(d) Performance figures and other particulars as specified by the bidder under schedule of guaranteed technical particulars.

(R) BUY BACK OF SUBSTATION ELECTRICAL EQUIPMENT FOR 11KV SUBSTATIONS

i) In this LSTK, 4 nos. electrical substations shall be upgraded to 11KV/415V, AC. After acceptance of the proposed new 11KV substations, the old 11KV substation equipment like transformers, CB & LT panel shall be disconnected and can be taken away from the substation by the party.

ii) It is essential for OIL to remove the existing 11KV substation equipment from the substation for which a buyback system is incorporated. In work schedule, buyback is incorporated and essential to be filled up by bidders. It is mandatory to quote against buy back for equipment like Transformers, Oil circuit breakers and LT panels. The quoted price shall be deducted from total price against work schedule. The details and quantity of equipment is mentioned against each substation for buyback of equipment in SOQ PART-II.

(S) Technical specifications of Electrical Equipment:

1.0 11KV VCB Panel:

Quantity and rating of VCB panels shall be as per respective SLD.

Supply, installation, testing and commissioning of 11 KV VCB Panels comprises of the following specifications:

The 11 KV Switchgear Panel comprising of indoor type VCB panel suitable for solidly grounded system, fully factory built and assembled for direct installation. Designed, manufactured and tested in accordance with relevant IS/IEC with latest amendment. Circuit breaker and cubicle must have type test certificate from NABL accredited laboratories or STL approved laboratories for design and performance as per above standards.

The VCB (cubicle and circuit breaker) panel should be made of steel clad, free standing, floor mounting, dust and vermin proof and horizontal isolation horizontal draw out, compartmentalized type, indoor switch board in standard execution with VCB. The panel shall be provided with 11KV,3 phase 50 HZ air insulated copper bus bar and suitable for short circuit capacity 31.5 KA for 3 second.

1.0.1 CUBICLE AND CIRCUIT BREAKER DETAILS

1.0.1.1 Cubicle:

i) The draw out type circuit breaker cubicles should be fabricated using high quality CRCA/GI steel sheet of minimum thickness for load bearing members and for other sheet work as per standard. The sheet metal should be given minimum seven/nine tank anti corrosion/Aluzinc treatment & then powder coated colour-SIEMENS GREY or equivalent.

ii) The totally metal enclosed panel shall be compartmentalized with internal positioning by insulated material of epoxy reinforced fibre glass to constitute the following:

a) Bus bar compartment

b) Circuit Breaker Compartment.

c) CT and Cable compartment.

d) Relay & metering compartment (LT compartment).

1.0.1.2 Circuit Breaker Compartment:

The circuit breaker should be totally enclosed & fully interlocked, front open type, horizontal draw-out, horizontal isolation type breaker (as per IS: 13118 as amended up to date), single break, trip free mechanism, electrically and manually charged and auto/manually closing breaker suitable for use on 11 KV, 3 Phase, 50Hz A.C. supply with short circuit fault level of 31.5 kA for 3 sec complete with self-contained, fully interlocked, rack in and rack out mechanism. Panel shall be complete with plugs and sockets, mechanical inter-locks and safety shutter. The circuit breaker panel shall have minimum of 6NO+6NC auxiliary contacts directly operated by the breaker. The circuit breaker drive mechanism shall be provided with facility for pad locking at any position

namely 'SERVICE', 'TEST' and 'ISOLATED'. The front door shall have view glass to facilitate observation of mechanical ON/OFF indication and operation counter.

1.0.1.3 CT and Cable Compartment:

The CT and the incoming and outgoing feeder cable compartment shall be in the rear. The LT control cable terminal arrangement shall be provided in the rear side in a separate box so as to have isolation from high voltage terminals. All the cable entry plates shall have removable gland plates. The CT required for metering and protection shall be as per IS-2705 (with latest amendment) & IS 4201(with latest amendment) and shall be of adequate size and its insulation will be epoxy cast resin type.

1.0.2 RELAY & METERING COMPARTMENT (LT COMPARTMENT)

The LT chamber of suitable height shall be positioned on the top of the panel & at the front. Protective relay, measuring equipment and auxiliary controls along with the switches and indications are to be accommodated in the LT Chamber. Three nos. of bright steel hinges shall be used on front door with door opening limited to 135 Degree (approx.). All devices in the LT box are to be marked with permanent labels. Panel rating plate shall be provided on the door.

Control wiring and CT wiring shall be done using single core, PVC insulated, FRLS, stranded copper cable of 1100V grade and 2.5sqmm size. All cables and wires shall be numbered with suitable ferrules. Suitable lugs shall be used for control wiring and ring type lugs shall be used for CT wiring. All wires shall terminate on suitable Terminal Blocks. All TBs shall have 10% spare terminals. TBs shall be marked. Reinforced flexible conduit shall be used for wiring and PVC spiral shall be provided on exposed wires near the door hinge in LT box. Colour coding of control cables shall be followed as required by relevant IS. Control cables shall be as per IS-694(with latest amendment).

1.0.3PANEL METERING AND INDICATION EQUIPMENT:

Microprocessor based flush type digital multifunction energy meter with accuracy class 0.5 and with RS485 port with MODBUS protocol for data logging/downloading shall be provided for all panels. The meter shall be of size 96mmx96mm and shall measure the following electrical parameters: frequency, voltage, current, power factor, KVA, KVAr, KWh and harmonic components. The multifunction meter shall have inbuilt selector switch and memory to store data for minimum 75 days.

The following indications shall be available:

a) Breaker ON and OFF/TNC switch

b) Trip circuit healthy push button
c) LED type Indication lamp for each panel for:
   (i) CB Close,
   (ii) CB open,
   (iii) Trip on fault,
   (iv) Trip circuit healthy,
   (v) Spring charged.
   (vi) Breaker in Service Position &
   (vii) Breaker in Test position

All LEDs shall be LVGP (low voltage glow protection) & industrial type.

1.0.4 CLOSING AND TRIPPING:

i) Manually: Spring charging, closing and tripping.
ii) Electrically: Motorised Spring charging, closing and shunt tripping.

1.0.5 DRY TYPE CAST RESIN V.T:

One in each incomer panel shall have cast resin, draw out type Voltage Transformer (One Additional winding of open delta for directional E/F relay) V.T Ratio = (11kV / 110V), Burden shall be calculated as per design, Accuracy class - 0.5 as per IS 3156(Part I,II,III) and protected with HRC fuse on HT & MCB on LT side. VT shall be horizontally draw out type and mounted on the top of the panel. Cable entry shall be from bottom side.

1.0.6 SPACE / PANEL HEATERS:

The panel shall be provided with 2nos, 80 W space heaters in each cubicle and adjustable thermostats of suitable rating for heater temperature monitoring along with protective HRC fuses and ON/OFF switch.

1.0.7 The front door of each breaker panel shall have glass window / windows to facilitate observation of the following:

-Spring Charged / Discharged indication,
-Mechanical ON/OFF indication and
-Operation counter.

1.0.8 CIRCUIT BREAKER DETAILS:

The VCB shall have the following features:

(i) Horizontal draw out type with Horizontal Isolation mounted on truck with rollers.

(ii) Truck cover with two handles and fixed to truck frame with four screws.

(iii) Truck earthing with welded boss.

(iv) Insulation bushings shall be epoxy cast resin type and suitable for ambient conditions

(v) Manual & motor operated spring charging system. Motor working voltage 230 V AC, 50 Hz

(vi) 11kV, four pole, vacuum type with 1250 A continuous rating for incomer and 1250 A/800A continuous rating for outgoings, 31.5 kA fault level.

(vii) Auxiliary contacts (6 NO + 6NC).

(viii) Operation counters of 5 digits.

(ix) High mechanical endurance as per IS/IEC 62271.

(x) Mechanical ON/OFF indication.

(xi) Spring FREE/ CHARGED indication.

(xii) Position indicator SERVICE/ TEST/ ISOLATE.

(xiii) Low maintenance.

(xiv) Manual ON and TRIP button.

(xv) Operating sequence: O -0.3 sec - CO - 3 min - CO

(xvi) Shunt trip coil: 24V DC.

(xvii) Insulation level:
Rated insulation level at power frequency: 28KV
Peak withstand voltage: 75 kV
Short time withstands current (3 s):31.5 kA
Rated breaking capacity:31.5 kA (rms)
Rated making capacity: 78.75 kA (peak)

(xviii) Surge suppressor/snubber circuit in- build with the VCB.

1.0.9 PROTECTION SCHEMES:

1.0.9.1 Incoming Panel:

Each incomer feeder panel shall have numeric relay with following protections/features:

i) Directional over current (67,67N).

ii) Non-directional-over current protection (50, 50N,51,51N)

iii) Sensitive directional /non-directional ground fault protection

iv) Overload protection (49)

v) Under voltage, /Overvoltage protection (27/59)

vi) Under/Over frequency protection (81O/U)

vii) Breaker failure protection (50BF)

viii) Phase unbalance or negative sequence protection (46)

ix) Auto reclosure (79)

x) Trip circuit supervision (74TC)
xi) Fault recorder

xii) Disturbance recorder and sequential events recorder

xiii) RS-232/485 communication

Provision shall be provided for external interlock contact to trip the breaker when HT breaker opens and another external interlock contact so that LT breaker cannot close without corresponding HT breaker being closed first. This is in addition to the TNC control switch and UV relay.

1.0.9.2 Outgoing feeder panel:

Each panel shall have Numeric relay with following protection/feature:

i) 3phase over current (50/51)

ii) Earth/over current(50/51N)

iii) Negative phase sequence over current (46)

iv) Thermal overload(49)

v) Broken conductor detection(46BC)

vi) Circuit breaker failure detection(50BF)

vii) Fault recorder (25)

viii) Disturbance recorder (5)

ix) Events recorder (250)

x) RS-232/485 communication

xi) Trip circuit supervisory relay- 1 no.

1.0.9.3 Protection of Bus-coupler:

Same relay with same protection as outgoing feeder having Synchro-check facility for paralleling of feeders.

1.0.10 Two Nos. cubicle lamps (LED) in each cubicle shall be provided along with switch.

1.0.11 SAFETY INTERLOCK:

The following minimum safety devices shall be provided to ensure the safety of operating personnel:

(i) Individual explosion vents for Bus bars/Breaker/Cable and CT chambers on the top of the panel to let out the gases under pressure generated during unlikely event of a fault inside the panel.

(ii) Cubicle with front door/panel pressure tested for arc faults.

(iii) CB and metal enclosure earthed in accordance with relevant IS with latest amendment.

(iv) Self-operating shutters, shielding live fixed contacts, shall be provided which closes automatically when truck is withdrawn to test position. Locking arrangement should be provided for the shutters.

(v) Breaker shall not be moved in ON condition from service to test position & vice versa.

(vi) The CB cannot be switched ÓN' when the truck is in any position between test and service.

(vii) All nut & bolts used inside the panel should be of high tensile, hexagonal headed, metric size, manufacture to DIN 931 coarse threaded with two nos. bright zinc plated flat and spring washers.

(viii) Lifting hooks shall be provided for the panels.

(ix) Panel Markings:

The switchgear panel shall have the following identification markings in a permanent manner:

a. Panel name both in front and rear side.
b. Caution boards conforming to IS-2551(with latest amendment) both in front and rear sides.
c. CT specification name plate on CT and at panel cover at rear.
d. Incoming & outgoing cable box.

The markings and identifications of conductors, apparatus terminals shall be as per IS: 5578 (with latest amendment) & IS:11353 (with latest amendment).

1.0.12 CABLE TERMINAL BOX:

HT cable boxes with termination links for termination of incoming and outgoing HT cables should be provided in the rear side of the unit. Rear incoming cable box should be of suitable size for safe entry of two nos. of incoming cables and should have suitable terminal links for safe termination of both the incoming cables for loop in/ loop out connection as is done in case of ring main unit. The termination arrangement should be such that it should be possible to disconnect one cable in the event of fault in that cable and power-up the unit with the other incoming cable. Link rating shall be 600amp (min).

Panel shall have incomer connections suitable for 2x 3Cx 240 sq. mm. XLPE 11KV cable (cable entry from bottom side) with outdoor kit, indoor kit, end termination with heat shrinkable jointing kit etc. as required.

1.0.13 BUS-BAR COMPARTMENT:

Quantity and rating as per respective substation SLD.

Bus bar shall be rectangular in cross section and made from electrolytic grade electro tinned copper having 99.99% high conductivity. Heat shrinkable sleeve insulation of 11KV voltage grade should be provided on bus-bar, its risers & connections and shall be marked in different colour codes for identification of three different phases (R, Y, B). Thickness of bus-bar sleeve shall be 3 mm and shall be made of Raychem RPG 11 kV grade or similar type. Bus-bar arrangement should be such that in future similar cubicles can be connected with this cubicle. Cast epoxy insulators supports for bus-bar & cable termination links designed to withstand full short circuit current at specified fault level for 3 seconds shall be provided.

1.0.14 CONTROL SUPPLY:

Control power supply shall be taken from 1 no battery bank for 24 V DC with battery charger. It consists of the following:

i) Each cell voltage: 2.0 V, 200 AH, sealed maintenance free (SMF)

ii) 12 Nos. batteries shall be connected to give 24 V DC

iii) 12 Nos. cells shall be fixed in self stackable MS trays with insulated shoe.

iv) Incomer to battery charger shall have single phase supply with 20 Amps double pole MCB with overload, short circuit protection.

v) Charging current: 20 A

vi) Float and boost charging facility shall be available.

vii) Outgoing shall be double pole 20A MCBs-3 Nos.

viii) Protection for control circuit shall be provided.

2.0 Earthing:

(i) The separate earthing trucks shall be provided for bus-bar side earthing and feeder earthing purposes.

(ii) The bus bar earthing trucks shall enter only into the incomer panels and feeder earthing trucks shall enter only into outgoing panels. Suitable mechanical interlock shall be provided for the same.

(iii) The earthing trucks shall have built in provision, such that it shall not be possible to earth the live circuit on feeder or bus bar side.

(iv) The earthing truck shall be of permissive advance contact type construction by virtue of which the feeder or the bus bar side shall be sensed by providing suitable 1 phase voltage transformer, preferably on the Y phase. The advance contact type arrangement shall be such that while insertion of the earthing truck into the respective cubicle, shall facilitate the sensing of the voltage by the 1 phase, VT prior to earthing.

(v) The further racking for final earth position shall be blocked by suitable solenoid interlock with audio visual alarm to avoid the earthing of the live bus bar or feeder side.

(vi) The isolating contact fitted on the earthing truck and the current carrying part shall be suitable for 31.5 kA current carrying capacity for 1 sec.

(vii) Panel shall have proper protective earthing terminals for connection to external earth cable. Earthing connection between truck and cubicle shall be provided by means of sliding contact. The earth truck should be arranged in such a way that the truck is earthed in isolated position when inserted. While the truck is being withdrawn, the earthing connection shall not be interrupted until the truck has moved past the isolated position.

3.0 Site Condition:

a) Maximum Ambient air temperature : 40 ° C
b) Minimum ambient air temperature : 5 ° C
c) Maximum humidity at site (at 40 ° C) : 98 %
d) Surrounding atmospheric condition : Humid
e) Site altitude : 150 mtr.

4.0 General Notes:

1. Vacuum interrupter and circuit breaker should be of the same make.

2. VCB manufacturer of panel must have powder coating facilities for painting of panel.

3. Height of the panel shall not exceed 2.4 m.

4. Manufacturer of 11KV, VCB panel shall have the testing facilities to carry out the routine tests of the VCBs panel as per relevant IS with latest amendment in their manufacturing works.

5. The H.T switchgear and the components should conform to the relevant Indian Standard (with latest amendments) and type tested by NABL accredited laboratories or STL Approved laboratories for desired performance. Type test certificates should be submitted with the offer.

6. Bidder has to fill up the DATA SHEET enclosed (Annexure-II & IV) otherwise the offer is liable to be rejected.

7. All similar equipment, materials, removable parts of similar equipment etc. shall be inter-changeable with each other
8. Suppressors or other protection devices shall be provided, if required as per schedule of quantities, wherever the sub-station installation is likely to interfere during the operation with any other electric or electronic equipment.

5.0 Test and Inspection:

1.The Circuit breaker and cubicle must have type test certificate from NABL accredited laboratories or STL Approved laboratories for design and performance as per relevant IS.

2. Routine tests on switchgear, relay including primary & secondary injection tests in accordance with IS shall be carried out at the manufacturers works which shall be witnessed by OIL engineer.

3. Equipment shall be inspected by OIL engineer at manufacturer's premises prior to dispatch.

4. The supplier will give 30-day advance intimation to enable depute OIL representative for witnessing the acceptance and routine tests.

6.0 Warranty:

The goods/ equipment shall be of best quality and workmanship. The equipment shall be guaranteed for 12 (Twelve) months from the date of acceptance against defects arising due to material, workmanship or design. Relay will also be included in this guarantee.

7.0 Technical specifications of LT PCC panel:

7.0.1 Scope:

This Section covers the detailed requirements of PCC Panel for 415V, 3 phase 50Hz 4 wire system. All switchgears shall be fully rated at an ambient temperature of 40° C.
Type of Panel:

i) The PCC panel shall comprise of any one of the following types of switchgears or combination thereof as specified.

ii) Air Circuit breakers EDO type.

iii) MCCBs of suitable Ics ratings and MCCBs shall invariably be Current Limiting type. Features like Double Break, Positive Isolation functions shall be preferred.

iv) The Panel shall be indoor type having incoming sectionalisation and outgoing switchgears as specified. The design shall be cubicle type. The degree of enclosure protection shall be as per relevant IS/IEC with latest amendment.

7.0.2 General Construction:

The PCC shall be floor mounted free standing totally enclosed and extensible type. The PCC shall be dust & vermin proof and shall be suitable for the climate conditions as specified. The design shall include all provisions for safety of operation and maintenance personnel. The general construction shall conform to relevant IS/IEC with latest amendment for factory assembled switch board.

Cubicle Type Panels:

(i) Cubicle type panels shall be fabricated out of CRCA/GI sheet of not less than 2.0 mm thick. Wherever necessary, such sheet steel members shall be stiffened by angle iron frame work. General construction shall employ the principle of compartmentalization and segregation for each circuit.

(ii) Incomer section and bus section shall be separate and independent. No feeder shall be placed vertically with the incomer section.

(iii)Each section of the rear accessible type panel shall have hinged access doors at the rear. Overall height of the panel shall not exceed 2.4 meters.

(iv) Operating levers, handle etc. of highest unit shall not be higher than 1.6 meters. Multi-tier mounting of feeder is permissible.

(v) The general arrangement for multi-tier construction shall be such that the horizontal tiers formed present a pleasing and aesthetic look. The general arrangement shall be approved before fabrication. Cable entries for various feeders shall be from bottom.

(vi) Cable alleys located in between two circuit sections, either in the rear or in the front of the panel. All cable terminations shall be through detachable gland plates.

(vii)There shall be separate detachable gland plate for each cable entry so that there will not be dislocation of already wired circuits when new feeders are added. Cable entry

plates shall therefore be sectionalized. The construction shall include necessary cable supports for clamping the cable in the cable alley or rear cable chamber.

(viii)Cubicle panels with more than 1000 Amps bus shall be made of tested structural modular sections.

(ix) The PCC Panel shall have the following features:
(a) Panel shall be indoor, cubicle type with provision of extension of panels in future and Panel shall be built on Self-supporting, floor mounting, rigid framework.

(b) The frame of the panel shall be sufficiently strong and made of minimum 50 x 50 x 6mm MS angle iron with intermediate members of suitable section & size. The frame shall be mounted on a bottom structure made from 100 x 50x 5mm MS channel.

(c) The maximum size of the panel board shall not be more than 8000mm (L) x 1000mm (B) x 2400mm (H).

(d) Panel shall be sheet steel clad, cubicle type made of 2.0mm thick CRCA /GI sheet and panel shall be Dust / vermin proof and weatherproof with IP52 degree of protection.

(e) Bottom detachable gland plates shall be provided for all cable entries. Height of bottom detachable gland plate shall be 450 mm from floor level.

(f) The entire metal work shall be treated with minimum seven/nine tank antirust treatment/Aluzinc process and then powder coated in DA Grey colour or equivalent. Documentary evidence confirming the same shall be provided with the supply.

(g)Non-deteriorating Neoprene rubber gaskets shall be provided between all joints and Panel shall be designed for Ambient of 40°C (Max)/ 5°C (Min) and Humidity-98%.

(h) All feeders shall be suitable for operation from front side and shall have provision of inspection from backside and all panel doors shall be provided with single turn latches for opening / closing.

(i) Internal barriers shall be provided between cubicles to provide Form-2 separation as per relevant IS/IEC with latest amendment to prevent transmission of flashover from one panel to other panels.

(j) Danger plates shall be fitted on front and back of the panel and Legend plates of the feeders shall be provided in the front as well as at back of each feeder.

(k) Adequate nos. of lifting lugs shall be provided on top and Ventilation louvers shall be guarded with wire mesh.

(l) Internal earthing shall be provided for all equipment having earthing terminal and panel doors with suitably rated, PVC insulated, flexible copper earth wires or copper braids of suitable rating as per IS.

(m) Earthing bus shall be provided at bottom of the panel. Earthing Bus shall be made of 50x6 mm GI straps with minimum 80 micron galvanisation thickness. Brought out studs shall be provided on two sides complete with suitably sized zinc passivated double nuts and spring washers. Earth bus shall have holes drilled for connection with main earth electrodes and earth cable/ strap of outgoing feeders. All feeders shall be adequately connected to the earth bus.

(n) BIS ref.: Confirming to IS-8623 (with latest amendment), IS 60947(with latest amendment) and Legend LT POWER CONTROL CENTRE shall be provided at the top centre.

7.0.3 Panel Compartments / Sections:

The panel shall broadly have the following compartments / sections.

A) Incomer section
B) Bus chamber
C) Outgoing section
D) Cable chamber / cable alley

A) Incomer Section:

Quantity and rating as per respective substation SLD.

EDO Four Pole Air Circuit Breakers housed in a sheet steel enclosure and as specified in clause 7.0.4 below.

The incomer units shall be complete with brought out terminals of suitable rating and single compression cable gland suitable for 4 C x 240 mm^2, XLPE, Cu cable provided on the bottom detachable gland plate. Suitably rated tinned copper lugs for all incoming cable connections shall be supplied with the brought out terminals.

Instruments & indications on the Incoming Feeders

Each incoming feeder shall comprise the following instruments in an instruments panel complete with all necessary interconnections, fine wiring and duly tested:

1) Microprocessor based flush type digital multifunction meter with accuracy class 0.5 and with RS485 port with MODBUS protocol for data logging/downloading shall be provided for all panels. The meter shall be of size 96mmx96mm and shall measure the following electrical parameters: Frequency, Voltage, current, power factor, KVA, KVAr, KW, KWh and harmonic components. The multifunction meter shall have inbuilt selector switch and memory to store data for minimum 75 days.
Voltage range: 0-500V, current range: 0-1000 A, SIF-96, class of accuracy 0.5

2) 3Nos. LED showing R, Y, & B voltage and 16 Amp TNC switch for ON / OFF/ Close ACB required. Suitable nos. and appropriate rating of HRC fuses/ MCB required for protection of LED, multifunction meter and auxiliary power supply, control circuit for closing, tripping and indication circuit and numerical relay etc.
HRC Instrument Fuse Holders fused 4 Amps, SM type
Qty.: As per circuit requirement.

Auxiliary power supply of digital multifunction energy meter shall be 230VAC and shall be connected with separate HRC fuse and link system.

B) Bus Chamber:

Quantity and rating as per respective Substation SLD.

The bus chamber shall be sheet steel clad having front and rear bolted covers and shall consist of 1 set TP & N electrolytic grade, high conductivity Copper Bus Bars, conforming to BIS. Neutral bar shall be of same size as phase bus. The bus-bar shall be

insulated with heat shrinkable PVC sleeves and shall be supported at required intervals with non- hygroscopic, non-deteriorating, and non-inflammable SMC / FRP supports/self-supporting busbar having adequate mechanical strength and a high tracking resistance, to withstand short circuit fault levels up to 50 kA for 1 sec. All risers and connections from bus bar shall be done with same material as the main bus bars of current rating as per rating of individual cubicle switch. To suit the stringent site conditions, the bus bar system shall be designed with generous clearance between phases as specified in the standards. Adequate non-hygroscopic insulating sheet barriers between the bus chambers and feeders shall be provided.

C) Out-going Section

Quantity and rating as per respective Substation SLD.

Feeders:

1. For outgoing feeder comprising of 4 Pole horizontal draw-out type air circuit breaker of fault breaking capacity 50KA for 1 sec.

(i) Each outgoing shall consist of 3nos. cast resin type current transformer with suitable rating of brought out terminal for connecting 1no. single core 240sqmm, Al conductor, 1.1KV grade, XLPE cable.

(ii) Each breaker shall have microprocessor type release for O/C, S/C and earth fault protection.

(iii) Flush type digital multifunction meter with accuracy class 0.5 and with RS485 port provided for all panels. The meter shall be of size 96mmx96mm and shall measure the following electrical parameters: Frequency, Voltage, current, power factor, KVA, KVAr, KW, KWH and harmonic components. The multifunction meter shall have inbuilt selector switch and memory to store data for minimum 75 days.

2. For outgoing feeder comprising of MCCB

(i) Four pole, 1600 Amps ACB of breaking capacity min. 50 kA with adjustable OL protection, Short Circuit protection & EF protection inbuilt electronic trip unit in MCCB.

(ii) Four pole, 1000 Amps ACB of breaking capacity min. 50 kA with adjustable OL protection, Short Circuit protection (& EF protection through inbuilt electronic trip unit in MCCB.

(iii) Four pole, 630 Amps MCCB of breaking capacity min. 36kA with adjustable OL protection, Short Circuit protection & EF protection through inbuilt electronic trip unit in MCCB.

(iv) Four pole, 400 Amps MCCB of breaking capacity min. 36 kA with adjustable OL protection, Short Circuit protection & EF protection through inbuilt electronic trip unit in MCCB.

(v) Four pole, 100 Amp MCCB of breaking capacity of min. 25KA with adjustable OL Protection, short circuit protection and earth fault protection through inbuilt electronic trip unit in MCCB. Electronic timer with contactor shall be provided for street lighting feeder for automatic ON/OFF purposes.

(vi) Each outgoing feeder comprising of MCCB shall be complete with all necessary interconnections, fine wiring and duly tested:

(a) Three phase digital ammeter (with inbuilt selector switch) of required range, SIF-96, class of accuracy 1.0, CT operated with CT ratio 1600/5, 1000/5, 600/5,400/5,100/5 respectively (of burden 10VA) and Qty.: As per circuit requirement.

(b) HRC Instrument Fuse Holders fused 4 Amps and Qty.: As per circuit requirement.

(c) LED type Indication Lamps for 'Feeder ON' indication 'Feeder OFF' indication and 'Trip' indication. Qty.: 3 Nos.

(d)Auxiliary power supply of digital ammeter shall be 230VAC and shall be connected with separate HRC fuse and link system.

(e) Distribution Board: 1 No. MLDB [Main Lighting Distribution Board] for general lighting, comprising of 63A, FP MCCB with breaking capacity min 25 kA & Thermal adjustable OL protection; one no. 4P-63A-230V coil Contactor; an auto/manual switch; one no. 24 hrs time switch; ON/OFF push buttons and 6 nos. DP-10A, RCBOs (sensitivity 100mA) distributed evenly in three phases & neutral. The contactor shall be operated either in the auto mode through the timer or by the ON/OFF push buttons in the manual mode. Terminals shall be provided for a remote PBS.

(f)Legend: MLDB and Outlets: 2 Nos. Industrial Type outlets rated 20 A

D) Cable Chamber / Cable Alley:

Suitable cable chamber/cable alleys shall be provided in between sections of the panel with brought out terminals to drive the cables. Supports as required shall be provided along the cable alleys for supporting the cables / wires.

7.0.4 Technical Specifications of Air Circuit Breakers:

The air circuit breaker shall comply with the following specifications:

(i) Type: Indoor, horizontal isolation, horizontal draw out type.

(ii) Mounting: In cassette type enclosure

(iii) Insulation Medium: Air.

(iv) Rated operational voltage of circuit Breaker: 415 V

(v) Rated insulation voltage: 1000 V.

(vi) System earthing: Effectively earthed.

(vii) No of poles: Four.

(viii) Rated frequency: 50 Hz

(ix) Rated current: as per respective substation SLD

(x) Rated making current: 125 kA

(xi) Rated short time withstand capacity: 50 kA for 1 sec at 415V

(xii) Ultimate rated breaking capacity: 50 kA at 415 V

(xiii) Spring Charging: Motorized as well as manual.

(xiv) Method of closing: Through closing coil as well as Manual.

(xv) Closing coil voltage: 230 V AC

(xvi) Shunt trip coil voltage: 230 V AC

(xvii) Manual with mechanical open button.

(xviii) Auxiliary Switch: 4NO+4NC.

(xix) Mechanical indication:

a) Breaker ON/OFF b) Position SERVICE/TEST/ISOLATED

(xx) The air circuit breaker shall be equipped with Microprocessor based protection release with following features: Overload protection, Short circuit protection& Earth fault

7.0.5 General Requirements:

(i) The circuit breaker shall conform to latest edition of IS 60947 with latest amendment.

(ii) The circuit breakers shall be with air as insulating medium and shall comprise of four independent poles. Each pole of a breaker shall constitute a separate breaking chamber. These four breaking chambers shall be mounted to a common chassis and connected together for operating by a common operating mechanism.

(iii) Main contact material shall be of copper alloy with silver facing and shall have ample contact area and contact pressure for carrying rated normal / short time currents and shall be adequate to keep temperature rise within limits.

(iv) Working parts of operating mechanism shall be of corrosion resisting materials. Bearings, which require grease, shall be equipped with pressure type grease fittings. Bearings, pins, bolts, nuts etc. shall be adequately pinned or locked to prevent loosening or changing adjustments with repeated operation of the breaker. The outside parts of the breakers and ferrous parts such as hangers, supports, bolts and nuts shall preferably be hot dip galvanized or zinc plated.

(v) The ACBs shall be supplied complete with enclosures as may be necessary. Short circuit performance test shall be conducted on the ACBs along with the enclosures.

(vi) The enclosure shall not be liable to distortion and misalignment.

(vii) The formed and welded steel construction shall be given corrosion resistant treatment following fabrication work. The enclosure / cubicle and doors shall be finished with stove enamel paint.

(viii) The breakers shall have three distinct positions – SERVICE/TEST/ISOLATED, within the cubicle and this shall be achieved by suitable racking cam and slide rails system operated from the front of the equipment. Visual indicators shall be provided to show these three positions.

(ix) A STOP shall be provided on the guide rails to prevent accidental falling of the breaker while withdrawing the moving portion.

(x) SAFETY SHUTTER ASSEMBLY shall be provided for shrouding of the main contacts when the breaker is withdrawn. This must operate automatically during insertion and withdrawal of the circuit breakers.

7.0.6. Operating Mechanism:

(i)There shall be provision for manual as well as motorized spring charging. Closing shall be through 230 V AC closing coil. Provision for manually closing the breaker shall also be there. It shall be ensured for each breaker that it closes at the correct speed.

(ii) A direct mechanical coupling shall give indication of ACB ON or OFF.

(iii)A shunt release shall be provided for electrical tripping of the breaker.

(iv)Vendor shall ensure correct wiring to facilitate tripping of the breaker.

7.0.7. Control Circuit:

(i) Control wiring shall be done with 1.5 sq. mm PVC insulated and PVC sheathed FRLS Cables with copper conductor wires of 1100V grade. CT wiring shall be done with 2.5 Sq mm, PVC insulated and PVC sheathed FRLS Cables with copper conductor wires of 1100V grade.

(ii) Suitable lugs shall be used for termination and all wires shall be numbered with ferrules, as per drawings.

7.0.8. Interlocks:

The following minimum safety interlocks shall be provided.

(i) The breaker cannot be closed in any intermediate position other than three distinct positions SERVICE /TEST/ISOLATED.

(ii) The front door / cover cannot be opened when the circuit breaker is in closed condition.

(iii) The moving portion of the breaker shall be earthed before the main circuit breaker controls are plugged in the stationary contacts i.e. before the control circuit is completed. Positive earthing of the circuit breaker shall be maintained in the connected position.

(iv) Anti pumping feature shall be provided for each breaker.

8.0 General Notes On PCC

1. All main riser connections shall be done by suitably sized and rated copper links or copper cables as recommended by the switch manufacturer. In case of cables, terminations at both ends shall be done through suitably rated tinned copper lugs.
2. Brought out terminals of suitable rating (as per rating of the feeder) shall be provided for all cable terminations of incoming / outgoing feeder units.

3.Suitably rated tinned copper crimping lugs for each conductor of all outgoing cable connections shall be supplied with the brought out terminals including terminals for remote push buttons.

4. All cable entries shall be from bottom. Suitable cable entry arrangement with detachable gland plates shall be provided. Adequate nos. of single compression heavy duty nickel plated brass cable glands suitable for correspondingly rated XLPE, 4C, Al cable shall be provided on the bottom detachable gland plate. Adequate nos. of glands shall also be provided for circuits to be fed from DBs.

5. Sufficient space shall be provided for cable termination, dressing and connecting cable leads to the brought out terminals.

6. Control wiring shall be done with 1.5 sq. mm PVC insulated and PVC sheathed FRLS Cables with copper conductor wires of 1100V grade. CT wiring shall be done with 2.5 Sqmm PVC insulated and PVC sheathed FRLS Cables with copper conductor wires of 1100V grade. All power and Control wires shall have ferrule numbers. All joints in control & CT wiring shall be done with suitable TBs. All cables / wires shall have ferrule numbers for proper identification as per drawing. All terminations shall be done through lugs.

7. All feeders shall have Moulded fuse holder with fuse, for control & instrument circuits.

8. Legend plates for the indication lamps, meters, control switches / buttons and labels for the terminals shall be provided.

9. The board should be properly packed to avoid ingress of rain water/moisture and damage during the transit.

10. In their offer the party must mention their detailed comments point-wise against each point of tender specifications and general notes. Any deviation from the tender specification shall be specifically mentioned. In case of no deviation, it shall be clearly mentioned in the offer as 'NO DEVIATION'.

11. Specific type and make of all equipment shall be clearly mentioned. All the information required as per tender specifications must be submitted.

12. In case of an order the complete tender specification shall be mentioned in the order. However, deviations from tender specifications, as mentioned by party in their offer and subject to acceptance by OIL shall be mentioned in the order.

13. The manufacture of the equipment is to be started only after written approval of the drawings/ documents by OIL.

9.0 Test and Inspection:

1. All routine tests shall be carried out as per relevant IS and IEC.

2. The equipment shall be inspected by engineer(s) of OIL prior to dispatch. Routine tests in accordance with relevant IS shall be carried out at manufacture's works which shall be witnessed by OIL's engineer(s). The inspection shall include accuracy of dimensions & circuitry as per approved drawings, insulation tests, mechanical & electrical operation tests, primary current injection tests and any other test of the relays as recommended by the manufacturer. All necessary arrangements for the tests shall be made by the vendor at their works during the inspection.

3. Any alteration requirements pointed during the inspection shall be carried out by the manufacturer and confirmed before dispatch, without which dispatch clearance shall not be given.

4. Copies of the test certificates along with bound copies of complete test results shall be submitted for approval of OIL prior to dispatch of the PCC. This shall include complete reports and results of the routine tests as also certified copies of the type tests.

10.0 Warranty/Guarantee:

The supplier shall guarantee the equipment for a period of 12 (twelve) months from the date of acceptance against defects arising from faulty design, material and workmanship.

11.0 Technical Specifications of Transformer:

Quantity and rating as per respective substation SLD

Location: Bijulibari Substation: 2 nos. 750 kVA dry type transformer
Location: Tingri Substation: 2 nos. 750 kVA dry type transformer
Location: DD Substation: 2 nos. 750 kVA dry type transformer
Location: Switch Room 3: 2 nos. 1500 kVA dry type transformer

Scope:

This section covers the detailed requirements regarding supply, installation, testing, commissioning and handing over of cast resin dry type transformers required for 03 nos. of sub-stations and 01 no. of Switch room.

11.0.1 General Construction

1. The Transformers shall comply with the following Indian Standards as amended up to date:

(i) IS 11171: 1985 - Dry type power transformers.

(ii) IS 10028 (Part II & III) - Installation and Maintenance of Transformers.

(iii) IS 2099 - Bushing

(iv) IS 2705 - Current Transformers.

2. Constructional Features:

All the MS parts shall be either Hot dipped galvanized or cold galvanized to make them corrosion free. The core shall be made up of high grade low loss cold rolled grain oriented silicon steel. Both low & high voltage windings shall be made of copper conductor. The class of winding insulation shall correspond to class 'F'. The construction of the windings of the transformer shall be such that no creepage path is found even in dusty & corrosive ambient conditions. The core coil assembly shall be housed in a prefabricated enclosure.

The enclosure shall be fabricated with mild steel CRCA sheets with adequate provision for ventilation. The enclosures shall undergo minimum seven/nine tank/Aluzinc process. Finally, the external and internal surfaces of the enclosure shall be powder coated with shade as per standard.

3. General Requirements:

The transformer shall be indoor as specified. The transformer in addition shall have thermal and dynamic ability to withstand external short-circuit as per clause 9 of IS 2026 (Part I) 1977 and clause 5 of IS 11171-1985.

Continuous rating specified shall be irrespective of tapping position.

Indoor transformers shall be suitable for IP-23 protection.

Temperature Rise: The reference ambient temperatures assumed for the purpose of this specification are as follows:

(a) Maximum ambient air temperature 40 degree centigrade.

(b) Class of insulation F.

(c)The temperature rise limit at the above conditions and at the altitude not exceeding 1000 meters shall be as specified. If the site conditions indicated for a particular job is more severe than the referred ambient temperature mentioned above, the temperature rise above ambient shall be suitably scaled down such that the hot spot temperature shall not exceed the values for the reference conditions 90° C (F class insulation).

(d) Tap Changing Device: Preferred tapping range is -5% to +5% in steps of 2.5% by means of off load tap changing links or tap switch. The device shall be provided on HV for HV Voltage to keep LV Voltage constant.

(e) Terminal Markings Connections: Relevant provisions of IS:2026 (Part-IV)-1977(with latest amendment) shall be applicable.

Voltage Ratio: The transformer shall be suitable for a voltage ratio of 11 KV/415 V.

Vector Group: The winding connections shall conform to vector group Dyn11.

Cooling: The transformer cooling shall be air and naturally cooled (AN)

Accessories: The transformer shall be with enclosure with HV and MV terminations as specified both on HV and MV side. The MV side shall be suitable to receive MV cable inter-connection suitable for full load current of the transformer.

Fittings: The transformer shall be complete with the following fittings: -

(i) Off load type tap changing link or tap switch.

(ii) RTD controller
(iii) Lifting lugs for all transformers.

(iv) Bi-directional /Unidirectional Rollers to be specified.

(v) Rating diagram and terminal marking plate for all transformers.

(vi) Additional Neutral separately brought out on a bushing for earthing for all transformers.

(vii) Earth terminals (2 Nos.) for body earthing for all transformers.

11.0.2 General:

Applicable Indian Standard: IS: 11171 and IS: 2026 with latest amendments.

(i). Service duty : Continuous.
(ii). Installation : Indoor.
(iii). Auxiliary power supply : 230V AC ± 10 %
(iv). Control Voltage : 230V AC ± 10 %

11.0.3 Site Condition:

(i) a) MaximumAmbient air temperature : 40°C
b) Minimum Ambient air temperature : 5.0°C
(ii)Maximum humidity at site (at 40 ° C) : 98 %
(iii)Surrounding atmospheric condition : Humid
(iv)Site altitude : 150 mtrs.
(v)Rainfall : 200 cm (annually.)

11.0.4 Rating and General Data

1. Rating: as per respective substation SLD

2. No. of phases: 3

3. Frequency: 50 ± 3 %
4. Type of Insulation: Class-F. Temp. rise-90 ° C

5. Partial discharge: As per IS-11171, IEC 60270(with latest amendment)

6. Type of cooling: AN

7. Installation: Indoor

8. Vector group: Dyn 11

9. Percentage impedance: 5.0%. Tolerance as per IS-2026(with latest amendment)

10. Nominal system voltage: 11kV/ 415 Volts

11. Type of neutral earthing: Solidly grounded Neutral

12. Symmetrical short circuit withstands capacity: As per amended IS-11171

13. Rated short duration power frequency withstands voltage: As per amended IS 11171
14. Rated lightning impulses withstand voltage: As per amended IS 11171

15. Transformer sound level should not exceed 60

16. Chemical Resistance: Painting must have excellent performance rating

17. Dielectric Strength: Minimum of 3200 volts/mil d

18. TAP CHANGER:

Type	: Off-Circuit Tap Links
Total tapping range	: ± 5.0 %
Tapping steps	: In steps of 2.5 %.

Markings shall be clear enough to indicate the tap position.

19. TERMINAL ARRAGEMENT:

HV winding line end	: Cable box
LV winding line end	: Cable box

One neutral bushing outside the cable box shall be provided for grounding.

20. BUSHING: Made from non-hygroscopic epoxy resin cast material suitable for site condition mentioned in clause 11.0.3 & conforming to IS-2099 (with latest amendment).

21. CABLE BOX:
a) HV cable box should be suitable for termination of 3 nos. 1 Cx240 sq. mm XLPE armoured, copper conductor cable with heat shrink type cable termination. The bottom plate shall be detachable type and 3 nos. heavy duty single compression cable glands suitable for 1x240 sq. mm. XLPE armoured cables shall be fitted. Cable Box standard should be as per IP-54.

b) LV cable box should have brought out electro-tinned copper bus bars of suitable rating & size for termination of 4 nos. (750kVA transformer) and 6 nos.(1500kVA transformer) of 4x 240 sq. mm XLPE Copper cable. The cable box should have detachable cable gland plate fitted with suitable heavy duty single compression cable glands for the cables mentioned above. Support bar in LV cable box should be made up of fiber glass. Cable Box should be as per standard.
c) Terminals should be marked as per IS: 2026 -1977 (with latest amendment).

22. TRANSFORMER CORE:
a) Material : High grade cold rolled grain oriented silicon steel.
b) Structure : Grounded and sharp corners avoided.
c) Lamination : Treated and coated with suitable insulations. The core limbs & yokes are branded by means of resin glass tape to reduce vibration & noise.

23. TRANSFORMER WINDING: The winding material should be high conductivity electrolytic grade copper. The insulation should be Cast Resin type, Class-F. Conductor should have thermally upgraded paper insulation reinforced with fiber glass. The coil assembly is to be

impregnated & cast under vacuum with epoxy resin for achieving non-hygroscopic, acid & alkali resistant insulation. The complete winding should have smooth cylindrical finish after impregnation to ensure high mechanical strength. The thickness of resin should be uniform. The insulation should be self- extinguishing type. Mounting of the winding to the transformer case shall be of vibration resistance pad placed uniformly in all direction.

(i) The windings/connection of transformer shall be braced to withstand shocks, which may occur during transport or due to short circuit, repeated peak loads and other transient conditions during service.
(ii) Windings shall be subjected to a shrinkage treatment before final assembly so that no further shrinkage occurs during service.

(iii) The conductors shall be transposed at sufficient intervals in order to minimise eddy currents and equalise the distribution of currents and temperature along the windings.

(iv) Windings shall not have sharp bends which might damage insulation and /or produce high dielectric stresses.

(v) Coils shall be supported using dried and high pressure compressed wedge type insulation spacers at frequent intervals.

(vi) All threaded/bolted connections shall be locked. Leads from the winding to the terminal board and bushings shall be rigidly supported to prevent injury during short circuits/vibration.

(vii) Permanent current carrying joints in the windings and leads shall be welded or brazed.

24. ENCLOSURE: Enclosure for transformer shall be fabricated of minimum 14 SWG gauge properly cleaned degreased and painted as per manufacturer's standard practice. The core & winding assembly should be housed inside a sheet steel enclosure with removable inspection & tap changer covers. The enclosure should offer protection as per relevant IS/IEC with latest amendment and should have suitably designed louvers for circulation of cooling air. All the gaskets should be of neoprene rubber. All non-energized metallic parts of the transformer shall be grounded.

25. Name plate: Transformer shall be furnished with a non-corrosive diagrammatic name plate permanently attached with non-corrosive hardware with following information:

(i)KVA rating
(ii) Primary and secondary voltage.
(iii) Primary and secondary current.
(iv) Frequency.
(v) Nos. of phases.
(vi) Percentage of impedance.
(vii)Types of cooling.
(viii)Connection & symbol.
(ix)Tape configuration.
(x)Insulation system and rated maximum temperature rise.
(xi)Sound level.
(xii) K- factor rating (if available)
(xiii)Year of manufacture.
(xiv)Design impedance.
(xv)Manufacturer's name.
(xvi) Net weight.

(xvii) IS standard.
(xviii) OIL's P.O. no. and date.

26. Lifting hook: Suitable Lifting hook shall be provided on the top of the transformer for transportation/installation of transformer.

27 List of Fittings and Accessories:

a. HV bushings inside HV cable box: 3 nos. rated for 11kV.
b. LV bushings in side LV cable box: 4 nos.(3P+1N) rated 415 Volts
c. Outside LV cable box: 1 no. for grounding.
d. Digital Winding temperature scanner connected with three nos. RTDs, one each for each LV winding, should be provided in a metallic enclosure (Marshalling box) that is mounted on the main enclosure. The scanner shall have potential free NO contacts to provide indication, alarm & trip contacts. Winding temperature indicator should show maximum temperature attained. The RTDs should be properly wired up to the scanner terminals. Temperature setting of each contact shall be independently adjustable at site.
e. Earthing terminals - 2 nos. for body earthing.
f. Jacking lugs.
g. Inspection cover - 2 nos. placed in opposite site
h. Base channels with bi-directional rollers - 2 nos.
i. Any other accessories which bidders think essential may also be included as optional.

28. Earthing: Earthing shall be as per IS-3043.All metal parts of the transformer with the exception of individual core laminations core bolts and associated individual clamping plates shall be earthed. Suitable arrangement shall be made for earthing of neutral externally.

29. Wiring: All internal wiring shall be done with 1.1kv grade FRLS PVC insulated tinned copper multi stranded cable of standard size of 2.5sqmm with proper lugs. Ring lugs shall be used at all connections such as CTs connection etc. All terminal strips shall have minimum 2 nos. spare terminals to accommodate any modification required during commissioning /operation. All terminals shall be accessible for testing and troubleshooting/ maintenance. All cable shall have ferules.

30. INSPECTION.

(i) All the routine tests and special tests as per IS: 11171(with latest amendment) are to be carried out in presence of OIL's Engineer at manufacturer's works. The supplier will give intimation to OIL 30 days advance prior to commencement of tests so that OIL can depute representative for witnessing tests in time.

(ii) The dispatch will be cleared only if the test results comply with the specifications and testing results are within the tolerance limits.

(iii) Materials / equipment failed to conform to the specifications/during testing, OIL's representative shall have the right to reject the materials and in that case, the supplier will either replace the rejected materials or make alterations necessary to meet specifications requirements free of costs.

11.0.5 General Terms and Conditions:

1. Transformer winding shall be specially braced to withstand to thermal and mechanical stresses of harmonic current and voltage.

2. The transformer shall be type tested and following NABL accredited laboratories or STL approved laboratories Type test certificates on similar transformer of specified rating should be furnished along with the offer.
3. The transformer should be offered for pre-dispatch inspection at the manufacturer's works and the routine tests shall be made at the manufacturer's works only (party shall confirm the availability of the testing facility in the offer). The pre-dispatch tests to be carried out in presence of OIL's engineer as per IS: 11171 are:

(a) ROUTINE TESTS:
- (i) Measurement of winding resistance
- (ii) Measurement of voltage ratio and check of voltage vector group,
- (iii) Measurement of impedance of voltage (principal tap, lowest and highest tap), short-circuit impedance and load loss at rated current;
- (iv) Measurement of no-load loss and no load current
- (v) Measurement of Insulation resistance & PI value by insulation tester.
- (vi) Induced over voltage withstand test,
- (vii) One-minute power frequency withstand voltage test,
- (viii) Magnetic balance test,
- (ix) Calibration of winding temperature indicators.

(b) SPECIAL TESTS:
- (i) Partial discharge test
- (ii) Measurement of acoustic sound level.
- (iii) Short circuit test

4. Party should get the detail transformer drawings approved from OIL prior to manufacturing of the transformer.

5. Bidder should submit with quotation the list of customers to whom the bidder has supplied transformers of similar rating & type (as per NIT) during last five years.

6. Bidder's shall submit the list of manufacturer's authorized dealers of eastern region along with the offer.

7. Bidder's shall fill up the technical data sheet as per format attached as ANNEXURE-IV and submit along with the offer.

12.0 Technical specifications for 11/1.1KV (UE) XLPE Cable:

1. Specification of cable:

Cable with stranded compact circular Aluminium and copper conductor screened with non-metallic semi-conducting tape, cross linked polyethylene (XLPE) insulated, insulation screened with extruded semi conducting compound and copper tape screening; core identification tape, core laid up with Polymeric Fillers, inner PVC compound sheath (bedding); galvanized steel strip armoured and overall PVC sheathed conforming to IS 7098 (with latest amendment) suitable for 11kV unearthed system [11kV / 11kV (UE)] having following specification and features : The cable shall conform to IS-1554, Part II and BIS approved.

a). Size: 3Core x240Sqmm, Al conductor
b). Size: 1Core x 240 Sqmm, Copper

Specification of 1100 V cable:

1.1 KV grade XLPE insulated PVC sheathed armoured Aluminum / Copper cable shall be 4 corex240 Sqmm. The cable shall conform to IS: 1554 Part I (with latest amendment).

2. Marking:

a). Manufacture's name, voltage grade, size of cable, year of manufacture shall be embossed on the outer sheath of the cable at one-meter interval throughout the length of the cable.
b). Cable drum shall be marked with manufacture's name, voltage grade, size of cable, year of manufacturing, length of cable, ISI mark & OIL's purchase order number with suitable paint in permanent manner.
c). Cable length shall be embossed in permanent manner with suitable paint at one-meter interval.

3. Construction: Cable shall be so constructed that its outer side is completely round in shape.

13.0 Technical specifications of Earthing System:

13.0.1 Scope:

This section covers the general requirements of the earthing system for Sub-station installation. G.I. Pipe earthing with G.I. strip and single core insulated cable for sub-stations of 2X750KVA capacity and for sub-stations of higher capacity shall preferably used.

13.0.2 Systems:

Earthing system shall comprise of chemical earth electrode of 80mm diameter of G.I pipe of 3mtrs length shall be used as an individual electrode. For each transformer 2 separate and distinct earth electrodes shall be provided for neutral earthing. The body earthing for transformers, HV & LT panels shall be done to a common earth bus connected to two separate and distinct chemical earth electrodes.

Note: For a two transformer sub- station total number of earth electrodes shall be 8 (4 for neutral earthing, two each for two transformers, and 2 for connection to VCB & 2no. for PCC panel of common earth bus for body earthing). The no. of earth electrodes shall be more depends upon soil resistivity and the value of earth resistance which shall be not less than 5ohms when connected together.

13.0.3 Electrodes:

Supply and burying a heavy duty, Chemical electrode with suitable chemical for soil treatment GI pipe, 3mtrs x 80mm, as an earth electrode, with accessories and providing masonry enclosure size 600mmx 600mm x600mm with RCC cover plate having 2nos. metallic hooks for lifting cover and funnel type arrangement for watering pipe etc. complete as required.

13.0.4 Location of Earth Electrodes:

Normally an earth electrode shall not be situated less than 1.5 m from any building. Care shall be taken that the excavation of earth electrode may not affect the column footings or foundation of the building. In such cases electrodes may be farther away from the building.

The location of the electrode earth will be a place where the soil has reasonable chance of remaining moist. As far as possible, entrances, pavements and road ways, are to be definitely avoided for locating the earth electrode. The distance between two earth electrodes shall be min length of electrode.

13.0.5 Size of Earth Lead:

The recommended sizes of G.I earth bus lead in case of sub-stations shall be 50mmx6mm.The minimum size of earth lead shall be PVC insulated 120sqmm of single core aluminium conductor cable. 2Nos. of 50x6mm GI strap shall be kept in each Pucca cable trench with no. of holes from there single core 120sqmm PVC insulated aluminium conductor cable can be connected to earth electrode and body of equipment

14.0 Installation, Testing and Commissioning

14.0.1 HT Panel

14.0.1.1 Installation of VCB panel:

(i) The installation work shall cover assembly of panels lining up, grouting the units etc. In the case of multi panels switch boards after connecting up the bus- bar all joint shall be insulated with HV insulation tape or with approved insulation compound.

(ii) A common earth bar shall run preferably at the back of the switch board connecting all the sections for connecting the earth system. All protection, indications & metering connections and wirings shall be completed.

(iii) The trip supply battery installed shall be commissioned, completing initial charging of the batteries.

(iv) All relay instruments and meters shall be mounted and connected with appropriate wiring. Calibration checks of units as necessary and required by the licensee like CTs, VTs Energy Meters etc. shall be completed before pre-commission checks are undertaken.

14.0.1.2 Testing and Commissioning of VCB Panel

(i) Procedure for testing and commissioning of relay shall be in general accordance with good practice.

(ii) Commissioning checks and tests shall include in addition to checking of all small wiring connections, relays calibration and setting tests by secondary injection method and primary injection method. Primary injection test will be preferred for operation of relay through CTs. Before panel board is commissioned, provision of the safety namely fire extinguishers, rubber mats and danger board shall be ensured. In addition, all routine insulation tests shall be performed. Checks and test shall include following.

(iii)(a) Operation checks and lubrication of all moving parts.
(b) Interlock function checks.
(c) Continuity checks of wiring, fuses etc. as required.
(d) Insulation tests.
(e) Trip test and protection gear tests.

(f) The complete panel shall be tested with 5000V insulation for Insulation between poles and poles to earth. Insulation test of Secondary of CTs and VT to earth shall be conducted using 500V insulation tester.
(g) Any other tests as may be required by the Licensee / Inspector shall be conducted.
(h) Where specified, the entire switch board shall withstand high voltage test after installation.
(i) Any other test required by the consignee/inspecting officer.

14.0.2 LT Panel

14.0.2.1 Installation of LT Panel

(i) The installation work shall cover assembly of various sections of the panels lining up, grouting the units etc. In the case of multiple panel switch boards after connecting up the bus bars etc., all joints shall be insulated with necessary insulation tape or approved insulation compound. A common earth bar as per specifications shall be run inside at the back of switch panel connecting all the sections for connection to frame earth system.
(ii) All protection and other small wirings for indication etc. shall be completed before calibration and commissioning checks are commenced. All relays, meters etc. shall be mounted and connected with appropriate wiring.

14.0.2.2 Testing and Commissioning of LT panel

Commissioning checks and tests shall include all wiring checks and checking up of connections. Relay adjustment/setting shall be done before commissioning in addition to routine Insulation tests. Checks and tests shall include the following: -
(i) Operation checks and lubrication of all moving parts.
(ii) Interlock function checks.
(iii)Continuity checks of wiring, fuses etc. as required.
(iv)Insulation test: When measured with 500V Insulation tester the insulation Resistance shall not be less than 100 mega ohms.
(v) Trip tests and protection gear test

14.0.3 Transformer

Installation and Commissioning of Transformer

(i) The transformer shall be installed in accordance with IS 10028 (with latest amendment)-Code of practice for Installation and maintenance of transformer. Necessary support channels shall be grouted in the flooring.
(ii) The Transformer shall be moved to its location and shall be correctly positioned. Transformer wheels shall be either locked or provided with wheel stoppers.
(iii) Wiring of devices shall be carried out as per drawings; Earthing of neutral and body of the transformer shall be done in accordance with these specifications.
(iv) All devices shall be checked for satisfactory operation.
(v) All tests specified above of these specifications shall be carried out by the contractor in the presence of inspecting officer/consignee free of cost.

15.0 Scope of work for HT cable

(i) The scope of work includes supply, laying, jointing, end termination, testing and commissioning of 11 kV (UE,) 3x240 sq.mm., XLPE, Al cable and 1x240Sqmm Cu Cable.

(ii) The scope of work also includes laying of above cables in pre constructed pucca cable trench.

(iii) The scope also includes excavation of soil/strata/concrete of size 1.05mx.45 m for laying, jointing, installation and commissioning of 3x240 Sq.mm. Al and 1 x 240 Sq.mm. Cu cable including sand cushioning, placing of bricks, backfilling and covering the surface to original finish all as per standards and as directed by Oil's Engineer.

(iv) The scope also covers straight through jointing and end termination of cables with standard practice with kits supplied by the bidder and approved by OIL. The price of the kits shall be included in the bid.

(v) The cable shall be laid through 4" GI pipes at road crossings, across trenches, drainages and wherever necessary and the cost of the same shall be included in the bid.

(vi) Cable route markers (FRP) and cable identification tags shall be provided along the route and length of the cable at a distance of 30mtrs and cost of markers and tags shall be included in the bid. The details of FRP cable markers and drawing are enclosed.

(vii) Any other items that are not included but part of the execution shall be deemed to be included in the scope of and shall be included the cost of such items in their bid.

(viii) The quantities indicated in the schedule of items are tentative and payment shall be made to the actual quantities of work done only.

15.0.1 Transportation, Storage and Handling:

15.0.1.1 Transportation:

The cable drums shall be supplied directly to the site. Proper care shall be taken during transportation so that cable drums do not get damaged during transportation. If cable or drum gets damaged during transportation, it is sole responsibility of the bidder to take care of such damages. In case it requires replacement of damaged cable, the bidder has to replace the damaged cable with new cable at free of cost.

15.0.1.2 Storage:

(i) The cable drums shall be stored on a well-drained, hard surface, so that the drums do not sink in the ground causing rot and damage to the cable drums. Paved surface is preferred, particularly for long term storage.
(ii) The drums shall always be stored on their flanges, and not on their flat sides.
(iii)Protection from rain and sun is preferable for long term storage of cables. There should also ventilation between cable drums.
(iv) Damaged battens of drums etc. should be replaced as may be necessary.

15.0.1.3 Handling:

(i) When the cable drums have to be moved over short distances, they should be rolled in the direction of the arrow marked on the drum.
(ii) For manual transportation over a distance, the drum should be mounted on cable drum wheels, strong enough to carry the weight of the drum and pulled by means of ropes. Alternatively, they may be mounted on a trailer or on a suitable mechanical transport.
(iii) For loading into and unloading from vehicles, a crane or a suitable lifting tackle should be used. Small sized cable drums can also be rolled down carefully on a suitable ramp or rails, for unloading, provided no damage is likely to be caused to the cable or to the drum.

15.0.2 Installation

15.0.2.1 General:

(i) Cables with kinks, straightened kinks or any other apparent defects like defective armouring etc. shall not be installed.
(ii) Cables shall not be bent sharp to a small radius either while handing or in installation. The minimum safe bending radius for XLPE (MV) cables shall be 12 times the overall diameter of the cable as per IS 1255. At joints and terminations, the bending radius of individual cores shall not be less than 15 times its overall diameter.

15.0.2.2 Route:

Cable shall be laid through kaccha trench, the route of which shall be decided by the Engineer-in-Charge considering the following:

(i) While the shortest practicable route should be preferred, the cable route shall generally follow fixed developments such as roads, foot paths etc. with proper offsets so that future maintenance, identification etc. are rendered easy.

(ii) Cable route shall be planned away from drains and near the property, subject to any special local requirements that may have to be necessarily complied with.
(iii) As far as possible, the alignment of the cable route shall be decided after taking into consideration the present and likely future requirements of other services including cables enroute, possibility of widening of roads/lanes etc.

(iv) Corrosive soils, ground surrounding sewage effluent etc. shall be avoided for the routes.
(v) Proximity to communication cables
Power and communication cables shall as far as possible cross each other at right angles. The horizontal and vertical clearances between them shall not be less than 60cm.

15.0.2.3 Methods of laying:

(i) Laying direct in ground:

(a) The trenches shall be excavated in reasonably straight lines. Wherever there is a change in the direction, a suitable curvature shall be adopted.

(b) Where gradients and changes in depth are unavoidable, these shall be gradual

(c) The excavation should be done by suitable means-manual or mechanical. The excavated soil shall be stacked firmly by the side of the trench such that it may not fall back into the trench.

(d) Adequate precautions should be taken not to damage any existing cable(s), pipes or any other such installations in the route during excavation. Wherever brick or any other protective covers or bare cables are encountered, further excavation shall not be carried out without the approval of the Engineer-in-Charge.

(e) Existing property, if any, exposed during trenching shall be temporarily supported adequately as directed by the Engineer-in-Charge. The trenching in such cases shall be done in short lengths, necessary pipes laid for passing cables therein and the trench refilled as per standard.

(f)The normal size of the trench will be 45 cm Width and depth for 11KV shall be 105 cm and size of the pit is 120 cm to 150 cm diameter with same depth that of the trench. The bottom of the trench must be levelled and properly dressed. Any change in the above mentioned size shall be instructed by the Engineer- in - Charge.

(g) 75mm thick sand bed shall be spread at the bottom of the trench pit. Then unrolling and laying of cable shall be done as per instruction and again shall be covered with another 75mm of sand over the cable. Sand bed should cover entire width of trench and pits. Supply of sand is in the scope of the bidder.

(h) Bricks shall be placed crosswise (irrespective of one or more cables laid in the trench pit) over the cable /cables as well as the entire pit as per instructions. There shall be at least ten bricks in every 1150mm long normal trench and covering the entire cable/cables (brick size 230mm x 115mm).The bricks should be placed close to each other without any gap. Broken bricks shall not be allowed to use. Supply of bricks is in the scope of the bidder.

(i) The trenches shall be then back-filled with excavated earth, free from stones or other sharp ended debris and shall be rammed and watered, if necessary in successive layers not exceeding 30cm depth.

(j) Where road beams or lawns have been cut out of necessity, or kerb stones displaced, the same shall be repaired and made good, except for turfing /asphalting, to the satisfaction of the Engineer-in-Charge and all the surplus earth or rock shall be removed to places as specified.

(k) There shall be road crossings during which, 4inch dia GI pipes shall be used for routing the cables. Spare pipes shall be provided for future extension. Spare pipes shall be sealed off at both ends. Pipes shall be upto the edge of the road to permit smooth entry of cable without bending.

(l) 4 inch dia GI pipes shall be provided for individual cable entries to the sub-station buildings at both the ends of cables. The pipe for this purpose shall slope downwards from the building. The pipes at the building end shall be suitably sealed to avoid entry of water, after the cables are laid.

(ii) Testing of cable before laying:

All the time of issue of cables for laying, the cables shall be tested for continuity and insulation resistance.

(iii) Testing before sand cushioning:

The cables shall be tested for continuity of cores and insulation resistance and the cable length shall be measured, before closing the trench.

(iv) Laying in pucca cable trench:

a) While laying cables in pucca cable trench same general guidelines as mentioned above shall be followed.
b) After laying of cables in pucca cable trench, the trench shall be completely filled with dry and approved quality sand.

15.0.3 Route Markers:

FRP cable route markers shall be provided, as per the drawing attached in **ANNEXURE-V** along the runs of cables at locations approved by the Engineer-in-Charge and generally at intervals 30mtrs. Markers shall also be provided to identify change in the direction of the cable route and at locations of underground joints. Details & drawing of FRP cable markers with the inscription text with OIL logo is enclosed for estimation and reference.

15.0.4 Cable identification tags:

Whenever cable is laid, GI tags inscribed with cable identification details as directed by Engineer-in-charge shall be permanently attached to all the cables at a distance of 30 mtr. In case of cables laid directly in grounds the tags shall be attached before trenches are backfilled.

15.0.5 Cable termination & jointing Location:

(i) Before laying of a cable, proper locations for the proposed cable joints, if any, shall be decided, so that when the cable is actually laid, the joints are made in the most suitable places. As far as possible, water logged locations, carriage ways, pavements, proximity to telephone cables, gas or water mains, inaccessible places, ducts, pipes, racks etc. shall be avoided for locating the cable joints.

(ii) Joints shall be staggered by 2m to 3m when joints are to be done for two or more cables laid together in the same trench.

15.0.6 Jointing Pits:

(i) Joint pits shall be of sufficient dimensions as to allow easy and comfortable working. The sides of the pit shall be well protected from loose earth falling into it. It shall also be covered by a tarpaulin to prevent dust and other foreign matter being blown on the exposed joints and jointing materials.

(ii) Sufficient ventilation shall be provided during jointing operation in order to disperse fumes given out by fluxing.

15.0.7 Safety precaution

(i) A caution board indicating #CAUTION # CABLE JOINTING WORK IN PROGRESS# shall be displayed to warn the public and traffic where necessary.

(ii) Before jointing is commenced, all safety precautions like isolation, discharging, earthing, display of caution board on the controlling switchgear etc. shall be taken to ensure that the cable would not be inadvertently charged from live supply. Metallic armour and external metallic bonding shall be connected to earth.

15.0.8 Jointing & end termination materials:

Heat shrinkable cable jointing kits of following specification shall be supplied and used.

(i) Heat Shrinkable straight through jointing kit:

In case straight through joint is required while laying of cable, party has to supply all the materials for straight through joint kit, outdoor type along with cable jointer. The details of kit are given below:
Heat Shrinkable through jointing kit for following cable and having the following features:
Size of cable: 3 core, 240 sq.mm, Aluminium
Voltage grade: 11,000 V, AC (UE)
Cable type: Cross linked polyethylene (XLPE), armoured
Shelf life: Minimum 5 years.
Note: The package shall contain the following information/ documents:
a. Make.
b. Batch no.
c. Date of manufacture.
d. Date of expiry.
e. Shelf life of the kit.
f. Guarantee certificate.
g. Installation manual.

(ii) Heat Shrinkable indoor and outdoor type end termination kit:

11KV (UE) XLPE cable shall be terminated for indoor and outdoor use especially for indoor connection of 11KV VCB and outdoor connection of 11KV overhead lines. All the materials for indoor and outdoor termination shall be supplied by contractor along with cable jointer. The details of cable termination kit are given below:

Heat Shrinkable end termination kit for following cable and having the following features:
Size of cable: 3 core, 240 sq.mm, Aluminium and 1 Core 240 Sq.mm. Cu
Voltage grade: 11,000 V, AC (UE)

Cable type: Cross linked polyethylene (XLPE), armoured

Type of kit: Indoor and outdoor type

Shelf life: Minimum 5 years.

Note:
The package shall contain the following information/ documents:
a. Make.
b. Batch no.
c. Date of manufacture.
d. Date of expiry.
e. Shelf life of the kit.
f. Guarantee certificate.
g. Installation manual

iii) Storing as well as jointing instructions of the manufacturer of such materials shall be strictly followed.

15.0.9 Jointer:

Jointing work shall be carried out by experienced cable jointers having licence for HT cable laying and jointing (Electrical workman's permit; part VII for state of Assam or equivalent in other states).

Cable work with joints:
(i) About 3m long surplus cable shall be left on each side of joints.
(ii) Insulation resistance of cables to be jointed shall be tested prior to jointing. Unless the insulation resistance values are satisfactory, jointing shall not be done.
(iii) Cores of the cables must be properly identified before jointing.
(iv)Where cable is to be jointed with the existing cable, the sequence should be so arranged as to avoid crossing of cores while jointing.
(v) Whenever the aluminium conductor is exposed to outside atmosphere, a highly tenacious oxide film is formed which makes the soldering of aluminium conductor difficult. This oxide film should be removed by using appropriate type of flux.
(vi)The clamps for the armour shall be clean and tight.

Jointing procedure:
It is necessary to follow strictly the instructions for jointing furnished by the manufacturers of cables and joint kits.

16.0 Testing

Testing before laying:

All cables, before laying, shall be tested with 2500/5000V Insulation tester. The cable cores shall be tested for continuity, absence of cross phasing, insulation resistance from conductors to earth / armour and between conductors.

Testing before backfilling:

All cables shall be subjected to the above mentioned tests, before covering the cables by protective covers and back filling and also before taking up any jointing operation.
Testing after laying:

After laying and jointing, the cable shall be subjected to a 15 minutes pressure test. The test pressure shall be as per IS 1255, DC pressure testing may normally be preferred to AC pressure testing.

17.0 Cable Installation Plan

On completion of laying, terminating and jointing of the cables, a plan should be prepared as per IS 1255, which should contain the following details of the installation.

(i) Type of cables, cross-section area, rated voltage. Details of construction, cable number and drum number;

(ii) Year and month of laying;

(iii)Actual length between joint-to-joint or ends;

(iv) Location of cables and joints in relation to certain fixed reference points, for example, buildings, hydrant, boundary stones, etc;

(v) Name of the jointer who carried the jointing work;

(vi) Date of making joint;

(vii)Results of original electrical measurements and testing on cable installation.

18.0 Technical Terms and conditions for supply, laying& jointing & commissioning of cable:

(i) The cable laying works shall be carried out as per terms and condition of the cable laying works.

(ii) Jointing and end termination of the cable shall be carried out by experienced/ skilled cable jointer with valid work permit in Assam or equivalent in other states.

(iii)All the cable laying works shall be supervised by experienced supervisor having appropriate certificate of competency for carrying out 11KV works valid for Assam.

(iv) Before laying of the cable, Insulation resistance and continuity test to be carried out.

(v)The cable, straight through joints and end terminations shall be guaranteed for 12 months from the date of acceptance. If any failure of cable or joints or end terminations occurs during guarantee period, free of cost repair/ replacement will be carried out by bidder within short notice of 12hours.

19.0 General terms and conditions for supply, laying, jointing& commissioning of cable:

(i) The bidder shall visit the site for assessment of works for supply, storage, laying, jointing, testing and hand over the cable.

(ii) The bidder shall give 30 days earlier intimation for routine test when cable will be ready at manufacturer's works. The cable shall be inspected and routine tested at manufacturer's works. After dispatch clearance from Oils Engineer, cable will be dispatched to the site.

(iii)The cable drum shall be kept in custody of bidder before laying, jointing and handing over the cable and it is sole responsibility of bidder to keep supervision of the cable. The storage and security of cable is in the scope of the bidder.

(iv) The supply, laying, jointing, end termination, testing of cable shall be carried out within 3 months after receipt of the cable at site.

(v) The payment of installation and commissioning will be made only after successfully carried out the jobs and handing over the cable to the Oil.

(vi) The bidder will be penalized as per terms and condition of company, if job is not completed as per schedule of supply and laying of cable.

(vii)Bidder shall confirm in the offer that:

(a)The cable laying, jointing, testing & commissioning will be carried out under supervision of experienced supervisor having appropriate certificate of competency for carrying out 11 kV works valid for operating in Assam.

(b) All cable jointing, end termination works shall be carried out by persons having experienced and valid workman permit for cable jointing for HT cable.

(c) The cable manufacturer shall have routine test facilities to carry out testing of 11kV (UE), 3x240Sqmm XLPE, Al cable and 1x 240 Sq.mm. Cu as per IS 7098 (with latest amendments) at manufacturer's works.

20.0 Tools:

The party shall have one no. 2.5kV/ 5 kV Digital Insulation Resistance Tester of reputed make like Fluke, high voltage test set, multifunction meter and one set of hydraulic heavy duty crimping tool kit of reputed make of size 16 sq.mm.to 400Sq.mm. including complete set of suitable dies.

21.0 Technical specifications for 1.1KV grade LT Cable:

21.0.1 Scope of work:

The above cable shall be supplied, laid and commissioned from transformers to LT panel incomers & substation LT panel MCCBs to LT overhead line feeders.

(i) The scope of work includes supply, laying, termination, testing and commissioning of 1.1 kV, 4Cx240Sqmm, XLPE insulated, PVC sheathed, Al conductor and Cu conductor cables.
(ii) The scope also includes excavation of soil/strata/concrete of size 0.9mx.0.45 m for a cable of size 4C×240sqmm cable including sand cushioning, placing of bricks, backfilling and covering the surface to original finish all as per standards and as directed by Oil's Engineer.

(iii) The scope also covers termination and crimping of cables with sweating socket/ GI pipe/ clamp/ U Clip of standard practice with kits supplied by the bidder and approved by OIL. The cost of the items shall be included in the offer.

(iv) The cable shall be laid through 4-inch GI pipes at road crossings, across trenches, drainages and wherever necessary and the cost of the same shall be included in the bid.

(v) Cable route markers (FRP) and cable identification tags shall be provided along the route and length of the cable at a distance of 30mtrs and cost of markers and tags shall be included in the bid. The details of FRP cable markers and drawing are enclosed.

(vi) Any other items that are not included but part of the execution shall be deemed to be included in the scope of and shall be included the cost of such items in their bid.

(vii) The quantities indicated in the schedule of items are tentative and payment shall be made to the actual quantities of work done only.

(viii) Earth continuity wire of single core, 120sqmm insulated wire for 240sqmm cable shall be laid throughout length of cables. The cost of continuity wire shall be included in offer of cable.

21.0.2. Installation, testing and commissioning of cable:

21.0.2.1 General:

(i) Cables with kinks, straightened kinks or any other apparent defects like defective armouring etc. shall not be installed.

(ii) Cables shall not be bent sharp to a small radius either while handing or in installation. The minimum safe bending radius for cables shall as per IS. The terminations, the bending radius of individual cores shall not be less than 15 times its overall diameter.

21.0.2.2 Route of cable:

(i) Cable shall run through Kaccha/ pucca trench as shortest route possible.

(ii) While the shortest practicable route should be preferred, the cable route shall generally follow fixed developments such as roads, foot paths etc. with proper offsets so that future maintenance, identification etc. are rendered easy.

(iii) Cable route shall be planned away from drains and near the property, subject to any special local requirements that may have to be necessarily complied with.

(iv) As far as possible, the alignment of the cable route shall be decided after taking into consideration the present and likely future requirements of other services including cables en-route, possibility of widening of roads/lanes etc.

(v) Corrosive soils, ground surrounding sewage effluent etc. shall be avoided for the routes.

(vi) Proximity to communication cables:

Power and communication cables shall as far as possible cross each other at right angles. The horizontal and vertical clearances between them shall not be less than 60cm.

21.0.2.3 Methods of laying:

Laying direct in ground:

(a) The trenches shall be excavated in reasonably straight lines, wherever there is a change in the direction, a suitable curvature shall be adopted complying with the requirements of above.

(b) Where gradients and changes in depth are unavoidable, these shall be gradual.

(c) The excavation should be done by suitable means-manual or mechanical. The excavated soil shall be stacked firmly by the side of the trench such that it may not fall back into the trench.

(d) Adequate precautions should be taken not to damage any existing cable(s), pipes or any other such installations in the route during excavation. Wherever brick or any other protective covers or bare cables are encountered, further excavation shall not be carried out without the approval of the Engineer-in-Charge.

(e) Existing property, if any, exposed during trenching shall be temporarily supported adequately as directed by the Engineer-in-Charge. The trenching in such cases shall be done in short lengths, necessary pipes laid for passing cables therein and the trench refilled.

(f) The normal size of the trench will be 45 cm wide and depth shall be 900 cm and size of the pit is 120 cm. to 150 cm diameter with same depth that of the trench. The

bottom of the trench must be levelled and properly dressed. Any change in the above mentioned size shall be instructed by the Engineer- in - Charge.

(g) 75mm thick sand bed shall be spread at the bottom of the trench pit. Then unrolling and laying of cable shall be done as per instruction and again shall be covered with another 75mm of sand over the cable. Sand bed should cover entire width of trench and pits. Supply of sand is in the scope of the bidder.

(h)Bricks shall be placed crosswise (irrespective of one or more cables laid in the trench pit) over the cable /cables as well as the entire pit as per instructions. There shall be at least ten bricks in every 1150mm long normal trench and covering the entire cable/cables (brick size 230mm x 115mm). The bricks should be placed close to each other without any gap. Broken bricks shall not be allowed to use. Supply of bricks is in the scope of the bidder.

(i) The trenches shall be then back-filled with excavated earth, free from stones or other sharp ended debris and shall be rammed and watered, if necessary in successive layers not exceeding 30cm depth.

(j) Where road beams or lawns have been cut out of necessity, or kerb stones displaced, the same shall be repaired and made good, except for turfing /asphalting, to the satisfaction of the Engineer-in-Charge and all the surplus earth or rock shall be removed to places as specified.

(k) There shall be nos. of road crossings in cable routes. During road crossing, 4inch dia GI pipes shall be used for routing the cables. Spare pipes shall be provided for future extension. Spare pipes shall be sealed off at both ends. Pipes shall be up to the edge of the road to permit smooth entry of cable without bending.
(l) 4-inch dia. GI pipes shall be provided for individual cable entries to the sub-station buildings at both the ends of cables. The pipe for this purpose shall slope downwards from the building. The pipes at the building end shall be suitably sealed to avoid entry of water, after the cables are laid.

(m) The single core earthing cable of size & specification, approved by Engineer, shall be laid along with the power cable

21.0.3 Testing of cable before laying:

Before laying of the cables shall be tested for continuity and insulation resistance.

Testing before sand cushioning:

The cables shall be tested for continuity of cores and insulation resistance and the cable length shall be measured, before closing the trench.

21.0.4 Route Markers:

FRP cable route markers shall be provided along the runs of cables at locations approved by the Engineer-in-Charge and generally at intervals 30mtrs. Markers shall also be provided to identify change in the direction of the cable route and at locations of underground joints. Details & drawing of FRP markers with inscription text & OIL logo is enclosed as Annexure-V for estimation and reference. The cost of Cable route markers shall be included in the offer.

Inscription: The words #OIL-ELECT-UGC# shall be inscribed on the marker.

21.0.5 Cable identification tags:

Whenever cable is laid, GI tags inscribed with cable identification details as directed by Engineer-in-charge shall be permanently attached to all the cables at a distance of 30 mtrs. In case of cables laid directly in grounds the tags shall be attached before trenches are backfilled.

Termination & crimping of Cables:

The cable supplied by bidder is required to terminated and crimped. For termination and crimping of cable sweating Socket of below mentioned size is required. Cables are also required to be connected to overhead lines. Therefore, GI pipe, Clamp and U clip is required. The following quantities of above materials are as follows:

4C×240 sq.mm. = as per requirement - Heavy duty, aluminium sweating socket, Make: Dowell/ equivalent approved by OIL
4C×10 sq.mm. = as per requirement - Heavy duty, copper sweating socket Make: Dowell/equivalent approved by OIL
100mm GI pipe= as per requirement
Clamp = as per requirement
U Clip- as per requirement

The cable supplied by bidder is required to be terminated at substation, overhead lines. Cable gland for cable will be supplied by party. For crimping of cables suitable size of heavy duty sweating socket of Al/ Copper shall be supplied by bidder. For crimping of cable, crimping tools is required. The cost of above items shall be included in the offer.

22.0 Testing:

Testing before laying:

All cables, before laying shall be tested with 1.0KV megger. The cable cores shall be tested for continuity, absence of cross phasing, and insulation resistance from conductors to earth / armour and between conductors.

Testing before backfilling:

All cables shall be subjected to the above mentioned tests, before covering the cables by protective covers and back filling and also before taking up any jointing operation.

Marking on cable:

(i) Manufacture's name, voltage grade, size of cable, year of manufacture shall be embossed on the outer sheath of the cable at one mtr.interval throughout the length of the cable.

(ii) Cable drum shall be marked with manufacture's name, voltage grade, size of cable, year of manufacturing, length of cable, ISI mark & OIL#s purchase order number with suitable paint in permanent manner.

(iii) Cable length shall be embossed in permanent manner with suitable paint at one-meter interval.

(iv) Construction: Cable shall be so constructed that its outer side is completely round in shape.

23.0 Transportation, Storage and Handling of cable:

23.0.1Transportation of cable:

The cable drums shall be supplied directly to the site. Proper care shall be taken during transportation so that cable drums do not get damaged during transportation. If cable or drum gets damaged during transportation, it is sole responsibility of the bidder to take care of such damages. In case, if it requires replacement of damaged cable, the bidder has to replace the damaged cable with new cable at free of cost.

23.0.2Storage of cable:

(i) The cable drums shall be stored on a well-drained, hard surface, so that the drums do not sink in the ground causing rot and damage to the cable drums. Paved surface is preferred, particularly for long term storage.
(ii) The drums shall always be stored on their flanges, and not on their flat sides.
(iii) Protection from rain and sun is preferable for long term storage of cables. There should also ventilation between cable drums.
(iv)Damaged battens of drums etc. should be replaced as may be necessary.
(v) The space for storage of cable shall be provided by Oil. Safety and Security of the cable will be in the scope of bidder not in Oil Scope.

23.0.3 Handling of cable:

(i) When the cable drums have to be moved over short distances, they should be rolled in the direction of the arrow marked on the drum.
(ii) For manual transportation over a distance, the drum should be mounted on cable drum wheels, strong enough to carry the weight of the drum and pulled by means of ropes. Alternatively, they may be mounted on a trailer or on a suitable mechanical transport.

(iii) For loading and unloading from vehicles, a crane or a suitable lifting tackle should be used. Small sized cable drums can also be rolled down carefully on a suitable ramp or rails, for unloading, provided no damage is likely to be caused to the cable or to the drum. For loading and unloading of cable drum, crane services shall be provided by OIL.

24.0 Technical Terms and conditions for supply, laying and commissioning of cable:

(i) The cable laying works shall be carried out as per terms and condition of the cable laying works.

(ii) Crimping and end termination of the cable shall be carried out by experienced/ skilled Technician with valid work permit in Assam.

(iii) All the cable laying works shall be supervised by experienced supervisor having certificate of competency for carrying out 1.1KV works valid for Assam.

(iv) Before laying of the cable, cable shall be meggerd for Insulation resistance and continuity test to be carried out.

(v) After laying and termination of the cable, cable shall be tested by applying 2.0 KV DC for 15 Minutes.

(vi) The cable crimping and terminations shall be guaranteed for 12 months from the date of commissioning. If any failure of cable or terminations occurs during guarantee period, free of cost repair/ replacement will be carried out by bidder within short notice of 12hours.

25.0 General terms and conditions for supply, laying & commissioning of cable:

(i) The bidder shall visit the site for assessment of works for supply, storage, laying, testing and hand over the cable.
(ii) The bidder shall give 30 days earlier intimation for routine test when cable will be ready at manufacturer's works. The cable shall be inspected and routine tested at manufacturer's works. After dispatch clearance from Oil's Engineer, cable will be dispatched to the site shall be carried out.

(iii)The cable drum shall be kept in custody of bidder before laying, jointing and handing over the cable and it is sole responsibility of bidder to keep supervision of the cable. The storage and security of cable is in the scope of the bidder.

(iv)The supply, laying, termination, testing of cable shall be carried out within 4 months after receipt of the cable at site.

(v)The payment of installation and commissioning will be made only after successfully carried out the jobs and handing over the cable to the Oil.
(vi) The bidder will be penalized as per terms and condition of company, if job is not completed as per schedule of supply and laying of cable.

(vii) Bidder shall confirm in the offer that:

(a) The cable laying, testing &commissioning will be carried out under supervision of experienced supervisor having

(b) appropriate certificate of competency for carrying out 1.1 kV works valid for operating in Assam.

(c) All cable laying and termination works shall be carried out by persons having experienced and valid workman permit for cable jointing for LT cable.

(d) The cable manufacturer shall have routine test facilities to carry out testing of 1.1 kV grade, 3.5Cx240Sq.mm. XLPE, Al cable as per IS 7098 (with latest amendments) at manufacturer's works.

26.0 Tools:
The party shall have one no.1.0kV digital Insulation resistance tester of reputed make like Fluke, high voltage test set, multifunction meter and one set of hydraulic heavy duty crimping tool kit of reputed make of size 10sqmm to 240Sqmm including complete set of suitable dies.

27.0 Installation of Earthing:

All joints shall be riveted and sweated. Joints in the earth bar shall be bolted and the joints faces tinned. Where the diameter of the bolt for connecting earth bar to apparatus exceeds one quarter of the width of the earth bar, the connection to the bolt shall be made with a wider piece of flange of GI jointed to earth bar. These shall be tinned at the point of connection to equipment and special care taken to ensure a permanent low resistance contact

to iron or steel. All steel bolts, nuts, washers etc. shall be cadmium plated, main earth bars shall be spaced sufficiently on the surface to which they are fixed such as walls or the side trenches to allow for ease of connections. The earthing shall suitably be protected from mechanical injury by galvanized pipe wherever it passes through wall and floor. The portion within ground shall be buried at least 75 cm deep. The earthing lead shall be securely bolted and soldered to plate or pipe as the case may be. In the case of plate earthing the lead shall be connected by means of a cable socket with two bolts and nuts. All washers shall be of the same materials as the plate or pipe. All iron bolts nuts and washers shall be used.

28.0 Testing:

After installation, the tests as specified in IS 3043 shall be carried out and results recorded.

Earth pit Enclosure: For all earth electrodes earth pit enclosures are required. The size of an earth pit shall be brick wall enclosure of size - (90x90x90) cm. The earth electrode shall be 30cm above the soil level. 50mmx6mm GI strap shall be welded on top of earth electrode to connect 2nos. of earth lead wires. The cover of Enclosure shall be RCC/equivalent to strong FRP type with 2nos. lifting hooks suitable for brickwork enclosure.

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(T) Technical & other Deviations:

The work shall be carried out as per technical Specifications for Electrical works relevant to CEA regulations 2010, Indian Standard, IEC, IE rules, and as per directions of Engineer-in-charge.

Note: Any deviations from Technical Specifications due to design considerations, for Electrical works as given in NIT shall be subject to express acceptance by OIL. In case there is no deviation, “NO DEVIATIONS” should be mentioned in your offer.

1. CONDITIONS:

1.1. This specification covers construction of building, design, manufacture and testing as may be necessary before dispatch, delivery at site, all preparatory work, assembly and installation, commissioning, putting into operation of sub-station equipment consisting of HT panels, transformers, LT panels, HT and LT cabling etc. and final testing of sub-station equipment shall be carried out at OIL's substation site at Duliajan.
1.2. The construction of the building shall be carried out first and the sub- station equipment shall be unloaded, stored & installed in the newly constructed sub-station building in the above location.
1.3. The bidder should visit the site in his own interest and get familiarize with the site conditions before tendering

2. TERMS OF PAYMENTS:

The following percentage of contract rates for the various items included in the contract shall be payable against the stage of work shown herein.

2.1 Payments for Electrical Items/Works:

2.1.1Bidder shall quote for Civil cost and Electrical cost separately, per substation.

2.1.2In case bidder quotes lump sum amount per substation, 15% of that will be assumed as Civil cost, and 85% as Electrical cost.

2.1.3For Electrical Items, payment shall be made against receipt of complete material of individual substation, at the site, in good condition, after inspection, on pro -rata basis as below (Shown as % of electrical cost, per substation):

i)Supply of HT Panel and earthing truck system, per substation (complete)- 20%
ii)Supply of Transformers, per substation (complete)- 20%
iii)Supply of LT Panel, per substation (complete)- 20%
iv)Supply of total quantity of Cable (HT & LT), per substation- 10%
v)Supply of Battery bank and charger, per substation (Complete)- 5%
vi)Miscellaneous items (consisting of earthing systems, Lighting systems, Electrification, Safety Items, Items as per schedule of work not included above etc.), per substation- 5%
vii) Installation & Commissioning of all equipment in substation and successful trial run for one month, per substation (shall be paid after successful completion of trial run)-20%

2.1.4Note: Any excess or left over amount due to adjustments in intermediate payments shall be adjusted along with the final bill.

2.2. Payments for Civil works:
As per Clause F, Payment Schedule of Civil Part.

2.3. SECURITY DEPOSIT: Security Deposit shall be deducted from each running bill and the final bill to the extent of 7.5 % of contract value per year payable subject to a maximum amount of 5% of the tendered value. The earnest money deposited shall be adjusted against this security deposit. The security deposit shall be released on the expiry of guarantee period stipulated in the contract. Bank guarantee will not be accepted as security deposit.

2.4. Rates: The rates quoted shall be firm and inclusive of all taxes, duties levies, octroi etc. and all charges for packing, forwarding, insurance, freight and delivery, installation, testing, commissioning etc. at site including temporary construction of storage, risks, overhead charges, general liabilities /obligations and clearance from CEA, However, the fee for the CEA inspections shall be borne by OIL.

3. COMPLETENESS OF TENDER:

All sundry equipment, fittings, unit assemblies, accessories, hardware items, foundation bolts, termination lugs for electrical connections, and all other items which are useful and necessary for efficient assembly and installation of equipment and components of the work shall be deemed to have been included in the tender irrespective of the fact whether such items are specifically mentioned in the tender documents or not.

4. DESPATCH & STORAGE AND CUSTODY OF MATERIALS:

Successful bidder shall plan the construction of substation buildings such that they are ready for storing respective equipment on their arrival at Duliajan. No separate storage accommodation shall be provided by OIL. The despatch clearance for all the ordered equipment shall be given by OIL only after ensuring that respective substation buildings are ready for unloading and storing them inside the substation buildings on their arrival at Duliajan. Watch and ward of the stores and their safe custody shall be the responsibility of the contractor till the final taking over of the installation by OIL.

5. CARE OF THE BUILDING SITE:

Care shall be taken by the contractor while handling and installing the various equipment and components of the work to avoid damage to the building site & environment. He shall be responsible for repairing all damages and restoring the same to their original finish at his cost. He shall also remove at his cost all unwanted and waste materials arising out of the installation from the site of work.

6. COMPLETION PERIOD:

The completion period shall be 24 months from the date of signing the contract agreement with the bidder. This period is for the entire work of planning, designing, approval of drawings etc., Construction of substation building, delivery at site including transportation, Installation, testing, commissioning of equipment and handing over of the entire system to the satisfaction of the Engineer-in-charge. Offers indicating project completion period more than 24 months will be summarily rejected. Bidder should provide project bar chart along with the bid.

7. GUARANTEE:

All equipment shall be guaranteed for a period of 12 months by the LSTK contractor on behalf of OEM, from the date of taking over the installation by OIL, against unsatisfactory performance and/or break down due to defective design, workmanship or material. The equipment or components, or any part thereof, so found defective during guarantee period shall be forthwith repaired or replaced free of cost, to the satisfaction of the Engineer- in-Charge. In case it is felt by OIL that undue delay is being caused by the contractor in doing this, the same will be got done by OIL at the risk and cost of the contractor. The decision of the Engineer-in-charge in this regards shall be final & binding on the contractor. The bidder shall guarantee among other things, the following:

(i). Quality, strength and performance of the materials used as per manufacturers standards.

(ii). Safe mechanical and electrical stress on all parts under all specified conditions of operation.

8.POWER SUPPLY:

A temporary maximum of three phase power supply of 5 KW shall be provided, at a single point, during execution of work for lighting & other purpose only, but not for welding. This power supply cannot be used for operating any Electrical welding set. For welding purpose, contractor has to arrange his own Diesel engine driven welding set. Further arrangements for tapping power connection from this point shall be made by the contractor. Electricity shall be provided on chargeable basis as per OIL rate applicable to the outside parties.

9.WATER SUPPLY**:**

Water supply shall be made available by the contractor on their own for construction of substation buildings.

10.ACCEPTABLE MAKES OF VARIOUS EQUIPMENT:

The Acceptable makes of various equipment/ components /accessories have been indicated in "Make List-Annexure III" specified in the tender document. The bidder shall work out the cost of the offer on this basis. Bidders may offer equivalent makes, provided they enclose technical literature demonstrating equivalence with stated makes as Annexure III.

11. EXTENT OF WORK:

11.1 The work shall comprise of entire labour including supervision and all materials necessary to make a complete installation and tests, adjustments and commissioning as may be required by OIL. The term complete installation shall not only mean major items of the plant and equipment covered by the specifications but all incidental sundry components necessary for complete execution and satisfactory performance of installation with all layout charts whether or not those have been mentioned in details in the tender document in connection with this contract as this is a turnkey job.

11.2 The job is to Construct the Sub Station building as per approved civil drawing, install HT panels, LT panels and Transformers as per approved drawing, installation of battery bank and charger, installation of Chemical earth electrodes, connect 2nos. of transformers to main LT panel. Similarly, HT cable is to be laid inside the proposed sub-station in cable trench between HT panel board and 2 nos. of transformers and do the end terminations using kits. No joint shall be permissible in between HT panel & transformer. The cable trenches are to be covered with FRP cable trays.

11.3 In addition to supply, installation, testing and commissioning of substation equipment, following works shall be deemed to be included within the scope of work to be executed by the bidder as this is a turnkey job.

11.3.1 All building works necessary for installation of equipment, foundation, making of opening in walls or in floors and restoring them to their original condition / finish and necessary grouting etc. as required

11.3.2 All supports for cables and MS channels for erection of panels & transformers etc. as are necessary.

11.3.3 Testing of PTs/ CTs for metering & protection purpose & relay calibration & setting.

11.3.4 Getting CEA inspection done & obtaining approval for energizing the installation. However, necessary fees for inspection shall be borne by OIL.

12.EXCLUSION AND WORK TO BE DONE BY OTHER AGENCIES:

The following shall be excluded from the scope of the work:

(i)Major dismantling of any existing building work outside the substation fencing

(ii)Electricity supply in sub-station building for testing & commissioning purpose.

13.INSPECTION AND TESTING:

(i)All major equipment i.e. HT panel, transformers, LT panel etc. shall be offered for initial inspection at manufacturer's works. The contractor will intimate the date of testing of equipment at the manufacturer's works before dispatch. The successful bidder shall give advance notice of minimum four weeks regarding the dates proposed for such tests to the OIL's representative to facilitate his presence during testing. The Engineer-in-charge may witness such testing. The cost of the Engineer's visit to the factory will be borne by OIL. Equipment will be inspected at the manufacturer's premises before dispatch to the site by the contractor.

(ii)Copies of all documents of routine and type test certificates of the equipment, carried out at the manufacturers premises shall be furnished to the Engineer in-charge and consignee.

14. VALIDITY OF BID:

The bid document shall be valid for acceptance for a period of 180 days from the date of opening.

15.COMPLIANCE WITH REGULATIONS AND INDIAN STANDARDS**:**

(i) All works shall be carried out in accordance with relevant regulation, both statutory and those specified by the Indian Standards, CEA regulation2010 & IEC & other standards related to the works covered by this specification.
(ii) The entire Electrical jobs shall be carried out under the supervision of an Electrical supervisor having a valid Electrical supervisor's certificate of competency issued by Govt of Assam.

16.After completion of the installation, the same shall be offered for inspection by the representatives of the Central Electricity Authority. The contractor will extend all help including test facilities to the representatives of CEA. The observations/contraventions/non-compliance pointed out by CEA will be rectified /implemented by the contractor at his own cost. The final completion report will be given only after getting clearance from CEA.

17.Nothing in this specification shall be construed to relieve the successful tendered of his responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with currently applicable statutory regulations and safety codes.

18.Successful bidder shall arrange for compliance with statutory provisions of safety regulations and OIL's requirements of safety codes in respect of labour employed on the work by the bidder. Failure to provide such safety requirement would make the tender liable for penalty applicable as per company policy for each default. In addition, OIL will be at liberty to make arrangement for the safety requirements at the cost of bidder and recover the cost thereof from him.

19. All the operating spare parts & tools mentioned in the ANNEXURE-I shall be included in the scope of supply of equipment.

20.INDEMNITY:

The Successful bidder shall defend, indemnify and hold the Company, its officers, officials, employees and labours harmless from any and all claims, injuries, damages, losses or suits

including attorney fees, arising out of or in connection with the performance of this Agreement, except for injuries and damages caused by the sole negligence of the Company. The successful bidder shall be liable in accordance with the Indian Law and Regulations for contractor related accident occurring due to any cause and the contractor shall be responsible for any accident or damage incurred or claims arising there from during the period of erection, construction and putting into operation the equipment and ancillary equipment under the supervision of the successful bidder in so far as the latter in responsible. The Successful bidder shall also provide all insurance including third party insurance as may be necessary to cover the risk. No extra payment would be made to the successful bidder on account of the above.

21.ERECTION TOOLS:

No tools and tackles required for testing, installation and commissioning purposes would be made available by OIL.

22.COORDINATION WITH OTHER AGENCIES:

The Successful bidder shall co-ordinate with other agencies and exchanges freely all technical information so as to make the execution of this work/contract smooth. No remuneration should be claimed from OIL for such technical cooperation. If any unreasonable hindrance is caused to other agencies and any completed portion of the work has to be dismantled and re-done for want of cooperation and coordination by the bidder during the course of work, such expenditure incurred will be recovered from the successful bidder if the restoration work to the original condition or specification of the dismantled portion of the work was not undertaken by the bidder himself.

23. The work will be carried out with least disturbance during shifting & shut down taken in consultation with OIL.

24.MOBILIZATION ADVANCE:

No mobilization advance shall be paid for this work.

25.INSURANCE AND STORAGE:

All consignments are to be duly insured up to the destination from point of despatch at the cost of the contractor. The insurance covers shall be valid till the equipment is handed over duly installed, tested and commissioned. The equipment at site have to be stored securely by the contractor till handed over to OIL. The necessary arrangement to prevent theft/pilferage has to be made by the contractor.

26.VERIFICATION OF CORRECTNESS OF EQUIPMENT AT DESTINATION:

The contractor shall have to produce all the relevant records to certify that the genuine equipment from the manufacturers has been supplied and erected.

27. PAINTING:

This shall include cost of painting of the entire installation including the building as per the approved weather proof shades. The major equipment like HT panel, transformers, LT panel, bus duct, cable trays etc. shall be factory final finish painted. The agency shall be required to do only touching to the damages caused to the painting during transportation, handling

&installation at site. However, hangers, supports etc. of & cable tray etc. shall be painted with required shade including painting with two coats of anticorrosive primer paint at site. The following has to be incorporated during installation and commissioning:

a) Neutral earth pit cover to be painted yellow.
b) Body earth pit cover to be painted green.
c)Surge arrestor earth pit cover to be painted black
d)Available earth pit resistance values should be written on the earth pit cover (Both Individual and combined).

28.TRAINING:
The scope of work includes 'On the job technical training' of two persons of OIL at site. Nothing extra shall be payable on this account.

29. INTERPRETING SPECIFICATIONS:

In interpreting the specifications, the following order of decreasing importance shall be followed in case of contradictions:
(a) Schedule of quantities
(b) Technical specifications
(c) Drawing (if any)
(d) General specifications
(e) Relevant BIS or other international code in case BIS code is not available.

30.COMMENCEMENT OF WORK AND ISSUE OF WORK ORDER:

After signing the Contract, the contractor will have to obtain the labour license and the certificates relating to compliance with the statutory requirements as may be required for the specific contract. On fulfilling the statutory requirements, the concerned Contractor will collect the Work Order from the OIL and will commence the work as per the terms mentioned in the Work Order.

The Work Order will generally contain the following information:
(a)Work Order number
(b)Contract number
(c)Name of the Contractor
(d)Date of commencement of work, date of completion of work
(e)Contract price
(f)Date after which LD will be levied
(g)Special instructions

31.SAFETY REQUIREMENTS:

This section covers the requirements of items to be provided in the sub-station for Compliance with statutory regulations and Safety and operational needs.

31.1. Safety provisions shall be generally in conformity with CEA regulations 2010.In particular following items shall be provided:

31.2. Insulation mats conforming to IS: 15652:2006 shall be provided in front of main HT and LT switch boards as well as other control equipment as per CEA (Measures Relating to Safety and Electric Supply) regulations 2010, chapter III, 19 (5).

31.3. Trilingual First Aid Charts (English, Hindi & Regional language), displaying methods of giving artificial respiration to a recipient of electrical shock shall be prominently provided at appropriate place.

31.4. Standard first aid boxes containing materials as prescribed by St. John Ambulance brigade or Indian Red Cross should be provided in each sub-station.

31.5. Danger Plates shall be provided on all HV and LV equipment. LV danger plate shall be 200 mm x 150 mm made of mild steel at least 2mm thick vitreous enamelled white on both sides and with the descriptions in signal red colour on front side as required. Notice plates of other suitable materials such as stainless steel, brass or such other permanent nature material shall also be accepted with the description engraved is signal red colour.

31.6. Sufficient number of caution boards such as "Man on Line" 'Don't Switch on' etc. shall be available in the sub-station. OIL's approval for the text, design & layout of all the above shall be taken before commencement of installation

31.7. Portable CO2 conforming to IS: 2878:2004/ chemical conforming to IS: 2171-1976 extinguishers, HCFC Blend A (P-IV) shall be installed in the sub-station at suitable places. Other extinguishers recommended for electric fires may also be used.

31.8. Fire buckets conforming to IS: 2546-1974 shall be installed with the suitable stand for storage of water and sand.

31.9. Substation locks: 65 MM, 7 LEVER locks & extra 20% spare locks with 3 master key (i.e. all the locks shall be operable with the same single key) has to be provided in each Sub stations for all doors.

32.GENERAL HSE POINTS**:**

32.1. It will be solely the Contractor's responsibility to fulfill all the legal formalities with respect to the Health, Safety and Environmental aspects of the entire job (namely; the person employed by him, the equipment, the environment, etc.) under the jurisdiction of the district / state where it is operating. Ensure that all sub-contractors hired by him comply with the same requirement as the contractor himself and shall be liable for ensuring compliance of all HSE laws by the sub or sub-sub contractors.

32.2. Every person deployed by the contractor in a mine must wear safety gadgets to be provided by the contractor. The Contractor shall provide proper Personnel Protective Equipment as per the hazard identified and risk assessed for the job and conforming to statutory requirement and company PPE schedule. Safety appliances like protective footwear, Safety Helmet and Full Body harness has to be DGMS approved. Necessary supportive document shall have to be submitted as proof. If the Contractor fails to provide the safety items as mentioned above to the working personnel, the Contractor may apply to OIL for providing the same. OIL will provide the safety items, if available. But in turn, OIL will recover the actual cost of the items by deducting from Contractor's Bill. However, it will be the Contractor's sole responsibility to ensure that the persons engaged byhim in the mines use the proper PPE while at work. All the safety gears mentioned above are to be provided to the working personnel before commencement of the work.

32.3. The Contractor shall prepare written Safe Operating Procedure (SOP) for the work to be carried out, including an assessment of risk, wherever possible and safe methods to deal with

it/them. The SOP should clearly state the risk arising to men, machineries & material from the mining operation / operations to be done by the contractor and how it is to be managed.

32.4. The contractor shall provide a copy of the SOP to the person designated by the mine owner who shall be supervising the contractor's work.

32.5. Keep an up to date SOP and provide a copy of changes to a person designated by the Mine owner/Agent/Manager.
32.6. Contractor has to ensure that all work is carried out in accordance with the Statute and SOP and for the purpose he may deploy adequate qualified and competent personnel for the purpose of carrying out the job in a safe manner. For work of a specified scope/nature, he should develop and provide to the mine owner a site specific code of practice in line.

32.7. All persons deployed by the contractor for working in a mine must undergo Mines Vocational Training, initial medical examination, PME. They should be issued cards stating the name of the contractor and the work and its validity period, indicating status of MVT, IME& PME.

32.8. The Contractor shall submit to DGMS returns indicating name of his firm, Registration number, Name and Address of person heading the firm, Nature of work, type of deployment of work persons, Number of work person deployed, how many work persons hold VT certificate, how many work persons undergone IME and type of medical coverage given to the work person.

32.9. The return shall be submitted quarterly (by 10th of April, July, October & January) for Contracts of more than one year. However, for contracts of less than one year, returns shall be submitted monthly.

32.10. It will be entirely the responsibility of the Contractor/his Supervisor/representative to ensure strict adherence to all HSE measures and statutory rules during operation in OIL's installations and safety of workers engaged by him. The crew members will not refuse to follow any instruction given by OIL's Installation Manager / Safety Officer / Engineer / Official / Supervisor/Junior Engineer for safe operation.

32.11. Any compensation arising out of the job carried out by the Contractor whether related to pollution, Safety or Health will be paid by the contractor only.

32.12. Any compensation arising due to accident of the Contractor's personnel while carrying out the job will be payable by the contractor.

32.13. The contractor shall have to report all incidents including near miss to Installation Manager / departmental representative of the concerned department of OIL.

32.14. The contractor has to keep a register of the persons employed by him/her. The contractor's supervisor shall take and maintain attendance of his men every day for the work, punctually.

32.15. If the company arranges any safety class / training for the working personnel at site (company employee, contractor worker, etc) the contractor will not have any objection to any such training.

32.16. The health check-up of contractor's personnel is to be done by the contractor in authorized Health Centres as per OIL's requirement & proof of such test(s) is to be submitted to OIL. The frequency of periodic medical examinations should be every five years for the

employees below 45 years of age and every three years for employees of 45 years of age and above.

32.17. To arrange daily tool box meeting and regular site safety meetings and maintain records.

32.18. Records of daily attendance, accident report etc. are to be maintained in form B, E, J (as per Mines Rules 1955) by the contractor

32.19.A contractor employee must, while at work, take reasonable care for the health and safety of people who are at the employee's place of work and who may be affected by the employee's act or omissions at work.

32.20.A contractor employee must, while at work, cooperate with his or her employer or other persons as far as is necessary to enable compliance with any requirement under the act or the regulations that is imposed in the interest of health, safety and welfare of the employee or any other person.

32.21. Contractor's arrangements for health and safety management shall be consistent with those for the mine owner.

32.22. In case Contractor is found non-compliant of HSE laws as required company will have the right for directing the contractor to take action to comply with the requirements, and for further non-compliance, the contractor will be penalized prevailing relevant Acts/Rules/Regulations.

32.23. When there is a significant risk to health, environment or safety of a person or place arising because of a non-compliance of HSE Measures Company will have the right to direct the contractor to cease work until the non-compliance is corrected.

32.24. The contractor should prevent the frequent change of his contractual employees as far as practicable.

32.25. The contractor should frame a mutually agreed bridging document between OIL & the contractor with roles and responsibilities clearly defined.

32.26. For any HSE matters not specified in the contract document, the contractor will abide the relevant and prevailing Acts/rules/regulations/ pertaining to Health, Safety and Environment.

32.27 The contractor shall deploy a competent person throughout the contract under whose constant supervision only, the job will be carried out.

32.28 Necessary cold/Hot work/ Electrical isolation /energisation/work at height/vehicle entry permits, etc. are to be obtained from authorized personnel before starting the job (s).

32.29 First aid box to be provided by the contractor and same has to be kept ready at work site for contractor's personnel while carrying out the job (s).

32.30 The contractor shall inspect and have certification of all tools (hand operated as well as mechanically operated) being used. Defective tools shall be immediately removed.

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ANNEXURE-I

<u>11 KV VACUUM CIRCUIT BREAKER SPARES (FOR EMERGENCY REPLACEMENT)</u> for all the substations

SL.No.	SPARE PARTS DESCRIPTION	QNTY.	UNIT	REMARKS
1	Spring Charging Motor Assembly of 11 KV VCB Type : Make :	1	No.	
2	Complete Mechanism Box Assembly of VCB Type : Make :	1	No.	
3	Closing Coil Voltage : Type : Make :	2	No.	
4	Shunt Trip Coil Voltage : Type : Make :	2	No.	
5	Closing Coil Assembly of VCB Make & Type :	1	No.	
6	Tripping Coil Assembly of VCB Make & Type :	1	No.	
7	Spring Charging Motor for VCB (Only Motor) Make & Type :	1	No.	
8	Spout Bushing (For 11 KV Panel) Make :	3	No.	
9	Trip Catch Assembly of VCB Make & Type :	1	No.	
10	Vacuum Interuptor of VCB Make & Type :	1	No.	

ANNEXURE- II

DATA SHEET of Vacuum Circuit Breaker :
(To be filled by the bidder)

A. 11KV VCB:

1. Name of manufacturer :
2. Manufacturer's
   Type No. :
   Model No. :
3. Panel type :
4. Degree of protection :
5. Fully Type tested : Yes/No.
6. Type tested at :
   (Specify lab/Institution where test was carried out)
7. Conforms to (Standards):
   a) IEC :
   b) BIS :
   c) Others :
8. Rated Insulation:
   a) Min. withstands voltage :
   b) Impulse voltage withstand (dry) :
9. General details of Panels
   a) Extensible : Yes/No.
   b) Compartmentalized : Yes/No
   c) No. of compartments :
   d) Names of the compartments (To be indicated)
      i)
      ii)
      iii)
      iv)
10. Material of internal partitions :
11. Thickness of Panel Sheet metal :
12. Busbars
   a) Busbar material:
   b) Busbar shape :
   c) Busbar size :
   d) Busbarinsulation :
   e) Busbar rating (Amps) :
   f) Busbar Spouts insulation material :
13. Busbar support insulation :
   Type & materials
14. Guaranteed maintenance free life of
   a) Panels:
   b) Circuit breaker:
15. Operational safety interlocks provided (To be indicated)

a)
b)
c)

16. Earthing facilities provided for
   a) Bus-bars: Yes/No
   b) Circuit/Cable: Yes/No.

17. Circuit breaker cubicle with front plate/door pressure tested for internal arc faults. : Yes/No

18. Panel Wiring:

a) Voltage rating :
b) Insulation type &material :
c) Wire size :

19. ENVIRONMENTAL CONDITIONS

a) Maximum Ambient air temperature :
b) Minimum Ambient air temperature :
c) Maximum humidity at site (at 40 ° C) :
d) Surrounding atmospheric condition :

20. Confirmed insulation provided is suitable for above environmental conditions: Yes/No

B. VACUUM CIRCUIT BREAKER

(Information to be given IS: 13118: 1991 Clause 9.102)

1) Rated Values and Characteristics

a) Number of Poles :
b) Class : Indoor/Outdoor
Temperature :
Ice coating :
c) Rated voltage :
d) Rated insulation level :
e) Rated frequency :
f) Rated normal current :
g) Rated line charging : breaking current
h) Rated cable charging : breaking current
i) Rated small inductive : breaking current
j) Rated Short Circuit : breaking current
k) First pole to clear factor :
l) Rated Transient Recovery voltage : for terminal faults
m) Rated characteristics for short : line faults
n) Rated Short Circuit making current:
o) Rated Operating sequence :
p) Rated duration of short circuit :
q) Rated out of phase breaking current :
r) Rated opening time :
s) Rated break time. :
t) Rated closing time :
u) Frequency of operation :

2. Characteristics of the operating mechanism of CB and associated equipment in particular:

a) Method of operation :
b) Number and type of spares : auxiliary switches.
c) Rated supply voltage power and rated supply frequency :
d) Panel, Light space heater :
e) Closing devices - Normal voltage :

Min. voltage :
Max. voltage :

f) Shunt trip coil - Normal voltage :
Min. voltage :
Max. voltage :

g) Series trip coil- Normal voltage :
Min. voltage :
Max. voltage :

h) Indication supply :

3. Bushings - Material :

C. CURRENT TRANSFORMERS OF SWITCHGEAR PANEL:

1. Feeder panel DC/EF (Protection) CT's

i) Make :
ii) Type :
iii) Class :
iv) Ratio :
v) Burden (VA) :

2. Panel Metering CT's

i) Make :
ii) Type
iii) Class :
iv) Ratio :
v) Burden (VA) :

3: Panel Protection CT's

i) Make :
ii) Type :
iii) Class :
iv) Ratio :
v) No. of cores (Secondary):
vi) Burden (VA) :

D. VOLTAGE TRANSFORMERS OF SWITCHGEAR PANEL:

1. Incoming Panel VT :

i) Make:
ii) Type:
iii) No. of phases :
iv) Ratio:
v) Class :
vi) Burden (VA) :
vii) Location/Mounted on :
viii) Fixed/Withdrawal:
ix) Primary side protection:
x) Secondary side protection:

E. CONTROL CABLES:

a) Make :
b) Voltage Grade :
c) Insulation :
d) Conductor Material :
e) Size (Sq. mm. per core):

F. Multifunction meter:

a) Make:
b) Class :
c) Ratio :

H. SELECTOR SWITCHES:

a) Make :
b) Type :

I. CONTROL SWITCHES:

a) Make :
b) Type :

J.PROTECTIVE RELAY

a) Type of Relay :
b) Make of Relay :
c) Model :

Annexure III

Acceptable Make with Specification:
A. For 415V, AC equipment:

Digital Multifunction meter, Current Transformer, LED, HRC fuses, Trip- neutral-close selector switch, Air Circuit Breaker and MCCB are as follows:

1. Digital Multifunction Meter:

Make:
Schneider Power logic PM200 series, HPL -Socomec (Diris A41), Siemens PAC3200, Secure.

2. **Digital Ammeter with inbuilt selector switch:**

Make:
Schneider electric, HPL, LT, Siemens, IndoAsian.

3. Current Transformer:

Make:
Kappa, Precise Electrical, Pragati Electrical, Siemens, L&T, Schneider electric, IndoAsian, ECS.

4. LED:

Make:
Binay, Tecnic, L&T, Siemens.

5. HRC Fuses:

Make:
GE, Siemens, L&T, Schneider, Cooper Bussman, IndoAsian.

6. Trip-Neutal-Close Selector Switch:

Make:
Kaycee, Salzar, Schneider, L&T, Siemens, IndoAsian.

7. **Air Circuit Breaker:** ACB with minimum LSIG Protection EDO type, fault level 50 kA or above at 500 V,AC. Draw-out type, electrical and manual operated having master-pact with O/C, S/C and Earth fault protection. Spring charging shall be motorized and manual also with 230V AC supply.

Make:
i) Schneider Electric (Merlin Gerin) of NW series with micro logic P/6.0H or above.

ii) Siemens India-WL Series with electronic trip unit ETU 76B release.
iii) GE India- EntelliGuard SL. ACB with electronic trip unit
iv) ABB india- Emax series with electronic trip unit
v) Legrand- model DMX3-N with electronic release microprocessor based protection unit MP4 LSIG.
vi) L&T Air Ciruit Breaker, Type U- Power omega with matrix protection and control unit MTX4.
vii) IndoAsian Optibreak model, EDO with LSIG Protection.

8. MCCB: 415 volt, fault level 36kA and above with O/C, S/C and Earth fault protection (for distribution application with 4 sets of spreaders for cable connection)/ 25 kA for 250/100 Amps MCCB with LSIG protection

Make:
i) Schneider Electric (Merlin Gerin): model compact NSX with electronic trip unit with micro logic.
ii) ABB - Tmax Series, model-TP5 electronic Trip unit -LSIG.
iii) Siemens India Ltd: Sentron VL MCCB, model VL standard with electronic release and microprocessor based ETU-LSIG/LSING.
iv) Legrand: Model- DPX/DPX3 with LSIG release.
v) GE India: Record Plus, FG with electronic trip unit.
vi) Indoasian Optium Series with LSIG release

9. Stainless steel single compression cable gland:

Make:
Dowell/gland make/Jainson/Baliga/3D

10. Sweating socket:
Make:
Dowell, 3M

11. 18/20 Watt LED light fitting/ 150 watt LED fitting

Make
Phillips/ GE/ Crompton greaves/ Bajaj/Havells

12. Modular switches/ socket:

Make:
Legrand/ Crab tree/L&T/IndoAsian

13. 1.1 KV grade XLPE/PVC cable:

Make:
Polycab/ Nicco/ Crystal/ RPG/NECAB/Prestige/Havells

14. Auxiliary contactor:

Make:
Siemens/ ABB/ Schneider electric/IndoAsian

15. MCB:

Make:
Siemens/ ABB/ Schneider electric/Legrand/L&T

B. 11KV, AC HT equipment:

1. HT Current transformer-

Make:
Kappa/Precise Electricals/ Intrans Electro Components Pvt Ltd/Pragati Electricals, ECS/Same as the maker of the VCB.

2. Voltage transformer –

Make:
Kappa/Precise Electricals/Intrans Electro Components Pvt Ltd/Pragati Electricals/Same as the maker of the VCB.

3. Make of battery:

Make:
Exide/Amco/Amararaja/Amron/Tata Green

4. Make battery charger:

Make:
Exide/Ruttonsha/ HBL/Emerson/Amararaja

5. Directional type Numerical protection relay:

Make:
ABB(Type REF615)/Siemens(Type Siprotec 7SJ80 & 7SD80)/ Siemens-Argus /SEL(Type SEL-751&SEL-311)/Schneider Group,type Micom-P14X series/Merlin-GErin (Schneider Group,typeSepam Series S-84)

6. Non directional type Numerical protection relay

Make:
ABB(Type REF615)/Siemens(Type Siprotec 7SD80)/ Siemens-Argus /SEL(Type SEL-751)/Schneider Group,type Micom-p14x series/Merlin-GErin(Schneider Group, type Sepam Series S-84)

7. 11KV, Vacuum circuit breaker make:

Make:
Siemens/ ABB/ Schneider/ Crompton greaves

8. 11KV Interrupter:

Make:
Siemens/ ABB/ Schneider/ Crompton greaves/L&T

9. 11KV XLPE cable:

Make:
Havells/Nicco/Crystal/Polycab/Raychem RPG

10. Cable termination kit:

Make:
Raychem RPG/ Xicon/3M/ Multishrink

11. Dry type Transformer:

Make:
Voltamp/ ABB/Raychem RPG/PETE Hammond/Schneider

NOTE: Bidders may offer equivalent makes, provided they enclose technical literature demonstrating equivalence with stated makes as above.

ANNEXURE-IV

TECHNICAL DATA SHEET FOR TRANSFORMER

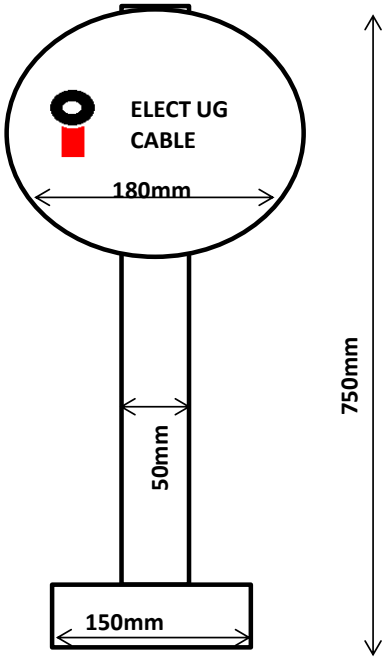
(To be filled in by the Bidder)

Sr. No.	T ECHNICAL PARTICULARS	SPECIFICATIONS
1	Type of Transformer	Cast Resin Dry Type
2	Service	
3	KVA Rating (continuously rated)	
4	Duty	
5	Rated Voltage	
	(a) HV (Volts)	
	(b) LV(VOLTS)	
6	Rated Frequency	
7	No. of Phases	
8	Type of Cooling	
9	Winding Connection	
10	Tappings	
	(a) Range	
	(b) No. of steps	
	(c) In steps of	
	(d) Tapping provided on HV side	
11	Tap changer type	
12	Vector Group	
13	Reference ambient temperature	
14	Temperature rise winding	
15	Class of Insulation	
16	% Impedance	
1 7	Physical Dimensions	
	(a) Length (in mm)	
	(b) Width (in mm)	
	(c) Height (in mm)	
18	Approximate weight	
	(a) Core and Windings (Kgs)	
	(b) Total Weight (Kgs)	
19	Iron losses at normal voltage ratio	
20	Copper losses at normal voltage ratio at full load	
21	Efficiency at unity power factor	
	(a) Full load	
	(b) 75% load	
	(c) 50% load	
22	Regulation	
	(a)at unity power	
	(b) at 0.8 power factor	
23	Reference standards	
24	Method of Earthing	
25	Fittings and Accessories	
	(a) Off circuit tap links	

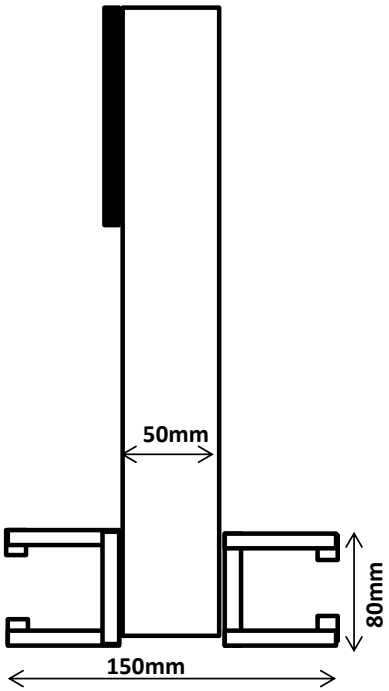
	(b) Earthing terminals	
	(c) Rating and Diagram Plate	
	(d) Lifting Lugs for Complete Transformer	
	(e) Cover Lifting Lugs	
	(f) Bidirectional Rollers	
	(g) Digital Temperature Scanner	
26	Transformer Type Tested	

Sketch for Cable Route Marker

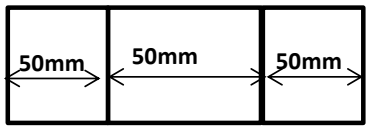
Annexure-V



Front View



SideView



TopView

Item description: Marker shall consist of the following components:

a) Round FRP board, minimum dia 180 mm, minimum thickness 5 mm, with the warning letters "ELECT U/G CABLE" and OIL logo embossed on the same;

b) Square FRP tube, minimum 750 mm long, square cross section, minimum 50 x 50 mm size with minimum 5 mm wall thickness. One end of the tube shall be fixed to the FRP board bearing the warning with SS fasteners and sealed rivets and the other end shall be fitted with two angle pieces, minimum 50x50x5 mm size, minimum 150 mm long. Angles shall also be fixed to the tube with SS fasteners and sealed rivets. Top and bottom open ends of the tube shall be sealed with FRP material to prevent entry of water.

Material: FRP Components should be manufactured through automatic pultrusion process and assembled with SS-304 fasteners and aluminum rivets. FRP material shall be Resin System, Fire Retardant, Corrosion Resistant & UV Stabilized for longevity of the material. Glass Fibre Content shall be within 55% to 60%.

Material shall be manufactured as per the following standards:

a. Unsaturated Polyester Resin Systems for low pressure Fibre Reinforced Plastics- Specification: Tested as per IS 6746-1994

b. Flame Retardant properties/ Low flammability as per IS 6746 Appendix K/UL 94

c. Impact Strength as per ASTM-D-256 IZod, minimum 25 ft - lbs

d. Tensile Strength (break point) as per ASTM-D-638, minimum 30,000 psi

e. Flexural Strength (break point) as per ASTM-D-790, minimum 30,000 psi

To,
CGM-CONTRACTS
OIL INDIA LIMITED
DULIAJAN-786602

SUB: SAFETY MEASURES

Description of work/service: Design and construction of 03 Nos. of substation building and 01 No. of Switch room including supply, installation, testing and commissioning of electrical equipment of 03 Nos. 11KV/415V substation and 01 No. of 11KV/415V Switch room at Duliajan on LSTK basis.

Sir,

We hereby confirm that we have fully understood the safety measures to be adopted during execution of the above contract and that the same have been explained to us by the concerned authorities. We also give the following assurances.

a) Only experienced and competent persons shall be engaged by us for carrying out work under the said contract.

b) The names of the authorized persons who would be supervising the jobs on day to day basis from our end are the following:

i) _____

ii) _____

iii) _____

The above personnel are fully familiar with the nature of jobs assigned and safety precautions required.

c) Due notice would be given for any change of personnel under item(b) above.

d) We hereby accept the responsibility for the safety of all the personnel engaged by us and for the safety of the Company's personnel and property involved during the course of our working under this contract. We would ensure that all the provisions under the Oil Mines Regulations, 1984 and other safety rules related to execution of our work would be strictly followed by our personnel. Any violation pointed out by the Company's Engineers would be rectified forthwith or the work suspended till such time the rectification is completed by us and all expenditure towards this would be on our account.

e) We confirm that all persons engaged by us would be provided with the necessary Safety Gears at our cost.

f) All losses caused due to inadequate safety measures or lack of supervision on our part would be fully compensated by us and the Company will not be responsible for any lapses on our part in this regard.

g) We shall abide by the following HSE (Health, Safety & Environmental) POINTS:

GENERAL HEALTH, SAFETY & ENVIRONMENT (HSE) POINTS:

1. It will be solely the Contractor's responsibility to fulfill all the legal formalities with respect to the Health, Safety and Environmental aspects of the entire job (namely; the person employed by him, the equipment, the environment, etc.) under the jurisdiction of the district of that state where it is operating. Ensure that all sub-contractors hired by him comply with the same requirement as the contractor himself and shall be liable for ensuring compliance all HSE laws by the sub or sub-sub-contractors.

2. Every person deployed by the contractor in a mine must wear safety gadgets to be provided by the contractor. The Contractor shall provide proper Personnel Protective Equipment as per the hazard identified and risk assessed for the job and conforming to statutory requirement and company PPE schedule. Safety appliances like protective footwear, Safety Helmet and Full Body harness has to be DGMS approved. Necessary supportive document shall have to be submitted as proof. If the Contractor fails to provide the safety items as mentioned above to the working personnel, the Contractor may apply to the Company (OIL) for providing the same. OIL will provide the safety items, if available. But in turn, OIL will recover the actual cost of the items by deducting from Contractor's Bill. However, it will be the Contractor's sole responsibility to ensure that the persons engaged by him in the mines use the proper PPE while at work. All the safety gears mentioned above are to be provided to the working personnel before commencement of the work.

3. The Contractor shall prepare written Safe Operating Procedure (SOP) for the work to be carried out, including an assessment of risk, wherever possible and safe methods to deal with it/them. The SOP should clearly state the risk arising to men, machineries & material from the mining operation / operations to be done by the contractor and how it is to be managed.

4. The contractor shall provide a copy of the SOP to the person designated by the mine owner who shall be supervising the contractor's work.

5. Keep an up to date SOP and provide a copy of changes to a person designated by the Mine Owner /Agent /Manager.

6. Contractor has to ensure that all work is carried out in accordance with the Statute and SOP and for the purpose he may deploy adequate qualified and competent personnel for the purpose of carrying out the job in a safe manner. For work of a specified scope/nature, he should develop and provide to the mine owner a site specific code of practice in line.

7. All persons deployed by the contractor for working in a mine must undergo Mines Vocational Training, initial medical examination, PME. They should be issued cards stating the name of the contractor and the work and its validity period, indicating status of MVT, IME & PME.

8. The contractor shall submit to DGMS returns indicating - Name of his firm, Registration number, Name and address of person heading the firm, Nature of work, type of deployment of work persons, Number of work persons deployed, how many work persons hold VT Certificate, how many work persons undergone IME and type of medical coverage given to the work persons.

9. The return shall be submitted quarterly (by 10th of April, July, October & January) for contracts of more than one year. However, for contracts of less than one year, returns shall be submitted monthly.

10. It will be entirely the responsibility of the Contractor/his Supervisor/representative to ensure strict adherence to all HSE measures and statutory rules during operation in OIL's installations and safety of workers engaged by him. The crew members will not refuse to follow any instruction given by company's Installation Manager / Safety Officer / Engineer / Official / Supervisor/Junior Engineer for safe operation.

11. Any compensation arising out of the job carried out by the Contractor whether related to pollution, Safety or Health will be paid by the contractor only.

12. Any compensation arising due to accident of the Contractor's personnel while carrying out the job, will be payable by the contractor.

13. The contractor shall have to report all incidents including near miss to Installation Manager / departmental representative of the concerned department of OIL.

14. The contractor has to keep a register of the persons employed by him/her. The contractor's supervisor shall take and maintain attendance of his men every day for the work, punctually.

15. If the company arranges any safety class / training for the working personnel at site (company employee, contractor worker, etc) the contractor will not have any objection to any such training.

16. The health check up of contractor's personnel is to be done by the contractor in authorized Health Centers as per OIL's requirement & proof of such test(s) is to be submitted to OIL. The frequency of periodic medical examinations should be every five years for the employees below 45 years of age and every three years for employees of 45 years of age and above.

17. To arrange daily tool box meeting and regular site safety meetings and maintain records.

18. Records of daily attendance, accident report etc. are to be maintained in Form B, E, J (as per Mines Rules 1955) by the contractor.

19. A contractor employee must, while at work, take reasonable care for the health and safety of people who are at the employee's place of work and who may be affected by the employee's act or omissions at work.

20. A contractor employee must, while at work, cooperate with his or her employer or other persons so far as is necessary to enable compliance with any requirement under the act or the regulations that is imposed in the interest of health, safety and welfare of the employee or any other person.

21. Contractor's arrangements for health and safety management shall be consistent with those for the mine owner.

22. In case Contractor is found non-compliant of HSE laws as required company will have the right for directing the contractor to take action to comply with the requirements, and for further non-compliance, the contractor will be penalized prevailing relevant Acts/Rules/Regulations.

23. When there is a significant risk to health, environment or safety of a person or place arising because of a non-compliance of HSE Measures Company will have the right to direct the contractor to cease work until the non-compliance is corrected.

24. The contractor should prevent the frequent change of his contractual employees as far as practicable.

25. The contractor should frame a mutually agreed bridging document between OIL & the contractor with roles and responsibilities clearly defined.

26. For any HSE matters not specified in the contract document, the contractor will abide the relevant and prevailing Acts/rules/regulations/ pertaining to Health, Safety and Environment.

(Seal) Yours Faithfully,

Date_____ M/s._____

FOR & ON BEHALF OF CONTRACTOR

INTEGRITY PACT

Between

Oil India Limited (OIL) hereinafter referred to as "The Principal"

And

(Name of the bidder) ..... hereinafter referred to as "The Bidder/Contractor"

Preamble:

The Principal intends to award, under laid down organizational procedures, contract/s for "**Design and construction of 03 Nos. of substation building and 01 No. of Switch room including supply, installation, testing and commissioning of electrical equipment of 03 Nos. 11KV/415V substation and 01 No. of 11KV/415V Switch room at Duliajan on LSTK basis."**

(IFB No. CDI7408P18)

The Principal values full compliance with all relevant laws and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder/s and Contractor/s.

In order to achieve these goals, the Principal cooperates with the renowned international Non-Governmental Organization "Transparency International" (TI). Following TI's national and international experience, the Principal will appoint an external independent Monitor who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section: 1 - Commitments of the Principal

(1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:

1. No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for him/herself or third person, any material or immaterial benefit which he/she is not legally entitled to.

2. The Principal will, during the tender process treat all Bidders with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidders the same information and will not provide to any Bidder confidential/additional information through which the Bidder could obtain an advantage in relation to the tender process or the contract execution.

3. The Principal will exclude from the process all known prejudiced persons.

(2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the relevant Anti-Corruption Laws of India, or if there be a

Page 2 of 6 substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section: 2 - Commitments of the Bidder/Contractor

(1) The Bidder/Contractor commits itself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

1. The Bidder/Contractor will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or immaterial benefit which h e/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2. The Bidder/Contractor will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, Subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

3. The Bidder/Contractor will not commit any offence under the relevant Anticorruption Laws of India; further the Bidder/Contractor will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

4. The Bidder/Contractor will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

(2) The Bidder/Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.

(3) The Bidder/Contractor signing Integrity Pact shall not approach the Courts while representing the matters to IEMs and he/she will await their decision in the matter.

Section 3 - Disqualification from tender process and exclusion from future Contracts

If the Bidder, before contract award has committed a transgression through a violation of Section 2 or in any other form such as to put his reliability or risibility as Bidder into question, the Principal is entitled to disqualify the Bidder from the tender process or to terminate the contract, if already signed, for such reason.

1. If the Bidder/Contractor has committed a transgression through a violation of Section 2 such as to put his reliability or credibility into question, the Principal is entitled also to exclude the Bidder/Contractor from future contract

award processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressions within the company hierarchy of the Bidder and the amount of the damage. The exclusion will be imposed for a minimum of 6 months and maximum of 3 years.

2. The Bidder accepts and undertakes to respect and uphold the Principal's Absolute right to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining independent legal advice.

3. If the Bidder/Contractor can prove that he has restored/recouped the Damage caused by him and has installed a suitable corruption prevention system, the Principal may revoke the exclusion prematurely.

4. A transgression is considered to have occurred if in light of available evidence no reasonable doubt is possible.

5. Integrity Pact, in respect of a particular contract, shall be operative from the date Integrity Pact is signed by both the parties till the final completion of the contract **or as mentioned in Section 9 - Pact Duration whichever is later**. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.

Section 4 - Compensation for Damages

(1) If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover from the Bidder liquidated damages equivalent to Earnest Money Deposit / Bid Security.

(2) If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the principal shall be entitled to demand and recover from the Contractor liquidated damages equivalent to Security Deposit / Performance Bank Guarantee.

(3) The bidder agrees and undertakes to pay the said amounts without protest or demur subject only to condition that if the Bidder/Contractor can prove and establish that the exclusion of the Bidder from the tender process or the termination of the contract after the contract award has caused no damage or less damage than the amount or the liquidated damages, the Bidder/Contractor shall compensate the Principal only to the extent of the damage in the amount proved.

Section 5 - Previous transgression

(1) The Bidder declares that no previous transgression occurred in the last 3 years with any other Company in any country conforming to the TI approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

(2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section: 6 - Equal treatment of all Bidders/Contractor/Subcontractors

(1) The Principal will enter into Pacts on identical terms with all bidders and contractors.

(2) The Bidder / Contractor undertake(s) to procure from all subcontractors a commitment in conformity with this Integrity Pact. The Bidder/Contractor shall be responsible for any violation(s) of the provisions laid down in this agreement/Pact by any of its sub-contractors/sub-vendors.

(3) The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section: 7 - Criminal charges against violating Bidders/Contractors/ Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor, which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section: 8 - External Independent Monitor/Monitors

(1) The Principal appoints competent and credible external independent Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

(2) The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Chairperson of the Board of the Principal.

(3) The Contractor accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including that provided by the Contractor. The Contractor will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder/Contractor/Subcontractor with confidentiality.

(4) The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

(5) As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or heal the violation, or to take other relevant action. The monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action. However, the Independent External Monitor shall give an opportunity to the bidder / contractor to present its case before making its recommendations to the Principal.

(6) The Monitor will submit a written report to the Chairperson of the Board of the Principal within 8 to 10 weeks from the date of reference or intimation to him by the 'Principal' and, should the occasion arise, submit proposals for correcting problematic situations.

(7) If the Monitor has reported to the Chairperson of the Board a Substantiated suspicion of an offence under relevant Anti-Corruption Laws of India, and the Chairperson has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

(8) The word 'Monitor' would include both singular and plural.

Section: 9 - Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the respective contract, and for all other Bidders 6 months after the contract has been awarded.

If any claim is made/ lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/determined by Chairperson of the Principal.

Section: 10 - Other provisions

(1) This agreement is subject to Indian Law. Place of performance and jurisdiction is the Registered Office of the Principal, i.e. New Delhi. The Arbitration clause provided in the main tender document / contract shall not be applicable for any issue / dispute arising under Integrity Pact.

(2) Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

(3) If the Contractor is a partnership or a consortium, this agreement must be, signed by all partners or consortium members.

(4) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intensions.

.....	.....
For the Principal	For the Bidder/Contractor
Place:	Witness 1: .....
Date:	Witness 2: .....

E-TENDER NO. CDI7408P18

PROFORMA - I

CERTIFICATE OF ANNUAL TURNOVER & NET WORTH

TO BE ISSUED BY PRACTISING **CHARTERED ACCOUNTANTS' FIRM** ON THEIR LETTER HEAD

TO WHOM IT MAY CONCERN

This is to certify that the following financial positions extracted from the audited financial statements of M/s..... (Name of the Bidder) for the last three (3) completed accounting years up to ..... **(as the case may be)** are correct.

YEAR	**TURN OVER** In INR (Rs.) Crores	**NET WORTH** In INR (Rs.) Crores

Place:
Date:

Seal:

Membership Code & Registration No.:
Signature

E-TENDER NO. CDI7408P18

PROFORMA-II

BID FORM

To,
M/s. Oil India Limited,
P.O. Duliajan, Assam, India

Sub: IFB No. CDI7408P18

Gentlemen,

Having examined the General and Special Conditions of Contract and the Terms of Reference including all attachments thereto, the receipt of which is hereby duly acknowledged, we the undersigned offer to perform the services in conformity with the said conditions of Contract and Terms of Reference for the sum of _____ **"NOT TO BE QUOTED HERE"** (Total Bid Amount in words and figures) or such other sums as may be ascertained in accordance with the Schedule of Prices attached herewith and made part of this Bid.

We undertake, if our Bid is accepted, to commence the work as per the terms & conditions set out in the subject tender.

If our Bid is accepted, we will obtain the guarantee of a bank in a sum not exceeding **10% of contract value** for the due performance of the Contract.

We agree to abide by this Bid for a period of **120 days** from the date fixed for Bid closing and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

Until a formal Contract is prepared and executed, this Bid, together with your written acceptance thereof in your notification of award shall constitute a binding Contract between us.

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

Dated this _____ day of _____ 20__.

Authorised Person's Signature: _____

Name: _____

Designation: _____

Seal of the Bidder:

E-TENDER NO. CDI7408P18

PROFORMA-III

STATEMENT OF NON-COMPLIANCE (IF ANY)

(Only exceptions/deviations to be rendered)

1.0 The Bidder shall furnish detailed statement of **exceptions/deviations,** if any, to the IFB stipulations, terms and conditions in respect of each Section of Bid Document in the following format:

Section No.	Clause No. (Page No.)	Non-Compliance	Remarks

Signature of Bidder: _____

Name: _____

NOTE:

OIL INDIA LIMITED expects the bidders to fully accept the terms and conditions of the bid document. However, should the bidders still envisage some exceptions/deviations to the terms and conditions of the bid document, the same should be indicated as per above format and submit along with their bids. If the "**Statement of Non-Compliance**" in the above Proforma is left blank (or not submitted along with the Bid), then it would be constructed that the bidder has not taken any exception/deviation to the IFB requirements.

E-TENDER NO. CDI7408P18

PROFORMA-IV

LETTER OF AUTHORITY FOR ATTENDING BID OPENING

TO
CGM – CONTRACTS
OIL INDIA LIMITED
P.O. Duliajan - 786 602
Assam, India

Sir,

Sub: **OIL's IFB No. CDI7408P18**

I / We _____ confirm that Mr. _____ (Name and address) as authorized to represent us during bid opening on our behalf with you against IFB Invitation No. **CDI7408P18** for **"Design and construction of 03 Nos. of substation building and 01 No. of Switch room including supply, installation, testing and commissioning of electrical equipment of 03 Nos. 11KV/415V substation and 01 No. of 11KV/415V Switch room at Duliajan on LSTK basis."**

We confirm that we shall be bound by all and whatsoever our said representative shall commit.

Yours Faithfully,

Authorised Person's Signature: _____

Name: _____

Signature of Bidder: _____

Name: _____

Date: _____

E-TENDER NO. CDI7408P18

PROFORMA-V

DETAILS OF BIDDER
(WHEREVER APPLICABLE, TO BE FILLED BY THE BIDDER)

a.	Name of the Bidder / Firm:		
b.	Registered postal address with PIN code:		
c.	Telephone No:		
d.	Mobile No:		
e.	E-mail ID:		
f.	Fax No:		
g.	Contact Person:		
h.	Contact person's contact No:		
i.	PAN No:		
j.	Bidder's Bank details:	Name: Address: A/c Type: A/c No.: IFSC/RTGS Code: NEFT Code:	
k.	EMD / Bid Security Details:		
	EMD / Bid Security Deposited vide: (Tick √ whichever is applicable)	ONLINE PAYMENT	BANK GUARANTEE (BG)
	EMD Instrument No. & Date:		
	Validity of BG: (If EMD submitted vide BG)		
	Name & Address of EMD issuing Bank / Branch (only in case of EMD submitted in the form of BG)		
l.	GST Regn. No. (If not available then to be submitted on issuance of LOA)		
m.	PF code no. (Or a declaration by the applicant that provisions of Provident Fund Act is not applicable to them. In case P.F. is required to be deposited later on, the same will be deposited by the bidder)		
n.	Vendor code with OIL (if available)		

Signature: _____

Name in Block letters _____

For M/S. _____

PROFORMA-VI

STANDARD FORMAT OF PERFORMANCE SECURITY (BANK GUARANTEE)
(TO BE FURNISHED BY THE CONTRACTOR IN CASE OF SUBMITTING PERFORMANCE SECURITY IN THE FORM OF BANK GUARANTEE AFTER ISSUE OF LOA)

To,
M/s. OIL INDIA LIMITED,
CONTRACTS DEPARTMENT
DULIAJAN, ASSAM, INDIA, PIN - 786 602.

WHEREAS _____ (Name and address of Contractor) (hereinafter called "Contractor") had undertaken, in pursuance of Contract No. _____ to execute (Name of Contract and Brief Description of the Work) _____ (hereinafter called "the Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee as security for compliance with Contractor's obligations in accordance with the Contract.

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee; NOW THEREFORE we hereby affirm that we are Guarantors on behalf of the Contractor, up to a total of (Amount of Guarantee in figures) _____ (in words _____), such amount being payable in the types and proportions of currencies in which the Contract price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of guarantee sum as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein. We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or the work to be performed thereunder or of any of the Contract documents which may be made between you and the Contractor shall in any way cease us from any liability under this guarantee, and we hereby waive notice of such change, addition or modification.

This guarantee is valid until the _____day of _____

The details of the Issuing Bank and Controlling Bank are as under:

A. Issuing Bank:

BANK FAX NO:

BANK EMAIL ID:

BANK TELEPHONE NO.:

IFSC CODE OF THE BANK:

B. Controlling Office:

Address of the Controlling Office of the BG issuing Bank:

Name of the Contact Person at the Controlling Office with Mobile No. and e-mail address:

Contd.....P/2

SIGNATURE AND SEAL OF THE GUARANTORS _____
Designation _____
Name of Bank _____
Address _____

Witness _____
Address _____
_____

Date .....
Place _____

Note:

The Bank Guarantee issuing bank branch must ensure the following:

The Bank Guarantee issued by the bank must be routed through SFMS platform as per the following details:

i) "MT 760 / MT 760 COV for issuance of bank guarantee.
ii) "MT 760 / MT 767 COV for amendment of bank guarantee.

The above message/intimation shall be sent through SFMS by the BG issuing bank branch to Axis Bank, Duliajan Branch, IFS Code – UTIB0001129, Branch address – AXIS Bank Ltd., Duliajan Branch, Daily Bazar, Jyotinagar, Duliajan, District Dibrugarh, PIN – 786602.

PROFORMA-VII

FORM OF BID SECURITY (BANK GUARANTEE)

To:
M/s. OIL INDIA LIMITED,
CONTRACTS DEPARTMENT,
DULIAJAN, ASSAM, INDIA, PIN - 786 602.

WHEREAS, (Name of Bidder) _____ (hereinafter called "the Bidder") has submitted their offer Dated _____ for the provision of certain services (hereinafter called "the Bid") against OIL INDIA LIMITED, Duliajan, Assam, India (hereinafter called the Company)'s Tender No. _____ KNOW ALL MEN BY these presents that we (Name of Bank) _____ of (Name of Country) _____ having our registered office at _____ (hereinafter called "Bank") are bound unto the Company in the sum of (*_____) for which payment well and truly to be made to Company, the Bank binds itself, its successors and assignees by these presents.

SEALED with the said Bank this ___ day of _____ 20_____.

THE CONDITIONS of these obligations are:

1. If the Bidder withdraws their Bid within its original/extended validity; or
2. The Bidder modifies/revises their bid suomoto; or
3. The Bidder does not accept the contract; or
4. The Bidder does not furnish Performance Security Deposit within the stipulated time as per tender/contract; or
5. If it is established that the Bidder has submitted fraudulent documents or has indulged into corrupt and fraudulent practice.

We undertake to pay to Company up to the above amount upon receipt of its first written demand (by way of letter/fax/cable), without Company having to substantiate its demand provided that in its demand Company will note that the amount claimed by it is due to it owing to the occurrence of any of the conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including the date (**--/--/--) and any demand in respect thereof should reach the Bank not later than the above date.

The details of the Issuing Bank and Controlling Bank are as under:

A. Issuing Bank:

   BANK FAX NO:
   BANK EMAIL ID:
   BANK TELEPHONE NO.:
   IFSC CODE OF THE BANK:

B. Controlling Office:
   Address of the Controlling Office of the BG issuing Bank:
   Name of the Contact Person at the Controlling Office with Mobile No. and e-mail address:

Contd.....P/2

SIGNATURE AND SEAL OF THE GUARANTORS _____

Name of Bank & Address _____

Witness _____
Address _____
_____
(Signature, Name and Address)
Date: _____
Place: _____

* The Bidder should insert the amount of the guarantee in words and figures.
** Date of expiry of Bank Guarantee should be minimum 30 days after the end of the validity period of the Bid /as specified in the Tender.

Note:

The Bank Guarantee issuing bank branch must ensure the following:

The Bank Guarantee issued by the bank must be routed through SFMS platform as per the following details:

i) "MT 760 / MT 760 COV for issuance of bank guarantee.
ii) "MT 760 / MT 767 COV for amendment of bank guarantee.

The above message/intimation shall be sent through SFMS by the BG issuing bank branch to Axis Bank, Duliajan Branch, IFS Code – UTIB0001129, Branch address – AXIS Bank Ltd., Duliajan Branch, Daily Bazar, Jyotinagar, Duliajan, District Dibrugarh, PIN – 786602.

PROFORMA-VIII

Proforma of Bank Guarantee towards Purchase Preference – Local Content

Ref. No._____ Bank Guarantee No. _____
Dated _____

To
Oil India Limited
_____
_____
India

Dear Sirs,

1. In consideration of _____ _____ (hereinafter referred to as OIL, which expression shall, unless repugnant to the context or meaning thereof, include all its successors, administrators, executors and assignees) having entered into a CONTRACT No._____ dated _____ (hereinafter called 'the CONTRACT' which expression shall include all the amendments thereto) with M/s _____ having its registered/head office at _____(hereinafter referred to as the 'CONTRACTOR') which expression shall, unless repugnant to the context or meaning thereof include all its successors, administrators, executors and assignees) and OIL having agreed that the CONTRACTOR shall furnish to OIL a Bank guarantee for India Rupees/US$ _____ for the faithful fulfillment of conditions pertaining to Local Content in accordance with the value mentioned in the certificate of Local Content submitted by the contractor for claiming purchase preference under the Purchase Preference Policy (linked with Local Content).

2. We (name of the bank) _____ registered under the laws of _____ having head/registered office at _____ (hereinafter referred to as "the Bank", which expression shall, unless repugnant to the context or meaning thereof, include all its successors, administrators, executors and permitted assignees) do hereby guarantee and undertake to pay to OIL immediately on first demand in writing any / all money to the extent of Indian Rs./US$ (in figures) _____ (Indian Rupees/US Dollars (in words) _____) without any demur, reservation, contest or protest and/or without any reference to the CONTRACTOR. Any such demand made by OIL on the Bank by serving a written notice shall be conclusive and binding, without any proof, on the bank as regards the amount due and payable, notwithstanding any dispute(s) pending before any Court, Tribunal, Arbitrator or any other authority and/or any other matter or thin whatsoever, as liability under these presents being absolute and unequivocal. We agree that the guarantee herein contained shall be irrevocable and shall continue to be enforceable until it is discharged by OIL in writing. This guarantee shall not be determined, discharged or affected by the liquidation, winding up, dissolution or insolvency of the CONTRACTOR and shall remain valid, binding and operating against the bank.

Contd.....P/2

3. The Bank also agrees that OIL at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance, without proceeding against the CONTRACTOR and notwithstanding any security or other guarantee that OIL may have in relation to the CONTRACTOR's liabilities.

4. The Bank further agrees the OIL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said CONTRACT or to extend time of performance by the said CONTRACTOR(s) from time to time or to postpone for any time or from time to time exercise of any of the powers vested in OIL against the said CONTRACTOR(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relived from our liability by reason of any such variation, or extension being granted to the said CONTRACTOR(s) or for any forbearance, act or omission on the part of OIL or any indulgence by OIL to the said CONTRACTOR(s) or any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

5. The Bank further agrees that the Guarantee herein contained shall remain in full force during the period that is taken for the performance of the CONTRACT and all dues of OIL under or by virtue of this CONTRACT have been fully paid and its claim satisfied or discharged or till OIL discharges this guarantee in writing, whichever is earlier.

6. This Guarantee shall not be discharged by any change in our constitution, in the constitution of OIL or that of the CONTRACTOR.

7. The Bank confirms that this guarantee has been issued with observance of appropriate laws of the country of issue.

8. The Bank also agrees that this guarantee shall be governed and construed in accordance with Indian Laws and subject to the exclusive jurisdiction of Indian Courts of the place from where the purchase CONTRACT has been placed.

9. Notwithstanding anything contained herein above, out liability under this Guarantee is limited to Indian Rs. /US$(in figures) _____ (Indian Rupees/US Dollars (in words) _____) and our guarantee shall remain in force until _____ (indicate the date of expiry of bank guarantee).

Any claim under this Guarantee must be received by us before the expiry of this Bank Guarantee. If no such claim has been received by us by the said date, the rights of OIL under this Guarantee will cease. However, if such a claim has been received by us within the said date, all the rights of OIL under this Guarantee shall be valid and shall not cease until we have satisfied that claim.

In witness whereof, the Bank through its authorized officer has set its hand and stamp on this _____ date of _____ 20___ at _____

Contd.....P/3

WITNESS NO.1

_____
(Signature)
Full name and official address
(in legible letters)
Stamp

_____
(Signature)
Full name, designation and address
(in legible letters)
With Bank

Attorney as per power of
Attorney No._____
Dated _____

WITNESS NO.2

_____
(Signature)
Full name and official address
(in legible letters)
Stamp

PROFORMA-IX

AGREEMENT FORM

This Agreement is made on ____ day of _____ between Oil India Limited, a Government of India Enterprise, incorporated under the Companies Act 1956, having its registered office at Duliajan in the State of Assam, hereinafter called the "Company" which expression unless repugnant to the context shall include executors, administrators and assignees on the one part, and M/s. _____ (Name and address of Contractor) hereinafter called the "Contractor" which expression unless repugnant to the context shall include executors, administrators and assignees on the other part,

WHEREAS the Company desires that Services _____ (brief description of services) should be provided by the Contractor as detailed hereinafter or as Company may requires;

WHEREAS, Contractor engaged themselves in the business of offering such services represents that they have adequate resources and equipment, material etc. in good working order and fully trained personnel capable of efficiently undertaking the operations and is ready, willing and able to carry out the said services for the Company as per Section-II attached herewith for this purpose and

WHEREAS, Company had issued a firm Letter of Award No. _____ dated _____ based on Offer No. _____ dated _____ submitted by the Contractor against Company's IFB No. _____ and the Contractor accepted the same vide Letter No. _____ dated _____**.** All these aforesaid documents shall be deemed to form and be read and construed as part of this agreement/contract. However, should there be any dispute arising out of interpretation of this contract in regard to the terms and conditions with those mentioned in Company's tender document and subsequent letters including the Letter of Intent and Contractor's offer and their subsequent letters, the terms and conditions attached hereto shall prevail. Changes, additions or deletions to the terms of the contract shall be authorized solely by an amendment to the contract executed in the same manner as this contract.

NOW WHEREAS, in consideration of the mutual covenants and agreements hereinafter contained, it is hereby agreed as follows -

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.

2. In addition to documents herein above, the following Sections and Annexures attached herewith shall be deemed to form and be read and construed as part of this agreement viz.:

(a) PART-I	indicating the General Conditions of this Contract;
(b) PART-II	indicating the Schedule of work, unit, quantities & rates;
(c) PART-III	indicating the Special Conditions of Contract;
(d) PART-V	indicating the Safety Measures.

3. In consideration of the payments to be made by the Company to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Company to provide the Services and to remedy defects therein in conformity in all respect with the provisions of this Contract.

4. The Company hereby covenants to pay the Contractor in consideration of the provision of the Services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of this Contract at the times and in the manner prescribed by this Contract.

Contd.....P/2

IN WITNESS thereof, each party has executed this contract at Duliajan, Assam as of the date shown above.

Signed, Sealed and Delivered,

For and on behalf of Company (Oil India Limited)	for and on behalf of Contractor (M/s. _____)
Name:	Name:
Status:	Status:
In presence of	In presence of
1.	1.
2.	2.