

E- TENDER DOCUMENT

FOR

Design, Supply, Erection, Testing & Commissioning of OHE for Sasaram RFO



**DEDICATED FREIGHT CORRIDOR
CORPORATION OF INDIA LIMITED
(A Government of India Undertaking)
MINISTRY OF RAILWAY**

CGM/DDU/DFCCIL OFFICE

**Manas Nagar Railway Colony, Near RPF Post,
Pt. Deen Dayal Upadhyay Nagar,
Chandauli, Uttar Pradesh-232101**

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TOP SHEET

Tender No. DFCCIL/DDU/EL/OHE/T003

Date 07.02.2023

Name of work: **Design, Supply, Erection, Testing & Commissioning of OHE for Sasaram RFO**

Estimated Cost of work: Rs. 3,14,30,269.94 (Rs. Three Crore Fourteen Lakhs Thirty Thousand Two Hundred Sixty Nine and Ninety Four Paise Only)

Bid Security Deposit: Rs. 3,07,200.00 (Rs. Three Lakh Seven Thousand Two Hundred Only)

Any firm recognized by Department of Industrial Policy and Promotion (DIPP) as 'Startups' shall be exempted from payment of Bid Security deposit

Labour Cooperative Societies shall deposit only 50% of above Bid Security deposit detailed above.

Completion Period: Total 18 (Eighteen) Months from the date of issue of letter of acceptance.

Date of Opening: 10.03. 2023 at 15:30 hrs

For and on behalf of

**CGM/DDU,
DFCCIL Office.**

Format for covering letter of Tender Form

(On Letter Head of Firm / Company)

Place:.....

Date:

Tender No.

Name of Work

Chief General Manager, DFCCIL
Manas Nagar Railway Colony, Near RPF Post,
Pt. DeenDayalUpadhyay Nagar,
Chandauli, Uttar Pradesh-232101

1. I / We have read the various conditions of tender attached hereto and agree to abide by the said conditions. I / We also agree to keep this offer open for your acceptance for a period of **60 days** from the date fixed for closing of the tender and in default thereof, I/We will be liable for forfeiture of my/our “Bid Security”. I /We offer to do the work for “**Design, Supply, Erection, Testing & Commissioning of OHE for Sasaram RFO**” at the rates quoted in attached bill(s) of quantities and hereby bind myself/ourselves to complete the work in all respects within **18(Eighteen) months from the date of issue of letter of acceptance of the tender.**
2. I / We also hereby agree to abide by the all the DFCCIL/Indian Railway Standard General Conditions of Contract, with all correction slip 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 DFCCIL/Railway in the annexed Special Conditions/Specifications, Standard Schedule of Rates (SSOR)with all correction slip up-to-date for the present contract.
3. A Bid Security of ₹ _____ has already been deposited online/ submitted as Bank Guarantee bond. Full value of the Bid Security shall stand forfeited without prejudice to any other right or remedies in case my/our Tender is accepted and if:
 - (a) I/We do not submit the Performance Guarantee within the time specified in the Tender document;
 - (b) I/We do not execute the contract documents within seven days after receipt of notice issued by the Railway that such documents are ready; and
 - (c) I/We do not commence the work within fifteen days after receipt of orders to that effect.
4. (a) I/We am/are a Startup firm registered by Department of Industrial Policy and Promotion (DIPP) and my registration number is valid upto (Copy enclosed) and hence exempted from submission of Bid Security.

5. We are a Labour Cooperative Society and our Registration No. is withand hence required to deposit only 50% of Bid Security.
6. Until a formal agreement is prepared and executed, acceptance of this tender shall constitute a binding contract between us subject to modifications, as may be mutually agreed to between us and indicated in the letter of acceptance of my/our offer for this work.

Signature of Witnesses:

(1) _____

(2) _____

Signature of Tenderer(s)

Date _____

Address of the Tenderer(s)

Dedicated Freight Corridor Corporation of India Limited
(A Government of India Undertaking)
MINISTRY OF DFCCIL

Tender No. DFCCIL/DDU/EL/OHE/T003
Date: 07.02.2023

M/s _____

NOTICE INVITING E- TENDER

Chief General Manager/DDU, DFCCIL, Manas Nagar Railway Colony, Near RPF Post, Pt. Deen Dayal Upadhyay Nagar, Chandauli, Uttar Pradesh-232101, invites **open E - Tenders in single packet system** on prescribed forms from firms/companies meeting qualifying requirements and having requisite experience and financial capacity for the following works: -

Tender No.	DFCCIL/DDU/EL/OHE/T003
Name of Work	Design, Supply, Erection, Testing & Commissioning of OHE for Sasaram RFO
Estimated Cost of work	Rs. 3,14,30,269.94 (Rs. Three Crore Fourteen Lakhs Thirty Thousand Two Hundred Sixty Nine and Ninety Four Paise Only)
Period of Contract	Total 18 (Eighteen) Months
Bid Security Deposit	Rs. 3,07,200.00 (Rs. Three Lakh Seven Thousand Two Hundred Only) Any firm recognized by Department of Industrial Policy and Promotion (DIPP) as 'Startups' shall be exempted from payment of Bid Security deposit Labour Cooperative Societies shall deposit only 50% of above Bid Security deposit detailed above.
Tender Document Cost	Nil
Date of Sale (Online)	From Date 07.02.2023
Issue of Corrigendum, if any	On or after Date 07.02.2023 (on www.ireps.gov.in)
Date and Time of submission of tender	On or before Date 10.03.2023 and time 15:00hrs
Date and Time of opening of tender	Date 10.03.2023 and time 15:30hrs
Defect Liability Period	12 (Twelve) Months

2 **ELIGIBILITY CRITERIA**

Eligibility of the applicants shall be assessed based on the “**Eligibility Criteria**”, “**Essential Qualifying Criteria**” and “**Other Qualifying Criteria**” as given in **Notice Inviting E-Tender.**

The Tender document can be downloaded from IREPS website www.ireps.gov.in and DFCCIL’s website www.dfccil.com. Tenderers are advised not to make any corrections, additions or alterations in the downloaded tender documents. In case, any corrections, additions or alterations in the downloaded tender documents are made, such tender shall summarily rejected.

3. DFCCIL may issue addendum(s)/corrigendum(s) to the tender documents. In such case, the addendum(s)/corrigendum(s) shall be issued and placed on IREPS website. The tenderers who have downloaded the tender documents from website must visit the website and ensure that such addendum(s)/corrigendum(s) (if any) is also downloaded by them. Such addendum(s)/corrigendum(s) (if any) shall also be submitted, duly stamped and signed, along with the submission of the tenders.
4. The tender documents shall be submitted in online mode through website www.ireps.gov.in in single bids only. Single offer viz. containing Technical offer and financial offer along with necessary documents like scanned copy of EMD to be uploaded. Detailed credentials as per the requirement of eligibility criteria in “**Technical offer**” as well as “**Financial offer**” to be submitted through IREPS portal. **Bids are required to be submitted only by online mode and uploaded on the e-tendering web site using Digital Signature for signing the documents.**
5. Tenders shall be opened at **the address given below** at 15:30 hours on the same day in the presence of the tenderer(s) or their authorized representatives intending to attend the opening.

Address of Office of the Chief General Manager/ DDU (for Opening of E-tenders):

Chief General Manager/DDU, DFCCIL, Manas Nagar Railway Colony, Near RPF Post, Pt. Deen Dayal Upadhyay Nagar, Chandauli, Uttar Pradesh-232101

All the Bids received shall be opened on the date and time mentioned above in the tender notice, through process of e-tendering. The sequence of opening shall be:

- i) Bid Security
- ii) Technical offer.
- iii) Financial offer.

6. Tender shall be submitted as per “Instructions to Tenderers” as followed on IREPS portal.
7. **Bid Security:**
 - (a) Subject to exemptions provided for Bid Security, the tender must be accompanied by a Bid Security as mentioned in tender documents, failing which the tender shall be summarily rejected.
 - (b) The Tenderer(s) shall keep the offer open for a minimum period of 60 days (in case of two packet system of tendering 90days) from the date of closing 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 resale from his offer or modify the terms and conditions thereof in a manner not acceptable to DFCCIL. Should the tenderer fail to observe or comply with the foregoing stipulation, the amount deposited or Bank guarantee bond submitted as Bid Security for the due performance of the above stipulation, shall be forfeited to the Railway.

- (c) If his tender is accepted,
- (i) the Bid Security mentioned in sub para(a) above deposited in cash through e-payment gateway will be retained as part security for the due and faithful fulfillment of the contract in terms of Clause 16 of the Standard General Conditions of Contract 2022;
 - (ii) the Bid Security mentioned in sub para(a) above submitted as Bank guarantee bond, will be encashed as part security for the due and faithful fulfillment of the contract in terms of Clause 16 of the Standard General Conditions of Contract 2022.

The Bid Security of other Tenderers shall, save as herein before provided, be returned to them, but the Railway shall not be responsible for any loss or depreciation to the Bid Security that may happen thereto while in their possession, nor be liable to pay interest thereon.

- (d) In case Contractor submits the Term Deposit Receipt/Bank Guarantee Bond towards either the Full Security Depositor the Part Security Deposit equal to or more than Bid Security, the Railway shall return the Bid Security so retained as per sub para(c) above, to the Contractor.
8. DFCCIL reserves the right to cancel the tenders before submission/opening of tenders, postpone the tender submission/opening date and to accept / reject any or all tenders without assigning any reasons thereof. DFCCIL's assessment of suitability as per eligibility criteria shall be final and binding.
 9. Tenderers may note that they are liable to be disqualified at any time during tendering process in case any of the information furnished by them is not found to be true. The decision of DFCCIL in this regard shall be final and binding.
 10. DFCCIL reserves the right to pre-qualify the bidder(s) provisionally based on the documents submitted by them and open financial bid(s), subject to their final verification. In the event of any document being found false, the provisional qualification shall stand withdrawn, and the next lower bidder shall automatically come to the position of such disqualified bidder. Action against such disqualified tenderers shall be taken as per above Clause No. 10.0 of Notice Inviting Tender.
 11. The validity of the offer shall be 60 days.
 12. The transfer of tender documents purchased by one intending tenderer to another tenderer is not admissible. Tenderer can submit tenders only on the documents purchased/downloaded from website mentioned above.

We look forward for your active participation.

For and on behalf of **DFCCIL**
Chief General Manager/DDU

1.0 **ELIGIBILITY CRITERIA**

The tenderer shall satisfy the following eligibility criteria to qualify for this tender:

I. **Essential Qualifying Criteria**

1. **Firm/companies**

- a. The tenderer should have a registered office anywhere in India.

The documentary proof regarding A. above should be submitted as part of the tender document.

Note: For the purpose of documentary proof of “registered office” as mentioned in (i) above any address of office as mentioned in any of the following documents submitted along with the original offer by tenderer(s) may be considered as registered office of the tenderer(s).

1. Address mentioned in the article of association of company duly registered under Companies Act, 1956.
2. Address mentioned in Partnership Deed
3. Address mentioned in Trade License obtained by the individual from Govt. body.
4. Address mentioned in any tax departments.
5. Address mentioned in P.F. Registration documents.

2. **Technical Eligibility Criteria:**

1. In support of their credentials, the Tenderer(s) should have to submit documents as stipulated in tender document along with their tenders.
2. THE TENDERER(S) SHOULD SATISFY THE FOLLOWING MINIMUM ELIGIBILITY CRITERIA AS UNDER –

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:

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

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

certificate has been issued by a person authorized by the Public listed company to issue such certificates.

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

The Tenderer(s) will produce/attach the certificate of Work completion with the Tender Document as per above and such certificate should clearly supported by following details:-

- a) Name of Agency issuing a certificate.
- b) Date of issue of certificate.
- c) The name of Work.
- d) The Acceptance letter no.
- e) The date of issue of Acceptance letter.
- f) Agreement no.
- g) Date of execution of Agreement.
- h) Date of original Completion of Work as per Acceptance Letter.
- i) Date of Actual completion of Work.
- j) The Amount of Work done as per Agreement (in Rupees).
- k) The Final Amount of Work at the time of Completion of Work (in Rupees).
- l) Whether the Work is completed satisfactory or not satisfactory.

Notes:

Following will be considered as similar work:

Nature of work for this tender is defined as

- (i) Supply, Erection and commissioning of 25 kV OHE (Not PSI)

Or

- (ii) Supply, Erection and commissioning of 132 kV and above voltage transmission line.

The tenderer (s) must be an established, experienced and reputed construction firm and have regularly undertaken works of the similar type tendered for and have adequate technical knowledge and practical experience in field.

3. Financial Eligibility Criteria:

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 tenderers 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.

4. JVs SHALL NOT BE CONSIDERED.**5. ELECTRICAL CONTRACTOR LICENSE—**

- a. The Contractor should have valid A-Class Electrical license to be submitted along with tender failing which tender would be consider ineligible (i.e., not eligible).
- b. The work shall be carried out by the contractor, having valid Electrical Contractor's License for carrying out installation work under the direct supervision of the persons holding valid certificates of competency issued by the State Government.
- c. The successful tenderer shall furnish the names and particulars of the certificate of competency of supervisor and workmen to be engaged for carrying out this work.

II. System of verification of Tenderer's credentials : -

Railway board letter no. 2017/Trans/01/Policy dated 08.02.2018, accordingly following changes have been approved by Railway board.

For the works tenders, it has been decided to adopt the affidavit-based system of credential verification. The tenderer shall submit along with the tender document, documents in support of his/their claim to fulfill the eligibility criteria as mentioned in the tender document. Each page of the copy of documents/certificates 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 operational in IREPS. This system is already being followed by some of Railway/DFCCIL PSUs.

1. In all works tender documents, followings para may be added in the section describing the qualification and eligibility criteria.

"The tenderers shall submit a notarized affidavit on a non judicial stamp stating that they are not liable to be disqualified and all their statements/documents submitted along with bid are true and factual. Standard format of the affidavit to be submitted by the bidder is enclosed as Annexure-V. Non submission of an affidavit by the bidder shall result in summary rejection of his/their bid. And it shall be mandatorily incumbent upon the tenderer to identify, state and submit the supporting documents duly self attested by which they/he is qualifying the Qualifying Criteria mentioned in the tender document. It will not be obligatory on the part of Tender Committee to scrutinize beyond the submitted document of tenderer as far as his qualification for the tender is concerned".

With the submission of the affidavit as mentioned above, the practice of verification of tenderer(s) documents by the Railway/DFCCIL may be dispensed with.

 - a) The Railway/DFCCIL 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/DFCCIL, make available such information, evidence and documents as may be necessary for such verification. Any verification or lack of such verification, by the Railway/DFCCIL shall not relieve the bidder of its obligations or liabilities hereunder nor will it affect any right of the Railway/DFCCIL thereafter.
 - b) In case any wrong information submitted by the tenderer, the contract shall be terminated, Bid Security Deposit (EMD), Performance Guarantee (PG) and Security Deposit (SD) of contract forfeited and agency barred for doing business on entire Indian Railway/DFCCILs for 5 (five) years.
2. The tenderers shall provide satisfactory documentary evidences acceptable to Railway/DFCCIL along with the tender to show that:

- 2.1 They have an established technically competent and adequate staffs organization to ensure that the services required under this tender can do satisfactorily.
- 2.2 They have sufficient equipments; plants and machinery to meet the obligations under the contract and to complete the work contract all within the stipulated time schedule and accepted by him.
- 3 The tenderer should submit the details of similar works done in the past.
- 4 The tenderer should submit the attested copies of the certificates obtained from the agencies wherever the works have completed successfully. These certificates should indicate the details of installation and successful commissioning of the similar type of equipments executed by the tenderer.
- 5 The tenderer will submit, along with offer list of work in hand indicating description of work, contract value, approximate value of balance work yet to be done and date of award of work.
- 6 They have adequate financial resources to meet the obligations under the contract. They have also required to submit the report from recognized bank of financial institutions.

PART – I

CHAPTER –I

Instructions to Tenderer and Conditions of Tendering

1.1.1 General (for on line tendering system)

Submission of Online Bids is mandatory for this Notice Inviting Tender. E-Tendering is a new methodology for conducting Public Procurement in a transparent and secured manner. Suppliers/ Vendors will be the biggest beneficiaries of this new system of procurement. For conducting electronic tendering, DFCCIL, Delhi has decided to use the portal (<https://www.ireps.gov.in>) of a Government of India. Benefits to Suppliers/service providers are outlined on the Home-page of the portal.

1.1.2 Instructions

a. Online E-Bidding Methodology:

Online E- Bid System – Financial bids and Technical bids shall be submitted by the bidder at the same time in single Packet

b. Broad outline of activities from Bidders perspective:

- i. Procure a Digital Signing Certificate (DSC)
 - ii. Register on Electronic Tendering System (ETS)
 - iii. Create Users and assign roles on ETS
 - iv. View Notice Inviting Tender (NIT) on ETS
 - v. Download Official Copy of Tender Documents from ETS
 - vi. Clarification to Tender Documents on ETS – Query to DFCCIL (Optional) - view response to queries posted by DFCCIL, through addenda.
 - vii. Bid-Submission on ETS: Prepare and arrange all document/paper for submission of bid online and tender fees and EMD deposit on offline.
 - viii. Attend Public Online Tender Opening Event (TOE) on ETS
 - ix. Post-TOE Clarification on ETS (Optional)-Respond to DFCCIL's Post-TOE queries
 - x. Attend Public Online Tender Opening Event (TOE) on ETS
- For participating in this tender online, the following instructions are to be read carefully. These instructions are supplemented with more detailed guidelines on the relevant screens of the ETS.

Note 1: It is advised that all the documents to be submitted are kept scanned and converted to PDF format in a separate folder on your computer before starting online submission. Fin. offer tab brings up the Financial Offer Page where the bidder can submit his rates against the schedule items included in the tender.

Note 2: While uploading the documents, it should be ensured that the file name should be the name of the document itself.

c. Digital Certificates

For integrity of data and its authenticity/non-repudiation of electronic records and to be compliant with IT Act 2000, it is necessary for each user to have a Digital Certificate (DC), also referred to as Digital Signature Certificate (DSC), of Class-III issued by a Certifying Authority (CA) licensed by Controller of Certifying Authorities (CCA) [refer <http://www.cca.gov.in>].

d. Registration

The Tender document can be downloaded from the website www.ireps.gov.in and to be submitted in the e-format. Cost of the Tender Document has to be submitted to DFCCIL online through IREPS portal before the scheduled date and time of submission of the tender and Bid security declaration has to be submitted otherwise the Bid will not be considered. Amendments, if any, to the tender document will be notified in the above website as and when such amendments are notified. It is the responsibility of the bidders who have downloaded the tender document from the website to keep themselves abreast of such amendments before submitting the tender document.

Intending bidders are requested to register themselves with www.ireps.gov.in for obtaining user-id, Digital Signature etc. by paying Vendor registration fee and processing fee for participating in the above mentioned tender.

DFCCIL, has decided to use process of e-tendering for inviting this tender and thus the physical copy of the tender would not be sold.

1.1.3 General (for tender)

1.1.3.1 Name of the Work: Design, Supply, Erection, Testing & Commissioning of OHE for Sasaram RFO.

1.1.3.2 “A bidder in the capacity of Individual or Sole Proprietor, Partnership Firm, or Company can participate in the tender and the bidder must forward attested copies of the constitution of its firm such as partnership deed, Memorandum and Articles of Association, etc. along with original Power of Attorney of authorized Signatory”.

1.1.3.3 The work is proposed to be executed under the following relationship.

A) Employer: DFCCIL address - Chief General Manager/DDU, DFCCIL, Manas Nagar Railway Colony, Near RPF Post, Pt. Deen Dayal Upadhyay Nagar, Chandauli, Uttar Pradesh-232101

B) Contractor: The successful tenderer to whom the work is awarded shall become the contractor for the execution of this work

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1.1.3.4 Throughout these bidding documents, the terms “bid” and “tender” and their derivatives (“bidder”/“tenderer”), “bid/tendered”, “bidding”/“tendering”, etc.) are synonymous. Day means calendar day. Singular also means plural.

1.1.3.5 Scope of Work -

Design, Supply, Erection, Testing & Commissioning of OHE for Sasaram RFO. The scope given above is only indicative. The detailed scope has been described in the tender documents.

1.1.3.6 Estimated cost of the work: Rs. 3,14,30,269.94 (Rs. Three Crore Fourteen Lakhs Thirty Thousand Two Hundred Sixty Nine and Ninety Four Paise Only) including GST.

1.1.3.7 Tenderer(s) may carefully note that they are liable to be disqualified at any time during tendering process in case any of the information furnished by them is not found to be true. The decision of Employer in this respect shall be final and binding.

1.1.3.8 A bidder shall submit only one bid in the capacity of an Individual or Sole Proprietor, Partnership firm or Company. Violation of this condition is liable to disqualify the tenders in which such bidder has participated.

1.1.4 Cost of Bidding

1.1.4.1 The bidder shall bear all costs associated with the preparation and submission of the bid and the Employer will in no case be responsible or liable for these costs regardless of the conduct or the outcome of the bidding process.

B. The Bidding Documents

1.1.5 Content of bidding documents submitted through online mode only

1.1.5.1 The bidding documents include the following:

1. Notice Inviting Tender
2. Instructions to tenderer(s)
3. Tender Form
4. Special Conditions of Contract
5. General Terms and Conditions of Contract
6. Financial bid and Bill of Quantities

1.1.5.2 The bidder is expected to examine all instructions, terms, conditions, forms, specifications and other information in the bidding documents. Failure to furnish all information required by the bidding documents or submission of a bid not substantially responsive to the bidding documents in every respect will be at the bidder's risk and may result in rejection of his bid.

1.1.6 Understanding and Amendment of Tender Documents

1.1.6.1 The bidder must obtain for itself on its own responsibility and its own cost all the information including risks, contingencies and other circumstances in execution of

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the work. It shall also carefully read and understand all its obligations and liabilities given in tender documents.

- 1.1.6.2 The bidder is advised to visit and examine the site where the work is to be executed and its surroundings or other areas as deemed fit by the bidder and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and execution of the contract. The cost of visiting the site and collecting relevant data shall be at the bidder's own expenses. It is a condition of the tender that the tenderer is deemed to have visited the site and satisfied himself with all the conditions prevailing including any difficulties for executing the work.
- 1.1.6.3 At any time prior to the deadline for submission of bids, Employer may for any reason whether at its own initiative or in response to any request by any prospective bidder amend the bidding documents by issuing Corrigendum, which shall be part of the Tender documents.
- 1.1.6.4 Employer may at its discretion extend the deadline for submission of the bids at any time before the time of submission of the bids.

C. Preparation of the Bids

1.1.7 Language of Bid

- 1.1.7.1 The bid prepared by the bidder and all documents related to the bid shall be written in English.

1.1.8 Signing of All Bid papers and Completing Bill of Quantities

- 1.1.8.1 All the pages of the tender documents and credentials submitted by tenderer shall be digitally signed by the tenderer or his representative holding the Power of Attorney.
- 1.1.8.2 The tenderer must fill and submit the prices as per instructions given in schedule of rates. He shall not make any addition or alteration in the tender documents. The requisite details should be filled in by the tenderer wherever required in the documents. Incomplete tender or tender not submitted as per instructions is liable to be rejected. If a tenderer does not quote a price/rate as per instructions, his tender shall be summarily rejected.
- 1.1.8.3 The tenderer must ensure that tender documents shall be submitted on line through class 3 Digital Signature only. To participate in the E-Bid submission, it is mandatory for the bidders to have user ID and password in www.ireps.gov.in through IREPS portal.

1.1.9 Deviations

The tenderer should clearly read and understand all the terms and conditions, specifications, etc. mentioned in the original tender documents. If the tenderer has any observations, the same may be indicated in his forwarding letter along with the tender. Tenderers are advised not to make any corrections, additions or alterations in the in his own entries the same shall be initialed and stamped by him. If this condition is not complied with, tender is liable to be rejected.

1.1.10 Bid Security Deposit (Tender Security):

- a) The tender must be accompanied by Bid Security of Rs. 3,07,200.00 (Rs. Three Lakh Seven Thousand Two Hundred Only) in favor of “DFCCIL” payable as mentioned in IREPS portal.
- b) The Bid Security shall remain deposited with the DFCCIL for the period of validity of the offer prescribed in this tender i.e. 60 days from the date of opening of tender. If the validity of the offer is extended, the validity of Bid Security should also be extended failing which the offer after the expiry of the aforesaid period may not be considered by the DFCCIL.
- c) Only online payment will be applicable.
- d) It shall be understood that the tender documents have been sold/issued to the tenderer and the tenderer is permitted to tender in consideration of stipulation on his part, that after submitting his tender he will not resile from his offer or modify the terms and conditions, thereof in a manner not acceptable to the Employer. Should the tenderer fail to observe or comply with the said stipulation, the aforesaid amount shall be liable to be forfeited to the DFCCIL.
- e) The Bid Security of the unsuccessful tenderer(s) will be returned to the unsuccessful tenderer(s) within a reasonable time but the DFCCIL shall not be responsible for any loss or depreciation that may happen for the due performance of the stipulation to keep the offer open for the period specified in the tender documents or to the Bid Security while in their possession nor be liable to pay interest thereon.

NOTE: No interest shall be paid by DFCCIL on Bid Security amount.

1.1.11 Period of validity of the tender:

- 1.1.11.1 The tender shall remain valid for the period 60 days after the date of the opening of the tender. If the Tenderer gives validity period less than that fixed/prescribed by Employer, the tender shall be liable to be rejected.
- 1.1.11.2 Notwithstanding the above clause, Employer may solicit the tenderer’s consent to an extension of the validity period of the tender. The request and the response shall be made in writing and/or on IREPS portal.

Submission of Bids

1.1.12 Deadline for submission of tender

- 1.1.12.1 The tender documents shall be submitted in online mode through website www.ireps.gov.in in single bids only. Single offer viz. containing Technical offer and financial offer along with necessary documents like scanned copy of EMD and scanned copy of TDC to be uploaded. Detailed credentials as per the requirement of eligibility criteria in “**Technical offer**” as well as in “**Financial offer**” are to be uploaded. **Bids are required to be submitted only by online mode through e-tendering web site (IREPS portal) using Digital Signature class 3 for signing the documents.**
- 1.1.12.2 A tender received without on line to Employer is liable to be rejected.

1.1.12.3 Tender document fees received after opening of the tender shall be rejected.

1.1.13 Withdrawal of tender

No tender can be withdrawn after submission and during tender validity period.

1.1.13.1 Submission of a tender by a tenderer implies that he had read all the tender documents including amendments if any, visited the site and has made himself aware of the scope and specifications of the work to be done, local conditions and other factors having any bearing on the execution of the work.

1.1.14 Submission of tender/bid:-

1.1.14.1 The tenders shall be submitted on or before the due date and time with all the relevant documents as mentioned -

- a) Forwarding letter of the tenderer.
- b) Documents to be submitted as per required documents
- c) Scanned copy of tender document fees.
- d) The Bill of Quantities with prices quoted as mentioned.

1.1.14.2 Tender document fees shall be deposited in DFCCIL account and proof of transaction along with transaction ID to be scanned and uploaded along with Tender document.

1.1.15 Bid opening and Evaluation

1.1.15.1 **Opening of the Tender:-** Tenders will be opened on line at the address mentioned in “Notice Inviting Tender” in presence of tenderer(s) or authorized representatives of tenderer(s) who wish to attend the opening of tenders.

The sequence of opening shall be:

- i) Bid Security
- ii) Technical offer.
- iii) Financial offer.

1.1.15.2 Tenderer(s) or their authorized representatives who are present shall sign register in evidence of their attendance.

1.1.15.3 Tenderer’s name, presence or absence of Bid Security Deposit (EMD) total cost of work quoted or any other details as Employer may consider appropriate will be announced and recorded at the time of bid opening.

1.1.16 Clarification of the tenders

1.1.16.1 To assist the examination, evaluation and comparison of the tenders, Employer may at his discretion ask the tenderers for any clarifications as considered essential. All such correspondence shall be in writing and no change in price or substance of the tender shall be sought or permitted. The above clarification for submission of the details shall form part of the tender and shall be binding on tenderer.

1.1.17 Preliminary examination of bids

- 1.1.17.1 The Employer shall examine the bids to determine whether they are complete, whether any computational errors have been made, whether the documents have been properly signed and whether the bids are generally in order.
- 1.1.17.2 Arithmetical errors shall be rectified on the following basis if found. If there is a discrepancy between the unit price and the total price, which is obtained by multiplying the unit price and quantity, or between subtotals and the total price, the unit or subtotal price shall prevail, and the total price shall be corrected. If there is a discrepancy between words and figures, the rate in words shall prevail.
- 1.1.17.3 Prior to the detailed evaluation, Employer shall determine whether each bid is of acceptable quality, is generally complete and is substantially responsive to the bidding documents. For purposes of this determination, a substantially responsive bid is one that conforms to all the terms, conditions and specifications of the bidding documents without material deviations, objections, conditionality or reservation. A material deviation, objections, conditionality or reservation is one:
- i) That affects in any substantial way the scope, quality or performance of the contract.
 - ii) That limits in any substantial way, inconsistent with the bidding documents, the Employers' rights or the successful Bidder's obligations under the contracts; or
 - iii) Whose rectification would unfairly affect the competitive position of other Bidders who are presenting substantially responsive bids.
- 1.1.17.4 If a bid is not substantially responsive, it shall be rejected by the Employer.
- 1.1.17.5 In case of tenders containing any conditions or deviations or reservations about contents of tender document, Employer may ask for withdrawal of such conditions/deviations/reservations. If the tenderer does not withdraw such conditions/deviations/ reservations, the tender shall be treated as non-responsive. Employer's decision regarding responsiveness or non-responsiveness of a tender shall be final and binding.

1.1.18 Evaluation and comparison of tenders

- 1.1.18.1 In case of open tenders, bids, which are determined as substantially responsive, shall be evaluated based on criteria as given in "**Eligibility Criteria**". The tenderer must submit all necessary authentic data with necessary supporting certificates of the various items of evaluation criteria failing which his tender is liable to be rejected.
- 1.1.18.2 The Employer reserves the right to negotiate the offer submitted by the tenderer to withdraw certain conditions or to bring down the rates to a reasonable level. The tenderer must note that during negotiations of rates of items of BOQ can only be reduced and not increased by the tenderer. In case the tenderer introduces any new condition or increases rates of any item of BOQ, his negotiated offer is liable to be rejected and the original offer shall remain valid and binding on him.

1.1.19 Canvassing

No tenderer is permitted to canvass to Employer on any matter relating to this tender. Any tenderer found doing so may be disqualified and his bid may be rejected.

1.1.20 Right to accept any tender or reject all tenders

Employer reserves the right to accept, split, divide, negotiate, cancel or reject any tender or to annul and reject all tenders at any time prior to the award of the contract without incurring any liability to the affected tenderers or any obligation to inform affected tenderer, the grounds of such action.

1.1.21 If the tenderer, as individual or as a partner of partnership firm, expires after the submission of his tender but before award of work, the Employer shall deem such tender as invalid.

1.1.22 Award of Contract

1.1.22.1 **Employer** shall notify the successful tenderer in writing by a Registered Letter /Courier /Speed Post/email or per bearer that his tender has been accepted.

1.1.22.2 Letter of Acceptance after it is signed by the Contractor in token of his acceptance shall constitute a legal and binding contract between Employer and the contractor till such time the contract agreement is signed.

1.1.23 Help desk for E-Tendering

1.1.23.1 For any difficulty in downloading and submission of tender document visit at website www.ireps.gov.in. Users can send their queries to the Help desk through E-Mail. E-Mail ID of Help Desk is mentioned on the Help desk page (helpdesk.eps@cris.org.in). The reply to the query will be sent to the E-Mail ID of the user.

1.1.23.2 Bidder manual and system requirement is available on web site www.ireps.gov.in for necessary help.

PART-I CHAPTER -II

SPECIAL CONDITIONS OF CONTRACT

1.2.1 INTRODUCTION

Dedicated Freight Corporation of India (DFCCIL) is a Public Sector Undertaking under the administrative control of Government of India (Ministry of DFCCILs) for construction, maintenance and operation of the Dedicated Rail Freight Corridors. At present the company is undertaking construction of Eastern and Western corridors and has its corporate office at New Delhi and Field Units at various cities associated with CGM unit.

CGM/DDU unit have jurisdiction from New DDU ERC to New ChirailaPauthu / New Sonnagar with it's CGM/ DDU unit at Pt. Deen Dayal Upadhyay Nagar.

1.2.2 Definitions

1.2.2.1 In the Conditions of Contract, the following terms shall have the meanings assigned here under except where the context otherwise requires:

- i) "Railway/DFCCIL" shall mean the President of the Republic of India or the Administrative Officers of the DFCCIL/Railway/DFCCIL or of the successor. DFCCIL authorized or any other officer of DFCCIL authorized to deal with any matters which these presents are concerned on his behalf.
- ii) "CHIEF GENERAL MANAGER" shall mean the officer in administrative in-charge of the project and shall mean and include their successors, of the successor DFCCIL.
- iii) "GENERAL MANAGER " shall mean the officer in charge of lot wise or department /S&T/Electrical/Finance wise (Engineering department) of the DFCCIL include their successors of and shall mean and the successor DFCCIL.
- iv) PROJECT MANAGER/ DEPUTY PROJECT MANAGER/ASSISTANT PROJECT MANAGER shall mean the officer department wise (Engineering /S&T/ Electrical/ Finance Department) of the DFCCIL and shall mean and include their successors of the success of DFCCIL.
- v) "TENDER or BID" means the offer (Technical and/or Financial) made by individual, firm, Company, corporation, or Consortium for the execution of the works.
- vi) "TENDERER" shall mean the person/ the firm or company whether incorporated or not who tenders for the work with a view to execute the works on contract with DFCCIL and shall include their personal representatives, successors and permitted assigns.
- vii) "WORKS" shall mean the works contemplated in scope and schedules set forth in the tender forms and required to be executed according to terms and condition mentioned.
- viii) "Bill of Quantities (B.O.Q.)"/ "Schedule of Rates" means list of items of work, their quantities and rates as accepted and forming part of contract agreement.
- ix) "EMPLOYER" means the Dedicated Freight Corridor Corporation of India Limited, A Govt. of India Undertaking (DFCCIL in abbreviation) acting through its Managing Director or any other authorized officer and shall include their legal successors in title and permitted assignees.
- xi) "CONTRACT" shall mean and include the Agreement or Letter of Acceptance, the accepted Bill of Quantities and Rates, the General Conditions of Contract, Special Conditions of Contract, Appendix

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to Tender, Tender Form, and Instructions to the Tenders and other Tender Documents.

xii) “CONTRACTOR” shall mean the person or firm, company, corporation, whether incorporated or not who enters into the contract with DFCCIL and shall include legal representatives of such individual or persons comprising such firm or company or successors of such firm or company as the case may be such individual, or firm or company.

xiii) "ENGINEER OR ENGINEER IN CHARGE" means the Chief General Manager of DFCCIL/DDU(Employer), or any other officer authorized by the Employer to act on his behalf and for the purpose of operating the contract. “Engineers Representative” shall mean officer authorized by DFCCIL in direct charge of works.

xv) “ACCEPTING AUTHORITY” shall mean the Chief General Manager/DDU of DFCCIL or any other officer authorized for dealing with the works for the purpose of this tender/Contract.

xvi) Definitions mentioned in these tender documents elsewhere will be followed. In Case there is an ambiguity in any definition, the decision of CHIEF GENERALMANAGER /DDU / DFCCIL regarding the interpretation shall be final and binding.

1.2.3 GENERAL DESCRIPTION OF SITE AREA, CLIMATIC CONDITIONS AND SYSTEM PARTICULARS

1.2.3.1 The tenderer(s) are requested to visit the area of work and ascertain himself/themselves with the proposed works / services, surroundings and prevailing law and order conditions.

1.2.3.2 The location of work is located in the state of Uttar Pradesh.

1.2.3.3 SCOPE OF WORK:-

Design, Supply, Erection, Testing & Commissioning of OHE for Sasaram RFO

1.2.4.1 The brief scope of work covers “Design, Supply, Erection, Testing & Commissioning of OHE for Sasaram RFO”.

1.2.4.2 Place of work- In the jurisdiction of DFCCIL, New DDU ERC to New Chiraila Pauthu / New Sonnagar section under CGM DDU and nearby Indian Railway section. The work shall be executed under supervision of authorized representative of CGM/DDU, GM/EL/DDU or PM/EL/DDU. If required by DFCCIL any other station/Site may be included under Schedule of work and no additional charges shall be given for this.

1.2.4.3 Quantities in schedule annexed to Contract- The quantities set out in the accepted schedule of rates with item of work quantified are the estimated quantities of the works and they shall not be taken as the actual and correct quantities of the works to be executed by the Contractor in fulfillment of his obligations under the contract. The actual/final quantity shall be executed as per approved design and drawing which is to be prepared by contractor if required. All the design calculations, if any, shall be done by contractor before execution of work. The contractor shall be responsible for any wastage of material due to mistake in design calculations.

1.2.4.4 New item of work – If during execution of the work, the contractor is called upon to carry out any new item of work not included in schedule of prices, the contractor shall execute such work at such prices as may be mutually agreed with the purchaser before commencement.

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If required by DFCCIL, the contractor have to execute some portion of work as per/under the tender schedule at new location (at the same rate/ Price) over Uttar Pradesh/Bihar.

1.2.5 LOCAL CONDITIONS :

1.2.5.1 It will be imperative on each tenderer to fully acquaint himself with all the local conditions and factors which would have any effect on the performance of the contract and cost of the stores. The DFCCILs shall not entertain any request for clarifications from the tenderer regarding such local conditions. No request for the change of price, or time schedule of completion of work on account of any local condition or factor shall be entertained after the offer is accepted.

1.2.5.2 The intending tenderer will be deemed to have satisfied himself by actual inspection of the site and locality of the works, that all conditions liable to be encountered during the execution of the works are taken into account and that the rates he enters in the tender papers are adequate and all inclusive, for the completion of works to the entire satisfaction of the DFCCILs.

1.2.5.3 In the event of the intending tenderer desiring to have a field survey before furnishing his tender/quotations, he may apply to DFCCILs for permission in this regard. The DFCCILs will give such permission in writing but all the expenses in this regard will be borne by the tenderers.

1.2.5.4 The intending tenderer is advised to study the tender papers carefully, any submission of a bid by the tenderers shall be deemed to have been done after a careful study and examination of these documents with full understanding of the implication thereof. These conditions and specifications shall be deemed to have been accepted unless otherwise, specifically commented upon by the Tenderer in his offer. Failure to adhere to anyone of these instructions may render his offer liable to be ignored without any references.

1.2.6 **INTEGRATION WITH EXISTING WORKS:**The tenderer should keep in mind, visit the location of works, take due note and give proper consideration of integrating the new works (sometimes on replacement account) with the existing system.

1.2.7 ELECTRIC SUPPLY:

The contractor shall make his own arrangements for electricity required by him for the purpose of execution of the contract. However, the DFCCIL shall arrange the required power supply for testing and commissioning of the works completed by the contractor.

1.2.8 SCHEME OF WORK AND PROGRESS REPORT:

1.2.8.1 The Contractor shall within fifteen (15) days of the date of award of the contract submit a BAR/PERT CHART and scheme for the execution. The contractor shall indicate in the form of notes of the assumptions and the basis adopted for the preparation of this BAR/PERT CHART.

1.2.8.2 The contractor shall submit a monthly progress report detailing the actual progress made in all activities as compared to the above BAR/PERT CHART. The monthly progress report shall indicate the reasons for the variations if any between the schedule quantities and actual progress, the action proposed and corrective measures required wherever necessary.

1.2.9 TAXATION:

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 relevant GCC clause 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.

1.2.10 FORCE MAJEURE:

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 non-performance 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

1.2.11 AGREEMENT:

The successful tenderer shall within 14 (fourteen) days after having been called upon by notice to do so be bound to execute an agreement based on accepted rates and lodge the same with purchaser together with the conditions of contract, specification and schedule of prices referred to therein duly completed.

1.2.12 A)EXPENSES OF CONTRACTOR DRAWINGS ETC.:

Any calculation, designs, drawings, schedules information, progress charts etc required by the purchaser's Engineers in connection with the contract, shall be furnished by the contractor at his own expenses.

C) CONTRACTOR'S DRAWINGS:

If required, before execution of the work the contractor shall submit to the purchaser for approval, three copies of all required drawings, work schedule program which are necessary to ensure correct/satisfactory performance as detailed in tender papers

1.2.13 SUB CONTRACTORS

The contractor shall not sublet any part of the work under this contract for the purpose of this. However contractor may enter into contract with supplier for supply of the material for the purpose of this work. However such suppliers should be approved sources of RDSO for materials for which RDSO approved sources are available.

1.2.14 DEFAULT AND DELAY

1.2.14.1 The contractor shall execute the work with due diligence and expedition keeping to the approved time schedule. Should he refuse or neglect to comply with any reasonable orders given to him

in writing by the Engineer's representative in connection with the work or contrivance the provision of the contract or the progress of work lags persistently behind the time schedule due to his neglect, the purchaser shall be at liberty to give seven (7) days notice in writing to the contractor requiring him to make good the neglect or contravention complained and should the contractor fail to comply with requisition made in the notice within seven days from the receipt thereof, it shall be lawful for the purchaser to take the work wholly or in part, out of the contractor's hands without any further reference and get the work or any part thereof as the case may be completed by other agencies at expense of the contractor without prejudice to any other right or remedy of the purchaser.

1.2.14.2 LOSS SUSTAINED DUE TO DEFAULT AND DELAY:

In the event of any loss to the purchaser on account of execution and/or completion of the work or any parts thereof by agencies other than the contractor, the contractor shall be liable to reimburse the loss to the purchaser without prejudice to any other right and remedies of the purchaser, and as the case may be met at the option, of the purchaser, from out of all or any of the following sources viz.

- i) Any amount due and payable to the purchaser on any account whatsoever.
- ii) The contractor's security deposit with the purchaser so far as available and
- iii) Any other assets whatsoever belonging to contractor.

1.2.15 CONTRACTOR'S RESPONSIBILITY FOR DISCREPANCY:

a) All designs and drawings submitted by the contractor shall be based on thorough study and shall be such that the contractor is satisfied about their suitability. The purchaser's approval will be based on these considerations. Notwithstanding approval communicated by the purchaser, during the progress of the contract for designs and drawings, proto type samples of material after inspection of materials after erection and adjustments to installations the ultimate responsibility for correct designs and execution of work shall rest with the contractor.

b) The contractor shall be responsible for and bear and pay the costs for any alteration of works arising from any discrepancies errors or omissions in the design and drawings supplied by him, whether such designs and drawings have been approved by the purchaser or not.

1.2.16 Provision of Efficient and Competent Staff at Work Sites by the Contractor:

1.2.16.1 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 and proper manner and shall employ only such supervisors, workmen and laborers in or about the execution of any of these works as are careful and skilled in the various trades.

1.2.16.2 The Contractor shall at once remove from the works any agents, permitted sub-contractor, supervisor, workman 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.

1.2.16.2 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 labor 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/DFCCIL to rescind the contract under Clause 62 of these conditions.

1.2.17 Deployment of Qualified Engineers at Work Sites by the Contractor:

1.2.17.1 The Contractor shall also employ qualified Graduate Engineer(s) or equivalent, or qualified Diploma Engineer(s).

1.2.17.2 In case the Contractor fails to employ the Engineer, as aforesaid Para, he shall be liable to pay liquidated damages at the rates, as prescribed in the tender documents.

1.2.18 WORKS BY OTHER AGENCIES:

Any other works undertaken at the same time by the purchaser or the DFCCIL direct or through some other agency at the same site where the contractor is carrying out his work will not entitle the contractor to prefer any claim, regarding any delays or hindrance he may have to face on this account. The contractor shall comply with any instructions which may be given to him by the purchaser in order to permit simultaneous execution of his own works and of those undertaken by other contractors or the DFCCIL without being entitled on this account to any extra charge.

1.2.19 ACCESS TO WORK SITE:

a) The purchaser shall afford access to the site for the purpose of this contract to the contractor at all reasonable times. In the execution of the work, no person other than the contractor or his only appointed representatives or approved sub contractor and bona-fide workman shall have access to site. Access to the site of work at all times shall be allowed by contractor to officials or approved representative of the purchaser or to DFCCIL staff for purpose of maintenance.

b) The purchaser or his authorized representative shall have the right to refuse admission to the work site to any. Person employed by the contractor to whom the purchaser or his engineer may consider undesirable.

c) The engineer or his representative shall be at liberty to object to the presence of any representative or other person employed by the contractor in or about the works on the ground of misconduct, incompetence or negligence, the contractor on receipt of notices of such objection in writing, shall forthwith remove the person so objected to and provide in his place another competent person and shall not allow such person to enter the site of work subsequently. The purchaser will not be able to pay any cost or damage on this account.

1.2.20 PENALTY FOR DELAY IN COMPLETION:

a) If the contractor fails to execute and complete the work within time specified in the agreement or within the period of extension granted except in so far that the delay is on the purchaser's account; the contractor shall accept reduction in the total amount payable to him by the purchaser at the rate of ½% (half percent) per week of the contract value for the actual delay occurred and until the work shall have been completed under the contract and such reduction shall be accepted by the purchaser in full satisfaction of the contractor's liability arising from delay only. The Engineer shall at his sole discretion, specify a time limit within which the unfinished portion of the work shall be completed. In the event of failure of the contractor, the purchaser shall be at liberty to take action in accordance with provision in

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General Conditions of Contract 2022 of Indian Railway, along with latest correction slips and amendments.

- b) Extension of time- If aforesaid shall have arisen from any cause which the purchaser may admit as being a responsible ground for extension of time the purchaser shall allow such additional time as he may in his absolute discretion consider to be reasonably justified by the circumstances of the case.
- c) The contractor in the presence of the purchaser or his representative shall carry out tests as required under the specification as soon as possible after commissioning. The contractor at his own expense shall carry out any other additional test that the purchaser may prescribe for testing the satisfactory operation of the plants. Necessary electrical power required in C/W the test will be supplied free of any charges by the purchaser. The contractor shall submit six copies of the results to the purchaser for acceptance. The contractor shall also submit 6 copies of the manufacturer's test certificates for equipments such as motor, cable etc
- d) Should the result of the test not be satisfactory, an extension of one month will be granted to the contractor to make good the defects and or any deficiencies pointed out by the purchaser a fresh test will then be carried out after the contractor has attended to the defects and deficiencies. If these do not yield satisfactory results, the purchaser may proceed at the contractor's expense, by all means as deemed expedient to have installation made satisfactory until they comply with the specification, approved drawings and designs
- e) In such a case or in a case of delay in completion of the work under this contract within the time limit, the purchaser reserves the right to get the work completed by contractor as per provisions of contract. The purchaser will give to the contractor for this purpose 7 days previous notice. The contractor shall then take at his own expense all necessary steps to complete the works in accordance with the provision of the contract. In case it becomes impossible to proceed with the above mentioned taking over tests, for reason other than for which the contractor is responsible, the "Provisional Acceptance Certificate" shall be issued at or within a mutually agreed reasonable period not exceeding 6 months after completion of the work.
- f) Imposition of token penalty for delay in the completion of work- Competent authority while granting extension to the currency of contract under clause 17 (B) of GCC may also consider levy of token penalty as deemed fit based on the merit of the case.

1.2.21 FINAL ACCEPTANCE:

- a) The final acceptance of the entire plant shall take effect from the date of expiration of the period of guarantee provided the installations provisionally accepted are still in perfect working order.
- b) If on the other hand the installations are not in the perfect working order at the end of the guarantee period the purchaser may either extend the period of guarantee until necessary works are carried out by the contractor, or carry out these works or have them carried out on behalf of the contractor and at his expense. A certificate of final acceptance shall then be issued by the purchaser, which will terminate the contract.

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1.2.22 **MATERIAL-** All materials, components and fittings etc. to be supplied by the contractor shall be procured from RDSO/ CORE/ Railway approved suppliers/ vendors/manufactures. Inspection of material to be done by RITES or authorized representative of GM/EL/DDU in OEM premises before dispatch. For low value item “**onsite inspection**” will be done by authorized representative of GM/EL/DDU. Firm will provide necessary document for the inspection.

1.2.23 **Safety Gear-** During execution of the work, contractors shall ensure that all safety precautions are taken by their men to protect themselves and site to prevent any untoward incident. DFCCIL reserve the right to stop the work in the absence of proper safety gear and no claim shall be entertained in this regard; decision of the Engineer-in-charge will be final and binding upon the contractor. The cost of all the safety gear is deemed to have been included in the rates quoted and nothing extra is payable under this contract.

1.2.24 **TIME SCHEDULE:** -

1.2.24.1 The entire work is required to be completed in all respects within 18 (Eighteen) month from the date of issue of acceptance letter/telegram. Time is the essence of contract. The contractor will be required to maintain steady and regular progress to the satisfaction of the engineer to ensure that the work will be completed in all respects within the stipulated time failing which action may be taken by the DFCCIL Administration in terms of General Conditions of Contract 2022 of Indian Railway, along with latest correction slips and amendments.

1.2.24.2 The Contractor shall be expected to initiate work immediately after receipt of “**Letter of Acceptance**”.

1.2.25 **RATES:** -

1.2.25.1 The rates quoted and accepted by DFCCIL shall be firm and final during the currency of contract.

1.2.25.2 All statutory taxes and liabilities levied/may be levied in future by the Central and State Government or any other governing authority/agency from time to time shall be borne by the contractor and the rate shall be inclusive of all such liabilities.

1.2.25.3 GST is inclusive for this tender.

1.2.25.4 The Work Provider will, for the purpose, aforesaid continuously monitor the Works being rendered by it to ensure that these are up to the standards required by DFCCIL.

1.2.25.5 The Work Provider shall indemnify and keep DFCCIL indemnified and harmless from and against all disputes, claims, fines, penalties, litigations criminal as well as civil that may be initiated against the DFCCIL on account of and/or arising out of the failure of the Work Provider to adhere to any statutory requirement, or to follow such rules regulations, guidelines or procedures as may be required under any statute or directive.

1.2.26 **QUANTITY VARIATION:**

Rates quoted in the schedule of items shall be valid for a variation of the quantity up to maximum of (\pm) 25% for each item. In case of variation in quantities beyond $\pm 25\%$, the rates for the additional quantities beyond $\pm 25\%$ variation shall be negotiated/decided on mutually acceptable terms, provided the rate so arrived does not exceed the originally accepted rate as per agreement.

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(iv) 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 (in which no variation limit shall apply).However, the rates for the increased quantities shall be as per sub-para (iii) below.

(v) 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.

d. 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 contract value.

d.(i) 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;

d.(ii)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;

d.(iii) 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.

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

(v) (v) As far as Standard Schedule of Rates (SSOR) items are concerned, the variation limit of 25% would apply to the value of SSOR schedule(s) as a whole and not on individual SSOR items. However, in case of Non Standard Schedule of Rates (SSOR) 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)

1.2.26 TERMINATION OF CONTRACT:-

In case the work of the contractor is not found satisfactory, or there is a breach of any of the terms and conditions of the contract and/or fails/neglects to carry out any instruction issued to it by DFCCIL from time to time the same can be terminated by DFCCIL on giving of the notice as stipulated in GCC.

1.2.28 **IMPLEMENTATION OF INTEGRITY PACT IN DFCCIL:-**

As per office memorandum no F.No DPE/13(12)/11-Fin Dated 09.09.2011 issued by Ministry of Heavy Industries (DPE) all PSU should enter into Integrity pact in the required Performa in their procurement transaction/ Contracts with suitable changes specific to the situation in which the pact is to be used. The pact, entering into which would be a preliminary qualification for any bidder, essentially envisages an agreement between the prospective vendors / bidders and the DFCCIL, committing the persons/ officials on both sides not to resort to any corrupt practices in any aspect / stage of the contract.

The pact has to be implemented through a panel of independent external monitor who will review independently and objectively the compliance of the obligations by both the parties. As these IEM's are to be appointed by the CVC in consultation with the CVO and are being processed separately.

A copy of pre contract integrity pact is enclosed at Annexure IX for signature of bidder as acceptance, as and when Independent External monitor is appointed.

1.2.29 **ORDER OF PRIORITY OF CONTRACT DOCUMENTS:-**

The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of interpretation, the priority of the documents shall be in accordance with the following sequence:

- i) The Contract Agreement.
- ii) Letter of Acceptance.
- iii) Tender Form
- iv) General Information
- v) Notice Inviting Tender (with Annexes)
- vi) Instructions to Tenderers
- vii) Special Conditions of Contract
- viii) Annexure
- ix) Bill of Quantities (BOQ)/Schedule of Rate
- x) General Terms and Conditions of Contract

1.2.30 **JURSDICTION OF COURTS:-**

In case of any disputes/differences between contractor and DFCCIL the jurisdiction shall be of Chanduali Courts only.

1.2.31 In case of any deviation in downloaded copy of the tender documents, the master Copy kept in the office of CGM/DDU/DFCCIL, will prevail and the interpretation of CGM/DDU will prevail.

1.2.32 **RISK PURCHASE:-**

During execution of this Tender, if any delay is observed due to reasons attributable to tenderer other than force majeure conditions which may cause delay in completion of the work, DFCCIL shall be at liberty to cancel the contract, totally or partially, at any point of time without assigning any reason, whosever, and take alternative measures at your risk and cost.

1.2.33 **Penalties for Safety lapses:-**

Any violation in adhere to the terms and conditions stipulated in IR GCC 2022 would also attract to penalties by you as per IR GCC 2022 provisions.

1.2.34 SECURITY DEPOSIT:

The Security Deposit shall be 5% of the contract value. The Bid Security submitted by the Contractor with his tender will be retained/encased by Railways/DFCCIL as part of security for the due and faithful fulfillment of the contract by the Contractor. Provided further that, if Contractor submits the Cash or Term Deposit Receipt issued from a Scheduled commercial bank of India or irrevocable Bank Guarantee Bond from a Scheduled commercial bank of India, either towards the Full Security Depositor the Part Security Deposit equal to or more than Bid Security, the Railway shall return the Bid Security, to the Contractor.

Balance of Security Deposit may be deposited by the Contractor in cash or Term Deposit Receipt issued from Scheduled commercial bank of India or irrevocable Bank Guarantee bond issued from Scheduled commercial bank of India, or may be recovered at the rate of 6% 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.

The Irrevocable Bank Guarantee submitted towards Security deposit shall be initially valid up to the stipulated date of Maintenance period plus 60 days and shall be extended from time to time, depending upon extension of contract granted in terms of Clause 17A and 17B of the Standard General Conditions of Contract 2022.

Note: Security Deposit deposited in cash by the Contractor or recovered from the running bills of a Contractor or submitted by contractor as Term Deposit Receipt(s) can be refunded/returned to the contractor, in lieu of irrevocable Bank Guarantee bond issued from scheduled commercial bank of India, to be submitted by him, for an amount equal to or more than the already available Security Deposit, provided however that, in a contract of value less than Rs. 50 Crore, such refund/ return of the already available Security Deposit is permitted up to two times and in a contract of value equal to or more than Rs. 50 Crore, such refund / return of the already available Security Deposit is permitted up to three times.

1.2.35 (i) REFUND OF SECURITY DEPOSIT:

Security Deposit mentioned in above shall be returned to the Contractor along with or after, the following:

- (a) Final Payment of the Contract **and**
- (b) Execution of Final Supplementary Agreement or Certification by Engineer that DFCCIL has No Claim on Contractor **and**
- (c) On expiry of the defect liability period.

(ii) Forfeiture of Security Deposit: Whenever the contract is rescinded as a whole under clause 62 (1) of GCC2022 conditions, the Security Deposit already with DFCCIL under the contract shall be forfeited. However, in case the contract is rescinded in part or parts under clause 62 (1) of GCC 2022, the Security Deposit shall not be forfeited.

(iii) No interest shall be payable upon the Bid Security and Security Deposit or amounts payable to the Contractor under the Contract, but Government Securities deposited in terms of GCC 2022 will be payable with interest accrued thereon.

1.2.36 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

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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 Bid Security and other dues payable to the contractor against that particular contract, subject to maximum of PG amount. In case a tenderer has not submitted Bid Security on the strength of their registration as a Startup recognized by Department of Industrial Policy and Promotion (DIPP) under Ministry of Commerce and Industry, DIPP shall be informed to this effect.

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

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

- (i) A deposit of Cash;
- (ii) Irrevocable Bank Guarantee;
- (iii) Government Securities including State Loan Bonds at 5% below the market value;
- (iv) Pay Orders and Demand Drafts tendered by any Scheduled Commercial Bank of India;
- (v) Guarantee Bonds executed or Deposits Receipts tendered by any Scheduled Commercial Bank of India;
- (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 60 days.

(d) The value of PG to be submitted by the Contractor is based on original contract value and shall not change due to subsequent variation(s) in the original contract value.

(e) The Performance Guarantee (PG) shall be released after physical completion of the work based on 'Completion Certificate' issued by the competent authority stating that the Contractor has completed the work in all respects satisfactorily.

(f) Whenever the contract is rescinded, the Performance Guarantee already submitted for the contract shall be encashed.

(g) The Engineer shall not make a claim under the Performance Guarantee except for amounts to which the President of India is entitled under the contract (not withstanding and/or without prejudice to any other provisions in the contract agreement) in the event of:

(i) Failure by the Contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer may claim the full amount of the Performance Guarantee.

(ii) Failure by the Contractor to pay President of India any amount due, either as agreed by the Contractor or determined under any of the Clauses/Conditions of the Agreement, within 30 days of the service of notice to this effect by Engineer.

(iii) The Contract being determined or rescinded as per GCC, 2022.

1.2.37 INSURANCE:

The contractor shall take out and keep in force a policy or policies of insurance against all liabilities of the contractor or the purchaser at common law or under any status in respect of accidents to person who shall be employed by the contractor in or about the site of the contractor's office for the purpose of carrying out the works on the site. The contractor shall also take out and keep in force a policy or policies of insurance against all recognized risks to their offices and depots. Such insurance shall in all respects be to the approval of the purchaser and if he so requires in his name.

1.2.38 DEFECT LIABILITY PERIOD :

The period of defect liability for the works shall be 12 (Twelve) Months starting from the date of completion of the work or as certified by the DFCCIL.

1.2.39 ELECTRICAL CONTRACTOR LICENSE:

Contractor must have valid Class-'A', Electrical Contractor License issued from appropriate government authority to execute mentioned works.

PART -I

CHAPTER -III

PRICES AND PAYMENT

1.3.1 SCOPE

This chapter deals with prices to be paid for supply and/or erection of various items of work or for suppliers and other amounts payable in accordance with accepted schedules of prices and rates and terms and 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.

1.3.2 SCHEDULE OF PRICES

(a) The unit rates given against various items of work in tender papers are the standard schedule of rates. The tenderers are required to quote uniform percentage below / at par / above against the total estimated cost of work. The actual payment to be made against any item of schedule of rates, shall be derived after loading the schedule of rates with the tenderer's quoted percentage. The prices so obtained shall be the unit prices for the various items of work given in schedule of rates.

(b) UNIT PRICES FOR MATERIALS.

The unit prices for supply indicated in the schedule of rates are inclusive of the prices of materials including all incidental charges for transport, loading/unloading and handling of materials, commission for arranging dispatch by rail/road direct from manufacturer's factory and completing all necessary formalities in this respect, such as submission of forwarding notes, arranging placement of wagons, collection of railway receipt, conservancy charges as applicable from time to time, all insurance premium, bankers charges for bank guarantee, indemnity bonds inclusive of cost of stamps, etc. as also siding or shunting charges, if any levied by the Railway. The unit prices includes all taxes, duties and levies (include Works Contract Tax) applicable on this works contract. Therefore, they should quote their prices taking into account the rate of taxes as leviable in the event of sale through works contract to the Central Railway Organization in that state and present tax structure applicable. Necessary, Sales Tax concessional Form A/D and Octroi exemption certificate will be issued by DFCCIL/Railways on written request of the contractor. No reimbursement on account of Octroi duty will be entertained by the purchaser. The price are inclusive of provision for losses and wastages in transit and erection.

(d) OTHER PRICE ADJUSTMENT

The price adjustment of unit prices or prices of fittings, materials, equipment or components on account of prices fluctuation of raw materials will not be permitted. No adjustment on account of variation in insurance and freight charges (Road or Rail) will be permitted. The Price will remain firm during the Currency of Contract.

(e) QUANTITIES

The approximate estimated quantities of various items or works are included in Schedule. **However, the contractor will work out the quantities based on approved drawing for schedule and get it approved from the purchaser before placing order.**

(f) EXPLANATORY NOTES

Explanatory notes for various items of work included in Schedule, are given in Part-I, Chapter-IV.

1.3.3 NON-SCHEDULE & ADDITIONAL SUPPLIES:

1.3.3.1 NON-SCHEDULE ITEMS:

i) If during the execution of the work, the contractor is called upon to carry out any new item of work not included in Schedules, the contractor shall execute such works at such price as may be mutually agreed with the Purchaser before commencement after obtaining the competent authority's approval and sanction. The rates will be based on the Rly's LOA/rate analysis as per the current market / prevalent rates of such or similar items available with the DFCCIL/Railway Administration in that or nearby areas.

ii) Provided that if the Contractor commence work or incurs any expenditure in regard thereto before the rates are determined and agreed upon as lastly here on-to-fore mentioned, then and in such a case the Contractor shall only entitled to be paid in respect of the work carried out or expenditure incurred by him prior to the date of determination of the rates as aforesaid according to the rates as shall be by the Purchaser. However, if the contractor is not satisfied with the decision of the Purchaser in this respect, he may appeal to Chief General Manager within 30 days of getting the decision of the Purchaser, supported by analysis of the rates claimed. The Chief General Manager's decision after hearing both the parties in the matter would be final and binding on the contractor and the Railway

1.3.3.2 PRICE OF ADDITIONAL SUPPLIES:

The additional supplies of individual scheduled items, if necessary, will be taken over from the contractor at the rate of the bid received.

1.3.4 PAYMENTS AND RECOVERIES:

a) No advance payment shall be made to the contractor. However, on account payment will be made against receipt of materials at site and also progressive payments will be made for each item of work during the erection stage.

b) Subject to any deductions or recoveries which the purchaser be entitled to make under the Contract, the contractor shall unless otherwise agreed to been titled to get the following payments subject to conditions stipulated in subsequent paragraphs.

- i) Progress payments for supply and erection
- iii) Payments for additional supplies
- iv) Payment for provisional acceptance
- v) Payment for surplus materials taken over
- vi) Payment for T&P and Maintenance Spares.
- vi) Final settlement.

1.3.5 INVOICING PROCEDURE :

(a) The contractor shall submit his invoicing procedure if applicable, for approval by the purchaser's representative within two months from the date of receipt of letter of acceptance of tender. Separate invoices shall be submitted for different type of payments mentioned above. All invoices shall be submitted with original supporting documents or certified true copies of supporting documents wherever these are acceptable to the purchaser's engineer. Where copies of original documents are required in support of several invoices, true certified copies of the original documents may be forwarded to the purchaser's engineer with his consent.

(b) Invoices shall be submitted only on the basis of agreed principles and prices, quantities and measurement 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.

(c) All invoices /Bills shall be accompanied by the following

- 1. Supplier Challans
- 2. Commissioning certificate granted by the concern Engineer In-charge's authorized representative

3. Certificate of receipt of material duly accepted by the concern Engineer Incharge's authorized representative

1.3.6 TERMS OF PAYMENT

A. Payment

Payments for Supply erection and commissioning included in schedule shall be made in stages as under;

a. 80% payment as per rates indicated in schedule along with percentage accepted will be made after Supply on receipt of material.

b. 10% of payment will be made after successful erection of material.

c. Balance 10% of payment will be made after completion of entire work on successful commissioning and issue of provisional acceptance.

1.3.7 Payment for additional supplies:

The contractor shall receive payment for additional supplies and erection in accordance with conditions stipulated in Para 1.3.3.2.

1.3.8 Final settlement: On Successful completion of guarantee period and issue of certificate of final acceptance of entire installations, the security deposit will be refunded /returned to the contractor after adjustment of any dues payable by the contractor to the purchaser.

1.3.9 MEASUREMENTS:

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

(b) The measurement will be made generally in accordance with standard engineering practice conformity with the Explanatory notes for Schedule in Part-I, Chapter- IV of the tender documents.

1.3.10 TAXES:

(a) The Contractor and all personnel employed by him shall pay such taxes like income tax as are payable under statutory laws of India and the Purchaser will not accept any liability for the same.

(b) Deduction of income tax at source as per provision of finance act and income tax act in force may be made from the Contractor/sub-Contractor and the amount so deducted may be credited to the Central Government.

(c) Tenderers will examine the various provisions of the Central Goods and Services Tax Act 2017 (CGST) 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.

(d) The successful tenderer who is liable to be 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.

(e) 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.

1.3.11 RELEASE OF PERFORMANCE GUARANTEE:

The Performance Guarantee (PG) shall be **released by 21 days 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.

1.3.12 RELEASE OF SECURITY DEPOSIT:

Security Deposit shall be returned to the Contractor after the following:

- (a) Final Payment of the Contract as per relevant GCC clause and
- (b) Signature of Final Supplementary Agreement or Certification by Engineer that DFCCIL has No Claim on Contractor and
- (c) Issue of Maintenance Certificate on expiry of the Defect Liability/period as per relevant GCC clause.

Forfeiture of Security Deposit:

Whenever the contract is rescinded as a whole under relevant GCC clause, the Security Deposit already with Railways/DFCCIL under the contract shall be forfeited. However, in case the contract is rescinded in part or parts under relevant GCC clause, the Security Deposit shall not be forfeited.

No interest shall be payable upon the Bid Security and Security Deposit or amounts payable to the Contractor under the Contract, but Government Securities deposited, will be payable with interest accrued thereon as per relevant GCC –Clause.

1.3.13 RATES FOR ITEMS OF WORKS:

(i) The rates, entered in the accepted Schedule of Rates of the Contract are intended to provide for works duly and properly completed in accordance with the General and Special (if any) Conditions of the Contract and the Specifications and drawings together with such enlargements, extensions, diminutions, reductions, alterations or additions as may be ordered in terms of GCC 2022 and without prejudice to the generality thereof and shall be deemed to include and cover superintendence and labour, supply, including full freight of materials, stores, patterns, profiles, moulds, fittings, centerings, scaffolding, shoring props, timber, machinery, barracks, tackle, roads, pegs, posts, tools and all apparatus and plant required on the works, except such tools, plant or materials as may be specified in the contract to be supplied to the Contractor by the Railway, the erection, maintenance and removal of all temporary works and buildings, all watching, lighting, bailing, pumping and draining, all prevention of or compensation for trespass, all barriers and arrangements for the safety of the public or of employees during the execution of works, all sanitary and medical arrangements for labour camps as may be prescribed by the Railway/DFCCIL, the setting of all work and of the construction, repair and upkeep of all centre lines, bench marks and level pegs thereon, site clearance, all fees duties, royalties, rent and compensation to owners for surface damage or taxes and impositions payable to local authorities in respect of land, structures and all material supplied for the work or other duties of or expenses for which the Contractor may become liable or may be put to under any provision of law for the purpose of or in connection with the execution of the contract and all such other incidental charges or contingencies as may have been specially provided for in the Specifications.

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 relevant GCC clause 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.

PRICE VARIATION CLAUSE in Works Contracts is dealt with in accordance with provisions of GCC 2022 with latest amendments & correction slips.

As per Railway Board's letter no. 2017/Trans/01/Policy dated 08/02/2018, **Since, the Cost of advertisement value of this tender is less than Rs 5 crore, so PVC will not be applicable.**

1.3.14 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/DFCCIL or other persons legally entitled thereto 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.

1.3.14.1 Certificate of Completion of Works: As soon as in the opinion of the Engineer, the work has been completed and has satisfactorily passed any final test or tests that may be prescribed, the Engineer shall issue a certificate of completion duly indicating the date of completion in respect of the work and the period of maintenance/Defect liability period of the work shall commence from the date of completion mentioned in such 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 Contractor and that there is no due from the Contractor to Railways/DFCCIL against the contract concerned.

The Engineer may also issue such a certificate indicating date of completion with respect to any part of the work (before the completion of the whole of work), which has been both completed to the satisfaction of the Engineer and occupied or used by the Railway. When any such certificate is given in respect of part of a work, such part shall be considered as completed and the period of maintenance of such part shall commence from the date of completion mentioned in the completion certificate issued for that part of the work.

1.3.14.2 Contractor not Absolved by Completion Certificate: The Certificate of Completion in respect of the works referred to in Sub-Clause (1) of this Clause shall not absolve the Contractor from his liability to make good any defects imperfections, shrinkages or faults which may appear during the period of maintenance specified in the tender arising in the opinion of the Engineer from materials or workmanship not in accordance with the drawings or specifications or instruction of the Engineer, which defects, imperfections, shrinkages or faults shall upon the direction in writing of the Engineer be amended and made good by the Contractor at his own cost; and in case of default on the part of Contractor, the Engineer may employ labour and materials or appoint another Contractor to amend and make good such defects, imperfections, shrinkages and faults and all expenses consequent thereon and incidental thereto shall be borne by the Contractor and shall be recoverable from any moneys due to him under the contract.

1.3.14.3 Final Supplementary Agreement: After the work is completed and taken over by the Railway/DFCCIL as per terms and conditions of the contract agreement or otherwise concluded by the parties with mutual consent and full and final payment is made by the Railway to the Contractor for work done, and there is unequivocal no claim on either side under the contract, the parties shall execute the final supplementary agreement.

1.3.15 Approval only by Maintenance Certificate: No certificate other than maintenance certificate referred to in relevant Clause of GCC of the Conditions shall be deemed to constitute approval of any work or other matter in respect of which it is issued or shall be taken as an admission of the due performance of the contract or any part thereof.

1.3.15.1 Maintenance Certificate: The Contract shall not be considered as completed until a Maintenance Certificate shall have been signed by the Engineer stating that the works have been completed and maintained to his satisfaction. The Maintenance Certificate shall be given by the Engineer upon the expiration of the period of maintenance or as soon thereafter as any works ordered during such period.

The Competent Authority to issue above Maintenance Certificate shall normally be the authority who is competent to sign the contract. If this Competent Authority is of the rank lower than JA Grade, then 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 Contractor and that there is no due from the Contractor to Railways/DFCCIL against the contract concerned.

1.3.15.2 Cessation of Railway's/DFCCIL's Liability: The Railway/DFCCIL shall not be liable to the Contractor for any matter arising out of or in connection with the contract for execution of the works unless the Contractor has made a claim in writing in respect thereof before the issue of the Maintenance Certificate under this clause.

1.3.15.3 Unfulfilled Obligations: Notwithstanding the issue of the Maintenance Certificate the Contractor and the Railway/DFCCIL shall remain liable for the fulfillment of any obligation incurred under the provision of the contract prior to the issue of the Maintenance Certificate which remains unperformed at the time such certificate is issued and for the purposes of determining the nature and extent of any such obligations, the contract shall be deemed to remain in force between the parties thereto.

1.3.16.1 Final Payment: On the Engineer's certificate of completion in respect of the works, adjustment shall be made and the balance of account based on the Engineer or the Engineer's representative's certified measurements or Engineer's certified "contractor's authorized engineer's measurements" of the total quantity of work executed by the Contractor upto the date of completion and on the accepted schedule of rates and for extra works on rates determined shall be paid to the Contractor subject always to any deduction which may be made under these presents and further subject to the Contractor having signed delivered to the Engineer enclosing either a full account in detail of all claims he may have on the Railway/DFCCIL in respect of the works or having delivered No Claim Certificate. and the Engineer having after the receipt of such account given a certificate in writing that the whole of the works to be done under the provisions of the Contracts have been completed, that they have been inspected by him since their completion and found to be in good and substantial order, that all properties, works and things, removed, disturbed or injured in consequence of the works have been properly replaced and made good and all expenses and demands incurred by or made upon the Railway/DFCCIL for or in the respect of damage or loss by from or in consequence of the works, have been satisfied agreeably and in conformity with the contract.

1.3.16.2 Post Payment Audit: It is an agreed term of contract that the Railway reserves to itself the right to carry out a post-payment audit and/ or technical examination of the works and the final bill including all supporting vouchers, abstracts etc. and to make a claim on the Contractor for the refund of any excess amount paid to him till the release of security deposit or settlement of claims, whichever is later, if as a result of such examination any over-payment to him is discovered to have been made in respect of any works done or alleged to have been done by him under the contract.

1.3.17 PRODUCTION OF VOUCHERS ETC BY THE CONTRACTOR:

(i) For a contract of more than one crore of rupees, the Contractor shall, whenever required, produce or cause to be produced for examination by the Engineer any quotation, invoice, cost or other account, book of accounts, voucher, receipt, letter, memorandum, paper of writing or any copy of or extract from any such document and also furnish information and returns verified in such manner as may be required in any way relating to the execution of this contract or relevant for verifying or ascertaining cost of execution of this contract (the decision of the Engineer on the question of relevancy of any documents, information or return being final and binding in the parties). The Contractor shall similarly produce vouchers etc, if required to prove to the Engineer, that materials supplied by him, are in accordance with the specifications laid down in the contract.

(ii) If any portion of the work in a contract of value more than one crore of rupees be carried out by a sub-contractor or any subsidiary or allied firm or company, the Engineer shall have power to secure the books of such sub-contract or any subsidiary or allied firm or company, through the Contractor, and such books shall be open to his inspection.

(iii) The obligations imposed by Sub Clause (i) & (ii) above is without prejudice to the obligations of the Contractor under any statute rules or orders binding on the Contractor.

1.3.18 LABOUR:

1.3.18.1 Wages to Labour: The Contractor shall be responsible to ensure compliance with the provision of the Minimum Wages Act, 1948 (hereinafter referred to as the “said Act”) and the Rules made there under in respect of any employees directly or through petty Contractors or sub-contractors employed by him for the purpose of carrying out this contract.

If, in compliance with the terms of the contract, the Contractor supplied any labour to be used wholly or partly under the direct orders and control of the Railways whether in connection with any work being executed by the Contractor or otherwise for the purpose of the Railway such labour shall, for the purpose of this Clause, still be deemed to be persons employed by the Contractor.

If any moneys shall, as a result of any claim or application made under the said Act be directed to be paid by the Railway, such money shall be deemed to be moneys payable to the Railway by the Contractor and on failure by the Contractor to repay the Railway any moneys paid by it as aforesaid within seven days after the same shall have been demanded, the Railways shall be entitled to recover the same from Contractor’s bills/Security Deposit or any other dues of Contractor with the Government of India.

1.3.18.2 Apprentices Act: The Contractor shall be responsible to ensure compliance with the provisions of the Apprentices Act, 1961 and the Rules and Orders issued thereunder from time to time in respect of apprentices directly or through petty Contractors or sub-contractors employed by him for the purpose of carrying out the Contract.

If the Contractor directly or through petty Contractors or sub-contractors fails to do so, his failure will be a breach of the contract and the Railway may, in its discretion, rescind the contract. The Contractor shall also be liable for any pecuniary liability arising on account of any violation of the provisions of the Act.

1.3.18.3 Provisions of Payments of Wages Act: The Contractor shall comply with the provisions of the Payment of Wages Act, 1936 and the rules made there under in respect of all employees employed by him either directly or through petty Contractors or sub-contractors in the works. If in compliance with the terms of the contract, the Contractor directly or through petty Contractors or sub-contractors shall supply any labour to be used wholly or partly under the direct orders and control of the Engineer whether in connection with the works to be executed hereunder or otherwise for the purpose of the Engineer, such labour shall nevertheless be deemed to comprise persons employed by the Contractor and any moneys which may be ordered to be paid by the Engineer shall be deemed to be moneys payable by the Engineer on behalf of the Contractor and the Engineer may on failure of the Contractor to repay such money to the Railways deduct the same from any moneys due to the Contractor in terms of the contract. The Railway shall be entitled to recover the same from Contractor's bills/Security Deposit or any other dues of Contractor with the Government of India all moneys paid or payable by the Railway by way of compensation of aforesaid or for costs of expenses in connection with any claim thereto and the decision of the Engineer upon any question arising out of the effect or force of this Clause shall be final and binding upon the Contractor.

1.3.18.4 Provisions of Contract Labour (Regulation and Abolition) Act, 1970:

(1) 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.

(2) The Contractor shall obtain a valid license under the aforesaid Act as modified from time to time before the commencement of the work and continue to have a valid license until the completion of the work. Any failure to fulfill the requirement shall attract the penal provision of the Act.

(3) The Contractor shall pay to the labour employed by him directly or through sub-contractors the wages as per provision of the aforesaid Act and the Rules wherever applicable. The Contractor shall notwithstanding the provisions of the contract to the contrary, cause to be paid the wages to labour, indirectly engaged on the works including any engaged by sub-contractors in connection with the said work, as if the labour had been immediately employed by him.

(4) In respect of all labour directly or indirectly employed in the work for performance of the Contractor's part of the contract, the Contractor shall comply with or cause to be complied with the provisions of the aforesaid Act and Rules wherever applicable.

(5) In every case in which, by virtue of the provisions of the aforesaid Act or the rules, the Railway is obliged to pay any amount of wages to a workman employed by the Contractor or his sub-contractor in execution of the work or to incur any expenditure on account of the contingent, liability of the Railway due to the Contractor's failure to fulfill his statutory obligations under the aforesaid Act or the rules, the Railway will recover from the Contractor, the amount of wages so paid or the amount of expenditure so incurred and without prejudice to the rights of the Railway under the Section 20, Sub-Section (2) and Section 2, Sub-Section (4) of the aforesaid Act, the Railway shall be at liberty to recover such amount or part thereof from Contractor's bills/Security Deposit or any other dues of Contractor with the Government of India. The Railway shall not be bound to contest any claim made against it under Sub-Section (1) of Section 20 and Sub-Section (4) of Section 21 of the aforesaid Act except on the written request of the Contractor and upon his giving to the Railway full security for all costs for which the Railway might become liable in contesting such claim. The decision of the Chief Electrical Engineer regarding the amount actually recoverable from the Contractor as stated above shall be final and binding on the Contractor.

1.3.18.5 Provisions of Employees Provident Fund and Miscellaneous Provisions Act, 1952:

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

1.3.18.6 Contractor is to abide by the provisions of Payment of Wages act & Minimum Wages act in terms Indian Railways General Condition of Contract. 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 as under:

(a) Contractor shall apply for one time registration of his company/firm etc. in the **Shramikkalyan 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 LOAs issued in his favour.

(c) The contractor once registered on the portal, shall provide details of his Letter of Acceptances (LOA) / Contract Agreements on shramikkalyan 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 shramikkalyan portal on monthly basis.

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

(f) 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 Shramikkalyan portal at 'www.shramikkalyan.indianrailways.gov.in' till ____Month, ____Year."

1.3.18.7 Provisions of "The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996" and "The Building and Other Construction Workers' Welfare Cess Act, 1996":

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 Workers Act, 1996 and rules made thereto by the concerned State Govt., and submit certificate of Registration issued from the Registering Officer of the concerned State Govt. (Labour Dept.). **The Cess shall be deducted from contractor's bills as per provisions of the Act.**

1.3.18.8 Reporting of Accidents: 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 wherever occurring on the works to the Engineer or the Engineers Representative and shall make every arrangements to render all possible assistance.

1.3.18.9 Provision of Workmen's Compensation Act: In every case in which by virtue of the provisions of Section 12 Sub-Section (1) of the Workmen's Compensation Act 1923, Railway is obliged to pay compensation to a workman directly or through petty Contractor or sub-contractor employed by the Contractor in executing the work, Railway will recover from the Contractor the amount of the compensation so paid, and, without prejudice to the rights of Railway under Section 12 Sub-section (2) of the said Act, Railway shall be at liberty to recover such amount or any part thereof from Contractor's bills/Security Deposit or any other dues of Contractor with the Government of India. Railway shall not be bound to contest any claim made against it under Section 12 Sub-Section (1) of the said Act except on the written request of the Contractor and upon his giving to Railway full security for all costs for which Railway might become liable in consequence of contesting such claim.

1.3.18.10 Provision of Mines Act: The Contractor shall observe and perform all the provisions of the Mines Act, 1952 or any statutory modifications or re-enactment thereof for the time being in force and any rules and regulations made there under in respect of all the persons directly or through the petty Contractors or sub-contractors employed by him under this contract and shall indemnify the Railway from and against any claims under the Mines Act, or the rules and regulations framed thereunder, by or on behalf of any persons employed by him or otherwise.

1.3.19 DETERMINATION OF CONTRACT:

1.3.19.1 Right of Railway/DFCCIL to Determine the Contract: The Railway/DFCCIL shall be entitled to determine and terminate the contract at any time, should in the Railway's opinion, the cessation of work becomes necessary owing to paucity of funds or from any other cause whatever, in which case the value of approved materials at site and of work done to date by the Contractor will be paid for in full at the rate specified in the contract. Notice in writing from the Railway of such determination and the reasons therefore shall be conclusive evidence thereof.

1.3.19.2 Payment on Determination of Contract: Should the contract be determined under sub clause (1) of this clause and the Contractor claims payment for expenditure incurred by him in the expectation of completing the whole of the work, the Railways/DFCCIL shall admit and consider such claims as are deemed reasonable and are supported by vouchers to the satisfaction of the Engineer. The Railway's/DFCCIL's decision on the necessity and propriety of such expenditure shall be final and conclusive.

1.3.19.3 The Contractor shall have no claim to any payment of compensation or otherwise, howsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not derive in consequence of determination of contract.

1.3.19.4 Determination of Contract owing to Default of Contractor:

If the Contractor should:

- (i) Becomes bankrupt or insolvent, or
- (ii) Make an arrangement for assignment in favour of his creditors, or agree to carry out the contract under a Committee of Inspection of his creditors, or
- (iii) Being a Company or Corporation, go into liquidation (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), or

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- (iv) Have an execution levied on his goods or property on the works, or
- (v) Assign the contract or any part thereof otherwise than as provided in Clause 7 of these Conditions, or
- (vi) Abandon the contract, or
- (vii) Persistently disregard the instructions of the Engineer, or contravene any provision of the contract, or
- (viii) Fail to adhere to the agreed program of work by a margin of 10% of the stipulated period, or
- (ix) Fail to execute the contract documents.
- (x) Fails to submit the documents pertaining to identity of JV and PAN. Form available in the Regulations for Tenders and Contracts.
- (xi) Fail to remove materials from the site or to pull down and replace work after receiving from the Engineer notice to the effect that the said materials or works have been condemned or rejected.
- (xii) Fail to take steps to employ competent or additional staff and labour as required.
- (xiii) Fail to afford the Engineer or Engineer's representative proper facilities for inspecting the works or any part thereof as required.
- (xiv) Promise, offer or give any bribe, commission, gift or advantage either himself or through his partner, agent or servant to any officer or employee of the Railway/DFCCIL or to any person on his or on their behalf in relation to the execution of this or any other contract with this Railway.
- (xv)(A) At any time after the tender relating to the contract, has been signed and submitted by the Contractor, being a partnership firm admit as one of its partners or employee under it or being an incorporated company elect or nominate or allow to act as one of its directors or employee under it in any capacity whatsoever any retired Engineer of the gazetted rank or any other retired gazetted officer working before his retirement, whether in the executive or administrative capacity, or whether holding any pensionable post or not, in the Railways/DFCCIL for the time being owned and administered by the President of India before the expiry of one year from the date of retirement from the said service of such Engineer or Officer unless such Engineer or Officer has obtained permission from the President of India or any officer duly authorized by him in this behalf to become a partner or a director or to take employment under the contract as the case may be, or
- (xv)(B) Fail to give at the time of submitting the said tender:
 - (a) The correct information as to the date of retirement of such retired Engineer or retired officer from the said service, or as to whether any such retired Engineer or retired officer was under the employment of the Contractor at the time of submitting the said tender, or
 - (b) The correct information as to such Engineers or officers obtaining permission to take employment under the Contractor, or
 - (c) Being a partnership firm, the correct information as to, whether any of its partners was such a retired Engineer or a retired officer, or
 - (d) Being in incorporated company, correct information as to whether any of its directors was such a retired Engineer or a retired officer, or
 - (e) Being such a retired Engineer or retired officer suppress and not disclose at the time of submitting the said tender the fact of his being such a retired Engineer or a retired officer or make at the time of submitting the said tender a wrong statement in relation to his obtaining permission to take the contract or if the Contractor be a partnership firm or an incorporated company to be a partner or director of such firm or company as the case may be or to seek employment under the Contractor.
 - (f) Submits copy of fake documents / certificates in support of credentials, submitted by the tenderer

Then and in any of the **said Clause**, the Engineer on behalf of the Railway/DFCCIL may serve the Contractor with a notice in writing to that effect and if the Contractor does not within seven days after the delivery to him of such notice proceed to make good his default in so far as the same is capable of being made good and carry on the work or comply with such directions as aforesaid of the entire

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satisfaction of the Engineer, the Railway shall be entitled after giving 48 hours' notice in writing under the hand of the Engineer to rescind the contract as a whole or in part or parts (as may be specified in such notice) and after expiry of 48 hours' notice, a final termination notice should be issued.

Note: Engineer at his discretion may resort to the part termination of contract with notices, only in cases where progress of work is more than or equal to 80% of the original scope of work.

1.3.19.5 Right of Railway/DFCCIL after Rescission of Contract owing to Default of Contractor: In the event of any or several of the courses, referred to in Sub-Clause (1) of this Clause, being adopted:

(a) The Contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any commitments or made any advances on account of or with a view to the execution of the works or the performance of the contract and Contractor shall not be entitled to recover or be paid any sum for any work thereto for actually performed under the contract unless and until the Engineer shall have certified the performance of such work and the value payable in respect thereof and the Contractor shall only be entitled to be paid the value so certified.

(b) In the contract which has been rescinded as a whole, the Security Deposit already with railways under the contract shall be encashed/ forfeited and the Performance Guarantee already submitted for the contract shall be encashed. The balance work shall be got done independently without risk & cost of the failed Contractor. The failed Contractor shall be debarred from participating in the tender for executing the balance work. If the failed Contractor is a JV or a Partnership firm, then every member/partner of such a firm shall be debarred from participating in the tender for the balance work in his/her individual capacity or as a partner of any other JV /partnership firm.

Further the authorized representative of failed Contractor cannot be accepted as authorized representative in new contract.

(c) In the contract rescinded in part or parts,

(i) The full Performance Guarantee for the contract shall be recovered. No additional Performance Guarantee shall be required for balance of work being executed through the part terminated contract. The contract value of part terminated contract stands reduced to the balance value of work under the contract.

(ii) The Security Deposit of part terminated contract shall be dealt as per relevant clause of GCC.

(iii) The defaulting Contractor shall not be issued any completion certificate for the contract.

(iv) The balance work shall be got done independently without risk & cost of the failed Contractor. The failed Contractor shall be debarred from participating in the tender for executing the balance work. If the failed Contractor is a JV or a Partnership firm, then every member/partner of such a firm shall be debarred from participating in the tender for the balance work in his/her individual capacity or as a partner of any other JV /partnership firm.

(v) Further the authorized representative of failed Contractor will not be accepted as authorized representative in new contract.

(d) The Engineer or the Engineer's Representative shall be entitled to take possession of any materials, tools, implements, machinery and buildings on the works or on the property on which these are being or ought to have been executed, and to retain and employ the same in the further execution of the works or any part thereof until the completion of the works without the Contractor being entitled to any compensation for the use and employment thereof or for wear and tear or destruction thereof.

(e) The Engineer shall as soon as may be practicable after removal of the Contractor fix and determine ex-parte or by or after reference to the parties or after such investigation or enquiries as he may consider

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fit to make or institute and shall certify what amount (if any) had at the time of rescission of the contract been reasonably earned by or would reasonably accrue to the Contractor in respect of the work then actually done by him under the contract and what was the value of any unused, or partially used materials, any constructional plant and any temporary works upon the site. The legitimate amount due to the Contractor after making necessary deductions and certified by the Engineer should be released expeditiously.

PART – I

CHAPTER- IV

SCOPE OF WORK & EXPLANATORY NOTES

1.4.1 Scope of Work:

The scope of work covers “Design, Supply, Erection, Testing & Commissioning of OHE for Sasaram RFO”.

1.4.2 Explanatory Notes:

Item-1:- Preparation of designs & drawings for overhead equipment: The Price shall cover site survey, design and preparation of complete layout plan of the each station / sections (i.e. including existing unmodified portion) and all drawings for overhead equipment, as per Engineering plan also including sectioning/schematic arrangement of OHE (In consultation with Rly/DFCCIL), which shall be furnished by the purchaser, indicating location of structures required to be finalized by the Contractor as per RDSO/CORE standards. A print of the existing layout plan shall be obtained from the purchaser. The price shall include the following:

1. Making any modifications with the approval of the Purchaser to the layout of structures and overhead equipment, if necessary, and submission of overhead equipment layout plans complete with all details. No extra payment shall be made for modifications required to be done due to change in track centers, slewing of tracks and modifications in engineering plans.
2. Preparation of cross section drawings and structures erection drawings for each new and modified structure – locations.
3. Choice of type and size of foundations to suit soil and loading conditions, except for the ones which are considered as “Works under other Agencies”.
4. Preparation of long section drawings of overhead equipment where such drawing are required including detailed study of over-line structures such as foot over bridges, road over bridges etc. for maintaining the specified height of contact wire and requisite clearances, OHE profile shall be submitted by the contractor in digitize format also.
5. Preparation of other designs and drawings including drawings of small parts steel work (other than those for which RDSO standard drawings are available) and L.T. supply transformer stations in digitize format also.
6. Supply of requisite number of copies of all drawings, including completion drawings digitalization.
7. OHE layout plan shall show connected wired line to the extent necessary for better understanding and appreciation of scheme of work.
8. Supply of requisite number of copies of all Drawings (Initially-3 copies, duly approved- 6 copies, 4 copies for EIG application, and as erected -6 copies along with RTF and soft copy in 4 nos Pen drives (16 GB each), along with digitalization of all.

The price shall also cover soil investigation and testing in an approved manner.

NOTES FOR MEASUREMENTS:

For the purpose of payment against this item, the length of track shall be measured as under: -

1. General - By the difference in the chainages of the length under consideration, as incorporated in the layout plans.
2. Turnouts: The track taking off shall be deemed as starting from the toe of the switch of the turnout.
3. Crossovers: The length of track shall be taken as the difference in the chain ages of the toes of

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switches of the two turnouts constituting the cross-over.

4. Diamond crossing with or without slips: The two tracks crossing each other shall be measured independently as per Note 1 above as though there were no crossing. No extra shall be provided for slip points.
5. Dead ends and tops of loops: The lengths for payment under this item shall be up to the chain age of anchor mast of the terminating OHE.
6. Feeders and return feeders from grid sub-station to feeding station.

Payment against item is restricted to the extent of new and/or modification works only.

The existing wired tracks shown in layout shall not be counted for the purpose of payment.

This item will also be applicable independently in case of feeders/return feeders/conductors from grid sub-station to overhead equipment feeding stations or in a case of feeders/conductors running on independent structures (not supporting OHE) along or across tracks.

In such a case the length of line to be considered for purpose of item (a) shall be measured by the distance between center of gantries of the grid sub-station and feeding stations, in case of feeder/return feeders/conductors line from grid sub-station, or by the distance between the centerline of the two structures to which the feeders/return feeders/conductors are anchored in case of feeders running along the track if such feeder/return feeders/conductors are running completely on independent structures or by the distance between the center of the two structures supporting the OHE on either side of the first and last independent structure in case of feeders/return feeders/conductors running along the track supporting OHE.

Item-2:- Cement concrete for foundation & plinth in all types of soil : The price shall cover excavation, supply and handling of all materials and accessories, temporary arrangements for excavation in all type soil. Shoring where ever necessary, casting concrete as per IS:456 (Latest) and relevant RDSO drawing for foundation including frame work where necessary, tamping the concrete, grouting of masts with concrete as per relevant RDSO drawing and finishing the top of concrete foundation or anchor blocks. The price also include dismantling of all connected temporary arrangements, back filling with earth and compacting the same to the required height and width as per drawing to ensure safety of foundation, confining the exposed height of foundation block to within 10 cm., and removal of soil to safe place. The price shall also include the cost of cement. The price shall include all works required in all classes of soil except hard soil, concrete or masonry drains and walls and rock.

Concrete for foundation shall be nominal mix of grades as per IS 456- of latest version.

For Moderate type of soil type M-15, Severe type M-20 and for core M-20 concrete mix should be used.

NOTE: Nominal reinforcement will be necessary proper ramming in black cotton soil foundations. Such nominally reinforced foundations in black cotton soil will be payable under item 2. The steel for nominal reinforcement will be arranged by the Contractor and the concrete mixture, in such a case shall be as per ISS 456 latest. Notes for item code 2:

1. The prices under item 2 shall be same for any shape or size of concrete blocks. In calculating the individual volume of concrete, fraction of a cubic meter beyond the third decimal shall be rounded off to the next nearest third decimal.
2. The prices under items 2 shall apply for concreting of all foundations for mast, gantries, portals anchor blocks for guy rods, and fencing uprights.
3. For purposes of computation of volume of concrete under item 2, the volume of steel work embedded in the foundation block and muff shall be ignored.

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4. Cost of all concrete will be paid for only under item 2 and the price of other items shall not include cost of concrete except for Item 17.
5. For purposes of computation of volume of concrete under item 2, the volume of concrete shall include the volume of sand and bitumen in sand cored foundation. However, for the purpose of computation, of quantity of cement utilized in sand core foundations, the volume of the sand bitumen used in core hole should be deducted from the total volume of the foundation.
6. For purposes of computation of volume of concrete the volume of each muff for all masts shall be taken as 0.02 Cum except for masts with balance weights and for each column of portal, each head span mast, 2 or 3 track cantilever masts, and special fabricated masts for which the volume of muff shall be taken as 0.08 Cum irrespective of the size and shape of muff, on a flat basis.
7. The pieces prices under items 2 shall also include the cost of concrete cable trenches and trench covers at the switching stations as well as embedment of drain pipes, where required.
8. The prices under items 2 shall also cover the cost of diversion of masonry / earth drain wherever necessary for casting of foundations.

The Cube test Report should be submitted, one very 50 CuM casting of Foundation work.

Item-3:- Manual erection of traction masts: The price shall cover cost of manual erection, alignment and setting before grouting of individual rolled traction masts and main masts.

Item-4:- Supply of fabricated Galvanized steel structures (i.e. B series mast TTC and portals):The price shall cover cost of supply, at respective site / locations, as per RDSO drawing of individual fabricated & galvanized steel structures (B-series mast, TTC & Portal). For the purpose of payment, the weights of individual traction mast and masts of head span shall be determined for each type on the basis of the payable weights per meter length and per meter weights given in tables of Railways [as per respective RDSO drawing for standard types]. For special types, the payable weight per meter length will be decided by the Purchaser, at the time of approval of designs. The galvanization should be of 1000 gms/sq/mtr.

Item-5 & 6:- Supply & Erection of fabricated & galvanized steel work other than masts including SPS: The price shall cover the cost of supply & erection of all galvanized fabricated steel work including fasteners, which are required to be supplied by the Contractor. For standard fabricated steel work for which RDSO's drawings are available, the weight of steel work as specified in RDSO's drawing shall be considered for payment. However, in case the unit sectional weight of any member indicated in RDSO's drawing is not in conformity with the unit sectional weight as per the latest IS specification, the weight of the fabricated steel work shall be calculated on the basis of latest IS Specification and the same will be considered for payment. For the non- standard fabricated steel work, the calculated weight to be considered for payment under this item shall be included in the relevant drawing based on latest IS sectional weight at the time of submitting the designs for approval of the Purchaser. The galvanization should be of 1000 gms/sq/mtr. The prices shall also include supply and erection of galvanized (Above 16 mm Dia.)/ Stainless Steel (Up to 16 mm Dia.) bolts, nuts, washers etc wherever required as per approved designs and drawings

Notes for Items 3 to 6:

1. For the purpose of payment against items 3 to 6; weight of individual traction mast and masts of head span shall be determined for each type on the basis of the payable weights per meter length and per meter weights given in tables of Railways [for standard types]. For special type, the payable weight per meter length will be decided by the Purchaser, at the time of approval of designs. Also weight of fabricated steel work will be calculated according to the weight of black steel given in section books for the lengths of various members shown in the approved drawings. There will be no addition for increased weight due to galvanizing or painting or weld material or reduction for holes or skew cuts. The price shall cover shifting/transportation of each masts up to individual locations.

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2. The rates against item 4 shall be applicable to the erection of small part steel work, which are not covered under the various other items of work. Unless specifically indicated none of the other items of work shall include the cost of supply and / or erection of small part steel work, which will invariably be paid for under item 4 or 5 as applicable respectively.

3. All Galvanized / SS bolts, nuts, lock nuts and washers required for assembly and fastening of steel work mentioned against item No. 4 and mounting of the above equipments in gantries shall be supplied by the Contractor and appropriate item of Schedule of rates should include the cost thereof.

The price shall also include the straightening of masts/portal uprights bent during transit and cutting of masts/portal uprights to suit the site conditions. In case cutting of mast or worn out galvanization, application of cold galvanization paint at the site shall be done by the contractor.

Item-7 & 8:- Supply & Erection of guy rod assembly: The price shall cover supply and erection of guy rod assembly of various lengths for traction masts, feeder line towers or portals or other supports with adjustments and parts to be grouted in the anchor block [The price shall not include the cost of supply and erection of a dwarf or stub mast with anchor plates drilled and welded in position, where required, for anchorage, and small parts steel work, complete with bolts and nuts etc., if any for attaching the mast guy rod fittings to the mast/structure which shall be paid for separately under the relevant item]. Prices indicated against all other items should be exclusive of the price of erection of guy rod, if any, which will be paid for under this item.

Item-9&10:- Supply & Erection of conventional type single bracket assembly including Insulators: The price shall cover on a flat rate basis any bracket assembly on a traction mast or support or on drop arm and shall include those on high/low rail level platform, in the vicinity of turnouts, over bridges or over-laps and at locations with reduced encumbrance or terminating wires. The price shall include the cost of supply of all components including galvanized steel tube, solid core insulators (ID Nos. 6000, 6030, 6000-2 & 6030-1), small parts steel work complete with bolts and nuts etc, if any. The price shall cover erection of all components including solid core insulators and dropper wires, but excluding small parts steel work, if any. However, this does not include the anti creep arrangement at masts/structures. Erection is inclusive of testing of insulators as per RDSO specifications / procedure before erection.

Item-11&12:- Supply & Erection of 130 sq.mm large Span Wire: The price shall cover supply of 130 Sq. mm large span wire, as per RDSO specification No. ETI/OHE/50 (6/97) or latest at Site / Railway depot. The price shall cover supply of all associated components including ending cones but excluding wire and erection of a 130 Sq. mm. span wire per meter including ending cones and other components. The payable length shall be the horizontal distance between the inner faces of all traction masts/structures on which the mast attachments are mounted. No extra shall be provided for sag. The price is applicable for all types of span wires including head span wires. Erections of a meter beyond the first decimal shall be rounded off to the nearest first decimal.

Item-13,14,15 & 16 :- Supply & Erection of conventional type OHE along with catenary & contract wire and all required components: The price shall cover supply of 65 sqmm catenary wire, 107sqmm contact wire and all components including dropper wire, Contact & Catenary dropper clips, parallel clamps for anti-creep, jumper wire (C, G, F & antitheft jumper), splices wherever required. The price shall cover erection of all components, contact, catenary wires, droppers, jumper wire and terminating wires, if any. The price shall also include the cost of painting of the setting distance of masts/structures, contact height and rail level on masts/structures. The price shall not include termination of conductors, which will be paid under relevant item. Contractor shall use such jigs, fixtures and mechanisms (of his own), which would avoid kinks and twists in overhead conductors while manual erection under this item. Trolley should be used to load the conductor drum.

Item-17 & 18:- Supply & Erection of 3 pulley type Regulating equipment with counter weight

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assembly for conventional type OHE: The price shall cover, supply and erection of 3 pulley type (Modified type) regulating equipment with counter-weight assembly suitable for conventional type OHE, as per RDSO drawing No.TI/DRG/OHE/ATD/RDSO/00001/99/2 or latest, including 9 tonne adjuster with double strap assembly and normal/anti-theft guide tube assembly, the supply of regulating equipment and stainless steel wire rope, required for the regulating equipment and small part steel work, if any. The price shall also cover adjustment of the entire regulating equipment. The price shall not include supply and erection of termination, which will be paid for under item 19& 20. Price shall include the cost of provision of steel tube on hexagonal tie rod as per RDSO maintenance instruction.

Item-19&20:-Supply & Erection of materials for termination of Double Overhead equipment conductor including insulator: The price shall cover supply of all materials necessary for the yoked termination of two overhead equipment conductors on a traction mast or structure, including appropriate mast anchor fittings, clevis assembly, adjusters, ending clamps for catenary and contact wires, anchor double strap assembly, equalising / compensating plate and fittings including 9 tonne insulator assembly and the termination wire, if any, as per RDSO drawing latest. The price shall cover erection of all materials including the 9 tonne insulator [after testing as per RDSO procedure before erection] assembly.

Item-21 & 22:-Supply & Erection of Anticreep arrangement with 65 Sq. mm catenary wire for conventional type OHE: The price shall cover supply of all materials for anti-creep including adjusters, catenary wire (Railway Supply), mast anchor fittings at its terminations on either side on structures, ending clamps and fittings including 9 tonne insulator assembly and small parts steel work, if any. The price shall cover erection of all materials including 9 tonne insulator & 65 sq. mm catenary wire (Railway supply) [after testing as per RDSO procedure before erection] assembly but excluding small parts steel work, if any.

NOTE:

1. The price shall not include the cost of any additional cut-in or suspension insulator which will be paid for under item 25 or 26 as applicable.
2. In case the anti-creep extends beyond one span on either side of anti-creep centre, payment for the supply and erection of extra length shall be paid additionally at the rate of 20% of the rate for 21 & 22 for each extra span.

Item-23 & 24:-Supply & Erection of additional fittings at overlap: The price shall cover on flat rate basis supply of additional components and fittings required at turnouts, crossings or overlaps (insulated or un-insulated), knuckle or crossing equipment at a turnout, or a diamond crossing and parallel clamps / bimetallic parallel clamp for jumper connections between two sets of overhead equipment conductor at a turnout, diamond crossing, overlaps or neutral section and including jumper wire. The price shall cover erection of all materials including jumper wire, and all adjustments required at turnouts, crossings, overlaps and neutral sections. The price shall also cover erection of potential equalizer jumpers at insulated overlaps and neutral sections. The price shall not include extra bracket assemblies, overhead equipment, termination of overhead equipment and cut-in-insulators in the case of insulated overlap and neutral section which will be paid for under items 4, 6, and 11 respectively.

NOTE:

A cross-over shall be paid for as 2 off of item 10, special configuration of OHE commonly known as half overlap shall be paid for as 1 off under this item. This shall apply in case of half overlap used in changing over from regulated to unregulated equipment or unregulated to regulated equipment.

Item-25 & 26:-Supply & Erection of Solid core cut-in insulator: The price is applicable to the provision of an additional 9 tonne cut-in-insulator on a flat rate basis such as in a head span, cross span or in span wire or an overhead equipment conductor at an insulated overlap, anti-creep not provided for

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in other items. The price shall cover supply of all components, required for the cut in insulator assembly, including the appropriate terminal fitting for the conductor including the 9 tonne insulator. The price shall cover erection of all components, including the 9 tonne insulator (after testing as per RDSO's procedure before erection). The price shall also be applicable as an adjustment price for non-provision of insulators.

Item-27 & 28:-Supply & Erection of a copper jumper: The price shall cover, on a flat rate basis, the supply of all type of jumper wire ('AT', Isolator & drop Jumper) as per requirement, all components and fittings required for providing a flexible copper jumper connection, including parallel clamps, bimetallic and aluminum copper ALUC strips, wherever required, and terminal connector or the clamps at either end, including jumper wire. The price shall also cover the erection of the complete jumper assembly including jumper wire as per RDSO latest specification.

Item-29 & 30:-Supply & Erection of structure bond.: The price shall cover supply of all materials including mild steel flat as per latest railway/DFCCIL practice required to provide a structure bond connecting a traction mast or structures to the nearest non-track circuited rail, or earth electrode, including all fastenings at both ends. The price shall include shaping and drilling of the bond and erection of all materials including the bond. The price shall also include provision of heat shrinkable PVC tube for structure bond under track-circuited rail. This would also cover connections or earthing terminals of equipments like L.T. transformers with structures and then to Rails as per relevant drawing.

The cost is also includes the painting with black enamel color to bonds.

Item-31&32:-Supply & Erection of longitudinal / inter Rail bond: The price shall cover the supply of all materials including mild steel flat, as per latest railway/DFCCIL practice fasteners etc required to provide longitudinal bond connecting 2 rails at the rail joint at the locations to be specified by the Purchaser. The price shall include shaping and drilling of the bond and erection of all materials including the bonds. The cost is also including the painting with black enamel color to bonds.

Item-33&34:-Supply & Erection of Transverse & special bond: The price shall cover supply of all materials including mild steel flats, fasteners etc required to provide transverse bond connecting rails of the same/adjacent tracks at the locations to be specified by the Purchaser. The price shall also cover the supply of all materials including mild steel flat to provide special bonds at a level crossing, foot over/road over bridge/protective screen etc for which the location will be specified by the Purchaser. The price shall include shaping and drilling of the bond and erection of all materials including bond. The cost is also include the painting with black enamel color to bonds.

Item-35&36:-Supply & Erection of Caution Board/sigma board: The price shall cover supply and erection, wherever required, of enameled caution boards (Staff/Public/25kv) including GI mounting clamps, as per relevant RDSO drawings and specifications with nut and bolts etc.

Item-37&38:-Supply & Erection of approved make retro-reflective Number Plate: The price shall cover supply and erection, wherever required, of retro-reflective Number Plate including GI mounting clamps, as per relevant RDSO drawings and specifications with nut and bolts etc. The erection price covers erection of SPS / clamps.

Item-39:-Cutting/Trimming of various type tree branches only of diameter between 5 cm to 10 cm (approx.) above 5.5 Mtrs from ground level or infringing the HT/LT lines, such as babhool, neem, Gulmohor, Nilgiri, Pipal, Banyan etc.:

The branches of trees, infringing to the new OHE / New / existing HT / LT OH lines are to be trimmed/cut, as per directives of Railway/DFCCIL Representative.

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Item-40 & 41:-Supply& erection of Anticreep Arrangement: The price shall cover supply and erection of Anticreep arrangement with 12.5 mm dia (19/2.5) or as per latest Railway/DFCCIL practice.

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PART – II

CHAPTER–I

GENERAL SPECIFICATIONS

SECTION – I

GENERAL

INTRODUCTION:

This part of Tender Papers is divided into seven chapters and contains general, technical and other specifications for design and erection of complete 25KV A.C. 50Hz. Single phase traction overhead equipment, switching stations, L.T. supply transformer stations complete with foundations, structures, and 25KV feeders, if any. This part also give only indicative reference to technical specifications of materials and components, procedure for submission of designs and drawings of basic arrangements, components fittings design and other typical design relating to overhead equipment, However, the work shall be completed as per design/drawings based on latest practices adopted in Indian Railways/DFCCIL as applicable.

CLIMATICDATA.

Generally for OHE construction a minimum temperature of 4 deg.C and maximum temperature of 65 deg. C are to be considered. Mean temperature should be taken as 35deg.C. Rain fall generally occurs from June to September. The average rain fall during monsoon season is approx. 65 cm. Maximum relative humidity in area is generally 83%.

WINDPRESSURE.

For design of layout of overhead equipment maximum span etc. wind pressure shall be applicable as per relevant IS. Structures and foundations of over head equipment, switching stations, booster transformer stations and LT supply transformer stations shall be designed for the wind pressure applicable.

SYSTEM PARTICULARS.

The nominal voltage of the overhead equipment will be 25KV A.C, 50Hz. single phase. The supply voltage may, however, rise upto 27.5 KV. One terminal of the 25KV 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 the feeding station.

SECTION – 2
OVERHEAD EQUIPMENT

TRACK:

- a) Gauge-The track gauge is 1676 mm (5' – 6").
- b) Speed.

The overhead equipment which shall be of the simple polygonal type and pre-sag should be designed for a maximum speed of 160 km/h (approx. 100 miles/h) if regulated, and for maximum speed of 80 km/h (approx. 50 miles/h) if unregulated, unless otherwise specified in other parts of tender papers. Pre-sag to be adopted shall be as per latest RDSO guidelines.

- c) Curves.

The minimum radius permissible is 175M (573 ft.) i.e. a 10 deg. Curve. Inside station limits, the curvature at a 1 in 8 ½ turnout is 8 deg. I.e. of radius 219M (716ft.).

- d) Super Elevation,

The maximum super elevation is 165mm (6 ½"). 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 25mm (1") 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.

- g) Displacement:

The general design of overhead equipment shall permit a displacement of +/- 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.

- a) Sectioning Insulated Overlaps.

Insulated overlaps are provided for facility of isolation. Some of the overlaps may be provided with manually operated isolator switches. In addition for connection in overhead equipment to booster transformers insulated overlaps are indicated in the Sectioning Diagram/s.

- b) Sectioning Yard Supply.

The sectioning diagram/s also indicate the tracks in station yards and siding whose equipment is electrically independent from those of other tracks.

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The overhead equipment in yards and sidings may be fed through isolator switch or interrupt or in accordance with arrangement indicated in the sectioning diagram/s.

c) Section Insulators.

Section Insulators shall be provided as indicated in the Sectioning diagram or cross-over 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 approved drawings.

d) Feeders

Where a traction sub-station is located away from the track to be electrified, 25kV feeder and return feeders will be run from the traction sub-station to the feeding station. A 150Sq.mm Hard drawn copper conductor shall makeup such feeders.

e) 25kV along Track Feeders.

25kV track feeders may connect sections of overhead equipment or connect the overhead equipment to a switching station or an isolator switch or gantry. Such feeders will be run usually on traction structure and sometimes on independent masts. A 150 Sq. mm Hard drawn copper conductor shall makeup such feeders.

f) Schematic Arrangements.

The different arrangements of feeders, return feeders 25kV along track feeders and return conductors.

g) Sectioning Diagram.

The provisional sectioning diagram/s of the sections to be electrified is/are supplied by the purchaser to successful tenderer.

PANTOGRAPHS.

- a) The outline of the pantograph, its dimensions and its current collecting area is as per standard RDSO's guidelines.

- b) Number of pantograph and Pressure.

Each locomotive will be equipped with two pantographs but only one pantograph generally the trailing one will be in use at a time. The working pressure of the pantograph on the contact wire may vary between 5 and 15Kgs.

- c) Spacing in multiple headed trains.

The distance between adjacent running pantographs in the case of multiple heading would normally be 20M. This distance may, however, be reduced to 7.9M. between the two pantographs in very exceptions cases.

- d) Insulation Clearance.

The electrical clearances for the pantographs on tangent tracks and on curves for design and erection of overhead equipment shall be based on the Schedule of Dimensions 1676mm Gauge, 1939 printed in 1973 in metric units, issued by the Ministry of Railway (Railway Board), Government of India and any other orders that may be issued by the Railway Board from time to time.

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 value of which shall conform to latest RDSO's guidelines for 72M span and reduced suitably for other spans.

b) Catenary:

The Catenary wire shall be either of cadmium copper 19/2.19mm, 65sq.mm nominal section.

c) Contact Wire.

The contact wire shall be grooved and made of hard drawn copper having 107sq.mm cross section.

d) Droppers.

Droppers shall be made of hard drawn round copper wire, approximately 5mm dia. Droppers shall be spaced not more than 9 M apart.

e) Encumbrance.

As a general rule, the nominal "encumbrance" i.e. the centre distance between the catenary and the contact wire at the support shall be 1.40M. 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 50sq.mm nominal, 19/1.8mm size. Flexible jumpers of nominal section 105sq.mm, 19/7/1.06mm size shall be used at overlaps, turnouts, crossings etc.

g) Bridle wire.

Bridle wire for supporting contact wire for regulated tramway equipment shall be of Cadmium Copper 7/2.10mm in size.

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. The jumpers connecting the Al. Conductors to any other conductors, terminal or clamp shall be made with the aid of suitable bimetallic clamps. All aluminium jumpers of size 19/7/1.4mm bare ¾ hard shall be used to connect other aluminium conductors such as return conductor. The tail ends of feeder wires from the strain clamps at the termination of a feeder, return feeder or return conductor may be connected directly to a terminal or clamp where feasible to avoid the use of separate jumper wire.

TYPE OF EQUIPMENT.

The overhead equipment used shall normally be of the regulated 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 Mtr from any one of them. 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 RDSO's drawings. 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 RDSO's drawing. The Purchaser shall indicate the type of anti-creeps to be adopted in the pegging plans.

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 35deg. 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, spans 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.

TENSION.

a) Regulated.

i) In regulated equipment the tension in the catenary and in the contact wire shall be 1000 Kgf. in each conductor.

ii) The regulated tension in the aluminum alloy catenary shall be 1000 kgf and 1000kgf. In the copper contact wire.

b) Unregulated.

In unregulated equipment the tension in the catenary and in the contact wire at 35 deg. C without wind shall be 1000kgf. In each conductor.

c) Tramway type.

In regulated type tramway equipment, the tensions shall be 1250kgf.

CLEARANCES.

a) General

The distance between live parts and parts at earth potential (or parts likely to be earthed) shall be as large as possible. In all cases the values given in Schedule of Dimensions (B.G. – 1676 mm) revised in 2004, 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 clearances 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 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 advice the Purchaser in time to enable the latter to take up necessary modifications.

HEIGHT OF CONTACT WIRE.

- a) Normally, the minimum height of contact wire above rail level shall be 5.50 Mtr at mid span under the worst temperature conditions. This height may be reduced under bridges and in tunnels to the extent permitted by the Purchaser. The minimum height shall be 4.80 Mtr. At level crossings 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 3 mm per meter on main lines and 10 mm per meter on sidings. The end spans of any section with a gradient of contact wire shall have a slope not greater than half the main slope.

STAGGER.

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

TERMINATION.

- a) General.
Traction overhead line shall be terminated using components specified. 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) Elementary 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

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conductor shall be separated by means of insulators. The insulators shall be located in such a manner as to clear the swept zone of the pantograph under the worst conditions and as far away as is possible from live conductors.

TYPE OF STRUCTURES.

a) Cantilever.

The overhead equipment of main track in case of multiple track sections shall be electrically and mechanically independent of one another by provision of independent cantilever masts to the maximum extent possible as per RDSO's drawing.

b) Head Spans.

Head spans construction may be adopted with unregulated overhead equipment. A single head span shall not normally cover more than six tracks.

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 equipments 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. Portal structures will 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 indicted by the Purchaser and observing the schedule furnished by him.

CANTILEVER ASSEMBLY.

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

OVERLAPS.

Overlaps shall be provided at suitable intervals such that neither the tension length exceeds, 1500Mtr not the fixed anchor to balance weight anchor exceeds 750 Mtr.

a) General.

The two contact wires at the overlapping zone shall 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 case of insulated overlaps the separation between the two contact and the two catenary wires shall be 0.5M.

POINTS AND 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 RDSO's drawings.

SECTION INSULATORS.

a) Brief description.

The section insulators shall provide effective electrical isolation of two elementary electrical sections 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 450mm. The weight of the complete assembly shall not be more than 45 Kgs for single wire type excluding the weight of the catenary insulator and the catenary ending clamps.

ISOLATORS.

Manually operated isolators single or double pole type with or without earth contact assembly may be required to bridge certain section insulators or insulated overlaps. In certain large yards isolators controlling different lines may be grouped together on a gantry.

BRIDGES & 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 the catenary may be anchored on either side of the over line structure and the contact wire carried underneath.

b) Tunnels & Cuttings.

The arrangements proposed for the equipment in tunnels and cutting shall take into account the special features of each location and shall be in accordance with the RDSO's drawing & design.

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 all level crossings in accordance with the RDSO's drawing & design.

BONDING AND EARTHING.

- a) Bonding and earthing shall 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 to 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 circulated rail unless it is provided with a continuous earth wire or it is individually earthed by means of an earthing station.
- d) Double Rail Track Circuit.
Where 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 aluminium conductor consisting of 6 strands of aluminium and one strand of steel each of 4.09mm 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 1,000M long. The earth wire in each such section shall be connected at two traction structures, situated at a distance not exceeding 250M on either side of the mid-point of the section to two 10 Ohm earth which will be provided by the Contractor. Sections on which earth wire is required to be provided as per the RDSO's drawing.

2.1.30. LIGHTING ARRESTORS.

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

CERAMIC BEADED GLASS FIBRE TYPE SHORT NEUTRAL SECTION ASSEMBLY.

Ceramic beaded glass fiber type Neutral section assembly shall consist of resin bonded fiber glass (or equivalent) or ceramic beads 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 upto 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 those adjustments of components can easily be made during erection and 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 connection 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 and contact wire is available as also shown in GA drawing in the RDSO's drawings.

PART-II

CHAPTER-II

FOUNDATIONS

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

DESIGN OF FOUNDATIONS:

- a.** Soil Pressure:- For design of foundations for traction structure 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 5Kilometer interval or less wherever change of soil is encountered. In general IS code of practice (IS: 6403) should be followed. In addition, at every 250m the soil bearing pressure should be determined by dial guage 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 foundations for masts and gantries at switching stations and booster stations, the Contractor shall determine the type and allowably 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.** Structure carrying overhead equipment:-
Foundation 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, new pure gravity sand-filled core foundations, or foundations with cast-in-situ reinforced concrete piles, or cantilever type foundation with counter-weights or guyed foundations may be adopted.
- c.** On Bridge Piers-
Complete design of foundation for traction structures on bridges to suit different locations and local conditions shall be prepared and submitted by the contractor along with detailed calculation, justifying the design for purchaser's approval will be furnished by the Purchaser.
- d.** Masts and Fabricated Structures at Switching Stations Fencing.
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.** Foundations for fencing posts shall rest on consolidated soil if the depth of unconsolidated soil is less than 1.5m below the datum level and shall be rectangular parallel piped, in shape. If the depth of unconsolidated soil is more than 1.5m the

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foundation block shall rest on reinforced concrete piles cast-in-citu or reinforced concrete foundation may be adopted as desires by the Purchaser.

- f. Typical Design. Typical designs and drawings of side bearing and new pure gravity and side gravity type foundations etc., employment schedules for standard foundations for traction structures for various locations and types areas per standard RDSO drawings.
- 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 special pile foundations of under reamed type as per RDSO's standard designs (Reference RDSO's Drawing 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 foundations 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.
- i. Cable trenches.
The cable trench shall rest on original ground if the depth of unconsolidated soil is less than 0.5m. If the depth of unconsolidated soil is more 0.5m the cable trench shall be made of reinforced cement concrete of approved design supported at suitable intervals on concrete pillars.

BEARING PRESSURE.

a. Guiding Information:-

b. Subject to Para 2.2.2 (a) above, the following allowable bearing pressures may generally be expected for kinds of soil. The information is given for guidance only.

- (i). Average good soil in banks and cuttings 11,000Kg/sq.m.
- (ii). Morrum soil in cuttings 22,000Kg/sq.m.
- (iii) New Banks and bad soils bank & cuttings 5,500Kg/sq.m.
- (iii) 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 case of dry black cotton soil, the soil should be subjected to bearing pressure as close as possible but not exceeding 16,500 kg / sq. mtr the depth of the foundation block being not less than 2.8mtr. In the case of wet black cotton soil, the soil should be subjected to a bearing pressure as close as possible but not exceeding 8000 kg / sq. m. 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.

CONCRETE:- Concrete for foundations shall be nominal mix of grade M-15 as per IS 456 latest version and for grouting, maffing, embedding of structures in foundations, normal mix concrete of M-20 grade of IS:456 latest. Proportions of mix as per details given in IS 456.

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SIZE & GRADING OF AGGREGATES: The graded coarse aggregate 40 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 20mm 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 10mm downwards. The maximum size of aggregate for under reamed pile foundation shall be 20mm graded nominal size.

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

SINKING OF CONCRETE SHELLS: Where the water table is high, one or more sections of reinforced concrete shells may have to sunk before casting concrete. The size of each shell shall be 1200 mm outside dia. x 50 mm thick x 600 height reinforced with 6mm ¼” dia. rods spaced 150mm apart, both longitudinally & circumferentially. The concrete shall be grade M 15.

TYPE OF FOUNDATION IN BLACK COTTON SOIL: The foundations in dryblack cotton soil should be of type NBC as per RDSO Drawing No. – TI/DRG/CIV/FND/RDSO/00001/04/0 or latest.

* * * * *

PART – II
CHAPTER-III

STRUCTURES

SCOPE:

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

TYPES:

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

- i) Broad flange beams.
- ii) Rolled Steel joists.
- iii) Fabricated steel structures like B / K / 175 , 200, 225, 250,

TTC / G/O / N / R portals structures. Structure/ uprights shall generally be embedded in concrete foundation blocks; in special cases structures may be secured by means of holding down bolts.

DESIGN:

- a) Steel Structures.
Design 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 or its latest version.. The thickness of smallest steel section used shall be 5mm for galvanized members.
- b) All 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) & to the latest amendments and no painted structures are to be used.

CANTILEVER MASTS:

- a) For purpose 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 OHE (1.6 Kgs / M for each conventional OHE, and 1.32 Kg/Metre for each composite OHE).
 - ii) Weight of bracket supporting the OHE (60 Kgs / normal bracket).
Weight of a man (60 Kgs).
 - iii) Weight of feeder, return conductor or other special equipment wherever they occur as per RDSO.
 - iv) Weight of earth wire (0.32 Kgs / M).
 - v) The affect of eccentricity of vertical and horizontal loads on the bracket due to variation in temperature.

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- vii) Radial forces on the mast, due to stagger, curvature, anchorage, etc.
- viii) Winds load perpendicular and parallel to the track. The wind pressure adopted shall be taken as that indicated in part –II, chapter – I.
- ix) Weight of the mast upright itself, and
- x) Any other load or loads that may occur due to the special location of the structure
- b) Deflection.
- c) Not with standing the provisions contained in IS: 800-1984 referred to in Para 2.3.3 above regarding permissible deflection, the following shall apply:
 - i) The deflection at the top of the mast due to permanent load shall not exceed 8 cm. and the mast shall be so erected that it becomes reasonably vertical after application of permanent loads; and
 - ii) Additional deflection under maximum wind pressure shall not exceed 8cm at the level of the contact wire.
- d) Torsion:
The torsion rotation of the mast due to permanent load shall not exceed 0.1radian.
- e) Typical Design:
The typical design of a traction mast is included in the set of standard drawings. Employment schedules for standard masts for various locations and types are as per standard RDSO drawings.

ANCHOR MAST:

- a) Mast 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, strut may be permitted in special cases.
- b) Dwarf Mast: 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 design.

HEAD SPANS

- a) Load.
The loads to be considered shall be as far as applicable and at their worst combination.
- b) Sag for Head Span wire.
The sad for the head span wire shall be approximately one-tenth (1/10) of the span.
- c) Minimum Tension in Cross Span and Steady Span Wires.
For purpose of design, a minimum tension of 200Kg. 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 on-eightieth ($1/80^{\text{th}}$) of its height above foundation.

PORTALS:

- a) **General-** Portals shall be of fabricated steel of standard types to RDSO designs/drawings.
- b) **Load:** The loads shall be as applicable.

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STRUCTURES ON BRIDGES:

- a) The structures may be either cantilever mast or portal (hinged or fixed at base) depending on the type & condition of bridge pier capping. The arrangement shall be decided on referring Paper No. – ELCORE/ALD/C&D/OHE/DESIGN/9/4/05, dated 25-04-2005. As far as possible cantilever mast grouted in foundation on pier will be used. Where this is not possible cantilever mast with holding down bolts or suitable portals (hinged or fixed at 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. In case of bolted structure on bridge piers contractor has to submit the detail design for base arrangement for approval of purchaser.

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.

SETTING OF STRUCTURES.

- a) The setting is the distance from the centre line of the track, on straight or curve to the face of the mast/structure of fitting located on mast.
- b) On straight and outside of curve, the standard setting shall be as per the relevant RDSO drawing. Minimum setting of structures shall be 2.8 Mtrs plus curve allowance as required. Wherever this distance cannot be provided specific approval of Purchaser shall be obtained before erection. Setting of portal upright, overlap/turnout structures, anchoring structures and other masts carrying more than one OHE will be 3.0m wherever possible.
- (c) Extra Clearance in Curves.
The minimum setting of structures on curves shall be determined by adding to the above minimum figures an extra clearance as per RDSO's guidelines.
- 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 centre under the worst conditions of wind.
- e) Structures on Platform.
The setting of structures on platforms will be not less than 4.75m.
- 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 as per relevant RDSO drawings/designs.
- g) Setting of Structures.
The value of setting of masts/structures shall be painted on each mast/structures. The figures 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.
- h) General
 1. This Specification provide for fabrication, galvanization and supply of structures as mentioned in Schedule-1 for supporting Traction Overhead Equipment of permanent way and distribution lines of the Central Railway. The Contractor shall carryout the

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manufacture / supply the structures as mentioned in schedule of rates and quantity.

The work shall be strictly in accordance with the following standard specification, rules and codes of practice. All steel used for manufacture shall be as prescribed below:

- | | | | |
|----|----------------------|---|----------------------------------|
| a) | Quality of steel | - | IS 2062 Grade-A. |
| b) | Fabrication etc. | - | IS 800 |
| c) | Electric Arc Welding | - | IS 816 |
| d) | Galvanization | - | RDSO Specn. No.ETI/OHE/13 (4/84) |

Latest edition of the above codes/specifications with correction slips issued from time to time shall be applicable to the work except to the extent it is modified.

NUMBERING OF STRUCTURES CARRYING OVERHEAD EQUIPMENT

All structures shall be numbered in accordance with the numbering given in the approved overhead equipment layout plans. Retro reflective number plates shall be provided on each mast or structure as per RDSO standards.

CHECKING OF STEEL WORK.

The fabricated steel work will be inspected and passed by a representative of Purchaser (Like M/s RITES or Chief Electrical Engineer (Construction)) but such passing shall in no way relieve the Contractors from the responsibilities under the contract.

STEEL WORK FOR SWITCHING STATIONS & GANTRIES.

- a) Horizontal members 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 joints, single or fabricated. They shall preferably be attached to masts by means of clamps to avoid drilling of mast section.
- b) For purpose of design, all possible loads which may occur in the worst combination shall be considered. The loads shall include the following:-
 - 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 structure 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 per relevant IS specification.
 - vi) Weight of man working on the structures;

Weight of structure itself;

Erection of loads and any other load or loads which may occur due to special equipment wherever they occur.

- c) Tension of Conductors.

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For purpose of designs, the maximum tension of different conductors, without wind load, shall normally be as under:-

- i) Maximum tension in the incoming feeder from traction sub-station to the auxiliary gantry at the feeding posts under worst conditions 600Kgf.
- ii) Maximum tension in the cross feeders at switching stations under worst conditions.
 1. For spans less than 18m.100Kgf.
 2. For spans more than 18m.200Kgf.
- iii) Maximum tension in longitudinal feeders running parallel to the track at the switching stations under worst conditions1500Kgf.
- iv) Tension in anchored overhead equipment in case of sectioning and paralleling stations. -200Kgf.
- d) Deflection of Gantry Masts.

Deflection under the permanent loads (as an average temperature of 35 deg.C without wind) at the top of the fabricated structures of mast shall be limited to the one eightieth ($1/80^{\text{th}}$) 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 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 or auxiliary gantry preferably by means of clamps to avoid drilling of mast section.

- g) Uprights and Fencing Posts.

Uprights carrying operating handles of isolators and fencing posts shall be made from steel sections, viz. channels, angles or joints, either single or fabricated.

STEEL SECTION AND SPECIFICATION.

The rolled steel joists, plates, channels, flats, angles and other rolled steel sections and rivets if any used in execution of the contract shall be of Quality Gr. – A and shall conform I.S.I. Specification No.2062 of or its latest revision for structural steel. The steel sections shall be free from blisters, scales, laminations or other such defects. No filling or plugging of defective steel section will be permitted. No joints either welded or bolted type shall be provided in any of the members.

DRAWINGS AND DESIGNS:

1. The structure shall be fabricated from rolled steel section plates and bars generally in accordance with the drawings referred to in Annexure.

The dimensions shown in the structure drawings are in metric system. In the event of equivalent metric size steel sections being not available, the Contractor may use the nearest rationalized size of steel sections with the prior approval of Central Railway. When the use of alternate steel sections is approved, the resulting increase in weight up to 5% on overall quantum of work is

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permitted, for which payment will be made by the Purchaser. Over and above 5% increase in over all weight permitted as above, in case of any increase in weight is involved, it will be to the account of the Contractor. The Purchaser will not be liable to make payments on this account.

WORKMANSHIP:

Unless otherwise approved the main angles, channels and joists used in the fabrication of structures shall be as shown in the drawing and all holes shall be drilled to templates. The back angles and light steel sections may be sheared to gauge and shall be accurately drilled or punched to templates. All parts shall be carefully cut and holes shall be cut and holes accurately drilled so that when the members are in position the holes shall be truly opposite each other for accurate assembly of the various sections. For the purpose of calculating structure weight, the actual length used in fabricating the structures will be taken into consideration which excludes wastages, if any, while cutting/shearing the rolled steel sections. The drilling, punching, cutting and bonding of all fabricated steel work shall be such as to prevent any possibility of irregularity occurring to introduce difficulty of erection of steel assembly in the field. Built members shall, when finished, be true and free from all kinds of twists or open joints and the material shall, when finished, be true and free from all kinds of twists or open joints and the material shall not be defective or strained in any way. All lattice work on the main structures shall be riveted/welded together; Main members should be bolted together. No rivets or bolts shall be used in tension, except where specifically approved by the Railway. No bolthole shall be more than 8 mm larger than the diameter of the bolt.

DESPATCH OF STRUCTURE:

1. The manufacturer shall assemble the complete structure in a horizontal position before dispatch from their works as may be required by the Railway for inspection.
2. The structure shall be dispatched in sections of approved sizes and where possible shall be bundled with similar sections and tied securely for safe transit. As far as possible, full capacity of the wagon should be utilized to avoid under loading.

GALVANISATION:

The galvanization may be carried out as per the RDSO's specification. The minimum average weight of zinc coating of 610 grams / sq. mtr i.e. for non-polluted zone

Setting of structures:

The value of setting of mast/structures shall be painted on each mast/structures. In addition track level should also be marked on steel structures.

PA R T-II
C H A P T E R - IV
EQUIPMENTS COMPONENTS & MATERIALS

GENERAL : This chapter deals with the details and specifications of the equipments, components and materials to be used for traction overhead equipment, switching stations, booster transformer stations and LT supply transformer stations. This chapter does not cover structure and foundations, which are dealt with in Part-II, Chapter-II and

III. In general based on the specifications issued by various bodies, such as Indian Standard Institutions, British Standards Institution etc specifications have been issued by the Purchaser. Such specifications may be bought separately from the office of the Purchaser. All these specifications are included in the set of drawings and specifications.

COMPLIANCE WITH STANDARD SPECIFICATION:

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

- i. International Electro-technical commission (abbreviated as (IEC)) publication.
- ii. British Standards (abbreviated as BS)
- iii. Indian Standards (abbreviated as IS)

QUALITY ASSURANCE: The provisions of Part-I for quality assurance will apply, including facilities to be provided by the manufacturer.

PROTO-TYPE TESTS.

- a) Fittings, components and materials: All the fittings, components and 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 test will be conducted to a laboratory selected by the Purchaser.
- b) Equipments: This comprise 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 test shall be conducted on each equipment as indicated in the individual specifications referred to in Para 2.4.1 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 prototypes 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 Proto-type tests: If proto-type samples of equipments, components or fittings of any manufacture have already been approved in connection with the electrification of other sections of Indian Railways on the 25 kV, 50 Hz single phase A.C. system, proto-type 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.

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- e) The results of proto-type 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.

INSPECTION AND TESTS: These comprise inspection and tests conducted at the manufacturer's factory for ensuring quality of manufactured items as part of the Quality Assurance programme.

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).

BULK MANUFACTURE: Bulk manufacture may be under taken only after specific written approval of the Purchaser or his representative has been obtained indicating that tests on the prototype are satisfactory. Where proto-types have already been approved in connection with manufacture may proceed after exemption from proto-type tests is received from the Purchaser in writing.

INTER-CHANGEABILITY: All equipments, components and fittings shall be interchangeable 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.

TECHNICAL SPECIFICATION: The following specifications (latest revision) will govern the supply and testing of important materials components and equipments:-

Structural Steel:	IS: 226 – 1975, IS:2062 Gr.A (Latest), IS:800/1984, IS: 808 -1964 & IS:808(Pt.-I-1978), IS: 808 (Pt.II)/1978, (Pt-III)/1979 (Pt-V)/1976, (Pt-VI)/1976
Tensile testing:	IS:1731 – 1971, IS-2004 – 1978, IS:1608-1972 for steel products etc.
Welding:	IS:816-1969
Disc Insulator:	IS:731-1971, IS:3100-1980, IS:3188-1980
Dropper wire:	IS:282-1982
Annealed cu. jumper wire:	IS:434(Pt-I)-1964
All Aluminum conductor:	IS:398 (Pt-1-1974) (Pt.I-1976)
Material for aluminum tubular bus bar:	IS:5002-1981
Dimensions for al. tubular busbar:	IS:2673-1979
Galvanized stay stranded:	IS:2141-1979
PVC insulated cables:	IS:1554(Pt-1)1976
Tin bronze castings:	IS:306 – 1968
Aluminum bronze casting:	IS:3091 – 1965
Malleable iron casting:	IS:2108 – 1977
Grey iron castings:	IS:210 – 1978
Aluminum castings:	IS:617 – 1975
Copper strip for formed fittings:	IS:1897 – 1985
Cadmium copper conductor:	ETI/OHE/50(8/83) with A&C slip no. 1 & 2 of 10/88 (4/85) & (8/85) or latest amendment.
Contact wire:	ETI-OHE/42 (11/83) with A&C slip No. 1 & 2 of

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	(4/85) and (8/85).
Annealed stranded copper conductors for Jumper:	ETI/OHE/3(1/83) with A&C slip no. 2 of Feb 85.
Copper busbar:	RE/30/OHE/5(11/60)
Structural steel tubes:	ETI/OHE/11(5/89)
Hot dip galvanization of steel masts latest revision, 610 gm/sq. mtr (Rolled and fabricated) for non-polluted zone :	ETI/OHE/13(4/84)
Hot dip galvanization of tubes & fittings For non-polluted zone:	ETI/OHE/23(4/84) or its latest revision.
Stainless steel wire rope:	TI/SPC/OHE/WR/1060 and latest amendments.
25 KV solid core insulator including those for polluted zones:	TI/SPC/OHE/INS/007 and latest amendments.
25 KV single and double pole isolator:	ETI/OHE/16(1/94) with latest amendment.
Bolts, nuts and washers:	ETI/OHE/18(4/84) with amendment 3(9/87)
Aluminum alloy section & tube:	ETI/OHE/21(9/74)
Standard drawings for traction overhead equipment:	RE/OHE/25(3/66)
Enamelled steel plates:	ETI/OHE/33(8/85) or its latest revision.
Galvanized steel wire:	ETI/OHE/36(12/73)
Fittings for 25 kV 50 Hz. AC Traction Equipment:	ETI/OHE/49(5/84) with A&C slip no.1 of Sept.85, No.2 of (6/86), 3 of (7/88) and 4 of (8/89)
Cadmium copper conductor for OHE Traction:	ETI/OHE/50 (8/83) with A&C slip No.1 of Oct 88, Amend 5 (10/92)
25 KV Potential Transformer:	TI/SPC/PSI/PT/0990, A&C Slip No. – 8 or latest.
Three pulley type regulating equipment:	TI/SPC/OHE/ATD/OO60
Bimetallic (Al. Cu) Strip:	ETI/OHE/55(5/85)
Section insulator assembly:	ETI/OHE/27 (8/84)

NOTE: Unless otherwise specified, the latest amendments to the specification shall be used.

NOMENCLATURE AND MARKING:

- All components and fittings supplied by the contractors 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 an/or any other fittings as may be agreed to by the Purchaser.
- In case of insulators, galvanized steel tubes, stainless steel wire rope and conductors, name of manufacture shall be specified in 'As erected' drawings for identification.

STEEL WORK AND PROTECTING AGAINST RUST:

- Galvanizing: All ferrous materials and fittings shall be hot dip galvanized according to the specification ETI/OHE/13 (4/84) with latest amendment.
- 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 Aluminum primer and two coats of Aluminum paints. The second coat of Aluminum paint shall be applied after erection.
- Rectification at Site: In case of modifications which would damage the protective coat, repairs to such damage would be allowed only in exceptional circumstances. The part

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damaged shall be protected in accordance with the method indicated in specification ETI/OHE/13(4/84) with latest amendment or any other method approved by the Purchaser. The contractor shall, in all such cases obtain prior permission from the Purchaser before carrying out repair.

BRACKET ASSEMBLY COMPONENTS:

- a) Arrangements for Normal OHE: The arrangements of the different fittings and structural components of bracket assemblies are as per RDSO's drawings.
- b) 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)).
- c) Tubular Stay Arm; Steel tubes with adjustable steel rods shall be used for tubular stay arm of all bracket assemblies.
- d) Register arm: The register arm shall also be electrical resistance weld or cold drawn steel tube of proper dimensions duly formed. It shall be suspended by a dropper from the catenary suspension clamp/bracket tube. A hook and eye arrangement shall be used at the bracket end to permit free movement in every direction.
- e) 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. Bent steady arms of aluminum tube conforming in specification ETI/OHE/21 (9/74) shall be used for neutral section overlap and in the central mast of a 4 span insulated overlap.
- f) Bracket for unregulated tramway type equipment: Brackets provided on cantilever masts for tramway type unregulated equipment shall normally span two tracks and the contact wires carried on V type clamps suspended from a span wire. The span wire shall be provided with a turnbuckle at only one end.

DROPPERS:

- a) General Designs: The droppers shall generally be so designed as shown in standard drawings and made of copper wire about 5 mm. diameter conforming to IS:282, and shall be attached to the catenary wire by a copper dropper clip. The contact wire shall be held by a clip of aluminum bronze as shown in the standard drawings. The distribution of dropper shall be in accordance with standard designs.
- b) Loading: The droppers shall be able to withstand a vertical load of 200 kg. At the point of attachment to the contact wire and the clip shall not slide under a horizontal load of 120 kgf.
- c) The permissible tolerance in the overall length of a dropper will be +/- 5mm.

INSULATORS:

- a) All insulators except those on return conductors and earth wire shall be of the solid core

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type. Disc insulators shall be used on return conductors and earth wires or other locations as desired by the Purchaser. All solid core insulators shall confirm to TI/SPC/OHE/INS/007 LATEST.

- b) Inter changeability: For free inter-changeability only the followings types of insulators shall be used. While the shapes of the insulators may vary slightly from those shown in the drawing, 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 Tone Insulators: These will be used at all places for cut-in and terminal insulation including those in additional catenary/earth wire.
 - iv. Solid core post Insulators: These will be used at all places for supporting isolator mechanisms, busbars, jumpers etc of 25 KV.
 - v. Disc Insulators: Clevis type 255 mm disc insulators will be used for return conductor, suspension and for earth wire cut in insulator (as per IS:731 latest).
 - vi. 11 KV Post Insulators: These will be used at all places for supporting busbars. Jumpers etc. in conjunction with return conductor return feeders.

ENDING FITTINGS & SPLICES:

- a) Terminating or ending fittings and splices on copper conductors shall be of the cone type clamping on both the inner and outer strands of conductors except for contact wire ending clamps which may be of wedge type. The arrangements shall be easy to install and also be such as would apply the clamping pressure gradually without shock (See ETI/OHE/49 (5/84). For Aluminum Alloy/pure Aluminum Conductor, the end fittings shall be either cone type, strain clamp type or any other type as approved by the Purchaser.
- b) Loading: All the parts shall be capable of withstanding without damage, a load greater than the ultimate strength of the wires to which they are fitted. In the case of threads 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 be used to 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 be not less than that of the conductor or wire itself.
- e) Additional termination wires: Cadmium copper stranded wire of 65 sq. mm nominal section or 37/2.1mm (as used in head span construction) may be used as additional

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terminating wires for extending single and double conductors respectively, if termination of the nearest structure is not feasible.

ELECTRICAL CONNECTION FOR OHE:

- a) All electrical connections between conductors shall be made by parallel clamps. The general arrangements of connections are as per RDSO drawings.
- b) Jumpers: Coppers jumpers shall be of any of the following:
 - i. Large jumper of annealed copper in accordance with the specification ETI/OHE/3(1/83) LATEST.
 - ii. Small jumper of annealed flexible copper conductor in accordance with the specification BS: 4102, IS: 434 – Pt-I OF 1970 or its latest revision or equivalent IS standard.
- c) Bus bars: Aluminum bus bars wherever used shall be of 36/20mm tubing (See 2.4.29) Aluminum tubular bus bars shall be made of alloy to IS:5082-1981. The tolerance on diameter and thickness shall be as per IS: 673-1979.
- d) Feeders: Feeders shall also be of 150 Sq. mm. copper conductor.

TERMINAL CONNECTORS FOR EQUIPMENTS:

Isolators, Interrupter, Potential Transformers line indication type, Lightning Arrestor, Fuse Switch, 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, Alloy strips shall be provided by the Contractor for bimetallic connections wherever required.

REGULATING EQUIPMENT: Shall be as per latest specification.

General:

- a) Conductor weights and arrangements used shall be such that these could be accommodated within 330 mm (13 in.) measured transverse to the track under the worst condition of wind. The vertical upward movement shall be limited with a fixed top.
- b) Reduction ratio: Reduction ratio in the arrangement used shall be five for winch type and three in case of three-pulley type.

HEADSPAN CONSTRUCTION:

- a) Size & Factor of Safety: All span wires used in head span construction shall be of stranded cadmium copper conductor 65sq.mm or 139sq.mm cross section. All the wires shall be designed with a factor of safety of not less than 4 under the most unfavorable condition.
- b) Turn Buckles: Each span wire shall be equipped with a turnbuckle 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 section.

ISOLATORS:

25kV Isolator switches shall comply with specification as applicable or latest.

INSULATION LEVEL:

Interrupters, Potential Transformer line indication type, 42kV Lightning arrestors and other equipment shall be suitable for insulation levels indicated in the relevant specifications.

BUSBARS:

- a) No splicing will normally be allowed in the tubular bus bars unless the length of the bus bar exceeds 6m.
- b) General: The bus bar shall be clean, smooth, mechanically sound and free from surface and other defects. Provision shall be made where necessary to allow for expansion and contraction of bus bars caused by temperature variation. The open ends of bus bars shall be covered by suitable tube caps, wherever the tubular bus bars are required to be bent, the radius of the bend shall be not less than 200 mm.
- c) Joints: The Joints in bus bars shall be mechanically and electrically sound so that the temperature rise under normal working conditions does not exceed 40 degree C for an ambient temperature of 65 deg. C.
- d) All aluminum joints shall be thoroughly cleaned and applied with suitable corrosion inhibiting joint compound before and after assembling the joint. Similar procedure shall be followed for connecting the equipment terminals to the aluminum bus bars with bimetallic connectors.

CABLING:

- a) Cable for LT supply - 230V AC supply from LT supply transformer at switching stations shall be brought and terminated on the LT AC distribution board in the remote control cubicles at the switching stations by 110V 25 sq. mm aluminum two core PVC insulated; PVC sheathed and steel armoured heavy duty cable conforming to IS:1554 (Part-I) 1976.
- b) Control & Indication - All other cables for control and indication at switching stations shall be 1100V grade PVC insulated and sheathed un-armored (heavy duty) complying with IS: 1554 (Part-I) 1976. The cables shall be provided as indicated in the Table below:

Purpose	Run	Circuit voltage	Core size & material	No. of cores.
Control and indication of interrupters.	From each interrupter to terminal board	110V/DC	2.5sq.mm	1
Catenary indication	From each PT line indication type to terminal board	110V/AC	2.5sq.mm	2
Heater supply for interrupter control mechanism cabinet	i) From each interrupter to interrupter.			
	ii) From each interrupter to fuse box	230V, AC	4.0 sq.mm alu.	2
	iii) From fuse box to distribution board.			
Battery supply	i) 110V battery charger to 110V battery			
	ii) 110V battery to 15A DC fuse box.	110V DC	2.5sq.mm copper	2
	iii) 15A DC fuse box to terminal board			

Note: i) In case of feeding posts which are located within the traction sub-station premises, the cables shall be run from individual equipment and terminated inside the sub-station control room.

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- ii) Notwithstanding the sizes of cables given above, the tenderer shall assure himself that the various cables would suit the ratings of equipment offered by him.
- c) Specification. The cables shall be resistant to decay, abrasion, acids, alkalies and other corrosive materials. All indoor wiring on wall shall be clamped neatly on teak wood battens fixed to the wall by means of wall plugs/wood pegs. The cables run layout at typical switching station is shown in the relevant drawing already included in Annexure-I

LITERATURE FOR EQUIPMENT: The Contractor shall within 2 months of issue of Letter of Acceptance of Tender, supply 2 copies of detailed schedule, catalogues and drawings of all parts of the equipments.

PART – II

CHAPTER-V

DESIGNS AND DRAWINGS

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, and
- c) In all drawings, as far as possible only such symbols as are in international use, shall be used.

a) Contractor's Drawings:

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, components and materials and to enable correct and complete erection of overhead equipment, switching stations, booster transformer stations and LT supply transformer stations in an expeditious and economic manner.

b) Responsibility:

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, components and materials and to enable correct and complete erection of overhead equipment, switching stations, booster transformer stations and LT supply transformer stations in an expeditious and economic manner.

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 basic designs and drawings shall conform to Specification RE/OHE/53 (6/88) / RDSO' drawing.

a) Basic Designs: Where the Contractor adopts designs and drawings conforming to standard designs, drawings and specifications of Research Designs & Standards Organization, Manak Nagar, Lucknow - 226011 (RDSO) for basic arrangements, equipments, components and fittings of traction overhead equipment, switching stations, booster transformer stations and LT supply transformer stations and adopts employment schedules furnished by the Purchaser, he shall verify such designs, drawing and employment schedules and satisfy himself that those are correct and the latest approved drawings, before use. Within two months of the issue of Letter of Acceptance of Tender, the Contractor shall intimate to the Purchaser the list of standard basic arrangement, 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 and fittings drawings and employment schedules from Chief Electrical Engineer, Railway Electrification, Allahabad - 211001, 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 a result of his experience or other development he shall justify his proposal with supporting explanatory notes.

STANDARD DRAWINGS EMPLOYMENT SCHEDULES ETC:

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.

PARTICULAR DESIGNS & WORKING DRAWINGS FOR OHE:

- (a) 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 Contractor.
- (b) Layout Plans: [Provisional Layout Plans]. The Contractor shall prepare and submit overhead equipment layout plans incorporating the following information:
 - i) The run of wires in different thickness or color in special cases and terminations.
 - ii) The run of wires for future wiring indicated to the Contractor, in dotted lines.
 - iii) Exact 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) Layout of feeders.
 - vii) Jumper connections and connection to switches and switching stations.
 - vi) List of infringements.
 - vii) Kilometer numbers and type of structures.
 - viii) Location and numbers of switches.
 - ix) Schematic sectioning diagram drawn to a convenient scales showing section insulator, number of switches, elementary sections and connections to switches and switching stations.
 - x) Table giving reference on approved profile drawings, feeder layout plans and other relevant drawings.
 - xi) Any other information as instructed by the ENGINEER.
- c) OHE profile Drawings:
After completion of the overhead equipment layout plans, the Contractor shall prepare an overhead equipment profile drawing showing the actual height of the contact wire under each over 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.
- d) Cross Section Drawings: While the layout plans are being finalized, the Contractor shall submit for approval, in-so-far as yards between outermost points and crossings are concerned, cross section drawings for each structure showing guy rods, if any, indicating the cross section of the formation, height and nature of the bank, whether new or old,

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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, points rods and their correct location in reference to track/tracks as well as underground obstructions like pipes, cables, etc. after collecting 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 as such location and necessary details for anchor foundation will be submitted.

PARTICULAR DESIGNS & WORKING DRAWINGS FOR OHE:

e) CROSS SECTION FOR THE OPEN ROUTE SECTION.

Sl. No.	1	2	3	4	5	6	7	8	9	10	11	12	13
LOCATION NO.													
CHAINAGE													
D	SETTING DISTANCE IN 'M'												
E	STEP DISTANCE IN 'M'												
T	DISTANCE IN 'M'												
A	F.B.M. CODE												
I	SOIL TYPE & PRESSURE												
L	FOUNDATION TYPE & SIZE												
S	MAST SIZE & LENGTH IN 'M'												
	MAST EMBEDDED LENGTH 'M'												
	REVERSE DEFLECTION (CM)												
	SUPER MAST LENGTH (M)												
	CROSS ARM LENGTH (M)												
	ANY OTHER INFORMATION AS INSTRUCTED BY ENGINEER												
	ANY OBSTRUCTION												

- f) Final Layout Plans: After all the cross section drawings in a section covered by one 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.
- g) Structure Erection Drawings: The Contractor shall then submit structure erection drawings for each structure incorporating all the details included in the cross section drawing 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 return conductors proposed for each structure together with all particulars necessary for the correct erection of overhead equipment at the structure. For structures with isolators, the details of electrical connections shall also be incorporated. In open line section the Contractor shall submit structure erection particulars in the typical 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, if found necessary will be finalized at the time of making structure erection drawings.

SUBMISSION OF DRAWINGS & SCHEDULES:

- a) The submission of drawing and designs for approval shall be done as applicable.
- b) The contractor shall supply the sufficient copies of the approved drawing as required by the purchaser for distribution/reference purpose.
- c) Supply of requisite number of copies of all Drawings (Initially-3 copies, duly approved- 6 copies, 4 copies for EIG application, and as erected -6 copies along with RTF and soft copy in 2 DVD, along with digitalization of all including SWR, sectioning diagram.

COMPLETION DRAWING & SCHEDULE:.

After completion of works, all drawings and designs submitted by the Contractor and approved by the Purchaser shall be made up-to-date incorporating actual supply and erection particulars including the name of 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 **Six sets**, one of which shall be transparencies of linen or film reproduction or any other durable material approved by the Purchaser, **along with soft copies in two DVDs**.

ADDRESSES:

Addresses to which designs and drawings should be submitted are as applicable.

PART-II

CHAPTER-VI

ERECTION AND INSTALLATION OF EQUIPMENTS

SECTION-I: PRINCIPLES

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

METHOD 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, LT supply transformer stations, standard methods adopted for erection and installation of electrical equipment's shall be adopted.

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.

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.

MEASUREMENTS:

All measurements for location of structures and foundations shall be made with the aid of steel tapes. On curves, these 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 number of tracks. Structures on curves shall be located in the radial off set of the location as determined.

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's to the Purchaser for inspection and testing.

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 repair.

FOUNDATION:

- 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

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site inspection. He shall adopt only those values as accepted by the Purchaser for the design of foundations.

- b) **Location:** The location of each foundation or anchor blocks 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) **Methods of Installation:** The Contractor shall adopt mechanized method (concrete mixer) for installation of foundation in the station areas with five 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 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.

Excavation: Normally, excavation of soil for foundations on anchor blocks alongside the track may be done up to length of 1 to 1.2 m and depth of 0.8 to 1 m without shoring, provided and excavated hole is concreted immediately and not left over night. Shoring shall otherwise be done unless the hole is refilled with soil and tamped. 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 than 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 satisfaction of the Purchaser's representative. 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 water logged 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 hour) and their edges cemented to the foundation blocks. Prior to doing so, water should be filled in the core holes so as to assist in curing. The date of casting should be inscribed on the foundation block. In case of platform areas and level crossing, 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 form promptly after casting of the foundation block. The excavated earth should be removed well clear of the area so as to avoid the mixing up with the track ballast or any obstruction to the track drains. In case of cuttings, the earth drains should be thrown well away from the shoulders so that there is no risk of its flowing back to the drain during the rains.

- d) **Concreting:** All concreting or grouting shall be done in accordance with Para 2.2.4 with ballast graded for the purpose of specified in Para 2.2.5. The concrete shall be poured and tamped 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. Testing shall be arranged by the Purchaser at his own cost.
- e) **Anchor Blocks:** 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 the masts are grouted or after the masts/structure is loaded with equipment. 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 frame work of the equipment.
- f) **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.

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- g) Conduits for cables should be embedded in the foundation blocks, wherever required to avoid consequent chipping off and breaking of the foundation blocks.

MASTS & STRUCTURES ERECTION:

- a) In case of 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 the approved drawings.
Note: Masts/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 infringes the Schedule of Dimensions 1676 gauge printed in metric units in 1973.
- d) **Alignment of Masts at Gantries:** The main masts of gantries shall be carefully aligned to enable easy and good assembly of fabricated steel work.

OVERHEAD EQUIPMENT:

- a) A suggested method for erection of traction overhead equipment which would ensure good speed and quality erection, is included in Section-2 of this chapter. 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 string 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 150 mm to facilitate adjustment during maintenance.
- c) **Stay Arms:** The choice of stay arms shall be such that their adjuster are capable of adjustments of minimum of 90mm in either direction except as otherwise relaxed.
- d) **Insulators:** Before insulators are used in bracket assemblies or dispatched to work site for erection from the 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 completed sections of equipment for inspection and testing.
- d) **Stringing of 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 assemblies. The pulleys shall be fitted with ball bearing and shall be of the swivelling 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 Section-2 of this Chapter) for a minimum duration of 48 hours 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.
- e) **Stringing of Contact Wire:** Care shall be taken to avoid formation of kinks, twists and

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damage to contact wire in stringing and subsequent operations. While stringing the contact wire, it shall be suspended from pulleys hung from dropper 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.

- f) **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.
- g) **Clipping of Droppers:** The droppers shall be clipped on to 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.
- h) **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 deg. C before it is connected to the overhead equipment and put into action. The installation of the devices shall be such as to permit free, easy and unobstructed movement of the counter-weight.
- i) **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 2m away from the structures other than those supporting traction overhead equipments.
- j) **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 not unusual sag due to the same. Where section insulators are installed, the contract plane of the runners of the insulators as well as those of overhead equipment connected to it shall be parallel to the track plane.
- k) **Anti-wind Clamp:** Anti-wind clamp shall be provided as per RDSO's standard drawing.
- l) **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 jumper shall be adequate to avoid any disturbance to overhead equipment to restraint in the relative movement of conductors but the jumpers should not be excessively long. The end of jumpers shall be tinned including the portion inside the first parallel clamp.

Separation between OHE: In erection, the physical separation required between overhead equipment's and bracket assemblies on the same structure as insulated overlap shall be ensured. 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 structure and live equipment's.

Adjustment at turn-outs, etc: Careful adjustment of equipment shall be made on equipment at turn-outs, crossovers, diamond crossings, overlaps in 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 with any parts of the bracket assemblies and changeover of the contact wire is effected smoothly.

For wiring in large yards, the Contractor shall, prior to the execution of works, submit to the Purchaser's Engineer for his approval the sequence of stringing of catenary and contact wires to arrange for proper crossing of wires. Endeavour will be made to arrange for traffic blocks to suit approved sequence of wiring.

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.

BUSBARS AND CONNECTIONS: Bus bars and connections shall be neatly shaped and bent to give a good appearance.

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EARTHING: The earthing shall be done as per code of practice for bonding.

TOLERANCE: The permissible tolerance in dimensions for erection 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.

The cumulative error of measurement of all spans in a kilometer shall be not more than 1000 mm.

b) Setting of Structures: The setting of structure shall not be less than that included in the appropriate cross-section drawings, specially those with the minimum setting of 2.36m tolerance of ± 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 structures 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 length: ± 5 mm will be permitted for dropper length.

f) Dropper Location : ± 100 mm will be permitted for dropper locations.

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 required to be improved.

WIRING PROCEDURE : This section deals with the wiring procedure which may be adopted for erection 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 adjustment of overhead equipment immediately before energization and commissioning is virtually eliminated.

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 straight angles to the track and secured in that position by means of steel wires tied to similar brackets located on the opposite side of the track or other suitable means.

STRINGING CATENARY: The catenary is initially terminated in the ending clamp of the temporary arrangement at one end of tension length. The catenary is then paid out from the reel of the wiring trolley [of contractor] and run on pulley blocks hung from the suspension clamp eyes of brackets until the terminating point at the other end of the tension length is reached.

TENSIONING OF CATENARY:

The catenary is strained upto 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 dynamo-meter, and terminated at the tension. point. For this, the ambient temperature shall be deemed to be the temperature registered by a thermo-meter tied to a length of catenary wire 3 to 4 metres 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 levelling gauge attached to suspension points and to the catenary at mid span by a ladder working party. The sag shall be measured in two spans, each preferably greater than 54 metres, and situated on either side of anti-creep and the termination points. The value of sag measured by this method should be within 5% of the critical value for the corresponding stringing tension, and the temperature at the time of this measurement. In case the discrepancy is more, the tension should be adjusted again and sag rechecked as above. 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 blocks to the minimum, in the first block, the catenary is strained to the stringing tension with the aid of dynamometers and the catenary is terminated. In a subsequent block, the sag is checked and the tension readjusted with ladders, if necessary.

CLAMPING THE CATENARY:

The catenary is clamped on the brackets placed at right angles to the track.

DROPPERING:

Droppers are fitted to the catenary at the correct locations. At the contact wire ends these droppers may be provided with small pulleys or hooks to set as temporary supports when the contact wire is strung.

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

STRINGING CONTACT WIRE:

The contact wire is initially terminated in the contact wire-ending clamp of the temporary arrangement at one end of the tension length. The wire is then paid out from the reel put on the wiring trolley [of contractor] and supported on the pulleys hung from droppers or on hooks until the terminating point at the other end of the tension length is reached. In curves, the contact wire shall be registered or pulleys located at traction masts or supports corresponding to the approximate final position of the wire. The axes of these pulleys should be more or less vertical.

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

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. The temporary pulleys are removed and the conductors terminated in the permanent ending fittings, compensating plates, insulators and turn buckles. 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 droppers (in the vertical position) and on the steady arms. Contact wire height at the bracket is adjusted as also the staffer and register arm clearance.

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 turn buckle is inserted in the temporary termination.
The use of leveling lathes is recommended for the following reasons:
 - i) The accuracy of adjustment is greater than that with a dynamometer:
 - ii) No traffic block is required for this operation; and
 - iii) It obviates the necessity of initial tensioning 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 progress of works, the catenary may be maintained at stringing tension for a period of 48 hours before checking sag and clamping it to the brackets. This would ensure equalization of tension in the different spans.
Before clamping the catenary to the brackets, the sag should, however, be checked in two spans as indicated in Para 2.6.27.
3. If it is difficult to obtain a separate traffic block for stringing contact wire, the wire may be paid out at the same time, as catenary with the following precautions.
 - i) The contact wire is run and should not be suspended from the independent pulleys hooked on to the brackets, separately from the catenary pulleys, to avoid twisting together of the two conductors.
 - ii) The contact wire should not be suspended from the catenary until the later is clamped on to the brackets.
 - iii) The tension in the contact wire before termination should be about 1,500kgf. This will ensure that sag is not excessive.
 - (iv) The adjustment of tension and checking of sag of the catenary wire is carried out as if the contact wire had not been 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 2.6.31.
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 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 adjustments before energization and commissioning of the OHE may be reduced to a great extent. If this precaution is not taken, at the time of energization of the OHE, the droppers may not all be vertical and stall would have to be detailed for shifting the dropper clips which in attendant with risk of damage to the contact wire.
5. Before the temporary arrangement is removed a reference mark should be made in each conductor. After final termination of the conductors, it should be ensured that two marks are in the same relative longitudinal position as they were before the removal of the temporary arrangement.

PAR T-II

CH A P T E R-VII

INSPECTION AND TESTING

SCOPE:

This Chapter deals with the inspection and testing of completely erected overhead equipment. Switching stations, booster transformer stations and L.T. supply transformer stations as provided in Part-I.

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, with out mechanical shocks prejudicial sparks and without undue heating in the case of other equipments.

RESPONSIBILITY:

The general tests of overall performance stipulated below are only supplementary to other tests on structures, foundations, equipments, components and fittings as specified in Part-II, Chapter-II, III and IV. Any testing and acceptance by the Purchaser of overall performance shall be subject to the general terms of general terms of guarantee which shall continue to be valid as provided for in Part-I, Chapter-II.

TESTS ON OHE GENERAL:

- (a) As soon as a section is ready for inspection and testing, the Contractor shall advise the Purchaser in writing. Tests to be carried out by the Purchaser will be done in the presence of the Contractor's representative and shall include the following apart from other reasonable tests that the Purchaser may like to conduct with a view to ensure, himself of the soundness of the equipments and their erection in strict compliance with the specifications.

INSULATION.

- (b) The strength of the insulation and the di-electric strength of the entire equipment as installed shall be tested with a 2500V Megger.

TESTS ON THE CONTINUITY.

The electrical continuity of the line and the existence of bad contacts, if any, will be tested with a Megger.

ELECTRICAL IMPEDENCE.

- (d) The electrical impedance of individual of elementary sections in relation to one another shall also be tested with a Megger.

SWITCHES.

- (e) All isolators shall be tested for smooth and trouble free operation.

TENSION DEVICES.

- (f) All automatic tensioning devices installed shall be tested for sensitive functioning and adjustment.

STAGGER AND HEIGHT.

- (g) 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 Part-II, Chapter-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 under section insulators, particularly those which are likely to be frequently traversed.

MECHANICAL BEHAVIOUR.

- (h) The mechanical behavior of the entire equipment shall be tested at various speeds under normal pantographs pressure without energizing the overhead equipment.

ENERGISING.

- (i) If the overhead equipment, after being subjected to the above tests in an unenergised condition, is found to be satisfactory, it will be energised with the normal 25 KV A.C. supply.
- (j) Tests shall be conducted to check if the current collection performance of the overhead equipment is satisfactory after ensuring that the contact wire is adequately clean. For this purpose, an observation car shall be attached next to the electric locomotive. The behavior of the overhead equipment will be watched at various speeds. Current 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.

EARTHING.

- a) Earth wires will be checked for continuity and electrical isolation every 1000 m approx.
- b) Clearance between out-of-run wires and earth wires of overhead equipment and signals shall be checked.
- c) Earth resistance shall be measured separately for each earth electrode. In the case of inter-connected earth electrodes, the net resistance of the inter-connected electrodes shall also be measured.

DETAILS PROCEDURE FOR TESTS:

The detailed 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.

GENERAL CONDITIONS OF CONTRACT

The General Conditions of Contract 2022 of the Indian Railway shall be followed with its latest correction slips and amendments issued from Indian Railway.

The General Conditions of Contract 2022 of the Indian Railway, along with its latest correction slips and amendments, will form part of the tender/contract documents.

In case, there is an ambiguity in any definition, the decision of DFCCIL regarding the interpretation shall be final and binding.

Wherever there is conflict in any condition between GCC and special condition mentioned in tender documents. The condition mentioned in special condition of contract will prevail. However, DFCCIL decision in this connection shall be final and binding.

A copy of the book-let incorporating the above “General Conditions of Contract -2022” maybe perused in the Office of CGM/DDU or respective division.

ANNEXURES

ANNEXURE-I

Performa for Experience Certificate. {on the letter head of the issuing department}

M/s..... has executed the following work to this department and has completed the work successfully. The details are as under:

1. Name of work:
2. Agreement/contract number:
3. Date of start of work:
4. Date of completion of work:
5. Total value of work during the contract period (if completed):
6. In case of on-going work, please indicate the annual payment for
 - a) F.Y. 2021-22
 - b) F.Y. 2020-21
 - c) F.Y. 2019 -20

(Name and Signature of the officer with seal of the department and phone no.)

ANNEXURE-II

Performa for Affidavit. {on the letterhead of the bidder}

I _____ Proprietor/Director/Partner of the firm M/s._____ do hereby solemnly affirm that the firm M/s._____ has never been black listed/debarred by any organization/office and there has not been any work cancelled against them for poor performance in the last three years reckoned from the date of invitation of Tender.

**Signature of
Proprietor/Director/Partner**

Annexure-III

CERTIFICATION OF FAMILIARISATION

- A.** I/We hereby solemnly declare that I/We have visited the site of work and have familiarized myself/ourselves of the working conditions there in all respects and in particular, the following:
- a) Topography of the Area.
 - b) Climatic condition and law and order situation in project area.
- B.** I/We have kept myself/ourselves fully informed of the provisions of this tender document comprising Instructions to the Tenderers, General Conditions of the Contract, Special Conditions, special terms and conditions apart from information conveyed to me/us through various other provisions in this tender document.
- C.** I/We have quoted my / our rates as “Percentage above / below / at par” of costs as per Schedule of items Rates **in Offer Sheet**, taking into account all the factors given above.

(Signature of Tenderer/s)

ANNEXURE – IV

SUPPLEMENTARY AGREEMENT

Articles of Agreement made on this in the year and between DFCCIL acting through the Chief General Manager hereinafter called as one party and of the second part.

Where the party hereto of the second part executed an agreement with the party hereto of the first part being agreement No. dated for the performance of herein called the principal agreement.

And whereas it was agreed by and between the parties hereto that the works would be completed by the party hereto of the second part on “datelastextended”and whereas the party hereto of the second part has executed the work to the entire satisfaction of the party hereto of the first part and whereas the party hereto of the first part already made payments to the party hereto of the second part diverse sums from time to time aggregating to **Rs.** including the final billbearingvoucherNo.....dated..... (the receipt of which is herebyacknowledged by the party heretoof the secondpart) in full and final settlement of all his claim under the principal agreement.

Now it is hereby agreed by and between the parties in the consideration of sums already paid by the party hereto of the first part to the party hereto of the second part against all outstanding dues and claims for all works done under the aforesaid principal agreement including / excluding security deposit, the party hereto of the second part have no further dues / claims against the party hereto of the first part under the said principal agreement.

It is further agreed by and between the parties that they party hereto of the second part has accepted the said sums mentioned above in full and final satisfaction of all its dues and claims under the said principal agreement.

It is further agreed and understood by and between the party that in consideration of the payment already made under the agreement the said principle agreement shall finally discharged and rescinded all the terms and conditions including the arbitration clause.

It is further agreed and understood by and between the parties that the arbitration clause contained in the said principal agreement shall cease to have any effect and / or shall seems to be nonexistent for all purposes.

Signature of the Tenderer/s

For and on behalf of

Witness of the signatures

Witness

.....

1.

2.

ANNEXURE-V**AFFIDAVIT****FORMAT FOR AFFIDAVIT TO BE UPLOADED BY TENDERER ALONGWITH THE TENDER DOCUMENTS**

*(To be executed in presence of Public notary on non-judicial stamp paper of the value of Rs. 100/-. The stamp paper has to be in the name of the tenderer) ***

- 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 ofas per the **E- Tender No.: ----- Date-----** of (DFCCIL), 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 DFCCIL 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 undersigned that if the contents of the affidavit 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 five year on entire IR. 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 affidavit 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 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 fulfil all the requirements in this regard and am/are eligible to be considered (evidence of valid registration by the competent authority is enclosed)

DEPONENT
SEAL AND SIGNATURE
OF THE TENDERER

VERIFICATION

I/We above named tenderer do hereby solemnly affirm and verify that the contents of my/our above affidavit are true and correct. Nothing has been concealed and no part of it is false.

DEPONENT

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. Attestation before Magistrate/Notary Public .

ANNEXURE-VI

(Guarantee –Bond offered by bank to DFCC in connection with the execution of Contracts)
(SD)

GUARANTEE BOND FORMAT
(To be used by approved Schedule Banks)

1. In consideration of the Employer DFCCIL (herewith called “ The Employer”) having agreed to exempt_____ (hereinafter called “The said Contractor(s)”) from the demand, under the terms and conditions of an Agreement No..... dated _____made between _____and _____for _____(hereinafter called the “The Said Agreement”) of **security deposit** for the due fulfillment by the said contractor(s) of the terms and conditions contained in the said Agreement, on production of a Bank Guarantee for Rs. _____ (Rupees _____ only), we, _____ (indicate the name of the bank) (hereinafter referred to as “ The Bank”) at the request of contractor(s) do hereby undertake to pay to the Employer an amount not exceeding Rs. _____ against any loss or damage caused to or suffered or would be caused to or suffered by the Employer by reason of any breach by the said contractor(s) of any of the terms and conditions contained in the said Agreement.
2. We _____ (indicate the name of the Bank) do hereby undertake to pay the amounts due and payable under this Guarantee without any demur merely on a demand from the DFCCIL stating that the amount claimed is due by way of loss or damages caused to or would be caused to or suffered by the DFCCIL by reason of any 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 to the Employer any money so demanded not withstanding 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 is being absolute and unequivocal. The payment so made by us under this Bond shall be valid discharges of our liability for payment hereunder the Contractor(S)/Supplier(s) shall have no claim against us for making such payment.
4. We _____ (indicate the name of Bank) further agree that the guarantee 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 Employer under or by virtue of the said Agreement have been fully paid and its claims satisfied

or discharged or till _____ the Employer/DFCCIL certify that terms and conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges the Guarantee. Unless a demand or claim under this Guarantee is made on us in writing on or before the _____, we shall be discharged from all liability under this Guarantee thereafter.

5. At any time during the period in which this guarantee is valid the Employer may request for its extension and the Bank will extend this guarantee under the same condition for the required time at the cost of the Contractor.
6. We _____ (indicate the name of Bank) further agree with the DFCC that the DFCC shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extent time of performance by the said Contractor(s) from time to time any of the powers exercisable by the DFCCIL against the said Contractor(s) and to forbear or enforce any of 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 DFCCIL or any indulgence by the DFCCIL to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties for the said reservation would relieve us from the liability.
7. This Guarantee will not be discharged due to the change in the constitution of the Bank or the contractor(s)/Supplier(s).
8. We _____, (indicate the name of Bank) lastly undertake not to revoke this Bank Guarantee during its currency except with the previous consent of the DFCCIL in writing.

IN WITNESS WHEREOF we of the Bank have signed and stamped this guarantee on this day of..... being herewith duly authorized.

Bank Seal Signature of Bank Authorize Official with Seal

Name: -----

Designation: -----

Address:

Witness:

1. Name:.....
Designation:.....
Address:
2. Name:.....
Designation:.....
Address:.....

Annexure –VIB
Reference –GCC April 2022

Each Bidder must fill in this form separately:

NAME OF BIDDER/JV PARTNER:

Annual Contractual Turnover Data for the Previous 3/4 Years (Contractual Payment only)			
Year	Amount Currency	Exchange Rate	Indian National Rupees Equivalent
Average Annual Contractual Turnover for last 3 years			

1. The average annual contractual turnover shall be calculated as an average of “total contractual payments” in the previous three financial years. 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.
2. The information supplied shall be substantiated by data in the audited balance sheets and profit and loss accounts for the relevant years in respect of the bidder or all members constituting the bidder.
3. Contents of this form should be certified by a Chartered Accountant duly supported by Audited Balance Sheet duly certified by the Chartered Accountant.

SEAL AND SIGNATURE OF THE BIDDER

Certified that all figures and facts submitted in this form have been furnished after full consideration of all observations/notes in Auditor’s reports. _____

(Signature of Chartered Accountant)
Name of CA: _____
Registration No: _____
(Seal)

ANNEXURE-VII

Format of Bank Guarantee for Performance Security

Bank Guarantee No. : Dated :

To,
Chief General Manager/DDU /DFCCIL OFFICE
Manas Nagar Railway Colony,
Pt. Deen Dayal Upadhyay Nagar (Mughalsarai)
Chnadauli-232101 (Uttar Pradesh)

Reference: - Contract No. -----, Awarded on -----

This deed of guarantee made this day of _____ between _____ (Name of Bank) having registered office at _____ and branch office at _____ (hereinafter referred to as "Bank") of the one part, and Dedicated Freight Corridor Corporation of India Limited (hereinafter called the "Client") of the other part.

Whereas Dedicated Freight Corridor Corporation of India Limited has awarded the contract no. _____ for construction of _____ (hereinafter called "the Contract") to M/s _____ its registered office at _____ (hereinafter called the "the Contractor").

Whereas the contractor is bound by the said Contract to submit to the Employer an irrevocable performance security guarantee bond for a total amount of Rs. _____ (Rs in words).

Now, we the undersigned (name of the Bank official), of the Bank being fully authorized to sign and to incur obligations for and on behalf of the Bank hereby declare that the said Bank will guarantee the Employer the full amount of Rs. -----
----- (Rs. In words) as stated above.

After the Contractor has signed the aforesaid contract with the Employer, the Bank further agrees and promise to pay the amount due and payable under this guarantee without any demure merely on a demand from the Employer stating that the amount claimed is due by way of loss or damage cause to or would be caused or suffered by the Employer by reason of any breach by the said contractor of any of the terms or conditions contained in the said agreement or by reason of the contractor 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. ----- (in words) only.

We ----- (indicate the name of Bank), further undertake to pay to the Employer any money so demanded notwithstanding any dispute or dispute raised by the contractor in any suit or proceeding pending before any court or Tribunal relating to liability under this present being absolute and unequivocal.

The Payment so made by us (name of Bank) under this bond shall be a valid discharge of our liability for payment there under and the Contractor shall have no claim against us for making such payment.

We------(indicate the name of bank), to further agree that the guarantee 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 at all the dues of the Employer under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged by -----

(Designation & address of contract signing authority) on behalf of Employer certify that the terms and conditions of the said agreement have been fully and properly carried out by the said contractor and accordingly discharges this guarantee.

Not with standing anything to the contrary contained herein the liability of the bank under this guarantee will remain in force and effect until such time as this guarantee is discharged in writing by the Employer or until (date of validity/extended validity) whichever is earlier and no claim shall be valid under the guarantee unless notice in writing, thereof is given by the Employer within validity/extended validity period of guarantee from the date aforesaid.

Provided always that we(name of bank) un conditionally undertakes to renew this guarantee or to extend the period of guarantee from year to year before the expiry of the period or the extended period of guarantee, as the case may be on being called upon to do so by the Employer. If the guarantee is not renewed or the period extended on demand, we ----- (name of bank) shall pay the Employer the full amount of the guarantee on demand without demur.

We------(indicate the name of Bank), to further agree with the Employer that the Employer shall have the fullest liberty without our consent and without effecting in any manner out of obligation hereunder to vary any of the terms and conditions of the said contract from time to time or to postpone for any time or from time to time any to power exercisable by the Employer against the said contractor and to forbear or enforce any of the terms and conditions of the said agreement and we shall not be relieved from our liabilities by reason of such variation, or extension being granted to the said contractor for any forbearance act or omission on the part of the Employer or any indulgence by the Employer to the said contractor or by any such matter or thing whatsoever which under the law relating to sureties for the said reservation would relieve us from the liability.

The Guarantee hereinbefore contained shall not be affected by any change in the constitution of Bank or of the Contractor.

The expression “The Employer”, “The Bank” and “The Contractor” hereinbefore used shall include their respective successors and assigns.

We----- (name of the bank lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing. Notwithstanding anything to the contrary contained hereinbefore:

- i) Our liability under this Bank Guarantee shall not exceed and restricted to Rs. ----- (in words).
- ii) This Bank Guarantee shall be valid up to -----, unless extended on demand by Employer.
- iii) The Bank is liable to pay the Guaranteed amount or any part thereof under this Bank Guarantee only if Employer serve a written claim or demand on or before-----

IN WITNESS WHEREOF we of the Bank have signed and stamped this guarantee on this day of ----- being herewith duly authorized.

Bank Seal

Signature of Bank Authorize Official with Seal

Name :-----

Designation:-----

Address :

Witness:

1. Name :.....
Designation :.....
Address :

2. Name :.....
Designation:.....
Address :.....

ANNEXURE-VIII

FORM OF AGREEMENT

_____ DFCCIL

CONTRACT AGREEMENT OF WORKS

CONTRACT AGREEMENT NO. _____ DATED _____

ARTICLES OF AGREEMENT made this _____ day of _____ 20____ between DFCCIL hereafter called the "Employer" of the one part and _____ herein after called the "Contractor" of other part.

WHEREAS the Contractor has agreed with the DFCCIL for performance of the works _____ set forth in the Bill(s) of Quantities hereto annexed upon the Standard General Conditions of Contract, updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents and the Specifications of _____ updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents and the applicable Standard Schedule of Rates (SSOR) of _____ updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents and the Special Conditions and Special Specifications, if any and in conformity with the drawings here-into annexed AND WHEREAS the performance of the said works is an act in which the public are interested.

NOW THIS INDENTURE WITNESSETH that in consideration to the payments to be made by the DFCCIL, the Contractors will duly perform the said works in the said Bill(s) of Quantities set forth and shall execute the same with great promptness, care and accuracy in a workman like manner to the satisfaction of the DFCCIL and will complete the same in accordance with the said specifications and said drawings and said conditions of contract on or before the _____ day of _____ 20__ and will maintain the said works for a period of _____ Calendar months from the certified date of their completion and will observe, fulfill and keep all the conditions therein mentioned (which shall be deemed and taken to be part of this contract, as if the same have been fully set forth herein), AND the DFCCIL, both hereby agree that if the Contractor shall duly perform the said works in the manner aforesaid and observe and keep the said terms and conditions, the DFCCIL will pay or cause to be paid to the Contractor for the said works on the final completion thereof the amount due in respect thereof at the rates specified in the Bill(s) of Quantities hereto annexed.

Contractor _____ (Signature)

DFCCIL: Designation _____

Address _____

(For CGM/DDU/DFCCIL)

Date _____

Date _____

Signature of **Witnesses** (to Signature of Contractor) with address:

Witnesses:

PRE CONTRACT INTEGRITY PACT**General**

This pre-bid pre-contract Agreement (hereinafter called the Integrity Pact) is made on----- day of the month of----- 20xx, between, on one hand, the DFCCIL acting through Shri ----- Designation of the officer, (hereinafter called the CLIENT, which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns) of the First Part and M/s----- represented by Shri -----Chief Executive Officer (hereinafter called the "BIDDER/SELLER" which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second part.

WHEREAS the CLIENT proposes to procure (Name of the Stores/Equipment/Item, Name of the Consultancy Service, Name of Works Contract, Name of Services) and the [A] is willing to Offer/has offered for stores or works.

WHEREAS the [A] is a private company/ public company/ Government undertaking/ partnership/ registered export agency, constituted in accordance with the relevant law in the matter and the CLIENT is a PSU performing its functions or behalf of the President of India.

NOW, THEREFOR,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:-

Enabling the CLIENT to obtain the desired said (Name of the Stores/Equipment/Item, Name of the Consultancy Service, Name of Works Contract, Name of Services) at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDERS to abstain from bribing or indulging in any corrupt practice in order to secure [B] by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the CLIENT will commit to prevent corruption, in any form, by its Officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:

Commitments of the CLIENT

- 1.1 The CLIENT undertakes that no official of the CLIENT, connected directly or indirectly with the [B], will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the [A] either for themselves or for any person, organization or third party related to the [B], in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the [B].
- 1.2 The CLIENT will, during the pre-contract stage, treat all BIDDERS alike, and will provide to all BIDDERS the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular [A] in comparison to other BIDDERS.

- 1.3 All the officials of the CLIENT will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.
2. In case any such preceding misconduct on the part of such official(s) is reported by the [A] to the CLIENT with full, and verifiable facts and the same is prima facie found to be correct by the CLIENT, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the CLIENT and such a person shall be debarred from further dealings related to the [B] process. In such a case while an enquiry is being conducted by the CLIENT the proceedings under the [B] would not be stalled.

Commitments of BIDDERS

3. The [A] commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage) in order to secure the [B] contract or in furtherance to secure it and in particular commit itself to the following:-
 - 3.1 The [A] will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission fees, brokerage or inducement to any official of the CLIENT, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the [B] in exchange for any advantage in the bidding, evaluation, contracting and implementation of the [B].
 - 3.2 The [A] further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any Material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the CLIENT or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the [B] or any other [B] with the Government for showing or forbearing to show favour or disfavor to any person in relation to the [B] or any other [B] with the Government.
 - 3.3 * [A] shall disclose the name and address of agents and representatives and Indian [A] shall disclose their foreign principals or associates.
 - 3.4 * [A] shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.
 - 3.5 The [A] further confirms and declares to the CLIENT that the [A] is the original manufacturer/integrator/authorized government sponsored export entity of the defense stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the CLIENT or any of its functionaries, whether officially or unofficially to the award of the [B] to the [A] nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.
 - 3.6 The [A] either while presenting the bid or during pre-contract negotiations or before signing the [B] shall disclose any payments he has made, is committed to or intends to make to officials of the CLIENT or their family members, agents, brokers or any other intermediaries in connection with the [B] and the details of services agreed upon for such payments.

- 3.7 The [A] will not collude with other parties interested in the [B] to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the [B].
- 3.8 The [A] will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.
- 3.9 The [A] shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the CLIENT as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The [A] also undertakes to exercise due and adequate care lest any such information is divulged.
- 3.10 The [A] commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.
- 3.11 The [A] shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.
- 3.12 If the, [A] or any employee of the [A] or any person acting on behalf of the [A], either directly or Indirectly, is a relative of any of the officers of the CLIENT, or alternatively, if any relative of an officer of the CLIENT has financial. Interest/stake in the Bidder's firm, the same shall be disclosed by the [A] at the time of filling of tender.

The term "relative" for this purpose would be as defined in section 6 of the companies act 1956.

- 3.13 The [A] shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the CLIENT.

4. Previous Transaction

- 4.1 The [A] declares that no previous transgression occurred in the last three years immediately before signing of this integrity Pact, with any other company in any country in respect of any corrupt practices envisage hereunder or with any public sector enterprise in India or any Government department in India that could justify BIDDER's from the tender process.
- 4.2 The [A] agrees that if it makes incorrect statement on this subject, [A] can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5. Bid Security (Security Deposit)

- 5.1 While submitting commercial bid, the [A] shall deposit an amount ____ (to be specified in RFP) as Bid Security/Security Deposit, with the CLIENT through any of the following instruments:-

- i. Bank draft or a pay order in favor of _____.
- ii. A confirmed guarantee by an Indian nationalized bank, promising payment of the guaranteed sum to the CLIENT on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the CLIENT shall be treated as conclusive proof or payment.

- iii. Any other mode or through any other instrument (to be specified in the RFP).
- 5.2 The Bid Security/Security deposit shall be valid up to a period of five years or the contractual obligations to the complete satisfaction of both the BIDDER and the CLIENT, including warranty period, whichever is later.
- 5.3 In case of the successful [A] a clause would also be incorporated in the article pertaining to performance Guarantee in the [B] that the provisions of sanctions for violation shall be applicable for forfeiture of performance bond in case of a decision by client to forfeit the same without assigning any reason for imposing sanction for violation of this pact.
- 5.4 No interest shall be payable by CLIENT to the [A] on Bid Security/Security Deposit for the period of its currency.

6. Sanctions for Violations

- 6.1 Any breach of the aforesaid provisions by the [A] or any one employed by it or acting on its behalf (whether with or without the knowledge of the [A]) shall entitle the CLIENT to take all or any one of the following actions, wherever required :-
 - (i) To immediately call off the pre-contract negotiations without assigning any reason or giving any compensation to the [A]. However, the proceedings with the other BIDDER(s) would continue.
 - (ii) The Bid Security deposit (in pre-contract stage) and/or security Deposit/performance Bond (after the [B] is signed) shall stand forfeited fully and the CLIENT shall not be required to assign any reason therefore.
 - (iii) To immediately cancel the [B], if already signed, without giving any compensation to the [A].
 - (iv) To recover all sums already paid by the CLIENT, and in case of an Indian [A] with interest thereon at 2% higher than the prevailing prime lending rate of state bank of India, while in case of a [A] from the country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to [A] from the CLIENT in connection with any other [B], such outstanding payment could also be utilized to recover the aforesaid sum and interest.
 - (v) To encash the advance bank guarantee and performance bond, if furnished by the [A], in order to recover the payments, already made by CLIENT, along with interest.
 - (vi) To cancel all or any other contracts with the [A]. The [A] shall be liable to pay compensation for any loss or damage to the Client resulting from such cancellation/rescission and the client shall be entitled to deduct the amount so payable from the money(s) due to the [A].
 - (vii) To debar the [A] from participating in future bidding processes of the Government of India for a minimum period of five years, which may be further extended at the discretion of the CLIENT.

- (viii) To recover all sums paid in violation of this pact by [A]) to any middleman or agent or broker with a view a view to securing [B] the contract.
 - (ix) In cases where irrevocable letters of credit have been received in respect of any [B] signed by the client with the [A], the shall not be opened.
 - (x) Forfeiture of Performance Bond in case of a decision by the client to forfeit the same without assigning any reason for imposing sanction for violation of this pact.
- 6.2 The client will entitled to take all or any of the actions mentioned at para 6.1(i) to (x) of this pact also on the commission by the [A] or any one employed by it or acting on its behalf (whether with or without the knowledge of the [A], of an offence as defined in chapter IX of the Indian penal code, 1860 or prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.
- 6.3 The decision of the CLIENT to the effect that a breach of the provisions of this pact has been committed by the [A] shall be final and conclusive on the [A]. However, the [A] can approach the Independent Monitor(s) appointed for the purposes of this Pact.

7. Fall Clause

- 7.1 The [A] undertakes that it has not supplied/is not supplying similar product/systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/system or sub systems way supplied by [A] to any other Ministry/Department of the Government of India or a PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the [A] to the CLIENT, if the [B] has already been concluded

8. Independent Monitors

- 8.1 The CLIENT has appointed Independent Monitors (hereinafter referred to as Monitors) for this pact in consultant with the central vigilance commission (Names and addresses of the Monitors to be given)
- 8.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this pact.
- 8.3 The monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.
- 8.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.
- 8.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the CLIENT.
- 8.6 The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the CLIENT including that provided by the BIDDER. The [A] will also grant the Monitor, upon his request and demonstration of a valid Interest, unrestricted and unconditional access to his project

documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the [A] with confidentiality.

8.7 The client will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

8.8 The monitor will submit a written report to the MD/DFCCIL within 8 to 10 weeks from the date of reference or intimation to him by the CLIENT/BIDDER and, should the occasion arise, submit proposal for correcting problematic situations.

9. **Facilitation of Investigation**

In case of any allegation of violation of any provisions of this Pact or payment of commission, the CLIENT or its agencies shall be entitled to examine all the documents including the Books of Accounts of the [A] and the [A] shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

10. **Law and Place of Jurisdiction**

This pact is subject to Indian law. The place of performance and jurisdiction is the seat of the CLIENT.

11. **Other Legal Actions**

The actions stipulated in this integrity pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

12. **Validity**

12.1 The validity of this integrity pact shall be from date of its signing and extend upto 5 years or the complete execution of the [B] to the satisfaction of both the CLIENT and the [A] including warranty period, whichever is later. In case [A] is unsuccessful, this integrity pact shall expire after six months from the date of the signing of the [B].

12.2 Should one or several provisions of this pact turn out to be invalid; the remainder of this pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

13. The parties hereby sign this integrity pact at on

CLIENT

Name of the officer
Designation
Deptt./Ministry/PSU

Witness

1.....

BIDDER

CHIEF EXECUTIVE OFFICER

Witness

2.....

Note:

[A]- To be replaced by
BIDDER/Seller/Consultant/Consultancy
firm/Service provider as the case may be

[B]- To be replaced by contract/supply
contract/consultancy contract/works
contract as the case may be.

FINANCIAL OFFER

Schedule for Work

Name of Work – Design , Supply,Erection, testing & Commissioning of OHE for Sasaram RFO .

Sr. No.	Description	Unit	Sch. Quantity		Unit Rate		TOTAL COST		Total Amount (S+E)
			Supply	Erection	Supply	Erection	Supply	Erection	
1	Preparation of designs & drawings for overhead equipment	TKM	0	6	0	18642.80	0.00	111856.80	111856.80
2	Cement concrete for foundation & plinth in hard soil & rocky soil.	Cu.m	0	121	0	6149.03	0.00	744032.63	744032.63
3	Manual erection of traction masts.	MT	0	110	0	6111.43	0.00	672257.30	672257.30
4	Supply of fabricated Galvanised steel structures (i.e.B series mast TTC and portals)	MT	110	0	108531.63	0	11938479.30	0.00	11938479.30
5	Supply only of fabricated & galvanised steel work other than masts including SPS.	MT	10	0	112416.00	0	1124160.00	0.00	1124160.00
6	Erection of fabricated & galvanised steel work other than masts including SPS.	MT	0	10	0	6671.57	0.00	66715.70	66715.70
7	Supply only of guy rod assembly.	Each	20	0	5681.44	0	113628.80	0.00	113628.80
8	Erection of guy rod assembly.	Each	0	20	0	883.12	0.00	17662.40	17662.40
9	Supply only of conventional type single bracket assembly including Insulators.	Each	210	0	18833.69	0	3955074.90	0.00	3955074.90
10	Erection of conventional type single bracket assembly including Insulators.	Each	0	210	0	867.69	0.00	182214.90	182214.90
11	Supply only of 130 sq.mm	Mtr	500	0	736.57	0	368285.00	0.00	368285.00

	large Span Wire								
12	Erection of 130 sq.mm large Span Wire	Mtr	0	500	0	164.86	0.00	82430.00	82430.00
13	Supply only of 65 sq mm catenary wire.	MT	5.5	0	776409.00	0	4270249.50	0.00	4270249.50
14	Supply only of 107 sq mm contact wire.	MT	7.5	0	712234.37	0	5341757.78	0.00	5341757.78
15	Supply only of conventional type OHE along with all required components.	Km	7	0	45360.91	0	317526.37	0.00	317526.37
16	Manual erection of conventional type OHE along with all required components.	Km	0	7	0	42841.71	0.00	299891.97	299891.97
17	Supply only of 3 pulley type Regulating equipment with counter weight assembly for conventional type OHE.	Each	9	0	63075.28	0	567677.52	0.00	567677.52
18	Erection of 3 pulley type Regulating equipment with counter weight assembly for conventional type OHE.	Each	0	9	0	2842.17	0.00	25579.53	25579.53
19	Supply only of materials for termination of Double Overhead equipment conductor including insulator.	Each	18	0	10205.00	0	183690.00	0.00	183690.00
20	Erection of materials for termination of Double Overhead equipment conductor including insulator.	Each	0	18	0	1391.20	0.00	25041.60	25041.60
21	Supply only of Anticreep arrangement	Each	4	0	17313.31	0	69253.24	0.00	69253.24

	with 65 Sq. mm catenary wire for conventional type OHE.								
22	Erection of Anticreep arrangement with 65 Sq. mm catenary wire for conventional type OHE.	Each	0	4	0	2873.00	0.00	11492.00	11492.00
23	Supply only of additional fittings at overlap.	Each	6	0	3185.39	0	19112.34	0.00	19112.34
24	Erection of additional fittings at overlap.	Each	0	6	0	448.31	0.00	2689.86	2689.86
25	Supply only of Solid core cut-in insulator.	Each	20	0	9726.80	0	194536.00	0.00	194536.00
26	Erection of Solid core cut-in insulator.	Each	0	20	0	583.28	0.00	11665.60	11665.60
27	Supply only of a copper jumper.	Each	30	0	3185.39	0	95561.70	0.00	95561.70
28	Erection of a copper jumper.	Each	0	30	0	449.27	0.00	13478.10	13478.10
29	Supply only of structure bond.	Each	210	0	479.16	0	100623.60	0.00	100623.60
30	Erection of structure bond.	Each	0	210	0	472.41	0.00	99206.10	99206.10
31	Supply only of longitudinal / inter Rail bond.	Each	35	0	455.00	0	15925.00	0.00	15925.00
32	Erection of longitudinal / inter Rail bond.	Each	0	35	0	439.63	0.00	15387.05	15387.05
33	Supply only of Transverse & special bond.	Each	35	0	758.75	0	26556.25	0.00	26556.25
34	Erection of Transverse & special bond.	Each	0	35	0	469.52	0.00	16433.20	16433.20
35	Supply only of Caution Board/sigma board	Each	15	0	1191.63	0	17874.45	0.00	17874.45
36	Erection of Caution Board.	Each	0	15	0	177.39	0.00	2660.85	2660.85
37	Supply only of approved make retro-reflective Number Plate.	Each	220	0	887.94	0	195346.80	0.00	195346.80
38	Erection of	Each	0	220	0	155.22	0.00	34148.40	34148.40

	approved make retro-reflective Number Plate.								
39	Cutting / Trimming of various type tree branches only of diameter between 5 cm to 10 cm (approx.) above 5.5 Mtrs from ground level or infringing the HT/LT lines, such as babhool, neem, Gulmohor, Nilgiri, Pipal, Bayan etc.	Nos.	0	26	0	351.90	0.00	9149.40	9149.40
40	Supply only of Anticreep arrangement with 12.5 mm dia (19/2.5)	Mtr	600	0	70.38	0	42228.00	0.00	42228.00
41	Erection of Anticreep arrangement with 12.5 mm dia (19/2.5)	Nos.	0	10	0	2873.00	0.00	28730.00	28730.00
							28957546.55	2472723.39	31430269.94

OFFER SHEET						
Offer to be filled up by Tenderer(s) in below table						
S.N.	Scope of work	Estimated cost(Rs.)	Below/ Above/ At par	% quoted by bidder	% quoted by bidder in words	Total cost
Col.- 1	Col.-2	Col. -3	Col.-4	Col.-5	Col. -6	Col.-7
1	Design , Supply,Erection, testing & Commissioning of OHE for Sasaram RFO	31430269.94				

Quoting of rates

1. The above price is inclusive of GST.
2. Tenderer is not allowed to quote for individual section(s).
3. Tenderer should offer rate in above table in % below, above and at par in figures as well as in words.
4. Tenderer must sign the following certificate.

I/We offer and agree to execute the above work at rate uploaded online at www.ireps.gov.in through digital Signature.

Signature of tenderer with seal

End of Document
