



ELECTRICAL (CONSTRUCTION)

TENDER DOCUMENT

(Two Packet)

TENDER NO : EL-C-RTM- 2026-03-T

NAME OF WORK : Design, Supply, Erection, Testing and Commissioning of high speed (160kmph) 25 KV, 50 Hz, AC Single Phase OHE For Proposed New Ujjain Bypass Between Naikheri Station Chintaman Ganesh Station & Proposed New Nagda Bypass Between Rohalkhurd (Kota Division, WCR) - Bhatissuda (Ratlam Division) including Provision of new SSP, Modification of existing Feeding Post, and removal of infringements, in Connection With New Ujjain Bypass Line and new Nagda Bypass line Projects of Ratlam Division, Western Railway.

BOOK CONTAINS PAGES : 95

DATE OF CLOSING OF TENDER : As specified on IREPS Portal.

DATE OF OPENING OF OFFERS : 15.30 hrs. on date of closing specified on IREPS Portal

APPROXIMATE COST OF WORK : Rs. 10,44,35,949.23/-

TENDER DOCUMENT COST : NIL

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CHAPTER - I**TENDER DOCUMENTS**

1.01.00 TENDER ENQUIRY

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TENDER ENQUIRY

- Design, Supply, Erection, Testing and Commissioning of high speed (160kmph) 25 KV, 50 Hz, AC Single Phase OHE For**
1. NAME OF WORK : **Proposed New Ujjain Bypass Between Naikheri Station Chintaman Ganesh Station & Proposed New Nagda Bypass Between Rohalkhurd (Kota Division, WCR) - Bhatissuda (Ratlam Division) including Provision of new SSP, Modification of existing Feeding Post, and removal of infringements, in Connection With New Ujjain Bypass Line and new Nagda Bypass line Projects of Ratlam Division, Western Railway.**
 2. APPROXIMATE COST OF WORK : **Rs. 10,44,35,949.23/-**
 3. BID SECURITY : **Rs. 20,88,700/-**
 4. COMPLETION PERIOD : **18 (Eighteen Months, including Monsoon)**
 5. LAST DATE AND TIME FOR SUBMISSION OF TENDER : **As specified on IREPS Portal.**
 6. ADDRESS FOR SUBMISSION OF TENDER : **E-Tendering**
 7. IMPORTANT NOTE :
 - 1. "In case the successful tenderer is not liable to be registered under CGST/IGST/UTGST/SGST Act. The Railway shall deduct the applicable GST from his/their bills under Reverse Charge Mechanism (RCM) and deposit the same to the concerned Tax authority".**
 - 2. Tenderers shall be complying Railway Board's letters No. 2017/CE-I/CT/4/GST dated 23.06.2017, 2016/CE-I/CT/12/GST/Pt. dated 29.06.2017 & 2017/CE-I/CT/4/GST dated 05.07.2017 and other instructions issued time to time**
 - 3. Tenderers shall be complying to GCC April 2022 with all latest ACS and other instructions issued from time to time.**

INSTRUCTIONS TO THE TENDERERS

1. The following components form a part of tender:

- I. NIT header
- II. Schedule
- III. Item break up
- IV. Eligibility condition
- V. Compliance
- VI. Document attached

1. A. GCC with latest AC's (as per GCC April2022)

B. Tender Document

- a. Instructions to the tenderer.
- b. Tender
- c. Condition of tender
- d. Special condition

2. It is responsibility of the tenderer to check any correction or any modifications published subsequently in website and the same shall be taken into account while submitting the tender on website.
3. Your digital signature on the E-Tender form will be considered as your confirmation that you have read and accepted all the conditions laid down in the documents as well as schedule of tender consisting of technical bid form (including special conditions attached to E- Tender) and financial offer form, unless specific deviation is quoted in the technical bid.
4. Tenderer/s are free to download tender document at their own risk and cost, for the purpose of perusal as well as for using the same as tender document for submitting the offer. Master copy of the tender document is available in the office of The Deputy Chief Electrical Engineer (construction) Ratlam-457001. After award of work an agreement will be prepared based on the master copy of tender available in the above-mentioned office. In case, any discrepancy between the tender documents downloaded from the Internet and master copy later shall prevail and will be binding on the tenderer/s no claim on this account will be entertained.
5. If any change/addition/deletion is made by the Tenderer/Contractor and the same is detected at any stage even after the award of the tender, full amount deposited as Bid security will be forfeited and the contract will be terminated at his/their risk and cost. The tenderer is also liable to be banned from doing business with Railways and/or prosecuted.
6. **Error/omission and discrepancies-** The tenderer shall not take advantage of any error due to typing or otherwise, if there is any doubt, that shall be brought to notice of Dy.CEE/C/RTM without delay and same shall be dealt as per Railway's requirement only and to Railway's advantage only.
7. Tenderers are advised to quote their rates on www.ireps.gov. site through e-offer. Other modes for submitting offer are not allowed and same will be summarily rejected.
8. **Payment of Bid Security in respect of E-Tendering shall be accepted through net banking or payment gateway facility provided on IREPS Website only, failing which tender will not be considered.**
Note- The cost of Bid Security will not be accepted physically.

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

9. **The prospective tenderers are advised to revisit the website frequently before the date of closing of tender to note any changes/corrigendum issued for this tender. Website: www.ireps.gov.in.**

10. A declaration should be given by the tenderer that I/We have downloaded the tender from the Internet site <http://ireps.gov.in> and I/We have not tampered/ modified the tender forms in any manner. In case, if the same is found to be tampered/modified, I/We understand that my/our tender will be summarily rejected and full earnest money will be forfeited and I/We am/areliable to the banned from doing business with Railways and/or prosecuted.

11. In case of Two packet system of bidding, after scrutinizing the technical bid and short listing the tenderers, the Financial Bid shall be opened on a subsequent date only for those tenderers who will be qualifying Technical Bid as per eligibility/qualifying criteria laid down. The date of opening of financial bid will be advised online. The Railway's decision in this regard will be final.

12. An option for the contractor to take payment from Railways through a letter of credit (LC) arrangement shall be considered as per guidelines conveyed vide Railway board letter No. 2018/CE-I/CT/9 dated 04.06.18 in reference (i) Railway Board's letter No. 2017/AC-II/9/10 Pt 3 dated 09.05.18 (ii) Railway Board Letter No. 2017/AC II/9/10 Pt I, dated 20.02.18.

13. Eligibility Criteria: (As per GCC – April 2022 Part-I, Para 10 must follow with latest ACS for GCC.)

13.1 Technical Eligibility Criteria:

(a) The tenderer must have successfully completed or substantially completed any one of the following categories of work(s) during last 07 (seven) years, ending last day of month previous to the one in which tender is invited:

- (i) *Three similar works each costing not less than the amount equal to 30% of advertised value of the tender, or*
- (ii) *Two similar works each costing not less than the amount equal to 40% of advertised value of the tender, or*
- (iii) *One similar work costing not less than the amount equal to 60% of advertised value of the tender.*

(b) (1) In case of tenders for composite works (e.g. works involving more than one distinct component, such as Civil Engineering works, S&T works, Electrical works, OHE works etc. and in the case of major bridges – substructure, superstructure etc.), tenderer must have successfully completed or substantially completed any one of the following categories of work(s) during last 07 (seven) years, ending last day of month previous to the one in which tender is invited:

- (i) *Three similar works each costing not less than the amount equal to 30% of advertised value of each component of tender, or*
- (ii) *Two similar works each costing not less than the amount equal to 40% of advertised value of each component of tender, or*
- (iii) *One similar work each costing not less than the amount equal to 60% of advertised value of each component of tender.*

Note for b (1): Separate completed works of minimum required values shall also be considered for fulfilment of technical eligibility criteria for different components.

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

(b)(2) In such cases, what constitutes a component in a composite work shall be clearly pre-defined with estimated tender cost of it, as part of the tender documents without any ambiguity.

(b) (3) To evaluate the technical eligibility of tenderer, only components of work as stipulated in tender documents for evaluation of technical eligibility, shall be considered. The scope of work covered in other remaining components shall be either executed by tenderer himself if he has work experience as mentioned in clause 7 of the Standard General Conditions of Contractor through subcontractor fulfilling the requirements as per clause 7 of the Standard General Conditions of Contract or jointly i.e., partly himself and remaining through subcontractor, with prior approval of Chief Engineer in writing.

However, if required in tender documents by way of Special Conditions, a formal agreement duly notarized, legally enforceable in the court of law, shall be executed by the main contractor with the subcontractor for the component(s) of work proposed to be executed by the subcontractor(s), and shall be submitted along with the offer for considering subletting of that scope of work towards fulfilment of technical eligibility. Such subcontractor must fulfil technical eligibility criteria as follows:

The subcontractor shall have successfully completed at least one work similar to work proposed for subcontract, costing not less than 35% value of work to be subletted, in last 5 years, ending last day of month previous to the one in which tender is invited through a works contract.

Note: for subletting of work costing up to Rs 50 lakh, no previous work experience of subcontractor shall be asked for by the Railway.

In case after award of contract or during execution of work it becomes necessary for contractor to change subcontractor, the same shall be done with subcontractor(s) fulfilling the requirements as per clause 7 of the Standard General Conditions of Contract, with prior approval of Chief Engineer in writing.

Note for Item 13.1:

Work experience certificate from private individual shall not be considered. However, in addition to work experience certificates issued by any Govt. Organization, work experience certificate issued by Public listed company having average annual turnover of Rs 500 crore and above in last 3 financial years excluding the current financial year, listed on National Stock Exchange or Bombay Stock Exchange, incorporated/registered at least 5 years prior to the date of closing of tender, shall also be considered provided the work experience certificate has been issued by a person authorized by the Public listed company to issue such certificates.

In case tenderer submits work experience certificate issued by public listed company, the tenderer shall also submit along with work experience certificate, the relevant copy of work order, bill of quantities, bill wise details of payment received duly certified by Chartered Accountant, TDS certificates for all payments received and copy of final/last bill paid by company in support of above work experience certificate.

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

"Similar nature of work shall mean: "Execution of any 1500 V DC or 25 KV AC OHE work"

13.2 Financial Eligibility Criteria: (GCC April 2022 Para 10.2, with ACS-01 dtd 14/07/2022 or latest to be followed)

The tenderer must have minimum average annual contractual turnover of V/N or V crores, whichever is lower, where:

V= Advertised value of the tender in crores of Rupees.

N= Number of years prescribed for completion of work for which bids have been invited.

The average annual contractual turnover shall be calculated as an average of "total contractual payments" in the previous three financial years, as per the audited balance sheet. However, in case balance sheet of the previous year is yet to be prepared/ audited, the audited balance sheet of the fourth previous year shall be considered for calculating average annual contractual turnover.

The tenderers shall submit requisite information as per Annexure-VIB of GCC, along with copies of Audited Balance Sheets duly certified by the Chartered Accountant/ Certificate from Chartered Accountant duly supported by Audited Balance Sheet.

13.3. Bid Capacity: (as per GCC April 2022 Para 10.3)

The tender/technical bid will be evaluated based on bid capacity formula detailed as Annexure-VI of GCC.

13.4 No Technical and Financial credentials are required for tenders having value up to Rs 50 lakh.

13.5. Tenderer Credentials:

Documents testifying tenderer previous experience and financial status should be produced along with the tender.

Tenderer(s) who is / are not borne on the approved list of the Contractors of Western Railway shall submit along-with his / their tender:

- (i) Certificates and testimonials regarding contracting experience for the type of job for which tender is invited with list of works carried out in the past.
- (ii) Certificates which may be an attested Certificate from the client, Audited Balance Sheet duly certified by the Chartered Accountant etc regarding contractual payments received in the past.
- (iii) The list of personnel / organization on hand and proposed to be engaged for the tendered work. Similarly list of Plant & Machinery available on hand and proposed to be inducted and hired for the tendered work.
- (iv) A copy of notarized/self-attested affidavit on a non-judicial stamp paper stating that they are not liable to be disqualified and all their statements/documents submitted along with bid are true and factual. Standard format of the affidavit to be submitted by the bidder is enclosed as Annexure-V of GCC. Non-submission of a copy of affidavit by the bidder shall result in summarily rejection of his/their bid. It shall be mandatorily incumbent upon the tenderer to identify, state and submit the supporting documents duly self-attested by which they/he are/is qualifying the Qualifying Criteria mentioned in the Tender Document.
- (v) The Railway reserves the right to verify all statements, information and documents submitted by the bidder in his tender offer, and the bidder shall, when so required by the Railway, make available all such information, evidence and documents as may be necessary for such verification. Any such verification or lack of such verification, by The Railway shall not relieve the bidder of its obligations or liabilities hereunder nor will it affect any rights of the Railway thereunder.
- (vi) (a) In case of any information submitted by tenderer is found to be false forged or incorrect at any time during process for evaluation of tenders, it shall lead to forfeiture of the tender Earnest Money Deposit besides banning of business for a period of up to five years.

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

- (b) In case of any information submitted by tenderer is found to be false forged or incorrect after the award of contract, the contract shall be terminated. Earnest Money Deposit (EMD), Performance Guarantee and Security Deposit available with the railway shall be forfeited. In addition, other dues of the contractor, if any, under this contract shall be forfeited and agency shall be banned for doing business for a period of up to five years.
14. Non-compliance with any of the conditions set forth therein above is liable to result in the tender being rejected.

Note: - In case a work is considered similar in nature for fulfilment of technical credentials, the overall cost including the PVC amount (if paid) of that completed work or substantially completed work, shall be considered and no separate evaluation for each component of that work shall be made to decide eligibility.

15. Technical capacity of JV partners shall be as per GCC-April-2022.

Technical capacity of JV must fulfil GCC April - 2022

Instructions for Letter of Credit as per Rly. Board letter No. 2018/CE-I/CT/9 dated 04.06.18

It has been decided by Board (MRS, MTR, ME, FC, CRB) that henceforth, all works tenders or service tenders invited by railways through e-tendering on IREPS, having advertised value of Rs 10 lakh and above, shall include in tender conditions, an option for the contractor to take payment from Railways through a letter of credit (LC) arrangement.

As such, following special conditions shall be included in the works tenders or service tenders to be invited henceforth:

- (i) For all the tenders having advertised cost of Rs 10 lakh or above, the contractor shall have the option to take payment from Railways through a letter of credit (LC) arrangement.
- (ii) This option of taking payment through LC arrangement has to be exercised in IREPS (Indian Railway Electronic Procurement System - the e-application on which tenders are called by Railways) by the tenderer at the time of bidding itself, and the tenderer shall affirm having read over and agreed to the terms and conditions of the LC option.
- (iii) The option so exercised, shall be an integral part of the bidder's offer.
- (iv) The above option of taking payment through LC arrangement, once exercised by tenderer at the time of bidding, shall be final and no change shall be permitted, thereafter, during execution of contract.
- (v) In case tenderer opts for payment through LC, following shall be the procedure to deal release of payment through LC:
 - (a) The LC shall be a sight LC
 - (b) The contractor shall select his Advising/Negotiating bank for LC the incidental cost towards issue of LC and its operation thereof shall be borne by the contractor.
 - (c) SBI, New Delhi, Main Branch will be the nodal branch for issue of LCs based on online requests received from Railway Accounts Units for tenders opened in financial year 2021-2022. SBI branches where the respective Railway Accounts Office has its Account (local SBI branch) will be the issuance/reimbursing branch for LC issued under this arrangement. The Bank shall remain same for this tender till completion of contract. The incidental cost @0.15% per annum of LC value, towards issue of LC and operation thereof shall be borne by the contractor and shall be recovered from his bills.
 - (d) The LC shall be opened initially for duration of 180 to 365 days in consultation with contractor. The LC shall be extended time to time as per the progress of the contract, on the

Signature of tenderer

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(Const.) Western Railway

request of the contractor. The value of LC to be opened initially as well as extended thereafter shall be finalized by the engineer in consultation with the contractor on the basis of expected progress of work.

- (e) The LC terms and conditions shall inter-alia indemnify and save harmless the Railway from and against all losses, claims and demands of every nature and description brought or recovered against the Railways by reason of any act or omission of the contractor, his, agents or employees, in relation to the Letter of Credit (LC). All sums payable/borne by Railways on this account shall be considered as reasonable compensation and paid by contractor.
- (f) The LC terms and conditions shall inter-alia provide that Railways will issue a Document of Authorization (format enclosed as Annexure 2) after passing the bill for completed work, to enable Contractor to claim the authorized amount from their bank.
- (g) The acceptable, agreed upon document for payments to be released under the LC shall be the Document of Authorization.
- (h) The Document of Authorization shall be issued by Railway Accounts Office against each bill passed by Railways.
- (i) On issuance of Document of Authorization, a copy of Document of Authorization shall be posted on IREPS for download by the contractor. A digitally signed copy of Document of Authorization shall also be sent by Railway Accounts Office to Railway's bank (Local SBI Branch).
- (j) The contractor shall take print out of the Document of Authorization available on IREPS and present his claim to his bank (advising Bank) for necessary payments as per LC terms and conditions. The claim shall comprise of copy of Document of Authorization, Bill of Exchange and Bill.
- (k) The payment against LC shall be subject to verification from Railway's Bank (Local SBI Branch).
- (l) The contractor's bank (advising bank) shall submit the documents to the Railway's Bank (Local SBI Branch).
- (m) The railway's bank (issuing bank) shall, after verifying the claim so received w.r.t. the digitally signed Document of Authorization received from Railway Accounts Office, release the payment to contractor's bank (advising bank) for crediting the same to contractor's account.
- (n) Any number of bills can be dealt within one L.C, provided the sum total of payments to contractor is within the amount for which LC has been opened.
- (o) The LC shall be closed after the release of final payment including P VC amount, if any, to the contractor.
- (p) The release of performance guarantee or security deposit shall be dealt directly by railway with the contractor i.e., not through LC.
- (q) For opening of LC, executive department shall make a request letter to concerned Accounts Department on a format, placed as Annexure - 1.

Necessary changes in IREPS and IPAS e-applications have already been carried out, for having option for payment to contractors through LC.

This issue with the concurrence of Finance Directorate of Ministry of Railways.

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

Letter for e-Tender offer

To,
The President of India,

Acting through,

Dy. Chief Electrical Engineer (Construction)

Western Railway, Ratlam.

I/We _____ have read the various conditions to tender attached hereto and agree to abide by the said conditions. I/We also agree to keep this offer open for acceptance for a period of 60 days from the date fixed for closing of the tender and in default thereof, I/We will be liable for forfeiture of my/our "Bid Security". I/We offer to do the work of "**Design, Supply, Erection, Testing and Commissioning of high speed (160kmph) 25 KV, 50 Hz, AC Single Phase OHE For Proposed New Ujjain Bypass Between Naikheri Station Chintaman Ganesh Station & Proposed New Nagda Bypass Between Rohalkhurd (Kota Division, WCR) - Bhatissuda (Ratlam Division) including Provision of new SSP, Modification of existing Feeding Post, and removal of infringements, in Connection With New Ujjain Bypass Line and new Nagda Bypass line Projects of Ratlam Division, Western Railway.**" at the rates quoted in the attached bill(s) of quantities and hereby bind myself/ourselves to complete the work in all respects within 06 months from the date of issue of letter of acceptance of the tender.

2. I/We also hereby agree to abide by the Indian Railways Standard General Conditions of Contract, with all correction slips up-to-date and to carry out the work according to the Special Conditions of Contract and Specifications of materials and works as laid down by Railway in the annexed Special Conditions/Specifications, Standard Schedule of Rates (SSOR) with all correction slips up-to-date for the present contract.

3. A Bid Security of ₹ 20,88,700/- has already been deposited online/ submitted as Bank Guarantee bond. Full value of the Bid Security shall stand forfeited without prejudice to any other right or remedies in case my/our Tender is accepted and if:

- (a) I/We do not submit the Performance Guarantee within the time specified in the Tender document;
- (b) I/We do not execute the contract documents within seven days after receipt of notice issued by the Railway that such documents are ready; and
- (c) I/We do not commence the work within fifteen days after receipt of orders to that effect.

4. (a) I/We am/are a Startup firm registered by.....Department of Industrial Policy and Promotion (DIPP) and my registration number is valid up to (Copy enclosed) and hence exempted from submission of Bid Security.

5. We are a Labor Cooperative Society and our Registration No. is withand hence required to deposit only 50% of Bid Security.

6. Until a formal agreement is prepared and executed, acceptance of this tender shall constitute a binding contract between us subject to modifications, as may be mutually agreed to between us and indicated in the letter of acceptance of my/our offer for this work.

Signature of witnesses.

(1)

(2)

Signature & Address of tenderer(s)(& date)

Signature of tenderer

Dy.Chief Electrical Engineer
 (Const.) Western Railway

Performance Guarantee:

The procedure for obtaining Performance Guarantee is outlined below:

(a) The successful bidder shall have to submit a Performance Guarantee (PG) within 21 (Twenty-one) days from the date of issue of Letter of Acceptance (LOA). Extension of time for submission of PG beyond 21 (Twenty-one) days and up to 60 days from the date of issue of LOA may be given by the Authority who is competent to sign the contract agreement. However, a penal interest of 12% per annum shall be charged for the delay beyond 21 (Twenty-one) days, i.e., from 22nd day after the date of issue of LOA. Further, if the 60th day happens to be a declared holiday in the concerned office of the Railway, submission of PG can be accepted on the next working day.

In all other cases, if the Contractor fails to submit the requisite PG even after 60 days from the date of issue of LOA, the contract is liable to be terminated. In case contract is terminated railway shall be entitled to forfeit Bid Security and other dues payable to the contractor against that particular contract, subject to maximum of PG amount. In case a tenderer has not submitted Bid Security on the strength of their registration as a Startup recognized by Department of Industrial Policy and Promotion (DIPP) under Ministry of Commerce and Industry, DIPP shall be informed to this effect.

The failed Contractor shall be debarred from participating in re-tender for that work.

(b) The successful bidder shall submit the Performance Guarantee (PG) in any of the following forms, amounting to 5% of the original contract value: -

- (i) A deposit of Cash;
- (ii) Irrevocable Bank Guarantee;
- (iii) Insurance Surety Bond as per Annexure-XVII

Note:

In case of extension of Date of Completion, selected bidder needs to submit extended Insurance Surety Bond/Fresh Insurance Surety Bond/fresh Performance Security, in any form as given above, before expiry of existing Insurance Surety Bond.

- (iv) Government Securities including State Loan Bonds at 5% below the market value;
- (v) Pay Orders and Demand Drafts tendered by any Scheduled Commercial Bank of India;
- (vi) Guarantee Bonds executed or Deposits Receipts tendered by any Scheduled Commercial Bank of India;
- (vii) Deposit in the Post Office Saving Bank;
- (viii) Deposit in the National Savings Bank Certificates: -
- (ix) Twelve years National Defence Certificates;
- (x) Ten years Defence Deposits;
- (xi) National Defence Bonds; and
- (xii) Unit Trust Certificates at 5% below market value or at the face value whichever is less. Also, FDR in favour of FA&CAO (free from any encumbrance) may be accepted.

(c) The Performance Guarantee shall be submitted by the successful bidder after the Letter of Acceptance (LOA) has been issued, but before signing of the contract agreement. This P.G. shall be initially valid up to the stipulated date of completion plus 60 days beyond that. In case, the time for completion of work gets extended, the Contractor shall get the validity of P.G. extended to cover such extended time for completion of work plus 60 days.

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

- (d) The value of PG to be submitted by the Contractor is based on original contract value and shall not change due to subsequent variation(s) in the original contract value.
- (e) The Performance Guarantee (PG) shall be released after physical completion of the work based on 'Completion Certificate' issued by the competent authority stating that the Contractor has completed the work in all respects satisfactorily.
- (f) Whenever the contract is rescinded, the Performance Guarantee already submitted for the contract shall be encased.
- (g) The Engineer shall not make a claim under the Performance Guarantee except for amounts to which the President of India is entitled under the contract (not withstanding and/or without prejudice to any other provisions in the contract agreement) in the event of:
 - (i) Failure by the Contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer may claim the full amount of the Performance Guarantee.
 - (ii) Failure by the Contractor to pay President of India any amount due, either as agreed by the Contractor or determined under any of the Clauses/Conditions of the Agreement, within 30 days of the service of notice to this effect by Engineer.
 - (iii) The Contract being determined or rescinded under clause 62 of these conditions.

CHAPTER - II**PREAMBLE**

2.01.00	GENERAL
2.02.00	CLARIFICATION
2.03.00	FORM OF TENDER
2.04.00	TENDER DOCUMENTS
2.05.00	MEMORANDUM OF DESCRIPTIVE MATTER
2.06.00	DEVIATIONS FROM TENDER PAPERS
2.07.00	ALTERNATIVE PROPOSALS
2.08.00	DISSOLUTION OF FIRM
2.09.00	SCHEDULE OF WORK
2.10.00	RLY ADMINISTRATION RESERVES THE RIGHTS
2.11.00	COMMUNICATION OF CHANGE IN DOCUMENTS
2.12.00	NEGOTIATION
2.13.00	TENDERER'S ADDRESS
2.14.00	SUBMISSION OF TENDER
2.15.00	SIGNING OF TENDERS
2.16.00	GUARANTEE CLAUSE
2.17.00	SPECIAL CONDITION

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

2.01.00 GENERAL

The intending Tenderer is advised to study the tender papers carefully. The Tenderer shall also acquaint himself with the nature of work and all other matters pertaining there to. The submission of a tender shall be deemed to have been done after careful study and examination of the tender papers with a full understanding of the implications thereof. Tender documents to be returned duly signed on each page. All the quantities and prices shall also be expressed in words wherever indicated.

Dimensions, weights, etc. shall be quoted only in metric system. The terms Tonne=1000 Kg. shall be used to indicate a metric tonne. If any other systems of units are quoted the equivalent metric measures shall be given invariably.

2.02.00 CLARIFICATION

Deputy Chief Electrical Engineer, (Construction), Western Railway, Ratlam-457001.

2.03.00 FORM OF TENDER

The tenderer shall submit his tender through E-tendering only.

2.04.00 TENDER DOCUMENTS

Each copy of the tender shall consist of the following: -

- i. Forwarding letter
- ii. Tender fee in prescribed form
- iii. Earnest money or deposit receipt for earnest money
- iv. Tenderer's credentials
- v. Offer letter
- vi. Memorandum of the Tenderer
- vii. Variations from Tender Papers
- viii. Alternative proposal of the Tenderer
- ix. Complete summary of prices, duly filled in
- x. Schedule of Qty./Schedule of prices duly filled in and signed.

a) The rates shall be quoted both in figures and words.

b) If there is variation between the rate quoted in figures and in words, the lower rate quoted shall be taken into consideration. If more than one rate is indicated, the tender is liable to be rejected.

2.04.01

Original copy of the tender papers duly E-signed by the Tenderer, on each and every page in token of having studied the Tender papers carefully. The original copy of the guarantee bond or deposit receipt for Earnest Money and income tax clearance certificate shall be incorporated in the Tender.

2.05.00 MEMORANDUM OF DESCRIPTIVE MATTER

The Tenderer may, if he deems it necessary, submit a short and concise memorandum or descriptive matter, which cannot be incorporated in other parts of the Tender. The Tenderer shall keep the length of such memorandum or descriptive matter to the minimum.

2.06.0 DEVIATIONS FROM TENDER PAPERS

- a. Deviations from Tender papers will not normally be agreed to Should the Tenderer be unable for good and sufficient reasons to comply entirely with the Tender papers, he shall indicate the deviations desired by him in his Tender. Such deviations, if any, shall be kept down to the absolute minimum and reasons for the deviations shall be indicated.
- b. The Tenderer, in all cases shall indicate clearly the specific addition or amendment desired by him to the relevant Para of the Tender papers.

- c. The Railway Administration, however, reserves the right to reject the offer, if any deviation is not acceptable and if the Tenderer is unwilling to modify such deviations in the manner acceptable to the Railway Administration.

2.07.00 ALTERNATIVE PROPOSALS

Should the Tenderer have alternative proposals for basic arrangement, typical designs and specification and drawings for components and materials which the Tenderer considers should improve the operating performance of the equipment or would reduce the cost of the tender for consideration by the Railway Administration. He shall clearly indicate in detail the technical and or financial advantages, which would accrue to the Railway Administration specifically for each alternative proposal suggested by him.

2.08.0 DISSOLUTION OF FIRM

1. If Tenderer expires after the submission of his tender, or after the acceptance of his tender, the Railway shall deem such tender as cancelled. If a partner of firm expires after the submission of their tender or after the acceptance of their tender, the Railway shall deem such tender as cancelled, unless the firm retains its character.
2. If the contractor's firm is dissolved on account of death or retirement of any partner of any reason what so ever before duly completing the principal amendment the partner shall be the principal amendment, the partner shall remain jointly, severally and personally liable to complete the whole work to the satisfaction of the Railways and pay compensation for loss sustained if any, by Railway due to such dissolution. The amount of such compensation shall be decided by the General Manager or his accredited officer and his decision in the matter shall be final and binding on the contractor.

2.09.00 SCHEDULE OF WORK

The tenderer shall complete the work as per "Period of completion" indicated in Chapter 3.05.00. In case it is not possible, the tenderer shall indicate his/their own delivery schedule in their offer. In case the suggested time schedule by tenderer is not acceptable to Railway. The tenderer has to followed the Railway schedule if contract is awarded to them.

2.10.00 RLY. ADMINISTRATION RESERVES THE RIGHTS

The Railway Administration reserves the right to change or amend the drawings as and when necessary, at any stage of the work. No claim of any kind what so ever will be entertained by the railway. In case the execution of any item of the work is held up for want of approved design or later supply of such material as are to be arranged by the railway then such failure or delay shall in no way affect or vitiate the contract or alter the character thereof or entitle the contractor for damages or compensation therefore but in any such case, the Rly may grant such extension of the completion date as may be considered reasonable.

2.11.00 COMMUNICATION OF CHANGE IN DOCUMENTS

The cancellation of any documents such as power of attorney, partnership deed, etc. should be forth with communicated by the contractor to the Railway Administration in writing, failing which the Railway Administration shall have no reasonability or liability for an action taken on the strength of the said documents.

2.12.00 NEGOTIATION

Tenderer shall not increase his/their quoted rates in case the Railway Administration negotiates for reduction of rates. Such negotiations shall not amount to cancellation or withdrawal of the original offer and the rates, quoted will be binding on the tenderer.

2.13.00 TENDERER'S ADDRESS AND CONTACT

Every tenderer shall state in the tender his postal address fully and clearly. Any communication sent in time to the tenderer by post at his said address shall be deemed to have reached the tenderer duly and in time notwithstanding the fact that the communication, did not reach the tenderer at all or in time for whatever reason important documents shall be sent by Registered post. In addition to this, contact number of the Tenderer/ Representative along with their post shall be mentioned for

2.14.00 SUBMISSION OF TENDER

The tender shall be submitting through e-tender Only No other mode allowed.

2.15.00 SIGNING OF TENDERS

Any individual or individuals signing the Tender or other documents connected therewith should specify whether he is signing: -

As sole proprietor of the concerned of his Attorney or, as a partner or partners of the firm or consortium or, for the firm per procurator, or as a Director, Manager or Secretary duly authorized in the case of a company registered under Company Act.

In the case of partnership firm all the partners or Attorney duly authorized by all of them should sign the Tender and all other connected documents. A copy of the document empowering the individual or individual to sign should also be enclosed with the Tender. In any case the Tenderer should disclose his contribution fully and copies of all necessary legal documents in support thereof should be produced as and when called for should the tenderer be a partnership firm and in the event of the contract becoming inoperative due to the death of its partners, the Railway Administration shall have the right to enter into a separate agreement with the surviving partners of the firm to continue the execution of the work under the terms and conditions of this agreement.

2.16.00 GUARANTEE CLAUSE

- (a) The work done by the contractor shall be guaranteed for satisfactory working of all the equipment and the installations provided by him, for a minimum period of **ONE YEAR**, from the date of completion of entire work, unless it is mentioned in the chapter 'Technical Specification'. The guarantee for the spare parts should be coincident with the guarantee for entire work.
- (b) During this period of guarantee, the contractor shall keep available an experienced engineer and necessary equipment's to attend to any defective installations. The contractor shall bear the cost of all modifications, additions or substitutions that may be considered necessary due to faulty material, design or workmanship for the satisfactory working of the equipment's. The final decision shall rest with the Chief Electrical Engineer (construction) or his (their) successor(s).
- (c) During the period of guarantee the contractor shall be liable for the replacement of any equipment & any parts which may be found defective whether such equipment's be of his own manufacture or those of his sub contract, whether arising from faulty design, material, workmanship or negligence in any manner on the part of the contractor at his (contractor's)

own expenses. In case of type defect in the contractor's equipment and components detected during the guarantee period, the contractor should replace all such items irrespective of the fact that whether all such items have failed or not. The contractor shall bear the cost of the repairs carried out on his behalf by the purchaser at site. In such a case, the contractor shall be informed in advance of the works proposed to be carried out by the purchaser.

- (d) It becomes necessary for the contractor to replace or renew any defective portions of the installation under the Para aforesaid then the provisions of the said Para shall also apply to the portion of the installation so replaced or renewed until the expiration of six months from the date of such replacement or renewal or until the end of above-mentioned period (see sub Para (a) above whichever is later. If any defect be not remedied within a reasonable time during the aforesaid period, the purchaser may proceed to do the work at the contractor's risk and expense, but without prejudice to any other rights and remedies which the purchaser may have against the contract in respect of such defects or faults.
- (e) The contractor will be responsible for any damage / theft for part of the work completed & paid in running bills till entire work is taken over by the Railway.
- (f) The repaired or renewed parts shall be delivered and erected on site free of charge to the purchaser.

The contractor guarantees that the stores which he supplies will be fully in accordance with specifications and will be operate properly. In all cases, the contractor guarantees that his designs would strictly follow the 'as made' detailed drawings with such modification as are modified in respect of each type. The contractor further guarantees that the store will be free from defects in materials and workmanship provided that the contractor's liability in this respect shall be limited to furnishing and installation of replacement parts free of any charge or the repair of defective parts only to the extent that such replacements or repairs are attributable to or arise from faulty workmanship or material or design in the manufacture of stores.

It shall be a condition of the guarantee hereunder that any defects complaint of shall be brought to the contractor's attention within a reasonable time of their being first discovered. The guarantee therein contains shall not apply to any material which shall have been repaired or altered by the purchaser or on behalf in any way to misuse, negligence or incidents.

All replacement and repairs that the purchaser shall take up on the contractor to delivery of the firm under this guarantee shall be delivered and perform by the contractor promptly and satisfactorily.

Any approval or acceptance by the purchaser of the stores or of the materials incorporated therein shall not in any way limit the contractor's liabilities hereunder-

The decision of the purchaser in regard the contractor's liability under guarantee shall be final and conclusive.

2.17.00 **SPECIAL CONDITIONS**

For other Railway Stores If any material other than specified material is supplied by the purchaser either at the contractors request or Suo-Moto in order to prevent any possible delay in the execution of the work likely to occur due to the contractors inability to make adequate arrangement for supply thereof or otherwise, recovery will be made from contractor's bill at the book rate or last purchase rate whichever is higher plus 5% on account of initial freight and 2% on account of incidental charges together with supervision charges at 12.5 % of the total cost inclusive of material, freight and incidental charges, freight between the punchers source of supply and the contractor's depot or rail head shall beto the contractor's account. If, however, the material required by the contractor is not available in purchaser's stock or the purchaser decide not to the same be that for whatever reason, the purchaser shall not be bound to arrange for the supply at cost quoted above or at any other cost nor will this fact be accepted as any other cost nor will this fact be acceptedas an excuse for delay in execution of works.

CHAPTER - III SPECIAL CONDITION OF CONTRACTS

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Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

3.01.00 TENDER IN AGREEMENT

The fact of the submission to the Railway Administration of a tender shall be deemed to constitute in agreement between the Tenderer and the Railway administration whereby such tender shall remain open for acceptance either in part or in full, or as may be modified by negotiation, by the purchaser for a period of 60 days from the date on which Tenders are opened, during which period the Tenderer shall not withdraw his offer nor amend, impair or derogate there from the earnest money deposited in accordance with Part-I, Para 5.0 of GCC April 2022 shall be forfeited if the Tenderer unilaterally, withdraw, amends, impairs or derogates from the Tender in any respect within the said period of 60 days. The Tenderer shall be deemed to have agreed as aforesaid in consideration of his tender being considered by the Railway Administration in terms thereof provided the same has been duly submitted and is otherwise in order. When the successful Tenderer is notified in writing at his address given in the Tender papers within the said period of three months that his Tender has been accepted by the Railway Administration either in whole or in part, he shall be bound by the terms of Agreement constituted by his tender and such acceptance thereof form a contract has been executed between the Rly. Administration and the tenderer.

3.02.00 TENDER CONFIDENTIAL

The tenderer (whether his tender be accepted or not) shall treat the contents of his tender as private and strictly confidential till Tenders are opened. He is advised in his own interest not to send copies of his tender to anybody other than: -

Deputy Chief Electrical Engineer, Construction, Western Railway, Ratlam – 457001.

3.03.00 CANVASSING AND BRIBERY

No Tenderer shall canvass any Government official or any Railway Employees in respect of this or any other tender. Contravention of this condition will involve rejection of tender. This clause shall not be deemed to prevent the Tenderer from supplying the Railways Administration information asked for by them. Any bribe, commission, gift or advantage given, promised or offered by the Tenderer, or his partner, agent or servant or any one of his or their behalf to any officer, servant, representative or agent of the Railway Administration or any person on his or their behalf, in relation to the obtaining of this or any other contract with the Railway Administration shall in addition to the criminal liability he may incur under the prevention of Corruption Act.(1988) subject to the Tenderer to the Cancellation or dispute as to the commission of any offence under the present clause shall be decided by the Railway Administration, in such manner and on such evidence or information as may be thought fit and sufficient and his decision shall be final and conclusive in the matter Should a Tenderer be a retired Engineer of the Gazette rank or any other Gazette officer working before his retirement whether in the executive or administrative capacity, or whether holding a pensionable post or not, in any Deptt. of any of the Railway owned and administered by the President of India for the time being or should a Tenderer being a partnership firm have as one of its partners a retired Engineer or a retired Gazetted officer aforesaid or should a tenderer being an incorporated company have any such retired Engineer or retired Gazetted officer as aforesaid, the full information as to the date of retirement of such Engineer or Gazetted officer from the said service and in cases where such Engineer or officer had not retired from Government service at least two years prior to the date of submission of the tender should a tenderer be a retired Engineer of the Gazette rank or any other Gazette officer working before his retirement whether in the executive or administrative capacity, or whether holding a pensionable post or not, in any Deptt. of any of the Railway owned and administered by the President of India for the time being or should a Tenderer being a partnership firm have as one of its partners a retired Engineer or a retired Gazetted officer aforesaid or should a tenderer being an incorporated company have any such retired Engineer or retired Gazetted

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

officer as aforesaid, the full information as to the date of retirement of such Engineer or Gazetted officer from the said service and incases where such Engineer or officer had not retired from Government service at least two years prior to the date of submission of the Tender as to whether permission for taking such contract or if the Contractor be a partnership firm or an incorporated company to become a partner or director as the case may be or take employment under the Contractor, has been obtained by the Tenderer or the Engineer or the Officer as the case may be, from the President of India or any officer duly authorized by him in his behalf shall be clearly stated in writing at the time of submitting the tender. Tenders without the information above referred to or a statement of to the effect that no such retired Engineer or retired Gazetted officer is so associated with the Tenderer, as the case may be rejected.

3.04.00 INSPECTION OF SITE BEFORE TENDERING

The tenderer(s) shall inspect the proposed site of work and acquaint himself/themselves with the site conditions.

3.05.00 COMPLETION PERIOD SUBMISSION OF TENDER

The entire work shall be completed by the contractor with in a period of **Eighteen Months (including monsoon)** from the date of issue of letter of acceptance. In case it is not possible the tenderer shall indicate his/their own delivery schedule.

3.06.0 TERMS OF PAYMENT

- a. 70% of price of supply of material on receipt and acceptance of material at site, unless stated otherwise.
- b. Balance 20% of price of supply and 90% of price of erection after erection of equipment and material at site.
- i. Balance 10% of price of supply & 10% price of erection after the portion of OHE charged, goods/passenger train operation has started on regular basis.
- ii. All payment shall be made on certificate of Dy. Chief Electrical Engineer (Construction), Western Railway or his authorized representative.

3.07.0 PREVAILING CONDITIONS

1. Railway's General condition of contract will be applicable along with special conditions of contract.
2. In case of conflict between special conditions of contract and the general conditions of contract, the special conditions of contract will prevail.

3.08.00 VALIDITY

Tenderer shall keep of the offer open for a minimum period of 60 days from the date of opening of the tender within which period, tenderer cannot withdraw his offer subject to the period being extended if required by mutual agreement from time to time.

3.09.00 SUPPLY OF ELECTRICITY

The Contractor/s shall be responsible for obtaining electrical supply required for the works from concerned local agency, Electricity Board; BEST as the case may be at his/their own cost. However, if required by the Contractor the Railway administration may give necessary assistance in recommending to the local electricity authorities for giving necessary electric connection to the contractor for execution of works. In case the Railway electricity is available connection can be given on usual terms through concerned Sr. DEE.

3.10.00 CARE OF STAFF

No quarters will be provided by the Railway for the accommodation of the Contractor or any of his staff employed on the work. The contractor may be allowed to erect any labour camps for housing the labour at or near the site of work on available Railway land subject to

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

payment of cess and water charges. The Contractor shall at his own cost make all necessary and adequate arrangement for the importation, feeding and preservation of the hygiene of his staff. The Contractor shall permit inspection at all times of all sanitary arrangements made by him, by the Engineer or his assistant or medical staff of the railway. If the Contractor fails to make adequate medical, sanitary arrangements, these will be provided by the Railway, the cost thereof being recovered from the Contractor. In casesome accommodation is available, it can be given on licence fee.

3.11.00 DAMAGE BY ACCIDENT, FLOODS OR TIDES

- a The Contractor shall take all precautions against damage from accident, floods or tides. No compensation will be allowed to the contractor for his plant or part or material lost or damaged by any cause whatsoever. The contractor shall be liable to make good the damages to any structure or part of structure, plant or material of every description belonging to the administration lost or damaged by any cause during the course of the Contractor's work.
- b The administration will not be liable to pay to the contractor any charges for rectification or repairs to any damage which may have occurred from any cause, whatsoever, to any part of the new/existing structure, during construction.

3.12.00 FIRST AID

The Contractor shall maintain in a readily accessible place first aid appliances including an adequate supply of sterilized + cotton wool. The appliance shall be placed under the charge of a responsible person who shall be readily available during working hours.

3.13.00 INSPECTION REGISTER AND RECORDS

The Contractor/s shall maintain accurate records, plans and charts showing the dates and progress of all main operations and the Engineer shall have access to this information at all reasonable times. Records of tests made shall be handed over to the Engineer's representative after carrying out the tests. The following registers will be maintained at site by the Contractor/s.

1. Bar chart & Drawings
2. Insulation Resistance Register
3. Earth Resistance & Earth continuity Register
4. Material Receipt from Railway & used at site Register

3.14.00 AVAILABILITY OF G.C.C. (April 2022)

Copy of G.C.C. is available in General Section of GM(E)'s office, Church gate on Payment.

3.15.00 ENGAGEMENT OF QUALIFIED ENGINEER

- a. In terms of provisions of new Clause 26A.1 to the General Conditions of Contract (GCC), contractor shall also employ following Qualified Engineers during execution of the allotted work:
- b. One Qualified Graduate Engineer when cost of work to be executed is Rs.200 lakhs and above, and
- c. One Qualified Diploma Holder Engineer when cost of work to be executed is more than Rs.25 lakhs, but less than Rs.200 lakhs.

3.15.01

(a) The tenderer/s shall also give a declaration along with his/their tender to the effect that he/they shall engage and continue in service for the period of the contract, One Electrical Engineer Degree Holder and also one Electrical Engineers Diploma Holder. If they are without experience of any kind, they will be given training by the contractor on stipend basis at the rate of not less than Rs.1000/- per month for a period of six months. Those who have gained experience and have completed the period of six months will thereafter be paid as under:

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

Electrical Engineering: Degree Holder	Not less than Rs.20000/- per month for the duration of the contract.
Electrical Engineering: Diploma Holder	Not less than Rs.15000/- per month for the duration of the contract.

If, the tenderer(s) fails/fail to comply the above declaration, his/their tender will be ignored. In case it is subsequently discovered that the declaration as aforesaid is in any way incorrect or the information furnished therein is wrong, the administration reserves the right to rescind the contract and to take action in accordance with clause 60 of the General Conditions of Contract.

(b) Declaration Form

I/We hereby declare that I/We shall engage and continue in service for the particular work for which tender is submitted one Electrical Engineering Degree holder and one Electrical Engineering Diploma holder. If they are without any experience of any kind, they will be taken under training by us on stipend basis at the rate of not less than Rs.1000/-per month for a period of 6 months. Those who have gained experience and have completed the period of 6 months will thereafter to paid as under:

- i. Electrical Engg. Degree Holders: Not less than Rs.20000/- p.m. for the duration of contract.
 - ii. Electrical Engg. Diploma Holders: Not less than Rs.15000/-p.m. for the duration of contract.
- None of the Engineers will be related to me/us.

Date:

Signature of Tenderer/s

3.15.02

Further, in case the contractor fails to employ the Qualified Engineer, as aforesaid in Para 3.25.01 above, he, in terms of provisions of Clause 26A.2 to the General conditions of Contract, shall be liable to pay an amount of Rs. 40,000 & Rs. 25,000 for each month or part thereof for the default period for the provisions, as contained in Para 3.25.01 (a) & (b) above respectively.

3.15.03

Provision for deployment of Qualified Engineers (Graduate Engineer or Diploma Holder Engineer) shall be for the values as prescribed above. However, for the works contract tenders, if it is considered appropriate by the tender inviting authority, not to have the services of qualified engineer, the same shall be mentioned in the tender documents by the concerned Executive with the approval of Officer not below the level of SAG Officer, for reasons to be recorded in writing.

3.16.00 TAXES AND ROYALTIES

Special Note: *This Clause (3.31.01 to 3.31.05) will be reviewed as per GST act and guidelines received from competent authority and will be applicable for this tender.*

3.16.01

All rates quoted in the tender shall be deemed to be inclusive of all taxes, royalty's payable by the Contractor(s) to the government or public body or local authority and no additional amount will be paid or claim entertained on this account by the Railway.

3.16.02

Deduction for Income Tax & Labour cess and compliance with EPFS, EPS rules

The Railway will deduct 2% of income tax on the gross amount and surcharge on income tax of each bill as prescribed by Government from time to time and such deduction of Income Tax shall be recovered while making payment to the Contractor/s. The settlement of income

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

tax should be made with the Income Tax authorities.

3.16.03

All taxes such as Income tax, Sales tax and other taxes as prescribed by Central/State Govt. from time to time shall be applicable. The Contractor shall be fully responsible for payments of all such taxes without any liability of Railway Administration deducting towards such taxes shall be made from the payments of the contractor in accordance with rules in force from time to time.

3.16.04

The tenderer for carrying out any construction work in Maharashtra State must get themselves registered from the Registering Officer under Section- 7 of the Building and Other Construction Workers Act, 1996 and rules made thereto by Maharashtra State Govt. and submit certificate of Registration issued from the Registering Officer of the Maharashtra State Govt, Labour Department. For enactment of this Act, the tenderer shall be required to pay cess @ 1% of the cost of construction work, to be deducted from each bill. Cost of material shall be outside the purview of cess, when supplied under a separate schedule item.

3.16.05

The contractor shall comply with the provisions of para 30 & 36-B of the Employees Provident Fund scheme (EPFS), 1952; para 3 & 4 of Employee's Pension Scheme (EPS), 1995; and para 7 & 8 of Employees Deposit Linked Insurance Scheme, 1976; as modified from time to time through enactment of "Employees Provident Fund & Miscellaneous Provisions Act, 1952, wherever applicable and shall also indemnify the Railway from and against any claims under the aforesaid Act and Rules.

3.17.00 FOREIGN EXCHANGE REQUIREMENT

Any demand of foreign exchange for importing of equipment's and materials shall not be accepted.

3.18.0 EMERGENCY WORKS

- i. In the event of any accident or failure occurring in, on or about the work or arising out of or in connection with the construction, completion or maintenance of the works, which in the opinion of the Engineer requires immediate attention, the Railway may bring its own workmen or other agency to execute or partly execute the necessary work or carry out repairs if the Engineer considers that the contractor/s is/are not in a position to do so in time and charge the cost thereof, which will be determined by the Chief Electrical Engineer (C)/Chief Administrative Officer (C), Western Railway, to the contractor.
- ii. Vehicle and equipment of contractors can be drafted by Railway administration in case of accident/ natural calamities involving human lives and market rate as mutually agreed will be paid.

3.19.00 SAFETY PRECAUTIONS

1. The Contractor/s shall at all times adopt such safe methods of work as will ensure safety of structure, equipment and labour. If at any time the Rly. finds the safety arrangements unsafe, the contractor/s shall take immediate corrective action as directed by the Railway's in the matter shall in no way absolve the contractor/s of his/their sole responsibility to adopt safe working methods.
2. The Contractor/s shall design and execute temporary works such as form work and supports, so as to ensure absolute safety of contractor/s personnel as well as Railway staff and personnel engaged on the work. The Contractor/s should indemnify the Railway against damages and injury to workmen. Railway reserves the right to enforce safety regulations on the contractor/s and recover any cost which may be incurred for the purpose.

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

3.20.00 SAFETY PRECAUTION TO BE TAKEN WHILE PERMITTING PLYING OF VEHICLES ADJACENT TO RUNNING LINES TO PREVENT ACCIDENT TO TRAINS:

3.20.01

Whenever a lorry or any other form of road transport is required to ply along, or in the vicinity of a running line or any other railway track where Railway Engines or trains are scheduled to move, the contractor shall inform the Engineer, in writing, of such requirements specifying the locations and the duration of the time over which such specified road vehicles have to operate in the area (for loading, loading or unloading of earth, ballast or any other material, plant or equipment) without any obstruction or dislocation to the running of trains. The contractor shall also furnish the particulars of vehicles and the names and photographs of driver and attendant retained for each vehicle to enable the Engineer to issue necessary permits allowing the holder to operate the vehicles, with such restrictions regarding the duration and/or location as are considered necessary. Such permits shall be returned to the Engineer as soon as the work for which it is issued is over.

3.20.02

The contractor shall execute a Bond undertaking to ply the road vehicles in a safe and satisfactory manner and strictly in accordance with the stipulations and other conditions specified by the Engineer and to engage and retain only the permit holder to be the contractor's agent in-charge of the vehicle, while driving or at rest. The person in charge of the vehicle and the attendants shall at all times be vigilant and on the lookout for signals from the lookout men, flagmen or other personnel available at site with a view to stop or regulate the road movement so as to ensure adequate margin of safety for the timely passage of an approaching train or a Railway engine, without any delay or detention.

3.20.03

The contractor shall also be bound by the provisions of this agreement, to ply the road vehicles only with adequate margin of safety, well clear of the fixed structure profile of infringements, as stipulated in the rules made under the Indian Railway Act and to seek and be guided by the signals and other directions of any lookout men or other personnel retained for the purpose of ensuring safety, and to ensure care and vigilance while turning, reversing or moving the road vehicle in any other manner, at an inclination to the running Railway track or the siding, as the case may be.

3.20.04

The contractor also undertakes to make good at his own cost any inconvenience, loss, damage or other expenses caused to or incurred by the Railway Administration and to pay such amounts as determined by the Engineer to be recoverable from the contractor as penalty or damage for any omission, negligence, carelessness, oversight or accident on the part of any of the contractor's agent, drivers or attendants or any other person to whom the services of the holder of the permit (issued by the Engineer) has been lent or otherwise made accessible or available).

3.20.05

Any breach of these conditions by the contractor and/or his agent affecting the safety of movements of trains, engines or other rolling stock of the Railway shall constitute a breach of contract by the contractor entailing liability for termination of contract for default on the part of the contractor.

3.20.06

The tenderer/s will be permitted to make use of the level crossing for crossing the track after observing the standard railway safety precaution. If such precautions are not taken, these will be enforced by the railway by adequate arrangements and the cost thereof shall be recovered from the contractor.

The contractor/s shall inspect the proposed site of work and acquaint himself/themselves with

site conditions working hours storing space for materials, approach road/pathways available etc. and all relevant items connected with the execution of work. No claim shall be entertained from contractor making his own arrangements for approach/approach roads from outside Railway land and contractor will bear entire expenses such as road taxes payment on right of way etc. to outsiders.

3.21.00 SAFETY MEASURES

- a. The contractor shall take all precautionary measures and confirm to rules and regulations of the Railway in force for the time being in order to ensure the protection of his own personnel moving about or working on the Railway premises.

The purchaser shall remain indemnified by the contractor in the event of any accident occurring in the normal course of work arising out of the failure of contractor or his men to exercise reasonable precaution at all places of work whether or not, the purchaser decides to post flagmen at any particular site of work. The flagmen will be appointed by the purchaser and no expenses on this account will be charged from the contractor.

- b. Blasting of rock for foundation work shall be done only after due notice is given to the purchaser and time/s and date/s for blasting operations agreed to, by the purchaser. Blasting, if required to be done in the vicinity of the track, shall not be undertaken until the purchaser's flagmen on duty take necessary steps to protect train and the track is adequately protected by the contractor against damage by blasting rock. The contractor shall follow detailed instructions applicable in this regard.
- c. Ladder trolleys / ladders shall be used with caution. They shall not be on the track/s. and the until the purchaser's flagmen are on duty to protect the trolleys and the purchaser's representative authorize in writing for the trolleys to be put on the track/s. Ladder trolleys / ladders shall be promptly removed on instructions from the purchaser's representative and well in advance of trains. No claim shall rest on the purchaser in the event of a ladder trolley / ladder being run over by a train.
- d. While working within station limit, especially on passenger platforms, the contractor shall ensure that at all time sufficient space is left for free movement of passenger traffic. He must cover and / or barricade the excavation carried out in such areas and continue to maintain these, till the work is completed with a view to avoid any accident to public or to Railway staff.
- e. If safety of track or track drainage etc. is affected, as a consequence of works undertaken by the contractor, the contractor shall take immediate steps to restore normal conditions. In case of delay, the purchaser shall take necessary steps and recover the costs from the contractor.
- f. Moreover, if at any time the works to be carried out directly concern the safety of trains, the contractor's staff must comply fully with the Railway regulations given to him by the authorized Railway staff. The contractor's employees and workers may for no reason operate any installation concerning train safety or train movement. They shall notify the authorized representative, of the purchaser who will take all necessary steps in this regard.
- g. The contractor shall be responsible for safe custody of all equipment's till its commissioning.
- h. The contractor liability to meet third party claims or the type of outline above will be applicable only in case where accident have been caused by the bad workmanship material or negligence on the part of the contractor and further the liability of the contractor will be limited to Rs.25 lakhs for any one accident.
- i. The contractor shall ensure that unauthorized careless or inadvertent operation of switchgear, which may result in accident to staff and or damage to equipment doesn't occur.
- j. The contractor shall not allow any road vehicle belonging to him or his suppliers etc, to ply in Railway land next to the running line. If for execution of certain works viz. supply & cement concrete for foundation work & transportation of electric poles/OHE mast, the contractor shall apply to the engineer in-charge for permission giving the type and number of individual vehicles, name and license particulars of the drivers, location, duration and timings for such works / movement. The engineer in-charge or his authorized representative will personally counsel

examine and certify the road vehicle drivers, contractor's flagmen and supervisor and will give written permission giving name road vehicles drives, contractor's flagmen and supervisor to be deployed on the work, location, period of the work. This permission will be subject to the following obligatory conditions—

- i. The road vehicle will apply only between sunrise and sunset.
- ii. Nominated vehicles and drivers will be utilized for the work in presence of at least one flagman and one supervisor certified for such work.
- iii. The vehicles shall ply six meters clear of the track. Any movement/work at less than in the six meters and up to minimum of 3.5 Mtrs clear of the track center shall be done only in presence of Railway employee authorized by Engineer-in-charge. No part of road vehicle will be allowed at less than 3.5 Mtrs from track center. Cost of such Railway employee shall be borne by the Railway.
- iv. The contractor shall remain fully responsible for ensuring safety and in case of any accident shall bear cost of all damages to this equipment and men and also damages to Railway and its passenger. Engineer in-charge may impose any other condition necessary for a particular workin site.

3.22.00 CABLE LAYING

- (i) Contractor is instructed to carry out laying of cable as per specified depth and quantity mentioned in schedule with cable route marker as per specification & drawing at specified interval, failing which no payment will be made.
- (ii) In case of minor nature of works where shifting of cable is not required, in order to prevent damage to the cable, contractor shall take out the S&T or optical Fiber cable or Electrical cable carefully from the trench and place it properly alongside at a safe location before starting the earthwork under the supervision of SE/Sig. or SE/Tele or SE/Electrical (TRD or G). The cable shall be reburied soon after completion of excavation with proper care including placement of the brick over the cable under the supervision of S&T or Electrical supervisors. The contractor will go ahead with the shifting of cables as per the program decided.
- (iii) In case the cable is not executed as per approved plan, the penalty will be imposed for damages as under/ latest amount as authority decided time to time.:

Cable damaged	Penalty per location
Only Quad cable or Signalling cable	Rs. 1.0 Lakh
Only OFC	Rs. 1.25 Lakh
Both OFC & Quad	Rs. 1.5 Lakh
Electrical Cable	Rs. 1.0 Lakh

Necessary debit in this regard shall be raised on the department undertaking the work who shall in turn levy the penalty on the defaulting contractor. S&T department shall raise the debits in case of damage to OFC or Quad or Signalling cable and Electrical department shall raise the debits in case of damage to Electrical cable. (Authority: Railway Board's letter No. 2003/Tele/RCIL/1 Pt. IX dt. 24.06.13)

3.23.00 LIQUIDITY DAMAGE

For delay in completion of work liquidated damage will be governed by G.C.C. April 2022 Part II Para 17-B which is reproduced as under (with ACS-01 dtd 14/07/2022 or latest):

The time for the execution of the work or part of the works specified in the contract documents shall be deemed to be the essence of the contract and the works must be completed not later than the date(s) as specified in the contract. If the Contractor fails to complete the works within the time as specified in the contract for the reasons other than the reasons specified in Clause 17 and 17A of GCC, the Railway may, if satisfied that the works can be completed by the Contractor within reasonable short time thereafter, allow the Contractor for further extension of time (Proforma at Annexure-VII of GCC) as the Engineer may decide. On such extension the Railway will be entitled without prejudice to any other right and remedy available on that behalf, to recover from the

Contractor as agreed damages and not by way of penalty for each week or part of the week, a sum calculated at the rate of the Liquidated Damages as decided by Engineer, between 0.05% to 0.30% of Contract value of the works for each week or part of the work.

For the purpose of this Clause, the contract value of the works shall be taken as value of work as per contract agreement including any supplementary work order/contract agreement issued. Provided also, that the total amount of liquidated damages under this condition shall not exceed 5% of the contract value or of the total value of the item or groups of items of work for which a separate distinct completion period is specified in the contract. (i) For contract value up to Rs. 2 lakhs - 10% of the total value of the contract.

Provided further, that if the Railway is not satisfied that the works can be completed by the Contractor and in the event of failure on the part of the contractor to complete the work within further extension of time allowed as aforesaid, the Railway shall be entitled without prejudice to any other right or remedy available in that behalf, to appropriate the contractor's Security Deposit and rescind the contract under Clause 62 of these Conditions under GCC, whether or not actual damage is caused by such default.

NOTE:

In a contract, where extension(s) of time have been allowed once under clause 17B of GCC, further request(s) for extension of time under clause 17A of GCC can also be considered under exceptional circumstances. Such extension(s) of time under clause 17A shall be without any Liquidated damages, but the Liquidated damages already recovered during extension(s) of time granted previously under clause 17B shall not be waived. However, Price variation during such extension(s) shall be dealt as applicable for extension(s) of time under clause 17B of GCC.

3.24.00 PROVISION OF CONTRACT LABOUR ACT/RULES WILL BE APPLICABLE TO RAILWAY CONTRACTS.

Responsibility for payment of wages. -

- (1) Contractor shall be responsible for payment of wages to each worker employed by him as contract labour and such wages shall be paid before the expiry of such period as may be prescribed.
- (2) Every principal employer shall nominate a representative duly authorized by him to be present at the time of disbursement of wages by the contractor and it shall be the duty of such representative to certify the amounts paid as wages in such manner as may be prescribed.
- (3) It shall be the duty of the contractor to ensure the disbursement of wages in the presence of the authorized representative of the principal employer.

Registers and other records to be maintained. -

- (1) Every principal employer and every contractor shall maintain such registers and records giving such particulars of contract labour employed, the nature of work performed by the contract labour, the rates of wages paid to the contract labour and such other particulars in such form as may be prescribed.

Besides above, all provisions should be complied by the contractor.

- (2) Every principal employer and every contractor shall keep exhibited in such manner as may be prescribed within the premises of the establishment where the contract labour is employed, notices in the prescribed form containing particulars about the hours of work, nature of duty and such other information as may be prescribed.

CHAPTER – IV

TECHNICAL SPECIFICATION

1. GENERAL

The chapter deals with the details and specifications of the equipment, components and materials to works **Design, Supply, Erection, Testing and Commissioning of high speed (160kmph) 25 KV, 50 Hz, AC Single Phase OHE For Proposed New Ujjain Bypass Between Naikheri Station Chintaman Ganesh Station & Proposed New Nagda Bypass Between Rohalkhurd (Kota Division, WCR) - Bhatissuda (Ratlam Division) including Provision of new SSP, Modification of existing Feeding Post, and removal of infringements, in Connection With New Ujjain Bypass Line and new Nagda Bypass line Projects of Ratlam Division, Western Railway.** In general, based on the specifications issued by various bodies, such as Bureau of Indian Standards, British Standard Institution etc. Specifications have been issued by the Purchaser. Such specification may be brought separately from the office of the Purchaser. All these specifications are included in the set of drawings and specifications.

2. COMPLIANCE WITH STANDARD SPECIFICATION

In the technical specifications of equipment's, components and materials, reference is made to the following standard specifications:

- (i) International electro Technical Commission (abbreviated as IEC) publications.
- (ii) British Standards (abbreviated as BS)
- (iii) Bureau of Indian Standards (abbreviated as IS)

Tenderers may, however, offer equipment in accordance with the appropriate national standard specifications of the country of manufacture, but such offers will be treated as deviations and should be quoted for in the manner specified in Para 1.1.7 (d) English rendering of the text and illustrations of the national standard specifications and explanatory notes on the specific deviations from IEC, British Bureau of Indian Standard in question, shall also be submitted in form-3. In case of doubt, the Purchaser shall decide the clause and specification applicable and the contents of the specification and standard mentioned above shall guide such decisions.

3. TECHNICAL SPECIFICATIONS

The following specifications (as per version available as on date issue of LOA) will govern the supply and testing of important materials, components and equipment's: -

Structural Steel	IS 2062:2011 Grade E250(A/B) or latest.
Tensile Testing	IS:1731-1989 or latest IS:2004-1991 or latest IS:1608(part 1)-2018 For steel products etc.
Welding	IS:816-1969 or latest
Dropper Wire	IS:282-1982 or latest
Annealed Copper jumper Wire	IS:9968(PT.I):1988 or latest

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Al. jumper wire	IS:694-2010 or latest
Aluminium conductor	IS:398(PT.I)-1996 or latest
Material for Aluminium tubular busbar	IS:5082-1998 or latest.
Dimensions for Aluminium Tubular Busbar	IS:2673-2002 or latest
Galvanized stay strand	IS:2141-2000 or latest
PVC insulated cables	IS:1554(Part-I):1988 or latest
Tin bronze castings	IS:306-1997 or latest
Aluminium bronze castings	IS:3091-1999 or latest
Gray iron castings	IS:210-2009 or latest
Aluminium castings	IS:617-1994 or latest
Copper strip for formed fittings	IS:1897-2008 or latest
Cadmium copper conductor for overhead rly. traction	TI/SPC/OHE/CATY/0140 (with latest correction slips)
Copper Busbar	TI/SPC/OHE/BUSBAR/0050.
Steel tubes	TI/OHE/11 REV 2 (2026)
Hot dip galvanization of steel masts (Rolled and fabricated) tubes and fittings used on 25 KV A.C. OHE.	ETI/OHE/13(4/84) with A&C slip No.1 of (5/86) 2 of (4/90) & 3 of (4/90).
Stainless steel wire ropes	TI/SPC/OHE/WR/1060 with A&C slip no. 4
25 KV solid core insulator. For polluted zones (Composite)	TI/SPC/OHE/INSCOM/1070 or latest
25 KV single and double pole isolator.	TI/SPC/OHE/ISOLATOR/0210
Steel and stainless-steel Bolts, Nuts and washer.	TI/SPC/OHE/FASTNERS/0120 or latest
Aluminium Alloy Section and tube.	TI/SPC/OHE/ALPT/0020 or latest
enamelled steel plates	TI/SPC/OHE/NP/0030 or latest

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Galvanized steel wire	TI/SPC/OHE/GSTR/0160 or latest
Fittings for 25 KV 50 Hz AC traction equipment	TI/SPC/OHE/FITTINGS/0130 REV 1
25 KV AC 50 Hz Single pole outdoor Vacuum Interrupter.	TI/SPC/PSI/CB/0120 or latest
25 KV Potential Transformer	TI/SPC/PSI/PT/0210 with latest A&C slip.
25 KV drop out fuse switch & operating pole for use with 10 KVA	TI/SPC/PSI/DOFUSE/0130 or latest
25 KV/230 V LT supply transformer	TI/SPC/PSI/LTSF/0150 or latest
Metal Oxide Gapless Type Lightning Arrestor use on 25 KV side or latest	TI/SPC/PSI/MOGTLA/0101 or latest
3-pulley type Regulating equipment (3:1)	TI/SPC/OHE/ATD/0060(8/06) with A&C slip No.1 & 2 91/2013
110 V 40 AH battery charger	TI/SPC/PSI/CHGR/0170
Bimetallic (Al-Cu) strip	ETI/OHE/55 (4/90) or latest

4. NOMENCLATURE AND MARKING

- (a) All components and fittings supplied by the Contractor's shall bear the respective identification number and a mark to identify the source of supply except in the case of galvanized tubes, bolts & nuts and/or any other fittings as may be agreed to by the Purchaser.
- (b) In case of insulators, galvanized steel tubes, stainless steel wire rope and conductors, name of manufacturer shall be specified in "As Erected" drawings for identification.

5. STEEL WORK AND PROTECTION AGAINST RUST

(a) GALVANISING

All ferrous materials and fittings shall be hot dip galvanized according to the specification ETI/OHE/13 (4/84) with A&C slip No.1 of 5/86), 2 of (4/90) & 3 of (4/90).

(b) PAINTING

Some components or parts may, with the approval of the Purchaser, be protected only by paint and parts so protected shall be given two coats of composite Aluminium primer and two coats of Aluminium paints. The second coat of Aluminium paint shall be applied after erection.

(c) RECTIFICATION AT SITE

In case of modification which would damage the protective coat, repairs to such damage would be allowed only in exceptional circumstance. the part damaged shall be protected in accordance with the method indicated in specification ETI/OHE/12 (4/84) with A&C slip No.1 of (5/86), 2 of (4/90) & 3 of (4/90) or any other method approved by the Purchaser. The contractor shall in all such obtain prior permission from the Purchaser before carrying out repairs.

6. BRACKET ASSEMBLY COMPONENTS(a) BRACKET

Bracket tubes shall be of seamless cold drawn or electric resistance weld steel complying with ETI/OHE/11 (5/89) with an insulator near the support. The length of the tubes shall be such that their use a free length of about 200 mm beyond the catenary suspension bracket. To facilitate adjustment during track maintenance.

(b) TUBULAR STAY ARM

Steel tubes with adjustable steel rods shall be used for tubular stay arm of all bracket's assemblies.

(c) REGISTER ARM

The register arm shall also be electrical resistance weld or cold drawn steel tubes or proper dimensions duly formed. It shall be suspended by a dropper from the catenary suspension clamp/bracket tube. A hook and eye arrangement shall be used at the bracket end to permit free movement in every direction.

(d) STEADY ARM

Steady arm shall normally be fitted in all assembly for overhead equipment in running. The steady arm shall be of light alloy BFB section arranged to work always in tension in accordance with ETI/OHE/21(9/74). Steady arms of secondary tracks may be off solid galvanized steel rodding.

The contact wire shall be fixed by a simple swivel clip without threaded parts. Steady arms shall normally be 1.0 m long but for special locations such as turnouts, diamond crossing etc.

7. DROPPERS(a) GENERALS DESIGNS

The droppers shall generally be designed as shown in standard drawings and made of copper wire about 5 mm diameter conforming to IS: 282:1982 and shall be attached to the catenary wire by a copper dropper clip. the contact wire shall be held by a clip of aluminium bronze as shown in the standard drawings. The distribution of dropper shall be in accordance with standard design.

(b) LOADING

The droppers shall be able to withstand a vertical load of 200 kg at the point of attachment to the contact wire and the clip shall not slide under a horizontal load of 120 Kgf.

(c) The permissible tolerance in the overall length of a dropper will be +/- 5 mm.

8. INSULATORS

(a) All insulators except those on return conductors and earth wires shall be of the solid core type. Disc insulators shall be used on return conductors and earth wires or other locations

as desired by the Purchaser. All solid core insulators shall conform to TI/SPC/OHE/INS/0070(04/07). Before erection all types of insulators to be tested jointly with open line staff.

(b) INTER-CHANGEABILITY

For free inter-changeability, only the following types of insulators shall be used. While the shapes of the insulators may vary slightly from those shown in the drawings, the essential dimension of the galvanized malleable cast iron caps as given in standard drawings shall be adopted.

- (i) **Stay arm Insulators** : These insulators will be used in connection with the tubular stay arm of all bracket assemblies.
- (ii) **Bracket Insulators** : These will be used at the base of each bracket assembly in conjunction with bracket tubes.
- (iii) **9-Tonne Insulators** : These will be used at all places for cut-in and terminal insulation including those in return conductors, but excluding those in earth wire.
- (iv) **Solid core post Insulators** : These will be used at all places for supporting isolators mechanisms, bus-bars, jumpers etc of 25 KV

9. ENDING FITTINGS AND SPLICE

(a) GENERAL DESIGNS

Terminating or ending fittings and splices on copper conductor shall be of the cone type clamping on both the inner and outer strands of conductor except for contract wire ending clamps which may be wedge type. The arrangement shall be easy to install and also be such as would apply the clamping pressure gradually without shock (See ETI/OHE/49 (9/95) with A&C slip No.1 of (3/97), 2 of (10/10) for aluminium Alloy/conductor, the end fittings shall be either cone type, strain clamp type or any other type as approved by the Purchaser.

(b) LOADING

All the parts shall be capable of withstanding without damage, a load greater than the ultimate strength of the wires to which they are fitted. In the case of thread, no damage shall occur when they are subjected to a load equal to two third of the ultimate strength of the wires.

(c) STRENGTH OF ASSEMBLED FITTINGS

The strength of fittings assembled with appropriate conductors or wire shall be not less than that of the conductor or wire itself.

(e) ADDITIONAL TERMINATING WIRES

Cadmium copper stranded wire of 65 sq. mm nominal section or 37/2.1 mm (as used head span construction) may be used as additional terminating wires for extending single and double conductors respectively, if termination at the nearest structure is not feasible.

10. ELECTRICAL CONNECTIONS FOR OHE

(a) GENERAL DESIGNS

All electrical connections between conductors shall be made by parallel clamps. The general arrangement of connections is as shown in the standard drawings. Further, latest HQ Guidelines including TC-127 (placed at annexure-I) shall be followed wherever applicable. Provision of Large-size modified double bolted PG clamps at all G-jumper connections to ensure better electrical continuity and mechanical strength (As per Annexure-I). Further, Provision of Three (03) PG clamps, instead of two (02 on G-jumpers, F jumper, ATJ Jumpers and isolator jumpers) to ensure firm connections and Provision of Double G-Jumper at the first Sub-sector to enhance current carrying reliability (as per Annexure-I).

(b) JUMPERS

Copper jumpers shall be of any of the followings:

- (i) Large jumpers of annealed copper in accordance with specification ETI/OHE/3 (2/94) with A&C slip No.1 of (4/95).
- (ii) Small jumper of annealed copper in accordance with the specification IS:9968(PT:2)-1981.

Aluminium jumpers wherever used, shall be of all Aluminium stranded conductor 19/7/1.4mm bare 3/4.11 H generally conforming to IS:8130:1984.

(c) FEEDERS

Feeders shall be of all 37/2.25mm HDBC (150sq.mm)

11. TERMINAL CONNECTORS FOR EQUIPMENTS

Interrupter and L.T. Supply Transformer shall be supplied by the Contractor along with the terminal connectors suitable for taking jumper/bus-bar as required including ALCU strips for bimetallic connections wherever required. The ALCU strips required for the connection of Booster Transformers shall also be provided by the Contractor.

12. REGULATING EQUIPMENT

(a) GENERAL

The regulating equipment should have a minimum adjustment range of 950 mm. Stainless steel wire rope in accordance with TI/SPC/OHE/WR/1060(06/06 A&C slip No.1 of (5/07) shall be used in these equipment's and these shall be sufficiently.

(b) COUNTER WEIGHT

Counter weights and arrangements used shall be such that these could be accommodated within 330 mm (13 inches) measured transverse to the track under the worst conditions of wind. The vertical upward movement shall be limited with affixed top.

(c) REDUCTION RATIO

Reduction ratio in the arrangement used shall be five for winch type and three in case of three pulley type.

13. HEADSPAN CONSTRUCTION

(a) SIZE AND FACTORS OF SAFETY

All span wires used in head-span construction shall be of stranded cadmium copper conductor 65 sq mm or 130 sq mm cross section. All the wires shall be designed with a factor of safety of not less than 4 under the most un-favorable conditions.

(b) TURN BUCKLES

Each span wire shall be equipped with a turn buckle at each end of the span.

(c) ADDITIONAL INSULATORS

Additional insulators shall be provided as necessary in head span, cross span and stay span, wires to ensure electrical independence between the equipment in different elementary electrical sections.

14. ISOLATORS

25 KV Isolators switches shall comply with specifications as indicated in para 2.4.9.

15. INSULATION LEVEL

Interrupters, Potential Transformers line indication type, 42 KV Lightning Arrestors and other equipment's shall be suitable for insulation levels indicated in the relevant specifications.

16. BUSBARS

- (a) No splicing will normally be allowed in the tubular bus-bar unless the length of the bus-bar exceeds 6m.

(b) GENERAL

The bus-bar shall be clean, smooth, mechanically sound and free from surface and other defects. Provisions shall be made where necessary to allow for expansion and contraction

of bus- bars caused by temperature variation. The open ends of bus-bars shall be covered by suitable tube caps, wherever the tubular bus-bars are required to be bent, the radius of the bend shall be not less than 200 mm.

JOINTS

- (c) The joints in bus-bars shall be mechanically and electrically sound so that the temperature under normal working condition does not exceed 40-degree C for an ambient temperature of 65-degree C.
- (d) All Aluminium joints shall be thoroughly cleaned and smeared with suitable oxidation inhibiting joint compound before and after assembling the joint similar procedure shall be followed for connecting the equipment terminals to the Aluminium bus-bars with bi-metallic connectors.

17. CABLING

(a) CABLE FOR L.T. SUPPLY

240 V A.C. supply from L.T. supply transformer at switching stations shall be brought and terminated on the I.T.A.C. distribution board in the remote-control cubicles at the switching stations by 1100 Volt 25 sq. mm. aluminium two-core PVC insulated PVC sheathed and steel armoured heavy duty cable conforming to IS:1554 (Part-I):1998.

(b) CONTROL AND INDICATIONS CIRCUITS

All other cables for control and indication at switching stations shall be 110 V grade PVC insulated and sheathed un-armoured (heavy duty) complying with IS:1554 (Part-I)-1988. The cables shall be provided as indicated in the Table below: -

Purpose	Run	Circuit Voltage	Core size &Material	No. OF CORES
Control and Indication of interrupters.	From each Interrupter to terminal board	110V/D.C	2.5 sq. mm copper	7
Catenary indication	From each PT line indication type to terminal Board.	100 V/ A.C	-- do --	2
Heater supply for interrupter control mechanism cabinet.	i) From interrupter to interrupter	240 V/ A.C	4.0 sq. mm Aluminium	2
	ii) From each interrupter to fuse box.	-- do --	-- do --	2
	iii) From fuse box to distribution Board.	-- do --	-- do --	2
Battery supply 110 V	i) 110 V Battery charger to Battery.	110V D.C	2.5 sq. mm copper	2
	ii) 110 V Battery to D.C. fuse box.	-- do --	-- do --	2
	iii) 15 a DC fuse box to terminal board.	-- do --	-- do --	2

(c) SPECIFICATION

The cables shall be resistance to delay, abrasion, acids, alkalis and other corrosive materials. All indoor wiring on walls shall be clamped neatly on teak wood battens fixed to the wall by means of wall plugs/wooden pegs. The cable run layout at typical switching stations is shown in the relevant drawing.

18. LITERATURE FOR EQUIPMENT

The Contractor shall within six months of issue of Letter of Acceptance of Tender, supply 25 copies of detailed schedule, catalogues and drawings of all parts of the equipment.

19. DESIGN STANDARDS

The Railway Project including Project Facilities shall conform to design requirements set out in the following documents:

List of Standards:

Sr. No.	Description
1	Indian Railway Code, for the Engineering Department
2	Indian Railway Permanent Way Manual
3	Indian Railway Works Manual
4	Rules for the opening of a Railway for the Public Carriage of passengers
5	General & Subsidiary Rules, Pt.- I & II
6	Schedule of Dimensions
7	Manual of Instruction of fabrication, installation and maintenance of glued insulated rail joint
8	Code of practice for Flash Butt Welding of rails
9	Code of practice for welding of rail joints by Alumino Thermit Process
10	Indian Railway Bridge Manual
11	IRS Concrete Bridge Code
12	IRS Code of practice for the design of substructures and foundation of bridges
13	Bridge Rule 1964
14	IRS Specification (IRS B-1 and BS-110), BS -111
15	IS:1786-1985, Specification for high strength deformed steel bars and wires for concrete reinforcement
16	IS:875 (Part 1 to 5) Code of Practice for Wind loads
17	IS:456-2000, Plain and reinforced concrete code of practice
18	IS:383-1970, Specification for coarse & fine aggregates for concrete
19	IS:269-1989, Ordinary Portland Cement 33 grade specification
20	IS:8112-1989, 43 Grade Ordinary Portland Cement
21	IS:12269-1987, Specification for 53 Grade Ordinary Portland Cement
22	IS:516-1959, Method of testing for strength of cement
23	IS:1383-1980, Code of practice for prestressed concrete
24	IS:1948-1970, Classification & Identification of soils for general engineering purposes
25	IS: 226 or IS: 2062 (2011) (GR-A) "Hot Rolled Medium and High Tensile Structural steel".
26	Comprehensive guidelines and Specifications for Railway Formation specification No. RDSO/2020/GE: IRS-0004, Sept.-2020

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27	IRS: Code of practice for plain, reinforced & prestressed concrete for General Bridge Construction
28	RDSO Station Manual on Indian Railway
29	IS:800-1984, Code of practice for General construction in Steel
30	USFD Manual
31	Codes, Indian Railways Standard for Bridges, structures and other subjects
32	Signal Engineering Manual Part-I
33	Signal Engineering Manual Part-II
34	ACTM Volume - I & II with latest ACS
35	Indian Railway Electricity Rules
36	Indian Railway Standard Code of Practice for The Design of Steel or Wrought Iron Bridges Carrying Rail, Road or Pedestrian Traffic (Steel Bridge Code) Adopted –1941 with latest correction slips
37	IS:808 Dimensions for hot rolled steel, Beam, Column and channel Section.
38	IS: 813 (1986) or its latest version “Scheme of Indian standard of symbols for welding”
39	IS: 802 (1995) or its latest version “Use of structural steel in overhead transmission line towers – code of practice”.
40	EN: 50119 “Fixed Installation-Electric Traction Overhead Contact lines”.
41	IS: 1080 latest version “Code of practice for design and construction of shallow foundation”.
42	IS: 2720 latest version “Method of test of Soil”.
43	IS: 2911 latest version “Design and construction of pile foundations — code of practice”.
45	IS: 1904 latest version “Code of practice for design and construction of foundation requirement”.
46	IS: 6403 latest version “Code for determination of bearing capacity of soil”.
47	IS: 4091 (2011) “Code of Practice for Design and Construction of Foundations for Transmission Line Towers and Poles”.
48	TI/IN/0035 “Instruction for testing of OHE structure’s foundation” issued by RDSO.
49	Design Manual for Electric Traction Vol.-III Traction Over Head Equipment (RITES).
50	TI/DRG/CIV/ES/RDSO/00001/23/0 or latest: Design manual and employment schedule for OHE masts of sheet no. 01 to 18 for high speed OHE.
51	TI/DRG/OHE/DROP/00007/18/0 & TI/DRG/OHE/DROP/00001/20/0 or latest: Design manual and employment schedule for OHE dropper work for High speed OHE.
52	MI no. TI/IN/0059: DRG ETI/OHE/G/05516 REV A: “Instruction for isolator jumper of 160sq. mm to be use at OHE work.
53	MI no. TI/IN/0059: DRG ETI/OHE/G/05102 REV C: “Instruction for G jumper of 105sq. mm & 160sq. mm to be use at OHE work.
54	Reliability Action plans and TC-127 vide HQ letter no. EL: 94/15/1 dtd. 23.03.2026.
55	BS-121: Guidelines For Provisions of OHE Mast For Electrification At New And Existing Bridge Pier/Abutment.

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56	RDSO Instruction No. TI/IN/0042 with latest amendments- OHE guideline for Increasing Speed Potential to 160kmph.
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20. GALVANIZATION OF ALL STEEL WORKS

Steel structure for outdoor, TSS, SSP, AT (if any), SP/SSP's and those required for support of Overhead equipments, all small part steelworks (SPS) shall be hot deep galvanized as per RDOS's specifications no. ETI/OHE/13 (4/84) A&C-4 or latest. For all regions in WR (unless otherwise stated) the uniform zinc coating shall be adopted as under:

S. No.	Items	Zinc Coating for all areas of WR
1	Steel Structure, SPS and other galvanized items with more than 5mm thickness	1000 gm/sqm
2	Structural tubes	800 gm/sqm
3	Steel components with less than 5mm thickness	460 gm/sqm
4	All Traction bonds	750 gm/sqm

SPECIAL CONDITION OF CONTRACT

(1) The cable shall have to be laid in the ground as well as through the spun concrete pipe as per track crossings regulation s 1987. IE Rules IE - Act wherever applicable. Specification of cable laying enclosed.

(2) The overhead crossings shall have to be modified by laying underground cable. Two lengths of cable for each crossing shall have to be laid and the cable shall be terminated by cable end termination and the connection with the overhead shall be done by the contract. The locations of the crossings indicating KM have been enclosed.

(3) The tenderer should inspect the site of various locations before quoting the rates and should acquaint themselves with the scope of work, method of execution and approach roads which are leading to the locations so that no difficulty is experienced at the time of execution of the work.

(4) No joints shall be permitted in the cable of the crossings span.

(5) Tenderer should have his own permanent establishment/ independent office and should have experience in executing similar type of works, in any of the Government organization, for which he should submit his credentials, certificate of completion of work.

(6) During the execution of the work, the contractor shall have to observe utmost safety while carrying out digging and laying work of the cable, all the work shall be executed in the presence of Railway Representative. If any damages are done by the contractor's labour during digging, then the loss shall be borne by the contractor.

(7) The contractor should ensure that during the execution of work, either he himself is present at the site or his responsible engineer should always remain present at site Co-ordination shall be maintained with this office for day-to-day planning and execution of the work, which is to be completed within the targeted period.

(8) The tenderer should fully understand that the work is a targeted work. This work is to be completed well before the target as such every care shall have to be taken to maintain the completion period.

(9) The contractor shall have to make his own arrangement for transportation of materials and keep all materials safely at his own depot at site, tools, labour etc. at site for the execution of the work.

(10) Contractor shall have to execute all works in accordance with latest IE rules and Track crossing regulations.

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- (11) All materials should be complying with latest RDSO/CORE specifications and suitable for 65 sq.mm catenary and 107 sq.mm contact wire and SMI/MI&TCs.
- (12) The tenderer should inspect the site of various locations before quoting the rates and should acquaint himself with the scope of work, method of execution and approach roads which are leading to the locations so that no difficulty is experienced at the time of execution of the work.
- (13) Tenderer should have his own permanent establishment/ independent office and should have experience in executing similar type of works, in any of the Government organization, for which he should submit his credentials, certificate of completion of work.
- (14) During the execution of the work, the contractor shall have to observe utmost safety while carrying out digging and laying work of the cable, all the work shall be executed in the presence of Railway Representative. If any damages are done by the contractor's labour during digging, then the loss shall be borne by the contractor.
- (15) The contractor should ensure that during the execution of work, either he himself is present at the site or his responsible engineer should always remain present at site Co-ordination shall be maintained with this office for day-to-day planning and execution of the work, which is to be completed within the targeted period.
- (16) The tenderer should fully understand that the G.C. work is a targeted work. This work is to be completed well before the target as such every care shall have to be taken to maintain the completion period.
- (17) The contractor shall have to make his own arrangement for transportation of materials and keep all materials safely at his own depot at site, tools, labour etc at site for the execution of the work.
- (18) Contractor shall have to execute all works in accordance with latest RDSO/IE rules and Track crossing regulations.

All materials should be complying with latest RDSO/CORE specifications and SMI/MI&TCs.

Chapter V**SCHEDULE AND EXPLANATORY NOTE**

Name of Work: Design, Supply, Erection, Testing and Commissioning of high speed (160kmph) 25 KV, 50 Hz, AC Single Phase OHE For Proposed New Ujjain Bypass Between Naikheri Station Chintaman Ganesh Station & Proposed New Nagda Bypass Between Rohalkhurd (Kota Division, WCR) - Bhatiusuda (Ratlam Division) including Provision of new SSP, Modification of existing Feeding Post, and removal of infringements, in Connection With New Ujjain Bypass Line and new Nagda Bypass line Projects of Ratlam Division, Western Railway.

S.NO.		DECEIPTION OF WORK	UNIT	QTY	UNIT RATE	TOTAL
SCHEDULE A - EARTH WORK AND FOUNDATION						
1.	A1	Concrete for foundation and plinth in all type of soil incl. hard/rocky soil (incl. excavation and supply of all materials viz., sand, cement, and ballast etc.)	Cu.m	2931	5948.00	1,74,33,588.00
2.	A2	Reinforced concrete for foundation & trench	Cu.m	28	8948.00	2,50,544.00
3.	A3	Reinforced concrete for cable trench covers.	Sq.m	21	2142.00	44,982.00
4.	A4	Supply, spreading and levelling of 20mm down graded ballast, padding 150mm	Cu.m	95	1444.00	1,37,180.00
5.	A5	Construction of RCC brick baffle wall complete with Plastering	Cu.m	11	4875.00	53,625.00
SCHEDULE B - FERROUS & STEEL WORK						
6.	B1	Supply of rolled or fabricated and galvanized traction mast, TTC, Portal with boom, AT masts, Feeder mast, Tower gantries, supporting structures etc.	MT	267	108415.00	2,89,46,805.00
7.	B2	Supply of fabricated and galvanized steel works other than traction mast, TTC, portals etc. (SPS)	MT	30	109035.00	32,71,050.00
8.	B3.1	Supply & erection of single cantilever assembly complete with insulator for conventional OHE and inside the tunnel	Each	595	20,360.00	1,21,14,200.00
9.	B4	Supply of pull-off arrangement for OHE	Each	18	15675.00	2,82,150.00
10.	B5	Supply of guy rod assembly	Each	129	8507.00	10,97,403.00
11.	B7	Supply of all types of GI bonds (40 X 6 mm)	Each	978	1058.00	10,34,724.00
12.	B8	Supply of Earth electrode	Each	28	4175.00	1,16,900.00
13.	B9	Supply of GI flat for earth (50 X 6 mm)	Meter	240	188.00	45,120.00
14.	B10	Supply of Fencing upright	MT	0.5	67725.00	33,862.50
15.	B11	Supply of fencing panel as per RDSO approved drawing	Meter	50	2738.00	1,36,900.00
16.	B12	Supply of material i.e Three Pulley, SS rope and Tie rods etc. for modification in regulating equipment (ATD) for 2400kgf Tension as per RDSO specification no. TI/SPC/OHE/ 3PHTAD/0150 with latest ACS.	Each	4	11009.00	44,036.00
17.	B13	Supply of regulating equipment (5 pulley type) with counter weight assembly for regulated OHE with 2400kgf tension.	Each	48	103056.75	49,46,724.00
18.	B14	Supply of 20mm dia. galvanized steel conductor as per RDSO drg.	KM	2	26211.00	52,422.00
19.	B15	Supply of 50 mm GI pipe N.B.	Meter	22	387.60	8,527.20
20.	B16	Supply of MS, C class column pipe	Meter	22	551.16	12,125.52
21.	B17	Supply of Bridge mast Bolt	Each	32	1946.50	62,288.00
22.	B18	Supply of Antibird disc on insulator end fitting	Each	540	573.48	3,09,676.50
23.	B19	Supply of Anti Monkey climbing device (AMCD) as Monkey Scare for mast	Each	302	5434.21	16,41,131.42
24.	B20	Supply of Anti Monkey climbing device as Monkey Scare for Portal	Each	32	7260.00	2,32,320.00
25.	B21	Supply of nylon/plastic net - High density polyethylene (HDPE) monofilament netting type III, UV stabilized as per IS 16008(part-2)-2016/PVC virgin HDPE Net preferably in black colour.	Sq. meter	2112	93.57	1,97,619.84

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26.	B22	Supply of All Aluminium spider conductor of size 234Sq.mm. as per explanatory note	Meter	3300	147.00	4,85,100.00
27.	B23	Supply of 12.24 mm Dia ACSR Raccoon with mast fitting as per RDSO Drg. No. TI/DRG/OHE/ERBOND/RDSO/ 00001/11/0	Meter	3300	141.60	4,67,280.00
SCHEDULE C - SWITCH GEAR, INSULATORS AND OTHER ITEMS						
28.	C1A	Supply, erection, testing and commissioning 25 KV vacuum SINGLE pole type interrupter	Each	1	410962.00	4,10,962.00
29.	C1B	Supply of 1x25 kV single pole Vacuum Circuit Breaker	Each	1	693959.00	6,93,959.00
30.	C2	Supply of 25 KV double pole isolator with interlocking mechanism.	Each	2	131887.00	2,63,774.00
31.	C3	Supply of 25KV single pole, 1600A isolator	Each	10	79206.00	7,92,060.00
32.	C4	Supply of PTFE short Neutral section	Each	2	966045.00	19,32,090.00
33.	C5	Supply of materials for termination of double conductor (including supply of 9 t cut-in insulator) of overhead equipment.	Each	49	14947.00	7,32,403.00
34.	C6	Supply of materials for termination of single conductor (including supply of 9 t cut-in insulator) of overhead equipment.	Each	33	9350.00	3,08,550.00
35.	C7	Supply of section insulator assembly including core and cut-in insulator	Each	9	55928.00	5,03,352.00
36.	C8	Supply of 25KV solid core cut-in insulator	Each	24	6048.67	1,45,168.00
37.	C9	Supply of 25KV solid core suspension insulator	Each	16	5780.00	92,480.00
38.	C10	Supply of 25KV post insulator	Each	25	8378.67	2,09,466.67
39.	C11	Supply of 10 KVA Change over panel as per RDSO spec. suitable for 10 KVA AT supply	Each	2	31412.00	62,824.00
40.	C12	Supply of terminal board in control cubicle.	Each	1	2066.00	2,066.00
41.	C13	Supply of 110V DC distribution board.	Each	1	26129.00	26,129.00
42.	C14	Supply of 230V AC distribution board.	Each	1	60457.00	60,457.00
43.	C15A	Supply of PT Type-II	Each	2	80871.00	1,61,742.00
44.	C15B	Supply of PT Type-I	Each	1	75401.00	75,401.00
45.	C17	Supply of 110V, 40 AH, Lead Acid Batteries.	Set	1	94811.00	94,811.00
46.	C18	Supply of Battery Chargers for 110V, 40AH, Lead Acid Batteries	Each	1	97983.00	97,983.00
47.	C19	Supply of Auxiliary Transformer 25 kV/230 V, 10 KVA with DO fuse assembly, LV box & Anti climbing device	Each	3	84904.00	2,54,712.00
48.	C20	Supply of Lightning arrestor for 25 KV OHE.	Each	4	42624.00	1,70,496.00
49.	C21	Supply of Station Equipments at SP/SSP as per RDSO Spec. No. TI/RCC/ SCADA/0134 (or latest).	Each	1	1500000.00	15,00,000.00
50.	C22	Supply of 50/39 mm aluminium bus bar.	Meter	165	621.00	1,02,465.00
51.	C23	Supply of all types of aluminium bus bar terminal assembly, splice and connectors for 50mm bus bar.	Each	22	2296.00	50,512.00
52.	C24	Supply of All Aluminium spider conductor of size 234 Sq.mm. as per explanatory note	Meter	1210	147.00	1,77,870.00
53.	C25	Supply of 12.24 mm dia. ACSR Raccoon with mast fitting as per RDSO Drg. No. TI/DRG/OHE/ERBOND/RDSO/ 00001/ 11/0	Meter	1800	141.60	2,54,880.00
54.	C26	Supply of Auxiliary transformer 25kV/230V, 25KVA capacity with DO fuse assembly, LV box & Anticlimbing Device	Each	1	235882.00	2,35,882.00
55.	C27	Supply of Change over panel (CLS) as per RDSO spec. suitable for 25 KVA AT supply	Each	1	123673.00	1,23,673.00
56.	C28	Supply of 25KV Current Transformer	Each	2	111677.00	2,23,354.00
SCHEDULE D - COPPER ITEMS AND CABLES						
57.	D1	Supply of overhead equipment excluding catenary & contact wire. Scope includes supply of number plates & various types of caution & other boards including shock treatment chart etc.	TKM	28.6	306863.00	87,76,281.80
58.	D2	Supply of Catenary wire splice Over & above as required for item D1	Each	5	450.00	2,250.00

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59.	D3	Supply of Contact wire splice over & above as required for item D1	Each	5	1156.00	5,780.00
60.	D4	Supply of 10 x 2.5 Sq.mm PVC insulated stranded copper cable for control and indication of interrupters.	Meter	450	165.00	74,250.00
61.	D5	Supply of 2x2.5 Sq.mm PVC insulated stranded copper cable for catenary indication.	Meter	250	50.00	12,500.00
62.	D6	Supply of 2x4 Sq.mm PVC insulated stranded copper cable for heater supply.	Meter	250	57.00	14,250.00
63.	D7	Supply installation of PVC insulated and sheathed copper unarmoured cable size 7 core 2.5 sq. mm.	Meter	50	130.00	6,500.00
64.	D8	Supply of copper strip for earthing (25mm x 3mm)	Meter	150	644.00	96,600.00
65.	D9	Supply of Solid copper busbar 18mm	Meter	126	2206.00	2,77,956.00
66.	D10	Supply of solid copper bus bar terminals	Each	30	2345.00	70,350.00
67.	D11	Supply of solid copper bus bar connectors bus splice	Each	26	2587.00	67,262.00
SCHEDULE E - ERECTION						
68.	E1	Preparation all drawing and design for overhead equipment including preparation of pre pegging, pegging and OHE layout plan	TKM	28.214	15382.00	4,33,987.75
69.	E2	Preparation of design and drawing of switching stations	Each	2	48491.00	96,982.00
70.	E3	Erection of rolled or fabricated and galvanized traction mast and auxiliary transformer masts, TTC and portals	MT	267	6786.00	18,11,862.00
71.	E4	Erection of fabricated and galvanized steel works other than traction mast (SPS)	MT	32	6669.00	2,13,408.00
72.	E6	Erection of pull-off arrangement for OHE	Each	18	1237.00	22,266.00
73.	E7	Erection of guy rod assembly	Each	129	1490.00	1,92,210.00
74.	E9	Erection of all types of GI bonds	Each	978	266.00	2,60,148.00
75.	E10	Erection of Earth electrode	Each	28	1513.00	42,364.00
76.	E11	Erection of MS flat for earth (50mmx6mm) laid in ground/exposed	Mtr	240	64.00	15,360.00
77.	E12	Erection of Fencing upright	MT	0.5	6835.00	3,417.50
78.	E13	Erection of fencing panel	Meter	50	167.00	8,350.00
79.	E14A	Erection, testing and commissioning of 25 kV vacuum Interrupter	Each	1	12478.00	12,478.00
80.	E14B	Erection, testing and commissioning of 1x25 kV vacuum Circuit Breaker	Each	1	11872.00	11,872.00
81.	E15	Erection of material i.e Three Pulley, SS rope and Tie rod sets. for modification in regulating equipment (ATD) for 2400kgf Tension as per RDSO specification no. TI/SPC/OHE/ 3PHTAD/0150 with latest ACS.	Each	4	1101.00	4,404.00
82.	E16	Erection of regulating equipment (3/5 pulley type) with counter weight assembly for conventional OHE (regulated) 2400kgf tension.	Each	48	8553.00	4,10,544.00
83.	E17	Erection of 20mm Dia galvanized steel conductor as per RDSO drg.	kM	2	1311.00	2,622.00
84.	E18	Supply and erection of Tee connector for BEC end and lug for connection	Each	34	1330.00	45,220.00
85.	E19	E, T & C of 50 mm GI pipe N.B.	Meter	22	14.26	313.79
86.	E20	E, T & C of RCC pipe NP-4 150 mm	Nos.	22	65.35	1,437.62
87.	E21	Erection of 25 KV double pole isolator with interlocking mechanism	Each	2	9181.00	18,362.00
88.	E22	Erection of 25KV single pole isolator without earth contact assembly	Each	10	4568.00	45,680.00
89.	E23	Erection PTFE Short Neutral section	Each	2	6702.00	13,404.00
90.	E24	Erection of materials for termination of Single/double conductor (including supply of cut-in insulator) of overhead equipment.	Each	49	1435.00	70,315.00
91.	E25	Erection of anti-creep with 9T insulator over & above as incl. in E34	Each	20	3886.00	77,720.00
92.	E26	Erection of section insulator assembly including core and cut-in insulator	Each	9	5947.00	53,523.00

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93.	E27	Erection 25KV solid core cut-in insulator	Each	24	906.67	21,760.00
94.	E28	Erection of 25KV solid core suspension insulator	Each	16	1063.00	17,008.00
95.	E29	Erection of 25KV Post/Support insulator	Each	25	849.00	21,225.00
96.	E30	Erection of 10 KVA Change over panel as per RDSO spec. suitable for 10 KVA AT supply	Each	2	3109.00	6,218.00
97.	E31	Erection of terminal board in control cubicle.	Each	1	56.00	56.00
98.	E32	Erection of 110V DC distribution board.	Each	1	1002.00	1,002.00
99.	E33	Erection of 230V AC distribution board.	Each	1	564.00	564.00
100.	E34	Erection of PT Type-II	Each	2	2496.00	4,992.00
101.	E35	Erection of PT Type-I	Each	1	2093.00	2,093.00
102.	E36	Erection of 110V, 40AH lead acid battery charger.	Each	1	9845.00	9,845.00
103.	E37	Erection of 110V lead acid, 40 AH battery	Each	1	1507.00	1,507.00
104.	E38	Erection & commissioning of auxiliary transformer 10KVA including DO fuse assembly, LV box & anti climbing device	Each	3	6186.00	18,558.00
105.	E39	Erection of Lightning arrestor 42 KV	Each	4	1395.00	5,580.00
106.	E40	Erection, testing & commissioning of Station Equipments at SP/SSP as per RDSO Spec. No. TI/RCC/ SCADA/0134 (or latest)	Each	1	150000.00	1,50,000.00
107.	E41	Modification in existing standard SCADA for Integration of SP/SSP RTU	LS	1	200000.00	2,00,000.00
108.	E42	Erection of overhead equipment, including catenary, contact, jumper and dropper wires, fixing of number plates & various type of boards	TKM	28.6	64108.00	18,33,488.80
109.	E43	Transportation & laying of 10X2.5/2X2.5/2X4 Sq.mm PVC insulated stranded copper cable for control and indication	Meter	1000	15.00	15,000.00
110.	E44	Transportation & laying of 2x70/150 Sq.mm PVC insulated stranded aluminium cable from AT to DB	Meter	3150	48.00	1,51,200.00
111.	E45	Erection of copper strip for earthing. (25 x 3mm)	Each	160	341.57	54,650.40
112.	E46	Erection of 150 sq. mm copper feeder wire.	Meter	2608	33.00	86,064.00
113.	E47	Erection of 50/39mm aluminium bus bar.	Meter	165	206.00	33,990.00
114.	E48	Erection of all types of aluminium bus bar terminal assembly, splice and connectors for 50mm bus bar.	Each	22	73.00	1,606.00
115.	E49	Erection of All Aluminium spider conductor of size 234Sq.mm. as per explanatory note	Meter	3300	15.00	49,500.00
116.	E50	Erection of 12.24 mm Dia ACSR Raccoon with mast fitting as per RDSO Drg. No. TI/DRG/OHE/ERBOND/RDSO/ 00001/11/0	Meter	3300	55.64	183612
117.	E51	Erection of Solid copper busbar 18mm	Meter	126	92.00	11,592.00
118.	E52	Erection of solid copper bus bar terminals	Each	30	41.00	1,230.00
119.	E53	Erection of solid copper bus bar connectors bus splice	Each	26	41.00	1,066.00
120.	E54	Erection and commissioning of Auxiliary transformer 25kV/230V, 25KVA capacity with DO fuse assembly, LV box & Anticlimbing Device	Each	1	12348.00	12,348.00
121.	E55	Erection of Change over panel (CLS) as per RDSO spec. suitable for 25 KVA AT supply	Each	1	13659.00	13,659.00
122.	E57	Transfer of OHE from one support to another and adjustment of droppers	Nos	20	4763.00	95,260.00
123.	E58	Providing (Supply with erection) of anticlimbing device for SSP/SP	Mtr.	50	281.00	14,050.00
124.	E59	Dismantling & removal of OHE complete with cantilever, droppers, contact & catenary wire etc.	Km	3	36873.00	1,10,619.00
125.	E60	Dismantling & removal of Auxiliary transformer with DO fuse	Each	2	4112.00	8,224.00
126.	E61	Dismantling & removal of Isolator complete	Each	4	3435.00	13,740.00

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127.	E62	Dismantling & removal of Mast, portal, TTC & other small part steel	MT	3	6937.00	20,811.00
128.	E63	Breaking of concrete foundation of Masts, portals & TTC	Each	30	2654.00	79,620.00
129.	E64	Dismantling & removal of Guy rod assembly	Each	10	1277.00	12,770.00
130.	E65	Providing (Supply & erection) of layout board for switching posts	Each	3	3547.00	10,641.00
131.	E66	Providing (Supply & erection) of Sectioning diagram board at stations	Each	6	10154.00	60,924.00
132.	E67	Provision of digging of trench 300mm deep and refilling in all soil and repair of PF area as per explanatory note.	km	2	43537.00	87,074.00
133.	E68	Supply & erection of firefighting equipment	Each	1	4804.00	4,804.00
134.	E69	Supply of First aid Box with Stretcher etc.	Each	1	989.00	989.00
135.	E70	Digging of trench 450x1000m for AT cable	Mtr.	3150	37.00	1,16,550.00
136.	E71	Drilling of horizontal bore below track by pushing method for laying of HDPE pipe of various size up to 450 mm dia.	Mtr.	280	2830.25	7,92,470.00
137.	E72	Supply and fixing of HDPE pipe outer Dia 63mm for AT cable.	Mtr.	3150	254.00	8,00,100.00
138.	E73	Transportation of Railway supply materials from Railways depots to work site OR Transportation of Released material from work site to Railway depot.	MT	27.8	5020.00	1,39,556.00
139.	E74	Work under Power Block: Any erection work as per schedule done under power and /or Traffic block is subject to have extra rate.	LS	1	140319.00	1,40,319.00
140.	E75	Tree Trimming for OHE section	Each	136	433.00	58,888.00
141.	E76	Core cutting at bridge pier block 40mm Dia, hole 1000mm gap, and epoxy chemical grouting with minimum bond stress m20 concrete for 20mm bolt	Each	8	27165.00	2,17,320.00
142.	E77	Grouting of Bridge mast bolt by suitable epoxy resin chemical compound	Each	8	14803.00	1,18,424.00
143.	E78	Provision of buried rail with suitable length along with 2 earth pits and other accessories as per the Earthing specification no. TI/SPC/PSI/ERTHNG/0210 or latest, for SP/SSP (Rail piece to be provided by Railways)	Each	2	41500.00	83,000.00
144.	E79	Erection of Antibird disc	Each	539	113.49	61,171.11
145.	E80	Erection of Anti Monkey climbing device as Monkey Scare for mast	Each	302	581.03	1,75,471.06
146.	E81	Erection of Anti Monkey climbing device as Monkey Scare for Portal	Each	32	581.00	18,592.00
147.	E82	Erection of nylon/plastic net - High density polyethylene (HDPE) monofilament netting type III, UV stabilized as per IS 16008(part-2)-2016/PVC virgin HDPE Net	Each	2112	37.00	78,144.00
148.	E83	E, T & C of 25KV Current Transformer	Each	2	1808.00	3,616.00
149.	E84	Erection of additional contact wire piece across RRA clamp with 02 Nos. of PG clamps on either side (contact wire piece shall be supplied by railway)	Each Loc	69	2700.00	1,86,300.00
150.	F1	Pull lift machine 3 tonne pulling capacity and 3 tonne lifting capacity Make Tracel Tirfer India Pvt Ltd or similar	Nos	2	28011.00	56,022.00
151.	F2	Pull lift machine 5.2 tonne pulling capacity and 3.2 tonne lifting capacity Make Tracel Tirfer India Pvt Ltd or similar	Nos	2	27781.00	55,562.00
152.	F3	Pull lift machine 1.5 tonne pulling capacity and 2 tonne lifting capacity Make Tracel Tirfer India Pvt Ltd or similar	Nos	2	17127.00	34,254.00
153.	F4	Earthing discharge rod complete.	Nos	4	11503.00	46,012.00
154.	F5	Aluminium straight ladder (9.3 m) with hook on top.	Nos	2	15924.00	31,848.00

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155.	F6	Aluminium folding ladder (11 m) with hook on top.	Nos	2	47709.00	95,418.00
156.	F7	Portable electric drill machine 21mm, single phase 230 Volt (for drilling rails for bonding).	Nos	1	7792.00	7,792.00
157.	F8	Contact wire cutter 36".	Nos	2	6042.00	12,084.00
158.	F9	Dropper wire cutter 12".	Nos	2	5275.00	10,550.00
159.	F10	Single sleeve pulley block 3 1/2" x 1/2" groove steel.	Nos	2	8272.00	16,544.00
160.	F11	Contact wire twist cum bender 6"	Nos	1	1993.00	1,993.00
161.	F12	Steel sling 1m long, eye at each end 19 mm dia.	Nos	2	996.00	1,992.00
162.	F13	Steel sling 2m long, eye at each end 19 mm dia.	Nos	2	1177.00	2,354.00
163.	F14	Steel sling 3m long, eye at each end 19 mm dia.	Nos	2	1384.00	2,768.00
164.	F15	Steel sling 4m long, eye at each end 19 mm dia.	Nos	2	1738.00	3,476.00
165.	F16	Steel sling 5m long, eye at each end 19 mm dia.	Nos	2	5145.00	10,290.00
166.	F17	Fabric metric tape 30 Mtrs long 15 mm wide each.	Nos	2	927.00	1,854.00
167.	F18	Engineering ratchet with socket set	Nos	2	5393.00	10,786.00
168.	F19	Earth Megger/tester	Nos	1	7757.00	7,757.00
169.	F20	Screw driver set consisting of 6", 8", 12", 16" & 18"	Set	2	1879.00	3,758.00
170.	F21	Insulated cutting plier (12") & (8")	Set	4	648.00	2,592.00
171.	F22	Sprit level (12") & (6")	Set	2	7301.00	14,602.00
172.	F23	Tensiometer IDT-10 Ton capacity.	Nos	1	23973.00	23,973.00
173.	F24	Hydraulic crimping tool.	Nos	1	20379.00	20,379.00
174.	F25	Bench grinder (Double end pedestal) Motor driven.	Nos	1	42666.00	42,666.00
175.	F26	50W LED flood light IP65 rating	Nos	2	2183.00	4,366.00
176.	F27	Syren covering distance one kilometre (Electric).	Nos	1	9104.00	9,104.00
177.	F28	High Beam (Range 1 km) rechargeable 15W LED torch	Nos	2	4376.00	8,752.00
178.	F29	D' Spanner double ended 24 sizes in a set of 12 pieces Gedore make or equivalent	Nos	2	2217.00	4,434.00
179.	F30	Ring spanner double ended 24 sizes in a set of 12 pieces Gedore make or any other substantially equipment makes.	Nos	2	5086.00	10,172.00
180.	F31	Portable fire extinguisher capacity 4.5 Kg DCP type.	Nos	6	4796.00	28,776.00
181.	F32	36 KV Class-4 Hand Gloves Rubber made suitable insulating Rubber for electrical application, Test potential voltage 40000V & maximum use 36KV volt length- 400mm, palm size 10 inch as per IEC 60903:2014. Note- At the time of delivery the firm should submit necessary test certificate by GOVT. APPROVED Agency along with material. Test voltage 40KV, working voltage, 36KV break down voltage 50KV	Nos	50	3894.00	1,94,700.00
182.	F33	Supply of 13 Mtrs long Rail jumper with PVC Cable and rail clamps at both ends as per RDSO Drg No: RE/33/P/500 with necessary test and guarantee Certificate. Followed by i) Rail clamp made of Al-Bronze IS 3091/1999 as per RDSO Drg.No.RE/33/P/501. ii) Rail jumper ferrule as per Drg. No: RE/33/P/504 iii) Size of copper cable will be 248/0.45mm (40 Sq. mm) as per RDSO spec to IS 1554(Pt-I)1988.	Nos	30	7906.00	2,37,180.00
183.	F34	Rail Jumper with clamps at both ends 05 mts Long complete as per RDSO Drg. No.RE/33/P-500. (RAILCLAMP MADE OF AL. BRONZE IS: 3091/1999 and PVC COPPER CABLE SIZE: 248/0.45mm) Make: - PEC, SDU, SST, IM or Equivalent.	Nos	30	3448.00	1,03,440.00

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184.	F35	Set of industrial Personal protective equipments. One set consist of (1) Industrial safety belt and harnesses as per BIS specification no IS 3521:1999, Amds-2 Qty:01 Set. (2) Supply of Luminous vests safety jackets Net type as per BIS Specification i.e. IS:15809-2008, TYPE-2, Class 3 specified by EN471 standard "High visibility warning clothes" with synthetic side fasteners, Fluorescent Orange colour Qty/Set : 01 No.(Size : XXL). (3) Industrial Safety helmet with lamp, NEW AIRWING 8000 VPR conforming to IS: 2925, Qty/Set : 01 No	Nos	30	1522.20	45,666.00
185.	F36	Supply, installation, testing and commissioning of Overhead line inspection with video recording system with laptop for current collection test conforming to RDSO spec. No. TI/SPEC/HE/OLIVER/0051 or latest, make: MH Electronics, Pacific dynamics Global enterprise or similar	Nos	1	363132.00	3,63,132.00
TOTAL AMOUNT						10,44,35,949.23

EXPLANATORY NOTES

General Notes:

- Wherever an item of work covers supply of materials and erection such item shall include all bolts, nuts, lock nuts and washers etc. to complete the item of work.
- Erection of any item of equipment's, whether supplied by the purchaser will include testing, commissioning and bringing the equipment into operation to the entire satisfaction of the purchaser.
- The basic quantity of components and materials required to make up the unit of work for the selected items are indicated for guidance. In estimating the price for various items of works provision of loss and wastage in transit and during erection including cost of freight handling, taxes, duties, insurance if any etc.
- All OHE/PSI components to be supplied by the contractor must be of approved make by CORE/ALD or RDSO whether specifically mentioned or not.
- All works shall be carried out as per standard code of practice (I.E. Rule) and specification and drawings approved by the Railways.
- Railways have the right to provide materials, if contractor fails to supply with in target. Payment for which will be deducted from the supply items.
- All equipment's shall be commissioned in presence of OEM/Representative of OEM.
- Cost of operation of TW, Crane, BFR etc. are to be borne by the contractor whenever utilized by them.
- Testing related to all equipment's including IR value, E/R, BDV measurement, etc., and provision of various standard meggers shall be arranged by the contractor.
- Soil profile testing report shall be submitted for each KM to this office, prior to the start of foundation works in the said KM. The sample shall be taken at and only after the preparation of formation from Civil dept. The sample collection and method of soil testing shall be done

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in accordance with IS:2720 (latest version), and Safe bearing capacity determination shall be in accordance with IS:6403 (Latest version).

11. All OHE works (foundation, steel works, regulating equipment, dropper schedule, mast employment e.t.c.) covered under various scope shall be designed and executed in accordance with the requirements of a 25kv AC OHE system with high speed capability (160 kmph) for any future upgradation.

EXPLANATORY NOTE FOR OHE:

SCHEDULE - A (Earth work & Foundation)

Item No. A-1: Concrete for foundation and plinth in all type of soil including hard/rocky soil (including excavation and supply of all materials):

The Price shall include all works mentioned in all classes of soil, concrete or, masonry/drains/walls and rock. The scope shall also include digging, cement concrete & soil refilling. The scope shall be same for any shape and size of concrete blocks for foundation, in calculating the individual volume of concrete, fraction of a cubic meter beyond the third decimal shall be rounded off to the next nearest third decimal. The scope shall apply for concreting of all foundations for masts, gantries, portals, anchor blocks for guy rods and fencing uprights. For purposes of computation of volume of concrete, the volume of steel work embedded in the foundation block and muff shall be ignored. Cost of all concrete will be paid for only under item No.1 and the scopes of other item shall not include. For purposes of compilation of volume of concrete, the volume of concrete shall include the volume of sand and bitumen in sand core foundation. For purposes of compilation of volume of concrete, the volume of each muff for all masts shall be taken as 0.02 cum., except for masts with balance weights and for column of portal, each head span masts, 2 or 3 track cantilever masts and special fabricated masts for which the volume of muff shall be taken as 0.08 cum. irrespective of the size and shape of muff on a flat basis. Mixture for casting of foundation shall be 1:3:6 and mixture for grouting shall be 1:2:4. Curing of foundation shall be done by contractor for 28 days. No scroll will be supplied by Railway; contractor will use his scroll. Necessary details like, type, implantation, chainage shall be supplied by Railway. Contractor has to prepare standard cube of size 150x150x150mm for every 25 cum of foundation cast & is to be tested in the Govt. approved laboratory as per IS-516/1959(or Latest) to obtain the result as per IS 456/1978. Cement used shall confirm to IS 12269 - 1987 or latest, & grade 53, with preferred makes: ACC, ULTRATECH, VIKRAM, SHREE CEMENT, AMBUJA, JAYPEE CEMENT, CENTURY CEMENT, WONDER CEMENT & J.K. CEMENT. In case the tenderer is required to use cement of any other make, prior approval of Dy.CEE/C/RTM shall be mandatory. The scope also covers smooth plasters on exposed foundation and muff.

Item No. A-2: Reinforced Concrete for foundation and trench

The price shall cover excavation and all reinforced concrete work for foundation including supply of steel for reinforcement and other materials Including bending /Binding laying of reinforcement shoring and shuttering where necessary, costing concrete including frame work where necessary, grouting and finishing the tops of foundation blocks with the required slope/muff. The price shall include dismantling of all connected temporary arrangement back filling as required and removal of soil. The scope shall also cover all concrete work for cost in situ piles and pedestals /columns for mounting equipment. The volume of cast-in-situ piles and pedestals columns shall be added of the volume of foundation block for purposes of payment, Dowel bars will not be considered as reinforcement for the purpose of this item. The scope shall include the cement also. Cement will not be supplied by Rlys. The scope shall include paint with distemper on exposed portion of foundation. The scope also covers smooth plastering on exposed portion of foundation. Cement shall be used of OPC& 53 grade and of above-mentioned brands.

Item No. A-3 Reinforcement concrete for Cable trench cover

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The scope shall cover cable trench covers in reinforced concrete as per drawing. The cable trench covers will be cashed in on angle iron frame of angle size 40x40x5. The scope shall include the supply of steel for reinforcement angle iron for the frame work fabrication of angle iron frame etc. The scope shall include Positioning and dressing up of the trench covers, if required. The scope shall include the cement, ballast and sand also. Cement will not be supplied by Rlys. Cement shall be used of 53 grade and of popular brand. Curing of concrete shall be carried out for 28 Days.

Item No. A-4: Supply, spreading and levelling of 20 mm downgraded ballast, padding 150mm

The scope shall cover supply and spreading of uniformly graded gravel/ballast of size 30 mm, in the outdoor switch yard after completing all the works and levelling the switch yard area, but before commissioning of the sub-station. The gravel/ballast shall be of good quality and free from any dust and dirt. Prior approval of ballast shall be taken from the Purchaser for the gravel samples. The gravel/ballast shall be spread out uniformly to a depth of 15cm. over the area indicated by the Purchaser's Engineer.

Note: for Schedule “A”

1. The prices under item shall be same for any shape of size of Concrete blocks, cable trenches & brick wall. In calculating the individual volume of concrete and brick wall fraction of a cubic meter beyond the third decimal shall be rounded off to the nearest third decimal.
2. The prices under Item shall apply for concreting at all pedestals plinths and foundations for gantries/portals and supporting steel work and cable trenches.
3. For purpose of computation of volume of concrete and brick wall under Item, the volume of steel work embedded in the foundation block or muff shall be ignored.
4. The volume of each muff will be included in the volume of concrete for the respective foundation for purpose of computation of volume of concrete.
5. The prices shall include cost of embodiment of drain pipes, conduits for cable or earthing flats where necessary.
6. In respect of concrete for cable trenches the price shall not include the cost of cable supports and trays, which shall be supplied and erected by the contractor and shall be paid for under item.
7. Dowel bars in special foundations and nominal reinforcement in block cotton soil foundation will be necessary such nominally reinforced foundations in black cotton soil will be payable under item. The steel for nominal reinforcement and dowel bars will be supplied by the contractor and the concrete mixture in such a case shall be as for normal foundation 1:3:6.

SCHEDULE - B (Steel and OHE items)

Item No. B-1: Supply of rolled or fabricated and galvanized traction mast, TTC, Portals, auxiliary transformer masts, feeder mast, bridge masts, Tower gantries, portal, supporting structures etc.

Supply of traction main masts of OHE comprising rolled, broad flanged beams, fabricated K-series, B series, portal upright, boom pieces & associated fittings, D.A., extension chairs and AT Masts, feeder mast, bridge mast, Tower gantries, portal, supporting structures etc.

1. The price shall cover cost of fabrication, galvanization, and supply of individual tractions masts, Tower gantries, portal, and other structures.
2. Galvanization thickness shall be as per Railway Specification No. ETI/OHE/13(4/84) with c.s.4/90 or latest with galvanization thickness of 1000 gram per sq. meter.
3. In case, required size of channels are not available as per approved drawing, higher size of channels can be used with approval of Dy. Chief Electrical Engineer (construction) and

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payment as per actual black weight will be paid.

4. The price shall also include the straightening of masts/portal uprights etc. bent during transit and cutting of masts/portal uprights to suit the site condition.
5. For standard fabrication of steel work or structures for which RDSO/CORE approved drawing are available, the black steel weight of steel work as specified in RDSO/CORE drawing, shall be considered for payment.
6. However in case the unit sectional weight of any member indicated in RDSO's drawing is not in conformity with the unit sectional weight as per the latest IS specification the weight of the fabricated steel work shall be calculated on the basis of latest IS specification and the same will be considered for payment for the nonstandard fabricated steel work, the calculated weight to be considered for payment under this item shall be included in the relevant drawing based on latest IS sectional weight at the time of submitting the designs for approval of the purchaser.
7. There will be no addition for increased weight due to galvanizing or painting or reduction for holes or screw cut.
8. Galvanization damaged during transportation/ carting will be touch up with cold ZINC paints by tenderer.
9. Materials will be supplied at site of work.
10. Payable unit weights for standard mast.
11. It Should Be Insured That Only Forged Fitting Will Be Used at The Place of MCI (Malleable Cast Iron) Fittings as Per HQ -TC No. 84 & 89.
12. Provision Of Spare OHE Mast Foundation on Bridge Pier & Spare Bridge Mast Shall Be Made as Per Railway Guidelines Letter No. 2022/EEM/148/4/IRSOD Dated 10.09.2025.

Sr. No.	Type of mast	Weight in Kg/m incl. galvanization	Sr. No.	Type of mast	Weight in Kg/m incl. galvanization
1	6"x6"x25.15 BFB	38.03	14	K-150	38.18
2	162x154x27.1 BFB	38.00	15	K-175	43.72
3	200x200x49.9 BFB	51.20	16	K-200	49.87
4	8"x6"x35 RSJ	53.39	17	K-225	57.50
5	S-1	53.30	18	K-250	66.72
6	S-3	76.40	19	B-100	27.71
7	S-4	53.39	20	B-125	32.47
8	S-5	111.53	21	B-150	39.07
9	S-6	53.39	22	B-175	44.61
10	S-7	76.40	23	B-200	50.76
11	S-8	111.53	24	B-225	61.50
12	K-100	23.70	25	B-250	70.72
13	K-125	30.30	26	S-100	23.72

Item No. B-2: Supply of fabricated and galvanized steel works other than traction mast, TTC, portals etc. (SPS)

The price shall cover cost for supply of SPS for different type of masts, portals, DA, isolator, boom, Tower gantries, portal, supporting structures. Payment of SPS will be made as per black steel weight of material as per RDSO/CORE latest approved drawings and supplier.

1. The price shall cover cost of fabrication, galvanization, supply setting before grouting of

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individual tractions masts.

2. Galvanization thickness shall be as per Railway Specification No. ETI/OHE/13(4/84) with c.s.4/90 or latest with galvanization thickness as per normal and polluted zones.
3. In case, required size of channels are not available as per approved drawing, higher size of channels can be used with approval of Dy. Chief Electrical Engineer (construction) and payment as per actual black weight will be paid.
4. The price shall also include the straightening of masts/portal uprights etc bent during transit and cutting of masts/portal uprights to suit the site condition.
5. For standard fabrication of steel work or structures for which RDSO/CORE approved drawing are available, the black steel weight of steel work as specified in RDSO/CORE drawing, shall be considered for payment.
6. However in case the unit sectional weight of any member indicated in RDSO's drawing is not in conformity with the unit sectional weight as per the latest IS specification the weight of the fabricated steel work shall be calculated on the basis of latest IS specification and the same will be considered for payment for the nonstandard fabricated steel work, the calculated weight to be considered for payment under this item shall be included in the relevant drawing based on latest IS sectional weight at the time of submitting the designs for approval of the purchaser.
7. There will be no addition for increased weight due to galvanizing or painting or reduction for holes or screw cut.
8. Galvanization damaged during transportation/ carting will be touch up with cold ZINC paints by tenderer.
9. Materials will be supplied at site of work.
10. It should be insured that only forged fitting to be used in the place Of MCI (Malleable Cast Iron) Fittings as Per HQ -TC No. 84 & 89

Item No. B-3: Supply and erection of single cantilever assembly complete with insulator for conventional OHE and inside the tunnel

The price shall cover on a flat rate basis any bracket assembly on a traction mast or support or on drop arm and shall include those on high /low rail level platform, in the vicinity of turnouts, over bridges or overlaps and at locations with reduced encumbrance or terminating wires. The price shall include the cost of supply of bracket assembly complete in all respect with all components including galvanized steel tubes, backing angles for bracket assembly, solid core porcelain insulators, Incline dropper wires, top fitting, bottom fitting, bolts, nuts and any other items/fixture required to erect the bracket assembly complete in all respect, if any. The price shall cover erection of complete bracket assembly with all components including solid core porcelain insulators and dropper wires. However, this does not include the anti-creep arrangement at masts/ structures. Erection is inclusive of testing of insulators as per RDSO specs. / Procedure before erection. This price shall also include the cost of any extra fittings required for erection of double /triple cantilevers. The price shall include

Rly.ID. No.	Description of components	Qty. per Set
3021	Mast fitting for hook insulator with bolt nuts, locknuts and washer of 16 dia	1 set
2402,2402-1,2403-2	Tubular stay arm assembly (including galvanized steel tube)	1 set
2110/2130/2380	Catenary suspension bracket assembly or hook bracket	1 set
1160/1171	Suspension clamp/ Double suspension clamp	1 nos

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2120,2140, 2040,2080	Bracket tube (40/49mm) assembly complete with tube cap and sleeve where required (including galvanised steel tube)	1 set
3070-1/2	Mast bracket fitting assembly including bolts, nuts, lock nuts and washers of 16dia for attachment to structure or to small part steel work.	1 set
2151-1, 2152-1, 2161-, 2162-1	Register arm hook assembly complete with bolts nuts and lock nuts.	1 set
2420 or 2430 or 2270-4 or 5	Register arm assembly or raised register arm assembly (including galvanized steel tube)	1 set
2460-style-02 or 2470-style-02	Register arm dropper assembly excluding dropper wire, but complete with bolts, nuts etc.	1 set
2391-1, 2540/2520	Steady arm hook (BFB) (Forged) or bent steady arm	1 nos.
2361-1, 2491-2, 2492-2	25 mm drop bracket (Forged) with bolts & locknuts. 25 mm Steady arm clamp (Forged) with bolts & locknuts & 25 mm steady arm clamp jaw.	1 set
1220/1370-1	Contact wire swivel clip or raised register arm clamp.	1 nos.
3076-1,3076-2	Backing angle	2 nos.
3131-1,3131-2	Adapter	2 nos.
	Bolt 16x360x100 with washer & check nut	4 nos.
2550-1/2	Anti-wind clamp	1 set
RI-1174	Saddle plate/packing saddle	As required
	Stay tube Porcelain/Composite insulator (as desired by Competent Authority)	1 off
	Bracket tube Porcelain/Composite insulator (as desired by Competent Authority)	1 off

Further, Provision of Double inclined droppers throughout the entire section in all the cantilevers to improve mechanical stability of the contact wire as per guidelines including TC-127 (attached at Annexure-I).

Any other fitting required in the work shall be paid under this item. This activity is to be carried out under power block wherever applicable.

Item No. B-4: Supply of pull-off arrangement for OHE

The price shall cover supply of all components required for a pull-off arrangement to pull OHE equipment, including head span mast fittings complete with M.S. angle equalizing plate assembly steady arm, catenary dropper clip, contact wire swivel clip and fittings, including porcelain 9-ton insulators (1050mm CD) conductors, small jumpers (50 Sq.mm) wire. The price shall cover erection of all components including composite solid core insulators, small jumper wire and conductors.

Note: - 1. It Should Be Insured That Only Forged Fitting Will Be Used At The Place Of MCI (Malleable Cast Iron) Fittings As Per HQ -TC No. 84 & 89.

2. It should be insured that three (3) PG clamps, instead of two (2) on G-jumper, F jumper, ATJ jumpers and isolator jumpers to ensure firm connections as per latest RB guideline HQ TC- 127.

Item No. B-5: Supply of guy rod assembly

The price shall cover Supply & Erection of guy rod assembly of various lengths for traction masts, feeder line towers or supports complete with masts guy rod fittings, guy rod with adjustments and

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parts be grouted in the anchor block. The price shall not include the cost of erection of a dwarf or stub mast with anchor plates drilled and welded in position, where required for anchorage, and small part steel work, complete with bolts and nuts etc. if any. Prices indicated against all other items should be exclusive of the price of supply & erection of guy rod, if any which will be paid for under this item. Supply of guy rod assembly at anti-creep, portals will also be paid for under this item.

COMPONENTS REQUIREMENTS

Rly. ID. No.	Description of components	Qty. per unit
3241, 3242	Mast guy rod fitting (welded) complete with 4 short bolts, nuts, lock nuts and washers for attachment to mast/S.P. S including appropriate fittings. 04 nos 20x260x100 mm	1 set
5001/ 5001-1/ 5001-3	Anchor bolts (complete with nuts, lock nuts and split pins)	1 set
5002	Guy rod stirrup	1 set
5004 or 5005 or 5005-2 or 5006-1 or 9070 or 9071 or 5006-2	Guy rod with nut, lock nut, washer and split pin	1 set
5007-1	Anchor 'v' bolt	1 nos
5008	Anchor Loop	1 nos
5220	Guy rod Double Strap assembly	2 nos

Note: Components mentioned above are indicative for a particular structure type. Similar fittings and assemblies required for above provision for portals, other mast types and other anchoring structures shall also be included in the scope of this item.

Item No. B-7: Supply of galvanized GI Structure and other bonds

The price shall include the supply of galvanized structure & other bonds & galvanization shall be based on RDSO specification No. ETI/OHE/13 (4/8) with ACS 1 to 4 ensuring quality of zinc, base metal, surface preparation and galvanizing as per relevant standards as given in above RDSO specification The weight of zinc coating to be adopted is 750g/Cm². The price shall also include supply of PVC sleeve of approved design for structure under track circuit rail.

It should be ensured that connection of structure bond to rail track circuiting area shall be done as per HQ letter no. EL-94/15/1 (Comp. no. 677982) dated 17.10.2025. Also, the proper chamfering of holes in rail for provision of bond shall be ensured

Note: The Payment for supply of Schedule Item (B-7) shall be done only after the successful and satisfactory erection of material under Schedule Item E9.

Item No. B-8: Supply of Earth electrode assembly as per IS 3043/ RDSO specification

The price shall cover supply of an earth electrode assembly as per RDSO Specification No. ETI/OHE/P/7021 rev.(A) or latest for OHE, and RDSO Specification No. ETI/PSI/222 rev. 1 or latest for PSI(SWS) with all accessories & fasteners. The price also covers the provision of a protective concrete box with removable cover.

Note: - It should be ensured that provision of earthing station at SP and SSP -RDSO modification vide RDSO SMI No. TI/SMI/0032 (Rev-2 or latest) as per latest RB guideline HQ TC-127.

Item No. B-9: Supply of galvanized GI flat for earth (50mmx6mm)

The price shall include the supply of galvanized flats & galvanization shall be based on RDSO specification No. ETI/OHE/13 (4/8) with ACS 1 to 4 ensuring quality of zinc, base metal, surface preparation and galvanizing as per relevant standards as given in above RDSO specification The weight of zinc coating to be adopted is 750g/Cm². The price shall also include supply of PVC sleeve

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of approved design for structure under track circuit rail.

It should be ensured that connection of structure bond to rail track circuiting area shall be done as per HQ letter no. EL-94/15/1 (Comp. no. 677982) dated 17.10.2025

Also, the chamfering of holes in rail for provision of bond shall be ensured.

Note: 1. The Payment for supply of Schedule Item (B-9) shall be done only after the successful and satisfactory erection of the material under schedule item E11.

2. Bonding and earthing of OHE mast for concrete bridges with provision of earth wire /strip and earthing on both side of bridge needs to be provided.

Item No. B-10: Supply and erection of Fencing upright.

The Price shall cover Supply & Erection of fabricated fencing uprights. The scope shall be on the basis of black weight of the steel section of the approved drawing with no deduction for holes and skew cuts or no increase for weld materials.

Note: - It Should Be ensured That Only Forged Fitting Will Be Used at The Place of MCI (Malleable Cast Iron) Fittings as Per HQ -TC No. 84 & 89

Item No. B-11: Supply and Erection of fencing panel as per RDSO approved drawing

The scope shall include supply & erection of GI fencing panels. The scopes shall not include supply of fencing uprights, anti-climbing devices but shall include the fasteners and the scope for a meter length of the panels, measured in the plan view of the approved drawings.

Note: - It Should Be ensured That Only Forged Fitting Will Be Used at The Place of MCI (Malleable Cast Iron) Fittings as Per HQ -TC No. 84 & 89.

Item No. B-12: Supply of material i.e. Three Pulley, SS rope and Tie rods etc. for modification in regulating equipment (ATD) for 2400kgf Tension as per RDSO specification no. TI/SPC/OHE/ 3PHTAD/0150 with latest ACS.

The price shall cover supply of counter weight eye rod (1.8m length) as per drawing no. ETI/OHE/SK/588 Rev B as per CORE / RDSO specification with all fasteners and fittings; additional weight of 140kg, cast iron counter weight of 03 nos. 40kg (RI no 5092) and 01 no. 20kg (RI no-5093) for regulating equipment for increasing the weight of existing balance weight as per CORE/RDSO specification & as per drawing no. ETI/OHE/SK/587 Rev B; three-pulley as per RDSO specification no. TI/SPC/OHE/3PHTATD/0150 with A&C Slip No.1 or latest with small parts steel work in existing ATD arrangement. The material to be procured from the RDSO/CORE approved sources. The price shall also cover supply of all type of fasteners and fittings so as to complete the erection work of regulating equipment. The price shall also cover the supply of distance rod, SS wire rope, hex tie rods etc. and all the necessary items needed for completion of this item.

Item No. B-13: Supply of regulating equipment (5 pulley type) with counter weight assembly for regulated OHE with 2400kgf tension.

The price shall cover supply of regulating equipment with Five-pulley as per RDSO specification no. TI/SPC/OHE/3PHTATD/0150 with latest ACS, with small parts steel work. The material to be procured from the RDSO/CORE approved sources. The price shall also cover supply all type of fasteners and fittings so as to complete the erection work of regulating equipment. The price shall also cover the supply of Guide tube, 9-Ton adjuster, distance rod, SS wire rope etc. and all the necessary items which needs for completion of this item.

Item No. B-14: Supply of 20mm dia. galvanized steel conductor as per RDSO drg.

The price shall cover supply of 20mm dia (238.64mm² cross section) galvanized steel conductor along the UP & DN line track separately, 300mm below the ground surface and approximately 1mtr away or as per site condition from the OHE mast foundation (opposite to the direction of track i.e. away from the track). The BEC will be connected to each OHE mast/Portal and Feeder mast by same conductor having Tee Connector & Lug Connector as per Drawing No. TI/DRG/OHE/TC/RDSO/00001/20/0 & TI/DRG/OHE/SC/RDSO/00001/20/0 attached as Annexure 42 & 43 for BEC end and Lug for

connection with mast/portal. The price shall also cover the supply of Tee connector and lugs. The cross bonding of the UP BEC –UP Mast/Portal-UP Traction Rail-DN Traction Rail-DN mast/Portal –DN BEC should be done by 50X6 mm MS/GI flat at every 450 mtr. The details of the AEC/BEC and cross bonding scheme are given in drawing no TI/DRG/OHE/EARTHING/RDSO/00001/20/0 (Annexure-44). At stations, BEC conductor should be laid underground for Loop lines & platform also. BEC can be run on the side wall of Platform (platform coping) with suitable clamp & bolt grouted in the coping. BEC should be connected to Earth Pit as per Drawing No. ETI/OHE/P/7020 Rev. B at every 450m wherever it is exposed above the ground. At Bridges/Platform coping laying arrangement of BEC should be as given in Annexure-4. For Three-line and four-line section separate BEC should be provided for each line.

Item No. B-15: Supply of 50 mm GI pipe N.B.

The price shall cover the supply of 50mm dia GI pipe (Unit 'Each' stands for 3 mtr length) under railway track 1.5 meter below rail formation level by pushing method (i.e. without affecting the formation of railway track) by boring horizontally of suitable dia. hole under track with tools, tackles, manpower safely and securely. All necessary arrangements shall be done by the contractor for crossing track/nalah. Necessary T&P and M&P items with all type of machineries shall be arrange by the contractor at his own cost. The GI pipe should be embossed with ISI marking. The GI pipe shall be conforming to IS 1239/latest. The end of the pipe shall be sealed by basement compound.

Item No. B-16: Supply of MS, C class column pipe

The price shall cover for supply, erection, testing & commissioning of Column pipe 'C' class heavy duty black hot finished, wall thickness minimum 4.54 mm for 50 mm dia. conforming to IS-1239- 1981 or latest, in 3 mtrs. (Approx.) length threaded at 8 TPI on both ends with heavy duty couplings fixed and tag welded at one end. The pipe shall be of TATA/ SURYA/ ZENITH/ GST/ AMBICA/ SWASTIK or similar recognised make, and of ISI marked only.

Item No. B-17: Supply of Bridge mast Bolt.

The scope shall include the supply of Bridge mast bolt shall be based on RDSO specification No. TI/SPEC/OHE/FASTENERS/120 REV/1.

Item No. B-18: Supply of Antibird disc on insulator end fitting

The price shall include supply of Anti disc on ST, BT & 9-ton insulators end fitting as per Drg. No. TI/DRG/OHE/ABD/RDSO/00000/19/0 Rev 1 (Sh 1 & 2), Under RDSO MI No. TI/MI/00059 Rev 3 or latest. The disk shall be made up of polycarbonate of fire flammability rating of V-2 or higher as per UL94, from Group 01, class 2 of latest ASTM D 3935-2, with additional properties as given in SM1.

Item No. B-19: Supply of Anti Monkey climbing device (AMCD) as Monkey Scare for mast.

The price shall include supply and fabrication of Anti Monkey scare measure for OHE mast at Monkey menace prone area as per RDSO SMI No. TI/MI/0056 Rev-2 or latest. The AMCD shall be barbed wire frame type as per Drg. No. TI/SK/OHE/ANTIMON/RDSO/0001/08/0 given in Annexure 1 or cylindrical arrangement as per Drg. Given in Annexure II. Location and type of AMCD shall be jointly decided by SSE/Elect/Construction and SSE/TRD and approval by Sr DEE/TRD. One sample for each type of OHE mast/Structure is to be fabricated and submitted to concern SSE for approval before utilization at site. Any modification suggested by concern SSE based on practical implication must be incorporated in the design.

Item No. B-20: Supply of Anti Monkey climbing device as Monkey Scare for Portal.

The price shall include supply and fabrication of Anti Monkey scare measure for OHE Portal/TTC at Monkey menace prone areas as per RDSO SMI No. TI/MI/0056 Rev-2 or latest. The AMCD shall be barbed wire frame type as per Drg. No. TI/SK/OHE/ANTIMON/Rev-2 or latest. The AMCD shall be barbed wire frame type as per Drg. No. TI/SK/OHE/ANTIMON/RDSO/0001/08/0 given in Annexure 1 or cylindrical arrangement as per Drg. Given in Annexure II. Location and type of AMCD shall be jointly decided by SSE/Elect/Construction and SSE/TRD and approval by Sr DEE/TRD. One sample for each type of OHE mast/Structure is to be fabricated and

submitted to concern SSE for approval before utilization at site. Any modification suggested by concern SSE based on practical implication must be incorporated in the design.

Item No. B-21: Supply of nylon/plastic net - High density polyethylene (HDPE) monofilament netting type III, UV stabilized as per IS 16008(part-2)-2016/PVC virgin HDPE Net preferably in black colour.

The scope shall include supply of Anti Bird high density poly Ethelene (HDPE) filament netting type III, UV stabilized as per IS 16008 (Part-2)-2016. PVC virgin HDPE net preferably in black colour on fabricated structure, Portal/TTC, Fabricated DA, Gantry boom, etc. as per RDSO MI No. TI/MI/0050 Rev-2 or latest. the scope shall include supply and tying with UV resistant nylon cable tie as per para 4.4 of RDSO SMI.

Item No. B-22: Supply of All Aluminium spider conductor of size 234Sq.mm. as per explanatory note.

The price shall cover supply of Hard-drawn stranded Aluminium conductor conforming to IS-398 (Pt.I) with latest amendment and of size 19/3.99mm (234 Sq.mm) feeder/return conductor (along or across the tracks). The price shall not include the cost of suspension assembly (which will be paid for under item-03) and termination (which will be paid for under item-08.) and small part steel work, complete with bolts and nuts etc, if any. The price shall also cover on a flat rate basis, the cost of supply of splices to the extent required. This activity is to be carried out under power block.

Item No. B-23: Supply of 12.24 mm Dia ACSR Raccoon with mast fitting as per RDSO Drg. No. TI/DRG/OHE/ERBOND/RDSO/ 00001/11/0

The Price shall cover Supply of Arial Earth Conductor (AEC) with necessary accessories, fittings and fasteners on mast/portals as per RDSO TI/IN/0042 dt 23.10.2020 with latest amendment if any. As per RDSO drawing number TI/dawning/OHE/earthling/ RDSO/00001/20/0 12.27 mm diameter ACSR Raccoon conductor for Arial Earth Conductor (AEC), Earth clamps with fasteners, etc shall be provided on back side of the mast/portals as approved in the RDSO instruction. ACSR conductor jointing, Anchoring/ termination arrangement as and where required in one TKM as per site conditions. The above recommendation is as per prevalent practice used in 2X25 kV system.

SCHEDULE –C (Switch Gear, Insulators & other Elec. Items).

Item No. C-1A: Supply of 25KV single pole Vacuum interrupter.

The scope shall cover supply of 25kV, 1600A Vacuum interrupter, complete with operating mechanism, all fittings, and accessories including terminal connectors as per RDSO Spec. No. TI/SPC/PSI/LVCBIN/0121 (05/23) or latest. The price shall also cover the supply of an enamelled number plate and required quantity of long shackle brass Pad lock (Make - Godrej, Link).

Item No. C-1B: Supply of 1x25 kV single pole Vacuum Circuit Breaker

The scope shall cover supply & erection of 25kV Vacuum Circuit Breaker, complete with operating mechanism, all fittings, and accessories including terminal connectors as per RDSO Spec. No. TI/SPC/PSI/LVCBIN/0121 (05/23) or latest. The price shall also cover the supply & erection of an enamelled number plate and required quantity of long shackle brass Pad lock (Make - Godrej, Link).

Item No. C-2: Supply of 25KV double pole isolator with interlocking mechanism.

The price shall cover supply & erection of 25KV, 1600A double pole isolator switch of approved make, and as per RDSO Specification no. TI/SPC/PSI/ISOLTR/0210 with A&C slip No.1 or latest, complete with arcing horns, operating rods, operating rod guides, mounting base (including 25KV pedestal insulators-4Nos and operating rod insulator-2 No), Terminal connectors with bimetallic strip and integral locks. The scope shall also cover supply & erection of long shackle brass Pad lock (Make - Godrej, Link) and a number plate of approved design for each isolator, and also cover supply & erection of copper

flexible jumper along with accessories between isolator to OHE and support of operating rods on gantries/mast. The scope shall not include supply of small parts steel work completes with bolts and nuts etc.

Note: - 1. The copper flexible jumper should be of 160 sq. mm with bolt type connector and anti-falling arrangement shall be provided as per latest HQ guideline TC-127 dtd. 21.04.2026

Item No. C-3: Supply of 25KV single pole, 1600A isolator.

The price shall cover supply of a 25 KV, 1600A for SP/SSP's (1600A for OHE) Single pole isolator complete (as per RDSO specification No. TI/SPC/PSI/ISOLTR/0210 with A&C slip No.1 or latest and RDSO's letter No. TI/PSI/25/ISOL/POLICY/99 dt 3.6.99 or latest), with mounting base (including 25 KV pedestal insulators-2 Nos. and operating rod insulators- 1 Nos.), operating rod and operating rod guides required for the operation of the isolator.

1. The price shall also cover supply of Al/Cu strips, a 50 mm Brass pad-lock (Make - Godrej, Link), copper jumper for earthing and an Enamelled number plate of approved design for each isolator.
2. The price also covers cost for 02 no. terminal connector.
3. The price also covers supply of out-trigger complete assembly (if applicable).
4. The scope work should ensure all the work as per latest HQ guideline letter TC-127 dtd. 21.04.2026

Item No. C-4: Supply of PTFE short Neutral section.

The price shall cover supply of a complete assembly of short neutral section (PTFE) (Phase brake). The price shall also cover end fitting for contact & catenary wire and other material required for erection & smooth operation with earthing arrangement. The short neutral assembly to be as per RDSO specification No. TI/SPC/OHE/SNS/0000 Rev.-1 with A&C Slip No.1 or latest. Neutral section should be purchased from RDSO/CORE approved source only. The material is suitable for i.e. 65 sq.mm Catenary and 107 sq.mm contact wires.

Note: - It should be ensured that PTFE neutral section in place of insulated overlap of TSS shall be provided as per HQ guidelines letter no. TC-127. Dtd. 21.04.2026

Item No. C-5: Supply of materials for termination of double conductor (including supply of 9 t cut-in insulator) of overhead equipment.

The price shall cover supply of all material necessary for the termination of double conductor of overhead equipment terminating wire on a traction mast or structure including clevis assembly, adjuster, anchor double strap, ending clamp for catenary or contact or terminating wire with fitting and porcelain 9-ton insulator assembly (for polluted zone) equalizing /compensating double strap assembly, as per ETI/OHE/G/03121 MOD-F or latest, but excluding terminating wire if any, wherever double termination is required. It includes all fasteners required for termination. The provision of pipe oh Hex tie rod of ATD's as per RDSO MI No. TI/MI/0035 Rev-1 dt. 28.09.2001 (or latest). The provision on Hex tie rod shall be on ATDs connected on Turnouts, X-over, Neutral sections, other short tension length and tension length with FTA on another end. The length of pipe shall be as per procedure given in RDSO MI. The pipe shall be 20mm Dia GI, medium class as per IS 1161-1979 (or latest).

The ending clamp shall be installed corrected duly following instruction given in the RDSO SMI no. TI/MI/0051 dtd. 08.12.2017 (or Latest).

The scope shall include fluorescent red tape before ending clamp as per RDSO SMI no. TI/MI/0037 Rev-3 and TI/MI/0051 or latest.

Note: - the scope shall ensure that packing of saddle in catenary suspension clamp for prevention of melting / flashing of catenary wire as per RDSO SMI no. TI/MI/0059 Rev-3 or latest.

Item No. C-6: Supply of materials for termination of Single conductor including supply of 9T insulator.

The price shall cover supply of all material necessary for the termination of Single conductor of overhead equipment terminating wire on a traction mast or structure including clevis assembly, adjuster, anchor double strap, ending clamp for catenary or contact or terminating wire with fitting and porcelain 9-ton insulator assembly (for polluted zone) equalizing /compensating double strap assembly, as per ETI/OHE/G/03121 MOD-F or latest, but excluding terminating wire if any, wherever double termination if required. It includes the all fasteners required for termination.

Item No. C-7: Supply of section insulator assembly including core and cut-in insulator

The price shall cover supply of all components required for a standard section insulator assembly on conventional OHE including section insulator assembly (Five parts), also provide 2 nos., stiffener (contact bar) & other materials as per details given below: All material shall be with latest specifications.

Railway ID No.	Description of component	Qty per unit
RI-1120	Catenary ending clamp	2 Nos.
RI-1190	Catenary dropper clip assembly	As required
RI-6170	Parallel clamp for double contact wire.	12 Nos.
RI-6110	Dropper assembly for Section Insulator.	As required
RI-6100-1	Porcelain section insulator along creepage.	01 No.
RI-6020-1	Porcelain 9-ton insulator	01 No
RI-6181-2	Double straps for section insulator.	02 Nos.

Item No. C-8: Supply of 25KV solid core cut-in insulator.

The price shall cover cost for supply of complete 25 KV solid core long creepage Porcelain cut-in-insulator including Double strap, Catenary wire or contact wire ending cone etc. as per latest RDSO/CORE specification.

Item No. C-9: Supply of 25KV solid core suspension insulator.

The price shall cover cost for supply of complete 25 KV solid core long creepage Porcelain suspension insulator assembly including Double strap, single eye clevis, suspension clamp etc. as per latest RDSO/CORE specification and drawings.

Item No. C-10: Supply of 25KV Post/Support insulator.

The price shall cover cost for supply of 25KV Post Insulator with fasteners and saddles as per RDSO specification No. - TI/SPC/OHE/INS/0070 (04/2007) with A & C slip no. 1 & 2 or latest.

Item No. C-11: Supply of 10KVA Change over panel as per RDSO spec.

The price shall cover cost for supply of Change over panel as per RDSO specification No. 0TI/SPC/PSI/CLS/0020(12/02) (with A&C slip No. 1 to 4) or latest and suitable for 10 KVA AT Supply. The price also covers the cost of any relay, fittings, Glands, fasteners, Lugs etc. for commissioning of panel and smooth working.

Item No. C-12: Supply of terminal board in control cubicle

The price shall cover cost for supply of terminal board for 230V AC supply to Interrupters in switching post control cubicle as per RDSO/CORE latest drawings and specifications.

Item No. C-13: Supply of 110V DC distribution board.

The price shall cover cost for supply of 110V DC distribution board in switching post control cubicle suitable for respective section and as per RDSO/CORE latest drawings and specifications.

Item No. C-14: Supply of 230V AC distribution board.

The price shall cover cost for supply of 230V AC distribution board in switching post control cubicle

suitable for respective section and as per RDSO/CORE latest drawings and specifications.

Item No. C-15: Supply of PT Type- I and II

The price shall cover cost for supply of 27.5 kV/100V potential transformer type-I (as per RDSO specification no. TI/SPC/PSI/PT/0210 (06/2021) with latest amendments) complete with all fittings and accessories including terminal connectors. The price also cover cost for supply of an enameled number of plate and material for any Modification required for comply Latest TC, SMI/MI or local arrangement by open line. The price shall also cover for supply and modification of PT DO Fuse in SSP/SP post.

Item No. C-17: Supply of 110V battery charger (40AH).

The price shall cover supply of a battery charger for 110V, 40Ah low maintenance lead acid battery complete with stand and accessories as per RDSO specification No. TI/SPC/PSI/200-250CHGR/0210 (07/2021) or latest with a tool board, Hydro Meter and thermometer. The price shall also cover for cost of suitable size of cable to connect between battery charger and battery including lugs and connectors.

Item No. C-18 Supply of 110 V, 40AH lead acid battery.

The price shall cover supply of a 110V, 40Ah low maintenance lead acid battery complete with stand and accessories as per RDSO specification No. RDSO/PE/SPEC/TL/0040-2003 (Rev.-0) with amendment No.-1 or latest, and a tool board.

Item No. C-19: Supply of Auxiliary Transformer 25 kV/230 V, 10 KVA with DO fuse assembly, LV box & Anti climbing device.

The price shall cover cost for supply of Auxiliary Transformer 25 kV/230 V, 10 KVA as per RDSO specification No. ETI/PSI/15 (8 /03) or latest, with 25 KV DO fuse complete assembly including insulators as per RDSO Specification No. ETI/ PSI/14(1/86) Rev 1 (Apr-87), LV box for AT & Anti climbing device complete including barbed wires etc. the price also cover cost for Clamps, lugs, Name Plate etc.

Item No. C-20: Supply of Lightning arrestor for 25 KV OHE.

The Price shall cover cost for supply of 42 KV Metal oxide gapless type Lightening Arrestor as per RDSO specification No. TI/SPC/PSI/MOGTLA/0101 (02/ 2015) or latest including surge monitor (including suitable length of 35 sqmm cu. cable & clamps) and dis-connector assembly and an enameled number plate with fasteners and clamps.

Item No. C-21: Supply of Station Equipments at SP/SSP as per RDSO Spec. No. TI/RCC/SCADA/0134 (or latest).

The Price shall cover cost for supply of Station Equipments or the Remote terminal unit (RTU) for switching posts as per RDSO specification No. TI/SPC/RCC/SCADA/0134 with latest amendment, and same shall support existing SCADA system at RCC.

Item No. C-22: Supply of 50/39 mm aluminium bus bar

The price shall cover cost for supply of 50/39 mm Al. bus bars procured from CORE approved sources in standard length. Bus bar shall be made of aluminium alloy grade63401 (WP condition to IS:5082-1981 or latest. The tolerance on diameter & thickness shall be as per Class-I of IS:2673-1979 or latest. The bus bar shall be clean, smooth, mechanically sound and free from surface and other defects. The open end of bus-bar shall be covered by suitable tube cap. No splicing normally be allowed in the tubular bus-bars, unless the bus-bars exceeds 6M.

Item No. C-23: Supply of all types of aluminium bus bar terminal assembly, Splice assembly and various types of connectors for 50/39 mm bus bar

The price shall cover cost for supply aluminium bus bar terminal assembly, splice assembly and various types of connectors for 50/39 mm bus bar. as per requirement. The price also covers supply of fasteners and bimetallic strip (if applicable). The material shall be procured with latest RDSO specifications and approved source only.

Item No. C-24: Supply of 234sqmm Aluminum (Spider conductor) feeder arrangement

The price shall cover supply of Hard-drawn stranded Aluminium conductor conforming to IS-398 (Pt.I) with latest amendment and of size 19/3.99mm (234 Sq.mm) feeder/return conductor (along or across the tracks). The price shall include the cost of suspension and small part steel work, complete with bolts and nuts etc, if any. The price shall also cover on a flat rate basis, the cost of supply of splices to the extent required.

Item No. C-25: Supply of 12.24 mm dia. ACSR Raccoon with mast fitting as per RDSO Drg. No.TI/DRG/OHE/ERBOND/RDSO/ 00001/ 11/0

The Price shall cover the Supply of Arial Earth Conductor (AEC) with necessary accessories, fittings and fasteners on mast/portals as per RDSO TI/IN/0042 dt 23.10.2020 with latest amendment if any. As per RDSO drawing number TI/dawning/OHE/earthling/ RDSO/00001/20/0 12.27 mm diameter ACSR Raccoon conductor for Arial Earth Conductor (AEC), Earth clamps with fasteners, etc shall be provided on back side of the mast/portals as approved in the RDSO instruction. ACSR conductor jointing, Anchoring/ termination arrangement as and where required in one TKM as per site conditions. The above recommendation is as per prevalent practice used in 2X25 kV system.

Item No. C-26: Supply of Auxiliary Transformer 25 kV/240 V, 25 KVA with DO fuse assembly, LV box & Anti climbing device

The price shall cover cost for supply of Auxiliary Transformer 25 kV/230 V, 25 KVA as per RDSO specification No. ETI/PSI/15 (8 /03) or latest, with 25 KV DO fuse complete assembly including insulators as per RDSO Specification No. ETI/ PSI/14(1/86) Rev 1 (Apr'87), LV box for AT & Anti climbing device complete including barbed wires etc. the price also cover cost for Clamps, lugs, Name Plate etc.

Item No. C-27: Supply of 25KVA Change over panel as per RDSO spec.

The price shall cover cost for supply of Change over panel as per RDSO specification No. 0TI/SPC/PSI/CLS/0020(12/02) (with A&C slip No. 1 to 4) or latest and suitable for 25 KVA AT Supply. The price also covers the cost of any relay, fittings, Glands, fasteners, Lugs etc. for commissioning of panel and smooth working.

Item No. C-28: Supply of 25KV Current Transformer.

The price shall cover supply, erection and connecting of a 25 KV,1500-750/5A current transformer complete with all fittings and accessories including terminal connector as per RDSO spec. No. ETI/SPC/PSI/CT/0210 (07/2021) or latest. It shall include supply of an enamelled Number plate.

SCHEDULE - D (Copper items and PVC cables).

Item No. D-1: Supply of overhead equipment excluding catenary & contact wire. Scope includes supply of number plates & various types of caution & other boards including shock

treatment chart etc.

The price shall cover supply of all components i.e. different type of PG clamps, 5 mm Dropper wire, contact and catenary wire dropper clip, catenary and contact wire ending clamp, catenary and contact wire splices, double straps, Retro-reflective/ enamelled Number plate & various type of caution & other boards, shock treatment chart, anti-creep anchor including 9T insulator and fittings (Catenary wire will be supplied by railway), Material required for providing contact wire in place of catenary wire (Contact wire will be supplied by railway) under FOB, ROB and over line structure etc. (As per latest guide lines) with SPS for attachment on mast / structure, Jumper wires of suitable size with PG clamps for 'G, jumper(160sqmm), potential equalizing jumper, anti-theft jumper, X-feeder drop jumper, Isolator Jumpers and any other jumpers (where their use is approved), terminating wires etc. The price shall also cover cost of supply of additional fasteners RI No 1041-2 (MOD-B) conforming to RDSO DRG NO. ETI/OHE/P/1041-2 MOD E for supporting parallel contact wire across RRA clamp arrangement & the dropper schedule to be followed as per latest TI/DRG/OHE/DROP/00007/18/0 & TI/DRG/OHE/DROP/00001/20/0 or latest.

S. No.	Description of Items
1.	Different types Parallel grooved clamps
2.	5 mm Copper Droppers.
3.	Contact and catenary clips assembly.
4.	Contact and Catenary ending clamp assembly.
5.	Catenary & Contact Splice
6.	Retro-reflective/ Enamel Number Plates with latest SPS and fastener, Caution boards, Danger Boards, Power block working limit boards, Unwired OHE/ Turn out, 250M, 500M, DJ close, DJ open and other indication boards must for commissioning for OHE.
7.	Different type of Copper Jumpers i.e. 'G'(160 sqmm), Potential equalizing, Anti-theft, X-feeder, Drop, Isolator Jumpers etc.
8.	Any extra fittings required for Turn-out, X-over, Diamond X-ing.
9.	Anchor Double straps, Cut-in-insulators (9T) assembly for IOL's, compensating plate/equalizing plate
10.	If tramway OHE is required to be erected then it will be paid in OHE erection only for erection of contact wire including supply & erection of Bridle wire, PG clamp etc.
11.	Anti-creep complete assembly (excluding anti-creep copper wire which will be supplied by railway from railway store)
12.	The price shall not cover cost of catenary and contact wire.

Item No. D-2: Supply of Catenary wire splice suitable for 65 sq. mm. catenary wire over and above as required of item no D1.

The price shall cover cost for supply of Catenary Splice suitable for 65 sq mm catenary wire, over and above the requirement for item no. D1, as per Drawing No. ETI/OHE/P/1090 or latest.

Item No. D-3: Supply of Contact wire splice suitable for 107 sq. mm. contact wire over and above as required of item no D1.

The price shall cover cost for supply of Contact wire splice (toothed type) suitable for 107 sq mm contact wire, over and above the requirement for item no. D1, as per Drawing No. ETI/OHE/P/1081-1Rev-C or latest.

Item No. D-4: Supply of 10 x 2.5 Sq.mm PVC insulated stranded copper cable for control and indication of Interrupters.

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

The price shall cover cost for supply of 10 core x 2.5 sq mm PVC insulated, PVC sheathed, Copper conductor, Un armoured Electric Control cable for working voltage up to and including 1100 volts as per specification No. IS:1554/ Pt-I/ 1988 or latest and shall be packed in corrugated steel drums and procured at concern SSE's store or as desired by railway administration.

Item No. D-5: Supply of 2x2.5 Sq.mm PVC insulated stranded copper cable for catenary indication.

The price shall cover cost for supply of 2 core x 2.5 sq mm PVC insulated, PVC sheathed, Copper conductor, Un armoured Electric Control cable for working voltage up to and including 1100 volts as per specification No. IS:1554/ Pt-I/ 1988 or latest and shall be packed in corrugated steel drums and procured at concern SSE's store or as desired by railway administration.

Item No. D-6: Supply of 2x4 Sq.mm PVC insulated stranded copper cable for heater supply.

The price shall cover cost for supply of 2 core x 4.0 sq mm PVC insulated, PVC sheathed, Copper conductor, Un armoured Electric Control cable for working voltage up to and including 1100 volts as per specification No. IS:1554/ Pt-I/ 1988 or latest and shall be packed in corrugated steel drums and procured at concern SSE's store or as desired by railway administration.

Item No. D-7: Supply of 7x2.5 Sq.mm PVC insulated stranded copper cable unarmored.

The price shall cover cost for supply of 7 core x 2.5 sq mm PVC insulated, PVC sheathed, Copper conductor, Un armoured Electric Control cable for working voltage up to and including 1100 volts as per specification No. IS:1554/ Pt-I/ 1988 or latest and shall be packed in corrugated steel drums and procured at concern SSE's store or as desired by railway administration.

Item No. D-8: Supply and erection of copper strip for earthing. (25 x 3mm)

The price shall cover cost for supply and erection of 25 x 3.0 sq mm and confirming IS 191/1981 & IS:613/ 1984 or latest, and procured at concern SSE's store or as desired by railway administration.

Item No. D-9: Supply of 18 mm solid copper bus bar

The price shall cover supply of solid copper busbar 18mm wherever required in OHE, including for Isolators.

Item No. C-10 & 11: Supply of solid copper bus-bar connectors. Bus Terminal (6310) & Bus Splice (6320)

The price shall cover supply of solid copper bus-bar junctions and connectors of various types specified, including bolts, nuts, etc, required at junctions or terminations of solid copper bus- bars.

SCHEDULE – E: (Erection)

Item No. E-1: Preparation all drawing and design for overhead equipment including preparation of pre pegging, pegging and OHE layout plan.

The scope shall be covered for preparation of Pre-pegging and Pegging Plan of OHE LOP, CSD, SED, SWR (Traction diagram with Appendix G), LSD for the OHE work and supply of 6 sets hard copy. The scope also covers the supply of AED of LOP, SED, SWR, LSD with minimum 6 sets of Hard copy with soft copy. The scope also covers preparation of digitalized sectioning and power supply diagram and supply of minimum 6 sets of hard copy with soft copy. The scope shall also cover soil testing at each KM or as required at site, or any other requirement to complete the above schedule item. Railway will be supplied soft copy of ESP yard plans only. All electrical (TRD) related drawings shall be prepared by successful tenderer. The scope also covers retracing of existing drawings on new drawings. Preparation of Power supply diagram and sectioning diagram also included in item for complete section as related to respective section. The scope shall also cover the preparation of Documents pertaining to CRS Inspection, including presentable file with all required documents at the time of CRS inspection. 50% of the scope will be paid on approval of the drawing for execution and balance 50% after successful completion of the work and handing over of the soft and hard copies to the client.

Note: - 1. The scope shall cover all the work i.e. under latest HQ letter no. HQ TC- 127 (No EL/TRD/127(10/2014) dtd. 06.10.2014).

2. All mandatory ACTM-2022 revised proformas shall be submitted along with EIG applications.
3. All OHE design shall be as per ACTM and cross over / turn out and overlap layout as per latest RDSO drawing.

Item No. E-2: Preparation of design and drawing of switching stations.

Design, supply, erection, testing and commissioning of single phase, 25 KV, 50 Hz, AC Switching Stations (SP/SSP) including Foundations, Structures and all ancillary equipment etc. as per following details along with Earth work, construction of buildings, fencing, retaining wall, Internal Wiring with switch/fittings/equipment, Battery Set, All types of caution (25 KV caution boards to be provide on alternate fencing panels), warning, instruction, protection, location/Name and schematic diagram boards, earthing stations, Safety items (i.e. Firefighting equipment, First Aid box, Shock treatment chart, key box etc.), manning till stabilization of SCADA (At least for a period of 06months from commissioning) and all necessary documentation for EIG sanction and CRS Inspection, breakdown maintenance till CRS/PCEE inspection.

(Note: -All SP/SSP/FP are to be designed and constructed keeping in view of Double Line section for future. Earthwork, Fencing, Foundation activities are to be completed suitable for double line section)

Item No. E-3: Erection of rolled or fabricated and galvanized traction mast and auxiliary transformer masts, TTC and Portals

The price shall cover cost of erection of traction main masts of OHE comprising rolled, broad flanged beams, fabricated K series, B series, portal upright, boom pieces & associated fittings,D.A., extension chairs etc.

1. The price shall cover cost of erection, alignment and setting before grouting of individual tractions masts.
2. In case, required size of channels are not available as per approved drawing, higher size of channels can be used with approval of Dy. Chief Electrical Engineer (construction) Western Railway, and payment as per actual black weight will be paid.
3. The prices shall also include the cost of stencilling of location number, height of contact wire, implantation, R.L. etc on masts/portal uprights in the manner as directed by purchaser.
4. The price shall also include the straightening of masts/portal uprights etc bent during transit and cutting of masts/portal uprights to suit the site condition.
5. For standard fabrication of steel work or structures for which RDSO/CORE approved drawing are available, the black steel weight of steel work as specified in RDSO/CORE drawing, shall be considered for payment.
6. However in case the unit sectional weight of any member indicated in RDSO's drawing is not in conformity with the unit sectional weight as per the latest IS specification the weightof the fabricated steel work shall be calculated on the basis of latest IS specification and the same will be considered for payment for the nonstandard fabricated steel work, the calculated weight to be considered for payment under this item shall be included in the relevant drawing based on latest IS sectional weight at the time of submitting the designs for approval of the purchaser.
7. There will be no addition for increased weight due to galvanizing or painting or reduction for holes or screw cut.
8. Galvanization damaged during transportation/ carting will be touch up with cold ZINC paints by tenderer.

Note: - In case of Erection with BFR is provided by railway for erection of Mast/Portal, then70% of Erection rates shall be paid.

Item No. E-4: Erection of fabricated and galvanized steel works other than traction mast (SPS)

The price shall cover cost for erection of SPS for different type of masts, portals, DA, isolator, Portal

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boom, AT Mast etc. Payment of SPS will be made as per black steel weight of material as per RDSO/CORE latest approved drawings and supplier.

Item No. E-5: Erection of single cantilever assembly complete with insulator for conventional OHE and inside the tunnel

The price shall cover cost for erection of single cantilever assembly complete with insulator for conventional OHE and inside the tunnel

1. The price shall cover on a flat rate basis for erection of bracket assembly on a traction mast or support on drop arm and shall include those on high/low level platform in the vicinity of turnouts over bridges or overlaps and at all locations with reduced encumbrance/terminating wires as per latest RDSO drawing.
2. The price shall include the cost of erection of all components including galvanised steel tube duly fabricated and solid core Porcelain / Composite insulators (CD 1050/1600 mm) for polluted Zone (Id. 6000-1,6030-1) including bolts, nuts etc if any.
3. The price shall cover erection of all components including solid core insulators & registered arm dropper excluding small parts steel work if any.
4. However, this does not include the anti-creep arrangement at masts/structures.
5. The price shall cover cost of insulator testing with hydraulic testing zig. Zig shall be arranged by contractor.
6. The price shall also include the erection of Packing saddle (RI 1174) with catenary suspension clamp (RI 1160) as per TI/MI/0059-Rev01 or latest.
7. Necessary SED will be required to get approved by Railway for each cantilever.
8. the locations where's the composite insulator required at that place it should be ensured that double composite ST and BT to be erected at the place of single insulator in order to avoid/minimise insulator flashing and bird fault cases.

Item No. E-6: Erection of pull-off arrangement for OHE

The price shall cover erection of all components required for a pull-off arrangement to pull OHE equipment, including head span mast fittings complete with M.S. angle equalizing plate assembly steady arm, catenary dropper clip, contact wire swivel clip and fittings, including composite/porcelain 9-ton insulators (1050/1600 mm CD) conductors, small jumpers (50 Sq.mm.) wire. The price shall cover erection of all components including composite solid core insulators, small jumper wire and conductors.

Item No. E-7: Erection of guy rod assembly.

1. The price shall cover erection of complete guy rod assembly of various lengths for traction masts/portal upright complete with mast guy rod fittings, guy rod with adjustments and parts to be grouted etc. in the anchor block including S.P.S
2. The price shall not include the cost of supply of dwarf masts.

Item No. E-9: Erection galvanized (GI) Structure & other bonds.

The price shall include the erection of galvanized structure & other bonds & galvanization shall be based on RDSO specification No. ETI/OHE/13 (4/8) with ACS 1 to 4 ensuring quality of zinc, base metal, surface preparation and galvanizing as per relevant standards as given in above RDSO specification The weight of zinc coating to be adopted is 750g/Cm². In case during installation, if galvanization is damaged due to hole drilling, welding, cutting, handling etc., the rectification shall be done as per clause 8 of RDSO specification no ETI/OHE/13(4/84) with ACS 1-4 (using zinc-based solder/zinc-based paints). For fabrication of various bonds (of different size), prevailing guidelines of ACTM, RDSO drawing will be followed in all respects albeit with galvanisation instead of paints. The price shall cover connecting a bond from traction feeder mast to the nearest non-track circuited rail, or earth electrode, including all fastenings at both ends. The price shall include shaping of the bond & chamfering of rail holes prior to erection of bonds. The price shall also include erection of PVC sleeve of approved design for structure under track circuit rail.

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- Note: 1. The Payment for supply of Schedule Item (B-7) shall be done only after the successful and satisfactory erection of material under Schedule Item E9**
- 2. The work in this scope shall be completed as per latest HQ letter no. HQ TC -127 (No EL/TRD/127(10/2014) dated: 06.10.2014).**

Item No. E-10: Erection of Earth electrode as per IS 3043 OR RDSO specification

The price shall cover cost of erection testing and commissioning of an earth station confirming to IS 3043 or RDSO specification with latest amendment. The price also covers cost for manual excavation of earth for providing earth station, cost for wooden charcoal, salt to found earth resistance within limits and erection of protective concrete box and RCC cover. This shall also cover the erection of Earth station for Auxiliary Transformer of 4m length confirming to IS 1239 and RDSO Specification no. ETI/PSI/222 or latest. This shall also cover the cost of excavation and erection of buried rail with all associated standard fittings and Earth electrodes as per RDSO specification no. TI/DRG/PSI/E.STN/00001/14/0 or latest, and other amendments.

Note: - The work in this scope shall be completed as per latest HQ letter no. HQ TC -127 (No EL/TRD/127(10/2014) dated: 06.10.2014).

Item No. E-11: Erection of galvanized GI flat for earth (50mmx6mm) laid in ground/exposed

The price shall include the erection of galvanized flats& galvanizations shall be based on RDSO specification No. ETI/OHE/13 (4/8) with ACS 1 to 4 ensuring quality of zinc, base metal, surface preparation and galvanizing as per relevant standards as given in above RDSO specification The weight of zinc coating to be adopted is 750g/Cm². In case during installation, if galvanizations is damaged due to hole drilling, welding, cutting, handling etc., the rectification shall be done as per clause 8 of RDSO specification no ETI/OHE/13(4/84) with ACS 1-4 (using zinc based solder/zinc based paints). For fabrication of various bonds (of different size), prevailing guidelines of ACTM, RDSO drawing will be followed in all respects albeit with galvanizations instead of paints. The price shall cover connecting a bond from traction feeder mast to the nearest non-track circuited rail, or earth electrode, including all fastenings at both ends. The price shall include shaping of the bond & chamfering of rail holes prior to erection of bonds. The price shall also include erection of PVC sleeve of approved design for structure under track circuit rail.

Note: - The work in this scope shall be completed as per latest HQ letter no. HQ TC -127 (No EL/TRD/127(10/2014) dated: 06.10.2014).

Item No. E-14A: Erection, testing and commissioning of 25 kV vacuum Interrupter

The scope shall cover erection of 25kV Vacuum interrupter, complete with operating mechanism, all fittings, and accessories including terminal connectors. The scope shall cover grouting the supporting frame and mechanism box on foundation block and mounting of other accessories in their respective places. It shall also cover, testing and commissioning of the circuit breaker. The scope shall also cover the erection of an enamelled number plate and required quantity of long shackle brass Pad lock (Make - Godrej, Link). The Contractor shall make his own arrangement for power supply requirement for testing purpose. All necessary tools, equipment's instruments required for carrying out necessary checks and tests and commissioning shall be arranged by the Contractor.

Item No. E-14B: Erection, testing and commissioning of 1x25 kV vacuum Circuit Breaker

The price shall cover erection of 25kV Vacuum Circuit breaker, complete with operating mechanism, all fittings, and accessories including terminal connectors. The price shall cover grouting the supporting frame and mechanism box on foundation block and mounting of other accessories in their respective places. It shall also cover, testing and commissioning of the circuit breaker. The price shall also cover the erection of an enameled number plate and required quantity of Long shackle brass Pad lock (Make - Godrej, Link). The Contractor shall make his own arrangement for power supply requirement for testing purpose. All necessary tools, equipment instruments required for carrying out necessary checks and tests and commissioning shall be arranged by the Contractor.

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Item No. E-15: Erection of material i.e. Three Pulley, SS rope and Tie rod setc. for modification in regulating equipment (ATD) for 2400kgf Tension as per RDSO specification no. TI/SPC/OHE/ 3PHTAD/0150 with latest ACS.

The price shall cover erection of regulating equipment three-pulley as per RDSO specification no. TI/SPC/OHE/3PHTATD/0150 with A&C Slip No.1 or latest with small parts steel work in existing ATD arrangement. The material to be procured from the RDSO/CORE approved sources. The price shall also cover supply and erection all type of fasteners and fittings so as to complete the erection work of regulating equipment. The price shall also cover the supply and erection of Guide tube, 9-Ton adjuster, distance rod, SSS wire rope etc. and all the necessary items which needs for completion of this item.

Item No. E-16: Erection of regulating equipment (3/5 pulley type) with counter weight assembly for conventional OHE (regulated) 2400kgf tension.

The price shall cover erection of regulating equipment with Five-pulley as per RDSO specification no. TI/SPC/OHE/3PHTATD/0150 with latest ACS, with small parts steel work. The price shall also cover erection all type of fasteners and fittings so as to complete the erection work of regulating equipment. The price shall also cover the erection of Guide tube, 9-Ton adjuster, distance rod, SS wire rope etc. and all the necessary items which needs for completion of this item.

Item No. E-17: Erection of 20mm Dia galvanized steel conductor asper RDSO drg.

The price shall cover Erection & Laying of 20mm dia (238.64mm² cross section) galvanized steel conductor along the UP & DN line track separately, 300mm below the ground surface and approximately 1mtr away or as per site condition from the OHE mast foundation (opposite to the direction of track i.e. away from the track). Digging & laying is included in this price and no extra payment shall be given for these activities. The BEC will be connected to each OHE mast/Portal and Feeder mast by same conductor having Tee Connector & Lug Connector as per Drawing No. TI/DRG/OHE/TC/RDSO/00001/20/0 & TI/DRG/OHE/SC/RDSO/00001/20/0 attached as Annexure 42 & 43 for BEC end and Lug for connection with mast/portal. The cross bonding of the UP BEC –UP Mast/Portal-UP Traction Rail-DN Traction Rail-DN mast/Portal –DN BEC should be done by 50X6 mm MS/GS flat at every 450 mtr. The details of the AEC/BEC and cross bonding scheme are given in drawing no TI/DRG/OHE/EARTHING/RDSO/00001/20/0 (Annexure-44). At stations, BEC conductor should be laid underground for Loop lines & platform also. BEC can be run on the side wall of Platform (platform coping) with suitable clamp & bolt grouted in the coping. BEC should be connected to Earth Pit as per Drawing No. ETI/OHE/P/7020 Rev. B at every 450m wherever it is exposed above the ground. At Bridges/Platform coping laying arrangement of BEC should be as given in Annexure-45. For Three line and four line section separate BEC should be provided for each line.

For above mentioned all annexure, reference is TI/IN/0042 (OHE Guidelines for Increasing speed potential to 160kmph on NDLS-HWH & NDLS-BCT routes) dtd 23.10.2020. Price shall also cover the Preparation and submission of BEC plan & Bonding / Earthing plan.

Item No. E-18: Supply and erection of Tee connector for BEC end and lug for connection.

The BEC will be connected to each OHE mast/Portal and Feeder mast by same conductor having Tee Connector & Lug Connector as per Drawing No. TI/DRG/OHE/TC/RDSO/00001/20/0 & TI/DRG/OHE/SC/RDSO/00001/20/0 attached as Annexure 42 & 43 for BEC end and Lug for connection with mast/portal. The price shall also cover the supply of Tee connector and lugs. The cross bonding of the UP BEC –UP Mast/Portal-UP Traction Rail-DN Traction Rail-DN mast/Portal –DN BEC should be done by 50X6 mm MS/GI flat at every 450 mtr.

Item No. E-19: Erection, Testing & Commissioning of 50 mm GI pipe N.B.

For protecting the cable at ground level and along the terminating structures, the upright cable shall

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be encased in G.I. pipes, for this the contractor shall supply and provide 50 mm dia 'B' class GI pipes of ISI mark only of sizes given in quantity schedule. On each location for each upright cable length, the contractor shall use pipe of above-mentioned size and class. At the bottom edge of the pipe proper arrangement shall be made by the contractor to avoid damage to the cable by the edge and weight of the G.I. Pipe. The arrangement of supporting the cables and its protecting G.I. pipes with earth wire shall be done by the contractor by means of clamps, nuts & bolts.

Item No. E-20: Erection, Testing & Commissioning of RCC pipe NP-4 150 mm.

The contractor shall erection, testing & commissioning of Round Spun Concrete pipes of 150mm sizes given in quantity schedule and 2.0 m in length with proper size of collars for joining the pipes. The spun concrete pipes shall confirm to IS 458 /1988 of Class NP-4. The pipes shall have been well cured and shall have a minimum strength of 200 kg/cm².

The cement used shall confirm to ISS-269/1976 or ISS 142/1971. Maximum size of aggregate shall be 20mm.

Clear cover shall be 10 mm thick.

All reinforcement shall be of hard drawn steel wire confirming to IS-432/1982. The steel spirals shall have one complete ring at each end.

The spirals shall be welded or tied by binding wires with longitudinal bars at every third inter- section. The internal surface shall have a smooth finish without any bulge or projections to avoid damage to the cable while pulling. The contractor shall arrange testing of the Spun Round Concrete Pipes at the manufacturer's works before delivering the lot. The testing shall be in the presence of Railway Supervisor/ officers.

Laying of Pipes:

The tenderer shall lay the ground spun concrete pipes in the ground or below the tracks by digging open trench method.

For laying the pipes below the tracks the tenderer shall excavate the earth between the two adjacent Railway track sleepers only at a depth of 1.00 M below the formation level. The term "formation" level means the earth surface just below the bedding of the ballast.

At this depth two separate lines of the round spun concrete pipes shall be laid. Each length of the pipes shall be joined together using proper size of collars properly cemented and aligned in a straight line, keeping an inclination to facilitate the draining of water. The round spun concrete pipes shall be laid at a depth of 1.0 m below ground level in open ground area in the same manner as described above.

The two lines of concrete pipes in the open ground shall be laid up to the Railway boundary or on both sides of the tracks.

On a level surface the pipes shall be laid in continuous length from the edge of the Railway boundary on one side of the tracks to the edge of the Railway boundary on the other side of the tracks including the pipes below the Railway tracks on one plane.

At locations where the Railway tracks are laid on a High Bank the continuity of the round spun concrete pipe to be laid shall break on both side of the tracks.

The pipe length on both the side of such bank shall start from the bottom edge of the bank on the ground level and shall end at the Railway boundary on both sides. At these locations the length of pipe under the tracks and the length of the pipes on both side of the bank shall be in on line on two different.

Item No. E-21: Erection of 25 KV double pole isolator with interlocking mechanism.

The scope shall cover erection of 25KV, 1600A double pole isolator switch of approved make, complete with arcing horns, operating rods, operating rod guides, mounting base (including 25KV pedestal insulators-4Nos and operating rod insulator-2 No), Terminal connectors with bimetallic strip and integral locks. The scope shall also cover erection of long shackle brass Pad lock (Make - Godrej, Link) and a number plate of approved design for each isolator, and also cover supply & erection of copper flexible jumper along with accessories between isolator to OHE and support of operating rods

on gantries/mast. The scope shall not include supply of small parts steel work completes with bolts and nuts etc.

Note:- 1. The copper flexible jumper should be of 160 sq. mm with bolt type connector and anti-falling arrangement shall be provided as per latest RB guideline HQ TC-127 dtd. 21.04.2026

Item No. E-22: Erection of 25KV single pole isolator without earth contact assembly.

The prices shall cover erection testing and commissioning of isolator switches of approved make, complete with arcing horns, operating rods, out-trigger, operating rod guides, mounting base (Including 25KV pedestal insulators-2Nos and operating rod insulator-1 No) and integral locks. The price shall also cover erection of a pad lock and a number plate of approved design for each isolator, and also cover erection of copper flexible jumper along with accessories between isolator to OHE and support of operating rods on gantries/mast. The price shall not include supply and erection of small parts steel work complete with bolts and nuts etc. The price shall also cover the Erection of 18mm copper bus bar for use with SPI in OHE. The Isolator and its assembly erection shall comply with the latest approved specifications and Instructions with latest amendments.

Item No. E-23: Erection of PTFE Short Neutral section.

The price shall cover erection, testing and commissioning of a complete assembly of short neutral section (PTFE) (Phase brake). The price shall also cover end fitting for contact & catenary wire and other material required for erection & smooth operation with earthing arrangement. The short neutral assembly to be as per RDSO specification No. TI/SPC/OHE /SNS/ 0000 Rev.-1 with A&C Slip No.1 or latest.

Note :- The work in this scope shall be completed as per latest HQ letter no. HQ TC -127 (No EL/TRD/127(10/2014)dated: 06.10.2014).

Item No. E-24: Erection of materials for termination of Single/double conductor (including erection of cut-in insulator) of overhead equipment.

The price shall cover erection of all material necessary for the termination of double conductor of overhead equipment terminating wire on a traction mast or structure including clevis assembly, adjuster, anchor double strap, ending clamp for catenary or contact or terminating wire with fitting and 9-ton Composite or porcelain insulator (as desired by railway) assembly (for polluted zone) but excluding terminating wire if any, wherever double termination if required. Materials like equalizing /compensating double strap assembly. The Price shall also cover double composite insulators at termination locations in platform areas to enhance reliability and safety.

Note :- The work in this scope shall be completed as per latest HQ letter no. HQ TC -127 (No EL/TRD/127(10/2014)dated: 06.10.2014).

Item No. E-25: Erection of anti-creep with 9T insulator over & above as incl. in E34

The price shall cover cost for erection of complete Anti-creep assembly including 9T insulators, Terminations, copper anti creep wire etc. over and above as included in item no. E34. The copper wire will be supplied by railway from concern SSE's store. Erection shall comply with the latest approved specifications and Instructions with latest amendments.

Item No. E-26: Erection of section insulator assembly including core and cut-in insulator.

The price shall cover erection testing and commissioning of all components required for a standard section insulator assembly on conventional OHE including section insulator assembly (Five parts), also provide 2 nos., stiffener (contact bar) & other materials as per details given below: All material shall be with latest specifications.

Railway ID No.	Description of component	Qty per unit
RI-1120	Catenary ending clamp	2 Nos.

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RI-1190	Catenary dropper clip assembly	As required
RI-6170	Parallel clamp for double contact wire.	12 Nos.
RI-6110	Dropper assembly for Section Insulator.	As required
RI-6100-1	Porcelain section insulator along cree-page.	01 No.
RI-6020-1	9-ton insulator	01 No
RI-6181-2	Double straps for section insulator.	02 Nos.

Item No. E-27: Erection 25KV solid core cut-in insulator.

The price shall cover cost for erection testing and commissioning of complete 25 KV solid core Porcelain/ Composite cut-in-insulator including Double strap, Catenary wire or contact wire ending cone etc. as per latest RDSO/CORE specification. This item not covers cost for erection of cut-in-insulator which is covered in any other schedule.

Item No. E-28: Erection of 25KV solid core suspension insulator.

The price shall cover cost for erection testing and commissioning of complete 25 KV solid core Porcelain / Composite suspension insulator assembly including Double strap, single eye clevis, suspension clamp etc. as per latest RDSO/CORE specification and drawings. This item not covers cost for erection of suspension insulator which is covered in any other schedule.

Item No. E-29: Erection of 25KV Post/Support insulator.

The price shall cover cost for erection of 25KV Post Insulator with fasteners and saddles as per RDSO specification No. - TI/SPC/OHE/INS/0070 (04/2007) with A & C slip no. 1 & 2 or latest.

Note for E-27 to E-29 and other insulator schedule: - As per latest HQ letter no. HQ TC-127 (No EL/TRD/127(10/2014) dated: 06.10.2014), This to be ensured that 100% testing (joint testing) of insulators before providing to the line. (as per the latest guidelines- use of only UTM)

Item No. E-30: Erection of Change over panel as per RDSO spec. suitable for AT supply.

The price shall cover cost for erection, testing and commissioning of Change over panel as per RDSO specification No. TI/SPC/PSI/CLS/0020(12/02) (with A&C slip No. 1 to 4) or latest and suitable for 10 KVA required AT Supply specifications. The price also covers cost of Type-1 Box, any relay, fittings, Glands, fasteners, Lugs etc. for commissioning of panel and smooth working.

Item No. E-31: Erection of terminal board in control cubicle.

The scope shall cover the erection, testing and commissioning of terminal board for 230V AC supply to Interrupters in switching post control cubicle as per RDSO/CORE latest drawings and specifications

Item No. E-32: Erection of 110V DC distribution board.

The scope also includes the grouting of the frame work of the distribution board in position or mounting it on the wall and necessary connections.

Item No. E-33: Erection of 230V DC distribution board.

The scope shall cover erection of a 230V AC distribution board in the Control Room. It shall include the grouting of the framework of the distribution board in position or mounting it on the wall and necessary connections.

Item No. E-34 and E-35: Erection of PT Type-I/II

The scope shall cover erection and connecting of a 27.5 kV/100V potential transformer complete with all fittings and accessories including terminal connector. It shall also include mounting of the transformer in position and erection of the enamelled Number plate. Bus bar connectors provided with jumper connections.

Item No. E-36: Erection of 110V, 40AH lead acid battery charger.

The scope shall also cover erection of a 110V, 200Ah low maintenance lead acid battery complete

with stand and accessories as mentioned in relevant specification and a tool board. The scope for erection shall include installation, connecting up, charging and commissioning of the battery.

Item No. E-37: Erection of 110V lead acid, 40 AH battery.

The scope shall cover erection of a battery charger for 110V, 40AH low maintenance lead acid battery complete with stand and accessories as mentioned in relevant specification and a tool board. The scope for erection shall include installation, connecting up, charging and commissioning of the battery.

Item No. E-38: Erection & commissioning of auxiliary transformer including DO fuse assembly, LV box & anti climbing device.

The price shall cover cost for erection, testing and commissioning of Auxiliary Transformer 25 KV/230 V, as per RDSO specification No. RDSO specification no. ETI/PSI/15 (8 /03) or latest, with 25 KV DO fuse complete assembly including insulators as per RDSO Specification No. ETI/PSI/14(1/86) Rev 1 (Apr-87), LV box for AT & Anti climbing device complete including barbed wires etc. the price also cover cost for Clamps, lugs, Name Plate etc. The price shall also include modified arcing horn arrangements and fitting cost.

Item No. E-39: Erection of Lightning arrestor 42 KV.

It shall also include mounting and connecting up of the Lightning Arrestor in position and erection of an enamelled number plate. The scope also covers THRC testing.

Item No. E-40: Erection, testing & commissioning of Station Equipments (RTU) at SP/SSP as per RDSO Spec. No. TI/RCC/ SCADA/0134 (with latest amendments)

The price shall include supply, erection, testing & commissioning of SP/SSP RTUs RDSO Specification No. TI/SPC/RCC/SCADA/0134 with latest amendments. The lump sum price shall cover on a flat rate basis the cost of Remote Terminal Units per controlled station. The price shall also cover the cost of power supply units, memory units, digital input/output module, interposing Contactors, surge arrestors and the steel cubicles required for housing the RTUs, cost of interconnecting cables and wiring etc., and all materials necessary for proper functioning of the RTUs. The price shall also cover testing of materials and equipment at the manufacturer's works. The RTU shall be supplied in accordance with RDSO's standard specification & shall be capable of working on standard communication protocol as defined in the specification. The price shall also cover the cost of supply of catenary Voltage, indication circuits, under voltage circuits, voltage failure circuits and necessary interposing Contactors/relays/optocouplers to meet the requirements of RDSO's specification. The number of tele-signals given against each of the controlled stations in the Schedule does not include the tele-signals required for signaling defects in the operation of remote-control equipment. The telecom arrangement for high-speed TCP/IP based Scada system shall be in the scope of S&T wing of Western Railway a per Section 4 of RDSO specification no. TI/SPC/RCC/SCADA/0134.

Item No. E-41: Modification in existing standard SCADA for Integration of SP/SSP RTU.

The price shall cover the cost for Modification & commissioning of existing standard SCADA software at RCC equipments for configuration, integration/ hooking up of additional RTUs with master station as per RDSO Spec. No. TI/RCC/SCADA/ 0134/Rev-2) with latest amendments

Item No. E-42: Erection of overhead equipment, including catenary, contact, jumper and dropper wires, fixing of number plates & various type of boards

The price shall cover erection of all components which is covered under Supply of OHE items (Schedule 'D' Item No.-1) including Catenary & Contact wire, 5 mm Dropper wire, ending cones, contact/catenary splices, Retro-reflective/ enamelled Number plate, various types of caution and warning boards, retro-reflective Boards for Neutral section (As per latest guide lines) with SPS for attachment on mast/structure, Jumper wires of suitable size with suitable PG clamps, double bolted

for 'G, jumper(160sqmm) (Provision of Large-size modified double bolted PG clamps at all G-jumper

connections to ensure better electrical continuity and mechanical strength, and provision of Double G-Jumper at the first Sub-sector to enhance current carrying reliability as per TC-127), potential equalizing jumper, anti-theft jumper, X-feeder drop jumper, Isolator Jumpers and any other jumpers(when their use is approved) including anti-falling arrangement of jumpers wherever applicable (as per TC-127), terminating wires etc. The price also covers cost for providing anti creep anchor, contact wire or false catenary wire in place of catenary under ROB, FOB and over line structures As per RDSO SMI TI/MI/0062 Rev-1 or latest. Catenary and contact wire shall be supplied to contractor at concern SSE's store. Transportation cost shall be borne by contractor and shall not be paid under transportation item.

Note: -

1. The price shall also include erection of any extra fitting required for turnout, cross over, diamond crossing.
2. The price shall cover erection of all components fitting required for erection of contact and catenary wire including contact and catenary splices, catenary wire ending clamp, contact wire ending clamp, Anchor double strap, compensating plate/equalizing plate etc.
3. The price also covers cost for Cut in (9T) insulator with catenary/contact wire ending clamp for catenary & contact wire for all insulated overlaps.
4. The price also covers cost for erection of terminating assembly complete for new OHE wirings.
5. The price shall cover cost for erection of Catenary/Contact wire splices and other materials required for modification in existing OHE/New OHE where contractor claims erection of OHE cost.
6. If tramway OHE is required to be erected then it will be paid in OHE erection only for erection of contact wire including supply & erection of Bridle wire, PG clamp etc.
7. The price shall cover cost for erection of complete Anti-creep assembly including termination assembly, anti-creep wire and other SPS's etc.
8. The price shall also erection of Packing Saddle (1174) as per SPEC: TI/SPC/OHE/FITTINGS/0130-10/13-Rev-1, DRW: RE 33 P 1174
9. The price also covers cost for erection of a large span wire.
10. The price shall also include erection of additional contact wire across RRA clamps with PG clamps (RI NO. 1141-2) as per SMI no. TI/MI/0058 Rev-1 or latest.
11. The scope shall also cover erection of Double composite insulators at termination locations in platform areas to enhance reliability and safety, as per Latest HQ Guidelines including TC-127 (placed at annexure-I)

Note: Tower wagon may be supplied by Railway as per availability. Contractor shall make their own arrangement for erection of OHE structures & wiring. Road crane shall be hired by contractor for erection of OHE structures for locations easily accessible by Road. However, Tower wagon shall be made available for final checking of OHE prior to commissioning.

Item No. E-43: Transportation & laying of 10X2.5/2X2.5/2X4 Sq.mm PVC insulated stranded copper cable for control and indication.

The scope also covers the transportation of cables from SSE/TRD/C's store including loading, unloading and handling. The scope also covers the supply & erection of cu lugs, lacing and cable identification made of AL. labels at every 5 metres and at every corner on cable trench. The scope shall also cover insulation resistance measurement. Megger will be arranged by contractor. Method of erection available in Tender Document.

Item No. E-44: Transportation & laying of 2x70/150 Sq.mm PVC insulated stranded aluminium

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cable from AT to DB

The price shall cover erection, testing & commissioning of per meter length of 2x70/ 2x150sqmm AT cable as specified in relevant item. The price also covers cost for transportation of cables from concern SSE's store including loading, unloading and handling. The price also cover cost for supply & erection of Cu lugs, lacing and cable identification labels made of AL. at every 5 Mtrs and at every corner on cable trench. The price shall also cover cost of insulation resistance measurement. Megger shall be arranged by contractor. Method of erection shall be as per Rly. guidelines. Price shall also cover that of supply and erection of half round pipe for protection of Cable.

Item No. E-46: Erection of 150 sq.mm copper feeder wire.

The price shall cover manual erection of a 25KV feeder (along or across tracks) at the location of SP/SSP/FP/Gantries station. made of a single 37/2.25mm HDB stranded copper cross feeder (150sq.mm) The price shall exclusive of cost of feeder wire termination with anti-falling arrangement with jumper wire to OHE and small parts steel work complete with bolts, nuts etc. if any. The price also covers cost for transportation of feeder wire from concern SSE's Store.

Note:- As per latest HQ letter No. HQ TC-127 (No EL/TRD/127(10/2014) dated: 06.10.2014) , it should be ensured that copper feeder wire of 150 sq. mm and to run on separate mast. Also crossing of the feeder wire through gantry arrangement.

Item No. E-47: Erection of 50/39mm aluminium bus bar.

The price shall cover erection Testing & commissioning of per metre length of 50x39 mm dia. Aluminium tube to serve as bus bar or equipment to equipment bus bar connection in the traction sub-station, SP and SSP wherever required. The price shall include bending, shaping and connecting/clamping of the Aluminium tube to the equipment terminals/bus bar supports as required.

Item No. E-48: Erection of all types of aluminium bus bar terminal assembly, splice and connectors for 50mm bus bar.

The price shall cover cost for erection, testing and commissioning of all types of aluminium bus bar terminal assembly, splice and connectors for 50 mm bus bar as specified in concern item. The price also cover cost for contact resistance measurement as per procedure laid down in ACTM for commissioning of TSS, SP and SSP.

Item No. E-49: Erection of All Aluminium spider conductor of size 234Sq.mm. as per explanatory note.

The price shall cover erection of Hard-drawn stranded Aluminium conductor conforming to IS-398 (Pt.I) with latest amendment and of size 19/3.99mm (234 Sq.mm)

feeder/return conductor (along or across the tracks). The price shall not include the cost of suspension assembly (which will be paid for under item-03) and termination (which will be paid for under item-08.) and small part steel work, complete with bolts and nuts etc, if any. The price shall also cover on a flat rate basis, the cost of erection of splices to the extent required. This activity is to be carried out under power block.

Item No. E-50: Erection of 12.24 mm Dia ACSR Raccoon with mast fitting as per RDSO Drg. No. TI/DRG/OHE/ERBOND/RDSO/ 00001/11/0

The Price shall cover erection of Arial Earth Conductor (AEC) with necessary accessories, fittings and fasteners on mast/portals as per RDSO TI/IN/0042 dt 23.10.2020 with latest amendment if any. As per RDSO drawing number TI/dawning/OHE/earthling/ RDSO/00001/20/0 12.27 mm diameter ACSR Raccoon conductor for Arial Earth Conductor (AEC), Earth clamps with fasteners, etc shall be provided on back side of the mast/portals as approved in the RDSO instruction. ACSR conductor jointing, Anchoring/ termination arrangement as and where required in one TKM as per site conditions. The above recommendation is as per prevalent practice used in 2X25 kV system.

Item No. E-54: Erection and commissioning of Auxiliary transformer 25kV/230V, 25KVA capacity with DO fuse assembly, LV box & Anticlimbing Device

The price shall cover cost for erection, testing and commissioning of Auxiliary Transformer 25 kV/230 V, 25 KVA as per RDSO specification No. ETI/PSI/15 (8 /03) or latest, with 25 KV DO fuse complete assembly including insulators as per RDSO Specification No. ETI/ PSI/14(1/86) Rev 1 (Apr-87), provision of LV box for AT & Anti climbing device complete including barbed wires etc. the price also cover cost for Clamps, lugs, Name Plate etc.

Item No. E-55: Erection of Change over panel (CLS) as per RDSO spec. suitable for 25 KVA AT supply

The price shall cover cost for erection, testing and commissioning of Change over panel as per RDSO specification No. TI/SPC/PSI/CLS/0020(12/02) (with A&C slip No. 1 to 4) or latest and suitable for 25 KVA required AT Supply specifications. The price also covers cost of Type-1 Box, any relay, fittings, Glands, fasteners, Lugs etc. for commissioning of panel and smooth working.

Item No. E-57: Transfer of OHE from one support to another and adjustment of droppers

The price shall cover transfer of overhead equipment to a bracket assembly on a new mast or support and dismantling of the erected bracket assembly from the old mast or support and consequent adjustment to overhead equipment required such as re spacing of droppers.

Item No. E-58: Providing (Supply with erection) of anticlimbing device for SSP/SP.

The scope shall cover supply & erection of an anti-climbing device consisting of steel fixtures and galvanized barbed wire for mounting on the fencing panels as per approved drawings, the scope shall be per meter length of the panel. The scope shall include painting of the fixtures with two coats of red oxide zinc chromate primer and finished with two coats of Aluminium paint as per IS: 2339.

Item No. E-59: Dismantling & removal of OHE complete with cantilever, droppers, contact & catenary wire etc.

The scope shall cover the dismantle of complete OHE including contact and catenary wire, droppers, jumpers, insulators & other fitting if any. The scope also covers cutting of catenary wire, contact wire and other materials for DS-8 purpose (if required) and same will be handed over to concern SSE/C, Railways scrap depot for DS-8 or as desired by SSE/TRD/C. Transportation charges will be given relevant item of transportation. Site for DS-8 of dismantled items shall be decided by the SSE in charge.

Item No. E-60: Dismantling & removal of Auxiliary transformer with DO fuse.

The scope shall cover the dismantle of Auxiliary transformer including DO fuse assembly, Jumper wire, PG clamps, LT fuse box, anti-climbing device, Earth connection etc. Transportation charges will be given relevant item of transportation.

Item No. E-61: Dismantling & removal of Isolator complete.

The scope shall cover the dismantle of complete isolator including terminal connectors, jumper wire, PG clamps operating rod and support insulators, operating handle and SPS. Transportation charges will be given relevant item of transportation.

Item No. E-62: Dismantling & removal of Mast, portal, TTC & other small part steel

1. The price shall cover the dismantling of OHE mast, portal upright with boom, TTC and other small part steel by gas cutting and handing over to the railway at nominated place.
2. The price shall exclude the transportation charges and the same will be paid for against relevant item.
3. Crane will be given by Railway for dismantle of Portal boom only.
4. The price shall also cover cost of cutting in suitable size pieces for scraping the material (i.e. 2.0M to 3.0M or as accepted by railway scrap depot).

Item No. E-63: Breaking of concrete foundation of Masts, portals & TTC

The price shall cover cost for breaking of foundation of Mast, Portal TTC etc. up to 0.8 M below rail level. The price also covers cost for removal of debris outside track.

Item No. E-64: Dismantling & removal of Guy rod assembly

The price shall cover to dismantle the Guy rods with Anchor fitting, Guy rod fittings, double strap, stirrup & Anchor V bolt etc. and same will be handed over to concern SSE/C Railways scrap depot for DS-8 or as desired by SSE/TRD/C. Transportation charges will be given relevant item of transportation.

Item No. E-65: Providing (Supply & erection) of layout board for switching posts.

The scope shall cover the providing (Supply with erection) of lay-out board for switching post. The board shall be framed with Aluminium section in suitable size. Before supply the board necessary approval should be obtained from Dy.CEE/C/RTM.

Item No. E-66: Providing (Supply & erection) of Sectioning diagram board at stations.

The scope shall cover providing (Supply with erection) of Sectioning diagram boards at Stations. The board shall be framed with Aluminium section in suitable size. Before supply of the board necessary approval of design, material, should be obtained from Dy.CEE/C/RTM.

Item No. E-67: Provision of digging of trench 300mm deep and refilling in all soil and repair of PF area as per explanatory note.

The provision covers the cost of digging of trench with 300 depth for the erection of BEC wire, and refilling of the same, in all types of soil as well as platform areas. The cost shall also cover the repairing of platform areas and in yards.

Item No. E-68: Supply & erection of firefighting equipment.

The scope shall cover providing (supply with erection) of fire extinguisher confirming to IS: 2171 or latest. The firefighting equipment shall be suitable to take care of B & C class of fire. The extinguisher shall have 10 Kg. Capacity of dry chemical powder. The scope also covers hanging arrangement / suitable clamps.

Item No. E-69: Supply of First aid Box with Stretcher etc.

The scope shall cover supply with erection of standard first Aid box and stretcher with hanging arrangement of GI Sheet with pad lock as approved by the Employer. The list of items containing min the first aid box shall be obtained from employer/engineer.

Item No. E-70: Digging of trench 450x1000m for AT cable.

The price shall cover the cost of manual digging of trench of suitable size as per RDSO specification, any changes and instructions may subject to site conditions and as per DYCEE/C/RTM.

Item No. E-71: Drilling of horizontal bore below track by pushing method for laying of RCC/DWC/HDPE pipes of various sizes up to 450mm dia.

The price covers the cost of Drilling of horizontal bore below track by pushing method for laying of HDPE pipes of suitable size for cable crossing below the tracks, roads, etc, and as per the instructions issued by DYCEE/C/RTM. Prior approval for the location and work is mandatory from DYCEE/C/RTM.

Item No. E-72: Supply and fixing of HDPE pipe outer dia. 63mm for AT cable.

The price shall cover the supply and fixing of Poly propylene rope 3strand hawser laid and strand pleated size 16mm dia. conforming to IS 14929-2001 along with hardware to secure the complete AT cable under the trench including the cable track crossing.

Item No. E-73: Transportation of Railway supply materials from Railways depots to work site OR Transportation of Released material from work site to Railway depot.

Price shall cover cost for Loading, unloading and transportation of all released OHE materials i.e. OHE mast, cantilevers, SI, SP Isolator, Guy rod, insulators, DA, Chair etc. from site to Construction depot. /Scrap depot for DS-8 or as desired by SSE/TRD/C. The price also covers cost for transportation of materials (from OHE depot to Site) which is supplied by Railway and not covered in contractor's supply.

Item No. E-74: Work under Power Block: Any erection works as per schedule done under power and /or Traffic block is subject to have extra rate.

The scope covers additional 30% cost for erection of an item which is required Erection under a power block. The scope under this item covers extra charges over and above erection rates of items for erection of equipment in the vicinity (less than 2 Mtrs.) of energized overhead equipment which calls for a power block (shut off of traction power supply). Power block will be arranged by Railway as per suitable demand of contractor. The scope payable under this item shall be 30% extra (only in case of charged OHE section) over the erection rates of the items referred to above provide such work is not called for on account of non-compliance with specifications, approved drawings and instructions given by the purchaser from time to time.

Item No. E-75: Tree trimming for OHE section.

Clearance of OHE from any trees along the section should be maintained at least 4 mtr. Trees infringing the OHE should be trimmed. The price covers tree trimming irrespective of tree height, and will be paid per tree (irrespective of number of branches to be cut). Decision for trees to be trimmed should be as per railway supervisor deputed at site.

Item No. E-76: Core cutting at bridge pier block 40mm Dia, hole 1000mm gap, and epoxy chemical grouting with minimum bond stress m20 concrete for 20mm bolt.

The price shall cover the cost of Core cutting at bridge pier block 40mm Dia, hole 1000mm gap, and epoxy chemical grouting with minimum bond stress m20 concrete for 20mm bolt. and as per the instructions issued by Engineering. Prior approval for the location and work is mandatory from Engineering.

Item No. E-77: Grouting of Bridge mast bolt by suitable epoxy resin chemical compound.

The price shall cover cost of Grouting of Bridge mast bolt by suitable epoxy resin chemical compound. as per the instructions issued by Engineering. Prior approval for the location and work is mandatory from Engineering.

Item No. E-78: Provision of buried rail with suitable length along with 2 earth pits and other accessories as per the Earthing specification no. TI/SPC/PSI/ERTHNG/0210 or latest, for SP/SSP (Rail piece to be provided by Railways)

The scope shall cover Providing (supply with erection) of Buried Rail with all required materials except piece of Rail (13mtrs) as per RDSO specification No. TI/SPC/PSI/EARTHING/0210, dated

20.08.2021. The scope shall cover Providing Earth electrode with Earth pit, GI Flat size of 75x8 as required for connecting earth electrode to Buried Rail & Buried rail to Running track as mentioned in RDSO specification No. TI/SPC/PSI/EARTHING/0210, dated 20.08.2021. The scope shall cover Providing digging, copper rivet, fasteners, Nut bolt, washer, Check nut etc. Rail will be provided by Railway from nearby site/P-way depot. The transportation up to site shall be in contractor's scope. All material except rail shall be supplied by the contractor.

Item No. E-79: Erection of Anti Bird Disc Made from Acrylic Material (Rating 220 kv PIG Tall type) Suitable for Porcelain type Bracket/Stay/9 Tonne Insulator as per Drg. No. TI/DRG/ OHE/ ABD/ RDSO/ 00000/ 19/ 0 (sh-1 & sh-2).

The price shall cover for Erection of Anti-Bird disc on HT side of 9 Ton insulator, BT insulator, ST insulator of cantilevers under power block. The erection shall be carried out as per RDSO drawing No. TI/DRG/OHE/Anti-Bird/00001/00/01 (Sh1 & Sh-2) or latest. Prior approval for the locations where Anti Bird disc is to be erected, shall be obtained from Dy.CEE/C/RTM.

Item No. E-80: Erection of Hot Dip Galvanized anti monkey climbing arrangement for mast.

Price is inclusive of erection, Installation of Slippery, Monkey Anti—Climbing Arrangement Made of MSG Flat (40 X 06) mm, covered with galvanized sheet (22 Gauge) Welded cylindrical structure MSG Flat structure & G I—sheet attached with G I—round head self-screw. Complete Monkey Anti—Climbing Arrangement fitted with BFB-RJS Mast to clamps as per drawing no: TI/ MI/ 0056 with galvanized Bolt/ Nut/ spring Washer/ Washer Bolt/ Nut (M16 X 50) mm or as per requirement. Length 1500mm and diameter size 500 mm or above as per BFB mast & RJS. Vertical MSG Flat quantity 06nos. & light round curvy vertically, due to cylindrical shape. Both ends of Monkey Anti—Climbing Arrangement' covered with galvanized sheet (22 SWG) as per drawing, Welded portion of MSG Flat Structure will paint by Zinc Paint. Minor changes can be done on requirement according to location.

The scope shall include erection of Anti Monkey climbing device as Monkey scare measure of OHE mast at Monkey menace prone area as per RDSO SMI No. TI/MI/0056 Rev-2 or latest. The erection of AMCD shall be done as per site requirement of respective OHE structure and as directed by concern SSE/Elect/C.

Item No. E-81: Erection of Anti Monkey climbing device as Monkey Scare for Portal

The scope shall include erection of Anti Monkey climbing device as Monkey scare measure of OHE Portal/TTC upright at Monkey menace prone area as per RDSO SMI No. TI/MI/0056 Rev-2 or latest. The erection of AMCD shall be done as per site requirement of respective OHE structure and as directed by concern SSE/Elect/C.

Item No. E-82: Erection of nylon/plastic net - High density polyethylene (HDPE) monofilament netting type III, UV stabilized as per IS 16008(part-2)-2016/PVC virgin HDPE Net

The scope shall include Erection of Anti Bird high density poly ethylene (HDPE) filament netting type III, UV stabilized as per IS 16008 (Part-2)-2016. PVC virgin HDPE net preferably in black colour on fabricated structure, Portal/TTC, Fabricated DA, Gantry boom, etc. as per RDSO MI No. TI/MI/0050 Rev-1 Dtd.27.09.2021. the scope shall include tying with UV resistant nylon cable tie as per para 4.4 of RDSO SMI.

Item No. E-83: E, T & C of 25KV Current Transformer

The price shall cover erection and connecting, testing, commissioning of a 25 KV,1500-750/5A current transformer complete with all fittings and accessories including terminal connector as per

RDSO spec. No. ETI/SPC/PSI/CT/0210 (07/2021) or latest. It shall include erection of an enamelled Number plate.

Item No. E-84: Erection of additional contact wire piece across RRA clamp with 02 Nos. of PG clamps on either side (contact wire piece shall be supplied by railway)

The Scope shall include supply and fitting of 02 Nos. of PG clamps on either side of RRA clamp as per RDSO SMI No. TI/MI/0058 Rev-1, dated 10.08.2021. The additional contact wire of length 2.00 meter shall be fixed on out of run contact wire across RRA clamp with the help of two Nos. PG clamps on either side (RI No. 1041-2) as per SMI. The work involves bending and fixing of contact wire as per site requirement.

SCHEDULE F: T&P Items

This complete schedule i.e. T&P items, require prior approval from Dy.CEE(C) before supply.

ANNEXURE-I



पश्चिम रेलवे
Western Railway

प.सं.ई.एल: 94/15/1

Headquarter Office,

Churchgate, Mumbai-20.

प्रधान कार्यालय, चर्चगेट मुंबई-20

दिनांक: 23.03.2026.

मुख्य विजली अभियंता/निर्माण/ चर्चगेट एवं अहमदाबाद,
महाप्रबंधक (विजली)/मुंबई रेल विकास कारपोरेशन/ चर्चगेट

विषय: Uniformity of PTW & EIG applications and Inclusion of Action plan items and certificates of the same in the PTW & EIG applications.

सन्दर्भ: HQ TC-127 (No EL/TRD/127(10/2014)dated: 06.10.2014).

HQ Technical Circular No.127 was issued with the objective of streamlining and bringing uniformity in the submission of PTW and EIG applications to Headquarters. The Technical Circular also included Reliability Action Plan items pertaining to OHE and PSI.

Subsequently, based on the latest instructions issued by Railway Board, RDSO and Headquarters, certain new Reliability Action Plan items have been introduced and some of the earlier items have been deleted. Accordingly, an updated list of Reliability Action Plan items for OHE and PSI has been prepared, which will supersede the existing list.

The revised Reliability Action Plan items are as under:

A:OHE

1	Provision of anti falling arrangement for along feeder jumper connected to OHE.
2	Provision of Cross feeder wire with 150 Copper feeder and Drop jumper of 160 sq mm with Anti falling arrangement of Cross feeder.
3	Provision of isolators copper jumpers of 160 sq mm with bolt type connector and anti falling arrangement.
4	Provision of Copper feeder wire of 150 sq mm and to run on separate mast.
5	Crossings of 150 sq mm copper Feeder wire through gantry arrangement.
6	Provision of "G" jumper with cross type arrangement as per RDSO drawing.
7	Provision of 160 sqmm "G" jumper in Cross over and overlap.
8	Provision of 'G' jumper in overlap zone instead of cross over zone at X/O and T/O locations).
9	Modification of anti falling arrangement of 3-pulley type ATD - RDSO modification vide RDSO letter No.TI/OHE/ATD/10 dated: 31.05.2010 / 04.06.2010.
10	Provision of Composite and Porcelain as per latest guidelines issued vide letter No 2002/EEM/161/21/Vol-II , dated: 30.09.2020.

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11	100% testing (joint testing) of insulators before providing to the line. (As per the latest guidelines- Use of only UTM)
12	Provision of standard arrangement of false catenary under overline structure (FOB/ROB) location. (As per RDSO SMI TI/MI/0062 Rev-1 or latest).
13	Provision of 1600 Amp 25 KV single pole Isolator with 160 sq.mm Copper jumper arrangement- RDSO directives.
14	Provision of forge fittings instead of MCI fittings as per HQ – TC No.84 & 89.
15	Bonding and earthing of OHE mast for Concrete bridges with provision of Earth wire/strip and earthing on both side of Bridge.
16	Provision of spare OHE mast foundation on Bridges pier & spare bridge mast as per R.B letter No.2022/EEM/148/4/IRSOD dated: 10.09.2025
17	Provision of continuous protective screen on FOB and ROB from inside as per the RDSO latest drawing No. ETI/C/0068 Mod-H or latest.
18	Provision of PTFE Neutral section in place of Insulated over lap of TSS.
19	Standard of OHE design as per ACTM and Cross over/Turn out and overlap layout as per RDSO drawing.
20	Provision of Retro reflective number plates, Sigma board and other caution board on OHE mast as per HQ TC No.59 and R.Bd letter No.2001/Elect(G)/170/1 Pt, dated: 21.02.12
21	Whether Steady arm with length of 1 meter be provided.
22	DA implantation at station at Platform should be more than 1.85 meter.
24	Provision of parallel contact wire across RRA clamp.(As per RDSO SMI No. TI/MI/0058 Rev-1 or latest)
25	Provision of Packing Saddle in catenary suspension clamp for prevention of melting/flashing of catenary wire (As per As per RDSO SMI No. TI/MI/0059, Rev.3 or latest)
26	Connection of structure bond to Rail in track circuiting area as per HQ letter No.El-94/15/1(Comp. No. 677982) dated: 17.10.2025
27	Provision of fluorescent red tape before ending cone.(As per RDSO SMI No. TI/MI/0037 Rev-3 and TI/MI/0051 or latest)
28	Provision of Anti bird Disc for prevention of bird faults (As per RDSO SMI No. TI/MI/0059 Rev-3 or latest)
29	Provision of Nylon mesh for prevention of bird menace.(As per RDSO SMI No. TI/MI/0050, Rev-2 or latest)
30	Provision Anti monkey Climbing device for prevention of monkey menace (As per RDSO SMI No. TI/MI/0056, Rev-2 or latest)
31	Provision of copper catenary wire instead of steel anti creep wire in polluted and coastal area.
32	Provision of 7 mm dropper or steel dropper in girder bridges. (Rly Bd action plan item)
33	Provision of Insulation paint/Insulation sheet at girder bridges where sufficient electrical clearance not available. (As per RDSO SMI No. TI/MI/0061)
34	Provision of Double composite insulators at termination locations in platform areas to enhance reliability and safety, Anti-Creep, FTAs, etc.

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(Const.) Western Railway

35	Provision of Double inclined droppers throughout the entire section in all the cantilevers to improve mechanical stability of the contact wire.
35	Provision of Large-size modified double bolted PG clamps at all G-jumper connections to ensure better electrical continuity and mechanical strength
37	Provision of Only one (01) ATJ jumper in place of the earlier provision of three (03) jumpers to simplify the arrangement and improve reliability.
38	Provision of Three (03) PG clamps, instead of two (02 on G-jumpers, F jumper, ATJumpers and isolator jumpers to ensure firm connections.
39	Provision of Double G-jumpers at the first sub-sector to enhance current carrying Reliability.
40	Provision of Contact & Catenary Ending clamps at the BWA and FTA terminations. Usage of Large span wires should be discontinued & should only be provided with the approval of WR HQ.
41	Provision of double composite insulators in place of single ST and BT insulators in order to avoid/minimise insulator flashing and bird fault cases.
42	Provision of Updated Sectioning diagram/SWR in newly commissioned section by executing agencies.
43	Chamfering of holes in Rail for provision of Bond
44	Any other modification as per Rly.Bd/RDSO/HQ guidelines

B:PSI

1	Provision of insulating pad and surge monitor to Lightning Arresters – RDSO modification vide RDSO SMI No. TI/SMI/0048 (Rev-2 or latest).
2	Provision of disconnector assembly to Lightning arrestor- RDSO modification vide RDSO SMI No. TI/SMI/0048(Rev-2 or latest).
3	Provision of Earthing station at SP and SSP - RDSO modification vide RDSO SMI No. TI/SMI/0032 (Rev-2 or latest).
4	Provision of Battery monitoring relay at TSS- RDSO modification vide RDSO letter No.TI/PSI/PROCT/STATC/12 dated 01/05.03.2013 & 08/12.03.2013
5	Provision of 9-ton insulator with Arcing horn at Auxiliary Transformer - RDSO modification vide RDSO letter No.TI/PSI/AT/POLICY/10 dated 20/31.02.2010.
6	Provision of Control and Relay panels as per latest directive of RDSO letter No.TI/PSI/PROCT/STATC/12 dated 01/05.03.2013 & 08/12.03.2013 or latest.
7	Provision of PT on HT side of Transformer for voltage indication- RDSO modification.
8	Provision of ABT Energy meter in TSS with associated CT& PT.
9	Provision of PT fuse across PT to isolate PT in case of failure-RDSO modification.
10	Provision of CB and Protection arrangement for major yard/siding in TSS/SSP for isolation as per RDSO letter No. RDSO-TI0LKO(PSI)/5312020-O/O PED/TI/RDSO dated: 19.03.2024.
11	Double Earthing arrangement for Lightning Arresters and Auxiliary Transformer with Continuous Earthing patti from LA/AT to Earthing electrodes.

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(Const.) Western Railway

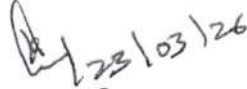
12	Provision of check energy meter at TSS.
13	Provision of PT on 220/132/110 KV side at TSS.
14	Provision of Duplicate / Stand by cable for Auxiliary Transformers.
15	Provision AT cable route markers and cable route plan
16	Any other modification as per Rly.Bd/RDSO/HQ guidelines.

The Google link of HQ Technical Circular No.127 is also being shared along with this letter for reference and for facilitating the updating of the latest Reliability Action Plan items.

Further, during scrutiny of EIG applications, it has been observed that mandatory ACTM proformas are not being submitted as per the latest revised ACTM.

Railway Board has revised ACTM in the year 2022, wherein some proformas have been deleted and some have been modified. Therefore, all Divisions / Executing Agencies are instructed to submit only the proformas as per the Revised ACTM-2022 along with the EIG applications.

संलग्न: उपरोक्त संदर्भित Google link


(कल्पना मीना)

उप.मुख्य वि.अभियंता (क.वि)
कृते प्रधान मुख्य विजली अभियंता

प्रति-/

व. मं. विजली अभियंता (उपनगरीय) एवं (गैर उपनगरीय) मुंबई सेंट्रल,
व. मं. विजली अभियंता (क.वि) रतलाम, वडोदरा, अहमदाबाद, राजकोट,
व. मं. विजली अभियंता (कर्षण) भावनगर

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पश्चिम रेलवे
Western Railway

प.सं.ई.एल: 94/15/1

Headquarter Office,

Churchgate, Mumbai-20.

प्रधान कार्यालय, चर्चगेट मुंबई-20

दिनांक: 11.03..2026.

मुख्य बिजली अभियंता/निर्माण/ चर्चगेट एवं अहमदाबाद,
महाप्रबंधक (बिजली)/मुंबई रेल विकास कारपोरेशन/ चर्चगेट

विषय: Provision/modification of items in ongoing/new electrification project to enhance OHE Reliability.

सन्दर्भ: (i) This office letter of even No dated: 06.02.2026.

(ii) MOM of Sr.DEE (TRD/TR) conference issued vide No. EL-204/51/4/16/1, dated: 04.11.2025.

Construction Organisation, vide letter under reference (i), was advised to carry out certain modifications in the OHE arrangements for ongoing and new electrification projects in order to enhance the reliability of the OHE system.

In addition to the above instructions, it has been decided that the following additional provisions shall also be implemented by the Construction Organisations in **all ongoing and future electrification works**:

1. **Double composite insulators** shall be provided at termination locations in **platform areas** to enhance reliability and safety, Anti-Creep, FTAs, etc.
2. **Double inclined droppers** shall be provided throughout the entire section in all the cantilevers to improve mechanical stability of the contact wire.
3. **Large-size modified double bolted PG clamps** shall be provided at all **G-jumper connections** to ensure better electrical continuity and mechanical strength.
4. **Only one (01) ATJ jumper** shall be provided in place of the earlier provision of **three (03) jumpers** to simplify the arrangement and improve reliability.
5. **Three (03) PG clamps**, instead of two (02), shall be provided on **G-jumpers, F jumper, AT-Jumpers and isolator jumpers** to ensure firm connections.
6. **Double G-jumpers** shall be provided at the **first sub-sector** to enhance current carrying reliability.
7. The BWA and FTA terminations shall be provided with Contact & Catenary Ending clamps. Usage of Large span wires should be discontinued & should only be provided with the approval of WR HQ.

यह आपकी जानकारी और आवश्यक कार्यवाही के लिए भेजा जा रहा है।

संलग्न: As above

SUBHASISH

SAMANYUJIT NAG

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(सुभाषिश नाग)

मुख्य बिजली वितरण इंजीनियर

प्रति -/

प्रधान मुख्य बिजली इंजीनियर - कृपया सूचनार्थ हेतु

- व. मं. बिजली अभियंता (उपनगरीय) एवं (गैर उपनगरीय) मुंबई सेंट्रल,
व. मं. बिजली अभियंता (क.वि) रतलाम, वडोदरा, अहमदाबाद, राजकोट
व. मं. बिजली अभियंता (कर्षण), भावनगर

कृपया सूचनार्थ व आवश्यक कार्यवाई हेतु



प.सं.ई.एल: 94/15/1

Headquarter Office,
Churchgate, Mumbai-20.
प्रधान कार्यालय, चर्चगेट मुंबई-20
दिनांक: 06.02.2026.

मुख्य बिजली अभियंता/निर्माण/ चर्चगेट एवं अहमदाबाद,
महाप्रबंधक (बिजली)/मुंबई रेल विकास कारपोरेशन/ चर्चगेट

विषय: Provision of Large size PG clamp and Double composite insulator in ongoing/new electrification project to enhance OHE Reliability.

सन्दर्भ: MOM of Sr.DEE (TRD/TR) conference issued vide No. EL-204/51/4/16/1, dated: 04.11.2025.

During the Sr.DEE (TRD/TR) conference, with a view to enhance the overall reliability of OHE, Western Railway has decided to implement the following measures:

- (i) Modification of existing OHE by providing double composite insulators at OHE terminations and replacement of existing single ST and BT insulators with double composite insulators, in order to avoid/minimise insulator flashing and bird fault cases.
- (ii) Replacement of existing single-bolt PG clamps with large PG clamps at "C" jumper and "G" jumper locations during maintenance activities.

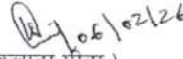
All divisions have already been advised to carry out the above-mentioned modifications on existing OHE.

It is further mentioned that several electrification works are currently in progress, and many future works related to New Line / Doubling are likely to be undertaken by Construction Organizations such as Construction, MRVC, etc.

Accordingly, it has been decided by the competent authority, i.e. PCEE/WR, that the implementation of the above modifications (Item Nos. (i) & (ii)) shall also be carried out by the Construction Organizations in all ongoing and future electrification works. This has the approval of competent authority.

In view of the above, it is advised to look into the matter and take necessary action accordingly.

यह आपकी जानकारी और आवश्यक कार्यवाही के लिए भेजा जा रहा है।


(कल्पना मोना)

उप.मुख्य वि.अभियंता (क.वि)
कृते प्रधान मुख्य बिजली अभियंता

प्रति -/

व. मं. बिजली अभियंता (उपनगरीय) एवं (गैर उपनगरीय) मुंबई सेंट्रल, } कृपया सूचनार्थ व आवश्यक
व. मं. बिजली अभियंता (क.वि) रतलाम, बडोदरा, अहमदाबाद, राजकोट } कार्रवाई हेतु
व. मं. बिजली अभियंता (कर्पण), भावनगर

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**MINUTES OF MEETING OF SR.DEE/TRD/TR'S CONFERENCE HELD AT WESTERN
RAILWAY HQ ON 07.10.2025**

Members Present

HQ	DIVISION
Shri. Rajnish Kumar Goyal, PCEE/WR	Shri. M.K.Tiwari, Sr.DEE/Sub/MMCT
Shri. G.P. Garg, CEDE/WR	Shri C.S.Yadav, Sr.DEE/N.S/MMCT
Smt. Kalpana Meena, Dy.CEE/TRD/CCG	Shri.Nalin Lochan Gupta, Sr.DEE/TRD/BRC
	Shri.Suresh Kumar, Sr.DEE/TRD/RTM
	Shri. Meethalal Meena, Sr.DEE/TRD/ADI
	Shri.Jitendra Mangal, Sr.DEE/TRD/RJT
	Shri.Vijendra Kumar Meena, Sr.DEE/TR/BVP

S.N.	Items	Action By
1	Reliability/Safety Items The meeting commenced with discussions on the agenda items, including the status of proposals for Reliability and Safety works. It was emphasized that all overhead power line crossings up to 66 kV should be converted to underground cable crossings , as per the correction slip issued by the Railway Board to the ACTM. Divisions were advised not to submit proposals for each crossing individually , but to prepare cluster proposals , prioritizing Main Line sections . No proposal for overhead lines to be accepted from the Electricity Board in future at least till 132KV, all crossings to be done by undergrounding.	All Sr.DEE's/ TRD & TR
2	Provision of Dielectric Shoes Use of Dielectric shoes can be explored by divisions. These shoes are intended to protect staff from accidental electrical shocks; however, their use does not permit any relaxation of safety protocols .	All Sr.DEE's/ TRD & TR
3	Installation of CCTV and Intrusion Alarm Systems All TRD Depots, TSS, and SWS shall be equipped with CCTV cameras integrated with motion sensors . In the event of unauthorized intrusion, audible (hooter) and visual (flasher) alarms should be activated automatically, with simultaneous alerts to be sent to the TPC.	All Sr.DEE's/ TRD & TR

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Dy.Chief Electrical Engineer
(Const.) Western Railway

4	Use of Safety Tools and Tackles Instances of staff not using prescribed safety tools and tackles during Tower Wagon or OHE work were noted. It was instructed that safety harnesses and helmets must be compulsorily worn during such work. If any staff member is found violating safety instructions, strict action to be taken. Surprise checks by officers should be conducted to enforce compliance, and disciplinary action should be taken against repeated offenders.	All Sr.DEE's/ TRD & TR
5	Provision of Spare Bridge Masts Divisions were instructed to ensure provision of spare bridge masts on bridges in place of bolt-only arrangements, maintaining at least 50% availability . Additionally, spare masts (or TTCs) of minimum 10 m length should be provided before bridge abutments, especially at locations prone to flooding .	All Sr.DEE's/ TRD & TR
6	Reduction in OHE Mast/Portal Implantations It was observed that reduction in mast/portal implantations is increasing due to unwarranted slewing of tracks by the Engineering Department. Divisions were advised to keep watch on track alteration and take up the matter with the engineering department so that OHE mast/foundation do not infringe IRSOD.	All Sr.DEE's/ TRD & TR
7	Frequent CB Trippings on Feeders Some feeder CBs have shown a high incidence of tripping. To address this, divisions should explore provision of double 1050 mm CD composite insulators in place of existing single ST and BT insulators . Sr.DEE/NS/MMCT has prepared the drawings & technical details of double insulators designed by NS team. All Divisions shall implement this measure on priority in one subsector where tripping cases are maximum. The TDC is Dec'25	All Sr.DEE's/ TRD & TR
8	Provision of Insulating paints under ROB/FOBs Divisions have reported that many CB tripping occurred under ROB/FOBs where electrical clearances are less. In this regard RDSO already issued the instruction for provision of insulating paint as per RDSO SMI No TI/MI/0061 effective from April 2025. Division shall use as per requirement.	All Sr.DEE's/ TRD & TR


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9	Condemnation of Old Tower Wagons Divisions shall initiate condemnation proposals for all 4-wheeler Tower Wagons that have completed codal life or beyond repair .	All Sr.DEE's/ TRD & TR
10	Data Accuracy in TDMS PCEE emphasized that correct asset entries in TDMS are critical for recording maintenance activities and ensuring accuracy in Power Block requisition, granting, and progress reporting . It was observed that deficiencies noted during foot patrolling and Non-PB module updates (including Special Drives, Compliance, and RAP progress) are not being updated. Divisions must ensure that scope, targets and progress data in TDMS match the TRD Daily Position .	All Sr.DEE's/ TRD & TR
11	Implementation of Quality System Framework (QSF) Implementation of QSF for Works, Rolling Stock, Signalling, and other assets was reviewed. PCEE advised that weekly training sessions (15–30 minutes) to be conducted. A knowledgeable supervisor or staff should deliver a briefing on a selected topic each week, and attendance must be recorded .	All Sr.DEE's/ TRD & TR
12	Installation of ATD Monitoring Devices. All divisions shall explore provision of ATD monitoring devices at nominated locations for real-time condition monitoring.	All Sr.DEE's/ TRD & TR
13	Change in Design of existing PG clamp There are cases of catenary strand breakage under PG clamp. There is a need to change the design of PG clamp so that contact resistance is reduced and cases of strand breakage should be minimised/eliminated.	All Sr.DEE's/ TRD & TR
14	Monitoring of T/O and X/O Parameters Special attention should be given to Turnouts (T/O) and Crossovers (X/O) . Divisions were advised to develop an App-based system for checking T/O and X/O parameters without requiring power blocks . The following items require critical monitoring : <ul style="list-style-type: none"> • Provision of double inclined droppers • Replacement of split pins during each AOH • Checking catenary strands under catenary suspension clamps, especially where CB tripping has occurred • Accurate data entry in relevant TDMS modules 	All Sr.DEE's/ TRD & TR

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15	Foot Patrolling Staff Identification and Tracking using GPS Tracker All foot patrolling staff must wear fluorescent jackets , distinct from those of the Engineering Department, for easy identification. GPS trackers to be provided to foot patrolling staff as used by Engineering Dept. so that live monitoring can be done.	All Sr.DEE's/ TRD & TR
16	Provision of Double composite Insulator at feeder wire suspension where clearance is available. Where clearance is not available, a single 9 to insulator can be continued.	All Sr.DEE's/ TRD & TR
17	At termination of OHE, a double composite insulator has to be provided by all divisions. Sample photo is attached for reference . 	All Sr.DEE's/ TRD & TR

(No. EL-204/51/4/16/1, date: 04.11.2025)

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Dy.CEE/TRD

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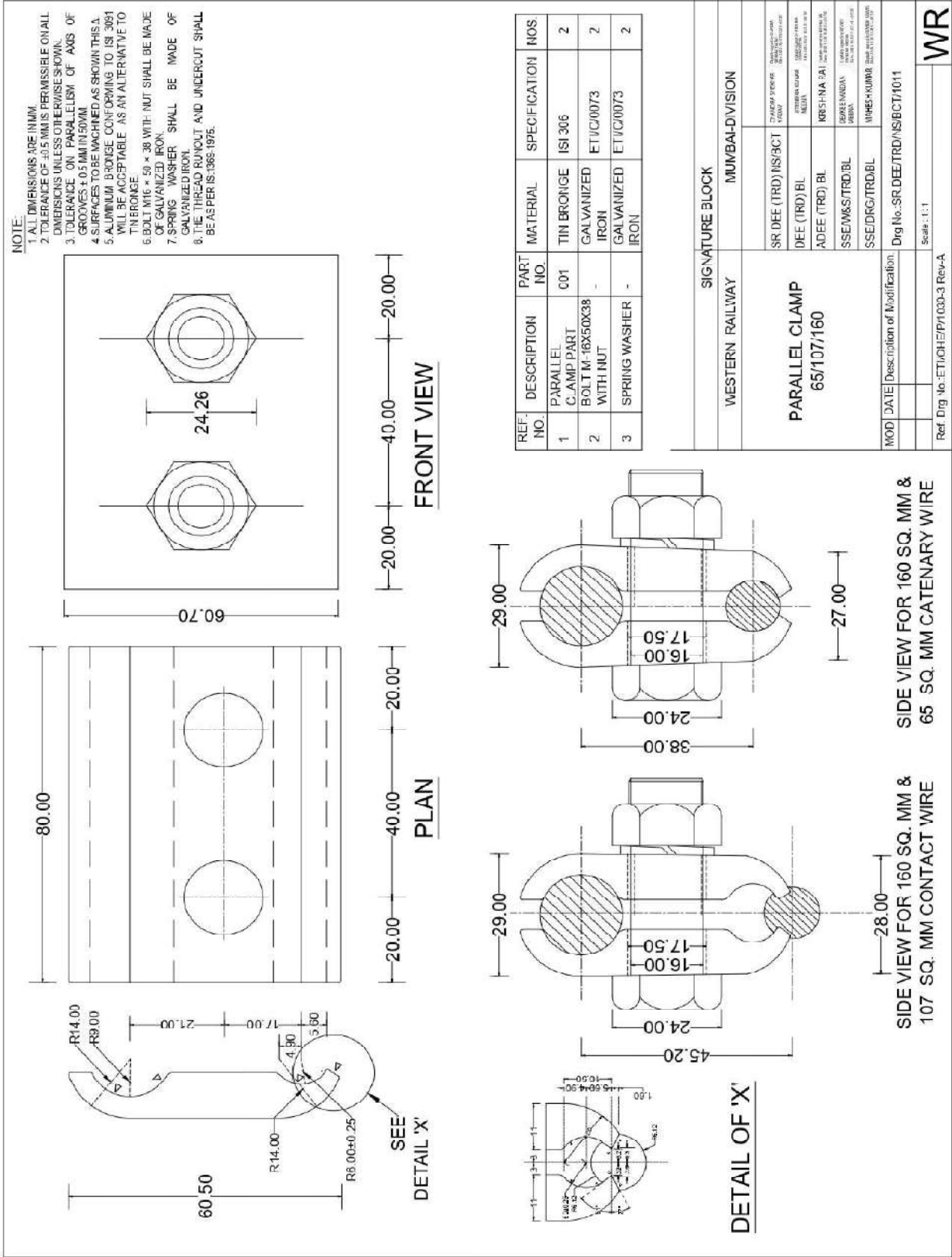
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Sr.DEE/Sub & N.S/MMCT
Sr.DEE/TRD/BRC, RTM, ADI, RJT - For information & necessary action .
Sr.DEE/TR/BVP

C/- PCEE:-For kind information please.

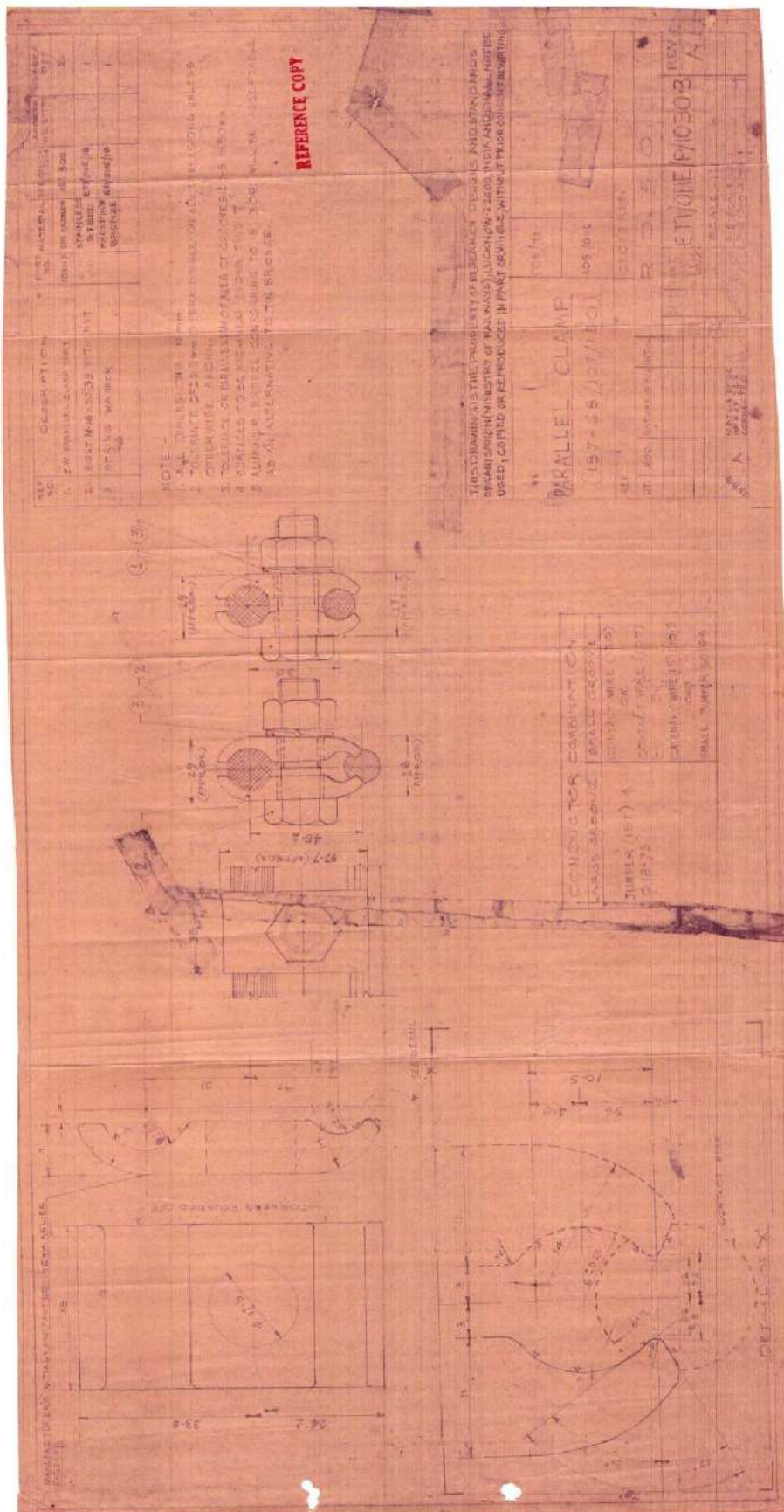
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Page 1 of 6	Effective from January 2026	Maintenance Instruction No. TI/IN/0059
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सत्यमेव जयते

भारत सरकार GOVERNMENT OF INDIA
रेल मंत्रालय Ministry of Railways

निर्देशसंख्या. टीआई/आईएन/0059

INSTRUCTION No. TI/IN/0059

Instruction for connection with 3 PG clamps in isolator jumper of 160 sqmm.
and G jumper of 160 sqmm in first sub sector including yards.
(January 2026)

अनुमोदित Approved by	प्रधानकार्यकारीनिदेशक (कर्षणसंस्थापन) Principal Executive Director (TI)	हस्ताक्षर/Signature
अनुशंसित Recommended by	कार्यकारीनिदेशक (कर्षणसंस्थापन) Executive Director (TI)	

जारीकर्ता/ ISSUED BY:

कर्षणसंस्थापननिदेशालय
TRACTION INSTALLATION DIRECTORATE,
अनुसंधानअभिकल्पऔरमानकसंगठन
RESEARCH DESIGNS & STANDARDS ORGANISATION,
मानकनगर, लखनऊ- 226011
MANAK NAGAR, LUCKNOW-226011

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	JYOTI SRIVASTAVA <small>Digitally signed by JYOTI SRIVASTAVA Date: 2026.01.12 17:38:21 +05:30</small>	AMIT KUMAR <small>Digitally signed by AMIT KUMAR Date: 2026.01.12 17:38:21 +05:30</small>	GAURANG GUPTA <small>Digitally signed by GAURANG GUPTA Date: 2026.01.12 17:38:21 +05:30</small>
Designation	SSE/ TI	ADE/ TP-2	DIRECTOR/ TI-2

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

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PARA	DESCRIPTION	PAGE NO.
1.	TITLE	03
2.	BACKGROUND	03
3.	OBJECTIVE	03-04
4.	INSTRUCTIONS	04-05

	Prepared By	Checked By	Issued by
Signature& Date	JYOTI SRIVASTAVA <small><i>Digitally signed by JYOTI SRIVASTAVA Date: 2026.01.12 12:00:00 +05'30'</i></small>	AMIT KUMAR <small><i>Digitally signed by AMIT KUMAR Date: 2026.01.12 08:40:12</i></small>	GAURANG GUPTA <small><i>Digitally signed by GAURANG GUPTA Date: 2026.01.12 08:40:12</i></small>
Designation	SSE/ TI	ACE/ TI-2	DIRECTOR/ TI-2

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

Page 3 of 6	Effective from January 2026	Maintenance Instruction No. TI/IN/0059
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1. TITLE:

Instruction for provision of PG clamps for connection of isolator jumpers and G-jumpers of 160 sqmm size.

2. BACKGROUND:

Railway Board vide letter No. 2024/EEM/148/1 dated 03.12.2025 has advised RDSO to issue instructions for provision of three (03) PG clamps for connection of isolator jumpers and G-jumpers of 160 sqmm size in 1st sub sector including yards to enhance current carrying capability and reliability.

3. OBJECTIVE:

The objective of this instruction is to:

1. To replace the existing **two (02) PG clamp** arrangement with **three (03) PG clamps** for **160 sqmm isolator jumpers** in the first subsector including yards, thereby increasing effective contact surface area and improving current-carrying capacity under high load and extended feed conditions.
2. To replace all existing **105 sqmm G-jumpers** with **160 sqmm G-jumpers** using **three (03) PG clamps** in the first subsector including yards.
3. At locations **other than the first subsector including yards**, to provide **160 sqmm G-jumpers** in place of 105 sqmm G-jumpers using **two (02) PG clamps**.

4. INSTRUCTIONS:

S N	Item	Existing provision	Modified/Proposed Provision	Remarks/Justification
1	Isolator Jumper of 160 sqmm	Connection with 2 PG clamp at each point Drg No. ETI/OHE/G/05516 Rev A	Connection with 3 PG clamps at each point in first sub sector. 3 rd PG shall be installed at a distance of 30 mm from the 2 nd PG, similar to how the 2 nd PG is installed 30 mm from the 1 st PG in existing drawing. This arrangement will be provided in the first sub sector including yards.	Additional clamp to provide increased contact area for better current carrying capacity and reliability under increased load condition and during extended feed condition.

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Signature & Date	JYOTI SRIVASTAVA <small>Digitaly signed by: JYOTI SRIVASTAVA Date: 2026.01.13 17:05:30</small>	AMIT KUMAR <small>Digitaly signed by: AMIT KUMAR Date: 2026.01.13 17:05:30</small>	GAURANG GUPTA <small>Digitaly signed by: GAURANG GUPTA Date: 2026.01.13 17:05:30</small>
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Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

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2	G Jumper	105 sqmm as per Drg no. ETI/OHE/G/05102 Rev C	160 sqmm G jumper with 3 PG at each point. 3 rd PG shall be installed at a distance of 30 mm from the 2 nd PG, similar to how the 2 nd PG is installed 30 mm from the 1 st PG in existing drawing. This arrangement shall be provided in the first sub sector including yards. Further, at locations other than first sub sector including yards, use of 160 sqmm jumper in place of 105 sqmm jumper to be provided using 2 PG clamp. Drg no. ETI/OHE/G/05102 Rev D (attached as Annexure I)	Standardization across OHE to handle higher current requirement & peaks due to increased traffic and advance rolling stock.
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5.0 Component & Installation details:

5.1 For Isolator Jumper Connection:

- One additional PG clamp (1030-3) shall be installed at a distance of 30mm from the 2nd PG clamp, where 2 PG clamp are already installed.
- This arrangement shall be applicable in the first subsector including yards.



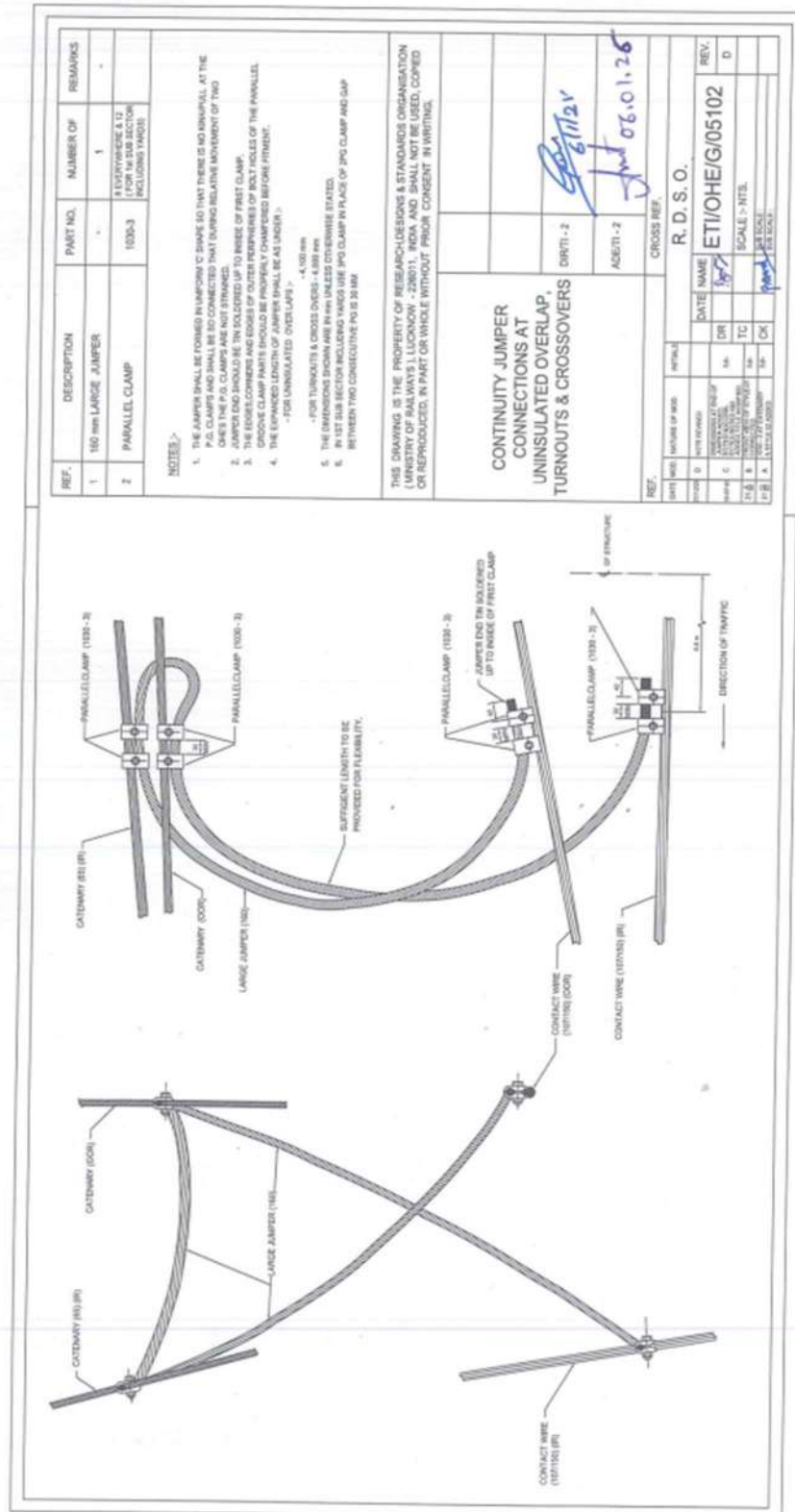
ISOLATOR JUMPER CONNECTION WITH 3PG

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Signature & Date	JYOTI SRIVASTAVA <small>Digitally signed by JYOTI SRIVASTAVA Date: 2026.03.22 11:00:01 +05'30'</small>	AMIT <small>Digitally signed by AMIT KUMAR Date: 2026.03.22 11:00:01 +05'30'</small>	GAURANG GUPTA <small>Digitally signed by GAURANG GUPTA Date: 2026.03.22 11:00:01 +05'30'</small>
Designation	SSE/ TI	KUMAR ADE/ TI-2	DIRECTOR/ TI-2

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

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Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

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5.2 G Jumper of 160 sqmm and cross type only: -

- In place of 105 sqmm G jumper, 160 sqmm G jumper shall be Provided.
- **PG clamp 1030-3 shall be used in place of 1030-2**, as the jumper size has increased.
- Jumper end shall be Tin soldered upto inside of first clamp.
- **Connection of G jumper should be only cross type.**

Good Practice	Bad Practice
Jumper end may be Tin soldered and properly projected upto inside of first clamp.	Jumper end extra projected & not soldered, which may lead to failures.

	Prepared By	Checked By	Issued by
Signature & Date	JYOTI SRIVASTAVA <small>Digitally signed by JYOTI SRIVASTAVA Date: 2025.01.13 11:04:07 +05'30'</small>	AMIT KUMAR <small>Digitally signed by AMIT KUMAR Date: 2025.01.13 11:04:07 +05'30'</small>	GAURANG GUPTA <small>Digitally signed by GAURANG GUPTA Date: 2025.01.13 11:04:07 +05'30'</small>
Designation	SSE/ TI	ADP/ W-2	DIRECTOR/ TI-2

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway

Deputy Chief Electrical Engineer
(Construction), Western Railway,
Ratlam –457001.

For and on behalf of the President of India.

General Conditions of Contract of April. - 2022 with latest correction slip is applicable for the above work. The relevant drawings can be seen in the office of Deputy Chief Electrical Engineer (Construction), Western Railway, Ratlam, during any working day between 10.00 hours to 17.00 hours.

End of Tender Document

Signature of tenderer

Dy.Chief Electrical Engineer
(Const.) Western Railway