



EASTERN RAILWAY
(Electrical Traction Distribution Department)

TENDER DOCUMENT

OF

TENDER NOTICE NO: ELD-300-WC-8-2026-27

TENDER NO: ELD-300-WC-8-2026-27

DATE AND TIME OF CLOSING: As per NIT

NAME OF WORK: Design, Drawing, Supply and Erection of 25 KV OHE and allied electrical Works in connection with (i) Re-girding of Br. No. 19CCR between station BLYG- BLYH on UP & DN Main Line of Sealdah Division; (ii) Platform at DAKE PF-1 & PF-2 can be extended to 600 mtr. and affected tension length under Jurisdiction of SSE/Tr-D/NKG of Sealdah Division.

OFFICE OF THE
SR. DIVISIONAL ELECTRICAL ENGINEER/TRD, SEALDAH,
EASTERN RAILWAY, CONTROL BUILDING, 1ST FLOOR, DRM
OFFICE, KAISER STREET, SEALDAH, KOLKATA – 700014.

(Only for e-tendering through the website of <https://ireps.gov.in>)

NOTE: 1. Manual offers are not allowed against this tender document and any such manual offer(s) received shall not be considered and will be summarily rejected.

2. Tenderers are requested to see for any Corrigendum Slips issued to this tender up to the date of closing available at <https://ireps.gov.in> portal, and to use updated tender form only, failing which tender is likely to be rejected.

3. The tenderer should upload the details of completed work(s) with complete postal address of the client/agency under which such work is executed. The details of postal address should include Road/Sector, Town, District, and State & Pin Code. Tenderer is also requested to furnish Fax No. & Telephone No. of issuing office which will facilitate verification of such document. In absence of such detailed address, cognizance of such credential may not be given by Railway.

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EASTERN RAILWAY
(Electrical Traction Distribution Department)

CHAPTER-I: SALIENT FEATURES OF THE TENDER

1. This document is the standard tender document consisting of the salient features, instructions to tenderer, conditions of tender, check list for tenderer, conditions of contract (general), special conditions (general), form of tender, special condition/ specifications, additional special conditions for safety aspects & various Annexure etc. as shown at the index page. Please note that the end of this document is marked as "END OF DOCUMENT".
2. The name/ scope of the work, tender type (open tender, single tender, special limited tender), bidding system (single packet system, double packet system), value of the works, value of earnest money, cost of tender document, period of completion, time & date of closing of bidding for the tender **are mentioned in the NIT (Notice Inviting Tender) which is available separately**. Tender will be opened on the tender closing date mentioned in the NIT itself within **three hours** after the closing time. The date and time of opening may be postponed at the sole discretion of Railways, if circumstances so warrant.
3. **The schedules of the works and explanatory notes (if any) are available separately.**
4. **The NIT, schedule of works, explanatory notes (if any) along with this standard tender document will be considered the tender document for this work:** All the above mentioned documents taken together if not scored off, shall constitute the complete tender document hereafter referred to as "tender document" & have to be read together & acted upon accordingly. No part of the tender document can be relied upon or acted upon in isolation.
5. The tender offer complete in all respect and with all documents is to be **submitted (in PDF Format) online** by e-tendering process through the website <https://ireps.gov.in> as works tender, up to the closing time/date as mentioned in the NIT. Tenderer can revise the bids any number of times till the closing time/date of the tender. **No manual offers shall be accepted.**
6. Joint Venture Firms are not permitted to participate if tender value is **₹10 Crores (Rupees Ten Crores) or less.**
7. **The tender document cost and earnest money cost** are to be paid in cash through e-payment gateway or as mentioned in tender documents failing which the tender shall not be considered. Any firm recognized by Department of Industrial Policy and Promotion (DIPP) as 'Start-ups' shall be exempted from payment of earnest money on submission of registration certificate issued by appropriate authority. **No other payment mode by manual/ offline shall be accepted in respect of e-tendering.**
8. **Corrigendum Notice on IREPS:** For the purpose of Corrigendum in the Tender, NIT period is split as under.
 - (a) **Advertisement period:** Time during which all information pertaining to tender shall be available but offers cannot be submitted.
 - (b) **Offer Submission Period:** Fifteen days prior to opening of tender, during which tenderer can submit their offer.
 Issue of 'corrigendum notice' is permitted as an exception only during Advertisement period. **No corrigendum is permitted during offer submission period and cases requiring corrigendum during offer submission period shall be retendered.** (Authority Railway Board's Letter No: 2015/CEI/CT/5/1 dated-31/08/2016).
9. The Tenderers are advised to visit the site of work and acquaint themselves with the conditions and expected quantum of work in their own interest before submitting their offer. For this, the tenderer may contact the concerned Sr. Divisional Electrical Engineer /TRD at the address mentioned on the cover page of this document.
10. The tenderer shall submit along with the tender document, documents in support of his/ their claim to fulfil the eligibility criteria as mentioned in the tender document. Each page of the copy of the documents/ certificate in support of credentials submitted by the tenderer shall be self-attested/ digitally signed by the tenderer or authorized representative of the tendering firm. Self-attestation shall include signature, stamp and date (on each page). Only those documents which are declared explicitly by the tenderer as "documents supporting the claim of qualifying the laid down eligibility criteria" will be considered for evaluating his/ their tender. The system shall be applicable once it is made operation in IREPS. If the tenderer(s) deliberately gives wrong information/ credentials/ documents in his/ their tenders and thereby create(s) circumstances for acceptance of his/ their tender, Railway reserves the right to reject such tender at any stage, besides, shall suspend the Business up to five years.
11. **Price Variation Clause:** The Price Variation Clause shall be applicable if the tender value is equal to and more than ₹2 Crores [for details refer to Clause-46A, Part-II of **Indian Railways Standard General Conditions of Contract'2022**]
12. **Performance Guarantee:** The successful tenderer will be required to furnish a Performance Guarantee [for details refer Clause-16(4), Part-II of **Indian Railways Standard General Conditions of Contract'2022**]
13. Construction workers cess @ 1% of the cost of construction work will be deducted from the bill of the contractor. Cost of materials supplied under separate item shall be outside the purview of the cess.
14. **Right of Railway to Deal with Tenders:** The Railway reserves the right of not to invite tenders for any of Railway work or works or to invite open or limited tenders and when tenders are called to accept a tender in whole or in part or reject any tender or all tenders without assigning reasons for any such action.
15. Tenderers are requested to read the NIT, tender document along with the conditions etc., Tender schedule, Explanatory Notes carefully and should agree to abide by the said documents.
16. Tenderers are requested to agree to abide by the **Indian Railways Standard General Conditions of Contract'2022**, 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, Schedule of Rates with all correction slips up-to-date for the present contract.
- 17.1 Tenderers are requested to ensure that the person submitting the bidding on behalf of the firm is the authorized person to represent the firm, to sign the tender & all other document on behalf of the firm.
- 17.2 Tenderers are requested to ensure that the statement and document submitted with the offer are true and correct.

17.3 Tenderers are requested to note that the railway reserves the right to amend the scope and value of the contract and to reject (or accept) this offer without assigning any financial liability.

17.4 Order of Precedence of Documents: In a tender/ contract, in case of any difference, contradiction, discrepancy, with regard to Conditions of tender/ contract, Specifications, Drawings, Bill of quantities etc., forming part of the tender/ contract, the order of precedence shall be as per Clause- 1.01 of the Indian Railways Standard General Conditions of Contract'2022.

17.5 Omissions & Discrepancies: Should a tenderer find discrepancies in or omissions from the drawings or any of the Tender Forms or should he be in doubt as to their meaning, he should at once notify the authority inviting tenders. The tender inviting authority may, if deemed necessary, clarify the same to all tenderer. It shall be understood that every endeavour has been made to avoid any error which can materially affect the basis of tender and successful tenderer shall take upon himself and provide for the risk of any error which may subsequently be discovered and shall make no subsequent claim on account thereof.

18.0 Eligibility Criteria - 18.1.1 - Technical Eligibility Criteria

(a) The tenderer must have **successfully completed or substantially completed** any of the following during **last 07 (seven) years**, ending last day of month previous to the one in which tender is invited. It will be evaluated as per GCC-2022.

- (i)** **Three similar works** costing not less than the amount equal to **30%** of advertised value of the tender, or
- (ii)** **Two similar works** 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)(i)** In case of 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 any of the following during last 07 (seven) years, ending last day of month previous to the one in which tender is invited.

Three similar works costing not less than the amount equal to 30% of advertised value of each component of tender, or

Two similar works costing not less than the amount equal to 40% of advertised value of each component of tender, or

One similar work costing not less than the amount equal to 60% of advertised value of each component of tender.

Note: Separate completed works of minimum required values for each component can also be considered for fulfilment of technical eligibility criteria.

(b)(ii) 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. Any work or set of works shall be considered to be a separate component, only when cost of the component is more than ₹2Crore each.

Note for Item 18.1: Work experience certificate from private individual shall not be considered. However, in addition to work experience certificates issued by any Govt. Organisation, work experience certificate issued by Public listed company having average annual turnover of ₹500 Crores 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 opening 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.

(c) **Similar Nature of Work for this Tender is Available in the NIT.**

(d) In support of fulfilment of specified minimum technical eligibility criteria, the tenderer has to submit the credential certificate (**scanned copy in PDF format of the original document**) with their e-offer for the physical completion of the similar nature of work.

(e) **TENDERS NOT ACCOMPANIED BY DOCUMENTARY EVIDENCE IN SUPPORT OF ELIGIBILITY CRITERIA FOR SIMILAR NATURE OF WORK WILL BE SUMMARILY REJECTED.**

(f) Tenderer has to produce supportive documents/certificates from the Organization for whom they have worked along with the tender offer. **Certificates from Private individual/ Private Limited Company/ Public Limited Company (Private Sector) for whom such works are executed shall not be accepted except provision mentioned under note for item No. 18.1 above.** Certificates from Govt./Semi Govt./ PSU/ Govt. Autonomous bodies/ Public Limited Company (Govt. Sector) will only be accepted.

18.1.2 Technical Eligibility Criteria of the Joint Venture (JV):

Technical eligibility of the JV shall be adjudged based on satisfactory fulfilment of the criteria as detailed in **Indian Railways Standard General Conditions of Contract'2022**

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

18.2 Financial Eligibility Criteria

18.2.1 For the Firm: - The tenderer must have minimum average annual contractual turnover of V/N or V whichever is less; 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 tenderer shall submit requisite information as per Annexure-VIB, along with copies of Audited Balance Sheets duly certified by the Chartered Accountant/ Certificate from Chartered Accountant duly supported by Audited Balance Sheet.

18.2.2 For Joint venture (JV): Financial eligibility of the JV shall be adjudged based on satisfactory fulfilment of the criteria as detailed in **Indian Railways Standard General Conditions of Contract'2022**.

19. The extended date of closing, if any, shall not be taken into account for the purpose of counting the above period as specified in Technical & financial criteria above.

19.1 Bid Capacity: The tender/ tender bid will be evaluated based on bid capacity formula detailed in **Indian Railways Standard General Conditions of Contract'2022**.

19.2 No technical and financial credentials are required for tenders having value upto ₹50 Lakhs.

19.3 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 Eastern 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) Submission of Document Verification Certificate: -

a) Bidders shall confirm and certify on the behalf of the tenderer including its constituents as mentioned in the NIT Document for the subject tender.

b) For Partnership Firm/Joint Venture (JV) /Hindu Undivided Family (HUF) /Limited Liability Partnership (LLP) etc. - Please submit a certificate in the prescribed format for verification /confirmation of the documents submitted for compliance of eligibility/qualifying criteria. Non submission of the certificate or submission of the certificate either not properly filled in, or in a format other than the prescribed format shall lead to summary rejection of your offer.

(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 there under.

(vi) (a) In case of any information submitted by the tenderer, is found to be false, forged or incorrect at any time during process for evolution of tenders, it shall need to forfeiture of the tender Earnest Money Deposit besides banning of business for a period of up to on entire Indian Railways for 5(five) years.

(vi) (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.

(vii) Non-compliance with any of the conditions set forth herein above is liable to result in the tender being rejected.

19.4 Ballast test report: Not Applicable in this tender.

19.5 All documents in support of fulfilment of eligibility criteria with respect to completion of 'Similar nature of work for Technical Eligibility Criteria' and 'Total contract value for Financial Eligibility Criteria' should be furnished along with the tender and should be submitted online at the time of tender bidding. Tenders not accompanied by documentary evidence in support of eligibility criteria will be summarily rejected. No post tender communication, in any form will be made or entertained, after opening of tenders, in this regard. Railways may however call for the originals of the credentials for verification or any clarifications/ confirmations on the contents of the documents submitted.

20. Tenderers shall note that the submission of other supporting documents namely constitution of firm/ JV, work in hand, arbitration/ court cases, tools & plants, technical personnel/ man power, association of Railway officers and NEFT details at the time of on line bidding of tender is important and they shall ensure the same. However, Railways may seek clarifications/ details/ documents in this regard.

21. Tenderers are requested to upload the following scanned copy (in PDF format) of original documents online through the website portal www.ireps.gov.in.

21.1 Scanned copy in PDF format of the **ballast test report. (Not Applicable)**

21.2 Scanned copy in PDF format of the **details of the works awarded to the firm**, during the last three years. [For details please refer Annexure-II of Chapter-II of tender document].

21.3 Scanned copy in PDF format of the **details of the List of the Arbitration & Court cases** during the last 3 years. [For details please refer Annexure-III of Chapter-II of tender document].

21.4 Scanned copy in PDF format of the **details of agency's own equipments** proposed to be included. [For details please refer Annexure-IV (A) of Chapter-II of tender document].

21.5 Scanned copy in PDF format of the **details of hired equipments** to be included. [For details please refer Annexure-IV (B) of Chapter-II of tender document].

21.6 Scanned copy in PDF format of the **details of technical personals** of the agency, available on hand. [For details please refer Annexure-V (A) of Chapter-II of tender document].

21.7 Scanned copy in PDF format of the **details of technical personals, proposed to be engaged** by agency. [For details please refer Annexure-V (B) of Chapter-II of tender document].

21.8 Scanned copy in PDF format of all documents of the firm required as per Clause-7 of Chapter-II of tender document or scanned copy in PDF format of the details of all documents of the JOINT VENTURE (JV) required as per Clause-29 of Chapter-II of tender document.

21.9 Scanned copy of the **NEFT** in PDF format as per **Annexure-B of Chapter-VIII** of the tender document. All Payments to the agency [including the refund of the Earnest Money (EMD) of the unsuccessful bidder] will be remitted through NEFT. The Tenderer is required to declare Bank details and A/C No. etc. in NEFT form.

21.10 Scanned copy in PDF format of the **complete address of the firm**, to which all the correspondences shall be made by the Railway.

21.11 Scanned copy in PDF format of the **details regarding the Association of Railway Officer(s)** with the Tenderer. [For details please refer Annexure-I of Chapter-II of tender document].

21.12 Scanned copy in PDF format of **valid electrical contractor's license** of the firm.

21.13 Scanned copy in PDF format of **GSTIN** in favour of the company.

21.14 Scanned copy in PDF format of **documents in support of technical eligibility criteria**.

21.15 Scanned copy in PDF format of **documents in support of financial eligibility criteria**.

21.16 Scanned copy in PDF format of a **bar chart** showing detailed programme of work indicating the time schedule of various items of works.

21.17 Scanned copy in PDF format of any other letters/documents etc. (If agency intends to submit)

22. Instructions for the two-packet tenders (These shall be applicable if the tender is two-packet tender. Any tender is either two-packet tender or single packet tender. The information shall be available in the NIT of the tender)

The tender is to be submitted online. The packet-I shall consist of only technical and commercial capabilities which should be furnished along with all the documents etc. as mentioned in the special criteria and special financial criteria and other technical compliance. **No conditions having any financial implication should be added with these documents.** The Packet-II shall consist of financial bid and will contain all the financial offers.

After the closing date of tender, only the 1st packet (which consists of the technical and commercial capabilities) will be opened online on IREPS web site www.ireps.gov.in. The technical capabilities of the tenderer/s will be examined by the Railway based on the documents submitted by them in Packet-I as per the eligibility criteria laid down in the tender notice/ Tender Document.

The successful tenderer who will be considered technically acceptable and eligible will be informed and the Financial bids (PACKET-II) of these tenderer only will be opened on line on IREPS web site

www.ireps.gov.in. on the date and time notified to these tenderer/s on line. The financial bids of unsuccessful Tenderers will not be opened and shall be destroyed by the railway. Railway's decision in this regard will be final.

23. The prospective Tenderers/ bidders must have a "Class III Digital Signature" with Company name from any Certifying Agency (CA) authorized by Controller of Certifying Authorities (CCA). They also have to submit online request for registration sufficiently in advance to get themselves registered on IREPS (Works) in order to participate in e-tendering in works contracts.

24. In order to participate in e-tendering on IREPS (Works), the prospective Joint Venture (JV) must have requisite valid Digital Signature issued in the name of the said JV and must have registration with IREPS (Works) in the name/ identity of the JV. E-offer of a JV submitted with digital signature issued and registered with IREPS in the name/identity of one of its constituent member shall be SUMMARILY REJECTED.

25. Care in Submission of Tender:

(a) (i) Before submitting the tender, the tenderer will be deemed to have satisfied himself by actual inspection of the site and locality of the works, that all conditions liable to encountered during the execution of the works are taken into account and that the rates he enters in the tender forms are adequate and all-inclusive to accord with the provisions in Clause-37 of the Standard General Condition of Contract'2022 for the completion of works to the entire satisfaction of the Engineer.

(a) (ii) Tenderers will examine the various provisions of the Central Goods and Services Tax Act, 2017(CGST)/Integrated Goods and Services Tax Act, 2017(IGST)/Union Territory Goods and Services Tax Act, 2017(UTGST)/respective state's State Goods and Services Tax Act (SGST) also, as notified by Central/State Govt. & as amended from time to time and applicable taxes before bidding. Tenderers will ensure that full benefit of Input Tax Credit (ITC) likely to be availed by them is duly considered while quoting rates.

(a) (iii) The successful tenderer who is liable to registered under CGST/ IGST/ UTGST/ SGST Act shall submit GSTIN along with other details required under CGST/ IGST/ UTGST/ SGST Act to railway immediately after the award of contract, without which no payment shall be released to the contractor. The contractor shall be responsible for deposition of applicable GST to the concerned authority.

(a)(iv) 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 authority.

(b)When work is tendered for by a firm or company, the tender shall be signed by the individual legally authorized to enter into commitments on their behalf.

(c) The Railway will not be bound by any power of attorney granted by the tenderer or by changes in the composition of the firm made subsequent to the execution of the contract. It may, however, recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the Contractor.

EASTERN RAILWAY
(Electrical Traction Distribution Department)

CHAPTER-II: CONDITIONS OF TENDER AND INSTRUCTIONS TO TENDERER(S)

1(a) Tenderer: The person/ Firm/ Co-operative or company whether incorporated or not who tenders for the works with a view to execute the works on contract with the Railway and shall include their personal representatives, successors and permitted assigns.

1(b) The Contractor(s): Contractor shall mean the person/ Firm/ co-operative society or company whether incorporated or not who enters into the contract with the Railway and also shall include their executors, administrators and successors and permitted assigns.

2. Books of Reference: These tender documents are to be read with the books:

(i) Indian Railway Standard General Conditions of Contract” (as amended by up-to-date correction slips) termed as GCC – 2022.

(ii) Indian Railways AC Traction Manual (as amended by up-to-date correction slips as to the date of opening of this tender) (if applicable for the tender).

These books are where-in-after called the “Books of reference” and shall governs this tender as well as the contract resulting from the acceptance from this tender, to the extent that their contents do not conflict with the contains of the various chapters of these documents.

3. Scope of Tender: E-tender is invited for and on behalf of the President of India for work described in the N.I.T and schedule of the work.

4. Inspection of Data: Copies of drawing and other information for the work, relevant to this tender, may be obtained in the office of the Sr. DEE/TRD/SDAH at address mentioned on top sheet.

5. Inspection of Site: Tenderer must acquaint himself, at his own responsibility, risk and expense, with all information of the site(s) of work(s) and their neighbourhoods, actual working and other prevalent conditions, laws/regulations, availability and suitability of local labours, materials, surface and sub soil condition, accessibility of site(s) of work(s) sources and availability of water, electricity, camp site, market, banking facilities etc. and all such possible factors as have bearing on rates and progress of the work under this tender and should be taken all this factors into consideration before submitting this tender.

6.0 Tenderers Postal Address:

6.1 Every tenderer shall submit the complete postal address fully and clearly of the agency during the submission of tender. Any communication sent in time to the Tenderer by post at the said address shall be deemed to have reached the Tenderer duly and in time. Important documents shall be sent by Registered Post.

6.2 Change of Address: The Tenderer must keep the Railway informed of any change of address during the currency of tender of work in his own interest.

7. Partnership Deeds, Power of Attorney etc.:

(i) The tenderer shall clearly specify whether the tender is submitted on his own (Proprietary Firm) or on behalf of a Partnership firm/ company/ Joint Venture (JV)/ Registered Society/ Registered Trust etc. The tenderer(s) shall enclose the attested copies of the constitution of their concern, and copy of PAN Card along with their tender. Tender Documents in such cases are to be signed by such persons as may be legally competent to sign them on behalf of the firm, company, association, trust or society, as the case may be.

(ii) In case tenderer is other than sole proprietorship firm, following documents shall be submitted by the tenderer.

(a) Partnership Firm: The tenderer shall submit (i) a copy of Partnership Deed and (ii) a copy of Power of Attorney (duly registered as per prevailing law) in favour of an individual to sign the tender documents and create liability against the Firm.

(b) Joint Venture (JV): The tenderer shall submit documents as mentioned in Clause-29 of Chapter-II of the Tender documents.

(c) Company registered under Companies Act-2013: The tenderer shall submit (i) the copies of MOA (Memorandum of Association)/ AOA (Articles of Association) of the company; and (ii) A copy of Authorization/ Power of Attorney issued by the Company (backed by the resolution of Board of Directors) in favour of the individual to sign the tender on behalf of the company and create liability against the company.

(d) LLP (Limited Liability Partnership) Firm: If the tender is submitted on behalf of a LLP Firm registered under LLP Act- 2008, the tenderer shall submit along with the tender - (i) a copy of LLP Agreement, (ii) a copy of Certificate of Incorporation; and (iii) a copy of Power of Attorney/ Authorisation issued by the LLP Firm in favour of the individual to sign the tender on behalf of the LLP Firm and create liability against the Firm.

(e) Registered Society & Registered Trust: The tenderer shall submit (i) a copy of the Certificate of Registration (ii) Deed of Formation; and (iii) a copy of Power of Attorney in favour of the individual to sign the tender documents and create liability against the Society/ Trust.

(iii) If it is NOT mentioned in the submitted tender that tender is being submitted on behalf of a Sole Proprietorship firm/ Partnership firm/ Joint Venture/ Registered Company etc., then the tender shall be treated as having been submitted by the individual who has signed the tender.

(iv) After opening of the tender, any document pertaining to the constitution of Sole Proprietorship Firm/ Partnership Firm/ Registered Company/ Registered Trust/ Registered Society etc. shall be neither asked nor considered, if submitted.

(v) A tender from JV/ Partnership firm etc. shall be considered only where permissible as per the tender conditions.

(vi) The Railway will not be bound by any change in the composition of the firm made subsequent to the submission of tender. Railway may, however, recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the Contractor.

(vii) The tenderer whether sole proprietor, a company or a partnership firm/ joint venture (JV)/ registered society/ registered trust etc. if they want to act through agent or individual partner(s), should submit along with the tender, a copy of power of attorney duly stamped and authenticated by a Notary Public or by Magistrate in favour of the specific person whether he/ they be partner(s) of the firm or any other person specifically authorizing him/ them to submit the tender, sign the agreement, receive money, co-ordinate measurements through contractor's authorized engineer, witness measurements, sign measurement books, compromise, settle, relinquish any claim(s) preferred by the firm and sign "No Claim Certificate" and refer all or any disputes to arbitration.

8 (a). Employment/ Partnership etc. of Retired Railway Employees: Should a tenderer be a retired Engineer of the gazetted rank or any other gazetted officer working before his retirement, whether in the executive or administrative capacity or whether holding a pensionable post or not, in the Engineering or any other department of any of the railways owned and administered by the President of India for the time being, or should a tenderer being partnership firm/ company/ joint venture (JV)/ registered society/ registered trust etc. have as one of its partners a retired Engineer or retired gazetted officer as aforesaid, or should a tenderer being an incorporated company have any such retired Engineer or retired officer as one of its directors or should a tenderer have in his employment any 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 case where such Engineer or officer had not retired from government service at least 1 year 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 to take the employment under the Contractor, has been obtained by the tenderer or the Engineer or officer, as the case may be from the President of India or any officer, duly authorized by him in this behalf, shall be clearly stated in writing at the time of submitting the tender. Tenders without the information above referred to or a statement to the effect that no such retired Engineer or retired gazetted officer is so associated with the tenderer, as the case may be, shall be rejected.

(b) Should a tenderer or Contractor being an individual on the list of approved Contractors, have a relative(s) or in the case of partnership firm/ company/ Joint Venture (JV)/ registered society/registered trust etc one or more of his shareholder(s) or a relative(s) of the shareholder(s) employed in gazetted capacity in the Engineering or any other department of the Eastern Railway, the authority inviting tenders shall be informed of the fact at the time of submission of tender, failing which the tender may be disqualified/ rejected or if such fact subsequently comes to light, the contract may be rescinded in accordance with provision in clause 62 of Indian Railway Standard General Conditions of Contract'2022.

9. Testimonials: The Tenderer(s) shall also submit a list of court cases filed and number of Arbitrations in progress as demanded by him from the Railway or other clients, during the three years preceding from the date of opening of this tender as per Annexure-III of Chapter-II of the tender document. In the event of the Tenderer not giving this information, the Railway shall compile such data in the said format from available records and the Tenderer(s) shall have no right to question the correctness or completeness of such data.

10. List of Equipments/ Tools, Technical Personnel: The Tenderer(s) shall submit list of equipments/ tools with him and the list of technical personnel in pro-forma given in Annexure-IV (A) to IV (B) & V (A) to V (B) of Chapter-II. The Tenderer(s) should also submit specific details along with tender indicating list of personnel and plant & machinery (owned and hired separately) proposed to be deployed for the subject work. The Tenderer(s) without this information may be treated as if the tenderer(s) has no organization and no equipments.

11(a) Railway Pass or Concession: No free railway pass shall be issued by the Railway to the Contractor or any of his employee/worker.

11(b) Carriage of Materials: No forwarding orders shall be issued by the Railway for the conveyance of Contractor's materials, tools and plant by train which may be required for use in the works and the Contractor shall pay full freight charges at public tariff rates therefore.

12. Period of Validity of Tender: The Tenderer(s) shall keep the offer open for a minimum period of 45 days (in case of two packet system of tendering 60 days) from the date of opening of the Tender.

It is understood that the tender documents have been issued to the Tenderer(s) and the Tenderer(s), is/ are permitted to tender in consideration of the stipulation on his/ their part that after submitting his/ their tender subject to the period being extended further, if required by mutual agreement from time to time, he will not resile from his offer or modify the terms and conditions thereof in a manner not acceptable to Eastern Railway, Should the tenderer fail to observe or comply with the foregoing stipulation, the amount deposited as Earnest Money for the due performance of the above stipulation, shall be forfeited to the Railway.

13. Time of Completion of Work:

13.1 This tender is submitted subject to the condition that the tenderer(s) shall complete the works covered by this tender in all respect within the period of time stipulated in N.I.T. The time reckoned from the date of issue of letter of acceptance.

13.2 Extension of Time for delay in completion of the work on contractors account: Railway reserves the right to recover liquidated damages from the contractor as per clause 17(B) of Indian Railway Standard GCC' 2022.

14. Specifications:

14.1 For Electrical/TRD works the work shall be carried out in accordance with Indian Railway AC Traction Manual with latest correction slips, if applicable.

14.2(i) The materials to be supplied by the Contractor for the works covered by these tender documents shall conform to specifications contained in these tender documents.

(ii) If called upon, the Tenderer(s) shall state the actual source of supply of material (s) to be supplied by him and shall submit samples for prior approval.

(iii) During the execution of work, all materials brought to site by the Contractor must be offered for inspection and passing by the Engineer of Railway or his representative before being used in the work and such approval shall be recorded in a register maintained for the purpose.

(iv) For Elect/TRD contracts all supply items shall strictly conform to the specification of RDSO/CORE (latest specification/ amendments) and to be procured from Railway approved (Part-I) sources only.

(v) All equipments, materials and components covered in the contract will be inspected by **M/s. RITES in stages and final (unless otherwise instructed in the LOA)** at manufacturer's/ supplier's premises before despatch. In this connection the contractor has to submit inspection call letter with copy of purchase order well in advance to Sr. Divisional Electrical Engineer/TRD/SDAH's office along with relevant documents.

14.3 (i) (a) All reinforcement Steel (TMT Bars) and Structural Steel shall be procured as per specifications motioned in BIS's documents – IS:1786 and IS:2062 respectively. Independent tests shall be conducted, wherever required, to ensure that the materials procured conform to the Specifications.

(b) These steel shall be procured only from those firms, which are Established, Reliable, Indigenous & Primary Producers of steel, having integrated steel plants (ISP), using iron ore as the basic raw material and having in-house iron rolling facilities, followed by production of liquid steel and crude steel, as per Ministry of Steel's guidelines.

(c) However, only certain isolated sections of structural steel, not being rolled by ISPs, can be procured from the authorized re-rollers of ISPs or authorized licensee of BIS having traceability system and who use billets produced by ISPs. Traceability shall be ensured by an officer specially authorized by the concerned SAG Officer of the Zonal Railway on case to case basis for this purpose.

All reinforcement steel (TMT Bar) and structural steel as per IS: 1786 and IS: 2062 with latest amendment should be procured from the primary producers of steel i.e.

1. SAIL
2. TISCO
3. RINL
4. Approved firms of R.D.S.O.

(ii) All paints / distemper / plastic paints to be used shall only be these manufactured by one of the following firms or any approved brand and of colour and shade approved before hand by the Engineer at site. In exceptional circumstances only when the following listed firm's material is not available, Agency can be permitted to use the material of other firms with approval of competent authority (i.e. tender accepting authority). These materials shall be brought in sealed drums and each drum shall be opened in the presence of the Engineer-at-site before use.

- (a) M/s Jenson Nicholson
- (b) M/s British / Barger paints.
- (c) M/s Shalimar Paints
- (d) I.C.I.
- (e) Nerolac.

14.4 Samples of any material supplied by the Contractor may be tested at the Contractor's cost in any recognized laboratory, at the sole discretion of the Engineer-in-charge.

14.5 Stage payment: Not Applicable to this tender.

15. Supply of Materials:

15.1 Railway will supply certain materials as detailed at [Chapter-VI](#) of this tender document/ Explanatory Notes. The Railway administration may supply under mentioned materials, free of cost, for item of works in various schedules unless otherwise specified in the said item(s) of works in the said schedules, subject to availability.

- (i) Cement.
- (ii) Mild steel / Tor steel in available sizes for RCC, PRC work.
- (iii) Structural Steel in available sizes.

15.2 (a) If these materials are not available with the Railway, the same shall be supplied by the Contractor under Schedule CI/CII of these documents and upon their use in the works, shall be paid for at the rates quoted by the tenderer and accepted in the said Schedule – "CI/CII".

(b) The quantities of cement which shall be paid for under the said Schedule "C/I" shall be calculated in accordance with the method outlined in ERUSSOR-2011 and IRUSS-2010[Volume-I & II] or standard relevant IS code or by actual site measurements (as in case of controlled concrete or in pile foundation etc.), in the said order.

(c) The quantities of both structural and reinforcement steel to be paid under schedule "C/II" shall be as calculated on the basis of actual consumption in the respective item(s) of work not allowing for any wastage, cut pieces etc.

15.3 For items executed under "ERUSSOR-2011 & Eastern Railway L&M schedule 1987" the supply of the materials by the Railway to contractor shall be under the terms and conditions specified in the preface of the book and the introductory remarks on top of each Chapter of the said book subject to the extent of modification detailed herein below.

(a) Materials supplied by the Railway, shall be from the Store/ Go down(s) of JE/SSE (Con) from where the Contractor shall carry the same to the site of work by his road vehicle, or by loading in wagons, as per Railway rules as directed by Engineer-at-site. The detention of wagons if any shall be on Contractors account. The tendered rates shall include loading, unloading, leading, lifting, stacking, handling, crossing of lines/ tracks/ obstructions etc. and no separate payment will be made in this respect.

(b) (i) **Contractor to supply water for works:** Unless otherwise provided in the Contract, the Contractor shall be responsible for the arrangements to obtain supply of water necessary for the works.

(ii) **Water Supply from Railway System:** The Railway may supply to the Contractor part or whole of the quantity of the water required for the execution of works from the Railway's existing water supply system at or near the site of works on specified terms and conditions and at such charges as shall be determined by the Railway and payable by the Contractor,

provided that the Contractor shall arrange, at his own expense, to effect the connections and lay additional pipelines and accessories on the site and that the Contractor shall not be entitled to any compensation for interruption of failure of the water supply.

15.4 Materials to be supplied by the Contractor shall be delivered at the site of consumption and Railway shall make no payment towards handling, transport, storing and safe custody of the same.

15.4.1 While transporting and storing Railway materials, the Contractor should guard against any deterioration, damage or loss due to any cause what so ever (viz. cement becoming set due to moisture, steel getting rusted etc.) for which the contractor shall make necessary precautions at his own cost and risk. Cost of materials damaged by the contractor shall be recovered as detailed in clause 15.6(b) below.

15.5 (a) In case of supply of cement by the Railway in Jute / Polythene bags, the empty bags, if not required by the Railway, shall be retained by the Contractor for disposal, preferably to the authorize bag collecting agents and a sum of ₹2/- (Rupees two only) per bag shall be recovered from the contractor's bills toward the cost of each bag. However, when cement is supplied by the contractor through a separate schedule as per actual requirement of the work, no such deduction will be made and packing of cement may be disposed of by the contractor.

(b) In case of supply of cement by the Railway in paper bags (as in the case of imported Cement) the paper bags shall be retained by the contractor for disposal in his own way and no recovery will be made from his bills towards empty paper bags.

15.6 The quantities of Railway materials issued by the Railway to the Contractor shall commensurate with the progress of works, and shall be on a written demand from the contractor.

(a) All materials issued by the Railway in excess of requirement shall be returned by the Contractor in good condition free of cost at the store of JE / SE (Con) from where they were issued. Cut pieces to the extent of maximum 2% (Two per cent) of actual consumption shall be returned without attracting any deduction. For any excess over this quantity deduction at the rate worked out as per Para 15.6(b) below would be affected.

(b) If the Contractor fails to return excesses material issued to him, the cost of such excess materials shall be recovered at 1.5 times the prevailing procurement cost at the time of last issue plus 5% (Five per cent) for freight, 12.5% (Twelve and half per cent) for supervision charges and 2% (two per cent) towards incidental charges on the quantity not returned.

15.7 While transporting materials, whether Railways or his own, the Contractor shall be fully responsible and answerable for any dislocation or damage caused to traffic on Road and for any accident which may occur on the route shall make good the same at his own risk. It is deemed that the Contractor has fully indemnified the Railway against any claim made by any party for such dislocation, damage or accident and in the event of the Contractor failing to make good such loss, the Railway shall do so, at the Contractor cost, at their sole discretion.

15.8 Hire Charges.

15.8.1 The Railway may give on hire to the Contractor any plant and equipment, if available, on a specific request made by the Contractor to the Railway. But it will not entertain any claim for compensation due to the Railways failure to do so or on the railways inability to supply such plant and equipment be an excuse for slow progress or non-performance of the work.

However, issue of such plant and equipment shall not be allowed as a matter of course but permitted only in those cases where the need for help for the Administration could be established having regard to nature and urgency of situation and without adversely affecting the normal requirements of the Railway. A statement of materials thus issued and hire charges recovered should invariably be furnished along with the final bill.

15.8.2 Recovery of Hire Charges: The hire charges to be recovered are to be calculated as under

(i) Cost of materials: The cost of materials shall be the book value or last purchase rate whichever is higher, plus 5% for freight and 2% for incidental charges thereon. The cost thus arrived at shall be increased by 12.5% for supervision charges as per extent rules.

(ii) Hire charges: The hire charges per annum will be calculated on the cost of the materials arrived at as per clause 15.8.2(i) above on the following basis.

(a) Interest on the total cost should be charged at the ruling rate of dividend payable by Railway in the General Revenue.

(b) Depreciation charges at 10% of the cost arrived at as per Para 15.8.2(i) above to be charged for all classes of materials.

(c) Additional depreciation charges at 10% on the total of (a) & (b) above shall be charged to meet the contingencies.

15.8.3 The Contractor shall bear the charges for carrying the materials to the site of work and other incidental charges including loading and unloading etc. to the place of work as also back to the depot from where they were issued.

15.8.4 No cutting of holes shall be allowed in the materials thus issued which shall be returned to the railways in a completely good and serviceable condition. In case of failure of the Contractor to return any material in a good and serviceable condition, the cost thereof shall be recovered from contractor at the rate arrived at as per clause 15.8.2(i) above increased by 100%. The decision of the DEE-in-charge of the work will be final in determining condition of the materials and same shall be binding on the Contractor.

15.8.5 Running expenses including fuel, lubricants and stores and labour, if supplied by the Railway, will also be paid for by the contractor at the cost to be determined by the Railway.

15.8.6 Staff and stores for running the plant may be supplied by the Contractor with approval of Engineer-in-charge. The staff must be properly skilled to operate the plant concerned.

16. Responsibility for Damage to Contractor's Materials:

(i) The railway Administration will not be responsible for any loss or damage to contractor's materials, equipments, tools and plants due to fire, flood or any other cause(s) whatsoever.

(ii) The materials issued by the Railway to the contractor for use in the works shall be treated as contractor's materials for this purpose, and the contractor(s) shall make good these materials in the event of any loss/ damage thereto.

(iii) Works finished but not taken over by the railway shall be treated as contractor's materials for this purpose, and the contractor shall be responsible for making good any loss or damage thereto.

17. Special Conditions by Tenderer(s)

(a) The Tenderer(s) is, normally, not expected to make any special condition/stipulation of his own and is expected to submit his tender in accordance with the conditions/ stipulations contained in these documents, if however, the Tenderer(s) wishes to make any special condition/ stipulation(s) or wishes to intimate the Railway of any matter of importance, he may do so through the letter and same should be submitted on line during the submission of the tender. Such stipulations and conditions shall be a part of the contract in case of acceptance of the tender, only to the extent explicitly accepted by the Railway Administration.

The accepting authority reserves the right not to accept any such special stipulations and conditions made by the tenderer and may reject the tender(s) as unacceptable without any reference to the Tenderer(s) or may ask the Tenderer to withdraw any or all such stipulations before awarding the contract and in the event of his refusals to do so, may not accept his tender.

(b) In case, any special conditions and/ or stipulations are made by the Tenderer, he shall also indicate, along with such conditions/ stipulations, the cost of withdrawal of the same. The accepting authority reserves the right, either to accept the conditions/ stipulations made by the tenderer or the cost thereof, at its sole discretion. If such cost is not indicated, it will be construed that the tenderer(s) is not in a position to withdraw these conditions at any cost and the tender may be adjudged accordingly without any reference to the tenderer(s).

18. Earnest Money:

18.1 The tenderer shall be required to deposit earnest money with the tender for the due performance with the stipulation to keep the offer open till such date as specified in the tender, under the conditions of tender. The earnest money shall be as under.

Value of the Work Earnest Money Deposit (EMD)

For works estimated to cost up to ₹1 crores	2% of the estimated cost of the work
For works estimated to cost more than ₹1 crores	₹2 Lakhs plus ½% (half per cent) of the excess of the estimated cost of work beyond ₹1 crores subject to a maximum of ₹1 crores

Note:

(i) The earnest money shall be rounded off to the nearest ₹100. This earnest money shall be applicable for all modes of tendering.

(ii) Any firm recognized by Department of Industrial Policy and Promotion (DIPP) as 'Start-ups' shall be exempted from payment of earnest money deposit detailed above.

(iii) 100% Govt. owned PSUs shall be exempt from payment of earnest money deposit detailed above.

(iv) Labour Cooperative Societies shall deposit only 50% of above earnest money deposit detailed above.

18.2 **Security Deposit:** The Earnest Money deposited by the Contractor with his tender will be retained by the Railways as part of security for the due and faithful fulfilment of the contract by the Contractor.

18.3 **Refund : (a)** The Earnest Money of the other tenderer(s) whose tender(s) have not been accepted, shall save as herein before provided, be returned to them, through NEFT as per the details given by the agency (as per [Annexure-B of Chapter-VIII](#)). But the railway shall not be responsible for any loss or depreciation to the Earnest Money that may happen thereto while in their possession, nor be liable to pay interest thereon.

(b) In case Contractor submits the Term Deposit Receipt/ Bank Guarantee Bond towards full Security Deposit, the Railway shall return the Earnest Money so retained to the Contractor.

18.4. **Forfeiture:(a)** It is understood that the tender documents have been issued to the tenderer(s) and the tenderer(s) is/ are permitted to tender in consideration of stipulations on his/ their part that after submitting his/ their tender subject to the period being extended further, if required by mutual agreement from time to time, he will not resile from his/ their offer or modify the terms and conditions thereof in a manner not acceptable to the Railway. Should the Tenderer(s) fail/ fails to observe or comply with the said stipulations the amount deposited as Earnest Money for the due performance of the above, shall be liable to be forfeited to the Railway.

(b) Full earnest money is liable to be forfeited in case any statement, declaration made by the tenderer is proved wrong/ false/ incomplete.

(c) In the event of tenderer(s), whose tender is accepted does/ do not submit the Performance Guarantee within the time specified in the tender document or he/ they does/ do not execute the contract documents within 07 days after receipt of notice issued by the Railway that such documents are ready or he/ they does/ do not commence the work within 15 days after receipt of orders to that effect.

19. **Tender without Earnest Money:** The online system of tendering shall allow the bidding by the tenderer, only after the submission of the requisite earnest money and tender document cost.

20. General Instructions for Completing Tender Documents:

Instructions for the two-packet tenders – Not Applicable for this tender.

(a) Eligibility Criteria: Wherever Eligibility Criteria is specified in the tender notice; the tenderer shall submit specific details of work executed and payment received thereof along with relevant documents which make him eligible for tendering. If the tenderer gives any wrong information or suppresses any material fact to cover his eligibility, his tender will be summarily rejected.

(b) False/incomplete statement: Any statement/ declaration made by the Tenderer, if proved wrong or false or incomplete or such as to withhold any information relevant to the award of the tender, at any stage of the tender or in the

event of his tender having been accepted at any stage of the contract, shall tender his/ their tender(s)/ contract(s) liable to be cancelled/ rescinded and action will be taken as per Clause 19.3(b) & (c) of Chapter-I, in addition to the followings.

- (i) If such statement is found at the tender stage, his total earnest money shall be forfeited.
- (ii) In case such a statement is found at the contract stage rights available to the Railways under Clause 62 of the Indian Railway Standard GCC'2022 shall be applicable.
- (c) Cancellation of document etc.: The cancellation or amendment of any documents such as power of attorney, partnership deed etc. should be forthwith communicated by the tenderer/ contractor to the Railway in writing, failing which the Railway shall have no responsibility or liability for any action taken on the strength of the documents available with the Railway.

21. Quotations of Rates:

21.1 The quantities of various items involved in the work covered by this tender & also the basic rate for each item are given in the Schedule of the tender. Submission of this tender including the rates of various items shall be deemed to have been done after careful study of the tender documents and site conditions, with full understanding of the implications thereof. The rate should be quoted as a single percentage above/ below for each schedule.

21.2 The Railway Administration reserves the right to modify any or all the schedules whether it is to increase or to decrease the scope of the work including deletion of any item(s) and therefore, the tenderer(s) should quote reasonable and workable rates for each of the item(s). The Tenderers shall not be entitled to any revision of rates due to such increase/ decrease in quantities of items. The payment shall be made on the basis of actual quantities executed under various item(s) and the accepted rates thereof, and not on the quantities mentioned in various schedules.

21.3 Fluctuation in Market Rates: The rates quoted by the Tenderer(s) and accepted by the Railway Administration shall hold good till the completion of the work and are not subjected to fluctuation(s) of any kind, save and except what is admissible under the Price Variation Clause (if at all applicable) contained in these documents and in Clause 21.4 below.

21.4 Rates to Include All Taxes: The rates quoted shall be inclusive of all taxes leviable by Central or State Govt. or by any Municipal/ Local or any other body at payment or during/ after execution of work. However, if rates of existing GST or cess on GST for Works Contract is increased or any new tax/ cess on Works Contract is imposed by Statute after the date of opening of tender but within the original date of completion/ date of completion extended under clause 17 & 17A and the Contractor thereupon properly pays such taxes/ cess, the Contractor shall be reimbursed the amount so paid. Further, if rates of existing GST or cess on GST for Works Contract is decreased or any tax/ cess on Works Contract is decreased/ removed by Statute after the date of opening of tender, the reduction in tax amount shall be recovered from Contractor's bills/ Security Deposit or any other dues of contractor with the Government of India.

22. The Tenderer(s) should quote his rates of the various schedules taking into consideration all the conditions of these documents and the Special Conditions mentioned in the various schedules.

23. Submission of Tender:(i) Tender must be submitted on line through the www.ireps.gov.in on and before the closing time and date specified in N.I.T.

(ii) **No manual offers shall be received for this tender.**

(iii) The requisite total Earnest Money as per NIT should be submitted on line in requisite manner along with the tender documents. Tenderers shall not be able to bid in the tender without the submission of requisite earnest money.

24.1 Opening of Tender: Tenders will be opened on the tender closing date mentioned in the N.I.T itself within three hours after the tender closing time. The date and time of opening may be postponed at the sole discretion of the Railway, if circumstances so warrant. The complete details rates etc. of all the bidders shall be available to the bidders in the website after the opening of the tender.

24.2 In case the date of closing mentioned in the Notice Inviting Tender is declared holiday on any account the tender shall be opened on the next working day. However, if the date of tender closing is declared as bandh/strike etc. on any account then, railway reserves the right to open the said tender on the specified date or next working day as deemed fit and situation warrants without any further notice.

However, the date and time of closing of tender shall not be postponed due to any holiday/bandh/ strike etc., on the closing date.

25. Clarification of Bids Submitted: To assist in the examination, evaluation and comparison of tenders, the Railway or its authorized person may ask the tenderer(s) for clarification(s), if any needed, for such examination, evaluation and comparison. The request for such clarification etc. and the response thereof shall be in writing.

26. Negotiation:

26.1 The accepting authority reserves the right to enter into negotiations with the L-1 or more (in special case) Tenderer(s) before acceptance of the tender in order to clarify special conditions, or, reduction of rates, or, for changes in scope of the work etc., at its sole discretion.

26.2 L-1 Should be defined as the lowest, valid, eligible and technically acceptable tenderer.

26.3 Should such negotiation with the tenderer(s) be entered into, the tenderer(s) shall not be permitted to increase their quoted rates under any circumstances, even if it includes withdrawal/modification of such special conditions as are given by the tenderer(s) along with their original tender.

26.4 Counter Offers: In cases where the overall value of L-1 is not unreasonably high but the rate(s) for certain item(s) in a schedule or the total value for a schedule happens to be higher than those quoted by other tenderers in the same tender or higher than the last accepted rates, the method of counter offering the lower rate(s) obtained in the same tender or if all these are higher, any other rate(s) considered reasonable by tender committee may be adopted while finalizing the tender.

27. Right of Railway to Deal with Tender: The authority for the acceptance of the tender will rest with the railway. It shall not be obligatory on the said authority to accept the lowest tender or any other tender, and tenderer(s) shall neither

demand any explanation for the cause of rejection of his/ their tender nor the Railway to assign reasons for declining to consider or reject any particular tender or tenders.

28. Acceptance of Tenders: The accepting authority, reserves the right of not to invite tenders for any of railway work or works or to invite open or limited tenders and when tenders are called to accept a tender in whole or in part or reject any tender or all tenders without assigning reasons for any such action.

29. Instruction for submitting the Tenders as Joint Venture Firms (Not Applicable if tender value is ₹10 Crore or less.)

Joint Venture (JV) in Works Tenders: - Participation of Joint Venture (JV) in Works Tender: This Clause shall be applicable for works tenders if tender value is above ₹10 Crore.

30.0 Participation of Partnership Firms in works tenders:

(i) The Partnership Firms participating in the tender should be legally valid under the provisions of the Indian Partnership Act.

(ii) The partnership firm should have been in existence or should have been formed prior to submission of tender. Partnership firm should have either been registered with the Registrar or the partnership deed should have been notarized prior to date of tender opening as per the Indian Partnership Act.

(iii) Separate identity/ name should be given to the partnership firm. The partnership firm should have PAN/ TAN number in its own name and PAN/ TAN number in the name of any of the constituent partners shall not be considered. The valid constituents of the firm shall be called partners.

(iv) Once the tender has been submitted, the constitution of the firm shall not normally be allowed to be modified/ altered/ terminated during the validity of the tender as well as the currency of the contract except when modification becomes inevitable due to succession laws etc., in which case prior permission should be taken from Railway and in any case the minimum eligibility criteria should not get vitiated.

The re-constitution of firm in such cases should be followed by a notary certified Supplementary Deed. The approval for change of constitution of the firm, in any case, shall be at the sole discretion of the Railways and the tenderer shall have no claims what-so-ever. Any change in the constitution of Partnership firm after opening of tender shall be with the consent of all partners and with the signatures of all partners as that in the Partnership Deed. Failure to observe this requirement shall render the offer invalid and full EMD shall be forfeited.

If any Partner/s withdraws from the firm after opening of the tender and before the award of the contract, the offer shall be rejected and EMD of the tenderer will be forfeited. If any new partner joins the firm after opening of tender but prior to award of contract, his/ her credentials shall not qualify for consideration towards eligibility criteria either individually or in proportion to his share in the previous firm. In case the tenderer fails to inform Railway beforehand about any such changes/ modification in the constitution which is inevitable due to succession laws etc. and the contract is awarded to such firm, then it will be considered a breach of the contract conditions liable for determination of the contract under Clause 62 of General Conditions of Contract.

(v) A partner of the firm shall not be permitted to participate either in his individual capacity or as a partner of any other firm in the same tender.

(vi) The tender form shall be submitted only in the name of partnership firm. The EMD shall be deposited by partnership firm through e-payment gateway or as mentioned in tender document. The EMD submitted in the name of any individual partner or in the name of authorized partner (s) shall not be considered.

(vii) One or more of the partners of the firm or any other person (s) shall be designated as the authorized person (s) on behalf of the firm, who will be authorized by all the partners to act on behalf of the firm through a "Power of Attorney", specially authorizing him/ them to submit & sign the tender, sign the agreement, receive payment, witness measurements, sign measurement books, make correspondences, compromise/ settle/ relinquish any claim (s) preferred by the firm, sign "No Claim Certificate", refer all or any dispute to arbitration and to take similar such action in respect of the said tender/ contract. Such "Power of Attorney" shall be notarized / registered and submitted along with the tender.

(viii) On issue of Letter of Acceptance (LOA) to the partnership firm, all the guarantees like Performance Guarantee, Guarantee for various Advances to the Contractor shall be submitted only in the name of the partnership firm and no splitting of guarantees among the partners shall be acceptable.

(ix) On issue of Letter of Acceptance (LOA), contract agreement with partnership firm shall be executed in the name of the firm only and not in the name of any individual partner.

(x) In case the Letter of Acceptance (LOA) is issued to a partnership firm, the following undertakings shall be furnished by all the partners through a notarized affidavit, before signing of contract agreement.

(a) Joint and several liabilities: The partners of the firm to which the Letter of Acceptance (LOA) is issued, shall be jointly and severally liable to the Railway for execution of the contract in accordance with General and Special Conditions of the Contract. The partners shall also be liable jointly and severally for the loss, damages caused to the Railway during the course of execution of the contract or due to non-execution of the contract or part thereof.

(b) Duration of the partnership deed and partnership firm agreement: The partnership deed/ partnership firm agreement shall normally not be modified/ altered/terminated during the currency of contract and the maintenance period after the work is completed as contemplated in the conditions of the contract. Any change carried out by partners in the constitution of the firm without permission of Railway, shall constitute a breach of the contract, liable for determination of the contract under Clause 62 of the General Conditions of Contract.

(c) Governing laws: The partnership firm agreement shall in all respect be governed by and interpreted in accordance with the Indian laws.

(d) No partner of the firm shall have the right to assign or transfer the interest right or liability in the contract without the written consent of the other partner/s and that of the Railway.

(xi) The tenderer shall clearly specify that the tender is submitted on behalf of a partnership firm. The following documents shall be submitted by the partnership firm, with the tender.

(a) A notarised copy of partnership deed.

(b) A notarised or registered copy of Power of Attorney (duly registered as per prevailing law) in favour of the individual to tender for the work, sign the agreement etc. and create liability against the firm.

(c) An undertaking by all partners of the partnership firm that they are not blacklisted or debarred by Railways or any other Ministry/ Department of the Govt. of India/ any State Govt. from participation in tenders/ contracts as on the date of opening of bids, either in their individual capacity or in any firm in which they were/ are partners. Concealment/ wrong information in regard to above shall make the contract liable for determination under Clause 62 of the General Conditions of Contract.

(d) All other documents in terms of explanatory notes in clause-10 of GCC'2022 (Clause-18 of Chapter-I of this tender Document).

30.1 Evaluation of eligibility of a partnership firm: Technical and financial eligibility of the firm shall be adjudged based on satisfactory fulfilment of the eligibility criteria laid down in Clause-18 of Chapter-I of this Tender document above by the partnership firm.

31. Letter of Acceptance:

31.1 The acceptance of the tender shall be communicated by Registered Post with A/D at the address given by the Tenderer. The letter of acceptance will remain operative till a formal Contract/ Agreement is executed and signed by and between the Contractor and competent officer of the Railway, for and on behalf of the President of India, after which the letter of acceptance will merge in the said formal agreement.

31.2 The Railway shall not intimate to the tenderer whose tenders have not been accepted and the result of their tender(s). However, Earnest Money will be refunded as per Clause-18.3 of Chapter-II.

32. Vehicles and equipments of contractors can be drafted by Railway administration in case of accidents/ natural calamities involving human lives.

Annexure –I

DECLARATION REGARDING ASSOCIATION OF RLY. OFFICER(S) WITH TENDERER(S)

Sl. No.	Name	Status with the tenderer	If working in Rly. on the date of tendering, designation & place of posting	Date of retirement	Status at retirement	Particulars of permission taken for association with the tenderer
1	2	3	4	5	6	7

Annexure-II

(A) DETAILS OF EXISTING COMMITMENTS AND BALANCE AMOUNT OF ONGOING WORKS WITH THE TENDERER

Sl. No.	Name of the works in progress/ awarded but not yet started	Contract Agreement No/ LOA No.	Name & address of client/ Dept./ Orgn. For whom executed	Contract value in cost lakhs of ₹	Date of completion of work/ contract	Value of executed work and payment received (Financial year wise)	Balance amount of on-going works to be completed in next ----- years
1	2	3	4	5	6	7	8

(B) VALE OF COMPLETED WORKS/ EXECUTED WORKS AND PAYMENT RECEIVED DURING THE CURRENT AND/ LAST THREE FINANCIAL YEARS IMMEDIATELY PRECEDING THE CURRENT FINANCIAL YEAR, UPTO DATE OF OPENING OF TENDER

Sl. No.	Name of the completed works	Contract Agreement No/ LOA No.	Name & address of client/ Dept./ Orgn. For whom executed	Contract value in cost lakhs of ₹	Date of completion of work/ contract	Value of executed work and payment received in any one financial year during the current and/ last three financial years immediately preceding the current financial year, upto date of opening of tender
1	2	3	4	5	6	7

Note: Tenderer(s) should also furnish the followings.

i) List of works on hand indicating description of work, contract value approx. Value of balance work yet to be done and date of award.

ii) Supportive documents/certificates from the organizations with would they worked/are working should be enclosed.

iii) **Certificates from private individuals for whom such works are executed/being executed should not be accepted.**

iv) If required, separate page may be annexed.

v) For details please see Clause 19.1 Chapter-I, 29.15.3 of Chapter-II and Annexure-VI (Tenderers Credential: Bid Capacity).

vi) In case of JV, details to be furnished as enumerated in Annexure-VI.

vii) **This document is to be furnished duly certified by the Chartered Accountant duly supported by Audited Balance Sheet.**

Annexure-III

LIST OF ARBITRATION CASES DURING LAST 3-YEARS

Sl. No.	Name of work	Value of work	Name of Client Dept.	Amount and date of claim preferred	Claim of Dept. If any.	Brief reasons of disputes	Final/ Present position of the case

LIST OF COURT CASES DURING LAST 3-YEARS

Sl. No.	Name of work	Value of work	Name of Client Dept.	Name of the court	Date of institution of case.	Relief sought from court.	Brief reasons of disputes	Final/ Present position of the case

Annexure-IV

A. DETAIL OF OWN EQUIPMENTS PROPOSED TO BE INDUCTED

Sl. No.	Details of equipments	Numbers available	Details of purchase	Date of manufacture	Material	How driven (i.e. petrol/ Diesel/ Electric)	Condition of the equipment	Where the equipments can be inspected
1	2	3	4	5	6	7	8	9

B. DETAIL OF HIRED EQUIPMENTS PROPOSED IN BE INDUCTED.

Sl. No	Details of equipments	Numbers available	Details of purchase	Date of manufacture	Material	How driven (i.e. Petrol/ Diesel/ Electric)	Condition of the equipment	Where the equipment can be inspected
1	2	3	4	5	6	7	8	9

Annexure-V

A. DETAIL OF TECHNICAL PERSONNEL AVAILABLE ON HAND

Sl. No.	Name	Age	Technical Qualifications	Commencement of present employment	Total experience	Emoluments
1	2	3	4	5	6	7

B. DETAIL OF TECHNICAL PERSONNEL PROPOSED TO BE ENGAGED

Sl. No.	Name	Age	Technical Qualifications	Commencement of present employment	Total experience	Emoluments
1	2	3	4	5	6	7

Annexure-VI

TENDERER'S CREDENTIALS (BID CAPACITY)

1. It will be dealt as per IR-GCC-2022 or latest.

EASTERN RAILWAY
(Electrical Traction Distribution Department)
CHAPTER-III: SPECIAL CONDITION OF CONTRACT (GENERAL)

1. Communications with Contractors(s): Subject to and as otherwise provided in this contract, all notices as are required to be given shall be signed by competent Officer of the Railway for and on behalf of The President of India and all other actions shall be taken by the Engineer and/or his representative.

2. Communication to be in writing: All notices, communications, reference and complaints made by the Railway or the Engineer or the Engineer's Representative or the Contractor inter-se concerning the works shall be in writing or e-mail on registered e-mail IDs and no notice, communication, reference or complaint not in writing or through e-mail, shall be recognized.

3. Commencement of Work: The contractor will commence the work within 15 days from the date of issue of the letter of acceptance of the tender, failing which full value of earnest money may be forfeited and contract terminated.

3.1 Arrangement of Required Land:

3.1.1 For construction of site office, labour huts, store sheds etc. and arrangement of required water and electricity for all purposes in connection with this work shall be at the contractor's responsibility, liability and cost as per tender condition. Any delay in making arrangements for the same shall not be taken as an excuse for delay in starting the work.

3.1.2 Occupation and Use of Land: No land belonging to or in the possession of the Railway shall be occupied by the Contractor without the permission of the Railway. The Contractor shall not use, or allow to be used, the site for any purposes other than that of executing the works. Whenever non-railway bodies/persons are permitted to use railway premises with competent authority's approval, conservancy charges as applicable from time to time may be levied.

3.2A Dismantling: When dismantling of any existing structure is involved to facilitate the Construction, the contractor shall submit the scheme for dismantling of the existing structure. Execution shall be done after approval of Railway.

(a) The dismantling of structure should be done under proper supervision and as per approved scheme of dismantling.

(b) At major dismantling sites minimum level of supervision shall be Senior Section Engineer (In-charge), who should be nominated by Sr. Divisional Electrical Engineer/TRD in writing.

(c) The dismantling plan should be scrutinized by the Drawing Office and approved by competent authority. The dismantling plan should invariably show various stages of dismantling, equipments to be used for dismantling, area likely to be affected by debris, any adjacent buildings likely to be affected and action to be taken thereof.

(d) Proper barricading should be done to stop access of unauthorized personnel near the dismantling area. Wherever felt necessary, assistance of RPF should be taken to prevent people from coming close to dismantling area. The contractor should also display sign Boards warning people not to enter the danger zone.

(e) Proper announcement through public address system should be done at regular intervals to keep the onlookers away from the major dismantling affected zone.

(f) The adjacent building likely to be affected by dismantling should also be informed and workers shall take all precautionary measures.

(g) In area where law and order is likely to be affected, assistance of local Police should be taken to keep people away from dismantling area.

3.2B Removal of Improper Work and Materials: The Engineer or the Engineer's Representative shall be entitled to order from time to time.

(a) The removal from the site, within the time specified in the order, of any materials which in his opinion are not in accordance with the specifications or drawings.

(b) The substitution of proper and suitable materials, and

(c) The removal and proper re-execution, notwithstanding any previous tests thereof or on account payments therefore, of any work which in respect of materials or workmanship is not in his opinion in accordance with the specifications and in case of default on the part of the Contractor in carrying out such order, the Railway shall be entitled to rescind the contract under Clause 62 of these conditions.

(d) The provision of Construction and Demolition Waste Management Rule 2016 issued by Ministry of Environment Forest and Climate Change dated 29.03.2016 and published in the Gazette of India, Part – II, Section -3, Sub-section (ii) are binding upon the Contractor. Contractor shall implement these provisions at worksites, for which no extra payment will be payable.

3.3 Safety Measure: The following measures should be adopted to ensure safety of the trains as well as work force.

i) The contractor shall not start any work without the presence of Railway Supervisor at site.

ii) Wherever the road vehicles and/or machinery are required to work in the close vicinity of railway line, the work shall be so carried out so that there is no infringement to the Railway's schedule of dimensions. For this purpose, the area where road vehicles and/or machinery are required to ply, shall be demarcated and acknowledged by the contractor. Special care shall be taken for turning/reversal of road vehicles/machinery without infringing the running track. Barricading shall be provided wherever justified and feasible as per site conditions.

iii) The look out and whistle caution orders shall be issued to the trains and speed restrictions imposed where considered necessary suitable flagmen/ detonators shall be provided where necessary for protection of trains.

iv) The supervisor/workmen should be counseled about safety measures. A competency certificate to the contractor's supervisor as below shall be issued by AEE, which will be valid only for the work for which it has been issued.

COMPETENCY CERTIFICATE

Certified that Sri.....Electrical supervisor of M/shas been examined regarding Electrical working onwork. His knowledge has been found satisfactory and he is capable of supervising the work safely.

Assistant Electrical Engineer

v) The unloaded ballast/ rails/ sleepers/ other Electrical materials after unloading along track should be kept clear off moving dimensions and stacked as per the specified heights and distance from the running track.

vi) Supplementary site-specific instructions, wherever considered necessary, shall be issued by the Engineer-in-charge.

vii) Safety of Public: The Contractor shall be responsible to take all precautions to ensure the safety of the public whether on public or railway property and shall post such look out men as may, in the opinion of the Engineer, be required to comply with regulations appertaining to the work. Contractor shall ensure placement of barricading/ partitions at the place of work to ensure safety of habitants of adjacent area, failing which Engineer may advise stoppage of work as per his discretion.

viii) Display Board: The Contractor shall be responsible for displaying the details of works i.e. name of work, approximate cost, expected date of completion, name and address of the Contractor and address of Engineer on a proper steel Board of size not less than 1m x 1m.

4. Execution of Contract Document: The Tenderer whose tender is accepted shall be required to appear in person at the office of General Manager/ General Manager (Construction)/ Chief Administrative Officer (Construction)/ Divisional Railway Manager, or concerned Engineer, as the case may be, or if tenderer is a firm or corporation, a duly authorized representative shall appear and execute the contract agreement within seven days of notice from Railways that the Contract Agreement is ready. The Contract Agreement shall be entered into by Railway only after submission of valid Performance Guarantee by the Contractor. Failure to do so shall constitute a breach of the agreement affected by the acceptance of the tender. In such cases the Railway may determine that such tenderer has abandoned the contract and there upon his tender and acceptance thereof shall be treated as cancelled and the Railway shall be entitled to forfeit the full amount of the Earnest Money and other dues payable to the Contractor under this contract. The failed Contractor shall be debarred from participating in the re tender for that work.

No payment will be made till execution of the Agreement.

5.0 Accepted Programme of Work

5.1(a) The Contractor who has been awarded the work shall as soon as possible but not later than 30days after the date of receipt of the acceptance letter in respect of contracts with initial completion period of two years or less or not later than 90days for other contracts have to submit the detailed programme of work indicating the time schedule of various items of works in the form of Bar Chart/ PERT/CPM. He shall also submit the details of organisation (in terms of labour and supervisors), plant and machinery that he intends to utilize (from time to time) for execution of the work within stipulated date of completion. The programme of work amended as necessary by discussions with the Engineer, shall be treated as the agreed programme of the work for the purpose of this contract and the Contractor shall endeavor to fulfill this programme of work. The progress of work will be watched accordingly and the liquidated damages will be with reference to the overall completion date. Nothing stated herein shall preclude the Contractor in achieving earlier completion of item or whole of the works than indicated in the programme.

5.1(b) Every extension of time of completion will be dealt under clause 17-A or 17-B of Indian Railway Standard GCC'2022.

6. Equipment – The contractor shall bring to the site, necessary equipments, tools and plants for carrying out the work within Ten days of the letter of acceptance, and report to the Engineer at site.

7.1 Security Deposit by Contractor – The Earnest Money deposited by the Contractor with his tender will be retained by the Railways as part of security for the due and faithful fulfillment of the contract by the Contractor. The Security Deposit shall be 5% of the contract value. Security Deposit may be deposited by the Contractor before release of first on account bill in cash or Term Deposit Receipt issued from Scheduled Bank, or may be recovered at the rate of 6% (Six Percent) of the bill amount till the full Security Deposit is recovered. Provided also that in case of defaulting Contractor, the Railway may retain any amount due for payment to the Contractor on the pending “on account bills” so that the amounts so retained (including amount guaranteed through Performance Guarantee) may not exceed 10% of the total value of the contract.

Further, in case of contracts having value equal to or more than ₹50 crore the Security Deposit may be deposited as Bank Guarantee Bond also, issued by a scheduled bank after execution of contract documents, but before payment of 1st on account bill. Provided further that, the validity of Bank Guarantee Bond shall be extended from time to time depending upon extension of contract granted in terms of Clause-17 of the Standard General Conditions of Contract. Further, in case Security Deposit has been submitted as Term Deposit Receipt/ Bank Guarantee Bond in full amount, the Earnest Money deposited by the Contractor with his tender will be returned by the Railways.

Note: After the work is physically completed as certified by competent authority, Security Deposit recovered from the running bills of a Contractor can be returned to him, if he so desires, in lieu of Term Deposit Receipt/ irrevocable Bank Guarantee for equivalent amount from Scheduled Bank, to be submitted by him.

7.2 Refund of Security Deposit – Security Deposit mentioned above shall be returned to the Contractor after the following.

- (a) Final Payment of the Contract as per clause-51(1), Part-II of Indian Railway Standard GCC'2022 and
- (b) Signature of Final Supplementary Agreement or Certification by Engineer that Railway has No Claim on Contractor and
- (c) Issue of Maintenance Certificate on expiry of the maintenance period as per Clause-50(1) of Part-II of Indian Railway Standard GCC'2022.

7.3 Forfeiture of Security Deposit – Whenever the contract is rescinded as a whole under Clause-62(1), Part-II of Indian Railway Standard GCC'2022, the Security Deposit already with railways under the contract shall be forfeited. However, in case the contract is rescinded in parts or part under Clause-62(1), Part-II of Indian Railway Standard GCC'2022, the Security Deposit shall not be forfeited.

7.4 No interest shall be payable upon the Earnest Money and Security Deposit or amounts payable to the Contractor under the Contract, but Government Securities deposited in terms of Sub Clause- 16.4(b), Part-II of Indian Railway Standard GCC'2022 will be payable with interest accrued thereon.

8. Prevention of Accidents - The contractor shall not allow any road vehicle belonging to him or his supplier's etc. to ply in Railway land next to the running line. If for execution of certain works viz. earthwork for parallel Railway line and supply of ballast for new or existing rail line, gauge conversion etc. Road vehicles are necessary to be used in railway land next to the railway line, the contractor shall apply to the Engineer-in-charge for permission giving the type & number of individual vehicles, name & license particular of the drivers, location duration & timings for such work/ 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 names of road vehicle's drivers, contractor's flagmen and supervisors to be deployed on the work, location, period and timing of the work. This permission will be subject to the following obligatory conditions:

- (i) Nominated vehicles & drivers will be utilized for work in the presence of at least one flagman & one supervisor certified for such work.
- (ii) The vehicles shall ply 6.0 m clear of track. Any movement/ work at less than 6.0 m and up to minimum 3.5m clear of track center shall be done only in the presence of Railway employee authorized by the Engineer-in-charge. No part of the road vehicle will be allowed at less than 3.5m from track center. Cost of such railway employee shall be borne by the Railway.
- (iii) The Contractor shall remain fully responsible for ensuring safety & in case of any accident shall bear cost of all damages to his equipment & men and also damages to railway & its passengers. Engineer-in-charge may impose any other condition necessary for a particular work or site.
- (iv) Road vehicle can ply along the track after suitable cordoning of track with minimum distance of 6m from the center of the nearest track. For plying of road vehicles during night hours, adequate measures to be communicated in writing along with a site sketch to the contractor/contractor's representative and controlling Engineer/ Supervisor-in-charge of the work including officers and the in-charge of the section.
- (v) Where contractor's vehicles are permitted to ply adjacent to the running lines, experienced Gang-man shall be posted by the Railway as Flagman at the cost of the contractor to prevent accidents and the cost so incurred will be recovered from the contractor's dues.
- (vi) The contractor(s) shall be responsible for the safety of his workmen and shall provide them with necessary standard wear and apparel consistent with the nature of work being executed by his workmen.
- (vii) The contractor(s) shall ensure the safety of his workmen by posting necessary flagman, whose job will be to caution the workmen of approaching trains, when his workmen work on or near running Railway tracks.
- (viii) The contractor(s) shall protect the site of work, e.g. excavated areas, by adequate fencing and/or other suitable means to prevent accidents to his own workmen, Railways men or any member of the public.
- (ix) Should any accident takes place, the total cost of such damage including the cost of treatment, loss and/or compensation shall be payable by the contractor. In case of Railway under any circumstance or law of the country pays such damage, the same shall be fully recovered from the Contractor's dues.

9. Safety First Book – The successful tenderer(s) i.e. the contractor(s) shall purchase, if he does not already possess a copy of the booklet "SAFETY FIRST" which may be purchased from the office of the Chief Administrative Officer (Con)/ Eastern Railway, 14, Strand Road (4th floor) Kolkata-700001.

10.1 Provision of Efficient and Competent Staff at Work Sites by the Contractor -

- (a) The Contractor shall place and keep on the works at all times efficient and competent staff to give the necessary directions to his workmen and to see that they execute their work in sound & proper manner and shall employ only such supervisors, workmen & labourers in or about the execution of any of these works as are careful and skilled in the various trades.
- (b) The Contractor shall at once remove from the works any agents, permitted sub-contractor, supervisor, workmen or labourer who shall be objected to by the Engineer and if and whenever required by the Engineer, he shall submit a correct return showing the names of all staff and workmen employed by him.
- (c) In the event of the Engineer being of the opinion that the Contractor is not employing on the works a sufficient number of staff and workmen as is necessary for proper completion of the works within the time prescribed, the Contractor shall forthwith on receiving intimation to this effect deploy the additional number of staff and labour as specified by the Engineer within seven days of being so required and failure on the part of the Contractor to comply with such instructions will entitle the Railway to rescind the contract under Clause-62 of the Indian Railway Standard GCC'2022.

10.2 Deployment of Qualified Engineers at Work Sites by the Contractor -

- (a) The Contractor shall also employ qualified Graduate Engineer or qualified Diploma Engineer during the execution of the allotted work as per following.
- (i) One Qualified Graduate Engineer when cost of work to be executed is ₹2 Crore and above and

(ii) One Qualified Diploma Holder Engineer when cost of work to be executed is more than ₹25 Lakh but less than ₹2 Crore.

(b) For track related contractual works, the individuals having Diploma in Railway Engineering awarded by IPWE (India), shall also be considered as Qualified Diploma Engineers and contractor for track contract works can employ such individuals at the work site. (Authority Rly Board Letter No: 2012/CE-I/CT/O/20, dt. 10.5.13 & dt. 12.7.13).

(c) In case the Contractor fails to employ the Engineer as mentioned above, he shall be liable to pay a penalty of ₹40,000/- & ₹25,000/- for each month or part thereof for the default period for the provisions, as contained in Para-10.2(a) & (b) above.

11. Recovery of Income Tax – Income Tax @2% (Two percent) of the gross amount of each bill will be recovered from all the bills of the contractor in terms of section 194C of the Income Tax Act, 1961 as introduced through the Finance Act-1972. A surcharge @15% (fifteen percent) on the amount of Income Tax so deducted will also be recovered from the contractor's bills.

12. Scope of Work & Payments Thereof –

(i) The Railway reserves the right to get the work executed in the best and most economical manner, and may add or may not operate any item(s) of work(s) as the Railway may consider fit.

(ii) The Contractor(s) is expected to use the latest technology and machinery and achieve a most efficient and best quality finished construction.

(iii) The Railway reserves the right to increase or decrease the scope of work and/or not to operate any one or more of the item(s) or work(s) of any one or more of the various Schedules. It is the responsibility of the Contractor to ascertain from the Engineer-in charge, the items to be operated with their actual quantities before making any arrangements(s) for taking up work under the item(s). No claim, whatsoever, from the Contractor will be entertained for non-operation of any of the item(s) or for variation in quantity of any of the item(s).

(iv) The payment shall be made on the basis of actual quantities executed under various item(s) and the accepted rates thereof, and not on the quantities mentioned in the various schedules up to normal variation of agreement quantity/ value i.e. + 25%.

(v) Payment to the contractor will be made through National Electronic Fund Transfer to specified Bank account as per detail in the NEFT mandate form is enclosed in Annexure-B of Chapter-VIII. Please note that unless NEFT mandate form is submitted, no payment will be released.

13. Variation in Extent of Contract -

13(a) Modification to Contract to be in Writing: In the event of any of the provisions of the contract required to be modified after the contract documents have been signed, the modifications shall be made in writing and signed by the Railway and the Contractor and no work shall proceed under such modifications until this has been done. Any verbal or written arrangement abandoning, modifying, extending, reducing or supplementing the contract or any of the terms thereof shall be deemed conditional and shall not be binding on the Railway unless and until the same is incorporated in a formal instrument and signed by the Railway and the Contractor, and till then the Railway shall have the right to repudiate such arrangements.

13(b) Powers of Modification to Contract: The Engineer on behalf of the Railway shall be entitled by order in writing to enlarge or extend, diminish or reduce the works or make any alterations in their design, character position, site, quantities, dimensions or in the method of their execution or in the combination and use of materials for the execution thereof or to order any additional work to be done or any works not to be done and the Contractor will not be entitled, to any compensation for any increase/ reduction in the quantities of work but will be paid only for the actual amount of work done and for approved materials supplied against a specific order.

13(c) (i) Unless otherwise specified in the special conditions of the contract, the accepted variation in quantity of each individual item of the contract would be upto 25% of the quantity originally contracted, except in case of foundation work.

(ii) The Contractor shall be bound to carry out the work at the agreed rates and shall not be entitled to any claim or any compensation whatsoever upto the limit of 25% variation in quantity of individual item of works.

(iii) In case an increase in quantity of an individual item by more than 25% of the agreement quantity is considered unavoidable, then same shall be executed at following rates -

(a) Quantities operated in excess of 125% but upto 140% of the agreement quantity of the concerned item, shall be paid at 98% of the rate awarded for that item in that particular tender.

(b) Quantities operated in excess of 140% but upto 150% of the agreement quantity of the concerned item shall be paid at 96% of the rate awarded for that item in that particular tender.

(c) Variation in quantities of individual items beyond 150% will be avoided and would be permitted only in exceptional unavoidable circumstances and shall be paid at 96% of the rate awarded for that item in that particular tender.

(iv) Variation to quantities of Minor Value Item:

The limit for varying quantities for minor value items shall be 100% (as against 25% prescribed for other items). A minor value item for this purpose is defined as an item whose original agreement value is less than 1% of the total original agreement value.

(a) Quantities operated upto and including 100% of the agreement quantity of the concerned minor value item, shall be paid at the rate awarded for that item in that particular tender.

(b) Quantities operated in excess of 100% but upto 200% of the agreement quantity of the concerned minor value item, shall be paid at 98% of the rate awarded for that item in that particular tender.

(c) Variation in quantities of individual minor value item beyond 200% will be avoided and would be permitted only in exceptional unavoidable circumstances and shall be paid at 96% of the rate awarded for that item in that particular tender.

(v) In case of earthwork, the variation limit of 25% shall apply to the gross quantity of earthwork and variation in the quantities of individual classifications of soil shall not be subject to this limit.

(vi) In case of foundation work, no variation limit shall apply and the work shall be carried out by the Contractor on agreed rates irrespective of any variation.

(vii) As far as SOR items are concerned, the limit of 25% would apply to the value of SOR schedule as a whole and not on individual SOR items. However, in case of NS items, the limit of 25% would apply on the individual items irrespective of the manner of quoting the rate (single percentage rate or individual item rate).

13(d) Valuation of variations – The enlargements, extensions, diminution, reduction, alterations or additions shall in no degree affect the validity of the contract; but shall be performed by the Contractor as provided therein and be subject to the same conditions, stipulations and obligations as if they had been originally and expressly included and provided for in the Specifications and Drawings and the amounts to be paid therefore shall be calculated in accordance with the accepted Schedule of Rates. Any extra items/ quantities of work falling outside the purview of the provisions of Sub Clause-12(c) above shall be paid for at the rates determined under Clause-39 of Indian Railways Standard GCC'2022.

14. Tools and Plants – It should be clearly understood that it is entirely the Contractor's responsibility and liability to find, procure and use all machinery, tools and plants and their spare parts that are required for efficient and methodical execution of the work. Delay in procurement of such items due to their non-availability or import difficulties or any other cause whatsoever will not be taken as an excuse for not carrying out the work.

15. A. Quality Assurances and Reduced Payment - (i) The Contractor shall supply all materials and execute all works according to the specification and drawings pertaining to the work, both in respect of structural strength and finish, in addition to complying with provision of GCC.

(ii) Mixing of cement for concrete, mortar etc. shall be done by Mechanical Mixer and concrete should be vibrated by vibrator of appropriate design. All charges for working of machines viz. fuels, drivers, repairs, etc. will have to be borne by the contractor. No extra payment will be made on this account.

(iii) In case a contractor executes a work, which is below the specified structural strength, the work shall be dismantled and re-executed at contractor's cost at the sole discretion of the Engineer at Site.

(iv) In case a contractor executes a work which is structurally up to specifications, but sub-standard in finish, the same may be approved and accepted by the Railway in cases where finish is not so important, at Railways sole discretion, provided that where such a work is accepted, the payment for such work shall be made @ equivalent to 90% (ninety percent) of the rates accepted for such work in the Schedule of items.

15. B. Measurements, Certificates and Payments - (a) Quantities in Schedule Annexed to Contract: The quantities set out in the accepted Schedule of Rates with items of works quantified are the estimated quantities of the works and they shall not be taken as the actual and correct quantities of the work to be executed by the Contractor in fulfillment of his obligations under the contract.

(b)(i) Measurement of Works by Railway – The Contractor shall be paid for the works at the rates in the accepted Schedule of Rates and for extra works at rates determined under Clause-39 of GCC'2022 on the measurements taken by the Engineer or the Engineer's representative in accordance with the rules prescribed for the purpose by the Railway. The quantities for items the unit of which in the accepted Schedule of Rates is 100 or 1000 shall be calculated to the nearest whole number, any fraction below half being dropped and half and above being taken as one; for items the unit of which in the accepted Schedule of Rates is single, the quantities shall be calculated to two places of decimals. Such measurements will be taken of the work in progress from time to time and at such intervals as in the opinion of the Engineer shall be proper having regard to the progress of works. The date and time on which 'on account' or 'final' measurements are to be made shall be communicated to the Contractor who shall be present at the site and shall sign the results of the measurements (which shall also be signed by the Engineer or the Engineer's representative) recorded in the official measurements book as an acknowledgement of his acceptance of the accuracy of the measurements. Failing the Contractor's attendance, the work may be measured up in his absence and such measurements shall, notwithstanding such absence, be binding upon the Contractor whether or not he shall have signed the measurement books provided always that any objection made by him to measurement shall be duly investigated and considered in the manner set out below:

(a) It shall be open to the Contractor to take specific objection to any recorded measurements or Classification on any ground within seven days of the date of such measurements. Any re-measurement taken by the Engineer or the Engineer's representative in the presence of the Contractor or in his absence after due notice has been given to him in consequence of objection made by the Contractor shall be final and binding on the Contractor and no claim whatsoever shall thereafter be entertained regarding the accuracy and Classification of the measurements.

(b) If an objection raised by the Contractor is found by the Engineer to be incorrect the Contractor shall be liable to pay the actual expenses incurred in measurements.

(b)(ii) Measurement of Works by Contractor's Authorized Representative (in case the contract provides for the same) - (a) The Contractor shall be paid for the works at the rates in the accepted Schedule of Rates and for extra works at rates determined under Clause 39 of GCC'2022 on the measurements taken by the Contractor's authorized Engineer in accordance with the rules prescribed for the purpose by the Railway. The quantities for items the unit of which in the accepted Schedule of Rates is 100 or 1000 shall be calculated to the nearest whole number, any fraction below half being dropped and half and above being taken as one; for items the unit of which in the accepted Schedule of Rates is single, the quantities shall be calculated to two places of decimals. Such measurements will be taken of the work in progress from time to time. The date and time on which 'on account' or 'final' measurements are to be made shall be communicated to the Engineer. The date and time of test checks shall be communicated to the Contractor who shall be present at the site and shall witness the test checks, failing the Contractor's attendance the test checks may be conducted in his absence and such test checks shall notwithstanding such absence be binding upon Contractor provided always that any objection made by Contractor to test check shall be duly investigated and considered in the manner set out below:

(i) It shall be open to the Contractor to take specific objection to test checks of any recorded measurement within 7 days of date of such test checks. Any re-test check done by the concerned Railway's authority in the presence of the Contractor or in his absence after due notice given to him in consequent of objection made by the Contractor shall be final and binding on the Contractor and no claim whatsoever shall thereafter be entertained regarding the accuracy and classification of the measurements.

(ii) If an objection raised by the Contractor is found by the Engineer to be incorrect the Contractor shall be liable to pay the actual expenses incurred in measurements.

(c) **Incorrect measurement, actions to be taken:** If in case during test check or otherwise, it is detected by the Engineer that agency has claimed any exaggerated measurement or has claimed any false measurement for the works which have not been executed; amounting to variation of 5% or more of claimed gross bill amount, action shall be taken as following:

(i) On first occasion of noticing exaggerated/ false measurement, Engineer shall recover liquidated damages equal to 10% of claimed gross bill value.

(ii) On any next occasion of noticing any exaggerated/false measurement, railway shall recover liquidated damages equal to 15% of claimed gross bill value. In addition the facility of recording of measurements by Contractor as well as release of provisional payment shall be withdrawn. Once withdrawn, measurements shall be done by railway as per clause 15. B. (b) (i) above.

(d) **"On-Account" Payments:** The Contractor shall be entitled to be paid from time to time by way of "On-Account" payment only for such works as in the opinion of the Engineer he has executed in terms of the contract. All payments due on the Engineer's/Engineer's Representative's certificates of measurements or Engineer's certified "Contractor's authorized Engineer's measurements" shall be subject to any deductions which may be made under these presents and shall further be subject to, unless otherwise required by Clause 16 of GCC'2022, a retention of six percent (6%) by way of Security Deposits, until the amount of Security Deposit by way of such retentions shall amount to 5% of the total value of the contract provided always that the Engineer may by any certificate make any correction or modification in any previous certificate which shall have been issued by him and that the Engineer may withhold any certificate, if the works or any part thereof are not being carried out to his satisfaction.

(e) **Rounding off Amounts:** The total amount due on each certificate shall be rounded off to the nearest rupee, i.e. sum less than 50 paise shall be omitted and sums of 50 paise and more upto ₹1 will be reckoned as ₹1.

(f) **On Account Payments not Prejudicial to Final Settlement:** "On-Account" payments made to the Contractor shall be without prejudice to the final making up of the accounts (except where measurements are specifically noted in the Measurement Book as "Final Measurements" and as such have been signed by the Contractor and Engineer/Engineer's Representative) and shall in no respect be considered or used as evidence of any facts stated in or to be inferred from such accounts nor of any particular quantity of work having been executed nor of the manner of its execution being satisfactory.

15.C. OFF LOADING OF WORK (2%) - At the final stage of completion and commissioning of work, in case the contractor's failure is limited to only some of the works costing not more than 2% of the original contract value, and the Contractor request the engineer that such works may be offloaded from him and got executed through another agency and additional cost incurred, if any, should be recovered from his dues; the Engineer on being convinced that the anticipated additional cost for such works will not be substantial and can be recovered from the dues of the contractor and that such offloading will help in completion and commissioning of work, may agree to such offloading without any adverse repercussion on the performance guarantee and security deposit of the Contractor. However, the Engineer will not be under any compulsion to agree to such a request. Further, before issuing letter of acceptance to another agency for such work, the Contractor shall be informed of the rates at which the work will be got executed and the Contractor should give his consent to do so and certify that he would have no future claim on this account and that the extra expenditure so incurred, if any, by the Engineer in getting the offloaded work done, shall be recovered from subsequent Bills or any other dues of the Contractor. In case the Contractor fails to give such consent within three working days, the Engineer may treat the same as not acceptable to Contractor and proceed accordingly. In any case, Railway shall deduct 10% of cost of such work or Rs one lakh whichever is lower, from the Contractor's dues as administrative charges for the process of finalizing new agency for such work irrespective of whether or not such work is finally offloaded from Contractor or not.

16. Workmen of the Contractor(s) - (i) It would be appreciated by the Contractor(s) that there are a number of areas of work where no amount of supervision by Railway can ensure proper quality of work. The quality can only be ensured if competent, experienced and skilled workmen are employed to carry out the job.

(ii) The Contractor shall, therefore, engage workmen having adequate competence, experience and skill for doing the work at site.

(iii) In case the Engineer-at-Site finds that any one or more of the workmen of the Contractor is not competent or is inexperienced or not skilled enough. He may order the contractor to remove such workmen from the site of work and to replace them by other suitable workmen. The Contractor shall be bound to remove such workmen from site and to replace them by suitable workmen without any claim and/or delay. The decision of the Engineer-at-Site shall be final and binding on the contractor.

17. Use of Explosives - Explosives shall not be used on the works or on the site by the Contractor without the permission of the Engineer and then also only in the manner and to the extent to which such permission is given. Where explosives are required for the works, they shall be stored in a special magazine to be provided by and at the cost of the Contractor in accordance with the Explosive Rules. The Contractor shall obtain the necessary license for the storage and the use of explosives. All operations in which or for which explosives are employed shall be at the sole risk and responsibility of the Contractor and the Contractor shall indemnify the Railway in respect thereof.

18. PRICE VARIATION CLAUSE (PVC) (APPLICABLE IF THE TENDER VALUE IS EQUAL TO OR MORE THAN Rs. 2 CRORES) - It will be dealt as per IR-GCC-2022 or latest.

(j) **Price Variation during Extended Period of Contract:** - The price adjustment as worked out above, i.e. either increase or decrease shall be applicable upto the stipulated date of completion of work including the extended period of completion where such extension has been granted under Clause 17A of the Standard General Conditions of Contract. However, where extension of time has been granted due to contractor's failure under Clause 17-B of the Standard General Conditions of Contract, price adjustment shall be done as follows.

(i) In case the indices increase above the indices applicable to the last month of original completion period or the extended period under Clause 17-A, the price adjustment for the period of extension granted under Clause 17-B shall be limited to the amount payable as per the Indices applicable to the last month of the original completion period or the extended period under Clause 17A of the Standard General Conditions of the Contract; as the case may be.

(ii) In case the indices fall below the indices applicable to the last month of original/extended period of completion under Clause 17-A, as the case may be; then the lower indices shall be adopted for the price adjustment for the period of extension under Clause 17-B of the Standard General Conditions of Contract'2022.

19. Extension of Completion Date: Extension of time for completion of the work shall be governed by Clause-17 of the Indian Railway Standard GCC'2022, and the contractor shall be responsible for requesting such extension in terms thereof. While applying for such extension, a Bar Chart showing the work already done and the programme for work to be done shall be prepared and shown in juxtaposition with the bar chart submitted under clause 5 of this chapter, giving reasons for slippage activity-wise.

The Railway shall agree to such extension of time of completion, as they consider justified.

19. a Force Majeure Clause: If at any time, during the continuance of this contract, the performance in whole or in part by either party of any obligation under this contract shall be prevented or delayed by reason of any war, hostility, acts of public enemy, civil commotion, sabotage, serious loss or damage by fire, explosions, epidemics/ pandemics, strikes, lockouts or acts of God (hereinafter, referred to events) provided, notice of the happening of any such event is given by either party to the other within 30 days from the date of occurrence thereof, neither party shall by reason of such event, be entitled to terminate this contract nor shall either party have any claim for damages against the other in respect of such nonperformance or delay in performance, and works under the contract shall be resumed as soon as practicable after such event has come to an end or ceased to exist, and the decision of the Engineer as to whether the works have been so resumed or not shall be final and conclusive, PROVIDED FURTHER that if the performance in whole or in part of any obligation under this contract is prevented or delayed by reason of any such event for a period exceeding 120 days, either party may at its option terminate the contract by giving notice to the other party.

19. b Bonus for Early Completion of Work: In case of open tenders having value more than ₹20 crore and original period of completion 12 months or more, when there is no reduction in original scope of work by more than 10%, and no extension granted on either railway or Contractor's account, Contractor shall be entitled for a bonus of 1% for each 30 days early completion of work. The period of less than 30 days shall be ignored while working out bonus. The maximum bonus shall be limited to 3% of original contract value. The completion date shall be reckoned as the date of issuance of completion certificate by engineer.

20. Payment of Advances to Contractors (Applicable for Tender Value more than ₹25Cr. only):

(a) **General:** The Railway may consider sanction of the advances to the contractors, as per following, in exceptional circumstances, only for works which are capital intensive and of specialized nature.

(b) **Mobilization Advance:** This shall be limited to 10% of the contract value and payable in 2 Stages, as indicated below.

Stage-I: 5% of contract value on signing of the contract agreement.

Stage-II: 5% on Mobilization of site-establishment, setting up offices, bringing in equipment and actual commencement of work.

The two stages of advances shall be payable immediately after signing of contract document and at the time of mobilization respectively.

(c) **Advance against Machinery and Equipment:** - This advance shall be limited to a maximum of 10% of the contract value against new machinery and equipment, involving substantial outlay, brought to site and essentially required for the work. This advance shall not exceed 75% of the purchase price of such equipment and shall be payable when hypothecated to the President of India by a suitable bond or alternatively covered by an irrevocable Bank Guarantee for full cost of the plant and equipment from a Nationalized Bank in India or the State Bank of India in a form acceptable to Railways. The plant and equipment shall be insured for the full value and for the entire period, they are required for the work. This plant and equipment shall not be removed from the site of work without prior written permission of the Engineer. No advance should be given against old plant and machinery.

(a) **Advance for Accelerating Progress of the Work During Course of Execution of Contract:** This advance is to be decided on the merits of each case for contracts lying within the powers of General Manager (upto ₹100Cr. or less or as decided and circulated by Board from time to time) and shall be restricted to a maximum of 5% of contract value or ₹1Cr. whichever is less. This is to be granted by the General Manager on the recommendations of the Chief Engineer in-charge, in consultation with the associate finance.

(b) **Advances in Exceptional Cases:**

General Managers are further empowered to grant advances in exceptional cases upto a maximum of ₹5Lakh in respect of even contracts of value of less than ₹50Lakh, if considered absolutely essential, depending on the merits of each case and circumstances in each situation, to be recommended by the Chief Engineer in-charge and in consultation with the associate finance.

(c) **The above Advances are Subject to the Following Conditions:**

(i) The advance shall carry an interest at the rate of **10% (Ten Percent)** per annum, of the advance to be granted by the competent authority and be restricted only for high value tenders of ₹25Cr. and above.

(ii) Advance except those against machinery and equipment, shall be payable against irrevocable guarantee (Bank guarantee, FDR's, KVP's / NSC's) of at least 110% of the value of the sanction advance amount (covering principal + interest). The Bank guarantee shall be from a Nationalized Bank in India or State Bank of India in a form acceptable to the Railways.

(iii) The recovery shall commence when the value of contract executed reaches 15% (fifteen percent) of original contract value, and shall be completed when the value of work executed reaches 85% (eighty five percent) of the original contract value. The installments on each 'on-account-bill' will be on pro- rata basis.

(iv) That the grant of advance is primarily in Railway's own interest.

(v) That a contract does not receive advances for same work from different officers.

(vi) That arrangements are made with Accounts Officer for proper account being kept with regard to payment and recovery of this advance and That all necessary precaution are taken to secure Government from the possibility of loss and for preventing the system becoming more general or continuing longer than what may be absolutely necessary for proper progress of the work.

(d) Method of Recovery of Interest: Interest shall be recovered on the advance outstanding for the period commencing from the date of payment of advance till date of particular on account bill (through which recovery of principal is effected) and adjusted fully against on account bill along with pro-rata principal recovery. In the event of any short-fall, the same shall be carried forward to the next on account bill and shall attract interest @10% (Ten Percent) per annum above the base rate of State Bank of India, as effective on the date of approval of payment of the advance by the competent authority.

The Bank Guarantee for such advances shall clearly cover at least 110% of the value of the sanctioned advance amount (covering principal + interest). (Authority: Railway Board's Letter No. 2007/CE-I/CT/18/ Part-3, dated 22.01.2018 and Letter no 2018/CE-I/CT/I, dated 22/01/2018).

21. 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 upto 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 Earnest Money Deposit and other dues payable against that contract. In case a tenderer has not submitted Earnest Money Deposit 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 contract value.

(i) A deposit of Cash;

(ii) Irrevocable Bank Guarantee;

(iii) Government Securities including State Loan Bonds at 5% below the market value;

(iv) Deposit Receipts, Pay Orders, Demand Drafts and Guarantee Bonds. These forms of Performance Guarantee could be either of the State Bank of India or of any of the Nationalized Banks;

(v) Guarantee Bonds executed or Deposits Receipts tendered by all Scheduled Banks;

(vi) Deposit in the Post Office Saving Bank;

(vii) Deposit in the National Savings Certificates;

(viii) Twelve years National Defence Certificates;

(ix) Ten years Defence Deposits;

(x) National Defence Bonds and

(xi) 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 upto 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 60days.

(d) The value of PG to be submitted by the Contractor will not change for variation upto 25 % (either increase or decrease). In case during the course of execution, value of the contract increases by more than 25% of the original contract value, an additional Performance Guarantee amounting to 5% (five percent) for the excess value over the original contract value shall be deposited by the Contractor. On the other hand, if the value of contract decreases by more than 25% of the original contract value, Performance Guarantee amounting to 5% (five percent) of the decrease in the contract value shall be returned to the Contractor. The PG amount in excess of required PG for decreased contract value, available with Railways, shall be returned to Contractor as per his request duly safeguarding the interest of Railways.

(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 encashed in addition to forfeiture of Security Deposit available with Railway.

(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 (notwithstanding 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 the GCC.

22.1 The tenderer who has offered lower total cost as compared to tender value by more than 10%, shall be required to submit additional Performance Guarantee of value equal to half the percentage of tender value by which offer is lower than 10%. (e.g. in a tender costing Rs 100, if contract value is Rs 80, additional Performance Guarantee shall be $[0.5 \times \{(100-80)-10\}$ percentage of tender value.)

22.2 Quarterly Statement of Claims: The Contractor shall prepare and furnish to the Engineer once in every quarter commencing from the month following the month of issue of Letter of Acceptance, an account giving full and detailed particulars of all claims for any additional expenses to which the Contractor may consider himself entitled to and of all extra or additional works ordered by the Engineer which he has executed during the preceding quarter and no claim for payment for such work will be considered which has not been included in such particulars.

22.3 Signing of "No Claim" Certificate: The Contractor shall not be entitled to make any claim whatsoever against the Railway under or by virtue of or arising out of this contract, nor shall the Railway entertain or consider any such claim, if made by the Contractor, after he shall have signed a "No Claim" Certificate in favor of the Railway in such form as shall be required by the Railway after the works are finally measured up. The Contractor shall be debarred from disputing the correctness of the items covered by "No Claim" Certificate or demanding a clearance to arbitration in respect thereof.

23. Settlement of Disputes – Indian Railway Arbitration and Conciliation Rules: All disputes and differences of any kind whatsoever arising out of or in connection with the contract, whether during the progress of the work or after its completion and whether before or after the determination of the contract shall be referred by the contractor to the Railway and same will be dealt under clause 63 to 64(7) of Indian Railway Standard GCC'2022.

24. Travel facilities to the Labour for the works in metropolitan area of Howrah/Kolkata:- Contractor will purchase season tickets as per the extant procedure for his labour for travel by train in order to ensure adequate facilities for their transportation from their place of living to the place of work and back.

25. (i) Maintenance of Works: The Contractor shall at all times during the progress and continuance of the works and also for the period of maintenance specified in the Tender Form after the date of issue of the certificate of completion by the Engineer or any other earlier date subsequent to the completion of the works that may be fixed by the Engineer, be responsible for and effectively maintain and uphold in good substantial, sound and perfect condition all and every part of the works and shall make good from time to time and at all times as often as the Engineer shall require, any damage or defect that may during the above period arise in or be discovered or be in any way connected with the works, provided that such damage or defect is not directly caused by errors in the contract documents, act of providence or insurrection or civil riot, and the Contractor shall be liable for and shall pay and make good to the Railway or other persons legally entitled there to whenever required by the Engineer so to do, all losses, damages, costs and expenses they or any of them may incur or be put or be liable to by reasons or in consequence of the operations of the Contractor or of his failure in any respect.

25(ii) Maintenance Period:

The maintenance period shall be 12(twelve) months from the date of completion of work as certified by the Engineer-in-Charge.

26. Provision of Contract Labour (Regulation and Abolition) Act'1970:

(A) The Contractor shall comply with the provision of the contract labour (Regulation and Abolition) Act, 1970 and the Contract labour (Regulation and Abolition) Central Rules 1971 as modified from time to time, wherever applicable and shall also indemnify the Railway from and against any claims under the aforesaid Act and the Rules [Ref Clause 55A (1) to 55A (5) of GCC'2022]

27. Provisions of "The Building and Other Construction Works (Regulation of Employment and Conditions of Service) Act, 1996" and "The Building and Other Construction Works' Welfare Case Act, 1996" (Clause 55-D of GCC'2022):

The tenderers for carrying out any construction work shall get themselves registered with the Registering Officer under Section-7 of the "Building and Other Construction Works Act, 1996" and Rules made thereto by the concerned State Govt. and submit certificate of Registration issued by Registering Officer of the concerned State Govt. (Labour Dept.). As per this Act, the cess @1% of cost of construction work shall be deducted from each contractor's bills. Cost of Material, when supplied under a separate schedule item, shall be outside the purview of cess." (Authority: Railway Board's Circular no. 2008/ CE-I/CT/6, dated 29.11.2013)

28. Provisions of Employees Provident Fund and Miscellaneous Provisions Act, 1952: (Clause 55-B of GCC'2022) - Authority Railway Board's letter no. 2012/CE-I/CT/O/22, dated 14.12.2012 - The Contractor shall comply with the provisions of Para 30 and 36-B of the Employees Provident Fund Scheme, 1952; Para-3 and 4 of Employees' Pension Scheme, 1995; and Para-7 and 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 the Rules".

29(i) Contractor is to abide by the provisions of various labour laws in terms of Clause 54, 55, 55A & 55B of Indian Railways GCC-2022. In order to ensure the same, an application has been developed and hosted on website 'www.shramikkalyan.indianrailways.gov.in'. Contractor shall register his firm/company etc. And upload requisite details of labour and their payment in this portal. These details shall be available in public domain. The Registration/ updation of Portal shall be done asunder:

(a) Contractor shall apply for one time registration of his company/firm etc. in the shramik kalyan portal with requisite details subsequent to issue of Letter of Acceptance. Engineer shall approve the contractor's registration in the portal within 7 days of receipt of such request.

(b) Contractor once approved by any Engineer, can create password with login ID (PAN No.) for subsequent use of portal for all Letter of Acceptances (LOAs) issued in his favour.

(c) The contractor once registered on the portal, shall provide details of his Letter of Acceptances (LoAs)

/ Contract Agreements on shramik kalyan portal within 15 days of issue of any LOA for approval of concerned engineer. Engineer shall update (if required) and approve the details of LOA filled by contractor within 7 days of receipt of such request.

(d) After approval of LOA by Engineer, contractor shall fill the salient details of contract labours engaged in the contract and ensure updating of each wage payment to them on shramik kalyan portal on monthly basis.

(e) It shall be mandatory upon the contract or to ensure correct and prompt uploading of all salient details of engaged contractual labour & payments made thereof after each wage period.

29(ii) While processing payment of any 'On Account bill' or 'Final bill' or release of 'Advances' or 'Performance Guarantee / Security deposit', contractor shall submit a certificate to the Engineer or Engineer's representatives that "I have uploaded the correct details of contract labours engaged in connection with this contract and payments made to them during the wage period in Railway's Shramik kalyan portal at 'www.shramikkalyan.indianrailways.gov.in' till Month, Year."

30. Implementation of GST Act 2017-Procedure for payment of Contractual Bill – With GST act in force, it will be the responsibility of service providers (i.e. contractors) to submit the invoice (bill) duly segregating the GST component from the Gross amount of work executed.

Following procedure are mentioned below while dealing with contractor's **payment, once GST is applicable.**

(A)(i) All works contracts are to be provided with goods/service code based on the type of Contract. In case contract consists of both goods & service, then interpretation regarding nature of contract shall be done as per clause-8, Chapter-III of CGST Act, 2017. The goods/service code is notified by Ministry of Finance and can be downloaded from the website www.cbec.gov.in.

(ii) The 'on account/final contract certificate' shall be prepared by the Railway on the basis of quantity of work executed and agreement rates, duly segregating the GST component as detailed in Para (iii) below.

(iii) Since the agreement rates of contracts are inclusive of all taxes as per clause-37 of GCC'2022, the calculation of Gross amount of work executed', 'Amount of work executed excluding GST amount' and 'GST amount' in the 'on account/final contract certificate' shall be done as under.

Let Z = Gross amount of work executed on the basis of quantum of work executed and agreement rates.

X = Amount of work executed excluding GST amount.

Y = GST amount as per applicable GST rate for that goods/ service code. R = Percentage rate of GST for that goods/service code

Then **Z = X+Y, Y = X*R/100**

(iv) Percentage rate of GST for various types of goods/ services as finalized by GST council can be downloaded from the website www.cbec.gov.in.

(B)(i) Once the 'on account/final contract certificate' is prepared by railway and communicated to contractor, the contractor shall submit invoice (bill) on his Letter head duly segregating the 'Amount of work executed excluding GST amount' and 'GST amount' (i.e. "X" & "Y" as mentioned in Para-(A) (iii) above) along with Invoice No. (Bill No.) and all other details required under GST act. The sample GST compliant invoice is annexed as per Annexure-E in the tender document.

(ii) In case contractor is liable to be registered under GST Act, Railway shall pay to the Contractor 'Gross amount of work executed' (i.e. "Z" as mentioned in Para A (iii) above) duly deducting all other leviable taxes like I/Tax, labour cess, royalty etc. as applicable. Contractor shall be liable to pay 'GST amount' to respective authority himself. Whereas, railway shall deposit all other taxes deducted to concerned authority as is being done presently.

(iii) In case contractor is not liable to be registered under GST Act, contract or shall be paid "Amount of work executed excluding GST amount" (i.e. "X" as mentioned in Para A(iii) above) duly deducting all other leviable taxes like I/Tax, labour cess, royalty etc. as applicable. Railway shall deposit 'GST amount' as well as all other taxes deducted to concerned authority.

(iv) In case any need arises to modify the Invoice (Bill) due to any reason, contractor shall submit amend fresh invoice for processing the payment. (Authority Railway Board's letter no. 2016/CE- I/CT/12/GST/Pt-I dt.29.6.17)

31. Use of Patented Items in Works Contract:

(1) In case the agency supplying the patented item is not the contractor to whom the work is assigned and these items are being procured by the contract or, the concerned contractor will obtain prior approval from the Engineer-in-Charge of the work (Min. JA Grade Officer), who will ensure that all design and safety aspects are taken care of. For any specific requirement concerning execution, warranty etc. an agreement/MOU is to be entered between the main contractor and the party supplying the patented items clearly bringing out the responsibility of party supplying such patented items. A copy of such MOU will be furnished to the Engineer-in-Charge by the main contractor to whom the work has been assigned by the Railway and after the approval of Engineer-in-Charge; such item can be used in work.

(2) The agency supplying the patented item shall provide complete details/specifications/drawings of the items

including the manner in which is to be used.

(3) During the installation of such patented items, authorized representative of the firm supplying such patented propriety shall be present and after the execution of work a certificate to be issued by the firm supplying the patented item indicating its proper installation. Such certificate will have to be kept in record by the concerned Engineer-in-Charge executing the contract, before releasing payment for the work done. (Authority Railway Board's letter no. 2018/CE-I/Innov/I, dt. 18.1.18 and CAO/Con/WT/Rly. Bd's Circular/Pt.II, dt.22.2.18)

32. Assignment or Subletting of Contract: The Contractor shall not assign or sublet the contract or any part thereof or allow any person to become interested therein in any manner whatsoever without the special permission in writing of the Chief Engineer, save as provided below. Any breach of this condition shall entitle the Railway to rescind the contract under Clause 62 of GCC-2022 and also render the Contractor liable for payment to the Railway in respect of any loss or damage arising or ensuing from such cancellation; provided always that execution of the details of the work by petty Contractor under the direct and personal supervision of the Contractor or his agent shall not be deemed to be sub-letting under this clause.

In case Contractor intends to subcontract part of work, he shall submit a proposal in writing seeking permission of Chief Engineer for the same. While submitting the proposal to railway, Contractor shall ensure the following:

(a)(i) Total value of work to be assigned to sub-contractor(s) shall not be more than 50% of total contract value.
(ii) The sub-contractor shall have successfully completed at least one work similar to work proposed for sub-contract, costing not less than 35% value of work to be Sublette, in last 5 years through a works contract directly given to him by a Govt. Department; or by a Public listed company having average annual turnover of ₹500 crore and above in last 3 financial years excluding the current financial year, listed on National Stock Exchange or Bombay Stock Exchange, registered at least 5 years back from the date of submission of proposal by Contractor to Railway and work experience certificate issued by a person authorized by the Public Listed Company to issue such certificates.

In case contractors submit sub-contractor's work experience certificate issued by public listed company, the contractor 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.

(iii) There is no banning of business with the sub-contractor in force over IR.

(b) The Contractor shall provide to the Engineer a copy of the agreement to be entered into by Contractor with sub-contractor. No sub-contractor shall be permitted without a formal agreement between Contractor and sub-contractor. This agreement shall clearly define the scope of work to be carried out by sub-contractor and the terms of payment in clear & un-ambiguous manner.

(c) On receipt of approval from Chief Engineer, Contractor shall enter into a formal agreement legally enforceable in Court of Law with subcontractor and submit a copy of the same to the Engineer.

(d) The Contractor shall intimate to the Engineer not less than 7-days in advance, the intended date of commencement of sub-contractor's work.

(e) Once having entered into above arrangement, Contractor shall discontinue such arrangement, if he intends to do so at his own or on the instructions of Railway, with prior intimation to Chief Engineer.

(f) The Contractor shall indemnify railway against any claim of sub-contractor.

(g) The Contractor shall endeavor to resolve all matters and payments amicably and speedily with the sub-contractor.

(h) In addition to issuance of work experience certificate to Contractor, the Engineer, when, based on documents, is satisfied that subcontracted work has been carried out by subcontractor, shall issue work experience certificate to the subcontractor also for the portion of work subcontracted and successfully completed by the sub-contractor.

(i) The responsibility of successful completion of work by subcontractor shall lie with Contractor. Subcontracting will in no way relieve the Contractor to execute the work as per terms of the Contract.

(j) Further, in case Engineer is of the view that subcontractor's performance is not satisfactory, he may instruct the Contractor to remove the subcontractor from the work and Contractor has to comply with the above instructions with due promptness. Contractor shall intimate the actual date of discontinuation of subcontract to Engineer. No claim of Contractor whatsoever on this account shall be entertained by the Railway and this shall be deemed as 'excepted matter' (matter not arbitrable).

(k) The permitted subcontracting of work by the Contractor shall not establish any contractual relationship between the sub-contractor and the Railway and shall not relieve the Contractor of any responsibility under the Contract.

EASTERN RAILWAY
(Electrical Traction Distribution Department)
CHAPTER-IV: TENDER FORM (First Sheet)

Tender No:

Name of the work:

To,

The President of India,

Acting through the Railway.

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 tender open for acceptance for a period of ____ Days from the date fixed for opening the same and in default thereof, I/We will be liable for forfeiture of my/our "Earnest Money". I/We offer to do the work for _____Railway, at the rates quoted in the attached schedule and hereby bind myself/ ourselves to complete the work in all respects within_____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 upto 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, Schedule of Rates with all correction slips up-to-date for the present contract.

3. A sum of ₹__is herewith forwarded/ has already been deposited online as Earnest Money. Full value of the Earnest Money 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 upto (copy enclosed) and hence exempted from submission of Earnest Money.

5. We are a 100% Govt. owned PSUs and hence exempted from payment of Earnest Money.

6. We are a Labour Cooperative Society and our Registration No. iswith __and hence required to deposit only 50% of Earnest Money.

7. 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)

Signature of Tenderer(s)

Date

(2)

Address of the Tenderer(s)

.....

EASTERN RAILWAY
(Electrical Traction Distribution Department)
CHAPTER-V: PRICES AND PAYMENTS

1. Scope - This chapter deals with prices to be paid for supply and/or erection of various items of work or for supplies and other amounts payable in accordance with accepted schedules of prices and rates and terms conditions of payment mentioned herein. This is a works contract. The total prices for the completed items of work are the actual prices payable to the contractor as per the terms and conditions of the contract. The unit of price is rupees.

2 (a). Schedule of Prices - The unit prices of various items of work shall be included in schedules. All unit prices shall be FIRM irrespective of minor variations in basic quantities and use of alternative types of various components and fittings approved by the Purchaser. Minor changes in basic designs shall not affect unit prices, so long as such changes are mutually agreed to by the purchaser and the Contractor. All unit prices shall be in RUPEES.

(b) Unit prices for materials: The unit prices indicated in schedules, shall include the prices of materials including all incidental charges for transport, loading/unloading and handling of materials, commission for arranging dispatch by rail direct from manufacturer's Factory and completing all necessary formalities in this respect, such as submission of forwarding notes, arranging placement of wagon, collection of Railway receipts all insurance premium banker's charges for bank guarantee, indemnity bond, inclusive of cost of stamp etc. as also siding or shunting charges, if any levied by the Railway.

The prices shall include CGST/IGST/UTGST/SGST, as applicable, payable on supplies. Hence the question of reimbursement from Railway on all statutory deduction does not arise. The prices shall also include provision for losses and wastage in transit and erection. No separate prices for supply of concreting materials shall be included against any of the items of any section. These shall be included in the unit prices for erection for such item(s).

For Erection: The unit price indicated in Schedules shall include cost of erection and testing, to be done by the Contractor to the extent of Inspection and Testing and also cover all cost of administration of the contract, insurance premium, banker's charges for guarantee, cost of stamps, cost of storage, loading/ unloading and handling of materials and for a road transport which the Contractor may use for carriage of materials between his depot and depot/s and site of work. The unit prices shall include cost of works and adjustments necessary to be done by the Contractor during or after the tests carried out by the Purchaser.

(c) Other Prices Adjustments: No adjustment on account of variation in insurance and freight charges (Road or Rail) will be permitted. No adjustment of unit price or prices of fittings, materials equipment or components on account of price fluctuation of raw materials will be permitted.

(d) Quantities: The approximate estimated quantities of various items of work are included in schedule.

(e) If it is considered that the work included in Schedules would not cover all works involved in putting the installation into commission additional items of work, which are considered necessary, and unit prices of such items shall be included in Schedules. Explanatory notes for such additional items shall be given under deviations from Tender Papers.

(f) Explanatory Notes: Explanatory Notes for various items of works, included in Schedule(s), are given separately (if applicable).

(g) New items of Work: If during the execution of the work the Contractor is called upon to carry out any new item of work not included Schedules, the Contractor shall execute such work at such prices as may be mutually agreed with Purchaser before commencement.

3. Price of Equipment, Components & Materials: The prices of individual's equipments, components and materials required for the work inclusive of CGST/IGST/UTGST/SGST and Insurance Premium under the Emergency Risks (Goods Insurance Act in-force) if, any shall be related to the actual prices of the components and materials to the Contractor as obtained by him at the time of submitting his tender. If required by the Purchaser, the Tenderer/Contractor shall substantiate such prices, if it considered that the components and materials in addition as alternative to those included in Schedules, are required for the work, such items shall be included separately. No adjustment of rates is permissible if alternative approved fittings are used for any rates whatsoever.

4. Payments and Recoveries: Subject to any deduction or recoveries, which the Purchaser may be entitled to make under the contract. The Contractor shall unless otherwise agreed to, been titled to the following payments subject to conditions stipulated sub sequent paragraphs:

- (i) Payment for designs,
- (ii) Payments for foundations,
- (iii) On account payments,
- (iv) Progress payments for erection,
- (v) Payment for completion for each sub-group,
- (vi) Payment for surplus materials taken over,
- (vii) Final settlement.

5. Invoice Procedure:

(a) The Contractor shall submit his invoicing procedure for approval by the Purchaser within 1 month from the date of receipt of Letter of Acceptance of Tender. Separate invoices shall be submitted for different types of payments mentioned above. All invoices shall be submitted with original supporting documents are required in support of several invoices; true certified copies of the original documents may be forwarded to the Purchaser's Engineers with his consent.

(b) Invoices shall be submitted only on the basis of agreed principles and prices, quantities and measurements of works completed shall be approved by the Purchaser's Engineer prior to the submission of invoices. For this purpose, the

Schedule of quantities and measurements submitted by the Contractor for approval of the Purchaser's Engineer may be only up to the extent of work completed except in case of payment on completion.

6. Payments for Designs: - Payments for designs shall be made on the basis of prices included in such items. The amount payable shall be based on assessed quantities against such items.

Payment for design and drawing will be made in two installments, first 50% will be paid on submission of designs and drawings and approval and balance 50% on approval of as erected drawings and submission of all RTF and Ferro copies.

7. Payments for Foundations: - Payment for foundation: 90% payment will be made on completion of casting of foundation duly certified by representative of Railway and recorded in the M.B. The balance 10% payment against foundation will be released on completion of entire foundation work and on issue of completion certificate duly certified by competent officer of Electrical Traction Distribution Department of Eastern Railway/Sealdah.

NOTE: Such payments will be made only on approval and certification by the Purchaser's representative.

8. On Account Payments

(a) General: - On account payment will be made for equipments Components, fittings and materials as described below. No on account payment will be made on supply of concreting materials.

(b) Equipments, Components & Fittings: - On account payment for equipment, components fittings and materials required for the execution of work will be made to the extent of 90% of the unit prices of such equipments, Components, fittings and materials as per Schedules. On handing over of the material to Purchaser at his Depot against received Challan and inspection certificate issued by Railway representative and production of following documents.

(i) Invoice in duplicate for the Consignments showing the quantity against the items and description of each consignment.

(ii) Manufacturer's certificate for large value items wherever necessary as decided by Railway Engineer duly counter signed, along with inspection certificate issued by authorized representative of concerned officer of Electrical Traction Distribution Department of Eastern Railway/Sealdah.

(iii) Certificate of current statutory taxes and dues.

(iv) Detailed entries made in the M.B.

(c) The Contractor's supply items will be reissued to contractor at purchaser's depot for erection purpose on submission of Indemnity Bond. The indemnity bond shall be in prescribed form valid for one year beyond the date of completion of work. In event of extension to the time of completion the contractor shall extend the validity equivalent cash would be held by the purchaser from the payments due to the Contract to achieve the require progress of work. In case, if contractor is not in a position to furnish additional BG or cash withheld will be returned/refunded soon after it is not required i.e. additional material issued to improve the progress work is erected. After completion of work surplus material if any kind and not required by the purchaser will be returned to contractor. Indemnity bond will be returned if no material if outstanding after material

(d) "On account payments" will commence only when Schedules are approved by the Purchaser.

(e) Balance 10% of the rate quoted against the supply items of the Schedule will be released on issue of completion certificate by competent authority.

9. Recoveries from the Contractor

(a) All the recoveries for material supplied and services rendered by the Purchaser to the Contractor and other refund due from the Contractor shall unless otherwise specified, ordinarily be made by deductions from payments due to the Contractor covering the value of supply and erection in the progress payment for erection (see Para-10) and from payment on completion (see Para-12).

(b) The cost of materials supplied by the Purchaser under the second Para of 15(b) will be recovered in full by the Purchaser at the relevant price on Schedules or book rate or last purchase rate, which-ever is higher, to the extent of requirement of such materials for each sub-group from the payments to make under Para-10 and Para-12. The cost of materials supplied by the Purchaser under the sub-Para-15(b) will be recovered in full by the Purchaser at the appropriate prices quoted in Schedules or book rate or last purchase rate whichever is higher to the extent or requirement of such materials for each sub-group from the payments to be made under Para-12.

(c) The cost of materials if supplied under para-5 below will be recovered in the manner indicated in the sub-Para-(a) above.

(d) The material supplied under Para-15(b) and Para-16 shall be covered by the valid standing Indemnity Bond.

10. Progress Payment for Erection

(a) General: In case the Contract or if unable to complete any item of work in particular sub-section for reason accepted as adequate by the purchaser, progress payments will be made to the extent of work completed in the subsection. Supplementary progress payments will be made on respect of the left over works when the work is completed.

(b) Adjustment of on account payment: On completion of each items of work in Schedules on each agreed sub-section the Contractor shall be payments to the extent of the prices for supply and / or erection included in Schedules.

The progress payments towards erection will be made as follows:

(i) Foundations: (as per payments for foundation) -

(ii) Masts and Portals: On completion of erection of masts and portals of each location the contractor shall receive payment to the extent of 90% of the prices for erection of masts and portals.

(iii) Other items of supply and / or erection: on completion of erection of other items included in schedules, on each agreed subsection the contractor shall receive payments to the extent of 90% of the erection prices included in schedules. All the above payments shall be subject to any recoveries, which may be due under "Recoveries from the Contractor".

(iv) Progress payment for the erection of traction masts and portals/structures will be made only when traction masts

of structures are erected in the foundation blocks and muffing is completed. Progress payment for erected bracket assemblies will be made even though the register arm dropper and steady arm are not erected and final revision and adjustment are not done.

11. Excise Duty, Sales Tax, and GST: -CGST/IGST/UTGST/SGST as applicable on works contracts on supplies will be included in the rates quoted by the Contractor in the relevant Schedule. The Purchase is to be made from the registered dealers only for that particular Class of goods.

12. Payment of Completion: - On satisfactory completion of the work as certified by the Competent Authority and on issue of Completion Certificate, balance 10% of the price will be paid.

13. Final Settlement: -

(a) Performance Guarantee shall be released after physical completion of the work based on 'completion certificate' i.e.; after actual date of completion as certified by the competent authority stating that the contractor has completed the work in all respect satisfactorily. Security Deposit shall be released only after the expiry of guarantee/maintenance period and also issue of Final Acceptance Certificate. The Competent Authority shall normally be the Authority who is competent to sign the contract. If the Competent Authority is of the rank lower than JA Grade, than a JA Grade Officer (concerned with the work) should issue the certificate. The certificate, inter alia, should mention that the work has been completed in all respects and that all the contractual obligations have been fulfilled by the contractors and that there is no due from the contractor to Railways against the contract concerned. Before releasing the Security Deposit and Performance Guarantee, an unconditional and unequivocal no claim certificate should be submitted by the contractor concerned.

(b) Final Completion Certificate can only be issued and security deposit can be released after expiry of the guarantee/maintenance period and after setting right/ rectifying the defects and deficiencies, if any, pointed out by Sr.DEE.

14. Measurements:

(a) Payment for field work shall be made in accordance with approved designs and drawings and measured in relevant units except where provided for or otherwise. In case the dimensions of the work are more than those shown in approved design and drawings. The Contractor will not be entitled to any extra amount unless dimensions were increased on account of Physical impossibility in carrying out the work in accordance with approved drawing and the work is accepted without being rejected payment will be made as per work actually done.

(b) The measurement shall be made generally in accordance with standard engineering practice and in conformity with the Explanatory note for schedules.

15. Specified Railway Stores:

(a) The Purchaser shall supply railway materials to the contractor that are indicated in separate Chapter. The materials will be loaded, transported, unloaded & stacked by the contractor at the appropriate place in the presence of Purchaser's representative. The materials, which are to be supplied by the Purchaser to the contractor, will be made available as described above sufficiently in advance of the planned dates of erection. The contractor may return to the Purchaser any materials found defective or damaged on account of manufacturing defects. After completion of the works, any undamaged surplus materials left over with the contractor shall be returned to the Purchaser, for the purpose of final reconciliation.

(b) **Equipments, Components, Fittings and other Materials:** - The various materials which will be supplied to the contractor by the Purchaser are listed in separate Chapter. The materials will be loaded, transported, unloaded & stacked by the contractor at the appropriate place in the presence of Purchaser's representative with their own cost. The prices in Schedules shall be exclusive of the cost of supply of these items. For the purpose of final reconciliation, the procedure laid down as per requirement by the purchaser will be followed. If there are any shortage during final reconciliation, their cost will be recovered by the Purchaser from the Contractor at the Book rate or the last purchase rate or the prevailing market rate whichever is higher plus 5% on account of initial freight, 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 purchaser's source of supply and the Contractor's depot shall be to the Contractor's account.

Further, the Purchaser reserves the right to supply any equipments, components or materials, indigenous or imported, from his own resources in quantities which may fulfill the contract either in whole or in part up to a maximum of 10% of the total value of the contract free on rail or free on lorry up to the RE siding/contractor's depot. The same shall be accepted by the Contractor provided that the Purchaser shall at the time of issue of letter of Acceptance of the tender to the Contractor, indicate to the contractor the list of materials and quantities there of which will be supplied by the Purchaser free on rail or free on lorry up to the RE siding / contractor's depot sufficiently in advance of the planned dates of erection. Such materials shall be tested by the contractor at his own cost before use to the extent that the specifications require tests at site prior to installation but the contractor shall not be responsible for any defects in the material or component and the contractor may return to the Purchaser any materials which are found defective or damaged on account of manufacturing defects. Any damaged surplus materials left out with the contractor on completion of works should also be returned to the Purchaser for which necessary adjustments would be made. The cost of materials supplied by the Purchaser to the contractor in terms of the above sub-para would be recovered from the contractor as indicated in Para- 9 above.

(c) Should it be impossible for the Contractor to obtain any of the items included in schedules for any reason accepted as adequate by the Purchaser, the Purchaser, will arrange to supply them to the Contractor in accordance with Para-15(b). The cost of such supplies shall be recovered in accordance with Para-9.

(d) The various equipments, components and materials supplied by the Purchaser to the Contractor will be handed over to the Contractor, as far as possible in a stage ready for installation. The Purchaser shall supply to the Contractor within reasonable time (as far as possible within 1 months of issue of the letter of Acceptance of Tender) three copies each of the drawings of all items to be supplied by the Purchaser, wherever possible 3-copies each of the instructions booklets for various equipments will also be supplied by the Purchaser. The Contractor shall carefully follow the instructions mentioned in the various instruction booklets and those indicated by the Purchaser during the erection of equipments supplied by the purchaser and shall endeavor to bring such equipment into successful operation. In the event of the failure

of any item supplied by the Purchaser due to inherent defects/ deficiencies in the item, the Contractor shall not be responsible. Should the defects be repairable at site without requiring the dismantlement of the equipment the repair shall be done by the Contractor, free of cost, for which the necessary replacement parts will be supplied by the Purchaser, free of cost, to the Contractor, if the defect cannot be rectified at site and the replacement of the equipment is required, then the Purchaser shall replace the defective equipment, alternatively the Contractor may be required to dismantle the defective equipment for which he shall be paid separately at original schedules rates as applicable, if available or at rates to be mutually agreed to between the Purchaser and the Contractor prior to undertaking the work.

(e) In-case damage to the stores handed over to the Contractor is caused by faulty test or careless handling by the contractor as distinct from damaged due to inherent manufacturing defect, the cost of repairs to replacement of the damaged equipment shall be borne by the Contractor.

16. Other Railway Stores:- If any material other than those specified in Para-15 above, is supplied by the Purchaser either at the Contractor's request or suo-moto in order to prevent any possible delay in the execution of the works likely to occur due to the Contractor's inability to make adequate arrangements for supply thereof or otherwise, recovery will be made from Contractor's bill at the issue rate or market rate prevailing at the time of supply, 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, whichever is higher, freight between the Purchaser's source of supply and the Contractor's depot shall be to the Contractors account. If, however, the material required by the Contractor is not available in Purchaser's stock or the Purchaser decides not to supply 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 an excuse for delay in execution of works.

NOTE: If the Contractor runs short of materials and such materials are available in Purchaser's stock, the material may be supplied by the Purchaser in exceptional cases with the specific approval of the project in-charge /Sr. Divisional Electrical Engineer/TRD on loan to the Contractor, who will return these on receipt supplies or within two months whichever is earlier. The value of the loaned material would be computed by the Purchaser based on accepted rates and hire charges @18% per annum would be charged from the subsequent progress payments due to the contractor. In case the Contractor fails to return the material within the stipulated two months period from the date of loaning of material, the material loaned earlier would be treated as sold. The recovery of the value of the sold material would be on the basis of the issue rate or market rate prevailing at the time of supply or market rate at the end of two months period, whichever is higher, plus 5% freight charges and 2% incidental charges together with supervision charges at 12.5% of the total cost inclusive of material, freight and incidental charges or accepted rates whichever is higher. This recovery would be made from any bill submitted by the Contractor subsequently either 'On Account' or 'Progress payment'.

If prevailing market rates are not available, the recovery rates may be worked out by escalating the last purchase rate @10% escalation per annum. The last purchase rate shall, however, not be more than one year old.

17. Tools and Plants: - It should be clearly understood that it is entirely the Contractor's responsibility and liability to find, procure and use all machinery, tools and plants and their spare parts that are required for efficient and methodical execution of the work. Delay in procurement of such items due to their non-availability or import difficulties or any other cause whatsoever will not be taken as an excuse for not carrying out the work.

Witness:

1.

Signature of Tenderer(s)

Date:

2.

EASTERN RAILWAY
(Electrical Traction Distribution Department)
CHAPTER-VI: MATERIALS TO BE SUPPLIED BY THE PURCHASER

Sl. No.	Description of the Materials	Unit	Qty.
1.	Contact Wire	Km	As per Requirement
2.	Catenary Wire	Km	As Required
Apart from the above any other material the purchaser intends to supply from its own store.			

EASTERN RAILWAY
(Electrical Traction Distribution Department)
CHAPTER-VII: SPECIAL CONDITIONS AND SPECIFICATIONS OF CONTRACT FOR OHE & PSI WORKS.
PART-I

GENERAL SPECIFICATIONS

PARA NO.	SUBJECT.
SECTION –1: GENERAL.	
7.1.1	Introduction.
7.1.2	Climatic Data.
7.1.3	Wind pressure.
7.1.4	System particulars.
7.1.5	Rolling stock.
7.1.6	Power supply.
SECTION –2: OVERHEAD EQUIPMENT.	
7.1.7	Track.
7.1.8	Sectioning.
7.1.9	Pantographs.
7.1.10	Description of overhead equipment.
7.1.11	Types of equipments.
7.1.12	Plane of contact.
7.1.13	Tensions.
7.1.14	Clearances.
7.1.15	Height of contact wire.
7.1.16	Stagger.
7.1.17	Termination.
7.1.18	Type of structures.
7.1.19	Cantilever assembly.
7.1.20	Overlap.
7.1.21	Points and crossings.
7.1.22	Section insulators.
7.1.23	Isolators.
7.1.24	Return conductors.
7.1.25	Bridges and tunnels.
7.1.26	Bonding and earthing.
7.1.27	L. T. supply transformer stations.
7.1.28	Lightning Arrestors.
7.1.29	Ceramic beaded glass fiber type short neutral section assembly.

SECTION-3: SWITCHING STATIONS, BOOSTER TRANSFORMER STATIONS AND L. T. SUPPLY TRANSFORMER STATIONS.	
7.1.30	Description.
7.1.31	Scope of work.
7.1.32	Clearances.
7.1.33	Setting distance of gantries.
7.1.34	Datum level.
7.1.35	Mounting of equipment and bus bar arrangements.
7.1.36	Fencing and anti-climbing devices.
7.1.37	Numbering.
7.1.38	Interlocking arrangements.
7.1.39	Earthing arrangements.
7.1.40	Cable connections.

NOTE: A number of references (A&C Slips) to various drawings and specifications etc. of RDSO, CORE etc. are made throughout this chapter and in some cases the specifications/ drawings written in this chapter may have been superseded by the latest ones. So the tenderers may please note that only the latest specifications/ drawings, as to the date of publication of this tender, is applicable to this contract. By participating in this tender the tenderer will be deemed to have accepted this condition, otherwise the offer of the participant shall be summarily rejected.

SECTION – 1 GENERAL

7.1.1. INTRODUCTION

This part of Tender papers is divided into seven Chapters and contains general, technical and other specifications for design and erection of complete 25 KV A.C. 50 Hz single phase traction overhead equipment including regulated tramway type, switching stations, L.T. supply transformer stations complete with foundations, structures, return Conductors and 25 KV feeders, if any. This part also gives reference to technical specifications of materials and components, procedure for submission of designs and drawings of basic arrangements, components and fittings designs and other typical designs relating to overhead equipment including regulated tramway, switching stations and booster transformer stations. A list of the standard drawings is included in Annexure – I, Part – IV.

SCOPE OF WORK- The sections of the Indian Railways to be equipped with traction overhead equipment in accordance with this specification is detailed in part – III where in the particular features of the sections to be electrified and their special requirements are indicated.

7.1.2. CLIMATIC DATA:

The data pertaining to section are given in part – III.

7.1.3. WIND PRESSURE:

For design of layout of overhead equipment maximum span etc. wind pressure shall be taken as specified in part – III. Structures and foundations of overhead equipment and L.T. supply transformer stations shall be designed for the wind pressure indicated in part –III.

7.1.4. SYSTEM PARTICULARS:

The nominal voltage of the overhead equipment will be 25 KV A.C. 50 Hz, single phase. The supply voltage may, however, rise up to 27.5 KV. One terminal of the 25 KV System will be solidly earthed at the traction sub-station and also connected to the running rails. The other terminal will be connected to the overhead equipment through switchgear provided at the traction sub-station and at the feeding station.

7.1.5. ROLLING STOCK:

(a) **LOCOMOTIVES:** - The electric locomotives will generally be equipped with DC motors fed through rectifiers installed on the locomotives.

(b) **OVERSIZE CONSIGNMENTS** - The specific requirements in regard to movement of steam locomotives and oversize consignments for each section are indicated in part –III.

7.1.6. POWER SUPPLY

(a) **SUB-STATIONS** - Electric power will be supplied at 25 KV A.C. 50 Hz. single phase from traction sub-stations to feeding stations spaced 50 to 80 km apart along the track.

(b) **SWITCHING STATIONS** - Power supply will be controlled to the different sections of traction overhead equipment by switching stations. At these stations the switching will be effected by means of “Interrupters” which are single pole, non-automatic. All circuit breakers capable of repeatedly interrupting normal full load current. There are three types of switching stations:

- 1) Feeding stations, 2) Sectioning stations and 3) Sub-sectioning stations.

- (c) FEEDING STATIONS - Supply will be affected to the overhead equipment through switchgear installed at feeding stations. All feeding station will be located normally near the track.
- (d) SECTIONING STATIONS - The sub- stations cannot, as a rule be paralleled and consequently a neutral section of overhead equipment with insulated overlaps on either side will be provided approximately midway between the two consecutive feeding stations. Neutral section may also be provided at feeding stations. Facilities for bridging the neutral section between feeding stations will be provided at sectioning stations.
- (e) SUB-SECTIONING STATIONS - In order to facilitate maintenance of overhead equipment and to permit isolation of faulty sections and expeditious restoration of power supply in healthy sections, sub-sections with insulated overlaps will be provided between the feeding stations and the sectioning stations.

SECTION – 2 OVERHEAD EQUIPMENT

7.1.7. TRACK

- (a) GAUGE AND TRACK CENTERS - The track gauge is 1676mm (5ft.6inch.). In multiple track zones, the normal distance between track centers varies between 4270mm (14ft.) and 4420mm (14ft.6inch.).
- (b) SPEED - The overhead equipment which shall be of the simple poly-graphical type and pre-sag should be designed for a maximum speed of 160Km/h (Approx.100 miles/h) if regulated and for a maximum speed 80 Km/h (Apprx.50 miles/h) if unregulated, unless otherwise specified in Part-III for any particular section.
- (c) CURVES - The minimum radius permissible is 175m (573 ft.) i.e. a 10 degree curve. Inside station limits, the curvature at a 1 in 8.5 turnout is 8 degree i.e. of radius 219m (716ft.).
- (d) SUPER ELEVATION - The maximum super elevation is 165mm (6.5inch.). On curves, the minimum setting of structures shall be decided on the basis of maximum super elevation (See para 2.3.10). For purposes of design and erection of overhead equipment, the actual super elevation as existing at site or as indicated to the contractor shall be adopted.
- (e) LOW JOINTS - For low or loosely packed rail joints a difference of 25 mm (1inch.) in the level of opposite rails may be taken as the basis for estimating the displacement of the pantograph with respect to its normal position.
- (f) FORMATION - Generally sections with more than one track have common formation. In certain lengths, however the formation for different tracks may be separate (see relevant drawing listed in Annexure-1, part-IV).
- (g) DISPLACEMENT - The general design of overhead equipment shall permit a displacement of +100mm. or – 100mm. of tracks without difficulty and any adjustment of the overhead equipment on this account shall be of such a nature as could be done conveniently without changing any component of the overhead equipment.

7.1.8. SECTIONING

- (a) INSULATED OVERLAPS - Insulated overlaps are provided for facility of isolation. Some of the overlaps may be provided with manually operated isolators switches.
- (b) YARD SUPPLY - The sectioning diagram/s also indicate the tracks in stations, yards and siding whose equipments is electrically independent from those of the other tracks. The overhead equipment in yards and sidings is to be fed through isolator switch or interrupter in accordance with arrangement indicated in the sectioning diagram/s.
- (c) SECTION INSULATORS - Section insulators shall be provided as indicated in the sectioning diagrams, or crossover between main tracks and to isolate sections of overhead equipment in yards and sidings. Section insulators may also be used to form neutral sections at special locations as indicated in the approved drawings.
- (d) Deleted.
- (e) FEEDERS & RETURN FEEDERS 25 KV ALONG TRACK FEEDERS - 25 KV along track feeders may connect sections of overhead equipment to a switching station or an isolator switch or gantry. Such feeders will be run usually on traction structures and sometimes on independent masts. A single 'SPIDER' conductor shall be used for such feeders.
- (f) Deleted.
- (g) SCHEMATIC ARRANGEMENTS - The different arrangements of feeders, return feeders, 25 KV along track feeders and return conductors are shown in the drawing listed in Annexure –I, part-IV.
- (h) SECTIONING DIAGRAM - The provisional sectioning diagram/s of the sections to be electrified is/are included in part – III.

7.1.9. PANTOGRAPHS

- (a) The outline of the pantograph, its dimensions and its current collecting area are shown in a drawing listed in Annexure –I, Part-IV.
- (b) NUMBER AND PRESSURE - Each EMU will be equipped with 3 pantographs. The working pressure of the pantograph on the contact wire may vary between 5 and 15 kg/m².
- (c) SPACING IN MULTIPLE HEADED TRAINS - The distance between adjacent running pantographs in the case of multiple heading would normally be 20 meter. This distance may, however, be reduced to 7.9 meter between two pantographs in very exceptional cases.
- (d) INSULATION CLEARANCE - The electrical clearances for the pantograph on tangent tracks and on curves for design and erection of overhead equipment shall be based on the schedule of Dimensions 1676 mm. Gauge, 1939 printed in 1973 in metric units, issued by the Ministry of Railways (Railway Board), Government of India and any other orders that may be issued by the Railway Board from time to time.

7.1.10. OVERHEAD EQUIPMENT

- (a) BRIEF DESCRIPTION - Essentially the traction overhead equipment shall consist of a standard catenary wire from which a grooved contact wire is suitably suspended by means of droppers. In order to cater for a speed of 160 kmph the contact wire is given a pre-sag of about 100mm for 72 m span and reduced suitably for other spans.
- (i) **Tramway type Overhead Equipment:** Regulated Equipment — in tramway type overhead equipment only a contact wire is provided without a continuous catenary or droppers and is auto-tensioned at the anchor by weight. The

contact wire is supported by swiveling type of brackets on individual masts as indicated in Drg. no. ETI/OHE/G/04204. Moreover the bridle wire is used for more supporting the contact wire, generally, the principles applicable to normal overhead equipment are also applicable to regulated tramway equipment except as specified below:

- A. Span- The maximum span is restricted to 63 m. The general arrangement is shown in Drg. No. ETI/OHE/G/04203.
- B. Section Insulators- Where a section insulator assembly is to be provided, the provision of a structure to support the assembly is obligatory. The arrangement is shown in Drg. no. ETI/OHE/G/04207 Sheet 1&2.
- C. The arrangement of tramway equipment at anti-creep and points and crossings are shown in Drg. No. ETI/OHE/G/04205 and 04208 respectively.
- (ii) **Unregulated equipment** - The general arrangement of tramway equipment to be adopted for head span and cantilever type construction is shown in Drg. No. ETI/OHE/G/04101. The principles applicable to normal OHE are applicable to this type of unregulated equipment except as specified below:
 - A. The maximum span is restricted to 30 m. In station areas, where this type runs side by side with conventional equipment with contact and catenary wires, the maximum span may be increase 31.5 m.
 - B. Where a section insulator is to be provided the provision of a structure becomes obligatory.
 - (b) CATENARY - The catenary wire shall be either of cadmium copper 19/2.10mm, 65mm².
 - (c) CONTACT WIRE - The contact wire shall be grooved and made of hard drawn copper having 107 sq.mm. cross section (continuous cost)
 - (d) DROPPERS - Droppers shall be made of hard drawn round copper wire, approximately 5 mm dia. Droppers shall be spaced not more than 9m. apart (see Annexure-I, Part-IV).
 - (e) ENCUMBRANCE - As a general rule, the nominal "encumbrance" i.e. the center distance between the catenary and the contact wire at the support shall be 1.4 m. Deviation from this figure will be permitted in special cases (e.g. spans near over-bridges, structures with more than one cantilever etc.)
 - (f) JUMPERS - All jumpers connected to OHE conductors shall be of copper only. The in-span jumpers' potential equalizer jumpers at insulated overlaps and neutral section shall be of 50 mm sq. nominal, 19/1.8 mm size. Flexible jumpers of nominal section 105sq mm. 19/7/1.06 mm size shall be used at overlaps, turnouts, crossings etc.
 - (g) BRIDLE WIRE - As per RDSO specification.
 - (h) ANTI THEFT JUMPER - Anti theft jumper of 50 sq mm. nominal, 19/1.8mm in size shall be used in out of run wire of conventional OHE and copper cadmium anti-creep wire as an anti-theft measure.

7.1.11. TYPE OF EQUIPMENT

The overhead equipment used shall normally be either of the regulated or unregulated type.

- (a) REGULATED - In the regulated type of overhead equipment, the tension of both the catenary and the contact wires shall be maintained at a constant value at all temperatures by means of automatic tensioning devices desired to take up the variation in the length of overhead equipment due to temperature variation.
An anti-creep shall be provided at a point approximately midway between two tensioning devices and not more than 750 meters from any one of them.

The general arrangement of an anti-creep is shown in a drawing listed in Annexure-I. The arrangement shall generally consist of the galvanized steel wire anchored on the masts adjacent to the anti-creep central mast in accordance with the relevant drawing listed in Annexure-I Part – IV. Alternatively, the arrangement may consist of anchoring the catenary on either side of the boom of a portal with the contact wire running through and providing a jumper connection as per general arrangement shown in typical drawing listed in Annexure-I, Part-IV. The Purchaser shall indicate the type of anti-creeps to be adopted in the pegging plans.

- (b) UNREGULATED - The unregulated type of overhead equipment has no provision for automatic regulation of tension of either the catenary or the contact wire.

(c) **Tramway Type equipment Regulated contact wire only--**

In Tramway type equipment regulated, only a contact wire is provided without a continuous catenary or droppers.

The tension in the contact wire is regulated. At support, bridle wire is used for supporting the contact wire.

- (d) The section in which different types of equipment should be provided is indicated in part – III.

7.1.12. PLANE OF CONTACT

- (a) REGULATED - The regulated overhead equipment shall be so erected that the contact wire has the designed sag.
- (b) Unregulated
In the case of unregulated equipment the contact wire shall have no sag at an ambient temperature of 35° C.
- (c) Tramway Type
In Tramway type equipment, the contact wire will have its own natural sag when erected.
- (d) DROPPER - Dropper charts to be used for standard span of regulated and unregulated overhead equipment would be supplied by the Purchaser. Dropper for non-standard spans, span with section insulators and special locations shall be calculated by the Contractor in accordance with the method indicated by the Purchaser and submitted to the Purchaser for approval.

7.1.13. TENSIONS:

- (a) REGULATED - In regulated equipment, the tension in the catenary and in the contact wire shall be 1,000 kgf. in each conductor.
- (b) UNREGULATED - In unregulated equipment the tension in the catenary and in the contact wire at 35 degree C without wind shall be 1,000 kgf. in each conductor.
- (c) Tramway Type - In regulated type Tramway equipment, the tension shall be 1250 Kgf.

7.1.14. CLEARANCE:

- (a) GENERAL - The distance between live parts and parts at earth potential (for parts likely to be earthed) shall be as large as possible. In all cases the values given in schedule of Dimensions, 1939. 1676 mm gauge 1939 printed in metric

units, 1973 or its latest revision shall be observed along with any other supplementary rules that may be issued by the Railway Board and advised to the Contractor.

(b) OVER BRIDGES & TUNNELS - The clearance which are to be made available at over bridges, signal, gantries and other over line structures shall be based on the above rules.

(c) PLATFORM SHEDS AND OTHER STRUCTURES - In the course of checking the overhead equipment pegging plans, the Contractor shall prepare a list of platform sheds and other structures in the vicinity of track to be wired. The clearances to these structures shall be in accordance with those shown in the relevant drawings listed in Annexure-I, Part-IV. If these clearances are not available, the Contractor shall advise the Purchaser in time to enable the later to take up necessary modifications.

7.1.15. HEIGHT OF CONTACT WIRE:

(a) Normally, the minimum height of contact wire above rail level shall be 5.50m at mid span under the worst temperature and conditions. This height may be reduced under bridges and in tunnels to the extent permitted by the purchaser. The minimum height shall be 4.80m. In electric locomotive sheds and over electric locomotive inspection pits, the minimum height shall be 5.80m. At level-crossing, the minimum height shall be 5.50m. Any infringement restricting minimum height at level crossings will be removed by the Purchaser.

(b) GRADIENT OF CONTACT WIRE - Any change in the height of the contact wire shall be made gradually and the maximum slope shall not normally exceed 3mm per meter on main lines and 10mm per meter on sidings. The end span of any section with a gradient of contact wire shall have a slope not greater than half the main slope.

7.1.16. STAGGER:

To ensure uniform wear of contact strips of pantographs, the contact wire shall normally be staggered in a manner, which will be indicated by the Purchaser.

7.1.17. TERMINATION:

(a) GENERAL - Traction overhead lines shall be terminated using components specified to Chapter 2.4. The termination may be carried forward by one or two spans if anchoring facilities so require.

(b) Terminating wires shall be electrically connected to the conductors with which they are likely to approach closely or come into contact under normal conditions.

(c) SUPPLEMENTARY INSULATION - If a terminating wire passes a live conductor to which it should not be connected, i.e. in a different elementary section, the portion of the terminating wire close to the live conductor shall be separated by means of insulators. The insulators swept shall be located in such a manner as to clear the zone of the pantograph under the worst conditions and as far away as is possible from live conductors.

7.1.18. TYPES OF STRUCTURES:

(a) The overhead equipment of main tracks in case of multiple tracks section shall be electrically and mechanically independent of the one another by provision of independent cantilever masts to the maximum extent possible (see Annexure-I for general arrangement drawings).

(b) HEADSPANS - Head span construction may be adopted with unregulated overhead equipment. A single head span shall not normally cover more than six tracks (See Annexure – I for general arrangement drawings of head span carrying complete overhead equipment).

(c) PORTALS - In cases where the tracks in a multiple track section do not permit location of independent masts and where automatic tensioning of overhead equipment is required, rigid portals may be used. Also in the vicinity of points and crossings, portals may be used, provided it is not possible to have prescribed setting with independent cantilever masts. These structures shall be equipped with standard bracket assemblies for supporting individual equipment of different tracks. The use of such structures is to be avoided as far as possible and for this purpose the Purchaser will arrange to slew the tracks, if practicable. A single portal shall normally not cover more than five tracks (See also 2.3.7). Portal structures shall also be employed at anti-creep central locations and such portals will have necessary guy arrangement.

(d) FOUNDATIONS - Foundations for all structures shall be designed in an economical manner by following the methods of design indicated by the Purchaser and observing the schedule furnished by him (See part -II, Chapter – II).

7.1.19. CANTILEVER ASSEMBLY

The bracket assembly carrying overhead equipment shall be of the swiveling type. The assembly shall be such that the process adopted will permit easy adjustment of the whole equipment under erection to cater for displacement of the track during maintenance up to the extent of 100mm on either side except as otherwise relaxed by the Purchaser (See Para 7.1.7 (g)). In special instructions, Pull-off arrangements may be used with the approval of the Purchaser (See Annexure – I) for drawings of the bracket assembly and components.

7.1.20. OVERLAPS:

Overlaps shall be provided at suitable intervals such that neither the tension length exceeds 1,500M. nor the fixed anchor to balance weight anchor exceed 750 meters.

(a) GENERAL - The two contact wires at the overlapping zone should be parallel to each other in a plane parallel to the track and run separated from each other (See Annexure – I for general arrangement drawings).

(b) INSULATED - In the case of insulated overlaps, the separation between the two contact and the two catenary wires shall be 0.5M. (See Annexure – I for general arrangement drawings).

7.1.21. POINTS & CROSSINGS:

Arrangements of overhead equipment of different types e.g. regulated, unregulated or tramway at points and crossings shall be in accordance with the standard drawings listed in Annexure – I.

7.1.22. SECTION INSULATORS (See also Para 7.1.8(c)):

(a) BRIEF DESCRIPTION - The section insulators shall provide effective electrical isolation of two elementary electrical section of overhead equipment and permit smooth passage of the pantograph in either direction at all speeds up to

70 KM/H. The outline of a section insulator is shown in a drawing listed in Annexure – I. The section insulators shall be of the single wire type.

(b) **SIZE AND WEIGHT** - The section insulator assembly shall be such that it should be possible to install the insulator in the overhead equipment provided the axial distance between the catenary and the contact wire with section insulator in position is not less than 450 mm. The weight of the complete assembly shall not be more than 45 kg. for single wire type excluding the weight of the catenary insulator and the catenary ending clamps.

7.1.23. ISOLATORS:

Manually operated isolator single or double pole type, with or without earth contact assembly may be required to bridge certain section insulators or insulated overlaps (See para-7.1.8). In certain large yards, isolators controlling different lines may be grouped together on a gantry (See Annexure – I).

7.1.24. RETURN CONDUCTORS – Deleted

7.1.25. BRIDGES AND TUNNELS:

(a) **OVER BRIDGES** - The complete overhead equipment (i.e. both the catenary and the contact wires) shall normally pass under over-line structures. Additional intermediate suspension points shall be provided, if necessary, to ensure the specified minimum height of contact wire being maintained. In special cases catenary may be anchored on either side of the over-line structure and the contact wire carried underneath.

(b) **TUNNELS AND CUTTINGS** - The arrangements proposed for the equipment in tunnels and cuttings shall take into account the special features of each location and shall be in accordance with general design specified in part – II.

(c) **SAFETY SCREENS** - On over-bridges, metallic protective screens shall be provided in order to prevent any person from coming into contact with the live overhead equipment. Such screens shall be properly earthed.

(d) **HEIGHT GAUGES AT LEVEL CROSSINGS** - Height gauges will be provided at all level crossings in accordance with the general arrangement drawings listed in Annexure – I.

7.1.26. BONDING AND EARTHING:

(a) Bonding and earthing should be done in accordance with the code for bonding and earthing.

(b) **LONGITUDINAL AND TRANSVERSE BONDING** - Longitudinal and transverse bonding of tracks, bonding of structures including traction structures in rails and associated earths shall be provided in accordance with the above code.

(c) **TRACTION STRUCTURE BONDING** - Every traction mast or structure shall be bonded to a non-track circuited rail unless if it is provided with continuous earth wire or it is individually earthed by means of an earthing station. For general arrangement drawings see Annexure – I.

(d) Double rail track circuit

When track circuits are provided on both rails, traction masts/structures shall not be bonded to rails but shall be provided with an earth wire made of steel reinforced aluminum conductor consisting of 6 strands of aluminum and one strand of steel each of 4.09 mm dia.(RACCOON) (conforming to IS : 398 PT.II 1976). The earth wire shall be run on traction masts or structures. They shall be divided into different electrical sections not exceeding 1000 m. long. The earth wire in each such section shall be connected at two traction structures, situated at a distance not exceeding 250 m on either side of the mid-point of the section to two 10 ohm, earths which will be provided by the Contractor. Sections on which earth wire is required to be provided are indicated in Part-III.

7.1.27. L.T. SUPPLY TRANSFORMER STATIONS - (See Para 9.1.30)

7.1.28. LIGHTNING ARRESTORS:

No Lightning Arrestors will be provided on the traction overhead equipment.

7.1.29. CERAMIC BEADED GLASS FIBER TYPE SHORT NEUTRAL SECTION ASSEMBLY:

Ceramic beaded glass fiber type insulator assembly shall consist of resin bonded fiber glass (or equivalent) insulators covered with either Teflon (or equivalent) or ceramic beaded with PTFE spacers (or similar) adequately dimensioned and rated for the application. The insulators shall have suitable end fitting for connections to the contact wire through end fitting. For smooth passage of pantograph without any shock from contact wire to insulator and vice-versa, suitable runners preferably of stainless steel shall be provided. The central position of the assembly along with arc trap shall be solidly earthed as the later with earthing clamp is provided to trap any arc current caused by break of contact between pantograph and live contact wire when it passes from contact wire to insulator. The distance between arc trap and nearest line position shall be adjustable up to a max. of 320mm suitable means of suspension of the components of the assembly from the catenary conductor shall be provided. The complete assembly shall be as light as possible and so constructed that adjustment of components can easily be made during erection of maintenance and also for ensuring smooth passage of pantograph.

In the catenary conductor, resin bonded fiberglass insulators with suitable covering shall be provided. The insulators shall have suitable end fittings for connections to catenary wire through end fittings. The central portion shall be solidly earthed.

The neutral section assembly shall be suitable for erection symmetrically on either side of the cantilever bracket support with regulated or unregulated conventional / composite OHE where one point each for suspension of catenary conductor & contact wire is available as also show in GA drawing under Annexure – I.

SECTION – 3

L.T. SUPPLY TRANSFORMER STATIONS

7.1.30. DESCRIPTION:

L.T. supply transformer stations - L.T. supply transformer stations shall essentially comprise of a mast mounted transformer connected to the traction overhead equipment through dropout fuse switches. The 240 V side shall be connected to a distribution board located at the remote control cubicle by means of 2 core 25 sq.mm. aluminium cable (see

2.4.23(a)). The general arrangement drawing for L.T. supply transformer stations for single double and multi-track section is included in Annexure – I.

7.1.31. SCOPE OF WORK:

The work involved for supply and erection of the LT Transformer Station.

7.1.32. CLEARANCES:

No part of the installations, which is live at 25KV, shall be erected at a height less than 3m from the datum level. Clearance between any part live at 25 KV and any part at earth potential (or part likely to be earthed) shall not normally be less than 500 mm. This clearance may be reduced under special circumstances but in no case static clearance shall be less than 320mm and any dynamic vertical and horizontal clearances 270mm and 220mm respectively. The clearance between any part live at 3 KV and any part at earth potential (or part likely to be earthed) shall be not less than 150mm under static condition and 70mm under dynamic conditions.

7.1.33. SETTING OF GANTRIES:

The gantries are normally aligned parallel to the track. The minimum distance of the face of the gantry from the center line of the nearest track is referred to as the 'setting' of the gantry. The setting shall normally be 3.5m. Setting of the individual gantries of different stations will be furnished by the Purchaser.

7.1.34. DATUM LEVEL:

The datum level will be the finished level of the gantry mast foundation. All vertical dimensions shall be stated with respect to this datum level. Datum levels of individual stations will be indicated on the location and connection diagrams.

7.1.35. MOUNTING OF EQUIPMENT AND BUSBAR ARRANGEMENT:

(a) The interrupters and isolators shall be mounted in such a way that these can be manually operated conveniently by a person standing on the ground. The indicators showing the 'OPEN' or 'CLOSED' position of the equipment shall be so arranged as to be visible from out-side the fencing enclosure on the side of the main gantry.

(b) The bus-bar arrangement for typical switching stations is schematically indicated in a drawing included in Annexure – I.

7.1.36. FENCING & ANTICLIMBING DEVICES:

Every switching station together with its associated control cubicle shall be enclosed by fencing except at feeding stations that are located within the traction sub-station premises. The fencing shall have an anti-climbing device also at top.

At booster transformer and L.T. supply transformer stations, suitable anti-climbing devices consisting of galvanized steel clamp fixtures shall be mounted on each mast. The device shall be fitted below the transformer supporting beam or steel work. The general arrangement drawings indicating the fencing and anti-climbing devices, are indicated in Annexure – I.

7.1.37. NUMBERING:

Each booster transformer, interrupter, potential transformer, L.T. supply transformer and isolator shall carry an enameled number plate of approved design (see Annexure –I). The Purchaser will furnish the actual numbers to be allocated to the various equipments as per specification No. ETI/OHE/53 (6/88) with addendum and corrigendum slip No. 1 of (12/88), 2 of (8/89), 3 of (6/90) and 4 of (8/92).

7.1.38. INTERLOCKING ARRANGEMENTS:

Interlock shall be provided, between each interrupter and its associated double pole isolator, to prevent operation of the Isolator from the open to the closed position or vice-versa, unless the interrupter is locked in the open position and to prevent operation of interrupter either manually or by remote control unless the isolator is lock in the open or closed position. The interlocking device shall consist of a lock combined with an electrical contact to make or break the remote control circuit on the operating mechanism of the interrupter and a lock on the isolator operating mechanism and interlock key for the two locks.

7.1.39. EARTHING ARRANGEMENTS:

Earthing of switching stations, booster transformer stations and L.T. transformer stations shall generally comply with the code of practice for earthing IS: 3043-1987 except where otherwise specified below:

Earthing System:

(i) Switching Stations - Each switching station two separate and independent earth pits shall be provided, one for earthing the HT equipment and other for earthing the L.T. equipment. The general arrangement earthing connections at a typical switching station is shown in relevant drawing included in Annexure – I.

(ii) Earth Circuits - Each earth circuit shall take the form of a closed ring and shall be provided with a minimum of two earth electrodes. Each earth electrode shall consist of galvanized iron pipe, 40mm nominal bore at least 3.1 m long provided with a spike at one end and welded lug suitable for taking minimum size of 40 x 6 mm mild steel flat, directly at the other. The pipe shall be embedded into the ground. The earth electrodes of the HT and the LT earth circuits shall be located as far apart as it is possible. The drawing of typical earth electrode is included in Annexure – I.

(iii) HT earth circuit - The resistance to earth of the HT earth circuit shall be less than 2.0 ohms. If this value cannot be achieved with a maximum of four separate but inter connected earth electrodes then the additional earth electrodes shall have the surrounding earth treated with charcoal and salt filling. All masts, structures, fencing uprights and equipment pedestals shall be connected by the two separate and distinct connections to the closed loop of the earth bus. Earth bus and connections to it shall be of M.S. flats of minimum size 40 mm x 6 mm. Potential transformers and lightning arrestors shall be bonded to masts / structures by 25mm x 3 mm copper strips.

(iv) LT earth circuits - The LT earth circuit shall also comprise of a minimum of two inter-connected earth electrodes as described in Para (iii) above and the total resistance to earth of the earth circuit shall be less than 2 ohms. This circuit will not form a part of this contract at those feeding stations that are located within the traction sub-station premises. All low tension equipment control boards, one terminal of the secondary of the potential and LT supply transformers, metal

casing of battery chargers, earth connections of 8 SWG galvanized iron wire to the LT earth bus. The section of the LT earth bus shall be the same as that of the HT earth circuit.

(v) **Earth Strips** - The earth bus and connections of HT earth circuit shall be painted with two coats of red oxide zinc chromate primer to IS 2074 : 1992 with a minimum thickness of 40 microns and with two finishing coats of bitumen 85/25 (blown grade to IS:702 :1988) with 20% mica to a thickness of about 375 microns either by hot application or by brushing a solution of it with suitable viscosity to obtain the thickness in minimum number of coats and buried at a depth of 300 mm below the ground level.

The earth bus of the LT earth circuit shall run along the wall fixed on wooden gutties at a height of 300 mm from the floors. The connections to equipment will run from the bus along the wall in recesses in the floor. All recesses will be covered with cement plaster after finishing the work. The connection of earth strips to each other shall be made by 10mm dia. Steel rivets or by welding. The connections to the various items of equipment and structures or fencing posts shall be made with G.I. bolts. The earth connection to the structural members shall be made at a height of about 150 mm. above the foundation.

(vi) **Inter-connection** - The HT and LT earthing systems shall be interconnected. In addition, at all switching stations, the HT earth shall be connected by the two independent mild steel flats each of minimum size 40 mm x 6 mm painted with two coats of red oxide zinc chromate primer to IS: 2074:1992 and finished with two coats of bitumen 85/25 blown grade as described above, to the non-track circuited rail in a single-rail-track-circuited section and to the neutral point of an impedance bond provided by the purchaser where double-rail-track circuiting is employed so as to limit high potential gradients developing in the vicinity of switching stations in the event of fault.

(vii) **L.T. supply Transformer Stations** - The earthing arrangement of a pole mounted LT supply transformer station shall comprise inter connected earth electrode/electrodes having a resistance not exceeding 10 ohms. If this value cannot be achieved with two electrodes, additional electrodes shall have surrounding earth treated with charcoal and salt filling. The Transformer and lightning arrestor shall be connected to the supporting steel structure by means of 2 independent connections at the top by means of 25 mm x 3 mm copper strip. At the bottom, the steel structures shall be connected to the inter-connected earth electrodes and to the nearest traction rail by means of two independent connections of mild steel flats having a minimum size of 40 mm x 6 mm. In addition, the earth electrode should be connected to the traction rail by means of a minimum size of 40 mm x 6 mm mild steel flat. The mild steel flat shall be painted with two coats of red oxide zinc chromate primer to IS: 2074:1992 with a minimum thickness of 40 microns and with two finishing coats of bitumen 85/25 (blown grade to IS: 702:1988) with 20% mica to a thickness of about 375 microns either by hot application or by brushing a solution of it with suitable viscosity to obtain the thickness in minimum number of coats.

7.1.40. CABLE CONNECTION:

(a) All PVC cables provided out-door shall be either laid in the trenches or neatly clamped to the structures as approved by the Purchaser.

(b) **Termination of cables** - The cable shall be terminated neatly and all the Crore arranged and dressed properly. Suitable indexed terminal strips or ferrules shall be provided at all terminals to facilitate maintenance.

PART – II FOUNDATIONS

<u>PARA NO.</u>	<u>SUBJECT</u>
7.2.1	SCOPE.
7.2.2	DESIGN OF FOUNDATION.
7.2.3	BEARING PRESSURE.
7.2.4	CONCRETE.
7.2.5	SIZE AND GRADING OF AGGREGATES.
7.2.6	SAND CORED FOUNDATIONS.
7.2.7	SINKING OF CONCRETE SHELLS.
7.2.8	TYPES OF FOUNDATION IN BLACK COTTON SOIL
7.2.9	CEMENT.

7.2.1. SCOPE:

This chapter deals with the design of foundations and anchor blocks for traction structures carrying overhead equipment (including those on bridges), structures at switching stations and booster stations and other concrete work. It also deals with the specification for concrete.

7.2.2. DESIGN OF FOUNDATION:

(a) **SOIL PRESSURE** - For design of foundations for traction structures carrying overhead equipment, the Contractor shall determine the type and allowable bearing pressure of soil at suitable intervals and adopt the type and size of foundations, suitable for particular locations with the help of the approved employment schedules. In cases of particularly weak soil, the bearing pressure may have to be determined for each location where so advised by the Purchaser. Soil bearing pressure, using SPT (falling weight equipment) should be determined generally for every 5 kilometer interval or less wherever change of soil is encountered. In general IS code of practice (IS 6403:1981) should be followed. In addition, at every 250 m the soil bearing pressure should be determined by dial gauge type penetrometers. Dial gauge type penetrometers shall also be made available by the Contractor at each foundation site so as to facilitate cross check at each individual location.

For design of foundation for masts and gantries at switching stations and booster stations, the Contractor shall determine the type and allowable bearing pressure of soil at the locations of such stations and shall prepare designs for the foundations suitable for each location to suit the bearing pressure of the soil in consultation with the Purchaser.

(b) **STRUCTURES CARRYING OVER-HEAD EQUIPMENT** - Foundations for traction structures carrying overhead equipment shall be either of the side bearing, side gravity or new pure gravity type according to their location, formation of the sub-grade and bearing pressure of the soil. In new filled up soil or cinder formation, pure gravity sand – filled core foundations, or foundations with cast-in-site reinforced concrete piles, or cantilever types foundation with counter-weights or guyed foundations may be adopted.

(c) **ON BRIDGE PIERS** - Complete design of foundations for traction structure on bridges to suit different locations and local conditions will be furnished by the Purchaser.

(d) **MASTS & FABRICATED STRUCTURES AT SWITCHING STATIONS** - Foundations for the masts of gantries at switching stations shall be of the pure gravity type, the base of which shall rest on consolidated soil.

(e) **FENCING POSTS** - Foundation for fencing posts shall rest on consolidated soil if the depth of unconsolidated soil is less than 1.5 m below the datum level and shall be rectangular parallel piped in shape. If the depth of unconsolidated soil is more than 1.5 m the foundation block shall rest on reinforced concrete piles cast-in-site or reinforced concrete foundation may be adopted as desired by the Purchaser.

(f) **TYPICAL DESIGN** - Typical design and drawings of side bearing and new pure gravity and side gravity type foundations are included in the drawings listed in Annexure – I. Employment schedules for standard foundations for traction structures for various locations and types are also included in the drawings listed in Annexure – I, Part IV.

(g) **SPECIAL FOUNDATIONS** - In the case of foundations at locations not covered by the employment schedules furnished by the Purchaser, the Contractor shall prepare special designs and furnish full design calculations justifying the choice of the type of foundations for such locations. In black cotton soil especially pile foundations of under reamed type as per RDSO's standard designs (Ref. Drawings No. ETI/C/0062 MOD. "A") or any other approved design may have to be cast at limited locations for trial purpose. The tenderer may furnish the technical details of alternative design, construction methods proposed to be adopted and their previous background/experience if any. The decision of the Purchaser with regard to feasibility and suitability of adoption of the alternative design for each type of foundation will be final.

(h) **EQUIPMENT PEDESTALS** - Pedestals for interrupters and L.T. supply transformers where required, shall be of mass concrete with the base resting on consolidated soil.

(j) **CABLE TRENCHES** - The cable trench shall rest on original ground if the depth of unconsolidated soil is less than 0.5 m. If the depth of the unconsolidated soil is more than 0.5 m., the cable trench shall be made of reinforced cement concrete of approved design supported at suitable intervals on concrete pillars.

7.2.3. BEARING PRESSURE:

(a) **GUIDING INFORMATION** - Subject to Para 7.2.2(a) above, the following allowable bearing pressures may generally be expected for various kinds of soil. The information is given for general guidance only.

- | | | |
|-------|--|-----------------|
| (i) | Average good soil in banks and cutting | 11,000 kg/sqm. |
| (ii) | Moorum soil in cutting | 22,000 kg./sqm. |
| (iii) | New banks & bad soils in banks and cutting | 5,500 kg/sqm. |

(iv) Black cotton soil-pure gravity foundation shall normally be adopted. However, under reamed pile foundations may be adopted at the option of the Purchaser in limited locations for trial purpose. In the case of dry black cotton soil, the soil should be subjected to a bearing pressure as close as possible but not exceeding 16,500 kg/sqm. the depths of the foundation block being not less than 2.8m. In the case of wet black cotton soil, the soil should be subjected to a bearing pressure as close as possible but not exceeding 8,000 kg/sqm.

In the case of hard rock, a hole should be blasted in the rock, or by means of any other drilling and pneumatic method and the mast sealed into it with concrete.

7.2.4. CONCRETE:

Concrete for foundations shall be nominal mix of grade M.15 obtained by mixing cement, coarse aggregate, fine aggregate and water in accordance with proportions given vide Table 3 of IS.456:2000 reproduced below. For grouting, mulling, embedding of structures in foundations and for cable trenches at switching stations, nominal mix concrete M.15 obtained by mixing materials in proportions as indicated in Table – 3 of IS.456:2000 shall be used. Volume batching may be adopted vide clause 7.2.2. of IS.456:2000 reproduced below:

IS.456:1978

TABLE-3: PROPORTIONS FOR NOMINAL MIX CONCRETE

(Clause 8.3, 8.3.1 and 8.3.2)			
Grade of concrete	Total quantity of dry aggregate by mass per 50 kg. of cement, to be taken as the sum of the individual masses of the fine and coarse aggregates max.	Proportion of fine aggregate per 50 kg. (by mass).	Quantity of water max.

1

2

3

4

KG.

Litres

M5	800	Generally 1:2	60
M7.5	625	but subject to	45
M10	480	an upper limit	34
M15	350	of 1:1.5 and	32
M20	250	a lower limit of 1:2.5	30

NOTE: The proportions of the fine to coarse aggregates should be adjusted from upper limit to lower limit progressively as the grading of the fine aggregates becomes finer and the maximum size of coarse aggregate becomes larger. Graded coarse aggregate shall be used.

Example:

For an average grading of the fine aggregate (that is zone II of Table 4 of IS : 383-1970*) the proportions shall be 1: 1.5, and 1:2 and 1:2.5 for maximum size of aggregate 10mm, 20 mm and 40 mm respectively.

* Specification for coarse and fine aggregates from natural sources for concrete (second revision).

"In case uniformity in the materials used for concrete making has been established over a period of time, the proportioning may be done by volume batching, provided periodic checks are made on mass/volume relationships of the materials, where weigh-batching is not practicable, the quantities of fine and coarse aggregate (not cement) may be determined by volume. If the fine aggregate is moist and volume batching is adopted, allowance shall be made for bulking in accordance with IS: 2386 (Part – III) – 1963". *

* Method of test for aggregates for concrete part – III specific gravity, density, voids, absorption and bulking.

In judging the acceptability of the materials, quality of concrete and the method of work, the Purchaser will generally observe the provisions of the "Indian Standard code of Practice for Plain and Reinforced Concrete, IS.456:2000. The crushing strength of concrete shall not be less than the limits given below:

		<u>Crushing strength of 15cm cubes by works test.</u>	
Concrete.		At 7 days age.	At 28 days age.
(a)	M. 10	70 kg/cm ²	100 Kg/cm ²
(b)	M. 15	100 kg/cm ²	150 Kg/cm ²

NOTE: (a) Test specimen of works tests shall be taken at the site of work from mixture of concrete ready for pouring into the foundation hole. All tests shall be carried out in accordance with IS: 516-1959 or its latest version. The sample of concrete from which test specimens are made shall be representative of the entire batch.

(b) Age is reckoned from the day of casting.

7.2.5. SIZE AND GRADING OF AGGREGATES:

The graded coarse aggregate 20 mm nominal size (table 2 of IS: 383-1970) shall be used for foundation. A coarse aggregate for grouting muffs and embedding shall be of 20 mm graded nominal size as per table 2 of IS: 383-1970 (specification for coarse and fine aggregate from natural sources for concrete).

Fine aggregate shall be graded from 10 mm downwards. The maximum size of aggregate for under reamed pile foundation shall be 20 mm graded nominal size.

7.2.6. SAND CORED FOUNDATIONS:

After erection of masts in sand-cored foundations, the core hole of the foundation blocks shall be filled with dried sand and covered with a layer of bitumen of 80 mm thickness below 30 mm from top level of the block. A hemispherical shaped muff shall be provided on such foundations in lieu of standard type.

7.2.7. SINKING OF CONCRETE SHELLS:

Where the water – level is high, one or more sections of reinforced concrete shells may have to be sunk before casting concrete. The size of each of shell shall be 1,200 mm outside dia x 50 mm thick x 600 mm high reinforced with 6 mm (1/4 inch) dia. rods spaced 150 mm apart, both longitudinally and circumferentially, the concrete shall be of grade M.15 as per provisions of Para 9.2.4.

7.2.8. TYPE OF FOUNDATION IN BLACK COTTON SOIL:

Types of foundations in black cotton soil. The foundations in dry black cotton soil should be of type BC or NBC or any other type as approved by the Purchaser.

7.2.9. CEMENT:

The cement to be used in the OHE foundation work should be of ordinary Portland /slag cement of 43/53 grade conforming to the relevant BIS specification. **Make of cement used for foundation must be: ACC, Ambuja, Binani, Birla Gold, Century Gold, Lafarge and Ultra Tech.**

PART – III STRUCTURES

<u>PARA NO.</u>	<u>SUBJECTS</u>
7.3.1	SCOPE.
7.3.2	TYPES.
7.3.3	DESIGN.
7.3.4	CANTILEVER MASTS.
7.3.5	ANCHOR MASTS.
7.3.6	HEAD-SPANS.
7.3.7	PORTALS.
7.3.8	STRUCTURES ON BRIDGES.
7.3.9	SPECIAL STRUCTURES.
7.3.10	SETTING OF STRUCTURES.
7.3.11	NUMBERING OF STRUCTURES.
7.3.12	STEEL WORK FOR SWITCHING STATIONS AND GANTRIES.
7.3.13	STEEL.

7.3.1. SCOPE:

This chapter deals with the design of steel structures and steel work for overhead equipment, switching stations, booster transformer stations and L.T. supply transformer stations and the specification for steel and pre-stressed concrete trial mast.

7.3.2. TYPES:

Structures and gantries may consist of any or more of the following types :-

- (i) Broad flange beams.
- (ii) Rolled steel joists (I section).
- (iii) Fabricated steel Structures (welded /bolted).

Structure / uprights shall generally be embedded in concrete foundation blocks; in special cases Structures may be secured by means of holding down bolts. Limited quantity (approx. 700 nos.) of circular spun pre-stressed concrete masts may also be used at the sole discretion of the Purchaser.

7.3.3. DESIGN:

(a) **STEEL STRUCTURES** - Designs for steel Structures shall, except where otherwise provided, comply with the Indian standard code of practice for use of structural steel in General Building Construction – IS : 800-1984. The thickness of smallest steel sections used shall be 5 mm for galvanized members.

(b) All the steel Structures and small part steel for carrying overhead equipment are to be fully galvanized after drilling and fabrication as per specification ETI / OHE / 13 (4/84) with A & C slip number 1 of 5/86, 2 of 4/90, 3 of 4/90 and no painted structures are to be used.

7.3.4. CANTILEVER MASTS:

(a) **LOAD** - For purposes of design the worst possible combination of all loads that may occur shall be considered.

The load shall include the following (weights to be assumed for design of Structures are shown against important items).

- (i) Weight of overhead equipment (1.60 kg/m for each conventional and 1.32 kg/m for each composite OHE).
 - (ii) Weight of bracket supporting the overhead equipment (60 kg/normal bracket).
 - (iii) Weight of a man (60 kg).
 - (iv) Weight of an earth wire (0.32 kg /meter).
 - (v) Weight of feeder, return conductor or other special equipment wherever they occur.
 - (vi) The effect of eccentricity of vertical and horizontal loads on the bracket due to variation in temperature.
 - (vii) Wind loads perpendicular and parallel to the track. The wind pressure adopted shall be taken as that indicated in part – III.
 - (viii) Radial forces on the mast, due to stagger, curvature, anchorage etc.
 - (ix) Weight of the mast itself.
 - (x) Any other load or loads that may occur due to special location of the Structures.
- (b) **DEFLECTION** - Notwithstanding the provisions contained in IS: 800 – 1984 referred to in para 7.3.3. above regarding permissible deflection, the following shall apply.

(i) The deflection at the top of the mast due to permanent loads shall not exceed 8 cm and the mast shall be so erected that it becomes reasonably vertical after application of permanent loads.

(ii) The additional deflection under maximum wind pressure shall not exceed 8 cm at the level of the contact wire.

(c) **TORSION** - The torsional rotation of the mast due to permanent loads shall not exceed 0.1 radian.

(d) **TYPICAL DESIGN** - The typical design of a traction mast is included in the set of standard drawings listed in Annexure – I, part – IV. Employment schedules for standard masts for various locations and types are included in the standard drawings listed in Annexure – I, part IV, to enable selection of suitable type for different locations and local conditions.

7.3.5. ANCHOR MASTS:

(a) Masts at which overhead equipment will be anchored shall also normally be of the same type as those in other locations. Anchor masts shall normally be provided with suitable guys but struts may be permitted in special cases.

(b) **DWARF MASTS** - At certain locations where due to local conditions it is not feasible to anchor the guy rod on a foundation block in the ground, a dwarf mast shall be used in accordance with approved designs.

7.3.6. HEAD SPANS: (See para 7.1.18 and 7.4.19)

- (a) LOAD - The loads to be considered shall be as detailed in para 7.3.4 (a) as far as applicable and at their worst combination.
- (b) SAG FOR HEAD SPAN WIRE - The sag of the head span wire shall be approx. one-tenth (1/80) of the span.
- (c) MINIMUM TENSION IN CROSS SPAN & STEADY SPAN WIRES - For purpose of design, a minimum tension of 200 kg shall be ensured in the span wires for worst combination of temperature and wind load.
- (d) DEFLECTION OF MAST - Deflection at the top of the mast or Structure shall be limited to one-eightieth (1/80th) of its height above foundation.
- (e) TYPICAL DESIGN - Typical design for head span mast carrying overhead equipment for 4 tracks will be furnished to the contractor.

7.3.7. PORTALS (See 7.1.18)

- (a) GENERAL - Portals shall be of fabricated steel of standard types of purchaser's designs. The most important designs are covered by Drawings listed in Annexure – I, Part – IV.
- (b) LOAD - The load shall be as detailed in para 7.3.4 (a) as applicable.

7.3.8. STRUCTURES ON BRIDGES:

- (a) The structure may be either cantilever masts or portals (hinged or fixed at base) depending on the type and condition of bridge pier capping. As far as possible cantilever masts grouted in foundations blocks on pier will be used. Where this is not possible cantilever masts with holding down bolts or suitable portals (hinged or fixed at the base) may be adopted.
- (b) Designs of structures on bridges to suit different locations and local conditions will be furnished to the contractor by the Purchaser.

7.3.9. SPECIAL STRUCTURES:

In the case of structures at locations not covered by the employment schedules furnished by the Purchaser, the contractor shall furnish complete design calculations justifying the choice of the type of structures for such locations.

7.3.10. SETTING OF STRUCTURES:

- (a) The setting is the distance from the Central line of the track, on straight or curve to the face of the mast / structure of fitting located on the mast.
- (b) On straight and outside of curve, the standard setting shall be as per the relevant drawing included in Annexure – I, Part IV. Minimum setting of structures shall be 2.5 m plus curve allowance as required. Whenever this distance cannot be provided, specific approval of Purchaser shall be obtained before erection. Setting of portal upright overlap/turn-out structures, anchoring structures and other masts carrying more than one OHE will be 3.0 m wherever possible.
- (c) EXTRA CLEARANCE ON CURVES - The minimum setting of structures on curves shall be determined by adding to the above minimum figures an extra clearance indicated in the table included in the set of standard drawings listed in Annexure – I, Part – IV.
- (d) STRUCTURES WITH COUNTER WEIGHTS - In case of structures carrying counter-weight assemblies, the term “setting” shall refer to the minimum distance of the counter-weight from the track center under the worst conditions of wind.
- (e) STRUCTURES ON PLATFORM - The setting of structures on platform shall be not less than 4.80 m.
- (f) STRUCTURES NEAR SIGNALS - In the vicinity of signals, structures shall be located in a manner which shall ensure good visibility where necessary, the setting shall be increased as per the relevant drawing included in Annexure – I, Part – IV.
- (g) SETTING OF STRUCTURES - The value of setting of masts/structures shall be painted on each mast/structure. The figure shall be 25mm in size in white on a red background. In addition, the track level shall also be marked on the mast/structure by a horizontal red painted stroke.

7.3.11. NUMBERING OF STRUCTURES CARRYING OVERHEAD EQUIPMENT:

All structures shall be numbered in accordance with the numbering given in the approved overhead equipment layout plans. Enameled number plate shall be provided on each mast or structure as per approved designs (See Annexure – I, Part – IV).

7.3.12. STEEL WORK FOR SWITCHING STATIONS AND GANTRIES

- (a) HORIZONTAL MEMBERS OF GANTRY - Horizontal member of main as well as auxiliary gantry carrying isolator switches, insulators, potential transformers etc. shall be made from steel sections viz. channels, angles and small joists, single or fabricated. They shall preferably be attached to masts by means of clamps to avoid drilling of masts sections.
- (b) For purpose of design, all possible loads which may occur in the worst combination shall be considered. The loads shall include the followings:
 - (i) Weight of insulators, instrument transformers, isolator switches, bus-bars, and their accessories.
 - (ii) Loads caused by feeders, along and across tracks, return feeders etc.
 - (iii) Loads caused by anchorage due to guying of anchored masts (where applicable).
 - (iv) Pull or Push on the structures due to anchorage and radial tension (where applicable).
 - (v) Wind load on the different structures, conductors and equipment. The wind pressure shall be taken as that indicated in Part – III.
 - (vi) Weight of men working on the structures.
 - (vii) Weight of structure itself.
 - (viii) Erection loads.
 - (ix) Any other load or loads which may occur due to special equipment wherever they occur.
- (c) TENSION OF CONDUCTORS - For purpose of designs, the maximum tension of different conductors, without wind load, shall normally be as under:

- (i) Deleted.
- (ii) Maximum tension in the cross feeders at switching stations under worst conditions:
 - (1) For spans less than 18m 100 kgf.
 - (2) For spans more than 18m200 kgf.
- (iii) Maximum tension in longitudinal feeders running parallel to the track at the switching stations under worst conditions. 1,500 kgf.
- (iv) Tension in anchored overhead equipment in case of sectioning and paralleling stations- 2,000 kgf.
- (d) DEFLECTION OF GANTRY MASTS - Deflection under the permanent loads (at an average temperature of 35°C. without wind) at the top of the fabricated structures of mast shall be limited to one eightieth (1/80) of its height above foundation.
- (e) ANCHOR MAST - Masts of the gantry at which feeder or overhead equipment will be anchored at the switching stations shall normally be provided with suitable guys, but struts shall not be permitted.
- (f) CHAIRS AND BRACKETS - Chairs, brackets and supporting steel work carrying potential transformers, lightning arrestors, insulators, etc. shall be made of fabricated steel and be mounted on the main auxiliary gantry preferably by means of clamps to avoid drilling of masts sections.
- (g) UPRIGHTS AND FENCING - Uprights carrying operating handles of isolators and fencing posts shall be made from steel sections, viz. channels, angles or small joists, either single or fabricated.

7.3.13. STEEL:

Steel conforming to IS: 2062-1992 shall be used for all fabricated steel work.

PART – IV EQUIPMENTS, COMPONENTS & MATERIALS

<u>PARA NO.</u>	<u>SUBJECT</u>
7.4.1	General
7.4.2	Compliance with standard specification.
7.4.3	Quality assurance.
7.4.4	Prototype test.
7.4.5	Inspection & tests.
7.4.6	Test certificates.
7.4.7	Bulk manufacture.
7.4.8	Inter-change ability.
7.4.9	Technical specifications.
7.4.10	Nomenclature & marking.
7.4.11	Steel work & protection against rust.
7.4.12	Bracket assembly components.
7.4.13	Droppers.
7.4.14	Insulators.
7.4.15	Ending fittings & splices.
7.4.16	Electrical connections for overhead equipment.
7.4.17	Terminal connection for other equipments.
7.4.18	Regulating equipments.
7.4.19	Head span construction.
7.4.20	Isolator.
7.4.21	Insulation level.
7.4.22	Bus bars (at switching stations, booster stations and gantries).
7.4.23	Cablings.
7.4.24	Literature for equipment.

7.4.1. GENERAL

This chapter deals with the details and specifications of the equipments, components & materials to be used for traction overhead equipment, switching stations, booster transformer stations & LT supply transformer stations. This chapter does not cover structures and foundations, which are dealt with in Chapter – IX, Part –II and III. 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 referred to in Para 1.1.10.

7.4.2. COMPLIANCE WITH STANDARD SPECIFICATIONS:

In the technical specifications of equipments, components and materials, references are made to the following standard specifications:

- 1) International Electro Technical Commission (abbreviated as IEC) publications.
- 2) British Standards (abbreviated as BS).
- 3) 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(b). English rendering of the text illustrations of the national standard specifications and explanatory notes on the specific deviations from IEC, British Bureau of Indian Standards, in question, shall also be submitting 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.

7.4.3. QUALITY ASSURANCE:

The provisions of Part-I or quality assurance will apply, including facilities to be provided by the manufacturer (see para 1.2.25)

7.4.4. PROTO TYPE TESTS:

(a) FITTINGS, COMPONENTS AND MATERIALS - All the fittings, components & materials to be supplied by the contractor, in terms of this contract, the requisite number of proto types of components shall be supplied free of cost to the purchaser for tests and approval. The tests will be conducted in a laboratory selected by the purchaser. Test to be carried as per RDSO's specification no. ETI/OHE/49 with its latest amends.

(b) EQUIPMENTS - This comprises inspection and tests conducted on the first equipment of a specified manufacturer, which the purchaser considers sufficient to prove that the design is in conformity with the specification at the manufacturer's factory. The type tests shall be conducted on each equipments as indicated in the individual specifications referred to in para 7.4.1 above, in the presence of the purchaser's representative. The contractor shall arrange to get these tests conducted at his own cost.

(c) RESPONSIBILITY - Any testing and approval by the purchaser of prototype shall in no way absolve the contractor of his responsibility under the terms of the contract for the equipment supplied and erected.

(d) EXEMPTION FROM PROTOTYPE TESTS - If prototype samples of equipments, components or fittings of any manufacturer have already been approved in connection with the electrification of other sections of Indian Railways, on the 25KV, 50 Hz single phase A.C system prototype samples of such equipments, components or fittings will be exempted from the tests. Supply of bulk quantities shall, however, be effected only after the purchaser's prior approval is obtained in writing.

(e) The results of prototype tests will be communicated to the contractor as expeditiously as possible. Any delay in this respect will be ground for extension of time for completion under para – 1.2.45.

7.4.5. INSPECTION AND TESTS:

These comprise inspection and tests conducted at the manufacturers' factory for ensuring quality of manufactured items as part of the Quality Assurance Programme.

7.4.6. TEST CERTIFICATES:

Three copies of the test certificates of successful prototype tests carried out at the manufacturer's factory on all equipments shall be furnished to the purchaser within a month after completion of the prototype tests. Three copies of the routine tests carried out on each equipment shall also be furnished, after the equipment is passed by the purchaser's representative for inspection (See para 1.2.25).

7.4.7. BULK MANUFACTURE:

Bulk manufacture may be undertaken only after specific written approval of the purchaser or his representative has been obtained indicating that tests on the prototypes are satisfactory. Where prototypes have already been approved in connection with it manufacturer may proceed after exemption from prototype tests is received from the purchaser in writing.

7.4.8 INTER- CHANGEABILITY: All equipments, components and fittings shall be inter – changeable and supplies shall be in accordance with the purchaser's designs unless otherwise specifically approved by him. Components such as fuses, indication lamps etc. should be replaceable with substitutes available indigenously as far as possible.

7.4.9. TECHNICAL SPECIFICATIONS:

The following specifications (latest revision) will govern the supply and testing of important materials, components and equipments: conductors have to be supplied as per RDSO's Drg. No.ETI/OHE/G/5600 Mod. A or latest Gr. A

Structural steel	IS : 2062-1992
	IS : 800-1984
	IS : 808-1989
Tensile testing	IS : 1731-1971
	IS : 2004-1991.
	IS : 1608-1972 For steel products etc
Welding	IS : 816-1969
Disc insulator	IS : 731-1971
	IS : 3188-1980
Dropper wire	IS : 282-1982
Annealed copper	IS : 9968(PT.2) 1981
Jumper wire	
AL Jumper wire	IS : 694:1990
All aluminium conductor	IS: 398(PT.I)-1976
Aluminium conductors	
Galvanized steel reinforced	IS : 398(PT-III)1976
Material for Aluminium	IS : 5082-1981
Tubular bus bar	
Dimensions for Aluminium	IS : 2673-1979
Tubular bus-bar	
General requirements for	IS : 1387-1993
the supply of metals and metal products	

Galvanized stay strand	IS : 2141-1992
PVC insulated cables	IS : 1354-(Part-I) 1988
Tin bronze castings	IS : 306-1983
Aluminium bronze castings	IS : 3091-1965
Malleable iron castings	IS : 2108-1977
Coarse and fine aggregate	IS : 383-1970
From natural sources for Concrete	
Code of practice for general	IS : 456-1978
Construction of plain and Reinforced concrete	
Method of tests for strength of concrete	IS : 516-1950
Gray iron castings	IS : 210-1978
Aluminium castings	IS : 617-1975
Copper strip for formed	IS : 1897-1985
Fittings.	
Cadmium copper conductor	ETI/OHE/50(6/97) AMEND-1(6/97)
For Overhead Rly. Traction.	
Contact wire	ETI/OHE/76(6/97) with A&C slip no. 3(3/05).
(Continuous cast.)	
Annealed stranded copper Conductors for jumper wire	ETI/OHE/3(2/94) With A & C slip No.1 of (4/95).
Copper Bus bar.	RE/30/OHE/5(11/60) IS-613.
Structural Steel tubes.	ETI/OHE/11(5/89).
Hot dip galvanization of steel	ETI/OHE/13(4/84) with A&C Slip
Masts (Rolled and fabricated)	No.1 of (5/86).2 of (4/90)&3 of (4/90).
Tubes and fittings used on 25 KV A.C OHE.	
Stainless Steel wire ropes.	TI/SPC/OHE/WR/1060 (6/06).
25KV solid core insulator	ETI/OHE/15(9/91) with A&C slip no.6 (9/05).
Including those for polluted Zones.	
25KV single and double pole Isolator	ETI/OHE/16(1/94) with A & C slip no.2 (3/04).
Bolts, nuts and washers.	ETI/OHE/18(4/84) with A&C Slip No. 1 of (11/84) 2 of (6/87) 3 of (9/87) & 4 of (10/02).
	ETI/OHE/21(9/74).
Aluminum Alloy Section and Tubes	Deleted from latest master list. No. TIM 0002
Standard drawings for Traction	Rev.7 dated 31.08.2005.
Overhead equipment.	ETI/OHE/27(8/84) with A&C slip No.1 (10/92)
Section Insulator Assembly.	ETI/OHE/33 (8/85).
Enameled Steel Plates.	ETI/OHE/36(12/73) with A&C slip no.1 (5/98).
Galvanized Steel Wire.	ETI/OHE/49(9/95) with A&C Slip No.1
Fittings for 25KV 50HZ A.C	
Traction equipment of (3/97).	
25KV Potential Transformer.	TI/SPC/PSI/PTS/0992 with A&C slip no.3 (8/05).
25 KV drop out fuse switch	ETI/PSI/14 (1/86) with A&C slip no.1
& operating pole for use with of (4/87).	
10 KVA, 25KV/230V LT supply transformer	
25 KV/240 V, 10 KVA LT supply transformer	ETI/PSI/15 (8/03).
Metal oxide gapless type	ETI/PSI/71 Rev. 1 (1/87) with A&C
Lightning Arrestor for use	slip no. 1 of 3/87,2 of 9/90, 3 of (2/91),
On 25 KV side.	4 of 12/91, 5 of (8/94).
110 V Lead Acid Battery 40 AH SMF.	RDSO/SPEC/TL/0040-2003 (Rev.0)
25 KV, 50 Hz. single pole	ETI/PSI/167 (9/97)
outdoor interrupter for	
Railway Traction switching station.	
3-Pulley type regulating Equipment (3:1).	TI/DRG./OHE/ATD/RDSO/00001/99/1.
Specification for short Neutral section assembly	
(Phase Break).	TI/SPC/OHE/SNS/0000 (01/00).
110 V 40 AH battery Charger SMF	ETI/PSI/1 (6/81).
Aluminium alloy stranded	ETI/OHE/54(2/85) with A.C slip no.1 of (11/89) & 2 of (10/92)
Catenary wire 19/2.79 mm	
Bi-metallic (AL-CU) strip	ETI/OHE/55(4/90)
Insulated cadmium copper Catenary	TI/SPC/OHE/INS CAT/0000 (04/00)

7.4.10. 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 and 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.

7.4.11. STEEL WORK AND PROTECTION AGAINST RUST:

- (a) GALVANIZING - 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) no. 2 of (4/90) & no.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 days of modifications which would damage the protective coat, repairs to such damage would be allowed only in exceptional circumstances. The part damaged shall be protected in accordance with the method indicated in specification ETI/OHE 13(4/84) with A&C slip no. 1 of 5/86, 2 of 4/96 & 3 of 4/90 or any other method approved by the purchaser. The contractor shall in all such cases obtain prior permission from the purchaser before carrying out repairs.

7.4.12 BRACKET ASSEMBLY COMPONENTS: (See para 7.1.19)**ARRANGEMENT FOR NORMAL OHE (High Speed)**

The arrangement of the different fittings and structural components of bracket assemblies are shown in drawings listed in Annexure-I, Part-IV. The employment schedule of bracket will be furnished to the Contractor.

- (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 there is a free length of about 200 mm. beyond the catenary suspension bracket. To facilitate adjustment during track maintenance (See Para-2.6.10(b))
- (b) TUBULAR STAY ARM - Steel tubes with adjustable steel rods shall be used for tubular stay arm of all bracket assemblies.
- (c) REGISTER ARM - The register arm shall also be electrical resistance weld or cold drawn steel tubes or proper dimension 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 assemblies 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 of solid galvanized steel rod. 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 turn outs, diamond crossing etc. Steady arms shall be longer as indicated in the relevant drawings listed in Annexure-I, Part-IV. Bent Steady arms of aluminium alloy tubes conforming to Spec. ETI/OHE/21(9/74) shall be used for neutral Section overlap and in the Central mast of a 4 span insulated overlap.

7.4.13. DROPPERS: (See Para 7.1.10)

- (a) GENERAL 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 slip under a horizontal load of 120 kgf.
- (c) The permissible tolerance in the overall length of a dropper will be +/-5 mm.

7.4.14. INSULATORS:

- (a) All insulators shall be of the solid core type. All solid core insulators shall conform to ETI/OHE/15 (9/91).
- (b) INTER CHANGEABILITY - For free inter changeability only the following types 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 conjunction 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 insulators' mechanisms, bus bars, jumpers etc. of 25 KV.

7.4.15. ENDING FITTINGS AND SPLICES GENERAL DESIGNS:

- (a) 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 contact wire ending clamps which may be of 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 13/27).
- (b) LOADING - All the parts shall be capable of withstanding without damage, a load greater than the ultimate strength of the wire 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) RESTRICTED USE OF SPLICES - The use of splices shall generally be avoided and their use shall be restricted to the minimum necessary. Over main tracks, there shall be no splice in the contact wire on first erection. Elsewhere, not more than one splice is used in any tension length (i.e. anchor to anchor) for which prior approval shall be taken from the Purchaser. Additional splices may, however, be provided to enable retention of conductors which are found defective during and/or after erection. Splices may also be permitted for repair of damage due to thefts or Railway accidents.
- (d) STRENGTH OF ASSEMBLED FITTINGS - The strength of fittings assembled with appropriate conductors or wires shall not be less than that of the conductor or wire it.

(e) **ADDITIONAL TERMINATING WIRES** - Cadmium copper stranded wire of 65 sq. mm. nominal section or 37/2.1mm (130mm as used in head span construction) may be used as additional terminating wires of extending single and double conductors respectively, if termination at the nearest structures is not feasible.

7.4.16. ELECTRICAL CONNECTIONS FOR OHE

(a) **GENERAL DESIGNS** - All electrical connections between conductors shall be made by parallel clamps. The general arrangements of connections are shown in the standard drawings, listed in Annexure-1.

(b) **JUMPER** - Copper jumper shall be of any of the followings:

(i) Large jumpers of annealed copper in accordance with specification ETI/OHE/3 (2/94) with A and C Slip No. 1 of (4/95).

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

(c) **BUSBARS** - Bus bars or rigid jumpers of copper where used shall be of 18 mm ϕ copper rod in accordance with RE/30/OHE/5 (11/60 IS.613.) Aluminium bus bars wherever used shall be of 36/28 mm tubing (See 2. 4.22). Aluminium tubular bus bars shall be made of Al. Alloy grade 63401 (WP condition) to IS: 5082 – 1981. The tolerance on diameter and thickness shall be as per class I, IS: 2673 – 1979.

(d) **FEEDERS** - Feeders shall be of all Copper conductors 37/2.25 mm.

7.4.17. TERMINAL CONNECTORS FOR EQUIPMENTS:

Interrupter, Booster Transformer and L.T. supply Transformer shall be supplied by the Purchaser along with the terminal connectors suitable for taking jumper/bus bar as required. However, ALCU strips shall be provided by the Contractor for bimetallic connections wherever required.

7.4.18. REGULATING EQUIPMENT:

(a) **GENERAL** - A general arrangement is shown in the standard drawings listed in annexure-1, part- IV. The regulating equipment should have a minimum adjustment range of 950 mm. Stainless steel wire rope in accordance with ETI/OHE/14 (9/94) with incorporated A&C slip No.1 to 4 shall be used in these equipments and these shall be sufficiently flexible for the purpose.

(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 a fixed top.

(c) **REDUCTION RATIO** - Reduction Ratio in the arrangement used shall be three in case of three pulley type.

7.4.19. HEAD SPAN CONSTRUCTION: (See Para 9.1.18 and 9.3.6)

(a) **SIZE AND FACTOR 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 unfavorable 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 steady span wires to ensure electrical independence between the equipment in different elementary electrical sections.

7.4.20. ISOLATORS:

25 KV Isolator switches shall comply with specifications as indicated in Para-7.4.9.

7.4.21. INSULATION LEVEL:

Interrupters, potential transformers line indication type, 42 KV lighting arrestors and other equipments shall be suitable for insulation level indicated in the relevant specifications.

7.4.22. BUSBARS:

(a) No splicing will normally be allowed in the tubular bus bars unless the length of the bus bars exceed 6 m.

(b) **GENERAL** - The bus bar shall be clean, smooth, mechanically sound and free from surface and other defects. Provision shall be made when necessary to allow for expansion and contraction of bus-bars caused by temperature variation. The open ends of the bus-bar shall be covered by suitable caps, whenever the tubular bus bars are required to be bent; the radius of the bent shall be not less than 200 mm.

(c) **JOINTS** - The joints in bus bars shall be mechanically and electrically sound so that the temperature rise 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 clean and smeared with suitable oxidation inhibiting joint compound before and after assembling the joint. Similar procedure shall be followed for connecting the equipment the terminals to the aluminium bus bars with bimetallic connectors.

7.4.23. CABLING:

(a) **CABLE FOR LT SUPPLY** - 240V AC supply from LT supply Transformer at switching station shall be brought and terminated on the LT AC distribution Board in the remote control Cubicles at the switching stations 1100V 25 sq.mm. aluminium 2 Core PVC insulated PVC sheathed and steel armoured heavy duty cable conforming to IS: 1554 (Part-1): 1988.

(b) **CONTROL & INDICATION CIRCUITS** - All other Cables for control and indication at switching station shall be 1100 V grade PVC insulated and sheathed armoured (heavy duty) complying with IS: 1554 (Part-1) 1988. The cables shall be provided as indicated in the Table below:

PURPOSE	RUN	CIRCUIT VOLTAGE	CORE SIZE & MATERIAL	No. OF CORES
Control & indication Of interrupters	From each interrupter to terminal Board.	110V D.C.	2.5 sq. mm copper	7

Heater supply for interrupter control mechanism cabinet	(i) From Interrupter to interrupter	240V A.C.	4.0 sq. mm Aluminium	2
	(ii) From each interrupter to fuse box.	- do -	- do -	- do -
	(iii) From fuse box to distribution Board.	- do -	- do -	- do -
Battery Supply	(i) 110V Battery Charger to 110V Battery.	110 V D.C	2.5 sq. mm. Copper	2
	(ii) 110V Battery to 15 A, DC fuse box.	110 V D.C.	2.5. sq.mm. Copper	2
	(iii) 15A DC fuse box to terminal board.	110 V D.C.	2.5. sq. mm. Copper	2

NOTE:

(1) In case of feeding station which are located within the traction substation premises, the cables shall be run from individual equipment and terminated inside the sub-station control room

(2) Notwithstanding the size of cable given above, the Tenderer shall assured that various cables would suit the ratings of equipment offered by him.

(c) **SPECIFICATION** - The cables shall be resistant to decay abrasion, acids alkalis and other corrosive materials. All indoor wiring all on walls shall be clamped neatly on teak wood battens fixed to the wall by means of wall plugs wooden pegs. The cable run lay out at a typical switching station shown in the relevant drawings already include in Annexure-I.

7.4.24. 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.

PART-V DESIGNS AND DRAWINGS

PARA NO.**SUBJECT**

7.5.1.	General
7.5.2.	Contractor's drawings
7.5.3.	Standards for drawings
7.5.4.	Basic Designs
7.5.5.	Special Designs
7.5.6.	Particular designs and working drawings for OHE
7.5.7.	Particular designs and working drawings for SWS & BT station
7.5.8.	Booster and LT supply transformer stations drawing.
7.5.9.	Schedule of quantities
7.5.10.	Submission of drawings and schedules
7.5.11.	Completion drawings and schedules
7.5.12.	Addresses.

7.5.1. General:

- (a) This Chapter deals with the procedure for approval of designs and drawings.
- (b) The type designs shall be as few as possible to cover the largest field of application consistent with economic consideration.
- (c) In all drawings as far as possible only such symbols as are in international use, shall be used.

7.5.2. CONTRACTOR'S DRAWINGS:

- (a) The Contractor shall submit to the Purchaser for approval except where otherwise specified below, all detailed designs and drawings which are necessary to ensure correct supply of equipments, component and materials and to enable correct and complete erection of overhead equipment, switching stations, LT supply transformer stations in an expeditious and economic manner.
- (b) **RESPONSIBILITY** - It is to be clearly understood that all original drawings and designs shall be based on a thorough study. General designs and dimensions shall be such that the contractor is satisfied about the suitability of the designs for the purpose. The purchaser's approval will be based on these considerations and notwithstanding the purchaser's acceptance; the ultimate responsibility for the correct design and execution of the work shall rest with the contractor in terms of the conditions of contract.

7.5.3. STANDARDS FOR DRAWINGS:

All designs, legends, notes on drawings and schedules of materials shall be in English and shall be prepared in the metric system. All designs and drawings shall conform to specifications RE/OHE/25(3/66).

7.5.4. BASIC DESIGNS:

- (a) **STANDARD DESIGNS** - Where the Contractor adopts designs and drawings conforming to the standard designs, drawings and specifications of the research, designs and standard organizations. Manaknagar, Lucknow – 226 011 (RDSO) for basic arrangements, equipments, components & fittings of traction overhead equipment, switching stations, L.T supply transformer stations and adopts employment schedules furnished by the purchaser, he shall verify each design, drawing and employment schedule and satisfy himself that these are correct before use within two months of the issue of letter of acceptance of Tender the contractor shall indicate to the purchaser, the list of standard basic arrangements, components and

fittings drawings and employment schedules, which he will adopt for the purpose of the work. The procedure outlined in Para-1.2.23 shall be followed for approval of basic designs. The contractor for his use and reference shall obtain reproducible transparent film (50 microns) each of such standard basic arrangement, component & fitting drawings and employment schedules from Chief Electrical Engineer/E. Railway/Kolkata on payment as per the prescribed rates.

(b) DEVIATIONS - Normally deviations from the standard drawings of the purchaser will not be accepted. However, in exceptional cases where the contractor desires to suggest improvements as results of his experience or other development, he shall justify his proposals with supporting explanatory notes.

(c) STANDARD DRAWINGS EMPLOYMENT SCHEDULES ETC. - Deleted.

7.5.5. SPECIAL DESIGNS:

(a) In cases where standard designs, drawings or employment schedules do not cover requirement of special locations or site conditions, the contractor shall submit his own designs or drawings along with supporting calculations and notes for scrutiny and approval of the purchaser.

(b) Such special designs shall generally be in conformity with basic designs furnished by the purchaser and in accordance with the specifications. If the Contractor wishes to adopt special designs, which do not conform to the general basic designs of the purchaser, he shall submit alternative designs and drawings justifying his proposals.

7.5.6. PARTICULAR DESIGNS AND WORKING DRAWINGS FOR OHE:

(a) PURCHASER'S PEGGING PLANS - The pegging plans for sections to be equipped indicating the type of overhead equipment, locations of masts and other general particulars prepared on the basis of the latest survey will be furnished by the purchaser. The Contractor shall verify and check these plans at site.

(b) CONTRACTOR'S PEGGING PLANS - If the Contractor is called upon to carry out survey and prepare overhead equipment pegging plans, he shall submit such plans for approval after checking their feasibility at site.

(c) PRINCIPLES OF LAY OUT - The Contractor shall in all cases ensure that the final pegging plans are in conformity with the latest principles of preparation and checking of OHE layout plans and sectioning diagram issued by RDSO.

(d) PROVISIONAL LAYOUT PLANS - The Contractor shall prepare and submit overhead equipment layout plans incorporating the following information's:

- (i) The run of wires in different thickness or color in special cases and termination.
- (ii) The run of wires for future wiring indicated to the contractor in dotted lines.
- (iii) Erect position of all cut in insulators, including section insulators.
- (iv) Direction and value of stagger at each traction structure location.
- (v) Clearance of live conductors to structures in the vicinity including bridges, signals, gantries etc.
- (vi) Lay out of feeders.
- (vii) Jumper connections and connection to switches and switching stations.
- (viii) List of infringements.
- (ix) Kilometer nos. and type of structures.
- (x) Location and no. of switches.
- (xi) Schematic sectioning diagram drawn to convenient scale showing section insulator, no. of switches, elementary sections and connections to switches and switching stations.
- (xii) Table giving references of approved profile drawings, feeder layout plan and other relevant drawings.
- (xiii) Implantation.
- (xiv) Location of mast.

(e) OHE PROFILE DRAWINGS - After completion of the overhead equipment layout plans, the contractor shall prepare an overhead equipment profile drawings showing the actual height of the contact wire under each overhead line structure the gradient and height of the contact wire on either side of the structure and the encumbrances at structures until normal height of contact wire and encumbrances are restored.

(f) CROSS SECTION DRAWINGS - While the layout plans are being finalized, the contractor shall submit for approval, in-so-far as yards between outer most points and crossing are concerned, cross section drawings for each structure showing guy rods, if any, indicating the cross section of the formation, height and nature of soil, type of foundation block, structure proposed, reverse deflection of the structure and all necessary particulars for erection of the foundation and the structures. In the preparation of drawings, care shall be taken to show all obstructions such as signal wires, point rods and their correct location in references to track/tracks as well as underground obstructions like pipe cables, etc. after connecting such information from the site.

In open line sections, cross sections shall be submitted in the following proforma separately for each railway line for special foundation drawings with all necessary details shall be submitted to the purchaser. In case of side bearing foundation with extra depth, formation details at such location and necessary details of anchor foundation will be submitted.

(g) FINAL LAYOUT PLANS - After all the cross section drawings in a section covered by the layout plan are finalized and foundations are cast, the contractor shall revise the layout plans to take into account any modifications to the locations of structures during the process of casting of foundations.

(h) STRUCTURE ERECTION DRAWINGS - The contractors shall then submit structure erection drawings for each structure incorporating all the details included in the cross section drawings for the structure and as erected at site and the details of the bracket assembly, mast extensions, isolator mounting frame and anchorage of overhead equipment, feeder or return conductors proposed for each structure together with all particulars necessary for the correct erection of overhead equipment at the structure. For structure with isolators, the details of electrical connections shall also be incorporated. In open line sections the contractor shall submit structure erection particulars in the tropical proforma as given below

separately for each main line track in addition to particular details as indicated in the proforma for cross-section drawings. Modification to this proforma is found necessary will be finalized at time of structure erection drawings.

Sl. No. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

.....
LOCATION NO. CHAINAGE

1. ENCUMBRANCE
2. CONTACT WIRE HEIGHT
3. STAGGER
- (I) CATENARY
- (II) CONTACT
4. STAY ARM

(i) (a) M

- (ii) CODE
5. BRACKET

(i) (b) M

- (ii) CODE
6. REGISTER

(i) C/D (M)

- (ii) CODE
7. STD/BENT
- CODE

8. IDENTIFICATION MARK (SEE PARA 2.5.11)

OTHER REFERENCES/CODES FOR MISC.ITEMS LIKE STEEL WORK FOR STAY/BRACKET ATTACHMENT MISC. SINGLE/DOUBLE CAT. ETC. WILL BE INDICATED.

ITEMS:

- (9) SUB-STATION FEEDER DRAWING Deleted.

7.5.7. PARTICULARS DESIGNS & DRAWING FOR SWITCHING STATIONS & BOOSTER STATIONS:

- (a) PURCHASER'S LOCATION PLAN ETC.

The location plans and schematic diagrams of connection for all the switching stations, and L. T. supply transformer stations will be furnished by the purchaser to the contractor. These will indicate the following as applicable.

- i) Overhead equipment layout in the vicinity of switching or other stations.
- ii) Location of main masts.
- iii) Arrangement of cross feeders and longitudinal feeders to be anchored on the gantry if any, including jumper connection to the overhead equipment.
- iv) Scheme of connections of interrupters.
- v) Position of the remote control cubicle with respect to the switching stations.
- vi) Fencing outline at the switching stations.

The contractor shall satisfy himself about the correctness and applicability of the location plans given by the purchaser before adopting them for detailed designs.

- (b) DETAILED DRAWINGS - The Contractor shall submit for approval of the purchaser. The following drawings:

- i) Cross section drawings for each switching station indicating the cross section of the formation transverse to the tract at such location of main masts and longitudinal section parallel to the track along the central line of the interrupters. This drawing shall be prepared after an accurate survey and site and shall indicate the nature of the soil, its bearing capacity, and compactness and in case of loose soil, transverse section of the parent soil. In the preparation of the drawings care shall be taken to show all obstruction to be removed, such a signal wire, rods and their correct location with reference to the tracks as well as underground construction like pipes, cables etc. after collection such formation from the site.

- ii) GENERAL ARRANGEMENT DRAWINGS - General arrangement drawings for switching station indicating the general arrangement of all equipment, run bus bars, position of pedestal insulators steel framework and fencing. The drawing shall also given a schematic connection/diagram and an isometric view of bus bars and connection. The drawing shall include an elevation view of the switching station from behind at transverse cross section and plan sectional views at the level of feeder anchors insulator beams, potential transformer and ground. Each drawing shall have a schedule of all equipment required at the switching stations along with drawing reference of details of the equipments.

- iii) STRUCTURAL DRAWINGS - Structural assembly drawing for switching station indicating the steel framework assembly. The drawing shall include one elevation view of the steel framework assembly from behind. A transverse cross section and plan views at various levels such as at the level of feeder anchors, Insulator beam/and ground. In the assembly each component number shall be marked with its reference number. The drawing shall also have a schedule of component numbers along with drawing reference various numbers. The weight of the component numbers shall be indicated in a separate weight schedule. The drawings shall be prepared for the various structural components. Individual drawings shall be made for each component and this shall include all fixing board, nuts and washers whose sizes will be maintained all the drawings. A unit isolator beams; potential transformer beam weight of the component shall also be given in the drawings.

- iv) FOUNDATION LAYOUT AND CROSS SECTION DRAWINGS - Foundation layout and cross section drawings for each switching station indicating layout of all foundation in plan, transverse cross section of various foundations through central line of main masts, interrupters, fencing uprights and LT supply transformers, if any, an longitudinal sections parallel to track through the central line of the cable trench .All foundation shall be marked serially on the drawing and listed in a schedule on the drawing indicating the volume of concrete for each foundation block.

v) **FENCING LAYOUT DRAWINGS** - Fencing layout drawings for each switching station indicating the layout of the entire fencing and anti climbing device in plan. Each upright, fencing plan and fixture on the upright shall be indicated on the drawing by its reference number. A schedule of components viz. uprights, panel fixture and barbed wire shall be included in the drawings indicating the drawing reference of components. An individual drawing shall be made for each type pane, fencing and fixture for mounting the anti climbing device. The drawing of each fencing post shall indicate the unit weight of the fencing post.

vi) **EARTHING LAYOUT DRAWINGS** - Earthing layout drawings for each switching station indicating the layout of full earthing system in plan. The drawing shall show the location of earth electrodes and mark the run of earthing strips and connection to each equipment, mast, fencing post and fencing panel. All components shall be marked with their reference n. for further details of the run of conductors and connections, separate drawings which may be common to all switching station may be made and reference to this drawings mark on the layout. A schedule of components shall be made out in the given drawing reference of components.

vii) **CABLE RUN LAYOUT** - Cable run layout of each switching station indicating inter connection between various equipments, indoor and outdoor along with schematic arrangements and physical disposition of equipment, color coding or code no. and the index scheme adopted for terminal. The drawings shall also indicate the cable size and grades of insulation. The quality of various cables required shall be indicated on the drawings.

viii) **EQUIPMENT DRAWINGS** - Equipment drawings applicable to all switching station except the ones for the equipments to be supplied by the purchaser. Drawings shall be dimensioned and should indicated:

1. Fixing or mounting hole dimensions and arrangement.
2. Net weight of the equipment.
3. Characteristic and rating of equipment.
4. Circuit and diagram.
5. Overall dimensions and other important dimension.
6. Height and vertical and horizontal dimensions of all exposed live parts; and
7. Notes explaining the operation of the equipment.

ix) **MISCELLANEOUS DRAWINGS** - Misc. drawing applicable to all switching station. This drawings shall include drawings or sketched made for study of clearance, isolator alignment details, scheme of interlocks, no. plates or various equipments and "U" bolts for cable mounting, caution or instruction boards, out riggers for bus bars support and non-standard bus bar connectors.

x) **EMPLOYMENT SCHEDULES & CHARTS** - Employment schedules and charts applicable to all switching stations. These will include:

1. Employment schedule for pure gravity type of foundation for main masts for various direct leads and bending moments.
2. Employment schedule for all other foundations for various depths of parent soil from the datum level.
3. Sag tension charts for cross feeders for various spans and tensions.

7.5.8. LT.SUPPLY TRANSFORMER STATION DRAWING:

The contractor shall submit for approval to the purchaser drawing for L.T. Supply transformer station, similar to those detailed for switching station in 2.5.7(b). The following drawings may, however, be combined together:

- i) cross section and foundation layout drawing.
- ii) General arrangement, structural and earthing layout drawings.

7.5.9. SCHEDULE OF QUANTITIES:

Within 30 days of issue of letter of acceptance of tender, the Contractor shall assess the quantities of various items of work including various component and fitting as covered in schedule-1 and submit schedule-1 (assess-1) along with the corresponding quantity of various fittings and components included in for approval of the purchaser. Such an assessment shall be revised at suitable intervals after the first assessment is approved till the work is completed. Such re-assessments denominated as schedule-1 (assess-2) (assess-3) etc. shall also be submitted for approval of the purchaser.

On receipt of approval of each final layout plan from the purchaser, the following schedules of quantities relating to each layout plan shall be submitted within a fortnight.

- i) Schedules of nos. of masts, types, weight of different masts and total weight of masts;
- ii) Schedules of no. of foundation, types, volume of different foundations and total value;
- iii) Schedule of quantities of various items of work other than masts and foundation under schedule-1
- iv) Schedule of net tension lengths of contact, catenary and feeder wires and lengths required to be ordered
- v) Schedule of lengths of other wires and conductors required to be ordered
- vi) Schedules of small parts and steel work to be supplied by the purchaser.

7.5.10 SUBMISSION OF DRAWINGS & SCHEDULES:

a) The submission of designs and drawings for approval shall be done in the manner indicated (See also Para-1.2.23)

GENERAL: In case, contractor wish to deviate from standard drawings he should submit to the purchaser revised drawings with full details of deviation sought explaining the necessity of deviation, calculations and other supporting documents. The purchaser, if satisfy about the necessity and adequacy of deviations, shall refer the matter to RDSO for necessary approval. In the case of deviation on working drawing, decision shall be communicated by the purchaser to the Contractor. The no. of copies of drawings, which shall be submitted, is indicated in the following sub-Para. The purchaser will return one copy of the drawing either with approval subject to modification where necessary or with comments. The purchaser shall endeavor to return this copy within a period of 15 days from the date of receipt and shall normally return the copy within a month. Where drawings are returned with comments or approval subject to modifications, the contractor shall submit to the purchaser within 15 days of receipt of such advice revised drawings for approval taking in to account the comments or modifications. Also the contractor shall as far as possible avoid correspondence on such comments endeavor to settle any

difference of opinion on the comments by discussions with the purchaser's engineers. No drawings shall be resubmitted without incorporating the modifications required by the comments of the purchaser, unless the purchaser has agreed to the deletion of such comments.

b) DEVIATION FROM STANDARD DESIGN - In case of deviation from standard designs and drawings copies of correspondence and drawings shall be sent in duplicate to the Chief Electrical Engineer, Eastern Railway, Kolkata, and his successor/nominee (whose address will be intimated in the due course). In the particular case of deviation in the design of fittings the drawings submitted by the contractor shall be actual manufacturing drawings complete with tolerances and full specifications of the materials used. In additions 4 samples of the modified fittings shall also be submitted, after the drawings are approved (see para-1.2.23).

c) SPECIAL DESIGNS - Special designs to meet the requirement of particular locations and local conditions shall be submitted in due time in duplicate for approval.

d) PURCHASER'S PEGGING PLANS - Two copies of the purchaser's pegging plans shall be sent back after verification if found correct. If modifications are required fresh pegging plans incorporating the modifications shall be submitted in two copies for approvals (See Paras-7.5.6).

e) CONTRACTOR'S PEGGING PLANS - When the Contractor is called upon to survey and prepare pegging plans, he shall send three copies of such plans while submitting them for approval.

f) CROSS SECTION DRAWINGS - Cross section drawings shall be submitted for approval in two copies for convenient sections at a time separately for sections within station limits and section outside station limits. Such drawings shall be submitted progressively and as far as possible without gaps (See Para-7.5.6).

g) OHE LAYOUT PLANS AND PROFILE DRAWINGS - Overhead equipment layout plans, provisional and final and profile drawings shall be submitted for approval in 03 copies (See Para- 2.5.6).

h) STRUCTURE ERECTION DRAWINGS:

Structure erection drawings shall be submitted for approval in two copies for a section at a time separately for sections within station limits and sections outside station limits, progressively and without gaps.

i) SCHEDULE OF QUANTITIES - Schedules of quantities for each approved layout plan/switching station shall be submitted for approval in two copies.

j) SUB-SECTION FEEDER DRAWINGS - Deleted.

k) All drawings for switching stations, booster transformer stations and LT supply transformer stations shall be submitted for approval in three copies.

l) DISTRIBUTION COPIES - On receipt of purchaser's un-qualified approval to the Contractor's drawings, schedule of quantities, the Contractor shall submit original tracings of those drawings and schedules for the signature of the purchaser in token of approval within 7 days of the receipt of approval and the purchaser shall as far as possible return the same to the contractor within 7 working days thereafter. On receipt of these tracings from the purchaser, the contractor shall submit copies for distribution to field officers and other departments as indicated below within 7 days of receipt of approved tracings:

i)	Standard designs including fittings, drawings as per Para 9.5.10 (b)	... 8 copies.
ii)	Special designs	... 8 copies
iii)	Final pegging plans	... 8 copies
iv)	Structure cross-section drawings	... 8 copies
v)	OHE layout plans	... 12 copies
vi)	OHE profile drawings	... 8 copies
vii)	Structure erection drawings	... 8 copies
viii)	Deleted	
ix)	Schedule of quantities	... 6 copies
x)	Drawings for switching stations, booster transformer stations and LT transformer stations.	... 9 copies

In all the above cases, the contractor has the option to supply only 06 copies of the approved drawings provided one of them is a transparent paper print.

7.5.11. COMPLETION DRAWINGS AND SCHEDULES:

After completion of works, all drawings and designs submitted by the contractor and approved by the purchaser shall be made up to date incorporation actual supply and erection particulars including the name and make of insulators, galvanized steel tubes, stainless steel wire rope etc. The mark of conductors shall be specified in the "As erected" OHE layout plans, SED and other relevant drawings for identification. Such drawings and schedules shall then be verified and corrected, if necessary, by the contractor jointly with the purchaser's representatives. The verified and corrected drawings shall be supplied in 4 sets including 2 sets of RTF. All as erected drawings shall also be submitted in Compact Disk (CD) in duplicate.

7.5.12. ADDRESSES

Addresses to which designs and drawings should be submitted are indicated in Part-III.

PART-VI
ERECTION AND INSTALLATION OF EQUIPMENT
SECTION 1: PRINCIPLES

<u>PARA NO.</u>	<u>SUBJECT</u>
7.6.1.	Scope
7.6.2.	Method of erection
7.6.3.	Sectioning
7.6.4.	Inspection
7.6.5.	Measurements
7.6.6.	Bolts, nuts etc.
7.6.7	Damage to galvanizing, painting
7.6.8.	Foundations
7.6.9.	Masts and structures
7.6.10.	Overhead equipments
7.6.11.	Isolators
7.6.12.	Bus-bars and connections
7.6.13.	Earthing
7.6.14.	Tolerances
7.6.15.	Supplementary Instructions

SECTION – 2: WIRING PROCEDURE

<u>PARA NO.</u>	<u>SUBJECT</u>
7.6.16	Wiring procedure
7.6.17	General
7.6.18	Erection of brackets
7.6.19	Anti-creep
7.6.20	Locking the regulating Equipment
7.6.21	Temporary arrangement
7.6.22	Stringing catenary
7.6.23	Tensioning of catenary
7.6.24	Clamping the catenary
7.6.25	Dropper
7.6.26	Stringing contact wire
7.6.27	Tensioning of contact wire
7.6.28	Regulating equipment in action
7.6.29	Final adjustment
7.6.30	Concluding remarks & Notes.

PART – VI
ERECTION AND INSTALLATION OF EQUIPMENT
SECTION – 1: PRINCIPLES

7.6.1. SCOPE

This Chapter deals with the methods of erection and installation of traction equipment, including casting of foundations and erection of structures.

7.6.2. METHODS OF ERECTION

All work shall be done in accordance with methods of erection and installation of equipment approved by the purchaser. In the case of switching station, booster transformer stations, L.T. supply transformer stations, standard methods adopted for erection and installation of electrical equipment shall be adopted.

7.6.3. SECTIONING

The entire equipment shall be erected in accordance with the finally adopted sectioning diagram and in such a way so as to facilitate sectioning which may be required in future and which will be indicated by the purchaser.

7.6.4. INSPECTION

All erection and installation work shall be subject to inspection by the purchaser to ensure that the work is done in accordance with the specification approved designs and drawings and is of the best quality suitable for the purpose.

7.6.5. MEASUREMENTS

All measurements for location of structures and foundation shall be made with the aid of steel tapes. On curves, the measurements shall be taken on the outer rail of the middle track in the case of odd number of tracks and on the inner rail of the first outer track from the center of the formation in the case of an even no. of tracks, structures on curves shall be located in the radial offset of the location as determined.

7.6.6. BOLTS, NUTS ETC.

All bolts, nuts, locknuts, screws, locking plates and split cotter pins etc. shall be properly tightened and secured and the contractor shall carry out systematic inspection of this aspect of work after all adjustments to overhead equipment are completed and prior to offering completed sections of equipment to the purchaser for inspection and testing.

7.6.7. DAMAGE TO GALVANISING PAINTING

In loading, transport and erection, all galvanized painted materials shall be handled with care to avoid damage to galvanizing/painting. If galvanizing/painting is damaged in spite of all care taken, the damaged part of component shall be put up for inspection, to obtain permission from the purchaser to carry out repairs as per Para 9.4.11(c).

7.6.8. FOUNDATIONS

(a) The contractor shall carry out soil pressure tests in accordance with methods approved by the purchaser to determine permissible bearing pressure of various representative types of soils in the presence of the purchaser's representative during the pegging out of site inspection. He shall adopt only those values of accepted by the purchaser for the design of foundations.

(b) LOCATION - The location of each foundation or anchor block shall be set out correctly in accordance with approved structure cross-section drawings or foundations layout drawings, as the case may be, in the presence of the purchaser's representative.

(c) METHOD OF INSTALLATION - The Contractor shall adopt mechanized method (concrete mixture) for installation of foundation in the station areas with 5 track lines or more. The contractor may adopt either manual or mechanized method for installation of foundations in the other areas. He may erect traction masts or structures in the same operation as casting of foundations or erect them subsequently in cored holes left in foundation blocks and grout them separately. In any case, the method of casting of foundation blocks and erection of masts or structures shall be subject to the approval of the purchaser.

(d) EXCAVATION - Normally, excavation of soil for foundations or anchor blocks alongside the tracks may be done up to length of 1 to 1.2 m. and depth of 0.8 to 1 m. without shoring, provided the excavated hole is concreted immediately and not left over night, shoring shall otherwise be done unless the hole is refilled with soil and temped. In case the length of excavation is 1 to 1.2 m. and depth of excavation for foundations and anchor blocks alongside the tracks is more 0.8 to 1 m., the excavation may be undertaken only after certification by the purchaser's representative to be safe and concrete is cast on the same day. Shoring shall be done to the satisfactions of the purchaser's representative, if the excavated hole is left overnight. All waterlogged locations will come under the purview of this para. In poor soil or ash banks, no excavation shall be done without adequate shoring and piling. For large foundations and waterlogged locations shoring shall be done in accordance with drawings submitted by the contractor and approved by the purchaser. Shoring/shuttering of the pits should be provided effectively to the satisfaction of the purchaser. Core hole covers should be provided promptly on casting of foundation (within 48 hrs.) and their edges cemented to the foundation blocks. Prior to doing so, water should be filled in the core hole, so as to assist curing. The date of casting should be inscribed on the foundation block. In case of platform areas and level crossings, the core holes should be filled with sand before provision of core hole covers so as to prevent any injury to rail users even if the core hole cover gets damaged or is displaced. The track ballast should be restored to its original from promptly after casting of foundation block. The excavated earth should be removed well clear of the area so as to avoid any mixing up with the track ballast or any obstruction to the track drains. In case of cuttings, the earth should be thrown well away from the shoulders so that there is no risk of its flowing back to the drain during the rains.

(e) CONCRETING - All concreting or grouting shall be done in accordance with Para 7.2.4 with ballast graded for the purpose specified in Para 7.2.5. The concrete shall be poured and temped properly in accordance with the method approved by the purchaser. The Contractor shall arrange to provide concrete testing samples for tests once every week or as and when required by the purchaser, to determine crushing strength after 7 days or 28 days curing as required.

(f) MUFFS - All anchor blocks and foundations of structures carrying overhead equipment shall be provided with concrete muffs. The top of these muffs shall be above the level of ground of the track formation and of adequate height of not less than 15 cm to afford reasonable protection during rainy weather. Muffs may be installed at the same time masts are grouted or after the mast/structure is loaded with equipment. The foundations of structures for switching stations need not, however, be provided with muffs. The top of such foundations shall be given a slope of 1 in 50 towards the edge to ensure that water does not collect at the base of the structure of the framework of the equipment.

(g) Suitable grooves or niches shall be provided in the foundation blocks, wherever required, at the time of casting, to enable embedment of earth strips etc. to avoid the necessity of chipping of concrete.

(h) Conduits for cables should be embedded in the foundation blocks, wherever required, to avoid subsequent chapping off and breaching of the foundation blocks.

7.6.9. MASTS AND STRUCTURES

(a) ERECTION - In case traction masts or structures are erected in cored foundations, till such time they are grouted, they shall be properly wedged to prevent them leaning towards the track and endanger safety of moving vehicles. In case traction masts or structures are erected simultaneously with the casting of the foundations, the contractor shall provide suitable temporary supports approved by the purchaser. The masts shall be embedded in the foundation blocks for the correct length specified in approved drawings.

NOTE: Mast/uprights should be grouted on the same day they are dropped in the foundations.

(b) REVERSE DEFLECTION - All traction masts and structures shall be erected with the correct reverse deflection so that they become reasonably vertical after they are loaded. The method of erection of masts with the correct reverse deflection shall be submitted to the purchaser for approval.

(c) INFRINGEMENT TO STANDARD DIMENSIONS - In erection, care shall be taken to ensure that no part of the traction mast, structure or any fitting located on such mast or structure infringe the schedule of dimensions 1676 gauge printed in metric units in 1978.

(d) ALIGNMENT OF MAST AT GANTRIES - The main masts of gantries shall be carefully aligned to enable easy and good assembly of fabricated steel work.

7.6.10. OVERHEAD EQUIPMENT

- (a) A suggested method for erection of traction overhead equipment, which would ensure good speed, and quality erection, included in section 2 of this part. The Contractor may, however, follow other methods, which they consider would speed up, and ensure good quality work, subject to the approval of the purchaser. Any wiring method should take into consideration appreciable stretch of the catenary and contact wires in the initial days after they are strong and put under tension.
- (b) BRACKET TUBES - In the erection of bracket assemblies, it shall be ensured that the free length of the bracket tube beyond the catenary suspension bracket is at least 200 mm to facilitate adjustment during maintenance.
- (c) STAY ARMS - The choice of stay arms shall be such that their adjuster is capable of adjustments of minimum of 90 mm in either direction except as otherwise relaxed.
- (d) INSULATORS - Before insulators are used in bracket assemblies or dispatched to work site for erection from Contractor's Stores Depot, they shall be tested as specified for routine mechanical test. No chipped or cracked insulators shall be installed. All insulators shall be cleaned before offering complete sections of equipment for inspection and testing.
- (e) STRINGING CATENARY - Care shall be taken to avoid kinking or bird caging of the catenary wire in stringing and subsequent operations. While stringing, the wire shall be suspended from pulley blocks hung from the suspension clamp eye of bracket assembly. The pulleys shall be fitted with ball bearing and shall be of the swiveling type to permit free movement in all directions to prevent damage to the strands of the wire. The design shall also be such that it will prevent slipping off of the wire during stringing operations. The designs of the pulley shall be submitted to the purchaser for approval. After initial stringing of the catenary, it shall be maintained at the 'no load tension' (see Sec.2 of this part) for a minimum duration of 48 hrs. before the pulley blocks are removed and the catenary is clamped to suspension clamps of bracket assemblies. Shorter periods may, however, be allowed by the purchaser.
- (f) STRINGING CONTACT WIRE - Care shall be taken to avoid formation of kinks, twists and damage to contact wire in stringing and subsequent operations. While stringing the contact wire, it shall be suspended from pulleys hung from droppers fitted to the catenary in their final position. In curves, the contact wire shall be run in pulleys located at traction masts or supports, corresponding to the approximate final position of the wire.
- (g) LOCATION OF DROPPERS - Droppers shall be correctly positioned in each span to ensure correct level of contact wire as per dropper chart applicable to the span.
- (h) CLIPPING DROPPERS - The dropper shall be clipped on the contact wire only after a minimum duration of 48 hours from the time the automatic tensioning device is brought into action. Shorter periods may, however, be allowed by the Purchaser.
- (i) AUTO TENSIONING DEVICE - The auto tensioning device shall be erected with the correct height of the counter weight above rail level with corresponding distance between the pulleys of the device for a temperature of 35 degree C before it is connected to the overhead equipment and put into action. The installation of the device shall be such as to permit free, easy and unobstructed movement of counter weight.
- (j) CUT- IN- INSULATORS - All insulators in out of run shall be so positioned that they are away from the swept zone of the pantographs and will not foul with them. The live parts of these insulators shall also be so located that they are at least 2 m. away from structures other than those supporting traction overhead equipment.
- (k) SECTION INSULATORS - All section insulators shall be so located that they are beyond the swept zone of the pantograph running on adjacent tracks and there is no unusual sag due to the same. Where section insulators are installed, the contact plane of the runners of the insulators as well as those of overhead equipment connected to it shall be parallel to the track plane.
- (l) ANTI-WIND CLAMP - Anti-wind clamp shall be provided as shown in drawing (Annexure-1).
- (m) CONNECTIONS - All jumper connections including anti-theft jumpers shall be made properly with parallel clamps and finished neatly without any loose wire or cables. The length of flexible jumpers shall be adequate to avoid any disturbance to overhead equipment or restraint in the relative movement of conductors, but the jumpers should not be excessively long. The ends of jumpers shall be tinned, including the portion inside the first parallel clamp.
- (n) SEPARATION BETWEEN OHE - In erection, the physical separation required between overhead equipments and bracket assemblies on the same structure at insulated overlaps shall be ensured.
- (o) GRADIENT OF CONTACT WIRE - The gradient of the contact wire on either side of over line structures with restricted clearances shall be correctly adjusted and adequate clearance maintained between the over line structures and live equipments.
- (p) ADJUSTMENT AT TURNOUTS ETC. - Careful adjustment of equipment shall be made on equipments at turnouts, crossovers, diamond crossings, overlaps and special locations, for position of bracket assemblies, stay arms and height of contact wire to ensure that pantographs of electric rolling stock on the run will not foul if any parts of the bracket assemblies and changeover of the contact wire is effected smoothly.
- (q) For wiring in large yards, the contractor shall, prior to the execution of works, submit to the purchaser's engineer for the approval the sequence of stringing of catenary and contact wires to arrange for proper crossing of wires. Endeavor will be made to arrange for traffic blocks to suit approved sequence of wiring.

7.6.11. ISOLATORS

Isolator switches shall normally be so mounted that when the switches are operated, the operator faces the directions of the motion of trains. The operating handles and contact blades shall be correctly aligned for easy operation.

7.6.12. BUS BARS AND CONFECTIONS

Bus bars and connections shall be neatly shaped and bent to give a good appearance.

7.6.13. EARTHING

The copper earth strips or MS flats used for earthing shall be bent and shape neatly before connection to the structure or frame work of equipment. The connection of MS flats to steel work shall be made at a height not exceeding 15cm. from the

datum level of a switching station. Before making earth connections the ends shall be cleaned thoroughly and tinned for copper stripes. All junctions shall be properly secured to avoid loose contact. Portions of copper earth stripes, which remain visible above the ground level, should be painted with suitable paint to make them inconspicuous.

7.6.14. TOLERANCE

The permissible tolerance in dimensions for erections from those included in the appropriate drawings or schedules for different items are given below:

- (a) MEASUREMENTS - The span length shall not vary more than 50 mm as measured along the appropriate rail (see Para 9.6.5). The cumulative error of measurement of all spans in a km. shall be not more than 1000 mm.
- (b) SETTING OF STRUCTURES - The setting of structures shall be not less than that included in the appropriate cross section drawings, especially those with the minimum setting of 2.36 m. A tolerance ± 20 mm will be permitted subject to minimum specified value, if the structure is not located in between tracks.
- (c) HEIGHT OF CONTACT WIRE - 20 mm will be permitted on the height of contact wire at points of supports as shown in the relevant structure erection drawings, except under over-line structures where no tolerance will be permitted.
- (d) STAGGER - Generally ± 20 mm will be permitted for stagger.
- (e) DROPPER LENGTHS - ± 5 mm will be permitted for dropper lengths.
- (f) DROPPER LOCATION - ± 100 mm will be permitted for dropper locations.

7.6.15. SUPPLEMENTARY INSTRUCTIONS

Further working instructions will be issued if considered necessary by the purchaser should be considered that the standard of work of the contractor requires to be improved.

SECTION 2: WIRING PROCEDURE

7.6.16. WIRING PROCEDURE

These sections deal with wiring procedure, which may be adopted for erections of normal overhead equipment.

The following procedure for erection of overhead equipment has been formulated with a view to ensure that

- (i) Bracket assemblies (brackets) and regulating equipment are correctly installed in their final position.
- (ii) The conductors are correctly tensioned, and
- (iii) The need for final adjustments of overhead equipment immediately before energisation and commissioning is virtually eliminated.

7.6.17. GENERAL

In the case regulated overhead equipment when the regulating equipments are in action, the tension in the conductors should remain constant, irrespective of variations in the ambient temperature. As the regulating equipments are brought into action a few days after the stringing of conductors the equipment is unregulated in the intervening period. Any of the following two procedures may be followed for tensioning and clamping of conductors of regulated overhead equipment during stringing operating, i.e. before the regulating equipments are brought into action.

- (i) The catenary is tensioned to 1000 kgf, the stipulated tension at the mean temperature of 35 degree C, whatever may be the ambient temperature during the stringing operations. In this case, at the time of clamping the catenary to the bracket, the bracket should be placed at angular positions corresponding to temperature at the time of clamping, and proportionate to their distance from the anti-creep.
- (ii) The aluminium catenary is tensioned at the calculated tension to correspond to 1000 kgf, the stipulated tension at the mean temperature of 35 degree C whatever may be the ambient temperature during the stringing operations.
- (iii) The catenary is strained to a stringing tension corresponding to the ambient temperature for the equipment span of the tension length. In this case, the brackets are placed in the mean position, i.e. at right angles to the track, when the catenary is clamped or the regulating equipment commissioned.

The advantage of the second method is that once the catenary is strung at the proper tension, there would be no necessity to adjust each bracket separately at the time of clamping the catenary of commissioning the regulating equipment. The erection work is, thus considerably simplified and the possibility of errors greatly reduced. This is also applicable to erection of unregulated overhead equipment.

7.6.18. ERECTION OF BRACKETS

After the brackets are fabricated correctly in the contractor's depot, in accordance with the approved structure erection drawings, and provided with indelible labels or /painted marking indicating the intended locations for each bracket, they are removed to the site of work and erected on traction masts or supports. The brackets are swiveled to a position at the right angles to the track and secured in that position by means of steel wires tied to similar brackets located on the opposite site of the track for other suitable means.

7.6.19. ANTICREEP

The anti-creep of the tension length installed in its final positions.

7.6.20. LOCKING THE REGULATING EQUIPMENT

In the case of regulated overhead equipment, the regulating equipments are erected on the terminal masts or structures and their movement locked by suitable means in the middle position, with the distance between the pulleys of the regulating equipment corresponding to 35 degree C.

7.6.21. TEMPORARY ARRANGEMENT

A pulley approximate 30-cm. dia. is attached to the overhead equipment and of the regulating equipment by means of temporary accommodation fitting at both ends of the tension length to be wired. Over this pulley his flexible stranded wire is passed over. At each end of the wire two ending clamps, one for catenary and one contact wire are attached. The wire is also clipped in the middle by "U" clamps. The length of this temporary arrangement from the regulating equipment to the

extremities of the stranded wire passing over the temporary pulley shall be a little longer than the distance between the regulating equipment and ends of the catenary and contact wire is their final position, to permit easy clamping of terminal fittings during the final termination of the wire.

7.6.22. STRINGING CATENARY

The catenary is initially terminated in the ending clamp of the temporary arrangement at one end of the tension length. The catenary is then paid out from the reel of the wiring train and run on pulley blocks hang from the suspensions clamps eyes of bracket until the terminating point at the other end of the tension length is reached.

7.6.23. TENSIONING OF CATENARY

The catenary is strained up to the stringing tension corresponding to the equivalent span of the tension length and the ambient temperature at the time of stringing with the aid of a dynamometer, and terminated at the tension. For this purpose, the ambient temperature shall be deemed to the temperature register by a thermometer tied to a length of catenary wire 3 to 4 mts. Long, laid flat on the top platform, on one of the wagons of the wiring train. Subsequently the tension in the wire is checked by measurement of sag with the help of leveling the attached to suspensions points and to the catenary at mid span by ladder working party. The sag shall be measured in two spans, each preferably greater than 54 mts., and situated on either side of anti-creep approximately mid way between the anti-creep and the termination point. The value of sag measured by this method should be within $\pm 5\%$ of the theoretical value for the corresponding string tension, and the temperature at the time of this measurement in case the discrepancy is more the tension should be adjusted and sag re-checked as above (See note-1). After the sag is checked the catenary is terminated at the ending fitting of the temporary arrangement at the terminating point.

In order to restrict the duration of traffic block to the minimum into first block, the catenary is strained to the stringing tension with the aid of dynamometer and the catenary is terminated. In the subsequent block, the sag is checked and the tension readjusted with ladders, if necessary.

7.6.24. CLAMPING THE CATENARY

The catenary is clamped on the bracket placed at right angles to the track (See note-2, Para- 7.6.30).

7.6.25. DROPPERING

Droppers are fitted to the catenary at the correct locations at the contact wires ends this dropper may be provided with small pulleys or hooks to act as temporary support when the contact wire is strung.

Hooks made of scrap contact wire, suspended from the catenary wire, may also be used as temporary supports.

7.6.26. STRINGING CONTACT WIRE

The contact wire is initially terminated in the contact wire ending clamp of the temporary arrangement at one of the tension length. The wire is then paid out from the reel wagon of the wiring train and supported on the pulleys hang from dropper or on hooks until the terminating point at the other end of the tension length is reached (See note-3). In curves, the contact wire shall be registered on pulleys located at traction masts or support corresponding to the approximate final position of the wire. The axes of the pulleys should be more or less vertical.

7.6.27. TENSIONING OF CONTACT WIRE

The contact wire is strained to a tension of approximately 1.2 times the tension corresponding to the ambient temperature and the terminated in the ending clamp of the temporary arrangement.

7.6.28. REGULATING EQUIPMENT IN ACTION

The regulating equipment is put in to action with the counterweight at the correct height above rail level and with distance between pulleys or the regulating equipment corresponding to a temperature of 35 degree C. The regulating equipment is then released and brought into action. The "U" clamp connecting the flexible stranded wire passing round the temporary pulley is also removed.

7.6.29. FINAL ADJUSTMENT

The entire installation is left in this condition as long as it is possible, preferably for a period not less than 15 days (See note -4). The temporary pulleys are removed and the conductors terminated in the permanent ending fittings, compensating plates, insulator and term buckles (See note-5). The equalizer plate is kept vertical or at a slightly inclined position (by 2 or 3 cm. the contact wire being shorter than the catenary) and the position of the regulating equipment is checked in relation to, the temperature at the time. The contact wire is clipped on to the droppers (in the vertical position) and on the steady arms. Contact wire height at the bracket is adjusted as also the stagger and register are arm clearance.

7.6.30. CONCLUDING REMARKS

If the above method is followed with care no further adjustment may be needed.

NOTE: 1. It should be ensured that sagging is done carefully and accurately. The adjustment of tension in the catenary after checking of sag, if required, would be easy if a temporary turnbuckle is inserted in the temporary termination.

The use of leveling lathes is recommended for the following reasons:

- (i) The accuracy of adjust is greater than that with a dynamometer.
- (ii) No traffic block is required for this operation.
- (iii) It obviates the necessity initial tension of the catenary accurately thus permitting a reduction in the period of traffic block required for the wiring train.

2. If feasible, without any hindrance to progresses of works, the catenary may be maintained at stringing tension for a period of 48 hrs. before checking sag and clamping it to the brackets. This would ensure equalization of tension in different spans. Before clamping the catenary to the brackets, the sag should however be checked in to spans as indicated in Para- 7.6.23.

3. It is difficult to obtain a separate traffic block for stringing contact wire the wire may be paid out at the same time, as the catenary with the following precaution.

- (i) The contact wire is run and suspended from independent pulleys hooked on to the brackets. Separately from the catenary pulleys, to avoid twisting together of the two conductors. The contact wire should not be suspended from the catenary until the latter is clamped on the brackets.
 - (ii) The tension in the contact wire before termination should be about 1500 Kgf. This will ensure that sag is not excessive.
 - (iii) The adjustment of tension and checking of sag of the catenary wire is carried out as if the contact wire had not strung. Only after adjustment of tension and checking of sag is completed, the contact wire is transferred to the pulleys attached to the droppers or to hooks suspended from the catenary and the tension is adjusted as indicated in Para-7.6.27.
4. When the contact wire is under tension creep takes place which results in an increase in the length of wire and consequently the droppers and the equalizer plates would become oblique. Though creep may continue for a long time about a year, the bulk of it would occur during the days following stringing. If sufficient period of time is allowed the contact wire may be clipped to the droppers and the equalizer plates, all in the vertical position and the necessity for any further adjustment before energisation and commissioning of the OHE may be reduced to a great extent. If this precaution is not taken, at the time of energisation of the OHE, the droppers may not all be vertical and staff would have to be detailed for shifting the dropper clips which is attendant with risk of damage to the contact wire.
5. Before the temporary arrangement is removed a reference mark should be made on each conductor. After final termination of the conductor it should be ensured that two marks are in the same relative longitudinal position as they were before the removal of the temporary arrangement.

PART – VII INSPECTION AND TESTING

<u>PARA NO.</u>	<u>SUBJECT</u>
7.7.1	Scope
7.7.2	Overall performance
7.7.3	Responsibility
7.7.4.	Tests on overhead equipment
7.7.5	Inspection and Testing of Switching Station
7.7.6	Earthing
7.7.7	Detailed procedure for tests

7.7.1. SCOPE

This chapter deals with the inspection and testing of completely erected overhead equipment, switching station, booster transformer station and L.T. transformer stations supply as provided in Part-I.

7.7.2. OVERALL PERFORMANCE

The overall performance of the overhead equipment should be such as would permit collection of current by electric rolling stock with full load at speeds, up to and including the maximum specified for the design of overhead equipment, smoothly, without mechanical shocks or prejudicial sparks (See Para 9.1.10) and without under heating in the case of other equipment.

7.7.3. RESPONSIBILITY

The general tests of overall performance stipulated below and only supplementary to other tests on structures, foundations, equipment, components and fittings as specified in Chapter -IX, part – II, III & IV. Any testing and acceptance by the purchaser of overall performance shall be subject to the general terms of guarantee which shall continue to be valid.

7.7.4. TESTS OF OHE

- (a) GENERAL - As soon as a section is ready for inspection and testing the contractor shall advise the purchaser in writing. Test to be carried out by the purchaser will be done in presence of the contractor's representative and shall include the following apart from the other reasonable tests that the purchaser may like to conduct with a view of ensure, himself of the soundness of the equipments and their erection in strict compliance with the specifications.
 - (b) INSULATION - The strength of the insulation and the dielectric strength of the entire equipment as installed shall be tested with a 2500 volt Megger.
 - (c) CONTINUITY - The electrical continuity of the line and existence of bad contracts, if any will be tested with a Megger.
 - (d) ELECTRICAL INDEPENDENCE - The electrical independence of individual elementary sections in relation to one another shall be tested with a Megger
 - (e) SWITCHES - All isolators shall be tested for smooth and trouble free operation.
 - (f) TENSION DEVICES - All automatic tensioning devices installed shall be tested for sensitive functioning and adjustment.
 - (g) STAGGER AND HEIGHT - The stagger and height of contact wire over the entire section of completed overhead equipment and the clearances available shall be measured and the measurement shall be checked against approved drawings. These measurements shall be carried out at low speed with a vehicle or device to be arranged by the purchaser, the movement of which will follow the track levels as closely as possible. Tolerances that will be permitted on the dimensions indicated in the approved drawings are shown in Chapter –IX, part-VI.
- The actual position of the two contact wires, relative to each other, at overlaps and turnouts shall also be checked. Special attention shall be paid to a smooth movement of pantographs over section insulators, particularly those that are likely to be frequently traversed.

- (h) MECHANICAL BEHAVIOUR - Mechanical behavior of the entire equipment shall be tested at various speeds under normal pantographs pressure without energizing the overhead equipment.
- (i) ENERGISING - If the overhead equipment, after being subjected to the above test in an un-energized condition, is found to be satisfactory, it will be energized with the normal 25 KV AC supply.
- (j) POWER COLLECTION - Tests shall then be conducted to check if the power collection performances of the overhead equipment satisfactory after ensuring that the contact wires are adequately clean. For the purpose and observation core shall be attached next to the electric locomotive. The behavior of the overhead equipment will be watched at various speeds. Power collection shall be considered unsatisfactory if a long blue flash is observed, indicating that the contact between the contact wire and the pantograph is not continuous.

7.7.5. INSPECTION AND TESTING OF SWITCHING STATION ETC.

(a) GENERAL - As soon as a switching station, booster transformer station or L.T. supply transformer station is ready for inspection and testing, the contractor shall advise the purchaser in writing. Testing will be carried out by the purchaser at contractor's cost jointly with the contractor. These shall include the tests, which the purchaser may like to conduct with a view to assure him of the soundness of the equipments and their erection in compliance with these specifications. However, testing equipments such as those indicated below and staff required for the tests shall be provided by the contractor free of charge.

- (i) Oil testing equipment.
- (ii) 2500 V and 500 V megger.
- (iii) Earth meager and accessories.
- (iv) Continuity test apparatus.
- (v) Avometer/Multi-meter.

The contractor shall take full responsibility for these tests inter-alia his other responsibilities.

(b) VISUAL INSPECTION - Visual inspection, which shall include check for satisfactory workmanship, shall cover all conditions, painting, plastering, cleanliness of all insulators etc. and compliance with Indian Electricity Rules.

(c) OPERATION TEST - This test will be conducted on every individual items of equipments such as interrupters, isolators, relays etc. to ensure that the equipment as a whole is functioning properly and is mechanically sound i.e. in the particular case of isolators the fixed contact and knife blade have been correctly aligned and operation does not cause undue strain on the equipments. The operation test will be carried out with the high-tension installation disconnected from the supply, but by actuating power devices where shall be provided. Continuity test of high-tension connections after setting such interrupters and isolators in their respective positions shall also be conducted as per of the operation test.

(d) INSULATION - The strength of insulation of the various items of equipment and of the entire installation as a whole shall be tested with a 2500V/500V meager or as required.

(e) DI-ELECTRIC STRENGTH OF OIL - The di-electric strength of the oil of the Booster transformer & LT supply transformer, at each station shall be tested before commissioning in accordance with IS: 335-1983 should this be found not correct, the Contractor shall arrange at his own expenses to have it rectified.

(f) ISOLATORS - All isolators will be tested for smooth and trouble free operation.

(g) INTERRUPTORS - Operation of trip and close coils for interrupters shall be tested for satisfactory performance with the respective equipments de-energized.

7.7.6. EARTHING

- (a) Earth wires will be checked for continuity and electrical isolation every 1000 m approx.
- (b) Clearances between earth wires and out-of-run wires of overhead equipment and signals shall be checked.
- (c) Earth resistance shall be measured separately for each earth electrode. In the case of interconnected earth electrodes, the net resistance of the interconnected electrodes shall also be measured.

7.7.7. DETAILS PROCEDURES FOR TESTS

The detail procedure for inspection and testing will be furnished to the contractor. The contractor shall submit the results of tests in the proforma which will be furnished by the purchaser, in quadruplicate.

PART – VIII PARTICULAR SPECIFICATIONS

<u>PARA NO.</u>	<u>SUBJECT</u>
7.8.1	Introduction
7.8.2	Location
7.8.3	Tracks to be equipped
7.8.4	General particulars
7.8.5	Climatic data
7.8.6	Rolling stock
7.8.7	Over dimensional consignments
7.8.8	Power supply
7.8.9	LT supply transformer station
7.8.10	Type of OHE
7.8.11	Pegging plans
7.8.12	Traction sub-station feeders
7.8.13	Track circuits
7.8.14	Labour and materials

7.8.15	Contractor's office
7.8.16	Contractor's depot and work
7.8.17	Duration of traffic blocks
7.8.18	Addresses
7.8.19	Quantities

PART – VIII PARTICULAR SPECIFICATIONS

7.8.1. INTRODUCTION

This part of the specification is complementary to Part-I

7.8.2. LOCATION

The section is located within entire Sealdah Division.

7.8.3. TRACKS TO BE EQUIPPED

The routes and track lengths of the sections to be equipped with overhead are as under:

SECTION

TKM

As mentioned in the NIT

As mentioned in the NIT

7.8.4. GENERAL PARTICULARS

(a) The sections are generally passes through open country in domestic area. The soil character strips of the entire area are generally normal soil. The type of soil ranges from normal to filled up soil. The bearing capacity of the soil is likely to vary from 5500 to 11000 Kgf/Sqm. The actual bearing capacity, shall, however, be determined in accordance with part-II.

(b) ACCESS TO ROAD

The section is located within entire Sealdah Division.

(c) Remodeling works affecting the tracks to be wired will be intimated as a when the work is planned/commenced at various stations.

7.8.5. CLIMATIC CONDITIOSN

(a) TEMPERATURE - For the overhead equipment which will be in open space a minimum temperature of 4 degree C and the maximum temperature of 65 degree C are to be considered. The mean temperature shall be taken as 35 degree C.

(b) RAINFALL - Rains occur generally from June to November. The average rainfall during the monsoon season is approx. 135 cm annually.

(c) HUMIDITY - The maximum relative humidity is nearly 50% to 95%.

(d) THUNDER STORMS - The region is subject to thunder storms during monsoon from June to September.

(e) WIND PRESSURE - This section falls in the Red Wind Pressure zone (IS: 875). Accordingly, the basic wind pressure 150 Kgf/Sqm. In terms if IS 875:87 amendment is to be adopted. Increased wind pressure is to be adopted on embankments more than 10 m i.e. 200 Kgf/Sqm. The Confirms with the wind pressure adopted by state Electricity Board for the design of their EHT transmission lines.

7.8.6. ROLLING STOCK

Electric locomotives with height not exceeding 4.165m their pantographs in the locked down position and Diesel locomotives 4.42m (14ft.6inch.) high would run on this section.

7.8.7. OVER DIMENSIONAL CONSIGNMENTS

The maximum height of over dimensional consignment which runs on this section is 4.80m (15'9") with movement to specified lines.

7.8.8. POWER SUPPLY

Electric power will be supplied to the overhead equipment from adjacent/nearest FP/TSS on its completion.

7.8.9. L.T. SUPPLY TRANSFORMER STATIONS

Pole mounted auxiliary transformers will be installed for giving power supply to colour light signaling, repeater stations, switching stations, traction sub-stations, MEMU Shed and some other places as required by the purchaser In double line section, important stations, 1No. Auxiliary transformer will be provided at each station to be fed from one different elementary section.

7.8.10. TYPE OF OHE

The overhead equipment used will normally be of regulated conventional type. The regulated Tramway Type will be used for yards and sidings and semi-regulated in cross-overs.

7.8.11. PEGGING PLANS

See Chapter -VII, part-V.

7.8.12. TRACTION SUB-STATION FEEDERS

25KV feeders from traction sub-stations to feeding posts are not envisaged at present.

7.8.13. TRACK CIRCUITS

Track circuits are to be provided by S&T and Civil Engg. Depts.

7.8.14. LABOUR AND MATERIALS

Unskilled labour is available almost all over the section while skilled labour would be available generally at the main towns in the section.

7.8.15. CONTRACTOR'S OFFICE

It is obligatory on the part of the contractor to establish an office at the HQs of Chief Electrical Engineer, Eastern Railway, Kolkata, for planning, design and for expeditious finalization of particular designs and working drawings. The office should be headed by a qualified engineer whose credentials shall be approved by the purchaser engineer. In addition, the contractor will have to establish field construction offices at convenient and approved locations for co-ordination and progressing of field works.

7.8.16. CONTRACTOR'S DEPOT AND WORK TRAINS

Suitable space shall be made available for the contractor to set up one main depot for the work. The exact location will be advised later on for work trains. However, additional work trains may be made available at the request of the contractor, if considered necessary by the purchaser to suit the time schedule for completion of works.

7.8.17. DURATION OF TRAFFIC BLOCKS

(a) Track occupation may be granted at any time during day or night to suit convenience of traffic operations and will ordinarily be granted on one track at time over a distance covered by one or two consecutive block sections. Work trains will normally be allowed to take advantage of block shadows. Normally, the total durations of block on any section will be maximum of 2 to 3 hrs. in a day for all the tracks in the section taken together, the total of blocks on any track being limited to 2-3 hrs. in a day. Block provided may be utilized for one or more work trains or track lorries or ladder trolleys to suit convenience of work.

(b) Material train and blocks will not ordinarily be given for paying out the feeders except where crossing of track is involved which will have to be paid out manually generally. However, material train can be used to drop the feeder drums alongside the track. The contractor shall however arrange to get the drums dropped to the maximum possible extent by road.

(c) For purpose of Para 1.2.27(d), the work train block hours shall be taken as 6 per TKM. For purpose of Para 1.2.28(c), the total block hours for completion of works shall also be taken as 5 per TKM.

7.8.18. ADDRESSES

The list of addresses, to which correspondence and documents relating to the contract should be sent, is as under:-

(i) For all policy, contractual and commercial matters:

(a) Prior to the award of contract:

The Chief Electrical Engineer, Eastern Railway, Kolkata-700001 or his successor/nominee.

(b) After the award of Contract:

Senior Divisional Electrical Engineer/Traction Distribution, Eastern Railway, Sealdah.

(ii) For Performance Guarantee:

The Financial Adviser and Chief Accounts Officer, Eastern Railway, Kolkata or his successor/nominee

(iii) For matters relating to particular design and working drawing:-

Senior Divisional Electrical Engineer/Traction Distribution, Eastern Railway, Sealdah

(iv) For matters relating to basic design and drawings for fittings, components equipments and prototype tests:-

The Director General (TI),
Research Designs and Standard Organisation,
Manaknagar, Lucknow – 226 001.

(v) Matters relating to progressing of field work, scheduling of quantities and submission of bills:

Senior Divisional Electrical Engineer/Traction Distribution, Eastern Railway, Sealdah

7.8.19. QUANTITIES APPROXIMATE

The approximate quantities for various items of OHE work mentioned in schedule of works (Uploaded Separately at ireps portal).

PART – IX**LIST OF STANDARD DRAWING & SPECIFICATION**

This Annexure contains reference to drawing numbers, charts, schedule specification and other data referred to in various paragraphs of the tender paper.

All references to drawings, charts, schedules or specifications given in the Annexure shall be taken to the latest revisions of such drawings, charts and schedules or specifications as issued by purchaser.

A. LIST OF STANDARD DRAWINGS:

Sl. No.	Brief Description	Drawing		Mod. No.
		Series	Number	
1	Extra allowance for settings of structures on curves (1676/ETI/OHE/G mm. broad gauge).	ETI/OHE/G	00111 Sch-1	C
2	Standard setting of structures in the vicinity of signals (broad gauge).	- do -	00112	D
3	Typical design of side bearing foundation.	- do -	00131	---
4	Typical design of new pure gravity foundation.	ETI/SK/C	131	---
5	Typical design of side gravity foundation (SPC 8000 Kgf/m ²	- do -	142	---
6	Typical design of cantilever masts.	RE/33/G	00141 Sh.3	---
7	Standard drilling schedule of OHE mast 9.5 m long RSJ and BFB	ETI/OHE/G	00144 Sh.3	C
8	Span and stagger chart for conventional OHE, wind pressure 75, 112.5 and 150 Kgf/m ² .	- do -	00202	---
9	Employment schedule for cantilever masts regulated OHE (wind pressure 75 Kgf/m ²) (Catenary 65 / Cu contact wire 107/ Cu) OHE only.	ETI/C	0702 Sh.1	B
10	Employment schedule for cantilever masts regulated OHE with earth wire (wind pressure 75 Kgf/m ²) (Catenary 65/ Cu. Contact wire 107/ Cu.) OHE + EW.	ETI/C	0702 Sh.2	B
11	Employment schedule for cantilever masts regulated OHE with return	ETI/C	0702 Sh.3	B

	conductor and without earth wire (wind pressure 75 Kgf/m ²) (Catenary 65/ Cu. Contact wire 107/ Cu.)			
12	Employment schedule for cantilever masts regulated OHE with return conductor and with earth wire (wind pressure 75 Kgf/m ²) (Catenary 65/ Cu. Contact wire 107/ Cu.) OHE+EW+RC	ETI/C	0702 Sh.4	B
13	Employment schedule for cantilever masts regulated OHE with return conductor (wind pressure 112.5 Kgf/m ²) (Catenary 65/ Cu. Contact wire 107/ Cu.) OHE+RC	ETI/OHE/G	00153 Sh.1	F
14	Employment schedule for cantilever masts regulated OHE with return conductor and without earth wire (wind pressure 75 Kgf/m ²) (Catenary 65/ Cu. Contact wire 107/ Cu.)	ETI/C	0702 Sh.3	B
15	Employment schedule for cantilever masts regulated OHE with return conductor, with earth wire (wind pressure 112.5 Kgf/m ²) (Catenary 65/ Cu. Contact wire 107/ Cu.) OHE+RC+EW	ETI/OHE/G	00153 Sh.2	F
16	Employment schedule for cantilever masts regulated OHE with return conductor, with earth wire (wind pressure 75 Kgf/m ²) (Catenary 65/ Cu. Contact wire 107/ Cu.) OHE+EW+RC	ETI/C	0702 Sh.4	B
17	Employment schedule for cantilever masts unregulated OHE without return conductor and without earth wire (wind pressure 112.5 Kgf/m ² at 35 degree C and 28 Kgf at 4 degree C) (Catenary 65/ Cu. Contact wire 107/ Cu.)	ETI/OHE/G	00154	D
18	Employment schedule for cantilever masts unregulated OHE without return conductor and without earth wire (wind pressure 75 Kgf/m ² at 35 degree C and 28 Kgf at 4 degree C) (Catenary 65/ Cu. Contact wire 107/ Cu.)	ETI/C	0702 Sh.5	B
19	General distribution of droppers.	ETI/OHE/G	00161	---
20	Outline of pantograph (broad gauge and m. gauge).	RE/33/G	00181	A
21	Employment schedule for OHE masts (9.5) overlap central location with 3.0 m./implantation (wind pressure 75 Kgf/m ²) (Catenary 65/Cu contact wire 107/ Cu.)	ETI/C	0709	A
22	Employment schedule for OHE masts (9.5) overlap central location with 3.0 m./implantation (wind pressure 112.5 Kgf/m ²) (Catenary 65/Cu contact wire 107/ Cu.)	ETI/C	0710	A
23	Employment schedule for OHE masts (9.5) overlap central location with 3.0 m./implantation (wind pressure 75 Kgf/m ²) (Catenary 65/Cu contact wire 107/ Cu.)	ETI/C	0711	A
24	Employment schedule for 9.5 mtr.200x200x49.9kg mast(wind Pr.75kgf/m ²)(Caty.65/Cu Contact wire 107/cu.	ETI/C	0713	B
25	Employment schedule for 9.5 m. 200 x 200 x 49.9 Kg. masts (Wind pressure 112 Kgf/m ² .) (Catenary 65/Cu contact wire 107/Cu.)	ETI/C	0714	B
26	Employment schedule for OHE mast (9.5 m.) WP 75 Kgf/m. overlaps anchor location with 3.0 m. implantation.	ETI/C	0715	A
27	Employment schedule for OHE mast (9.5 m.) WP 112.5 Kgf/m. overlap anchor location with 3.0 m. implantation.	ETI/C	0716	A
28	General formation of single track embankments and cutting (broad gauge).	RE/33/G	01101 Sh.1	A
29	General formation of double track embankments and cutting (broad gauge).	RE/33/G	01102 Sh.1	A
30	General formation of multiple tracks BG.	RE/33/G	01103 Sh.1	A
31	Standard anchor arrangement	RE/33/G	01401	E
32	Anchor arrange with dwarf mast	ETI/OHE/G	01402	B
33	Schedule of anchor blocks for BG track.	ETI/OHE/G	01403 Sh.1	D
34	Double guy rod arrangement with anchor block for BG track.	ETI/OHE/G	01403 Sh.2	C
35	Schedule of anchor blocks for BG track (black cotton soil)	ETI/OHE/G	01403 Sh.3	B
36	Rock anchor for BG track.	ETI/SK/G	208	---
37	Standard guide tube arrangement of mast and structures	RE/33/G	01501	B
38	Arrangement of antitheft guide tube.	ETI/OHE/S K	440/1	---
39	Trapezoidal counterweight and arrangement of OHE structure	ETI/OHE/G	01302	---
40	Arrangement of 3 KV and 25 KV pedestal insulators support on OHE mast and portals.	- do -	01601	---
41	Standard arrangement for mounting of no. plate on OHE structures.	ETI/OHE/G	01701	A
42	Schematic arrangement of regulated overhead equipment	- do -	02101	A
43	Typical arrangement of OHE on cantilever masts for double track	- do -	02102	---

	section.			
44	Typical arrangement for fixing of bracket assembly on 9.5 m mast and structure to suit raising of track (in future).	- do -	02102 Sh-3	---
45	Mast on platform BG.	- do -	02104 Sh.1	A
46	Details of bracket arrangement on tangent and curve track.	- do -	02106 Sh.1	A
47	Details of bracket arrangement for OHE (high speed)	- do -	02106 Sh.3	C
48	Single bracket assembly on structure and dropped arms.	RE/33/G	02107	D
49	Box type cantilever arrangement.	ETI/OHE/G	02108	A
50	Arrangement of anti-creep	- do -	02111	A
51	Standard cantilever arrangement for boom anchor and anti-creep location	- do -	02113	---
52	Schematic arrangement of un-insulated overlap (Type-I)(3 & 4 span overlaps.)	-do-	02121 Sh.1	F
53	Schematic arrangement of insulated overlap.	- do -	02131 Sch-1	---
54	General arrangement of regulated OHE at turn out (overlap and cross type)	ET/OHE/G	02141	C
55	General arrangement of regulated OHE at cross over (overlap and cross type)	-do-	02151	---
56	Arrangement of neutral section.	ETI/OHE/G	02161 Sh.1	C
57	Arrangement of short neutral section.	- do -	02161 Sh-2	---
	Arrangement of Neutral section assembly (PTFE type) at Switching station.	-do-	02162	---
58	Schematic arrangement of un-regulated overhead equipment.	-do-	03101	---
59	Standard termination of OHE (regulated and unregulated)	- do -	03121	E
60	General arrangement of unregulated OHE at turn out (overlap and cross type)	ETI/OHE/G	03151	----
61	General arrangement of unregulated OHE at cross over and diamond crossing (overlap and cross type)	- do -	03152 Sh.1	---
62	General arrangement of unregulated OHE at diamond crossing.	- do -	03152 Sh.2	---
63	General arrangement of head span.	- do -	03201	---
64	General arrangement of pull off.	- do -	03301	A
65	In span jumper connection between catenary and contact wire	- do -	05101	---
66	Continuity jumper connection at un-insulated overlap	- do -	05102	C
67	Arrangement of antitheft jumper	ETI/OHE/S K	432	---
68	Connection at turn out.	ETI/OHE/G	05103	B
69	Potential equalizer connection at insulated overlap and neutral section.	- do -	05104	---
70	Connection at diamond crossing	- do -	05106	A
71	General arrangement of connection to OHE by copper cross feeder 150.	- do -	05121 Sh.1	C
72	General arrangement of connection at switching stations on double track section by copper cross feeder (150).	- do -	05122 Sh.1	C
73	General arrangement of connection at switching stations on multiple track section by copper cross feeder (150).	ETI/OHE/G	05123 Sh.1	C
74	Suspension of 25 KV feeder (Spider on OHE mast)	- do -	05143	B
75	Termination of feeder return conductor and return feeder (copper and aluminium).	RE/33/G	05145-1	A
76	Arrangement of suspension of double spider 25 KV feeder and return between substation and feeding station.	- do -	05152	C
77	Assembly of section insulators.	RE/33/G	05181	C
78	General arrangement of earth wire on OHE mast.	ETI/OHE/G	05201	A
79	Arrangement of transverse bonds.	-do-	05251	A
80	Suspension arrangements of Aluminium return conductors (Spider) on traction structures.	ETI/OHE/G	05307	B
81	Connection of return conductor to track.	-do-	05306	F
82	Suspension of return conductor (Spider) from booms of structures.	-do-	05311	D
83	Connection between OHE and aluminium return conductor at booster stations.	-do-	05413	B
84	Mounting of 25KV Isolators on OHE structures General arrangement.	-do-	05513 Sh.1	A
85	Anchor assembly on "N" and "O" type portal upright.	ETI/OHE/P	3250	D
86	Structure bonds.	-do-	7000	E
87	Earthing Station.	-do-	7020	B
88	Longitudinal rail bond.	-do-	7030	F
89	Short supper mast assembly.	ETI/C/P	8010	G
90	Long super mast assembly.	-do-	8020	C
91	Bracket attachment assembly on portal upright (N, O, R, G and double	-do-	8030	B

	BFB type).			
92	Supper mast assembly on portals.	-do-	8050	C
93	Medium supper mast assembly.	ETI/OHE/P	8060	C
94	Standard portal (N, O, R, G and double BFB type).	ETI/C	0064	---
95	Volume chart and equivalent chart of foundation.	-do-	0058 Sh.1	E
96	Volume chart and equivalent chart of foundation for new pure gravity.	-do-	0058 Sh.2A	D
97	Dwarf mast foundation for loose soil (SBC-5500 kgf/sq.mtr.)	-do-	0014/70	A
98	Special BFB portal for 5 tracks (General arrangement).	- do -	0026 Sh.1	C
99	Protective screen at foot over and road over bridge.	- do -	0068	F
100	Chart for portal foundations.	- do -	0005/68	---
101	Muff for OHE structures	- do -	0007/68	E
102	Structure muff for sand core foundation	- do -	0012/69	E
103	Details of remote control cubicle (foundation RCC and steel door)	- do -	0067	B
104	9.5 m. standard traction mast (fabricated "K" series.)	- do -	0018-2	D
105	9.5 m. standard traction mast (fabricated "B" series.)	- do -	0071	E
106	Typical side bearing foundation on banks.	- do -	0023/70	A
107	Details of foundation for fencing upright	ETI/C	0032	B
108	Typical location and schematic connection diagram for a three interrupter	ETI/PSI	003	C
109	Typical general arrangement of three interrupter switching station	- do -	004	F
110	Typical location plan and general arrangement for switching and paralleling station.	- do -	005	F
111	Typical location plan and general arrangement for a feeding station	- do -	006	E
112	Typical general arrangement of booster transformer station (without cross feeder) type-I	- do -	011	---
113	Arrangement of mounting 25 KV/230 V 10 KVA LT supply transformer.	- do -	036	---
114	Typical location plan and general arrangement for sectioning and paralleling station.	- do -	005	F
115	Employment schedule for switching and booster station main masts.	ETI/C	0185	B
116	Drilling schedule for S-1 mast.	- do -	0030	F
117	Drilling schedule for S-2 mast.	- do -	0031	D
118	Drilling schedule for S-3 mast (length 11.4 m.)	- do -	0180	C
119	Drilling schedule for 8"x 6" x 351 RSJ mast 8 m. long booster transformer station.	- do -	0036	E
120	Drilling schedule for S-5 mast	- do -	0042	E
121	Drilling schedule for S-6 mast (length 12.4 m.)	- do-	0181	C
122	Drilling schedule for S-7 mast (length 11.4 m.)	- do -	0182	C
123	Drilling schedule for S-8 mast	ETI/C	0183	C
124	Drilling schedule for S-9 mast (length 9.4 m.)	- do -	1084	C
125	Gen. Arr. and details of fencing panels and gates for switching stations.	- do -	186 Sh.1	E
126	Detail of fencing upright and anti climbing device for switching station	- do -	186 Sh.2	E
127	S – 100 fabricated mast for mounting LT supply transformer and drop out fuse switch at switching station.	- do -	0043	B
128	S – 101 details of mast for supporting isolator inside switching station.	- do -	0044	A
129	Details of anchor beam for SP, SSP & FP.	- do -	0033	D
130	Details of small part steel for switching action.	- do -	0034 Sh.1	K
131	Typical fencing and anti climbing arrangement of switching station.	ETI/PSI	104	E
132	Typical earthing layout of sub-sectioning and paralleling station.	- do -	201	B
133	Typical earthing layout of sectioning and paralleling station.	- do -	202	B
134	Typical earthing layout of feeding station.	- do -	203	B
135	Earthing details for interrupter LT supply transformer 25 KV lighting arrestors PT type –1 (S-100 masts, S-101 masts, fencing upright and main masts).	- do -	204	C
136	Typical earthing layout of booster transformer stations.	- do -	211-1	A
137	Typical cable run layout of a sub-sectioning and paralleling station.	ETI/PSI	301	C
138	Typical cable run layout of a sectioning and paralleling station.	- do -	302	C
139	Typical cable run layout of a feeding station	- do -	303	B
140	Typical earthing layout of booster transformer stations (with 4 cross feeder) for Type-III, IV & V)	- do -	312	---
141	Typical drawing for terminal board.	- do -	501	C
142	36 mm AL bus terminal.	ETI/PSI/P	6480	C
143	36 mm AL bus terminal splice.	- do -	6490	B
144	36 mm AL bus terminal tee connector.	- do -	6500	C

145	36 mm AL terminal tee connector.	- do -	6510	D
146	36/15 tap connector.	ETI/PSI/P	6520	B
147	36 mm AL flexible bus splice cum tee connector.	- do -	6560	B
148	36 mm AL bus splice cum tee connector body.	- do -	6561	B
149	Typical no. plate for interrupter and double isolator	- do -	7520	B
150	Typical no. plate for potential transformer type-I	- do -	7521	B
151	Typical no. plate for booster transformer	- do -	7522	B
152	Details of braking for switching and booster transformer masts.	ETI/C	0034 Sh.2	B
153	Details of small parts steel of card rigger for switching stations and booster transformer station.	- do -	0037	C
154	Details of pre cost cable trench for switching station.	ETI/C	0038	E
155	Details of small parts steel for booster transformer station.	- do -	0040	E
156	Standard "R" type total Rod laced general arrangement	- do -	0054	B
157	"G" type portal special up right and end piece.	- do -	0056	C
158	Short bored pile foundation for traction mast (permissible-BM and volume).	- do -	0062	B
159	Chart for portal foundation in dry black cotton soil safe bearing capacity 16500 Kg/m ²	- do -	0063	B
160	11 KV post insulator.	ETI/OHE/P	6070-1	---
161	Span and stagger chart for TW OHE (regulated).	ETI/OHE/G	04201	---
162	Drilling schedule of OHE mast 9 m. and 8.5 m. long RSJ and BFB	- do -	04202 Sh.1&2	C
163	Schematic arrangement of TW OHE	- do -	04203	C
164	Arrangement of bracket assembly for TW OHE	- do -	04204	B
165	Hook bracket	ETI/OHE/P	2380	C
166	BFB steady arm assembly TW OHE	- do -	2540-1	---
167	Anti wind clamp for TW OHE (regulated).	- do -	2550-3	E
168	Arrangement of anti-creep for TW OHE (regulated).	ETI/OHE/G	04205	B
169	Arrangement of anti-creep for TW OHE(alternative arrangement regulated)	- do -	04206	B
170	Arrangement of section insulator for TW OHE (regulated).	- do -	04207 Sh.1	B
171	Small part steel for supporting section insulator assembly (for regulated TW OHE).	- do -	04207 Sh.2	B
172	Standard termination of TW type OHE (regulated with pulley type regulating equipment 3:1 ratio).	ETI/OHE/G	04212	B
173	General arrangement at turn outs for TW OHE (regulated).	- do -	04208	---
174	Adjustment chart (regulated TW OHE).	- do -	04209	---
175	Counterweight assembly(light)	ETI/OHE/P	5090-3	F
176	Employment schedule for TW type regulated OHE without R.C. and E.W. (W.P. 75 Kg/m ²).	ETI/C	0704	B
177	Employment schedule for TW type regulated OHE without R.C. and E.W. 112.5 Kg/m ²).	ETI/C	0705	B
178	Bridle wire clamp (6mm).	ETI/OHE/S K	516	
179	Schematic arrangement of un insulated overlap for composite OHE (Al. Ally. Caty. & copper contact wire).	ETI/OHE/G	02121 Sh.3	---
180	Schematic arrangement of insulated overlap for composite OHE (Al. Ally. Caty. & Copper contact wire).	ETI/OHE/G	02131 Sh.4	---
181	General arrangements of regulated composite OHE at turnouts (overlap and crossed type).	-do-	02141 Sh.2	---
182	Stander terminations of OHE (Regulated & unregulated).	-do-	02131 Sh.2	A
183	In-span jumper connection between Aluminium alloy catenary and copper contact wire.	-do-	05101 Sh.2	B
184	Continuity jumper connection at un-insulated overlap of composite OHE (Al. Alloy. Catenary and copper contact wire).	-do-	05102 Sh.2	B
185	Connections at turnouts for composite OHE.	-do-	05103 Sh.2	B
186	Potential equalizer connection at insulated overlap and neutral section for composite OHE (Al. Alloy catenary & copper contact wire).	ETI/OHE/G	05104 Sh.2	B
187	Connection at diamond crossing.	-do-	05106 Sh.2	C
188	General arrangement of connection composite OHE by cross feeder (Spider).	-do-	05124 Sh.2	B
189	General arrangement of connection to composite OHE by cross feeder (Spider) at switching station or double track section.	-do-	05125 Sh.2	B
190	General arrangement of connection at switching station on multiple track	-do-	05126 sh.2	B

	section (with composite OHE and spider cross feeder).			
191	Assembly of section insulator for composite OHE (Al. Alloy catenary & copper contact wire).	-do-	05181 sh.2	C
192	Bimetallic parallel groove clamp (14/9).	ETI/OHE/S K	123	D
193	Parallel groove clamp (18/14).	-do-	231	C
194	Catenary dropper clip assembly with bimetallic washer.	-do-	333	D
195	Compensating plate.	ETI/OHE/P	5191-1/2	D
196	Aluminium catenary suspension clamp. (MCI).	ETI/OHE/S K	176	D
197	Double catenary suspension clamp body (MCI).	ETI/OHE/P	1171-1	A
198	Double suspension lock plate (Galvanized. MCI).	ETI/OHE/S K	205	B
199	Envelop type and fitting assy.	-do-	436	B
200	Crimp type repair sleeve for A. A. stranded catenary wire.	-do-	285	C
201	Aluminium alloy catenary splices (cone type).	ETI/OHE/S K	134	D
202	Aluminium catenary suspension clamp assembly (MCI).	-do-	468	A
203	Double suspension clamp assy. (MIC) for aluminium catenary.-do-	-do-	469	A
204	Span and stagger chart for complete OHE.	-do-	375	A
205	Employment schedule for cantilever masts regulated OHE (Al. catenary (115) and Cu. Contact wire (107)) without return conductor and without earth wire (wind pressure 75Kgf/m2).	ETI/C	0703Sh.1	---
206	Employment schedule for cantilever masts regulated OHE (Al. catenary (115) and Cu. (107) Contact wire) without return conductor and with earth wire (wind pressure 75Kgf/m2).	ETI/C	0703Sh.2	A
207	Employment schedule for cantilever masts regulated OHE (Al. catenary (115) and Cu. (107) Contact wire) with return conductor and without earth wire (wind pressure 75Kgf/m2).	ETI/C	0703 Sh.3	A
208	Employment schedule for cantilever masts regulated OHE (Al. catenary and Cu. Contact wire) without return conductor and without earth wire (wind pressure 75Kgf/m2).	ETI/C	0703 Sh.4	A
209	Employment schedule for OHE (9.5m) WP 112.5Kgf/m2 composite OHE (1000+1000).	-do-	0717Sh.1	A
210	Employment schedule for OHE mast (9.5m) WP 112.5Kgf/m2 composite OHE (1000+1000) +RCEW.	-do-	0717Sh.2	A
211	Employment schedule for OHE mast (9.5m) WP112.5Kgf/m2 composite OHE (1000+1000)+RC.	-do-	0717Sh.3	A
212	Employment schedule for OHE mast (9.5m) wp112.5Kgf/m2 composite OHE (1000+1000)+EW+RC.	-do-	0717 Sh.4	A
213	Employment schedule for OHE mast (9.5m) overlap anchor with 3.0 meter implantation WP 112.5Kgf/m2 composite OHE (1000+1000).	ETI/C	0718	---
214	Employment schedule for OHE mast (9.5m) overlap anchor with 3.0 metre implantation WP 112.5Kgf/m2 composite OHE (1000+1000).	ETI/C	0719	---
215	Employment schedule for OHE mast (9.5m) overlap anchor with 3.0 metre implantation WP 112.5 Kgf/m2 composite OHE (1000+1000).	ETI/C	0720	---
216	Employment schedule for regulated OHE mast (9.5m) wind 75Kgf/m2 composite OHE. 1. -do- OHE only. 2. -do- OHE+EW. 3. -do- OHE+RC. 4. -do- OHE+EW+RC.	ETI/C/0721 -do- -do- -do-	Sh.1/4 2/4 3/4 4/4	---
217	Employment schedule for regulated OHE mast (9.5m) wind 75 KGF/m2 composite OHE with extra setting distance. 5.-do- overlap anchor location. 6.-do- central location. 7.-do- inter location.	ETI/C/0722 ETI/C/0723 ETI/C/0724		---
218	18 mm. Single clevis assembly	ETI/OHE/P	5040	Rev. C
219	18 mm. Single clevis assembly (Modified).	TI/DRG/OHE/FTGFE/RD SO	00001/00/1	---
220	Register arm eye piece 25 mm. (Forged)	TI/DRG/OHE/FTGFE/RD SO	00002/00/1	---
221	Terminal connector (19mm.) Multiple hole (Bolted type)	ETI/OHE/P	1009	Rev. A

222	Terminal connector (15mm.) Multiple hole (Bolted type)	ETI/OHE/P	1010	Rev. A
223	18 mm. Bus terminal (Multiple bolt)	ETI/OHE/P	6310-1	Rev. B
224	Terminal clamp (19 mm.) Compression type.	TI/DRG/OHE/FTGNF/RD SO	00002/02/1	---
225	Terminal clamp (15 mm.) Compression type.	TI/DRG/OHE/FTGNF/RD SO	00001/02/1	---
226	Steady arm hook (BFB)	ETI/OHE/P	2391	Rev. G
227	Mast fitting for hook Insulator	ETI/OHE/P	3021	Rev. C
228	Tubular stay sleeve	ETI/OHE/P	2403-1	Rev. C
229	Register arm eye piece 25mm.	ETI/OHE/P	2422-1	Rev. C

The drawing can be seen to the office of purchaser and will be available for sale.

B. LIST OF STANDARD SPECIFICATION:

SL. NO.	Title of specification	Specification No.
1	Annealed stranded copper conductor for jumper wire.	ETI/OHE/3(2/94), Amendment No.1 (4/95)
2.	Copper bus-bar.	RE/30/OHE/5(11/60). IS-613.
3.	Steel Tubes.	ETI/OHE/11(5/89).
4.	Hot dip galvanization of steel masts (rolled and fabricated tubes and fittings used on 25 KV AC OHE.	ETI/OHE/13(4/84) with A&C slip NO.1. Of 5/86, 2 of 4/90 and 3 of 4/90.
5.	Stainless steel wire ropes.	TI/SPC/OHE/WR/1060 (6/06)
6.	25 KV single and double pole isolators.	ETI/OHE/16(1/94) with A&C slip no.2 (3/04)
7.	Bolts, nuts and washers.	ETI/OHE/18(4/84) with A& C slip no 1 of (11/84), 2 of (6/87), 3 of (9/87) & 4 of (10/02).
8.	Aluminium alloy section and tube.	ETI/OHE/21(9/74).
9.	Standard for drawings for traction overhead equipment.	Deleted from latest master list no.TIM/0002 Rev.7 dated 31.08.2005.
10.	Section Insulator assembly.	ETI/OHE/27(8/84) with A&C slip no.1 of 10/92.
11	Double wire section insulators	RE/OHE/26(New).
12	Enameled steel plate	ETI/OHE/33 (8/85).
13.	Galvanized steel wire	ETI/OHE/36(12/73) with A&C slip no.1 (5/98).
14.	Copper trolley contact wire for AC & DC electric traction.	ETI/OHE/42(11/92)
15.	Fitting for 25 kv, 50 HZ AC overhead traction equipment.	ETI/OHE/49(9/95) with A&C slip no.1 of (3/97).
16	Cadmium copper conductor for overhead railway traction.	ETI/OHE/50(6/97) amendment-1 (6/97).
17.	7.5 KV line type lightning arrestor.	ETI/PSI/3(3/75)
18	25 KV AC Booster Transformers.	ETI/PSI/13(3/85)
19	25kv drop out fuse switch	ETI/PSI/14(1/86) with A&C slip no.1 of (4/87).
20.	25 KV/240 volt, 10 KVA LT transformer	ETI/PSI/15(8/03).
21.	Aluminum alloy stranded catenary wire 19/2.79 mm	ETI/OHE /54(2/85) with A&C slip no.1 of (11/89) and 2 of (10/92).
22	Standard code of practice painting of rolled steel electrification(not to be used)	ETI/C/1(1/80)
23	Aluminum alloy grooved contact wire 16.4mm dia. 193/190mm cross section.	ETI/EL/OHE/101(8/83)
24	110 volt,40 AH lead acid batteries SMF	RDSO/SPEC/TL/0040-2003 (Rev.0)

PART - X
UNIT QUANTITIES OF FINISHED WIRES AND CONDUCTORS FOR
VARIOUS ITEMS OF WORK

Wire/ conductor	Applicable linear density Kg/m.	Item No. Sh-1	Bare requirement per unit of work	Unit Allowance for erection per unit of work returnable as scrap	Total requirement per unit of work (Col.4 & 5)	Remarks
Contact wire (107)	0.9512	4	1005.0	10	1015.0	As required
Cadmium copper catenary wire (65)	0.5973	16	1005.0	10	1015.0	As required
Cadmium copper wire (130)	1.1692	--	--	--	--	As required
Large jumper (105)	0.982	22 26	--	--	--	As required
Cadmium copper bridle wire	0.2187	12	8.5			
Small jumper(50)	0.4352	12 17 26	-- -- 4.5		4.5	As required
Dropper wire(5 mm)	0.1746	--	--	--	--	As required
Dropper wire(7 mm)	0.341	--	--	--	--	As required
19/2.79mm Al. Alloy catenary	0.320	--	--	--	--	As required

NOTES:

- Col-4 of the above Table indicates the bare unit requirement of the various types of wire and conductors for various items of works. This includes allowance for sag wherever required.
- Col-5 of the above Table indicates the permissible amount for the defection which should be left over the contractor and should be returned to the purchaser in the form of scrap on completion of work. Such working allowance has been indicated on the assumption that all wire and conductors shall be available in tailor made length as shall be indicated by the contractor to suit individual employment and further that the actual supplied shall be made in the serial order as will be indicated by the conductor. Should the Purchaser be unable to supply the conductor as per above on account of which drums of a length longer than the ones desired by the contractor shall have to be erected, then such, extra length as shall result from the difference of the length of the drums actually employed and length of the drums by the contractor shall be considered over and above the quantities admitted as allowance for erection under Col. 5. Such extra length shall, in addition be considered and shall be returned to the purchaser in the form of scrap.
- Col-6 of the above Table indicates the total quantities of wires and conductors to be supplied to the contractor by the purchaser, free of cost. Such quantities may not take into account extra quantities which may be used on account of note-2 above and quantities damaged which shall be allowed for over above the quantities indicated in Col-5.
- Whenever cadmium copper wire (130) is required against schedule item, the same will supplied by the Purchaser and the quantity of cadmium wire (65) against this item will be correspondingly reduced.
When copper wire (130) is required against schedule item, the same will be supplied by the Purchaser and the quantities of cadmium copper wire (65) and contact wire (107) against this item will be correspondingly reduced.
- Whenever anti-theft jumper is provided against schedule item the length of jumper used shall be calculated depending on the setting distance of the anchor structure and the quantity required shall be supplied by the Purchaser.
Whenever large jumper (105) is employed against schedule item, the requirement of cadmium copper wire (65) shown against this item will not be permissible and vice-versa.
Whenever anti-creep is of the boom anchor type, catenary (cadmium copper) wire shall be 2 meters instead of 0.5 meters.
- If required by the contractor, the purchaser will supply to the contractor wires and conductors required for replacement due to thefts, accident etc. The cost of such wires and conductors shall be reimbursable to the purchaser by the contractor.

EASTERN RAILWAY
(Electrical Traction Distribution Department)
CHAPTER-VIII: ADDITIONAL SPECIAL CONDITION OF CONTRACT ON SAFETY ASPECTS

ACTIVITIES TO BE FOLLOWED BY CONTRACTOR ON SAFETY AT WORK SITES

The contractor is not allowed 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. earth work for parallel railway line and supply of ballast for new or existing rail line gauge conversion etc., road vehicles are necessary to be used in railway land next to the railway line, the contractor shall apply to the Engineer-in-Charge for permission giving the type and no. of individual vehicles, names and license particulars of the drivers, locations, duration and timings for such work/movement. The engineer in charge or his authorized representative will personally counsel, examine and certify the road vehicle drivers, contractor's flagman and supervisor and will give written permission giving names of road vehicles drivers, contractor's flagman and supervisor to be deployed on the work, location, period and timing of the work. This permission will be subject to the following obligatory conditions.

- 1.1 The road vehicles will ply only between sunrise and sunset
- 1.2 The vehicles shall ply 6m clear of track. Any movement/work at less than 6m and upto minimum 3.5m clear of track center shall be done only in the presence of railway employee authorized by the Engineer in Charge. No part of the road vehicle will be allowed at less than 3.5m from track center.
- 1.3 The contractor shall remain fully responsible for ensuing safety and in case of any accident shall bear cost of all damages to his equipments & men and also damages to railway & its passengers.
- 1.4 Contractor shall provide 150mm thick white line with lime at a distance of 3.5m from center of existing track. This white line shall be in the entire length where work is going on and/or the vehicles/machinery is playing along the track. Nothing extra shall be paid for this.
- 1.5 Barricading with the help of portable fencing shall be provided in the length where the days work is to be done in close vicinity of the track. The fencing shall consist of self-supporting steel columns shall be of 1.2m heights. This will be placed at a distance of 3.5 form centerline of the nearest track. This shall be paid.
- 1.6 Railway representative not less than a junior engineer shall issue competency certificate after checking license and their working to all drivers of nominated vehicles/machinery. Inspector at site shall ensure that the driver who does not possess competency certificate will not work at site.
- 1.7 The area between running line and white line shall to be permitted to become slushy and adequate drainage must be ensured at all times.
- 1.8 If vehicle/machinery/materials are to come within 3.5m of the existing track, work must be done under the presence o an inspector authorized to do safety works. A caution order shall be issued and track will be protected with the banner flags, hand signal lamps and detonators.
- 1.9 Normally, night working shall be avoided. However, in certain areas like Suburban Sections, the night working is unavoidable. The night working shall be permitted by AEN or DEN in writing. One inspector shall be specifically deputy to supervise the night working. The site/area where night working is to be done shall be adequately lit. Nothing extra shall be paid for this.
- 1.10 An authorized OHE staff should invariably be present, when relaying work or any major work in track is carried out, in order to ensure the following points.
- 1.11 Traffic block of Power Block is correctly taken and "Permit to work" (PTW) is issued.
- 1.12 The structure bonds, track bonds, cross bonds, longitudinal rail bonds etc. Are not disturbed and if disconnected for the work, they are reconnected properly when the work is completed.
- 1.13 The return feeder connections to the rails at the feeding posts are proper and not disturbed.
- 1.14 The setting distance of the structures is not disturbed affected during the slowing.
- 1.15 The track level is not raised beyond the permissible limits during the work.
- 1.16 Excavation of digging near a mast foundation is done in such a manner that the foundation is not exposed.
- 1.17 The clearance particularly at over line structure is maintained to the required standards.
- 1.18 Precautions for the safety of staff working under the OHE are taken correctly
- 1.19 All staff should be warned that contact within 2 mtrs. (Unless protected by the screen to live portion of 25KV traction OHE is dangerous and shall be strictly avoided.
- 1.20 No, work on overhead lines or in the Zone within two meters of any line equipment, shall be carried out unless a regular "Permit To Work" is obtained from the authorized traction staff and line is made dead and carted.
- 2 During the execution of works, unless otherwise specified the contractor shall at his own cost provide materials for an execute all shorting, timbering and strutting works as is necessary for the stability and safety of all structures, excavations and works and shall ensure that no damage, injury or loss is caused or likely to be caused to any person or property.
- 3 Existing roads or water courses shall not be blocked, cut through, altered, diverted or obstructed in any way by the contractor, except with the permission of the Engineer. All compensation claimed for any unauthorized closure, cutting through, alternation, diversion or obstruction to such roads or water courses by the Contractor or his agent or his staff shall be recoverable from the contractor by deduction from any sums which may become due to him in terms of the contract, or otherwise according to law.
- 4 During progress of work in any street or through farm, the contractor shall make adequate provision for the passage of traffic, for securing safe access to all premises approached from such street or through fare and for any drainage, water supply or means of lighting which may be interrupted by reason of the execution of the works and shall correct and maintain at his own cost barriers lights and other safeguards as prescribed by the Engineer for the regulation of traffic, and

provide watchmen necessary to prevent accidents. The work shall in such cases be executed night and day if so ordered by the Engineer and with such vigor so that the traffic way is impeded for as short a time as possible.

5 The contractor shall be responsible to take all precautions to ensure the safety of the public water on public or railway property and shall post such lookout men as may in the opinion of the Engineer be required to comply with regulations appertaining to the work

6 The contractor shall be responsible for the safety of all employees directly or through petty contractors or sub-contractor employed by him on the works and shall report serious accidents to any of them however and whenever occurring on the work to the Engineer or the Engineer's Representative and shall make every arrangement to tender all possible assistance.

7 The Contractor shall be responsible for all risk to the works and for trespass and shall make good at his own expense all loss or damage whether to the works themselves or to any other property of the Railway or the lives, persons or property of others from whatsoever cause in connection with the works until they are taken over by the Railway and this although all reasonable and proper precautions may have been taken by the Contractor and in case the Railway shall be called upon to make good any costs, loss or damages, or to pay any compensation, including that payable under the provisions of the Workmen's compensation Act or any statutory amendments thereof to any person or persons sustaining damages as aforesaid by reason of any act, or any negligence or omissions on the part of the contractor the amount of any costs or charges including costs and charges in connection with legal proceedings, which the Railway may incur in reference thereto, shall be charged to the Contractor. The Railway shall have the power and right to pay or to defend or compromise any claim of threatened legal proceedings or in anticipation of legal proceedings being instituted consequent on the action or default of the Contractor, to take such steps as may be considered necessary or desirable to ward off or mitigate the effect of such proceedings, charging to Contractor, as aforesaid, any sum or sums of money which may be paid any expenses whether of any such payment, defense or compromise, and the incurring of any such expenses shall not be call in question by the Contractor.

8 The area of work should be demarcated by providing barricades and signboard, which will enable the workmen posted at site and also the lorry drivers to have clear guidelines of movement of vehicles.

9 All the work inside a tunnel, deep cuttings, on bridges, constricted areas etc. Should be carried out in accordance to the provisions in Chapter VIII of IRPWM and Para. 1009 of Bridge manual 1098 and preferably under block protection.

Witness:

Signature of Tenderer(s)

1.

Date:

2.

Annexure-‘A’**MODEL FORM OF PERFORMANCE BANK GUARANTEE BOND****GUARANTEE BOND**

To
The President of India
 Acting through: FA&CAO/Eastern Railway/Kolkata

<p align="center">Bank Guarantee Bond</p> <p>No.....</p> <p>Date..... for</p> <p>Rs.....valid</p> <p>upto.....</p>

1. In consideration of the President of India (hereinafter called “the Government”) having agreed to exempt _____ (hereinafter called “the said contractor(s)”) from the demand, under the terms and conditions of an agreement/Acceptance Letter No. _____ dated _____ made between _____ and _____ for _____
 (Name & address of the Party) (Name & address of the Executive)
 _____ (hereinafter called “the said Agreement”), of
 (Name of the Work)

Performance Guarantee for the due fulfillment by the said Contractor(s) of the terms and condition contained in the said Agreement, on production of a irrevocable Bank Guarantee drawn in favour of FA&CAO/Eastern Railway, Kolkata for Rs. _____ (Rupees _____).

We _____ (hereinafter referred to as “the Bank”) at the request
 (Indicate the name & address of Bank)

of _____ [contractor(s)] do hereby undertake to pay to the Government an amount not exceeding Rs _____ against any loss or damage caused to or suffered or would be caused to or suffered by the Government by reason of any breach by the said Contractor(s) of any of the terms or conditions contained in the said Letter of acceptance & the tender document in which the contractor has submitted his offer.

2. We _____ do hereby undertake to pay the amount due and
 (Indicate the name & address of bank)

payable under this guarantee without any demur, merely on a demanded from the Government acting through FA&CAO/E. Railway stating that the amount claimed is due by way of loss or damage caused or would be caused to or suffered by the Government by reason of breach by the said contractor(s) of any of the terms or conditions contained in the said Agreement or by reason of the contractor(s) failure to perform the said Agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____.

3. We undertake to pay the Government acting through FA&CAO/E. Railway, any money so demanded notwithstanding any dispute or disputes raised by the contractor(s)/supplier(s) in any suit or proceeding pending before any court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the contractor(s)/supplier(s) shall have no claim against us for making such payment.

 Signature of Bank Official with
 Seal and Stamp

 Signature of Bank Official with
 Seal and Stamp

Bank Guarantee Bond

No.....
 Date..... for
 Rs.....valid
 upto.....

4. We _____ further agree that the guarantee

(Name & address of Bank)

herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of the Government under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till _____

Ministry of Railway

(Name & address of Office/ Department)

certifies that the terms and conditions of the said Contract have been fully and properly carried out by the said contractor and accordingly discharges this guarantee. Unless a demand of claim under the guarantee is made on us in writing on or before the _____

(Date of Completion + 2months
thereafter)

we shall be discharged from all liability under this guarantee thereafter.

5. We _____ further agree with

(Name & address of Bank)

the government acting through FA & CAO/ E. Rly., that the Government shall have the fullest liberty without any consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time of performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said Contractor(s) and to forbear or enforce any terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor(s) or for any forbearance act or omission on the part of the Government or any indulgence by the Government to the said Contractor(s) or any such matter or thing whatsoever which under the law relating to sureties would but for this provision, have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s)/Supplier(s).

7. We _____ lastly undertake not to revoke this guarantee during

(Name & address of Bank)

its currency except with the previous consent of the Government in writing.

Dated the _____ day of _____ 202

For _____

(Indicate the Name of the Bank)

Seal & Stamp

 Signature of Bank Official with
 Seal and Stamp

 Signature of Bank Official with
 Seal and Stamp

Annexure-B
NEFT MANDATE FORM

FROM:

Date:

To,
FA & CAO,
EASTERN RAILWAY, KOLKATA.

Sub: Willingness to Receive Payment through RBI's NEFT System.

We refer to the National Electronic Fund Transfer (NEFT) System being set up by Eastern Railway, Kolkata for remittance of our payments using RBI's NEFT scheme and confirm that we are agreeable to our payments being made through the above scheme to our under noted Account:

NAME OF ORGANISATION AND ADDRESS	:	
MICR CODE OF BANK	:	
IFSC (Indian Financial Service Code) OF BANK	:	
BANK NAME	:	
BRANCH NAME	:	
BANK ADDRESS	:	
BRANCH TELE/FAX NO.	:	
BANK ACCOUNT NO.	:	
TYPE OF ACCOUNT	:	

A Xerox copy of the cheque leaf is attached herewith for necessary action at your end.

Enclosure: As stated above

Signature & Stamp

Confirmed by Bank.

Annexure-C
MEMORANDUM OF UNDERSTANDING

(To be signed on Rs.100/- Non judicial stamp paper)

This Memorandum of Understanding (hereinafter referred to as the "MOU") is made and entered into this day of _____.

BY AND BETWEEN

AB, a company within the meaning of the Companies Act, 1956 having its registered office at _____
 _____ /a Partnership firm having its offices at _____
 _____ /a Proprietorship concern having its office at _____
 Represented by its Managing Directors/Partner/Proprietor which expression shall unless excluded by or repugnant to the context be deemed to mean and include its successors and assigns (hereinafter referred as AB) of the **FIRST PART**.

AND

CD, a company within the meaning of the Companies Act, 1956 having its registered office at _____
 _____ /a Partnership firm having its offices at _____
 _____ a Proprietorship concern having its office at _____
 Represented by its Managing Directors/Partner/Proprietor which expression shall unless excluded by or repugnant to the context be deemed to mean and include its successors and assigns (hereinafter referred as CD) of the **SECOND PART**.

AND

EF, a company within the meaning of the Companies Act, 1956 having its registered office at _____
 _____ a Partnership firm having its offices at _____
 _____ a Proprietorship concern having its office at _____
 Represented by its Managing Directors/Partner/Proprietor which expression shall unless excluded by or repugnant to the context be deemed to mean and include its successors and assigns (hereinafter referred as EF) of the **THIRD PART**.

The First Part, Second Part and Third Part hereinabove together are hereinafter referred to as "The parties".

WHEREAS the parties hereto have agreed to enter into a Joint venture for the purpose of participation of Bid in respect of the Tender No _____ for _____ hereinafter referred to as the said Tender) invited by the Sr. Divisional Electrical Engineer / TRD, Eastern Railway, Sealdah (hereinafter referred to as "Employer")

AND WHEREAS in the event of the joint venture being successful in its bid, the parties have agreed to perform the contract in accordance with the agreed terms and conditions thereof and in the spirit of mutual Co-operation to achieve the objective of this joint venture to the full satisfaction of the Employer.

NOW, therefore, for and in consideration of the foregoing premises and other considerations and covenants hereinafter set forth, the parties hereby agree as follows

ARTICLE 1 Form of Agreement

- 1.1 That a Joint Venture is formed herein by the said (1) AB _____ (2) CD _____ AND (3) EF _____ and to be carried out in the name and style of _____ (JV).
- 1.2 The Parties shall jointly prepare and submit tender documents for the said Contract and shall jointly perform the said Contract if any contract is awarded to the Joint Venture and shall be jointly and severally liable to the Employer for the contract.
- 1.3 The Principal place of the office of the joint venture shall be situated at the office of _____ and for the purpose of all correspondence the address is as follows _____

ARTICLE 2 Lead Partner

- 2.1 The parties have agreed to appoint AB/ CD/ EF as the lead Partner of the Joint Venture for the performance of said contract who are herein nominated by the parties to the Joint Venture as authorized representative for and on behalf of the Joint Venture during the qualification and bidding periods and in the event the Project is awarded to Joint Venture during the contract execution AB/ CD/ EF in the capacity of lead Partner are authorized to incur liabilities and receive instructions for and on behalf of all the parties to Joint Venture or its constituents.
- 2.2 In connection with the contract, if necessary, the parties shall take decisions by mutual consent.

ARTICLE 3 Participation of Share

- 3.0 The Parties agree that their respective participation/ share in the Joint Venture (hereinafter called "Participation share" shall be

_____ for AB
 _____ for CD
 _____ for EF

ARTICLE 4

On issue of L.O.A. if awarded the contract an agreement among the members of JV firm will be executed on the basis of the terms and conditions mentioned herein and the said agreement has to be registered before the Registrar of companies under companies Act or before the Registrar/Sub-Registrar under the Registration Act, 1908.

ARTICLE 5 Responsibility for Execution of Contracts

- 5.1 The Parties hereto shall, if awarded the contract for the Project, be jointly and severally liable to Employer for Execution of the project in accordance with General & Special Conditions of the Contract. The parties hereto also undertake to be liable jointly and severally for the loss, damages caused to the Employer in course of execution or due to non-execution of the contractor part thereof or arising out of the contract.
- 5.2 The parties shall be jointly and severally legally liable to the Employer for all obligations arising from and in connection with the bidding process and execution of the said Contract in accordance with the terms and conditions as shall be agreed with the employer.
- 5.3 AB/ CD/ EF shall act as most experienced partner. All the parties shall be responsible for providing key personnel in the discipline of site management general planning and plant operation during the whole period of contract execution, in addition to execution of the work and performance of the contract in accordance with the contract agreement.
- 5.4 As agreed between themselves, each party shall be fully responsible for the fulfillment of all obligations of its scope of the work for the said Contract to be executed subject to the Agreement between the parties and shall hold harmless and indemnified against any damage arising from its default or non-fulfillment of such obligations.
- 5.5 If any party fails to perform its obligations during the execution of the said contract and to cure such breach within the period designated by the non-defaulting party, then the other parties shall have the right to take up the work, the right and responsibilities of the defaulting party at the cost and risk of the defaulting party

ARTICLE 6 Duration of the Joint Venture Agreement

- 6.1 This MOU shall come into effect from the date it is executed and remain valid till all the matters in connection with the said contract for which this agreement is executed are over and settled and shall not be terminated unless and until this work awarded under this contract is completed in all respect and also till the maintenance period is over or till all these contractual liabilities are discharged completely.
- 6.2 This MOU shall be automatically terminated in case the L.O.A. is not AWARDED TO THE joint venture.

ARTICLE 7 Governing laws

- 7.0 This agreement shall be governed and constructed in accordance with the laws of the Republic of India.

ARTICLE 8 Authorized Member

- 8.1 All the joint ventures partners i.e. AB, CD and EF nominate, constitute, authorize and appoint _____ Director/ Partner/ Proprietor of _____ To deal with tender, to sign the agreement or enter into contract in respect of the said tender, to receive payment, to witness joint measurement of work done, to sign measurement books and similar such action in respect of the said tender/ contract.
- 8.2 All the correspondences with respect to the contract will be sent only to Sri _____ authorized member of _____ JV by Sri _____ authorized member of the JV. In case of any dispute/ deference arises with the Railway Administration then Sri _____ Authorized member of the JV firm will be authorized to refer the claim to the authorized on behalf of _____ (JV) in terms of General Conditions of Contract and Special condition of Contract of the Railway and any proceedings will be dealt by _____ Only, before the Arbitration during the Arbitration proceedings and before any Courts of Law in the country.

ARTICLE 9 Assign ability

- 9.0 No party to the Joint Venture has the right to assign or transfer the interest, right or liability in the contract without the written consent of the other party and that of the Employer in respect of the said tender/ contract.

ARTICLE 10 Use of Machinery, Instruments, Labour Force etc.

- 10.0 The parties here to undertake that whatever the machinery, instruments, labour force, (including unskilled, skilled, inspectors, engineers etc.) they possess at the time of entering into Joint Venture Agreement or which subsequently shall come in their possession and if such machinery, instruments, labour force is required for the speedy and efficient execution of the work, the party/ parties having the control over said machinery, instruments, labour force etc. without having any regard to their share of Profit and loss agreed to between the parties in Joint Venture Agreement shall hand over the same at the disposal of the other party who is actually executing the work for purpose of execution of the contract without any hindrance and obstacle.

ARTICLE 11 Bank Account

- 11.0 One or more Joint Venture account shall be opened in the name of the Joint Venture with such Bank or Banks and shall be operated by both the parties jointly. Payment should be made by the Railways in that particular Joint Venture Bank account only, which will be intimated by the parties jointly to the Railways after opening the said Joint Venture Bank Account.

ARTICLE 12 Tender/Estimation Work

- 12.1 Preparation for the tender/ bid will be coordinated by as agreed from time to time.
- 12.2 All the parties shall co-operate on the estimation work for the project.
- 12.3 Any expenses and costs incurred by any party for and in connection with the preparation, submission negotiation etc. up to and for bidding process shall be borne individually by the party incurring the same except when all the parties agree otherwise.

ARTICLE 13 Arbitration

- 13.1 All disputes or differences which may arise out of in relation to or in connection with this agreement shall be settled amicably between the parties hereto.
However, in case any dispute or difference is not settled each party shall have the right for arbitration and Conciliation Act 1996 and rules framed there under. Arbitration should be held within the jurisdiction of Kolkata.
- 13.2 None of the parties shall be entitled to suspend the performance of the agreement merely by reason of the reference of a dispute to arbitration and the parties shall continue with the execution of the Project irrespective of the Arbitration proceedings.
- 13.3 We the partners of JV firm shall have no objection if Earnest Money Deposit/Performance Guarantee is forfeited by Railway due to non-compliance, non-observance and/or any deviation from stipulated terms and conditions as indicated in clause 65.9 of Instruction for submitting the Tenders as Joint Venture Firms.

IN WITNESS WHEREOF the authorized representatives of the parties hereto have executed this agreement on the day, month and year first above written.

WITNESS:

1.

FIRST PART

2.

SECOND PARTY**THIRD PARTY**

Annexure - D**FORMAT FOR CERTIFICATE TO BE SUBMITTED / UPLOADED BY TENDERER ALONGWITH THE TENDER DOCUMENTS**

I.....(Name and designation)**appointed as the attorney/authorized signatory of the tenderer (including its constituents), M/s..... (hereinafter called the tenderer) for the purpose of the Tender documents for the work of as per the tender No..... of(Railway)***, do hereby solemnly affirm and state on the behalf of the tenderer including its constituents as under:

1. I/we the tenderer (s) am/are signing this document after carefully reading the contents.
2. I/We the tenderer(s) also accept all the conditions of the tender and have signed all the pages in confirmation thereof.
3. I/we hereby declare that I/we have downloaded the tender documents from Indian Railway website www.ireps.gov.in. I/we have verified the content of the document from the website and there is no addition, no deletion or no alteration to the content of the tender document. In case of any discrepancy noticed at any stage i.e. evaluation of tenders, execution of work or final payment of the contract, the master copy available with the railway Administration shall be final and binding upon me/us.
4. I/we declare and certify that I/we have not made any misleading or false representation in the forms, statements and attachments in proof of the qualification requirements.
5. I/We also understand that my/our offer will be evaluated based on the documents/credentials submitted along with the offer and same shall be binding upon me/us.
6. I/We declare that the information and documents submitted along with the tender by me/us are correct and I/we are fully responsible for the correctness of the information and documents, submitted by us.
7. I/we certify that I/we the tenderer(s) is/are not blacklisted or debarred by Railways or any other Ministry / Department of Govt. of India from participation in tender on the date of submission of bids, either in individual capacity or as a HUF/ member of the partnership firm/LLP/JV/Society/Trust.
8. I/we understand that if the contents of the certificate submitted by us are found to be forged/false or incorrect at any time during process for evaluation of tenders, it shall lead to forfeiture of the Bid Security besides banning of business for a period of upto five year. Further, I/we (insert name of the tenderer) **..... and all my/our constituents understand that my/our offer shall be summarily rejected.
9. I/we also understand that if the contents of the certificate submitted by us are found to be false/forged or incorrect at any time after the award of the contract, it will lead to termination of the contract, along with forfeiture of Bid Security/Security Deposit and Performance guarantee besides any other action provided in the contract including banning of business for a period of upto five year.
10. I/We have read the clause regarding restriction on procurement from a bidder of a country which shares a land border with India and certify that I am/We are not from such a country or, if from such a country, have been registered with the competent Authority. I/We hereby certify that I/we fulfill all the requirements in this regard and am/are eligible to be considered (evidence of valid registration by the competent authority is enclosed).

SEAL AND SIGNATURE OF THE TENDERER

Place:

Dated:

**The contents in Italics are only for guidance purpose. Details as appropriate are to be filled in suitably by tenderer.

This certificate is to be given by each member of JV or Partners of Partnership firm/LLP etc

Annexure-E
(The sample GST compliant invoice)

1. Supplier Name:
2. Supplier GSTIN:
3. Invoice No. :
4. Invoice Issue Date:
5. Total Value:
6. Taxable Value:
7. Goods A/c HSN, Service Accounting Code:
8. Goods and Services Description:
9. Unit Qty Code:
10. Quantity:
11. Rate:
12. Whether eligible for ITC – Partial / Full / Nil.
13. IGST Rate:
14. IGST Charged Amt:
15. CGST Rate:
16. CGST Charged Amt:
17. SGST/ UGST Rate:
18. SGST Charged Amt.:
19. Cess Rate:
20. Cess Charged Amount:
21. Name/ Recipient of Service/Goods:
22. Place of Supply:
23. Recipient GSTIN:
24. Tax Payable on Reverse Charge Basis (Y/N):
25. TDS:

"END OF DOCUMENT"