BID SPECIFICATION NO, RVPN/SE(T&C-JPR City)/33KV System/Sitapura/2019-20 /UBN-VPN19200B

SPPP NIB No
Bids are hereby invited in **e-Bid system** for incorporation of 33kV System alongwith 132/33kV Transformer at 220kV GSS Sitapura, Jaipur. Bids are to be submitted online in electronic format on website [http://eproc.rajasthan.gov.in](http://eproc.rajasthan.gov.in). The Bid document/ specification can be downloaded from above mentioned website.

(To be filled)

**GENERAL DETAIL OF WORKS:**

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<tbody>
<tr>
<td>A</td>
<td>BID No.</td>
<td>SE/T&amp;C /Jaipur City/2019-20/ UBN-VPN</td>
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<tr>
<td>B</td>
<td>Work Description</td>
<td>Incorporation of 33kV System along with 132/33kV Transformer at 220kV GSS Sitapura, Jaipur</td>
</tr>
<tr>
<td>C</td>
<td>Cost of Bid Specification</td>
<td>Rs. 1180/- (Rs. 1000 +18%GST) (One Thousand One hundred and eighty Only)</td>
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<tr>
<td>D</td>
<td>Processing Fee of RISL</td>
<td>Rs.1180 (One Thousand One hundred and eighty Only)</td>
</tr>
<tr>
<td>E</td>
<td>Bid Security</td>
<td>Amount of Bid Security: Rs. 11,500/- Only (Rupees Eleven Thousands and five hundred only) by Demand Draft (DD)/Banker’s Cheque in favour of Account Officer (T&amp;C-Jaipur City) or in the form of Bank Guarantee in favor of Superintending Engineer(T&amp;C-Jaipur City).</td>
</tr>
<tr>
<td>F</td>
<td>Estimated Cost</td>
<td>Rs. 5.69 Lac (Approx.) including GST @18%</td>
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<tr>
<td>G</td>
<td>Validity</td>
<td>120 days after the date of Bid Opening</td>
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<tr>
<td>H</td>
<td>Bidding Procedure</td>
<td>Two Part Bidding Procedure</td>
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**IMPORTANT DATES:**

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<tr>
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<th>Events</th>
<th>Date &amp; Time</th>
<th>Location</th>
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<tbody>
<tr>
<td>(i)</td>
<td>Date of downloading of Bid specification</td>
<td>From [28.6.2019 (11:00 AM)] To [28.6.2019 (5:00 PM)]</td>
<td><a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a></td>
</tr>
<tr>
<td>(ii)</td>
<td>Deposit of Cost of Bid Specification, Processing Fee &amp; Bid Security</td>
<td>Up to [1.7.2019 (2:30 PM)]</td>
<td>Accounts Officer (T&amp;C Jaipur City ), RVPN Ltd., Jaipur</td>
</tr>
</tbody>
</table>

Signature with seal of bidder
| (iii) | Date of Pre-bid meeting | 2-3-2019 (11:00 AM) | Office of the Superintending Engineer (T&C-Jaipur City), Rajasthan Rajya Vidyut Prasaran Nigam Limited, Heerapura, Jaipur |
| (iv) | Start date & time of submission of electronic bid | 4-5-2019 (11:00 AM) | http://eproc.rajasthan.gov.in |
| (v) | Last date & time of submission of electronic bid | Up to 7-7-2019 (Up to 6:00 PM) | http://eproc.rajasthan.gov.in |
| (vi) | Opening of Techno-Commercial Bid | On 5-7-2019 (11:00 AM) | http://eproc.rajasthan.gov.in |
| (vii) | Opening of Price Bid | To be intimated separately to the qualified bidders through e-procurement portal | http://eproc.rajasthan.gov.in |

**NOTE:**

1. The bidders are requested to submit their bids prior to last date of submission to avoid Non-submission of their bids up to prescribed date due to non-availability of hanging of website at last moments. The date of submission of bids will not be extended if system is hanging up in last hours or congestion.

2. Furnishing of Bid Security /Exemption certificate as per clause No.1.03 of Section-I of this specification is essential otherwise the electronic bid will not be opened. The bid security is 2% of the estimated value of Bid.

In lieu of bid security, Departments' of the Rajasthan State Government and Undertakings, Corporations, Autonomous bodies, Registered Societies, Cooperative Societies which are owned or controlled or managed by the Rajasthan State Government and Government Undertakings of the Central Government may furnish bid securing declaration in the prescribed format. Every bidder, if not exempted, participating in the procurement process shall be required to furnish the bid security as specified in the notice inviting bids.

3. (i) The bidder will have to deposit prescribed cost of Bid specification by DD/Banker's Cheque, payable in favor of Accounts Officer (T&C-Jaipur City), RVPN Ltd., Jaipur up to stipulated date & time in the office of the A.O. (T&C Jaipur City), Heerapura, Jaipur-302021 and obtain a receipt thereof.

(ii) The bidder will have to deposit prescribed Bid Security by DD/Banker’s Cheque payable in favor of Accounts Officer (T&C Jaipur City), RVPN Ltd., Jaipur payable at Jaipur or Bank guarantee in favor of the Superintending Engineer(T&C Jpr City), RVPN, Jaipur in prescribed format (Annexure-III) up to stipulated date & time in the office of the A.O. (T&C Jaipur City), Heerapura, Jaipur-302021 and obtain a receipt/ acknowledgement thereof and they shall upload the receipt/ acknowledgement along with their online bid.

(iii) The bidder will have to submit prescribed processing fee by DD/Banker’s Cheque in favor of M.D, RISL payable at Jaipur with the SE (T&C Jpr City). RVPN, Jaipur up to stipulated date & time and obtain a acknowledgement thereof.

4. Bid security is to be furnished also by the Vendors registered with the NIGAM.

5. The Central and State Govt. undertakings/Corporations and companies are exempted.

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2
Signature with seal of bidder
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from furnishing of bid security. However, they have to upload copy of certificate/documentary evidence in support of their being Govt. undertaking, with their bid.

6. Technical and Commercial deviations, if any, shall only be mentioned in 'Schedule-III Section IV 'Departure from Specification' attached with this specification. Mentioning of such deviations elsewhere in the offer will not be considered as deviation.

7. The printed terms and conditions of firms, if any, attached with the Bid will not be considered. RVPN shall have right to accept or reject these deviations.

8. Offers of bids without Schedules and without relevant documents with respect to qualifying requirements shall not be considered.

9. Any cutting/ over writing in the figures of Bided documents should also be clarified / indicated in words duly signed.

10. The bidders are required to furnish the clarification/confirmation/ documents sought subsequent to opening of bid within specified time failing which, the case shall be finalized/decided on the basis of available information. The responsibility of being ignored on account of delay in furnishing of desired information/documents shall be of the bidder.

11. The Bid documents can be downloaded from web site http://eproc.rajasthan.gov.in Details of this Bid notification and pre-qualification criteria can also be seen in BID exhibited on website http://eproc.rajasthan.gov.in & www.energy.rajasthan.gov.in Bids are to be submitted online in electronic format only on website http://eproc.rajasthan.gov.in.

12. The bidders who are interested in bidding can download Bid documents from http://eproc.rajasthan.gov.in up to the stipulated date & time.

13. Bidders who wish to participate in this Bid will have to register on http://eproc.rajasthan.gov.in (bidders registered on eproc.rajasthan.gov.in before 30.09.2011 need to register again). To participate in online Bids, bidders will have to procure Digital Signature Certificate (Type-II or Type-III) as per Information Technology Act-2000 by using which they can sign their electronic bids. Bidders can procure the same from any CCA approved certifying agency i.e TCS, Safe crypt, N-code- etc. or they may contact e-Procurement Cell, Department of IT & C, Government of Rajasthan for future assistance. Bidders who already have a valid Digital Certificate need not to procure a new Digital Certificate.

Contact No. 0141 – 4022688 (Help desk 10.00 AM to 6.00 PM on all working days)
e-mail eproc@rajasthan.gov.in
Address: e-Procurement Cell, RISL, Yojana Bhawan, Tilak Marg, C-Scheme, Jaipur

14. Bidder shall submit their offer online in electronic formats both for technical and financial proposals. However, cost of specification and Bid Security in the office of A.O. (T&C Jaipur City), Heerapura, Jaipur-302021 and Processing Fee with SE (T&C), RVPN, Jaipur City should be submitted physically at the respective offices, up to stipulated date & time. The Bidder shall upload scanned copies of receipts / acknowledgement of above fee documents along with their online bid.

15. Before electronically submitting the Bids, it should be ensured that all the Bid papers including conditions of contract are digitally signed by the Bidder.

16. Bidders are also advised to refer "Bidders Manual" available under "Downloads" section for further details about the e-Bidding process.

17. The online Bids will have to be digitally signed and submitted in time specified on http://eproc.rajasthan.gov.in in the following manner:-

Signature with seal of bidder
ONLINE SUBMISSION:
The Bidder have to submit their bid in 3 covers comprises of
(a) Cover 1 (.pdf) : FEE (scanned copies)
(i) Proof of depositing cost of Bid specification i.e. the receipt issued by the Accounts Officer (T&C Jaipur City), RVPN, Jaipur on account of depositing the cost of Bid specification through DD/Banker’s Cheque payable in favor of Accounts Officer (T&C Jaipur City), RVPN Ltd., Jaipur.

(ii) Proof of submitting Processing Fee i.e. the acknowledgement issued by the Accounts Officer (T&C Jaipur City), RVPN Ltd., Jaipur on account of depositing the processing fee through DD/Banker’s Cheque in favour of M.D, RISL payable at Jaipur.

(iii) (a) Proof of depositing bid security i.e. the receipt/ acknowledgement issued by the Accounts Officer (T&C Jaipur City), RVPN, Jaipur on account of depositing bid security through DD/Banker’s Cheque payable in favour of Accounts Officer (T&C Jaipur City), RVPN Ltd., Jaipur or bank guarantee in prescribed format.

(b) Cover 2 (.pdf): TECHNO COMMERCIAL BID (scanned copies)
The technical information has to be prepared very carefully since it will be the basis for the pre-qualification of bidders. Only relevant and to the point information should be indicated. Bidders should neither supply information not requested in the specification nor make any comments. Failure to provide any required information, may lead to the rejection of the offer. Bidder must read Section-I, Section-II, Section-III & Appendix of specification very carefully before signing the contract. Similarly, Schedules-I to IV of Section-IV, Documents in support of qualifying requirement etc. must be signed digitally on each & every page by the authorized representative of the firm after filling requisite information/details, desired in the specification & PQR (Pre-Qualifying Requirement).

(c) Cover 3 (.xls) : FINANCE : PRICE BID
This cover consists of price schedules-I (BOQ1) for incorporation of 33kV System along with 132/33kV Transformer at 220kV GSS Sitapura, Jaipur under jurisdiction of this circle T&C-JPR City. The Bidder must quote the prices in the manner as indicated in the Price schedules, failing which Bid is liable for rejection. The rates/prices shall be entered in figures. These schedule(s) must be digitally signed by the authorized representative of the firm.

18. The bidder, if is a Micro, Small or Medium enterprise as per the Micro, Small & Medium enterprise development act, 2006 (MSMED Act 2006) and registered with the authorities under the above Act for the items/services covered under this Bid, then the firm has to indicate the Entrepreneurs Memorandum No. (Twelve Digit) and scanned copy of the certificate issued by the Authorities under the MSMED Act, 2006 should be uploaded along with the online bid.

19. Payment shall be made to the contractor through RTGS/NEFT for quick and safe transfer of funds across the country. The charges for transfer through RTGS/NEFT shall be on the part of the contractor. The contractor shall furnish particulars to the payment making authorities of RVPN in prescribed format to be provided by the purchaser.

20. This specification includes Section-I, Section-II, Section-III, Section-IV (Schedules), Annexure and Appendix.
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Signature with seal of bidder
SECTION - I
INSTRUCTIONS TO BIDDERS

1.01 INTRODUCTION:
The Bidder, in his own interest is requested to read very carefully these instructions and the terms and conditions as incorporated in Section II & III before filling the Bid form. Submission of the Bid shall be deemed to be the conclusive proof of the fact that the Bidder has acquainted himself and is in agreement with all the instructions, terms and conditions governing the specification, unless otherwise specifically indicated / commented by him in his Bid.

1.02 FILLING OF BIDS:
(a). Before submission of the tender, the bidders are requested to make themselves fully conversant with the technical specification, nature of work, the site conditions and general conditions of contract etc. so that no ambiguity arises at a later date in this respect. They may visit the actual site working conditions and nature of work.

(b). Only such firms who are themselves capable of carrying out the work and can produce satisfactory evidence that they have necessary experience and the required man power and T & P etc. for handling such jobs, needs to apply for bid online.

(c). Bidders are requested to adhere to all clauses of the contract form and general conditions to facilitate finalization of the contract. Any clarification with regard to the specification should be sought for by the bidder before submission of the tender. No correspondence on this account will be entertained once the technical bid had been opened on e-portal.

(d). If the bidders deliberately give wrong information in his tender, RVPN is reserves right to reject such bid at any stage.

(e). Not more than one bid for a work will be submitted by one contractor or one firm of contractor.

(f). RVPN shall not be liable for expenses incurred by the bidder in the preparation of the bid whether his bid is accepted or not.

(g). Bids shall be submitted online in the electronic format attached hereto and all blanks in the Bid and the schedule to the specification shall be duly filled in. The completed forms, schedule(s) shall be considered as part of the contract documents in the case of successful Bidder(s).

(h). No alteration should be made to the format / rates of the Bid specification and schedules. The Bidder must comply entirely with specification.

(i). The Bid and all accompanying documents shall be in Hindi/English Language and shall be digitally signed by a responsible and authorized representative of firm. The name, designation and authority of the signatory shall be stated in the Bid.

(j). Bid should be filled in only with ink or typed and must be submitted online after signing digitally.

(k). All additions, alterations and over-writings in the Bid must be clearly initialed by the Signatory to the Bid.

(l). The Bidder must quote the prices strictly in the manner as indicated herein, failing which Bid is liable for rejection. The rates/prices shall be entered in figures only. These must not contain any additions, alterations, over-writing, cuttings or corrections and any other marking which leave any room for doubt.

Signature with seal of bidder
(m). The NIGAM will not be responsible to accept any cost involved in the preparation or submission of Bids.

(n). Any printed conditions of sale on the Bid shall not be accepted by the NIGAM. The Bidder shall incorporate his conditions of sales, if any, in the text of the Bid itself.

(o). All Bids and accompanying documents will have to be digitally signed and submitted in time specified on http://eproc.rajasthan.gov.in.

(p). The Bidder should digitally sign the Bid form at each every page at the end.

1.03 BID SECURITY:

(a) The Bidder shall furnish prescribed Bid Security by DD/ Banker's Cheque payable in the name of Accounts Officer (T&C Jaipur City), RVPN Ltd., Jaipur or Bank guarantee in favor of the Superintending Engineer(T&C Jpr City), RVPN, Jaipur in prescribed format (Annexure-III) up to stipulated date & time and obtain a receipt/acknowledgement thereof. No other mode of deposit shall be accepted.

(b) Any Bid not accompanied by a copy of receipt/ acknowledgement for cost of Bid Specification, Processing Fee and bid security / Exemption Certificate shall be rejected and the Bid will not be opened.

(c) The bid security of unsuccessful bidders shall be refunded soon after final acceptance of successful bid(s) and signing of contract agreement and submitting performance security either in form of bank guarantee (B.G.) or crossed Bank Draft or by furnishing an undertaking for deduction of performance security from his each running and final bill @ 10% of the amount of the bill by successful bidder(s). In case of the successful bidder, the amount of bid security may be adjusted in arriving at the amount of the Performance Security, or refunded if the successful bidder furnishes the full amount of performance security.

(d) Request for adjustments/proposal for acceptance of bid security, if any, already lying with the NIGAM in connection with some other Bids/orders shall not be entertained.

(e) No interest shall be payable on such deposits.

(f) The purchaser reserves the right to forfeit bid security or a part thereof in circumstance, which according to him indicate that the Bidder is not earnest in accepting/ executing any order placed under the specification.

(g) Bid security is to be furnished also by the Vendors registered with the NIGAM.

(h) A pre-bid conference is also scheduled to clarify doubts within the period specified in the NIB of the Prospective bidders who have deposited the cost of bid specification as per the details mentioned in the clause No.1.16 of Section-I. The minutes and response shall be provided promptly to all bidders and shall be published on the respective websites.

1.04 DOCUMENTS TO BE UPLOADED WITH THE BID:

Each Bid in electronic format shall be accompanied with the following schedules, documents and the fact of their having been enclosed should be as per Bid specification. All Bids and accompanying documents will have to be digitally signed and submitted in time specified on http://eproc.rajasthan.gov.in. The Bid which is not accompanied by any or all of

The following schedules, documents or is accompanied by incomplete Annexure / Schedules is liable for rejection:

(a) Cover 1 (.pdf) : FEE (scanned copies)
   (i) Proof of depositing cost of Bid specification
   (ii) Proof of submitting processing fee
   (iii) Proof of depositing bid security / Exemption certificate

(b) Cover 2 (.pdf) : TECHNO COMMERCIAL BID (scanned copies)
   (i) Section - I - Instructions to Bidders

Signature with seal of bidder
(ii) Section – II - General Conditions of Contract including Erection
(iii) Section – III – Scope and Technical Specification of the work
(iv) Appendix – Annexure A to D and Appendix-II
(v) Section – IV – Schedules (I to VI)
(vi) Documents in support of Qualifying Requirement etc.

The above information should be prepared very carefully since it will be the basis for the pre-qualification of bidders. Only relevant and to the point information shall be indicated. Failure to provide any required information may lead to the rejection of the offer. All above documents are to be digitally signed on each & every page by the authorized representative of the firm after filling requisite information/details desired in the specification & PQR. Departure from specification (Technical & Commercial) shall only be given in Schedule-III. Deviations indicated elsewhere will be ignored.

(c) Cover 3 (.xls): PRICEBID: PRICE SCHEDULES (Section – IV, Schedule – I)

This cover consists of price schedules-(BOQ) for Incorporation of 33kV System along with 132/33kV Transformer at 220kV GSS Sitapura, Jaipur under jurisdiction of this circle T&C-JPR City. The Bidder must quote the prices in the manner as indicated in the Price schedule(s), failing which Bid is liable for rejection. The rates/prices shall be entered in figures in % Excess/Less. These schedule(s) must be digitally signed by the authorized representative of the firm. The opening date for this shall be intimated later on.

1.05 BID FORMAT, SUBMISSION AND OPENING OF BIDS

(a) Bidder shall submit their bid in electronic format by digitally signing the same. Bidder shall procure Digital Signature Certificate (DSC) as per IT Act - 2000.
(b) The documents listed in ITT (Instructions To Bidders) clauses, along with addendum’s issued till date & time of bid submission, shall be filed by the bidder to bind the bidder to contract. All pages of the bid shall be stamped and digitally signed.
(c) All omissions in the schedule of price must be serially numbered and digitally attested by the officer opening the bids, so as to make further dispute impossible on this score.
(d) Bidders who have to participate in this Bid will have to register on http://eproc.rajasthan.gov.in. Further bidders who have to participate in online Bids will have to procure digital signature certificate as per IT act so that they can sign their electronic bids.
(e) Before electronic submission of Bid, it should be ensured that Section-I, Section-II, Section-III & Appendixes of the Bid specification are digitally signed by the Bidder.
(f) All Bids, in which any of the prescribed conditions are not fulfilled or which have been vitiated by errors in calculations, totaling or other discrepancies or which contain overwriting in figures or words or corrections not initialed and dated, may be liable to rejection.
(g) The electronically received bids will be opened in the office of the Superintending Engineer (T&C Jaipur City) on stipulated date & time in the presence of such Bidders or their authorized representative, who choose to be present.
(h) The opening of Bid shall not be witnessed by a Bidder or Bidders who himself / themselves has / have not bided for the same work.
   a) In case, the date fixed for opening of the Bids be declared as a public holiday, the bid shall be opened on the next date on which office re-opens after such holiday(s).
   b) Evaluation of bid:- Prior to the detailed evaluation, the Owner will determine whether each Bid is complete and is substantially responsive to the Bidding Documents. If a Bid is not substantially responsive, it will be rejected by the Owner, and may not subsequently be made responsive by the Bidder by correction of the nonconformity. The Owner's determination of a Bid's responsiveness is to be based on the contents of the Bid itself without recourse to extrinsic evidence.
   (k) The Owner will first carry out a detailed evaluation of the techno-commercial Bids (First Part of Two Part Bid) of the Bidders found meeting the requirements of Bid Security and other instructions mentioned in the Bid document in order to determine whether the technical & commercial aspects are in accordance with the requirements set forth in the Bidding Documents. In order to reach such a determination, the Owner will examine and compare the Qualification Requirements and technical & commercial aspects of the Bids
on the basis of the information supplied by the Bidders, taking into account the following factors:

(a) Meeting of Qualification Requirements

i) In the absence of pre-qualification, the Owner will determine to its satisfaction whether the Bidder is qualified, as per the Qualification Requirement specified in Bid document, to satisfactorily perform the contract. The Owner shall be the sole judge in this regard and the Owner’s interpretation of the Qualification Requirement shall be final and binding.

ii) The determination will take into account the Bidder’s financial, technical capabilities, in particular the Bidder’s contract work in hand, future commitments & current litigation and past Performance. It will be based upon an examination of the documentary evidence of the Bidder’s qualifications submitted by the Bidder in Attachment to the Bid, as well as such other information as the Owner deems necessary and appropriate.

(b) Overall completeness and compliance with the Specifications, deviations from the Technical Specifications & Commercial Requirements as identified in the Bid. The Bid that does not meet minimum acceptable standards of completeness, consistency and detail will be rejected for non-responsiveness.

The price part (Second Part of Two Part Bid) of the Bids of the techno-commercially qualified Bidders i.e. found suitable/ responsive after scrutiny/evaluation shall only be opened.

(i) Price Evaluation: The comparison shall be on the total price in Price Schedule-l. All applicable taxes shall also be taken into account while evaluating the Prices.

1.06 VALIDITY OF OFFERS:

Bids shall be valid for a minimum period of 120 days after the date of opening of Bid. Bids mentioning a shorter validity period than specified are likely to be rejected / ignored.

1.07 SIGNATURE OF BIDDER:

The Bid must contain the name, designation and place of business of the person or persons making the Bid and must submit online, placing them in 3 covers after filling & signing digitally with his DSC (Digital signature). Bid by a partnership firm must be furnished with full names of all the partners and should be signed digitally by one of the member of partnership firm or by a authorized representative indicating the designation of the person or persons, with authority letter signed by the Chairman/ Secretary other person authorized to bind the Corporation/ Company in the matter.

1.08 QUALIFYING REQUIREMENT:

Qualification of Bidder will be based on meeting the minimum pass / fail criteria specified in table below regarding the Bidder’s technical experience and financial position as demonstrated by the Bidder’s responses in the corresponding Bid Schedules.

The Bidder shall be required to furnish the information as detailed hereunder:

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<tr>
<th>Sr. No.</th>
<th>Qualifying Requirement Details</th>
<th>Supporting Documents Required</th>
</tr>
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</table>
| 1.      | **BIDDER STATUS**-  
1.1 The Bidder must be a company registered and incorporated in India as per Companies Act, 1956 / 2013 or Proprietary Firm or Partnership Firm | Memorandum of Association, Registration Certificate as per Companies act, 1956 or as per its latest amendment in case of Companies OR Registration Certificate under Rajasthan Shop & Establishment Act, 1958 or similar Act OR MSME certificate in case of Proprietary firm OR |
1.2 The bidder must have "A-Class" or Equivalent category Electrical contractor License issued in any State of India as on the date of bid opening.

1.3 The bidder must be registered for EPF.

1.4 The bidder must be registered for ESI.

1.5 The bidder shall have PAN Card.

1.6 The bidder should have filed Income Tax Returns of last three financial years.

1.7 The bidder shall have Goods and Service Tax (GST) Registration.

Registration certificate from Registrar of Firms in case of Partnership firm as the case may be.

"A-Class" Electrical Contractor License Certificate.

Copy of EPF Registration Number Certificate/Letter.

Copy of ESI Registration Number Certificate/Letter.

Copy of PAN Card.

Copy of ITR Returns of Last three Financial Year.

Copy of GST Number / Registration Certificate/Letter.

2. TECHNICAL EXPERIENCE-
The Bidder must have experience of following activities in India during last 5 Years as on the date of Bid opening -

Bidder should submit the following documents/certificates along with techno-commercial part of bid:

Experience Requirements:

1. The bidder/firm must have experience of completed 33KV or 132KV or above voltage of Bay work, transformer installation work, bus bar work, and other EHV equipments work or 132KV and above EHV Lines work for at least 80% of estimated cost of the proposed work during last five year, with RPVN/ Public Utilities/Companies/Corporations prior to the date of bid opening.

Completion/Performance certificates from the owner/User for satisfactorily/ successfully carrying out these works in India as per Schedule-IV. (Bidder should submit the such documents/certificates along with techno-commercial part of bid.)

3. FINANCIAL POSITION

3.1 The Bidder shall meet Minimum Average Annual Turnover (MAAT) for best three (3) Financial Years out of last Five (5) financial years equal to 1.5 times of estimated cost divided by Completion period in years. = 25.86 Lacs

3.2 The Bidder shall have minimum Liquid Assets (LA = Current Assets – Inventories) and/or evidence of access to or availability of credit facilities equal to 6 times of estimated cost divided by Completion period in months. = 8.5 Lacs

i) Audited Balance Sheets/ income statement / Profit & Loss accounts OR

ii) C.A. Certificate

i) Audited Balance Sheets / Profit & Loss accounts OR

ii) C.A. Certificate

iii) For Credit facility Certificate from Bank

Signature with seal of bidder
| 3.3 The Net Worth of the Bidder for last three (3) years should be positive | i) Audited Balance Sheets/ income statement / Profit & Loss accounts OR ii) C.A. Certificate |
| The Bidder should be qualified, not be insolvent, not be in receivership, not be bankrupt or being wound up, should not have affairs administered by a court or judicial officer, should not have business activities suspended, should not be blacklisted by any agency / utility, should not have a conflict of interest. | Declaration in Annexure -B |

1.09 PRICES:

Bidder must quote their prices indicating the percentage variation on total construction cost of each work mentioned in the Section-IV Schedule-I available in cover 3(.xls) of specification. The percentage variation Excess or Less quoted by the bidder for a particular work in Schedule-I shall also be applicable for unit rate items indicated in Schedule-II available in cover 2(.pdf) for that work. The rates/prices shall be quoted in the manner as desired in the schedule of prices. Any bid containing prices not quoted in the manner prescribed shall liable to be ignored. No representation for enhancement of rates once accepted, will be consider.

1.10 QUANTITIES:

a) The quantum of work indicated in the accompanied schedule (s) are only provisional and the purchaser reserves the right of revising the same at the time of placing the order.

1.11 AMENDMENT IN SPECIFICATIONS;

The Superintending Engineer (T&C -Jaipur City), RVPN, Jaipur may revise or amend the specification and timings prior to the date notified for opening of the Bids. Such revision or amendment, if any will be communicated to all the Bidders through corrugendum(s) on [http://eproc.rajasthan.gov.in](http://eproc.rajasthan.gov.in) as amendment or addenda to this invitation of the Bid. The amendment (if any) will be notified on web for all prospective Bidders who have received the Bid documents and it shall be binding on them. Bidders are required to immediately download any such amendment. It will be assumed that the information contained therein has been taken into account by the Bidder in its Bid. In order to provide prospective Bidders reasonable time to take the amendment into account, in preparing their Bid, the Nigam may, at its discretion, extend the deadline for the submission of Bids, in which case, the Nigam will notify all Bidders on web of the extended deadline, for submission of Bids.

1.12 GENERAL:

(a) Specification/Bid document may be downloaded by any of the interested Bidder from [http://eproc.rajasthan.gov.in](http://eproc.rajasthan.gov.in) for the consideration of his Bid up to stipulated date & time. The cost of specification once deposited will not be refunded under any circumstances.

(b) The contractor shall treat the details of the specification and other Bid documents as private and confidential and they shall not be reproduced without the written authorization of the NIGAM.

(c) The NIGAM does not bind himself to accept the lowest or any Bid or any part of the Bid and shall not assign any reason(s) for the rejection of any Bid or a part thereof.

(d) The fact of submission of Bid to the NIGAM shall be deemed to constitute an agreement between the Bidder and NIGAM whereby such Bid shall remain open for acceptance by the NIGAM and Bidder shall not have option to withdraw his offer, impair or derogate the same. If the Bidder be notified during the period of validity of Bid that his

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Signature with seal of bidder
Bid is accepted by the NIGAM, he shall be bound by the terms of agreement constituted by his Bid and such acceptance thereof by the NIGAM, until formal contract of the same Bid has been executed between him and the NIGAM, in replacement of such agreement.

(e) The successful Bidder shall have to execute the contract documents/agreement for the proper fulfillment of the contract. This shall be done by him and the NIGAM shall furnish such an executed stamped agreement free of charge.

1.13 Any action on the part of the Bidder to revise the rates/price at his own interest after the opening of the Bid may result in rejection of the Bid and also debar him from submission of Bids to the NIGAM at least for one year.

1.14 Direct or indirect canvassing on the part of the bidder or his representative will be a disqualification. The post bid correspondence shall not be desirable on the part of bidders and may also be a cause of disqualification.

1.15 Submission of a copy of this specification by the bidder by uploading after digitally signed is essential for participation in the tender.

1.16 RVPNCL does not bind itself to accept the lowest or any bid and will not assign any reason(s) for the rejection of any bid or a part thereof.

1.17 The acceptance of the bid offer(s) will rest with the competent authority i.e. Superintending Engineer(T&C Jpr City), RVPNL, Heerapura who does not bind itself to accept the lowest bid and reserves the right to reject any or all the tender(s) received without assigning any reason.

1.18 PRE-BID MEETING/ CLARIFICATIONS:

i. A pre-bid conference is also scheduled by the procuring entity as per the details mentioned in the NIB and to clarify doubts of potential bidders in respect of the procurement and the records of such conference shall be published on the respective websites.

ii. Prospective bidders/firms, who have deposited the prescribed cost of bid specification as specified in NIB, are allowed to attend the pre-bid conference/meeting and submit their pre-bid queries only in the specified format (Annexure-II) and schedule.

iii. The period within which the bidders may seek clarifications under (b) above and the period within which the procuring entity shall respond to such requests for clarifications shall be as under:-

(a) Last date of submitting clarifications requests by the bidder: As per bid specification.

(b) Response to clarifications by procuring entity: As specified in bid specifications

iv. The minutes and response, if any, shall be provided promptly to all bidders to which the procuring entity provided the bidding documents, so as to enable those bidders to take minutes into account in preparing their bids, and shall be published on the respective websites.

v. Publishing of any clarification on the respective website shall be deemed to have been conveyed to all bidders in cases of non-availability of contact details of those bidders who have purchased downloaded to the bid document, postal delay, loss of clarification in the transit.

1.19 NEGOTIATIONS:

(1) Except in case of procurement by method of single source procurement or procurement by competitive negotiations, to the extent possible, no negotiations shall be conducted after the pre-bid stage. All clarifications needed to be sought shall be sought in the pre-bid stage itself.

[Signature with seal of bidder]
(2) Negotiations shall, however, be undertaken only with the lowest or most advantageous bidder under the following circumstances-
   (a) when ring prices have been quoted by the bidders for the subject matter of procurement; or
   (b) when the rates quoted vary considerably and considered much higher than the prevailing market rates.

(3) The bid evaluation committee shall have full powers to undertake negotiations.

(4) The lowest or most advantageous bidder shall be informed in writing either through messenger or by registered letter and email (if available). A minimum time of seven days shall be given for calling negotiations. In case of urgency the bid evaluation committee may reduce the time, provided the lowest or most advantageous bidder has received the intimation and consented to regarding holding of negotiations.

(5) Negotiations shall not make the original offer made by the bidder inoperative. The bid evaluation committee shall have option to consider the original offer in case the bidder decides to increase rates originally quoted or imposes any new terms or conditions.

(6) In case of non-satisfactory achievement of rates from lowest or most advantageous bidder, the bid evaluation committee may choose to make a written counter offer to the lowest or most advantageous bidder and if this is not accepted by him, the committee may decide to reject and re-invite bids or to make the same counter-offer first to the second lowest or most advantageous bidder, then to the third lowest or most advantageous bidder and so on in the order of their initial standing and work / supply order be awarded to the bidder who accepts the counter-offer. This procedure should be used in exceptional cases only.

(7) In case the rates even after the negotiations are considered very high, fresh bids shall be invited.

Signature of Bidder

Signature with seal of bidder
RAJASTHAN RAJYA VIDHYUT PRASARAN NIGAM LTD
GENERAL CONDITIONS OF CONTRACT

Notwithstanding anything contained to the contrary in the specification or Bid or any subsequent exchange of correspondences, these General Conditions of Contract shall prevail and shall be binding on the Service provider and any change or variation expressed or impressed howsoever made shall be inoperative, unless expressly sanctioned by the NIGAM. The Service provider shall be deemed to have fully informed himself and to have specific knowledge of the provisions of the General Conditions of Contract mentioned here under.

1. DEFINATION OF TERMS

a) In constructing these general conditions and the annexed specification, the following words shall have the meaning herein assigned to them unless there is anything in the subject or context inconsistent with such construction.

b) The "NIGAM" shall mean the RAJASTHAN RAJYA VIDHYUT PRASARAN NIGAM LTD represented by Chairman & Managing Director and shall include their legal personal, representative, successors and assignees. The "NIGAM" owner or customer shall mean the NIGAM.

c) The "Bidder" shall mean and include one or more persons or any firm or any Company or Body incorporate who has submitted the Bid in response to "Invitation of Bid".

d) The "Service provider" shall mean the Bidder whose Bid has been accepted by the NIGAM and shall include the Bidder's heirs, legal representative, successors and assignees approved by the NIGAM.

e) The "Sub-service provider" shall mean the firm or the persons named in the contract for any part of the work or any person to whom any part of the contract has been sublet with the consent in writing of the NIGAM and shall include his heirs, legal representative, successors and assignees approved by the NIGAM.

f) The "CMD" shall mean the Chairman & Managing Director, RAJASTHAN RAJYA VIDHYUT PRASARAN NIGAM LTD, JAIPUR.

g) The "Engineer" shall mean the Chief Engineer, RAJASTHAN RAJYA VIDHYUT PRASARAN NIGAM LTD or other Engineer or officer for the time being or from time to time duly authorized and appointed in writing by the NIGAM to act as Engineer or Inspector for the purpose of the contract. In case where such Engineer has been so appointed, the word "Engineer" shall mean the NIGAM or his duly authorized representative.

h) "Plant", "Equipment", "Materials", "Stores", "Works", mean to include the plant and materials to be provided and work or works to be done by the Service provider under the Contract.

i) THE 'CONTRACT' SHALL MEAN AND INCLUDE THE FOLLOWING:
   1. Invitation of Bid.
   2. Instructions to Bids.
   3. Bid Form including schedule of prices.
   5. Letter of Intent and its acknowledgement.
   7. Formal work order.

   Signature with seal of bidder
10. Special instructions.
11. Site conditions.
12. Specification, specific conditions, schedules
13. Addenda which may hereafter be issued by the NIGAM on web to the service provider as agreed between the Service provider and the NIGAM.
14. The Agreement to be entered into under Clause 2 of these General Conditions.

j) The ‘Specification’ shall mean the specification, specific conditions annexed to the General Conditions of the Contract and the schedule thereto, if any.

k) The month shall mean, English calendar month i.e. period of 30 days and week shall mean a period of 7 days.

l) The “Site” shall mean the place or places named in the Contract and include, where applicable, the lands and buildings upon or in which the works are to be executed.

m) The “Place of delivery” shall mean the place of delivery at which the service provider is responsible to deliver the materials at the contract price.

n) The “Test of completion” shall mean such tests as are prescribed in the contract to be made by the Service provider before the Plant is taken over by the NIGAM as per the General Conditions.

o) "Letter of Intent" shall mean the NIGAM's letter conveying his acceptance of the Bid subject to such reservations as may have been stated therein.

p) The “Contract price” shall mean the sum named in or calculated in accordance with the provisions of the Contract/purchase or any amendments thereto.

q) CONSIGNEE", The consignee shall mean and include the Controller of Stores, Central Stores Officer, Asstt. Controller of Stores, Store Superintendents and or any other officer/official of the RAJASTHAN RAJYA VIDHYUT PRASARAN NIGAM LTD, all over Rajasthan, performing the duties of the consignee.

r) "Writing " Shall include any manuscript, type written or printed statement under or over signature or seal as the case may be.

s) The Word “Codes” shall mean and include the Indian Electricity Rules IS Code of practice and Factory Rules and Regulations applicable in the State of Rajasthan on the date of issue of the letter of intent of such modifications thereof as may be specially stipulated by competent State authorities i.e. Electrical Inspector and Chief Inspector of Factories, Rajasthan.

t) Words importing the singular only shall also include the plural and vice versa where the context requires.

2. ACCEPTANCE OF TENDER:

The order placing authority is not bound to accept the lowest bid or any other bid or assign any reason for the rejection of the tender. The order placing authority also reserves the right to either to call for fresh bidder accept either the whole or a part of bid or to place order for any increased or decreased work on the basis of prices quoted.

Right to split up or not to split up the tender or to reject any or all the tenders without assigning any reason thereof is reserved by the competent authority of Nigam.

The submission of the Tender by Bidder implies that he has read the instruction and condition of contract etc. and he has made himself aware the scope & specification of the work to be done.

The rates quoted should be firm and price variation will not be applicable.

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Signature with seal of bidder
3  CONTRACT:

The contract shall in all respect be deemed to be and shall be constructed and shall operate as per Indian Contracts Act, 1972 and all payment hereunder shall be made in rupees unless otherwise specified. The contractor and NIGAM shall as soon as possible, unless otherwise agreed upon enter into a sealed agreement for the proper fulfillment of the contract. The expenses of completing and stamping the agreement shall be paid by the contractor and the NIGAM shall be furnished free of charge with an executed stamped counter part of the agreement after the Bid has been accepted by the NIGAM. All orders/instructions to the contractor shall, except as herein otherwise provided, be given by the Engineer on behalf of the NIGAM.

4.  SUBLETING AND ASSIGNMENT:

The contractor shall not enter with the previous consent in writing of the NIGAM, sublet, transfer or assign the contract, or any part thereof, interest therein or benefit or advantage whatsoever provided nevertheless that any such permission granted to the contractor shall not relieve him from any obligation, duty or responsibility under the contract.

5.  PERFORMANCE SECURITY DEPOSIT:

In order to secure/assure the fulfillment of the contract, the successful Bidder(s) upon receipt of preliminary acceptance letter/detailed purchase order as the case may be shall furnish within a period of 15 days a Performance Security deposit amount equivalent to 10% (Ten percent) of the contract value either by furnishing an undertaking for deduction of performance security from his each running and final bill @ 10% of the amount of the bill or by crossed Bank Draft or by way of Bank Guarantee from the scheduled Bank in the prescribed proforma to be obtained from the NIGAM on a Rajasthan state Non judicial stamp paper of appropriate value as required under the Rajasthan stamp duty Act directly confirmed by the issuing banker along with a certificate with regard to stamp duty. RVPN may ask the issuer bank for confirmation of the bank guarantee for surety. Such Bank Guarantee shall be valid up to a period of 12 months validity from the date of completion of aforesaid work of raising height of line and if required by the NIGAM, the validity of the Bank guarantee shall be further extended for such period as desired. The B.G. is to be furnished in whole Rupees.

a) If the work is not completed at specified parameters but completed at reduced parameters due to any reasons beyond the control of the contractor in those cases such Bank Guarantee shall also be valid up to a period of 12 months from the date of completion at reduced parameters (e.g. up to the last day of the calendar month).

b) Unless otherwise specifically required to be retained/forfeited by the NIGAM, the Performance Security deposit shall be refunded on request of the contractor after 15 months on completion of the entire work to the satisfaction of the NIGAM.

c) If the contractor fails or neglect to observe or perform any of his obligation under the contract, it will be lawful for the NIGAM to forfeit either in whole or in part at his absolute discretion, the Performance Security deposit furnished by the contractor.

d) No interest shall be payable on such deposits. Bank charges or any other charges, if any, shall be to the Contractor’s account. If the contractor fails to provide the Security within the period specified, such failure shall constitute a breach of the Contract and the NIGAM shall be entitled to make other arrangements at the risk and expenses of the contractor and the Bid Security deposited by the Contractor shall stand forfeited to the NIGAM.

6.  FORCE MAJEURE CONDITIONS:

If any time during the currency of the contract the performance in whole or in part is prevented or delayed or the contractor is not able to arrange execution of the work by reasons of any war, hostility, acts of public enemy, civil commotion, sabotage, fire, floods, explosion,
epidemics, quarantine, restriction, strikes, lockouts, or act of God (hereinafter referred to as Events), then provided notice and adequate proof of execution performance of work having suffered on account of these events is given 24 hours from the hour of occurrence and further in case of strike/labour dispute prolongs beyond a period of 48 hours, the contractor shall immediately inform to RVPN and RVPN reserves the right to get the work done from any other agency at the cost and risk of the contractor.

7. TAXES & DUTIES.

Imposition of any new taxes, duties or other statutory levies during the entire contract period shall be payable at actual by the contractor. The tax deduction at applicable rates from time to time will be made from the bill of the contractor by the AO (T&C-Jaipur City), RVPN, Jaipur. Any increase in statutory liability and taxes shall be bear by the contractor.

a) GST (Goods and Service Tax):

Bidder must quote their prices inclusive of all taxes and levies except Goods & Service Tax (GST) which is to be mentioned separately in the same schedule in the Section-IV Schedule-I available in specification. The bidder shall give GST(Goods and Service Tax) registration number. Any statutory variations in taxes will be to the service provider's account. The liability of GST (Goods and Service Tax) shall be applicable as per provisions.

The contractor shall have to give an undertaking with each bill that due taxes shall be deposited by them regularly.

The contractor will submit the documentary proof of quarterly deposit of GST and also give an undertaking that if the GST deposited is refunded on any ground by Excise/Commercial tax Department, the same shall be deposited in RVPN.

If firm has not been deposited the GST or not submit the documentary proofs on GST, then his bill may not be prepared /paid/ entertained and same shall be deposited by RVPN to Excise/Commercial tax Department on reverse payment option of GST Rule basis in view of statutory liability.

b) Income Tax:

If any income tax, surcharge on income tax or any other corporate tax is attracted under the law then the same shall be paid by him as per Government rules / deducted from his bills / invoices at the prevailing rate and if such tax is not applicable, then the contractor can claim reimbursement of the same from the relevant competent authority. However necessary TDS certificate(s) shall be issued by Nigam paying Authority i.e. AO (T&C-Jaipur City), RVPN, Jaipur.

c) Royalty Tax:

In pursuance of the notification issued by Department of Mines, Government of Rajasthan vide circulars dtd.15.11.11, 18.10.12 & 09.01.13 regarding royalty determination and deposition of the same in the department of Mines & Geology, the Contractor shall be responsible for legitimacy of the civil material used in construction of the transmission line. The Contractor shall also be responsible for compliance of the instructions contained in the said circulars and further amendments if any. The payment of RA bills shall be made after ensuring compliance of the guidelines contained in the above circulars by the contractor. Short term permit (STP) must be taken by the contractor from Mining Department before start of the work. The Nigam will not be responsible for any delay payment for want of STP.

In case any liability/dues against royalty is finalized by the Department of Mines, GOR, the firm shall be fully responsible for payment of such dues to the Mining Department or the same may be deducted /recovered by the Nigam from the financial hold available under this contract or any other contacts of Nigam or its successor companies of erstwhile RSEB.

Signature with seal of bidder
d) In accordance with the scope of works, this is a labour contract of erection from the "FREE ISSUE" material. However tax on such labour contracts if levied, shall be to the Contractor's account.

e) If any TDS provision applicable due to GST, same may be deducted.

8. ERECTION INSURANCE:

The contractor shall take suitable storage cum erection insurance policy for entire project at his own cost, the estimated cost of project for the purpose of insurance may be calculated as per the rates given in the Section-IV Schedule-I.

The contractor shall also ensure the following:

I) Contractor shall take storage cum erection insurance policies for entire project. However the insurance premium could be paid on installment basis, but it will be the responsibility of the contractor that the installments are paid well within the time. In case the insurance is on installment basis, the receipt of payment of each installment shall be submitted to SE(T&C-JPR CITY), work in charge and A.O. (T&C-Jaipur city) by the contractor.

II) Deductible franchise should be minimum as per insurance rules. In case of any loss to the extent of deductible franchise, the same shall be borne by the contractor.

III) A policy indicating discount on account of "EXCESS" is not to be accepted.

IV) Insurance policy shall be drawn in favour of the project indicating the full name of transmission line.

V) Insurance policy shall be taken from Jaipur based office of nationalized insurance companies, however for the contractor whose office is situated outside the Rajasthan, the insurance policy may be taken from place where such office is situated.

VI) Insurance policy shall be in combined name of RVPN and contractor.

VII) Computerized and stamped insurance policy shall be furnished by the contractor to the SE(T&C-JPR CITY) for its Acceptance.

VIII) A copy of Computerized and stamped insurance policy shall also be furnished by the contractor to the line in-charge who on receipt of its acceptance issued by SE(T&C-JPR CITY), shall issue the material. If line is not completed within the schedule completion time, the extension of insurance policy shall be arranged by the contractor. A part of the premium paid to the insurance company for this extension, corresponding to the delay on the part of RVPN, shall be reimbursed to the contractor on finalization of time extension case. However part of the premium corresponding to the delay on the part of the contractor shall be borne by the contractor.

Deviation to this clause will not be acceptable. It is in the interest of contractor to take insurance policy for a longer period.

IX) In case of up-gradation/modification of existing EHV WORK, the contractor may take section wise (instead for complete line/work) storage cum erection insurance policy. However, this section wise policy shall also remain valid up to 30 days from the date of handing over the section of line to the Engineer-in-charge.

9. INSPECTION BY NIGAM'S REPRESENTATIVE:

I) The Representative of Zonal Chief Engineer (T&C)/ Superintending Engineer (T&C / Q.C, Inspection & Monitoring) / Executive Engineer/ In-charge of the works or his representative will be free to visit the contractor's works, their site stores and erection site and also verify the NIGAM's materials in the custody of the contractor, as and when required.

10. LABOUR LAWS:

Contractor shall maintain a valid labour license under the Contract Labour (Regulation & Abolition Act) for employing necessary manpower required by him. In the absence of such license, the contract shall be liable to be terminated without assigning any reasons thereof.

Signature with seal of bidder
NOTE:— "All contracts / Contractors with the Government shall require registration of workers under the Building & other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996 and extension of benefit to such workers under the Act. Deductions of cess at source will be made as per provisions of the said Act, in force from time to time."

11. LIABILITY OF THE CONTRACTOR:-
The contractor shall provide suitable supervisory, skilled, semi-skilled and unskilled labour as per requirement of the work. The work will be checked by the Engineer-in-charge at the site.

12. WAGES:-
The contractor shall ensure timely payment for the minimum wages to his labour as per statutory provision and shall fully comply with the rules laid under payment of wages act and enforced from time to time. The contractor shall keep an up to date account of deployment of labour and payment of their wages etc, which will be produced for inspection by the Engineer-in-charge, if so desired by him.

13. TERMS OF PAYMENT:
Payment for aforesaid work/material will be made to the contractor on submission of bills in accordance with the procedure as detailed below.

i) Payment equal to 100% (In case contractor furnishes Performance Security deposit by crossed Bank Draft or by way of Bank Guarantee) or 90% (In case contractor furnishes an undertaking for deduction of performance security amount from his each running and final bill @ 10% of the amount of the bill) of the total value of the work. Incorporation of 33kV System along with 132/33kV Transformer at 220kV GSS Sitapura, Jaipur shall be made against bills to be submitted to the AEN (T&C), in-charge of the work on the basis of certificate issued by the Engineer-In-charge that this much of quantity has been erected/ executed by the contractor.

ii) Balance 10% payment will be made after the 12 months performance period (from date of completion of work) is over and instructions for release of the RMD has been issued by the SE(T&C Jaipur City) as per clause of Performance GUARANTEE or on furnishing of 10% performance bank guarantee.

(iii) If a firm supplying material to the RVPN or executing any work obtain finance from bank by way of discounting of the bills. In such cases RVPN shall not at all be responsible for arranging payments to banks nor shall bear any liability towards the bank in such cases. This is to safeguard interest of the NIGAM against the firms/suppliers taking advantage of bank finance.

Deduction, in respect of deficiencies etc. will be made by the AEN-In charge while passing/verifying the bills and simultaneously be conveyed to the contractor.

The following time schedule is specified within which verification/ countersignature of all bills shall be done, against satisfactory performance of work done on monthly basis.

<table>
<thead>
<tr>
<th>All R.A.Bills</th>
<th>Other Bills (PV, balance payment etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Verification by AEN-In-charge &amp; submission to XEN.</td>
<td>7 days</td>
</tr>
<tr>
<td>b) Countersignature by XEN &amp; forwarding to AO(T&amp;C JPR City)</td>
<td>3 days</td>
</tr>
</tbody>
</table>

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Signature with seal of bidder
14. MODE OF PAYMENT:

14.01 Payment after making necessary deduction (towards S. D., Taxes & others if any) shall be made by the Accounts Officer (T&C-Jaipur City), RVPN, Heerapura. The payment for the material / equipment / work on order shall be made as under only after execution of the contract agreement & furnishing of performance security Bank guarantee as per relevant clauses.

14.02 The Contractor will submit the monthly bill in triplicate to the AEN / In-charge of work, same will be verified by concerned XEN (Engineer-In Charge) and forward the bill to the A.O. (T&C-Jaipur City), RVPN, Heerapura duly signed by the concerned XEN & forwarded for arranging the payment after obtaining the following from the contractor:-

(i) Self attested copy of bank challan of PF Deduction deposited in the bank.
(ii) Self attested copy of Insurance cover note.
(iii) PF deduction schedule and PF undertaking in duplicate.
(iv) Self attested copy of labour licence, if applicable.
(v) Self attested copy of ESI deposit challan.
(vi) Undertaking in respect of depositing GST by contractor.
(vii) The payment shall be made within thirty days from the date of submission of complete document and completion of all contractual formalities as per requirement of the work order but in case of delay in payment the purchaser shall not be liable to pay any interest on the outstanding amount to the contractor.

15.0 RATES:-

The rates quoted in price schedule-BOQ should be firm in all respect inclusive of all taxes, duties, labour charges, T&P, consumable, insurance, statutory levies, except GST (Goods And Service Tax) which is payable at actual. The GST (Goods and Service Tax) must be quoted/claimed separately in the price bid/quotation/schedule of rates itself, if any.

16.0 QUANTITY:-

The quantity of the work as given in the price schedule (BOQ) is estimated one. It may vary according to the site requirement. For any such variation the unit rate shall be applicable as shown in the "Price Schedule (BOQ)".

17.0 ENGINEER IN CHARGE:-

The firm will have to carry out the above Incorporation of 33kV System along with 132/33kV Transformer at 220KV GSS Sitapura, Jaipur as per directives of in charge of work i.e. the Assistant Engineer-I (T&C-JPR City), RVPN, Jaipur and the XEN(220KV GSS), RVPN, Sitapura Jaipur (Engineer-in-Charge). He shall deal all the issues pertaining to this work.

18.0 COMPLETION OF WORK:-

The firm will have to complete the work of Incorporation of 33kV System along with 132/33kV Transformer at 220KV GSS Sitapura, Jaipur within 04 (Four) months from the date of layout.

19.0 DELAY IN COMPLETION:-

The time and the date of delivery/completion period specified in the contract shall be deemed to be the essence of the contract and the facilities shall have to be completed no later than the period specified therein. If the Contractor fails to comply with the Time for Completion for the whole of the facilities, (or a part for which a separate time for completion is agreed) then the Contractor shall pay to the Nigam recovery for such default, without prejudice to the Nigam’s other rights and remedies under the Contract, as follows:

[Signature with seal of bidder]
<table>
<thead>
<tr>
<th></th>
<th>Delay over and above the prescribed completion period upto 1/4&lt;sup&gt;th&lt;/sup&gt; of scheduled completion period;</th>
<th>2.5% of the total contract price</th>
</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>Delay exceeding 1/4&lt;sup&gt;th&lt;/sup&gt; period but not exceeding 1/2 of scheduled completion period;</td>
<td>5% of the total contract price</td>
</tr>
<tr>
<td>c</td>
<td>Delay exceeding 1/2 period but not exceeding 3/4&lt;sup&gt;th&lt;/sup&gt; of scheduled completion period;</td>
<td>7.5% of the total contract price</td>
</tr>
<tr>
<td>d</td>
<td>Delay exceeding 3/4&lt;sup&gt;th&lt;/sup&gt; period of scheduled completion;</td>
<td>10% of the total contract price</td>
</tr>
</tbody>
</table>

Note: Any fraction in such calculation shall be rounded off to the nearest one.

The Nigam may, without prejudice to any other method of recovery, deduct the amount of such recovery from any payment immediately falling due or to become due to the Contractor. The payment or deduction of such recovery shall not relieve the Contractor from his obligation to complete the Works, or from any other of his obligations and liabilities under the Contract.

Any financial liability arising from and consequent upon the failure of the contractor to adhere to the stipulated completion schedule shall be to the contractor's account.

20.0 EXTENSION IN COMPLETION PERIOD:
Any delay due to natural hindrance such as flood/rains / storms etc. resulting into non-accessibility of the location shall be reported promptly by the contractor. Nigam may consider for the time extension in completion period if proper timely justification (s) are submitted by contractor in this regard to Nigam.

21.0 GUARANTEE:
The erection work/ material will be covered under guarantee period against any defect arising from erection workmanship or in supplied material up to a period of 15 months from the date on which the work is completed in all respects to the satisfaction of the NIGAM. The necessary instructions to release the P.B.G. or RMD (10% amount) retained against Guarantee (as the case may be) will be issued by the SE (T&C Jaipur City), VPN, Heerapura.

22.0 MODE OF GUARANTEE:
In order to ensure compliance of the provisions contained in Clause No. 20.0 above, the successful contractor who have furnished an undertaking for deduction of performance security from his bill @ 10% of the amount of the bill irrespective of his being a registered vendor with NIGAM or not, shall be required to furnish a performance bank guarantee after completion of aforesaid work and in case the contractor is claiming the balance 10% payment before expiry of guarantee period from any scheduled bank for an amount equivalent to 10% of the contract value on Rajasthan state Non judicial stamp paper of appropriate value as required under the Rajasthan stamp duty Act duly confirmed by the issuing Banker along with a certificate with regard to stamp duty. RVPN may ask the issuer bank for confirmation of the bank guarantee for surety.

Such guarantee shall be valid initially for a period of 15 months and to be extended for the period as specified in Clause No. 21. The contractor shall have to extend the validity period of the Bank guarantee, if required on intimation from the purchaser. Such Bank guarantee should remain valid up to the last day of the calendar month and be furnished in whole rupees.

23.0 EMPLOYEES PROVIDENT FUNDS:
The contractor shall have to submit a certificate every month that he is an establishment covered under the employees provident fund and miscellaneous provisions act.1952 and is having a separate code number with the Provident Fund Commissioner and also that the Provident Fund contribution in respect of all the employees employed by him along with employer's share of contribution etc. is being deposited with the Provident Fund authorities and shall also submit certified photo copies of the challans of deposits. In absence of above, the contractor shall be liable to deposit employee contribution as well as, Employer's

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contribution and other charges in respect of all the employees engaged by him for the said work with RVPN along with details of the employees, their wages and the amount of contribution as per RVPN CPF Rules every month. In case of failure, RVPN shall be entitled to deduct 46% of the amount from his bills.

24.0 CONTRIBUTION TOWARDS ESI:
The ESI Act 1948 shall be applicable and contractor should be got registered with ESI department and shall submit the copy of challan of depositing ESI contribution every month.

The contractor shall follow & submit the required declarations & contribution towards any of the Act enforced by Govt. of India / State Govt. during currency of contract.

25.0 INSURANCE:
It is the sole responsibility of the contractor to get his workmen insured under workman compensation Act. & Rules, while at work, as required by relevant rules and workmen compensation and pay compensation, as per act and provision/rules made there under.

26.0 CONTRACTOR TO INDEMNIFY THE NIGAM:

The contractor shall indemnify the NIGAM and every member, officer and employee of the NIGAM, also Engineer-in-charge and his staff against all actions proceedings, claims, demands, costs and expenses whatsoever, arising out of or in connection with the matters referred herein above elsewhere and against all actions, proceedings, claims, demands, costs and expenses which may be made against the NIGAM or Govt. for or in respect performance of obligation under contract documents. The NIGAM shall not be liable for or in respect of or in consequence of any accident or injury to any workman other person in the employment of the contractor or his sub-contractor, and the contractor shall indemnify and keep indemnified the NIGAM against all claims, demands, proceedings, cost, charge and expenses whatsoever in respect thereof or in relation thereto.

27.0 MATERIAL AND WORKMANSHIP
All the work executed/ material supplied shall be of best quality and capable of satisfactory operation. The workmanship/ material shall be of the highest grade and the entire work/material supplied shall be in accordance with the best modern Engineering practices.

28.0 INDIAN ELECTRICITY ACT:
All the works covered by the Contract shall be in accordance with the Indian Electricity Act, 1910 with the latest amendments and the Electricity rules made there under.

29.0 CHANGE OF NAME OF THE BIDDER/CONTRACTOR:

(a) At any stage after Biding the NIGAM shall deal with the Contractor only in the name and at the address under which he has submitted Bid. All the liabilities / responsibilities for due execution of the Contract shall be that of the Contractor and in no circumstances, he shall be relieved of any obligations under the Contract. The NIGAM may, however, at his discretion deal with the Agents/ Representatives/ Distributors/ Manufacturers/ Associates/ Principals/ Sister concerns and such dealings shall not absolve the Contractor(s) from his responsibilities/ obligations/ liabilities to the NIGAM, under the contract.

(b) Any change/alteration of name/Constitution/Organization of the Contractor shall be duly notified to the NIGAM and the NIGAM reserves the right to determine the Contract, in case of any such notification. In the event of such determination, the NIGAM may get the work executed from elsewhere at the risk and cost of the contractor.

30.0 DEDUCTION FROM CONTRACT PRICES:
The amount of all cost, damage or expense or other sums which under a particular Contract shall be payable by the Contractor to the NIGAM, shall be deducted by the NIGAM from amount due or becoming due by him to the Contractor under this contract or any other

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Contract without prejudice to the NIGAM's right to recover the same by ordinary process of law.

RVPN may with hold the whole or part of any payment for work claimed by the contractor, which in the opinion of the order placing authority is necessary to protect himself from loss on account of:

a) Defective work not remedied or guarantees not met.
b) Claim filed against the contractor.
c) Failure of the contractor to make due payment for material or labour employed by him.
d) Damage to another contractor / Nigam property.
e) Insufficient / unsatisfactory progress.

When grounds for withholding payment are removed, to the satisfaction of Engineer in-charge payment of the amount due to the contractor shall be made by the Nigam.

31.0 BANKRUPTCY:

Under a receiver, the executors, successors or other representative in law of the Contractor or any such receiver, liquidator or any person in whom the Contract may become vested, forthwith give notice thereof in writing to the NIGAM and shall for one month during which he shall take all reasonable steps responsible to prevent stoppage of the works, have the option of carry out the Contract subject to his or their providing such guarantee, as may be required by the NIGAM but not exceeding the value of the work for the time being remaining executed. In the event of stoppage of the works, the period of the option under this clause shall be fourteen days only. Provided that should the above option not be exercised, the Contract may be determined by the NIGAM by notice in writing to the Contractor and it shall be lawful for the NIGAM to take the work full or in part out of the Contractor's hands and re-contract at reasonable prices with any other persons and the NIGAM shall be entitled to retain and apply any balance which may be otherwise due on the Contract by him to the Contractor, or such part thereof as may be necessary to the payment of the cost of executing such work as aforesaid.

32.0 CONTRACT DOCUMENTS:

The order placed under this specification shall be governed by the terms and conditions as incorporated in this section of the specification and as given in the work order and its Annexure (s). The terms and conditions specified in this section, if differ from the terms as indicated in the work order and its annexure (s), the later shall prevail. The contract shall for all purpose be constructed according to the laws of India and subject to Jurisdiction of Jaipur Courts only. For the fulfillments of the contract the contractor shall execute an agreement in triplicate in the prescribed form to be obtained from the Order placing authority on non-judicial stamp paper (Stamp duty will be 0.25% of 'the estimated cost or value set forth in such contract subject to maximum of Rs.15000.00' or as per stamp Duty applicable in Governments of Rajasthan. Such agreement shall be executed and signed by the competent authority of the contractor on each page thereof. The original Copy is only to be executed on the stamp paper. The remaining two copies may be executed on simple paper. Such complete agreement form along with the contract Document shall be required to be returned to the order placing authority within a period of 15 days from the receipt of order.

One copy of executed agreement duly signed by the order placing authority shall be sent to the contractor for his reference. The contract document shall include the following.

1) Contract Agreement.
2) Work Order and its annexure.
3) Terms & Conditions of the bid specifications.
4) Scope of works of bid specifications.

The charges in respect of the contract shall be borne by the contractor. The Contractor shall be furnished with an executed counter part of the agreement.
It may however be ensured that the one copy of the work order and other Documents as above, are signed by an authorized person holding valid power of attorney. The power of attorney on non-judicial stamp paper worth Rs.100/- which should be attested by the notary public. For this a copy of power of attorney in favor of person signing these documents, duly notarized in original be also submitted along with the above documents.

The receipt of above documents in order shall be notified by the Accounts Officer (T&C Jaipur City), RVPN, Jaipur in due course of time under intimation to this office. No any payment shall be released without acceptance of the contract agreement.

33.0 CONTRACT VALUE:
The rates mentioned are subject to completion of entire works/material as per Price Schedule and are payable to the contractor on normal course but the quantities are tentative/indicative only. The work may increase or decrease as per actual requirement during the contract period. The payment shall be made for actual work done satisfactorily. Nigam does not guarantee for payment of entire amount of G-schedule.

34.0 FURTHER CORRESPONDENCE:
i) All correspondence pertaining to the work order in respect of any clarification required on the terms and conditions etc. should be addressed to the Superintending Engineer (T&C Jaipur City), RVPN, Heerapura, Ajmer Road, Jaipur-21.

ii) All the correspondence pertaining to the payment of the bills etc. should be addressed to the Account Officer (T&C-Jaipur city), RVPN, Heerapura, with copies to this office and the consignee.

iii) All the correspondence relating to operation/direction shall be addressed to the Engineer-In-Charge with a copy to this office and to the Account Officer (T&C-Jaipur city), RVPN, Heerapura.

35.0 DISPUTES:
i) All disputes, differences, questions, whatsoever arising between the NIGAM and Contractor upon or in relation to or in connection with the contract shall be deemed to have arisen at JAIPUR (RAJASTHAN) only and no courts other than courts in Jaipur shall have jurisdiction to entertain the same.

ii) The RVPN has constituted the centralized standing committee for settlement of disputed claims under conditions of contract relating to RVPN. The committee shall consider all cases for settlement of disputed claims relating to purchases, works, turnkey contracts and labor contracts, civil works etc. The committee shall also take decision whether a particular matter is required to be referred to the Board for approval before settlement. The matter for settlement shall only be referred to the centralized standing committee of RVPN by following the guide lines detailed below:

(1) Disputes will be referred contract wise.
(2) Disputes involving amount above Rs. 1.00 lacs only will be referred/entertained.
(3) Non-refundable fee shall be deposited by the contractor/firm @ 2% of disputed amount acclamed by the contractor/firm subject to maximum fee of Rs. 1.00 lac.
(4) In case of disputes, Application for settlement (only in prescribed format) may be collected from the purchaser office.

The centralized standing committee fees shall be deposited in cash/demand draft/pay order with the Accounts Officer (T&C Jaipur City), RVPN, Jaipur and shall furnish receipt thereof with a request for referring their disputes to the centralized standing committee for decision.

For settlement, the firm shall furnish their application (only in prescribed format) indicating the details of dispute / grievances along with requisite settlement fee within period of six months after receiving communication from Contracts Wing giving rise to cause of dispute / grievances.

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36. ACCEPTANCE OF THE ORDER:

The acceptance of the order shall be conveyed to the Superintending Engineer(T&C Jaipur City), RVPN, Heerapura, Jaipur, within ten days of the receipt of order in the prescribed proforma failing which it will be presumed that the terms and conditions incorporated in the order are acceptable to the contractor.

37. TERMINATION OF CONTRACT:-

RVPN reserve the right to cancel the contract at any moment without assigning any reason. If the contractor fails to carry out satisfactory work under this contract, The RVPN at its discretion get the work done by another party or parties at his risk and cost without prejudice to the RVPN’S right under the terms & conditions of this contract and any extra expenditure involved in this regards, shall be recovered from the contractor.

The Contractor shall be required to deposit the amount of recoveries finalized within a period of 30 days of receipt of intimation failing which the dues shall be recovered from the financial hold of the supplier available with the Nigam. In case, where the amount of recoveries against a firm/supplier exceed its financial hold, the Nigam will be at liberty to effect such recoveries out of the financial hold/pending payments of the supplier / contractor available with other successor companies of erstwhile RSEB/ with other power generating units of RVPNPL.

Signature with seal of bidder
RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LTD

OFFICE OF THE SUPERINTENDING ENGINEER (T&C-JAIPUR CITY)

SECTION – III A

TECHNICAL SPECIFICATIONS

1.0 SCOPE:
1.1 The erection work of Sub Stations covered under this section consists of the following:

TYPES AND AREAS OF WORK:
- Erection of 33 KV system & 132/33 KV, 40/50 MVA Transformer Bay at 220 kV GSS, Sitapura

A) The works/activities which may be required to be got done under this specification for the work of Erection of Sub Station are as given below:
   a) Laying of earth mesh.
   b) Laying of Earth risers.
   c) Placing/Driving of earth electrodes.
   d) Erection of Sub Station Steel Structures.
   e) Stringing of Bus bar of ACSR conductor.
   f) Stringing of Earth wire.
   g) Jumpering.
   h) Erection of EHV transformer (tank already placed on foundation with wheels)
   i) Erection of Circuit Breakers
   j) Erection of Station Transformer.
   k) Erection of current transformer/potential transformer/capacitive voltage transformer/Series Reactor/Residual Voltage Transformer/Neutral Current Transformer
   l) Erection of Lightening Arrestor.
   m) Erection of Isolator & Earthing Switches.
   n) Erection of Wave Trap.
   o) Erection of capacitor bank with series reactor and residual voltage transformer/Neutral current transformer.
   p) Erection of Post insulator.
   q) Erection of control relay panel/L.T Panel/D.C. Board/RTCC Panel/PLCC Panels, etc.
   r) Erection of marshalling kiosk/line matching unit/Line matching and distribution unit.
   s) Laying of control & Power cables & wiring etc.

B) The works/activities which may be required to be got done under this Labour Rate Contract for the work of Erection of 220KV/132KV/33KV/11KV Bays are as given below:
   a) Laying of earth mesh.
   b) Laying of Earth risers.
   c) Placing/Driving of earth electrodes.
   d) Erection of Sub Station Steel Structures.
   e) Stringing of Bus bar of ACSR conductor.
   f) Stringing of Earth wire.
   g) Jumpering.
   h) Erection of EHV transformer (tank already placed on foundation with wheels)
   i) Erection of Circuit Breakers
   j) Erection of Station Transformer.
   k) Erection of current transformer/potential transformer/capacitive voltage transformer/Series Reactor/Residual Voltage Transformer/Neutral Current Transformer
   l) Erection of Lightening Arrestor.

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m) Erection of Isolator & Earthing Switches.

n) Erection of Wave Trap.

o) Erection of capacitor bank with series reactor and residual voltage transformer/Neutral current transformer.

p) Erection of Post insulator.

q) Erection of control relay panel / RTCC Panel / PLCC Panels etc.

r) Erection of marshalling kiosk / line matching unit / Line matching and distribution unit.

s) Laying of control & Power cables & wiring etc.

1.2 The Contractor shall be fully responsible for completing all the above works and till they are taken over by the NIGAM.

1.3 The methods of erection activities not dealt in details are left to the Contractor who shall exercise his own judgment with regard to actual handling of materials and in deciding upon the best methods to be adopted.

2.0 GENERAL INSTRUCTIONS

(i) Transportation and unloading of the Sub Station material and equipment at the location shall be done in a safe manner so that they are not damaged or misplaced.

(ii) All the material and equipment shall be checked as per Bill of Material (BOM).

(iii) All support insulators and other fragile equipment shall be handled carefully preferably with cranes having suitable boom length and handling capacity.

(iv) Sling ropes etc. should be of sufficient strength to take the load of the equipment to be erected. They should be checked for breakages of strands before being used for the erection of equipments.

(v) The slings should be of sufficient length to avoid any damage to insulator or other fragile equipments due to excessive swing or scratching by sling ropes, etc.

(vi) Mulmul cloth shall be used for cleaning the inside and outside of hollow insulators.

(vii) Erection of equipment shall be carried out as per and in the manner prescribed in

(viii) The erection, testing and commissioning manual / instructions procedures of the manufacturer, to be provided by the Engineer-In-Charge.

(ix) The services of the manufacturer’s Engineer, wherever necessary may be utilized by VPN on its own account for erection, testing and commissioning of Sub Station equipment.

(x) Whenever the work is required to be got done at the existing GSS where the adjacent portions may be charged, effective earthing must be ensured for safety against induced voltages so that work can be carried out without any danger / hazard to the workmen.

(xi) Wherever EHT/HT/LT lines or installations are located in the land of the Sub Station, the Contractor shall ensure that adequate safety clearance is maintained during erection activities. In case shutdown of such lines or installations is required, the Contractor shall submit the request well in advance to the Work-In-Charge.

(xii) Wherever it is necessary to avail shutdowns of energized circuits for carrying out any work, the contractor shall request the work - In - charge for arranging the same. The Work - In - Charge shall submit a requisition to the Engineer In - charge of the GSS stating the date, time and duration of the shutdown and the section / portion which is to be kept out of circuit during the shutdown.

(xiii) The Work-In-Charge shall ensure that the portion of the switchyard under shutdown has been isolated and that effective earthing of the equipment / bus bar, on which work is to be carried out, has been done and obtain the PTW. He will then issue PTW to the contractor.

(xiv) The contractor shall ensure that the work is completed within the requisitioned time.

(xv) After completion of the erection work, all surplus material including bolts and nuts, templates, etc. shall be returned to the Nigam at site store. All unusable cut lengths of
material such as conductor, earth wire, M.S. Rod and M.S. Flat, etc. shall not be treated as wastage and shall also be deposited in the store.

3.0 **EARTHING:**

**PLACING / DRIVING OF EARTH ELECTRODE, LYING OF EARTHMAT AND LAYING AND FIXING OF EARTHING RISERS.**

Note 1: The text and the drawings in this clause refer to some particular sizes of M.S. Rod or M.S. Flat. The reference is indicative only. The procedure/method, etc. are typically applicable to all sizes of M.S. Rod/ M.S.Flat. The following basic principles shall be followed.

a) The minimum overlapping length for joints of M.S. Flat shall be equal to twice the width of the M.S. Flat.

b) The minimum overlapping length for joints of M.S. Rod shall be 100 mm for 25/28 mm dia and 200 mm for 40 mm dia. rod.

**Note 2:** The scope of work includes consumable items such as welding electrodes, bitumen compound, bitumen impregnated tape, red oxide paint, green paint and bentonite slurry except where specifically mentioned otherwise.

3.1. **GENERAL INSTRUCTIONS:**

(i) Earthing of the Sub Station shall be done as per the earth mat design provided by the Work-In-Charge.

The details of the earthing material generally used in a Sub Station are given below:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Purpose</th>
<th>Description &amp; Size of Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Main Earthing Conductor for Earth Mat.</td>
<td>132 kV Sub Stations: 25/28 mm dia. M.S. Rod. 220 kV Sub Stations: 280/40 mm dia. M.S. Rod.</td>
</tr>
<tr>
<td>2.</td>
<td>Earthing Conductor for Risers (for equipments &amp; structures).</td>
<td>132 kV Sub Stations: 50 x 10 mm M.S. Flat. 220 kV Sub Stations: 50 x 12 mm M.S. Flat or 75 x 12 mm GI/MS Flat.</td>
</tr>
<tr>
<td>3.</td>
<td>Earthing of LT panels, DC panel, C &amp; R Panels, marshalling boxes, Compressors, MOM boxes, junction boxes, lighting panels, etc.</td>
<td>132 kV Sub Stations: 50 x 6 mm M.S Flat. 220 kV Sub Stations: 50 x 6 mm M.S Flat.</td>
</tr>
<tr>
<td>4.</td>
<td>Earth Electrodes</td>
<td>132 kV Sub Stations: 25/28 mm dia. M.S. Rod, 3250 mm long. 220 kV Sub Stations: 28/40 mm dia. M.S. Rod, 3250 mm long.</td>
</tr>
</tbody>
</table>

(ii) All equipments and structures are required to be earthed by two separate and distinct connections with earth mat.

(iii) The neutrals of all voltage levels of transformers shall be earthed through independent earthing. All these earthing points should be interconnected with the Sub Station earth mat. Each earthing lead from the neutral of the power transformer shall be directly connected to two earth electrodes separately which, in turn, shall be connected to the earth mesh. The transformer tanks as well as associated accessories like separate cooler banks shall also be connected to the earth mat at two points.

(iv) Capacitor Voltage Transformers & Lightning Arresters shall be earthed through two independent risers directly connected to earth electrodes which should in turn be connected to the Sub Station earth mat. The distance between the electrodes should not be less than 4.0 metres.

(v) All other equipments such as Circuit Breakers, CTs, Isolators, Post Insulators, etc. shall also be earthed at two points.

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(vi) Bus Bar structures and equipment structures shall be earthed at two points.

(vii) Marshalling boxes, cubicles, C&R Panels and all other metallic enclosures, which are normally not carrying any current, shall also be earthed.

(viii) All the earthing connections to the earth mat shall be by 2 nos. direct earthing risers free from kinks and of the shortest length. The two earthing connections / risers should be connected to the different sides of the earth mat enclosing the structure / equipment to be earthed.

(ix) For equipment earthing (including isolators), the earthing risers should be connected to the earthing terminal / pad of equipment and brought down along the leg / main member of structure and connected to the earth mat. The structure shall not be used as a part of the earthing.

3.2 BURIAL OF EARTHING CONDUCTOR:

(i) The alignment of the earth mat conductor can be changed by forming U - loops in case it fouls with equipment / structure foundations. The average spacing for East - West rows and for North - South rows of the earth mat shall, however, be kept as near as possible to the spacing indicated in the earth mat design.

(ii) Earthing conductors in the switchyard area shall be buried at a depth of at least 800 mm from top level of foundations unless stated otherwise.

(iii) Earthing conductor around any building shall be buried in earth at a minimum distance of 1500 mm from the outer boundary of the building.

(iv) In case high temperature is encountered at any location, the earthing conductor shall be laid at a minimum distance of 1500 mm away from such location.

(v) Earthing conductors, if embedded in the concrete, shall have approximately 50 mm concrete cover.

(vi) Earthing conductors laid in cable trenches, ladder columns, beams, walls, etc. shall be supported by suitable welding / cleating at intervals of 750 mm.

(vii) The earthing conductors shall be clamped with the equipment support structures at 1000 mm interval.

(viii) Transformer / Railway tracks within the switchyard area shall be earthed at a spacing of 30 meters and also at both ends.

(ix) Flexible earthing connectors shall be provided for the moving parts of equipments such as earthing switches and operating handles of isolators, etc.

(x) All lighting panels, lighting fixtures, junction boxes, receptacles, conduits, etc. shall be earthed.

(xi) Earthing risers shall be run from the peaks of structures to the main earth mesh. The earthing bonds of the earth wire tension hardware shall be connected at the top of this earthing riser with bolts and nuts.

(xii) Bending of earthing rod and flat shall preferably be done by gas heating.

(xiii) Fencing should be separately earthed. Independent earthing conductor for earthing of fencing, buried at a depth of 600 mm, shall be provided 2 metres outside the switchyard fence. All the gates and every alternate post of the fence shall be connected to this earthing conductor at the corners and at every 20 metres.

3.3 EARTH ELECTRODES:

(i) The length of earth electrodes shall not be less than 3250 mm and shall be of one piece.

(ii) Except where rock is encountered, Rods shall be driven to a depth of at least 3000 mm.

(iii) Where rock is encountered at a depth of less than 3600 mm, the electrodes can be buried inclined to the vertical at an angle not more than 30° from the vertical. In all other cases, drilling shall be done for providing the pit for the electrode.

(iv) To reduce the depth of burial of an electrode in case of rocky soil without increasing the resistance, a number of rods shall be connected together in parallel as advised by the work-
3.4 JOINTS:

(i) Minimum joints shall be made in the earth mat conductor as well as in preparing the risers.

(ii) All joints in the steel earthing system, except those where earth mat may have to be separated from equipment, etc. for testing, shall be made by electric arc welding. Welded surfaces should be painted with bitumen compound and afterwards coated with bitumen tape to protect them from rusting and corrosion.

(iii) Joints in the earthing conductor between the switchgear units and such other Points which may be required to be subsequently opened for testing should be Bolted type. The bolted connections, after being checked and tested, shall be painted with anticorrosive paint/compound. These joints should be accessible for supervision.

(iv) Earthing connections with equipment earthing pads shall be bolted type. Contact surfaces shall be free from scale, paint, enamel, grease, rust or dirt.

(v) Steel to copper connections shall be first bolted, then brazed and shall be coated with bitumen tape to avoid moisture ingestion.

(vi) All welded joints shall be allowed to cool down gradually to atmospheric temperature. Artificial cooling should not be used.

3.5 PLACING OF EARTH ELECTRODES:

(See Annexure – A: (I) EARTH ELECTRODE)

3.5.1 Cut M. S. Rod of the applicable diameter to approximate length of 3.25 meters and, if required, prepare one end as spike for placing/driving into the ground.

3.5.2 Earth Electrode in Loose / Sandy Soil:

(i) Excavate a pit approximately 1 M. x 1 M. up to 0.6 meter depth.

(ii) Place the earth electrode in the excavated pit and drive it in the ground with a sledgehammer such that the top of the electrode is 0.55 meter below the foundation top level. This will leave 0.25 meters of the electrode above the ground for connecting it to the earth mat rods.

3.5.3 Earth Electrode in Hard Soil:

(i) Excavate a pit approximately 1 M. x 1 M. up to 0.6 meter depth.

(ii) Augur a hole in the ground to a depth of 3 meters inside this pit.

(iii) Place the electrode in the augured hole such that the top of the electrode is 0.55 meter below the foundation top level.

(iv) Backfill the excavation and compact the soil after completion of the work.

3.5.4 Earth Electrode in Rocky Soil (Normal Depth):

(i) Where rock is encountered at a depth of less than 3600 mm below the foundation level, excavate a trench which is inclined to the vertical at an angle not more than 30° from the vertical.

(ii) In all other cases, carry out drilling of the rocky soil for providing the pit for the electrode.

(iii) For connecting the electrode to the earth mat, clamp/hold the M. S. Rods of the electrode and the earth mat together. First weld these together at the crossing point.

(iv) Fabricate four cleats in the shape of M. S. Angles from M. S. Flat of size to be used for earthing risers and of length equal to 10 times the diameter of the M. S. Rod. Weld these at all the corners of the joint. A typical joint is shown in Annexure – A, (II): JOINT OF M.S. ROD TO M.S. ROD AT EARTH ELECTRODE AND AT MESH CROSSINGS.

(v) After welding, apply bituminous compound to the hot joints, and cover the joints with bitumen impregnated tape.

(vi) Backfill the excavation and compact the soil after completion of the work.

(vii) If advised by the Engineer-In-Charge, the backfilling shall also have to be
done with Bentonite, or a combination of bentonite and black cotton soil in the ratio of 1:6, to reduce the resistance to earth. The Bentonite & black cotton soil shall be arranged by RVPN in such case.

3.5.5 **Earth Electrode in Rocky Soil (8 Meter Depth):**

(i) Drill the earth pit having a throughout bore of 200mm dia to a depth of 8.0 meters from the top level of the foundations. This is to be done in all type of rocks by DTH system and over burden to be arranged by contractor.

(ii) Cut M.S. rod of applicable diameter to approximate length of 7.5 meters.

(iii) Place the earth electrode in the excavated pit such that the top of the electrode is 0.55 meters below the foundation top level.

(iv) For connecting the electrode to the earth mat, clamp / hold the M. S. Rods of the electrode and the earth mat together. First weld these together at the crossing point.

(v) Fabricate four cleats in the shape of M. S. Angles from M. S. Flat of size to be used for earthing risers and of length equal to 10 times the diameter of the M. S. Rod. Weld these at all the corners of the joint. A typical joint is shown in Annexure – A, (II): JOINT OF M.S. ROD TO M.S. ROD AT EARTH ELECTRODE AND AT MESH CROSSINGS.

(vi) After welding, apply bituminous compound to the hot joints, and cover the joints with bitumen impregnated tape.

(vii) Back fill the pit with Bentonite slurry (to be arranged by the Contractor) and compact it after completion of the work.

3.6 **LAYING OF EARTH MAT:**

(i) Excavate trenches along the specified alignments to a depth of 0.80 meter below the foundation top level.

(ii) Where different ground levels are provided in the switchyard, uniformly increase the depth of excavation in the higher level from a distance of 5 metres from the lower level so as to attain the required depth of excavation in the lower level.

(iii) Wherever the earth mat is to cross cable trenches, underground service ducts, pipes, transformer tracks, etc., increase the depth of excavation so that it can be laid at a minimum depth of 300 mm below them.

(iv) Wherever the earth mat is to cross a road, increase the depth of excavation so that it can be laid 300 mm below the road or at a greater depth to suit the site conditions.

(v) Lay the M. S. Rod in the excavated trenches.

3.7 **JOINTS IN EARTHING**:-

3.7.1 **Straight Joints of M. S. Rods in the Earth Mat:**

(i) Place the rods so that they overlap each other by 4 times their diameter, e.g., 100 mm in case of M. S. Rod of 25 mm diameter. Clamp / hold these two lengths of M.S. Rods together and weld them on both sides.

(ii) Thereafter, place two pieces of M. S. Flat of size to be used for earthing risers and length 4 times the diameter of the rods on both sides of this joint, and weld these pieces on the rods. A typical joint is shown in Annexure – A, (III): JOINT OF M.S. ROD TO M.S. ROD IN EARTH MAT.

(iii) After welding, apply bituminous compound to the hot joints, and cover the joints with bitumen impregnated tape.

3.7.2 **Cross Joints of M. S. Rods in the Earth Mat:**

(i) Clamp / hold together the two M. S. Rods crossing each other. First weld these together at the crossing point.

(ii) Fabricate four cleats in the shape of M. S. Angles from M. S. Flat of size to be used for earthing risers and of length equal to 10 times the diameter of the M. S. Rod. Weld these at all the corners of the joint. A typical joint is shown in Annexure – A, 

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(II): JOINT OF M.S. ROD TO M.S. ROD AT EARTH ELECTRODE AND AT MESH CROSSINGS.

(iii) After welding, apply bituminous compound to the hot joints, and cover the joints with bitumen impregnated tape.

3.7.3 Joint of M.S. Rod and Earth Electrode:

(i) Clamp / hold together the M.S. Rod and the earth electrode. First weld these together at the crossing point.

(ii) Fabricate two cleats in the shape of M.S. Angles from M.S. Flat of size to be used for earthing risers and of length equal to 10 times the diameter of the M.S. Rod. Weld these at the joint. A typical joint is shown in Annexure – A, (IV): JOINT OF M.S. ROD TO M.S. ROD AT EARTH ELECTRODE.

(iii) After welding, apply bituminous compound to the hot joints, and cover the joints with bitumen impregnated tape.

(iv) Backfill the excavation and compact the soil after completion of the work.

3.8 PREPARATION AND FITTING OF RISERS:

(i) Excavate trench from the equipment / structure foundation to the nearest rod of the earth mat. The depth shall be 0.80 meter below the foundation top level.

(ii) Cut M.S. Flat of the required length and form / bend it, by heating if required, to form a smooth and regular shape to match with the shape / form of the equipment / structures / foundation. The shape of the risers should be same / similar for the same type of equipment / structure.

(iii) Lay the prepared M.S. flat riser from the equipment / structure / peak of the structure (for grounding of earth wire) to the rod of the earth mesh in the excavated trench and then connect it to the equipment or structures or structure peak. The fitting to the equipment / structure may be bolted type (earthing terminal / pad of the equipment) or welded type (structure). For bolted type fitting, drill necessary holes in the riser and fix it with bolts & nuts. For welded type fitting, weld a length equal to at least twice the width of the M.S. Flat.

(iv) In case joints are required to increase the length of the M.S. Flat risers, the two lengths of the M.S. Flat should overlap each other by twice the width of the M.S. Flat. After placing the M.S. flats one above the other as above, clamp / hold them together to provide good surface contact. Weld the two sides of the joint as well as the part between the flats on the top surface. A typical joint is shown in Annexure – A, (V): JOINT OF M.S. FLAT TO M.S. FLAT.

(v) Weld the M.S. Flat riser to the rod of the earth mat after fitting / welding it to the equipment / structure / structure peak. Place the M.S. Flat below the rod, clamp / hold them together, and weld on both sides of the rod. Then form a piece of M.S. Flat 50 x 6 mm into a stirrup (as shown in the drawing) and place on the joint of the rod and flat. Alternatively, cut two pieces of M.S. Angle 50 x 50 x 6 mm of length equal to the width of the M.S. Flat and place these on both sides of the joint of the rod and flat. Weld these to both the rod and the flat. A typical joint is shown in Annexure – A; (VI) JOINT OF M.S. FLAT TO M.S. ROD OF EARTH MAT.

(vi) After welding, apply bituminous compound to the hot joints and cover the joints with bitumen impregnated tape.

(vii) Clamp the earthing risers with the equipment support structures at 1000 mm intervals.

(viii) Backfill the excavation and compact the soil after completion of the work.

(ix) Apply red oxide paint and then green enamel paint on the portion of the risers above ground level.

(x) A drawing showing the typical arrangement for earthing of equipment and its structure is given at Annexure-A.
VIEW A-A

TYPICAL EXAMPLE OF EARTHING OF SUB-STATION EQUIPMENT

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4.0 ERECTION OF SUB STATION STEEL STRUCTURES

4.1 General Instructions
   (i) The structure material shall be stacked member / item wise.
   (ii) The following shall be made available by RVN to the contractor for erection of
        Sub Station structures / beams and equipment structures:
        a) Drawings and bills of material of structures / beams / equipment structures.
        b) Templates of structures.

4.2 Type of Structures:
The types of structures generally used at Sub Stations are given below:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Structure</th>
<th>Type of Structure</th>
<th>Height of Column / Height of Conductor (Meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>220 kV Structures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>AT1</td>
<td>Column with Peak</td>
<td>20.0 / 14.5</td>
</tr>
<tr>
<td>2.</td>
<td>AT3</td>
<td>Column without Peak</td>
<td>15.0 / 14.5</td>
</tr>
<tr>
<td>3.</td>
<td>AT4</td>
<td>Column with Peak and Beams at two levels for Bus Bar stringing</td>
<td>20.0 / 14.5 and 9.5</td>
</tr>
<tr>
<td>4.</td>
<td>AT6</td>
<td>Column without Peak</td>
<td>10.0 / 9.5</td>
</tr>
<tr>
<td>5.</td>
<td>AT8</td>
<td>Column with Peak</td>
<td>15.0 / 9.5</td>
</tr>
<tr>
<td>6.</td>
<td>AB</td>
<td>Beam</td>
<td>16.6 (Width)</td>
</tr>
<tr>
<td>B. 132 kV Structures:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>BT1</td>
<td>Column with Peak</td>
<td>16.0 / 11.5</td>
</tr>
<tr>
<td>2.</td>
<td>BT3</td>
<td>Column without Peak</td>
<td>12.0 / 11.5</td>
</tr>
<tr>
<td>3.</td>
<td>BT4</td>
<td>Column with Peak and Beams at two levels for Bus Bar stringing</td>
<td>16.0 / 11.5 and 7.5</td>
</tr>
<tr>
<td>4.</td>
<td>BT6</td>
<td>Column without Peak</td>
<td>8.0 / 7.5</td>
</tr>
<tr>
<td>5.</td>
<td>BT7</td>
<td>Column with Peak</td>
<td>12.0 / 7.5</td>
</tr>
<tr>
<td>6.</td>
<td>BB</td>
<td>Beam</td>
<td>12.2 (Width)</td>
</tr>
<tr>
<td>7.</td>
<td>P</td>
<td>Peak</td>
<td>2.5</td>
</tr>
<tr>
<td>8.</td>
<td>Q</td>
<td>Column</td>
<td>7.5 / 7.5</td>
</tr>
<tr>
<td>9.</td>
<td>R</td>
<td>Extension</td>
<td>3.0</td>
</tr>
<tr>
<td>10.</td>
<td>GD</td>
<td>Beam</td>
<td>10.0 (Width)</td>
</tr>
</tbody>
</table>

Signature with seal of bidder
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Structure</th>
<th>Type of Structure</th>
<th>Height of Column / Height of Conductor (Meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.</td>
<td>33 kV and 11 kV Structures:</td>
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<td></td>
</tr>
<tr>
<td>1. X</td>
<td>Peak</td>
<td></td>
<td>1.5</td>
</tr>
<tr>
<td>2. Y</td>
<td>Column</td>
<td></td>
<td>5.5 / 5.5</td>
</tr>
<tr>
<td>3. Z</td>
<td>Extension</td>
<td></td>
<td>3.0</td>
</tr>
<tr>
<td>4. GF - 5.4</td>
<td>Beam for 33 kV</td>
<td></td>
<td>5.4 (Width)</td>
</tr>
<tr>
<td>5. GF - 4.6</td>
<td>Beam for 11 kV</td>
<td></td>
<td>4.6 (Width)</td>
</tr>
<tr>
<td>D.</td>
<td>Equipment Structures:</td>
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<td></td>
</tr>
<tr>
<td>1. AO1</td>
<td>220 kV Isolators</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>2. AO1 (T)</td>
<td>220 kV Tandem Isolators</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>3. AO3</td>
<td>220 kV CT</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>4. AO4</td>
<td>220 kV CVT</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>5. AO5</td>
<td>220 kV LA &amp; 132 kV CT, CVT / PT, LA</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>6. BO1</td>
<td>132 kV Isolator</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>7. BO1 (T)</td>
<td>132 kV Tandem Isolator</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>8. X – 15</td>
<td>33 kV &amp; 11kV Isolators</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>9. X – 15 (T)</td>
<td>33 kV &amp; 11kV Tandem Isolators</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>10. CT Structure</td>
<td>33 kV &amp; 11kV CT, PT</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>11. PI Structure</td>
<td>220 kV, 132kV, 33 kV &amp; 11 kV PI</td>
<td></td>
<td>--</td>
</tr>
</tbody>
</table>

THE WEIGHTS OF VARIOUS TYPE OF STRUCTURES ARE DETAILED BELOW FOR REFERENCE

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>Type of Structure</th>
<th>Unit Wt. of Structure along with Bolts &amp; Nuts Step Bolts &amp; Nuts &amp; Sp. Washers (MT)</th>
<th>Wt. of Structure in (MT)</th>
<th>Wt. of GI Bolts &amp; Nuts (KG)</th>
<th>Wt. of Step Bolts &amp; Nuts (KG)</th>
<th>Wt. of Spring. Washers (KG)</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>AT1</td>
<td>2.578</td>
<td>2.47800</td>
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<td>1.608</td>
<td>54.139</td>
<td>13.802</td>
<td>3.861</td>
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<td>3</td>
<td>AT4</td>
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<td>7</td>
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<td>1.71200</td>
<td>73.7310</td>
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<tr>
<td>8</td>
<td>BT3</td>
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<td>1.26623</td>
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<td>10.128</td>
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<tr>
<td>9</td>
<td>BT4</td>
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<td>2.484</td>
<td>106.545</td>
<td>11.394</td>
<td>6.849</td>
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</tbody>
</table>

Signature with seal of bidder
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<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>BT6</td>
<td>0.708</td>
<td>0.669</td>
<td>29.76</td>
<td>7.17</td>
</tr>
<tr>
<td>11</td>
<td>BT7</td>
<td>1.196</td>
<td>1.132</td>
<td>51.418</td>
<td>8.44</td>
</tr>
<tr>
<td>12</td>
<td>BB1</td>
<td>0.8098</td>
<td>0.7600</td>
<td>46.5000</td>
<td>NIL</td>
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<tr>
<td>13</td>
<td>PIS</td>
<td>0.1715</td>
<td>0.164</td>
<td>6.887</td>
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</tr>
<tr>
<td>14</td>
<td>AO1</td>
<td>1.0972</td>
<td>1.0724</td>
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<td>15</td>
<td>AO1(T)</td>
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<td>0.229</td>
<td>6.963</td>
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<td>AO3</td>
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<tr>
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<td>19</td>
<td>BO1</td>
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<tr>
<td>21</td>
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<td>0.08170</td>
<td>7.2960</td>
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<td>22</td>
<td>Q with Stub</td>
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<td>0.68850</td>
<td>23.2260</td>
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<td>Q W/O Stub</td>
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<td>16.342</td>
<td>NIL</td>
</tr>
<tr>
<td>24</td>
<td>R</td>
<td>0.441</td>
<td>0.42850</td>
<td>11.6720</td>
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</tr>
<tr>
<td>25</td>
<td>GD Beam</td>
<td>0.5403</td>
<td>0.51320</td>
<td>25.1700</td>
<td>NIL</td>
</tr>
<tr>
<td>26</td>
<td>X</td>
<td>0.05</td>
<td>0.04400</td>
<td>5.8590</td>
<td>NIL</td>
</tr>
<tr>
<td>27</td>
<td>Y with Stub</td>
<td>0.385</td>
<td>0.36500</td>
<td>18.8500</td>
<td>NIL</td>
</tr>
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<td>28</td>
<td>Y W/O Stub</td>
<td>0.332</td>
<td>0.3130</td>
<td>17.8400</td>
<td>NIL</td>
</tr>
<tr>
<td>29</td>
<td>Z</td>
<td>0.298</td>
<td>0.28900</td>
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<td>30</td>
<td>GF 5.4 mtr.</td>
<td>0.25</td>
<td>0.23000</td>
<td>18.7800</td>
<td>NIL</td>
</tr>
<tr>
<td>31</td>
<td>33 KV CT&amp;PT Str.</td>
<td>0.196</td>
<td>0.19030</td>
<td>5.3300</td>
<td>NIL</td>
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<tr>
<td>32</td>
<td>X-15</td>
<td>0.248734</td>
<td>0.241314</td>
<td>6.9160</td>
<td>NIL</td>
</tr>
</tbody>
</table>

The weights mentioned above are indicative only. The actual weights shall be taken as per approved BOM of supplied structures for the purpose of payment.

4.3 SETTING OF STUB / FOUNDATION BOLTS, LEVELLING AND PREPARING FOR GROUTING:

(i) In case of structures with foundation bolts, the template, along with the foundation bolts tightened on it with nuts on both sides, shall be placed on the foundation. The length of the foundation bolts above the template shall be sufficient so that all parts of the base plate assembly of the structure, washers, nuts and lock nuts can be tightened fully and 2 – 3 threads are left above the lock nut.

(ii) The template shall be levelled & centered with reference to its location on the foundation. The foundation bolts shall thereafter be grouted ensuring that there is no displacement during the placing of the concrete and use of vibrator. (Grouting work, i.e., concreting in the pockets of the foundations along with material, will be in the scope of RVPN)

(iii) In case of structures with stubs, the template with stubs shall be placed on the foundation. In case of structures in which the lowest member is used as a stub, the assembled lower part of the structure shall be placed on the foundation. This shall be levelled & centered with reference to its location on the foundation. The stubs / lowest member shall thereafter be grouted ensuring that there is no displacement during the placing of the concrete and use of vibrator. (Grouting work, i.e., concreting in the pockets of the foundations along with material, will be in the scope of RVPN)

(iv) While leveling and centering the structure / template, the following points shall be checked:
a) Level of structure / template with reference to the finished foundation level or the ground level.
b) The level of the structure / template with reference to level of other similar structures.
c) Distance of centre line of the structure from the center line of other structures or from a reference point.
d) Centre to centre distance between structures, particularly structures which are to be connected together, for example, by a common beam.

4.4 ERECTION OF STRUCTURES:

4.4.1 Method of Erection:
The contractor shall be at liberty to choose any of the three methods of erection of structures which are as below:
i) Ground assembly method.
ii) Section method.
iii) Built up method or piecemeal method.
He shall however be responsible for any damage to the structures/structure material or any adjacent structures/equipment.

4.4.2 Ground Assembly Method:
(i) This method is used for erection of equipment structures and is the preferred method of erection of Sub Station structures when crane facility is available.
(ii) This method consists of assembling the structure on the ground and erecting it as a complete unit.
   (iii) The complete structure is assembled in a horizontal position near its location. On sloping or uneven ground, suitable packing is provided in the lower level
   (iv) area before or during assembly, as required, to eliminate / minimize stress on the structure members.
   (v) After the assembly is complete, the structure is picked up from the ground with the help of a crane and set on its foundation.

4.4.3 Section Method:
(i) This method is used for large and heavy structures when crane facility is available.
(ii) A mobile crane is used for erecting the structures.
(iii) The two faces / sides of the complete structure are assembled on the ground and then erected. Alternatively, the two faces / sides of the major sections of the structure are assembled on the ground and the same are erected as units.
(iv) Each assembled side is then lifted clear of the ground with the crane and is lowered into position on its foundation or fitted on to stubs or foundation bolts which are already grouted. One side is held in place with props or rope guys while the other side is being erected. The two opposite sides are then connected together with cross members.
(v) In case where the major sections of the structure have been assembled, the first face of the second section is erected. After the two opposite faces have been erected, the bracings on the other two sides are bolted up. The last lift raises the top of the structure. After the structure top is erected and all side bracings have been bolted up, all the guys are thrown off.

4.4.4 Built up method or piecemeal method:
(i) This method is used for large and heavy structures when crane facility is not available.

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(ii) This method consists of erecting the structure member by member. The structure members are kept on ground serially according to erection sequence so that they can be sent up conveniently.

(iii) The erection progresses from the bottom upwards. The four main corner leg members of the first section of the structure are first erected.

(iv) The cross bracings of the first section are raised one by one and bolted to the already erected corner leg angles. If these have been assembled on the ground, then they are lifted up as a unit.

(v) For assembling the second section of the structure, a derrick is placed on one of the corner legs. This derrick is used for raising parts of second section. The leg members and bracings of this section are then hoisted and assembled.

(vi) The derrick is then shifted to the corner leg members on the top of second section to raise the parts of third section of the structure in position for assembly. The derrick is thus moved up as the structure grows. This process is continued till the complete structure is erected.

4.5 ERECTION OF BEAMS:

(i) The two faces of the beam are assembled on the ground.

(ii) Each face of the beam is raised with the help of crane or using derricks which are placed on the top of the already erected structures on both the sides of the beam. Single or multi-way pulleys with polypropylene / steel ropes are used as per load requirement. The ends of the beam are connected to the column as per fixing arrangement provided on the columns.

(iii) The bracings of the upper and lower faces of the beam are then raised up and fitted.

4.5.1 The columns shall be truly vertical and the beams truly horizontal after erection. Measures taken to bring the column to verticality and beam to horizontality should not result in strain on the structure members so as to cause distortion / bending of the members.

4.5.2 The work of erection of beams on erected columns and erection of equipment on erected structures shall not be taken up until these have been checked for tightening of the bolts & nuts.

4.5.3 All bolted connections shall be well tightened using spring washers & then punched at three points on the circumference of the bolt.

5.0 STRINGING OF BUS BARS OF ACSR CONDUCTOR, STRINGING OF SHIELD/ EARTH WIRE AND JUMPERING ETC.

5.1 General Instructions

Note: The binding wire to be used for these works shall be arranged by the Contractor.

(i) Care shall be taken during sagging operations so that no damage or deformation is caused to the structures.

(ii) The ends of the cut piece of conductor / earth wire shall be tied with at least two rounds of binding wire so that the strands do not open out. The tying of the binding wire shall be done such that the binding wire does not get tightened in the groove of the T - Clamps or the PG (Parallel Groove) - Clamps or the terminal connectors of the equipment.

(iii) Cut lengths of conductor and earth wire left after stringing of bus bars and earth wire can be used for jumpering work.

(iv) Compression machine, if required, shall be provided on rent free basis by RVPN.

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5.2 **BUS BAR MATERIAL:**
The bus bar material generally used in 220 kV & 132 kV sub Stations is given below:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description</th>
<th>Bus Bar and Jumper Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>132 kV Main Bus</td>
<td>ACSR Zebra</td>
</tr>
<tr>
<td>6</td>
<td>132 kV Auxiliary Bus</td>
<td>ACSR Panther</td>
</tr>
<tr>
<td>7</td>
<td>132 kV equipment interconnection</td>
<td>ACSR Zebra / ACSR Panther</td>
</tr>
<tr>
<td>8</td>
<td>132 kV overhead bus &amp; droppers in all bays.</td>
<td>ACSR Panther</td>
</tr>
<tr>
<td>9</td>
<td>33 kV Main Bus</td>
<td>ACSR Zebra</td>
</tr>
<tr>
<td>10</td>
<td>33 kV Auxiliary Bus</td>
<td>ACSR Zebra</td>
</tr>
<tr>
<td>11</td>
<td>33 kV equipment interconnection, overhead bus and droppers:</td>
<td>ACSR Zebra</td>
</tr>
<tr>
<td></td>
<td>(i) Bus coupler &amp; transformer bay</td>
<td>ACSR Zebra</td>
</tr>
<tr>
<td></td>
<td>(ii) Feeder bay.</td>
<td>ACSR Panther</td>
</tr>
<tr>
<td>12</td>
<td>11 kV Main Bus</td>
<td>Twin ACSR Zebra</td>
</tr>
<tr>
<td>13</td>
<td>11 kV Auxiliary Bus</td>
<td>ACSR Zebra</td>
</tr>
<tr>
<td>14</td>
<td>11 kV equipment interconnection, overhead bus and droppers:</td>
<td>Twin ACSR Zebra / Single ACSR Zebra</td>
</tr>
<tr>
<td></td>
<td>(i) Transformer bay</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(ii) Bus coupler</td>
<td>ACSR Zebra</td>
</tr>
<tr>
<td></td>
<td>(iii) Feeder bay</td>
<td>ACSR Panther</td>
</tr>
</tbody>
</table>

5.3 **STRINGING OF CONDUCTOR BUS BARS:**

(i) The conductor shall be handled with care to prevent scratches on it or damage to the strands of the conductor. When the conductor is to be taken from drums, small lengths can be unwound from the drum. For longer lengths, the conductor drum shall be placed on a turn table or jacked up on a suitable size of steel shaft. The conductor shall be paid out in a manner so that there are no scratches or damages caused to the conductor due to rubbing on the sides of the drum.

(ii) Disc insulators shall be cleaned and examined for any cracks / chipping, etc. Disc insulators having any hair cracks or chipping or defective glazing or any other defect shall not be used. The limits of the area of defective glazing are given by the following formulas.

\[
a) \quad \text{Single Glaze Defect} = 0.5 + \frac{D \times F}{20000} \quad \text{Sq. cm.}
\]

\[
b) \quad \text{Total Glaze Defect} = 1.0 + \frac{D \times F}{2000} \quad \text{Sq. cm.}
\]

where,

\[
D = \text{Diameter of the disc in cm.}
\]

\[
F = \text{Creepage distance in cm.}
\]

(iii) The disc insulators shall be assembled on the ground to form the suspension and tension strings as given below.

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(iv) After assembly of the strings, the mouth of the W - clips / R - clips shall be widened to prevent any inadvertent removal during service.

(v) The suspension and tension hardware shall be assembled as per their respective drawings to be provided by RVNP and the disc insulator string shall be fitted in the requisite portion of the hardware assembly.

(vi) For stringing of bus bars, the conductor shall be fixed and tightened in the clamp of the tension hardware on one side of the bus. Thereafter, the complete hardware assembly with the conductor shall be hoisted up and fixed on the beam at this end. Sagging arrangement shall be made on the other end of the bus and the conductor shall be tensioned.

(vii) Measurement of length of conductor required for the bus shall be made thereafter and the conductor shall be released so that it returns to the ground. The conductor shall be cut to the marked length after deducting the length of the tension hardware with insulators and fixed in the clamps of the tension hardware. The conductor along with tension hardware set shall then be again pulled up and connected to the beam.

(viii) Equalizing of tension in the different sub-conductors of the same phase and in the different phases shall be done, if required, to ensure equal sag of all the sub-conductors or between phases of the bus section as well as that of adjacent or parallel sections.

(ix) The spacers shall be fitted on the twin conductor bus bars at the spacing shown in the drawing (to be provided by RVNP). The spacers shall also be provided at points where jumpers are taken from the bus bar using T-clamps and / or P. G. clamps. Spacers are not used at jumper points in case T - Spacers are used for taking jumpers from multi conductor bus bars.

5.4 JUMPERING:

5.4.1 Jumpering of Conductors:

(i) The jumpers connecting different sections of the bus bars as well as those connecting equipment to bus bars shall be of Y - type.

(ii) A typical diagram of Y - type jumpering is given below.
(iii) For making Y-type jumpers, the jumper conductor(s) shall be first connected to the bus bar conductor(s) using T-Clamp / Spacer T-Clamp which is suitable for clamping the respective conductors, i.e., bus bar conductor(s) and the jumper conductor(s). Thereafter, the bus bar conductor(s) shall be again connected with the jumper conductor(s) using properly curved & shaped Y-conductor(s) and 2 nos. PG-clamps as shown in the diagram above.

(iv) The jumpering between equipment shall be done with single / twin conductors as per the terminal connectors provided on the equipment.

(v) In case of jumpers for twin conductors, the spacers shall also be fitted at a suitable spacing on the jumpers in order to maintain their shape.

5.4.2 Jumpering of Busbars:

(i) For jumpering of different sections of bus bars on the beam, the suspension hardware set along with disc insulators shall first be hoisted and fitted on the beam.

(ii) Conductor of approximately the length required for the jumper shall be cut and straightened so that kinks are removed. This shall be connected to the bus bar conductor on one side of the beam after taking into consideration the natural curve of the conductor.

(iii) This shall then be passed through the clamps on the suspension hardware so that the proper curve is obtained. The other end of the conductor shall then be taken up to the bus bar conductor on the other side and measurement of the length shall be taken. The conductor shall be cut to the appropriate length and then connected to the bus bar conductor on the other side. The length of the conductor used and its natural curve should be such that a neat and proper curve is obtained in the jumper without any kinks or bends. The clamp of the suspension hardware shall then be tightened after ensuring proportional lengths of the conductor on both the sides of the beam.

5.4.3 Jumpering from Busbar to Equipment:

(i) Approximate length of the conductor required for the jumper shall be cut and then connected to the bus bar conductor.

(ii) In case the jumper is to be connected to equipment near or under a beam, the suspension hardware along with disc insulators is first fitted on the beam. The conductor shall be passed through the clamp of the suspension hardware.

(iii) The end of the conductor shall be taken up to the terminal connector of the equipment. The measurement of length of the conductor up to the equipment shall be made.

(iv) After cutting the conductor to the required length, it shall be connected to the equipment.

(v) The clamps of the suspension hardware shall be tightened thereafter.

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5.4.4 **Jumpering between Equipments:**

(i) The distance between terminal connector of one equipment and terminal connector of other equipment is first measured. The appropriate length of the conductor shall be cut and then straightened so that curves and kinks are removed.

(ii) The jumper conductor shall then be connected to the terminal connectors of both the equipments and straightened or shaped as per site condition to give a neat and proper look.

(iii) Vertically supported insulators of equipments and Post Insulators should be checked for verticality again after jumpering on both sides and corrected if required.

5.5 **STRINGING OF SHIELD / EARTH WIRE:**

(i) The shield / earth wire shall be handled with care to prevent scratches on it or damage to the strands of the wire. When the shield / earth wire is to be taken from drums, small lengths can be unwound from the drum. For longer lengths, the earth wire drum shall be placed on a turn table or jacked up on a suitable size of steel shaft. The shield / earth wire shall be paid out in a manner so that there are no scratches or damages caused to the shield / earth wire due to rubbing on the sides of the drum.

(ii) The earth wire shall be strung from one peak to another peak of the structures as per layout of the GSS.

(iii) The tension hardware shall be assembled as per the relevant drawings to be provided by VPN.

(iv) The shield / earth wire shall be fitted and tightened in the clamp of the tension hardware on one side. Thereafter, the complete hardware assembly along with the shield / earth wire shall be hoisted up and fixed on the peak of the structure at one end.

(v) Sagging arrangement shall be made on the other end and the shield / earth wire shall be tensioned. Measurement of length of shield / earth wire required shall be made thereafter and the shield / earth wire shall again be released so that it is returned to the ground. The shield / earth wire shall be cut to the marked length after adding the length of the wire required for jumpering and fitted in the clamp of the tension hardware at the marked point. The shield / earth wire along with tension hardware set shall then be pulled up again and connected to the peak of the structure.

(vi) Adjustment of tension in the earth wire may be done, if required, to ensure equal sag of all the earth wires in adjacent or parallel sections.

5.6 **JUMPERING OF SHIELD / EARTH WIRE:**

(i) The lengths of the earth wire which remain outside the tension hardware on the peak of the structures shall be cut, if required, so that these lengths when joined together form a smooth and proper curve. These shall be connected together using a PG – Clamp.

(ii) The earth bond provided with the earth wire tension clamp shall be connected to the specified point on the peak of the structure and to the earthing riser, which is used as a down conductor from the peak, for the purpose of connecting the shield / earth wire to the earth mesh of the Sub Station.

6.0 **ERECTION ACTIVITIES IN RESPECT OF VARIOUS EQUIPMENTS.**

A. **POWER TRANSFORMER**

1.0 **GENERAL INSTRUCTIONS:**

1.1 The erection work shall be got done generally as per instructions/procedures prescribed in
the following documents:

b. Manufacturer's Erection Drawings.
d. Transformer Manual(TechnicalReportNo.1) issued by the Central Board of Irrigation on & Power

1.2 The work shall be carried out under the supervision of Work-In-Charge/Manufacturer's Engineer and as per instructions given by him/them.

1.3 Transformer oil drums should not be stored in low lying areas. They should be stored so that the air release hole (smaller hole) is on the upper side an data angle of 45° to the vertical as shown in the diagram below.

![Air Release Hole Diagram]

1.4 All the accessories should generally be stored in a closed shed/room. However, accessories such as condenser bushings, radiators, conservator, headers, pipe work and A-frame can be stored under covered sheds.

1.5 The gas pressure in transformers received gas filled should be checked periodically. A Positive pressure (generally 0.15kg/cm² at 30°C) should always be maintained. In case of reduction in pressure, it should be maintained by filling in gas from the cylinder on the transformer. Measure IR values with 2 KV Megger in between Core to Tank, Core to Frame and Tank to Frame prior to erection of Transformer.

1.6 The core and winding should be exposed to the atmospheric air forth minimum possible time period and for not more than 8 hours at a time. The weather conditions during transformer erection should be dry. The transformer tank should not be opened when it is raining.

1.7 The Bushing CT's fitted in the turrets should be got tested by the protection wing before erection of turrets.

1.8 Check the open and closed conditions of contacts provided in equipment such as M.O.L.G., Oil surge n relays, Buchholz relays, oil flow indicators, etc. be for the are installed.

1.9 The top oil temperature should invariably be noted during measurement of IR values of transformer.

1.10 IR values should not be measured when the transformer tank is under vacuum.

2.0 Initial oil filling in Transformers received gas filled:

2.1 Oil Preparation:

2.1.1 The oil supplied in oil drums (for first filling, top pinup & OLTC) is first filled in to oil storage tank(s) through filter machine. This oil is then filtered in the tank(s).

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2.1.2 The following oil values shall be attained so as to facilitate early defective dehydration of transformer:

   a. Break Down Voltage: 70kV (Minimum)
   b. Moisture Content: 10 ppm (Maximum)

The oil temperature thermostat in the filter machines should be set at 60°C.

2.2 Vacuuming of the Transformer:

2.2.1 Provide equalizing connections between main tank and OLTC Diverter Switch chamber(s) and isolate those part so the Transformer which are not designed for vacuum.

2.2.2 Erection of the par to f the pipe line between the tank and the conservator up to the Buchholz relay.

2.2.3 Connect a breather to any valve above the tank oil level through a suitable pipe.

2.2.4 Connect a transparent plastic pipe (either reinforced or having wall thickness of 5 to 8 mm suitable for with standing vacuum) between the Top and bottom valves of the transformer to check the oil level.

2.2.5 Apply vacuum to the transformer. The vacuum pipes generally connected to the pipe line between transformer tank and conservator. The extent of vacuum and the time duration of it supplications shall be as per Manufacturer’s recommendations. In case this is not specified by the Manufacturer, then vacuum of 1.00 to 1.01 (maximum) is to be applied for at least 12 hours for transformers of up to 145 kV class and 24 hours for transformers of higher voltage class.

2.3 Oil Filling:
2.3.1 The treated oil shall then be filled in to the transformer tank under vacuum until the oil level reaches 250 mm below the top cover level. The oil level can be seen in the transparent plastic pipe provided

2.3.2 The vacuum in the tank is then slowly released by slightly opening the valve on which the breather is connected so that only moisture free air goes inside the tank. The rate of release of vacuum should be kept very slow so that the silica gel in the breather does not get sucked in to the tank.

2.4 Internal Inspection:
2.4.1 Internal inspection of transformers up to 145 kV class may be carried out if recommended by the manufacturer and as per procedure prescribed by him.

2.4.2 The oil is drained from the tank for internal inspection, and for erection if required. Where Connections are required to be made inside the tank and when the erection work is to be continued on the next day, the oil is refilled after the day’s erection activities are completed. Additional precautions prescribed by the Manufacturer for dry air and human safety during such erection activities should be followed.

3.0 The oil received in drums (for top ping up &OLTC) for transformers received oil filled is filled in to a storage tank through filter machine. This oil is filtered in the tank until the values given at para 2.1.2 are attained.

4.0 Transformer switch separately mounted cooler banks:

4.1 Large size EHV Transformer (generally 245 kV class and above) are provided with separately mounted cooler banks.

4.2 Placing on foundation, leveling and centering of cooler bank supports (A-frame).

4.3 Erection of lower and upper headers on the A-frame.

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4.4 Assembly and fitting of upper and lower cooler pipe line from transformer tank to respective headers including fixing of Valves, Pumps, Non Return Valves, expansion joints, Oil flow indicators, etc., as per General Arrangement (GA) drawing. The arrow marks on the oil pump sand oil flow indicates or should point towards the transformer tank.

4.5 Grouting of cooler bank supports (A-frame).

4.6 Erection of Radiators on the headers.

5.0 Transformers with tank mounted cooler bank/radiators:
5.1 Erection of headers, if provided.

5.2 Erection of radiators on headers/tank.

6.0 Erection of Accessories:
6.1 Erection of main conservator & On Load Tap Changer (OLTC) conservator along with heir supports.
6.2 Erection of HV, LV and TV turrets, when supplied separately

6.3 Erection of HV, LV, TV & neutral bushing(s) and making their connections inside the tank, as required.

6.4 Fitting of Pressure Relief Devices along with pipes, if provided.

6.5 Erection of Explosion Vent, if provided. Ensure that diaphragms are fitted on both ends of the vent pipe.

6.6 Assembly and fitting of equalizing pipe line between tank cover, turrets, inspection over’s, etc. as provided.

6.7 Assembly and fitting of Buchholz pipe line, fitting of valves, expansion joints as provided an Buchholz relays, and connecting it to the equalizing Pipe line and the main conservator. The arrow marks on the Buchholz relays should point towards the conservator. Where two Buchholz relays are provided, there lay near the tank is designated as Buchholz Relay – I and there lay near the conservators Buchholz Relay – II.

6.8 Assembly and fitting of pipe lines for breathers of mainland OLTC conservators and fixing of breathers after checking the silica gel (to be replaced/regenerated, if not of blue colour), and also filling of oil in the oil cup. Ensure that the sealing provided on the air passage of the breathers has been removed.

6.9 Assembly and fitting of pipe line for the OLTC Diverter Switch including valves and oil surge relay and connecting it to the OLTC conservator. The arrow marks on the oil surge relays should point towards the conservator.

6.10 Assembly & fitting of cooler fans, including fitting of supports, if provided. The leveling, centering and grouting of ground mounted supports is to be got done before erection.

6.11 Erection/placing off an control cubicle/marshalling box & OLTC drive mechanism. In case these are ground mounted, then these are to be place on the foundation, leveled, centered and then grouted.

7.0 Filling of topping up oil in the transformer tank and conservator. During this process, the air Release valves/plugs provided on the top of the conservator should be kept open. The oil shall be filled up to 1/3rd level in the conservator.

8.0 Dehydration of Transformer by Hot Oil Circulation:

8.1 When starting the dehydration, oil is drawn from the bottom of transformer in to the filtration
plant and let into transformer against the top for removing any settled moisture/impurities. The readings of IR values shall not be taken during this process since these will be misleading due to erroneous indication of winding temperature. After about 8-12 hours of circulation in this manner, the cycle is reversed, i.e., oil is drawn from the top and fed at the bottom.

8.2 During dehydration, measure in sudation resistance values of the transformer every 2 hours. The test voltage of 5 kV is applied for one minute. The winding temperature is assumed to be the same as top oil temperature under steady state conditions.

8.3 In the beginning, the IR values drop down as the temperature increases. If there is moisture in the windings, then their values at constant temperature will drop down as the moisture is removed from the insulation and gets dissolved in the oil. The moisture in the oil is continuously removed by the filtration plant. After the moisture has been removed from the winding, the IR values will start rising as the dissolved moisture in the oil is removed. These reach a constant value after the drying out is complete. The dehydration process is thereafter continued for a minimum of another 24 hours or until the oil values given at Para 8.7 are attained.

8.4 If there is no moisture in the windings, then the IR values at constant temperature will remain the same. In such case, the dehydration is stopped after the time prescribed by the manufacturer. If no such time is prescribed, then the dehydration at constant temperature is carried out for a minimum of 72 hours or until the oil values given at Para 8.7 are attained.

8.5 Allow the transformer to cool down to atmospheric temperature. Measure the IR values at 2 Hour intervals during the cooling period.

8.6 IR values can be plotted against time. A typical indicative drying out curve is shown below:

8.7 The following oil values shall be attained in order to increase the time interval before refilteration of oil is required when the transformer is in service:

   a. Break Down Voltage: 80kV (Minimum)
   b. Moisture Content: 10ppm (Maximum)

8.8 Compare the insulation resistance values with the following reference values:

   i. New transformers: Factory Test Results.
   ii) Old transformers: Previous Test Results

Insulation resistance varies inversely with the temperature. For a 10°C change of temperature, the insulation resistance changes by a ratio generally in the range of 2:1 to 1:4. If the specified IR values are achieved, the transformer can be charged.

8.9 If the specified IR values are not attained, then carry out further drying out by adopting any of the following processes, as convenient. However, in case of transformers within guarantee period, the manufacturer is to be contacted.

   a. Hot air circulation.
   b. Hot oil circulation and short circuit heating.
   c. Heating, vacuum pulling and Nitrogen filling.
   d. Hot oil circulation and vacuum pulling.

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The processes at (a), (b) and (c) are described in the CBIP Manual on Transformers (Publication no.295) and in the IS:10028 (Part-II)–1981. The process at (d) is mostly adopted and is described at para 8.9 below.

8.10 Drying by Hot oil circulation and vacuum pulling:

8.10.1 Carry out hot oil circulation on the transformer. After maximum to p oil temperature is attained, the hot oil circulation is continued for 2–3 volumes of the transformer oil. The IR values and the temperature are noted.

8.10.2 Drain the oil from the tank and apply vacuum immediately and maintain for 12 hours. The precautions, as given earlier, for application of vacuum (para 2.2.1) as well as for allowing Dry air in to the transformer while draining oil (para 2.2.5) are to be followed.

8.10.3 Fill the oil again into the transformer. Start hot oil circulation and continue for 2–3 volumes of the transformer oil after maximum top oil temperature is attained. The IR values and the temperature are noted.

8.10.4 The IR values as measured above at para 8.10.1 & para 8.10.3 are compared. If there is improvement in the IR values, then the above process as given at para 8.10.2 & para 8.10.3 is continued till two consecutive readings are same.

8.10.5 If there is no change in the IR values as measured above at para 8.10.1 & para 8.10.3, then another cycle of the above process as given at para 8.10.2 & para 8.10.3 is carried out. If still there is no change, then the drying out process is stopped, otherwise it is continued till two consecutive readings are same.

8.10.6 After constant IR values are achieved, the drying out process is stopped and the transformer is allowed to cool down to atmospheric temperature.

8.11 The IR values are then measured and the temperature is noted. These are compared with the Reference values. If the previous IR values are achieved, the transformer can be charged.

9.0 Pressurizing of air cell in the main conservator:

9.1 Method recommended by the Manufacturer:
9.1.1 Open the air release plugs/valves provided on the top of the conservator.

9.1.2 Drain the oil from the transformer through the bottom filter valve till the conservator is empty. This can be checked by ensuring that there is no oil in the Buchholz relay(s).
9.1.3 Remove the breather. Connect the air filling device, which is provided with a pressure gauge and a filling pipe in which an on return valve is fitted, to the breather pipe. Any valves in the breather pipe should be kept open.

9.1.4 Inject air into the Air Bag/PRONAL through the air filling device to a maximum pressure of 0.1 kg/cm².

9.1.5 Slowly pump the oil through the bottom filter valve. Temporarily stop the oil filling operation when oil along with air bubbles starts coming out of the air release plugs/valves. Close the air release valve such that the flow of oil will be very slow. Where air release plugs are provided, they should be fitted but not fully tightened.

9.1.6 Continue the oil filling. Oil mixed with air bubbles shall start coming out. When all the air has been expelled, only oil will come out through the air release plugs/valves. The Prismatic oil level gauge, if provided on the conservator, will indicate full oil level.

9.1.7 Stop the oil filling after ensuring that no air bubbles come out with the oil. Close the air release plugs/valves while still maintaining the air pressure.

9.1.8 Release the air pressure thereafter.

9.1.9 Refit the breather on the pipeline.

9.1.10 Continue the oil filling in the transformer till the level shown on the Magnetic Oil Level Gauge (MOLG) corresponds to the oil temperature as per the reference mark given on the MOLG.

9.2 Alternate Method/Field Practice:

9.2.1 Keep the oil level in the conservator at approximately 1/3rd level.

9.2.2 Open the air release plugs/valves provided on the top of the conservator.

9.2.3 Remove the breather. Connect the air filling device, which is provided with a pressure gauge and a filling pipe in which an on return valve is fitted, to the breather pipe. Any valves in the breather pipe should be kept open.

9.2.4 Inject air into the Air Bag/PRONAL through the air filling device to a maximum pressure of 0.1 kg/cm².

9.2.5 The air in the conservator outside the Air Bag/PRONAL is pushed out through the air release plugs/valves. When all the air has been expelled, oil along with air bubbles starts coming out of the air release plugs/valves. The oil is allowed to come out until the reared no air bubbles in the oil.

9.2.6 The prismatic oil level gauge provided on the conservator will indicate full oil level. The air release plugs/valves are then closed while still maintaining the air pressure.

9.2.7 Release the air pressure thereafter.

9.2.8 Refit the breather on the pipe line.

9.2.9 The level of oil shown on the Magnetic Oil Level Gauge (MOLG) is checked with respect to the oil temperature and the reference mark given on the MOLG.

9.2.10 While injecting air into the air cell, the abrupt and excessive increase of pressure should be avoided since it may cause the PRV to operate causing wastage of oil and even an accident.

10.0 Fill in go foil in OLTC and its Dehydration:

10.1 Fill filtered oil (as per para 2.1.1/para 3.0) in the OLTC diverter switch chamber(s) and the

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OLTC conservator.

10.2 Carry out dehydration of the oil. This Oil is filtered in the OLTC diverter switch chamber(s) until the values given at para 8.7 are attained.

11.0 Air Release from the Transformer:

11.1 Release air from the following air release point still there are no air bubbles in the oil coming out from these air release points:
   a. Air release plugs provided on the Main tank cover and bushing turrets.
   b. Air release plugs provided on the Radiators, Headers and Cooler Bank pipe lines.
   c. Buchholz Relays.
   d. Float type Oil Surge Relays OSR.
   e. Pressure relief device (PRD) and Explosion Vent (if provided).
   f. Air release screws on through oil type Bushings (up to 33kV).
   g. Air release screws/plugs if provided on the mounting flange of O.I.P. Condenser type Bushings.
   h. Upper terminal of O.I.P. Condenser type Bushings.
   i. On Load Tap Changer/ Diverter Switch Chamber.

12.0 Assembly of OLTC Drive Mechanism & Operating System:

12.1 Fix the brackets, gearboxes and operating shafts between OLTC drive mechanism and OLTC diverter switches. When connecting the operating shaft(s), ensure that the tap position indicated in the OLTC drive mechanism and at the head of OLTC diverter switch(es) are the same. Lock the bolts & nuts of the coupling brackets of the operating shaft(s), if provided.

12.2 Check the operation of the OLTC manually and make adjustments so that there are equal numbers of free turns of the operating handle after each tap change in the diverter switch both during Raise & Lower operations.

12.3 Synchronize the operation of all the three OLTC diverter switches so that all the three phases operate almost simultaneously.

13.0 Cabling on the Transformer:

13.1 Carry out laying of control cables from fans, protective relays, bushing/WTICT's, etc. to the fan control cubicle/ marshalling box/ Temperature meter box.

13.2 Prepare the cables at both the ends and fit into cable glands.

13.3 Drill holes in the cable gland plates of the fan control cubicle / marshalling box / Temperature meter box as per requirement.

13.4 Fix the cables on these cable gland plates and connect the wires as per schematic drawing.

14.0 Fix/ fit minor accessories as below:

   a. Clamps/ Brackets for pipes and fixing of pipes on them.
   b. Protective covers for OLTC operating shaft(s).
   c. Fixing of cable trays/ brackets on the tank cover and clamping of cables on them.
   d. Fitting of sensors/probes for oil & winding temperature indicators after filling oil in the pockets provided for them.
   e. Fitting of terminal connectors on the bushings.
   f. Any other accessories, etc. as provided.

15.0 After installation work is over, the transformer is to be made ready for commissioning. Prior to putting the transformer in to service, attention should be paid to the checks and tests given in the following paras. The checks/tests given hereafter are generally

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applicable Specific checks/tests prescribed by the manufacturer are also to be carried out. Problems arising out of peculiar situations are to be assessed and solved on case to case basis.

16.0 PRE-COMMISSIONING CHECKS:

16.1 All equipments are mounted in position as per General Arrangement drawing of the manufacturer.

16.2 Minimum clearances between live parts and between live parts to earth are as per General Arrangement drawing.

16.3 Arrow on the Buchholz Relays & Oil Surge Relays is pointing towards the Conservator.
16.4 Arrow on the oil flow indicators and the oil Pumps is pointing towards the transformer tank.

16.5 Inspect the transformer all over and check all flanged joints and fittings for oil leakages. If found necessary, re-tighten the bolts.

16.6 Isolating valves in Buchholz pipe line and all the radiators and any valve if provided in the breather pipe line are fully opened and locked in the open position.

16.7 Release air from the inside of the transformer tank by opening all plugs/venting screws/valves on radiators, bushings, Buchholz relay, OLTC oil surge relay(float type) and gas collection pipe, if provided, and tank cover until oil appears. Close these after the above check has been carried out.

16.8 Oil level in the main conservator and OLTC conservator is as per the oil temperature.

16.9 Oil level in the condenser bushings.

16.10 The thermo meter pockets provided for oil and winding temperature indicators are filled with oil.

16.11 The colour of silica gel in the breathers is blue and that oil is filled up to correct oil level mark in the oil cup.

16.12 Buchholz relay contacts are not locked and these are in 'SERVICE ' position.

16.13 The transport locks provided in equipment such as the MOLG, oil flow indicators, OTI, WTI, etc. have been removed.

16.14 Setting of all the mercury switches for Alarm, Trip and Cooler control in the Oil and Winding Temperature Indicators. As per general prevailing practice, the settings are made. As given below:

a) Oil Temperature Indicator(OTI): Alarm: Trip: ON: 70°C OFF: 60°C ON: 80°C OFF: 70°C


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If the site and load conditions warrant, higher settings of the winding temperature alarm & trip contacts may be adopted for which the manufacturer's recommendations are to be followed.

16.15 The Transformer neutral is connected to earth at two separate earthpits/electrodes which in turn are connected to the earth mat.

16.16 The Transformer tank, OLTC drive mechanism, cooler bank, marshalling box, cooler control cabinet, temperature meter box, etc. as provided are earthed.

16.17 Proper connections and tightness of terminal connectors provided on Bushings.

16.18 Bolts & nut soft the coupling brackets of the operating shaft(s) of the OLTC have been locked.

16.19 No oil is visible in Explosion Vent sight glass, if provided.

16.20 jumpering arrangement to achieve phase matching, if the transformer is to run in parallel with another transformer.

16.21 Setting of overload/protection relays/MCBs for fans & pumps and for OLTC motor as per their rating.

17.0 PRE-COMMISSIONING TESTS: For DGA oil sample shall be taken after 24 hours of stopping filtration.

17.1 Non Trip Alarms: Operation of the corresponding auxiliary relays if provided and alarm annunciation on actual Operation of the transformer mounted protective Relays and supervisory equipments.

i. Main Conservator Low oil level alarm.
ii) OLTC Conservator Low oil level alarm.
iii) Oil temperature high alarm.
iv) Winding temperature high alarm (HV).
v) Winding temperature high alarm (LV).
v) Winding temperature high alarm (TV).
vii) Air cell fail alarm.

17.2 Trip Alarms:
Operation of the corresponding auxiliary relays, Master Trip relays and alarm annunciation on actual operation of the transformer mounted protective Relays and supervisory equipments.

i. Buchholz Alarm (I&II ) by draining oil from the relay.
ii) Buchholz Trip(I&II) by draining oil from the relay.
iii) Oil Temperature Trip.
iv) Winding Temperature Trip (HV).
v) Winding Temperature Trip(LV).
vii) Pressure Relief Device.

17.3 Testing by the Protection Wing of Over current, Earth fault, Over flux, Neutral Displacement alarm, Restricted Earth Fault (REF), Circulating Current Differential protection, Transformer Differential protection relays, associated Master Trip relays, alarm annunciations, etc., as provided.

17.4 Tripping of HV circuit breaker & inter tripping of LV circuit breaker on operation of

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Master Trip Relays. This may be checked for operation of each Master Trip Relay for 2 or 3 protective relays.

17.5 Phase sequence of the A.C. supply to the Cooler Control Cubicle (CCC)/Fan Control Cubic le (FCC)/ Marshalling Box.

17.6 Direction of rotation of fans and pumps.

17.7 Operation of fans/oil pumps as per settings made in the winding temperature indicators as per para 16.14.

17.8 Operation of standby fans/ pumps on failure of each fan/ pump.

17.9 Lamp indications on RTCC Panel for fans and pumps.

17.10 Testing of alarm annunciations, such as “Fan Fail: Group-1&2”, “Pump Fail: Group-1&2”, “Cooler Control Supply Fail”, “Stand by Fan Fail: Group-1&2”, “Standby Pump Fail: Group-1&2”, etc., as provided in the RTCC Panel.

17.11 Manual operation of OLTC:
   a. Operate by handle from tap no.1 to the maximum tap position & back to tap no.1.
   b. Verify the reading of Tap Position Indicator (TPI) on Remote Tap Changer Control (RTCC) panel on all the tap positions.
   c. Observe any abnormal sound during this operation.
   d. Confirm functioning of mechanical locking at extreme tap positions.
   e. Check functioning of operation counter.

17.12 Electrical operation of OLTC:
   a. Operation of handle inter lock. There should be no electrical operation of the OLTC with handle inserted.
   b. Check phase sequence of the A.C. supply to the OLTC drive mechanism.
   c. Operate On Load Tap Changer (OLTC) from tap no.1 to the maximum tap position & back to tap no.1 from local and from remote, i.e., RTCCP and Never start this OLTC operation from extreme tap positions.
   d. Confirm functioning of electrical limit switches at extreme tap positions.
   e. Step by step operation of the OLTC (only one tap should change in one pulse or with continuous pulse).
   f. Check tripping of MCB in OLTC Drive mechanism by pressing” Emergency Push Button” from local and from RTCC Panel.
   g. Checking of Lamp Indications provided in the RTCC Panel.
   h. If the transformer is to be run in parallel With another transformer, operation of OLTC Drive mechanism by making one transformer as ‘Master’ and another one as ‘Follower’ & vice versa, i.e., “Master–Follower Operation of Transformer”.
   i. Testing of alarm annunciations, such as “Tap Changer Stuck/Tap Change Delayed”, “OLTC Motor MCB Trip”, “OLTC Control Supply Fail”, “OLTC out of Step”, etc., as provided in the RTCC Panel.

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17.13 Reading of Oil & Winding temperatures on Remote Temperature indicators provided in RTCC Panel with reference to the OTI&WLI fitted on the transformer. 17.14 Testing of Transformer:

a. Magnetizing current measurement of all three phases of LV winding with single phase supply applied between phase and neutral one by one keeping HV&TV windings open.

b. Magnetizing current measurement of all three phases of HV winding at Tap no.1 with single phase supply applied between phase and neutral one by one keeping LV & TV windings open.

c. Magnetizing current measurement of all three phases of the TV winding in case all the three phases have been brought out. For star connected TV winding, single phase supply is applied between phase and neutral of TV winding one by one keeping HV & LV windings open. In case of delta connected TV winding, the voltage is applied one by one between phases of the TV winding keeping HV & LV windings open.

d. Magnetic balance test on all three phases of LV winding by applying single phase voltage one by one between phase and neutral of one phase and measuring the induced voltage on the other two phases.

e. Magnetic balance test on all three phases of TV winding, in case all the three phases of the TV winding have been brought out, by applying single phase voltage one by one between phase and neutral on one phase (for star connected winding) or between phase to phase (for delta connected winding) and measuring the induced voltage on the other two phases.

f. Short circuit current measurement of all three phases of HV winding at Tap no.1 with single phase supply applied between phase and neutral one by one with LV winding short–circuited and TV winding open–circuited.

g. Short circuit current measurement of all three phases of HV winding at Tap no.1 with single phase supply applied between phase and neutral one by one with TV winding short–circuited in case all the three phases of the TV winding have been brought out. LV winding is kept open–circuited.

h. HV, LV and TV WTICT testing by measuring the current in the leads from the WTI CT terminals to the winding temperature indicator (s) during the above short circuit current measurement tests.

i. Checking of continuity of contacts in diverter switch: During short circuit current measurement test above, connect analog type AVO/multi–meter on the HV winding and operate the OLTC from tap no.1 to the maximum tap. There should not be any break in the current during tap change which is indicated by the sudden deflection in the multi–meter reading.

j. In case of tertiary winding where two terminals have been brought out, testing of TV winding by giving 3–phase supply to HV, then shorting each LV phase with neutral one by one and measuring open delta voltage and closed delta current.

k. Transformer Turns ratio measurement between HV–LV, HV–TV&LV–TV using turns ratio measuring instrument.

l. Insulation resistance measurement (meggering) and recording the readings for 15sec. and 60sec. between HV–Earth, LV–Earth, TV–Earth, HV–LV, HV–TV&LV–TV using 5kV megger. The 60 second value shall be taken as the reference value for future comparison. The top oil temperature is to be recorded.

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m. Winding resistance measurement of all three phases of HV (at Tap no. 1), LV and TV windings. The top oil temperatures to be recorded.

n. Subject to availability of testing instrument, measurement of Capacitance and T and of condenser bushings and transformer windings for reference. The top oil temperature is to be recorded. It is not advisable to carry out this test when the relative humidity is above 75%.

o. Checking of Vector Group of the transformer. Check earth resistance of transformer neutrals Check SFRA

p. Testing of transformer oil. (Take oil sample after 24 hours of stopping filtration) The following tests are generally desired to be got carried out on transformer oil as per IS 1866:2000—Code of Practice for Electrical Maintenance and Supervision of Mineral Insulating Oil in Equipment. The limits for unused mineral oil filled in New Power Transformer as recommended in Table—1 of the above Indian Standard are given below.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Property</th>
<th>Highest voltage of Equipment (kV)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&lt;72.5</td>
</tr>
<tr>
<td>1</td>
<td>Appearance</td>
<td>Clear free from Sediments and Suspended matte</td>
</tr>
<tr>
<td>2</td>
<td>Density at 29.5 C (g/cm3). Max</td>
<td>0.89</td>
</tr>
<tr>
<td>3</td>
<td>Neutralization value (mg KOH/g). Max</td>
<td>0.03</td>
</tr>
<tr>
<td>4</td>
<td>Water Content (ppm). Max</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Dielectric dissipation factor at 90 C and 40 Hz to 60 Hz Max</td>
<td>0.015</td>
</tr>
<tr>
<td>6</td>
<td>Resistivity (90 C)X10 (Ohm-cm). Max</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Break down Voltage(kV). Min</td>
<td>80</td>
</tr>
<tr>
<td>8</td>
<td>Dissolved Gas Analysis</td>
<td>For reference</td>
</tr>
<tr>
<td>9</td>
<td>Viscosity at 27 C (cst). Max</td>
<td>27</td>
</tr>
<tr>
<td>10</td>
<td>Flash Point ( C). Min</td>
<td>140</td>
</tr>
<tr>
<td>11</td>
<td>Pour Point ( C). Max</td>
<td>-6</td>
</tr>
<tr>
<td>12</td>
<td>Inter Facila Tension(mN/m). Min</td>
<td>35</td>
</tr>
<tr>
<td>13</td>
<td>Oxidation Stability of Fun inhibited oil</td>
<td>Similar values as before filling</td>
</tr>
<tr>
<td>14</td>
<td>Induction Period(Hours)</td>
<td></td>
</tr>
</tbody>
</table>

q. The following tests as recommended in IS:1866 are the minimum tests which should be got done on the transformer oil. The limits as recommended in Table—1 of IS1866:2000 are also given below.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Property</th>
<th>Highest voltage of Equipment (kV)</th>
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<td>5</td>
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</tr>
<tr>
<td>7</td>
<td>Break down Voltage(kV). Min</td>
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</tr>
<tr>
<td>8</td>
<td>Dissolved Gas Analysis</td>
<td>For reference</td>
</tr>
</tbody>
</table>

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r. Other tests as prescribed in the Operation and Maintenance Manual of the Manufacturer

17.15 There suck so fall the above tests are to be recorded for future reference.

18.0 CHARGING OF TRANSFORMER:
18.1 Check the tripping of HV circuit breaker & inter tripping of LV circuit breaker on operation Of Master Trip Relays. This may be checked for operation of each Master Trip Relay for 2 or 3 protective relays.

18.2 Transformer is to be charged at tap no.2 other wise transformer may trip on differential protection due to high magnetizing in rush current.

18.3 After charging, the operation of the OLTC is to be checked by increasing the tap position up to the tap corresponding to the system voltage.

18.4 Manufacturers recommend that transformer be kept on no load for 24 hours. During this period observe the temperature rise of the oil & winding.

18.5 De-energize the transformer and check the Buchholz relay for any collection fair / gas.

18.6 Recharge the transformer at Tap no.2.

18.7 After re-charging, tap position of the transformer is to be fixed according to HV side voltage available. Tap position (same voltage ratio) should also match with the transformer already in service in case of parallel operation.

18.8 Then take load on the transformer.

B. STATION TRANSFORMER:
I) ERECTION OF STATION TRANSFORMERS
   i) Transportation of the station transformer and accessories, (if any provided loose) along with clamps and connectors from the site store to location carefully.
   ii) Cleaning of the transformer and the bushings.
   iii) Erecting the transformer on existing masonry platform by placing it properly, i.e., HV side towards 33 KV or 11 KV as the case may be.
   iv) Fitting of the accessories, (if any which have been provided loose).
   v) Checking that all the accessories as per the bill of material have been provided and the same are in position.
   vi) Making arrangements for locking the wheels of the transformer.
   vii) Fitting of the terminal connectors/clamps, etc.
   viii) Tightening of nuts, bolts, etc. complete in all respect.

II) ERECTION OF HORN GAP FUSE SET:
Transportation of Horn Gap fuse set and its accessories along with clamps and connectors and structures from site store to location.
   i) Assembling (if required) of structure of Horn Gap fuse set
   ii) Fixing of structure of Horn Gap fuse set and leveling thereof.
   iii) Assembling of Horn gap fuse set as per drawing.
   iv) Mounting of Horn Gap fuse set on the structure.
   v) Fitting of clamps and connectors, etc.
   vi) Tightening of nuts, bolts, etc. complete in all respect.

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III) JUMPERING FROM ISOLATOR TO HORN GAP FUSE & HORN GAP FUSE TO SUB STATION TRANSFORMER.
   i) Transportation of conductor from site store to location.
   ii) Carrying out jumpering between Isolator to Horn Gap fuse set and then from Horn Gap fuse set to Sub Station Transformer as detailed in clause 5.4.4 “JUMPERING BETWEEN EQUIPMENTS”.

C. CURRENT TRANSFORMERS:
I) GENERAL INSTRUCTIONS
   i) While erecting the current transformers, the P1 terminal of the current transformer shall be kept as per the instructions of Engineer-In-Charge.

II) ERECTION
   i) Transportation of complete current transformers and their accessories, etc. along with clamps & connectors, etc. from site store to location.
   ii) Carrying out leveling of already erected structure(s) and minor fabrication work, if required, for erection of the Current Transformer.
   iii) Cleaning of the insulator of the Current Transformer.
   iv) The IR values of primary terminals to earth will be measured by RVPN with 5 kV Megger.
   v) Erecting of the Current Transformer on the structure.
   vi) Fitting of the terminal connectors on the Current Transformer.
   vii) Tightening of the nut, bolts, etc. complete in all respect.

D. CAPACITOR VOLTAGE TRANSFORMERS (CVT) / POTENTIAL TRANSFORMERS (PT)
   i) Transportation of complete CVT/PT and its accessories along with terminal connectors, etc. from site store to location.
   ii) Carrying out leveling of already erected structure(s) and minor fabrication work, if required, for erection of the Capacitor Voltage Transformers / Potential Transformers.
   iii) Cleaning of the insulators of the VTs.
   iv) Assembling the different units of the same serial number of the CVT, if applicable.
   v) The IR values of primary terminal to earth will be measured by RVPN with 5 kV Megger.
   vi) Erecting the Capacitor Voltage Transformer / Potential Transformer on the structure.
   vii) Fitting of the covers on the joints between different units of the CVT, if applicable.
   viii) Fitting of the terminal connectors on the VT’s.
   ix) Tightening of the nuts, bolts, etc. complete in all respect.

E. SERIES REACTORS / RESIDUAL VOLTAGE TRANSFORMER/ NEUTRAL CURRENT TRANSFORMER.
   i) Transportation of complete Series Reactor / RVT/ NCT and its accessories along with terminal connectors, etc. from site store to location.
   ii) Carrying out leveling of already erected structures and minor fabrication work if required for erection of the equipments.
   iii) Cleaning of the insulators of the Series Reactors / Residual Voltage Transformers/ Neutral Current Transformers.
   iv) The IR values to earth of Series Reactors will be measured by RVPN with 5 KV Megger.

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v) The IR values between primary terminal to earth and primary terminal to secondary terminals of Residual Voltage Transformers/ Neutral Current Transformers will be measured by RVPN with 5 KV megger.

vi) Erecting the Series Reactors / Residual Voltage Transformers/ Neutral Current Transformers.

vii) Fitting of the terminal connectors.

viii) Tightening the nuts, bolts, etc. complete in all respect.

F) LIGHTNING ARRESTERS

I) GENERAL INSTRUCTIONS:

i) The serial number of all the units of a multi-unit Lightning Arrester (L.A) should be the same.

ii) The units of a multi-unit Lightning Arrester should be assembled in the sequence shown on the rating plate of the LA or in the catalogue of the manufacturer to be provided by the Engineer-In-Charge.

iii) The insulated base unit should be erected in case of Lightning Arresters provided with surge monitors.

iv) The installation of the Lightning Arresters should be such that the direction of the open end of the explosion release vent (at top and bottom) is away from adjacent expensive equipment such as transformers.

II) ERECTION OF LAs OF 132 KV CLASS & 220 KV CLASS:

i) Transportation of complete LAs along with accessories, clamps and connectors, etc. from site store to location.

ii) Leveling of the already erected supporting structure(s) and carrying out minor fabrication work thereon for erection of the Lightning Arresters and surge monitors, as required.

iii) Cleaning of the insulators of the Lightning Arresters.

iv) Assembling the different units of the same serial number of the Lightning Arresters, if applicable. Also, fitting of the corona rings between different units, if provided.

v) Erecting the Lightning Arresters on the already erected and leveled supporting structure(s).

vi) Fitting of the Surge Monitor on the structure and connecting it to the lowest unit of the Lightning Arrester above the base insulator.

vii) Fitting of the corona / grading ring on the top of the Lightning Arrester, if provided.

viii) Fitting of the terminal connectors on the Lightning Arresters.

ix) Tightening of the nuts, bolts, etc. complete in all respect.

III) ERECTION OF 33 KV & 11 KV LAs:

i) Transportation of complete LAs along with accessories, clamps and connectors, etc from site store to location.

ii) Making of the mounting arrangements on the beam of the already erected Sub Station structures.

iii) Cleaning of the insulators of the Lightning Arresters.

iv) Erecting the Lightning Arresters on the already prepared arrangement on the beam of the Sub Station structures.

v) Fitting of the terminal connectors on the Lightning Arresters.

vi) Tightening of the nuts, bolts, etc. complete in all respect.

G. ISOLATORS

I) ERECTION OF ISOLATORS:

i) Transportation of complete isolator with accessories, Post Insulators operating mechanism box, clamps and terminal connectors, etc. from site store to location.

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ii) Leveling of already erected structure(s) and carrying out minor fabrication works, if required, for erection of the Isolator and operating mechanism(s).

iii) Erecting the 3 nos. base frames of individual phases on the structure(s).

iv) Carrying out leveling and centering of the base frames.

v) Fixing of the link pipes on the rotating parts of the base frames of the individual phases.

vi) Cleaning and assembling of the polycone insulator / insulator stack, as applicable. For single break isolators, there will be six polycone insulators / insulator stacks whereas for double break Isolators, the quantity will be nine.

vii) Fitting of the male and female contact arms on the polycone insulators / insulator stacks in case of single break Isolator. In case of double break Isolator, 6 nos. fixed contacts and 3 nos. moving contacts are fitted on the polycone insulators / insulator stacks.

viii) Fitting of the fixed contacts of earth blades in case of Isolator with Earth Switch.

ix) Fixing of the arcing horns (make before & open after the main contacts) or corona rings, as applicable.

x) Erecting the above assemblies on the rotating parts of the base frames.

xi) Carrying out adjustment / alignment of individual phases for smooth opening and closing and proper making of contacts.

xii) Fitting of the inter – phase connecting pipes between the rotating parts of the base frames of the individual phases, including fixing of hardware for interlocking with earth switch wherever provided.

xiii) Fitting of the operating mechanism box for the Isolator.

xiv) Fitting of the main operating down pipe to operating mechanism for the Isolator.

xv) Checking of the operation and final adjustment / alignment of all the three phases of main Isolator for smooth, synchronized and complete operation as one unit.

xvi) Adjustment of the mechanical end stoppers on the base channel for both the closed and open positions.

xvii) Fitting of the terminal connectors on the Isolator.

xviii) Tightening of the nuts, bolts, etc. complete in all respect.

II ERECTION OF EARTH SWITCHES:

i) Transportation of complete Earth Switch along with accessories and operating mechanism box, clamps and connectors, etc. from site store to location.

ii) Fixing of the earth blade mounting arrangements on the base frames of all the three phases.

iii) Fitting of the moving contact (earth blade) of the earth switches and counterweights, wherever provided.

iv) Carrying out the operation and adjustment / alignment of earth switch of each phase for smooth opening and closing and proper making of contacts.

v) Fitting of the inter – phase connecting pipes between the earth switches of the individual phases, including fixing of hardware for interlocking with main Isolator.

vi) Fitting of the operating mechanism box for the earth switches.

vii) Fitting of the main operating down pipe to operating mechanism for earth switch.

viii) Checking the operation and final adjustment / alignment of all the three phases of the earth switch for smooth, synchronized and complete operation as one unit.

ix) Carrying out the adjustment and setting of mechanical interlock between main Isolator and earth switch to ensure that earth switch does not operate if the main Isolator is closed, and that main Isolator does not operate if the earth switch is closed.

x) Carrying out the adjustment of mechanical end stoppers for the OPEN and CLOSED positions of earth switch.

xi) Fitting of the earth bonds and other accessories as provided.

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xii) Tightening of the nuts, bolts, etc. complete in all respect.

III ERECTION OF OPERATING MECHANISM:
  i) Carrying out the adjustment and setting of auxiliary switches.
  ii) Carrying out the adjustment of limits switches in CLOSED and OPEN positions of isolators in case of motor operated mechanism.
  iii) Carrying out the adjustment of mechanical end stoppers for both the CLOSED and OPEN positions.
  iv) Carrying out the adjustment of interlocking coil and plunger in CLOSED and OPEN positions.
  v) Rechecking the alignment and adjustment of the isolator main contacts for smooth opening and closing and proper making of contacts after jumpering on both sides.

H. WAVE TRAPS

I GENERAL INSTRUCTIONS:
  i) The Wave Traps are erected as below.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Line</th>
<th>Type of Coupling</th>
<th>Phases on which Wave Traps are to be erected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Single Circuit</td>
<td>Phase to Phase</td>
<td>Two phases of the line</td>
</tr>
<tr>
<td>2.</td>
<td>Double Circuit</td>
<td>Inter – circuit</td>
<td>Same phase of both the circuits</td>
</tr>
</tbody>
</table>

  ii) For single circuit lines, the Wave Traps are generally erected on R & B phases.
  iii) For double circuit lines, the Wave Traps are generally erected on the Y phase of both the circuits.
  iv) The Wave Traps may be required to be erected on phases different from those mentioned at para (ii) and para (iii) above in case the end to end return loss is not found satisfactory during testing of the PLCC Carrier Sets.

II ASSEMBLY:
  i) Transportation of complete Wave Trap and its accessories, hardwares, clamps and connectors, etc. from site store to location.
  ii) Cleaning of the Wave Trap and its associated equipment.
  iii) Fitting of the tuning pot and associated equipment in the Wave Trap by RVPN.
  iv) Fitting of the end covers on the wave traps, and positioning them correctly by RVPN.
  v) Fitting of the terminal connectors on the Wave Traps.
  vi) Tightening of the nuts, bolts, etc. complete in all respect.

III ERECTION OF SUSPENSION TYPE WAVE TRAPS:
  i) Fitting of the hardware for fixing the Wave Trap to the suspension string assemblies of the designated phases.
  ii) Hoisting the Wave Trap through lifting arrangement on the beam of the Sub Station structure.
  iii) Fitting of the Wave Trap on the already erected suspension string assemblies through suitable attachment.
  iv) Tightening of the nuts, bolts, etc. complete in all respect.

IV ERECTION OF PEDESTAL TYPE WAVE TRAPS:
  i) Leveling of the top plate of the already erected structure for wave trap.
  ii) Assembling of the parts of the Polycone Insulators, if applicable.
  iii) Erecting the polycone insulator(s) on the supporting structure.

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iv) In case three Polycone Insulators are provided for each Wave Trap and these are in parts, then the connecting plate between the joints of the parts of the Polycone Insulators are also to be fitted.

v) Erecting the Wave Trap on the polycone insulators.

vi) Tightening of the nuts, bolts, etc complete in all respect.

I. CAPACITOR BANKS

I GENERAL INSTRUCTIONS:

i) DURING ERECTION WORK ON CAPACTIOR BANKS, THE CAPACITOR UNITS SHALL BE KEPT SHORTED AND EARTHED TO PREVENT ELECTRIC SHOCK DUE TO ACCUMULATED CHARGE.

II ERECTION OF STRUCTURES:

i) Transportation of Complete structure members, etc from site store to location.

ii) Assembling the structures for the Capacitor Banks, Series Reactors and Residual Voltage Transformers / Neutral Current Transformers, if the members are received in loose condition.

iii) Erecting the supporting structures on the foundation, carrying out their leveling, centering and preparation for grouting. (Grouting work, including, material, will be in the scope of RVPN).

iv) Leveling the top of the above erected supporting structures and checking their verticality.

III ERECTION OF CAPACITOR BANKS:

i) Transportation of Capacitor Banks with accessories, clamps & connectors, etc. from site store to location.

ii) Leveling the top plate of already erected structures.

iii) Cleaning of the post insulators/ Assembling of the post insulators, if required.

iv) Erecting the post insulators on the already erected structure(s).

v) In case individual structures are provided for each phase, erecting the frame of each phase of the Capacitor Bank on the post insulators.

vi) In case only one structure is provided for all the three phases, erecting the frame of the first phase on the post insulators. Erecting the frame of the second phase after erecting post insulators on the frame of the first phase. Similarly, erecting the frame of the third phase after erecting post insulators on the frame of the second phase.

vii) Erecting the capacitor units on the already erected frames as per the erection plan of the manufacturer so that the capacitances of all the phases are balanced. In case no erection plan is provided, measurement of the capacitance of all the units shall be done by RVPN and phase wise combinations will be advised to the contractor so that the capacitances of all the phases are balanced.

viii) Interconnecting the capacitor units and phases as per manufacturer's general arrangement drawing, including fitting of external fuses if provided. (Drawing will be provided by the Engineer-In-Charge)

ix) Fitting of the post insulators and connecting strips for jumpering as per manufacturer's general arrangement drawing.

IV ERECTION OF ASSOCIATED EQUIPMENT:
As detailed at Sub clause 6.0 (D) above.

J. POST / POLYCONIC INSULATORS

i) Transportation of complete Insulators & their accessories, clamps and connectors from site store to location.

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ii) Leveling the top plate of the already erected structure for Post / Polycone Insulators.
iii) Cleaning the Post / Polycone Insulators.
iv) Assembling the parts of Post / Polycone Insulators, if required.
v) Erecting the Post / Polycone Insulators on the already erected supporting structure.
vi) Fitting the corona ring on the Post / Polycone Insulators, if provided.
vii) Fitting the clamps on the Post / Polycone Insulators.
viii) Tightening the nuts, bolts, etc. complete in all respect.

**K. CONTROL & RELAY PANELS**

i) Transportation of Control and relay panels complete in all respect from site store to control room.
ii) Placing the panels at their designated locations on the trenches in the Control Room as per layout / instructions of Engineer-In-Charge.

iii) Fixing or bolting the panels (as per requirement of installation of the panels) on the channel / M. S. Angle fitted on the top of the walls of the trench or on the base frame, as provided, in the Control Room.
iv) Leveling the panels and checking their verticality.
v) In the case of Duplex type of panels, connecting the control panel to the relay panel across the corridor using the fittings provided with the panels. Also fitting the covers for the corridor portion.
vi) Where a number of panels are to be placed adjacent to each other to form a Board or where a panel is to be placed adjacent to an existing Panel / Board, these shall be bolted together. There shall be no gap between panels which are placed adjacent to each other.

vii) Connecting the Bus wiring / interconnecting wiring between the control & relay panels of the Duplex type. Also connecting the similar wiring between control panel to control panel and / or relay panel to relay panel where a Board formation is made or where panels are connected to an existing Board / panel as per their relevant schematic drawings to be made available by the Engineer-In-Charge.

viii) Connection of earthing to existing earth strip in control room.

**L LT PANELS**

i) Transportation of L.T. Panel complete in all respect from site store to control room.
ii) Checking the LT Panel for any mechanical damage before installation.

iii) The insulation resistance of panel wiring and the LT Bus Bar (phase to phase and phase to earth) will be measured by RVPN with 500 V Megger before connecting any cable.
iv) Placing the LT Panel at its designated location in the control room as per layout/ instructions of the Engineer-In-Charge.

v) Fixing / bolting the LT Panel on the trench provided in the floor of the control room.

vi) Connection of earthing to existing earth strip in control room.

**M. DC PANELS:**

i) Transportation of D.C. Panel complete in all respect from site store to control room.

ii) Checking the DC Panel for any mechanical damage before installation.

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iii) Placing the DC Panel at its designated location in the control room as per layout/ instructions of the Engineer-In-Charge.
iv) Fixing / bolting the DC Panel on the trench provided in the floor of the control room or on the base frame if provided.
v) Connection of earthing to existing earth strip in control room.

N. RTCC PANEL:
i) Transportation of RTCC Panel complete in all respect from site store to control room.
ii) Checking the RTCC panel for any mechanical damage before installation.
iii) The insulation resistance of panel wiring will be measured by RVPN with 500 V Megger before connecting any cable.
iv) Placing the RTCC Panel at its designated location in the control room as per layout/ instructions of the Engineer-In-Charge.
v) Fixing / bolting the RTCC Panel on the trench provided in the floor of the control room.
v) Connection of earthing to existing earth strip in control room.

O. MARSHALLING KIOSKS:
i) Transportation of Marshalling Kiosks complete in all respect from site store to location.
ii) Placing the Marshalling Kiosks on the foundation/ cable trench as per the instructions of Engineer-In-Charge.
iii) Carrying out centering and leveling of the Marshalling Kiosks including preparation for grouting work (grouting work, i.e., concreting in the pockets of the foundation along with material, will be in the scope of RVPN).
iv) After grouting, tightening of the nuts, bolts, etc. complete in all respect.

P. LINE MATCHING UNIT (LMU) / LINE MATCHING DISTRIBUTION UNIT (LMDU)
i) Transportation of Line Matching Unit / Line Matching Distribution unit & its accessories from site store to location.
ii) Making arrangements / carrying out minor fabrication work (if required) on the supporting structure of the 2 nos. designated Capacitor Voltage Transformers (as per coupling requirement) for fixing of Line Matching Unit (LMU) / Line Matching Distribution Unit (LMDU). These CVTs shall be of the same phase on which the wave traps have been / are to be erected.
iii) Fitting of the LMU / LMDU on the already erected structure.
iv) Connecting the HF terminal of the Capacitor Voltage Transformer to the HF terminal of the LMU / LMDU.
v) Tightening of the nuts, bolts, etc. complete in all respect.

Q. CABLE LAYING AND TERMINATIONS:

Note: The cable tags/marking strips, G.I. wire, cable glands, thimbles/lugs, ferrules, PVC perforated straps, sand and bricks are in the scope of supply of the Contractor.

I. GENERAL INSTRUCTIONS:

i) The number of cables of each size and their lengths shall be assessed and intimated to the contractor by the Engineer In-charge. The cable laying schedule shall then be prepared by the Engineer In-charge so that maximum length of the cable in a drum can be utilized, leaving minimum scrap lengths.

ii) Cable drums shall be unloaded, handled and stored properly.

iii) Rolling of drums shall be avoided as far as possible. The drums may be rolled for short distances provided they are rolled slowly and in the direction marked.

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on the drum. In the absence of any indication, the drums may be rolled in the same direction as it was rolled during winding.

iv) Pulling out of cables from stationary drums shall not be permitted.
v) Cables shall not be bent below the minimum permissible limits given below:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Type of cable</th>
<th>Minimum bending radius</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Power cable</td>
<td>12 D</td>
</tr>
<tr>
<td>2.</td>
<td>Control cable</td>
<td>10 D</td>
</tr>
</tbody>
</table>

Where ‘D’ is overall diameter of the cable.

vi) Cut lengths of cable which are available as surplus / left over material from other works should preferably be used first. Small cut lengths of cable left after laying long lengths can be used for bus wiring and looping.

II PAYING OUT OF CABLES:
i) Transportation of cable drums from the site store to location.

ii) Handle the cable with care to prevent forming of kinks and damage to the insulation of the cable.

iii) When the cable is to be taken from drums, small lengths can be unwound from the drum.

iv) For longer lengths, place the cable drum on a turn table or jack up the drum on a suitable size of steel shaft. The cable shall be laid in a manner so that there are no scratches or damages caused to the cable due to rubbing on the sides of the drum.

v) The required lengths of cables are to be laid between the following equipments:
   a) C&R Panels in Control Room to Marshalling Kiosk.
   b) Marshalling Kiosk to Equipment.
   c) Marshalling Kiosk to Marshalling Kiosk.
   d) Equipment to Equipment in switchyard.
   e) C&R Panel to C&R Panel / other panels in Control room, etc.

vi) The cables shall be cut after taking into account the length required for connecting to the farthest terminals of the terminal block in the Control & Relay Panel / MK / equipment at both the ends.

III LAYING OF CABLES IN TRENCHES:
i) The removing of trench covers and the refixing after completion of work will be done by the contractor.

ii) The cables shall be placed in the racks in cable trenches. Power and control cables shall be laid in separate tiers. The order of placing cables (other than those directly buried) in cable trenches shall be as follows:
   a) Bottom tiers: Power Cables / Cables having A.C. supply.
   b) Middle tiers: Cables from CT / CVT / PT.
   c) Upper most tiers: Cables having D.C. supply.

iii) The cables shall be securely fixed on the racks in the cable trenches. Particular care shall be taken when cables are laid in vertical & inclined cable trenches / galleries / vaults or supports.

IV MARKING AND TAGGING:
i) Cable tag / marking strip shall be provided on all cables at both ends (just before entry into the equipment enclosure), on both sides of a wall / floor crossing & on each duct / conduit entry for identification of the cable.

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tags shall also be provided inside the switchgear, control and relay panels, etc., wherever required for cable identification.

ii) The numbering of cables on the tags shall be done as per cable schedule. Generally Cable size, identification of initial point and terminating end of equipment / Panel and a cable number shall be punched on the cable tag / marking strip by the Contractor.

iii) Rectangular shaped cable tag / marking strip of 1.0 mm thick aluminum with the description punched on it shall be securely attached to the cable by not less that two turns of 20 SWG GI wire

V LAYING OF UNDERGROUND POWER CABLES:

i) Excavation of trench of 30 cm width and 75 cm depth along the proposed route / alignment. The width may be increased in case a number of cables are to be laid. At crossings of cable trenches / roads / transformer tracks / pipes / earth mat conductor, etc., the depth shall be increased such that the bottom of the trench is 40cm below them.

ii) Covering the bottom of the trench with a layer of sand 25 cm thick.

iii) Laying the cable in the excavated trench.

iv) Covering the cable with bricks and backfilling the trench with the excavated sand. Compacting the sand by ramming.(Supply of sand & bricks are in the scope of work of the contractor)

v) Securing the cables on the supports above ground level.

VI MARKING AND TAGGING:

i) Directly buried underground cables shall be clearly identified with cable marker made of iron plate (Cable marker will be provided by RVPN).

ii) Location of underground cable joints shall also be indicated with cable marker with an additional inscription "Cable joints". (Cable marker will be provided by RVPN).

iii) The markers shall project 150 mm above ground and shall be placed at intervals of 30 meters and at every change in direction. They shall also be located on both sides of road and drain crossings.

VII CABLE TERMINATION:

i) Drilling the required holes in the gland plates of the panels / equipment, etc. for fixing the cables.

ii) Stripping off the insulation of the cable for sufficient length so that any wire of the cable can be terminated at the farthest terminal in the terminal blocks.

iii) For unarmoured cable, stripping off the outer and inner insulation sheaths of the cable. Fixing the cable gland on the cable end and then fixing the cable gland on the gland plate of the equipment / panel.

iv) For armoured cables, stripping off the outer and inner insulation sheaths of the cable including cutting off the armouring for the stripped off length keeping a small length for fitting in the cable gland. Fitting the gland nut in the cable. Bending the armouring to fit the gland. Fitting the gland nut and tightening. Fitting the cable gland on the gland plate of the equipment / panel.

v) Sealing all unused openings for cables in the cable gland plate to prevent entry of vermin and dust.

VIII WIRE TERMINATION:

i) Identification of each core of the cable either by its physical location / marking / numbering or by testing continuity from both ends.

ii) Marking each core of the cable at both ends with a tag / ferrule as per cable schedule / schematic drawing as per instructions of Engineer-In-Charge. In
panels in which a large number of cables are terminated, wire identification may be difficult, therefore, the complete cable number shall also be included in the tag / ferrule on each core if advised by the Engineer In-charge.

iii) Cutting each wire at the length required for terminating it on the terminal block. This should be done after proper dressing of the wire in the wiring trough.

iv) Stripping off the insulation of each core of the cable which is to be connected. Crimping the termination end / thimble / lug (pin or ring type, as required) of appropriate size on the wire as approved by the Engineer-In-Charge.

v) Connecting the wire to its terminal on the terminal block and tightening to ensure secure and reliable connection.

vi) Marking all the spare cores of the cables with tags / ferrules indicating the cable number.

vii) All the wires in the Control & Relay panels, equipments, etc. shall be neatly bunched, clamped and tied with nylon strap or PVC perforated strap to keep them in position.
RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LTD

OFFICE OF THE SUPERINTENDING ENGINEER (T&C-JAIPUR CITY)
AJMER ROAD, JAIPUR – 302 021.

SECTION – III B

COMMERCIAL TERMS & CONDITIONS

1.0 SCOPE:
1.1 Please refer to Clause No. 1.1 of Section – III A of this specification.
1.2 This specification covers the Erection of 33 KV system & 132/33 KV, 40/50 MVA Transformer Bay at 220 KV GSS, Sitapura.
1.3 The Contractor shall carry out all additions / alterations required to complete the Sub Station works for commissioning at the same rates as indicated in the schedules.
1.4 The Contractor shall carry out / take up the work of erection activities awarded to him on as is where is basis.

2.0 WAY LEAVE AND REMOVAL OF OBSTRUCTIONS:
2.1 The NIGAM will arrange for right of way and clearance from obstructions for entry into the land from way outside. As such there is no likelihood of hindrances in carrying out the work by the Contactor.
2.2 The Contractor shall immediately notify obstructions or hindrance from local villagers or the local authorities in the execution of the work to the concerned Engineer – in – Charge but shall not deal the matter directly. The Engineer – in – Charge will arrange to remove the obstacles as soon as possible.

3.0 ACCESS TO LOCATIONS:
It will be the Contractor's sole responsibility to take the materials from the site store up to the location where it is to be installed/placed /erected. Any path way, temporary road, required will have to be provided by the Contractor at his cost. If for any reason the above is not feasible, the Contractor shall have to arrange transportation by head loads at his own cost. This is in connection with the transportation of material only.

4.0 DISTRIBUTION OF MATERIALS:
4.1 The Contractor has to take delivery of the equipments and other materials directly from the NIGAM's store at Sub Station site and handle them carefully and transport them to the location where these will be erected. He will be responsible for any damage to or loss of the equipments/ materials at any stage during transportation or erection. The materials that will be issued by the NIGAM will be on "as is where is" conditions at the Sub Station site stores of the purchaser. The materials shall normally be issued during working hours.
4.2 The equipments/materials for the work shall be issued from the site stores located within the Sub Station. The stubs/anchor bolts/parts of the structure required for grouting will be issued at one time for carrying out the grouting work without insisting for insurance. The remaining material (other than the stubs/anchor bolts/ parts of the structures required for grouting) shall be issued to the Contractor only after furnishing of valid insurance policy to the order placing authority and Indemnity Bond to the Work – In – Charge. The insurance policy shall be accepted by order placing authority as per Clause 5.0 of Section – II whereas Indemnity Bond shall be accepted by the Work – In – Charge. The provision of clause 1.10 “PRICES” of Section – I shall be applicable for transportation of material.
4.3 The material shall be issued to the Contractor based on the progress of the work and subject to acceptance of insurance policy and indemnity bond as per provisions of Clause 5.0 of Section – II.
4.4 All the material shall be thoroughly checked by the Contractor before lifting from NIGAM stores. Once the material is lifted, no complaint for quantity or / and quality will be entertained.
4.5 The empty drums of conductor, earth wire and control cables shall be returned by the Contractor on as is where basis is.

4.6 On completion of the work, all surplus materials including the excess bolts and nuts, spring washers, plain washers, D – shackles, step-bolts, etc. and stub/anchor bolt setting templates shall be returned by the Contractor at the site stores of the NIGAM.

4.7 All the surplus structure/structure material shall be returned to the site stores as per instructions of Engineer – in – Charge of the work within one month of completion of erection. This includes unloading of structure material and stacking it as per instructions of the Engineer – in – Charge.

5.0 METHOD OF MEASUREMENT:
(Refer Section III A for Scope of Work)

a) EARTHING
i) Earth Mat: The distance between the two points of the earth mat between which the M.S. Rod has been connected shall be measured for the purpose of payment. The length of M.S. Rod actually laid shall not be considered for measurement of this work. No payment will be made for the length of the rod which may extend outside the points connected. Also, no payment shall be made for the overlapping lengths of M.S. Rod in case of joints in the earth mat.

ii) Earth Risers: The length of the M.S. Flat laid between the earthed point of the equipment/structure and the earth mat where it is connected shall be measured for the purpose of payment. No payment shall be made for the overlapping lengths of M.S. Flat in case of joints in the risers between the structure/equipment and the earth mat.

iii) Earth Electrodes: The measurement shall be in terms of numbers of electrodes irrespective of the length of the electrodes.

iv) The actual length of M.S. Rod/M.S. Flat used shall not be measured for the purpose of payment, i.e., the overlapping length of M.S. Rod/Flat in case of joints shall not be considered while measuring the length in case of earth mat and earth risers.

v) However, the actual length of M.S. Rod/M.S. Flat laid, including the overlapping lengths and the lengths extending beyond the connecting points, shall be considered in the material at site Account submitted by the Contractor.

vi) Small extra lengths of M.S. Rod/M.S. Flat up to 100 mm extending beyond the connecting points need not be cut.

vii) Wastage up to 1.0% of the M.S. Rod/M.S. Flat shall be permitted. However, the pieces of M.S. Rod/M.S. Flat left after the work is completed shall be deposited as far as possible.

b) SUB STATION AND EQUIPMENT STRUCTURE ERECTION AND ASSEMBLY:
No measurements are to be taken, but payments shall be made in respect of fully assembled structures (in terms of the unit in the Schedule – III (B), i.e., weight in M.T. as applicable) at the rates indicated in the work order and in accordance with the Technical Specifications in Section – III A. (Note: The unit weight of the Sub Station and equipment structure in sections III A are indicative only. The actual weight shall be taken as per approved BOM of the supplied structure. This may vary to any extent depending on the types of structures at the substation).

c) STRINGING OF BUS BAR:
The measurement of each bus section shall be on the basis of the section length measured between the center lines of the structures at both ends. The work of each section shall mean stringing of all three phases.

d) STRINGING OF EARTH WIRE:
The measurement shall be in terms of each earth wire strung between any two structures irrespective of the distance between the structures.

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e) **JUMPERING:**
The measurement shall be in terms of each set of three jumpers of single/double conductors per phase connected between bus to equipment or equipment to equipment or between bus to bus irrespective of the length of the conductor used.

f) **EQUIPMENT ERECTION:**
The measurement of the works at clause 1.1A(h) to (t) and 1.1B(h) to (r) of Section III(A) shall be made only in terms of numbers of the items erected as per requirements of Section III A and relevant Schedule.

g) **CABLING:**
i) **Cable Laying:** The measurement of the length of the Power/Control cables laid shall be made.

ii) **Fixing in Cable Glands:** The measurement shall be in terms of each end of the cable laid. For clarity, the payment for two nos. shall be made for each cable laid and fixed at both ends.

iii) **Cable Termination:**
   a) **Control Cable:** The measurement shall be in terms of number of cables of each size which have been terminated, which includes termination of all the wires in the control cable at both ends. If all the wires are not got terminated, then deduction shall be made at the rate specified in the relevant item of the schedule for each wire not terminated.
   b) **Power Cables:** The measurement shall be in terms of the ends of the cables terminated which includes termination of all 4 wires at each end. To clarify, the payment for termination of each cable shall be for 2 sets of 4 wires each.

6.0 **INSPECTION BY NIGAM'S REPRESENTATIVE:**
a) The Contractor shall check the verticality of the towers / structures in the presence of NIGAM's Engineer before tightening and punching of bolts and nuts. The structures erected should be truly vertical after erection and no straining will be permitted to bring them so. The maximum tolerance permissible is one mm per 360 mm of tower height.

7.0 **ELECTRICITY RULES:**
7.1 All works shall be carried out in accordance with the revised and latest provisions under The Electricity Act, 2003 and Rules made there under.

8.0 **ERECTION TOOLS:**
8.1 a) All the erection tools required during construction of Sub Stations/bays shall be arranged by the Contractor at his own cost.

b) The crane required for any activity during erection shall be arranged by Contractor at his own cost. The price quoted shall also include charges for crane.

a) Templates for structures will however be supplied by the NIGAM which shall be returned by the Contractor in good condition on completion of the works.

b) Compression machine, if required for stringing/jumpering works, shall be provided by RVPN on rent free basis.

8.2 The Contractor only shall be completely responsible for any damage and or loss of erection tools.

9.0 **WASTAGES:**
9.1 a) The Contractor shall make every effort to minimize the breakages, losses and wastages of materials/equipments, etc. supplied “Free of Cost” by the NIGAM for construction.

b) No damage/breakage/wastage shall be permitted except for the items mentioned at clause 9.2 below.

9.2 The maximum ceiling for wastages permitted is as under:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Item</th>
<th>Percentage wastage permitted (Max.)</th>
<th>Compensation payable for excess wastage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Conductor and earth wire</td>
<td>1.0 %</td>
<td>Double the issue rate</td>
</tr>
<tr>
<td>2.</td>
<td>Insulators</td>
<td>1.0 %</td>
<td></td>
</tr>
</tbody>
</table>

Signature with seal of bidder
9.3 The erection Contractor shall return to the NIGAM all the unused items. Conductor / earth wire length(s) less than 20 metres will be treated as wastage, but will be required to be returned as far as possible. Small extra lengths of M.S. Rod/M.S. Flat shall also be deposited as far as possible. However, the erection Contractor shall compensate the NIGAM at double the issue rate for the quantities exceeding permitted wastage and for the material not returned by the Contractor. However, in case of theft of material, recovery shall be made at single issue rate provided FIR has been lodged timely by the Contractor and a copy of the same is submitted to the Work – in – Charge.

9.4 All the wastages are accountable except for item no. 1 of clause 9.2. The account of permissible wastages shall be maintained at site in the registers as prescribed by the Engineer – in – Charge of the work, which will be subjected to periodical checking by NIGAM's authorized representatives.

9.5 The account of wastages shall also be submitted with running accounts bills to the Engineer – in – Charge of the work. The copy of running account bill shall also be submitted to the concerned order placing authority.

10.0 PROGRESS REPORT:

10.1 Progress review meeting with the Contractor will be taken by the order placing authority as and when required. Minutes of such meeting shall be drawn and will include progress of works, site constraints, material constraints, delay on part of RVPN / Contractor, other bottlenecks, instructions given, decisions taken, agreed targets and views of both parties. Copy of these minutes shall be sent to the Contractor.

10.2 Deficiencies in the work shall be communicated in writing to the Contractor continuously and timely by all Inspecting Officers, and also taken up during progress review meetings.

10.3 Deficiencies which materially affect the safety and commercial use of the Sub Station/bay work will have to be attended by the Contractor before the Sub Station/bay is declared fit for charging or taking over.

11.0 QUANTITY OF WORK:

11.1 The quantities of various items of erection works indicated in the work orders placed against Labour Rate Contract shall be tentative / estimated. Final quantities shall be determined after completion of work. The Contractor has to carry out the work according to the final quantities as determined so as to complete the work for commissioning for which the rates of the BSR 2017 shall be valid.

12.0 QUALITY OF MATERIAL TO BE USED BY CONTRACTOR

The material used shall meet the following requirements:

a) **Cable Gland:** Heavy duty single compression brass gland SIBG type of Gripwel, Comet, Metalcraft, Cabend, Trinity Touch or HMI make

b) **Thimbles:** Copper Terminal lugs of Dowell, Jaisons, Elecon, Metalcraft, Cabend, Trinity Touch or Data make

c) **Bitumen Impregnated tape:** Bengal Bitumen, SPT Ltd. or Arcus Ltd. make

d) **Bitumen Compound:** Bengal Bitumen, SPT Ltd. or Arcus Ltd. make

e) **Welding Electrodes:** ISI marked.

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13.0 PENALTY FOR DELAY:
The Tenderer should note that the completion time allowed in the work order for carrying out the work shall be strictly observed. In case of failure to complete the contracted works within the stipulated completion period, the Contractor shall be liable to pay penalty as per Clause “Delay in Completion” of Section – II.

14.0 IMPORTANT INSTRUCTIONS:

In case of any doubt in the interpretation of the terms and conditions, the decision of the concerning Chief Engineer (T&C) will be final and binding on the bidder and no dispute in this regard will be entertained.

15.0 SPECIAL INSTRUCTIONS:

a) The Bidders shall specifically note that the NIGAM will not pay any extra amount towards any type of claim except for the description indicated in erection schedule.

b) Quantities of works indicated in the work orders placed against Labour Rate Contract will be tentative / estimated and may vary according to requirement. For the items where quantity is one (1), the Contractor has to execute the work as per requirement.

16.0 SAFETY MEASURE & ACCIDENT:

The contractor shall follow a safe method of working so that there is no damage to Nigam’s material and also no injury to any of his worker. The contractor shall be fully responsible for safety of his workers & during the work if any person gets injured due to any accident, the compensation if any, will be paid by contractor. No payment will be paid by RVPN on this account. The contractor will give an under taking on non-judicial stamp paper worth Rs. 100 /- to the effect that RVPN will not be responsible for any injury sustained by contractor’s worker due to an accident arising out of the above work and that contractor will bear entire cost of such injury or compensation if any to be paid to the workers. The cost of stamp / duty shall be borne by contractor.

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**SCHEDULE-I**  
Price Schedule  

Tender Inviting Authority: SUPERINTENDING ENGINEER(T&C- JAIPUR CITY), RVPN, JAIPUR

Name of Work: INCORPORATION OF 33KV SYSTEM ALONGWITH 132/33KV, 40/50 MVA TRANSFORMER AT 220KV GSS SITAPURA, JAIPUR

**NAME OF THE BIDDER/ BIDDING FIRM/ COMPANY**

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**PRICE SCHEDULE**

(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevant columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only)

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<thead>
<tr>
<th>NUM</th>
<th>TEXT #</th>
<th>NUM</th>
<th>TEXT #</th>
<th>NUM</th>
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<th>TOTAL AMOUNT</th>
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<tr>
<td>BER</td>
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<td>BER</td>
<td>NUMBER</td>
<td>BER</td>
<td>NUMBER</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item Description</th>
<th>Qty.</th>
<th>Unit</th>
<th>Estimated Rate in Rs. P</th>
<th>TOTAL AMOUNT Without Taxes in Rs. P</th>
<th>TOTAL AMOUNT In Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Laying of earth mesh with 40mm dia M.S Rod at a depth of .80 meter from top level of foundations including excavation of trench of required depth and backfilling of the same transportation of M.S. Rod from site store to locations, welding of M.S. Rod along the length at crossing and with earth electrodes as per drawing application of bitumen compound and covering with bitumen impregnated tap on all welded joints, for the type of soil prevent at .80 meter below top level of foundations(M.S. Rod of above sizes &amp; M.S. Flat as required shall be made available by RVPN). (a) In case electricity is made available by RVPN without charges.</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>53</td>
<td>55</td>
</tr>
</tbody>
</table>

1.01 (i) Normal dry soil  
48.00 Mtr  
400.00  
19200.00  
19200.00  
INR Nineteen Thousand Two Hundred Only

1.02 (ii) Hard soil/Murrum/Black cotton soil  
48.00 Nos  
80.00  
3840.00  
3840.00  
INR Three Thousand Eight Hundred & Forty Only

Signature with seal of bidder
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Laying of earthing risers of 75x12 mm size M.S. Flat at a depth of .80 meter from top level of foundation including excavation of trench of required depth and backfilling of the same transportation of M.S. Rod from site store to locations, preparation of risers bending as per requirement (after heating if necessary), fixing on and welding/bolting to equipment/structure and peaks of structures laying in the trench welding peaks of structures laying in the trench welding to the earth mesh of M.S Rod as per drawing, including welding of extra length of M.S. Flat if required application of bitumen compound and covering with bitumen impregnated tap on all welded joints, painting of all surface of risers above ground level with red oxide and green paint, for the type of soil prevalent at 0.80 metre below top level of foundations (M.S. Rod of above sizes &amp; M.S. Flat as required shall be made available by RVPNLS).</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2.01</td>
<td>(i) Normal dry soil</td>
<td>51.00</td>
<td>Mtr</td>
<td>1200.00</td>
<td>INR Sixty One Thousand Two Hundred Only</td>
</tr>
<tr>
<td>2.02</td>
<td>(ii) Hard soil/Murrum/Black cotton soil</td>
<td>51.00</td>
<td>Nos</td>
<td>300.00</td>
<td>INR Fifteen Thousand Three Hundred Only</td>
</tr>
<tr>
<td>3</td>
<td>Placing/ Drawing of earth electrode of 40 mm dia. M.S. Rod of length 3.30 meters (approx) to a depth of 3.80 meters from the top level of foundations, including excavation of pit as required and backfilling of the same transportation of M.S. Rod from site to locations, cutting of M.S. Rod to desired length preparation of one end as spike if necessary, welding of earth electrode to earth mesh of M.S. Rod as per drawing, application of bitumen compound and covering with bitumen impregnated tap on all welded joints, for the type of soil prevalent at 3.80 metres below top level of foundation (M.S. Rod of above sizes &amp; M.S. Flat as required shall be made available by a)In cash electricity is made available by RVPNLS without charges.</td>
<td></td>
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</tr>
<tr>
<td>3.01</td>
<td>(i) Normal dry soil</td>
<td>328.0000</td>
<td>Mtr</td>
<td>8.00</td>
<td>INR Two Thousand Six Hundred &amp; Twenty Four Only</td>
</tr>
<tr>
<td>3.02</td>
<td>(ii) Hard soil/Murrum/Black cotton soil</td>
<td>505.0000</td>
<td>Mtr</td>
<td>18.00</td>
<td>INR Nine Thousand &amp;Ninety Only</td>
</tr>
<tr>
<td>4</td>
<td>ERECTION OF SUB-STATION STEEL Structures columns, beams, lighting mastand equipment structures(excluding circuit breaker and capacitor bank) of all types including transportation capacitor bank) of all types including transportation of structure members, nut &amp; bolts washers etc. from site store to locations their assembly, placing on foundation, fixing template, with foundation</td>
<td>232.100</td>
<td>MT</td>
<td>38.00</td>
<td>INR Eighty Eight Thousand One Hundred &amp; Ninety Eight Only</td>
</tr>
</tbody>
</table>

Signature with seal of bidder
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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>bolts as required, levelling and preparing for grouting as required, but excluding grouting erection after grouting and tightening &amp; punching of nut &amp; bolts. (maximum height of structures up to 20 meters)</td>
<td></td>
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<tr>
<td>5</td>
<td>BUS BAR WORK Stringing of 132KV, 33KV bus bar of ACSR &amp; Tarantula conductor, disc insulators and tension hardware from site store to locations, laying and cutting required length of conductor, cleaning and assembly of disc insulators as required along with fitting of bolted type or compression type tension H/W as made available (compression machine shall be provided by RVPN on rent free basis), making up at one end, stringing of conductors between the beams with specified sag and tension, also equalizing sag and fitting spacers, spacer T clamps for twin conductors, for three phase of conductor in each bus section.</td>
<td></td>
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<tr>
<td>5.01</td>
<td>i) Single ACSR Zebra</td>
<td>135</td>
<td>secti 0</td>
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<td></td>
<td></td>
<td>6.00</td>
<td>4.00</td>
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<td></td>
<td>INR Five Thousand Four Hundred &amp; Twenty Four Only</td>
</tr>
<tr>
<td>5.02</td>
<td>ii) Double ACSR Zebra</td>
<td>195</td>
<td>secti 0</td>
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<td>5.00</td>
<td>6.00</td>
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<td></td>
<td></td>
<td></td>
<td>INR Eleven Thousand Seven Hundred &amp; Thirty Only</td>
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<tr>
<td>6</td>
<td>JUMPERS of ACSR conductor (3 nos Y type) between equipment or between bus to bus, including transportation of conductor, disc insulators and hardware from site stores to locations, cleaning and assembly of disc insulators as along with fitting of suspension hardware and erection as required, cutting required length of conductor, making connections, fixing of spacers &amp; spacer T clamps as required, tightening of clamps/connectors, dressing etc. For three phases</td>
<td></td>
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</tr>
<tr>
<td>6.01</td>
<td>1) Single ACSR zebra/panther conductor</td>
<td>333.000</td>
<td>set</td>
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<td></td>
<td></td>
<td>45.00</td>
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<td></td>
<td></td>
<td>14985.00</td>
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<td></td>
<td>INR Fourteen Thousand Nine Hundred &amp; Eighty Five Only</td>
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<tr>
<td>6.02</td>
<td>2) Double ACSR zebra conductor</td>
<td>665.000</td>
<td>set</td>
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<td>10.00</td>
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<td></td>
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<td>6650.00</td>
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<td>INR Six Thousand Six Hundred &amp; Fifty Only</td>
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<td>Signature with seal of bidder</td>
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<td></td>
<td>Description</td>
<td>Quantity</td>
<td>Rate (INR)</td>
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<tr>
<td>7</td>
<td>STRINGING of earth wire (size 7/3.15mm 7/4 mm) including transportation of</td>
<td>292</td>
<td>30.00</td>
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<tr>
<td></td>
<td>earth wire, tensile hardware etc. from site store to locations, laying and</td>
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<td></td>
<td>cutting required length of earth-wire, fixing of bolted type or compression</td>
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<td></td>
<td>type hardware as made available (compression machine shall be provided by</td>
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<td></td>
<td>RVPN on rent free basis), making up at one end, stringing of earthwire</td>
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<td></td>
<td>between structure peaks with speci- sag and tension, jumpering and</td>
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<tr>
<td></td>
<td>connecting earth bonds, for single earth wire</td>
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<tr>
<td>8</td>
<td>Erection of 33/0.4 KV Station Transformer upto 500KVA on existing masonry</td>
<td>396</td>
<td>1.00</td>
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<tr>
<td></td>
<td>platform including transportation of transformer &amp; accessories from site</td>
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<tr>
<td></td>
<td>store to location, erection of horn gap fuse set, jumpering from isolator</td>
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<tr>
<td></td>
<td>to horn gap to transformer</td>
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<td></td>
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<tr>
<td>9</td>
<td>Erection of Current Transformer/Potential Transformer/Capctive Voltage</td>
<td>141</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Transformer with clamps &amp; connectors on already erected steel structure</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>including transportation from site store to locations, fabricate of base</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>frame, fixing of terminal connectors tightening of nuts &amp; bolts etc.</td>
<td>532</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>complete in all respects</td>
<td></td>
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<tr>
<td>9.01</td>
<td>i) 132 KV CT/CVT/PT</td>
<td>142</td>
<td>3</td>
</tr>
<tr>
<td>9.02</td>
<td>ii) 33 KVCT/PT</td>
<td>317</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>Erection of lightening Arrestor on already erected steel structure</td>
<td>142</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>including transportation of lightening Arrestor, clamps &amp; connectors,</td>
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<td></td>
<td>surge counter etc. from site store to locations, fabricate of base frame,</td>
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<tr>
<td></td>
<td>fixing of terminal connectors surge counter, tightening of nuts &amp; bolts</td>
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<td></td>
<td>etc. complete in all respect</td>
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<td>11</td>
<td>Erection of isolators on already erected steel structure including</td>
<td>317</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>transportation of base fame, P.I.'s contacts, mechanism box, clamps &amp;</td>
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<td>connectors etc. from the site store to locations, minor fabrication as</td>
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<td></td>
<td>required and fixing of terminal connectors etc. adjustment/alignment of</td>
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<tr>
<td></td>
<td>isolator and its earth blade, if provided for their smooth operation and</td>
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<tr>
<td></td>
<td>final adjustment if required after jumpering etc</td>
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Signature with seal of bidder
| 11.01 | i) 132KV Without earth blade | 259 | Nos | 3 | 7788.00 | INR Seven Thousand Seven Hundred & Eighty Eight Only |
| 11.02 | ii) 33KV Without earth blade | 916 | Nos | 15 | 13740.00 | INR Thirteen Thousand Seven Hundred & Forty Only |
| 11.03 | iii) 33KV With earth blade | 136 | 4.00 | Nos | 3 | 4092.00 | INR Four Thousand Ninety Nine Only |

Erection of 220KV OR 132 Circuit Breaker including transportation of equipment structure members nuts & bolts, clamp & connectors, accessories etc. from site store to location, assembly of support structure their placing on foundation, leveling and preparing for grouting as required but excluding grouting, assembly placing of support columns/poles mechanism box/control cubicle and other accessories as per manufacture, as drawings fill in of sf6 gas pipeline, fabrication of air/oil pipe-line as required, electrical wing from pole to control cubicle, fixing of terminal connectors as required.

| 12.01 | i) 132 KV CB | 152 | Nos | 1 | 15223.00 | INR Fifteen Thousand Two Hundred & Twenty Three Only |

Erection of 33 Circuit Breaker including transportation of equipment structure members nuts & bolts, clamp & connectors, accessories etc from site store to location, assembly of support structure their placing on foundation, levelling and preparing for grouting as required but excluding grouting, assembly placing of support columns/poles mechanism box/control cubicle and other accessories as per manufacture, as drawings filling of sf6 gas pipeline, fabrication of air/oil pipeline as required, electrical wing from pole to control cubicle, fixing of terminal connectors as required but excluding commission of CB.

| 13.01 | i) 33 KV CB | 740 | Nos | 5 | 37020.00 | INR Thirty Seven Thousand & Twenty Only |

Erection of Post Insulator on already erected structure including transportation of P.I.'s nuts & bolts, clamps & connector etc. from site store to locations, fabrication of base frame& assembly if required, fixing of clamps etc.

| 14.01 | i) 33KV | 75 | Nos | 12 | 900.00 | INR Nine Hundred Only |

Signature with seal of bidder
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<tr>
<td><strong>15</strong></td>
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<tr>
<td></td>
<td>Erection of 132KV EHV Transformer(tank already placed on foundation with wheels),including transportation of accessories from site store to locations, erections of HV,IV,LV &amp; Netural bushings, Main &amp; OLTC conservator, radiators, equalizing pipe line, MK etc as per Manufacture's drawing preparation of oil, oil filling, dehydration of transformer(filter machine, oil tank &amp; operating staff shall be provided by RVPN) electrical wiring from individual equipment, e.g. Buchholz relay, MOLG,OSR etc. to Marshalling kiosk, etc. but excluding testing &amp; commissioning of transformer.</td>
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<td><strong>15.01</strong></td>
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<tr>
<td></td>
<td>i) 132 KV Transformer required oil filtered</td>
<td>420</td>
<td>Nos 1</td>
</tr>
<tr>
<td></td>
<td>Erection of control &amp; Relay panels complete in all respects including transportation from site store to control room, placing on foundation/cable trench as per layout, interconnection between control &amp; Realy panels and with existing panels, fixing of side/top covers and doors, earthing to existing earth strip in control room, connection of bus wiring to existing panel and between control and relay as required</td>
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<tr>
<td><strong>16</strong></td>
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<tr>
<td></td>
<td>i) Duplex panel</td>
<td>126</td>
<td>Nos 1</td>
</tr>
<tr>
<td></td>
<td>Erection of marshaling kiosk/line matching unit (LMU)/line matching &amp;distribution unit (LMDU)complete in all respect including transportation from site store to loction, placing on foundation/cable trench as per layout, preparing for grounding on foundation bolts but excluding grouting etc.</td>
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<td><strong>16.02</strong></td>
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<td></td>
<td>ii) Simplex panel, DC panel, RTCC panel, PLCC panel etc.</td>
<td>632</td>
<td>Nos 4</td>
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<tr>
<td><strong>17</strong></td>
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<tr>
<td></td>
<td>i) 220 KV or 132 KV marshalling box</td>
<td>374</td>
<td>Nos 1</td>
</tr>
<tr>
<td></td>
<td>ii) 33 KV or 11 KV marshalling box</td>
<td>192</td>
<td>Nos 3</td>
</tr>
</tbody>
</table>

Signature with seal of bidder
18. Control Cables
i) Laying of PVC insulated unarmored /armored control cables of 1.1 kv grade with copper conductor in cable trenches as per specification as required, including transportation of cable drum from site store to locations, cutting to required length, placing them on cable racks/cable trays/ cable batten and dressing, including removing and re-fixing trench covers as required, making necessary connections testing, cable marking on both terminating ends, etc. as required for all size from 2x2.5 sq. to 20x2.5 sq mm & 4x4 sq mm

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Meter</th>
<th>1000</th>
<th>50000</th>
<th>INR Fifty Thousand Only</th>
</tr>
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<tbody>
<tr>
<td>18.01</td>
<td>a) Unarmored control cable</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>ii) Fixing of control cable in position with single compression nickle plated brass cableglands confirming to IS 12943 &amp; having three metal washers and one rubber ring including preparing of cables and drilling of corresponding holes in gland plated etc as required &amp; including cost of cable glands, for each gland sizes.</td>
<td></td>
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</tr>
<tr>
<td>19.01</td>
<td>a) 19 mm Unarmored control cable</td>
<td>44</td>
<td>Nos 50</td>
<td>2200.00</td>
<td>INR Two Thousand Two Hundred Only</td>
</tr>
<tr>
<td>19.02</td>
<td>b) 25 mm Unarmored control cable</td>
<td>67</td>
<td>Nos 120</td>
<td>8040.00</td>
<td>INR Eight Thousand &amp; Forty Only</td>
</tr>
<tr>
<td>19.03</td>
<td>c) 32 mm Unarmored control cable</td>
<td>96</td>
<td>Nos 20</td>
<td>1920.00</td>
<td>INR One Thousand Nine Hundred &amp; Twenty Only</td>
</tr>
<tr>
<td>20</td>
<td>iii) Termination of wires of cables with copper conductor using copper terminal ends (pin or ring type as required of Dowells or equivalent make as approved by the Engineer-in-charge) duly crimped with crimping tool, including making wire ends ready for crimping ferruling &amp; dressing of wire etc as required including cost of terminal ends for all wires for each cable all both ends for cables of the following sizes</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>20.01</td>
<td>a) 2x2.5 sq.mm</td>
<td>21</td>
<td>Each 6</td>
<td>126.00</td>
<td>INR One Hundred Twenty Six Only</td>
</tr>
<tr>
<td>20.02</td>
<td>b) 3x2.5 sq.mm</td>
<td>32</td>
<td>Each 15</td>
<td>480.00</td>
<td>INR Four Hundred &amp; Eighty Only</td>
</tr>
<tr>
<td>20.03</td>
<td>c) 4x2.5 sq.mm</td>
<td>43</td>
<td>Each 6</td>
<td>258.00</td>
<td>INR Two Hundred &amp; Fifty Eight Only</td>
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<tr>
<td>20.04</td>
<td>d) 12x2.5 sq.mm</td>
<td>128</td>
<td>Each 10</td>
<td>1280.00</td>
<td>INR One Thousand Two Hundred &amp; Eighty Only</td>
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<tr>
<td>20.05</td>
<td>f) 18x2.5 sq.mm</td>
<td>191</td>
<td>Each 10</td>
<td>1910.00</td>
<td>INR One Thousand Nine Hundred &amp; Ten Only</td>
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<tr>
<td>21</td>
<td>In case all the wires of any cable are not got terminated then a deduction at the rate of Rs 4.00 shall be made for each end of the wire not terminated.</td>
<td></td>
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<tr>
<td>21.01</td>
<td>j) 4x4.0 sq.mm</td>
<td>57</td>
<td>Each 55</td>
<td>3135.00</td>
<td>INR Three Thousand One Hundred &amp; Thirty Five Only</td>
</tr>
</tbody>
</table>

Signature with seal of bidder
(i) Laying of P.V.C. insulated and PVC sheathed armoured/unarmoured L.T. Power cable of 1.1KV Grade with aluminium conductor as per IS:1255 in ground/cable trench/wall/surface including transportation of cable drum from site store to locations and excavation of 30cm x 75cm size trenches, providing 25mm thick under layer of sand & 2nd class brick covering & refilling earth in remaining portion, fixing as per approved/available spacing by means of M.S.U clamps, etc. as per specification as required, including marking necessary connections & testing etc. as required of the following sizes.

| 22 | (d) 3.5 core*300 sq. mm | 53 | meter | 300 | 15900.0 | INR Fifteen Thousand Nine Hundred Only |

(ii) Fixing of power cables in position with single compression, heavy duty nickel plated brass cable gland as per IS:12943 & having three metal washers and one rubber ring, including preparation of cable and drilling of corresponding holes in gland plate, etc including cost of cable gland if required for each end of cable size.

| 23 | (g) 75/76 mm for 3.5 core*300 sq mm cable with material | 442 | Nos | 1 | 442.00 | INR Four Hundred & Forty Two Only |

(iii) Termination of wires of cables with aluminium conductor using ISI marked tubular aluminium terminal ends as per IS:8309 duly crimped with crimping tool, including making cable end ready for crimping and providing insulation tape with colour code, dressing of wires etc. including cost of terminal ends if required for each end of cable(4 nos per end) for the following size of cables.

| 24 | (g) 3.5 core*300 Sq. mm cable with material | 820 | Set | 1 | 820.00 | INR Eight Hundred & Twenty Only |

Total in Figures (A)

| 482112.00 | Four Lakh Eighty Two Thousand One Hundred & Twelve Only |

Cumulative Quoted Rate in Figures (B) i.e. Above/Below on (A)

| Select | 0.00 | INR Zero Only |

| GST @18% (Rs.) of B | 0 | INR Zero Only |

Net Amount i.e. C=B+ GST @18 %

| 0.00 | INR Zero Only |

INR Zero Only

Signature with seal of bidder
## SCHEDULE-II
Technical and Commercial details
(Information about bidders)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Particulars</th>
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<tbody>
<tr>
<td>1.</td>
<td>Details of Bidder / Firm</td>
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<tr>
<td>(a)</td>
<td>Name of firm :</td>
</tr>
<tr>
<td>(b)</td>
<td>Name of owner of firm :</td>
</tr>
<tr>
<td>(c)</td>
<td>Name of contact person :</td>
</tr>
<tr>
<td>(d)</td>
<td>Mobile No. of owner of firm / Contact person :</td>
</tr>
<tr>
<td>(e)</td>
<td>Address of firm :</td>
</tr>
<tr>
<td>(f)</td>
<td>E-mail ID :</td>
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<tr>
<td>(g)</td>
<td>Fax No. :</td>
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</tbody>
</table>

2. Experience of work
   (a) Name of Organization. : |
   (b) Nature of work : |
   (c) Amount of work : |
   (d) Period of contract. : |
   Bidder should submit the information in a statement.

3. Documentary evidence in support of information at S. No. 1 : |

4. Certificate of performance of Work : |

5. Details of special T & P, if required as per Bid specification : |

6. Financial status of the firm : |

7. Status of the firm : |

8. Certificate of registration with PF Commissioner. : Registration No. |

9. Certificate of Registration of the firm at RVPN if any. (a) Registration No. (b) Valid up to |

10. Certificate of Registration with Central Excise Deptt. for GST {Goods and Service (a) Registration No. |

11. Certificate & Registration under contract labour laws. (a) Registration No. (b) Valid upto |

12. Any other information: |

---

Signature with seal of bidder
NOTE: - INFORMATION TO BE FURNISHED BY THE BIDDER FOR S. No. 4 TO 11.

(1) For Sr. No. 4 Performance / work completion certificate as detailed in qualifying requirement.
(2) For S. No. 5 Please submit the list of T & P as per bid specification.
(3) For S. No. 6 Please submit Scanned copy for Amount given in qualifying requirement.
(4) For S. No. 7 Please submit Scanned copy as documentary proof for whether firm is proprietary or partnership or limited company.
(5) For S. No. 8 Please submit Scanned copy of registration with PF Commissioner.
(6) For S. No. 9 Please submit Scanned copy of Certificate of Registration of the firm at KSTP if any.
(7) For S. No. 10 Please submit Scanned copy of Certificate of Registration with GST (Goods and Service Tax).
(8) For S. No. 11 Please submit Scanned copy of Certificate & Registration under contract labour laws.

Signature of Bidder:

Name of Firm:

Seal of the company:

Address:

Phone No.

Mobile No.

E.Mail.ID

Signature with seal of bidder
Section-IV

SCHEDULE -III

DEVIAITON FROM SPECIFICATION

The Bidder shall state under this schedule the departure from the purchaser's specification in respect of both technical and commercial terms & conditions:-

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Main Deviations from Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td><strong>Technical Deviations</strong> :</td>
</tr>
<tr>
<td>2)</td>
<td><strong>Commercial</strong> :</td>
</tr>
</tbody>
</table>

Certified that we agree to all Technical Specification and Commercial Terms and conditions as laid down in "General Conditions of Contract" except for the deviations to the extent indicated above.

Signature of bidders )
Name & Designation
with Seal of the firm.

Name of Firm __________________________

Signature of Bidders ____________________
Name of Bidder _________________________
Designation ___________________________
Date _________________________________

Seal of Company

Signature with seal of bidder
### Section-IV

### SCHEDULE-IV

Detail of Works executed by the Firm during last five year.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Work Order No. &amp; date</th>
<th>Awarded by Authority</th>
<th>Engineer / Officer in charge of Contract</th>
<th>Name of Work Contract</th>
<th>Contract period of work (date must be mentioned)</th>
<th>Contract value of work</th>
<th>Position of work completed / In Progress</th>
<th>If completed then Completion date</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>
**SECTION-IV**
**SCHEDULE-V**

**Subject:**- Incorporation of 33kV System along with 132/33kV Transformer at 220kV GSS Sitapura, Jaipur *under jurisdiction of this circle T&C-JPR City* against BID SPECIFICATION NO.RVPN/SE(T&C-JPR City)/33KV System/Sitapura/2019-20 /UBN-VPN1920

<table>
<thead>
<tr>
<th>S. No</th>
<th>Name of the line</th>
<th>Period of completion for replacement work of Raising Height of transmission lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Incorporation of 33kV System along with 132/33kV Transformer at 220kV GSS Sitapura, Jaipur</td>
<td>4 months</td>
</tr>
</tbody>
</table>

**Note:**-

1. Above targeted 4 period is inclusive of monsoon period.

(Signature Bidder)
Name & Designation
With seal of the firm

Signature with seal of bidder
SECTION-IV
SCHEDULE-VI

(Must be filled in by the bidder and upload with Technical Bid)

To,

The Superintending Engineer (T&C-Jaipur city),
RVPN/L Heerapura,
Jaipur.

Dear Sirs,

With reference to your invitation to the bid against BID SPECIFICATION NO.RVPN/SE(T&C-JPR City)/33KV System/Sitapura/2019-20/UBN-VPN1920..........................

We agree to conduct Incorporation of 33kV System along with 132/33kV Transformer at 220kV GSS Sitapura, Jaipur on Labour contract Basis.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the Line</th>
</tr>
</thead>
</table>

1. The percentage variation below / above for the cost of Incorporation of 33kV System along with 132/33kV Transformer at 220kV GSS Sitapura, Jaipur indicated in price schedule(s) shall also be applicable in case of unit rate items detailed in Schedule-II (For the same work).

2. Any increase / decrease in the quantity of individual items mentioned in the price schedule shall be finalized on basis of the actual. The cost of that item shall be increased / decreased in proportion to the % variation.

3. The offer is valid for a period of 120 days after the date of opening of Techno Commercial Bid.

We confirm that we agree to all the terms and conditions as well as the technical stipulations of your BID SPECIFICATION NO.RVPN/SE(T&C-JPR City)/ 33KV System/Sitapura/2019-20 /UBN-VPN1920.........................

2. and there are no deviations other than as specified in the Schedule-VI.

Yours faithfully,

(Signature)
Name & Designation
with seal of the firm.

Signature with seal of bidder
ANNEXURE-I

REAL TIME GROSS SETTLEMENT (RTGS)/NATIONAL ELECTRONIC FUNDTRANSFER (NEFT)

From:

M/s __________________________________________
______________________________________________
______________________________________________

The Accounts Officer (T&C-Jaipur City),
RRVPNl,
Heerapura.

SUBJECT :- RTGS/NEFT payments.

We refer to remittance of our payments using RGI's RTGS/NEFT. Our payments may be made through the above system to our under noted account at our cost:-

Name of city

Bank Code No.

Branch Code No.

Bank’s Name

Branch Address.

Branch Telephone/Fax No.

Contractor’s Account No.

Type of Account

IFSC Code for NEFT

IFSC Code for RTGS

Contractor’s Name as per Account

Contractor’s E-Mail ID.

Confirmed by Banker                             Signature of Bidder

Signature with seal of bidder
**ANNEXURE-II**

**PRE-BID QUERIES FORMAT**

Name of the company/Firm
Bidding document fee  Receipt No.__________ dated__________forRs2.__________
Name of Person(s) Representing the Company/Firm:

<table>
<thead>
<tr>
<th>Name of person</th>
<th>Designation</th>
<th>E-mail-ID(s)</th>
<th>Tel Nos &amp; Fax No</th>
</tr>
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<tbody>
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</tbody>
</table>

**Company/Firm Contacts**

<table>
<thead>
<tr>
<th>Contact Person(s)</th>
<th>Address for Correspondence</th>
<th>E-mail-ID(s)</th>
<th>Tel Nos &amp; Fax No</th>
</tr>
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<tbody>
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</tr>
</tbody>
</table>

**Query/Clarification Sought**

**MS(Excel Sheet Format)**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Bidder Name</th>
<th>ITB/GCC/ Specification clause No</th>
<th>Bid document page No</th>
<th>Clause details</th>
<th>Query/ Clarification/ suggestion</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

(Signature)
Name & Designation
With seal of the bidder

Signature with seal of bidder
PERFORMA OF BANK GUARANTEE FOR BID SECURITY

(Bank Guarantee in lieu of Bid security on non-judicial Stamp Paper of Rajasthan State of appropriate value)

The Superintending Engineer (T&C Jaipur City),
Rajasthan Rajya Vidyut Prasarani Nigam Ltd.,
Jaipur.

1. Whereas ...................... (name of the Bidder) (hereinafter called “the Bidder”) has submitted its bid dated........... (date of submission of bid) for ...................(name of contract/Name of the material with Bid no.) (hereinafter called "the Bid").

2. KNOW ALL PEOPLE by these presents that WE............. (name of bank) of .................. (name of country), having our registered office at .................. (address of bank) (hereinafter called "the Bank"), are bound into ..................... (name of Purchaser) (hereinafter called "the Purchaser") in the sum of Rs. .................. for which payment well and truly to be made to the said Purchaser, the Bank binds itself, its successors, and assigns by these presents. Sealed with the Common Seal of the said Bank this .................. day of ...................

3. THE CONDITIONS of this obligation are:
   (i) If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder in the Bid Form; or
   (ii) If the bidder refuses to accept the correction of error in his Bid; or
   (iii) If the Bidder, having been notified of the acceptance of its Bid by the purchaser during the period of bid validity:
      (a) Fails or refuses to execute the Contract Agreement within the time specified in purchase/work order, if required, or
      (b) Fails or refuses to furnish the performance security within the time specified in purchase/work order in accordance with the GCC, or
      (c) Fails to commence supply of goods or services or execute work as per purchase/work order within time specified.
   (iv) If the bidder breaches any provision of the Code of Integrity specified in the RTPP Act and Chapter VI of the RTPP Rules.

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

5. The decision of the Superintending Engineer (T&C Jaipur City), RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM, JAIPUR shall be final whether breach has been committed on the right to demand the amount of guarantee from us which has accrued to the purchaser.

6. This guarantee shall not cease or determine, if the purchaser grants time or indulgence or vary the terms of the contract with the Contractor or without our consent or knowledge.

7. The guarantee herein contained shall not be affected by any change in the constitution of the Contractor.

Signature with seal of bidder
8. We further undertake not to revoke this guarantee during its currency except with the previous consent of the Superintending Engineer (T&C Jaipur City), Rajasthan Rajya Vidyut Prasaran Nigam, Jaipur.

9. All disputes arising under the said guarantee between the Bank and the Nigam or between the Contractor and the Nigam pertaining to the guarantee, shall be subject to the jurisdiction of Courts in Jaipur, Rajasthan alone.

10. This guarantee will remain in force up to and including one hundred eighty (180) days after the date of the opening of bids, i.e. up to ................., with a further grace period of Ninety (90) days and any demand in respect thereof should reach the Bank not later than the above date.

Yours faithfully,
Bankers (EXECUTENT)
Signed by the above named Bank in presence of:
(Signature with full Name and Address)

Witness:

1. 
2. 

Attested by Notary Public, First Class Magistrate or directly confirmed by the executing bank.

* The Bidder should insert the amount of the guarantee in words and figures denominated in the currency of bid.

Note 1: In case the bid is submitted by a Joint Venture, the Bid Bank guarantee shall be in the name of Lead partner or in the name of joint venture partners submitting the Bid covering all the partners of the joint venture.
**ANNEXURE-IV**

*(Format for contract agreement)*

**CONTRACT AGREEMENT**

This Agreement is made at Jaipur this day ................................ between the ................................ RRVPN, Jaipur (herein after called ‘NIGAM’ which expression shall, where the context so admits include its successors and permitted assignees) and M/s. ..................................................., (herein after called ‘The Contractor’ which expression shall, where the context so admits include their heirs, executors, administrators and legal representative as well as successors and permitted assignees) are hereby held and firmly bind to the Rajasthan Rajya Vidyut Prasaran Nigam Ltd. to execute the work of: ................................ to be executed as per rate, terms and conditions of ........................................................., awarded by the Nigam as per details given below:

<table>
<thead>
<tr>
<th></th>
<th>Name of work</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Name of order placing authority/</td>
</tr>
<tr>
<td></td>
<td>purchaser</td>
</tr>
<tr>
<td>3</td>
<td>Name of contractor</td>
</tr>
<tr>
<td>4</td>
<td>Estimated cost</td>
</tr>
<tr>
<td>5</td>
<td>Earnest Money deposited.</td>
</tr>
<tr>
<td>6</td>
<td>Security Deposit</td>
</tr>
<tr>
<td>7</td>
<td>Tentative date of completion</td>
</tr>
<tr>
<td>8</td>
<td>Work order No. &amp; date</td>
</tr>
</tbody>
</table>

I/ we hereby assure and abide to fulfill all the conditions of the work order referred to above. I/we declare that I/we have read thoroughly and carefully all the terms & conditions, clauses of the work order/Bid specifications and I/we hereby accept & abide with the terms and conditions of the said work order/Bid specifications for execution of the said work. I/we declare that, I/We will be fully responsible for safety of Nigam’s material issued to us for
Incorporation of 33kV System along with 132/33kV Transformer at 220kV GSS Sitapura, Jaipur, erection works as well as safety of our workers and confirm that, if any person get injured due to any accident during execution of work, the compensation if any, will be paid by me/us (contractor) and RVPN shall not be responsible in any circumstances.

Signed and delivered by,
Signature of contractor..............................

Witness:
Signature
Address.................................

Notary attested:

Accepted on behalf of RVPN.

Superintending Engineer (T&C-JPR CITY)
RVPN, Jaipur City
ANNEXURE-V
(Format for indemnity bond)

INDEMNITY BOND

Know all men by these presents that we

..........................(herein after called ‘The Contractor’
which expression shall, where the context so admits include their, heirs, executors,
administrators and legal representative as well as successors and permitted assignees) are
hereby held and firmly bind to the Rajasthan Rajya Vidyut Prasaran Nigam Ltd. (herein
after called ‘NIGAM’ which expression shall, where the context so admits include its
successors and permitted assignees) to refund the full amount of owner supplied material
made available by the Nigam under the terms and conditions of work order No.
.......................... for the work
of.......................... If any loss, damage or deterioration of what
so ever nature occurs to such material which is held by us at our site stores at works site, in
trust for and on behalf of the Nigam and or if any of such material or fabricated articles
made there from are in inspection by any officer authorized by the Nigam in this behalf are
found to be defective and rejected by such officer. We, hereby further bind ourselves that
the amount of such refund may be deducted by the Nigam from any sum, which at any time
thereafter may become due to us under said work order or any other contract entered into by
us with the Nigam.

We bind ourselves firmly by these presents dated ......................... and
whereas the contractor do hereby agree to be responsible for the safe custody and
protection of the said material against all risks (excluding war risks) and against loss,
damage and deterioration of whatsoever nature in respect of the said material while it
remains in the custody and possession of the sub-contractor / contractor.

AND WHEREAS the said material shall at all time remains open for inspection by any
officer authorized by the Nigam. Now the conditions of the above written bond are such
that:

1. The said contractor shall refund the full amount against the material as has been
supplied by the Nigam to them in respect of which loss, damage or deterioration

Signature with seal of bidder
of whatsoever nature, except due to circumstances arising out of war has occurred.

2. The contractor shall keep the said material open at any time for inspection by the officers authorized by the Nigam till the said material is utilized by the contractor on the said works and balance / surplus material is deposited with In-charge of the works. If the material account is settled than the above written bond shall be void and of no effects, otherwise the same shall be and remain in full force.

IN WITNESS WHEREOF we the said have hereto signed at Jaipur in the presence of:

Authorized signatory

Witness:

Sign ______________________

Name ______________________

Address ______________________

Notary attested:

Signature with seal of bidder
PERFORMANCE SECURITY BANK GUARANTEE FORM
(Performance Security Bank Guarantee on non-judicial stamp paper of Rajasthan Govt. of appropriate value)

The Superintending Engineer (T&C Jaipur City),
RVPN, Ajmer Road, Heerapura,
Jaipur-302021

Dear Sir,

THIS DEED OF GUARANTEE is made this day _________ of the month _________ of the year _________ between the Superintending Engineer, Rajasthan Rajya Vidyut Prasarani Nigam Ltd., (which expression shall unless excluded by or repugnant to the context includes his successors, assigns and his authorized representatives, hereinafter called “The Purchaser”) of the one part and the (the name of Bank with address) ______________, having its Head office at ______________ hereinafter called ”The Bank” (which expression shall unless excluded by or repugnant to the context includes its successors and assigns) of the other part.

WHEREAS MESSERS ______________ (hereinafter called “The Contractor”), having their/its Registered/Head office at ______________, agreed to supply, the materials to the Superintending Engineer, Rajya Vidyut Prasarani Nigam Ltd. against Purchase Order No. ______________ dated ______________ (hereinafter referred to as the contract).

AND WHEREAS as per the terms of the contract it was provided that the contractor should furnish a Bank Guarantee towards performance security deposit equivalent to ___% of the total contract value by way of security for successful execution of purchase order No. ______________ Dated ______________ and supplying any material free of cost that may be required due to defects arising from faulty materials, design and workmanship, so as to make it meet the guarantee and requirements of the contract.

AND WHEREAS at the request of the contractor the Bank has agreed to execute these presents.

NOW THIS INDENTURE WITNESS AND IT IS HEREBY AGREED AND DECLARED by the and between the parties hereto as follows:

1. The Bank hereby guarantees to the Superintending Engineer(T&C-Jaipur City), Rajasthan Rajya Vidyut Prasarani Nigam Ltd., Jaipur the fulfillment by the contractor of the various obligations imposed on him under the aforesaid contract including the obligations of the contractor to timely supply materials of the good quality, design and workmanship and the bank further guarantees to the Rajasthan Rajya Vidyut Prasarani Nigam Ltd., that the contractor shall substitute and supply any material free of cost that may be required due to defects arising from faulty material, design and workmanship and the Bank undertakes to indemnify and keep the Superintending Engineer, Rajasthan Rajya Vidyut Prasarani Nigam Ltd., indemnified to the extent of Rs. ___________ (Rupees ___________) against any loss or damage that may be caused to or suffered by the Rajasthan Rajya Vidyut Prasarani Nigam Ltd., by reason of any failure by the contractor to timely supply materials of good quality, design and workmanship as aforesaid and further undertake to pay to the Superintending Engineer, Rajasthan Rajya Vidyut Prasarani Nigam Ltd., on demand a sum not exceeding Rs. ___________ (Rupees ___________) in the event of the contractor failing or neglecting to perform and discharge the aforesaid duties and obligations on their part to be observed and performed under the said contract.

2. Payment pursuant in this undertaking will be demanded by the purchaser from the Bank and will be met by the Bank without question in the case in which the contractor, on receipt of the order and/or after the acceptance of his Bid has been communicated to him by the purchaser, make default in entering into an agreement or having entered into such Agreement or otherwise the contractor makes default in carrying out the contract thereof. As to whether the occasion or ground is arisen for such demand the decision of the Superintending Engineer including Engineer and any other officer exercising the powers of Superintending Engineer, Rajasthan Rajya Vidyut Prasarani Nigam Ltd. shall be final.

3. The decision of the Superintending Engineer including Engineer and any other officer exercising the powers of Superintending Engineer, Rajasthan Rajya Vidyut Prasarani Nigam Ltd., as to whether the contractor has failed or neglected to perform or discharge his duties and obligations as aforesaid and as to the amount payable to the Superintending Engineer, Rajasthan Rajya Vidyut Prasarani Nigam Ltd., by the Bank herein shall be final and binding on the Bank.

Signature with seal of bidder
4. The guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said contract and it shall continue to be enforceable till all the obligations to the Rajasthan Rajya Vidyut Prasaran Nigam Ltd., under or by force of the contract have been fully and properly discharged by the said contractor, subject however, to the conditions that the Rajasthan Rajya Vidyut Prasaran Nigam Ltd., will have no right under this guarantee after ____ months from the date of commissioning of the equipment or ____ months from the date of receipt of last consignment at site/store, whichever is earlier, provided further that if any claim arises by virtue of this guarantee before the aforesaid date, the same shall be enforceable against this bank notwithstanding the fact that the same is enforced after the aforesaid date.

5. The guarantee herein contained shall not be affected by any change in the constitution of the contractor or Bank.

6. No variation in the terms of bid, acceptance or agreement as between the contractor and the purchaser made without the purchaser's consent shall discharge this undertaking.

7. No indulgence or grant of time by the purchaser to the contractor without the acknowledgement of the Bank will discharge the liabilities of the Bank under this guarantee.

8. The Superintending Engin eer(T&C-Jaipur City), Rajasthan Rajya Vidyut Prasaran Nigam Ltd., Jaipur, shall have the fullest liberty without affecting the guarantee to postpone for any time and from time to time of any of the powers exercisable by the VPN against contractor and either to enforce or forebear from enforcing any of terms and conditions of the said contract and the Bank shall not be released from its liability under this guarantee and exercise of the Rajasthan Rajya Vidyut Prasaran Nigam Ltd., of the liberty with reference to the matter aforesaid or by the reasons time being given to the contractor or any other forbearance, act or omission on the part of the Rajasthan Rajya Vidyut Prasaran Nigam Ltd., to the contractor or by any other matter or thing whatsoever which under the law relating to the sureties shall not for this provision have the effect of so releasing the bank from such liability.

9. The Bank further undertakes not to revoke this guarantee during its currency except with the previous consent of the Superintending Engineer(T&C-Jaipur City), Rajasthan Rajya Vidyut Prasaran Nigam Ltd., Jaipur, in writing.

10. All disputes arising under the said guarantee, between the Bank and the VPN or between the contractor and the VPN pertaining to this guarantee, shall be subject to the jurisdiction of Courts, only at Jaipur in Rajasthan alone.

11. Notwithstanding anything contained herein before, the Bank's liability under this guarantee is restricted to Rs. ________________ (Rupees ________________ ) and the guarantee shall remain in force upto ________________ with a grace period of 90 days. Unless demand or claim in writing is presented/ lodged on the Bank within six months i.e. upto ________________, the Bank shall be released and discharged from all liabilities there under. However the validity of the Bank Guarantee shall be extended as and when required by the Rajasthan Rajya Vidyut Prasaran Nigam Limited.

IN WITNESS WHEREOF THE BANK HAS executed these presents the day and year written above.

Yours faithfully,
Bankers (EXECUTANT)
Signed by the above named Bank in presence of:-
(Signature with full Name and Address)

Witness:-
1. 
2. Attested by Notary Public, First Class Magistrate or directly confirmed by the executing bank.

Signature with seal of bidder
APPENDIX

Annexure -A: Compliance with the Code of Integrity and No Conflict of Interest

Any person participating in a procurement process shall –

a) not offer any bribe, reward or gift or any material benefit either directly or indirectly in exchange for an unfair advantage in procurement process or to otherwise influence the procurement process;

(b) not misrepresent or omit that misleads or attempts to mislead so as to obtain a financial or other benefit or avoid an obligation;

(c) not indulge in any collusion, Bid rigging or anti-competitive behavior to impair the transparency, fairness and progress of the procurement process;

(d) not misuse any information shared between the procuring Entity and the Bidders with an intent to gain unfair advantage in the procurement process;

(e) not indulge in any coercion including impairing or harming or threatening to do the same, directly or indirectly, to any party or to its property to influence the procurement process;

(f) not obstruct any investigation or audit of a procurement process;

(g) disclose conflict of interest, if any; and

(h) disclose any previous transgressions with any Entity in India or any other country during the last three years or any debarment by any other procuring entity.

Conflict of Interest:

The Bidder participating in a bidding process must not have a conflict of interest.

A conflict of interest is considered to be a situation in which a party has interests that could improperly influence that party’s performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations.

A Bidder may be considered to be in conflict of interest with one or more parties in a bidding process if, including but not limited to:

a. have controlling partners/shareholders in common; or

b. receive or have received any direct or indirect subsidy from any of them; or

c. have the same legal representative for purposes of the Bid; or

d. have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the Bid of another Bidder, or influence the decisions of the Procuring Entity regarding the bidding process; or

e. the Bidder participates in more than one Bid in a bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all Bids in which the Bidders is involved. However, this does not limit the inclusion of the same subcontractor, not otherwise participating as a Bidder, in more than one Bid; or

f. the Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the Goods, Works or Services that are the subject of the Bid: or

g. Bidder or any of its affiliates has been hired (or is proposed to be hired) by the procurement Entity as engineer-in-charge/consultant for the contract.

Signature with seal of bidder
• Annexure –B: Declaration by the Bidder regarding Qualifications

**Declaration by the Bidder**

In relation to my/our Bid submitted to ........................................ for Contract
in response to their Notice Inviting Bids
Dated.......................... I/we hereby declare under
Section 7 of Rajasthan Transparency in Public Procurement Act, 2012 that:

1. I/we possess the necessary professional, technical, financial and managerial
resources and competence required by the Bidding Document issued by the
Procuring Entity;

2. I/we have fulfilled my/our obligation to pay such of the taxes payable to the
union and the State Government or any local authority as specified in the
Bidding Document;

3. I/we are not insolvent, in receivership, bankrupt or being wound up, not have
my/our affairs administered by a court or a judicial officer, not have my/our
business activities suspended and not the subject of the legal proceedings for
any of the foregoing reasons;

4. I/we do not have, and our directors and officers not have, been convicted of any
criminal offence related to my/our professional conduct or the making of false
statements or misrepresentations as to my/our qualifications to enter into
procurement contract within a period of three years preceding the
commencement of this procurement process, or not have been otherwise
disqualified pursuant to debarment proceedings;

5. I/we do not have a conflict of interest as specified in the Act, Rules and the
Bidding Document, which materially affects fair competition;

Date: .................................................. Signature of bidder

Place ................................................................

Name:
Designation:
Address:

Signature of Bidder

Signature with seal of bidder
Annexure - C: Grievance Redressal during Procurement process

The designation and address of the First Appellate Authority is as nominated vide order No. RVPN/AAO/F&F/R.98/D.53 dated 30.06.2016.

(1) Filling an Appeal

If any Bidder or prospective bidder is aggrieved that any decision, action or omission of the Procuring entity is in contravention to the provisions of the Act or the Rules or the Guidelines issued there under, he may file an appeal to First Appellate Authority, as specified in the Bidding Document within a period of ten days from the date of such decision or action, omission, as the case may be, clearly giving the specific ground or grounds on which he feels aggrieved:

Provide that after the declaration of a Bidder as successful the appeal may be filed only by a Bidder who has participated in procurement proceedings:

Provided further that in case a Procuring Entity evaluates the Technical Bids before the opening of the Financial Bids, an appeal related to the matter of financial Bids may be filed only by a Bidder whose Technical Bid is found to be acceptable.

(2) The officer to whom an appeal is filled under para (1) shall deal with the appeal as expeditiously as possible and shall endeavor to dispose it of within thirty days from the date of appeal.

(3) If the officer designated under para (1) fails to dispose of the appeal filed within the period specified in para (2), or if the Bidder or prospective bidder or the procuring Entity is aggrieved by the order passed by the First Appellate Authority, the Bidder or prospective bidder or procuring Entity, as the case may be, may file a second appeal to Second Appellate Authority specified in the Biding Document in this behalf within fifteen days from the expiry of the period specified in para (2) or of the date of receipt of the order passed by the First Appellate Authority, as the case may be.

(4) Appeal not to lie in certain cases

No appeal shall lie against any decision of the Procuring Entity relating to the following matters, namely:-
(a) determination of need of procurement;
(b) provisions limiting participation of Bidders in the Bid process;
(c) the decision of whether or not to enter into negotiations;
(d) cancellation of procurement process;
(e) applicability of the provisions of confidentiality.

Signature with seal of bidder
(5) **Form of Appeal**

(a) An appeal under para (1) or (3) above shall be in the annexed form along with as many copies as there are respondents in the appeal.

(b) Every appeal shall be accompanied by an order appealed against, if any, affidavit verifying the facts stated in the appeal and proof of payment of fee.

(c) Every appeal may be presented to First Appellate Authority or Second Appellate Authority, as the case may be, in person or through registered post or authorized representative.

(6) **Fee of filing Appeal**

(a) Fee of first appeal shall be rupees two thousand five hundred and/or second appeal shall be rupees ten thousand, which shall be non-refundable.

The fee shall be paid in the form of bank demand draft or banker's cheque of the Scheduled Bank in India payable in the name of Appellate Authority concerned.

(7) **Procedure for disposal of Appeal**

(a) The First Appellate Authority or Second Appellate Authority, as the case may be, upon filing of appeal, shall issue notice accompanied by copy of appeal, affidavit and documents, if any, to the respondents and fix date of hearing.

(b) On the date fixed for hearing, the First Appellate Authority or Second Appellate Authority, as the case may be, shall,-

(i) hear all the parties to appeal present before him; and

(ii) Peruse or inspect documents, relevant records or copies thereof relating to the matter.

(c) After hearing the parties, perusal or inspection of documents and relevant records or copies thereof relating to the matter, the Appellate Authority concerned shall pass an order in writing and provide the copy of order to the parties to appeal free of cost.

(d) The order passed under sub-clause(c) above shall also be placed on the State Public Procurement Portal.
Memorandum of Appeal under the Rajasthan Transparency in Public Procurement Act, 2012

Appeal No........................... of..........................
Before the ...........................................(First/Second Appellate Authority)

1. Particulars of appellant:
   (i) Name of the appellant:
   (ii) Official address, if any:
   (iii) Residential address:

2. Name and address of the respondent(s):
   (i)
   (ii)
   (iii)

3. Number and date of the order appealed against and name and designation of the officer/authority who passed the order (enclosed copy), or a statement of a decision, action or omission of the Procuring Entity in contravention to the provisions of the Act by which the appellant is aggrieved:

4. If the Appellant propose to be represented by a representative, the name and postal address of the representative:

5. Number of affidavits and documents enclosed with the appeal:

6. Grounds of appeal:..............................................................................................................
   (Supported by an affidavit)

7. Prayer:.................................................................................................................................

Place ..........................................................
Date ..........................................................

Appellant’s Signature

Signature with seal of bidder