TENDER COST DEPOSITED VIDE A-9 No. __________ DT. __________

To,
M/s ___________________________________________________________

________________________________________________________________

RAJASTHAN VIDYUT PRASARAN NIGAM LIMITED
TRANSMISSION & CONSTRUCTION CIRCLE

ADDRESS:

SUPERINTENDING ENGINEER (T&C)
R. R. V. P. N. LTD.,
400 KV GSS PREMISES, GUĐAPOL,
HINDAUN-322230

SPECIFICATION NO: RRVPNL/SE/T&C/TN.19/2018-19/ D.1335 Dt. 20.12.18

Name of Work: Augmentation of 220/132 KV,(+)160 MVA,(-)100 MVA Transformer at 220 KV GSS Dholpur.

EARNEST MONEY Rs. 7000.00

TENDER COST Rs. 1000.00 +180 GST Total 1180/-

LAST DATE OF ISSUE/SALE OF TENDER DOCUMENTS 03.01.2019 UP TO 01:00 PM

LAST DATE OF RECEIPT OF TENDER IN THIS OFFICE 03.01.2019 UP TO 3:00 PM

DATE OF OPENING 03.01.2019 AT 3:30 PM

VALIDITY 120 DAYS FROM THE DATE OF TENDER OPENING.

Superintending Engineer (T&C)
RRVPNL, Hindaun
RAJASTHAN RAJYA VIDHYUT PRASARAN NIGAM LIMITED  
(ISO 9001:2008 Certified Company)  
Corporate Identity Number (CIN): L40109RJ2000SGC016485  
Regd. Office: Vidyut Bhawan, Jyoti Nagar Jaipur- 302005  
OFFICE OF THE SUPERINTENDING ENGINEER (T&C) HINDAUN  
Email: se.tnc.hindaun@rvpn.co.in, Website: www.rvnp.co.in

NO.RVPN/SE/T&C/ HND/SEC.-I/F. /D. 1335 DATED:- 2.12.18

Notice for Inviting Bid for Augmentation of 220/132 KV,(+160 MVA,(-100 MVA Transformer at 220 KV GSS Dholpur. DETAILS GIVEN BELOW:-

<table>
<thead>
<tr>
<th>NIB NO</th>
<th>1335 /2018-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORK DESCRIPTION</td>
<td>Augmentation of 220/132 KV,(+160 MVA, (-100 MVA Transformer at 220 KV GSS Dholpur.</td>
</tr>
<tr>
<td>LAST DATE AND TIME FOR BID SUBMISSION</td>
<td>03.01.2019, UPTO 3:00PM</td>
</tr>
<tr>
<td>DATE AND TIME OF OPENING OF BID</td>
<td>03.01.2019, UPTO 3:30PM</td>
</tr>
<tr>
<td>ESTIMATE COST</td>
<td>350000=00</td>
</tr>
<tr>
<td>BID SECURITY TO BE DEPOSITED</td>
<td>7000=00</td>
</tr>
<tr>
<td>COST OF THE BID SPECIFICATIOEM</td>
<td>1180/- (1000+ 180 GST @18% of 1000)</td>
</tr>
<tr>
<td>VALIDITY OF OFFER</td>
<td>120 DAYS FROM THE DATE OF OPENING OF BID</td>
</tr>
</tbody>
</table>

GENERAL INSTRUCTIONS REGARDING BID:-

1. The bidder, in their own interest is requested to read very carefully the bid documents before
2. The bid should be addressed to the Superintending Engineer (T&C), Rajasthan Rajya Vidyut Prasaran Nigam Limited, Hindaun
3. The bid shall be submitted in closed/sealed envelope duly superscribed Augmentation of 220/132 KV,(+160 MVA, (-100 MVA Transformer at 220 KV GSS Dholpur "NIB NO. /2018-19

4. All additions and or alterations in the bid must be clearly initialed by the bidder.
5. Bid received late, from the date & time indicate above, due to any reason or incomplete bids shall not be accepted for consideration.
6. All the document required i.e. G-Schedule shall be submitted by the bidder duly filled up in all respect with seal & signature on each page.
7. The Bid is being invited by the Superintending Engineer (T&C), Rajasthan Rajya Vidyut Prasaran Nigam Limited, Hindaun having office at 400 KV GSS Premises on Gudapole, Hindaun and bid is to be sent on aforementioned address through registered post or handed over personally E-mail id is se.tnc.hindaun@rvpn.co.in and contact no., is 9414061458.
8. Bid will be accepted upto 03.00 PM of dated 03.01.2019 and will be opened on the same day i.e. on dt.03.01.2019 at 3.30 PM in the presence of bidders or their representative, who wish to be present.

(S.R. Jangid)
Superintending Engineer (T&C)
RVNP Hindaun

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SECTION I
(Instructions for the tenderers)

1.01 INTRODUCTION:

The tenderers in their own interest are requested to read very carefully these instructions, the terms and conditions as incorporated in section-II & III before filling up of the tender forms. If they have any doubt about meaning of these specifications or any portion thereof they shall before submitting the tender may write/enquire about the same to/from the Superintending Engineer (T&C), RVPNHL, Hindaun to clear such doubt before the specified date of opening of tenders, otherwise it shall be conclusive proof of the fact that the tenderer has acquainted himself and he agrees with these specification, unless otherwise specifically indicated/commented by him in his tender.

1.02 FILLING OF TENDERS:

a) Tenders shall be submitted in the form ‘G’ Schedule attached herewith. Fill up all the blanks in the tender form and the ‘G’ Schedule. The completed forms, schedules shall be considered as part of the contract documents in the case of successful tender.
b) No alteration should be made in the tender form/specifications and schedules. The tenderer must comply entirely with the specification and “G” schedule. Alternative proposals, if any, shall clearly be stated in the covering letter and shall accompany with copy of the tender.
c) The tender and all accompanying documents shall be in Hindi/English language and shall be signed by a responsible and authorized person. The name, designation and authority of the signatory shall be stated in the tender.
d) Tenders should be filled in with ink (Ball Pen) or typed. The tender filled in by pencil or otherwise shall not be considered.
e) All additions, alterations and over writings in the tender must be clearly initialed by the signatory to the tender.
f) The tenderer must quote the prices strictly in the manner as indicated herein failing which tender is liable for rejection. The rate/prices shall be entered in words as well as in figures. These must not contain any additions, alterations, overwriting, cutting or correction and any other marking, which leave any room for doubt.
g) The RVPNHL will not be responsible to accept any cost involved in the preparation or submission of tender.
h) Any printed/Written conditions on the tender shall not be accepted by the RVPNHL. The tenderer shall incorporate his condition, if any, in the covering letter.
i) The tenderers should sign the tender form in the end of each page of the tender.

The following documents/schedules are essentially to be submitted in the tender:

(a) *G-Schedule duly signed by the Tenderer or authorized representative. Only percentage above/below the BSR Rates is to be filled-in, and no alteration revision to be made in the G-Schedule, rates and amount.*
(b) Section – IV: Annexure-A to G-Schedule – Prices duly signed by the Tenderer or authorized representative.
(c) Section- IV: Schedule I- Capacity of tenderer duly signed by the Tenderer or authorized representative.
(d) Section- IV Schedule- II – Departure from Specification duly signed by the Tenderer or authorized representative.
(e) Section- IV Schedule- III – Period of Completion duly signed by the Tenderer or authorized representative.
(f) Section- IV Schedule- IV- Information regarding tenderer duly signed by the Tenderer or authorized representative.
(g) Any other document/information the tenderer used to submit with the tender.
(h) All the above document from (a) to (h) are to be placed in one proper size envelop duly double sealed/ gum pasted which should be superscribed as below.


(i) Telegraphic/Fax/Internet/E-mail offers will not be considered / entertained.

(l) All tenders and accompanying documents shall be addressed to the Superintending Engineer (T&C), RVPN/400 KV GSS Premises on, Gudapoal, Hindaun.

1.03 EARNEST MONEY:-

a) Before submitting the offer, the tenderer shall deposit an amount of Rs. 7000.00 (Rupees Seven Thousands Only) as Earnest money through Cash OR Demand Draft made in favour of Accounts Officer (T&C), RVPN, Hindaun only in the office of Superintending Engineer (T&C), RVPN, Hindaun and obtain a receipt there of. No other mode of deposit will be accepted.

b) Any tender not accompanied by a copy of receipt/proof deposit of Earnest Money shall be rejected and the tender will not be opened. It should be clearly mentioned on the tender envelope that earnest money Rs. 7000.00 (Rupees Seven Thousands Only) deposited vide A-9 No. _______ dated ________

c) Difference of Earnest Money, if any equivalent to 2% of order value will be deposited by successful tenderer before commencement of work.

d) The Earnest Money will be released to unsuccessful tenderers on production of the original receipt issued by the Superintending Engineer (T&C) RVPN, Hindaun through the Accounts Officer (T&C), RVPN, Hindaun at the earliest as possible after finalization of the tender. On submission of original cash receipt in case of successful tenderers the earnest money will be taken into account in arriving at the amount of the security deposit.

e) Request for adjustment/proposal for acceptance of Earnest Money deposits, if any, already lying with the RVPN in connection with some other tenders/orders shall not be entertained.

f) No interest shall be payable on such deposit of Earnest money

g) The RVPN reserves the right to forfeit the Earnest money deposit or a part thereof in circumstances which according to him indicate that the tenderer is not accepting/executing any order placed on him under the specification

h) The earnest money of the successful tenderer will be refunded after expiry of guarantee period subject to satisfactory performance of the material supplied or work executed as the case may be.

i) Firm registered with the respective wings / offices under the scheme for registration of firms / contractors on furnishing in original or Photo copy duly attested by any officer of the company regarding registration with the name of item for which registered, shall be exempted from furnishing of earnest money with the tender. Firms not registered for the material / works under tender enquiry, would not be entitled for exemption from Earnest money deposit, Govt. Depts. Undertakings, Boards, Nigam's etc. are also exempted from depositing EMD but documentary proofs to the submitted in this regard.

1.04. RECEIPT AND OPENING OF TENDERS

a) Sealed/gum pasted covers, in which tenders are enclosed, shall be delivered in the office of the Superintending Engineer (T&C), RVPN, Hindaun not later than 3:00 PM on the date specified in the notice inviting tender. Tender shall not be accepted after the time and date so fixed and will be returned unopened to the tenderer. The tender will be opened in the office of SE (T&C), RVPN.
Hindun at 3.30 PM on the prescribed date in the presence of such tenderers or their authorized representative who may be present.

b) If the date fixed for opening of the tenders is declared public holiday the tenders shall be received and opened on the date on which office reopen after such holiday on the timing as indicated above.

1.05. **VALIDITY OF OFFER:**

Tenders shall be valid for minimum period of 120 days from the date of opening the tenders. The tenders mentioned as shorter validity period than specified are likely to be ignored.

1.06 **SIGNATURE OF THE TENDERERS**

The tender must contain the name, designation and place of business of the person(s) making the tender and must be signed by the tenderer with his usual signature. Tender by a partnership firm must be furnished with full names of all partners and be signed with the authorized representative indicating the signature and designation of the person signed with the legal entity of the corporation/company by the Chairman/Secretary or other persons authorized to bind the company/corporation in the matter.

1.07 **RATES:**

The rates for the material/work should be quoted as per the form ‘G’ schedule attached. The prices quoted should be firm in all respect and independent of any variation on account of any reason till the completion of the works as per order. The prices shall remain valid till completion of the work. No representation fro enhancement of rates once accepted will be considered.

1.08 **QUANTITY:**

a) The quantity of material /work as indicated in the accompanied ‘G’ schedule is only provisional and the purchaser (RVPN) reserves the right of revising the same at the time of placing the order to any extent.

b) The purchaser also reserve the right to increase the ordered quantity to any extent within one year from the date of order or during the currency of contract whichever is later at the same terms and conditions stipulated in the order except in regard to delivery period/completion period which shall be as mutually agreed upon.

c) The purchaser also reserves the right to split the quantities and entrust the order for the specified work/supply of material to two or more tenderers. The tenderers shall agree to accept the order placed on him at the rates/prices mentioned in his tender and accepted by the purchaser. All incomplete work / supply shall be got executed / completed at the risk and cost of the contractor/ supplier.

1.09 **DELIVERY / COMPLETION PERIOD:**

The work/supply should be completed within the stipulated delivery schedule as specified in the order, failing which a penalty equivalent to 0.5% (half percent) per week or part thereof limited to 10% will be imposed on the remaining work/supply. The period of delay in supply/execution of the work order due to departmental reasons shall be excluded, from the completion period.

1.10 **GENERAL:**

a) Purchase of copy of the specification by the tenderer is essential for consideration of his tender. Only one tender will be accepted against each copy of the specification purchased. The copy of the specification is not transferable. The value of tender form once sold cannot be refunded under any circumstances.

b) The purchaser does not bind himself to accept the lowest or any tender or any part of tender and shall not assign any reasons for the rejection of any tender or a part thereof.

c) The tenderer shall treat the details of the specification of the tender document as private and confidential and these shall not be reproduced any where without the written authority of the purchaser.

d) The fact of submission of a tender to the purchaser shall be deemed to constitute an Agreement between the tenderer and the purchaser, where such tender shall remain open
for acceptance by the purchaser and tenderer shall not have option to withdraw his offer impair or derogate the same. If the tenderer be notified during the validity of tender, that his tender is accepted by the purchaser, he shall be bound by the terms of agreement until and unless formal contract of the same tender has been executed between him and the purchaser in replacement of such agreement.

1.11 Any action on the part of the tenderer to revise the price/prices at his own interest after the opening of the tenders may result in rejection of the tender and also debarring him from submission of tender to the Nigam at least for one year.

1.12 **RATES & TAXES**

(i) The BSR Rates - 2017 as given in the 'G - Schedule' are inclusive of all types of labour charges, but exclusive of GST and insurance charges etc, but clear offer is to be quoted by the tenderer

(ii) The Income tax shall be deducted as per prevailing rules/regulations.

Superintending Engineer (T&C)
RRVPN, Hindaun.

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SECTION II

GENERAL CONDITIONS OF CONTRACT:

2.00: Not withstanding any thing contained to the contrary in the specification or tender or any subsequent exchange of correspondence, these general conditions of contract shall prevail and shall be binding upon the contractor and any change or variation, expressed or impressed, whatsoever, made in the said general conditions shall not be valid for operation unless expressly sanctioned by the Nigam. The contractor shall be deemed to have fully informed himself and to have specific knowledge of the provisions of the General conditions of the contract.

2.01 DEFINITIONS:

In constructing these conditions of contract and specification of the following words shall have the meaning herein assigned unless here is something in the subject matter of context inconsistent with such construction.

PURCHASER: Shall mean Superintending Engineer (T&C), RRVPNL, Hindaun and shall include his representatives, successors / assignees and any officer(s) of the Nigam performing the duties/ functions of the purchaser.

SUPPLIER/ CONTRACTOR shall mean and include any trading concern, firm, company, association under taking manufacturer and/or any other organization furnishing the tenders under the specification. In case any order is placed under the specification, the word “SUPPLIER/ CONTRACTOR” shall mean and include the successful tenderer(s) and shall include his/their representatives, successor and assignees on whom the order is placed.

CONSIGNEE: Shall mean and include any officer/official of the RRVPNL who is designated by the Superintending Engineer (T&C), RRVPNL, Hindaun for performing the duties of consignee.

The Engineer shall mean the Executive Engineer/Assistant Engineer or any other Engineer or officer for the time being or who is from time to time duly authorized and appointed by the purchaser to act as Engineer or Inspector for the purpose of the contract. In case where no such Engineer has been so appointed, the word Engineer shall mean the purchaser or his duly authorized representative.

‘PLANT’ WORK OR ‘WORKS’ shall mean and include the plant and material to be provided and work to be done by the contractor under the contract.

‘THE CONTRACT’ shall mean and include the general conditions, specification, quantity and price schedules, drawing, form of tender, covering letter, and the agreement to be executed.

The specification shall mean the specification annexed to these general conditions and the schedule there to (if any), and also any other specifications mentioned in the contract or otherwise incorporated from time to time.

The month shall mean a period of 30 days (Thirty Days) and week means a period of SEVEN DAYS.

The contract price shall mean the sum named in or calculated in accordance with the provisions of the contract/purchase order and any amendments thereto.

ENGINEER INCHARGE OF WORK: In charge of work shall mean and include the Executive Engineer, Assistant Engineer, Junior Engineer or any other officer performing the duties of Engineer at the work site.

‘Successful Tenderer’ shall mean the L-l Bidder/tenderer, and whose tender has been accepted.

The ‘Site’ shall mean and include the lands and buildings over/under, upon and in which the material are to be installed and used in accordance with the contract and / or work will be executed.

The ‘Place of delivery’ shall mean the place of delivery at which the contractor is responsible to deliver/handover the material.
## 2.02 Qualifying Requirement:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Qualifying Requirement Details</th>
<th>Supporting Documents required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Bidder Status:</strong>&lt;br&gt;1.1 This invitation for Bids, issued by the Nigam is open to all firms who are single entity and not Joint Venture including company(ies), Government owned Enterprises registered and incorporated in India as per Companies Act, 2013/Other relevant Act, barring Government Department and those bidders with whom business is banned by the Nigam. 1.2 The bidder must be 'A' class contractor for Electrical works. 1.3 The bidder must be registered with Provident Fund Commissioner. 1.4 The bidder shall be registered in GST as per Act applicable w.e.f. 01.07.2017</td>
<td>Memorandum of Association/Partnership deed/other relevant document, Registration Certificate as per Companies Act / Relevant Act Certificate issued by the Electrical Inspector / Competent Authority. Certificate issued by Provident Fund Commissioner. Certificate of registration issued by competent authority.</td>
</tr>
<tr>
<td>2.</td>
<td><strong>TECHNICAL EXPERIENCE:</strong>&lt;br&gt;Bidder who have completed construction / Augmentation of any 220 KV GSS , 132 KV GSS and above or part thereof with erection of EHV transformer within the five year up to the date of opening of tender on labour contract and have completed within the contract time of the work order will be qualified.</td>
<td>A completion certificate issued by authority not below the rank of Superintending Engineer in case of RVPN and Project Manager in case of other than of RVPN is to be enclosed as proof of qualification.</td>
</tr>
<tr>
<td>3.</td>
<td><strong>FINANCIAL POSITION:</strong>&lt;br&gt;The Net Worth of bidder for last 3 years should be positive.</td>
<td>Audited balance sheet and income statement/CA certificate</td>
</tr>
<tr>
<td>4.</td>
<td>The bidder should be qualified, not be insolvent, not be in receivership, not be Bankrupt or being wind up, should not have affairs administered by a court or a judicial officer, should not have business activities suspended, should not be blacklisted by any utility/agency, should not have a conflict of interest etc.</td>
<td>Declaration in Annexure B</td>
</tr>
</tbody>
</table>
2.03: **SUBLETTING AND ASSIGNMENT:**

The supplier shall not sub let the work without prior consent in writing of the purchaser transfer or assign the contract, or any part thereof, interest therein or benefit or advantage whatsoever, provided never the less that any such permission granted to the supplier shall not relieve him from any obligation, duty or responsibility under the contract.

2.04: **PRICE:**

The tenderer must quote prices per unit for execution of work at the work site inclusive of labour charges and all type of other charges if any.

Unless otherwise specified the rates/prices quoted shall be firm in all respect and independent of any variation on account of any reason till completion of the work as per order.

2.05: **SECURITY DEPOSIT:**

a) Security deposit shall be furnished by the successful tenderer equal to 2% (Two percent) of the value of the works subject to a maximum of Rs. 1.00 lacs.

b) The earnest money of successful tenderer will be adjusted towards security deposit and the balance will have to be deposited by the successful tenderer at the time of execution of agreement or commencement of the supply which ever is earlier.

c) Unless otherwise specifically required to be retained/forfeited by the purchaser, the security deposit shall be refunded on request of the Tenderer after a period of three months of successfully completion of work/supply of material to the satisfaction of the consignee.

d) If the supplier fails or neglect to observe his obligation under the contract, it will be lawful for the purchaser to forfeit either in whole or in part at his absolute discretion, the security deposit furnished by the supplier.

e) If the Tenderer fails to provide the security deposit immediately, such failure shall constitute a breach of the contract and the purchaser shall be entitled to make other arrangements at the risk and expenses of the contractor and forfeit the earnest money of the contractor.

f) No interest shall be payable on such deposit.

2.06: **TERMS OF PAYMENT:**

The payment shall be made as under only after execution of the contract Agreement and the payment shall be arranged by the Accounts Officer (T&C), RRVPN, Hindaun as per norms against the bill(s) running bill(s) to be submitted to consignee who will verify the bill and send to Accounts Officer (T&C), RRVPN, Hindaun.

(A) Up to 90% payment of the total value of the work done will be paid against running bills to be submitted to the XEN/ Assistant Engineer, Incharge of the work.

(B) Balance 10% payment due will be made after a period of twelve months of Completion of work and accepted by the Engineer Incharge of the work. If the contractor wants to release the 10% balance payment during the guarantee period of the work, the Contractor shall furnish Performance Bank Guarantee for 10% of the cost of the work before claiming balance 10 % payments.

(C) The Payment will be made by the Accounts Officer (T&C), RRVPN, Hindaun through RTGS/ NEFT for quick and safe transfer of funds. The charges for transfer through RTGS/ NEFT shall be on the part of supplier/ contractor. Before claiming 90% payment the following documents are required to be furnished:

i) Security Deposit

ii) Contract Agreement and its acceptance by the Purchaser

iii) CPF Schedules of the workers of the Contractor or Registration Certification of the Firm/ Contractor with the PF Commissioner and monthly statement of depositing the CPF of his employees with the PF Commissioner as per Clause 2.09.

2.07: **INCHARGE OF WORK:**

The Executive Engineer (T&C), RRVPN, Hindaun and the Assistant Engineer (T&C), RVNP, Dholpur shall be the officer Incharge of the work. They will give the layout, issue the material,
supervise the work and verify the bills of the contractor and attend all other matters pertaining to this contract.

2.08: **CONTRACT DOCUMENTS/ AGREEMENT**

The Contractor will execute separate contract agreement after placement of the order for which they shall be require to furnish general conditions of contract, instructions to tenderers and specification including guaranteed technical particulars duly signed on each page of every such document sent to him up to the time of placement of the Order. After than two copies of Work Order will be sent by the Superintending Engineer (T&C), RRVPNL, Hindaun to you and you will be require to return one copy of the Work Order duly signed on each page. The Contractor shall also be required to enclose a Non-Judicial Stamp Paper applicable as per Cost/Value of works/ Work Order mentioning under their signature thereon as on dated __________ affixed it to Work Order No. __________ dated __________.

2.09: **CONTRACTOR EMPLOYEES PROVIDENT FUND**

The contractor shall have to submit a certificate every month that he has an establishment covered under the Employees Provident Fund and Miscellaneous Provision Act 1952 and is having a separate code number with the Provident fund contribution in respect of all the employees employed by him along with employer's have 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 employees, as well as employer's contribution @12% + 12% and other charges in respect of all the employees engaged by him for the said work with RRVPNL along with details of the employees their wages and the amount of contribution as per RSEB CPF Rules every month. In case of failure, RRVPNL shall be entitled to deduct 16% of the amount from his bills.

2.10: **QUANTITY**

The quantities given in schedule of work and prices are provisional and can vary to any extent. You will have to carry out the work according to the quantities as determined at site at the quoted rates till the complete work is executed. The payment shall be made accordingly.

2.11: **COMPLETION TIME**

(A) The work shall be completed within a period of 02 Months (Two Months) from the date of giving lay out by the Engineer In charge, who will provide the lay out within 15 days from the date of issue of Work Order.

(B) The time will be the essence of the contract and if the work is not completed on or before the stipulated period as above or within any period of extension, if granted you will be liable to Penalty @ 0.5 % (Half percent) per week or part thereof subject to maximum of 10% of the value of the work delayed/ left Uncompleted.

2.12: **INSPECTION**

Representative of the ZCE (T&C)/SE (T&C)/SE(QC, Insp. & Montg.)/ Executive Engineer / Engineer In-Charge will be free to visit your site store & work site. He will also be free to verify the Nigam's Material in your custody as and when required.

2.13: **DISPUTES**

All disputes, differences and questions whatsoever arising between the purchaser and supplier/ Contractor upon or in relation to or in connection with the contract shall be deemed to have arisen at Hindaun and no courts other than the court in Hindaun shall have jurisdiction to entertain or try the same.

2.14: **DAMAGE OF NIGAM MATERIAL/SAFETY MEASURES**

The contractor shall be responsible for the safe working at site so as to avoid any chance of damages to the Nigam's material / installations at site and also no injury to any of his worker. In case of any damages to Nigam material/installation/property the losses shall be recovered from the
contractor. The contractor shall be fully responsible for the safety of his workers and RRVPNL shall not be responsible for any type of accident minor or fatal to any person at works site. The staff insurance charges, if any, shall be borne by the contractor.

2.15 **FURTHER CORRESPONDENCE:**

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), RRVPNL, Hindaun.

2.16 **INDIAN ELECTRICITY ACT:**

All the works covered by the Contractor shall be in accordance with the Indian Electricity Act, 2003 with the latest amendments and the Electricity Rules made under them.

2.17 **LEGAL LIABILITY:**

The Contractor shall also be responsible for legal liability/ complication that may crop up during the course of execution of the Contract.

2.18 **FINANCIAL LIABILITY:**

The Contractor shall also be responsible for financial liability which may accrue to him or his personnel and Nigam’s personnel during the course of the contract. The Contractor shall also be liable to pay any statutory taxes/ levies and duties etc. of the State/ Central Govt. which may accrue during the course of Contract or in the future related to the contract.

2.19 **GENERAL LIABILITY:**

The Contractor shall be liable for any damage, theft, missing of his own equipment, T&P material etc. as well as to the Nigam’s material, T&P and Equipments during the course of execution of the work.

2.20 **CHANGE OF NAME OF THE TENDERER/ CONTRACTOR:**

At any stage after tendering, the Nigam shall deal with the Contractor only in the name and at the address under which he has submitted tender. All the liability/ responsibility for due execution of the Contract are of the Contractor.

2.21 **DEDUCTION FROM CONTRACT PRICES:**

The amount of all cost/ damage or expenses or other sums which under a particular contract shall be payable by the Contractor and shall be deducted from the Contractor’s amount due or becoming due under any other contract without prejudice to the Nigam’s right to recover the same by ordinary process of law.

2.22 **GUARANTEE:**

The work to be executed shall be under guarantee period of 12 months from the completion of work and accepted by the Engineer in charge of the work.

2.23 **SAFETY MEASURES:**

As the lighting work involves working in the live switchyard, therefore, the Contractor shall follow all safety methods of working so that there is no damage to Nigam’s properties and also no injury to any of the workman working in the yard. The Contractor shall be fully responsible for the safety of his worker as well as any other workman working in the switchyard and RVVPNL shall not be responsible for any type of accident (Minor or fatal) at the work site and Insurance charges of his staff and employees etc. shall be borne by the Contractor. The Contractor shall take up all the work in the yard only after taking written permission to do work from the Shift Incharge and shall work in the presence of RVVPNL Representative.

Superintending Engineer (T&C)
RRVPNL, Hindaun

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SECTION – III

Terms and conditions/ Specification for yard light work:

1. **SCOPE:**
   
The scope of work covers the providing & fixing of ordered and specified light/ luminaire in
   the yard of the GSS as indicated by the Incharge of the GSS.

2. **MATERIAL:**
   
   All yard light material shall be arranged by the Contractor as his own cost. The Contractor
   will have to deposit all the material of specified make with the Incharge of the work and
   Incharge will issue the same to the Contractor for yard lighting after checking the same
   make & specification of the items.

3. **APPLICATION:**
   
   No material shall be fixed/ installed by the Contractor without quality approval of the
   Incharge of the work.

4. **WORKING T&P:**
   
   All sorts of T&P which are required for this yard light work shall have to be arranged by the
   Contractor.

5. **SAFETY MEASURES:**
   
   The Contractor shall provide and make all necessary arrangement for safety of staff and
   labour at site of works. The Nigam will not in any way be responsible for any accident,
   minor or fatal to any person at the site of work or for any damages arising there during yard
   light which shall be Contractor’s sole responsibility. The staff insurance charges, if any,
   shall be borne by the Contractor.

   Since the work is to be carried out in the charged electrical yard at the GSS, therefore, the
   Contractor shall have to work under the guidance/ permission of the Engineer Incharge of
   the work. No person of the Contractor should be allowed by the Contractor to climb on the
   structure for yard light work except for which the shut down/ clearance is given by the
   Incharge of the work in writing to the Contractor. Violation of the said procedure may cause
   accident and responsibility shall be of the Contractor. The Contractor shall have to follow
   the rules of Electricity Act – 2003. For yard light work; the skilled labour having experience
   of yard light work up to height of 25 Meters. (Approx.) should be engaged.

   [Signature]
   Superintending Engineer (T&C)
   RVPN L Hindaun

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SECTION – III A

TECHNICAL SPECIFICATIONS
FOR ERECTION WORKS OF SUB STATIONS

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

TYPES AND AREAS OF WORK:

A) Erection of 220kV and 132kV Sub Stations
The works/activities which may be required to be got done 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) Stringing of Bus bar of ACSR conductor.
e) Stringing of Earth wire.
f) Jumpering.
g) Erection of EHV transformer (tank already placed on foundation with wheels).
h) Erection of current transformer/potential transformer/capacitive voltage transformer/Series
Reactor/Residual Voltage Transformer/Neutral Current Transformer.
i) Erection of Post insulator.
j) Erection of control relay panel/L.T Panel/D.C. Board/RTCC Panel/PLCC Panels, etc.
k) 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 the erection,
testing and commissioning manual/instructions procedures of the manufacturer, to be provided by
the Engineer-In-Charge.

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

(x) Wherever EHT/HT/LT lines or installations are located in the land of the Sub Station, the Contactor 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.

(xi) 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.

(xii) 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.

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

(xiv) After completion of the erection work, all surplus material including bolts and nuts, templates, etc. shall be returned to the 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, LAYING 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 200mm for 40mm 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</td>
</tr>
<tr>
<td>2</td>
<td>Earthing Conductor for Risers (for equipments &amp; structures).</td>
<td>50 x 10 mm M.S. Flat</td>
</tr>
<tr>
<td>3</td>
<td>Earthing of LT panels, DC panel, C &amp; R Panels, marshalling boxes,</td>
<td>50 x 6 mm M.S Flat</td>
</tr>
<tr>
<td>Compressors, MOM boxes, junction boxes, lighting panels, etc.</td>
<td>Earth Electrodes</td>
<td>25/28 mm dia. M.S. Rod, 3250 mm long</td>
</tr>
</tbody>
</table>

(ii) All equipment's 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.

(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 equipment's 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 meters 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 meters.

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.
   (i) 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-In-charge. The distance between two electrodes in such a case shall preferably be not less than twice the length of the electrode.

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:

3.5.1 Cut M. S. Rod of the applicable diameter to approximate lengths 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 approximately1 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 approximately1 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, (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.
(iv) Backfill the excavation and compact the soil after completion of the work.

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-B
JOINT OF M.S. FLAT TO M.S. FLAT

PLAN

SECTION: C - G

LENGTH OF
WELDED
250 mm

10/12

100
TYPICAL EXAMPLE OF EARTHING OF
SUB-STATION EQUIPMENT
4.0 STRINGING OF BUS BARS OF ACSR CONDUCTOR, STRINGING OF SHIELD/ EARTH WIRE AND JUMPERING ETC.

4.1 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.

4.2 BUS BAR MATERIAL:

The bus bar material generally used in 220 kV & 132 kV sub Stations is given below:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Description</th>
<th>Bus Bar and Jumper Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>220 kV Main Bus</td>
<td>Twin ACSR Zebra</td>
</tr>
<tr>
<td>2</td>
<td>220 kV Auxiliary Bus</td>
<td>ACSR Zebra</td>
</tr>
<tr>
<td>3</td>
<td>220 kV equipment interconnection</td>
<td>Twin ACSR Zebra / Single ACSR Zebra</td>
</tr>
<tr>
<td>4</td>
<td>220 kV overhead bus &amp; droppers in all bays</td>
<td>Twin ACSR Zebra / Single ACSR Zebra</td>
</tr>
<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>Twin ACSR Zebra / Single 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></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>
</tbody>
</table>
14 | 11 kV equipment interconnection, overhead bus and droppers:  
---|---
(i) Transformer bay | Twin ACSR Zebra / Single ACSR Zebra  
(ii) Bus coupler | ACSR Zebra  
(iii) Feeder bay | ACSR Panther

### 4.3 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.

\[
a) \quad \text{Single Glaze Defect} = 0.5 + \frac{DxF}{20000} \text{ Sq. cm} \\
b) \quad \text{Total Glaze Defect} = 0.5 + \frac{DxF}{20000} \text{ Sq. cm}
\]

where,

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

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

<table>
<thead>
<tr>
<th>S.No.</th>
<th>System Voltage</th>
<th>Suspension String</th>
<th>Tension String</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Nos.</td>
<td>E &amp; M Strength (kN)</td>
</tr>
<tr>
<td>1</td>
<td>220 KV</td>
<td>13</td>
<td>70</td>
</tr>
<tr>
<td>2</td>
<td>132 KV</td>
<td>9</td>
<td>45</td>
</tr>
<tr>
<td>3</td>
<td>33 KV</td>
<td>3</td>
<td>45</td>
</tr>
<tr>
<td>4</td>
<td>11 KV</td>
<td>3</td>
<td>45</td>
</tr>
</tbody>
</table>

(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 RVPN 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 RVPN). 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.

4.4 JUMPERING:

4.4.1 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.

![Diagram of Y-Type Jumpering]

(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.
4.4.2 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.

4.4.3 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.

4.4.4 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.

4.5 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 RVPN.

(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.

4.6 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.

5.0 ERECTION ACTIVITIES IN RESPECT OF VARIOUS EQUIPMENTS.

A. POWER TRANSFORMER:

1) ERECTION OF 220 KV Class EHV POWER TRANSFORMERS (Gas filled tank already placed on foundation with wheels)
   i) Transportation of accessories from site store to locations
   ii) Cleaning of the transformer and the bushings.
   iii) Erecton of HV, IV, LV & neutral bushings
   iv) erection of main & OLTC conservators radiotators equilising pipe line, marshaling kiosk etc. as per manufacturers drawings.
   v) preparation of oils, oil filling, dehydration of transformer.
   vi) filter Machine, oil tank and operating shall be provided by the RVPN.
   vii) electrical wiring from individual equipment, Bucholz relay, MOG, OSR, Fans, OLTC, Bushing CT’s etc. to marshaling Kiosk etc.
   viii) testing and commissioning of transformer in the part of RVPN.
   ix) Checking that all the accessories as per the bill of material have been provided and the same are in position.
   x) Fitting of the terminal connectors/clamps, etc.
   xi) Tightening of nuts, bolts, etc. complete in all respect.

B. CURRENT TRANSFORMERS:

1) 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.
C. 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.

D. POST / POLYCONC INSULATORS
   i) Transportation of complete Insulators & their accessories, clamps and connectors from site store to location.
   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.

E. 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.

F. 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.
   vi) Connection of earthing to existing earth strip in control room.
G. 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 VPN).
   iv) After grouting, tightening of the nuts, bolts, etc. complete in all respect.

6. CABLE LAYING AND TERMINATIONS:

   Note: The cable tags/markig 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 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. Cable 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
G-SCHEDULE
G-SCHEDULE FOR INSTALLATION OF 220/132 KV, (+)160MVA, (-) 100 MVA TRANSFORMER AT 220KV GSS Dholpur

1) The rates for the erection works given in this BSR are inclusive of all types of labor charges but exclusive of service tax, sales tax and insurance charges etc.

2) The base date for the rates given in this schedule is 01.04.2017

<table>
<thead>
<tr>
<th>CODE NO.</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QTY</th>
<th>RATE (Rupees)</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1</td>
<td>Earth Mesh Work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Laying of earth mesh with 0.25mm/28mm M.S. Rod at a depth of 0.80 meter from top level of foundations, including excavation of trench of required depth and back filling of the same, transportation of M.S. Rod from site store to locations, welding of M.S. Rod to M.S. Rod along the length at crossings and with earth electrodes as per drawing, application of bitumen compound and covering with bitumen impregnated tape on all welded joints, for the type of soil prevalent at 0.80 meter below top level of foundations (M.S. Rod of above sizes &amp; M.S. Flat as required shall be made available by RVPN)</td>
<td>MTRS</td>
<td>200</td>
<td>24</td>
<td>4800</td>
</tr>
<tr>
<td></td>
<td>(a) In case electricity is made available by RVPN without charges</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-1</td>
<td>Normal Soil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Laying of earthing risers of 50x6mm / 50x10mm / 50x12mm size M.S. Flat at a depth of 0.80 metre from top level of foundations, including excavation of trench of required depth and back filling of the same, transportation of M.S. Flat from site store to locations, preparation of risers, bending as per requirement (after heating if necessary), fixing on &amp; welding / bolting of equipment / structure &amp; peaks of structure, laying in the trench, welding to 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 tape on all welded joints, painting of all surfaces of risers above ground level with red oxide and green paint, for the type of soil prevalent at 0.80 meter below top level of foundations (M.S. Rod of above sizes &amp; M.S. Flat as required shall be made available by RVPN)</td>
<td>MTRS</td>
<td>200</td>
<td>27</td>
<td>5400</td>
</tr>
<tr>
<td>C-1</td>
<td>Normal Soil</td>
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<td></td>
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<tr>
<td></td>
<td>Placing / Driving of earth electrode of 25 / 28mm 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 back filling of the same, transportation of M.S. Rod from site store locations, cutting of M.S. Rod to desire 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 tape on all welded joints, for the type of soil prevalent at 3.80 mtrs below top level of foundations (M.S. Rod of above sizes &amp; M.S. Flat as required shall be made available by RVPN)</td>
<td>NOS.</td>
<td>8</td>
<td>200</td>
<td>1600</td>
</tr>
<tr>
<td></td>
<td>(a) In case electricity is made available by RVPN without charges</td>
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</table>

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<table>
<thead>
<tr>
<th></th>
<th>BUSS-BAR WORK</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td><strong>Stringing of 220KV, 132KV, 33KV &amp; 11KV Bus Bar of ACSR conductor including transportation of conductor, Disc Insulator &amp; Tension Hardware from store to locations lying and cutting required length of conductor for cleaning at assembly of Disc insulator as required along with fitting of bolted type or compression type tension hardware as made available (compression shell be provided by RVPN on Rent free Bases) making up at one end stringing of conductors between the beams with specified gauge and tension also equalizing bar and fixing spacers and spacer T-clamps for twin conductor for 3-Phases of conductors in each bus section.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>(iii) Double ACSR Zebra</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Jumpers of ACSR conductor (3nos. Y-type) between bus to equipment, or between equipment to equipment or between bus to bus, including transportation of conductor, disc insulators and hardware from site store to locations, cleaning and assembly of disc insulators as required along with fitting of suspension hardware and erection as required, cutting required length of conductor, making connections, fixing of spacers and spacer T-clamps as required, tightening of clamps/conductors, dressing etc. for all three phases.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>ii) Double ACSR Zebra Conductor</strong></td>
</tr>
<tr>
<td>B</td>
<td><strong>ERECTION OF SUB-STATION EQUIPMENT</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Erection of Current Transformer/ Potential Transformer/ Capacitive voltage Transformer/ Series Reactor/ Residual Transformer/ Neutral Current Transformer with clamps &amp; connectors, on already erected steel structure including transportation from site store to location, fabrication of base frame, fixing of terminal connectors, lightening of nuts &amp; bolts etc. complete in all respect.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>(i) 220 KV CT/PT/CVT</strong></td>
</tr>
<tr>
<td></td>
<td><strong>(ii) 132 KV CT/PT/CVT</strong></td>
</tr>
<tr>
<td>K</td>
<td><strong>Erection of 220 KV Class EHV Transformer (Gas filled tank already placed on foundation with wheels) including transportation of accessories from site store to locations, erection of HV, IV, LV &amp; Neutral bushings, main &amp; O/LTC conservators, radiators, equalizing pipe line, marshaling kiosk etc as per manufacturer’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, OSL, Fans, Pumps, Bushing CT’s etc to marshaling kiosk etc but excluding testing &amp; commissioning of transformer.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>(a) If electricity is available &amp; arrange by RVPN without charges.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>ERECUTION OF CONTROL &amp; RELAY PANALS complete in all respects including transportation from site store to control room, placing on foundation / cable trench as per layout, interconnection between Control &amp; Relay 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 panel as required.</strong></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Nos.</th>
<th>Part A (Laying and Termination of Cables)</th>
<th>Mtr.</th>
<th>1500</th>
<th>5.00</th>
<th>7500</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control Cables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>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 drums from site store to locations, laying in cable trenches, cutting of required length, placing them on cable racks / cable trays / cable batten &amp; dressing, including removing and re-fixing trench covers as required, making necessary connections, testing, cable marking on both the terminating ends etc as required for all sizes from 2C x 2.5 sq. mm. to 20C x 2.5 sq. mm. 4C x 4 sq. mm and 4C x 6 sq. mm.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>a) Unarmored control cable</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>(ii) Fixing of control cable in position with single compression nickel plated brass cable glands confirming to IS : 12943 &amp; having three metal washers and one rubber ring, including preparation of cable and drilling of corresponding holes in gland plates etc as required and including cost of cable glands for each cable gland size</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>a) 19mm Unarmored control cable</td>
<td>Nos.</td>
<td>70</td>
<td>44.00</td>
<td>3080</td>
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<tr>
<td></td>
<td>c) 25mm Unarmored control cable</td>
<td>Nos.</td>
<td>40</td>
<td>67.00</td>
<td>2680</td>
</tr>
<tr>
<td></td>
<td>i) Termination of wires of cables with copper conductor using copper terminal ends (pin or ring type as required of Dowell's 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 wires etc as required including cost of terminal ends for all wires for each cable at both ends for cables of the following sizes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) 4C x 2.5 sq. mm.</td>
<td>Each</td>
<td>70</td>
<td>43.00</td>
<td>3010</td>
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<td>f) 12C x 2.5 sq. mm.</td>
<td>Each</td>
<td>30</td>
<td>128.00</td>
<td>3840</td>
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<td></td>
<td>h) 18C x 2.5 sq. mm.</td>
<td>Each</td>
<td>15</td>
<td>191.00</td>
<td>2865</td>
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<tr>
<td></td>
<td>TOTAL(PART A)</td>
<td></td>
<td></td>
<td></td>
<td>193695</td>
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<table>
<thead>
<tr>
<th>PART-B</th>
<th>DISMANTLING WORKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DISMANTLING of 220 KV class EHV transformer already installed at site including transportation of dismantled accessories from power transformer to site store, staking and packing of accessories with care i.e. dismantled of HV, LV, neutral bushing, main and OLTC conservator, Radiators, equalizing pipe line, MK, etc as per manufactures drawing preparation of drain out oil as per requirement and removed or Determination of electrical wiring from individual equipment e.g. Buchholz Relay, MOLG, OSR etc to marshaling kiosk etc. Removing/ opening of connectors, clamps etc from HV, LV, Neutral bushing etc. Transportation of dismantle accessories from site to store with all lead and lift mechanically or manually with care as per direction of Engineer in charge</td>
</tr>
<tr>
<td>Nos.</td>
<td>Dismantling Charge of Sub Station Equipment/ Material @ 60% of erection charge as per CLRC of erection</td>
</tr>
</tbody>
</table>

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## DISMENTALLING of 132 KV Current Transformer/ Potential Transformer/ Capacitive voltage Transformer/ Series Reactor/ Residual Transformer/ Neutral Current Transformer with clamps & connectors,
on already installed at site including transportation of dismantled
accessories from site to store, staking and packing of accessories with
care and Transportation of dismantle accessories from site to store with
all lead and lift mechanically or manually with care as per direction of
Engineer in charge

<table>
<thead>
<tr>
<th></th>
<th>Nos.</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate taken @ 60% of erection charge of 220 KV CT</td>
<td>3</td>
<td>1517</td>
<td>4551</td>
</tr>
<tr>
<td>Rate taken @ 60% of erection charge OF 132 KV CT</td>
<td>3</td>
<td>849</td>
<td>2547</td>
</tr>
<tr>
<td>Rate taken @ 60% of erection charge</td>
<td>1</td>
<td>1170</td>
<td>1170</td>
</tr>
</tbody>
</table>

### BUS-BAR WORKS

Destripping of 220KV, 132KV, 33KV &11 KV Existing Bus-bar of
ACSR Zebra conductor Between beams, and removing / dismantling
of Hardware fitting, Clamp and connector Spacer, Disc insulators etc.
with specified resag and Detensing and also equalizing the sag.
Dehoisting of insulator stringing, removal of conductor from clamp
and fitting of bolted type or compression type tension hardware as
made available for three phase of conductor in each bus section and
collecting the material, including transportation, cleaning and
reassembly of dismantle accessories from site to store, with all lead and
lift mechanically or manually with care as per direction of Engineer in
charge.

(i) single ACSR Zebra

### JUMPERS

Dismantling /Remove of Jumpers of ACSR zebra / panther conductor
(3nos. Y-type, ) between bus to equipment, or between equipment to
equipment or between bus to bus, with cleaning and reassembly of
clamp for three phase of conductor, along with fitting of suspension
hardware & cutting required of conductor, rerolling and stacking at
site store, including transportation of dismantle accessories from site
to store, with all lead and lift mechanically or manually with care as
per direction of Engineer in charge.

(i) single ACSR zebra / panther conductor

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL PART (B)</td>
<td></td>
<td>199.80</td>
<td>5994</td>
</tr>
<tr>
<td>GRAND TOTAL PART (A+B)</td>
<td></td>
<td>98877</td>
<td>292572</td>
</tr>
</tbody>
</table>

I/We hereby Quoted........................% above/below on BSR

PART C

Add GST @.......................... PART D

Grand Total(A+B+C+D)

I hereby declare that I have read the all terms & condition of
the tender documents and agreed to comply the terms & condition

Seal & Signature of Contractor
SCHEDULE OF CAPACITY OF THE TENDERER IN RESPECT OF INSTALLATION OF 220/132 kV, (+)160MVA, (-) 100 MVA TRANSFORMER

(A) Details of orders executed

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Order NO. &amp; Dt.</th>
<th>Description of work</th>
<th>Ordered quantity/cap. of GSS</th>
<th>Name of order placing authority</th>
<th>Date of commencement</th>
<th>Date of completion of work</th>
<th>Remarks</th>
</tr>
</thead>
</table>

(B) Average erection/construction work done

CONSTRUCTION ACTIVITIES

<table>
<thead>
<tr>
<th>Period</th>
<th>Name of Project/ GSS</th>
<th>Description of Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013-14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014-15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015-16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016-17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017-18 (Up to latest)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(C) List of available Machinery, Tools, Tackles, Name of Engineers, Persons etc. for construction/erection work (Separate list may please be attached)

SIGNATURE OF AUTHORIZED REPRESENTATIVE OF THE TENDERER
1 DEPARTURE FROM SPECIFICATION

The tenderer shall state under this schedule the departure from the purchaser specification in respect of both technical and commercial terms and conditions:-

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Main deviation from specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Technical Deviation</td>
</tr>
<tr>
<td>2.</td>
<td>Commercial Deviation</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 deviation to the extent indicated above.

SIGNATURE OF AUTHORIZED REPRESENTATIVE OF THE TENDERER
SCHEDULE OF PERIOD OF COMPLETION FOR AUGMENTATION of 220/132 KV, (+)160 MVA, (-)100 MVA TRANSFORMER AT 220 KV GSS DHOLPUR. ON LABOUR CONTRACT BASIS.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of Work</th>
<th>Period of Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Augmentation of 220/132 KV, (+)160 MVA, (-)100 MVA Transformer at 220 KV GSS Dhulpur.</td>
<td>60 DAYS (Sixty Days)</td>
</tr>
</tbody>
</table>

SIGNATURE OF AUTHORIZED REPRESENTATIVE OF THE TENDERER
TO BE FILLED IN BY THE TENDERER AND ENCLOSE WITH THE TENDER.

Contractors who are quoting rates against TN.13/2018-19 are required to furnish the following information along with the tender. The RRVPNl will have the discretion to ignore the tender without the under noted particulars and/or ignore the tender particulars.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Information required</th>
<th>Information/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name &amp; Address of the Contractor</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Place where office exists</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Date when started functioning</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Work of construction of EHV GSS in hand</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Do you have spare capacity to execute this work</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Whether the Contractor is registered with PF Commissioner and Labour Department. (If yes attested photocopy of Registration Certificate may please be enclosed).</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Photocopy of latest balance sheet duly attested.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Income Tax paid during the year 2017-18</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Turn over for the year 2017-18</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Net profit after interest and depreciation for the year 2017-18</td>
<td></td>
</tr>
</tbody>
</table>

SIGNATURE OF AUTHORIZED REPRESENTATIVE OF THE TENDERER
## DETAILS OF PROGRESS ACHIEVED DURING THE I/II FORTNIGHT OF MONTH

**ORDER NO. & DATE**

**NAME OF GSS**

**DATE**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Activity</th>
<th>Unit</th>
<th>Total work involved</th>
<th>Work done up to last fortnight</th>
<th>Work done during current fortnight</th>
<th>Total work done up to this report</th>
<th>Balance work to be done</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 behaviour 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.

(i) 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

c). 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.
Annexure –B: Declaration by the Bidder regarding Qualifications

Declaration by the Bidder

In relation to my/our Bid submitted to..................................for Contract of........................................in response to their Notice Inviting Bids No..................................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: ........................................................................................................

Place ........................................................................................................

Signature of bidder

Name: .......................................................................................................

Designation: ..............................................................................................

Address: ..................................................................................................

................................................ ...............................................

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Annexure –C: Grievance Redressal during Procurement process

The designation and address of the First Appellate Authority is.............................................
The designation and address of the Second Appellate Authority is.............................................

as nominated vide order No.RVPN/AAO/F&R/F.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 thereunder, 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, ommssion, 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 filed under para (1) shall deal with the appeal as expeditiously as possible and shall endeavour to dispose of 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 Bidding 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.

(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 authorised representative.

(6) **Fee of filing Appeal**

(a) Fee of first appeal shall be rupees two thousand five hundred and for second appeal shall be rupees ten thousand, which shall be non-refundable.

(b) 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.
Annexure –D

FORM No.1
[See rule 83]

Memorandum of Appeal under the Rajasthan Transparency in Public Procurement Act, 2012

Appeal No......................... of.................................

Before the ...................................................(First/Second Appellate Authority)

(A). A Bidd

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