ರೈಲು ಮೂಲಸೌಲಭ್ಯ ಅಭಿವೃದ್ಧಿ ಕಂಪನಿ (ಕರ್ನಾಟಕ) ನಿಯಮಿತ

रेल इन्फ्रास्ट्रक्चर डेवलपमेंट कंपनी (कर्नाटक) लिमिटेड

Rail Infrastructure Development Company (Karnataka) Limited

BID DOCUMENT

Project:

Heelalige – Hosur Section Doubling

"Design, Supply, Erection, Testing & Commissioning of 25 KV, AC, 50 Hz, Single Phase, Traction Over Head Equipment works for Railway Electrification works in Bangalore division of South Western Railway, in single Package"

Date :13.03.2021

RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED

"Samparka Soudha" , 1st Floor,
B.E.P Premises (Opp. Orion Mall),
Dr. Rajkumar Road,
Rajajinagar 1st Block,
Bangalore - 560 010
Tel +91-63648 90842,
Email: md@kride.in

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K RIDE

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B I D D I N G D O C U M E N T S

For Execution of

Railway Electrification of Heelalige – Hosur : Doubling Projects – (including station yards) of Bangalore Division (SINGLE PACKAGE) .

IFB No: K-RIDE/DL/ 13/2021 **Date: 13.03.2021**

Employer: K RIDE (**Rail Infrastructure Development Company (Karnataka) Limited)**

K RIDE (**Rail Infrastructure Development Company (Karnataka) Limited)**

"Samparka Soudha" ,
1st Floor, B.E.P Premises (Opp. Orion Mall),
Dr. Rajkumar Road,
Rajajinagar 1st Block,
Bangalore - 560 010
Tel +91-63648 90842,
Email: md@kride.in

NOTICE

FOR

INVITATION FOR BIDS

(IFB)

Rail Infrastructure Development Company (Karnataka) Limited

INVITATION FOR BIDS

Bid Notice No ***K-RIDE/DL/ 13/2021*** ***Date: 13.03.2021***

RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED (K RIDE), having its Corporate office having its Corporate office at **"**Samparka Soudha" , 1st Floor, B.E.P Premises (Opp. Orion Mall), Dr. Rajkumar Road, Rajajinagar 1st Block, Bangalore - 560 010, India which is a Joint Venture of Government of Karnataka and Ministry of Railways set up as a wholly owned Government Company under the provisions of Section 2(45) of Companies Act 2013, invites bids under single stage two packet system for the work of **Railway Electrification of Heelalige – Hosur : Doubling Projects – (including station yards) of Bangalore Division (single Package).**

***THE TWO CONTRACT* PACKAGES ARE AS UNDER**

Sl. No.	Contract Package	Estimated Cost of Project	Bid Security	Period of Completion
Package	Design, Supply, Erection, Testing & Commissioning of 25 KV, AC, 50 Hz, Single Phase, Traction Over Head Equipment for Railway Electrification of **Heelalige (km. 180) (Excluding)– Hosur(km.159) (Including) Section (25 Track Kilometers approximately)** of Bangalore division (single package)	Rs 8,72,94,401	**Bid Security Declaration form should be filled by the Bidders (Section 4)**	30 Months

Note : The Bid Security Declaration form should be filled by only by the non MSMEs.

1. Bidders are advised to note the eligibility and minimum qualifying criteria specified in the Instruction to Bidders and Section 3 " Evaluation and Qualification Criteria" of bid document.

2. Bids must be accompanied by a bid security declaration form as mentioned above in the bidding documents.

3. Bidding Documents can also be downloaded free of cost from K RIDE website **www.kride.in** from 13.03.2021 and the bids can be submitted on the downloaded document.

Please note that drawings, if any, referred in the bid document, but not uploaded with the bidding document, can be viewed in this office on any working day. The Tenderer can also have a copy of the same on payment of non-refundable cost of Rs. 11,350/- (Rupees Eleven Thousand Three Hundred and fifty only) for package by a crossed Demand Draft on any Scheduled bank payable at Bangalore drawn in favour of **Rail Infrastructure Development Company (Karnataka) Limited,** Bangalore.

It will be the responsibility of the bidder who is submitting the bid on downloaded bidding documents to check and see any Addendum/Corrigendum issued in this regard from the website from time to time and ensure submission of bid along with all Addendum/Corrigendum.

In case of any clarification the tenderer can visit the **Rail Infrastructure Development Company (Karnataka) limited Corporate Office Bangalore at "Samparka Soudha" , 1st Floor, B.E.P Premises (Opp. Orion Mall), Dr. Rajkumar Road, Rajajinagar 1st Block, Bangalore - 560 010**

4. **Purchase Preference:** Shall not apply to Central Public Sector Enterprises, as per extant rules in force.

5. **Special Provisions for Micro, Small & Medium Enterprises (MSMEs):** MSMEs registered with District Industries Centers/ Khadi and Village Industries Commission/ Khadi and Village Industries Board/Coir Board/ National Small Industries Corporation/ Directorate of Handicraft and Handloom/ 'Udyog Aadhaar' – The Online Portal of MSME/ Any other body specified by Ministry of MSME are exempted from the payment of Bid document fee and proposal security for this tender.

6. The provisions of revised 'Public Procurement (Preference to Make in India) Order 2017' issued by Department of Industrial Policy and Promotion under Ministry of Commerce and Industry vide letter no. P-45021/2/2017-PP (BE-II) dated 28.05.2018 shall be applicable to the bidding process and award of the contract shall be done accordingly. In this connection, the minimum local content shall be 50% and the margin of purchase preference shall be 20%. For award of contract, para 3.c. of the revised 'Public Procurement (Preference to Make in India) Order 2017' (Annexure I of IFB) shall be applicable in addition to the other provisions in the bidding documents in this regard.

7. **Date of Receipt and opening of Bids:** The completed Bids must be dropped in the nominated tender box or delivered to the address below not later than **15:00 hrs on 06/04/2021** and the same shall be opened at **15.30 hrs**. in the same day in the presence of Bidders who choose to be present. KRIDE will not be responsible for any delays in receiving the Bidding documents by the Bidder or receipt of Bids by KRIDE.

8. **Address for Communication:** Interested eligible Bidders may obtain further information from the following address:

General Manager (Electrical),
Rail Infrastructure Development Company (Karnataka) Limited,
Samparka Soudha, 1st floor, B.E.P Premises(Opposite Orion Mall)
Dr.Rajkumar Road, Rajaji Nagar 1st Block
Bangalore – 560010

Tel: +91-63648 90842,
E – Mail: md@kride.in

Annexure I

No. P-45021/2/2017-PP (BE-II)
Government of India
Ministry of Commerce and Industry
Department of Industrial Policy and Promotion
(Public Procurement Section)
****

Dated 28th May, 2018
Udyog Bhawan, New Delhi

To
All Central Ministries/Departments/CPSUs/All concerned

ORDER

Subject: Public Procurement (Preference to Make in India), Order 2017 – Revision; regarding.

Department of Industrial Policy and Promotion, in partial modification of Order No.P-45021/2/2017-B.E.-II dated 15.6.2017, hereby issues the revised 'Public Procurement (Preference to Make in India), Order 2017" with immediate effect:-

Whereas it is the policy of the Government of India to encourage 'Make in India' and promote manufacturing and production of goods and services in India with a view to enhancing income and employment, and

Whereas procurement by the Government is substantial in amount and can contribute towards this policy objective, and

Whereas local content can be increased through partnerships, cooperation with local companies, establishing production units in India or Joint Ventures (JV) with Indian suppliers, increasing the participation of local employees in services and training them,

Now therefore the following Order is issued :

1. This Order is issued pursuant to Rule 153 (iii) of the General Financial Rules 2017.
2. **Definitions**: For the purposes of this Order:

   'Local content' means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent.

   'Local supplier' means a supplier or service provider whose product or service offered for procurement meets the minimum local content as prescribed under this Order or by the competent Ministries / Departments in pursuance of this order.

   'L1' means the lowest tender or lowest bid or the lowest quotation received in a tender, bidding process or other procurement solicitation as adjudged in the evaluation process as per the tender or other procurement solicitation.

   'margin of purchase preference' means the maximum extent to which the price quoted by a local supplier may be above the L1 for the purpose of purchase preference.

.....Contd. p/2

'Nodal Ministry' means the Ministry or Department identified pursuant to this order in respect of a particular item of goods or services or works.

'Procuring entity' means a Ministry or department or attached or subordinate office of, or autonomous body controlled by, the Government of India and includes Government companies as defined in the Companies Act.

'Works' means all works as per Rule 130 of GFR- 2017, and will also include *'turnkey works'*.

3. **Requirement of Purchase Preference :** Subject to the provisions of this Order and to any specific instructions issued by the Nodal Ministry or in pursuance of this Order, purchase preference shall be given to local suppliers in all procurements undertaken by procuring entities in the manner specified hereunder"

a. "In procurement of goods, services or works in respect of which the Nodal Ministry has communicated that there is sufficient local capacity and local competition, and where the estimated value of procurement is Rs. 50 lakhs or less, only local suppliers shall be eligible. If the estimated value of procurement of such goods or services or works is more than Rs. 50 lakhs, the provisions of sub-paragraph b or c, as the case may be, shall apply";

b. "In the procurements of goods or works which are not covered by paragraph 3a and which are divisible in nature, the following procedure shall be followed";

   i. Among all qualified bids, the lowest bid will be termed as L1. If L1 is from a local supplier, the contract for full quantity will be awarded to L1.

   ii. If L1 bid is not from a local supplier, 50% of the order quantity shall be awarded to L1. Thereafter, the lowest bidder among the local suppliers, will be invited to match the L1 price for the remaining 50% quantity subject to the local supplier's quoted price falling within the margin of purchase preference, and contract for that quantity shall be awarded to such local supplier subject to matching the L1 price. In case such lowest eligible local supplier fails to match the L1 price or accepts less than the offered quantity, the next higher local supplier within the margin of purchase preference shall be invited to match the L1 price for remaining quantity and so on, and contract shall be awarded accordingly. In case some quantity is still left uncovered on local suppliers, then such balance quantity may also be ordered on the L1 bidder.

c. "In procurements of goods or works not covered by sub-paragraph 3a and which are not divisible, and in procurement of services where the bid is evaluated on price alone, the following procedure shall be followed":-

   i. Among all qualified bids, the lowest bid will be termed as L1. If L1 is from a local supplier, the contract will be awarded to L1.

.....Contd. p/3

ii. If L1 is not from a local supplier, the lowest bidder among the local suppliers, will be invited to match the L1 price subject to local supplier's quoted price falling within the margin of purchase preference, and the contract shall be awarded to such local supplier subject to matching the L1 price.

iii. In case such lowest eligible local supplier fails to match the L1 price, the local supplier with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on and contract shall be awarded accordingly. In case none of the local suppliers within the margin of purchase preference matches the L1 price, then the contract may be awarded to the L1 bidder.

4. **Exemption of small purchases**: Notwithstanding anything contained in paragraph 3, procurements where the estimated value to be procured is less than Rs. 5 lakhs shall be exempt from this Order. However, it shall be ensured by procuring entities that procurement is not split for the purpose of avoiding the provisions of this Order.
5. **Minimum local content**: The minimum local content shall ordinarily be 50%. The Nodal Ministry may prescribe a higher or lower percentage in respect of any particular item and may also prescribe the manner of calculation of local content.
6. **Margin of Purchase Preference**: The margin of purchase preference shall be 20% .
7. **Requirement for specification in advance**: The minimum local content, the margin of purchase preference and the procedure for preference to Make in India shall be specified in the notice inviting tenders or other form of procurement solicitation and shall not be varied during a particular procurement transaction.
8. **Government E-marketplace**: In respect of procurement through the Government E-marketplace (GeM) shall, as far as possible, specifically mark the items which meet the minimum local content while registering the item for display, and shall, wherever feasible, make provision for automated comparison with purchase preference and without purchase preference and for obtaining consent of the local supplier in those cases where purchase preference is to be exercised.
9. **Verification of local content**:
   a. The local supplier at the time of tender, bidding or solicitation shall be required to provide self-certification that the item offered meets the minimum local content and shall give details of the location(s) at which the local value addition is made.
   b. In cases of procurement for a value in excess of Rs. 10 crores, the local supplier shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.
   c. Decisions on complaints relating to implementation of this Order shall be taken by the competent authority which is empowered to look into procurement-related complaints relating to the procuring entity.

.....Contd. p/4

d. Nodal Ministries may constitute committees with internal and external experts for independent verification of self-declarations and auditor's/ accountant's certificates on random basis and in the case of complaints.

e. Nodal Ministries and procuring entities may prescribe fees for such complaints.

f. False declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.

g. A supplier who has been debarred by any procuring entity for violation of this Order shall not be eligible for preference under this Order for procurement by any other procuring entity for the duration of the debarment. The debarment for such other procuring entities shall take effect prospectively from the date on which it comes to the notice of other procurement entities, in the manner prescribed under paragraph 9h below.

h. The Department of Expenditure shall issue suitable instructions for the effective and smooth operation of this process, so that:

   i. The fact and duration of debarment for violation of this Order by any procuring entity are promptly brought to the notice of the Member-Convenor of the Standing Committee and the Department of Expenditure through the concerned Ministry /Department or in some other manner;

   ii. on a periodical basis such cases are consolidated and a centralized list or decentralized lists of such suppliers with the period of debarment is maintained and displayed on website(s);

   iii. in respect of procuring entities other than the one which has carried out the debarment, the debarment takes effect prospectively from the date of uploading on the website(s) in the such a manner that ongoing procurements are not disrupted.

10. **Specifications in Tenders and other procurement solicitations**:

a. Every procuring entity shall ensure that the eligibility conditions in respect of previous experience fixed in any tender or solicitation do not require proof of supply in other countries or proof of exports.

b. Procuring entities shall endeavour to see that eligibility conditions, including on matters like turnover, production capability and financial strength do not result in unreasonable exclusion of local suppliers who would otherwise be eligible, beyond what is essential for ensuring quality or creditworthiness of the supplier.

c. Procuring entities shall, within 2 months of the issue of this Order review all existing eligibility norms and conditions with reference to sub-paragraphs 'a' and 'b' above.

d. If a Nodal Ministry is satisfied that Indian suppliers of an item are not allowed to participate and/ or compete in procurement by any foreign government, it may, if it deems appropriate, restrict or exclude bidders from that country from eligibility for procurement of that item and/ or other items relating to that Nodal Ministry. A copy of every instruction or decision taken in this regard shall be sent to the Chairman of the Standing Committee.

.....Contd. p/5

e. For the purpose of sub-paragraph 10 d above, a supplier or bidder shall be considered to be from a country if (i) the entity is incorporated in that country, or ii) a majority of its shareholding or effective control of the entity is exercised from that country; or (iii) more that 50% of the value of the item being supplied has been added in that country. Indian suppliers shall mean those entities which meet any of these tests with respect to India."

11. **Assessment of supply base by Nodal Ministries**: The Nodal Ministry shall keep in view the domestic manufacturing / supply base and assess the available capacity and the extent of local competition while identifying items and prescribing minimum local content or the manner of its calculation, with a view to avoiding cost increase from the operation of this Order.

12. **Increase in minimum local content**: The Nodal Ministry may annually review the local content requirements with a view to increasing them, subject to availability of sufficient local competition with adequate quality.

13. **Manufacture under license/ technology collaboration agreements with phased indigenization**: While notifying the minimum local content, Nodal Ministries may make special provisions for exempting suppliers from meeting the stipulated local content if the product is being manufactured in India under a license from a foreign manufacturer who holds intellectual property rights and where there is a technology collaboration agreement / transfer of technology agreement for indigenous manufacture of a product developed abroad with clear phasing of increase in local content.

14. **Powers to grant exemption and to reduce minimum local content**: Ministries /Departments of Government of India and the Boards of Directors of Government companies or autonomous bodies may, by written order,

    a. reduce the minimum local content below the prescribed level;

    b. reduce the margin of purchase preference below 20% ;

    c. exempt any particular item or procuring or supplying entities or class or classes of items or procuring or supplying entities from the operation of this Order or any part of the Order.

    A copy of every such order shall be marked to the Member-Convenor of the Standing Committee constituted under this Order.

15. **Directions to Government companies**: In respect of Government companies and other procuring entities not governed by the General Financial Rules, the administrative Ministry or Department shall issue policy directions requiring compliance with this Order.

16. **Standing Committee**: A standing committee is hereby constituted with the following membership:

    Secretary, Department of Industrial Policy and Promotion—Chairman
    Secretary, Commerce—Member
    Secretary, Ministry of Electronics and Information Technology—Member
    Joint Secretary (Public Procurement), Department of Expenditure—Member
    Joint Secretary (DIPP)—Member-Convenor

.....Contd. p/6

The Secretary of the Department concerned with a particular item shall be a member in respect of issues relating to such item. The Chairman of the Committee may co-opt technical experts as relevant to any issue or class of issues under its consideration.

17. **Functions of the Standing Committee**: The Standing Committee shall meet as often as necessary but not less than once in six months. The Committee
    a. shall oversee the implementation of this order and issues arising therefrom, and make recommendations to Nodal Ministries and procuring entities.
    b. shall annually assess and periodically monitor compliance with this Order
    c. shall identify Nodal Ministries and the allocation of items among them for issue of notifications on minimum local content
    d. may require furnishing of details or returns regarding compliance with this Order and related matters
    e. may, during the annual review or otherwise, assess issues, if any, where it is felt that the manner of implementation of the order results in any restrictive practices, cartelization or increase in public expenditure and suggest remedial measures
    f. may examine cases covered by paragraph 13 above relating to manufacture under license/ technology transfer agreements with a view to satisfying itself that adequate mechanisms exist for enforcement of such agreements and for attaining the underlying objective of progressive indigenization
    g. may consider any other issue relating to this Order which may arise.
18. **Removal of difficulties**: Ministries /Departments and the Boards of Directors of Government companies may issue such clarifications and instructions as may be necessary for the removal of any difficulties arising in the implementation of this Order.
19. **Ministries having existing policies**: Where any Ministry or Department has its own policy for preference to local content approved by the Cabinet after 1st January 2015, such policies will prevail over the provisions of this Order. All other existing orders on preference to local content shall be reviewed by the Nodal Ministries and revised as needed to conform to this Order, within two months of the issue of this Order.
20. **Transitional provision**: This Order shall not apply to any tender or procurement for which notice inviting tender or other form of procurement solicitation has been issued before the issue of this Order.

(B. S. Nayak)
Under Secretary to Government of India
Ph. 23061257

PART I	Bidding Procedure

ರೈಲು ಮೂಲಸೌಲಭ್ಯ ಅಭಿವೃದ್ಧಿ ಕಂಪನಿ (ಕರ್ನಾಟಕ) ನಿಯಮಿತ
रेल इन्फ्रास्ट्रक्चर डेवलपमेंट कंपनी (कर्नाटक) लिमिटेड
Rail Infrastructure Development Company (Karnataka) Limited
(A Joint Venture of Govt. of Karnataka & Ministry of Railways)

"Samparka Soudha", 1st Floor, B.E.P Premises(Opp. Orion Mall), Dr. Rajkumar Road, Rajajinagar 1st Block, Bangalore – 560 010
Tele – 91-6364890842, web : www.kride.in

Technical Proposal

for

Heelalige – Hosur Section Doubling

Execution of

"Design, Supply, Erection, Testing & Commissioning of 25 KV, AC, 50 Hz, Single Phase, Traction Over Head Equipment works for Railway Electrification works in Bangalore division of South Western Railway, in single Package"

Section 1	Instructions to Bidders (ITB)

Section 1 Instructions to Bidders (ITB)

Reasons for Rejection of Bids

ITB Clause No Section 1	Reason for Summary Rejection
4.4	Non-submission of Affidavit
4.5	Non-submission of immediate information to the Employer in case the Bidder ceasesto fulfill eligibility in terms of ITB 4.3 & 4.4
14.2	Quoting more than a single percentage for any schedule
14.9	Non-submission of the Letter of Price Bid (LPB) and/or Summary sheet of BOQ
16.4	Non-submission of the Letter of Technical Bid (LTB)
	Bid not accompanied withbid security declaration form

Note :

The Bidders are advised to note the above reasons and take care of the same to avoid rejection of their bids.

Important Note:

With regard to the procedure of sealing and submission of bids, please refer to ITB 21

Table of Clauses

A. General

1. Scope of Bid

1.1 In connection with the Invitation for Bids indicated in the Bid Data Sheet (BDS), Rail Infrastructure Development Company (Karnataka) Limited (K RIDE), a Joint Venture of Govt. of Karnataka & Ministry of Railways, hereinafter referred to as the 'Employer', issues these Bidding Documents for the Procurement of Works as specified in Section 5: Works Requirements. The name, identification, number of contract(s) are provided in the BDS.

1.2 Throughout these Bidding Documents:

(a) the term "in writing" means communicated in written form and delivered against receipt;

(b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular; and

(c) "day" means calendar day.

(d) "Agent" means is a person employed to do any act for another, or to represent another in dealings with third person.

2. Source of Funds

2.1 The required funds have been sourced by K RIDE, unless otherwise specified in the BDS.

3. Corrupt Practices

3.1 The Employer requires that bidders, suppliers, and contractors observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the Employer:

(a) defines, for the purposes of this provision, the terms set forth below as follows:

(i) "corrupt practice" means offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the action of any party in the procurement process or the execution of a contract;

(ii) "fraudulent practice" means a misrepresentation or omission of facts in order to influence a procurement process or the execution of a contract;

(iii) "collusive practice" means a scheme or arrangement between two or more bidders, with or without the knowledge of the Employer, designed to influence the action of any party in a procurement process or the execution of a contract;

(iv) "coercive practice" means harming or threatening to harm, directly or indirectly, persons, or their property to influence their participation in a procurement process, or affect the execution of a contract;

(b) will reject a Bid for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract; and

(c) will sanction a party or its successor, including declaring ineligible, either indefinitely or for a stated period of time, to participate in Employer's activities, if it at any time determines that the firm has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for, or in executing a contract of the employer.

4. Eligible Bidders

4.1 A Bidder means any person or firm or company, including any member of a consortium or joint venture (that is an association of several person, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders started hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process. The bidder must ensure the following:

(a) In case of Single Entity:

(i) Submit Power of Attorney authorizing the signatory of the bid to commit the bidder.

(b) In case of Joint Venture/ Consortium:

(i) The number of partners in the JV/ Consortium shall not be more than that indicated in the Bid DataSheet (BDS);

(ii) Submit MOU, as per the form given in Section 4.

(iii) The JV/ Consortium shall nominate a Representative through Power of Attorney (Form given in Section 4) who shall have the authority to conduct all business for and on behalf of any and all the parties of the JV/ Consortium during the bidding process and, in the event the JV/ Consortium is awarded the Contract, during contractexecution.

(iv) Submit Power of Attorney by individual partners to lead partners as per the form given in Section 4.

(v) In case a Joint Venture/ Consortium is the successful bidder, the Joint Venture/ Consortium Agreement should be entered by the Joint Venture/ Consortium partners. The duly signed Joint Venture/ Consortium Agreement should be submitted along with the Performance Security to the employer after notification of the award of contract within 28 days.

(c) Foreign Firm(s)should be covered under the grant of general permission to establish project offices in India (as per RBI Master Circular No.7/2015-16 updated up to the deadline for submission of bids) on securing the subject project or have already opened project office in India. In case of award of contract to a foreign firm, such foreign firm has to submit proof of having opened project office in India before submitting any interim payment certificate.

(d) "Bidder from a country which share a land border with India" for the purpose of this Order means:-

1. An entity incorporated, established or registered in such a country; or
2. A subsidiary of an entity incorporated, established or registered in such a country; or

3. An entity substantially controlled through entities incorporated, established or registered in such a country; or
4. An entity whose beneficial owner is situated in such a country; or
5. An Indian (or other) agent of such an entity; or
6. A natural person who is a citizen of such a country; or

A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

(e) The beneficial owner for the purpose of above clause will be as under:

(i) In case of a company or Limited Liability Partnership, the beneficial owner is the nature person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.

Explanation-

a. “Controlling ownership interest” means ownership of or entitlement to more than twenty-five percent of share or capital or profits of the company;

b. “Control” shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue their shareholding or management rights or shareholders agreements or voting agreements;

(ii) In case of a partnership firm, the beneficial owner is the nature person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

(iii) In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profit of such association or body of individuals;

(iv) Where no natural person is identified under (i) or (ii) or (iii) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;

(v) In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

The Bidder shall submit a Certificate stating that they have read the above clause using the appropriate Performa given in Section 4 - Form C1 & C2.

4.2 Bidders having a conflict of interest shall be disqualified. The conflict of interest is detailed below

4.3 A Bidder shall not have conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to be in a conflict of interest with one or more parties in this bidding process, if, including but not limited to:

(a) they have controlling shareholders in common; or

(b) they receive or have received any direct or indirect subsidy from any of them; or

(c) they have the same legal representative for purposes of this bid; or

(d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the Bid of another Bidder, or

(e) any firm, either individually or in Joint Venture (JV)/ Consortium, submits more than one offer irrespective of whether the firm is quoting against this bid. The bids submitted by two different bidders, having any common participant in JV/ Consortium formation or any common partner in partnership firms, or an individual will be treated as having conflict of interest or

(f) a Bidder participated as a consultant in the preparation of the design or specifications of the contract that is the subject of the Bid; or

(g) a Bidder was affiliated for any period(s)during last two years before the date of issue of Invitation for Bids with a firm or entity that has been hired (or is proposed to be hired) by the Employer as Engineer for the contract.

4.3.1 Conflict of Interest:

K RIDE requires that Consultants provide professional, objective and impartial advice and at all times hold the Client's interests paramount, avoid conflicts with other assignments or their own corporate interests and act without any consideration for future work. Consultants shall not be recruited for any assignment that would be in conflict with their prior or current obligations to other clients, or that may place them in a position of not being able to carry out the assignment in the best interest of the Client. Without limitation on the generality of the foregoing, Consultants, and any of their associates shall be considered to have a conflict of interest and shall not be recruited under any of the circumstances set forth below:

i) If a consultant combines the function of consulting with those of contracting and/or supply of equipment and/or supply of services other than consulting; or

ii) If a consultant is associated with or affiliated to a contractor or manufacturer for this project; or

iii) If a Consultant is owned by a contractor or a manufacturing firm with departments or design offices offering services as Consultants. The Consultant should include relevant information on such relationships along with a statement in the Proposal cover letter to the effect that the Consultant will limit its role to that of a Consultant and disqualify itself and its associates from work, in any other capacity or any future project within the next five

years, that may emerge from this assignment (including bidding for any part of the future project). The Consultant selected to undertake this assignment will give an appropriate undertaking to such effect, while signing the agreement; or

iv) If there is a conflict among consulting assignments, the Consultant (including its personnel and sub-consultants) and any subsidiaries or entities controlled by such consultant shall not be recruited for the relevant assignment.

A Consultant cannot be recruited to carry out an assignment that, by its nature, will result in conflict with another assignment of such Consultant. For example, a Consultant engaged to prepare engineering design for an infrastructure project shall not be recruited to prepare an independent environmental assessment or to proof check the designs for the same project. Similarly, a Consultant assisting a client in privatization of public assets shall neither purchase nor advise purchasers of such assets or a Consultant hired to prepare Terms of Reference for an assignment shall not be recruited for the assignment in question.

There are generally 3 types of consultancy services in K RIDE i.e.

(i) Pre-Investment studies (PETS & Bankability Studies),

(ii) Detailed Engineering & Design (FLS & DDE) and

(iii) Project Implementation (PMC).

If a consultancy firm has carried out pre-investment studies mentioned in (i) above, there may be advantage for appointing the same firm to carry out the consultancy mentioned in (ii) and (iii) above. Hence there is no conflict of interest involved for a firm doing the consultancy for (i) and/or (ii) and/or (iii).

4.3.2. If a Consultant submits or participates in more than one Proposal, such a Consultant shall be disqualified.

4.3.3 Proposal Validity

4.3.3.1 The Data Sheet indicates how long the Consultants' Proposals must remain valid after the submission date.

4.3.3.2 The Employer will make its best effort to finalise the Contract within this period. In exceptional circumstances, the Employer may request Consultants to extend the validity period of their Proposals. The request and the responses shall be made in writing. In case Consultant extends validity of their proposal, the bid security as furnished in accordance with ITB Clause 19, shall also be extended upto the date mentioned in the letter of request for extension. Consultants have the right to refuse to extend the validity period of their Proposals.

4.3.3.3 ***Participation of Government Employees:***

The Government employees are not permitted to undertake any assignment without the approval of the Government as per extant Government rules. In addition to this, no close relatives of K RIDE staff should be proposed for participation in the assignment.

4.4 **The bidder shall be disqualified if**:

(a) The bidder or any of its constituents has been blacklisted/ banned business dealings for all Government Departments or by Ministry of Railways or by K RIDE at any time till finalization of bids, except in cases where such blacklisting/ banning has been withdrawn by Competent Authority or has ceased on the deadline for submission of the bids, for which satisfactory evidence is to be produced.

(b) Any previous contract of the bidder or any of its constituents had been terminated for contractor's failure or part terminated for its failure as a JV/ Consortium partner with forfeiture of its full Performance Security, by Rail Infrastructure Development Company (Karnataka) Ltd.(K RIDE) at any time starting from 3 years before the deadline for submission of bids and upto one day before the date of opening of price bids;

Provided, however, there is no stay order or declaration by any Court against such termination of the Contract by Rail Infrastructure Development Company (Karnataka) Ltd. or such termination of the Contract has not been revoked by Rail Infrastructure Development Company (Karnataka) Ltd or competent authority of K RIDE has not passed an order of non-applicability of disqualification of the bidder or any of its constituents despite such termination.

(c) The bidder or any of its constituents has been imposed delay damages of 5% or more of contract value by K RIDE due to delay in the implementation of any previous contract within the period of last 2 years before the deadline for submission of bids (Period of 2 years shall be reckoned from the date on which the total accrued amount of Delay Damages has reached 5% or more of the contract price) or such accrued delay damages has not been fully recovered before the deadline for submission of bids on account of contractor's request for deferring recovery to maintain cash flow and K RIDE has acceded to the same in the interest of the project or the work under the previous contract in question has not been completed before the deadline for submission of bids, unless imposition of such delay damages has been set aside by the Competent Authority.

(d) Thebidderoranyofitsconstituents:

(i) has sufferedbankruptcy/insolvencyor

(ii) has any ongoing case ofinsolvencybeforethe NCLT/anyCourtwhereInterimResolution Professional (IRP) has beenappointedoris at anylaterstageoftheinsolvencyprocess

Onthedeadlineofsubmissionofbidsorthereaftertillfinalizationofbids.

(e) The bidder is found ineligible by the Employer, in accordance with ITB-3.

(f) The bidder or its constituent(s) has been declared by K RIDE to be a poor performer and the period of poor performance is still in force on the deadline for submission of bids.

OR

The bidder or its constituent(s) has been declared by K RIDE to be a poor performer at any time after the deadline for submission of bids and upto one day before the date of opening of price bids.

(g) The bidder or any of its constituents has changed its name or created a new business entity as covered by the definition of "Allied Firm" under para 1102 (iii) of Chapter XI of Vigilance Manual of Indian Railways (available on website of Indian Railways), consequent to having been banned business dealings or suspended business dealings or having been declared poor performer.

The Bidder shall submit an affidavit stating that they are not liable to be disqualified as per this sub clause using the appropriate Performa given in Section 4. Non-submission of an affidavit by the bidder shall result in summary rejection of his bid.

4.5 Bidders shall immediately inform the Employer in case they cease to fulfill eligibility in terms of ITB 4.3 & 4.4. In case the bidder fails to inform the Employer or submits a false affidavit, his bid shall be summarily rejected and bid security shall be forfeited. The bidder shall also be liable for Banning of Business dealings for a period up to five years.

5 Eligible Materials, Equipment and Services

5.1 The materials, equipment and services to be supplied under the Contract shall be from the approved sources as specified in Section 5: Works Requirements.

B. Contents of Bidding Document

6 Sections of Bidding Document

6.1 The Bidding Document consists of Parts I, II and III, which includes all the Sections indicated below, and should be read in conjunction with any Addenda issued in accordance with ITB 8.

PART I:Bidding Procedures

Section 1: Instructions to Bidders (ITB)

Section 2: Bid Data Sheet (BDS)

Section 3: Evaluation and Qualification Criteria (EQC)

Section 4: Bidding Forms (BDF)

PART II: Work's Requirements

Section 5: Work's Requirements (WRQ)

PART III: Conditions of Contract and Contract Forms

Section 6: General Conditions of Contract (GCC)

Section 7: Special Conditions of Contract (SCC)–

Part A: Contract Data (CD)

Part B: Specific Provisions (SP)

Section 8: Contract Forms (COF) – Annexes to SCC

Section 9: Bill of Quantities (BOQ)

6.2 The Invitation for Bids (IFB) issued by the Employer is not part of the Bidding Document.

6.3 The Employer is not responsible for the completeness of the Bidding Document and their Addenda, if they were not obtained directly from the source stated by the Employer in the Invitation for Bids.

6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Document. Failure to furnish all information or documentation required by the Bidding Document may result in the rejection of the bid.

7 Clarification of Bidding Document, Site Visit, Pre-Bid Meeting

7.1A prospective Bidder requiring any clarification of the Bidding Document shall contact the Employer in writing at the Employer's address indicated in the BDS or raise his inquiries during the pre-bid meeting if provided for in accordance with ITB 7.4. The Employer will respond in writing to any request for clarification, provided that such request is received no later than ten (10) days prior to the deadline for submission of bids. The Employer shall forward copies of its response to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3, including a description of the inquiry but without identifying its source. Should the Employer deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so following the procedure under ITB 8 and ITB 22.2.

7.2 The Bidder is advised to visit and examine the Site of Works and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and entering into a contract for construction of the Works. The costs of visiting the site shall be at the Bidder's own expense.

7.3 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and

against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.

7.4 The Bidder's designated representative is invited to attend a pre-bid meeting, if provided for in the BDS, either in person or through video conferencing. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

7.5 The Bidder is requested, as far as possible, to submit any questions in writing, to reach the Employer not later than one week before the meeting.

7.6 Minutes of the pre-bid meeting, including the text of the questions raised, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3. Any modification to the Bidding Document that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an addendum pursuant to ITB 8 and not through the minutes of the pre-bid meeting.

7.7 Non-attendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.

8 Amendment of Bidding Document

8.1At any time prior to the deadline for submission of bids, the Employer may amend the Bidding Document by issuing addenda.

8.2 Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document from the Employer.

8.3 To give prospective Bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may, at its discretion, extend the deadline for the submission of bids, pursuant to ITB 22.2

C. Preparation of Bids

9 Cost of Bidding

9.1The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

10 Language of Bid

10.1The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Employer, shall be written in English. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of

the relevant passages in English in which case, for purposes of interpretation of the Bid, such translation shall govern.

11 Documents Comprising the Bid

11.1 The Bid shall comprise two envelopes submitted simultaneously, one containing the Technical Bid and the other the Price Bid, enclosed together in an outer single envelope.

11.2 Initially, only the Technical Bids are opened at the address, date and time specified in ITB Sub-Clause 25.1. The Price Bids remain sealed and are held in custody by the Employer. The Technical Bids are evaluated by the Employer. No amendments or changes to the Technical Bids are permitted. Bids with Technical Bids which do not conform to the specified requirements will be rejected as deficient Bids

11.3 Price Bids of technically compliant Bids are opened in public at a date and time advised by the Employer. The Price Bids are evaluated and the Contract is awarded to the Bidder whose Bid has been determined to be the lowest evaluated substantially responsive Bid

11.4 The Bid shall contain the following :

(a) Letter of Bid in accordance with ITB 16;

(b) Bid Security, in accordance with ITB Clause 19;

(c) alternative Bid, if permissible, in accordance with ITB Clause 13;

(d) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB Clause 20.2;

(e) documentary evidence in accordance with ITB Clause 17 establishing the Bidder's qualifications to perform the contract; and

(f) any other document required in the BDS.

11.5 The Price Bid shall contain the following :

(a) Letter of Price Bid and completed schedules as required including Bill of Quantities in accordance with ITB Clauses 12, and 14;

(b) alternative Price Bid corresponding to the alternative Technical Bid, if permissible, in accordance with ITB Clause 13; and

(c) any other document required in the BDS.

12. Bid Letters and Price Schedules

12.1 The Bidder shall submit proposal and Separate Price Proposal using the appropriate Submission Sheets furnished in Section 4: Bidding Forms. These Forms must be completed without any alterations to their format, and no

substitutes shall be accepted. All blank spaces shall be filled in with the information requested.

12.2 The Bidder shall submit, as part of the Price Bid, the Schedules, including the Bill of Quantities.

13. Alternative Bids

13.1 Unless otherwise indicated in the BDS, alternative bids shall not be considered.

13.2 When alternative periods for completion are explicitly invited, a statement to that effect will be included in the BDS, as will the method of evaluating different periods for completion.

14. Bid Prices and Discounts

14.1 The prices and discounts quoted by the Bidder in the Letter of Price Bid(LPB)and in the Bill of Quantities shall conform to the requirements specified below.

14.2 In the BOQ, quantity and unit rates and thereby the amount against each item have been indicated where rates as percentage are to be quoted. From this, price of such schedules have been worked out and indicated in the summary sheet in BOQ. The Bidder shall quote rates as single percentage above/below/at par in figures and words as per format for such schedule in the summary sheet**. If any bidder quotes more than one percentage for such schedules, its bid shall be summarily rejected.**

14.3 The price to be quoted in the Letter of Price Bid, in accordance with ITB 12.1, shall be the total price of the Bid, excluding any discounts offered.

14.4 The Bidder shall quote any unconditional discounts and the methodology for their application (the discounts, and the methodology of their application, should be quoted on prices quoted in the bid so that the discounts can be evaluated by simple arithmetic calculation during financial evaluation of the bids, to arrive at the net total price of the bid. If the net total price cannot be calculated after application of the methodology of the discount(s) quoted, the bid shall be considered as incomplete and will be rejected) in the Letter of Price Bid, in accordance with ITB 12.1. However, any conditional discount if any offered for award of contract has to be quoted separatelyand to be submitted in separate envelope(s).

14.5 Unless otherwise provided in the BDS and the Contract, the rates and prices quoted by the Bidder are subject to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of Contract. In such a case, the indices and weightings for the price adjustment formulae shall be as specified in the Tables of Adjustment Data included in Contract Data.

14.6 If so, indicated in ITB 1.1, bids are being invited for individual contracts or for any combination of contracts (packages). Bidders wishing to offer any price

reduction for the award of more than one Contract shall specify in their bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Price reductions or discounts shall be submitted in accordance with ITB 14.4, provided the bids for all contracts are submitted and opened at the same time.

14.7 All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause (including standard specifications), as of the date 28 days prior to the deadline for submission of bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.

14.8 Bidders should note that during the progress of the works, the foreign currency requirements of the outstanding balance of the Contract Price may be adjusted by agreement between the Employer and the Contractor in order to reflect any changes in foreign currency requirements for the Contract, in accordance with Sub-Clause 14.15 of the Conditions of Contract. Any such adjustment shall be effected by comparing the percentages quoted in the bid with the amounts already used in the Works and the Contractor's future needs for imported items.

14.9 Bidder should note that non-submission of the Letter of Price Bid (LPB) and/or Summary sheet of BOQ by the bidder shall result in summary rejection of his bid.

15. Currencies of Bid and Payment

15.1 The bidder shall quote the unit rates and the prices entirely in the Indian Rupees.

16. Documents Comprising the Bid

16.1 The Bidder shall furnish a commitment in Letter of Technical Bid (LTB) for deployment of equipment and personnel as stipulated in Section 5: Work's Requirement and Bill of Quantities (BOQ) Section 9.

16.2 Deleted.

16.3 The Bidder shall furnish a commitment in Letter of Technical Bid (LTB) for adhering to mobilisation as stipulated in Section 5: Work's Requirementand Bill of Quantities (BOQ) Section 9.

16.4 Bidder should note that non-submission of the Letter of Technical Bid (LTB) by the bidder shall result in summary rejection of his bid.

17. Documents Establishing the Qualifications of the Bidder

17.1 To establish its qualifications to perform the Contract in accordance with Section 3: Evaluation and Qualification Criteria, the Bidder shall submit as part of its technical Bid the information requested in the corresponding information sheets included in Section 4: Bidding Forms.

17.2 Domestic Bidders, individually or in joint ventures, applying for eligibility for domestic preference shall supply all information required to satisfy the criteria for eligibility.

18. Period of Validity of Bids

18.1 Bids shall remain valid for a period of 120 days after the bid submission deadline date prescribed by the employer. A bid valid for a shorter period shall be rejected by the employer as non-responsive.

18.2 In exceptional circumstances, the Employer may request Bidders to extend the period of validity of their bids. The request and the responses shall be made in writing. If a bid security is requested in accordance with ITB 19, it shall also be extended upto the date mentioned in the letter of request for extension. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request shall not be required or permitted to modify its bid.

19. Bid Security/Bid Security Declaration

19.1 Unless otherwise specified in the BDS, the Bidder shall furnish as part of its bid, a bid security in original form either a Bid-Security Declaration or a bid security as specified in the BDS. In the case of a bid security, the said amount and currency in Indian Rupees shall be as specified in the BDS.

19.2 If a Bid-Security Declaration is required pursuant to ITB 19.1, it shall use the form included in Section 4 (Bidding Forms). The Employer will declare a Bidder ineligible to be awarded a Contract for a specified period of time, if the Bid-Security Declaration is executed.

19.3 The bid security shall be, at the Bidder's option, in any of the following forms:

(a) A Cashiers or Banker's certified cheque orBank draft drawn on a Scheduled/Nationalized Bank in India in favour of "Rail Infrastructure Development Company (Karnataka) Ltd" payable at Bangalore;

or

(b) An unconditional bank guarantee using the Form given in Section 4: Bidding Forms. The bank guarantee shall be from a bank having minimum net worth of over INR 500 million from the specified banks as under:

(i) a Scheduled Bank in India, or

(ii) a Foreign Bank having their operations in India, or

(iii) a Foreign Bank which do not have operations in India is required to provide a counter-guarantee by State Bank of India,

The bid security shall be valid upto the date as mentioned in BDS, or upto the date mentioned in the letter of request for extension, if any under ITB 18.2.

19.4 Unless otherwise specified in the BDS, any bid not accompanied by an enforceable and compliant bid security or Bid-Security Declaration, as required in accordance with ITB 19.1, shall be summarily rejected by the Employer as non-responsive.

19.5 The bid security of the Bidders who have been determined to be unqualified for opening of their financial bids shall be returned within 3 working days after the opening of financial bids. The Bid Security of unsuccessful bidders shall be returned within 7 working days after issue of LOA to the successful Bidder.

19.6 The bid security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required performance security.

19.7 The bid security may be forfeited or the Bid Securing Declaration executed, if:

(a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letter of Bids, except as provided in ITB 18.2 or

(b) if a Bidder misrepresents or omits the facts in order to influence the procurement process;

(c) if the successful Bidder fails to:

(i) sign the Contract in accordance with ITB 40;

(ii) furnish a performance security in accordance with ITB 41;

(iii) accept the correction of its Bid Price pursuant to ITB 32.2; or

(iv) furnish a domestic preference security if so required.

(d) if the undertaking of the affidavit submitted by the bidder or its constituents in pursuance to ITB clause 4.4 or any of the declarations of Letter of Bid or Letter of Price Bid submitted by the bidder has been found to be false at any stage during the process of bid evaluation.

19.8 The Security of a JV/ Consortium shall be in the name of the JV/ Consortium that submits the bid. If the JV/ Consortium has not been legally constituted at the time of bidding, the Bid Security shall be in the names of all future partners as named in the letter of intent/ of JV/ Consortium mentioned in ITB Clause 4.1. If the Bid-Security Declaration is required as per ITB 19.2, the Bid-Securing Declaration of a Joint Venture shall be in the name of the Joint Venture that submits the Bid. If the Joint Venture has not been legally constituted at the time of bidding, the Bid-Security Declaration shall be in the names of all future partners as named in the letter of intent mentioned in ITB 4.1

20. Format and Signing of Bid

20.1 The Bidder shall prepare one original of the Technical Bid and one original of the Price Bid as described in ITB Clause 11 and clearly mark each “ORIGINAL - TECHNICAL BID” and “ORIGINAL - PRICE BID”. In addition, the Bidder shall submit copies of the Technical Bid and the Price Bid, in the number specified in the BDS and clearly mark them “COPY NO… - TECHNICAL BID” and “COPY NO…. - PRICE BID”. In the event of any discrepancy between the original and the copies, the original shall prevail.

20.2 The original and all copies of the bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This

authorization shall consist of a written confirmation as specified in the BDS. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the bid, except for un-amended printed literature, shall be signed or initialed by the person signing the bid.

20.3 Any interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the bid.

D. Submission and Opening of Bids

21. Sealing and Marking of Bids

21.1 The Bidder shall enclose the original Technical Proposal, original Price proposal and marked "ORIGINAL PROPOSAL". in a super scribing cover, which shall contain all forms of section 4 envisaged in the Bid and all other relevant data specified in the Bid document. The Section 9 (BOQ) and discounts if any should be enclosed in separate cover(s) marked as price proposal and should be submitted in separate envelopes and packed in the superscribing envelop.

All forms should be typed in Contractors' letter head in the exact format of the forms.

21.2 The inner and outer envelopes shall:

(a) bear the name and address of the Bidder;
(b) be addressed to the Employer in accordance with BDS 22.1;
(c) bear the specific identification of this bidding process indicated in the BDS 1.1; and
(d) The outer envelopes and the inner envelopes containing the Technical Bids shall bear a warning not to open before the time and date for the opening of Technical Bids, in accordance with ITB Sub-Clause 25.
(e) The inner envelopes containing the Price Bids shall bear a warning not to open until advised by the Employer in accordance with ITB Sub-Clause 25.

21.3 If the envelope is not sealed and marked as required, the Employer will assume no responsibility for the misplacement or premature opening of the bid.

21.4 In case Price Bid, in a bid is received unsealed or Price Proposal Submission Sheet is found available in any other envelope/cover then the bid shall be considered as non-responsive and will be returned to the bidder immediately.

21.5 Alternative Bids, if permissible in accordance with ITB Clause 13, shall be prepared, sealed, marked, and delivered in accordance with the provisions of ITB Clauses 22 and 23, with the inner envelopes marked in addition "ALTERNATIVE NO…." as appropriate.

21.6 No details about price proposal shall be disclosed directly or indirectly in the technical proposal failing which the bid shall be rejected

22. Deadline for Submission of Bids

22.1 Bids must be received by the Employer at the address and not later than the date and time indicated in the BDS.

22.2 The Employer may, at its discretion, extend the deadline for the submission of bids by amending the Bidding Document in accordance with ITB 8, in which case all rights and obligations of the Employer and Bidders subject to the previous deadline shall thereafter be subject to the deadline as extended.

23. Late Bids

23.1 The Employer shall not consider any bid that arrives after the deadline for submission of bids, in accordance with ITB 22. Any bid received by the Employer after the deadline for submission of bids shall be declared late, rejected, and returned unopened to the Bidder.

24. Withdrawal, Substitution, and Modification of Bids

24.1 A Bidder may withdraw, substitute, or modify its bid after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB 20.2, (except that withdrawal notices do not require copies). The corresponding withdrawal of substitution or modification of the bid must accompany the respective written notice. All notices must be:

(a) prepared and submitted in accordance with ITB 20 and ITB 21 (except that withdrawal notices do not require copies), and in addition, the respective envelopes shall be clearly marked “WITHDRAWL”, “SUBSTITUTION”, “MODIFICATION”,and

(b) received by the Employer prior to the deadline prescribed for submission of bids, in accordance with ITB 22.

24.2 Bids requested to be withdrawn in accordance with ITB 24.1 shall be returned unopened to the Bidders.

24.3 No bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Letter of Bid or any extension thereof.

25. Bid Opening

25.1 The Employer shall conduct the opening of Technical Bids in the presence of Bidders’ representatives who choose to attend, at the address, date and time specified in the BDS.

25.2 The Price Bids will remain unopened and will be held in custody of the Employer until the time of opening of the Price Bids. The date, time, and location of the opening of Price Bids will be advised in writing by the Employer to all the bidders who have been determined qualified in technical evaluation

25.3 First, envelopes marked "WITHDRAWAL" shall be opened, read out, and recorded, and the envelope containing the corresponding Bid shall not be opened, but returned to the Bidder. No Bid shall be withdrawn unless the corresponding Withdrawal Notice contains a valid authorization to request the withdrawal and is read out and recorded at bid opening.

25.4 Next, outer envelopes marked "SUBSTITUTION" shall be opened. The inner envelopes containing the Substitution Technical Bid and/or Substitution Price Bid shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the Substitution Technical Bid, if any, shall be opened, read out, and recorded. Substitution Price Bids will remain unopened in accordance with ITB Sub-Clause 25.2. No envelope shall be substituted unless the corresponding Substitution Notice contains a valid authorization to request the substitution and is read out and recorded at bid opening.

25.5 Next, outer envelopes marked "MODIFICATION" shall be opened. No Technical Bid and/or Price Bid shall be modified unless the corresponding Modification Notice contains a valid authorization to request the modification and is read out and recorded at the opening of Technical Bids. Only the Technical Bids, both Original as well as Modification, are to be opened, read out, and recorded at the opening. Price Bids, both Original as well as Modification, will remain unopened in accordance with ITB Sub-Clause 25.2.

25.6 All other envelopes holding the Bids shall be opened one at a time, and the following read out and recorded :

(a) the name of the Bidder;

(b) whether there is a modification or substitution;

(c) the presence of a Bid Security, if required; and

(d) any other details as the Employer may consider appropriate.

Only Technical Bids and alternative Technical Bids read out and recorded at bid opening shall be considered for evaluation. No Bid shall be rejected at the opening of Technical Bids except for late bids, in accordance with ITB Sub-Clause 23.1.

25.7 The Employer shall prepare a record of the opening of Bids that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, modification, or alternative offer; and the presence or absence of a Bid Security, if one was required. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.

25.8 At the end of the evaluation of the Technical Bids, the Employer will invite bidders who have submitted substantially responsive Technical proposals and who have been determined as being qualified for award of bid to attend the opening of the price Proposals. The date, time, and location of the opening of Price Bid will be advised in writing by the Employer. Bidders shall be given reasonable notice of the opening of Price Bid.

25.9 The Employer will notify Bidders in writing who have been rejected on the grounds of being substantially non-responsive to the requirements of the Bidding Document and who have been determined as being not qualified as a result of evaluation of technical proposal for the bid and their unopened Price Proposal for along with bid security declaration form shall be returned. Similarly, the conditional discount envelopes, with condition of award shall not be opened and returned unopened, if the bidder has been determined as being not qualified as a result of evaluation of technical proposal.

25.10 The Employer shall conduct the opening of Price Bid of all Bidders who submitted substantially responsive Technical Bid and who have been determined qualified as a result of technical evaluation, in the presence of Bidders' representatives who choose to attend at the address, date and time specified by the Employer. The Bidder's representatives who are present shall be requested to sign a register evidencing their attendance.

25.11 All envelopes containing Price Proposals of a particular package shall be opened one at a time and the following read out and recorded :

(a) the name of the Bidder

(b) whether there is a modification or substitution;

(c) the Bid Price(s), including any discounts and alternative offers; and

(d) any other details as the Employer may consider appropriate.

Only Price Bids, discounts, and alternative offers read out and recorded during the opening of Price Bid shall be considered for evaluation. No Bid shall be rejected at the opening of Price Bid.

25.12 The Employer shall prepare a record of the opening of Price Bid that shall include, as a minimum: the name of the Bidder, the Bid Price (per contract if applicable), any discounts, and alternative offers. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.

E. Evaluation and Comparison of Bids

26. Confidentiality

26.1 Information relating to the examination, evaluation & comparison, pre-qualification of Bids and recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process until information on Contract award is communicated to all Bidders.

26.2 Any attempt by a Bidder to influence the Employer in the examination, evaluation & comparison and pre-qualification of the Bids or Contract award decisions may result in the rejection of its Bid.

26.3 Notwithstanding ITB Sub-Clause 26.2, from the time of opening the Bid to the time of Contract award, if any Bidder wishes to contact the Employer on any matter related to the bidding process, it should do so in writing.

27. Clarification of Bids

27.1 To assist in the examination, evaluation & comparison and pre-qualification of the Bids, the Employer may, at its discretion, ask any Bidder for a clarification of its Bid. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change in the prices or substance of the Bid shall be sought, offered, or permitted, except to confirm the correction of errors discovered by the Employer in the evaluation of the Price Bids, in accordance with ITB Clause 32.

27.2 If a Bidder does not provide clarifications of its bid by the date and time set in the Employer's request for clarification, its bid may be rejected.

28. Deviations, Reservations, and Omissions

28.1 During the evaluation of bids, the following definitions apply:

(a) "Deviation" is a departure from the requirements specified in the Bidding Document;

(b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and

(c) "Omission" is the failure to submit part or all of the information or documentation required in the Bidding Document.

29. Determination of Responsiveness

29.1 The Employer's determination of a bid's responsiveness is to be based on the contents of the bid itself, as defined in ITB11.

29.2 A substantially responsive bid is one that meets the requirements of the Bidding Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that,

(a) if accepted, would:

(i) affect in any substantial way the scope, quality, or performance of the Works specified in the Contract; or

(ii) limit in any substantial way, inconsistent with the Bidding Document, the Employer's rights or the Bidder's obligations under the proposed Contract; or

(b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive bids.

29.3 The Employer shall examine the technical aspects of the bid submitted in accordance with ITB 16, Technical Bid, in particular, to confirm that all requirements of Section 5 (Works Requirements)have been met without any material deviation or reservation.

29.4 If a bid is not substantially responsive to the requirements of the Bidding Document, it shall be rejected by the Employer and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.

30. Nonconformities, Errors, and Omissions

30.1 Provided that a bid is substantially responsive, the Employer may waive any nonconformities in the bid that do not constitute a material deviation, reservation or omission.

30.2 Provided that a bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the price of the bid. Failure of the Bidder to comply with the request may result in the rejection of its bid.

31. Pre-Qualification of the Bidder

31.1 The Employer shall determine to its satisfaction during the evaluation of Bid whether Bidders are qualified to perform the Contract satisfactorily.

31.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB Clause 17, to clarifications in accordance with ITB Clause 27 and the qualification criteria indicated in Section 3: Evaluation and Qualification Criteria. Factors not included in Section 3: Evaluation and Qualification Criteria shall not be used in the evaluation of the Bidder's qualification.

31.3 An affirmative determination of technical bid shall be a prerequisite for the opening and evaluation of a Bidder's Price Bid. A negative determination shall result into the disqualification of the Bid, in which event the Employer shall return the unopened Price Proposal to the Bidder.

32. Correction of Arithmetical Errors and Omissions in Bid and Evaluation of Bid Price

32.1 Provided that the bid is substantially responsive, the Employer shall correct arithmetical errors and omissions in the bid and then arrive at the Evaluated Bid Price on the following basis:

(a) If there is a discrepancy between the price mentioned in the summary sheet of the BOQ and the price that is obtained by calculation i.e. by taking into account the percentage rate quoted above/below/at par for any bill/ schedule in the summary sheet of BOQ, then the quoted percentage rate shall prevail and the price shall be corrected accordingly;

(b) if the percentage rate has been quoted both in words and in figures and there is a discrepancy in such rates, then the rate in words shall prevail and shall be considered for evaluation of the price of the schedule/bill;

(c) If the percentage rate has been quoted either in words or in figures only, then the same shall be considered for evaluation of the price of the schedule/bill;

(d) If no percentage rate has been indicated for any particular schedule/bill in words, as well as in figures, irrespective of the fact whether the bidder has written or not written above/below/at par, in such cases, the rate shall be considered as at par and the price shall be calculated accordingly;

(e) If the bidder has indicated a percentage rate other than zero percent without mentioning whether it is above/below or has mentioned it as at par, in such cases the percentage rate shall be considered as at par and the price shall be calculated accordingly;

(f) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected.

(g) The rate for each item of each schedule/bill shall first be calculated after applying percentage rate and discount(s) to the BOQ rate for that item and the net rate shall be rounded off to 2 decimal places. The net rate so calculated shall then be used for working out the amount for each item of the schedule/bill. Thereafter, evaluated price of a schedule shall be calculated as the sum of amounts of all items of that schedule and sum of evaluated prices of all schedules/bills shall be the overall Evaluated Bid Price.

32.2 If the Bidder that has submitted the lowest evaluated bid does not accept the correction of errors and omissions as per above provisions, its bid shall be disqualified and its bid security shall be forfeited.

33. Conversion to Single Currency

33.1 For evaluation and comparison purposes the currencies of the bid shall be converted into Indian Rupees as stated in BDS.

34. Purchase Preference

34.1 Unless otherwise specified in the BDS the Purchase Preference shall not apply.

34.2 Unless otherwise specified in the BDS the Domestic Preference shall not apply.

35. Evaluation of Bids

35.1 The Employer shall evaluate Price Bids of each Bid for which the Technical Bids have been determined to be substantially responsive. The Employer shall use the criteria and methodologies listed in this Clause. No other evaluation criteria or methodologies shall be permitted.

35.2 To evaluate the Bid, the Employer shall consider the following:

(a) the bid price, excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities, but including Day Work items, where priced competitively;

(b) price adjustment for correction of arithmetic errors and omissions in the price bid in accordance with ITB 32.1;

(c) price adjustment due to discounts offered in accordance with ITB 14.4;

(d) Application of all the evaluation factors indicated in Section 3 (Evaluation and Qualification Criteria).

35.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation.

35.4 If this Bidding Document allows Bidders to quote separate prices for different contracts, and the award to a single Bidder of multiple contracts, the methodology to determine the lowest evaluated price of the contract combinations, including any discounts offered in the Letter of Price Bid , is specified in Section 3 (Evaluation and Qualification Criteria).

35.5 If the bid, which results in the lowest Evaluated Bid Price is substantially on lower side and/or seriously unbalanced in the opinion of the Employer as per criteria defined below, the Employer may require the bidder to submit additional performance security as under:-

a) If overall price quoted by the L1 bidder is below the engineer's estimated price by more than 10% and the difference between overall price quoted by the L1 and L2 is more than 5% of the estimated price, then the bid price of L1 bidder shall be treated as substantially on lower side and such bidder shall be bound to furnish additional performance security equal to the (0.9x engineer's estimated price – L1 price) or (0.95 x L2 price – L1 price)

whichever is lower, on this account. Example below demonstrates the method of calculation to arrive at additional performance security:

Suppose overall price quoted by the L1 bidder is 17% below the estimated price and the overall price quoted by L2 bidder is 8% below the estimated price. In this case the overall price quoted by the L1 bidder is lower by more than 10% of the estimated price and also the difference between overall price quoted by the L2 and L1 bidder is more than 5% of the

estimated price, hence the L1 bidder shall be required to furnish additional performance security for an amount equal to

{0.9 x engineer's estimated price – (1-17/100) x engineer's estimated price} = {0.07 x engineer's estimated price} = 7% of engineer's estimated price or {0.95 x (1-8/100) x engineer's estimated price – (1-17/100) x engineer's estimated price} = {0.044 x engineer's estimated price} = 4.4% of engineer's estimated price; whichever is lower.

As per the above L1 bidder shall be required to submit additional performance security of 4.4% of engineer's estimated price.

b) If for any bill/ schedule of quantities % age above or below quoted by the bidder on the estimated price is beyond 15% below the overall % age difference between the quoted contract price and the engineers estimated price, then the price for that particular schedule shall be treated as seriously unbalanced and bidder shall be bound to furnish additional performance security for such unbalanced price. Example below demonstrates the method of calculation to arrive at unbalanced price and additional performance security:

Suppose for the L1 bidder overall % age difference between quoted contract price and the engineers estimated price;

(Overall contract price – Overall estimated price) x 100 ÷ overall estimated price = + 4 %

Maximum % age below permitted over estimated price of any bill / schedule in this case = +4 – 15 = -11%

Suppose for the L1 bidder has quoted 20% below estimated price of schedule "A" then the pricing of the schedule A shall be treated as unbalanced and the bidder shall be required to furnish additional performance security for an amount equal to (20 – 11) % of the estimated price of schedule A.

36. Comparison of Bids

36.1 The Employer shall compare all substantially responsive bids to determine the lowest evaluated bid, in accordance with ITB 34 and 35.

37. Employer's Right to Accept Any Bid, and to Reject Any or All Bids

37.1 The Employer reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to Bidders. In case of annulment, all bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.

(F) Award of Contract

38. Award Criteria

38.1 The Employer shall award the Contract to the Bidder whose bid is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily and whose offer has been determined to be the lowest evaluated subject to ITB 38.2 below. In case of more than one bids are evaluated to be lowest, Contract shall be awarded to the bidder having higher average annual construction turnover (calculated as total certified payments received for contracts in progress or completed) in equivalent INR within the last three financial years.

38.2 The Employer has the right to review at any time prior to award of contract that the qualification criteria as specified in Section 3: Evaluation and Qualification Criteria are still being met by the Bidder whose offer has been determined to be the lowest evaluated Bid. A Bid shall be rejected if the qualification criteria as specified in Section 3: Evaluation and Qualification Criteria are no longer met by the Bidder whose offer has been determined to be the lowest evaluated Bid. In this event the Employer shall proceed to the next lowest evaluated Bid to make a similar reassessment of that Bidder's capabilities to perform satisfactorily.

39. Notification of Award

39.1 Prior to the expiration of the period of bid validity, the Employer shall notify the successful Bidder, in writing, that its bid has been accepted by the Competent Authority at K RIDE's Corporate Office at Bangalore. The notification letter (hereinafter and in the Conditions of Contract and Contract Forms called the "Letter of Acceptance") shall specify the sum that the Employer will pay the Contractor in consideration of the execution and completion of the Works (hereinafter and in the Conditions of Contract and Contract Forms called "the Contract Price") and the requirement for the Contractor to remedy any defects therein as prescribed by the Contract**.**

39.2 Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.

40. Signing of Contract

40.1 Promptly after notification, the Employer shall send the successful Bidder the Contract Agreement.

40.2 Within twenty-eight (28) days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer.

41. Performance Security

41.1 On receipt of notification of award from the Employer, the successful Bidder shall furnish the performance security in accordance with the conditions of contract, subject to ITB 35.5, using for that purpose the Performance Security Form

included in Section 8: Contract Forms, or another form acceptable to the Employer.

41.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or to sign the Contract Agreement shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security.

41.3 The above provision shall not apply to the furnishing of a Domestic Preference Security, if so required.

42. Jurisdiction of Courts

The bidding process shall be governed by and construed in accordance with the laws of India and the Courts as indicated in Bid Data Sheet shall have exclusive jurisdiction over all the disputes/issues arising under, pursuant to and/ or in connection with the bidding process.

43. Special Provisions for Micro, Small& Medium Enterprises (MSMEs): MSMEs registered with District Industries Centers/ Khadi and Village Industries Commission/ Khadi and Village Industries Board/Coir Board/ National Small Industries Corporation/ Directorate of Handicraft and Handloom/ 'Udyog Aadhaar' – The Online Portal of MSME/ Any other body specified by Ministry of MSME are exempted from the payment of RFP document fee and proposal security for this tender.

44. The provisions of revised 'Public Procurement (Preference to Make in India) Order 2017' issued by Department of Industrial Policy and Promotion under Ministry of Commerce and Industry vide letter no. P-45021/2/2017-PP (BE-II) dated 28.05.2018 shall be applicable to the bidding process and award of the contract shall be done accordingly. In this connection, the minimum local content shall be 50% and the margin of purchase preference shall be 20%. For award of contract, para 3.c. of the revised 'Public Procurement (Preference to Make in India) Order 2017' shall be applicable in addition to the other provisions in the bidding documents in this regard.

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Section 2	Bid Data Sheet (BDS)

Section 2	Bid Data Sheet (BDS)

This section consists of provisions that are specific to each procurement and supplement the information or requirements included in Section I – Instructions to Bidders.

I N D E X

A. Introduction

ITB 1.1	The number of the Invitation for Bids is***:*** ***K-RIDE/DL/ 13/2021*** ***Date: 13.03.2021***
ITB 1.1	The Employer is: K RIDE (**Rail Infrastructure Development Company (Karnataka) Limited), Bangalore**
ITB 1.1	The name of the work is: Railway Electrification of Heelalige – Hosur: Doubling Projects – (including station yards) in Bangalore Division (Single Package).
ITB 4.1(b)(i)	No. of partners : 2

B. Bidding Documentss

ITB 7.1	For clarification purposes only, the Employer's address is General Manager (Electrical), K RIDE (Rail Infrastructure Development Company (Karnataka) Limited) #8, 1st Floor, Samparka Soudha, Dr.Rajkumar Road, Opposite Orion Mall, Rajaji Nagar 1st Block, Bengaluru – 560010 Tel : +91-6364890842, E – Mail: md@kride.in
ITB 7.4	**A Pre-Bid meeting is schedule on the following date, time and venue:** No Pre bid Meeting Proposed.

C. Preparation of Bids

ITB 10.1	The language of the bid is: **English**
ITB 11.2	Alternative technical solutions **are not** permitted.
ITB 11.4 (f)	Checklist as per Form No. 2 given in Section 4: Bidding Forms
ITB 13.1	Alternative bids **are not** permitted.

ITB 13.2	Alternative times for completion **are not** permitted.
ITB 14.5	**The prices quoted by the Bidder shall be adjustable in accordance with the provisions in Sub Clause 13.8 of GCC, Section 7, Part B; Special Conditions of Contract (SCC).**
ITB 15.1	The unit rates and the prices shall be quoted by the bidder entirely in **Indian Rupees (INR)**
ITB 18.1	The bid validity period shall be 90 **(Ninety only)** days.
ITB 19.1	The Bidder should submit along with the bid, a bid security declaration form as mentioned in the notice for invitation of Bids.
ITB 19.2 to 19.7	Not applicable
ITB 20.1	In addition to the original of the bid, the number of copies is: NIL
ITB 20.2	The written confirmation of authorization to sign on behalf of the Bidder shall consist of: (a) In case of Companies, a POA from the Director of the Company who has been authorized by the Board of Directors through resolution to sign on behalf of the Company (b) In case of firms, Power of Attorney by the Proprietors. (c) In case of JV, POA by the JV partners/Consortium partners.

D. Submission and Opening of Bids

ITB 22.1	For bid submission purposes only, the Employer's address is: General Manager (Electrical)/K RIDE, K RIDE (Rail Infrastructure Development Company (Karnataka) Limited) #8, 1st Floor, Samparka Soudha, Dr.Rajkumar Road, Opposite Orion Mall, Rajaji Nagar 1st Block, Bengaluru – 560010 Tel - +91-63648 90842, E – Mail: md@kride.in **The deadline for bid submission is:** **Date: 06*.04.2021*** ***Time: 15:00 hrs.***
ITB 22.2	Electronic bid submission **is not** permitted.
ITB 25.1	The bid opening shall take place at: Rail Infrastructure Development Company (Karnataka) Limited *Floor/Room No.* #8, 1st Floor, Samparka Soudha *Street Address* Dr. Rajkumar Road, Opposite Orion Mall, Rajaji Nagar. *City* Bangalore *Pin Code* 560010 *Country* *Indian Republic* *Tel. No.* *+91-63648 90842* *Fax:* ----- *E – Mail* md@kride.in **Bid Opening**: Date: *06.04.2021* *Time: 15:30 hrs.*
ITB 25.2	Electronic bid opening procedure is **Not permitted.**

E. Evaluation and Comparison of Bids

ITB 35.5 (a) & (b)	Not Applicable (as per Ministry of Finance Office Memorandum dated 12th November 2020)

ITB 42	Bangalore

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Section 3	Evaluation & Qualification Criteria (EQC)

Section 3	Evaluation & Qualification Criteria (EQC)

I N D E X

1 Evaluation

In addition to the criteria listed in ITB 35.2 (a)-(d), the following criteria shall apply:

1.1. Adequacy of Bid

Evaluation of the Bidder's commitment to mobilize key equipment and personnel for the contract consistent with the requirements stipulated in Section 5: Works Requirements and Bill of Quantities (BOQ) Section 9 regarding work methods, scheduling, and material sourcing.

1.2. DELETED (Multiple contract/package)

1.3. Completion Time

Alternative Completion Time is not permitted.

1.4. Technical Alternatives

Technical alternatives are not permitted

1.5. Margin of Preference

1.5.1. Purchase Preference to Central Public Sector Enterprises (CPSEs)
Purchase Perference to CPSEs shall not apply.

1.5.2. Domestic Preference
Domestic Preference is not applicable.

2. Eligibility Criteria:

2.1Technical Eligibility Criteria:

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

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

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

or

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

- Similar work is defined as below :

Railway Electrification works - Installation, testing and charging of 25 KV OHE system on railway track.

(b) To evaluate the technical eligibility of tenderer, only components of work as stipulated in tender documents for evaluation of technical eligibility, shall be considered. The scope of work covered in other remaining components shall be either executed by tenderer himself if he has work experience as mentioned or through subcontractor approved by K RIDE or jointly i.e., partly himself and remaining through subcontractor, with prior approval of K RIDE in writing.

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

In case after award of contract or during execution of work it becomes necessary for contractor to change subcontractor, the same shall be done with prior approval of KRIDE.

Note for Item 2.1:

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

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

2.2. Financial Eligibility Criteria:

The tenderer must have received contractual payments in the previous three financial years and the current financial year upto the date of inviting of tender, at least 150% of the advertised value of the tender. The tenderers shall submit Certificates to this effect which may be an attested Certificate from the concerned department /client or Audited Balance Sheet duly certified by the Chartered Accountant / Certificate from Chartered Accountant duly supported by Audited Balance Sheet.

Note for 2.2: Client certificate from other than Govt Organization should be duly supported by Form 16 A / 26 AS generated through TRACES of Income Tax Department of India.

2.3. Bid Capacity: The tender/technical bid will be evaluated based on bid capacity formula detailed as below:

For tenders costing more than Rs 20 crore wherein eligibility criteria includes bid capacity also, the tenderer will be qualified only if its available bid capacity is equal to or more than the total bid value of the present tender. The available bid capacity shall be calculated as under:

Available Bid Capacity = [A x N x 2] – B

Where,

A = Maximum value of construction works executed and payment received in any one of the
previous three financial years or the current financial year (up to date of inviting tender), taking into account the completed as well as works in progress.

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

B = Value of existing commitments and balance amount of ongoing works with the tenderer to be completed in next ‘N’ years.

Note:

(a) The Tenderer(s) shall furnish the details of existing commitments and balance amount of ongoing works with tenderer as per the prescribed proforma of Railway for statement of all works in progress and also the works which are awarded to tenderer but yet not started upto the date of inviting of tender. In case of no works in hand, a ‘NIL’ statement should be furnished. This statement should be submitted duly verified by Chartered Accountant.

(b) In case of JV/Consortium, the tenderer(s) must furnish the details of existing commitments and balance amount of ongoing works with each member of JV/ Consortium as per the prescribed proforma of Railway for statement of all works in progress and also the works which are awarded to tenderer but yet not started up to the date of inviting of tender. In case of no works in hand, a ‘NIL’ statement should be furnished. This statement should be submitted duly verified by Chartered Accountant.

(c) Value of a completed work/work in progress/work awarded but yet not started for a Member in an earlier JV shall be reckoned only to the extent of the concerned member's share in that JV for the purpose of satisfying his/her compliance to the above mentioned bid capacity in the tender under consideration.

(d) The arithmetic sum of individual “bid capacity” of all the members shall be taken as JV’s/ Consortium’s “bid capacity”.

(e) In case, the tenderer/s failed to submit the above statement along with offer, their/his offer shall be considered as incomplete and will be rejected **summarily**.

(f) The available bid capacity of tenderer shall be assessed based on the details submitted by the tenderer. In case, the available bid capacity is lesser than estimated cost of work-put to tender, his offer shall not be considered even if he has been found eligible in other eligibility criteria/tender requirement.

(g) Special Provision ***for Micro,Small and Medium Enterprises (MSMEs):***

i) Applicants registered with the agencies (as mentioned in para iii) below) as micro or small or medium enterprise (MSME) are exempted from the payment of BID/bidding document fee.

ii) Applicants registered with the agencies (as mentioned in para iii) below) as micro or small or medium enterprise (MSME) will be exempted from deposit of Proposal/Bid Security.

iii) Applicants who are interested in availing themselves of above benefits will enclose with their proposal;

a) The proof of their being micro or small or medium enterprise (MSME) registered with any of the following agencies;

1. District Industries Centers
2. Khadi and Village Industries Commission
3. Khadi and Village Industries Board
4. Coir Board
5. National Small Industries Corporation
6. Directorate of Handicraft and Handloom
7. ‘Udyog Aadhaar’ – The Online Portal of MSME
8. Any other body specified by Ministry of MSME.

b) Supporting document(s) indicating the terminal validity date of registration which should be a date after the deadline for submission of proposals, failing which, their proposals shall not be liable for consideration of benefits detailed in para (i) & (ii) above.

c) In case of Joint Venture/Consortium, the aforesaid MSME benefits will not be applicable

(h) ***Preference to Make in India:***

The provisions of revised 'Public Procurement (Preference to Make in India) Order 2017' issued by Department of Industrial Policy and Promotion under Ministry of Commerce and Industry vide letter no. P-45021/2/2017-PP (BE-II) dated 28.05.2018 shall be applicable to the bidding process and award of the contract shall be done accordingly. In this connection, the minimum local content shall be 50 and the margin of purchase preference shall be 20%. For award of contract, para 3.c. of the revised 'Public Procurement (Preference to Make in India) Order 2017' shall be applicable in addition to the other provisions in the bidding documents in this regard.

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

2.5 Credentials if submitted in foreign currency shall be converted into Indian currency i.e., Indian Rupee as under:

The conversion rate of US Dollars into Rupees shall be the daily representative exchange rates published by the Reserve Bank of India for the relevant date. Where, relevant date shall be as on the last day of month previous to the one in which tender is invited. In case of any other currency, the same first be converted to US Dollars as on the last day of month previous to the one in which tender is invited, and the amount so derived in US Dollars shall be converted into Rupees at the aforesaid rate. The conversion rate of such currencies shall be the daily representative exchange rates published by the International Monetary Fund for the relevant date.

[Explanation for clause 2 including clause 2.1 to 2.5 - Eligibility Criteria:

1. In case a work is started prior to 07 (seven) years, ending last day of month previous to the one in which tender is invited, but completed in last 07 (seven) years, ending last day of month previous to the one in which tender is invited, the completed work shall be considered for fulfilment of credentials.

2. If a work is physically completed and completion certificate to this extent is issued by the concerned organization but final bill is pending, such work shall be considered for fulfilment of credentials.

3. If a part or a component of work is completed but the overall scope of contract is not

completed, this work shall not be considered for fulfilment of technical credentials even if the cost of part completed work/component is more than required for fulfilment of credentials.

4. **In case a work is considered similar in nature for fulfilment of technical credentials, the overall cost of that work including PVC amount if any shall be considered and no separate evaluation for each component of that work shall be made to decide eligibility.**

5. The value of final bill including PVC amount-if paid, or otherwise in case final bill is pending the contract cost in last approved variation statement plus PVC amount paid or cumulative amount paid up to last on-account bill including PVC amount and statutory deductions whichever is less, shall be considered as the completion cost of work.

6. In case of newly formed partnership firm, the credentials of individual partners from previous propriety firm(s) or dissolved previous partnership firm(s) or split previous partnership firm(s), shall be considered only to the extent of their share in previous entity on the date of dissolution / split and their share in newly formed partnership firm. For example, a partner A had 30% share in previous entity and his share in present partnership firm is 20%. In the present tender under consideration, the credentials of partner A will be considered to the extent of 0.3*0.2*value of the work done in the previous entity. For this purpose, the tenderer shall submit along with his bid all the relevant documents which include copy of previous partnership deed(s), dissolution deed(s) and proof of surrender of PAN No.(s) in case of dissolution of partnership firm(s) etc.

7. In case of existing partnership firm, if any one or more partners quit the partnership firm, the credentials of remaining partnership firm shall be re-worked out i.e., the quitting partner(s) shall take away his credentials to the extent of his share on the date of quitting the partnership firm (e.g. in a partnership firm of partners A, B & C having share 30%,30% & 40% respectively and credentials of Rs 10 crore; in case partner C quits the firm, the credentials of this partnership firm shall remain as Rs 6 crore). For this purpose, the tenderer shall submit along with his bid all the relevant documents which include copy of previous partnership deed(s), dissolution deed(s) and proof of surrender of PAN No.(s) in case of dissolution of partnership firm(s) etc.

8. In case of existing partnership firm if any other partner(s) joins the firm, the credentials of partnership firm shall get enhanced to the extent of credentials of newly added partner(s)on the same principles as mentioned in item 6 above. For this purpose, the tenderer shall submit along with his bid all the relevant documents which include copy of previous partnership deeds, dissolution/splitting deeds and proof of surrender of PAN No.(s) in case of dissolution of partnership firm etc.

9. Any partner in a partnership firm cannot use or claim his credentials in any other firm without leaving the partnership firm i.e., In a partnership firm of A&B partners, A or B partner cannot use credentials of partnership firm of A&B partners in any other partnership firm or propriety firm without leaving partnership firm of A&B partners.

10. In case a partner in a partnership firm is replaced due to succession as per succession law, the proportion of credentials of the previous partner will be passed on to the successor.

11. If the percentage share among partners of a partnership firm is changed, but the partners remain the same, the credentials of the firm before such modification in the share will continue to be considered for the firm as it is without any change in their value. Further, in case a partner of partnership firm retires without taking away any credentials from the firm, the credentials of partnership firm shall remain the same as it is without any change in their value.

12. In a partnership firm "AB" of A&B partners, in case A also works as propriety firm "P" or partner in some other partnership firm "AX", credentials of A in propriety firm "P" or in other partnership firm "AX" earned after the date of becoming a partner of the firm AB shall not be added in partnership firm AB.

13. In case a tenderer is LLP, the credentials of tenderer shall be worked out on above lines similar to a partnership firm.

14. In case company A is merged with company B, then company B would get the credentials of company A also.]

3. Table showing the eligibility criteria limits

Rs. In Crores

S.No	Description	Package
	Estimated Value of Work	8,72,94,401
	Minimum Value of qualifying criteria	
1	SW1 – 30%	2,61,88,320
	SW2 – 40%	3,49,17,760
	SW3 – 60%	5,23,76,641
2	F E. 150%	13,09,41,602
3	Bid Capacity	NA

Note:

1) Technical Eligibility Criteria: (Clause 2.1 of section 3)

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

SW1 : Three similar works as defined in clause 2,

or

SW2 : Two similar works as defined in clause 2,

or

SW3 : One similar work each as defined in clause 2.

2) Similar work is defined as below:

Railway Electrification works - Installation, testing and charging of 25 KV OHE system on railway track.

3) F.E : Financial Eligibility Criteria as defined in Clause 2.2 of section 3

4) II. **Staffing Schedule:** The firm will be required to submit an undertaking that contractor shall deploy the personnel as per KRIDE.'s advice from the Staffing schedule which will be decided by KRIDE.

III. Approach and Methodology: The firm will be required to submit an undertaking that the Approach and Methodology for the project will be decided by the contractor in consultation with consultant and Employer as per stipulations in the construction contract agreement(s) for which the contractor's services are contemplated. It will be ensured that the approach and methodology prepared is in compliance to requirements in section 5 of the Bid document.

IV. **Responsiveness:** Deleted

V. **The Contractor shall be disqualified if**:

(a) The contractor has been blacklisted/ banned for business dealings for Government Departments, or by Ministry of Railways or by KRIDE at any time till finalization of proposals, except in cases where such blacklisting/banning has been withdrawn by Competent Authority or has ceased on the deadline for submission of the proposals, for which satisfactory evidence is to be produced.

(b) Any previous contract of the contractor had been terminated for Contractor's failure by Rail infrastructure Development company (Karnataka) Limited (KRIDE)/ Railway Organization at any time starting from 2 years before the deadline for submission of proposals and upto one day before the date of opening of financial proposals;

i. Provided, however, there is no stay order or declaration by any Court against such termination of the Contract by the Rail Infrastructure Development Company (Karnataka) Ltd./ Railway Organization or such termination of the Contract has not been revoked by Rail Infrastructure Development Company (Karnataka) Ltd/ Railway Organization.

(c) The contractor or any of its constituents:

(i) has suffered bankruptcy/insolvency or

(ii) has any ongoing case of insolvency before the NCLT/any Court where Interim Resolution Professional (IRP) has been appointed or is at any later stage of the insolvency process On the deadline of submission of bids or thereafter till finalization of bids.

(d) The contractor is found ineligible by the Employee, In accordance with ITB3.

(e) The contractor has been declared by KRIDE to be a poor performer and the period of poor performance is still in force on the deadline for submission of proposals.

or

(a) The contractor has been declared by KRIDE to be a poor performer at any time after the deadline for submission of proposals and upto one day before the date of opening of financial proposals.

(f) The contractor has changed their name or created a new business entity as covered by the definition of “Allied Firm” under para 1102 (iii) of Chapter XI of Vigilance Manual of Indian Railways (available on website of Indian Railways), consequent to having been banned business dealings or suspended business dealings or having been declared a poor performer.

The Contractor shall submit an affidavit stating that they are not liable to be disqualified as per this sub clause using the appropriate Performa given in Section 4. Non-submission of an affidavit by the contractor shall result in summary rejection of his proposal.

VI. Contractor shall immediately inform the Employer in case they cease to fulfill eligibility in terms of of ITB 4.4. In case the contractor fails to inform the Employer or submits a false affidavit his proposal shall be summarily rejected and proposal security shall be forfeited. The contractor shall also be liable for Banning of Business dealings for a period up to five years.

VII. The Bid Documents floated for the execution of the works of this Project, related drawings, and KRIDE Standard Specifications for Materials and Works are available in the Office of the Employer at the address specified in

Data Sheet. The Contractor may examine these documents at any time during the working hours in this Office.

VIII. **Examination of BID Documents**: In preparing their Proposals, Contractor are expected to examine in detail the documents comprising the BID. Material deficiencies in providing the information requested in the BID documents may result in rejection of Proposal.

--00--00--00--

Section 4 Bidding Forms

Section 4 Bidding Forms

This Section contains the forms which are to be completed by the Bidder and submitted as part of his Bid .

Form : PS 1

Letter of Technical Bid

Date:

Invitation for Bid No.: .....

To: .....

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB);

(b) We offer to execute the Works in conformity with the Bidding Documents ;

(c) Our bid shall be valid for a period of 120 days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(d) If our bid is accepted, we commit to obtain a performance security in accordance with the Bidding Documents;

(e) If our bid is accepted, we commit to deploy key equipment and key personnel consistent with the requirements stipulated in Section 5 : Works Requirements.

(f) If our bid is accepted, we commit to submit work method statements for all major activities and get these approved from the engineer prior to commencing work on such activities. We also understand that the work shall be executed as per the approved method statements without any deviations;

(g) We, including any subcontractors or suppliers for any part of the contract, do not have any conflict of interest in accordance with ITB 4.3;

(h) We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process in accordance with ITB 4.3, other than alternative offers submitted in accordance with ITB 13;

(i) We declare that we are not liable to be disqualified in Accordance with ITB 4.4, and we are enclosing the affidavit for the same as per the Performa given in the bid document.

(j) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed; and

(k) We have not made any deviations from the requirement of the bidding document and we have also not made any tampering or changes in the bidding documents on which the bid is being submitted and if any tampering or changes are detected at any stage, we understand the bid will invite summary rejection and forfeiture of bid security/the contract will be liable to be terminated along with forfeiture of performance security, even if LOA has been issued.

(l) We understand that we will be considered to be participating for the bid for which we have submitted the bid security declaration form and we will be considered for award, subject to fulfilling the eligibility criteria as given in bidding document;

(m) If our bid is accepted, we opt to take payment into the bank account, nominated by us.

or

If our bid is accepted, we opt to take payment through Letter of Credit(LC) arrangement as per GCC clause 14.7.1 and we hereby affirm having read over and agreed to the terms and conditions of the LC option. We also understand that the option of taking payment through LC arrangement, shall be final and no change shall be permitted, thereafter, during execution of contract.

[Delete whichever is not applicable. In case the bidder fails to delete one of the two options above, the option of payment into the bank account, nominated by the contractor shall prevail]

(n) We declare that the submission of this bid confirms that no agent, middleman or any intermediary has been, or will be engaged to provide any services or any other item of work related to the award and performance of this contract. We further confirm and declare that no agency commission or any payment which may be construed as an agency commission has been, or will be, paid and that the bid price does not include any such amount. We acknowledge the right of the Employer, if he finds to the contrary, to declare our bid to be noncompliant and if the contract has been awarded to declare the contract null and void

(o) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

Name .....

In the capacity of .....

Signed .....

Duly authorized to sign the Bid for and on behalf of .....

Date .....

(SEAL AND SIGNATURE OF THE BIDDER)

Form: PS 2

Letter of Price Bid

(To be given on the Letter head of the Firm)

Date: .....

Invitation for Bid No.: .....

To:.....

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB) 8;

(b) We offer to execute the Work in conformity with the Bidding Documents;

(c) The total price of our Bid, excluding any discounts offered in item (d) below is Rs……(Words)…… …… ……

(d) The discounts offered and the methodology for their application (see note below) are ----------

(e) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed; and

(f) We have not made any deviations from the requirement of the bidding document and we have also not made any tampering or changes in the bidding documents on which the bid is being submitted and if any tampering or changes are detected at any stage, we understand the bid will invite summary rejection and forfeiture of bid security/the contract will be liable to be terminated along with forfeiture of performance security, even if LOA has been issued.

(g) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

Name .....

In the capacity of .....

Signed .....

.....

Duly authorized to sign the Bid for and on behalf of .....

Date .....

Seal ……..

NOTE:

The discounts and the methodology of their application, should be quoted on prices quoted in the bid so that the discounts can be evaluated by simple arithmetic calculation during financial evaluation of the bids, to arrive at the net total price of the bid. If the net total price cannot be calculated after application the methodology of the discount(s) quoted, the bid shall be considered as incomplete and will be rejected.

Form: PS 3

FORMAT FOR AFFIDAVIT TO BE SUBMITTED BY BIDDER ALONGWITH THE BID

*(To be executed in presence of Public Notary on non-judicial stamp paper of the appropriate value in accordance with relevant stamp Act. The stamp paper has to be in the name of the bidder)***

I **…….** ***(Name and designation)*******…….** appointed as the attorney/authorized signatory of the bidder (including its constituents), M/s. _____ (hereinafter called the bidder) for the purpose of the Bid for the work of _____ as per the bid No._____ of K RIDE, do hereby solemnly affirm and state on behalf of the bidder including its constituents as under:

*1. That the bidder or any of its constituents has not been Blacklisted/ banned for business dealings for all Government Departments or by Ministry of Railways or by K RIDE at any time and/or no such blacklisting is in force as on the deadline for submission of bids.

*2. That none of the previous contracts of the bidder or any of its constituents had been terminated/rescinded for Contractor's failure or part terminated for its failure as a JV/ Consortium partner with forfeiture of its full Performance Security, by Rail Infrastructure Development Company (Karnataka) Ltd. during the period of last 3 years before the deadline for submission of bids.

(Add Proviso of Clause 4.4(b) (ITB) suitably, if any Contract was so terminated).

*3. The bidder or any of its constituents has not been imposed liquidated damages of 5% or more of contract value by any Government Department or by Ministry of Railways or by K RIDE due to delay in the implementation of any previous contract (either in the capacity of a single entity or as constituent of any other JV/ Consortium) within the period of last 2 years before the deadline for submission of bid [*2 years shall be reckoned from the date on which imposed L.D. has exceeded 5% of the contract price]* and there are no such accrued delay damages which has not been fully recovered before the deadline for submission of bids on account of contractor's request for deferring recovery to maintain cash flow and K RIDE has acceded to the same in the interest of the project and the work under the previous contract in question has been completed before the deadline for submission of bid, unless imposition of such delay damages has been set aside by the Competent Authority.

4. That the Bidder or any of its constituents is neither Bankrupt/Insolvent nor is in the process of winding-up nor such a case is pending before any Court on the deadline of submission of the bid.

*5. That the name of the Bidder or any of its constituents is not on the list of "Poor Performer" of any Government Department or by Ministry of Railways or by K RIDE as on the deadline for submission of bid.

6. We declare that the bidder or any of its constituents have not either changed their name or created a new business entity as covered by the definition of "Allied Firm" under para 1102 (iii) of chapter XI of Vigilance manual of Indian Railways with latest amendments and corrections (available on website of Indian Railways), consequent to having been banned business dealings for specified period which is not over or suspended business dealings or having been declared as poor performer.

7.# We declare and certify that balance sheets for last three financial years including that for the latest concluded financial year are being submitted.

OR

We declare and certify that balance sheet for the latest concluded financial year has not been finalized till date and that is why we are furnishing financial data for last three financial years ignoring the latest concluded financial year.

*(# - Delete whichever is not applicable)***.

8. We declare and certify that we have not made any misleading or false representation in the forms, statements and attachments in proof of the qualification requirements.

9. We declare that the information and documents submitted along with the tender by us are correct and we are fully responsible for the correctness of the information and documents, submitted by us.

10. We understand that in case we cease to fulfill the requirements of qualifying and eligibility criteria at any time after opening of bids and till finalization of bids, it will be our bounden duty to inform the Employer of our changed status immediately and in case of our failure to do so, our bid shall be rejected and bid security shall be forfeited. In case such failure comes to the notice of Employer at any time after award of the contract, it will lead to termination of the contract and forfeiture of Bid or Performance Security. We shall also be liable for Banning of Business dealings upto a period of five years.

11. We understand that if the contents of the affidavit are found to be false at any stage during bid evaluation, it will lead to rejection of our bid and forfeiture of the bid security. Further, we ***[insert name of the bidder]**** _____ and all our constituents understand that we shall be liable for banning of business dealings upto a period of five years.

12. We also understand that if the contents of the affidavit are found to be false at any time after the award of the contract it will lead to termination of the contract, forfeiture of Bid or Performance Security and Banning of Business dealings of the Bidder and all its constituents for a period of upto five years.

(SEAL AND SIGNATURE OF THE BIDDER)

Verification:

Verified on _____ day of _____ at _____ that the contents of the above-mentioned affidavit are true and correct and nothing material has been concealed there from.

(SEAL AND SIGNATURE OF THE BIDDER)

**Modify the contents wherever necessary, in terms of sub-clause 4.4 ITB.*
*** The contents in Italics are only for guidance purpose and details as appropriate, are to be filled in suitably by Bidder.*
Attestation before Magistrate/Public Notary

(NOTE: This form need not be filled, this is only for information)

BDF/1

Bid Security

Bank Guarantee

(*On non-judicial stamp paper of the appropriate value in accordance with Stamp Act. The stamp paper should be in the name of the Executing Bank).*

From:

.....[***Insert Bank's Name, and Address of Issuing Branch or Office]***

To:
The General Manager, Electrical
Rail Infrastructure Development Company (Karnataka) Limited,
"Samparka Soudha", 1st Floor,
B.E.P Premises (Opp. Orion Mall),
Rajajinagar 1st Block,
Bangalore - 560 010.

Beneficiary: Rail Infrastructure Development Company (Karnataka) Limited (hereinafter called "the Employer"**)**

Date:.....

Bid Security No.: .....

We have been informed that . . . . . *[***Insert** ***name of the Bidder]***..... (hereinafter called "the Bidder") intends to submit to you its bid (hereinafter called "the Bid") for the execution of . . . . . [***name of contract***]. . . . . under Invitation for Bids No. . . . . .dated……. ("the IFB").

WHEREAS, the Bidder is required to furnish Bid Security for the sum of ***[Insert Value of Bid Security required]***, in the form of Bank Guarantee, according to your conditions of Bid.

AND

WHEREAS, ...***[Insert Name of the Bank]***, with its Branch .....***[Insert Address]*** having its Headquarters office at..... ***[Insert Address]***, hereinafter called the **Bank,** acting through .....***[Insert Name and Designation of the authorised persons of the Bank]***, have, at the request of the Bidder, agreed to give guarantee for Bid security as hereinafter contained, in favour of the Employer:

1. KNOW ALL MEN that by these present that I/We the undersigned ***[Insert name(s) of authorized representatives of the Bank],*** being fully authorized to sign and incur obligations for and on behalf of the Bank**,** confirm that the Bank, hereby, unconditionally and irrevocably guarantee to pay to the Employer full amount in the sum of ***[Insert Value of Bid Security required]*** as above stated.

2. The Bank undertakes to immediately pay on presentation of demand by the Employer any amount up to and including aforementioned full amount without any demur, reservation or recourse. Any such demand made by the Employer on the Bank shall be final, conclusive and binding, absolute and unequivocal on the Bank notwithstanding any disputes raised/ pending before any Court, Tribunal, Arbitration or any Authority or any threatened litigation by the Bidder or Bank.

3. The Bank shall pay the amount as demanded immediately on presentation of the demand by Employer without any reference to the Bidder and without the Employer being required to show grounds or give reasons for its demand of the amount so demanded.

4. The guarantee hereinbefore shall not be affected by any change in the constitution of the Bank or in the constitution of the Bidder.

5. The Bank agrees that no change, addition, modifications to the terms of the Bid document or to any documents, which have been or may be made between the Employer and the Bidder, will in any way absolve the Bank from the liability under this guarantee; and the Bank, hereby, waives any requirement for notice of any such change, addition or modification made by Employer at any time.

6. This guarantee will remain valid and effective from…….[insert date of issue] till ……..[insert date, which should be minimum 42 days beyond the expiry of bid validity date in the IFB]. Any demand in respect of this Guarantee should reach the Bank within the validity period of Bid Security.

7. The Bank Guarantee is unconditional and irrevocable.

8. The expressions Bank and Employer herein before used shall include their respective successors and assigns.

9. The Bank hereby undertakes not to revoke the guarantee during its currency, except with the previous consent in writing of the Employer. This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No.758.

10. The Guarantee shall be valid in addition to and without prejudice to any other security Guarantee (s) of Bidder in favour of the Employer. The Bank, under this Guarantee, shall be deemed as Principal Debtor of the Employer.

Date …… ……

Place…….. Bank's Seal and authorized signature(s)

[Name in Block letters]……....

[Designation]…….……

[P/Attorney] No.

Witness:

1 Signature
Name & Address & Seal

2 Signature Bank's Seal
Name & address & Seal [*P/Attorney]* No.

Note:

All italicized text is for guidance on how to prepare this bank guarantee and shall be deleted from the final document.

Form: JV/Consortium/1

PRO-FORMA LETTER OF PARTICIPATION FROM EACH PARTNER OF JOINT VENTURE (JV)/ CONSORTIUM

(On each Firm's Letter Head)

No…. Dated

From:
……..
……..

To,

The General Manager, Electrical
Rail Infrastructure Development Company (Karnataka) Limited,
"Samparka Soudha", 1st Floor,
B.E.P Premises (Opp. Orion Mall),
Rajajinagar 1st Block,
Bangalore - 560 010.

Gentlemen,

Re: …"*[Insert name of work*]……..".

Ref: Your notice for Invitation for Bid (IFB) ……..

1. We wish to confirm that our company/firm (delete as appropriate) has formed a Joint Venture/ Consortium by name of …… with for the purposes associated with IFB referred to above.

(Members who are not the lead partner of the JV/ Consortium *should add the following paragraph)*.*

2. 'The JV/ Consortium is led by … whom we hereby authorize to act on our behalf for the purposes of submission of Bid for ……. and authorize to incur liabilities and receive instructions for and on behalf of any and all the partners or constituents of the Joint Venture/ Consortium.'

OR

*(Member(s) being the lead member of the group should add the following paragraph)**

2. 'In this group we act as leader and, for the purposes of applying for qualification, represent the Joint Venture/ Consortium:'

3. In the event of our group being awarded the contract, we agree to be jointly with …… (names of other members of our JV/ Consortium)…… and severally liable to the (K RIDE) Rail Infrastructure Development Company (Karnataka) Limited, Bangalore, its successors and assigns for all obligations, duties and responsibilities arising from or imposed by the contract subsequently entered into between Rail Infrastructure Development Company (Karnataka) Limited, Bangalore and our JV/ Consortium.

4. *I/We, further agree that entire execution of the contract shall be carried out exclusively through the lead partner.

Yours faithfully,

(Signature)

(Name of Signatory)……..

(Capacity of Signatory)……

Seal

* Delete as applicable

Form: JV/Consortium/2

FORMAT FOR POWER OF ATTORNEY FOR AUTHORISED SIGNATORY OF JOINT VENTURE (JV)/ CONSORTIUM PARTNERS

POWER OF ATTORNEY*

(*To be executed on non-judicial stamp paper of the appropriate value in accordance with relevant stamp Act. The stamp paper to be in the name of the company who is issuing the power of Attorney*)

Know all men by these presents, we … do hereby constitute, appoint and authorize Mr/Ms. …. who is presently employed with us and holding the position of ……as our attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to our bid for the work of …Including signing and submission of all documents and providing information/responses to Rail Infrastructure Development Company (Karnataka) Limited, Bangalore, representing us in all matters, dealing with Rail Infrastructure Development Company (Karnataka) Limited, Bangalore, in all matters in connection with our bid for the said project.

We hereby agree to ratify all acts, deeds and things lawfully done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall and shall always be deemed to have been done by us.

Dated this the …… day of ……. 21..

(Signature of authorized Signatory)

……
(Signature and Name in Block letters of Signatory)
Seal of Company

Witness

Witness 1:	Witness 2:
Name:	Name:
Address:	Address:
Occupation:	Occupation:

**Notes:*

i) To be executed by all the partners individually, in case of a Joint Venture/ Consortium.

ii) The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required the same should be under common seal affixed in accordance with the required procedure.

Form: JV/Consortium/3

FORMAT FOR POWER OF ATTORNEY TO LEAD PARTNER OF JOINT VENTURE (JV)/ CONSORTIUM

(To be executed on non-judicial stamp paper of the appropriate value in accordance with relevant stamp Act. The stamp paper to be in the name of the company who is issuing the power of Attorney)

POWER OF ATTORNEY[1]

Whereas Rail Infrastructure Development Company (Karnataka) Limited Bangalore, has invited Bids for the work of

Whereas, the members of the Joint Venture/ Consortium comprising of M/s. …, M/s. ……, and M/s. …. are interested in submission of bid for the work of …*[Insert name of work*]… in accordance with the terms and conditions contained in the bidding documents.

Whereas, it is necessary for the members of the Joint Venture/ Consortium to designate one of them as the Lead Partner, with all necessary power and authority to do, for and on behalf of the Joint Venture/ Consortium, all acts, deeds and things as may be necessary in connection with the Joint Venture's/ Consortium's bid for the project, as may be necessary in connection the Joint Venture's/ Consortium's bid for the project.

NOW THIS POWER OF ATTORNEY WITNESSETH THAT:

We, M/s. ……, hereby designate M/s. ……, being one of the partners of the Joint Venture/ Consortium, as the lead partner of the Joint Venture/ Consortium, to do on behalf of the Joint Venture/ Consortium, all or any of the acts, deeds or things necessary or incidental to the Joint Venture's/ Consortium's bid for the contract, including submission of bid, participating in conferences, responding to queries, submission of information/ documents and generally to represent the Joint Venture/ Consortium in all its dealings with the Railway or any other Government Agency or any person, in connection with the contract for the said work until culmination of the process of bidding till the contract agreement is entered into with the Rail Infrastructure

Development Company (Karnataka) Limited, Bangalore and thereafter till the expiry of the contract agreement.

We hereby agree to ratify all acts, deeds and things lawfully done by lead member, our said attorney, pursuant to this power of attorney and that all acts deeds and things done by our aforesaid attorney shall and shall always be deemed to have been done by us/ Joint Venture/ Consortium.

Dated this the …… Day of …….. 20..

…….
(Signature)

……
(Name in Block letters of Executant)
Seal of Company

Witness 1:	Witness 2:
Name:	Name:
Address:	Address:
Occupation:	Occupation:

Notes:

1. To be executed by all the Partners of the JV/Consortium except the lead Partner.

2. The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required the same should be under common seal affixed in accordance with the required procedure.

Form: JV/ Consortium/4

DRAFT MEMORANDUM OF UNDERSTANDING (MOU[2])
For
JOINT VENTURE PARTICIPATION/ CONSORTIUM PARTICIPATION

BETWEEN

M/s …….. having its registered office at ……. (Hereinafter referred to as ……) acting as the Lead Partner of the first part,

And

M/s ……..having its registered office at ……. (Hereinafter referred to as `…….') in the capacity of a Joint Partner of the other part.

The expressions of …….. and …….. shall wherever the context admits, mean and include their respective legal representatives, successors-in-interest and assigns and shall collectively be referred to as " the Parties" and individually as " the Party"

WHEREAS:

Rail Infrastructure Development Company (Karnataka) Limited (K RIDE) [hereinafter referred to as "Employer"] has invited bids for … *"[Insert name of work]……..."*

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. The following documents shall be deemed to form and be read and construed as an integral part of this MOU.

   i) Notice for Bid, and

   ii) Bidding document

   iii) Any Addendum/Corrigendum issued by Rail Infrastructure Development Company (Karnataka) Limited

   iv) The bid submitted on our behalf jointly by the Lead Partner.

2. The `Parties' have studied the documents and have agreed to participate in submitting a`bid' jointly in the name of_____.

[2]*In case of existing joint venture, the certified copy of JV Agreement be furnished.*

3. M/s ……shall be the lead member of the JV/ Consortium for all intents and purpose and shall represent the Joint Venture/ Consortium in its dealing with the Employer. For the purpose of submission of bid proposals, the parties agree to nominate …….. as the leader duly authorized to sign and submit all documents and subsequent clarifications, if any, to the Employer. However M/s …… shall not submit any such proposals, clarifications or commitments before securing the written clearance of the other partner which shall be expeditiously given by M/s……..…….to M/s…….

4. The 'Parties' have resolved that the distribution of share and responsibilities between the JV/ Consortium partners **(Bidder shall ensure that the JV/ Consortium partner who is qualifying minimum 70% of the EQC requirement of the key activity under Clause 2.3.1, shall be assigned responsibility of execution of atleast 50% of the key activity, duly indicating the Schedule/Bill Number of BOQ for such responsibilities, failing which the bid may be rejected)** is as under:-

(a) Lead Partner Share ..... %

Responsibilities

(I) Key Activities and %age execution assigned

(i) *.....*

(II) BOQ Schedule/Bill No. and %age execution assigned

(i) *.....*

(ii) *.....*

(iii) *.....*

(b) Joint Venture/ Consortium Partner Share.....%

Responsibilities

(I) Key Activities and %age execution assigned

(i) *.....*

(II) BOQ Schedule/Bill No. and %age execution assigned

(i) *.....*

(ii) *.....*

(iii) *.....*

(c) Joint Venture/ Consortium Partner Share.....%

Responsibilities

(I) Key Activities and %age execution assigned

(i) *.....*

(II) BOQ Schedule/Bill No. and %age execution assigned

(i) *.....*

(ii) *.....*

(iii) *.....*

Note: In case any Bill or items of a Bill are proposed to be executed by more than one JV/Consortium partner then indicate the breakup of that Item/Bill no. for each JV/Consortium partner.

5. **JOINT AND SEVERAL RESPONSIBILITY**

The Parties undertake that they shall be jointly and severally liable to the Employer in the discharge of all the obligations and liabilities as per the contract with the Employer and for the performance of contract awarded to their JV/Consortium.

6. **ASSIGNMENT AND THIRD PARTIES**

The parties shall co-operate throughout the entire period of this MOU on the basis of exclusivity and neither of the Parties shall make arrangement or enter into agreement either directly or indirectly with any other party or group of parties on matters relating to the Project except with prior written consent of the other party and the Employer.

7. **EXECUTIVE AUTHORITY**

The said Joint Venture/Consortium through its authorized representative shall receive instructions, payments from the Employer. The management structure for the project shall be prepared by mutual consultations to enable completion of project to quality requirements within permitted cost and time.

8. **GUARANTEES AND BONDS**

The Bid Security of a JV/ Consortium *shall be in the name of the* JV/ Consortium *that submits the bid. If the* JV/ Consortium *has not been legally constituted at the time of bidding, the Bid Security shall be in the names of all future partners through which* JV/ Consortium *is intended to be formed.*

9. **BID SUBMISSION**

Each Party shall bear its own cost and expenses for preparation and submission of the bid and all costs until conclusion of a contract with the Employer for the

Project. Common expenses shall be shared by both the parties in the ratio of their actual participation.

10. **INDEMNITY**

Each party hereto agrees to indemnify the other party against its respective parts in case of breach/default of the respective party of the contract works of any liabilities sustained by the Joint Venture/ Consortium*.*

11. For the execution of the respective portions of works, the parties shall make their own arrangements to bring the required finance, plants and equipment, materials, manpower and other resources.

12. **DOCUMENTS & CONFIDENTIALITY**

Each Party shall maintain in confidence and not use for any purpose related to the Project all commercial and technical information received or generated in the course of preparation and submission of the bid.

13. **ARBITRATION**

Any dispute, controversy or claim arising out of or relating to this MOU shall be settled in the first instance amicably between the parties. If an amicable settlement cannot be reached as above, it will be settled by arbitration in accordance with the Indian Arbitration and Conciliation Act 1996 or any amendments thereof. The venue of the arbitration shall be Bangalore.

14. **VALIDITY**

This MOU shall remain in force till the occurrence of the earliest to occur of the following, unless by mutual consent, the Parties agree in writing to extend the validity for a further period.

a. The bid submitted by the Joint Venture/ Consortium is declared unsuccessful, or

b. Cancellation/ shelving of the Project by the Employer for any reasons prior to award of work

c. Execution of detailed JV/ Consortium agreement by the parties, setting out detailed terms after award of work by the Employer.

15. This MOU is drawn in ….. number of copies with equal legal strength and status. One copy is held by M/s …… and the other by M/s. .....,M/s ……& M/s….. and a copy submitted with the bid.

16. This MOU shall be construed under the laws of India.

17. **NOTICES BETWEEN JV/ Consortium PARTNERS**

Notices shall be given in writing by fax confirmed by registered mail or commercial courier to the following fax numbers and addresses:

Lead Partner.	Other Partner
……..	……
…….	……
(Name & Address)	(Name & Address)

In witness whereof the parties have executed this MOU the day, month and year first before written.

M/s……..	M/s…….
…….	……..
(Seal)	(Seal)

Witness

1…….. (Name & Address)

2…….. (Name & Address)

*****

Form: JV/Consortium/5

DRAFT FORMAT OF JOINT VENTURE/CONSORTIUM AGREEMENT

M/s …….. having its registered office at …… (hereinafter referred to as ……) acting as the Lead Partner of the first part,

and

M/s ……..having its registered office at ……. (hereinafter referred to as …….) in the capacity of a Joint Partner of the other part.

The expressions of …….. and …….. shall wherever the context admits, mean and include their respective legal representatives, successors-in-interest and assigns and shall collectively be referred to as " the Parties" and individually as " the Party"

WHEREAS:

Rail Infrastructure Development Company (Karnataka) Limited (K RIDE) [hereinafter referred to as "Employer"] has invited bids for … *"[Insert name of work]*……..." Vide LOA No……awarded contract.

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. The following documents shall be deemed to form and be read and construed as an integral part of this AGREEMENT.

   i) Notice for Bid, and

   ii) Bidding document

   iii) Any Addendum/Corrigendum issued by Rail Infrastructure Development Company (Karnataka) Limited

   iv) The bid submitted on our behalf jointly by the Lead Partner.

   v) Letter of Acceptance issued by Rail Infrastructure Development Company (Karnataka) Ltd.

2. The `Parties' have studied the documents and LOA issued to enter into Joint Venture/ Consortium as under and have agreed to participate.

3. M/s ……shall be the lead member of the JV/ Consortium for all intents and purpose and shall represent the Joint Venture/ Consortium in its dealing with the Employer. For the purpose of execution, the parties agree to nominate …….. as the leader duly authorized to sign and submit all documents and enter into correspondence with the Employer.

4. The 'Parties' have resolved that the distribution of share and responsibilities between the JV/Consortium partners **(Bidder shall ensure that the JV/Consortium partner who is qualifying minimum 70% of the EQC requirement of the key activity under Clause 2.3.1 of this section, shall be assigned responsibility of execution of atleast 50% of the key activity, duly indicating the Schedule/Bill Number of BOQ for such responsibilities, failing which the bid may be rejected)** is as under:-

(a) Lead Partner Share ..... %

Responsibilities

(I) Key Activities and %age execution assigned

(i) .....

(II) BOQ Schedule/Bill No. and %age execution assigned

(i) *.....*

(ii) *.....*

(iii) *.....*

(b) Joint Venture// Consortium Partner Share.....%

Responsibilities

(I) Key Activities and %age execution assigned

(i) .....

(II) BOQ Schedule/Bill No. and %age execution assigned

(i) *.....*

(ii) *.....*

(iii)*.....*

(c) Joint Venture// Consortium Partner Share.....%

Responsibilities

(I) Key Activities and %age execution assigned

(i) *.....*

(II) BOQ Schedule/Bill No. and %age execution assigned

(i) *.....*

(ii) .....

(iii).....

Note: In case any Bill or items of a Bill are proposed to be executed by more than one JV/ Consortium partner then indicate the breakup of that Item/Bill no. for each JV/ Consortium partner.

5. **JOINT AND SEVERAL RESPONSIBILITIES**

The Parties undertake that they shall be jointly and severally liable to the Employer in the discharge of all the obligations and liabilities as per the contract with the Employer and for the performance of contract awarded to their JV/Consortium.

6. **ASSIGNMENT AND THIRD PARTIES**

The parties shall co-operate throughout the entire period of this AGREEMENT on the basis of exclusivity and neither of the Parties shall make arrangement or enter into agreement either directly or indirectly with any other party or group of parties on matters relating to the Project except with prior written consent of the other party and the Employer.

7. **EXECUTIVE AUTHORITY**

The said Joint Venture/ Consortium through its authorized representative shall receive instructions, payments from the Employer. The management structure for the project shall be prepared by mutual consultations to enable completion of project to quality requirements within permitted cost and time.

8. **GUARANTEES AND BONDS**

Performance Security and other Securities of a JV/ Consortium shall be in the name of the JV/ Consortium that submits the bid.

9. **BID SUBMISSION**

Each Party shall bear its own cost and expenses for preparation and submission of the bid and all costs until conclusion of a contract with the Employer for the Project. Common expenses shall be shared by both the parties in the ratio of their actual participation.

10. **INDEMNITY**

Each party hereto agrees to indemnify the other party against its respective parts in case of breach/default of the respective party of the contract works of any liabilities sustained by the Joint Venture/ Consortium.

11. For the execution of the respective portions of works, the parties shall make their own arrangements to bring the required finance, plants and equipment, materials, manpower and other resources.

12. **DOCUMENTS & CONFIDENTIALITY**

Each Party shall maintain in confidence and not use for any purpose related to the Project all commercial and technical information received or generated in the course of preparation and submission of the bid.

13. **ARBITRATION**

Any dispute, controversy or claim arising out of or relating to this agreement shall be settled in the first instance amicably between the parties. If an amicable settlement cannot be reached as above, it will be settled by arbitration in accordance with the Indian Arbitration and Conciliation Act 1996 or any amendments thereof. The venue of the arbitration shall be Bangalore.

14. **VALIDITY**

This Agreement shall remain in force till the defect liability period is over and Securities are released.

15. This AGREEMENT is drawn in ….. number of copies with equal legal strength and status. One copy is held by M/s …… and the other by M/s. & …….M/s …….. and a copy submitted with the Bid.

16. This AGREEMENT shall be construed under the laws of India.

17. **NOTICES BETWEEN JV/ CONSORTIUM PARTNERS**

Notices shall be given in writing by fax confirmed by registered mail or commercial courier to the following fax numbers and addresses:

Lead Partner.	Other Partner
……	……
…….	……
(Name & Address)	(Name & Address)

IN WITNESS WHEREOF THE PARTIES, have executed this AGREEMENT the day, month and year first before written.

M/s……..	M/s…….
…….	……..
(Seal)	(Seal)

Witness

1……..(Name & Address)

2…….. (Name & Address)

*****

Bidders Qualification

To establish its qualifications to perform the contract in accordance with Section 3 (Evaluation and Qualification Criteria) the Bidder shall provide the information requested in the corresponding Information Sheets included hereunder.

Form ELI - 1: Bidder's Information Sheet

Bidder's Information	
Bidder's legal name	
Bidder's country of constitution	
Bidder's year of constitution	
Bidder's legal address in country of constitution	
Bidder's authorized representative (name, address, telephone numbers, fax numbers, e-mail address)	

The bidder shall attach copies of the following original documents with the form:

1. In case of single entity, articles of incorporation or constitution of the legal entity named above, in accordance with ITB 4.1 and 4.2.
2. Authorization to represent the firm or JV/ Consortium named in above, in accordance with ITB 20.2.
3. In case of JV/ Consortium, MOU to form JV/ Consortium or JV/ Consortium agreement, in accordance with ITB 4.1.

_____

SEAL AND SIGNATURE

Form ELI - 2: JV/ Consortium Information Sheet

Each member of a JV/ Consortium must fill in this form separately

JV / Consortium Specialist Subcontractor Information	
Bidder's legal name	
JV/ Consortium Partner's or Subcontractor's legal name	
JV/ Consortium Partner's or Subcontractor's country of constitution	
JV/ Consortium Partner's or Subcontractor's year of constitution	
JV/ Consortium Partner's or Subcontractor's legal address in country of constitution	
JV/ Consortium Partner's or Subcontractor's authorized representative information (name, address, telephone numbers, fax numbers, e-mail address)	

The bidder shall attach copies of the following original documents with the form:

1. Articles of incorporation or constitution of the legal entity named above, in accordance with ITB 4.1 and 4.2.
2. Authorization to represent the firm named above, in accordance with ITB 20.2.

_____

SEAL AND SIGNATURE

Form FIN-1: Financial Situation

(Each Bidder or each member of a JV/Consortium must fill in this form separately)

NAME OF BIDDER/JV/CONSORTIUM PARTNER:

	Financial Data for Last 5 Years [Indian National Rupees]				
	Year 1:	Year 2:	Year 3:	Year 4:	Year 5:
1. Total Assets					
2. Current Assets					
3. Total Liabilities					
4. Current Liabilities					
5. Net Worth [= 1 – 3]					
6. Working Capital [= 2 - 4]					
7. Profit Before Tax (PBT)					

_____

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 CA/Auditor)

Name of CA/Auditor:_____

Registration No: _____

_____

(Seal)

1. The bidder shall attach copies of the following original documents with the form:

Copies of the audited balance sheets, including all related notes, and income statements for the last five years, as indicated above, complying with the following conditions.

- All such documents reflect the financial situation of the Bidder or partner to a JV/ Consortium, and not sister or parent companies.
- Historic financial statements must be audited by a certified accountant.
- Historic financial statements must be complete, including all notes to the financial statements.
- Historic financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).

2. Contents of this form should be certified by a Chartered Accountant/Auditor.

3. In the event that the audited accounts for the latest concluded Financial Year are not available, the Bidder shall furnish information pertaining to the last five financial years after ignoring the latest concluded financial year. In case, the bidder submits audited financial information for the last six or more years, only the figures for the latest five years shall be considered for evaluation.

Form FIN-2: Annual Construction Turnover for the last 5 years

Each Bidder or each member of a JV/ Consortium must fill in this form separately:

NAME OF BIDDER/JV/Consortium PARTNER:

Annual Turnover Data for the Last 5Years (Construction only)			
Year	**Amount Currency**	**Exchange Rate**	**Indian National Rupees Equivalent**
Average Annual Construction Turnover for last 5 years			

1. The information supplied shall be substantiated by data in the audited balance sheets and profit and loss accounts for the relevant years and submitted as attachments to form Fin-1 in respect of the bidder or all partners constituting the bidder.

2. Contents of this form should be certified by a Chartered Accountant/Auditor.

3. In the event that the audited accounts for the latest Financial Year are not available, the Bidder shall furnish information pertaining to last three financial years after ignoring the latest financial year. In case the bidder submits audited financial information for the last four or more years, only the figures for the latest three years shall be considered for evaluation.

_____

SEAL AND SIGNATURE

Form FIN-3: Current Contract Commitments / Works in Progress

Bidders and each partner to a JV/Consortium should provide information on their current commitments on all contract that have been awarded, or which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

Contract Commitments

SN	Des-crip-tion of work	Contrac t No. & date	Name & address of Employer, Tel./Fax/ Email	Value of Con-tract in INR	Stipulated Period of completion	Value of Balan ce work	Anti-cipa-ted date of Com ple-tion
1							
2							
Total							

Note: Enclose Certificate(s) from Engineer(s) Incharge (not below the rank of Executive Engineer) for Value of outstanding work. In case it is not feasible to furnish certificate from all the units the bidder should record the following certificate on Fin 3:

"Certified that current commitments on all the contracts that have been awarded or for which a letter of intent or acceptance has been received or for the works in progress or the works approaching completion, value of outstanding work has been indicated in the above table correctly. It is further certified that if later on the employer discovers that information provided in the table is incorrect then the employer will treat our bid invalid and it will be liable for rejection"

SEAL AND SIGNATURE

Form EXP-2(a): Specific Construction Experience

Fill up one form per contract

Contract of Similar Size and Nature			
Contract No.		**Contract Identification**	
Award Date		**Completion Date**	
Role in Contract	❑ **Contractor** ❑		❑ **Subcontractor**
Total Contract Amount	**INR**		
If partner in a JV/ Consortium or subcontractor, specify participation in total contract amount	**Percent of Total:**	**Amount: INR**	
Employer's Name, Current Address and Current Telephone/Fax Number, E-mail			
Description of the similarity in accordance with Section 3			

The bidder shall attach a copy of the Certificate(s) issued by the employer in support of the information being furnished in each Exp (2a) form, failing which the claim of the bidder shall be liable to be rejected (in case of experience as a sub-contractor, the employer shall be the owner of the Project who has engaged the main Contractor).

_____

SEAL AND SIGNATURE

Form EXP-2(b): Specific Construction Experience

Contract of Similar Size and Nature			
Contract No.		**Contract Identification**	
Award Date		**Completion Date**	
Role in Contract	❑ **Contractor**		❑ **Subcontractor**
Total Contract Amount	**INR**		
If partner in a JV/ Consortium or subcontractor, specify participation in total contract amount	**Percent of Total:**	**Amount: INR**	
Employer's Name, Current Address and Current Telephone/Fax Number, E-mail			
Description, quantity & period of execution of the key activities in accordance with Section 3			

Fill up one form per contract

Copy of Certificate(s) issued by the employer in support of the information being furnished above, shall be attached with each respective Exp (2b) form, as per detailed requirements indicated in note 6 below clause 2.3.1 of Section 3 failing which the claim of the bidder shall be liable to be rejected (in case of experience as a sub-contractor, the employer shall be the owner of the Project who has engaged the main Contractor).

SEAL AND SIGNATURE

EQC FORM NO.1

Important Note for special attention of Bidders:

Clause No & Clause heading of Section 3	Details of value of work/quantity of activity and References (Folio No) of Documents through which criteria against each item is being met.		
2 Qualification			
2.1.1 Conflict of Interest mentioned in ITB 4.3			
2.1.2 Share of partners			
2.1.3 Disqualification of Bidder			
2.2 Financial Status			
2.2.1 Historical Financial Performance			
2.2.2 **Average** Annual Construction Turnover			
2.2.3 Net Worth			
2.2.4 Bid Capacity			
2.3 Experience			
2.3.1 Specific construction Experience Contracts of Similar Size Nature and Key activity - Railway Electrification works - Installation, testing and charging of 25 KV OHE system on railway track.			
2.4 Personnel: Undertaking submitted			
2.5 Equipment: **Undertaking submitted**			
2.6 Specialist sub-contractor undertaking: submitted 1) Foundation - if applicable			

Each bidder should submit detail/references as to how the eligibility criteria is being made by the bidder against each item of EQC. This should be prepared and submitted in the proforma EQC form No.1 enclosed in Section 4.

FORM NO. 2

CHECKLIST FOR CLAUSES PERTAINING TO SUMMARY REJECTION OF BID

We, the undersigned, declare that we have read and understood the content of ITB clauses mentioned below. We also understand that our bid shall be summarily rejected in case we fail to comply the requirements of undermentioned clauses:

ITB Clause No Section 1	**Reason for Summary Rejection**
4.4	Non-submission of Affidavit
4.5	Non-submission of immediate information to the Employer in case Bidder ceases to fulfill eligibility in terms of ITB 4.3 & 4.4
14.2	Quoting more than one percentage for any schedule
14.9	Non-submission of Summary sheet of BOQ
16.4	Non-submission of the Letter of Bid (LB)
	Bid not accompanied with bid security declaration form

SEAL AND SIGNATURE OF THE BIDDER

Form: C 1

FORMAT FOR CERTIFICATE TO BE SUBMITTED BY BIDDER ALONGWITH THE BID

(On the letter head of the Firm)

We/I,_____, having registered office at _____ do hereby certify that "I "I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this bidder fulfils all requirements in this regard and is eligible to be considered. (Where applicable, evidence of valid registration by the competent Authority shall be attached.)"

Dated this _____ day of _____, 2021

For- _____
Authorized Signatory Signature _____
Full Name: _____
Place: _____

(SEAL AND SIGNATURE OF THE BIDDER)

Form: C 2

FORMAT FOR CERTIFICATE TO BE SUBMITTED BY BIDDER ALONGWITH THE BID FOR SUB CONTRACTING

(On the letter head of the Firm)

We/I,_____, having registered office at _____ do hereby certify that ""I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries; I certify that this bidder is not from such a country or, if from such a country, has been registered with the competent Authority and will not sub-contractor any work to a contractor from such countries unless such contractor is registered with the competent Authority. I hereby certify that his bidder fulfils all requirements in this regard and is eligible to be considered. (Where applicable, evidence of valid registration the Competent Authority shall be attached.)"

Dated this _____ day of _____, 2021

For- _____
Authorized Signatory Signature _____
Full Name: _____
Place: _____

(SEAL AND SIGNATURE OF THE BIDDER)

Form 4

Bid Security Declaration Form

Tender No. _____ Date:_____

To,
The General Manager, Electrical,
Rail Infrastructure Development Company (Karnataka) Limited,
"Samparka Soudha", 1st Floor, B.E.P Premises (Opp. Orion Mall),
Rajajinagar 1st Block, Bangalore - 560 010.

I/We, (Name of bidder) am/are aware that I/We have been exempted from submission of Bid Security/Earnest Money Deposit in lieu of this Bid Security Declaration. According to your conditions, bid must be supported by a Bid Security Declaration.

I/We accept that I/We may be disqualified from bidding for any contract of works/service with K RIDE/Government of India and its PSUs/ Government of Karnataka and its PSUs for **a period of one year** from the date of notification if I am /We are in a breach of any obligation under the bid conditions, because I/We

a) have withdrawn/modified/amended, impaired or derogated from the tender, Bid during the period of bid validity specified in the form of Bid; or

b) if awarded the tender and on being called upon to submit the Performance Guarantee/Performance Security fail to submit the same within the stipulated time period mentioned in tender documents or on being called upon to sign the contract agreement fail to sign the same within stipulated period mentioned in tender documents, in accordance with the Instructions to Bidders.

I/We understand this Bid Security Declaration shall cease to be valid if I am/we are not the successful Bidder, upon the earlier of (i) the receipt of your notification of the name of the successful Bidder; or (ii) thirty days after the expiration of the validity of my/our Bid.

(Signature)

(Name of Signatory)…….

(Capacity of Signatory)……

Seal

Duly authorized to sign the bid for an on behalf of (insert complete name of Bidder)

Dated on _____ day of _____ (insert date of signing)

Corporate Seal (where appropriate)
(Note: In case of a Joint Venture, the Bid Securing Declaration must be in the name of all partners to the Joint Venture that submits the bid).

--00--00--00--

PART II	Work's Requirements

Section 5	Works/Employer's Requirements

Section 5 Works/Employers Requirements

This Section contains the specifications, the safety precautions and supplementary information that describe the Work to be executed.

I N D E X

1. Safety and Security at work

1.1 The works included in this contract are to be carried out close to the running tracks and public utilities, therefore, safety of running trains and the public is paramount. Therefore, all activities undertaken by the Contractor/his Sub-contractors shall ensure safety at all times. The contractor shall comply with the instructions issued by the Railway/ Engineer/Employer from time to time to ensure safe running of trains while carrying out works. The rates quoted by the Contractor shall be deemed to include all expenditure incurred in compliance with the same.

1.2 Before starting any excavation work adjacent to existing track, the contractor shall ensure that necessary permissions has been obtained and required precautions have been taken for doing such work in terms Joint Procedure Order (JPO). The penalties mentioned in the following JPO shall be levied on the contractor if such event occur. The JPO is reproduced below:

"JOINT PROCEDURE ORDER FOR UNDERTAKING DIGGING WORK IN THE VICINITY OF UNDERGROUND SIGNALING, ELECTRICAL AND TELECOMMUNICATION CABLES"

(A) A Number of Engineering works in connection with gauge conversion/doubling/third line are in progress on various railways, which require extensive digging work near the running track, in close vicinity of the working S&T cables carrying vital safety circuits as well as electrical cables feeding the power supply to cabins. ASM room, RRI Cabin, Intermediate Block Huts (IBH) etc. Similarly, S&T organization under open line or construction units under CAO/C, are executing various Signaling and Telecom works requiring digging of earth for laying of cables or casting of foundations for the erection of signal posts etc. Rail-Tel is also executing the work of laying of quad cable and OFC on various Railways as a part of sanctioned works for exclusive use of Railways for carrying voice and data i.e. administrative and control communication, PRS, FOIS etc. or shared by RailTel Corporation of India Ltd. On certain sections, digging is also required for laying of electrical cable and casting of foundation for the erection of OHE masts by Electrical Dept. Generally, these works are executed by contractors employed by these organizations.

(B) However, while carrying out these works in the vicinity of working signaling, telecommunication and electrical cables, at times, cable cuts take place due to JCB machines working along the track or during the digging work being done by contractors carrying out the Civil Engineering Works. Similarly, such cable cut are also resulting due to works undertaken by S&T or Electrical departments. Such cable faults results in the failure of vital signaling and telecommunication circuits & electrical installations.

(C) Henceforth, the following joint procedure shall be followed by Engineering, Electrical and S&T (and Rail Tel organization, wherever such works are being done by them) officers of the respective divisions and by the construction

organization, while carrying out any digging work near to existing signaling & telecommunication and electrical cables, so that the instances of cable cut dueto execution of works, can be controlled and minimized.

1. S&T Department (and Rail Tel, where they have laid the cables) and Electrical department shall provide a detailed cable route plan showing exact location of cable at an interval of 200m or wherever there is change in alignment so that the same is located easily by the Engineering official/contractor. In addition, S&T department and Electrical department shall also provide cable markers along the alignment of the cable. These cable route plans shall be made available to the Sr.DEN/DEN or Dy. CE/C, as the case may be, by Sr. DSTE/DSTE or Sr. DEE/DEE of the divisions or Dy. CSTE/C or Dy.CEE/C within 15 days in duplicate. Sr.DEN/DEN or Dy. CE/C will send copies to their field unit i.e. AEN/SE/P. Way & Works.

2. Before taking up any digging activity on a particular work by any agency, Sr. DSTE/DSTE or Sr.DEE/DEE of the section shall be approached in writing by the concerned Engg. or S&T or Electrical officer for permitting to undertake the work. Sr. DSTE/DSTE or Sr.DEE/DEE, after ensuring that the concerned executing agencies including the contractor have fully understood the S&T and Electrical cable route plan shall permit the work in writing within 7 days of the request by concerned department.

3. After getting the permission from S&T or Electrical department as the case may be, the relevant portion of the cable route plan shall be attached to the letter through which permission is issued to the contractor by concerned Engg. official for commencement or work and ensuring that the contractors have fully understood the cable route plan and precautions to be taken to prevent damage to the underground cables. The contractor shall be asked to study the cable plan and follow it meticulously to ensure that the safety of the cable is not endangered. Such a provision, including any penalty for default, should form part of agreement also. It is advisable that a suitable post of SE/Sig or SE/Tele or SE/Electrical(TRD or G) shall be created chargeable to the estimates of doubling/gauge conversion, who can help Engg. agencies in the execution of the work. However basic responsibility will be of the department executing the work and the Contractor. Creation of posts is not mandatory.

4 The SE/P. Way or SE/Works shall pass on the information to the concerned SE/Sig SE/Tele or SE/Electrical(TRD or G) about the works being taken up by the contractors in their sections at least 3 days in advance of the day of the work. In addition Engineering control shall also be informed by SE/P. Way or SE/Works, who in turn shall pass on the information to the test room/network operation centre of Rail Tel/TPC/Electrical control.

5. On receiving the above information, SE/Sig or SE/Tele or SE/Electrical (TRD or G) shall visit the site on or before the date of taking up the work and issue permission to the contractor to commence the work after checking that adequate

precautions have been taken to avoid the damage to the cables. The permission shall be granted within 3 days of submission of such requests.

6. The name of the contractor, his contact telephone number, the nature of the work shall be notified in the Engineering control as soon as the concerned Engineering officials issue the letter authorizing commencement of work to the contractor. Test room shall be given copies. Test room shall collect any further details from the Engineering Control and shall pass it on to S&T/Rail Tel & Electrical officials regularly. In case the supervisors of concerned departments do not turn up on the day as advised in terms of Para 4 and 5 above, the works of contractor should not be stopped on this account.

7. In case of works being taken up by the State Government, National Highway Authority etc., the details of the permission given i.e. the nature the work, kilometer etc. be given to the Engineering control including the contact person's number so that the work can be done in a planned manner. The permission letter shall indicate the contact numbers of Test room/network Operating Centre of Rail Tel/TPC/Elect. Control.

8. Where the nature of the work taken up by the Engineering department is such that the OFC or other S&T cables or Electrical cables is to be shifted and relocated, notice of minimum one week shall be given so that the Division/Rail Tel/Construction can plan the works properly for shifting. Such shifting works shall in addition, for security and integrity of the cables, be supervised by S&T supervisors/Rail Tel supervisors/Electrical Supervisors.

9. The concerned SE/P.Way/SE/Works/SE/Sig/SE/Tele/SE/Electrical (TRD or G) or Rail Tel supervisors supervising the work of the contractor shall ensure that the existing emergency sockets are not damaged in view of their importance in providing communication during accident/emergency.

10. In case of minor nature of works where shifting of cable is not required, in order to prevent damage to the cable, the Engineering contractor shall take out the S&T or optical fiber cable or Electrical cable carefully from the trench and place it properly alongside at a safe location before starting the earthwork under the supervision of SE/Sig or SE/Tele or SE/Electrical(TRD or G). The cable shall be reburied soon after completion of excavation with proper care including placement of the brick over the cable under the supervision of S&T or Electrical supervisors. However, the work will be charged to the concerned engineering works. The responsibility for ensuring availability of SE (Signal), SE (Electrical) as per Para 4 and 5 above lies with the respective department. The contractor will go ahead with the shifting of cables as per the program decided and he will not be held responsible for any cable cut.

11. In all the sections where major project are to be taken up/going on Rail Tel/S&T department shall deploy their official to take preventive/corrective action at site of work. As regards Electrical Department, the official may be deputed on need basis.

12. No new OFC or quad cable shall be laid close to existing track. It shall be laid close to the Railway boundary on one side of the Railway track to the extent possible to avoid any interference with the future works (doubling etc.). It shall be ensured in the new works of cable laying that the cable route is properly identified with electronic or concrete markers. Wherever multiple cables are laid in a trench, RFID markers may be provided for easy identification of the cable. Henceforth, wherever cable laying is planned, before undertaking the cable laying work, the cable route plan of the same shall be prepared by the Dy. CSTE/A or Dy.CEE/C and shall be got approved from the concerned Sr. DSTE/DSTE or Sr.DEE/DEE and also from the concerned Dy. CE/C for new lines and from the concerned Sr.DEN for all other projects including GC etc., to avoid possible damages in future. Such approvals shall be granted within 15 days of the submission of the request.

13. The works of excavating the trench and laying of the cable should proceed in quick succession, leaving a minimum time between the two activities.

14. In case damage caused to OFC/Quad cable or Electrical cable during execution of the work, the contractor is liable to pay a penalty for damaging the cable. Penalty shall not be levied in case of the following:-

    i. Detailed cable route plan as per clause C-1 not provided by concerned department or cable is not protected as per laid down procedures.

    ii. The alignment of the cable does not tally with the information provided to the contractor.

    iii. The cable depth is found to be less than 800 mm from normal ground level.

    iv. No representative of S&T department/Rail Tel was available at site guarding the cables on the fixed pre determined date and time.

15. Penalty to be imposed for damages to cable shall be as under:-

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

Necessary debit in this regard shall be raised on the department undertaking the work who shall in turn levy the penalty on the defaulting contractor. S&T department shall raise the debits in case of damage to OFC or Quad or Signaling cable and Electrical department shall raise the debits in case of damage to Electrical cable.

16. Railways will not lodge FIR with RPF in case of works being executed by

authorized contractors of Railways who have been duly permitted to execute the works in accordance with this JPO. Joint note by the supervisors of the concerned department shall be prepared and the responsibility of the cable cut should be decided without involving RPF. The joint note deciding the fact whether the contactor should be penalized shall be completed in a day's time from the occurrence of cable cut. In all other cases, when the cable is cut by an agency that was not permitted to execute any work, FIR should be lodged with RPF.

17. While giving permission for taking up the works, concerned departments may note that earthwork by engineering contractors will normally be done by machines except in a few isolated locations where the quantity of earth work is very less.

    I. Railways shall make necessary correction in their future contract so that this JPO can also be enforced contractually.

    II. In case of damages to OFC, Rail Tel should be paid 5/6th of the penalty recovered. Rail Tel shall raise demands on the S&T department in this regard.

    III. All types of signaling & OHE bonds i.e. rail bond, cross bond and structure bond shall be restored by the contractor with a view to keep rail voltage low to ensure safety of personnel.

18. Above joint circular shall be applicable for construction as well as open line organization of Engineering, S&T and Electrical.

19. S&T cable and electrical cable route plan should be prepared by the concerned S&T and Electrical officers respectively and got approved as stipulated in Para C-12 before undertaking the work. The completion cable route plan should be finalized block section by block section as soon as the work is completed.

20. All cable laying works shall be executed as per laid down technical specifications, such as protection measures/protective cover, compaction of refilled material etc.

1.3. Working near running line

1.3.1 The contractor shall not allow any road vehicle belonging to him or his suppliers etc. to ply in railway land next to the running line. If for execution of certain works viz. earth work for parallel railway line and supply of ballast for new or existing rail line, gauge conversion etc, road vehicles are necessary to be used in railway land next to the railway line, the contractor shall apply to the Engineer for permission giving the type & no. of individual vehicles, names & license particulars of the drivers, location, duration & timings for such work/movement. The Railways/Employer/Engineer or his authorized representative will personally counsel, examine & certify, the road vehicle drivers, contractor's flag men & supervisor and will give written permission giving names of road vehicle drivers, contractor's flag men and supervisor to be deployed on the work, location, period and timing of the work. This permission will be subject to the following obligatory conditions:

1.3.2 Road vehicles can ply along the track after suitable cordoning of track with minimum distance of 6 meters from the centre of the nearest track. For working of machinery close to the running tracks or plying of road vehicles during night hours, the contractor shall apply to the Engineer in writing for permission, duly indicating the site details in a neat sketch and safety measures proposed to be taken. Subject to the approval of concerned Railway authorities, the Engineer or his authorized representative will communicate permission to the contractor/contractor's representative. The contractor and his men shall strictly adhere to the instructions given along with such permissions.

1.3.3 Nominated vehicles and drivers shall be utilized for work in the presence of at least one flag man and one supervisor certified for such work. In order to monitor the activities during night hours, additional staff may have to be posted based on the need of the individual site.

1.3.4. The Contractor' machinery, equipment and vehicles shall normally operate 6 m clear of track. Any movement/work at less than 6m and upto a minimum of 3.5m clear of track centre, shall be carried out only in the presence of a person (including any railway employee) authorized by the Engineer. No part of the road vehicle shall be allowed at less than 3.5m from track centre.

1.3.5 The Contractor's machinery and equipment are required to operate close to the existing line carrying traffic. Contractor is fully responsible for operating these machineries without endangering the safety of the running line and traffic.

a) The "look out and whistle" caution orders shall be issued to the trains and speed restrictions imposed where considered necessary. Suitable flag men/detonators shall be provided where necessary for protection of trains.
b) The supervisors/workmen should be counseled about safety measures. A competency certificate to the contractor's supervisor as per proforma annexed shall be issued by Manager/Electrical which will be valid only for the work for which it has been issued.
c) The unloaded masts, portals, copper drums, cement/ sand bags, cut pieces of steel and other such materials after unloading along track should be kept clear off moving dimensions and stacked as per the specified heights and distance from the running track.
d) Supplementary site-specific instructions, wherever considered necessary, shall be issued by the Engineer.

COMPETENCY CERTIFICATE

"Certified that Shri_____ TRD supervisor of M/S_____ _____has been examined regarding OHE working on_____ work. His knowledge has been found satisfactory and he is capable of supervising the work safely.

_____

Authorized Representative / South Western Railway

1.4 The contractor shall provide at site at his own cost, all protection measures including exhibition and lighting of all Temporary Engineering Signals as per Railway rules, instructions and norms. All lights provided by the contractor shall be screened so as not to interfere with any signal light on the Railways or with any traffic or signal lights of any local or other authority.

1.5 <u>Ancillary and Temporary works</u>

a) The Contractor's proposals for erection of all ancillary and temporary works shall be in conformity with the proposals submitted along with the tender and modifications thereto as approved by the Engineer.

b) The Contractor shall submit drawings, supporting design calculations where called for by the Engineer and other relevant details of all such works to the Engineer for approval at least one month before he desires to commence such works. Approval by the Engineer of any such proposal shall not relieve the contractor of his responsibility for the sufficiency of such works.

c) The contractor shall, at his own cost, design and provide any temporary arrangements including modifications required in connection with the above said works and remove the old lines/masts/portals etc., when no longer required. These arrangements shall conform to Railway norms. The contractor shall obtain all necessary approvals and sanctions of the concerned Railway / K RIDE authorities including Commissioner of Railway Safety through the Engineer/ Employer in advance and well in time.

d) The contractor shall ensure and be entirely responsible for proper design, fabrication, provision and upkeep of all temporary arrangements and all associated activities so as not to endanger safety of any assets, running track, traffic and traveling public

e) Not withstanding the above, the contractor shall not, however, be relieved of his responsibility and obligation as aforesaid.

f) Save as provided in Para 1.5(e) above, the contractor shall bear the cost of complying with all safety requirements. No extra payment will be made

for complying with the safety provisions under this chapter and the cost of all such elements to meet the safety requirements shall be deemed to be included in the Bill of Quantities.

g) The contractor remains fully responsible for ensuring safety. In case of any accident, the Contractor shall bear cost of all damages to his equipment and men and also damages to Railway and its passengers.

1.6. Indemnity by Contractor

The Contractor shall indemnify and save harmless the Railway/Employer/Engineer from and against all actions, suit proceedings, losses, costs, damages, claims, and demands of every nature and description brought or recovered against the Railways/ Employer/Engineer by reason of any act or omission of the contractor, his agents or employees, in the execution of the works or in his guarding the same. All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the actual loss or damage sustained, and whether or not any damage shall have been sustained.

1.7. Damage to Railway Property or Life or Private Property

The contractor shall be responsible for all risks to the works and for the trespass and shall make good at his own expense all loss or damage whether to the works themselves or to any other property of the Railway or the lives of persons or property of others from whatsoever cause in connection with the works until they are taken over by the Employer and this although all reasonable and proper precautions may have been taken by the Contractor, and in case the Railway/ Employer/ Engineer shall be called upon to make good any costs, loss or damages, or to pay any compensation, including that payable under the provisions of Workmen's compensation act or any statutory amendments thereof to any person or persons sustaining damages as aforesaid, by reason of any act, or any negligence or any omissions on the part of the contractor, the amount of any costs or charges including costs and charges in connection with legal proceedings, which the Railway/ Employer/ Engineer may incur in reference thereto, shall be charged to the contractor. The Railway/ Employer/ Engineer shall have the power and right to pay or to defend or compromise any claim of threatened legal proceedings or in anticipation of legal proceedings being instituted consequent on the action or default of the contractor, to take such steps as may be considered necessary or desirable to ward off or mitigate the effect of such proceedings, charging to Contractor, as aforesaid, any sum or sums of money which may be paid and any expenses whether for reinstatement or otherwise which may be incurred and the propriety of any such payment, defense or compromise, and the incurring of any such expense shall not be called in question by the Contractor.

1.8. Safety of Public

a) The Contractor shall be responsible to take all precautions to ensure the safety of the Public whether on Public or Railway property and shall post such look out men as may in the opinion of the Engineer be required to comply with regulations pertaining to the work.
b) The Contractor shall provide effective barricading using G.I. corrugated sheets around foundation pits, trenches, erection sites, demolition sites etc., to prevent accidents and injuries to the public. He shall erect barricading duly leaving safe passage for the movement of the public as per the directions of Engineer.

c) No payment will be made for providing such barricading and the rates quoted by the Contractor shall be inclusive of such safety measures.

1.9. Reporting of Accidents

The Contractor shall report to the Engineer details of any accidents as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition, notify the Engineer and the Employer immediately by the quickest available means.

1.10. Life-saving Appliances and First-aid Equipment: The Contractor shall provide and maintain upon the Works sufficient, proper and efficient life-saving appliances and first-aid equipment to the approval of the Engineer and in accordance with the requirements of ILO Convention No. 62. The appliances and equipment shall be available for use at all time

1.11 Security Measure

a) Security arrangements for the work shall be in accordance with general requirements and the contractor shall conform to such requirements and shall be held responsible for the action or inaction on the part of his staff, employees and the staff and employees of his subcontractors.
b) Contractor's as well as Sub Contractor's employees and representatives shall wear identification Badges (cards), uniforms, helmets, gum boots and other safety/ protection gadgets/ accessories provided by the Contractor. Badges shall identify the Contractor and show the employee's name and number and shall be worn at all times while at site.
c) All vehicles used by the contractor shall be clearly marked with the Contractor's name or identification mark.
d) The contractor shall be responsible for security of works for the duration of the contract and shall provide and maintain continuously adequate security personnel to fulfill these obligations. The requirements of security measures shall include, but not be limited to, maintenance of Law and Order at site, provision of all lighting, guard, flagmen, and all

other measures necessary for protection of works within the colonies, camps and elsewhere at site, all materials delivered to the site and all persons employed in connection with the works continuously throughout working and non-working periods including nights, Sundays and holidays, for the duration of the contract. However, at work sites in close proximity of traffic corridors where public and traffic are likely to come close to the work area, suitable barricading as proposed by contractor and approved by Engineer shall be provided.

e) No separate payment will be made for providing security measures and will be deemed to be included in the rates quoted by the contractor.

1.12. Contractor will have to comply the instructions circulated for Safety on Worksites Specially Doubling Works being implemented on Indian Railways as per relevant letters and any subsequent instructions on this issue.
It is presumed that bidders have gone through the Indian Railway's policies including any subsequent instructions on this issue if any, before quoting the rates.

1.13. Ensuring Safety at work site

All safety precautions required to be adhered while working on 25 kV OHE or in the vicinity of OHE as stipulated in AC traction manual. The contractor shall make sure that all the Labor working on the site shall adhere to the safety precautions and shall be trained accordingly. They shall be supplied with personal Protective Equipment like safety shoes, Jacket, Ladder, helmet, Safety belt, Flags, safety rope, measuring tape cotton etc., It is the personal responsibility of the contractor to ensure that all staff working at site wear and conversant to use the protective and safety equipments.

In terms of contract conditions, preventing entry of outsiders at the worksites is the responsibility of contractor and this has to be ensured. Contractor shall note and ensure:

1. Inductive effects occur on large metallic structures such as fencings, structural steel of platforms running parallel to the track. They will have to be earthed suitably to afford safety.

2. Each working party shall be protected by at least two independent earths, one on ach side of a working party.

3. If the distance between the working parties exceeds 100 meters, intermediate earth shall be provided in such a manner as to ensure that the distance between earths does not exceed 100 meters.

4. Men shall be posted on both sides of the site of work to warn the working party of any approaching train on the same track and adjacent track.

5. For providing earth on the OHE, fix the earthing clamp securely to a mast at least one span away after making sure that the mast to earth rail bond of this mast is intact.

6. Earthing clamps should always be fixed to the traction rail or mast first and then the top clamp should be hooked to the OHE to be earthed.

7. For removing the earthing, first remove the hook on the OHE and then the clamp fixed to the rail or mast.

8. Two sections of conductors or ends of conductors which may have snapped should be separately earthed at two points after switching off supply to both parts of the OHE. This precaution should also be observed when working or in the vicinity of a sectioning point and cut in insulators.

9. Neutral sections should be treated as live equipment and earthed separately at two points on either side of the work party before commencing work.

10. When work is to be carried out on an isolator, both sides of the isolator should be earthed at two points.

11. No fallen wires shall be touched unless power is switched off and the wire suitably earthed.

12. In electrified track, steel tape or metallic tape or tape with woven metal reinforcement should not be used.

13. Ropes, come along clamps, tirfor, discharge rods, earth rods etc., should be tested once in a month.

14. All the staff should wear helmets to protect their heads against any tools or equipment which may drop down accidentally.

15. Staff should protect themselves against an inadvertent fall by wearing a safety belt for supporting themselves by a rope sling.

16. Ropes used with ladders should be cotton or jute.

17. A ladder should be held by one person on the ground to prevent slipping, while the top end should be tied to the supporting structure or conductor to keep it in position and prevent it sliding away.

18. Ladders should never be allowed to fall on or rest against the contact wire.

19. More than one person shall not normally be allowed on a ladder as far as possible.

20. Climbing on a ladder with wet or slippery foot wear is forbidden.

21. A rope should be used to pass tools or any equipment to the men working on a ladder.

22. No one should stand directly below a work spot under a ladder.

23. The strength of the anchoring rope should not be less than of the cable to be anchored.

24. Do not tie the rope on rail without taking traffic block.

25. It is necessary to take traffic block while working on tunnel or bridge.

26. In addition to above following Safety Personal Protective Equipment must be ensured to all staff under the control/ engaged by the contractor.

    1.Shoes 2.Jacket 3.Ladder 4.Helmet 5.Safety Belt 6.Flags"

    In the event of any untoward incident resulting accident, contractor is solely responsible. In terms of contract conditions, preventing entry of outsiders at the worksites is the responsibility of contractor and this has to be ensured.

1.14 Additional Conditions to Safety at Work Spot

To ensure safety at all the work sites all the time, a dedicated Safety officer duly trained as per the provisions of the contract shall be posted by the contractor for each project. Following works will in general be assigned to safety officer.

1. The Safety officer (in charge) shall be from the permanent rolls of the contractor. He will work under the administrative control of the Project Manager of the contractor.

2. The person from any sub-contractor deputed by the main contractor shall not be designated as Safety officer.

3. The Safety officer shall be overall in charge of the safety methods being undertaken at various work sites. He shall not be given any other task related to the project planning and execution.

4. The Safety officer should be well versed with the safety aspects related to worksites in the vicinity of running railway lines and should impart training to the officials assisting him.

5. The Safety officer shall be given suitable means of transport (depending on the requirement) by the contractor to approach all the work sites frequently and ensure that adequate precautions to ensure safety have been taken. He shall

a) Take assurance from the contractor officials at regular interval of complying with the safety instructions.

b) Any safety violation to be advised to all concerned and remedial action taken thereof.

6. The Safety officer will frequently counsel the contractor engineers/supervisors/ operators/drivers/lookout men about safety provisions during his day to day inspections and keep a record of the same. The Safety officer will prepare a monthly report of the safety inspections carried out and remedial action taken thereof and send it to the Project Manager of the contractor and the employer/engineer.

7. The contractor should open new sites only after discussing the safety measures to be undertaken with his Safety officer and obtaining the permission from Employer/ Engineer.

8. It shall be the duty of the Project Manager/ Resident Engineer and Safety officer of the contractor that the instructions contained in the agreement related to safety and the same issued by the Railway/Employer/Engineer from time to time are strictly complied with.

Based on the above, it is advised that a thorough review of the safety provisions may be undertaken and it should be ensured that competent safety officers are available at all the work spots.

2. GENERAL INFORMATION AND SCOPE OF WORK

2.0 SCOPE OF WORK:

The proposed work is in connection with: **Railway Electrification between Heelalige – Hosur: Design, Supply, Erection, Testing & Commissioning of 25 KV, AC, 50 Hz, Single Phase, Traction Over Head Equipment for Railway Electrification work in SINGLE Package.**

2.1. Introduction

Single Package:

This work pertains to **Design, Supply, Erection, Testing & Commissioning of 25 KV, AC, 50 Hz, Single Phase, Traction Over Head Equipment for Railway Electrification of Heelalige (km.180) (Excluding) – Hosur (km.159) (Including) Section (25 Track Kilometers approximately) under Doubling Project of Bangalore division of South Western Railway.**

General :

The tendered work is part of the doubling with Electrification Project for Section **Heelalige** - **Hosur** of South Western Railway. The works are located on the alignment between Heelalige – Hosur.

This Second line is covering following stations as mentioned below:

S.No	Station	State	Division	Railway
1.	Anekal Road	Karnataka	Bangalore	SWR
2.	Maranayakanahalli	Karnataka	Bangalore	SWR
3.	Hosur	Karnataka	Bangalore	SWR

2.2. Scope of Present Tender

The proposed work is in connection with Railway Electrification of proposed line between Heelalige – Hosur as provision of Doubling.

a) The proposed Railway Electrification will connect railway stations viz. Anekal Road, Maranayakanahalli, Hosur.

b) Entire section is mostly plain and maximum ruling gradient is 1 in 100 compensated. This project site lies in the state of Karnataka.

c) The section falls in the basic wind speed of 33 and 39 m/s classification given in IS 875-1987. Accordingly, the basic wind pressure of 73 and 105 kgf/m2 respectively is to be adopted. Increased wind pressure is also to be adopted on embankments more than 100 meters i.e 150 kgf/m2. This conforms to the wind pressure adopted by State Electricity Boards for the design of their EHT transmission lines.

d) Electric Locomotives with chimney height not exceeding 4.232m (WAP with their pantographs in the locked down position) and diesel Locomotives with height of 4.42 (14 ft. 6 inch) would run on this section.

2.3. FORMATION : DELETED

2.4. The contemplated works as a part of this tender consists of --

a. Design, Supply, Erection, Testing & Commissioning of 25 kV, 50 Hz, AC, Single phase, Traction Overhead Equipments, Switching Stations and LT Supply Transformer Stations including foundations, structures, all Ancillary Equipments.

b. Making and supply of Drawing Preliminary and 'As erected" of all the assets Modified/ created and SWR Diagrams & Rules.

2.5 The Nature of Service /work:

The services to be performed by the Contractor shall include, but not be limited to, the following:

a) Design, supply, system quality management, installation, testing including integrated testing and commissioning of the 25 KV AC and all associated works including preparation of all drawings.

b) Presentations, PERT charts, reviews and audit support as specified in this Specification;

c) Interface management

d) Ground Investigation including, survey, design, identification of locations, soil bearing pressure and soil bearing resistivity reports and installation for foundations for trackside equipment.

e) System operations and maintenance support services;

f) Decommissioning, removal and/or responsible for disposal of Temporary Works;

g) Prototype and Factory Acceptance Testing as per test plan.

h) Defects liability of Traction distribution 25 kV AC OHE work after commissioning after commissioning as stipulated in the General Conditions (GC),

i) Assist in obtaining statutory clearances and submittal of information asked for by statutory bodies (e.g., Government of India, Ministry of Railways, Commissioner of Railway Safety, Electrical Inspector to Govt. of India (EIG) etc. as directed by Engineer) authorities to ensure energisation of newly erected OHE, removal of existing overhead Line / conductors wherever required, Liaison with Karnataka state electricity supply

j) Provision of integration test plans for commissioning of the electrification works.

k) Modifications to existing Overhead Electrical Crossings is not covered in this contract. However, the contractor, shall ensure in advance and submit the details to the Engineer to comply the standards.

Document Submitted during Construction Stage by Contractor

I. Construction and Installation activity Plan;
II. RITES/ Factory acceptance test certificates for equipment;
III. Operation and maintenance manuals covering, installation, operation and maintenance instruction of all equipment;
IV. Records and drawings of equipment to be installed;
V. Inter connection drawings;
VI. Site test report of equipment;
VII. Earthing and bonding plans;
VIII. Updated EMC control plan and certificates
IX. Testing and commissioning documents, as required by the Engineer.
X. Drawings for Layout Plan (LOP), Cross Sectional Drawing (CSD), Structure Erection drawing (SED), sectioning diagram, General Power supply drawings, Station working rules and station working diagrams.
XI. Contractor shall maintain site register, hindrance register, inspection register and to get certified from the engineer-in-charge.
XII. Insurance certificate that stores has been insured
XIII. Labour insurance certificate.
XIV. Other documentation as required, by the Engineer.

The drawings and documents to be submitted for each stage of construction shall be proposed to the Engineer for his approval and subsequently used for construction. The above is not an exhaustive list covering all the works to be done under this Tender. Major works only have been listed for guidance.

2.6 Some Special stipulations/features:

OHE work

2.6.1 For supporting the OHE on the major bridges, the contractor shall provide special

fabricated galvanized steel mast of suitable length to be erected on the bridge piers to maintain the required height the OHE. The drawing of OHE masts to be provided on bridges piers shall be got approved form the engineer/employer

2.6.2 In case the length of the bridge is more than 1 KM and anti-creep needs to be provided in the tension length of OHE, no anchoring arrangement may be possible in case the bridge is designed with concrete slabs, in such cases load calculations for OHE tensions anticipated on the masts of anti-creep terminations on the bridge piers shall be done by the contractor and submitted for approval of the Engineer prior to erection of masts and OHE.

2.6.3 Design & Drawings:

(i) The contractor shall execute the work according to Standard Specifications

(ii) The design of OHE span shall be for basic wind speed of 33 and 39 m/sec and accordingly designed wind pressure 73 and 105 kg/m^2 respectively is to be adopted.

(iii) The contractor shall furnish the details of soil test report for designs.

(iv) Auto tensioning devices at Cross-overs, Turnouts, overlap type neutral sections and all other such locations having short tension lengths shall be provided with hexagonal tie-rods as per latest RDSO instructions

(v) The Raised Register Arm Clamp and Parallel grooved clamps conforming to following RDSO drawings (with latest amended) shall only be used:

a) Parallel Clamp (90/50)- RDSO drawing no. ETI/OHE/P/1040-3 , Revision 'B'
b) Contact Wire Parallel Clamp (part small) – RDSO drawing no. ETI/OHE/P/1041-2, Revision 'D'
c) Parallel Clamp (150/160) – RDSO drawing no.ETI/OHE/P/1050-3, Revision 'A'
d) Parallel Clamp(150/105-150) – RDSO drawing no. ETI/OHE/P/1051-2, Revision 'C'
e) Parallel Clamp part (150/240) – RDSO drawing no. ETI/OHE/P/1530-1, Revision 'C'
f) Provision of saddle for catenary shall be as per RDSO guide line.

(vi) Porcelain and composite insulators shall be tested as per latest RDSO instructions.

(vii) Normally use of Porcelain insulators only permitted. As per RDSO circular No.TI/OHE/INS/GEN/13 dated 19.06.2013 composite insulators of 1050 mm CD shall be used in stone pelting areas only with the approval of competent authority of K-Ride. The latest RDSO/ Railway Board guidelines shall be applicable, if any revised guidelines is being issued.

(viii) Any calculations, designs, drawings, schedules information, data, progress charts, etc required by the Engineer in connection with the contract, shall be furnished by the contractor at his own expenses. The contractor will not be required to furnish

drawings, designs and calculations etc for basic designs and employment schedule in case no modification/deviation is proposed by the contractor for particular basic design/employment schedule. In case of new developments in designs, comments on Research Designs and Standards Organization (here-in after called RDSO) basic drawings/ designs/employment schedules, will be submitted by the contractor to the Engineer. If the RDSOs / drawings/ designs/equipments are not revised, contractor need not submit drawings /designs/employment schedules to the Engineer. In the event of the contractor suggesting any alternation/deviation in standard drawing, he shall submit the retracted drawings wit full clarifications and justifications of the change to the Engineer. The Engineer, if convinced of the need of the alteration, shall approach RDSO/KRIDE for necessary approval.

(ix) The contractor shall be solely responsible for the correctness of the positions, levels and dimensions of the works according to approved drawings, not withstanding that he may have been assisted by the Engineer or his men in setting out the same.

(x) If any dimension figured upon a drawing differs from that obtained by scaling the drawings the figured dimension should be normally taken as correct unless it is prima facie a mistake. But all such cases shall be brought to the notice of the Engineer and the discrepancy set right before execution.

(xi) All designs and drawings submitted by the contractor shall be based on a thorough study and shall be such that the contractor is satisfied about their suitability. The Engineer's approval will be based on these considerations. Not-withstanding approval communicated by the Engineer, during the progress of the contract for designs, and drawings prototype samples of components materials, and equipment after inspection of materials, after erection and adjustments to installations, the ultimate responsibility for correct design and execution of work shall rest with the contractor or unless the Engineer insists on adoption of his own designs inspite of the contractor not being agreeable to it.

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

(xiii) The contractor is forbidden to use any patents or registered drawings, process or patterns in fulfilling his contract without the previous consent in writing of the owner of such patent, drawing, pattern or trade mark, except where these are specified by the Engineer himself. Royalty, where payable, for the use of the patented processes, registered drawings or patterns shall be borne exclusively by the contractor, The contractor shall advise the Engineer of any proprietary rights that may exist on such processes drawings or patterns, which he may use of his own

accord.

(xiv) In the case of patents taken by the contractor of the drawings or patterns registered by him or of those patents, drawings, or patterns for which he holds a license, the signing of the contract automatically gives the Engineer the right to repair by himself the purchased articles covered by the patent or by any person or body chosen by him and to obtain from any sources he desires the component parts required by him in carrying out the repair work. In the event of infringement of any patent rights due to above action of the Engineer, he shall be entitled to claim damages from the contractor on the grounds of any loss of any nature, which he may suffer e.g. in the case of attachment because of counterfeiting.

(xv) Minimum 120 m distance shall be available between stop signals and centre line of insulated overlaps.

(xvi) Separate DJ close boards shall be provided for MEMU/EMU

(xvii) Modified protective screen shall be provided at all FOBs/ROBs (ETI/C/0068(07/09) Rev. H) or latest.

(xviii) Catenary wire shall be used in place of GI wire for anti creep locations in polluted areas (Ref. ETI/OHE/G/02111 Rev A dt. 23.10.12) or as per latest guidelines.

(xix) Double eye distance rod shall be used as per RDSO drg TI/MI/0008 Rev 0 or latest.

(xx) Soft copies along with three sets of Hard copies of all drawings shall be submitted.

(xxi) Forged OHE fittings shall be used for Register arm book, Drop Bracket, Steady arm hook, Stay Sleeve, Register Arm Eye, Steady Arm Clamp, Mast fittings for hook insulators, 9 T Turn Buckle, 9 T Clevis, 18 mm Single Clevis & Clevis and Eye.

2.6.4 Contractors Organisation.

i) It is obligatory on the part of the contractor to establish an office/Depot at station(s) to be advised by Engineer, for planning, design and for expeditious finalization of particular designs and working drawings. The office should be headed by a qualified Engineer whose credentials shall be approved by the Engineer. In addition, the contractor will have to establish field construction offices at convenient and approved locations for co-ordination and progressing of field works.

(ii) In addition to the establishment of an office/Depot, the contractor shall set up at least one depot for receiving and storing steel work and other materials and establish a workshop for small fabrication and assembly work, if necessary. The location of contractor's depot will be mutually agreed upon by the Engineer and the contractor. The depot shall as far as possible be located such as to be

accessible by road. Subject to availability, the Employer shall offer open space for storage of materials, inside the Railway premises at the site. In case the Employer is not in a position to provide the space, the contractor has to make his own arrangement at his cost.

(iii) In case the depot is provided by the Employer, the Contractor shall hand over the same, cleared of all contractors' storage or refuge, within a period of 28 days from completion of work, unless otherwise agreed to by the Engineer.

(iv) The contractor shall not be allowed to dig any wells on the Railway/Employer land without specific permission in writing.

(v) If for reasons of urgency the work has to be executed at night contractor shall make his own arrangement for illuminating the site. Nothing extra will be paid for doing work at night. He will have to make his own arrangements for arranging electricity if the same is required for illumination purpose or for running of any plant or machinery.

vi) The contractor shall arrange at his own cost all tools, plant and facilities required for execution of works.

Note:

a. All expenses for providing covered and enclosed storage and workshop accommodation other facilities and running the establishment shall be borne by the Contractor.

b. The main depots will be located at stations. The proposed location/s of sub depot is to be given by the Tenderer for scrutiny and approval by the Purchaser.

c. The Contractor shall hand over the depot, sub depot area complete within a period of one year from completion of the work, cleaned of all Contractor's stores, refuse unless otherwise agreed to by the purchaser.

d. The Contractor will be responsible for transfer of materials from main depot or sub depots between depot/s and workshops except where otherwise stated. The Contractor will be responsible for all loss and / or damage in the transfer of materials and no loss damage or expenses incurred on this account will be reimbursed by the Purchaser.

e. The Contractor shall arrange at his own cost all tools plant and facilities as necessary for erection and testing of the equipment, in compliance with the specification.

f. For every contract in operation, a spot for the dumpling of the materials/debris should be identified jointly with K-Ride.

g. Each bill of the contractor submitted have to be necessarily accompanied by a certificate by the concerned K-Ride AM/SM/DGM that the debris for the work done till the stage of payment (for which the bill is being put up) has been

cleaned and dumped at the nominated place.

2.6.5 **Power & Traffic Block:**

(i) Track Block may be granted at any time during day or night to suit convenience of traffic operations and will ordinarily be granted over a distance covered by one or two consecutive block sections. Contractor will normally be allowed to take advantage of block shadows. Normally the total durations of block on any section will be maximum of 1.5 to 2.5 hours in a day for all the tracks in the section taken together, the total of blocks on any track being limited to 1 or 2 hours in a day. Block provided may be utilized for one or more work utilizing track lorries or ladder trolleys or tower car to suit convenience of work.

(ii) Blocks will not ordinarily be given for laying the feeders except where crossing of track is involved, which will have to be laid manually in general.

(iii) Any Traffic/ power blocks, temporary speed restrictions and caution orders required in connection with execution of works by the contractor, shall be got sanctioned from the Railway authorities well in advance, through the Engineer. The Railways may sanction the same for specific sites within the overall recovery time available in the Railways time table. The contractor shall have to schedule his programme according to the convenience of the Railways. No claim from the contractor for any delay/inconvenience/loss on this account shall be entertained by the Employer/Engineer.

(iv) The contractor shall undertake the work involving Railway Track, Railway Electrification installations in co-ordination with the Engineer/ Employer and Railways in accordance with the programme of work. Where traffic/power blocks are involved, the contractor shall ensure that interruption to Railway operations, if any, is kept to the bare minimum level.

(v) The contractor may use light ladder trolleys on tracks for carrying out installation of dropper and adjustment of traction overhead equipment. The ladder trolleys shall not weight more than 200 kg and should be capable of beings removed from the track easily and quickly. The detailed drawing of these should be submitted within three month from the date of issue of letter of intent/acceptance of tender to enable the purchaser to obtain approval from the competent authorities for the use of such trolleys on track, if required.

(vi) In order to minimize blocking the track for work, the contractor shall consider the working conditions on the sections and assess use of all alternative method of construction on a part or whole of the work. He should submit clear proposal along with financial implication, if any to the purchaser for such special method of saving of blocks that could be obtained along with reduction /redundancy of the facilities being provided by the Railway /KRIDE.

(vii) The protection required for block working i.e. flagmen, flags etc shall be provide by the contractor, Competency for the above shall, however, be given by the Railway authority. Protection of track by banner flags etc shall be done in accordance with General Rules of Indian Railway and Subsidiary Rules of the concerned Zonal Railway where work is being carried out. Contractor shall

provide Safety helmet, Safety belt, retro reflective jackets and Safety shoes to their staff while working at site.

2.6.6 Transport of Men, Material, Equipment and Machinery

(i) Contractor shall transport the Men, materials to the section by road on his own. Wherever this is not possible, KRIDE may assist the use of MET from railways, however this is not obligation on the K-RIDE and K-RIDE will not be responsible for any delay or what so ever reason for execution of project. In such cases, however contractor shall arrange loading and unloading at his own cost.

(ii) Use of Road cum rail vehicle by the contractor is prefered for foundations/ mast erection etc., Modern machineries like simultaneous stringing of catenary and contact wire is preferable.

(iii) Wherever possible, the tower wagon shall be facilitated by K-Ride through South Western Railway for final adjustments and alignment of OHE to measure stagger and other inspections. Contractor shall ensure qualified staff with sufficient men and materials for optimum utilization of the tower wagons However this shall not be binding on K Ride & no claims what so ever shall be entertained in case Tower Wagon could not be made available by K Ride.

2.6.7 Protection from Theft

i. In case of theft/breakdown, the contractor shall restore the traffic in minimum possible time. Failure to do so shall attract suitable penalty.

ii. At stations, the Employer/Engineer after the inspection of OHE and satisfying himself shall permit the contractor to make proper isolation to electrically charge the line at 2.2 KV. The contractor shall protect the erected OHE from thefts and damages at his own cost.

iii. The contractor shall liaise with the Engineer to finalize the procedure for taking over of the whole or part of the section and for disposal of the released materials till that time released materials shall remain in the custody/responsibility of the contractor

2.6.8 Additions & Alterations to Erected Equipment

i. If the OHE work involves modifications /alterations to the existing installations, a detailed foot-by-foot inspection of the proposed section shall be carried out jointly by the representatives of the contractor, Railway & Engineer and a record of inventory of existing materials shall be made.

ii. Engineer may require additional installations or modifications to be carried out on the works he deems necessary, either during the execution or after a part or whole of the installations coming within the purview of the contract has been put in to commercial service. Further it may be necessary and expedient to energize Over Head Equipment, which has been completed and finally adjusted in portions in yards. This will necessitate erection of new equipment in the vicinity of or joining energized equipment. In case the prices for such additional works or modifications are not covered by the schedule of prices and are such that either party considers additional

prices for such works justified, such additional prices proposed by the contractor are accepted by the Engineer. In case additional installations for modifications are required to be carried out under this para, the Engineer shall grant a reasonable extension of time, should it be necessary.

2.6.9 Access to Work Site

i. Access to the site for the purpose of this contract shall be afforded to the contractor by the Engineer at all times. In the execution of the work, no person other than the contractor or his duty appointed representative and bonafide workmen shall have access to the site of work. Access to the site of work at all times shall be allowed by the contractor to officials or approved representative of the Engineer or to Railway staff for purpose of maintenance.
ii. The Engineer shall have the right to refuse admission to the work site of any person employed by the contractor whom the Engineer may consider undesirable.
iii. In this context, the Engineer will not be liable to pay any cost or damage on this account.

2.6.10 **Provisional Acceptance:**

(a) Immediately after completion of works/such part of works, the contractor shall certify and advice the Engineer in writing that the works are
(i) complete
(ii) ready for satisfactory commercial service and
(iii) ready to be handed over.
He will also place at the disposal of the Engineer the required staff for checking it and putting it into operation.

(b) The test or tests as stipulated in KRIDE's standard specifications for Material and Works (Excluding power collection tests which would be carried out subsequently in connection with the taking over by the railway) shall be carried out jointly by the Railway/ Engineer and the contractor within a month after the receipt of the Contractor's notification as stated in sub para above.

(c) The provisions contained in the sub clause 10 of GCC shall be followed for taking over of the installations.

2.6.11 **Use of Rejected Equipment**

In the event of such rejection as aforesaid, the Engineer shall, without prejudice to this other rights and remedies and in particular without prejudice to his rights under the clause just preceding be entitled to the use of the rejected equipment for a time reasonably sufficient to enable him to obtain other replacement. During such period, if the rejected equipment is used commercially the Contractor shall not be entitled to the payment on energisation until such rejected equipment is rectified and /or replaced, but the Engineer shall not be entitled to claim any damages arising out of rejected equipment in respect of such period.

2.6.12 The General Power supply diagram and the Sectioning Diagram (approved in principal) will be prepared by the successful bidder and shall take approval from

Employer/Railways.

The bidder shall be required to prepare the other drawings such as Cross section drawings of foundations etc. as per extant instructions and get them approved from the Engineer/Employer. Contractor shall get soil testing done to verify soil bearing at a stretch of not more than Five km of OHE foundations and at the location of new TSS/SWS and where ever soil strata changes. However, contractor shall verify the Soil bearing capacity as per guidelines.

2.6.13 The successful bidder shall obtain/possess a valid electrical license to handle power system installation electrical equipment, issued by any license issuing authority, in accordance with the relevant provision of Indian Electricity Rule and Amendments thereafter.

2.6.14 Any work pertaining to the project can be asked by Employer/Engineer to be executed anywhere in the concerned section.

2.7 Procurement and storage of materials

2.7.1 Procurement of Electrical Items has to be planned by the contractor in consultation with the Engineer and procurement plan shall be got approved from the Employer before placing any orders for such materials.

Procurement Plan should be prepared in such a manner that those materials which have a shelf life like rubber pads etc may be procured in a staggered manner so that the materials are used before its properties get modified with age. The procurement of materials shall be planned as per the milestone/key activities specified in pursuance to GCC clause 8.3. If the material/product does not remain of required specifications at the time of its actual use, the same will be replaced by the contractor with materials conforming to Specifications at his own cost. Contractor shall use all the materials judiciously and payments will be made only for the work executed portion. Bits and pieces of copper/ steal items and any other likewise items will not counted for payment. Hence contractor shall use all the items/materials to the optimum and to avoid wastage.

The procurement of materials for the works by the contractor shall also be subject to the following:

(i) Procurement Schedule:

SN	Items	Schedule
1	Supply of items under Electrical BOQ	Since design and drawing for the work is part of the Electrical BOQ, normally, the contractor would place his procurement plan as per the drawing & design prepared by him. However, procurement process shall commence for copper and steel items and other related materials as approved by competent authority. The materials maybe procured as per approved plans/drgs. The materials to be procured should be expected to be installed within an year of receipt.
2	The contractor would make out a list of items for which procurement process to start indicating the expected time of arrival at site and installation as per the period indicated above. The concerned GM/Elect would approve the programme.	

(ii) Based on the above schedule, the contractor shall prepare BOQ Schedule/Bill-wise procurement plan and submit a statement in the following format:

Procurement Plan- Installment No.1				
BOQ Bill No:				
Item No.	Description	BOQ Quantity	Quantity planned for procurement	Justification for placing order for procurement (lead, likely month of execution/installation)

Certified that all efforts have been taken to ensure that the quantity of materials being planned for procurement is as per the BOQ and as per the requirement at the site based on approved drawing.

Signature of Contractor

The requirement planned is commensurate with the progress of work and as per approved drawing/ design.

Engineer /PMC:

Manager/Electrical/KRIDE

GM/Electrical/KRIDE

While submitting the 1st stage payment of the materials, a copy of the above approval certificate should accompany the bill/IPC.

(iii) Reconciliation of materials after each milestone is reached: For procurement of materials in subsequent installment(s), the contractor shall enclose along with his proposal, a review statement of consumption already made or likely to be made in respect of materials already procured in the following format:

Review of the materials procured up to Previous Installment					
BOQ Bill No:					
Item No.	Description	Quantity procured upto previous Installment	Quantity Consumed/ installed	Balance Quantity	Remark

Considering the consumption and further targets, second installment of materials may approve for procurement.

Signature of the Contractor

The requirement planned is commensurate with the progress of work and as per approved drawing/ design.

Engineer /PMC

Manager/Electrical/KRIDE:

GM/Elec./KRIDE:

2.7.2. In case the contractor places an order on an approved firm, but the firm is subsequently de-listed before the supply is completed, then in such cases, if there are any outstanding orders on the de-listed firm, then wherever the balance delivery period is available, the extent of supply made by the firm within the original delivery period, shall be accepted provided it passes the inspection of RITES/RDSO/inspecting authority specified in the contract. If the de-listed firm fails to deliver the material within the original delivery period, no extension shall be granted by the contractor to such firms after date of issue of de-listing order. In case where delivery period has expired, no extension shall be granted and all such orders shall be cancelled and a fresh purchase action should be taken.

2.7.3 The plant and materials etc. so procured for the works shall be properly stored on Site and protected against loss, damage or deterioration. For this purpose, the contractor shall make necessary arrangements of store godown/fenced area at site in Railway land as per directions of Engineer. In case the contract is terminated, the Employer shall have the right to take possession of the godown/ store and reasonable cost of such store/ godown shall be determined by the Engineer and included in the Final Payment Certificate

2.7.4. In case, during the currency of the contract, any material/ equipment is supplied by the Employer, the same shall be accounted for and reconciled by the contractor. The procedure for this reconciliation/ accountable shall be decided mutually between the contractor and the Engineer and the Contractor shall abide by this procedure till the completion of the contract.

2.7.5. The Contractor shall liaise with the Engineer to finalize the procedure for taking over of the whole or part of the section and for disposal of the released materials. If the OHE work involves modifications/alterations to the existing installations a detailed foot by foot inspection of the proposed section shall be carried out jointly by the representative of the contractor, Railway and Engineer and a record of inventory of existing materials shall be made.

2.7.6. All released materials shall be handed over to the authorized Railways Representative through the Engineer at the nearest OHE/PSI depot or places nominated by Railways/KRIDE

2.7.7. The material released on account of modifications/alterations shall be accounted by the contractor in the presence of the Engineer and the Railway Representative except for the material permitted to be re-used by the Engineer. For this material, only erection cost shall be paid, under the appropriate item of the schedule.

2.7.8. If any shortfall of released material is noticed at the time of completion of the work, the contractor shall be liable to pay for the shortfall as per the prevailing rates or the same shall be recovered from the final bill of the contractor.

2.7.9. The contractor shall make his own arrangements for storage and protection of materials at his depot as well as at work sites, however in the vicinity of work site if Railway land/ space is available same shall be provided as per terms and conditions of KRIDE/ Railway as applicable.

2.7.10. Equipment/material to be supplied by the contractor should confirm to the latest RDSO/CORE/KRIDE/ Railway specification, drawing & as per IS specification wherever RDSO/CORE/KRIDE/Railway specification are not available.

2.7.11. The material / equipment / T&P to be supplied by the Contractor shall be procured from RDSO/CORE/KRIDE/Railway (as per the extant directives from Railway /KRIDE) approved suppliers, barring those cases where RDSO/CORE/KRIDE/Railway approved supplier/vendors are not available, in such case the material shall be ISI marked/ conforming to latest IS and approval shall be obtained from KRIDE prior to procurement.

Note: The decision of the Engineer shall be final in respect of acceptability or otherwise of any material, fittings, component or equipment required for the work.

2.8 MONTHLY PROGRESS REPORT

The Contractor shall furnish to the Manager/Sr.Manager/DGM/Sr.DGM/GM of KRIDE during the first week of every calendar month, a progress report showing progress of finalization of designs and drawings, materials and equipment received at site and the works carried out during the preceding month and up-to-date progress of these items along with the total quantum of designs and drawings, materials and equipment and the works required for the contract.

For finalizing the scheme for work out-line in above sub-paras, the Contractor shall make use of the latest network analysis techniques like CPM technique, PERT chart etc.

Contractor shall widely use IT (Information Technology) for the purpose of progress reporting and Material Management. The contractor shall make the following information available to the purchaser in the form of reports which shall be uploaded on a Web based system. Following Reports shall be deliverable by the IT management system.

SN	Name of the report	Data update frequency
1	Daily progress report of all OHE works specifying the total quantum, balance quantum, location of work and the work done on the previous day.	Once a day before 09:00 hrs on the following day
2	Weekly progress report of all OHE works specifying the total quantum, balance quantum, location of work and the work done on the previous week.	Once a week on the following Monday before 09:00 hrs
3	Monthly progress report of all OHE works specifying the total quantum, balance quantum, location of work and the work done on the previous Month.	Once a month on the third day of the next MONTH before 09:00 hrs
4	Material requirement sub section wise	After completion of design once. Thereafter on every change in designs.
5	Material consumed, Ground balance and the balance material required	Once in a week on the following Monday at 09:00 hrs
6	Daily, Weekly, Monthly Traffic and Power Block demanded and granted	Once a day/week/month as the case may be for each report at 09:00 hrs.
7	Traffic Block and Power Block plan for next day/week	10:00 hrs each day for the next day requirement

The Reports provided shall be generally be normally in a format which requires smaller network bandwidth to open quickly (within < 5 sec for a 64 kbps band width system).

2.9 CODES & SPECIFICATIONS

2.9.1 GENERAL

Wherever reference is made in the Contract to specific standards and codes to be met by the goods and materials to be furnished and work performed or tested the provisions of the latest current edition or revision of the relevant standards and codes in effect shall apply, unless otherwise expressly stated in the Contract. Where such standards and codes are national or relate to a particular country or region, other authoritative standards which ensure an equal or higher quality than the standards and codes specified will be accepted subject to the Engineer's prior review and written approval. Differences between the standards specified and the proposed alternative standards must be fully described in writing by the Contractor and submitted to the Engineer at least 28 days prior to the date when the Contractor desires the Engineer's approval. In the event the Engineer determines that such proposed deviations do not ensure equal or higher quality, the Contractor shall comply with the standards specified in the documents.

All goods and materials to be incorporated in the goods be new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials unless provided for otherwise in the contract.

(a) The specifications mentioned in these specifications shall be prime governing.

(b) Where there is conflict between provision in IRS & IS specifications, provisions in IRS specifications shall prevail.

(c) Where there is no provision of specifications in IRS, provisions in IS specifications should be adopted. Where there are no provisions in IRS and IS Specifications, provisions in IRC Specifications should be followed.

(d) For items not covered in IRS/IS/IRC specifications, BS-5400 Part 1 to 10 may also be considered.

(e) Where applicable CEB/FIP recommendations and codes of practices shall be used if specific recommendation does not exist in IRS/IRC/BS specifications.

(f) The decision of Engineer shall be final and binding in the interpretation of the clause of the codes of practice and specifications of this tender and no claim whatsoever shall be entertained on this account from the Contractor.

2.10 Alignment : DELETED

2.11 Responsibility for establishing and maintaining working bench marks and alignment markers : DELETED

2.12 INTERFACING AND INTEGRATION OF WORKS

2.12.1 As a part of doubling with Electrification of Heelalige – Hosur section, Construction of quarters, service building, earth work filling, track installation, OHE, PSI, S&T works and Electrical works will be done in this section. Hence interfacing for the purpose of integration of works between different Contractors is of very much importance so that progress of work is not hampered. Coordination between all agencies has to be ensured. Such interfacing for the purpose of integration of works will arise between the partners of JV, in case the work is awarded to a JV or between the Contractor and his sub contractors will arise. This has to be kept in view.

2.12.2 It is the intention of the Employer that the overall interfacing, planning, scheduling, logistic administration inclusive of necessary logistic planning and all tasks that are necessary to guarantee proper co-ordination and proper interfacing of all activities during the complete execution of the works, is clearly understood and agreed to. Integrated programme shall set out in detail how the different contractors will work together in execution of the works. It shall also spell out the overall interfacing, planning, scheduling, logistic administration inclusive of necessary logistic planning and all tasks that are necessary to guarantee proper co-ordination and proper interfacing of the different activities by various agencies during the execution of the works. A master schedule incorporating the milestone of works completion by each contractor shall be included in the integrated programme to demonstrate the capability of all parties involved in the completion of the works. The essence of the integrated programme shall be that the contractors have both overall responsibility for the completeness and the timeliness of all the works and quality of the contractual works within the agreed timeframe. Allowance need to be made by the contractors in their resources and pricing to ensure that proper co-ordination of the various items is incorporated in their contract.

2.12.3 Needless to say that commissioning of this second line project requires close coordination among various agencies executing the works in this section, Engineer, Employer and the Railway authorities. The contractor shall therefore plan all his works requiring interfacing, like works in mid section, station yards, with other agencies, meticulously, in consultation and coordination with all concerned parties, in advance, for expeditious execution, without causing any delay either to his works or those of others.

2.12.4 The contractor shall strictly adhere to the work plan made for works requiring interfacing. Any delay either on his part or on the part of other agencies and other bottlenecks that could affect the pace of works shall be informed to the Engineer in time so as to enable him to take corrective steps.

2.12.5 If, in the opinion of Engineer, any delay in execution of any part of the Project requiring interfacing is attributable to the failures of the contractor to take adequate steps for smooth execution of such works, then the Engineer shall have the right to take necessary steps to organize and streamline such works, including excluding the requisite portion of work from the scope of the Contractor and getting the same executed by other agencies, at the risk and cost of the contractor.

2.13 Survey Equipment:

All survey shall be done with Total Stations and high precision. The contractor should provide the survey equipment and other accessories as per the instructions of Engineer as and when required. He should also provide all necessary help as required by the Engineer for checking the works, whenever required.

2.14 Quality Assurance Materials:

(a) All the equipments, materials, fittings and components will be subject to quality control programme of the manufacturer, being part of the quality Assurance programme of the Contractor. The materials may also be inspected by the Purchaser or his representative either at the manufacturer works or at the Contractor's depot. The Purchaser or his representative shall have the right to be present during all the stages of manufacture and shall be accorded free of charge all reasonable facilities for inspection and testing as well as to examine the stage inspection report of the manufacturer in addition to the quality audit which the Contractor may institute as a part of his programme so as to satisfy himself that the materials are in accordance with specifications, approved drawings and designs and Purchaser's prescribed quality Assurance Standards.

(b) **Erection**
All erection work will also be subjected to the Quality Assurance Programme including inspection by the Purchaser or his representative to ensure that the work is done in accordance with the specifications and approved drawings and designs and Purchaser's prescribed Quality Assurance Standards.

(c) **Expenses of Purchaser's Representative**
All the expenses of Purchaser's representative shall be borne by the Purchaser whether the inspected material is finally utilized in work or not drawings, specification, the contractor shall adopt a suitable quality assurance.
(d) The decision of the Purchaser or his representative shall be final in respect of acceptability or otherwise of any material, fittings, components or equipment's required for the work.

(e) **Quality Assurance Programme**

For proper control of quality and to ensure that the materials, equipment's and fittings are manufactured according to specification and the erection is according to approved instructions, ensure quality at all necessary points, whether at manufacturer's works, or in his depot or at work site as well as during erection. Such quality assurance programme shall also meet the requirement of the Purchaser's Prescribed Quality Assurance Standards. This programme of the Contractor shall generally cover the following:-

1. The organization to manage and implement the Quality Assurance programme.
2. The documentation control system: -
   i) Basic control system.

ii) Adopted at manufacturer's works.
iii) Adopted at the Contractor's Depot and work site.

3. Procedure adopted for :-
   i) Source Inspection.
   ii) Incoming raw material inspection.
   iii) Verification of materials purchased.
   iv) Fabrication controls.
   v) Site erection controls.
4. Inspection and Test Procedure for :-
   i) Manufacture and quality control procedure.
   ii) Field activities.
5. System of handling and storage.
6. System of quality audit.
7. System of maintenance of records.
8. For the purpose of obtaining ` On Account Payment ' the Contractor shall submit along with the invoice, the documents indicated in the Prescribed Quality Assurance Standard which should inter-alia cover the following as may be applicable in each case.
   i) Material test reports on raw materials used.
   ii) Material type and routine test report on components specification.
   iii) Inspection plan with reports of the Inspection plan check points.
   iv) Routine test report.
   v) Factory test results as required under the specification.
   vi) Quality audit report including test check report of Purchaser's representative if any.

3. SITE FACILITIES FOR THE EMPLOYER AND THE ENGINEER

3.0 ***SINGLE PACKAGE:*** Design, Supply, Erection, Testing & Commissioning of 25 KV, AC, 50 Hz, Single Phase, Traction Over Head Equipment for Railway Electrification of Heelalige (km.180) (Excluding) – Hosur (km.159) (Including) Section (25 Track Kilometers approximately) under Doubling Project of Bangalore division.

3.1 GENERAL

The Contractor shall provide for the use of the Employer/Engineer equipment, communication & drawing facilities throughout the course of the work and for such period of time during the defects liability period as the employer & Engineer may require, The details of the accommodation & the other facilities are detailed below:

All the facilities under this clause will continue to be maintained by the Contractor free of cost till the defect liability period is over. Thereafter the Contractor shall dismantle the building and take away all the materials & equipment etc which will be the property of the Contractor.

3.2 SITE OFFICES : DELETED

3.3 FURNITURE AND OTHER OFFICE EQUIPMENT : DELETED

3.4 TRANSPORT : DELETED

3.5 OFFICE/DEPOT MAINTENANCE :

3.5.1 The contractor is required to maintain the office/Depot throughout the contract period and defect liability period and provide the following, but not limited to:

i. Pay all electricity charges.
ii. Pay all water charges.
iii. Carry out necessary repairs to office and equipment as and when required.
iv. Day - to - Day cleaning and maintenance and watch & ward etc

3.5.2 The contractor shall provide within Two months from the Date of Commencement following personnel in the office as required for watch and ward of the office/Depot. Watchmen / Security(3 shifts of 1 men in a shift, till the defect Liability period is over)

Note: In case of delay beyond two months, penalty @ Rs 5000/- Per week or part thereof will be imposed.

3.6 EQUIPMENT FOR USE AT SITE OFFICE.

The Contractor shall provide new equipment and software as listed below and maintain them for the exclusive use of the Employer and the Engineer. The Contractor shall provide and maintain the following equipment for the use of the Engineer and the Employer within one month from the date of commencement of the works until the defect liability period is over. The payment for the same shall be made separately under relevant BOQ item. On completion of defect liability period, the equipment shall be property of the Contractor.

(a)	Desktop Computer two Nos.	With minimum specification of Intel Core i7/i9, 3.4 GHz, 3 MB Cache, 8 GB DDR3 RAM, 500 GB Hard Disk Drive, 21" colour TFT monitor, 10/100 LAN Card, Modem Card, Operating System - Windows 10 Professional or higher preloaded with media and documentation and certificate of authenticity and Microsoft Security Essentials preloaded antivirus software.
(b)	Laptop rugged – One Nos.	With minimum specification of Intel Core i7/i9, 8 GB RAM, 500 GB Hard Disk Drive, 15" color display, 2xUSB-2.0, standard keyboard Weight - not more than 2.5 kg, Battery backup - minimum 4 hrs Operating System - Windows 10 or higher preloaded with media and documentation and certificate of authenticity and Microsoft Security Essentials preloaded antivirus software. A laptop bag and Adapter/Battery charger shall also be provided with the laptop.
(c)	Printers – 2 nos. (A4 size – 1 No. and A3 size – 1 No.)	The A4 size colour printer cum scanner cum copier shall be all in one officejet having features of Fax, Scanner and Printer, A3 size printer cum scanner cum copier shall be Colour Officejet with a print speed of up to 8 pages at 800 dpi or More.
(d)	Application Software	(i) Microsoft Office Latest release (ii) AUTOCAD 3D 2015 (iii) M.S. PROJECT /Sure Track (iv) PDF Converter/Professional
(e)	UPS system with sufficient power backup (with minimum backup time of 30 minute) to meet the sufficient power load in case of power disruption.	

(g)	Power supply for the systems is to be AC 240 volts, 50 Hz from normal building wiring circuit mains, power regulator, stabilizer or transformer should be supplied by the Contractor for the computer systems such that the systems can function efficiently.
(h)	At least 20 MBPS internet connection with wifi facility so that multiple devices can be connected.
(i)	50 MBPS wifi HotSpot/USB Dongle with 4 GB data connection and minimum monthly download limit of 50 GB for use with laptops – two nos.

Note: In case of failure to provide the equipment including original software & internet connectivity within one month, penalty @ Rs 25000/- Per week or part thereof will be imposed

3.7 Documentation:

A complete set of documentation will be supplied with each System. The documentation should be self-tutorial in nature and be readily understood by non-computer personnel. The following manuals will be supplied with the system:

(a) Manual on how to operate the equipment; and

(b) Manual on how to use the facilities and software provided by the supplier (including languages and utilities).

4. SPECIFICATIONS

SINGLE PACKAGE: Design, Supply, Erection, Testing & Commissioning of 25 KV, AC, 50 Hz, Single Phase, Traction Over Head Equipment for Railway Electrification of Heelalige (km.180) (Excluding) – Hosur (km.159) (Including) Section (25 Track Kilometers approximately)under Doubling Project of Bangalore division

4.1 Separate priced booklet containing Indian Railway/South Western Railway Standard Specifications for Materials and Works Civil, Electrical and Signalling and Telecommunication) are available in K RIDE office. These specifications shall be applicable for all works covered in this contract.
It is presumed that bidders have gone through the above (including latest correction slips issued up to the date 28 days prior to the deadline for submission of bids) before quoting the rates.

4.2 Contractor has to make arrangements for approach to site, stacking of materials and all temporary works necessary for the execution of work at his own cost.

4.3 Contractor will have to make arrangements for required tests (as directed by the Engineer) for testing the soundness of the work or any of the materials at Contractor's own cost.

4.4 Sampling and testing of work/material at site/laboratory shall be as per the relevant Indian Standard Specifications, with up to date corrections.

4.5 If any work is found unsatisfactory or under specification the same will have to be redone by the Contractor at Contractor's own cost. In case, the Contractor fails to do so, the same will be got done by Engineer at the Contractor's cost.

4.6 The Engineer will be at liberty to get any work or material dismantled/removed by any other means at Contractor's cost if it is found unsatisfactory or under specification, and the contractor fails to rectify the same within specified time.

4.7 The site shall be cleared of all debris etc. before commissioning of work.

4.8 The contractor shall take all necessary safety precautions during fabrication, erection etc. He shall also ensure safety of railway track if the work is required to be done near the track or above railway tracks.

4.9 In case there is any damage to road, drain or other structure during construction of the work by the contractor, the damages will have to be rectified by the contractor at his own cost.

5. Personnel

SINGLE PACKAGE:

Design, Supply, Erection, Testing & Commissioning of 25 KV, AC, 50 Hz, Single Phase, Traction Over Head Equipment for Railway Electrification of Heelalige (km.180) (Excluding) – Hosur (km.159) (Including) Section (25 Track Kilometers approximately) under Doubling Project of Bangalore division

The Bidder shall deploy, as per the programme, the minimum number of personnel for the key positions with requisite qualification and experience as mentioned hereunder:-

S. No.	Position	Minimum No. of Personnel	Qualification	Minimum Experience In Similar Work [years]
1	Project Manager	1	Graduate/ Diploma in Electrical Engineering	10 years, out of which 3 years in-charge of Railway project in OHE (for Graduate). 16 years, out of which 3 years in-charge of Railway project in OHE (for Diploma).
2	Sr. Engineers i) for OHE ii) for General electrical	1	Graduate/ Diploma in Electrical Engg.	5 Years (for Graduate) 10 years for Diploma
3	Technicians/Supervisors			
	(a) for OHE	3	Minimum Diploma in Electrical Engineering	5 years
4	Draftsman with knowledge of AutoCAD Electrical	1	Minimum Diploma in Electrical Engineering	3 years
5	Safety Officer	1	Preferably Graduate on any discipline. But have completed Diploma in Industrial safety management Or construction management	5 years

Note:

(1)Project Manager is to be deployed within 30 days of issue of Letter of Acceptance. The programme for deployment of other personnel shall be conveyed by PMC/Employer and personnel shall be deployed within 30 days

of the stated requirement. In case of failure to deploy any personnel within 30 days of the stated requirement, a penalty shall be imposed for each day of delay as under:

(2)Rs 2000/- per person per day for Project Manager.

(3)Rs 1000/- per person per day for Sr. Engineers; Quality Assurance Specialist/ Quality Officer

(4)Rs 500/- per person per day for other personnel.

(5)On completion/likely completion of activities concerned to a particular personnel, demobilization of that personnel shall be requested by the Contractor at least 30 days in advance and demobilization shall be done with the approval of PMC/Employer only. In case demobilization is done without approval of PMC/Employer, the penalty mentioned in note (1) above, as relevant, shall be imposed for each day of absence of the personnel.

(6)The professional qualification requirement can be relaxed by the concerned GM (Electrical)/K RIDE in case of ex-Railwayman who has worked in Engineering department of Railway in a position of Gazetted officer for Sr Engineer (OHE/PSI/Genl.Elec.) / Junior Engineer or above for Supervisor (OHE/PSI/Genl.Elec) and has relevant experience not less than that prescribed for minimum professional qualification.

(7)The experience requirement can be relaxed by the concerned GM (Electrical) /K RIDE if he is satisfied with reasons put forth by the contractor for failure to deploy personnel with requisite qualification and experience and he also finds the proposed personnel otherwise suitable for the job.

(8) The above manpower is bare minimum and not limited to. The contractor has to put additional manpower required as per the Project requirement or as decided by the Purchaser.

NOTE:

The Contractor shall employ proper managerial & Technical Personnel during the execution of this work. The Personnel deployed shall have adequate Experience & thorough knowledge of the works to be executed including the Specifications & proceedings involved.

The List of Technical staff along with copy of their bio-data and Degree/Diploma certificate shall be submitted to the Engineer-in-charge within 15 days from the date of issue of LOA. The approval of Engineer in charge is to be obtained for engaging them for this specified works. The period of deployment of Technical staff covers from 15 days after the date of issue of LOA till the works are completed and handed over to K-RIDE.

6. Equipment

SINGLE PACKAGE:

Design, Supply, Erection, Testing & Commissioning of 25 KV, AC, 50 Hz, Single Phase, Traction Over Head Equipment for Railway Electrification of Heelalige (km.180) (Excluding) – Hosur (km.159) (Including) Section (25 Track Kilometers approximately) under Doubling Project of Bangalore division

The Bidder shall deploy, as per the mutually agreed programme, the minimum number of equipments for execution of the work as mentioned hereunder: The contractor must ensure the below mentioned Equipment separately for Each package.

Equipment Type and Characteristics		
Sl No.	**Equipment type and characteristics for OHE**	**Min. Number Required**
1	Tirfor 3/1.5 T Cap	6 No.
2	Pull lift 3/1.5 T Cap	6 No
3	Come along clamp	6 No
4	Chain Pulley Block	10 No.
5	“D” Shackle	20 No.
6	Tripod	3 No.
7	Derrick	3 No.
8	Mandrill (50cm dia.)	6 No.
9	Ladder Extension Type (20’ x 36’)	3 No.
10	Ladder trolly P/F type	3 No.
11	Drum lifting jacks	2 Sets
12	Gas cutter	2 No.
13	Grinder	1 No.
14	Power Hacksaw	2 No.
15	Dropper making jig & Fixure	3 No,
16	Megger 2.5 KV	2 No.
17	Megger 5 KV	2 No.
18	Earth Tester	2 No.
19	Bonding Jig	3 No.

20	Vibrator for foundations	2 No.
21	Emergency lighting arrangement for night work.	1 Set
22	Manila rope	10 m x 10 Nos.
23	Spanners	8 Sets
24	Hammers 1.5 Lbs.	2 No.
25	Hammers 3.0 Lbs	2 No..
26	Discharge rod	10 No..
27	D O operating rod	2 No.
28	Rail Jumper	10 No.
29	Aero plane Jack	5 No..

Note:

1. Failure to deploy the above equipment as per mutually agreed programme shall attract penalty @ Rs.20,000/- per day of delay for each equipment
2. The type of equipment specified can be changed by the Engineer depending upon suitability of the equipment as per site conditions with the approval of competent authority concerned subject to the following;

   (i) The total rate of production/output of proposed number and type of equipments should be equal to or more than that of the number and type of equipments stipulated in the contract agreement and quality of work is not compromised in any way.

   (ii) Eligibility and Qualification Criteria (EQC) in the bid document did not include any past experience criteria of execution of a key activity with the use of particular type of equipment proposed to be changed;

   (iii) Higher rates for works were not justified in the estimate or BOQ on account of use of particular type of equipment proposed to be changed;

   (iv) Financial implications due to change in type and number of equipment shall be prepared and signed by both the parties and placed on record. If any financial benefit is found to accrue to the contractor, the same shall be recoverable from the contractor's bills.

   (v) If the equipment proposed to be changed is covered under penalty clause specified in note above then the applicable rate of penalty per equipment shall be modified in proportion to increase/decrease in number of equipments."

3. Any equipment not required further can be demobilized with the prior approval of the Engineer.The records of mutually agreed programme of deployment as well as request for demobilisation of any equipment/plant and approval of the same should be maintained in a register.

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PART III	Conditions of Contract and Contract Forms

Section 6	General Conditions of Contract (GCC)

Section 6	General Conditions of Contract (GCC)

Table of Clauses

1. General Provisions

1.1 Definitions

In the Conditions of Contract ("these Conditions"), which include Special Conditions of Contract, Parts A and B, and these General Conditions, the following words and expressions shall have the meanings stated. Words indicating persons or parties include corporations and other legal entities, except where the context requires otherwise.

1.1.1 The Contract

1.1.1.1 "**Contract**" means the Contract Agreement, the Letter of Acceptance, the Letter of Bid, these Conditions, the Specification, the Drawings, the Schedules, and the further documents (if any) which are listed in the Contract Agreement or in the Letter of Acceptance.

1.1.1.2 "**Contract Agreement"** means the contract agreement (*if any*) **referred** to in Sub-Clause 1.6 [Contract Agreement].

1.1.1.3 **"Letter of Acceptance**" means the letter of formal acceptance, signed by the Employer, of the Letter of Bid, including any annexed memoranda comprising agreements between and signed by both Parties. If there is no such letter of acceptance, the expression "Letter of Acceptance" means the Contract Agreement and the date of issuing or receiving the Letter of Acceptance means the date of signing the Contract Agreement.

1.1.1.4 **"Letter of Bid"** means the document entitled letter of bid, which was completed by the Contractor and includes the signed offer to the Employer for the Works.

1.1.1.5 **"Specification**" means the document entitled specification, as included in the Contract, and any additions and modifications to the specification in accordance with the Contract. Such document specifies the Works.

1.1.1.6 **"Drawings"** means the drawings of the Works, as included in the **Contract**, and any additional and modified drawings issued by (or on behalf of) the Employer in accordance with the Contract.

1.1.1.7 **"Schedules"** means the document(s) entitled schedules, completed by the Contractor and submitted with the Letter of Bid, as included in the Contract. Such document may include the Bill of Quantities, data, lists, and schedules of rates and/or prices.

1.1.1.8 **"Bid/Tender"** means the Letter of Technical Bid **and** Letter of Price Bid and all other documents which the Contractor submitted with the Letter of Technical Bid and Letter of Price Bid , as included in the Contract.

1.1.1.9 **"Bill of Quantities"** and **"Daywork Schedule**" and "Schedule of Payment Currencies" mean the documents so named (if any) which are comprised in the Schedules.

1.1.1.10 **"Contract Data"** means the pages completed by the Employer entitled

contract data which constitute Part A of the Special Conditions of Contract.

1.1.1.11 **"Employer's Requirements"** means the document entitled 'Employer's Requirements' as part of Works Requirements and as included in the Contract, and any additions and modifications to such document in accordance with the Contract. Such document specifies the purpose, scope, and/or design and/or other technical criteria, for the works.

1.1.2 Parties and Persons

1.1.2.1 **"Party"** means the Employer or the Contractor, as the context requires.

1.1.2.2 **"Employer"** means the person named as employer in the Contract Data and the legal successors in title to this person.

1.1.2.3 **"Contractor"** means the person(s) named as contractor in the Letter of Bid accepted by the Employer and the legal successors in title to this person(s).

1.1.2.4 **"Engineer"** means the person nominated by the Employer to act as the Engineer for the purposes of the Contract and named in the Contract Data, or other person appointed from time to time by the Employer and notified to the Contractor under Sub-Clause 3.4 [Replacement of the Engineer]. The person nominated to act as an engineer may be an employee of Rail Infrastructure Development Company (Karnataka) Ltd (K RIDE) or an employee of a Project Management Consultancy firm engaged by K RIDE for project management as per the discretion of the Employer.

1.1.2.5 **"**Contractor's **Representative"** means the person named by the Contractor in the Contract or appointed from time to time by the Contractor under Sub-Clause 4.3 [Contractor's Representative], who acts on behalf of the Contractor.

1.1.2.6 "Employer's **Representative"** means the person named by the Employer in the Contract or appointed from time to time by the Employer who acts on behalf of the Employer.

1.1.2.7 **"Employer's Personnel"** means the Engineer, the assistants referred to in Sub-Clause 3.2 [Delegation by the Engineer] and all other staff, labour and other employees of the Engineer and of the Employer; and any other personnel notified to the Contractor, by the Employer or the Engineer, as Employer's Personnel.

1.1.2.8 **"Contractor's Personnel"** means the Contractor's Representative and all personnel whom the Contractor utilises on Site, who may include the staff, labour and other employees of the Contractor and of each Subcontractor; and any other personnel assisting the Contractor in the execution of the Works.

1.1.2.9 **"**Subcontractor**"** means any person named in the Contract as a subcontractor, or any person appointed as a subcontractor, for a part of the Works; and the legal successors in title to each of these persons.

1.1.3 Dates, Tests, Periods and Completion

1.1.3.1 **"Base Date"** means the date 28 days prior to the deadline for submission of

bids.

1.1.3.2 **"**Commencement **Date**" means the date notified under Sub-Clause 8.1 [Commencement of Works].

1.1.3.3 **"Time for Completion"** means the time for completing the Works or a Section (as the case may be) under Sub-Clause 8.2 [Time for Completion], as stated
in the Contract Data (with any extension under Sub-Clause 8.4 [Extension of Time for Completion]), calculated from the Commencement Date.

1.1.3.4 **"Tests on Completion"** means the tests which are specified in the Contract or agreed by both Parties or instructed as a Variation, and which are carried out under Clause 9 [Tests on Completion] before the Works or a Section (as the case may be) are taken over by the Employer.

1.1.3.5 **"Taking-Over Certificate"** means a certificate issued under Clause 10 [Employer's Taking Over].

1.1.3.6 **"Tests after Completion"** means the tests (if any) which are specified in the Contract and which are carried out in accordance with the Specification after the Works or a Section (as the case may be) are taken over by the Employer.

1.1.3.7 **"Defects Notification Period"** means the period for notifying defects in the Works or a Section (as the case may be) under Sub-Clause 11.1 [Completion of Outstanding Work and Remedying Defects], as stated in the Contract Data (with any extension under Sub-Clause 11.3 [Extension of Defects Notification Period]), calculated from the date on which the Works or Section is completed as certified under Sub-Clause 10.1 [Taking Over of the Works and Sections].

1.1.3.8 **"Performance Certificate"** means the certificate issued under Sub-Clause 11.9 [Performance Certificate].

1.1.3.9 "**Day"** means any (working or non-working) calendar day from 00:00 hrs. to 24:00 hrs.

1.1.3.10 **"Months"** means any calendar month of the Gregorian calendar year.

1.1.3.11 **"Year"** means 365 days

1.1.3.12 "**Time** Periods" Any reference to time period commencing "from" the specified day or date "till" or "until" a specified day shall include both such days.

1.1.3.13 Any reference to **"Time"** shall be according to Indian Standard Time (IST).

1.1.4 Money and Payments

1.1.4.1 "Accepted Contract Amount" means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects. In the Letter of Acceptance, the Accepted Contract Amount shall have two components i.e. (i) the base amount excluding GST (ii) GST component (calculated at the rate for works contract service as per GST Laws).

1.1.4.2 **"Contract Price"** means the price defined in Sub-Clause 14.1 [The Contract Price], and includes adjustments in accordance with the Contract.

1.1.4.3 **"Cost"** means all expenditure reasonably incurred (or to be incurred) by the Contractor, whether on or off the Site, including overhead and similar charges, but does not include profit.

1.1.4.4 **"Final** Payment **Certificate"** means the payment certificate issued under Sub-Clause 14.13 [Issue of Final Payment Certificate].

1.1.4.5 **"Final Statement"** means the statement defined in Sub-Clause 14.11 [Application for Final Payment Certificate].

1.1.4.6 **"Foreign Currency"** means a currency in which part (or all) of the Contract Price is payable, but not the Local Currency.

1.1.4.7 **"Interim Payment Certificate**" means a payment certificate issued under Clause 14 [Contract Price and Payment], other than the Final Payment Certificate.

1.1.4.8 **"Local Currency"** means the currency in Indian Rupees.

1.1.4.9 **"Payment Certificate"** means a payment certificate issued under Clause 14 [Contract Price and Payment].

1.1.4.10 **"Provisional Sum"** means a sum (if any) which is specified in the Contract as a provisional sum, for the execution of any part of the Works or for the supply of Plant, Materials or services under Sub-Clause 13.5 [Provisional Sums].

1.1.4.11 **"Retention Money"** means the accumulated retention moneys which the Employer retains under Sub-Clause 14.3 [Application for Interim Payment Certificates] and pays under Sub-Clause 14.9 [Payment of Retention Money].

1.1.4.12 **"Statement"** means a statement submitted by the Contractor as part of an application, under Clause 14 [Contract Price and Payment], for a payment certificate.

1.1.5 Works and Goods

1.1.5.1 **"Contractor's Equipment**" means all apparatus, machinery, vehicles and other things required for the execution and completion of the Works and the remedying of any defects. However, Contractor's Equipment excludes Temporary Works, Employer's Equipment (if any), Plant, Materials and any other things intended to form or forming part of the Permanent Works.

1.1.5.2 **"Goods"** means Contractor's Equipment, Materials, Plant and Temporary Works, or any of them as appropriate.

1.1.5.3 **"Materials"** means things of all kinds (other than Plant) intended to form or forming part of the Permanent Works, including the supply-only materials (if any) to be supplied by the Contractor under the Contract.

1.1.5.4 **"Permanent Works"** means the permanent works to be executed by the Contractor under the Contract.

1.1.5.5 **"Plant"** means the apparatus, machinery and vehicles intended to form or

forming part of the Permanent Works.

1.1.5.6 **"Section**" means a part of the Works specified in the Contract Data as a Section (if any).

1.1.5.7 **"Temporary Works"** means all temporary works of every kind (other than Contractor's Equipment) required on Site for the execution and completion of the Permanent Works and the remedying of any defects.

1.1.5.8 **"Works"** mean the Permanent Works and the Temporary Works, or either of them as appropriate.

1.1.6 Other Definitions

1.1.6.1 **"Contractor's** Documents" means the calculations, computer programs and other software, drawings, manuals, models and other documents of a technical nature (if any) supplied by the Contractor under the Contract.

1.1.6.2 **"Country**" means India, the country in which the Site (or most of it) is located, where the Permanent Works are to be executed.

1.1.6.3 **"Employer's Equipment**" means the apparatus, machinery and vehicles (if any) made available by the Employer for the use of the Contractor in the execution of the Works, as stated in the Specification; but does not include Plant which has not been taken over by the Employer.

1.1.6.4 **"Force Majeure**" is defined in Clause 19 [Force Majeure].

1.1.6.5 **"Laws"** means all national (or state) legislation, statutes, ordinances and other laws, and regulations and by-laws of any legally constituted public authority.

1.1.6.6 **"Performance Security**" means the security (or securities, if any) under Sub-Clause 4.2 [Performance Security].

1.1.6.7 **"Site"** means the places where the Permanent Works are to be executed and to which Plant and Materials are to be delivered, and any other places as may be specified in the Contract as forming part of the Site.

1.1.6.8 **"Unforeseeable**" means not reasonably foreseeable and against which adequate preventive precautions could not reasonably be taken by an experienced contractor by the date for submission of the Bid.

1.1.6.9 **"Variation**" means any change to the Works, which is instructed or approved as a variation under Clause 13 [Variations and Adjustments].

1.1.6.10 **"Railway"** means a railway, or any portion of a railway for public carriage of passengers and goods as defined in the Railways ACT 1989. Any reference to railway means the Indian Railways and the respective Zonal Railway

1.2 Interpretation

In the Contract, except where the context requires otherwise:

(a) words indicating one gender include all genders;

(b) words indicating the singular also include the plural and words indicating the plural

also include the singular;

(c) provisions including the word “agree,” “agreed” or “agreement” require the agreement to be recorded in writing;

(d) “written” or “in writing” means hand-written, type-written, printed or electronically made, and resulting in a permanent record; and

(e) the word “tender” is synonymous with “bid”, and “tenderer” with “bidder” and the words “tender documents” with “bidding documents”

The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions.

In these Conditions, provisions including the expression "Cost plus profit" require this profit to be one twentieth (5%) of this Cost unless otherwise indicated in the Contract Data.

1.3 Communications

Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices, requests and discharges, these communications shall be:

(a) in writing and delivered by hand (against receipt), sent by mail or courier, or transmitted using any of the agreed systems of electronic transmission as stated in the Contract Data; and

(b) delivered, sent or transmitted to the address for the recipient’s communications as stated in the Contract Data. However:

  (i) if the recipient gives notice of another address, communications shall thereafter be delivered accordingly; and

  (ii) if the recipient has not stated otherwise when requesting an approval or consent, it may be sent to the address from which the request was issued.

Approvals, certificates, consents and determinations shall not be unreasonably withheld or delayed. When a certificate is issued to a Party, the certifier shall send a copy to the other Party. When a notice is issued to a Party, by the other Party or the Engineer, a copy shall be sent to the Engineer or the other Party, as the case may be.

1.4 Law and Language

The Contract shall be governed by the law of the country or other jurisdiction stated in the Contract Data.

The ruling language of the Contract shall be that stated in the Contract Data.

The language for communications shall be that stated in the Contract Data. If no language is stated there, the language for communications shall be the ruling language of the Contract.

1.5 Priority of 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:

(a) the Contract Agreement (if any),

(b) the Letter of Acceptance,

(c) the Letter of bid,

(d) the Schedules (including Priced Bill of Quantities),

(e) Special Conditions of Contract:

(i) Part A – Contract Data

(ii) Part B - Specific Provisions

(f) the General Conditions of Contract

(g) Works/Employer's Requirements,

(h) the Drawings,

(i) any other documents forming part of the Contract.

If an ambiguity or discrepancy is found in the documents, the Engineer shall issue any necessary clarification or instruction.

1.6 Contract Agreement

The Parties shall enter into a Contract Agreement within 28 days after the Contractor receives the Letter of Acceptance, unless they agree otherwise. The Contract Agreement shall be based upon the form annexed to the Special Conditions of Contract. The costs of stamp duties and similar charges (if any) imposed by law in connection with entry into the Contract Agreement shall be borne by the Employer.

1.7 Assignment

Neither Party shall assign the whole or any part of the Contract or any benefit or interest in or under the Contract. However, either Party:

(a) may assign the whole or any part with the prior agreement of the other Party, at the sole discretion of such other Party, and

(b) may, as security in favour of a bank or financial institution, assign its right to any moneys due, or to become due, under the Contract.

1.8 Care and Supply of Documents

The Specification and Drawings shall be in the custody and care of the Employer. Unless otherwise stated in the Contract, two copies of the Contract and of each subsequent Drawing shall be supplied to the Contractor, who may make or request further copies at the cost of the Contractor.

Each of the Contractor's Documents shall be in the custody and care of the Contractor, unless and until taken over by the Employer. Unless otherwise stated in the Contract, the Contractor shall supply to the Engineer six copies of each of the Contractor's Documents.

The Contractor shall keep, on the Site, a copy of the Contract, publications named in the Specification, the Contractor's Documents (if any), the Drawings and Variations and other communications given under the Contract. The Employer's Personnel shall have the right

of access to all these documents at all reasonable times.

If a Party becomes aware of an error or defect in a document which was prepared for use in executing the Works, the Party shall promptly give notice to the other Party of such error or defect.

1.9 Delayed Drawings or Instructions

The Contractor shall give notice to the Engineer whenever the Works are likely to be delayed or disrupted if any necessary drawing or instruction is not issued to the Contractor within a particular time, which shall be reasonable. The notice shall include details of the necessary drawing or instruction, details of why and by when it should be issued, and details of the nature and amount of the delay or disruption likely to be suffered if it is late.If the Contractor suffers delay and/or incurs Cost as a result of a failure of the Engineer to issue the notified drawing or instruction within a time which is reasonable and is specified in the notice with supporting details, the Contractor shall give a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

(a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

(b) payment of any such Cost , which shall be included in the Contract Price.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

However, if and to the extent that the Engineer's failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time, Cost or profit

1.10 Employer's Use of Contractor's Documents

As between the Parties, the Contractor shall retain the copyright and other intellectual property rights in the Contractor's Documents and other design documents made by (or on behalf of) the Contractor.

The Contractor shall be deemed (by signing the Contract) to give to the Employer a non-terminable transferable non-exclusive royalty-free licence to copy, use and communicate the Contractor's Documents, including making and using modifications of them. This licence shall:

(a) apply throughout the actual or intended working life (whichever is longer) of the relevant parts of the Works,

(b) entitle any person in proper possession of the relevant part of the Works to copy, use and communicate the Contractor's Documents for the purposes of completing, operating, maintaining, altering, adjusting, repairing and demolishing the Works, and

(c) in the case of Contractor's Documents which are in the form of computer programs and other software, permit their use on any computer on the Site and other places as envisaged by the Contract, including replacements of any computers supplied by the Contractor.

The Contractor's Documents and other design documents made by (or on behalf of) the Contractor shall not, without the Contractor's consent, be used, copied or communicated to a third party by (or on behalf of) the Employer for purposes other than those permitted

under this Sub-Clause.

1.11 Contractor's Use of Employer's Documents

As between the Parties, the Employer shall retain the copyright and other intellectual property rights in the Specification, the Drawings and other documents made by (or on behalf of) the Employer. The Contractor may, at his cost, copy, use, and obtain communication of these documents for the purposes of the Contract. They shall not, without the Employer's consent, be copied, used or communicated to a third party by the Contractor, except as necessary for the purposes of the Contract.

1.12 Confidential Details

The Contractor shall disclose all such confidential and other information as the Engineer may reasonably require in order to verify the Contractor's compliance with the Contract.

The Contractor shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out the Contractor's obligations under the Contract or to comply with applicable Laws. The Contractor shall not publish or disclose any particulars of the Works without the previous agreement of the Employer. However, the Contractor shall be permitted to disclose any publicly available information, or information otherwise required to establish his qualifications to compete for other projects.

1.13 Compliance with Laws

The Contractor shall, in performing the Contract, comply with applicable Laws. Unless otherwise stated in the Special Conditions of Contract:

(a) the Employer shall have obtained (or shall obtain) the planning, zoning or similar permission for the Permanent Works, and any other permissions described in the Specification as having been (or being) obtained by the Employer; and the Employer shall indemnify and hold the Contractor harmless against and from the consequences of any failure to do so; and

(b) the Contractor shall give all notices, pay all taxes, duties and fees, and obtain all permits, licences and approvals, as required by the Laws in relation to the execution and completion of the Works and the remedying of any defects; and the Contractor shall indemnify and hold the Employer harmless against and from the consequences of any failure to do so.

1.14 Joint and Several Liability

If the Contractor constitutes (under applicable Laws) a joint venture of two or more persons/firms:

(a) these persons shall be deemed to be jointly and severally liable to the Employer for the performance of the Contract;

(b) these persons shall notify the Employer of their leader who shall have authority to bind the Contractor and each of these persons; and

(c) the Contractor shall not alter its composition or legal status without the prior consent

of the Employer.

(d) In the event of default by any partner of joint venture, on or after achieving 25% of the financial progress (excluding advance if any) the lead partner or remaining partner(s), in case the defaulting partner is the lead partner, shall notify the Employer within twenty eight (28) days of the occurrence and within Fifty six (56) days of the said notification, the lead partner or remaining partner(s), who are not the defaulting partner, shall assign the works of the defaulting partner, to equally competent party with prior consent of the Employer. For this purpose the term "equally competent party" shall mean as under:

"The new JV partner replacing the defaulting partner should meet the EQC requirement of package/combination of packages which was met by the defaulting partner on the basis of which the original tender was awarded."

The replacement of any defaulting partner, with the new partner shall be subject to the condition that the new partner has to submit additional performance security equal to 10% of balance cost of work of the JV partner being replaced. The performance security submitted by the defaulting partner shall also continue with K RIDE till satisfactory completion of the work.

e) Notwithstanding the consent of the Employer for change in composition or legal status of the joint venture the partners shall continue to be jointly and severally liable to the Employer.

f) The joint venture shall enter into a joint venture agreement incorporating the provisions of sub-paras (a) to (e) based upon the form annexed to the Conditions of Contract. The JV agreement shall indicate precisely the specific role of all members of the JV in respect of planning, design, construction equipment, key personnel, work execution, and financing of the project. The authority to sign the agreement shall be evidenced by approved legal instruments.

Notwithstanding the contents of the sub-clauses above, if the performance of any JV partner is not found satisfactory by the Employer, in respect of the responsibilities assigned to him as per JV agreement which is a part of this agreement, the Employer may issue notice of such default to the said JV partner or the JV (depending upon reasons of default) and declare the said JV partner or the JV as Poor Performer. The issue of such notice shall automatically debar the JV partner or JV as the case may be from participating in any K RIDE tender from the date of issue of notice of default.

1.15 Inspections by the Employer

The Contractor shall permit the Employer and/or persons appointed by the Employer to inspect the Site and/or the Contractor's records relating to the performance of the Contract.

1.16 Bidder's Credentials:

The bidder shall submit an affidavit on a stamp paper to the effect that all the documents submitted by her along with her bid are true. This shall be mandatory all bids. The bid shall be summarily rejected if the bidder fails to submit this undertaking along with the bid.

After opening the financial bid, the tender committee shall verify the credentials of the bidder who is declared as the lowest bidder(L1)for their authenticity. In case the credentials of L1 are not found to be in order, her bid shall be treated as technically unresponsive and thus invalid. The process shall be repeated for the next higher bidder till the valid L1 is established. If any document (or copy thereof) submitted by a bidder is found to be false/forged:

(a) The bidder/each partner/member of the bidding firm shall be liable to legal actions apart from punitive actions, as decided by competent authority of K-RIDE. In such an eventuality. The bid shall also be summarily rejected.

(b) If the contract has already been awarded, or Letter of Acceptance (LoA) has been issued and in the event of any failure to comply with the above, the contract shall be terminated, irrespective of the stage of progress in execution of the work. In such an eventuality, Security Deposit (SD), performance Guarantee (PG) and partial/full payments otherwise due to the contractor, in respect of the partial/full work executed by the contractor, shall be forfeited by the K-RIDE.

(c) Other punitive actions, like banning the bidder and partners/members of the biding firm for future dealings with K-RIDE/Government of India/ Government of Karnataka may also be taken.

2	The Employer

2.1 Right of Access to the Site

The Employer shall give the Contractor right of access to, and possession of, all parts of the Site within the time (or times) stated in the Contract Data. The right and possession may not be exclusive to the Contractor. If, under the Contract, the Employer is required to give (to the Contractor) possession of any foundation, structure, plant or means of access, the Employer shall do so in the time and manner stated in the Specification. However, the Employer may withhold any such right or possession until the Performance Security has been received.

If no such time is stated in the Contract Data, the Employer shall give the Contractor right of access to, and possession of, the Site within such times as may be required to enable the Contractor to proceed in accordance with the programme submitted under Sub-Clause 8.3 [Programme].

If the Contractor suffers delay as a result of a failure by the Employer to give any such right or possession within such time, the Contractor shall give notice to the Engineer and shall be entitled to:

(a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

(b) new rates in terms of clause 12.3.1 (c) .

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

However, if and to the extent that the Employer's failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time or new rates.

2.2 Permits, Licenses or Approvals

The Employer shall (where he is in a position to do so) provide reasonable assistanceto the Contractor at the request of the Contractor:

(a) by obtaining copies of the Laws of the Country which are relevant to the Contract but are not readily available, and

(b) for the Contractor's applications for any permits, licences or approvals required by the Laws of the Country:

  (i) which the Contractor is required to obtain under Sub-Clause 1.13 [Compliance with Laws],

  (ii) for the delivery of Goods, including clearance through customs, and

  (iii) for the export of Contractor's Equipment when it is removed from the Site.

2.3 Employer's Personnel

The Employer shall be responsible for ensuring that the Employer's Personnel and the Employer's other contractors on the Site:

(a) co-operate with the Contractor's efforts under Sub-Clause 4.6 [Co-operation], and

(b) take actions similar to those which the Contractor is required to take under sub-paragraphs (a), (b) and (c) of Sub-Clause 4.8 [Safety Procedures] and under Sub-Clause 4.18 [Protection of the Environment].

2.4 Employer's Financial Arrangements

The Employer has sourced the funds to finance the project

2.5 Employer's Claims

If the Employer considers himself to be entitled to any payment under any Clause of these Conditions or otherwise in connection with the Contract, and/or to any extension of the Defects Notification Period, the Employer or the Engineer shall give notice and particulars to the Contractor. However, notice is not required for payments due under Sub-Clause 4.19 [Electricity, Water and Gas], under Sub-Clause 4.20 [Employer's Equipment and Free-Issue Material], or for other services requested by the Contractor.

The notice shall be given as soon as practicable after the Employer became aware, or should have become aware, of the event or circumstances giving rise to the claim. A notice relating to any extension of the Defects Notification Period shall be given before the expiry of such period.

The particulars shall specify the Clause or other basis of the claim, and shall include substantiation of the amount and/or extension to which the Employer considers himself to be entitled in connection with the Contract. The Engineer shall then proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) the amount (if any) which the Employer is entitled to be paid by the Contractor, and/or (ii) the extension (if any) of the Defects Notification Period in accordance with Sub-Clause 11.3 [Extension

of Defects Notification Period].

This amount may be included as a deduction in the Contract Price and Payment Certificates. The Employer shall only be entitled to set off against or make any deduction from an amount certified in a Payment Certificate, or to otherwise claim against the Contractor, in accordance with this Sub-Clause.

3	The Engineer

3.1 **Engineer's Duties and Authority**

The Employer shall appoint the Engineer who shall carry out the duties assigned to him in the Contract. The Engineer's staff shall include suitably qualified engineers and other professionals who are competent to carry out these duties.

The Engineer shall have no authority to amend the Contract.

The Engineer may exercise the authority attributable to the Engineer as specified in or necessarily to be implied from the Contract.

However, the Engineer shall obtain the specific approval of the Employer before taking action under the-following Sub-Clauses of these Conditions:

(a) Sub-Clause 4.12-Unforeseeable Physical Conditions: Agreeing or determining an extension of time and/or additional cost.

(b) Sub-Clause 8.4-Extension of Time for Completion: Agreeing or determining extension of time.

(c) Sub-Clause 11.9-Performance Certificate: Issue of Performance Certificate.

(d) Sub-Clause 13.1-Instructing a Variation: Except,

i) in an emergency situation as determined by the Engineer and as amplified in sub-paras (h) and (i) below, or

ii) for other situations, if the variation in quantity of any item does not exceed 25% of the stipulated quantity in the agreement, the variation in quantity in such item does not result in increase in excess of 0.1% of contract price and variation in quantity in such item does not result in cumulative variation in contract price in excess of 2%.

(e) Sub-Clause 13.3-Variation Procedure: Approving a proposal for Variation submitted by the Contractor in accordance with Sub Clause 13.1 or 13.2.

(f) Sub-Clause 13.4-Payment in applicable Currencies: Specifying the amount payable in each of the applicable currencies for a Variation.

(g) Clause 20.1: Contractor Claims for extension of time and/or additional payment.

(h) Notwithstanding the obligation, as set out above, to obtain approval, if, in the opinion of the Engineer, an emergency occurs affecting the safety of life or of the Works or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibility under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply, despite the absence of approval of the Employer, with any such instruction of the Engineer. The Engineer

shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 13 and shall notify the Contractor accordingly, with a copy to the Employer.

(i) In case the emergency mentioned in above Sub-paras occurs on account of failure of Contractor, by way of not adhering to the approved scheme of work or not taking adequate safety precautions or by any other reason attributable to the contractor, then no additional amounts shall be paid to the Contractor for attending to such emergencies and the Contractor shall be liable for Employer's claims.

(j) Sub-clause 4.4 regarding deployment of Sub-Contractors.

3.2 Delegation by the Engineer

The Engineer may from time to time assign duties and delegate authority to assistants, and may also revoke such assignment or delegation. These assistants may include a resident engineer, and/or independent inspectors appointed to inspect and/or test items of Plant and/or Materials. The assignment, delegation or revocation shall be in writing and shall not take effect until copies have been received by both Parties.

However, unless otherwise agreed by both Parties, the Engineer shall not delegate the authority to determine any matter in accordance with Sub-Clause 3.5 [Determinations].

Assistants shall be suitably qualified persons, who are competent to carry out these duties and exercise this authority, and who are fluent in the language for communications defined in Sub-Clause 1.4 [Law and Language].

Each assistant, to whom duties have been assigned or authority has been delegated, shall only be authorised to issue instructions to the Contractor to the extent defined by the delegation. Any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by an assistant, in accordance with the delegation, shall have the same effect as though the act had been an act of the Engineer. However:

(a) any failure to disapprove any work, Plant or Materials shall not constitute approval, and shall therefore not prejudice the right of the Engineer to reject the work, Plant or Materials;

(b) if the Contractor questions any determination or instruction of an assistant, the Contractor may refer the matter to the Engineer, who shall promptly confirm, reverse or vary the determination or instruction.

3.3 Instructions of the Engineer

The Engineer may issue to the Contractor (at any time) instructions and additional or modified Drawings which may be necessary for the execution of the Works and the remedying of any defects, all in accordance with the Contract. The Contractor shall only take instructions from the Engineer, or from an assistant to whom the appropriate authority has been delegated under this Clause. If an instruction constitutes a Variation, Clause 13 [Variations and Adjustments] shall apply.

The Contractor shall comply with the instructions given by the Engineer or delegated assistant, on any matter related to the Contract. Whenever practicable, their instructions shall be given in writing. If the Engineer or a delegated assistant,

(a) gives an oral instruction and

(b) receives a written confirmation of the instruction, from (or on behalf of) the Contractor, within two working days after giving the instruction, and

(c) does not reply by issuing a written rejection and/or instruction within two working days after receiving the confirmation,

(d) then the confirmation shall constitute the written instruction of the Engineer or delegated assistant (as the case may be).

3.4 Replacement of the Engineer

Notwithstanding Sub-Clause 3.1, if the Employer intends to replace the Engineer, the Employer shall, not less than 21 days before the intended date of replacement, give notice to the Contractor of the name, address and relevant experience of the replacement Engineer.

3.5 Determinations

Whenever these Conditions provide that the Engineer shall proceed in accordance with this Sub-Clause 3.5 to agree or determine any matter, the Engineer shall consult with each Party in an endeavour to reach agreement. If agreement is not achieved, the Engineer shall make a fair determination in accordance with the Contract, taking due regard of all relevant circumstances.

The Engineer shall give notice to both Parties of each agreement or determination, with supporting particulars. Each Party shall give effect to each agreement or determination unless and until revised under Clause 20 [Claims, Disputes and Arbitration].

4 The Contractor

4.1 Contractor's General Obligations

The Contractor shall design (to the extent specified in the Contract), execute and complete the Works in accordance with the Contract and with the Engineer's instructions, and shall remedy any defects in the Works.

The Contractor shall provide the Plant and Contractor's Documents specified in the Contract, and all Contractor's Personnel, Goods, consumables and other things and services, whether of a temporary or permanent nature, required in and for this design, execution, completion and remedying of defects.

All equipment, and material, to be incorporated in or required for the Works shall be procured from approved sources as stipulated in the Contract.

The Contractor shall be responsible for the adequacy, stability and safety of all Site operations and of all methods of construction. Except to the extent specified in the

Contract, the Contractor (i) shall be responsible for all Contractor's Documents, Temporary Works, and such design of each item of Plant and Materials as is required for the item to be in accordance with the Contract, and (ii) shall not otherwise be responsible for the design or specification of the Permanent Works.

The Contractor shall, whenever required by the Engineer, submit details of the arrangements and methods which the Contractor proposes to adopt for the execution of the Works. No significant alteration to these arrangements and methods shall be made without this having previously been notified to the Engineer.

On completion of the works, the contractor shall arrange to furnish to the Employer two (2) bound sets of all "As Built" drawings for every component of the Works at his own cost, all such copies being on Polyester film of quality to be approved by the Engineer or his Representative. The Taking – over Certificate of the Works, as per the provisions of Clause 10.1 herein, shall not be issued by the Engineer in the event of the Contractor's failure to furnish the aforesaid "As Built" drawings for the entire works.

If the Contract specifies that the Contractor shall design any part of the Permanent Works, then unless otherwise stated in the Special Conditions of Contract:

(a) the Contractor shall submit to the Engineer the Contractor's Documents for this part in accordance with the procedures specified in the Contract;

(b) these Contractor's Documents shall be in accordance with the Specification and Drawings, shall be written in the language for communications defined in Sub-Clause 1.4 [Law and Language], and shall include additional information required by the Engineer to add to the Drawings for co-ordination of each Party's designs;

(c) the Contractor shall be responsible for this part and it shall, when the Works are completed, be fit for such purposes for which the part is intended as are specified in the Contract; and

(d) prior to the commencement of the Tests on Completion, the Contractor shall submit to the Engineer the "as-built" documents and operation and maintenance manuals in accordance with the Specification and in sufficient detail for the Employer to operate, maintain, dismantle, reassemble, adjust and repair this part of the Works. Such part shall not be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 [Taking Over of the Works and Sections] until these documents and manuals have been submitted to the Engineer.

4.2 (a) Performance Security

The Contractor shall obtain (at his cost) a Performance Security and an additional Performance Security, if any in terms of ITB 35.5, for proper performance of the contract, for the amount, currencies and validity period for Performance Security stated in the Contract Data. If an amount is not stated in the Contract Data, this Sub-Clause shall not apply.

The Contractor shall deliver the Performance Security and additional Performance Security, if any, to the Employer within 28 days after receiving the Letter of Acceptance, and shall send a copy to the Engineer. The Performance Security/additional

Performance Security shall be issued by an entity and from within a country (or other jurisdiction) approved by the Employer, and shall be in the form as given in Section 8 (Contract Forms) or in another form specifically approved by the Employer.

The Performance Security/additional Performance Security shall be, at the Contractor's option, in any of the following forms:

An unconditional Bank guarantee in the prescribed format

A Pay Order / Demand Draft drawn on a Scheduled / Nationalized Bank in India in favour of "Rail Infrastructure Development Company (Karnataka) Ltd" payable at Bangalore

FDR in favour of "Rail Infrastructure Development Company (Karnataka) Ltd." (free from any encumbrance).

A deposit of cash or online bank transfer to K RIDE account

The bank guarantee shall be from a bank having minimum net-worth of over INR 500 million from the specified banks as under:

a Schedule Bank in India, or

a Foreign Bank having their operations in India, or

a Foreign Bank which does not have operations in India is required to provide a counter-guarantee by State Bank of India,

The Scheduled Bank is suing the Bank Guarantee must be on "Structured Financial Messaging System(SFMS)"platform. A separate advice of the BG shall be invariable be sent by the issuing bank to the Employer's Bank through SFMS and only after this the BG shall become operative and acceptable to the Employer.

The Issuing Bank shall send the SFMS to:

Beneficiary: Rail Infrastructure Development Company (Karnataka) Ltd. (K-RIDE)

Bank Name: Canara Bank
Branch: Prime Corporate Branch
Account No. 0430201012110
IFSC Code: CNRB0002636

In case the contractor is a JV; "the Performance Security/additional Performance Security, if any in terms of ITB 35.5, shall be submitted by each JV Partner separately on behalf of the JV in favour of K RIDE in proportion of their respective percentage share specified in the JV Agreement. The additional Performance Security shall be submitted by the partner(s) responsible for execution of schedule(s) (as per JV agreement) against which additional Performance Security is required to be submitted in terms of ITB 35.5. However,

Submission of Performance Guarantee Security by individual partners on behalf of the JV shall in no way dilute their Joint & Several responsibility. The Employer shall be entitled to recover the amount of Bank Guarantees individually and all the Partners jointly at its discretion."

The Contractor shall ensure that the Performance Security/additional Performance Security is valid and enforceable until the Contractor has executed and completed the Works and remedied defects, if any. If the contractor does not complete the work for any reasons whatsoever, the terms of the Performance Security/ additional Performance Security specify its expiry date, and the Contractor has not become entitled to receive the Performance Certificate by the date 28 days prior to the expiry date, the Contractor shall be bound to extend the validity of the Performance Security/additional Performance Security until the Works have been completed and any defects have been remedied.

The Guarantees shall be unconditional and irrevocable. The Employer shall return the Performance Security to the Contractor within 21 days after receiving a copy of the Performance Certificate or passing of the Final Payment Certificate whichever is later. However, on completion of specified section(s) and successful passage of defect liability period for such section(s) along with execution of any leftover works at the time of completion of such section(s), the contractor shall be entitled for release of 90% of the proportionate Performance Security calculated as specified in Contract Data subject to the condition that Engineer certifies that no recoveries are pending in the contract. In case Engineer points out amount to be recovered then the contractor shall be entitled for release of 90% of the proportionate Performance Security calculated as specified in Contract Data minus the amount to be recovered.

The Employer shall return additional Performance Security submitted in terms of ITB 35.5 as per the following;

If the contractor submits an application stating that all the works against the particular schedule(s)/bill(s) for which additional Performance Security was submitted in terms of ITB 35.5 have been completed in all respect, then the Employer, on being satisfied with the claim of the contractor, shall return the full additional Performance Security against the particular schedule(s). Decision of the Employer regarding completion of works against a particular schedule/bill shall be final and binding on the contractor.

If the contractor submits an application stating that majority of the works (physical progress being not less than 90%) against the particular schedule(s)/bill(s) for which additional Performance Security was submitted in terms of ITB 35.5 have been completed and execution of balance works is held up for reasons not attributable to the Contractor, then the Employer, on being satisfied with the claim of the contractor, shall return 75% of the amount of additional Performance Security against the particular schedule(s). The balance amount of additional Performance Security shall however be returned only after completion of the works against the particular schedule(s)/bill(s) for which additional Performance Security was submitted in terms of ITB 35.5, in all respects to the satisfaction of the Employer. Decision of the Employer regarding completion of works against a particular schedule/bill shall be final and binding on the contractor.

Without limitation to the provisions of the rest of this Sub-Clause, whenever the Engineer determines an addition or a reduction to the Contract Price as a result of a change in cost and/or legislation or as a result of a Variation amounting to more than 25 percent of the portion of the Contract Price payable in a specific currency, the Contractor shall at the Engineer's request promptly submit Performance Guarantee @ 10% of the increased amount over the original contract price in a specific currency. On the other hand if the

value of contract price decreases by more than 25% of the original contract price payable in a specific currency, Performance Guarantee @ 10% of the decrease in contract price from the original contract price in a specific currency shall be returned to the contractor, on his request.

Wherever the contract is terminated under Clause 15.2, the Performance Guarantee shall be encashed by the Employer:

in full including additional performance guarantee amount, if any, taken in terms of sub clause 35.5 of ITB and not due for release on the date of issue of termination letter in terms of this clause, in case of termination of the contract as a whole; Or

at the discretion of the Employer it may be encashed in part/parts proportionate to the Contract price of the bill/schedule to which the terminated part of work belongs i.e P=(A x B)÷C where

P=Proportionate Bank Guarantee Amount.

A=Contract price of the particular bill/schedule to which the terminated part of work belongs.

B=Performance Guarantee amount in terms of GCC sub clause 4.2.

C=Total Contract price.

Plus additional performance Guarantee amount, if any, taken in terms of sub clause 35.5 of ITB and not due for release on the date of issue of termination letter in terms of this clause against this particular bill/schedule to which the terminated part of the work belongs, in case of termination in part/parts.

The balance work should be got done separately, and independently by K RIDE without risk and cost of the original contractor. The original 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 would be debarred from participating in the tender for the balance work either in his/her individual capacity or as a partner of any other JV/partnership firm.

In case the contractor fails to perform the contract or any JV partner fails to perform its obligations under the JV agreement, which is a part of this agreement, the Employer may issue notice of such default to the said JV partner or the JV (depending upon reasons of default) and declare the said JV partner or the JV as Poor Performer. The issue of such notice shall automatically debar the JV partner or JV, as the case may be, from participating in any K RIDE tender from the date of issue of notice of default. The relevant performance security including additional performance security, if any, in terms of sub clauses 35.5 of ITB submitted by the Contractor or submitted on behalf of JV partner to the extent not due for release at the time of contemplation of such action shall be encashed and forfeited either fully or in proportion of the percentage share of that partner in the JV agreement, as the case may be.

4.(2)(b) Security Deposit: The Security Deposit shall be 5% of the contract value. Security Deposit may be deposited by the Contractor before release of first on account bill in cash or Term Deposit Receipt issued from Scheduled Bank, or may be recovered at the rate defined in section 7A 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 Security)

may not exceed 10% of the total value of the contract.

Further, in case of contracts having value equal to or more than ₹ 50 crore (Rs Fifty crore) the Security Deposit may be deposited as Bank Guarantee Bond also, issued by a scheduled bank after execution of contract documents, but before payment of 1st on account bill. Provided further that the validity of Bank Guarantee Bond shall be extended from time to time, depending upon extension of contract granted in terms of Clause 19 of the Standard General Conditions of Contract.

Further, in case Security Deposit has been submitted as Term Deposit Receipt/Bank Guarantee Bond in full amount, the Bid security by the Contractor with his tender will be returned by the K-Ride.

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

4.(2)(b) (i) Refund of Security Deposit: Security Deposit mentioned in clause 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 K-RIDE has No Claim on Contractor **and**

(c) Maintenance Certificate issued, on expiry of the maintenance period.

4.(2)(b) (ii) Forfeiture of Security Deposit: Whenever the contract is rescinded as a whole under clause 15 of GCC, the Security Deposit already with K-Ride under the contract shall be forfeited. However, in case the contract is rescinded in part or parts under clause 15 of GCC, the Security Deposit shall not be forfeited.

4.(2)(c) 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 Sub-Clause 4.(2)(a) of this clause will be payable with interest accrued thereon.

4.3 Contractor's Representative

The Contractor shall appoint the Contractor's Representative and shall give him all authority necessary, including financial powers, to act on the Contractor's behalf under the Contract.

Unless the Contractor's Representative is named in the Contract, the Contractor shall, prior to the Commencement Date, submit to the Engineer for consent the name and particulars of the person the Contractor proposes to appoint as Contractor's Representative. If consent is withheld or subsequently revoked, or if the appointed person fails to act as Contractor's Representative, the Contractor shall similarly submit the name and particulars of another suitable person for such appointment.

The Contractor shall not, without the prior consent of the Engineer, revoke the

appointment of the Contractor's Representative or appoint a replacement.

The whole time of the Contractor's Representative shall be given to directing the Contractor's performance of the Contract. If the Contractor's Representative is to be temporarily absent from the Site during the execution of the Works, a suitable replacement person shall be appointed, subject to the Engineer's prior consent, and the Engineer shall be notified accordingly.

The Contractor's Representative shall, on behalf of the Contractor, receive instructions under Sub-Clause 3.3 [Instructions of the Engineer].

The Contractor's Representative may delegate any powers, functions and authority to any competent person, and may at any time revoke the delegation. Any delegation or revocation shall not take effect until the Engineer has received prior notice signed by the Contractor's Representative, naming the person and specifying the powers, functions and authority being delegated or revoked.

The Contractor's Representative shall be fluent in the language for communications defined in Sub-Clause 1.4 [Law and Language]. If the Contractor's Representative's delegates are not fluent in the said language, the Contractor shall make competent interpreters available during all working hours in a number deemed sufficient by the Engineer.

The Contractor shall depute his Representative to attend all the review meetings notified by the Engineer.

4.4 **Sub-contractors**

The Contractor shall not subcontract the whole of the Works. The Contractor shall be responsible for the acts or defaults of any Subcontractor, his agents or employees, as if they were the acts or defaults of the Contractor.

Unless otherwise stated in the Special Conditions of Contract:

(a) the Contractor shall not be required to obtain consent to suppliers solely of Materials, or to a subcontract for which the Subcontractor is named in the Contract or as specifically provided in the Contract data or value of any sub-contract for Works, or the aggregate value of such sub-contracts with any Subcontractor, does not exceed 5% (five per cent) of the Contract Price provided that such works are not for the key activities in terms of clause 2.6 of section 3 (Evaluation and Qualification Criteria) which are to be executed by specialist subcontractor(s);

(b) the prior consent of the Engineer shall be obtained to other proposed Subcontractors and/or suppliers. While submitting his proposal in this regard, the Contractor shall ensure that;

(i) total value of Works requiring such consent for subcontracting shall not be more than 70% (seventy per cent) of the Contract Price;

(ii) the proposed subcontractor must have executed woks of 40% of value of the proposed subcontract through a single contract during last seven years; and

(iii) No banning/blacklisting/declaration as poor performer by K RIDE is in force on the proposed subcontractor (on the date of grant of consent by the Engineer);

(iv) No contract of the proposed subcontractor has been terminated by K RIDE

during the last two years (to be reckoned from the date of grant of consent by the Engineer);

(v) the Contractor shall submit the proposal for subcontracting with the name, particulars and the relevant experience of the proposed subcontractor;

(c) the Contractor shall give the Engineer not less than 28 days' notice of the intended date of the commencement of each Subcontractor's work, and of the commencement of such work on the Site;

(d) each subcontract shall include provisions which would entitle the Employer to require the subcontract to be assigned to the Employer under Sub-Clause 4.5 [Assignment of Benefit of Subcontract] (if or when applicable) or in the event of termination under Sub-Clause 15.2 [Termination by Employer]; and

(e) On getting consent from the Engineer, the Contractor shall provide to the Engineer copy of the agreement entered with such subcontractor.

The Contractor shall ensure that the requirements imposed on the Contractor by Sub-Clause 1.12 [Confidential Details] apply equally to each Subcontractor.

Where practicable, the Contractor shall give fair and reasonable opportunity for contractors from the Country to be appointed as Subcontractors.

The Contractor shall endeavour to resolve all matters and payments amicably and speedily with the sub-contractors.

The Contractor shall indemnify and hold the Employer harmless against and from any claim of subcontractors or suppliers of the materials.

The Contractor shall release payment to the Sub-contractors/Suppliers promptly and shall endeavour to resolve all issues amicably and speedily with the Sub-contractors/Suppliers, so that the execution of work is not affected in any manner whatsoever.

In case a Sub-contractor/Supplier represents to the Engineer in writing with supporting documents, stating that he has not received payment due as per the agreement/work or purchase order for the works executed by such Sub-contractor or supplies made by such Supplier, which have been covered in previous Payment Certificates and the Engineer finds such representation having merit, the Engineer, before issuing next Payment Certificate, may forward a copy of the representation to the Contractor requesting the Contractor to supply reasonable evidence that the amount stated to be outstanding by the Sub-contractor/Supplier for the works executed or supplies made, which have been covered in previous Payment Certificates has been paid and if not, why the same is not payable. The Engineer may recommend to make payment to the Sub-contractor/Supplier unless the Contractor submits reasonable evidence to the Engineer:

(i) that the amount claimed has been paid, or

(ii) satisfying the Engineer in writing that the Contractor is entitled to withhold or that the amount is not payable.

On the recommendation of the Engineer, the Employer may (at his sole discretion) directly pay to the Sub-contractor/Supplier the amount due for and on behalf of the Contractor, part or all of such amounts previously certified (less applicable deductions) as are found due to the Sub-contractor/Supplier by the Engineer. The Employer shall adjust the amount paid directly to the Sub-contractor/Supplier from any amount due by it to the Contractor. The Contractor shall repay the amount, in case no amount is found due by the Employer

to the Contractor.

That the payment by Employer, on behalf of the Contractor to its Sub-contractor/Supplier, shall not alter any terms of agreement between the Employer and the Contractor and nor the same shall result in any privity of contract between the Employer and the Sub-contractor/Supplier.

4.5 **Assignment of Benefit of Subcontract**

If a Subcontractor's obligations extend beyond the expiry date of the relevant Defects Notification Period and the Engineer, prior to this date, instructs the Contractor to assign the benefit of such obligations to the Employer, then the Contractor shall do so. Unless otherwise stated in the assignment, the Contractor shall have no liability to the Employer for the work carried out by the Subcontractor after the assignment takes effect.

4.6 **Co-operation**

The Contractor shall, as specified in the Contract or as instructed by the Engineer, allow appropriate opportunities for carrying out work to:

(a) the Employer's Personnel,

(b) any other contractors employed by the Employer, and

(c) the personnel of any legally constituted public authorities,

who may be employed in the execution on or near the Site of any work not included in the Contract.

Any such instruction shall constitute a Variation if and to the extent that it causes the Contractor to incur Unforeseeable Cost. Services for these personnel and other contractors may include the use of Contractor's Equipment, Temporary Works or access arrangements which are the responsibility of the Contractor.

If, under the Contract, the Employer is required to give to the Contractor possession of any foundation, structure, plant or means of access in accordance with Contractor's Documents, the Contractor shall submit such documents to the Engineer in the time and manner stated in the Specification.

4.7 **Setting Out**

The Contractor shall set out the Works in relation to original points, lines and levels of reference specified in the Contract or notified by the Engineer. The Contractor shall be responsible for the correct positioning of all parts of the Works, and shall rectify any error in the positions, levels, dimensions or alignment of the works, notifying the Engineer within 28 days of the date of commencement

In the event of such discrepancy arising during the course of the work, for which Employer's documents are handed over after the date of commencement, the contractor shall seek clarifications within 14 days of receipt of such documents

The Employer shall be responsible for any errors in these specified or notified items of reference, but the Contractor shall use reasonable efforts to verify their accuracy before

they are used.

Contractor shall promptly notify the Employer and the Engineer of any error, omission, fault, or any other defect in the design, drawing or specifications for the works, which he discovers when reviewing the Contract Documents, and in the process of execution of the Works. The contractor shall be responsible to ensure correlation in various drawings and bill of quantities, before commencement and execution of work. In case of any discrepancy the contractor shall bring it to notice of the Engineer for clarification within 28 days of the issue of Letter of Acceptance. In the event of such discrepancy arising during the course of the work, for which drawings are given after the date of issue of Letter of Acceptance, the contractor shall seek clarifications within 14 days of receipt of such drawings.

4.8 **Safety Procedures**

The Contractor shall follow the provisions laid down in (Special Conditions of Contract), Chapter 1. (Safety and Security) of Section 5 (Works/Employers Requirements) and shall:

(a) comply with all applicable safety regulations,

(b) take care for the safety of all persons entitled to be on the Site,

(c) use reasonable efforts to keep the Site and Works clear of unnecessary obstruction so as to avoid danger to these persons,

(d) provide fencing, lighting, guarding and watching of the Works until completion and taking over under Clause 10 [Employer's Taking Over], and

(e) provide any Temporary Works (including roadways, footways, guards and fences) which may be necessary, because of the execution of the Works, for the use and protection of the public and of owners and occupiers of adjacent land.

Additional Safety Precautions

(1) The Contractor shall comply with all the precautions as required for the safety of the workmen by the I.L.O Convention No.62 as far as they are applicable to the Contract. The Contractor shall provide all necessary safety appliances; such as safety goggles, helmets, masks, etc to the workmen and the staff.

(2) Suitable scaffolds shall be provided for workmen for all work that cannot safely be done from the ground, or from solid construction except for such short period work as can be done safely from ladders. When a ladder is used, an extra labourer shall be engaged for holding the ladder and if the ladder is used for carrying materials as well, suitable foot-holds and hand-holds shall be provided on the ladder, which shall be given an inclination not steeper than 1/4 to 1 (1/4 horizontal in 1 vertical)

(3) Scaffolding or staging more than 3.25 metres above the ground or floor, swung or suspended from an overhead support or erected with stationary support, shall have a guard rail properly attached, bolted, braced and otherwise secured at least 1 metre high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as maybe necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying in from the support or structure.

(4) Working platforms, gangways and stairways shall be so constructed that they do not sag unduly or unequally, and if the height of any platform or gangway or stairway is more than 3.25 metres above ground level or floor level, it shall have closely spaced boards, have adequate width and be suitably provided with guard rails as described in (3) above.

(5) Every opening in the floor of a structure or in a working platform shall be provided with suitable means to prevent fall of persons or materials by providing suitable fencing or railing with a minimum height of one metre.

(6) Safe means of access and egress shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 metres in length. The width between side rails in a rung ladder shall in no case be less than 30 cm for ladders up to and including 3 metres in length. For longer ladders the width shall be increased at least 6 mm for each additional 30 cm of length. Spacing of steps shall be uniform and shall not exceed 30 cm.

(7) Adequate precautions shall be taken to prevent danger from electrical equipment. Adequate safety measures shall be taken when any work is undertaken near any live highly charged electric wire. Necessary shutdown may be arranged, where and whenever essential. All rules in force in this connection shall be fully complied with. The Contractor shall ensure all precautions to prevent any accidents due to electrocution or otherwise.

(8) No materials on any of the sites shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The Contractor shall provide all necessary fencing and lights to protect the public from accidents and shall be bound to bear the expenses of defending every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and costs which may be awarded in any such suit, action or proceedings to any such person or which may with the consent of the Contractor be paid to compromise any claim by any such person.

(9) Excavation and Trenching : All trenches, 1.5 metres or more in depth, shall at all times be supplied with at least one ladder for each 20 metres in length or fraction thereof, Ladders shall be extended from the bottom of the trench to at least 1 metre above the surface of the ground. The sides of a trench, which is 1.5 metres or more in depth shall be stepped back to provide a suitable slope, or be securely held by timber bracing so as to avoid the danger of side collapse. Excavated material shall not be placed within 1.5 metres of the edge of any trench or half the depth of the trench, whichever is more. Excavation shall be made from the top to the bottom. Under no circumstances shall undermining or undercutting be done.

(10) Demolition : Before any demolition work is commenced and also during the process of the work :

(a) All roads and open areas adjacent to the work site shall either be closed or suitably protected.

(b) No electric cable or apparatus, which is liable to be a source of danger other than a cable or apparatus used by operators, shall remain electrically charged:

(c) All practical steps shall be taken to prevent danger to persons employed by the Employer, from risk of fire or explosion, or flooding. No floor, roof or other part of a building shall be so overloaded with debris or materials as to render it unsafe.

(11) All necessary personal safety equipment as considered adequate by the Engineer shall be available for use of persons employed on the site and maintained in a condition suitable for immediate use; and the Contractor shall take adequate steps to ensure proper use of such equipment by those concerned.

(a) Workers employed on mixing asphaltic materials, cement, lime mortars, concrete etc. shall be provided with protective footwear and protective goggles.

(b) Those engaged in handling any material, which is injurious to the eyes, shall be provided with protective goggles.

(c) Those engaged in welding works shall be provided with welder's protective eye-shield.

(d) Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.

(e) When workers are employed in sewers and manhole, which are in use, the contractor shall ensure that manhole covers are open and manholes are ventilated at least for an hour before workers are allowed to go into them. Manholes so open shall be cordoned off with suitable railing and provide warning signals or boards to prevent accidents to the public.

(12) The Contractor shall not employ men below the age of 18 years and women, on the work of painting with products containing lead in any form. Whenever men above the age of 18 years are employed on the work of lead painting, the following precautions shall be taken:

(a) No paint containing lead or lead products shall be used except in the form of paste or ready made paint.

(b) Suitable face masks shall be supplied for use by workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.

(c) Overalls shall be supplied by the Contractor to workmen and adequate facilities shall be provided to enable workers to wash during and at the close of any day's work.

13) When work is performed near any place where there is risk of drowning all

necessary equipment shall be provided and kept ready for use and all necessary steps taken for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

(14) Use of hoisting machines and tackle including their attachments, anchorage and supports shall conform to the following:

(a) (i) These shall be of good mechanical construction, sound material and adequate strength and free from patent defects and shall be kept in good working order, be regularly inspected and properly maintained.

(ii) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength, and free from defects

(b) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 shall be in charge of any hoisting machine including scaffold equipment. Only trained men over the age of 21 shall be permitted to give signals to such plant and appliance operators.

(c) For every hoisting machine and every chain hook, shackle, swivel and pulley block used in hoisting, lowering or as means of suspension, safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with safe working load. In case of a hoisting machine or a variable safe working load, each safe working load and conditions under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to in the paragraph above shall be loaded beyond safe working load except for the purpose of testing.

(d) In case of the Employer's machine, safe working load shall be notified by the Engineer or his Representative. As regards Contractor's machines, the Contractor shall notify safe working load of each machine to the Engineer or his Representative, whenever he brings it to the site of work and get it verified by him.

(15) Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances shall be provided with efficient safeguards; hoisting appliances shall be provided with such meansas will reduce the risk of accident during descent of load to the minimum. Adequate precautions shall be taken to reduce to the minimum risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations, which are already energised, insulating mats, working apparel such as gloves, sleeves and boots, as may be necessary, shall be provided. Workers shall not wear any rings, watches and carry keys or other materials which are good conductor of electricity.

(16) All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in a safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities shall be provided

at or near places of work.

(17) These safety provisions shall be brought to the notice of all concerned by displaying on a notice board at a prominent place at the work location. Persons responsible for ensuring compliance with the Safety Code shall be named therein by the Contractor.

(18) To ensure effective enforcement of the rules and regulations relating to safety precautions, arrangements made by the contractor shall be open to inspection by the Engineer or his Representative.

(19) Notwithstanding anything contained in conditions (1) to (17) above, the Contractor shall at its own costs, remain liable to comply with the provisions of all acts, rules, regulations, and bylaws for the time being in force in India and applicable in this matter.

(20) For work carried out in the vicinity of any wharf or quay, the Contractor shall abide by all the provisions of the Dock Workers (Safety, Health and Welfare) Scheme, 1961.

(21) The Contractor shall at his own expense provide protective safety Equipment like gloves and footwear for all labour engaged on concrete mixing work and all other types of working involving the use of tar, cement, etc. to the satisfaction of the Engineer or his Representative, and on his failure to do so, the employer shall be entitled to provide the same and recover the cost from the Contractor.

(22) The Contractor shall be responsible for observance, by the sub-contractors, of the foregoing provisions.

(23) All construction labour at all time shall use personal protective equipment like, safety shoes, helmets and reflective jackets in all activities at site.
This shall be ensured without fail on each work site. Failing to comply with this, provision shall attract penalty of Rs. 500/- per occasion per staff.

4.8.1 Notwithstanding with any other provision, the Contractor shall have to pay penalty for damage to Railway cable in terms of clause C 15 of the JPO as given in para 1.2 of Chapter 1. (Safety and Security) of Section 5 (Works/Employers Requirements) and shall also indemnify the Employer against any losses, damages to property or life in terms of para 1.11 and 1.12 of the chapter 1. (Safety and Security) of Section 5 (Works/Employers Requirements).

4.9 **Quality Assurance**

The Contractor shall institute a quality assurance system to demonstrate compliance with the requirements of the Contract. The system shall be in accordance with the details stated in the Contract. The Engineer shall be entitled to audit any aspect of the system.

Details of all procedures and compliance documents shall be submitted to the Engineer for information before each design and execution stage is commenced. When any document of a technical nature is issued to the Engineer, evidence of the prior approval by the Contractor himself shall be apparent on the document itself.

Compliance with the quality assurance system shall not relieve the Contractor of any of his duties, obligations or responsibilities under the Contract.

4.10 Site Data

The Employer shall have made available to the Contractor for his information, prior to the Base Date, all relevant data in the Employer's possession on sub-surface and hydrological conditions at the Site, including environmental aspects. The Employer shall similarly make available to the Contractor all such data which come into the Employer's possession after the Base Date. The Contractor shall be responsible for interpreting all such data.

To the extent which was practicable (taking account of cost and time), the Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Bid or Works. To the same extent, the Contractor shall be deemed to have inspected and examined the Site, its surroundings, the above data and other available information, and to have been satisfied before submitting the Bid as to all relevant matters, including (without limitation):

(a) the form and nature of the Site, including sub-surface conditions,

(b) the hydrological and climatic conditions,

(c) the extent and nature of the work and Goods necessary for the execution and completion of the Works and the remedying of any defects,

(d) the Laws, procedures and labour practices of the Country, and

(e) the Contractor's requirements for access, accommodation, facilities, personnel, power, transport, water and other services.

(f) Data made available by the Employer in accordance with the preceding paragraph shall be deemed to include data listed elsewhere in the contract as open for inspection at the address stipulated in the Contract.

4.11 Sufficiency of the Accepted Contract Amount

The Contractor shall be deemed to:

(a) have satisfied himself as to the correctness and sufficiency of the Accepted Contract Amount, and

(b) have based the Accepted Contract Amount on the data, interpretations, necessary information, inspections, examinations and satisfaction as to all relevant matters referred to in Sub-Clause 4.10 [Site Data].

Unless otherwise stated in the Contract, the Accepted Contract Amount covers all the Contractor's obligations under the Contract (including those under Provisional Sums, if any) and all things necessary for the proper execution and completion of the Works and the remedying of any defects.

4.12 Unforeseeable Physical Conditions

In this Sub-Clause, "physical conditions" means natural physical conditions and man-made and other physical obstructions and pollutants, which the Contractor encounters at the Site when executing the Works, including sub-surface and hydrological conditions but excluding climatic conditions.

If the Contractor encounters adverse physical conditions which he considers to have been Unforeseeable, the Contractor shall give notice to the Engineer as soon as practicable.

This notice shall describe the physical conditions, so that they can be inspected by the Engineer, and shall set out the reasons why the Contractor considers them to be Unforeseeable. The Contractor shall continue executing the Works, using such proper and reasonable measures as are appropriate for the physical conditions, and shall comply with any instructions which the Engineer may give. If an instruction constitutes a Variation, Clause 13 [Variations and Adjustments] shall apply.

If and to the extent that the Contractor encounters physical conditions which are Unforeseeable, gives such a notice, and suffers delay and/or incurs Cost due to these conditions, the Contractor shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

(a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

(b) payment of any such Cost, which shall be included in the Contract Price.

After receiving such notice and inspecting and/or investigating these physical conditions, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) whether and (if so) to what extent these physical conditions were Unforeseeable, and (ii) the matters described in sub-paragraphs (a) and (b) above related to this extent.

However, before additional Cost is finally agreed or determined under sub-paragraph (ii), the Engineer may also review whether other physical conditions in similar parts of the Works (if any) were more favourable than could reasonably have been foreseen when the Contractor submitted the Bid. If and to the extent that these more favourable conditions were encountered, the Engineer may proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the reductions in Cost which were due to these conditions, which may be included (as deductions) in the Contract Price and Payment Certificates. However, the net effect of all adjustments under sub-paragraph (b) and all these reductions, for all the physical conditions encountered in similar parts of the Works, shall not result in a net reduction in the Contract Price.

The Engineer may take account of any evidence of the physical conditions foreseen by the Contractor when submitting the Bid, which may be made available by the Contractor, but shall not be bound by any such evidence.

4.13 Rights of Way and Facilities

The Contractor shall bear all costs and charges for special and/or temporary rights-of-way which he may require, including those for access to the Site. The Contractor shall also obtain, at his risk and cost, any additional facilities outside the Site which he may require for the purposes of the Works.

In case any operation connected with traffic necessitates diversion, obstruction or closure of any road, railway or any other right of way, the approval of the Engineer and the concerned authorities shall be obtained well in advance by the Contractor.

Provided that if it is found necessary for the Contractor to move one or more loads of heavy constructional plants and equipment, materials or Pre-constructed units or parts of units of work over roads, highways, bridges on which such oversized and overweight

items that are not normally to be moved, the contractor shall obtain prior permission from the concerned authorities.

Payments for complying with the requirements, if any, for protection or strengthening of the roads, highways or bridges shall be made by the contractor and such expenses shall be deemed to be included in his quoted contract price.

4.14 Avoidance of Interference

The Contractor shall not interfere unnecessarily or improperly with:

(a) the convenience of the public, or

(b) the access to and use and occupation of all roads and footpaths, irrespective of whether they are public or in the possession of the Employer or of others or

(c) Passenger amenities at stations and station platforms.

The Contractor shall indemnify and hold the Employer harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from any such unnecessary or improper interference.

4.15 Access Route

The Contractor shall be deemed to have been satisfied as to the suitability and availability of access routes to the Site. The Contractor shall use reasonable efforts to prevent any road or bridge from being damaged by the Contractor's traffic or by the Contractor's Personnel. These efforts shall include the proper use of appropriate vehicles and routes.

Except as otherwise stated in these Conditions:

(a) the Contractor shall (as between the Parties) be responsible for any maintenance which may be required for his use of access routes;

(b) the Contractor shall provide all necessary signs or directions along access routes, and shall obtain any permission which may be required from the relevant authorities for his use of routes, signs and directions;

(c) the Employer shall not be responsible for any claims which may arise from the use or otherwise of any access route;

(d) the Employer does not guarantee the suitability or availability of particular access routes; and

(e) Costs due to non-suitability or non-availability, for the use required by the Contractor, of access routes shall be borne by the Contractor.

4.16 Transport of Goods

Unless otherwise stated in the Special Conditions of Contract:

(a) the Contractor shall give the Engineer not less than 21 days' notice of the date on which any Plant or a major item of other Goods will be delivered to the Site;

(b) the Contractor shall be responsible for packing, loading, transporting, receiving, unloading, storing and protecting all Goods and other things required for the Works; and

(c) the Contractor shall indemnify and hold the Employer harmless against and from all

damages, losses and expenses (including legal fees and expenses) resulting from the transport of Goods, and shall negotiate and pay all claims arising from their transport.

4.17 Contractor's Equipment

The Contractor shall be responsible for all Contractors' Equipment. When brought on to the Site, Contractor's Equipment shall be deemed to be exclusively intended for the execution of the Works. The Contractor shall not remove from the Site any major items of Contractor's Equipment without the consent of the Engineer. However, consent shall not be required for vehicles transporting Goods or Contractor's Personnel off Site.

In the event of Contractor imports any equipment the following shall apply"

(a) Custom Clearance: The Employer will assist the contractor, when required by furnishing letters of recommendation for obtaining expeditious clearance through customs of constructional plants, material and other things required for the works and then for re-export, if any. The following publications, may be referred to by the contractor for guidance about custom regulations etc :

(i) Import & export policy, together with amendments, if any, published by Govt. of India, Ministry of Commerce..

(j) Hand Book of Procedures, together with amendments, if any, Volume 1 and 2 published by Ministry of Commerce.

(iii) Customs Tariff, together with amendments, if any published by Central Customs.

The Contractor shall be responsible to follow the latest rules and regulations without any liability of the Employer.

(c) **Re-export of contractors equipment:** The contractor shall obtain all the relevant information regarding procedure for the import and subsequent re-export of his equipment and materials from the Chief Controller of Imports and Exports, Bangalore, and shall inform himself and keep himself informed on the details of custom charges and draw-back regulations as applicable to the items of Constructional plant. The contractor shall provide the necessary guarantee/bonds where these are required by the customs notwithstanding that import licenses may be granted in the name of Employer.

(c) Notwithstanding the provisions mentioned above, Contractor's Equipment, including essential spare parts therefore, imported by the Contractor for the sole purpose of executing the Contract shall be temporarily exempt from the payment of import duties and taxes upon initial importation, provided the Contractor shall post with the customs authorities at the port of entry an approved export bond or bank guarantee, valid until the Time for Completion plus six months, in an amount equal to the full import duties and taxes which would be payable on the assessed imported value of such Contractor's Equipment and spare parts, and **callable** in the event the Contractor's Equipment is not exported from the Country on completion of the Contract. A copy of the **bond** or bank guarantee endorsed by the custom authorities shall be provided by the Contractor to the Employer upon the importation of individual items of Contractor's Equipment and spare parts. Upon export of individual items of Contractor's Equipment or spare parts, or upon the completion of

the Contract, Contractor shall prepare for approval by the customs authority the authorities, an assessment of the residual value of the Contractor's Equipment and spare parts to be exported based on the depreciation scale(s) and other criteria used by the customs authorities for such purposes under the provisions of the applicable Laws. Import duties and taxes shall be due and payable to the customs authorities by the Contractor on (a) the difference between the initial imported value and the residual value of the contractor's equipment and spare parts to be exported and (b) on the initial imported value that contractor's equipment and spare parts remaining in the Country after completion of the Contract. Upon payment of such dues within 28 days of being invoiced, the bond or bank guarantee shall be reduced or released accordingly; otherwise the security shall be called in the full amount remaining in the Country.

(d) **Conditions of hire of the contractor's equipment:** A certified copy of the agreement in respect of any item of Equipment held by contractor under any agreement for hire or hire purchase thereof, shall be supplied to the Engineer/Employer."

4.18 Protection of the Environment

The Contractor shall take all reasonable steps to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations.

The Contractor shall ensure that emissions, surface discharges and effluent from the Contractor's activities shall not exceed the values stated in the Specification or prescribed by applicable Laws.

4.19 Electricity, Water and Gas

The Contractor shall, except as stated below, be responsible for the provision of all power, water and other services he may require.

The Contractor shall be entitled to use for the purposes of the Works such supplies of electricity, water, gas and other services as may be available on the Site and of which details and prices are given in the Specification. The Contractor shall, at his risk and cost, provide any apparatus necessary for his use of these services and for measuring the quantities consumed.

The quantities consumed and the amounts due (at these prices) for such services shall be agreed or determined by the Engineer in accordance with Sub-Clause 2.5 [Employer's Claims] and Sub-Clause 3.5 [Determinations]. The Contractor shall pay these amounts to the Employer.

4.20 Employer's, Equipment and Free-Issue Material

The Employer shall make the Employer's Equipment (if any) available for the use of the Contractor in the execution of the Works in accordance with the details, arrangements and prices stated in the Specification. Unless otherwise stated in the Specification:

(a) the Employer shall be responsible for the Employer's Equipment, except that

(b) the Contractor shall be responsible for each item of Employer's Equipment whilst any of the Contractor's Personnel is operating it, driving it, directing it or in possession or

control of it.

The appropriate quantities and the amounts due (at such stated prices) for the use of Employer's Equipment shall be agreed or determined by the Engineer in accordance with Sub-Clause 2.5 [Employer's Claims] and Sub-Clause 3.5 [Determinations]. The Contractor shall pay these amounts to the Employer.

The Employer shall supply, free of charge, the "free-issue materials" (if any) in accordance with the details stated in the Contract data.

The Employer shall, at his risk and cost, provide these materials at the time and place specified in the Contract. The Contractor shall then visually inspect them, and shall promptly give notice to the Engineer of any shortage, defect or default in these materials. Unless otherwise agreed by both Parties, the Employer shall immediately rectify the notified shortage, defect or default.

In case materials are handed over, in accordance with the procedure prescribed by the Engineer, after proper measurement and accounted for, the contractor shall be solely liable for any shortage, damage, defect or default in such material, and shall indemnify the Employer until the final accountal of materials is made by the Contractor on completion of the work.

4.21 Progress Reports

Unless otherwise stated in the Special Conditions of Contract, monthly progress reports shall be prepared by the Contractor and submitted to the Engineer in six copies. The first report shall cover the period up to the end of the first calendar month following the Commencement Date. Reports shall be submitted monthly thereafter, each within 7 days after the last day of the period to which it relates.

Reporting shall continue until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works.

Each report shall include:

i. charts and detailed descriptions of progress, including each stage of design (if any), Contractor's Documents, procurement, manufacture, delivery to Site, construction, erection and testing; and including these stages for work by each nominated Subcontractor (as defined in Clause 5 [Nominated Subcontractors]),

photographs showing the status of manufacture and of progress on the Site; for the manufacture of each main item of Plant and Materials, the name of the manufacturer, manufacture location, percentage progress, and the actual or expected dates of:

(i) commencement of manufacture,

(ii) Contractor's inspections,

(iii) tests, and

(iv) shipment and arrival at the Site;

the details described in Sub-Clause 6.10 [Records of Contractor's Personnel and Equipment];

copies of quality assurance documents, test results and certificates of Materials;

list of notices given under Sub-Clause 2.5 [Employer's Claims] and notices given under Sub-Clause 20.1 [Contractor's Claims];

- safety statistics, including details of any hazardous incidents and activities relating to environmental aspects and public relations; and
- comparisons of actual and planned progress of all activities, with details of any events or circumstances which may jeopardise the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome delays.

4.22 Security of the Site

Unless otherwise stated in the Special Conditions of Contract:

(a) the Contractor shall be responsible for keeping unauthorised persons off the Site, and

(b) authorised persons shall be limited to the Contractor's Personnel and the Employer's Personnel; and to any other personnel notified to the Contractor, by the Employer or the Engineer, as authorised personnel of the Employer's other contractors on the Site.

4.23 Contractor's Operations on Site

The Contractor shall confine his operations to the Site, and to any additional areas which may be obtained by the Contractor and agreed by the Engineer as working areas. The Contractor shall take all necessary precautions to keep Contractor's Equipment and Contractor's Personnel within the Site and these additional areas, and to keep them off adjacent land.

During the execution of the Works, the Contractor shall keep the Site free from all unnecessary obstruction, and shall store or dispose of any Contractor's Equipment or surplus materials. The Contractor shall clear away and remove from the Site any wreckage, rubbish and Temporary Works which are no longer required.

Upon the issue of a Taking-Over Certificate, the Contractor shall clear away and remove, from that part of the Site and Works to which the Taking-Over Certificate refers, all Contractor's Equipment, surplus material, wreckage, rubbish and Temporary Works. The Contractor shall leave that part of the Site and the Works in a clean and safe condition.

However, the Contractor may retain on Site, during the Defects Notification Period, such Goods as are required for the Contractor to fulfill obligations under the Contract.

4.24 Fossils

All fossils, coins, articles of value or antiquity, and structures and other remains or items of geological or archaeological interest found on the Site shall be placed under the care and authority of the Employer. The Contractor shall take reasonable precautions to prevent Contractor's Personnel or other persons from removing or damaging any of these findings.

The Contractor shall, upon discovery of any such finding, promptly give notice to the Engineer, who shall issue instructions for dealing with it. If the Contractor suffers delay and/or incurs Cost from complying with the instructions, the Contractor shall give a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

(a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

(b) payment of any such Cost, which shall be included in the Contract Price.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

5	Nominated Subcontractors

5.1 Definition of nominated Subcontractor

In the Contract, "nominated Subcontractor" means a Subcontractor:

(a) who is stated in the Contract as being a nominated Subcontractor, or

(b) whom the Engineer, under Clause 13 [Variations and Adjustments], instructs the Contractor to employ as a Subcontractor.

5.2 Objection to Nomination

The Contractor shall not be under any obligation to employ a nominated Subcontractor against whom the Contractor raises reasonable objection by notice to the Engineer as soon as practicable, with supporting particulars. An objection shall be deemed reasonable if it arises from (among other things) any of the following matters, unless the Employer agrees to indemnify the Contractor against and from the consequences of the matter:

(a) there are reasons to believe that the Subcontractor does not have sufficient competence, resources or financial strength;

(b) the subcontract does not specify that the nominated Subcontractor shall indemnify the Contractor against and from any negligence or misuse of Goods by the nominated Subcontractor, his agents and employees; or

(c) the subcontract does not specify that, for the subcontracted work (including design, if any), the nominated Subcontractor shall:

  (i) undertake to the Contractor such obligations and liabilities as will enable the Contractor to discharge his obligations and liabilities under the Contract, and

  (ii) indemnify the Contractor against and from all obligations and liabilities arising under or in connection with the Contract and from the consequences of any failure by the Subcontractor to perform these obligations or to fulfil these liabilities.

5.3 Payments to nominated Subcontractors

The Contractor shall pay to the nominated Subcontractor the amounts which the Engineer certifies to be due in accordance with the subcontract. These amounts plus other charges shall be included in the Contract Price in accordance with sub-paragraph (b) of Sub-Clause 13.5 [Provisional Sums], except as stated in Sub-Clause 5.4 [Evidence of Payments].

5.4 Evidence of Payments

Before issuing a Payment Certificate which includes an amount payable to a nominated Subcontractor, the Engineer may request the Contractor to supply reasonable evidence that the nominated Subcontractor has received (Within 7 days of receipt of previous

payment by the contractor) all amounts due in accordance with previous Payment Certificates, less applicable deductions for retention or otherwise. Unless the Contractor:

(a) submits this reasonable evidence to the Engineer, or

(b)

(i) satisfies the Engineer in writing that the Contractor is reasonably entitled to withhold or refuse to pay these amounts, and

(ii) submits to the Engineer reasonable evidence that the nominated Subcontractor has been notified of the Contractor's entitlement,

then the Employer may (at his sole discretion) pay, direct to the nominated Subcontractor, part or all of such amounts previously certified (less applicable deductions) as are due to the nominated Subcontractor and for which the Contractor has failed to submit the evidence described in sub-paragraphs (a) or (b) above. The Contractor shall then repay, to the Employer, the amount which the nominated Subcontractor was directly paid by the Employer.

6	Staff and Labour

6.1 Engagement of Staff and Labour

Except as otherwise stated in the Specification, the Contractor shall make arrangements for the engagement of all staff and labour, local or otherwise, and for their payment, housing, feeding and transport.

The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labor with appropriate qualifications and experience from sources within the Country.

6.2 Rates of Wages and Conditions of Labour

The Contractor shall pay rates of wages, and observe conditions of labour, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose trade or industry is similar to that of the Contractor.

If the Employer is obliged to provide amenities or arrange payment of wages to contract labour employed by the contractor either directly or through sub contractor under the contract on account of failures on the part the contractor to provide the amenities and / or arrange payment of wages to the contract labour as required of him under the provision of the said act / rules made there under, the Engineer/Employer shall be at liberty without prejudice to the rights of Engineer/Employer under Section 20(2) and 21(4) of the contract labour (Regulation and Abolition) Act 1970 to recover the whole or part of the expenditure so incurred on the wages so paid by the Engineer/Employer/Railway from the security deposit and/or from any sum or sums due to the contractor whether under this contract or any other contract.

The Contractor shall inform the Contractor's Personnel about their liability to pay personal income taxes in the Country in respect of such of their salaries, wages, allowances, and any benefits as are subject to taxes under the Laws of the Country for the time being in force, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such Laws.

The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contravention of any of the provisions of any Act or rules made there-under, regulation or notifications including amendment. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/bye laws/Acts/Rules/ regulations including amendments, if any, on the part of the Contractor, the Engineer/Employer shall have the right to deduct any money due to the contractor including his amount of performance security. The Employer/Engineer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.

The employees of the Contractor and the Sub-Contractor in no case shall be treated as the employees of the Employer at any point of time.

The Contractor shall duly comply with the provisions of the Apprentices Act 1961 (III of 1961), the rules made there under and the orders that may be issued from time to time under the said Act and the said Rules and on his failure or neglect to do so he shall be subject to all liabilities provide by the said Act and said Rules.

The Contractor and his Sub Contractors shall comply with all applicable Labour Laws, and should not employ Child Labour for construction and maintenance activities. The Contractor shall provide appropriate facilities for children in Construction Camp sites.

The Contractors shall not differentiate wages between men and women for work of equal value.

6.3 Persons in the Service of Employer

The Contractor shall not recruit, or attempt to recruit, staff and labour from amongst persons in the service of the Employer or the Engineer.

6.4 Labour Laws

The Contractor shall comply with all the relevant labour Laws applicable to the Contractor's Personnel, including Laws relating to their employment, health, safety, welfare, immigration, and emigration, and shall allow them all their legal rights. The contractor and his sub-contractors shall be responsible to ensure at his own cost, compliance to all laws, bye-laws, rules and regulations for the time being in force pertaining to the employment of local or imported labour and shall take all necessary precautions to ensure and preserve the health and safety of all staff employed directly or through sub-contractors or petty contractors on the works which shall include all the acts listed in Appendex – 1 but not limited to the same.

The Contractor shall require his employees to obey all applicable Laws, including those concerning safety at work.

During continuance of the Contract, the Contractor and his Sub-Contractors shall abide at all times by all existing labour enactments and rules made thereunder, regulations, notifications and bye laws of the State or Central government or local authority and any other labour laws (including rules), regulations, bye laws that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or the local authority. Salient features of some of the major labour laws hat are applicable to construction industry are given in Appendix 1 to these Conditions of Contract.

6.5 Working Hours

No work shall be carried out on the Site on locally recognised days of rest, or outside the normal working hours stated in the Contract Data, unless:

(a) otherwise stated in the Contract,

(b) the Engineer gives consent, or

(c) the work is unavoidable, or necessary for the protection of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Engineer.

6.6 Facilities for Staff and Labour

Except as otherwise stated in the Specification, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel. The Contractor shall also provide facilities for the Employer's Personnel as stated in the Specification.

The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.

6.7 Health and Safety

The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel. In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay and a standing arrangement for ambulance service are available at a phone call at all times at the Site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.

In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government or the local medical or sanitary authorities, for the purpose of dealing with and overcoming the same. The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the execution of the Works, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.

The Contractor shall send, to the Engineer, details of any accident as soon as practicable

after its occurrence.

HIV-AIDS Prevention. The Contractor shall conduct an HIV-AIDS awareness programme via an approved service provider, and shall undertake such other measures as are specified in this Contract to reduce the risk of the transfer of the HIV virus between and among the Contractor's Personnel and the local community, to promote early diagnosis and to assist affected individuals.

Epidemics

In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government or the local medical or sanitary authorities, for the purpose of dealing with and overcoming the same.

Records of Safety and Health

The Contractor shall maintain such records and make such reports concerning safety, health and welfare of persons and damage to property as the Engineer may from time to time prescribe.

Submission of Returns: :

The contractor shall be responsible for timely submission of all returns and statements to the concerned authorities in full compliance of all rules, bye-laws and regulations for the time being in force.

The Contractor shall throughout the contract (including the Defects Notification Period): (i) conduct Information, Education and Consultation Communication (IEC) campaigns, at least every other month, addressed to all the Site staff and labor (including all the Contractor's employees, all Sub-Contractors and Consultants' employees, and all truck drivers and crew making deliveries to Site for construction activities) and to the immediate local communities, concerning the risks, dangers and impact, and appropriate avoidance behavior with respect to of Sexually Transmitted Diseases (STD)—or Sexually Transmitted Infections (STI) in general and HIV/AIDS in particular; (ii) provide male or female condoms for all Site staff and labor as appropriate; and (iii) provide for STI and HIV/AIDS screening, diagnosis, counseling and referral to a dedicated national STI and HIV/AIDS program, (unless otherwise agreed) of all Site staff and labor.

The Contractor shall include in the program to be submitted for the execution of the Works under Sub-Clause 8.3 an alleviation program for Site staff and labour and their families in respect of Sexually Transmitted Infections (STI) and Sexually Transmitted Diseases (STD) including HIV/AIDS. The STI, STD and HIV/AIDS alleviation program shall indicate when, how and at what cost the Contractor plans to satisfy the requirements of this Sub-Clause and the related specification. For each component, the program shall detail the resources to be provided or utilized and any related sub-contracting proposed. The program shall also include provision of a detailed cost estimate with supporting documentation. Payment to the Contractor for preparation and implementation this program shall not exceed the Provisional Sum dedicated for this purpose.

6.8 Contractor's Superintendence

Throughout the execution of the Works, and as long thereafter as is necessary to fulfil the Contractor's obligations, the Contractor shall provide all necessary superintendence to

plan, arrange, direct, manage, inspect and test the work.

Superintendence shall be given by a sufficient number of persons having adequate knowledge of the language for communications (defined in Sub-Clause 1.4 [Law and Language]) and of the operations to be carried out (including the methods and techniques required, the hazards likely to be encountered and methods of preventing accidents), for the satisfactory and safe execution of the Works.

The Contractor shall employ the key personnel named in the Schedule of Personnel as referred to in the Contract Data to carry out the functions stated in the Schedule or other personnel approved by the Engineer. The Engineer will approve any proposed replacement of key personnel only if their qualifications, abilities and relevant experience are substantially equal to or better than those of the personnel listed in the Schedule.

The Contractor shall not employ any retired government Gazetted officer, who has either not completed one year after the date of retirement, or has not obtained permission to employment with the Contractor.

6.9 Contractor's Personnel

The Contractor's Personnel shall be appropriately qualified, skilled and experienced in their respective trades or occupations. The Engineer may require the Contractor to remove (or cause to be removed) any person employed on the Site or Works, including the Contractor's Representative if applicable, who:

(a) persists in any misconduct or lack of care,

(b) carries out duties incompetently or negligently,

(c) fails to conform with any provisions of the Contract, or

(d) persists in any conduct which is prejudicial to safety, health, or the protection of the environment.

If the Engineer asks the Contractor to remove a person who is a member of the Contractor's staff or his work force stating the reasons, the Contractor shall ensure that the person leaves the Site within seven (7) days and has no further connection with the work in the Contract. The replacement person shall be appointed within fourteen (14) days of the notification by the Engineer.

A reasonable proportion of the Contractor's Superintending Staff shall have a working knowledge of the English language or the Contractor shall have available on site at all times a sufficient number of competent interpreters to ensure the proper transmission of instructions and information. If appropriate, the Contractor shall then appoint (or cause to be appointed) a suitable replacement person.

6.10 Records of Contractor's Personnel and Equipment

The Contractor shall submit, to the Engineer, details showing the number of each class of Contractor's Personnel and of each type of Contractor's Equipment on the Site. Details shall be submitted each calendar month, in a form approved by the Engineer, until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works.

6.11 Disorderly Conduct

The Contractor shall at all times take all reasonable precautions to prevent any unlawful,

riotous or disorderly conduct by or amongst the Contractor's Personnel, and to preserve peace and protection of persons and property on and near the Site.

6.12 Foreign Personnel

The Contractor may bring in to the country any foreign personnel who are necessary for the execution of the Works to the extent allowed by the applicable Laws. The Contractor shall ensure that these personnel are provided with the required residence visas and work permits. The Employer will, without any financial liability, if requested by the Contractor, use his best endeavours in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national, or government permission required for bringing in the Contractor's personnel.

The Contractor shall be responsible for the return of these personnel to the place where they were recruited or to their domicile. In the event of the death in the Country of any of these personnel or members of their families, the Contractor shall similarly be responsible for making the appropriate arrangements for their return or burial. Contractor shall also be responsible for any legal liabilities during their stay.

6.13 Supply of Foodstuffs

The Contractor shall arrange for the provision of a sufficient supply of suitable food as may be stated in the Specification at reasonable prices for the Contractor's Personnel for the purposes of or in connection with the Contract.

6.14 Supply of Water

The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor's Personnel.

6.15 Measures against Insect and Pest Nuisance

The Contractor shall at all times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce their danger to health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.

The Contractor shall provide his staff and labour with suitable prophylactics for the prevention of malaria, and take steps to prevent the formation of stagnant pools of water. He shall comply with all the regulations of the local health authorities in these respects and shall in particular arrange to spray thoroughly with approved insecticides all buildings erected on the site such treatment shall be carried out at least once a year or as instructed by the Engineer. The Contractor shall warn his staff and labour of the dangers of diseases like Malaria, Filaria and other contagious diseases etc. and also Scorpions, Snakes, Wild animals etc. and preventive actions required to be taken by the labour and staff.

6.16 Alcoholic Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Laws of the Country, import, sell, give barter or otherwise dispose of any alcoholic liquor or drugs, or permit or

allow importation, sale, gift barter or disposal thereto by Contractor's Personnel.

6.17 Arms and Ammunition

The Contractor shall not give, barter, or otherwise dispose of, to any person, any arms or ammunition of any kind, or allow Contractor's Personnel to do so.

6.18 Festivals and Religious Customs

The Contractor shall respect the Country's recognized festivals, days of rest and religious or other customs.

6.19 Funeral Arrangements

The Contractor shall be responsible, to the extent required by local regulations, for making any funeral arrangements for any of his local employees who may die while engaged upon the Works.

6.20 Prohibition of Forced or Compulsory Labour

The contractor shall not employ "forced or compulsory labour" in any form. "Forced or compulsory labour" consists of all work or service, not voluntarily performed, that is extracted from an individual under threat of force or penalty.

6.21 Prohibition of Harmful Child Labour

The Contractor shall not employ any child to perform any work that is economically exploitative, or is likely to be hazardous to, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.

6.22 Employment Records of Workers

The Contractor shall keep complete and accurate records of the employment of labour at the Site. The records shall include the names, ages, genders, hours worked and wages paid to all workers. These records shall be summarized on a monthly basis and shall be available for inspection by the Engineer during normal working hours. These records shall be included in the details to be submitted by the Contractor under Sub-Clause 6.10 [Records of Contractor's Personnel and Equipment].

(j) In addition to the above, the Contractor shall register his firm/company etc. on website 'www.shramikkalyan.indianrailways.gov.in' and upload requisite details of labour and their payment in this portal. These details shall be available in public domain. The Registration/ updation on Portal shall be done as under:

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

(b)Contractor once approved by any Employer/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 Employer/Engineer. Employer/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 Employer/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.

(ii) While processing payment of any 'Interim Payment Certificate' or 'Final Payment Certificate' 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."

7	Plant, Materials and Workmanship

7.1 Manner of Execution

The Contractor shall carry out the manufacture of Plant, the production and manufacture of Materials, and all other execution of the Works:

(a) in the manner (if any) specified in the Contract,

(b) in a proper workmanlike and careful manner, in accordance with recognised good practice, and

(c) with properly equipped facilities and non-hazardous Materials, except as otherwise specified in the Contract.

7.2 Samples

The Contractor shall submit the following samples of Materials, and relevant information, to the Engineer for consent prior to using the Materials in or for the Works:

(a) manufacturer's standard samples of Materials and samples specified in the Contract, all at the Contractor's cost, and

(b) additional samples instructed by the Engineer as a Variation.

Each sample shall be labelled as to origin and intended use in the Works.

7.3 Inspection

The Employer's Personnel shall at all reasonable times:

(a) have full access to all parts of the Site and to all places from which natural Materials are being obtained, and

(b) during production, manufacture and construction (at the Site and elsewhere), be entitled to examine, inspect, measure and test the materials and workmanship, and to check the progress of manufacture of Plant and production and manufacture of Materials.

The Contractor shall give the Employer's Personnel full opportunity to carry out these activities, including providing access, facilities, permissions and safety equipment. No such activity shall relieve the Contractor from any obligation or responsibility.

The Contractor shall give notice to the Engineer whenever any work is ready and before it is covered up, put out of sight, or packaged for storage or transport. The Engineer shall then either carry out the examination, inspection, measurement or testing without unreasonable delay, or promptly give notice to the Contractor that the Engineer does not require to do so. If the Contractor fails to give the notice, he shall, if and when required by the Engineer, uncover the work and thereafter reinstate and make good, all at the Contractor's cost.

7.4 Testing

This Sub-Clause shall apply to all tests specified in the Contract, other than the Tests after Completion (if any).

The Contractor shall provide all apparatus, assistance, documents and other information, electricity, equipment, fuel, consumables, instruments, labour, materials, and suitably qualified and experienced staff, as are necessary to carry out the specified tests efficiently. The Contractor shall agree, with the Engineer, the time and place for the specified testing of any Plant, Materials and other parts of the Works.

The Engineer may, under Clause 13 [Variations and Adjustments], vary the location or details of specified tests, or instruct the Contractor to carry out additional tests. If these varied or additional tests show that the tested Plant, Materials or workmanship is not in accordance with the Contract, the cost of carrying out this Variation shall be borne by the Contractor, notwithstanding other provisions of the Contract.

The Engineer shall give the Contractor not less than 24 hours' notice of the Engineer's intention to attend the tests. If the Engineer does not attend at the time and place agreed, the Contractor may proceed with the tests, unless otherwise instructed by the Engineer,

and the tests shall then be deemed to have been made in the Engineer's presence.

If the Contractor suffers delay and/or incurs Cost from complying with these instructions or as a result of a delay for which the Employer is responsible, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

(a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

(b) payment of any such Cost , which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

The Contractor shall promptly forward to the Engineer duly certified reports of the tests. When the specified tests have been passed, the Engineer shall endorse the Contractor's test certificate, or issue a certificate to him, to that effect. If the Engineer has not attended the tests, he shall be deemed to have accepted the readings as accurate.

7.5 Rejection

If, as a result of an examination, inspection, measurement or testing, any Plant, Materials or workmanship is found to be defective or otherwise not in accordance with the Contract, the Engineer may reject the Plant, Materials or workmanship by giving notice to the Contractor, with reasons. The Contractor shall then promptly make good the defect and ensure that the rejected item complies with the Contract.

If the Engineer requires this Plant, Materials or workmanship to be retested, the tests shall be repeated under the same terms and conditions. If the rejection and retesting cause the Employer to incur additional costs, the Contractor shall subject to Sub-Clause 2.5 [Employer's Claims] pay these costs to the Employer.

7.6 Remedial Work

Notwithstanding any previous test or certification, the Engineer may instruct the Contractor to:

(a) remove from the Site and replace any Plant or Materials which is not in accordance with the Contract,

(b) remove and re-execute any other work which is not in accordance with the Contract, and

(c) execute any work which is urgently required for the safety of the Works, whether because of an accident, unforeseeable event or otherwise.

The Contractor shall comply with the instruction within a reasonable time, which shall be the time (if any) specified in the instruction, or immediately if urgency is specified under sub-paragraph (c).

If the Contractor fails to comply with the instruction, the Employer shall be entitled to employ and pay other persons to carry out the work. Except to the extent that the Contractor would have been entitled to payment for the work, the Contractor shall subject to Sub-Clause 2.5 [Employer's Claims] pay to the Employer all costs arising from this failure.

7.7 Ownership of Plant and Materials

Each item of Plant and Materials shall, to the extent consistent with the Laws of the Country, become the property of the Employer at whichever is the earlier of the following times, free from liens and other encumbrances:

(a) when it is delivered to the Site;

(b) when the Contractor is entitled to payment of the value of the Plant and Materials under Sub-Clause 8.10 [Payment for Plant and Materials in Event of Suspension].

Unless otherwise stated in the Specification, the Contractor shall pay all royalties, rents and other payments for:

(a) natural Materials obtained from outside the Site, and

(b) the disposal of material from demolitions and excavations and of other surplus material (whether natural or man-made), except to the extent that disposal areas within the Site are specified in the Contract.

8 Commencement, Delay and Suspension

8.1 Commencement of Works

The Engineer shall give the Contractor not less than 7 days' notice of the Commencement of work. Unless otherwise stated in the Special Conditions of Contract, the Commencement of work shall be within the number of days after the Contractor receives the Letter of Acceptance as specified in Contract Data.

The Contractor shall commence the execution of the Works as soon as is reasonably practicable after the Commencement Date, and shall then proceed with the Works with due expedition and without delay.

8.2 Time for Completion

The Contractor shall complete the whole of the Works, and each Section (if any), within the Time for Completion for the Works or Section (as the case may be), including:

(a) achieving the passing of the Tests on Completion, and

(b) completing all work which is stated in the Contract as being required for whole of the Works or Section(s) to be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 [Taking Over of the Works and Sections].

(c) The date of completion for works described in this sub-clause, shall be the earliest of the following :

(i) The date CRS recommends opening of the Section(s) for public carriage of passengers to Central Government, for speeds of not less than 75% of the designed operating speeds or,

(ii) The date CRS authorises the Railway Administration for opening of Section(s), subject to sanction of the Central Government for speeds of not less than 75% of the designed operating speeds, or,

(iii) The date CRS authorizes/sanctions opening of Section(s) without inspection.

8.3 Programme

The Contractor shall submit a detailed time programme to the Engineer within 28 days after receiving the notice under Sub-Clause 8.1 [Commencement of Works]. The program shall include the physical and Financial Progress vis-à-vis program and forecast cash flow adopting Project Management Software Primavera/Sure Track/MS Project or as mutually agreed. The program must identify the milestones, interface requirements and program reporting elements. The Contractor shall supply, free of cost one set of authorized software to the Engineer and the soft copy of structured program for the project. This shall be updated every month. The Contractor shall also submit a revised programme whenever the previous programme is inconsistent with actual progress or with the Contractor's obligations. Each programme shall include:

(a) the order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage of design (if any), Contractor's Documents, procurement, manufacture of Plant, delivery to Site, construction, erection and testing,

(b) each of these stages for work by each nominated Subcontractor (as defined in Clause 5 [Nominated Subcontractors]),

(c) the sequence and timing of inspections and tests specified in the Contract, and

(d) a supporting report which includes:

  (i) a general description of the methods which the Contractor intends to adopt, and of the major stages, in the execution of the Works, and

  (ii) details showing the Contractor's reasonable estimate of the number of each class of Contractor's Personnel and of each type of Contractor's Equipment, required on the Site for each major stage.

Unless the Engineer, within 21 days after receiving a programme, gives notice to the Contractor stating the extent to which it does not comply with the Contract, the Contractor shall proceed in accordance with the programme, subject to his other obligations under the Contract. The Employer's Personnel shall be entitled to rely upon the programme when planning their activities.

The Contractor shall promptly give notice to the Engineer of specific probable future events or circumstances which may adversely affect the work, increase the Contract Price or delay the execution of the Works. The Engineer may require the Contractor to submit an estimate of the anticipated effect of the future event or circumstances, and/or a proposal under Sub-Clause 13.3 [Variation Procedure].

If, at any time, the Engineer gives notice to the Contractor that a programme fails (to the extent stated) to comply with the Contract or to be consistent with actual progress and the Contractor's stated intentions, the Contractor shall submit a revised programme to the Engineer within 15 days in accordance with this Sub-Clause.

8.4 Extension of Time for Completion

The Contractor shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to an extension of the Time for Completion if and to the extent that completion for the purposes of Sub-Clause 10.1 [Taking-Over of the Works and Sections] is or will be delayed by any of the following causes:

(a) a Variation (unless an adjustment to the Time for Completion has been agreed under Sub-Clause 13.3 [Variation Procedure]) or other substantial change in the quantity of an item of work included in the Contract,

(b) a cause of delay giving an entitlement to extension of time under a Sub-Clause of these Conditions,

(c) exceptionally adverse climatic conditions,

(d) Unforeseeable shortages in the availability of personnel or Goods caused by epidemic or governmental actions, or

(e) any delay, impediment or prevention caused by or attributable to the Employer, the Employer's Personnel, or the Employer's other contractors.

If the Contractor considers himself to be entitled to an extension of the Time for Completion, the Contractor shall give notice to the Engineer in accordance with Sub-Clause 20.1 [Contractor's Claims]. When determining each extension of time under Sub-Clause 20.1, the Engineer shall review previous determinations and may increase, but shall not decrease, the total extension of time.

8.5 Delays Caused by Authorities

If the following conditions apply, namely:

(a) the Contractor has diligently followed the procedures laid down by the relevant legally constituted public authorities in the Country,

(b) these authorities delay or disrupt the Contractor's work, and

(c) the delay or disruption was Unforeseeable,

then this delay or disruption will be considered as a cause of delay under sub-paragraph (b) of Sub-Clause 8.4 [Extension of Time for Completion].

8.6 Rate of Progress

If, at any time:

(a) actual progress is too slow to complete within the Time for Completion, and/or

(b) progress has fallen (or will fall) behind the current programme under Sub-Clause 8.3 [Programme],

other than as a result of a cause listed in Sub-Clause 8.4 [Extension of Time for Completion], then the Engineer may instruct the Contractor to submit, under Sub-Clause 8.3 [Programme], a revised programme and supporting report describing the revised methods which the Contractor proposes to adopt in order to expedite progress and complete within the Time for Completion.

Unless the Engineer notifies otherwise, the Contractor shall adopt these revised methods, which may require increases in the working hours and/or in the numbers of Contractor's

Personnel and/or Goods, at the risk and cost of the Contractor. If these revised methods cause the Employer to incur additional costs, the Contractor shall subject to Sub-Clause 2.5 [Employer's Claims] pay these costs to the Employer, in addition to delay damages (if any) under Sub-Clause 8.7 below.

8.7 Extension of Time for Completion with Delay Damages

If the Contractor fails to comply with Sub-Clause 8.2 [Time for Completion for entire work or for specified section wise completion period], and he is not entitled to an extension of time under sub clause 8.4 then the employer may grant extension of time with delay damage in such case, the Contractor shall subject to Sub-Clause 2.5 [Employer's Claims] pay delay damages to the Employer for this default. These delay damages shall be the sum stated in the Contract Data, which shall be paid for every day which shall elapse between the relevant Time for Completion and the date stated in the Taking-Over Certificate. However, the total amount due under this Sub-Clause shall not exceed the maximum amount of delay damages (if any) stated in the Contract Data.

Further, if the contractor fails to achieve physical/financial targets as per the agreed programme for a consecutive period of 3 months without any valid reasons, other than attributable to the contractor, a provisional recovery of delay damages shall be made from the next interim payment certificate @ $1/10^{th}$ of the sum of delay damages stated in the contract data, for the entire period of 3 months. Such recovery shall continue from the further interim payment certificates till the contractor is able to make good the shortfall and achieve the cumulative targets as per agreed programme. On achieving the cumulative progress targets as per agreed programme, the entire amount recovered till that month, shall be refunded to the contractor in the next interim payment certificate. In case the contractor is unable to make good the shortfall and achieve the cumulative targets resulting in delay in completion of the project, then the provisional recoveries made shall be adjusted against the delay damages to be finally imposed on the contractor.

These delay damages shall be the only damages due from the Contractor for such default, other than in the event of termination under Sub-Clause 15.2 [Termination by Employer] prior to completion of the Works. These damages shall not relieve the Contractor from his obligation to complete the Works, or from any other duties, obligations or responsibilities which he may have under the Contract.

8.8 Suspension of Work

The Engineer may at any time instruct the Contractor to suspend progress of part or all of the Works. During such suspension, the Contractor shall protect, store and secure such part or the Works against any deterioration, loss or damage.

The Engineer may also notify the cause for the suspension. If and to the extent that the cause is notified and is the responsibility of the Contractor, the following Sub-Clauses 8.9, 8.10 and 8.11 shall not apply.

8.9 Consequences of Suspension

If the Contractor suffers delay and/or incurs Cost from complying with the Engineer's instructions under Sub-Clause 8.8 [Suspension of Work] and/or from resuming the work, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

(a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

(b) payment of any such Cost, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

The Contractor shall not be entitled to an extension of time for, or to payment of the Cost incurred in, making good the consequences of the Contractor's faulty design, workmanship or materials, or of the Contractor's failure to protect, store or secure in accordance with Sub-Clause 8.8 [Suspension of Work].

8.10 Payment for Plant and Materials in Event of Suspension

The Contractor shall be entitled to payment of the value (as at the date of suspension)of Plant and/or Materials, if:

(a) the work on Plant or delivery of Plant and/or Materials has been suspended for more than 28 days,

(b) the Contractor has marked the Plant and/or Materials as the Employer's property in accordance with the Engineer's instructions, and

(c) Such materials or plant is received at site.

8.11 Prolonged Suspension

If the suspension under Sub-Clause 8.8 [Suspension of Work] has continued for more than 84 days, the Contractor may request the Engineer's permission to proceed. If the Engineer does not give permission within 28 days after being requested to do so, the Contractor may, by giving notice to the Engineer, treat the suspension as an omission under Clause 13 [Variations and Adjustments] of the affected part of the Works. If the suspension affects the whole of the Works, the Contractor may give notice of termination under Sub-Clause 16.2 [Termination by Contractor].

8.12 Resumption of Work

After the permission or instruction to proceed is given, the Contractor and the Engineer shall jointly examine the Works and the Plant and Materials affected by the suspension. The Contractor shall make good any deterioration or defect in or loss of the Works or Plant or Materials, which has occurred during the suspension.

8.13 Bonus for early completion:

If the Contractor achieves completion of the whole of the Works or any section(s) prior to the intended Completion Date prescribed in Contract data (Extension of time pursuant to Clause 8.4 or any other clause of these conditions will not be considered), the Employer shall pay to the Contractor a sum stated in the Contract data as bonus for early completion, for every calendar month which shall elapse between the date of completion of all items of works as stipulated in the contract, including variations ordered by the Engineer and the time prescribed in Clause 8.2. However, on handing over of the particular section for construction of OHE foundations after completing formation, turfing, side drains & protection works for the section excluding station yards but including buildings required for commissioning of the section, the section shall be considered to be substantially completed for the purposes of first stage bonus payment.

If General Manager of the Zonal Railway has signed application for opening of the section(s), such section(s) shall be treated as substantially completed on the date 45 days after the date of signing the application for the purposes of second stage bonus under this clause subject to the conditions that: -

a) In case the CRS has authorized the opening of the section(s) within 45 days from the date of signing the application, then date of authorization shall be the date of completion.

b) In case the CRS has not authorized opening of the section(s) after having come for inspection within 45 days from the date of signing the application, then the section(s) shall not be treated as substantially completed for the purposes of bonus under this clause.

For the purpose of calculating bonus payments, the time given in the Bid for completion of the whole works or any section(s) is fixed and unless otherwise agreed, no adjustment of the time by reasons of granting an extension of time pursuant to clause 8.4 or any other clause of these conditions will be allowed. Any period falling short of completed month shall be ignored for the purpose of computing the period relevant for the payment of bonus.

If the Contractor achieves completion of the whole of the Works or any section(s) prior to the intended Completion Date prescribed in Contract data (Extension of time pursuant to Clause 8.4 or any other clause of these conditions will not be considered), the Employer shall pay to the Contractor a sum stated in the Contract data as bonus for early completion, for every calendar month which shall elapse between the date of completion of all items of works as stipulated in the contract, including variations ordered by the Engineer and the time prescribed in Clause 8.2. However, on completion of all PSC girder/slab bridges including protection works and successful passing of load testing but excluding linking of track, and on completion of all steel girder bridges, if any, including protection works but excluding load testing and linking of track on steel girder bridges, the section shall be considered to be substantially completed for the purposes of bonus payment under this clause. In case the particular section involves construction of steel bridges, the payment of bonus shall only be done on successful passing of load testing of steel bridges but the bonus is to be calculated from the date of substantial completion as defined above.

For the purpose of calculating bonus payments, the time given in the Bid for completion of the whole works or any section(s) is fixed and unless otherwise agreed, no adjustment of the time by reasons of granting an extension of time pursuant to clause 8.4 or any other clause of these conditions will be allowed. Any period falling short of completed month shall be ignored for the purpose of computing the period relevant for the payment of bonus.

9	Tests on Completion

9.1 Contractor's Obligations

The Contractor shall carry out the Tests on Completion in accordance with this Clause and Sub-Clause 7.4 [Testing], after providing the documents in accordance with sub-paragraph (d) of Sub-Clause 4.1 [Contractor's General Obligations].

The Contractor shall give to the Engineer not less than 21 days' notice of the date after which the Contractor will be ready to carry out each of the Tests on Completion. Unless otherwise agreed, Tests on Completion shall be carried out within 14 days after this date, on such day or days as the Engineer shall instruct.

In considering the results of the Tests on Completion, the Engineer shall make allowances for the effect of any use of the Works by the Employer on the performance or other characteristics of the Works. As soon as the Works, or a Section, have passed any Tests on Completion, the Contractor shall submit a certified report of the results of these Tests to the Engineer.

9.2 Delayed Tests

If the Tests on Completion are being unduly delayed by the Employer, Sub-Clause 7.4 [Testing] (fifth paragraph) and/or Sub-Clause 10.3 [Interference with Tests on Completion] shall be applicable.

If the Tests on Completion are being unduly delayed by the Contractor, the Engineer may by notice require the Contractor to carry out the Tests within 21 days after receiving the notice. The Contractor shall carry out the Tests on such day or days within that period as the Contractor may fix and of which he shall give notice to the Engineer.

If the Contractor fails to carry out the Tests on Completion within the period of 21 days, the Employer's Personnel may proceed with the Tests at the risk and cost of the Contractor. The Tests on Completion shall then be deemed to have been carried out in the presence of the Contractor and the results of the Tests shall be accepted as accurate.

9.3 Retesting

If the Works, or a Section, fail to pass the Tests on Completion, Sub-Clause 7.5 [Rejection] shall apply, and the Engineer or the Contractor may require the failed Tests, and Tests on Completion on any related work, to be repeated under the same terms and conditions.

9.4 Failure to Pass Tests on Completion

If the Works, or a Section, fail to pass the Tests on Completion repeated under Sub-Clause 9.3 [Retesting], the Engineer shall be entitled to:

(a) order further repetition of Tests on Completion under Sub-Clause 9.3;

(b) if the failure deprives the Employer of substantially the whole benefit of the Works or Section, reject the Works or Section (as the case may be), in which event the Employer shall have the same remedies as are provided in sub-paragraph (c) of Sub-Clause 11.4 [Failure to Remedy Defects]; or

(c) issue a Taking-Over Certificate, if the Employer so requests.

In the event of sub-paragraph (c), the Contractor shall proceed in accordance with all

other obligations under the Contract, and the Contract Price shall be reduced by such amount as shall be appropriate to cover the reduced value to the Employer as a result of this failure. Unless the relevant reduction for this failure is stated (or its method of calculation is defined) in the Contract, the Employer may require the reduction to be (i) agreed by both Parties (in full satisfaction of this failure only) and paid before this Taking-Over Certificate is issued, or (ii) determined and paid under Sub-Clause 2.5 [Employer's Claims] and Sub-Clause 3.5 [Determinations].

9.5 Contractor's obligations

Notwithstanding the provisions of sub-clauses 4.1, 9.1 to 9.4 the provisions in subsequent sub-clauses shall apply for works of Permanent Way, signaling and telecommunication and railway electrification excluding General Electrical Services.

(a) The Contractor shall be responsible for the execution of temporary and/or permanent works which may require the prior sanction/approval of Commissioner of Railway Safety (CRS) in accordance with extant rules for " The Railways opening for Public Carriage of Passengers" was amended from time to time. And applicable as and when the works are undertaken. The Contractor shall initiate the process for approval at least **63** (sixty three) days prior to undertaking such works which require the approval of Commissioner of Railway Safety (CRS) and furnish draft documentation to the Engineer.

(b) The Contractor shall ensure that existing services and operations for public carriage of passengers or goods, are not affected except those, which are essentially required to be regulated for execution of works. Such items of works shall be planned and coordinated through the Engineer.

(c) Prior to the commencement of commercial operations of passenger traffic :

(i) The Contractor may have to operate locomotives, track machines and any other rolling stock for track tamping, trial runs, etc. for which track, signaling or OHE works must comply with the specifications.

(ii) The Employer may permit freight train operations to Railway after certification by the authorized person of Zonal Railway

(iii) The Contractor shall be responsible for maintaining the facilities ensuring safety of operations under (i) & (ii) above as per specifications.

(iv)

10 Employer's Taking Over

10.1 Taking Over of the Works and Sections

Except as stated in Sub-Clause 9.4 [Failure to Pass Tests on Completion], the Works shall be taken over by the Employer/Railway when (i) the Works have been completed in accordance with the Contract, including the matters described in Sub-Clause 8.2 [Time for Completion] and except as allowed in sub-paragraph (a) below, and (ii) a Taking-Over Certificate for the Works has been issued, or is deemed to have been issued in accordance with this Sub-Clause.

The Contractor may apply by notice to the Engineer for a Taking-Over Certificate not earlier than 14 days before the Works will, in the Contractor's opinion, be complete and ready for taking over. If the Works are divided into Sections, the Contractor may similarly apply for a Taking-Over Certificate for each Section.

In case the works are to be taken over in accordance with sub-clause 9.5, the completed works shall be taken over by the Zonal Railway with the procedure specified by the Engineer.

The Engineer shall, within 28 days after receiving the Contractor's application:

(a) issue the Taking-Over Certificate to the Contractor, stating the date on which the Works or Section were completed in accordance with the Contract, except for any minor outstanding work and defects which will not substantially affect the use of the Works or Section for their intended purpose (either until or whilst this work is completed and these defects are remedied); or

(b) reject the application, giving reasons and specifying the work required to be done by the Contractor to enable the Taking-Over Certificate to be issued. The Contractor shall then complete this work before issuing a further notice under this Sub-Clause.

If the Engineer fails either to issue the Taking-Over Certificate or to reject the Contractor's application within the period of 28 days, and if the Works or Section (as the case may be) are substantially in accordance with the Contract, the Taking-Over Certificate shall be deemed to have been issued on the last day of that period.

10.2 Taking Over of Parts of the Works

The Engineer may, at the sole discretion of the Employer, issue a Taking-Over Certificate for any part of the Permanent Works.

The Employer shall not use any part of the Works (other than as a temporary measure which is either specified in the Contract or agreed by both Parties) unless and until the Engineer has issued a Taking-Over Certificate for this part. However, if the Employer does use any part of the Works before the Taking-Over Certificate is issued:

(a) the part which is used shall be deemed to have been taken over as from the date on which it is used,

(b) the Contractor shall cease to be liable for the care of such part as from this date, when responsibility shall pass to the Employer, and

(c) if requested by the Contractor, the Engineer shall issue a Taking-Over Certificate for this part.

After the Engineer has issued a Taking-Over Certificate for a part of the Works, the Contractor shall be given the earliest opportunity to take such steps as may be necessary to carry out any outstanding Tests on Completion. The Contractor shall carry out these Tests on Completion as soon as practicable before the expiry date of the relevant Defects Notification Period.

If the Contractor incurs Cost as a result of the Employer taking over and/or using a part of the Works, other than such use as is specified in the Contract or agreed by the Contractor, the Contractor shall (i) give notice to the Engineer and (ii) be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to payment of any such Cost, which shall be included in the Contract Price. After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine this Cost and

profit.

If a Taking-Over Certificate has been issued for a part of the Works (other than a Section), the delay damages thereafter for completion of the remainder of the Works shall be reduced. Similarly, the delay damages for the remainder of the Section (if any) in which this part is included shall also be reduced. For any period of delay after the date stated in this Taking-Over Certificate, the proportional reduction in these delay damages shall be calculated as the proportion which the value of the part so certified bears to the value of the Works or Section (as the case may be) as a whole. The Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these proportions. The provisions of this paragraph shall only apply to the daily rate of delay damages under Sub-Clause 8.7 [Delay Damages], and shall not affect the maximum amount of these damages.

10.3 Interference with Tests on Completion

If the Contractor is prevented, for more than 14 days, from carrying out the Tests on Completion by a cause for which the Employer/Engineer/other Contractors of the Employer, are responsible, the Employer shall be deemed to have taken over the Works or Section (as the case may be) on the date when the Tests on Completion would otherwise have been completed.

The Engineer shall then issue a Taking-Over Certificate accordingly, and the Contractor shall carry out the Tests on Completion as soon as practicable, before the expiry date of the Defects Notification Period. The Engineer shall require the Tests on Completion to be carried out by giving 14 days' notice and in accordance with the relevant provisions of the Contract.

If the Contractor suffers delay and/or incurs Cost as a result of this delay in carrying out the Tests on Completion, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

(a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

(b) payment of any such Cost, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

10.4 Surfaces Requiring Reinstatement

Except as otherwise stated in a Taking-Over Certificate, a certificate for a Section or part of the Works shall not be deemed to certify completion of any ground or other surfaces requiring reinstatement.

11 Defects Liability

11.1 Completion of Outstanding Work and Remedying Defects

In order that the Works and Contractor's Documents, and each Section, shall be in the condition required by the Contract (fair wear and tear excepted) by the expiry date of the relevant Defects Notification Period or as soon as practicable thereafter, the Contractor shall:

(a) complete any work which is outstanding on the date stated in a Taking-Over Certificate, within such reasonable time as is instructed by the Engineer, and

(b) execute all work required to remedy defects or damage, as may be notified by (or on behalf of) the Employer on or before the expiry date of the Defects Notification Period for the Works or Section (as the case may be).

If a defect appears or damage occurs, the Contractor shall be notified accordingly, by (or on behalf of) the Employer.

11.2 Cost of Remedying Defects

All work referred to in sub-paragraph (b) of Sub-Clause 11.1 [Completion of Outstanding Work and Remedying Defects] shall be executed at the risk and cost of the Contractor, if and to the extent that the work is attributable to:

(a) any design for which the Contractor is responsible,

(b) Plant, Materials or workmanship not being in accordance with the Contract, or

(c) failure by the Contractor to comply with any other obligation.

If and to the extent that such work is attributable to any other cause, the Contractor shall be notified promptly by (or on behalf of) the Employer, and Sub-Clause 13.3 [Variation Procedure] shall apply

11.3 Extension of Defects Notification Period

The Employer shall be entitled subject to Sub-Clause 2.5 [Employer's Claims] to an extension of the Defects Notification Period for the Works or a Section if and to the extent that the Works, Section or a major item of Plant (as the case may be, and after taking over) cannot be used for the purposes for which they are intended by reason of a defect or damage. However, a Defects Notification Period shall not be extended by more than two years.

If delivery and/or erection of Plant and/or Materials was suspended under Sub-Clause 8.8 [Suspension of Work] or Sub-Clause 16.1 [Contractor's Entitlement to Suspend Work], the Contractor's obligations under this Clause shall not apply to any defects or damage occurring more than two years after the Defects Notification Period for the Plant and/or Materials would otherwise have expired.

11.4 Failure to Remedy Defects

If the Contractor fails to remedy any defect or damage within a reasonable time, a date may be fixed by (or on behalf of) the Employer, on or by which the defect or damage is to be remedied. The Contractor shall be given reasonable notice of this date.

If the Contractor fails to remedy the defect or damage by this notified date and this remedial work was to be executed at the cost of the Contractor under Sub-Clause 11.2 [Cost of Remedying Defects], the Employer may (at his option):

(a) Carry out the work himself or by others, in a reasonable manner and at the

Contractor's cost, but the Contractor shall have no responsibility for this work; and the Contractor shall subject to Sub-Clause 2.5 [Employer's Claims] pay to the Employer the costs reasonably incurred by the Employer in remedying the defect or damage;

(b) require the Engineer to agree or determine a reasonable reduction in the Contract Price in accordance with Sub-Clause 3.5 [Determinations]; or

(c) if the defect or damage deprives the Employer of substantially the whole benefit of the Works or any major part of the Works, terminate the Contract as a whole, or in respect of such major part which cannot be put to the intended use. Without prejudice to any other rights, under the Contract or otherwise, the Employer shall then be entitled to recover all sums paid for the Works or for such part (as the case may be), plus financing costs and the cost of dismantling the same, clearing the Site and returning Plant and Materials to the Contractor.

11.5 Removal of Defective Work

If the defect or damage cannot be remedied expeditiously on the Site and the Employer gives consent, the Contractor may remove from the Site for the purposes of repair such items of Plant as are defective or damaged. This consent may require the Contractor to increase the amount of the Performance Security by the full replacement cost of these items, or to provide other appropriate security.

11.6 Further Tests

If the work of remedying of any defect or damage may affect the performance of the Works, the Engineer may require the repetition of any of the tests described in the Contract. The requirement shall be made by notice within 28 days after the defect or damage is remedied.

These tests shall be carried out in accordance with the terms applicable to the previous tests, except that they shall be carried out at the risk and cost of the Party liable, under Sub-Clause 11.2 [Cost of Remedying Defects], for the cost of the remedial work.

11.7 Right of Access

Until the Performance Certificate has been issued, the Contractor shall have such right of access to the Works as is reasonably required in order to comply with this Clause, except as may be inconsistent with the Employer's reasonable security restrictions.

11.8 Contractor to Search

The Contractor shall, if required by the Engineer, search for the cause of any defect, under the direction of the Engineer. Unless the defect is to be remedied at the cost of the Contractor under Sub-Clause 11.2 [Cost of Remedying Defects], the Cost of the search shall be agreed or determined by the Engineer in accordance with Sub-Clause 3.5 [Determinations] and shall be included in the Contract Price.

11.9 Performance and Maintenance Certificate

a) Maintenance Certificate

Contractor's obligations shall not be considered to have been completed until the Employer has issued the Maintenance Certificate to the Contractor, stating the date on which the Contractor completed his obligations under the

Contract.

The Employer shall issue the Maintenance Certificate within 28 days after the latest of the expiry dates of the Defects Notification Periods, or as soon thereafter as the Contractor has supplied all the Contractor's Documents and completed and tested all the Works, including remedying any defects If any during the defect liability period.

b) Performance Certificate

Performance of the Contractor's obligations shall not be considered to have been completed until the Employer has issued the Performance Certificate to the Contractor, stating the date on which the Contractor completed all the works under the Contract.

The Employer shall issue the **Performance** Certificate within 28 days after the Completion of all works , or as soon thereafter if the Contractor has supplied all the Contractor's Documents and completed and tested all the Works, including remedying any defects before handing over the assets.

11.10 Unfulfilled Obligations

After the Performance Certificate has been issued, each Party shall remain liable for the fulfilment of any obligation which remains unperformed at that time. For the purposes of determining the nature and extent of unperformed obligations, the Contract shall be deemed to remain in force.

11.11 Clearance of Site

Upon receiving the Performance Certificate, the Contractor shall remove any remaining Contractor's Equipment, surplus material, wreckage, rubbish and Temporary Works from the Site.

If all these items have not been removed within 28 days after the Employer receives a copy of the Performance Certificate, the Employer may sell or otherwise dispose of any remaining items. The Employer shall be entitled to be paid the costs incurred in connection with, or attributable to, such sale or disposal and restoring the Site.

Any balance of the moneys from the sale shall be paid to the Contractor. If these moneys are less than the Employer's costs, the Contractor shall pay the outstanding balance to the Employer.

12 Measurement and Evaluation

12.1 Works to be Measured

The Works shall be measured, and valued for payment, in accordance with this Clause.

Whenever the Engineer requires any part of the Works to be measured, reasonable notice shall be given to the Contractor's Representative, who shall:

(a) promptly either attend or send another qualified representative to assist the Engineer in making the measurement, and

(b) supply any particulars requested by the Engineer.

If the Contractor fails to attend or send a representative, the measurement made by (or on behalf of) the Engineer shall be accepted as accurate.

Except as otherwise stated in the Contract, wherever any Permanent Works are to be measured from records, these shall be prepared by the Engineer. The Contractor shall, as and when requested, attend to examine and agree the records with the Engineer, and shall sign the same when agreed. If the Contractor does not attend, the records shall be accepted as accurate.

If the Contractor examines and disagrees the records, and/or does not sign them as agreed, then the Contractor shall give notice to the Engineer of the respects in which the records are asserted to be inaccurate. After receiving this notice, the Engineer shall review the records and either confirm or vary them. If the Contractor does not so give notice to the Engineer within 14 days after being requested to examine the records, they shall be accepted as accurate.

12.2 Method of Measurement

Except as otherwise stated in the Contract and notwithstanding local practice:

(a) measurement shall be made of the net actual quantity of each item of the Permanent Works, and

(b) the method of measurement shall be in accordance with the Bill of Quantities or other applicable Schedules.

12.3 Evaluation

Except as otherwise stated in the contract, the Engineer shall proceed in accordance with sub clause 3.5 (Determinations) to agree or determine the contract price by evaluating each item of work, applying the measurement agreed or determined in accordance with the above sub clause 12.1 and 12.2 and the appropriate rate or price for the item.
For each item of work, the appropriate rate or price for the item shall be the rate or price specified for such item in the contract or, if there is no such item, specified for similar work.

12.3.1However, a new rate or price shall be appropriate for an item of work if :

(a) all the following conditions are met for existing item of the contract:

(i) the measured quantity of the item is increased by more than 50% from the quantity of this item in the Bill of Quantities or the Schedule,

(ii) this increase in quantity multiplied by specified rate for this item in the Bill of Quantities or the Schedule, exceeds 0.25% of the Accepted Contract Amount,

(iii) this item is not specified in the contract as a “fixed rate item”.

Note: New rates in case of increase in quantity of the agreement items shall be applicable to the increase in quantities beyond the quantities required to meet conditions specified under 12.3.1 (a) (i) & (ii) above.

OR

(b) (i) the work is instructed under clause 13[Variations and Adjustments],

(ii) no rate or price is specified in the contract for this item, and

(iii) no specified rate or price is appropriate because the item of work is not of

similar character, or is not executed under similar conditions, as any item in the contract.

OR

(c) On passage of original completion period stipulated in the contract, if site in some stretches has not been handed over for execution of the work due to any of the reasons mentioned below:

(i) non acquisition of land,

(ii) non availability of forest/wild life clearances,

(iii) non removal of encroachments, delay in shifting of utilities (to be shifted by other agencies) and

(iv) non handing over of the sites by other agencies/authorities

and the contractor otherwise has been executing the works satisfactorily on other sites, as certified by the Engineer, the contractor shall be entitled for new rates for the items and quantities of work which could not be executed in the stretches still to be handed over. In case the progress is not satisfactory, the contractor shall not be entitled for new rates and the Employer shall have the option either to continue the work in these stretches through the same agency or get it executed through other means.

In case of entitlement for new rates, if the contractor is not willing to take up the work in these stretches, he will have the option to say so in writing or if no agreement is reached on new rates, the remaining works of such stretches shall be excluded from the scope of the contract through a variation statement. In such a case the contractor shall not be entitled for any claim or compensation on this account. The employer shall get the remaining works on these stretches executed through other means.

12.3.2

(i) Each new rate or price for item(s) as described in sub paragraph 12.3.1 (a) & (c) above shall be derived from an assessment of the reasonable cost of executing the work with an additional element of 15% towards overheads and profit of the Contractor.

(ii) Each new rate or price for item(s) as described in sub paragraph 12.3.1 (b) above shall be derived from an assessment of the reasonable cost of executing the work with an additional element of 15% towards overheads and profit of the Contractor, subject to the condition that such item(s) as described in sub paragraph 12.3.1 (b) above is/are not available in the “Standard Bill of Quantities of K RIDE”.

(iii) In case item(s) as described in sub paragraph 12.3.1 (b) above is/are available in the “Standard Bill of Quantities of K RIDE (updated upto 28 days prior to deadline for submission of bids)”, new rate or price for such items shall be the rate as available in the “Standard Bill of Quantities of K RIDE (updated upto 28 days prior to deadline for submission of bids)”, modified by the percentage above/below accepted in this contract for the respective schedule and also price variation shall be applicable in the same manner as applicable to items specified in the contract.

(iv) The assessment of reasonable cost of executing the work (except over heads and profit which shall be 15%) shall be arrived at based on the prevailing rates and by taking guidance from the following documents. The priority of the documents shall

be in accordance with the following sequence:

a) Analysis of Unified SOR of Indian Railway;

b) Analysis issued by MORTH;

c) Schedule of Rates issued by CPWD;

d) Market analysis.

(v) If the final rate decided by the competent authority as per K RIDE SOP is not acceptable to the contractor, the contractor will be bound to execute the work at the rates as decided by the competent authority of K RIDE but he may refer the dispute in rate for settlement as per provisions of clause 20 of General Conditions of Contract.Until such time as an appropriate rate or price is agreed or determined, the Engineer shall make the Interim payment at the rate of 80% of the rate proposed by him and accepted by the Project Director (concerned GM(Civil) in charge of the project).

12.3.3

Until such time as an appropriate rate or price is agreed or determined, the Engineer shall make the Interim payment at the rate of 80% of the rate proposed by him and accepted by the Project Director (concerned GM(Civil) in charge of the project).

12.4 Omissions

Whenever the omission of any work forms part (or all) of a Variation, the value of which has not been agreed, if:

(a) the Contractor will incur (or has incurred) cost which, if the work had not been omitted, would have been deemed to be covered by a sum forming part of the Accepted Contract Amount;

(b) the omission of the work will result (or has resulted) in this sum not forming part of the Contract Price; and

(c) this cost is not deemed to be included in the evaluation of any substituted work;

then the Contractor shall give notice to the Engineer accordingly, with supporting particulars. Upon receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine this cost, which shall be included in the Contract Price.

13 Variations and Adjustments

13.1 Right to Vary

Variations may be initiated by the Employer at any time prior to issuing the Taking-Over Certificate for the Works, either by an instruction or by making a request to the Contractor to submit a proposal.

The Contractor shall execute and be bound by each Variation till the price does not exceed 50% of the agreemental value as specified in letter of acceptance / original agreement. For variation beyond the above the contractor shall be bound to execute, unless the Contractor promptly gives notice to the Engineer stating (with supporting particulars) that the Contractor cannot readily obtain the Goods required for the Variation. Upon receiving this notice, the Engineer shall cancel, confirm or vary the instruction.

Each Variation may include:

(a) changes to the quantities of any item of work included in the Contract,

(b) changes to the quality and other characteristics of any item of work,

(c) changes to the levels, positions and/or dimensions of any part of the Works,

(d) omission of any work unless it is to be carried out by others,

(e) any additional work, Plant, Materials or services necessary for the Permanent Works, including any associated Tests on Completion, boreholes and other testing and exploratory work, or

(f) changes to the sequence or timing of the execution of the Works.

The Contractor shall not make any alteration and/or modification of the Permanent Works, unless and until the Engineer instructs or approves a Variation.

13.2 Value Engineering

The Contractor may, at any time, submit to the Engineer a written proposal which (in the Contractor's opinion) will, if adopted, (i) accelerate completion, (ii) reduce the cost to the Employer of executing, maintaining or operating the Works, (iii) improve the efficiency or value to the Employer of the completed Works, or (iv) otherwise be of benefit to the Employer.

The proposal shall be prepared at the cost of the Contractor and shall include the items listed in Sub-Clause 13.3 [Variation Procedure].

If a proposal, which is approved by the Engineer, includes a change in the design of part of the Permanent Works, then unless otherwise agreed by both Parties:

(a) the Contractor shall design this part,

(b) sub-paragraphs (a) to (d) of Sub-Clause 4.1 [Contractor's General Obligations] shall apply, and

(c) if this change results in a reduction in the contract value of this part, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine a fee, which shall be included in the Contract Price. This fee shall be half (50%) of the difference between the following amounts:

(i) such reduction in contract value, resulting from the change, excluding adjustments under Sub-Clause 13.7 [Adjustments for Changes in Legislation] and Sub-Clause 13.8 [Adjustments for Changes in Cost],and

(ii) the reduction (if any) in the value to the Employer of the varied works, taking account of any reductions in quality, anticipated life or operational efficiencies.

However, if amount (i) is less than amount (ii), there shall not be a fee.

13.3 Variation Procedure

If the Engineer requests a proposal, prior to instructing a Variation, the Contractor shall respond in writing as soon as practicable, either by giving reasons why he cannot comply (if this is the case) or by submitting:

(a) a description of the proposed work to be performed and a programme for its execution,

(b) the Contractor's proposal for any necessary modifications to the programme according to Sub-Clause 8.3 [Programme] and to the Time for Completion, and

(c) the evaluation of the Variation shall be as specified in Clause 12.3 Evaluation.

The Engineer shall, as soon as practicable after receiving such proposal (under Sub-Clause 13.2 [Value Engineering] or otherwise), respond with approval, disapproval or comments. The Contractor shall not delay any work whilst awaiting a response.

Each instruction to execute a Variation, with any requirements for the recording of Costs, shall be issued by the Engineer to the Contractor, who shall acknowledge receipt.

Each Variation shall be evaluated in accordance with Clause 12 [Measurement and Evaluation], unless the Engineer instructs or approves otherwise in accordance with this Clause.

13.4 Payment in Applicable Currencies

If the Contract provides for payment of the Contract Price in more than one currency, then whenever an adjustment is agreed, approved or determined as stated above, the amount payable in each of the applicable currencies shall be specified. For this purpose, reference shall be made to the actual or expected currency proportions of the Cost of the varied work, and to the proportions of various currencies specified for payment of the Contract Price.

13.5 Provisional Sums

Each Provisional Sum shall only be used, in whole or in part, in accordance with the Engineer's instructions, and the Contract Price shall be adjusted accordingly. The total sum paid to the Contractor shall include only such amounts, for the work, supplies or services to which the Provisional Sum relates, as the Engineer shall have instructed. For each Provisional Sum, the Engineer may instruct:

(a) work to be executed (including Plant, Materials or services to be supplied) by the Contractor and valued under Sub-Clause 13.3 [Variation Procedure]; and/or

(b) Plant, Materials or services to be purchased by the Contractor, from a nominated Subcontractor (as defined in Clause 5 [Nominated Subcontractors]) or otherwise; and

for which these shall be included in the Contract Price:

(i) the actual amounts paid (or due to be paid) by the Contractor, and

(ii) a sum for overhead charges and profit, calculated as a percentage of these actual amounts by applying the relevant percentage rate (if any) stated in the appropriate Schedule. If there is no such rate, the percentage rate stated in the Contract Data shall be applied.

The Contractor shall, when required by the Engineer, produce quotations, invoices, vouchers and accounts or receipts in substantiation.

13.6 Day work

For work of a minor or incidental nature, the Engineer may instruct that a Variation shall be executed on a daywork basis. The work shall then be valued in accordance with the Daywork Schedule included in the Contract, and the following procedure shall apply. If a Daywork Schedule is not included in the Contract, this Sub-Clause shall not apply.

Before ordering Goods for the work, the Contractor shall submit quotations to the Engineer. When applying for payment, the Contractor shall submit invoices, vouchers and accounts or receipts for any Goods.

Except for any items for which the Daywork Schedule specifies that payment is not due, the Contractor shall deliver each day to the Engineer accurate statements in duplicate which shall include the following details of the resources used in executing the previous day's work:

(a) the names, occupations and time of Contractor's Personnel,

(b) the identification, type and time of Contractor's Equipment and Temporary Works, and

(c) the quantities and types of Plant and Materials used.

One copy of each statement will, if correct, or when agreed, be signed by the Engineer and returned to the Contractor. The Contractor shall then submit priced statements of these resources to the Engineer, prior to their inclusion in the next Statement under Sub-Clause 14.3 [Application for Interim Payment Certificates]

13.7 Adjustmentsfor Changes in Legislation

Contract Price shall be adjusted to take account of any increase or decrease in Cost resulting from a change in the Laws of the Country (including the introduction of new Laws and the repeal or modification of existing Laws) or in the judicial or official governmental interpretation of such Laws, made after the Base Date, which affect the Contractor in the performance of obligations under the Contract.

If the Contractor suffers (or will suffer) delay and/or incurs (or will incur) additional Cost as a result of these changes in the Laws or in such interpretations, made after the Base Date, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

(a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

(b) payment of any such Cost, which shall be included in the Contract Price

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

In case there is a decrease in cost as a result of changes of Law by Legislation after the Base Date, the Engineer shall proceed in accordance with Sub Clause 3.5 (determination) to agree or determine these matters without waiting for Contractor's / Employer's Notice.

Notwithstanding the foregoing, the Contractor shall not be entitled to such an extension of time if the same shall already have been taken into account in determining an extension and such Cost shall not be separately paid if the same shall already have been taken into account in the indexing of any inputs to the table of adjustment data in accordance with the provisions of Sub-Clause 13.8.

13.8Adjustment for changes in cost.

Price Variation Clause (PVC):

13.8.1Applicability: Price Variation Clause (PVC) shall be applicable only in those contracts where tender conditions specifically permit it. Materials supplied free of cost by Railway to the Contractors and any extra NS item(s) included in subsequent variation falling outside the purview of the Schedule of Items of tender shall fall outside the purview of Price Variation Clause. If, in any case, accepted offer includes some specific payment to be made to consultants or some materials supplied by Railway free or at fixed rate, such payments shall be excluded from the gross value of the work for the purpose of payment/recovery of price variation.

13.8.2Base Month: The Base Month for 'Price Variation Clause' shall be taken as month 28 days prior to opening of tender including extensions, if any, unless otherwise stated elsewhere. The quarter for applicability of PVC shall commence from the month following Base month. The Price Variation shall be based on the average Price Index of the quarter under consideration.

13.8.3Validity: Rates accepted by Railway Administration shall hold good till completion of work and no additional individual claim shall be admissible except:

(a) Payment/recovery for increase/decrease in GST on works contract or imposition/removal of any tax/cess on Works Contract as per Clause 37,

(b) Payment/recovery for overall market situation as per Price Variation Clause given hereunder.

13.8.4 Adjustment for variation in prices of material, labour, fuel, explosives, detonators, steel, concreting, ferrous, non-ferrous, insulators, zinc and cement shall be determined in the manner prescribed.

13.8.5 Components of various items in a contract on which variation in prices be admissible, shall be Material, Labour, Fuel, Explosives & Detonators, Steel, Cement, Concreting, Ferrous, Non-ferrous, Insulator, Zinc, Erection etc. However, for fixed components, no price variation shall be admissible.

13.8.6 The percentages of labour component, material component, fuel component etc. in various types of Engineering contracts shall be as under:

S. No.	Component	E/Work & Minor Bridges Contracts, Ballast Supply Contracts, Tunneling Contracts (without explosive)	Tunneling Contracts (with explosives)	Major and Important Bridges Contracts	Building Contracts	Permanent Way linking Contracts (Manual)	Other Works Contracts
1	Labour Component	20	20	20	40	50	20
2	Other Material Components	10	15	30	35	5	20
3	Plant Machinery & Spares	30	15	20	5	15	30
4	Fuel & Lubricants Component	25	15	15	5	15	15
5	Fixed Component*	15	15	15	15	15	15
6	Detonators & Explosive Component	-	20	-	-	-	-

* It shall not be considered for any price variation.

13.8.7 Formulae: The Amount of variation in prices in several components (labour, material etc.) shall be worked out by the following formulae:

(i) $$L = W \times (LQ - LB) \times \frac{LC}{LB} \times \frac{}{100}$$

(ii) $$M = W \times (MQ - MB) \times \frac{MC}{MB} \times \frac{}{100}$$

(iii) $$F = W \times (FQ - FB) \times \frac{FC}{FB} \times \frac{}{100}$$

(iv) $$E = W \times (EQ - EB) \times \frac{EC}{EB} \times \frac{}{100}$$

(v) $$PM = W \times (PMQ\text{-}PMB) \times \frac{PMC}{PMB} \times \frac{}{100}$$

(vi) $S = SW \times \frac{(SQ - SB)}{SB}$

(vii) $C = CV \times (CQ - CB) / CB$

For Railway Electrification Works:

(viii) $T = [(CS - CO) / CO \times 0.4136] \times TC$
(ix) $R = [(RT - RO) / RO + (ZT - ZO) / ZO \times 0.06] \times RC$
(x) $N = [(PT - PO) / PO] \times NC$
(xi) $Z = [(ZT - ZO) / ZO] \times ZC$
(xii) $I = [(IT – IO) / IT] \times 85$

Where,

L Amount of price variation in Labour

M Amount of price variation in Materials

F Amount of price variation in Fuel

E Amount of price variation in Explosives

PM Amount of price variation in Manufacture of machinery for mining, Quarrying and Construction

S Amount of price variation in Steel

C Amount of price variation in Cement

T Amount of price variation in Concreting

R Amount of price variation in Ferrous Items

N Amount of price variation in Non-Ferrous Items

Z Amount of price variation in Zinc

I Amount of price variation in Insulator

Lc % of Labour Component

Mc % of Material Component

Fc % of Fuel Component

Ec % of Explosive Component

PMc % of Manufacture of machinery for mining, Quarrying and Construction Component

Tc % of Concreting Component

Rc % of Ferrous Component

Nc % of Non-Ferrous Component

Zc % of Zinc Component

W Gross value of work done by Contractor as per on-account bill(s) excluding cost of materials supplied by Railway at fixed price, minus the price values of cement and steel. This will also exclude specific payment, if any, to be made to the consultants engaged by Contractors (such payment shall be indicated in the Contractor's offer)

LB Consumer Price Index for Industrial Workers - All India: Published in R.B.I. Bulletin for the base period

LQ Consumer Price Index for Industrial Workers - All India: Published in R.B.I. Bulletin for the average price index of the 3 months of the quarter under

consideration

MB Wholesale Price Index: All commodities – as published in the R.B.I. Bulletin for the base period

MQ Wholesale Price Index: All commodities – as published in the R.B.I. Bulletin for the average price index of the 3 months of the quarter under consideration

FB Wholesale Price Index for the group Fuel & Power as published in the R.B.I. Bulletin for the base period

FQ Index Number of Wholesale Price Index – By Groups and Sub-Groups for the group Fuel & Power as published in the R.B.I. Bulletin for the average price index of the 3 months of the quarter under consideration

EB Index number of Monthly Whole Sale Price Index for the category 'Explosive' of (g).Manufacture of other chemical products under (J) MANUFACTURE OF CHEMICALS AND CHEMICAL PRODUCTS, published by Office of Economic Adviser, Govt. of India, Ministry of Commerce & Industry, Department of Industrial Policy & Promotion (DIPP), for the base period.

EQ Index number of Monthly Whole Sale Price Index for the category 'Explosive' of (g).Manufacture of other chemical products under (J) MANUFACTURE OF CHEMICALS AND CHEMICAL PRODUCTS, published by Office of Economic Adviser, Govt. of India, Govt. of India, Ministry of Commerce & Industry, Department of Industrial Policy & Promotion (DIPP), for the average price index of 3 months of the quarter under consideration.

PMB Index number of Monthly Whole Sale Price Index for the category 'k. Manufacture of machinery for mining, quarrying and construction' under (R) MANUFACTURE OF MACHINERY AND EQUIPMENT, published by Office of Economic Adviser, Govt. of India, Ministry of Commerce & Industry, Department of Industrial Policy & Promotion (DIPP), for the base period.

PMQ Index number of Monthly Whole Sale Price Index for the category 'k. Manufacture of machinery for mining, quarrying and construction' under (R) MANUFACTURE OF MACHINERY AND EQUIPMENT, published by Office of Economic Adviser, Govt. of India, Ministry of Commerce & Industry, Department of Industrial Policy & Promotion (DIPP), for the average price index of 3 months of the quarter under consideration.

SW Gross value of steel supplied by the Contractor as per the 'on-account' bill for the month under consideration

SB Index number of Monthly Whole Sale Price Index for the relevant category of mild steel item as mentioned in Clause 13.8.9, published by Office of Economic Adviser, Govt. of India, Ministry of Commerce & Industry Department of Industrial Policy & Promotion (DIPP); for the base period.

SQ Index number of Monthly Whole Sale Price Index for the relevant category of mild steel item as mentioned in Clause 13.8.9, published by Office of Economic Adviser, Govt. of India, Ministry of Commerce & Industry Department of Industrial Policy & Promotion (DIPP); for the average price index of the 3 months of the quarter under consideration.

CV Value of Cement supplied by Contractor as per on account bill in the quarter under consideration

CB Index No. of Wholesale Price Index of sub-group Cement, Lime & Plaster as published in RBI Bulletin for the base period

CQ No. of Wholesale Price Index of sub-group Cement, Lime & Plaster as published in RBI Bulletin for the average price index of the 3 months of the quarter under consideration

CS RBI wholesale price index for Cement, Lime & Plaster for the month which is six months prior to date of casting of foundation

Co RBI wholesale price index for Cement, Lime & Plaster for the month which is one month prior to date of opening of tender

RT IEEMA price index for Iron & Steel for the month which is two months prior to date of inspection of material.

RO IEEMA price index for Iron & Steel for the month which is one month prior to date of opening of tender.

PT IEEMA price index for Copper wire bar for the month which is two months prior to date of inspection of material.

PO IEEMA price index for Copper wire bar for the month which is one month prior to date of opening of tender.

ZT IEEMA price index for Zinc for the month which is two months prior to date of inspection of material

ZO IEEMA price index for Zinc for the month which is one month prior to date of opening of tender

IT RBI wholesale price index for the sub-group "other Portland and Ceramic product" for the month which is two months prior to date of inspection of material

IO RBI wholesale price index for the sub-group "other Portland and Ceramic product" for the month which is one month prior to date of opening of tender

13.8.8 The demands for escalation of cost shall be allowed on the basis of provisional indices as mentioned above in Clause 13.8.7. Any adjustment needed to be done based on the finally published indices shall be made as and when they become available.

13.8.9: Relevant categories of steel for the purpose of operating Price Variation formula as mentioned in this Clause shall be as under:

SL	Category of Steel Supplied in Railway Work	Category of Steel Items as mentioned in Office of Economic Adviser, Govt. of India, Ministry of Commerce & Industry Department of Industrial Policy & Promotion (DIPP).
1.	Reinforcement bars and other rounds	'MS Bright Bars' individual commodity of group item (d) Mild Steel-Long Products under (N) MANUFACTURE OF BASIC METAL.
2.	All types and sizes of angles, channels and joists	'Angles, Channels, Sections, Steel' individual commodity of group item (d) Mild Steel-Long Products under (N) MANUFACTURE OF BASIC METAL.
3.	All types and sizes of plates	'e. Mild Steel – Flat Products' of (N) MANUFACTURER OF BASIC METAL
4	Any other section of steel not covered in the above categories and excluding HTS	Average of price for the 3 categories covered under SL 1, 2 & 3 above

13.8.10 Price Variation during Extended Period of Contract

The price adjustment as worked out above, i.e. either increase or decrease shall

be applicable upto the stipulated date of completion of work including the extended period of completion where such extension has been granted under Clause 8.4 of the Standard General Conditions of Contract. However, where extension of time has been granted due to Contractor's failure under Clause 8.7 of the Standard General Conditions of Contract, price adjustment shall be done as follows:

a. In case the indices increase above the indices applicable to the last month of original completion period or the extended period under Clause 8.4, the price adjustment for the period of extension granted under Clause 8.7 shall be limited to the amount payable as per the Indices applicable to the last month of the original completion period or the extended period under Clause 8.4 of the Standard General Conditions of Contract; as the case may be.

b. In case the indices fall below the indices applicable to the last month of original/extended period of completion under Clause 8.4, as the case may be; then the lower indices shall be adopted for the price adjustment for the period of extension under Clause 8.7 of the Standard General Conditions of Contract.

14 The Contract Price

14.1 The Contract Price

Unless otherwise stated in the Special Conditions of Contract:

(a) the Contract Price shall be agreed or determined under Sub-Clause 12.3 [Evaluation] and be subject to adjustments in accordance with the Contract;

(b) the Contractor shall pay all taxes, duties and fees required to be paid by him under the Contract, and the Contract Price shall not be adjusted for any of these costs except as stated in Sub-Clause 13.7 [Adjustments for Changes in Legislation];

(c) any quantities which may be set out in the Bill of Quantities or other Schedule are estimated quantities and are not to be taken as the actual and final quantities:

  (i) of the Works which the Contractor is required to execute, or

  (ii) for the purposes of Clause 12 [Measurement and Evaluation]; and

(d) the Contractor shall submit to the Engineer, within 28 days after the Commencement Date, a proposed breakdown of each lump sum price in the Schedules, if applicable. The Engineer may take account of the breakdown when preparing Payment Certificates, but shall not be bound by it.

(e) It may be noted that in the event of the Contractor not making the due payments stated in sub-clause (b) above, and the concerned party puts up a claim with the Employer / Engineer, then the Employer / Engineer may make such payments and deduct the same from the sums due to the Contractor.

14.2 Advance Payment

14.2.1 Mobilization Advance

The Employer shall make payment, as an Interest bearing advance for mobilization, when the Contractor submits a guarantee in accordance with this Sub-Clause. The total advance payment, the number and timing of instalments (if more than one), and the applicable currencies and proportions, shall be as stated in the Contract Data.

Unless and until the Employer receives this guarantee, or if the total advance payment is not stated in the Contract Data, this Sub-Clause shall not apply.

The Engineer shall issue an interim payment certificate for the first installment of mobilisation advance after receiving an application for advance payment(under sub clause 14.3 [Application for Interim Payment Certificates]) and after the Employer receives (i) the Performance Security in accordance with Sub-Clause 4.2 [Performance Security] and (ii) a guarantee in amounts and currencies equal to the advance payment plus 10%. The next installment shall be released only when the contractor submits statement of having utilized the previous installment of mobilization advance and the Employer is satisfied that the utilization has been done in purposeful manner.

14.2.2 Advance against Plant and Machinery

Interest bearing advance against plant and machinery, is payable for procurement of

plant, equipment and machinery to be utilized specifically for the subject works, provided the same have reached the site along with purchase order and the invoices against a guarantee in amounts and currencies equal to the advance payment plus 10%. The total advance payment under this sub-clause, including the applicable currencies and proportions, shall be as stated in the Contract Data.

All such plant, equipment and machinery shall be used only for executing the works under this Contract. No such plant, equipment and machinery shall be removed from the site, unless advance equivalent to the advance against such machinery has been fully repaid and prior permission of the Engineer has been obtained.

The Engineer shall decide whether a particular plant, equipment or machinery is actually required to execute the work. No advance is payable against items identified as unnecessary. The plant and machinery admissible for advance payment and its valuation shall be done by the Engineer on following considerations;

(i) New items : 80% of purchase price

(ii) Used or Second hand items : Not to be considered

(iii) New Items valued at less than Rs. 10,00,000 each : Not to be considered.

14.2.3 Guarantees

Advances as mentioned in sub-clauses 14.2.1 & 14.2.2 above, shall be payable against acceptable Bank Guarantees from banks as specified in clause 4.2. The guarantees shall be in the form as given in Section 8 (Contract Forms) or in another form approved by the Employer. The Contractor shall ensure that the guarantees are valid and enforceable until the advance amount paid as has been repaid, but its amount may be progressively reduced by the amount repaid by theContractor as indicated in the Payment Certificates. If the terms of the guarantee specify its expiry date, and the advance payment has not been repaid by the date 28 days prior to the expiry date, the Contractor shall extend the validity of the guarantee until the advance payment has been repaid.

14.2.4 Recovery of Advances

Unless stated otherwise in the Contract Data, the advance payment shall be repaid through percentage deductions from the interim payments determined by the Engineer in accordance with Sub-Clause 14.6 [Issue of Interim Payment Certificates], as follows:

(a) deductions shall commence in the next interim Payment Certificate following that in which the total of all certified interim payments (excluding the advance payment) exceeds 5 percent of the Accepted Contract Amount less Provisional Sums or passage of six months from the date of release of first advance payment, whichever is earlier; and

(b) deductions shall be made for accrued interest on the advance up to the month and advance at the rate stated in the Contract Data of the amount of each Interim Payment Certificate (excluding the advance payment and deductions and repayments of retention) in the currencies and proportions of the advance payment until such time as the advance payment and accrued interest has been repaid; provided that the advance payment and accrued interest shall be completely repaid prior to the time when 80 percent of the Accepted Contract Amount has been certified for payment. If the amount of interim payment certificate is not sufficient

for recovery of accrued interest or in the opinion of the Employer satisfactory progress is not being achieved by the contractor, then the contractor will have to deposit the accrued interest and return the mobilisation advance in part or in full as demanded by the Employer, failing which Employer shall have the right to encash the Bank Guarantee(s)

The contractor shall always have the option to start repayment earlier and/or to complete the repayment earlier than the due date.

If the advance payment has not been repaid prior to the issue of the Taking-Over Certificate for the Works or prior to termination under Clause 15 [Termination by Employer], Clause 16 [Suspension and Termination by Contractor] or Clause 19 [Force Majeure] (as the case may be), the whole of the balance then outstanding shall immediately become due and payable by the Contractor to the Employer.

14.2.5 Advances to be Used only for this Work

The advances shall be used by the Contractor strictly for the purpose of the Contract, and for the purpose for which they are paid. Under no circumstances, shall the advances be diverted for other purposes. Any such diversion shall be construed as a breach of the Contract and the Contractor shall be asked to return the advance at once and pay interest at 15% per annum till the advance is recovered back from him. The Contractor shall return the advance and pay the interest in one go without demur.

Employer retains the right for any other remedy prescribed for breach of Contract in this regard.

The Contractor, if required by the Engineer shall provide the details of utilisation of Mobilisation advance.

14.3 Application for Interim Payment Certificates

The Contractor shall submit a Statement in six copies to the Engineer in accordance with the payment procedure specified by the Engineer, after the end of each month, in a form approved by the Engineer, showing in detail the amounts to which the Contractor considers himself to be entitled, together with supporting documents which shall include the report on the progress during this month in accordance with Sub-Clause 4.21 [Progress Reports] and Record Measurement Sheets.

The Statement shall include the following items, as applicable, which shall be expressed in the various currencies in which the Contract Price is payable, in the sequence listed:

(a) the estimated contract value of the Works executed and the Contractor's Documents produced up to the end of the month (including Variations but excluding items described in sub-paragraphs (b) to (g) below);

(b) any amounts to be added and deducted for changes in legislation and changes in cost, in accordance with Sub-Clause 13.7 [Adjustments for Changes in Legislation] and Sub-Clause 13.8 [Adjustments for Changes in Cost];

(c) any amount to be deducted for retention, calculated by applying the percentage of retention stated in the Contract Data to the total of the above amounts, until the amount so retained by the Employer reaches the limit of Retention Money (if any) stated in the Contract Data;

(d) Any amounts to be added and deducted for the advance payments and repayments

in accordance with sub clause 14.2 [Advance Payment];

(e) any amounts to be added and deducted for Plant and Materials in accordance with Sub-Clause 14.5 [Plant and Materials intended for the Works];

(f) any other additions or deductions which may have become due under the Contract or otherwise, including those under Clause 20 [Claims, Disputes and Arbitration]; and

(g) the deduction of amounts certified in all previous Payment Certificates.

(h) for invoicing as per GST Laws, the estimated contract value of the Works executed in terms of (a) above and any amounts added or deducted as per (b), (e) to (g) above is to be broken up in two components i.e. (i) the base amount excluding GST (ii) GST component (calculated at the rate for works contract service as per GST Laws).

(i) Statement of interim payments certificates should be submitted by the Contractor to the Engineer by the 7th day of each month for the work executed upto the end of the previous month.

(j) An amount to be deducted for the payments to be made to different Departments towards payments liable to be made by the Contractor.

14.4 Schedule of Payments

If the Contract includes a schedule of payments specifying the instalments in which the Contract Price will be paid, then unless otherwise stated in this schedule:

(a) the instalments quoted in this schedule of payments shall be the estimated contract values for the purposes of sub-paragraph (a) of Sub-Clause 14.3 [Application for Interim Payment Certificates];

(b) Sub-Clause 14.5 [Plant and Materials intended for the Works] shall not apply; and

(c) if these instalments are not defined by reference to the actual progress achieved in executing the Works, and if actual progress is found to be less than that on which this schedule of payments was based, then the Engineer may proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine revised instalments, which shall take account of the extent to which progress is less than that on which the instalments were previously based.

If the Contract does not include a schedule of payments, the Contractor shall submit non-binding estimates of the payments which he expects to become due during each quarterly period. The first estimate shall be submitted within 42 days after the Commencement Date. Revised estimates shall be submitted at quarterly intervals, until the Taking-Over Certificate has been issued for the Works.

14.5 Plant and Materials intended for the Works

If this Sub-Clause applies, Interim Payment Certificates shall include, under sub-paragraph (e) of Sub-Clause 14.3:

(k) an amount for Plant and Materials which have been sent to the Site for incorporation in the Permanent Works, and

(ii) a reduction when the contract value of such Plant and Materials is included as part of the Permanent Works under sub-paragraph (a) of Sub-Clause 14.3 [Application for Interim Payment Certificates].

If the lists referred to in sub-paragraphs (b)(i) or (c)(i) below are not included in the Contract Data, this Sub-Clause shall not apply.

The Engineer shall determine and certify each addition if the following conditions are satisfied:

(a) the Contractor has:

(i) kept satisfactory records (including the orders, receipts, Costs and use of Plant and Materials) which are available for inspection, and

(ii) submitted a statement of the Cost of acquiring and delivering the Plant and Materials to the Site, supported by satisfactory evidence;

and either:

(b) the relevant Plant and Materials:

(i) are those listed in the Schedules for payment when shipped,

(ii) have been shipped to the Country, en route to the Site, in accordance with the Contract; and

(iii) are described in a clean shipped bill of lading or other evidence of shipment, which has been submitted to the Engineer together with evidence of payment of freight and insurance, any other documents reasonably required, and a bank guarantee in a form and issued by an entity approved by the Employer in amounts and currencies equal to the amount due under this Sub-Clause: this guarantee may be in a similar form to the form referred to in Sub-Clause 14.2 [Advance Payment] and shall be valid until the Plant and Materials are properly stored on Site and protected against loss, damage or deterioration;

or

(c) the relevant Plant and Materials:

(i) are those listed in the Schedules for payment when delivered to the Site,

(ii) the original 'Invoice' and the original 'Inspection Certificate' by the approved Inspection agency marked 'for payment' is furnished with the Application for IPC [sub-Clause 14.3].

(iii) have been delivered to and are properly stored on the Site, are protected against loss, damage or deterioration, and appear to be in accordance with the Contract.

The additional amount to be certified shall be the equivalent of eighty percent of the Engineer's determination of the cost of the Plant and Materials (including delivery to Site), taking account of the documents mentioned in this Sub-Clause and of the contract value of the Plant and Materials. The amount shall be certified on receipt of an Indemnity Bond for the stated amount in the Form approved by the Employer.

The currencies for this additional amount shall be the same as those in which payment will become due when the contract value is included under

sub-paragraph (a) of Sub-Clause 14.3 [Application for Interim Payment Certificates]. At that time, the Payment Certificate shall include the applicable reduction which shall be equivalent to, and in the same currencies and proportions as, this additional amount for the relevant Plant and Materials.

14.6 Issue of Interim Payment Certificates

No amount will be certified or paid until the employer has received and approved the performance security. Thereafter, the Engineer shall within two days after receiving a statement and supporting documents (including Contractor's certificate in terms of Sub-Clause 6.22 (ii)), issue to the Employer a provisional interim payment certificate which shall state the amount which the Engineer determines to be due after preliminary check as per K RIDE's procedure order. After this the Engineer shall, within 28 days after receiving a statement and supporting documents, issue to the employer an Interim Payment Certificate which shall state the amount which the Engineer fairly determines to be due, with supporting particulars.

However, prior to issuing the Taking-Over Certificate for the Works, the Engineer shall not be bound to issue the Interim Payment Certificate in an amount which would (after retention and other deductions) be less than the minimum amount of Interim Payment Certificates (if any) stated in the Contract Data. In this event, the Engineer shall give notice to the Contractor accordingly.

An Interim Payment Certificate shall not be withheld for any other reason, although:

(a) if anything supplied or work done by the Contractor is not in accordance with the Contract, the cost of rectification or replacement may be withheld until rectification or replacement has been completed; and/or

(b) if the Contractor was or is failing to perform any work or obligation in accordance with the Contract, and had been so notified by the Engineer, the value of this work or obligation may be withheld until the work or obligation has been performed.

The Engineer may in any Payment Certificate make any correction or modification that should properly be made to any previous Payment Certificate. A Payment Certificate shall not be deemed to indicate the Engineer's acceptance, approval, consent or satisfaction.

14.7 Payment

The Employer shall pay to the Contractor:

(a) the first instalment of the advance payment within 42 days after issuing the Letter of Acceptance or within 21 days after receiving the documents in accordance with Sub-Clause 4.2 [Performance Security] and Sub-Clause 14.2 [Advance Payment], whichever is later;

(b) (i) After preliminary scrutiny and certifications by the Engineer, payment of 70% of the certified net payment due (after recoveries and deductions), shall be made by the Employer within 10 days of receiving a statement and supporting documents by the Engineer subject to the condition that last interim payment certificate has been settled after detailed check. In the event of the contractor submitting bills based on false measurements, Project Director should issue a written warning to him to the effect that the facility of 70% payment without detailed check will be withdrawn in future. If the contractor repeats the misconduct this facility should be withdrawn.

(iii) The amount certified in each Interim Payment Certificate within 56 days after the Engineer receives the Statement and supporting documents. Any discrepancy shall be rectified in the next payment to the Contractor; and

(c) the amount certified in the Final Payment Certificate within 56 days after the Employer receives this Payment Certificate or, the undisputed amount shown in the Final Statement, within 56 days after the date of notification of the suspension in accordance with Sub-Clause 16.2.

Payment of the amount due, unless specified in the Contract Data, shall be made in INR into the bank account, nominated by the Contractor except for the Contract where the Contractor has opted for payment through Letter of Credit (LC) arrangement. In such a case, the procedure for payment shall be as prescribed in clause 14.7.1 below.

(d) the amount certified in the Final Payment Certificate within 56 days after the Employer receives this Payment Certificate or, the undisputed amount shown in the Final Statement, within 56 days after the date of notification of the suspension in accordance with Sub-Clause 16.2.

Payment of the amount due, unless specified in the Contract Data, shall be made in INR into the bank account, nominated by the Contractor except for the Contract where the Contractor has opted for payment through Letter of Credit (LC) arrangement. In such a case, the procedure for payment shall be as prescribed in clause 14.7.1 below.

However, in case of JV, direct payment to individual JV partners shall be made on joint certification (about the net amounts payable to individual partners) by the authorized representative of the JV and concerned respective authorized representative of individual JV partners, after making requisite recoveries/deductions from the gross payment. In case of any dispute regarding the net amounts payable to individual partners, the Engineer shall decide the same on the basis of the execution of items of works under Schedules/Bills indicated in the JV agreement as the responsibility of execution of each JV partner. Payment to individual JV partners shall be treated as payment made to the JV. The said payment shall not alter any obligation of the JV and its individual Partners under the Agreement and their obligations under the agreement shall remain joint and several.

A foreign company (either single entity or JV partner), shall have to submit proof of having opened their project office in India before any payment (including advance payment) is released to such a company. The required proof here shall be a copy of the report containing information as per format prescribed by Reserve Bank of India submitted to the Director General of Police (DGP) of the state concerned in which project office has been established.

14.7.1Procedure for payment through LC:

(i) The LC shall be a sight LC.

(ii) The contractor shall select his Advising/Negotiating bank for LC. The incidental cost towards issue of LC and its operation thereof shall be borne by the

contractor.

(iii) The Employer's Bank and its nodal branch for issue of LCs based on requests received from Employer Accounts Units shall be as indicated in the Contract Data. The Branch office of the Employer's Bank, where the Employer Accounts Office has its Account, as indicated in the Contract Data, will be the issuance/reimbursing branch for LC issued under this arrangement. The Bank shall remain same for this tender till completion of contract. The present incidental cost @ 0.15% per annum of LC value or any increase/decrease by the banks for issue of LC and operation thereof shall be borne by the contractor and shall be recovered from his Interim Payment Certificates.

(iv) The LC shall be opened initially for duration of 180 to 365 days in consultation with contractor. The LC shall be extended time to time as per the progress of the contract, on the request of the contractor. The value of LC to be opened initially as well as extended thereafter shall be finalized by the engineer in consultation with the contractor on the basis of expected progress of work.

(v) The LC terms and conditions shall inter-alia indemnify and save harmless the Employer from and against all losses, claims and demands of every nature and description brought or recovered against the Employer by reason of any act or omission of the contractor, his agents or employees, in relation to the Letter of Credit (LC). All sums payable/borne by Employer on this account shall be considered as reasonable compensation and paid by contractor.

(vi) The LC terms and conditions shall inter-alia provide that Employer will issue a Document of Authorisation (in the format decided in consultation with the Employer's Bank) after passing the Interim Payment Certificate for completed work, to enable contractor to claim the authorized amount from their bank.

(vii) The acceptable, agreed upon document for payments to be released under the LC shall be the Document of Authorisation.

(viii) The Document of Authorisation shall be issued by Employer Accounts Office against each Interim Payment Certificate passed by Employers.

(ix) On issuance of document of Authorisation, a copy of Document of Authorization shall be sent to the contractor. A copy of Document of Authorisation shall also be

sent by Employer Accounts Office to Employer's bank.

(x) On receipt of Document of Authorization, the contractor shall present his claim to his bank (advising Bank) for necessary payments as per LC terms and conditions. The claim shall comprise of copy of Document of Authorization, Bill of Exchange and Payment Certificate.

(xi) The payment against LC shall be subject to verification from Employer's Bank .

(xii) The contractor's bank (advising bank) shall submit the documents to the Employer's Bank .

(xiii) The Employer's bank (Issuing Bank) shall, after verifying the claim so received w.r.t. the Document of Authorisation received from Employer Accounts Office release the payment to contractor's bank (advising bank) for crediting the same to contractor's account.

(xiv) Any number of Interim Payment Certificates can be dealt within one LC, provided the sum total of payments to contractor is within the amount for which LC has been opened.

(xv) The LC shall be closed after the release of Final Payment certificate including PVC amount, if any, to the contractor.

(xvi) In case of JV, LC shall be opened in the name of JV and option of direct payment to individual JV partners through LC shall not be permissible.

14.8 Delayed Payment

If the Contractor does not receive payment in accordance with Sub-Clause 14.7 [Payment], the Contractor shall be entitled to receive interest compounded monthly on the amount unpaid during the period of delay. This period shall be deemed to commence on the date for payment specified in Sub-Clause 14.7 [Payment], irrespective (in the case of its sub-paragraph (b)) of the date on which any Interim Payment Certificate is issued.

Unless otherwise stated in the Special Conditions of Contract, the interest amount be calculated at the annual rate of seven percent.

The Contractor shall be entitled to this payment without formal notice or certification, and without prejudice to any other right or remedy.

14.9 Payment of Retention Money

The Retention Money shall be certified and paid with the final payment certificate or bank guarantee against retention money shall be released, after making required adjustments for recovery for shortage/excess materials, if any (except those quantities which become surplus due to change in planning/scheme by K RIDE in case the recovery for surplus/excess materials is still balance after adjusting the amount payable in the final payment certificate.

The contractor shall be entitled to substitute a bank guarantee in the form approved by the Employer with the retention money amount recovered upto the date of request. Such substitution shall be permissible maximum upto 3 times. The Bank Guarantee shall be valid upto end of Defect Liability Period. In case of extension of date of completion of contract, the Contractor shall extend the validity of the Bank Guarantee(s) until the revised end of Defect Liability Period.

Wherever the contract is terminated under Clause 15.2, the Retention Money shall be forfeited and the balance work should be got done separately.

14.10 Statement at Completion

Within 84 days after receiving the Taking-Over Certificate for the Works, the Contractor shall submit to the Engineer six copies of a Statement at completion with supporting documents, in accordance with Sub-Clause 14.3 [Application for Interim Payment Certificates], showing:

(a) the value of all work done in accordance with the Contract up to the date stated in the Taking-Over Certificate for the Works,

(b) any further sums which the Contractor considers to be due, and

(c) an estimate of any other amounts which the Contractor considers will become due to him under the Contract. Estimated amounts shall be shown separately in this Statement at completion.

The Engineer shall then certify in accordance with Sub-Clause 14.6 [Issue of Interim Payment Certificates].

Within 56 days after receiving the Performance Certificate, the Contractor shall submit, to the Engineer, six copies of a draft final statement as per procedure prescribed by the Engineer, with supporting documents showing in detail in a form approved by the Engineer:

14.11 Application for Final Payment Certificate

Within 56 days after receiving the Performance Certificate, the Contractor shall submit, to the Engineer, six copies of a draft final statement as per procedure prescribed by the Engineer, with supporting documents (including Contractor's certificate in terms of Sub-Clause 6.22 (ii)) showing in detail in a form approved by the Engineer:

(a) the value of all work done in accordance with the Contract, and

(b) any further sums which the Contractor considers to be due to him under the

Contract or otherwise.

If the Engineer disagrees with or cannot verify any part of the draft final statement, as per procedure prescribed by the Engineer the Contractor shall submit such further information as the Engineer may reasonably require and shall make such changes in the draft as may be agreed between them. The Contractor shall then prepare and submit to the Engineer the final statement as agreed. This agreed statement is referred to in these Conditions as the "Final Statement".

However if, following discussions between the Engineer and the Contractor and any changes to the draft final statement which are agreed, it becomes evident that a dispute exists, the Engineer shall deliver to the Employer (with a copy to the Contractor) an Interim Payment Certificate for the agreed parts of the draft final statement. Thereafter, if the dispute is finally resolved under Sub-Clause 20.3 [Obtaining Dispute Board's Decision] or Sub-Clause 20.2 [Amicable Settlement], the Contractor shall then prepare and submit to the Employer (with a copy to the Engineer) a Final Statement.

14.12 Discharge

When submitting the Final Statement, the Contractor shall submit a discharge which confirms that the total of the Final Statement represents full and final settlement of all moneys due to the Contractor under or in connection with the Contract. This discharge may state that it becomes effective when the Contractor has received the Performance Security and the outstanding balance of this total, in which event the discharge shall be effective on such date.

14.13 Issue of Final Payment Certificate

Within 28 days after receiving the Final Statement and discharge in accordance with Sub-Clause 14.11 [Application for Final Payment Certificate] and Sub-Clause 14.12 [Discharge], the Engineer shall issue, to the Employer, the Final Payment Certificate which shall state:

(a) the amount which he fairly determines is finally due, and

(b) after giving credit to the Employer for all amounts previously paid by the Employer and for all sums to which the Employer is entitled, the balance (if any) due from the Employer to the Contractor or from the Contractor to the Employer, as the case may be.

If the Contractor has not applied for a Final Payment Certificate in accordance with Sub-Clause 14.11 [Application for Final Payment Certificate] and Sub-Clause 14.12 [Discharge], the Engineer shall request the Contractor to do so. If the Contractor fails to submit an application within a period of 28 days, the Engineer shall issue the Final Payment Certificate for such amount as he fairly determines to be due.

14.14 Cessation of Employer's Liability

The Employer shall not be liable to the Contractor for any matter or thing under or in connection with the Contract or execution of the Works, except to the extent that the Contractor shall have included an amount expressly for it:

(a) in the Final Statement and also

(b) (except for matters or things arising after the issue of the Taking-Over Certificate for the Works) in the Statement at completion described in Sub-Clause 14.10 [Statement at Completion].

However, this Sub-Clause shall not limit the Employer's liability under his indemnification obligations, or the Employer's liability in any case of fraud, deliberate default or reckless misconduct by the Employer.

14.15 Currencies of Payment

The Contract Price shall be paid in Indian Rupees (INR).

15	Termination by Employer

15.1 Notice to Correct

If the Contractor fails to carry out any obligation under the Contract as mentioned below, but not limited to, the Engineer/ Employer may serve the contractor with a 14 days notice in writing calling upon the contractor to make good the failure and to remedy it. If the contractor;

(a) fails to comply with Sub-Clause 4.2 [Performance Security],

(b) abandons the Works or otherwise plainly demonstrates the intention not to continue performance of his obligations under the Contract,

(c) without reasonable excuse fails to:

(i) proceed with the Works in accordance with Clause 8 [Commencement, Delays and Suspension], or

(ii) comply with a notice issued under Sub-Clause 7.5 [Rejection] or Sub-Clause 7.6 [Remedial Work], within 28 days after receiving it, or

(iii) adhere to the agreed programme of work / activity on the critical path, by a margin of 10% of the stipulated period, or

(iv) take steps to deploy competent and adequate number of personnel, and equipment to achieve progress as per agreed programme or

(v) adhere to the instructions of Engineers/Employer persistently or

(vi) comply any provision of the contract or

(vii) provide the Engineer/Employer or their representative proper facilities for inspecting the works or any part thereof as required, under Clause 7.3 (Inspection) and 7.4 (Testing).

(d) subcontracts the whole or major part of the Works or assigns the Contract without prior written consent of the Employer.,

If the contractor does not, within 14 days of receipt of notice under this sub-clause, proceed to make good his default in so far as the same is capable of being made good and carry on the work of complying with such direction as contained in the notice under sub clause 15.1, to the entire satisfaction of the Engineer/Employer, the Employer shall be entitled to take action under sub-clause 15.1.1 or 15.1.2 or 15.2 below.

15.1.1

In case of contractor's repeated failure to adhere to the agreed program, and whereas the contractor has been served with a Notice to Correct under Clause 15.1 of GCC, if the contractor approaches K RIDE with a revised program with specific monthly physical and financial targets along with the proposal to deploy matching inputs in the form of manpower and other resources to the satisfaction of the Employer, then the Employer may consider whether to proceed with termination of

the contract under Clause 15.2 of GCC or to continue with the contract. However, the request to continue with the contract shall only be considered if the contractor supports his earnestness to adhere to the revised program by submitting additional Performance Security in the form of Bank Guarantee(s) of specified number and value as decided by the Employer (total value of which will not exceed 10% of the contract price). The encashment of these additional Bank Guarantee(s) shall be linked with the non achievement of agreed physical/financial targets agreed upon by the Contractor and the Employer.

15.1.2

In case the contractor's failure is limited to only some of the works, and in response to Notice to Correct under Clause 15.1 of GCC, the contractor approaches the Employer that such works may be offloaded from him and got executed through another agency and additional cost incurred, if any, should be recovered from his dues, the Employer, on being convinced that the anticipated additional cost for such works will not be substantial and can be recovered from the dues of the contractor and that such offloading will help in improving the overall progress of the project, may agree to such offloading without any repercussion on the performance security and/or additional bank guarantees, if any, submitted by the contractor. However, the Employer will not be under any compulsion to agree to such a request. The Contractor shall be informed of the LOA issued to other agency(ies) for such works.

In case the contractor does not approach the employer for offloading but the Employer is convinced that:

(i) offloading of some works will help in improving the progress of the project;

(ii) termination/part termination of the contract at this stage will not be in the interest of the project;

(iii) the anticipated additional cost for such works will not be substantial and can be recovered from the dues of the contractor;

The Employer may issue 7 days notice to the Contractor stating the resources required to be deployed against each work. If the contractor fails to deploy the required resources as indicated in the notice, the employer shall offload such works and proceed with getting the works executed through other agency(ies). The Contractor shall be informed of the LOA issued to other agency(ies) for such works.

Offloading under the sub clause 15.1.2 shall be without any repercussion on the performance security and/or additional bank guarantees, if any, submitted by the contractor. The Contractor would have no future claim on this account and the extra expenditure so incurred, if any, by the Employer in getting the offloaded work done, shall be recovered from subsequent payment certificates or any other dues of the contractor.

15.2 Termination by Employer

The Employer shall be entitled to terminate the Contract as a whole or any part or parts (as may be specified in the Notice of Termination under any of the above Sub-Clause issue) if the Contractor:

(a) fails to comply with the directions contained in the notice under Sub-Clause 15.1 [Notice to Correct],

(b) becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against it by Court or Statutory Authority him, compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of these acts or events, or

(c) gives or offers to give (directly or indirectly) to any person any bribe, gift, gratuity, commission or other thing of value, as an inducement or reward:

(i) for doing or forbearing to do any action in relation to the Contract, or

(ii) for showing or forbearing to show favour or disfavour to any person in relation to the Contract,

or if any of the Contractor's Personnel, agents or Subcontractors gives or offers to give (directly or indirectly) to any person any such inducement or reward as is described in this sub-paragraph (c). However, lawful inducements and rewards to Contractor's Personnel shall not entitle termination

In any of these events or circumstances, the Employer may, by Notice Terminate the contract with immediate effect.

The Employer's election to terminate the Contract shall not prejudice any other rights of the Employer, under the Contract or otherwise.

The Contractor shall remove all his plants and machinery from the site then leave the Site and deliver any required Goods, all Contractors' Documents, and other design documents made by or for him, to the Engineer within 7 days from the issue of Notice of Termination, failing which Delay Damages as prescribed for delay in completion of works shall be imposed as per provision of clause 8.7. However, the Contractor shall use his best efforts to comply immediately with any reasonable instructions included in the notice of Termination (i) for the assignment of any subcontract, and (ii) for the protection of life or property or for the safety of the Works.

After termination, the Employer may complete the Works and/or arrange for any other entities to do so. The Employer and these entities may then use any Goods, Contractor's Documents and other design documents made by or on behalf of the Contractor for completing the work.

15.3 Valuation at Date of Termination

As soon as practicable after a notice of termination under Sub-Clause 15.2 [Termination by Employer] has taken effect, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the value of the Works, Goods and Contractor's Documents, and any other sums due to the Contractor for work executed in accordance with the Contract. For this purpose, the contractor shall be notified the date for witnessing of measurements and handing over of the materials for which contractor has already been paid. In case the contractor fails to attend or send a representative even after such notice, the Engineer shall ex parte proceed with measurements of the works executed and taking over of plants and materials etc. for which payment has already been made to the contractor, which shall be treated as final.

15.4 Payment after Termination

After a notice of termination under Sub-Clause 15.2 [Termination by Employer] has taken effect, the Employer may:

(a) proceed in accordance with Sub-Clause 2.5 [Employer's Claims],

(b) encash the Performance Guarantee and forfeit the Performance

Security:

i) In full including additional Performance Guarantee amount if any taken in terms of sub clause 35.5 of ITB and not due for release on the date of issue of termination letter, in case of termination of the contract as a whole; Or

ii) in part/parts proportionate to the contract price of the bill/schedule to which the terminated part of work belongs i.e.

P = (A x B) ÷ C where,

P = Proportionate Bank Guarantee Amount

A = Contract Price of the particular bill/schedule to which the terminated part of work belongs

B = Performance Guarantee amount in terms of GCC sub clause 4.2

C = Total Contract Price

Plus additional Performance Guarantee amount if any taken in terms of sub clause 35.5 of ITB and not due for release on the date of issue of termination letter against that particular bill/Schedule to which the terminated part of the work belongs in case of termination in part/parts.

(c) release any payment due to the contractor for works executed prior to termination and evaluation under clause 15.3 (valuation at date of termination, however, if by this time the Contractor has failed to make a payment due to the Employer, the same will be deducted from the payment due and any balance remaining shall then be paid to the Contractor.)

15.5 Employer's Entitlement to Termination for Convenience

The Employer shall be entitled to terminate the Contract, at any time for the Employer's convenience, by giving notice of such termination to the Contractor. The termination shall take effect 28 days after the later of the dates on which the Contractor receives this notice or the Employer returns the Performance Security. The Employer shall not terminate the Contract under this Sub-Clause in order to execute the Works himself or to arrange for the Works to be executed by another contractor or to avoid a termination of the Contract by the Contractor under Clause 16.2 [Termination by Contractor].

After this termination, the Contractor shall proceed in accordance with Sub-Clause 16.3 [Cessation of Work and Removal of Contractor's Equipment] and shall be paid in accordance with Sub-Clause 19.1 [Payment and Release in case of Optional Termination].

15.6 Corrupt or Fraudulent Practices

If the Employer determines that the Contractor has engaged in corrupt, fraudulent, collusive or coercive practices, in competing for or in executing the Contract, then the

Employer may, after giving 14 days' notice to the Contractor, terminate the Contractor's employment under the Contract and expel him from the Site, and the provisions of Clause 15 shall apply as if such expulsion had been made under Sub-Clause 15.2.

For the purposes of this Sub-Clause:

(a) "corrupt practice" means the offering, giving, receiving of soliciting of anything of "value to influence the action of a public official in the procurement process or in the Contract execution.

(b) "fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of the Contract to the detriment of the Employer, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition.

(c) *"collusive practice" means a scheme or arrangement between two or more bidders, with or without the knowledge of the Employer, designed to establish bid prices at artificial, noncompetitive levels.*

(d) *"coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the procurement process or affect the execution of a contract.*

16	Deleted

17	Risk and Responsibility

17.1 Indemnities

The Contractor shall indemnify and hold harmless the Employer, the Employer's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of:

(a) bodily injury, sickness, disease or death, of any person including railway user whatsoever arising out of or in the course of or by reason of the Contractor's design (if any), the execution and completion of the Works and the remedying of any defects, unless attributable to any negligence, wilful act or breach of the Contract by the Employer, the Employer's Personnel, or any of their respective agents, and

(b) damage to or loss of any property, real or personal (other than the Works), to the extent that such damage or loss arises out of or in the course of or by reason of the Contractor's design (if any), the execution and completion of the Works and the remedying of any defects, unless and to the extent that any such damage or loss is attributable to any negligence, wilful act or breach of the Contract by the Employer,

the Employer's Personnel,, their respective agents, or anyone directly or indirectly employed by any of them.

The Employer shall indemnify and hold harmless the Contractor, the Contractor's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of (1) bodily injury, sickness, disease or death, which is attributable to any negligence, wilful act or breach of the Contract by the Employer, the Employer's Personnel, or any of their respective agents, and (2) the matters for which liability may be excluded from insurance cover, as described in sub-paragraphs (d)(i), (ii) and (iii) of Sub-Clause 18.3 [Insurance Against Injury to Persons and Damage to Property].

17.2 Contractor's Care of the Works

The Contractor shall take full responsibility for the care of the Works and Goods from the Commencement Date until the Taking-Over Certificate is issued (or is deemed to be issued under Sub-Clause 10.1 [Taking Over of the Works and Sections]) for the Works, when responsibility for the care of the Works shall pass to the Employer. If a Taking-Over Certificate is issued (or is so deemed to be issued) for any Section or part of the Works, responsibility for the care of the Section or part shall then pass to the Employer.

After responsibility has accordingly passed to the Employer, the Contractor shall take responsibility for the care of any work which is outstanding on the date stated in a Taking-Over Certificate, until this outstanding work has been completed.

If any loss or damage happens to the Works, Goods or Contractor's Documents during the period when the Contractor is responsible for their care, from any cause not listed in Sub-Clause 17.3 [Employer's Risks], the Contractor shall rectify the loss or damage at the Contractor's risk and cost, so that the Works, Goods and Contractor's Documents conform with the Contract.

The Contractor shall be liable for any loss or damage caused by any actions performed by the Contractor after a Taking-Over Certificate has been issued. The Contractor shall also be liable for any loss or damage which occurs after a Taking-Over Certificate has been issued and which arose from a previous event for which the Contractor was liable.

17.3 Employer's Risks

The risks referred to in Sub-Clause 17.4 below, insofar as they directly affect the execution of the works in the Country, are:

(a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies,

(b) rebellion, terrorism, sabotage by persons other than the Contractor's Personnel, revolution, insurrection, military or usurped power, or civil war, within the Country,

(c) riot, commotion or disorder within the Country by persons other than the Contractor's Personnel,

(d) munitions of war, explosive materials, ionising radiation or contamination by radio-activity, within the Country, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity,

(e) pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds,

(f) use or occupation by the Employer of any part of the Permanent Works, except as may be specified in the Contract,

(g) design of any part of the Works by the Employer's Personnel or by others for whom the Employer is responsible, and

(h) any operation of the forces of nature which is Unforeseeable or against which an experienced contractor could not reasonably have been expected to have taken adequate preventative precautions.

17.4 Consequences of Employer's Risks

If and to the extent that any of the risks listed in Sub-Clause 17.3 above results in loss or damage to the Works, Goods or Contractor's Documents, the Contractor shall promptly give notice to the Engineer and shall rectify this loss or damage to the extent required by the Engineer.

If the Contractor suffers delay and/or incurs Cost from rectifying this loss or damage, the Contractor shall give a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

(a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

(b) payment of any such Cost, which shall be included in the Contract Price. In the case of sub-paragraphs (f) and (g) of Sub-Clause 17.3 [Employer's Risks], Cost shall be payable.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

17.5 Intellectual and Industrial Property Rights

In this Sub-Clause, "infringement" means an infringement (or alleged infringement) of any patent, registered design, copyright, trade mark, trade name, trade secret or other intellectual or industrial property right relating to the Works; and "claim" means a claim (or proceedings pursuing a claim) alleging an infringement.

Whenever a Party does not give notice to the other Party of any claim within 28 days of receiving the claim, the first Party shall be deemed to have waived any right to indemnity under this Sub-Clause.

The Employer shall indemnify and hold the Contractor harmless against and from any claim alleging an infringement which is or was:

(a) an unavoidable result of the Contractor's compliance with the Contract, or

(b) a result of any Works being used by the Employer:
  (i) for a purpose other than that indicated by, or reasonably to be inferred from, the Contract, or
  (ii) in conjunction with any thing not supplied by the Contractor, unless such use was disclosed to the Contractor prior to the Base Date or is stated in the Contract.

The Contractor shall indemnify and hold the Employer harmless against and from any other claim which arises out of or in relation to (i) the manufacture, use, sale or import of any Goods, or (ii) any design for which the Contractor is responsible.

If a Party is entitled to be indemnified under this Sub-Clause, the indemnifying Party may (at its cost) conduct negotiations for the settlement of the claim, and any litigation or arbitration which may arise from it. The other Party shall, at the request and cost of the indemnifying Party, assist in contesting the claim. This other Party (and its Personnel) shall not make any admission which might be prejudicial to the indemnifying Party, unless the indemnifying Party failed to take over the conduct of any negotiations, litigation or arbitration upon being requested to do so by such other Party.

17.6 Limitation of Liability

Neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any contract or for any indirect or consequential loss or damage which may be suffered by the other Party in connection with the Contract, provided that this exclusion shall not apply to any obligation of the Contractor to pay Delay Damages to the Employer under Sub-Clause 8.7 [Delay Damages].

The total liability of the Contractor to the Employer, under or in connection with the Contract other than under Sub-Clause 4.19 [Electricity, Water and Gas], Sub-Clause 4.20 [Employer's Equipment and Free-Issue Material], Sub-Clause 17.1 [Indemnities] and Sub-Clause 17.5 [Intellectual and Industrial Property Rights], shall not exceed the sum as specified in the Contract Data or if nothing is specified in the Contract Data, the accepted Contract Amount.

This Sub-Clause shall not limit liability in any case of fraud, deliberate default or reckless misconduct by the defaulting Party.

17.7 Use of Employer's Accommodation/ Facilities

The Contractor shall take full responsibility for the care of the Employer provided accommodation and facilities, if any, as detailed in the Specification, from the respective dates of hand-over to the Contractor until cessation of occupation(where hand-over or cessation of occupation may take place after the date stated in the Taking-Over Certificate for the Works).

If any loss or damage happens to any of the above items while the Contractor is responsible for their care arising from any cause whatsoever other than those for which the Employer is liable, the Contractor shall, at his own cost, rectify the loss or damage to the satisfaction of the Engineer.

18 Insurance

18.1 General Requirements for Insurances

In this Clause, "insuring Party" means, for each type of insurance, the Party responsible for effecting and maintaining the insurance specified in the relevant Sub-Clause.

Wherever the Contractor is the insuring Party, each insurance shall be effected with insurers and in terms approved by the Employer. These terms shall be consistent with any terms agreed by both Parties before the date of the Letter of Acceptance. This agreement of terms shall take precedence over the provisions of this Clause.

If a policy is required to indemnify joint insured, the cover shall apply separately to each insured as though a separate policy had been issued for each of the joint insured. If a policy indemnifies additional joint insured, namely in addition to the insured specified in this Clause, (i) the Contractor shall act under the policy on behalf of these additional joint insured except that the Employer shall act for Employer's Personnel, (ii) additional joint insured shall not be entitled to receive payments directly from the insurer or to have any other direct dealings with the insurer, and (iii) the insuring Party shall require all additional joint insured to comply with the conditions stipulated in the policy.

Each policy insuring against loss or damage shall provide for payments to be made in the currencies required to rectify the loss or damage. Payments received from insurers shall be used for the rectification of the loss or damage.

The relevant insuring Party shall, within the respective periods stated in the Contract Data (calculated from the Commencement Date), submit to the other Party:

(a) evidence that the insurances described in this Clause have been effected, and

(b) copies of the policies for the insurances described in Sub-Clause 18.2 [Insurance for Works and Contractor's Equipment] and Sub-Clause 18.3 [Insurance against Injury to Persons and Damage to Property].

(c) If the contractor fails to submit evidence and copies of the policies as mentioned in (a) & (b) above to prove that the policies have been obtained within the period specified in the contract data, and submits the same later on and from the submitted evidence it is found that the policies have not been obtained within the period specified, the Employer shall recover double the cost of the premium for the period the policies have been delayed.

When each premium is paid, the insuring Party shall submit evidence of payment to the other Party. Whenever evidence or policies are submitted, the insuring Party shall also give notice to the Engineer.

Each Party shall comply with the conditions stipulated in each of the insurance policies. The insuring Party shall keep the insurers informed of any relevant changes to the execution of the Works and ensure that insurance is maintained in accordance with this Clause.
Neither Party shall make any material alteration to the terms of any insurance without the prior approval of the other Party. If an insurer makes (or attempts to make) any alteration,

the Party first notified by the insurer shall promptly give notice to the other Party.

If the insuring Party fails to effect and keep in force any of the insurances it is required to effect and maintain under the Contract, or fails to provide satisfactory evidence and copies of policies in accordance with this Sub-Clause, the other Party may (at its option and without prejudice to any other right or remedy) effect insurance for the relevant coverage and pay the premiums due. The insuring Party shall pay double the amount of these premiums to the other Party, and the Contract Price shall be adjusted accordingly.

Nothing in this Clause limits the obligations, liabilities or responsibilities of the Contractor or the Employer, under the other terms of the Contract or otherwise. Any amounts not insured or not recovered from the insurers shall be borne by the Contractor and/or the Employer in accordance with these obligations, liabilities or responsibilities. However, if the insuring Party fails to effect and keep in force an insurance which is available and which it is required to effect and maintain under the Contract, and the other Party neither approves the omission nor effects insurance for the coverage relevant to this default, any moneys which should have been recoverable under this insurance shall be paid by the insuring Party.

Payments by one Party to the other Party shall be subject to Sub-Clause 2.5 [Employer's Claims] or Sub-Clause 20.1 [Contractor's Claims], as applicable.

The Contractor shall be entitled to place all insurance relating to the Contract (including, but not limited to the insurance referred to Clause 18) with insurers from any eligible source country.

18.2 Insurance for Works and Contractor's Equipment

The Contractor shall insure the Works, Plant, Materials, including those issued by the Employer and Contractor's Documents for not less than the full reinstatement cost including the costs of demolition, removal of debris and professional fees and profit, subject to a maximum value indicated in Contract Data**.**. This insurance shall be effective from the date by which the evidence is to be submitted under sub-paragraph (a) of Sub-Clause 18.1 [General Requirements for Insurances], until the date of issue of the Taking-Over Certificate for the Works.

The insuring Party shall maintain this insurance to provide cover until the date of issue of the Performance Certificate, for loss or damage for which the Contractor is liable arising from a cause occurring prior to the issue of the Taking-Over Certificate, and for loss or damage caused by the Contractor in the course of any other operations (including those under Clause 11 [Defects Liability]).

The insuring Party shall insure the Contractor's Equipment for not less than the full replacement value, including delivery to Site. For each item of Contractor's Equipment, the insurance shall be effective while it is being transported to the Site and until it is no longer required as Contractor's Equipment.

Unless otherwise stated in the Special Conditions of Contract, insurances under this Sub-Clause:

(a) shall be effected and maintained by the Contractor as insuring Party,

(b) shall be in the joint names of the Parties, who shall be jointly entitled to receive

payments from the insurers, payments being held or allocated between the Parties for the sole purpose of rectifying the loss or damage,

(c) shall cover all loss and damage from any cause not listed in Sub-Clause 17.3 [Employer's Risks],

(d) shall also cover loss or damage to a part of the Works which is attributable to the use or occupation by the Employer of another part of the Works, and loss or damage from the risks listed in sub-paragraphs (c), (g) and (h) of Sub-Clause 17.3 [Employer's Risks], excluding (in each case) risks which are not insurable at commercially reasonable terms, with deductibles per occurrence of not more than the amount stated in the Contract Data (if an amount is not so stated, this sub-paragraph (d) shall not apply), and

(e) may however exclude loss of, damage to, and reinstatement of:

i) part of the Works which is in a defective condition due to a defect in its design, materials or workmanship (but cover shall include any other parts which are lost or damaged as a direct result of this defective condition and not as described in sub-paragraph (ii) below),

ii) a part of the Works which is lost or damaged in order to reinstate any other part of the Works if this other part is in a defective condition due to a defect in its design, materials or workmanship,

iii) a part of the Works which has been taken over by the Employer, except to the extent that the Contractor is liable for the loss or damage, and

iv) Goods while they are not in the Country, subject to Sub-Clause 14.5 [Plant and Materials intended for the Works].

If, more than one year after the Base Date, the cover described in sub-paragraph (d) above ceases to be available at commercially reasonable terms, the Contractor shall (as insuring Party) give notice to the Employer, with supporting particulars. The Employer shall then (i) be entitled subject to Sub-Clause 2.5 [Employer's Claims] to payment of an amount equivalent to such commercially reasonable terms as the Contractor should have expected to have paid for such cover, and (ii) be deemed, unless he obtains the cover at commercially reasonable terms, to have approved the omission under Sub-Clause 18.1 [General Requirements for Insurances].

18.3 Insurance against injury to Persons and Damage to Property

The insuring Party shall insure against each Party's liability for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Sub-Clause 18.2 [Insurance for Works and Contractor's Equipment]) or to any person (except persons insured under Sub-Clause 18.4 [Insurance for Contractor's Personnel]), which may arise out of the Contractor's performance of the Contract and occurring before the issue of the Performance Certificate.

This insurance shall be for a limit per occurrence of not less than the amount stated in the Contract Data, with no limit on the number of occurrences. If an amount is not stated in the Contract Data, this Sub-Clause shall not apply.

Unless otherwise stated in the Special Conditions of Contract, the insurances specified in this Sub-Clause:

(a) shall be effected and maintained by the Contractor as insuring Party,

(b) shall be in the joint names of the Parties,

(c) shall be extended to cover liability for all loss and damage to the Employer's property including Railways Property (except things insured under Sub-Clause 18.2) arising out of the Contractor's performance of the Contract, and

(d) may however exclude liability to the extent that it arises from:

(i) the Employer's right to have the Permanent Works executed on, over, under, in or through any land, and to occupy this land for the Permanent Works,

(ii) damage which is an unavoidable result of the Contractor's obligations to execute the Works and remedy any defects, and

(iii) a cause listed in Sub-Clause 17.3 [Employer's Risks], except to the extent that cover is available at commercially reasonable terms.

18.4 Insurance for Contractor's Personnel

The Contractor shall abide by the provisions of ESIC Act, 1948 (extended from time to time) to take care of insurance against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness or disease. In addition the contractor shall also maintain insurance against liability for claim of death of any person employed by the Contractor or any other of the Contractor's Personnel.

The Employer and the Engineer shall also be indemnified under the policy of insurance, except that this insurance may exclude losses and claims to the extent that they arise from any act or neglect of the Employer or of the Employer's Personnel.

The insurance shall be maintained in full force and effect during the whole time that these personnel are assisting in the execution of the Works. For a Subcontractor's employees, the insurance may be effected by the Subcontractor, but the Contractor shall be responsible for compliance with this Clause.

19 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, 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 14 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 of 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 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 continuous period exceeding 84 days, either party may at its option terminate the contract by giving notice to the other party.

19.1 Payment and Release in case of Optional Termination

Upon such termination, the Engineer shall determine the value of the work done and issue a Payment Certificate which shall include :

(a) The amounts payable for any work carried out for which a price is stated in the contract;

(b) The Cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the contractor is liable to accept delivery; this Plant and materials shall become the property of (and be at the risk of) the Employer when paid for by the Employer, the Contractor shall place the same at the Employer's disposal;

(c) Other Costs or liabilities supported by necessary documentary evidence which in the circumstances were reasonably and necessarily incurred by the Contractor in the expectation of completing the Works as per mutually agreed programme.

(d) the Cost of removal of Temporary Works and Contractor's Equipment from the Site and the return of these items to the Contractor's works in his country (or to any other destination at no greater cost).

20	Claims, Disputes and Arbitration

20.1 Contractor's Claims

If the Contractor considers himself to be entitled to any extension of the Time for Completion and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall give notice to the Engineer, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than 28 days after the Contractor became aware, or should have become aware, of the event or circumstance.

If the Contractor fails to give notice of a claim within such period of 28 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this Sub-Clause shall apply.

The Contractor shall also submit any other notices which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.

The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at another location acceptable to the Engineer. Without admitting the Employer's liability, the Engineer may, after receiving any

notice under this Sub-Clause, monitor the record-keeping and/or instruct the Contractor to keep further contemporary records. The Contractor shall permit the Engineer to inspect all these records, and shall (if instructed) submit copies to the Engineer.

Within 42 days after the Contractor became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Engineer, the Contractor shall send to the Engineer a fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect:

(a) this fully detailed claim shall be considered as interim;

(b) the Contractor shall send further interim claims at monthly intervals, giving the accumulated delay and/or amount claimed, and such further particulars as the Engineer may reasonably require; and

(c) the Contractor shall send a final claim within 28 days after the end of the effects resulting from the event or circumstance, or within such other period as may be proposed by the Contractor and approved by the Engineer.

Within 42 days after receiving a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the Engineer and approved by the Contractor, the Engineer shall respond with approval, or with disapproval and detailed comments. He may also request any necessary further particulars, but shall nevertheless give his response on the principles of the claim within such time.

Each Payment Certificate shall include such amounts for any claim as have been reasonably substantiated as due under the relevant provision of the Contract. Unless and until the particulars supplied are sufficient to substantiate the whole of the claim, the Contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate.

The Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) the extension (if any) of the Time for Completion (before or after its expiry) in accordance with Sub-Clause 8.4 [Extension of Time for Completion], and/or (ii) the additional payment (if any) to which the Contractor is entitled under the Contract.

The requirements of this Sub-Clause are in addition to those of any other Sub-Clause which may apply to a claim. If the Contractor fails to comply with this or another Sub-Clause in relation to any claim, any extension of time and/or additional payment shall take account of the extent (if any) to which the failure has prevented or prejudiced proper investigation of the claim, unless the claim is excluded under the second paragraph of this Sub-Clause.

20.2 Amicable Settlement

In case any dispute between the Engineer and the Contractor for which claim has already been made by the contractor, remains unresolved, the Contractor shall, then, give notice of dissatisfaction and intention to commence arbitration to the Employer duly specifying the subject of the dispute or difference as also the amount of claim item wise. The Parties shall make attempts to settle the dispute amicably before the commencement of arbitration as per procedure by KRIDE. However, unless both Parties agree otherwise, demand for arbitration may be made by the contractor after ninety days from the day on which a notice of dissatisfaction and intention to commence arbitration was given, even if

no attempt at amicable settlement has been made.

Procedure for Amicable Settlement in contracts

1. Amicable Settlement Committee at senior management level shall make an attempt to resolve the issues/disputes within 90 days of request by the contractor.

2. The committee shall comprise of the following:-

(i) GM /K RIDE directly in-charge of the project;
(ii) Concerned finance officer, and
(iii) GM /K RIDE (in the same order) directly in-charge of the project of other discipline(s) in case the issues involve other discipline(s) of the engineering

3. Whenever the contractor submits a request for amicable settlement, MD/K RIDE should forward the same to concerned GM /K RIDE (in the same order) directly in-charge of the project. GM /K RIDE on receipt of the same shall issue a note to the concerned finance officer and concerned GM/K RIDE of other discipline in case the issues involved other discipline(s) of engineering, about the request for amicable settlement to be dealt by them and fix a date in consultation with them for a hearing. The date should then be communicated to the MD/K RIDE, GM/ /K RIDE of other department (if the issues involved their department) and contractor for presenting their case before the Amicable Settlement Committee.

4. This being an additional workload like arbitration, the Committee members shall be paid fee by KRIDE at the rates payable to the Arbitrators of KRIDE.

20.3 Arbitration

Any dispute, in respect of which amicable settlement has not been reached, arising between the Employer and the Domestic or Foreign Contractor related to any matter arising out of or connected with this contract, then the contractor shall be entitled to demand in writing that the dispute or difference be referred to arbitration.

Only such dispute(s) or difference(s) in respect of which the demand had been made for amicable settlement under GCC 20.2 but could not be settled, shall be referred to arbitration subject to the condition that cumulative amount of claims in the contract is not exceeding 20% of the contract price. In case the cumulative amount of claims exceeds 20% of the contract price, arbitration clause will not be applicable.

The Arbitration proceedings shall commence from the day, a written and duly quantified demand for arbitration is received by Managing Director, Rail Infrastructure Development Company (Karnataka) Limited, Bangalore /K RIDE).

The disputes so referred to arbitration shall be settled in accordance with the Indian Arbitration & Conciliation Act, 1996 and any statutory modification or re-enactment thereof.

Further, it is agreed between the parties as under:

20.3.1

Number of Arbitrators: The arbitral tribunal shall consist of three arbitrators.

20.3.2

Procedure for Appointment of Arbitrators: The arbitrators shall be appointed as per following procedure:

(a) The Contractor, while invoking demand for arbitration, shall submit to MD/K RIDE, claims duly quantified along with name and contact details of his nominee arbitrator. Thereafter, he Employer will nominate his nominee arbitrator within a period of 30 days from receipt of such demand from the Contractor and will issue letter of appointment to both the arbitrators appointed by the parties with a copy to the Contractor.

(b) The third Arbitrator shall be chosen by the two Arbitrators so appointed by the parties and shall act as Presiding Arbitrator. In case of failure of the two Arbitrators appointed by the parties to reach upon consensus within a period of 30 days from the appointment of the Arbitrators subsequently appointed, then, upon the request of either or both parties, the Presiding Arbitrator shall be appointed by the Managing Director, Rail Infrastructure Development Company (Karnataka) Limited, Bangalore.

(c) If one or more of the arbitrators appointed as above refuses to act as arbitrator, withdraws from his office as arbitrator, or vacates his/their office/offices or is/are unable or unwilling to perform his functions as arbitrator for any reason whatsoever or dies or in the opinion of the concerned GM/K RIDE fails to act without undue delay, the MD/K RIDE shall appoint new arbitrator/arbitrators to act in his/their place except in case of new Presiding Arbitrator who shall be chosen following the same procedure as mentioned in para (b) above. Such re-constituted Tribunal may, at its discretion, proceed with the reference from the stage at which it was left by the previous arbitrator(s).

20.3.3

Qualification and Experience of Arbitrators (to be appointed as per sub-clause 20.3.2 above): The contract being of specialized nature requiring knowledge and experience of dealing with construction contracts, the arbitrators to be appointed shall have minimum qualification and experience as under:

Arbitrator shall be;

a working/retired officer (not below E-9 grade and above in a PSU with which K RIDE has no business relationship) of any discipline of Engineering or Accounts/Finance department, having experience in Contract Management of construction contracts; or

a retired officer (retired not below the HAG level) of any Engineering/Accounts Services of Central Government, having experience in Contract Management of construction contracts; ora retired officer who should have retired more than 3 years previously from the date of appointment as Arbitrator (retired not below E-9 grade in K RIDE or a PSU with which K RIDE has a business relationship) of any Engineering discipline or Accounts

department, having experience in Contract Management of construction contracts.

20.3.4

No person other than the persons appointed as per above procedure and having above qualification and experience shall act as Arbitrator. In case any person having the qualification and experience other than that mentioned above is nominated as arbitrator, the arbitration clause shall cease to exist and shall not be applicable.

No new claim, except as otherwise mutually agreed by the Parties, shall be added during proceedings by either party. However, a party may amend or supplement the original claim or defence thereof during the course of arbitration proceedings subject to acceptance by Tribunal having due regard to the delay in making it.

20.3.5

Neither party shall be limited in the proceedings before such arbitrators to the evidence nor did arguments previously put before during amicable settlement.

20.3.6

The reference to arbitration may proceed, notwithstanding that the Works shall not then be or be alleged to be complete, provided always that the obligations of the Employer, the Engineer and the Contractor shall not be altered by the reason of the arbitration being conducted during the progress of the Works. Neither party shall be entitled to suspend the Works, nor shall payment to the Contractor be withheld on account of such proceedings

20.3.7

If the contractor(s) does/do not prefer his/their specific and final claims in writing, within a period of 90 days of receiving the intimation from the Employer/Engineer that the final bill is ready for signature of the contractor(s), he/they will be deemed to have waived his/their claim(s) and the Employer shall be discharged and released of all liabilities under the contract in respect of these claims.

20.3.8

Arbitration proceedings shall be held at Bangalore, India or at a place where GM(CIVIL)/K RIDE's (dealing the contract) office is located, and the language of the arbitration proceedings and that of all documents and communications between the parties shall be in English.

20.3.9

The Arbitral Tribunal should record day to day proceedings. The proceedings shall normally be conducted on the basis of documents and written statements.

All arbitration awards shall be in writing and shall state item wise, the sum and detailed reasons upon which it is based.

20.3.10

Any ruling on award shall be made by a majority of members of Tribunal. In the absence of such a majority, the views of the Presiding Arbitrator shall prevail.

A party may apply for correction of any computational errors, any typographical or clerical errors or any other error of similar nature occurring in the award of a tribunal and interpretation of specific point of award to tribunal within 60 days of the receipt of award.

A party may apply to tribunal within 60 days of receipt of award to make an additional award as to claims presented in the arbitral proceedings but omitted from the arbitral award.

20.3.11

Where the Arbitral award is for the payment of money, no interest shall be payable on whole or any part of the money for any period till the date on which the award is made.

20.3.12

The fees and other charges of the conciliator/arbitrators shall be as per the fee structure fixed by the employer as amended from time to time irrespective of the fact whether the Arbitrator(s) is/are appointed by the parties or by the Court of law unless specifically directed by Hon'ble Court otherwise on the matter, and shall be shared equally by the Employer and the Contractor. However, the expenses incurred by each party in connection with the preparation, presentation will be borne by itself

21. Jurisdiction of courts

The Contract Agreement shall be subject to exclusive jurisdiction of Courts as indicated in the Contract Data.

APPENDIX 1

SALIENT FEATURES OF SOME MAJOR LABOUR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTION WORK

(The laws as current on the date of bid opening will apply)

a) **Workmen Compensation Act 1923**: The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

b) **Payment of Gratuity Act 1972**: Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years service or more or on death the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.

c) **Employees P.F. and Miscellaneous Provision Act 1952 (since amended):** The Act Providesfor monthly contributions by the employer plus workers @ 10% or 8.33%. The benefits payable under the Act are :

   (i) Pension or family pension on retirement or death, as the case may be.

   (ii) Deposit linked insurance on the death in harness of the worker.

   (iii) payment of P.F. accumulation on retirement/death etc.

d) **Maternity Benefit Act 1951**: The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

e) **Contract Labour (Regulation & Abolition) Act 1970**: The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by Law. The Principal Employer is required to take Certificate of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ 20 or more contract labour.

f) **Minimum Wages Act 1948**: The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employments.

g) **Payment of Wages Act 1936:** It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.

h) **Equal Remuneration Act 1979**: The Act provides for payment of equal wages for work of equal nature to Male and Female workers and for not making discrimination against Female employees in the matters of transfers, training and promotions etc.

i) **Payment of Bonus Act 1965**: The Act is applicable to all establishments employing 20 or more employees. The Act provides for payments of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages to employees drawing Rs.3500/-per month or less. The bonus to be paid to employees getting Rs.2500/- per month or above upto Rs.3500/- per month shall be worked out by taking wages as Rs.2500/-per month only. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of this Act.

j) **Industrial Disputes Act 1947**: The Act lays down the machinery and procedure for resolution of Industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

k) **Industrial Employment (Standing Orders) Act 1946**: It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get the same certified by the designated Authority.

l) **Trade Unions Act 1926:** The Act lays down the procedure for registration of trade unions of workmen and employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.

m) **Child Labour (Prohibition & Regulation) Act 1986**:The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child Labour is prohibited in Building and Construction Industry.

n) **Inter-State Migrant workmen's (Regulation of Employment & Conditions of Service) Act 1979:** The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, travelling expenses from home upto the establishment and back, etc.

o) **The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996:** All the establishments who carry on any building or other construction work and employs 10 or more workers are covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the Government. The Employer of the establishment is required to provide safety measures at the Building or construction work and other welfare measures, such as Canteens, First-Aid facilities, Ambulance, Housing accommodations for workers near the work place etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

As per Central Government's Notification No.S.O.2899 dated 26.09.1996 under this act, the cess shall be levied @1% of cost of construction works which shall be deducted from each bill of the payment due to the contractor.

p) **Factories Act 1948**: The Act lays down the procedure for approval at plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process.

q) **The Employees State Insurance Act, 1948 (Act No. 34 of 1948) (Provisions as extended from time to time):**An Act to provide for certain benefits to employees in case of sickness, maternity and 'employment injury' and to make provision for certain other matters in relation thereto.

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Section 7 Part A	Particular Conditions of Contract (PCC) Contract Data

Section 7 — Particular Conditions of Contract

The following Special Conditions of Contract (SCC) shall supplement the General Conditions of Contract (GCC). Whenever there is a conflict, the provisions herein shall prevail over those in the GCC.

Part A – Contract Data

Conditions	Reference to GCC	Data
Employer's name and address	1.1.2.2 & 1.3	K RIDE (Rail Infrastructure Development Company (Karnataka) Limited) (A Joint venture of GoK and MoR) #8 , 1st Floor, Samparka Soudha, Dr. Rajkumar Road, Opposite Orion Mall Rajaji Nagar 1st Block Bangalore – 560010 Tele: +91 6364890842
Employer's Representative	1.1.2.6	General Manager (Electrical)/K RIDE, K RIDE (Rail Infrastructure Development Company (Karnataka) Limited) #8 , 1st Floor, Samparka Soudha, Dr. Rajkumar Road, Opposite Orion Mall Rajaji Nagar 1st Block Bangalore – 560010 Tele: +91 6364890842 E – Mail: md@kride.in
Engineer's name and address	1.1.2.4 & 1.3 (b)	*Will be notified later*
Defects Notification Period	1.1.3.7	180 days
Electronic transmission systems	1.3 (a)	Not permitted
Address for Communication to Employer	1.3 (b)	General Manager (Electrical)/K RIDE, K RIDE (Rail Infrastructure Development Company (Karnataka) Limited) #8 , 1st Floor, Samparka Soudha, Dr. Rajkumar Road, Opposite Orion Mall Rajaji Nagar 1st Block Bangalore – 560010 Tele: +91 6364890842 E – Mail: md@kride.in
Governing Law	1.4	The Laws of Republic of India

Conditions	Reference to GCC	Data
Ruling language	1.4	English
Language for communications	1.4	English
Time for access to Site (after the date of commencement)	2.1	Starting from the Date of Commencement, the section will be progressively handed over in 90 days.
Performance Security	4.2 (a)	(a) The Performance Security shall be for an amount of 3% (Three percent) of the Accepted Contract Amount and in the same currency(ies) of the Accepted Contract amount in the prescribed form for the stated amount valid for a period of 28 days beyond issue of performance certificate. The contractor shall have the following options; (i) to submit full performance security for an amount equal to 3% of the contract price; or (ii) to submit part performance security for an amount equal to 1.5% of the contract price and the balance performance security shall be recovered from interim payment certificates @ 10% of the bill amount starting from 1st bill till it reaches full Performance Security. The contractor shall not be entitled to any interest on the amounts so recovered. However, the contractor shall be entitled for release of recovered amount of performance security against submission of bank guarantee of an equivalent amount, maximum three times during the contract.
Security Deposit	4.2 (b)	The Security Deposit shall be 5% of the contract value. Security Deposit may be deposited by the Contractor before release of first on account bill in cash or Term Deposit Receipt issued from Scheduled Bank, or may be recovered at the rate of 6% of the bill amount till the full security deposit is recovered.
Normal working hours	6.5	Sunrise to Sunset, (This may be modified to suit the work requirements).
Commencement of works	8.1	Within fifteen (15) days from the date Contractor receives Letter of acceptance.

Conditions	Reference to GCC	Data
Maximum amount of delay damages	8.7	10% (ten percent) of the Contract Price.
Amount of bonus for early completion	8.13	1% of initial Contract Price per month (part of the month to be excluded) for substantial completion of work.
Maximum limit of bonus	8.13	5% of Contract Price
State Capital Applicable		Bengaluru
Percentage of Retention Money	14.3	Retention money shall be deducted @ 2% of the total value of 'exclusive supply items' of BOQ; i. against which last installment of stage payment is included in the interim payment certificate for items having stage payment condition; ii. full payment against items (not having any stage payment condition) included in the interim payment certificate.
Limit of Retention Money	14.3	2% of the Contract Price Refer 7B
Employers' Bank details for Letter of Credit **(a) Nodal Branch** **(b) Issuance/ reimbursing branch for LC**	14.7.1	(a) Canara Bank, MG Road, Bangalore 560001 IFSC Code – CNRB0002636 A/c No - 0430201012110 (b) Should be indicated later
Maximum Total Liability of the Contractor	17.6	Accepted Contract Amount
Periods for submission of insurance: **a) evidence of insurance** **b) relevant policies**	18.1	a) 14 days b) 28 days

Conditions	Reference to GCC	Data
Maximum amount of deductibles for insurance of Employer's risks.	18.2 (d)	NIL
Minimum amount of insurance by the Contractor for Works and Contractor's Plant and Materials including loss or damage to equipment.	18.2	100 (hundred) percent of Contract price
Minimum amount of insurance by the Contractor for Third party insurance including damage to Other Property and personal injury or death insurance for: a) for other people, and b) for Contractor's Employees.	18.3	Rs.2 (two) crores per occurrence without any limit for number of occurrences.
Jurisdiction of Courts	21	*Bangalore*

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Section 7 Part B	Special Conditions of Contract (SCC) Specific Provisions

Section 7	Special condition of contract

Part B -Special condition of contract

Whenever there is a conflict or inconsistency between the provisions of the Special Conditions of Contract–Section 7 PART B and the General Conditions of Contract–Section 6, the provisions stipulated in Special Conditions of Contract–Section 7 PART B shall prevail and supersede those appearing in the General Conditions of Contract–Section 6.

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SPECIAL CONDITIONS OF CONTRACT

1. GENERAL

(i) The Special Conditions of Contract contained herein shall be supplemented to General Conditions of the Contract. In the event of any conflict or inconsistency between them, the Special Conditions of contract contained herein shall prevail.

(ii) The Contract labour (Regulation and Abolition) Act-1970 (CLRA) as amended up to date will form part of the contract Agreement. Further it is obligatory on the part of every contractor to obtain a valid license from the licensing officer before under taking /executing the work.

(iii) Latest RDSO specifications shall be considered wherever applicable as per the organization requirement.

(iv) In case of any conflicts and deficiencies in the tender documents and schedules, K-RIDE will have rights to take final decisions.

2. SCOPE OF WORK

2.1 The scope of this work broadly includes, doubling with Electrification Project for Section **Heelalige** - **Hosur** of South Western Railway. The work is for all the associated OHE works commencing from foundations, mast erection, bracket erection, wiring, neutral section, bonding, testing and commissioning and also includes modifications if any to the existing to the OHE, the feeder lines etc. inclusive of removal of infringements.

2.2 The work shall be carried out according to the technical specifications referred, drawings approved by the KRIDE and shall conform to the provision of AC traction Manual and schedule of dimensions of Indian Railways. The contractor shall be solely responsible for the proper execution of the work as per specification.

3. COMPLETION PERIOD OF WORK: 24 Months

4. MAINTENANCE:

4.1 The contractor shall maintain the executed work in all respect including material & works for any defect & fault for a **period of 12 months** from the date of issue of Provisional Acceptance Certificate entirely free of cost including repairing/ replacing the defective/ damaged equipments without any additional cost of spares and repairs etc. This 12 month period shall be referred as Maintenance Period.

4.2 The services of Maintenance Technicians/ Supervisors/ Engineer shall be made available throughout day and night for the period of 12 months and as and when required by the KRIDE Engineer/ or their representative. The contractor shall ensure the R personnel are fully acquainted and familiar with the detailed procedure to follow for proper testing and satisfactory maintenance of equipments.

5. WARRANTY:

5.1 The contractor shall warranty that all materials and equipment to be supplied and installed as per this tender shall be free from defects and faults in design, material, workmanship and manufacture and shall be of the highest grade and consistent with the established and generally accepted standard for materials of the type ordered and in full conformity with the contract specification.

5.2 The entire OHE work shall be under warranty for a period of **12 months** from the date of completion of the work, i.e. date of issue of the Work Completion certificate.

5.3 During the period of Warranty, the Contractor shall remain responsible to arrange replacement and for setting right at his own cost any equipment supplied by him which is of defective manufacture or defective design or defective material/ component becomes unworkable due to any cause whatsoever. The decision of K RIDE to attend to any damage or defect in work shall be final and binding on the contractor.

5.4 If it becomes necessary for the contractor to replace or renew any defective portions of the system under this clause, the provision of this clause shall apply to the expiry of six months from the date of which replacement or renewal or until the end of the warranty period whichever may be later. If any defect is not remedied within reasonable time, the K RIDE may proceed to do the work at contractor's risk and expense, but without prejudice to any other rights, which the K RIDE may have against the contractor in respect of such defects.

5.5 All inspections, replacements or renewals carried out by the contractor during the warranty period shall be subject to the same conditions of the contract.

5.6 All replacement and repairs that the K RIDE shall call upon the contractor to deliver or perform under this warranty shall be delivered and performed by the contractor within one month, promptly and satisfactorily.

5.7 The decision of the **K-RIDE** in regard to contractor's liability and the amount, if any, payable under this warranty shall be final and conclusive.

5.8 During the analysis of failures, if any design deficiency is pointed out by the K RIDE, the contractor shall rectify it at his own cost.

6. VARIATION IN QUANTITIES:

6.1 The drawings referred to in the list of plans, if any, are intended only to give a rough and general idea of the location and approximate details of work to be done. No claim whatsoever will be admissible in respect of any alteration/ addition/ deletion/ change in the type of works/ change in locations.

6.2 The quantities of various items given in the Schedule for the works to be executed are only approximate and are only for the guidance of the tenderer/ contractor. As far as possible, they have been assessed correctly but are likely to vary during the execution of the work.

6.3 The amount of variations permitted without any extra price are discussed in the chapter and shall be binding through-out the contract.

6.4 The aspect of vitiation of tender with respect to variation in quantities should be checked and avoided. In case of vitiation of the tender (both for increase as well as decrease of value of contract agreement), sanction of the competent authority as per single tender should be

obtained.

7. INCOME TAX:

Income tax will be deducted at prevailing rates and also surcharge if any at source from each bill as per the Laws of the Country.

8. Care in Submission of Tenders:

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

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

(a)(iii) The successful tenderer who is liable to 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.

(a)(iv) In case the successful tenderer is not liable to be registered under CGST/IGST/UTGST/ SGST Act, the railway shall deduct the applicable GST from his/their bills under reverse charge mechanism (RCM) and deposit the same to the concerned authority.

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

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

9. EXECUTIVE INCHARGE OF WORKS will be indicated at the time of Issue of Letter of Acceptance.

10. CONSIGNEE'S RIGHT OF REJECTION:

10.1 Notwithstanding any approval which the inspecting officer may have given in respect of the stores or any materials or the work or workmanship involved in the performance of the contract (Whether with or without any test carried out by the contractor or the Inspecting officer or under the direction of the Inspecting officer) and notwithstanding delivery of the stores where so provided to the interim

10.2 Consignee, it shall be lawful for the consignee, on behalf of the purchaser, to reject the stores or any part, portion of consignment thereof within a reasonable time after actual delivery thereof to him at the place or destination specified in the contract. If such stores or part, portion of consignment thereof is not in all respects in conformity with the terms and conditions of the contract whether on account of any loss, deterioration or damage before dispatch or delivery or during transit or otherwise whatsoever.

10.3 When any stores delivered to K-RIDE are rejected, this shall be removed by the contractor within 15 days from the date of rejection. Such rejected stores shall lie at the contractor's risk from the date of rejection. If the stores are not removed by the contractor within this period, the purchaser or his nominee shall have the right to dispose of such stores, as deemed fit, at the contractor's risk and account.

10.4 The purchaser shall also be entitled to recover from the contractor, handling and ground rent/demurrage and any other charges for the period the rejected stores are not removed after the aforementioned period.

11. SERVICE ROADS:

The K RIDE does not undertake to provide any service roads for the movement of the contractor's vehicles. The contractor can however make use of the service roads, where they exist free of charge. However, the railway shall not undertake to maintain them and the contractor shall maintain them at his own cost. In other places, the contractor should make his own arrangements for the movement of the vehicles and no extra rate shall be paid for this. The K RIDE reserves the right to make use of the roads formed and maintained by the contractor, as and when necessary, without any payment to the contractor. In the event of the contractor forming the service roads where land is not available or cannot be given by the K RIDE for this purpose, it shall be clearly noted that the contractor shall make his own arrangements for obtaining the required land and K RIDE shall not take any responsibility in this respect and shall not compensate the contractor in any way.

12 License, Permission Etc:

12.1 The contractor shall arrange to obtain permission direct from the State Government or local authorities concerned for using Forest, PWD roads. The rates tendered shall be inclusive of any cess, tax or any other charges payable to the authorities concerned.

12.2 The contractor shall make his own arrangements for obtaining the license for any explosives, as may be necessary, for procurement, transportation, storage and use of the same. All possible assistance will be given by the K-RIDE, should there be any

difficulties in obtaining the license etc. However, any failure shall not form the basis for any claim by the contractor against the K-RIDE or for additional payment for the work.

12.3 In case of use of explosives for blasting the contractor shall strictly abide by the Indian Explosive Act, the Rules and Regulations framed there under in carrying out the work, shall observe all the provisions of the Indian Mine Act and the mines regulations and rules there under as well as any other Act and Rules, as may be enacted and laid down by the State and Central Government from time to time, for such work.

12.4 The contractor will be held responsible for any loss/damage/injury caused during explosion to the labourers or to the public/ private persons or to K-RIDE/Railway/Public/Private property and the contractor should bear all the loss/expenditure thereby involved.

13. CONTRACTOR'S VEHICLES, PLANT & MACHINERY ETC.

13.1 Necessary permit/ interstate permits for the movements of vehicles/ Plant & machinery shall be arranged by the contractor.

13.2 Breakdown to transport vehicles, machinery etc., if any, will be on the contractor's account.

13.3 Accidents, if any, to his vehicles, Plant and Machinery or to persons would be the responsibility of the contractor and the KRIDE will not be responsible for the damage or compensation thereof.

14. USE OF CONTRACTORS VEHICLES, PLANT & MACHINERY ETC., FOR ACCIDENT RESTORATION WORKS:

14.1 The vehicle and equipment of contractors are liable to be drafted by K-RIDE administration in case of accidents/ natural calamities involving human lives for speedy restoration work.

For payment purpose, this item will be operated as a Non-Schedule (NS) item, duly negotiating rates as per the conditions of contract.

Contractor/Tenderer shall furnish the details of vehicles/equipment available with them to keep a record of the same.

15. PROVISION OF MULTI ROAD VEHICLE:

The contractor at his own cost shall provide one Multi Utility Road Vehicle in good condition with driver, fuel etc., for the use of K-RIDE as and when required to monitor the work through out the currency of the contract.

Note: No additional payment made for this item.

Section 8	Contract Forms

Section 8 Contract Forms

This Section contains forms which, once completed, will form part of the Contract. The forms for Performance Security and Advance Payment Security, when required, shall only be completed by the successful Bidder after contract award.

All italicized text is for guidance how to prepare the various forms and shall be deleted from the final documents.

Table of Forms

FORM No. COF/1

Letter of Acceptance

[on letterhead paper of the Employer]

. . . . . date. . .. . . .

To: . ...*[name and address of the Contractor]* . . . . . .

Subject:. . . . . [*Insert Name and Identification number]……..[Notification of Award]…..*

This is to notify you that your Bid dated . . . .*[Insert Date]*. . . for execution of the *. . . [name of the contract and identification number, as given in the Contract Data] . . .* for the Accepted Contract Amount of the equivalent of INR *. . . [Insert amount in numbers and words and name of the currency]. .*, as corrected and modified in accordance with the Instructions to Bidders, is hereby accepted.

You are requested to furnish the Performance Security within 28 days in accordance with the Conditions of Contract, using for that purpose the *of* the Performance Security Form No. COF/3 included in Section 8 (Contract Forms) of the Bidding Document.

Authorized Signature: .....

Name and Title of Signatory: .....

FORM No. COF/2

Contract Agreement

THIS AGREEMENT made the . . . . . .day of . . . ., between . . . . . [N*ame of the Employer. . ..* . . . . (hereinafter "the Employer"), of the one part, and . . . . . [*name of the Contractor**]. .**[1]. . .*(hereinafter "the Contractor"), of the other part:

WHEREAS the *Employer* desires that the Works known as . . . . . [*name of the Contract**]. . . . .*should be executed by the Contractor, and has accepted a Bid by the Contractor for the execution and completion of these Works and the remedying of any defects therein,

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.

2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.

   - the Letter of Acceptance
   - the Letter of Bid
   - the Addenda Nos. . . . . [***insert addenda numbers if any]****. . . . .*
   - the Special Conditions of Contract

     Part A : Contract Data

     Part B : Specific Provisions
   - the General Conditions of Contract;
   - the Specification
   - the Drawings*;*
   - the Work's Requirements
   - the completed Schedules including (priced Bill of Quantities)
   - Any other documents

[1]*In case Contractor is a Joint Venture the 'name of the contractor' shall be inserted as under : "the Joint Venture under the name and title of ……, comprising of ….[Lead Partner] ;……..; and ….."*

3. In consideration of the payments to be made by the Employer to the Contractor as indicated in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.

4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of . . . . . [*name of the borrowing country*]. . . . .on the day, month and year indicated above.

Signed by	Signed by .....
for and on behalf of the Employer in the presence of	for and on behalf the Contractor in the presence of
Witness, Name, Signature, Address, Date	Witness, Name, Signature, Address, Date

COF/3

FORM OF CONTRACT PERFORMANCE SECURITY(BANK GUARANTEE)

[*Refer Clause 41 of Instructions to Bidders]*

(*On non-judicial stamp paper of the appropriate value in accordance with stamp Act. The stamp paper to be in the name of Executing Bank).*

From:
Name and Address of the Bank…..
……..
To:
The Managing Director,
Rail Infrastructure Development Company (Karnataka) Limited,
"SamparkaSoudha" , 1st Floor,
B.E.P Premises (Opp. Orion Mall),
Dr. Rajkumar Road,
Rajajinagar 1st Block,
Bangalore - 560 010

WHEREAS**,** Rail Infrastructure Development Company (Karnataka) Limited, hereinafter called the **Employer,** acting through ***[Insert Designation and address of the Employer's Representative]***, has accepted the bid of ***[Insert Name and address of the Contractor]***, hereinafter called the **Contractor,** for the work of ***[Insert Name of Work]***, vide Notification of Award No.***[Insert Notification of Award No.]***.

AND

WHEREAS, the contractor is required to furnish Performance Security for the sum of ***[Insert Value of Performance Security required]***, in the form of bank guarantee, being a condition precedent to the signing of the contract agreement.

WHEREAS, ***[Insert Name of the Bank]***, with its Branch ***[Address]*** having its Headquarters office at ***[Address]***, hereinafter called the **Bank,** acting through ***[Designation(s) of the authorised person of the Bank]***, have, at the request of the *[Insert name of the JV partner]* , a JV partner on behalf of the contractor, agreed to give guarantee for performance security and additional performance security as hereinafter contained:

1 KNOW ALL MEN by these present that I/We the undersigned ***[Insert name(s) of authorized representatives of the Bank],***being fully authorized to sign and incur obligations for and on behalf of the Bank**,** confirm that the Bank, hereby, unconditionally and irrevocably guarantee to pay the Employer the full amount in the sum of ***[Insert Value of Performance Security required]*** as above stated.

2 The Bank undertakes to immediately pay on presentation of demand by the Employer any amount up to and including aforementioned full amount

without any demur, reservation or recourse. Any such demand made by the Employer on the Bank shall be final, conclusive and binding, absolute and unequivocal notwithstanding any disputes raised/ pending before any Court, Tribunal, Arbitration or any Authority or any threatened litigation by the Employer of Bank..

3 On payment of any amount less than aforementioned full amount, as per demand of the Employer, the guarantee shall remain valid for the balance amount i.e. the aforementioned full amount less the payment made to the Employer.

4 The Bank shall pay the amount as demanded immediately on presentation of the demand by Employer without any reference to the contractor and without the Employer being required to show grounds or give reasons for its demand or the amount demanded.

5. The Bank Guarantee shall be unconditional and irrevocable.

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

7 The Bank agrees that no change, addition, modifications to the terms of the Contract Agreement or to any documents, which have been or may be made between the Employer and the Contractor, will in any way release us from the liability under this guarantee; and the Bank, hereby, waives any requirement for notice of any such change, addition or modification to the Bank.

8 This guarantee is valid and effective from the date of its issue, which is ***[insert date of issue]***. The guarantee and our obligations under it will expire on [***Insert the date twenty-eight days after the expected end of defect liability period]***. All demands for payment under the guarantee must be received by us on or before that date.

9 The Bank agrees that the Employers right to demand payment of aforementioned full amount in one instance or demand payments in parts totaling up to the aforementioned full amount in several instances will be valid until either the aforementioned full amount is paid to the Employer or the guarantee is released by Employer before the Expiry date.

10 The Bank agrees that its obligation to pay any amount demanded by the Employer before the expiry of this guarantee will continue until the amount demanded has been paid in full.

11 The expressions Bank and Employer herein before used shall include their respective successors and assigns.

12 The Bank hereby undertakes not to revoke the guarantee during its currency, except with the previous consent in writing of the employer. This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758.

13 The Guarantee shall be in addition to and without prejudice to any other security Guarantee (s) of the contractor in favour of the Employer available with the Employer. The Bank, under this Guarantee, shall be deemed as Principal Debtor of the Employer.

Date …… ……

Place……. [*Signature of Authorised person of Bank]*

……
[Name in Block letters]

……..
[Designation]

……..……
[P/Attorney] No.

……..
Bank's Seal

[P/Attorney] No……

Witness:

1. *Signature*
   Name & Address & Seal

2. *Signature*
   Name & address & Seal

Note :

1. *All italicized text is for guidance on how to prepare this bank guarantee and shall be deleted from the final document.*

2. *In case the guarantee is issued by a foreign Bank, which does not have operations in India, the said bank shall have to provide a counter-guarantee by State Bank of India.*
3. *In case the Contractor is a JV, the Performance Security is required to be furnished on behalf of the JV in favour of the Employer by the JV Partners in proportion of of their respective percentage share specified in the JV Agreement. The percentage share of M/s [**Insert Name of the JV Partner**] in the JV is [**Fill share % in the JV**] percent. All the Bank Guarantee of JV Partners are liable to be encashed cumulatively.*

FORM OF ADDITIONAL PERFORMANCE SECURITY
(BANK GUARANTEE)

[Refer Clause 35.5 of Instructions to Bidders]

(On non-judicial stamppaperoftheappropriatevalue in accordancewithstampAct. Thestamppaperto be in thenameofExecuting Bank)

From:

Name and Address of the Bank…..
……..

To:
The Managing Director,
Rail Infrastructure Development Company (Karnataka) Limited,
"SamparkaSoudha" , 1st Floor,
B.E.P Premises (Opp. Orion Mall),
Dr. Rajkumar Road,
Rajajinagar 1st Block,
Bangalore - 560 010

WHEREAS**,** Rail Infrastructure Development Company (Karnataka) Limited, hereinafter called the **Employer,** acting through ***[Insert Designation and address of the Employer's Representative]***, has accepted the bid of ***[Insert Name and address of the Contractor]***, hereinafter called the **Contractor,** for the work of ***[Insert Name of Work]***, vide Notification of Award No.***[Insert Notification of Award No.]***.

AND

WHEREAS, the contractor is required to furnish additional Performance Security for the sum of ***[Insert Value of additional Performance Security required]***, in the form of bank guarantee, being a condition precedent to the signing of the contract agreement.

WHEREAS, ***[Insert Name of the Bank]***, with its Branch ***[Address]*** having its Headquarters office at ***[Address]***, hereinafter called the **Bank,** acting through ***[Designation(s) of the authorised person of the Bank]***, have, at the request of the [Insert name of the JV/Consortium partner], a JV/Consortium partner on behalf of the contractor, agreed to give guarantee for additional performance security as hereinafter contained:

1 KNOW ALL MEN by these present that I/We the undersigned ***[Insert name(s) of authorized representatives of the Bank]*,**being fully authorized to sign and incur obligations for and on behalf of the Bank**,** confirm that the Bank, hereby, unconditionally and irrevocably guarantee to pay the Employer the full amount in the sum of ***[Insert Value of additional Performance Security required]***as above stated.

2 The Bank undertakes to immediately pay on presentation of demand by the Employer any amount up to and including aforementioned full amount without any demur, reservation or recourse. Any such demand made by the Employer on the Bank shall be final, conclusive and binding, absolute and unequivocal notwithstanding any disputes raised/ pending before any Court, Tribunal, Arbitration or any Authority or any threatened litigation by the Employer of Bank.

3 On payment of any amount less than aforementioned full amount, as per demand of the Employer, the guarantee shall remain valid for the balance amount i.e. the aforementioned full amount less the payment made to the Employer.

4 The Bank shall pay the amount as demanded immediately on presentation of the demand by Employer without any reference to the contractor and without the Employer being required to show grounds or give reasons for its demand or the amount demanded.

5 The Bank Guarantee shall be unconditional and irrevocable.

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

7 The Bank agrees that no change, addition, modifications to the terms of the Contract Agreement or to any documents, which have been or may be made between the Employer and the Contractor, will in any way release us from the liability under this guarantee; and the Bank, hereby, waives any requirement for notice of any such change, addition or modification to the Bank.

8 This guarantee is valid and effective from the date of its issue, which is ***[insert date of issue]***. The guarantee and our obligations under it will expire on ***[Insert the date twenty eight days after the expected end of defect liability period]***. All demands for payment under the guarantee must be received by us on or before that date.

9 The Bank agrees that the Employers right to demand payment of aforementioned full amount in one instance or demand payments in parts totaling up to the aforementioned full amount in several instances will be valid until either the aforementioned full amount is paid to the Employer or the guarantee is released by Employer before the Expiry date.

10 The Bank agrees that its obligation to pay any amount demanded by the Employer before the expiry of this guarantee will continue until the amount demanded has been paid in full.

11 The expressions Bank and Employer herein before used shall include their respective successors and assigns.

12 The Bank hereby undertakes not to revoke the guarantee during its currency, except with the previous consent in writing of the employer. This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758.

13 The Guarantee shall be in addition to and without prejudice to any other security Guarantee(s) of the contractor in favour of the Employer available with the Employer. The Bank, under this Guarantee, shall be deemed as Principal Debtor of the Employer.

Date …… ……
Place…….. *[Signature of Authorised person of Bank]*

……..
[Name in Block letters]

……...
[Designation]

……..……

[P/Attorney] No.

……..
Bank's Seal

[P/Attorney] No.……

Witness:

1. *Signature*
   Name & Address & Seal

2. *Signature*
   Name & address & Seal

Note :

1 *All italicized text is for guidance on how to prepare this bank guarantee and shall be deleted from the final document.*

2 *In case the guarantee is issued by a foreign Bank, which does not have operations in India, the said bank shall have to provide a counter-guarantee by State Bank of India.*

3 *The Bank Guarantee should be duly attested by Notary public with notarial stamp of appropriate value affixed thereon.*

4 *In case the Contractor is a JV/Consortium, the additional Performance Security is required to be furnished on behalf of the JV/ Consortium in favour of the Employer by the JV/Consortium Partner(s) who is responsible for execution of schedule(s) (as per JV/Consortium agreement) against which additional Performance Security is required to be submitted in terms of ITB 35.5. All the Bank Guarantee of J/VConsortium Partners are liable to be encashed cumulatively.*

Advance Payment Security

[Refer Clause 14.2 of GCC]

(On non-judicial stamp paper of appropriate value in accordance with stamp Act. The stamp paper to be in the name of Executing Bank)

From
[Name and Address of the Bank]

To
The Managing Director,
Rail Infrastructure Development Company (Karnataka) Limited,
"SamparkaSoudha" , 1st Floor,
B.E.P Premises (Opp. Orion Mall),
Dr. Rajkumar Road,
Rajajinagar 1st Block,
Bangalore - 560 010

Beneficiary: Rail Infrastructure Development Company (Karnataka) Limited.

Guarantee No.: *[…..reference number of the guarantee….]***Dated:** *[……..]*

WHEREAS, Rail Infrastructure Development Company (Karnataka) Limited**(hereinafter called the Employer)** has entered into Contract No. [….*reference number of the Contract….]*dated *[……..]* for the execution of *[name of the contract]* **(hereinafter called the Contract)** with*[….name of the Contractor….]***(hereinafter called the Contractor)**.

WHEREAS, according to the Conditions of the Contract, an advance payment is admissible to the contractor against submission of bank guarantee(s).

At the request of the Contractor, we *[….name of the Bank….]* with our branch at*[….address….],*having our Head Office at *[….address….]* **(hereinafter called the Bank)** have, at the request of *[.....Insert name of the JV partner.....]*, a JV partner on behalf of the Contractor, agreed to give the said guarantee as hereinafter contained:

1. KNOW ALL MEN by these present that I/We the undersigned *[….Insert name(s) of authorized representative(s) of the Bank….],* being fully authorized to sign and incur obligations for and on behalf of the Bank**,** confirm that the Bank, hereby, unconditionally and irrevocably guarantees

   to pay the Employer the sum of Rs.*[….value in figure….]*(Rupees [….*value in words….] only***(hereinafter called the Full Amount)**.

2. The Bank undertakes to immediately pay to the Employer, without any demur, reservation or recourse, any amount up to and including aforementioned full amount upon first written demand/demands from the Employer.

3. On payment of any amount less than aforementioned full amount, as per demand of the Employer, the guarantee shall remain valid for the balance amount i.e. the aforementioned full amount less the payment made to the Employer.

4. The Bank shall pay the amount so demanded without any reference to the contractor and without the Employer being required to show grounds or give reasons for its demand or the amount demanded.

5. The guarantee hereinbefore shall not be affected by any change in the constitution of the Bank, the Contractor or the Employer.

6. The Bank agrees that no change, addition, modification to the terms of the Contract Agreement or to any document, which have been or may be made between the Employer and the Contractor, will in any way release us from the liability under this guarantee; and the Bank, hereby, waives any requirement for notice of any such change, addition or modification to the Bank.

7. This guarantee is valid and effective from the date of it's issue, which is *[….date of issue….]*. The guarantee and our obligations under it will expire on dated ……..*[….Please refer note 4 & 5….]*. All demands for payment under the guarantee must be received by us on or before that date.

8. The Bank agrees that the Employer's right to demand payment of aforementioned full amount in one instance or demand payments in parts totaling up to the aforementioned full amount in several instances will continue until either the aforementioned full amount is paid to the Employer or the guarantee validity period expires.

9. The Bank agrees that it's obligation to pay any amount demanded by the Employer before the expiry of this guarantee will continue until the amount demanded has been paid in full.

10. The expressions Bank and Employer herein before used shall include their respective successors and assigns.

11. The Bank hereby undertakes not to revoke the guarantee during its currency, except with the previous consent in writing of the employer. This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758.

Dated[.....]

Place[.....]

…….
(Signature of the Authorized Person of the Bank)

.....
(Name in Block Letters)

.....
(Designation)

.....
(Bank's Seal)

.....
(Authorization No.)

Witness:

.....
1. Signature, Name & Address

.....
2. Signature, Name & Address

Note:

1. *All italicized text in brackets [….text….] is for guidance on how to prepare this bank guarantee and shall be deleted from the final document.*

2. *In case the guarantee is issued by a foreign Bank, the said bank shall have operations in India and should be issued by Indian operations branch of the said bank.*

3. *The Bank Guarantee should be duly attested by Notary Public with notarial stamps of*
4. *appropriate value affixed thereon.*

5. ***Mobilization Advance under GCC 14.2.1**:*

(a) For Single Entity

For each Installment of Advance, two Bank Guarantees of equal amounts (each equal to half of the first installment of advance plus 10%) shall be furnished. Each Bank Guarantee shall be valid for the stipulated completion period of the contract.

OR

(b) For JV/Consortium

*For each Installment of Advance, individual JV/*Consortium *partner shall furnish Bank Guarantee equal to his share in the installment of Advance plus 10%. Each Bank Guarantee shall be valid for the stipulated completion period of the contract.*

6. ***Advance against Plant and Machinery under GCC 14.2.2:***

(a) For Single Entity

For each Installment of Advance, a Bank Guarantee equal to the installment of advance plus 10% shall be furnished. The Bank Guarantee shall be valid for the stipulated completion period of the contract.

OR

(b) For JV/Consortium

*For each Installment of Advance, individual JV/*Consortium *partner shall furnish a Bank Guarantee equal to his share in the installment of advance plus 10%. Each Bank Guarantee shall be valid for the stipulated completion period of the contract.*

FORM OF BANK GUARANTEE FOR RELEASE OF BALANCE RETENTION MONEY

(On non-judicial stamp paper of the appropriate value in accordance with stamp Act. The stamp paper to be in the name of Executing Bank).

From:

……..
…….*Name and Address of the Bank*…..
……..

To:

The Managing Director,
Rail Infrastructure Development Company (Karnataka) Limited,
"SamparkaSoudha" , 1st Floor,
B.E.P Premises (Opp. Orion Mall),
Dr. Rajkumar Road,
Rajajinagar 1st Block,
Bangalore - 560 010
.

a) WHEREAS**,** Rail Infrastructure Development Company (Karnataka) Limited, (hereinafter called the **Employer),** acting through ***[Insert Designation and address of the Employer's Representative]***, has entered into a contract with ***[Insert Name and address of the Contractor's Representative]***,, (hereinafter called the **Contractor),** for the work of ***[Insert Name of Work]***, vide Notification of Award No.***[Insert Notification of Award No.].***

b) WHEREAS as per conditions of contract Employer has deducted an amount of RS____***[Insert Amount deducted as retention money]***towards retention money till date, and WHEREAS now the contractor has requested the Employer for releasing the said amount on submission of a bank guarantee of equivalent amount which has been accepted by the Employer.****

OR

WHEREAS as per conditions of contract Employer has deducted an amount of RS____***[Insert Amount deducted as retention money]***towards retention money till date, out of a total amount of Rs____ [***Insert total Amount of retention money deductable as specified in the contract]***which is due to be deducted as retention money as per Contract agreement and WHEREAS now the Contractor has requested the Employer to accept a bank guarantee of the equivalent amount of the total retention money due as per contract agreement so that the amount already deducted may be released in favour of the contractor and that no further deduction towards retention money will be made in future which has been accepted by the Employer. ****

c) WHEREAS, ***[Insert Name of the Bank]***, with its Branch ***[Address]*** having its Headquarters office at ***[Address]***, hereinafter called the **Bank,** acting through

[Designation(s) of the authorised person of the Bank], have, at the request of the contractor, agreed to give guarantee as hereinafter contained:

1. KNOW ALL MEN by these present that I/We the undersigned ***[Insert name(s) of authorized representatives of the Bank],***being fully authorized to sign and incur obligations for and on behalf of the Bank**,** confirm that the Bank, hereby, unconditionally and irrevocably guarantee the Employer to pay the full amount in the sum of ***[Insert Value of the Bank Guarantee being submitted]*** as above stated.

2. The Bank undertakes to immediately pay to the Employer any amount up to and including aforementioned full amount upon written order/orders from the Employer without any demur, reservation or recourse.

3. On payment of any amount less than aforementioned full amount, as per demand of the Employer, the guarantee shall remain valid for the balance amount i.e. the aforementioned full amount less the payment made to the Employer.

4. The Bank shall pay the amount so demanded without any reference to the contractor and without the Employer being required to show grounds or give reasons for its demand or the amount demanded.

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

6. The Bank agrees that no change, addition, modifications to the terms of the Contract Agreement or to any documents, which have been or may be made between the Employer and the Contractor, will in any way release us from the liability under this guarantee; and the Bank, hereby, waives any requirement for notice of any such change, addition or modification to the Bank.

7. This guarantee is valid and effective from the date of it's issue, which is ***[insert date of issue]***. The guarantee and our obligations under it will expire on ***[Insert the date twenty eight days after the expected end of defect liability period.]***. All demands for payment under the guarantee must be received by us on or before that date.

8. The Bank agrees that the Employers right to demand payment of aforementioned full amount in one instance or demand payments in parts totaling up to the aforementioned full amount in several instances will continue

until either the aforementioned full amount is paid to the Employer or the guarantee expires.

9. The Bank agrees that it's obligation to pay any amount demanded by the Employer before the expiry of this guarantee will continue until the amount demanded has been paid in full.

10. The expressions Bank and Employer herein before used shall include their respective successors and assigns.

11. The Bank hereby undertakes not to revoke the guarantee during its currency, except with the previous consent in writing of the employer. This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758.

Date ……
Place…….

……
[*Signature of Authorised person of Bank]*
…….
[Name in Block letters]
……..
[Designation]
……..
……[Address]……
…….

Witness :

1. *Signature*
   Name & Address & Seal
2. *Signature*
   Name & address & Seal

Bank's Seal
Authorisation No……..

Note :

1) *All italicized text is for guidance on how to prepare this bank guarantee and shall be deleted from the final document.*
2) *In case the guarantee is issued by a foreign Bank, the said bank shall have operations in India and should be countersigned by Indian operations branch of the said bank.*
3) *The Bank Guarantee should be duly attested by Notary public with notarial stamps of appropriate value affixed thereon.*
4) ***** strike out whichever is not applicable.*

INDEMNITY BONDFOR THE SAFE CUSTODY OF THE MATERIALS SUPPLIED BY THE CONTRACTOR

[Refer Clause 14.5 of GCC]

(To be executed on Non-Judicial Stamp Paper of Appropriate Value and notarized)

THIS INDEMNITY BONDmade on this _____ day of _____ 20___ by _____(*insert the name of the Contractor and its registered address*) (hereinafter called "the Contractor") which expression shall where the context do admits or implies be deemed to include its executors, administrators and assigns, in favour of the Rail Infrastructure Development Company (Karnataka) Limited,"Samparka Soudha", 1st Floor B.E.P Premises (Opp. Orion Mall), Dr.Rajkumar Road, Rajajinagar 1st Block, Bangalore-560010(hereinafter called "K RIDE") on the other part.

WHEREAS by an Agreement/Letter of Acceptance No._____dated _____ (hereinafter called "the said agreement"), the Contractor has agreed to execute the _____(*Name of Work*) (hereinafter called "the Works") .

AND WHEREAS the Contractor has submitted to K RIDE/ the Engineer for payment on materials procured by him and brought to the site of the Works or his workshop for use in the Works.

AND WHEREAS K RIDE/ the Engineer has agreed to make advance/stage payment to the Contractor the total sum of Rs._____ (*in Figures*) [Rupees _____ (*in Words*) in Interim Payment Certificate (IPC) No._____, the quantities and other particulars of which are detailed in this IPC for the said works signed by the Contractor on _____ for theMaterialsbrought by the Contractor to site of the works. Brief details are also mentioned in schedule 1 appended hereto.

NOW THIS INDEMNITY BONDWITNESS that in pursuance of the said agreement and in consideration of the sum of Rs. _____ (*in Figures*) _____ (*in Words*) on or before the execution of these presents to be paid to the Contractor by K RIDE so aforesaid, the Contractor doth hereby covenant and agree with K RIDE and declare as follows: -

1. That the said sum of Rs. _____ (*In Figures*) _____ (*in Words*) to be paid by K RIDE to the Contractor as aforesaid shall be utilized by the Contractor in or towards the execution of the said works and for no other purpose whatsoever.
2. That the Materials detailed in the said IPC which have been offered to and accepted by K RIDE/ the Engineer, are absolutely the Contractor's own property and free from encumbrances of any kind and the Contractor will not make any

application for or receive any further payment on the Materialswhich are not absolutely his own property and free from encumbrances of any kind, the Contractor indemnifies the K RIDE against all claims on any Materials in respect of which payment is to be made to him as aforesaid.

3. That the Contractor undertakes that the Materials shall be used exclusively for the performance / execution of the Contract strictly in accordance with the terms and conditions of the Contract and no part of the Materials shall be utilized for any other work or purpose whatsoever.

4. That the Contractor is obliged and shall remain absolutely responsible for the safe transit / protection and custody of the Materials against all risks whatsoever including acts of the God till the Materials are duly incorporated in the works, commissioned and are taken over by K RIDE/Railway (including surplus Materials, if required as instructed by K RIDE/ the Engineer) in accordance with the terms of the Contract. The Contractor undertakes to keep K RIDE harmless against any loss or damage that may be caused to the Materials.

5. That the said Materials shall not on any account be removed from the site of the works except with the written permission of K RIDE/ the Engineer. Further, K RIDE/ the Engineer shall always be free at all times to take possession of the materials in whatever form the materials may be in, if in its opinion, the Materials are likely to be endangered, mis-utilized or converted to uses other than those specified in the Contract, by any acts or omission or commission on the part of the Contractor or any other person or on account of any reason whatsoever and the Contractor binds himself and undertakes to comply with the directions of demand of K RIDE to return the Materials without any demur or reservation.

6. That the said materials shall, at all times, be open to inspection by K RIDE/ the Engineer or any authorized representative. In the event of the said material or any part thereof at any time being found to be in lesser quantity than for which payment has been released or the same has been stolen, destroyed or damaged or becoming deteriorated, the Contractor will forthwith replace the same or repair and make good the same as required by K RIDE/ the Engineer.

7. That making payment does not mean that Materials are of required specifications and quality or that whole of the quantity brought to site by Contractor will be used in the work. The Contractor is fully responsible for the materials to conform to required quality and specification and if at any time K RIDE/ the Engineer do not find the material satisfactory, the Contractor at his own cost would replace these.

K RIDE/ the Engineer would be at liberty to recover cost of these from any dues of the Contractor. Also any Materials which are in excess of what is finally required under the contract would be the Contractor's property without any liability on K RIDE/ the Engineer who would recover the cost of this from the Contractor.

8. That this Indemnity Bondis irrevocable. If at any time, any loss or damage occurs to the Materials or the same or any part thereof is mis-utilized in any manner whatsoever, then the Contractor hereby agrees that the decision of K RIDE/ the Engineer as to assessment of loss or damage to the Materials shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Materials at its own cost and/or shall pay the amount of loss to K RIDE without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to K RIDE/ the Engineer against the Contractor under the Contract or under this Indemnity Bond.
9. That if the Contractor shall at any time make any default in the performance or observance in any respect of any of the terms and provisions of the said agreement or of those presents, the total amount of the payment shall immediately on the happening of such default be recovered by K RIDE/ the Engineer from any dues of Contractor. It is also clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal / penal consequences.

10. IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorized representative, the day, month and year first above mentioned.

11. SCHEDULE 1

Particulars of the Materials	**Quantity**	**Value of the Materials**

Signed, Sealed and Delivered by the said Contractor

(Contractor's Name)

Dated:……. (AUTHORISED SIGNATORY)

Place: ……. SEAL OF COMPANY

IN THE PRESENCE OF:

WITNESS: SIGNATURE _____

NAME: _____

ADDRESS : _____

Note:

The contractor has the option to submit the Indemnity Bond*to cover all the items and quantities of Materials of stage payment or to submit* Indemnity Bond*each time the stage payment is to be taken or Materials advance is to be taken.*

Office of the……

No. Date:……...

WORK EXPERIENCE CERTIFICATE

To whom so ever it may concern
(Issued for the purpose of Quoting in K-RIDE tenders)

M/s/Sri …….. (Name and address of the contractor) is aworking contractor of thisunit and was awarded the following work. The relevant details of the work are as under: -

Sl.No	Description	Details
1	Name of work	
2	Acceptance Letter No and Date	
3	Agreement Number, date and name ofthe agency	
4	Agreement value in Rupees (in words and figures)	
5	Due date of completion	
6	Actual date of completion of work	
7	Value of Final Bill if passed (in words)	
8	Work completed but Final measurements not recorded. a) Amount paid so far as in CC bill No.	
9	Work completed. Final measurements recorded with negative variation a) Amount so far paid as in CC bill No.	
10	Work completed. If Final measurements recorded with Positive variation which is not sanctioned yet. a) Original agreement value of Last sanctioned agreement value whichever is lower.	
11	Scope of work (Broad category of works i.e., the name of the work in the agreement on which work is	
12	Details of values of major components/ works executed in the completed work.	

Note:
The Certificate to satisfy similar work should be signed by an officer not lower than JAG officer in Railwaysand Executive Engineer rank or equivalent grade in other department of Govt. of India/State Government/PSUs of Government of India / State Undertaking and Competent Authority of Public Listed Company.

Signature :.....

Name of officer..... .....

Designation: .....

Address: .....

Office seal: .....

Phone/FAX No.: .....

Date : ……

ರೈಲು ಮೂಲಸೌಲಭ್ಯ ಅಭಿವೃದ್ಧಿ ಕಂಪನಿ (ಕರ್ನಾಟಕ) ನಿಯಮಿತ
रेल इन्फ्रास्ट्रक्चर डेवलपमेंट कंपनी (कर्नाटक) लिमिटेड
Rail Infrastructure Development Company (Karnataka) Limited
(A Joint Venture of Govt. of Karnataka & Ministry of Railways)

"Samparka Soudha", 1st Floor, B.E.P Premises(Opp. Orion Mall), Dr. Rajkumar Road, Rajajinagar 1st Block, Bangalore – 560 010
Tele – 91-6364890842, web : www.kride.in

Price Proposal

Heelalige - Hosur Section Doubling

"Design, Supply, Erection, Testing & Commissioning of 25 KV, AC, 50 Hz, Single Phase, Traction Over Head Equipment works for Railway Electrification works in Bangalore division of South Western Railway, in single Package"

Section 9

I N D E X

Name of the work: Design, Supply, Erection, Testing & Commissioning of 25KV, AC, 50Hz, Single phase, Traction Over Head Equipment of Heelalige (180 km) (Excluding)-Hosur (159km)(Including) Section (25 Track Kilometer approximately) of Bangalore division of South Western Railway.	
Summary Sheet of Estimated Bill of Quantities	
Schedule	**Estimated Cost in Rs.**
1	**2**
A	5589664
B	31652201
C	13023476
D	34668383
E	342100
F	2018577
Total Estimated Price	**87294401**
Total value quoted is : onpar/ above/ below:	

Signature of Bidder

Note:1
(a) Please refer to ITB 14 and 32 while filling the rates.
(b) Please mention the percentage rate, in both figures and words, for each schedule above or below or at par over the estimated rates.
(c) Bidder should ensure that the rates are filled with due care and caution so as not to lead to any omission or discrepancy or ambiguity.
d) The item rates given in each bill are based on all- inclusive taxes prevalent prior to enactment of GST Act i.e. 1st July, 2017.
e) The Successful bidder who is liable to be registered under CGST/IGST/UTGST/SGST Act shall submit CSTIN along with other details required under CGST/IGST/UTGST/SGST Act to the Employer within 28 days from the date of the award of the 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. In case the successful bidder is not liable to be registered under CGST/IGST/UTGST/SGST Act, the Employer shall deduct the applicable GST from his/their bills under reverse charge mechanism (RCM) and deposit the same to the concerned authority.
Note : 2
a) The bidder shall read the explanatory note for all items and payment terms which are part of this chapter.

Signature of Bidder

Name of the work: Design, Supply, Erection, Testing & Commissioning of 25KV, AC, 50Hz, Single phase, Traction Over Head Equipment of Heelalige (180 km) (Excluding)-Hosur (159km)(Including) Section (25 Track Kilometer approximately) of Bangalore division of South Western Railway.

Schedule A

ITEM	Description	Unit	Qty	Rate in Rs.			Amount in Rs.		
				Supply	Erection	Total	Supply	Erection	Total
A1	Supply (excluding supply of copper contact wire and catenary wire) and erection of over head equipment.	TKM	22	63932	51930	115863	1406509	1142470	2548979
A2	Supply (excluding supply of copper contact) and erection of contact wire only(regulated with briddle wire)	KM	3	72891	43194	116085	218674	129583	348256
A3	Supply and erection of 25 kV Feeder wire.	KM	1.5	1560142	27799	1587942	2340214	41699	2381913
A4	Supply (excluding supply of copper conductor) and erection of anti creep with cadmium Copper Catenary Wire	Each	20	10817	2688	13505	216335	53757	270092
A5	Supply (excluding supply of copper conductor) and erection of anti creep with Cadmium copper catenary wire suitable for tramway type OHE (Regulated).	Each	3	10904	2571	13475	32713	7712	40425
							4214444	**1375220**	**5589664**
Total for Bill No. A									**5589664**

Tenderer / Contractors Percentage (At par / Below / Above) in figure.

Tenderer / Contractors Percentage (At par / Below / Above) in words.

Please Ensure there are no overwritings,if there is any discrepency in figures & words then words will be taken for assessment.

Name of the work: Design, Supply, Erection, Testing & Commissioning of 25KV, AC, 50Hz, Single phase, Traction Over Head Equipment of Heelalige (180 km) (Excluding)-Hosur (159km)(Including) Section (25 Track Kilometer approximately) of Bangalore division of South Western Railway.

Schedule B

ITEM	Description	Unit	Qty	Rate in Rs.			Amount in Rs.		
				Supply	Erection	Total	Supply	Erection	Total
B1	Supply and erection of fabricated mast K,B,S, series etc.	MT	190	118954	6257	125212	22601344	1188917	23790261
B2	Supply and erection of 8"x8", 8"x6" and 6"x6" mast	MT	5	118954	6257	125212	594772	31287	626060
B3	Supply and erection of fabricated steel work other than masts by manual only	MT	40	123899	8735	132634	4955958	349415	5305373
B4	Supply & Erection of fabricated & galvanised small part steel steel work(SPS).	MT	15	121427	7273	128701	1821410	109098	1930508
							29973484	**1678717**	**31652201**
Total for Bill No. B									**31652201**

Tenderer / Contractors Percentage (At par / Below / Above) in figure.

Tenderer / Contractors Percentage (At par / Below / Above) in words.

Please Ensure there are no overwritings,if there is any discrepency in figures & words then words will be taken for assessment.

Signature of Bidder

Name of the work: Design, Supply, Erection, Testing & Commissioning of 25KV, AC, 50Hz, Single phase, Traction Over Head Equipment of Heelalige (180 km) (Excluding)-Hosur (159km)(Including) Section (25 Track Kilometer approximately) of Bangalore division of South Western Railway.

Schedule C

ITEM	Description	Unit	Qty	Rate in Rs.			Amount in Rs.		
				Supply	Erection	Total	Supply	Erection	Total
C1	For Foundation and Plinth - Concrete in hard soil -Supply and Erection	CUM	95	7307	1581	8888	694183	150217	844400
C2	Concrete in rocky soil -Supply and Erection	CUM	24	7533	2096	9630	180803	50312	231115
C3	Concrete in other than hard soil and rock -Supply and Erection	CUM	1350	7605	1222	8827	10267201	1649508	11916709
C4	Reinforced concrete-Supply and Erection	CUM	2	10136	5490	15626	20271	10981	31252
							11162458	**1861018**	**13023476**
Total for Bill No. C									**13023476**

Tenderer / Contractors Percentage (At par / Below / Above) in figure.

Tenderer / Contractors Percentage (At par / Below / Above) in words.

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Signature of Bidder

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Schedule D

Common Schedule of OHE/TSS

ITEM	Description	Unit	Qty	Rate in Rs.			Amount in Rs.		
				Supply	Erection	Total	Supply	Erection	Total
D1	Preparation of designs and drawings for over head equipment complete.	STKM	29	0	13116	13116	0	380364	380364
D2	Supply and Erection of Preparation of station working rule diagram and working instruction	EACH	3	8932	297	9229	26796	892	27688
D3	Supply and erection of a Guy rod assembly	EACH	100	11979	692	12671	1197909	69159	1267068
D4	Supply and erection of a single bracket assembly	EACH	660	24622	1285	25907	16250319	848055	17098374
D5	Extra on D4 for supply and erection of additional fittings on a single bracket assembly for supporting two OHES	EACH	165	3638	237	3875	600250	39160	639410
D6	Supply and erection of single bracket assembly suitable for tramway type OHE (Regulated).	EACH	17	24601	801	25403	418222	13623	431844
D7	Supply and erection of a pull off arrangement for one OHE	EACH	2	14351	856	15207	28702	1712	30415
D8	Extra for each additional equipment pulled	EACH	5	4573	517	5090	22866	2584	25450
D9	Supply and Erection of a pull - off arrangement for Regulated Tramway type OHE.	EACH	7	9718	804	10522	68026	5627	73653
D10	Supply and Erection of mounting arrangement for span wire	EACH	3	16221	1115	17336	48662	3346	52007
D11	Supply and Erection of span wire	MTR	3	741	94	836	2224	283	2507
D12	Supply and Erection of suspension of one conventional OHE from head span	EACH	2	5651	893	6545	11303	1786	13089
D13	Suspension / Registration for contact wire only	EACH	2	6113	8947	15061	12227	17895	30121
D14	Supply and erection of earth wire	km	1	119360	13810	133170	119360	13810	133170
D15	Supply and erection of regulating equipment (3 pulley type) with counter-weight assembly for conventional OHE	EACH	40	95482	3528	99010	3819272	141126	3960398
D16	Supply and erection of regulating equipment (3 pulley type) with counter weight assembly for tramway type OHE (Regulated).	EACH	5	68709	3706	72414	343544	18528	362071
D17	Supply and erection of materials for termination of Single conductor of overhead equipment or terminating wire	EACH	4	8446	1270	9715	33783	5078	38862
D18	Supply and erection of materials for termination of Double conductor	EACH	42	14319	906	15225	601409	38050	639460

Schedule D

Common Schedule of OHE/TSS

ITEM	Description	Unit	Qty	Rate in Rs.			Amount in Rs.		
				Supply	Erection	Total	Supply	Erection	Total
D19	Supply and erection of materials for termination of Anticreep wire on one end.	EACH	12	10689	1437	12126	128269	17241	145510
D20	Supply and erection of materials for termination of an earth wire(RACCON)	EACH	1	5711	379	6090	5711	379	6090
D21	Supply and erection of materials for termination of tramway type OHE	EACH	2	8548	1207	9755	17096	2414	19510
D22	Supply and erection of materials/termination of 25 kV terminating wire (150 sq mm)copper cross track / along track feeder	EACH	7	8516	1270	9786	59612	8887	68500
D23	Extra on item A1 for supply and erection of additional fittings at a turnout, diamond crossing or overlap	EACH	15	7916	1016	8932	118745	15235	133980
D24	Extra on item A2 for supply and erection of additional fittings required at a turnout/diamond crossing or over lap	EACH	15	7872	951	8822	118075	14259	132334
D25	Supply and Erection of Porcelain cut-in-insulator	EACH	35	6385	686	7072	223479	24027	247506
D26	Supply and Erection of a Porcelain suspension insulator	EACH	12	6231	634	6865	74768	7610	82379
D27	Supply and erection of 25kV Post insulator	EACH	22	7433	596	8029	163519	13110	176629
D28	Supply and erection of a section insulator assembly	EACH	12	44674	3825	48499	536088	45905	581994
D29	Supply and erection of a section insulator assembly for tramway type OHE(Regulated)	EACH	2	41540	3273	44813	83080	6546	89626
D30	Supply and Erection of PTFE Type short neutral section assembly	EACH	2	950620	4204	954824	1901240	8409	1909649
D31	Supply and erection of a 25 kV single pole isolator without earth contact assembly.	EACH	10	44102	4845	48947	441024	48450	489474
D32	Supply and erection of 25 kV double pole Isolator	EACH	2	79745	7363	87107	159490	14725	174215
D33	Provision of interlocking device on 25kV Single/Double Pole isolator with or without earth contact aasembly.	EACH	4	3126	484	3610	12505	1934	14439
D34	Supply and erection of a copper jumper	EACH	120	3727	232	3959	447264	27868	475131
D35	Supply and erection of an aluminium jumper	EACH	2	2997	191	3189	5995	383	6377
D36	Supply and erection of a structure bond	EACH	650	637	256	893	413871	166709	580580
D37	Supply and erection of longitudinal bond	EACH	130	282	322	604	36659	41802	78461

Signature of Bidder

Schedule D									
Common Schedule of OHE/TSS									
ITEM	Description	Unit	Qty	Rate in Rs.			Amount in Rs.		
				Supply	Erection	Total	Supply	Erection	Total
D38	Supply and erection of transverse and special bond	EACH	140	582	412	994	81460	57701	139161
D39	Supply and erection of a single earth electrode	EACH	25	2740	968	3708	68489	24212	92701
D40	Supply and Erection of 8 SWG GI wire for earthing	MTR	95	32	20	52	3031	1940	4970
D41	Supply and laying of 70 sq mm XLPE insulated PVC sheathed Aluminium cable	MTR	475	314	262	575	149101	124251	273351
D42	Cable trench cutting -Erection only	MTR	400	0	324	324	0	129642	129642
D43	Supply, Erection, oil filtration, testing and commissioning of 10 kVA capacity LT supply transformers	EACH	8	102024	8057	110081	816191	64453	880644
D44	Supply and erection of LT control board for AT location as pe RDSO spec. no.TI/SPC/PSI/CLS/0020 with A & C slip No.4.(7/2010) or latest	EACH	8	75870	2350	78220	606957	18803	625761
D45	Supply and erection of 25 kV fuse switch	EACH	8	19192	1899	21091	153539	15190	168728
D46	Supply & Erection of Protective Screen for FOB/ROB	EACH	10	24282	1901	26184	242823	19012	261835
D47	Supply and erection of anti-climbing device,etc LT. Supply transformer stations	EACH	8	1567	292	1859	12535	2338	14873
D48	Supply and erection of Fixing of caution boards	LS	2	36563	2732	39294	73125	5464	78589
	Supply and erection of Fixing of sigma boards	Pair	10	1206	128	1333	12058	1276	13334
	Supply and erection of Fixing of DJ ON /OFF Board	Pair	15	1206	128	1333	18087	1914	20001
D49	Modification to erected equipment Transfer of equipment from one mast or support to another	EACH	120	0	2280	2280	0	273625	273625
D50	Provision of an additional bracket assembly / assemblies on a mast or support	EACH	35	0	2021	2021	0	70741	70741
D51	Dismantling of overhead equipment	KMS	4	0	46842	46842	0	187368	187368
D52	Dismantling of feeder / return conductor.	KMS	2	0	15651	15651	0	31303	31303
D53	Splicing and extension of an anchored over head equipment -Supply only	EACH	7	1809	7861	9671	12666	55030	67696
D54	Dismantling of a section insulator	EACH	8	3625	5390	9015	29001	43119	72120
D55	Slewing of equipment	SPAN	25	0	1818	1818	0	45458	45458
D56	Dismantling of an isolator.	EACH	8	0	1210	1210	0	9677	9677

Schedule D									
Common Schedule of OHE/TSS									
ITEM	**Description**	**Unit**	**Qty**	**Rate in Rs.**			**Amount in Rs.**		
				Supply	**Erection**	**Total**	**Supply**	**Erection**	**Total**
D57	Dismantlement of OHE mast / structure by cutting	EACH	40	0	4563	4563	0	182519	182519
D58	Dismantlement of OHE mast structure of breaking the foundation - Erection only	EACH	4	0	6508	6508	0	26030	26030
D59	Dismantling of guy rod	EACH	8	0	2946	2946	0	23570	23570
D60	Erection of Temp, mast including cantilever assembly transfer of OHE to New mast and releasing the temp mast under power / non power block -Erection only	EACH	2	0	14314	14314	0	28628	28628
D61	Releasing of portal Boom under power/non power block	EACH	15	0	19501	19501	0	292517	292517
D62	Releasing of plinth/ pole mounted AT along with drop out fuse,fencing panels and Las etc.	EACH	5	0	7041	7041	0	35205	35205
Total of D							**30830425**	**3837958**	**34668383**
Total for Bill No. D									**34668383**
Tenderer / Contractors Percentage (At par / Below / Above) in figure.									
Tenderer / Contractors Percentage (At par / Below / Above) in words.									
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Schedule E

ITEM	Description	Unit	Qty	Rate in Rs.			Amount in Rs.		
				Supply	Erection	Total	Supply	Erection	Total
E1	Transporting of OHE Materials	MTKM	60	0	77	77	0	4620	4620
E2	Supply and erection of Schematic diagram and shock treatment board	SET	8	880	55	935	7040	440	7480
E3	Manning of Antitheft Arrangements.	DAY	300	0	1100	1100	0	330000	330000
							7040	**335060**	**342100**
Total for Bill No. E									**342100**

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SCHEDULE - F

Tools & Plants (OHE & PSI)

Item No	Description	Unit	Qty	Rate in Rs.	Amount in Rs.
1	Tirfor 2.5T/1.5T	Nos	5	14380	71900
2	Trifor 5T/3T	Nos	5	19651	98255
3	Pull lift 3 T	Nos	5	11629	58145
4	Pull lift 3/4 T	Nos	6	7909	47454
5	Aluminium / Light weight metal conduit Platform ladder trolley	Nos	5	70560	352800
6	Earthing discharge rod complete	Nos	5	14495	72475
7	Aluminium Straight ladder extensive (11 M)	Nos	4	17024	68096
8	Portable Electric Drill 21mm, single phase, 230V (for drilling) Ralli Wolf, Hitachi, Black & Decker makes only	Nos	2	14914	29828
9	First aid box filled with medicines as per standard	Nos	3	2397	7191
10	Two Fold Strecther Made of high quality aluminium alloy tubes.	Nos	2	3105	6210
11	Fire bucket (10 Ltrs) capacity with one stand and cover for set of 4/6 buckets at each switching station/TSS	Nos	3	6720	20160
12	Portable fire extinghuisher powder type	Nos	3	2530	7590
13	D' Shackles set of on each (1", 3/4", 5/8", 1/2")	Set	12	2397	28764
14	Set of Steel sling 19mm Dia with Eye each end of 1M, 2 M, 3 M,4M & 10 M	Set	12	2996	35952
15	Digimatic Digital Micro meter 0-25 mm resolution 0.001mm. Mitutoyo make or equivalent as approved by Engineer	Nos	3	9957	29871
16	Canvass Tarpaulin 12 m x 12m	Nos	3	4792	14376
17	Binoculars Nikon-8252 ACULON A211 10-22x50 zoom Binocular or equivalent as approved by Engineer	Nos	1	12938	12938
18	Vernier Calipers Digital, range 0-200mm Mitutoyo make Model 500-197-30or equivalent as approved by Engineer	Nos	1	12872	12872
19	Walkie Talkie Sets (2W output)	Nos	9	14532	130788
20	Digital Multimeter 1000V, 10A Motwane make DM352 or equivalent as approved by Engineer	Nos	2	13245	26490
21	Drop out fuse pull rod	Nos	6	5712	34272
22	1/2" square drive socket set containing 22 sockets with 5 attachments	Set	3	4212	12636
23	Transformer oil Acidity testing Kit	Nos	1	11984	11984
24	Pocket size clip on Tong tester	Nos	2	9355	18710
25	Insulation tester 2.5 KV	Nos	2	7700	15400

SCHEDULE - F					
Tools & Plants (OHE & PSI)					
Item No	**Description**	**Unit**	**Qty**	**Rate in Rs.**	**Amount in Rs.**
26	Load cell tester suitable for 40 AH and 200 AH battery	Nos	3	2397	7191
27	Emergency Telephone	Nos	10	8032	80320
28	Spanner set double ended, 24 size 12 pieces set (6mm to 42mm) Gedore or Tapraia make with ISI Mark	Set	5	11523	57615
29	Cogex or Similar 52 pieces socket set (box spanners)	Set	3	8642	25926
30	Digital earth tester make Megger model no. DET4TR2 with all standard accessories and carrying case make Motwane or equivalent as approved by Engineer	Each	1	137382	137382
31	Rail jumpers set with clamps at both ends along with RITES inspection certificate. Set consisting of: as per RDSO Drg. No: RE/DNR/EL/TP/07.				
	(a) 3 Mtrs Length	Nos	40	1288	51520
	(b) 5 Mtrs Length	Nos	8	1758	14064
	(b) 13 Mtrs Length	Nos	5	2716	13580
32	Come-along clamps for Catenary suitable for 19/2.65 mm conductor	Set	6	4248	25488
33	Come-along clamps for contact wire 107 mm	Set	6	4248	25488
34	Come-along clamps for Aluminium "SPIDER" Conductor (20 mm)	Set	6	8968	53808
35	Come-along clamps for earth wire (19/2.5 mm) Galvanised steel	Set	3	4248	12744
36	Contact Wire cutter 36"	Nos	3	4201	12603
37	Dropper Wire Cutter 12"	Nos	6	1168	7008
38	Single Sheave Pulley Block 3 1/2"x1/2" Groove Steel	Nos	6	1470	8820
39	Single sheave Pulley Block 3 1/2"x1/2" Groove Fiber for drawal of Contact Catenary wire	Nos	6	1575	9450
40	Single Sheave Pulley Block 6"x1"Groove Steel	Nos	8	4200	33600
41	Mobile aluminium ladder 36'	Nos	3	11285	33855
42	Air cooled, regulator type Welding machine (Single phase, 230 V, with output 250 Amps)	Nos.	3	14000	42000
43	Aluminium Straight ladder (8 m) with hook on top	Nos	6	13200	79200
44	Crimping tool up to 6 mm^2 size	Nos	6	400	2400
45	Chain pulley block 3.0 ton cap	Nos	3	7786	23358
46	Safety electrical Rubber Hand Gloves 33 Kv	Pairs	60	600	36000
Total of Tools & Plants (OHE & PSI)					**2018577**
Total for Bill No. F					**2018577**
Tenderer / Contractors Percentage (At par / Below / Above) in figure.					
Tenderer / Contractors Percentage (At par / Below / Above) in words.					
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PART -B

EXPLANATORY NOTES

OVER HEAD EQUIPMENTS

SCHEDULE A ITEM

1. **Item A1: Supply (excluding supply of copper contact wire and catenary wire) and erection of Overhead equipment.**

   The price for above shall cover supply and erection of all items (excluding supply of 65 sq. mm cadmium copper Catenary , Hard drawn 107 sq. mm copper contact wire), Supply and erection of 130 sq.mm feeder tail wire if any and supply and erection of 5 mm dropper wire and supply and erection of all components including dropper clips, parallel clamps for PH/F/H/C jumpering and splices (where their use is approved) dropper wire and terminating wire/s and including small parts steel works complete with bolts and nuts etc for attachment of number plates to mast/ structure. The price shall cover erection of all components and wires and conductors including contact wire, catenary, droppers, PH/F/H/C jumpers and terminating wires including small parts steel work, if any.

   The price shall cover adjustment of OHE height and stagger at the specified rail level and any further adjustment of OHE height and stagger along with track packing/ permanent way works as and when required till the final track position by Engineering branch. The work includes supply & erection of Retro reflective/Enamel Structure No. plates complete with 2 S.S. bolts dia 10 x 35/30 nuts and rubber Washer for dia 10 bolts.

2. **Item A2 : Supply (excluding supply of copper contact wire) and erection of (tramway OHE with) contact wire only (regulated with catenary wire by manual means).**

   The price shall cover erection of Tramway OHE with catenary and contact wire. The price shall exclude termination, which will be paid for under item D16. The price shall include provision of Catenary with clamps and two droppers including clips, Enamel number plates on traction masts/ structures. The price shall also include the supply of Catenary wire, small part steel works complete with bolts and nuts for attachment of enamel number plates to masts/ structures. The hard-drawn copper contact wire and bridle wire used shall confirm to RDSO's latest specification.

3. **Item A3 : Supply and erection of 25 kV feeder wire**

   The price shall cover supply and erection of a 25 kV feeder along or across track made of a 150 sq. mm copper wire (37/2.5 mm) Drop jumpers/Jumpers shall be of 160 sq.mm wire with 1050-3 PG clamps.

Notes for measurements:

a. The price for the connection of feeders, jumpers, cut-in insulators, suspension insulators will be paid under D22, D27, D34, D35, D26.

b. For the purpose of payment the length of feeders, return conductors or earth wire shall be measured from the centre lines of the mast/ structure at which the two ends of each length of feeder or conductor run are anchored by adding actual spans. In case of feeder return conductors crossing a track, the length shall be measured between the faces of traction masts/ structures at which the two ends of the cross feeder or return conductors are anchored as indicated in the as erected structure erection drawings for traction masts/ structures. For purposes of progress payment reference to "as approved drawings" shall be made.

4. Item A4 : Supply (excluding supply of copper conductor) and erection of anti-creep with cadmium copper catenary wire

The price shall cover the supply of all materials for anti-creep including adjusters, mast anchor fittings at its terminations on either side of structure, ending clamps including 9 tonne porcelain insulator, mast anchor fitting and backing angle as required. The price shall cover erection of all materials including pure/cadmium copper catenary wire, 9 tonne porcelain insulators assembly and small parts, steel work if any.

Rly Id No.	Description of Components	Qty per Unit
	copper catenary and contact wires	Will be supplied by Railways
6020-1	9 tonne insulator assembly	
6020-2	–Polluted zone	As required
6020-3	type for Polluted area	
1120	Catenary ending clamp (65)/ 1360	As required
5020	9 tonne adjusters	As required
5030	Anchor double strap assembly	As required
5040	Clevis assembly	2 Off
3231	Mast anchor fitting including suitable attachment for mast /structure with bolts nuts and backing angle	2 Sets
1170	Double suspension clamp	1 Off
5183	Double eye distance rod	As required

In case the anti-creep extends beyond one span on either side of anti-creep centre, payment for the extra spans shall be made on pro-rata basis

Anti-creep provided on single bridge mast shall be paid under D19 item

5. Item A5 : Supply (excluding supply of copper conductor) and erection of anti-creep with cadmium copper catenary wire suitable for tramway type OHE (regulated)

Same as item A4 with the following changes. Id. No. 2140 large catenary contact clamp to be used in place of Id. No. 1170

Notes:

No extra rate is admissible for double eye distance rod provided if any.

As per site requirement if the termination insulator is to be shifted in the same wire to any other place, no extra rate is admissible.

Wherever Portal structures are provided, the anti-creep wire shall be terminated on uprights crossing number of tracks as required.

Wherever anti-creep wire passes through underneath the over-line structures as desired by the purchaser, contact wire shall be provided in lieu of anti-creep wire for suitable length. Anti-creep termination insulators shall be of normal porcelain type 9 – tonne insulators for normal zone and polluted 9 – tonne insulator for polluted and Red zone areas. Where 65 sq.mm cadmium copper catenary wire is used for conventional /tramway OHE, the anti-creep wire shall also be of 65 sq.mm cadmium copper catenary wire.

SCHEDULE B ITEMs:

6. Item B1 and B2:

Supply and erection of fabricated traction mast and main masts etc

The price shall cover cost for manual/crane erection, alignment and setting before grouting of individual traction mast, gantry masts, dwarf mast and mast for L.T. supply transformer stations whether rolled or fabricated including those for head span. Erection of traction mast also includes painting with cold galvanizing paint in rusted area and also removal of the bends if any. The price shall cover the cost of supply, pit cleaning, erection, alignment and setting before grouting of individual traction masts/portals and main masts of switching stations/TSS including those for head spans of traction mast as per follows:-

i. Rolled mild steel beam (BFB) 152 mm x 152 mm (37.1 Kg/m), designated SC-150, Table 3.1 of IS: 808/1989.

ii. Rolled Mild Steel Joist (RSJ) 203 mm x 152 mm (52.0 Kg/m), designated WB-200, Table 2.2 of IS: 808/1989.

iii. All types of B-Series traction mast, Bridge mast, Emergency mast, double/**fabricated** 'S' series masts/Dwarf masts of various structures & TTC masts along with Booms.

iv. N, O, R, G, P, BFB type and special portals.

Gantries, steel work for feeders drop arms, standard super masts and suspension brackets for feeders.

Description	Drawing No.	Mod
1	2	3
For Conventional OHE		
Drilling schedule of 11.4 m (S1) mast	ETI/C/0030	Mod -F or latest
Drilling schedule of 11.4 m (S2) mast	ETI/C/0031	Mod -D or latest
Drilling schedule of 11.4 m (S3) mast	ETI/C/0180	Mod -C or latest
Drilling schedule of 8.0 m (S4) mast	ETI/C/0036	Mod -E or latest
Drilling schedule of 11.4 m (S5) mast	ETI/C/0042	Mod -E or latest
Drilling schedule of 12.4 m (S6) mast	ETI/C/0181	Mod -C or latest
Drilling schedule of 12.4 m (S7) mast	ETI/C/0182	Mod -C or latest
Drilling schedule of 12.4 m (S8) mast	ETI/C/0183	Mod -C or latest
Drilling schedule of 9.4 m (S9) mast	ETI/C/0184	Mod -B or latest
S-100, for LT Transformer at SWS	ETI/C/0043	Mod -B or latest
S-101, for Isolators inside SWS	ETI/C/0180	Mod -A or latest
T-150, for LT Supply Transformer	ETI/PSI/037	Mod -C or latest
'N' type Portal (General Arrangement)	ETI/C/0008	Latest
'O' type Portal (General Arrangement)	ETI/C/0017	Latest
Standard 'R' type Portal Rod Laced General Arrangement	ETI/C/0011/69	Latest
Standard 'P' Type Portal General Arrangement and details of upright & End pieces	ETI/C/0048	Mod -B or latest
'G' Type Portal special upright and end piece	ETI/C/0056	Mod -C or latest
Special 'BFB' Portal for 5 tracks (General Arrangement)	ETI/C/0026	Mod -B or latest

For High Rise OHE		
Drilling schedule of 11.4m B series mast	ETI/DRG/CIV/B – Mast/00001 /13 /0	Latest
Drilling schedule for S-6 H mast (length13.0 m)	ETI/C/HR/0181	Latest
Drilling schedule for S-7 H mast (length13.0 m)	ETI/C/HR/0182	Latest
Drilling schedule for S-8 H mast (length13.0 m)	ETI/C/HR/0183	Latest
Two Track Cantilever (TTC) General Arrangement	TI/DRG/CIV/TTC/ 00001/13/0 Sh. 1	Latest

Standard 'N' Type Portal General Arrangement	TI/DRG/CIV/N - PORTAL/00001/13/0	Latest
Standard 'O' Type Portal General Arrangement	TI/DRG/CIV/O - PORTAL/00001/13/0	Latest
Standard 'R' Type Portal	TI/DRG/CIV/R - PORTAL/00001 /13/0	Latest
Standard 'P' Type Portal General Arrangement and details of upright & End pieces	TI/DRG/CIV/P - PORTAL/00001/13/0	Latest
'G' Type Portal special upright and end piece	TI/DRG/CIV/G - PORTAL/00001/13/0	Latest
Special 'BFB' Portal for 5 tracks (General Arrangement)	TI/DRG/CIV/BFB – PORTAL/00001/13/0 Sh No. 1	Latest

The price shall also include the supply and erection of small parts steel (SPS) which are not covered under the various other items of work. The price shall also include the cost of steel, fabrication, galvanization and supply at site for erection.

The price shall also cover the cost of assembly of boom components of TTC/portals & any special structures across the track, not covered under this item and erection of the same. The prices shall also include supply and erection of galvanized bolts, nuts washers etc. wherever required as per approved designs and drawings.

The price shall cover cost of erection, alignment and setting before grouting, wherever required, gantries, including steel work for feeders for traction sub-station, drop arms, standard super masts and suspension brackets for feeders and return conductors. Dwarf masts of stub masts for anchoring, complete with anchor plates drilled and welded in position multiple cantilevers cross arm, chairs, adopters for bracket assemblies and all other small part steel works, the erection of which is carried out by the contractor.

The price shall also include the cost of repairing of platform shelters in case the shelter is dismantled/removed/damaged during the course of erection of a mast / portal at platforms. For standard fabricated steel work for which RDSO'S approved drawings are available, the weight of steel work as specified in RDSO'S drawings 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 Employer.

Note:

I. The prices for the items shall also include the cost of stencilling of location number on masts/portal uprights in the manner as directed by the Purchaser.

II. The price shall also include straightening of masts/portals uprights wherever approved by the purchaser and cutting of mast/portals/upright to suit the site condition.

III. The payment shall be made on the basis of the final lengths/weight of the structures, in case the same are cut or modified as indicated above before erection.

IV. For the purpose of payment against items, weight of structures or 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 duly issued by Sr.manager/ Sr.DGM/GM- KRIDE. There will be no addition for increased weight due to galvanizing or painting or weld material or reduction for holes or skew cuts.

V. The rates against item shall be applicable to the erection of small part steel work which are not covered under the various other items of work.

VI. In case of difference between actual weight and weight as specified in RDSO drawings or calculated weights (for structures whose weights are not available as per RDSO drawings), payment shall be made as per least of these weights.

7. Item B3: Supply and erection of fabricated steel work other than mast by manual only.

The price shall cover cost of supply and erection, alignment and setting before grouting, wherever required, the portals, gantries, 2/3 tracks cantilever structures, booms. The price shall also include supply and erection of galvanized bolts, nuts washers etc. Wherever required as per approved designs and drawings. Drop arms will be paid under item No. 3(c)

Note for item B1, B2 and B3

(I) The price for the item 3 (a) and (b) shall also includes, cost of stencilling of location number, contact wire height, stagger, implantation and Rail level including emergency telephone indication. On Mast/ Portal uprights in the manner as directed by the purchaser. The price shall also include the straightening of masts/ portal upright bent during transit and cutting of mast/ portals to suit the site conditions. The mast/structures cut to suit site condition,

(ii) For erection under B1, B2 and B3 the contractor can use his own road crane duly transporting the structures to site.

(iii) The mast/ portals supplied shall conforms to the following :

i) Quality of steel – ST 42-S of IS 226, IS – 2062
ii) Fabricated etc. – IS – 800
iii) Electric arc welding – IS – 816.

For galvanization of the mast, zinc confirming to grade ZN 99.99 and as per IS – 209 and 1966 shall be used. The Mast/ Portals shall be Galvanized as per IS 2629 of 1968 and the masts of Zinc coating shall not be less than 610 gms/ sq.m generally and in the case of polluted area, the steel galvanisation shall be 1000 gms/ sq.m for all galvanised materials under this contract.

The mast/portals which are not conforming to the standard mentioned above will be rejected.

(iv) Temporary bonding of structure by means of 2 nos. of 8 SWG wire shall be done before boom erection, where proper bonding arrangement is not available.

(v) In case mast erected due to any modifications/alterations and where OHE wiring is not done mast number plate and stencilling of number and other parameters as per RDSO directives have to be provided by the contractor.

(vi) The quantity schedule for item No. B1, B2 and B3 are prepared based on certain drawings given during preparation of schedule. The purchaser reserves the right to change quantities among item No. B1, B2 and B3 during execution of works as per site requirements.

(vii) If the purchase Engineer desires for the mast/ structure erected in between two main lines/yard lines to coat with different color bands for easy identification of elementary section, the contractor shall do so at no extra cost.

8. Item B4 : Supply and erection of fabricated and galvanized small parts steel work

The price shall cover the cost of supply and erection of the above steel works including fasteners which are to be supplied by the contractor as per the approved designs and drawings.

For standard fabricated steel work for which RDSO's approved 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. All type of Drop arm with accessories, Pedestal Insulator outrigger (with mast/structure) and feeder super (individual or on portal) mast, 3121/3122 will only be paid under this schedule. Other small parts steels provided if any are considered in the schedule of works other than B4.

Note for items B1, B2, B3 and B4:

For the purpose of payment against items B1, B2, B3 and B4 weight for structures or 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. If the weight of

structure received by the contractor is less than the weights specified for the standard mast, payment shall be made for less weight only.

All masts including bridge masts to be supplied by the tenderer. However, For bridge mast, 32mm dia galvanised hard steel bolts or as required – 4 Nos. with necessary washer, nut and check nut, the bolt shall be 32 x 1110/300 mm or as required by the purchaser to be provided. The weight of the same may be got approved by the purchaser. The cost of the bolt, washer, nut and check nut will be paid as per the weight approved by the purchaser under item B4. For bridge mast if any angle/channel arrangement is required to be provided as per purchase engineers directive. The same also will be paid under item B4.

SCHEDULE C ITEM

9. C1 and C2

C1) concrete for foundation and plinth in hard soil
C2) concrete for foundation and plinth in rocky soil

The price shall cover excavation, supply and handling of all materials, and accessories, temporary arrangements for excavation in hard soil and concrete/ masonry drains/ walls requiring use of chisel and hammer C1 or requiring blasting C2 shoring where necessary, casting concrete including form work where necessary, casting concrete grouting of masts and finishing the top of concrete foundation or anchor blocks wherever underground cable or pipes are met with the contractor should arrange to excavate with due care so as not to damage the U.G. cables/ Pipes and arrange for slight deviation of the U.G. cable to the extent necessary to cast foundation and protect the cables using PVC pipes of adequate thickness and length as approved by the Purchaser's Engineer at site. The price also includes 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 spoil. The contractor shall arrange for filling up of earth around foundation where the embankment is low and enough shoulder width is not available as directed by Purchaser's Engineers. The price shall also include diverting the tracks side drains if any on account of OHE mast foundation works. The purchaser engineer shall certify where use of chisel and hammer or blasting has been necessary. The contractor shall arrange for supply of explosives and all tools and plants for blasting operations at his own cost. If half or more of the depth or width of excavation is in hard soil/ concrete/ masonry drains/ walls or in rock, the entire foundations shall be paid for under item C1 or C2 as the case may be. If half of the depth or width of the excavations is in hard soil/ concrete/ masonry/ drains/ walls and the other half is in rock the entire foundation shall be paid under item C2. The price shall also include the cost of cement. The cement to be used for construction of PCC/RCC should be of ISI branded ordinary Portland cement to

IS269 of latest version or Portland Pozzolana cement (fly ash based) as per IS :1489 Pt-I,1991,3rd revision or its latest.

Notes for measurement for items:

1.The payable volume of the foundations under item C1 or C2 shall be the designed one as shown in the drawings for which the whole has been blasted/ chiselled irrespective of the actual configuration assumed by the later due to the following.

2.The depth of the excavation shall be measured from the formation level to the maximum excavated point.

10. Item C3 : **Concrete for foundation and plinth in other than hard soil and rocky soil**.

The price shall include all works mentioned in item C1 or C2 in all classes of soil except hard soil concrete or masonry drains and walls and rock.

11. Item C4

Reinforced concrete for foundation and plinth

The price shall cover excavation for reinforced concrete work for foundations, supply of steel for reinforcement and other materials including bending, binding, laying of the reinforcement, shoring where necessary casting concrete including form work where necessary, grouting and finishing the tops of foundation blocks. The price shall also include dismantling of all connected temporary arrangements back filling as required and removal of spoil. The price shall also cover all concrete work for foundation or anchor blocks on bridge piers, irrespective of whether they are actually reinforced or not, and those for cast- in-situ piles foundations and counter weight foundations. Rails and fasteners required for counter weight foundations shall be supplied by the purchaser free at the contractors' depot or workshop according to the convenience of the purchaser. The volume of cast-in-situ piles shall be added to the volume of foundation block for the purpose of payment. Dowel bars as may be required for bond with bridge structures shall be supplied and erected free of cost by the purchaser. Dowel bars will not be considered as reinforcement for the purpose of this item.

Note: Nominal reinforcement will be necessary in black cotton soil foundations. Such nominally reinforced foundation in black cotton soil will be payable under item C3 and not under item C4.

The steel for nominal reinforcement will be arranged by the contractor and the concrete mixture, in such a case shall be as for normal of foundations 1:2:4

Notes for items in C

1. The price under item C shall be same for any shape of size on concrete blocks, cable trench or brick wall in calculating the individual volume of concrete and

brick work, or a cubic meter beyond the third decimal shall be rounded off to the nearest third decimal.

2. The price under item C1-C4 shall apply for concreting of all pedestals, plinths and foundations for gantries/ portals and supporting steel work and cable trenches and for other civil engineering work wherever required.

3. For purpose of computation of volume of concrete and brick work under item C the volume of steel work embedded in the foundation block of muff shall be ignored.

4. The volume of each muff will be included in the volume of concrete for the respective foundation for purposes of computation of volume of concrete.

5. The prices shall include cost of embedment of drain pipes, conduits for cables or earthing flats where necessary.

6. Dowel bars in special foundations and nominal reinforcement in black cotton soil foundations will be necessary. Such nominal reinforced foundation in black cotton soil will be payable under item C3 and not under item C4. The steel for nominal reinforcement and dowel bars will be supplied by the contractor and the concrete mixture, in such a case shall be as for normal foundation 1: 2: 4.

7. In case, the anchor foundation cast becomes redundant due to reasons beyond the control of Railways, no extra rates are admissible for the Anchor loops embedded in the anchor foundation.

8. Muffing of OHE mast/structures should be done along with grouting in order to ensure homogeneous bonding between Muffing and grouting concretes.

9. For all foundation works in OHE/Feeder/PSI works – M-15 concrete shall be used and for core – M – 20 concrete shall be used with 20mm ballast for both the concrete.

10. For every 50 m3 of concrete casted, three samples of test cubes of size 15x15x15 cm shall be made and tested for crushing strength after 28 days at any government approved agency/colleges. If any sample test cube fails, the performance of the foundations will be observed for a period of one year from the date of casting for any crack or disintegration; if found satisfactory, payment for that batch will be made after the observation period.

11. If any foundation becomes obsolete due to change in track alignment etc during the execution of the work, the contractor may be asked to recast new foundation in lieu of the old. In such cases, the contractor is eligible to get payment for each such new foundation.

SCHEDULE D

12. ITEM – D1: Preparation and submission of designs and drawings for overhead equipment complete

The price shall cover preparation and submission of overhead equipment plans indicating location of structures in stages, and preparation of all drawings and designs relevant to the tendered works and required to be finalized by the Contractor. The price shall include the following:

a. Preparation and submission of pegging plans layout plans incorporating span, height, chainage, curves, gradients, type of masts/portals, foundations, ATD locations, stagger, location of cut-in-insulators, signal locations etc, making minor modifications with the approval of the Employer/Engineer to the layout of the structures and overhead equipment, if necessary.

b. Preparation and submission of cross section drawings and structure erection drawings for each structure location.

c. Choice of type and size of foundations to suit soil and loading conditions

d. Preparation and submission of long section drawings of overhead equipment where such drawings 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.

e. Preparation and submission of other designs and drawings including drawings of small parts steel work (other than those for which RDSO standard drawings are available) and detailed designs for LT. Supply Transformer stations, design of OHE structures for bridges etc.

f. Supply of requisite number of copies of Bonding Plan drawings.

g. The price shall include supply of requisite number of copies of all drawings, including completion drawings.

h. Supply of requisite No. of soft (in Auto Cad colour) and hard copies of all drawings, including completion/approved/as erected drawings for OHE and Switching stations.

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 SRJ of the Turnout.
3. Cross-over's: The length of track shall be taken as the difference in the chainages of the toes of switches of the two turnouts constituting the crossover.
4. Diamond crossing with or without slips**:** The two tracks crossing each other shall be measured independently as though there were no crossing. No extra payment 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 chainage of anchor mast of the terminating OHE.

6. Feeders from feeding station/ switching station **:** 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 shall be measured by (a) the distance between the center of gantries of the grid sub-station and feeding stations in case of feeder / return feeders / conductors line from grid sub-station, or
   (b) by the distance between the center line 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
   (c) by the distance between the center of the two structures supporting the OHE on either side of the first and last independent structure or (d) in case of feeders / return feeders / conductors running along the track supporting OHE.

7. No extra payment shall be made for any revision/changes/Modification in OHE/PSI drawings on account of changes in ESP/SIP/L-section etc.

13. ITEM – D2: Preparation of station working rule diagram and working instruction pertaining to 25 kV ac traction.

This includes preparing of revised station working instructions and drawings based on the revised OHE and signalling plans. This will include preparing / Altering of station working rule diagrams and instructions, pertaining to 25 KV AC Electric Traction. The Drawing size depends on the No. of Loop Lines/ Road in the stations. A minimum of 20 copies of stations rules diagram (Colour CAD print) and 20 copies of station working instructions are to be prepared as directed by the purchaser's Design Engineer. The rate includes supply, painting and Erection of station working rule diagram on a Milky White Decolam Sheet 4 mm thick and Aluminium Framed Board in a neat manner. Generally, one Board per station is to be provided. The Board should be a minimum of 1800 mm x 1200 mm size and if the number of Loops/ Roads are more than size of the Board shall be increased as directed by the Purchaser Engineer. The rate shall also include replacement to the existing Sectioning Diagrams available in Sr. SE/ SE/ CTPC/ AEE/ TRD/ SR. DEE/ TRD and at section control rooms. If the works proposed in a contract is done in a phased manner, the contractor is eligible to get payment for each phase at the same rate paid under item 1(c). The new board will be supplied only one time.

If the purchaser so desire that if any station have major yard having RRI cabin, Station Manager Room, station master room separately, any other cabins are to be provided with separate station working rule diagram boards, the contractor shall provide the board as directed by Engineer in charge.

All the painting works on the White Decolam Sheets should be done with colour Fluorescent Paints as Directed by the Purchaser Engineer. If the purchaser so desires instead of painting in the white Decolam board, the station working diagram shall be taken on flex sheet by the contractor and fixed on the white Decolam Board. For major stations having RRI cabins and SMR rooms/PF SM rooms separately, the number of such boards as required will be decided by the purchaser's Engineer at site.

14. ITEM - D3 Supply and erection of a guy rod assembly:

The price shall cover supply and erection of a guy rod assembly of various lengths for traction masts/Portals/TTC, feeder line towers or supports etc complete with mast guy rod fittings, guy rod with adjustments and part/s 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.

Components requirement:

Rly. Id No.	Description of components	Qty. for unit
1	2	3
3232	Mast guy rod fitting (welded) complete with 4 short bolts, nuts, lock nuts and washers for attachment to mast/S.P.S including appropriate fittings	1 off
5001/5001-1 or 5001-3	Anchor bolts (complete with nuts, lock nuts and split pins)	1 Set
5002	Guy rod stirrup	1 off
5004 or 5005 or 5006-1or 5070 or 5071	Guy rod with nut, washer and split pin	1 off
5007-1	Anchor 'v' bolt	1 off
5008	Anchor loop	1 off
5220	Guy rod double strap assembly	1 off or 2 off (as required)

Note :

1. In case the Contractor desires to adopt a different design for guy rod assembly, the same shall be indicated by him in the tender and the components required should be clearly listed under this item as deviation.

2. Supply and erection of guy rod assembly at anti-creep portals will also be paid for under this item.

15. ITEM – D4 : Supply and Erection OF Single Bracket assembly including stay and bracket

The price shall cover on a flat rate basis for supply and erection of any bracket assembly on a traction mast or support or drop arm and shall include those on high/low/medium 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, dropper wires and 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, small parts steel work, if any. However, this does not include the anti-creep arrangement at masts/ structures

The price shall include the cost of following components:

Rly. Id No.	Description of components	Qty. for unit
1	2	3
3020	Mast fitting for hook insulator with 2 off bolts, nuts, lock nuts and washers of 16 mm dia.	1 set
2400	Tubular stay arm assembly (including galvanized steel tube).	1 set
2110/ 2130/2380	Catenary suspension bracket assembly or hook bracket	1 off
1160	Suspension clamp	1 off (as required)
2120/2140/ 2040/2080	Bracket tube assembly complete with tube cap and sleeve where required (including galvanized steel tube).	1 set
3070-1/2	Mast bracket fitting assembly including 2 off bolts, nuts, lock nuts and washers of 16 mm for attachment to structure or to small part steel work.	1 set
2150-1 & 2160-1	Register arm hook assembly complete with bolts, nuts and lock nuts.	1 off
2420 or 2430	Register arm assembly or raised register arm assembly (including galvanized steel tube).	1 set
2270-4 or 5, 2460 Style- 02 or 2470 Style - 02	Register arm dropper assembly including dropper wire complete with bolts, nuts etc.	1 set

2390/2540/ 2520	BFB steady arm or bent steady arm	(As required)
2360/2490-2	25 mm steady arm drop bracket/clamp	-do-
1220/1370/-1	Contact wire swivel clip or raised register arm	1 off
2550-1/2	Anti-wind clamp	As required
	5mm inclined copper	As required
	Bracket insulator/Stay arm insulator	one set

The contractor shall provide composite insulator in the vandal prone area/polluted areas instead of porcelain insulator as directed by engineer in-charge.

The price is also applicable for the provision of any additional fitting & required to support an additional OHE on a single bracket assembly payable under this item. The price shall include supply of all extra fittings including the double contact wire swivel clip.

Wherever cantilevers are supported in drop arms with track centre more than 4.72 m, drop arm cantilevers shall be with 2.35 m setting distance. The cantilevers provided on drop arm assemblies and individual mast shall invariably be provided with large bracket tube. This is applicable to all types of bracket assemblies under item no. 4. For track centre less than or equal to 4.72m, drop arm cantilevers shall be with a minimum of 2.15 m setting distance.

16. ITEM – D5: Extra on D4 for supply and erection of additional fittings on a single bracket assembly for supporting two OHE's

The price is applicable as an extra to item D4 for the provision of additional fittings required to support an additional OHE on a single bracket assembly payable under item D4. The price shall include supply of all extra fittings including the double contract wire swivel clip, if any.

17. ITEM – D6 : Supply and Erection OF Single Bracket assembly suitable for tramway type OHE(regulated)

The price shall cover on a flat rate basis any bracket assembly on a traction mast or support on drop arm and shall include those on high level platform in the vicinity of turnouts over-bridges or overlaps and at locations with reduced encumbrance or terminating wires. The prices shall include the cost of supply of all components including dropper galvanized steel tubes, including wires small parts steel work complete with bolts and nuts etc. If any. The price shall cover erection of all components including solid core insulator, dropper wires and small part steel work

excluding MCC i.e., 3121/3122 in the case of multiple cantilever locations. This includes the anti-creep arrangement at masts/ structures. The price shall include:

Rly Id No.	Description of Components	Qty per unit
3020	Mast fitting for hook insulator with 2 of bolts, nuts, locknuts washers of 16 mm	1 set or as required.
2400	Tubular stay arm assembly (including description of components galvanized steel tube)	1 set or as required
2110/2130	Catenary suspension bracket assembly or hook	1 Off
2382	bracket	
1160/2120 2142	Suspension clamp	1 Off (as required)
2040 or 2080	Bracket tube assembly complete with tube cap and sleeve where required (including galvanized steel tube).	1 set
3070-1/2	Mast Bracket fitting assembly including 2 off bolts, nuts locknuts and washers of 16 for attachment to structure or to small part steel work.	
2150-1/	Register arm hook assembly complete with bolts,	1 Off

2160-3	nuts and locknuts.	
6000-1	Stay arm insulators –	1 Each or as required
6030-1	Bracket insulators -	1 Each or as required
2420 or 2432	Register arm assembly or raised register arm assembly (including galvanized steel tube).	1 Set
2270-4 or 5 2460 style 02 or 2470 style – 02	Register arm dropper assembly including 5 mm dropper wire, complete bolts, nuts etc.	1 Set
2390/2540	BFB steady arm or bent steady arm	As reqd.
2520	(where ever required)	Required
2360/2490-2	25 mm steady arm drop bracket/ clamp	do
3131 & 3076	Adaptors & Backing angle	do
1220/ 1370/-1(Mod-F)	Contact wire swivel clip or raised register arm clamp	1 off
2550-1/2	anti-wind clamp	as required

The contractor shall provide composite insulator in the vandal prone area/polluted areas instead of porcelain insulator as directed by engineer in-charge.

18. ITEM – D7

Supply and erection of pull off arrangement for one OHE.

The price shall cover supply for all components required for a pull off arrangement to pull one equipment only including head span mast fittings, complete with M.S. angle equalising plate assembly steady arm catenary, dropper clip, contact wire swivel clip and fittings, conductors, small jumper (50) wire. The price shall cover supply and erection of all components including solid core insulators small jumper wire and conductors as required.

19. ITEM – D8: Extra for each additional equipment pulled

The price shall cover as an extra to item D7 supply and erection of additional fittings required in case of the pull off to pull more than one equipment. The price is applicable for each extra equipment pulled.

No extra length shall be provided for Sag. The price is applicable for all types of span wires including head span wires. Erection of a metre beyond the first decimal shall be rounded off to the nearest first decimal.

20. ITEM – D9: Supply and erection of a pull-off arrangement for regulated tramway type OHE.

The price shall cover supply of all components required for a pull off arrangement to pull one equipment only complete with steady arm, contact wire swivel clip and fittings, conductors. The price shall cover erection of all components including solid core insulators, small jumpers and conductors as required.

Note : No extra payment shall be admissible under for bracket assemblies on platform structures with extra insulators to support cantilever assemblies,

21. ITEM – D10: Supply and erection of mounting arrangement for span wire

The price shall cover supply of all components including adjusters, terminal fittings and mast attachments required to attach a span wire of a head span wire or a cross span wire or a steady span wire or a support span wire for supporting contact wire only at both ends to traction masts/ structures or special brackets. The price shall not include the cost of small parts steel work if any. The price shall cover erection of all components including mounting arrangements for span wire and including solid core insulators but excluding small parts steel work if any.

22. ITEM – D11: Supply and erection of a span wire.

The price shall cover supply and erection of a span wire per metre. 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 length shall be provided for Sag. The price is applicable for all types of span wires including head span wires. Erection of a metre beyond the first decimal shall be rounded off to the nearest first decimal.

23. ITEM – D12 : Supply and erection of suspension of one conventional OHE from head span

The price shall cover supply of a suspension assembly to carry complete all copper OHE on head spans inclusive of all dropper assemblies inclusive of dropper wire and from head span, cross span, steady wire attachment, steady arm/ rod catenary suspension clamps and other fittings required to make complete suspension arrangements for copper OHE/ composite OHE on head span. The prices shall cover the erection of all components, fittings and droppers for suspension of OHE from head span.

24. ITEM – D13 Suspension/ registration for contact wire only

The price shall cover supply and erection of all fittings required for suspension/ registration of a contact wire only whether under head spans carrying other types of OHE or not or on any bracket for carrying contact wire only. The price shall include the followings.

Vee clamp or double vee clamp with adjuster or steady arm with steady wire clamp. Contact wire swivel clip.

25. ITEM – D14: Supply and erection of earth wire

The price shall cover supply and erection of earth wire made of 7/4.09 mm steel reinforced aluminium conductor (RACCOON) excluding termination which will be paid under item 8 and shall include cost of fittings on structures for supporting the earth wire including bonding of the earth wire to the structure by suitable jumpers and 40 x 6 mm bond with structure to earth electrodes or a non – track circuited running rail or impedance bond which will be provided by the purchaser. The price shall include erection of disc insulators; cut in insulators to isolate sections of earth wire and the cost of small parts steel works complete with bolts and nuts to attach the earth wire mast clamp to masts/structures, if any. The rate includes the cost of provision of flat armour tape used at the mast/structure support as per standard length with end ferrules.

26. ITEM – D15: Supply and erection of regulating equipment (3 pulley type) modified with counter weight assembly for conventional OHE.

The price shall cover supply of a 3-Pulley type counter weight assembly including 9 ton adjuster with double strap assembly. provision of adequate length pipe on Hex-Tie rod wherever required, SS wire rope, anti- falling rod of suitable length, counter weight and small part steel required for fixing with mast /structure for regulating equipment and anti-falling rods. Suitable forged clevis as approved by RDSO for fixing with mast/structures to be used. The price shall cover supply and erection of all items given above including 665 kg of counter weight. The price shall also cover adjustment of the entire regulating equipment. The price shall also includes for marking 15^0, 35^0 and 45^0 deg. temperature marking on the BWA mast and colour band including the half tension lengths as required by the purchaser.

27. ITEM – D16: Supply and erection of regulating equipment (3 pulley type) with counter weight assembly for tramway type OHE (regulated)

Same as D15 above but with counter weight assembly confirming to style 01 of the relevant termination arrangement drawing No. ETI/OHE/G/04212 or latest.

28. ITEM – D17: Supply and erection of materials for termination of single conductor of overhead equipment or terminating wire

The price shall cover supply of all material necessary for the termination of single conductor of overhead equipment on traction mast or structure, including appropriate mast anchor fittings including suitable attachment with mast/structure, backing angle, cleaves assembly, adjuster, anchor double straps, ending clamp for the catenary or contact wire or terminating wire and fitting including 9 tonne

porcelain insulator assembly but excluding terminating wire if any. The price shall cover erection of all materials including the 9 tonne conventional porcelain insulator assembly and except terminating wire if any.

Note : In case if `V' type anchorage is adopted for terminating a single conductor such an arrangement would be counted as two off under item D17 for the purpose of payment.

29. ITEM – D18

Supply and erection of materials for termination of double conductor conventional OHE

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 fitting including attachment with mast/structure, Backing angle, cleaves – assembly three adjusters, ending clamps for catenary and contact wire anchor double strap assembly, equalizing/ compensating plate and fittings including 9 tonne conventional porcelain insulator assembly in a FTA/RE location but excluding the termination wire if any. The price shall cover erection of all materials including the 9 tonne conventional porcelain insulator assembly. When anchoring of a OHE (Both catenary and contact wire) through large span wire (130 sq. mm) is done, supply and erection rate for termination will be paid under this schedule of work.

30. ITEM – D19

Supply and erection of materials for termination anti-creep termination (one end)

The price shall cover supply and erection of all materials required for termination of Anti-creep wire alone on one side. This includes appropriate mast Anchor fittings including attachment with mast/structure, Backing angle if any, clevis assembly, adjuster, distance Rod if any, 9 tonne conventional porcelain insulator, wire ending clamp Double straps etc. The wire used for extension of anti-creep wire shall be paid under Schedule B and D3. Payment for the terminations of anti-creep wire -2 No. and wires provided on bridge mast if any shall be paid under this schedule The price includes the cost of double eye distance rod (ID No.5183).

31. ITEM – D20: Supply and erection of materials for termination of an earth wire (Raccon)

The price shall cover supply and erection of all materials required for the termination of an earth wire Raccoon including appropriate mast anchor fittings including attachment with mast/structure, adjuster, terminal clamp end fittings, and backing angles.

32. ITEM – D2: Supply and erection of materials for termination of tramway type OHE

The price shall cover supply and erection of all materials required for the termination of a single contact wire (Regulated) including 9 tonne conventional insulator and will exclude the parts covered under separate item.

33. ITEM – D22: Supply and erection of materials for termination of 25 kV terminating wire (150 SQ.MM) copper cross track/ along track feeder.

The price shall cover supply of all materials necessary for termination of terminating wire 150 sq. mm Copper on a structure for cross track or along track including appropriate anchor fittings, Backing angle, Cleaves assembly, adjuster anchor double straps, ending clamp for 150 sq. mm Copper wire and fitting including 9 tonne conventional porcelain insulator assembly and but excluding terminating wire (150 sq. mm Copper) if any. The price shall also cover erection of all materials including 9 tonne conventional insulator assembly and excepting terminating wire if any.

Notes:

1. Anchor fittings including suitable attachment for mast/structure and backing angle complete with bolts and nuts wherever required is included in this item.
2. Supply and erection of materials for terminations of catenary wire on either side of the portal at anti-creep locations or at bridge face will also be paid for under this item.
3. As per site requirement if the termination 9 tonne insulator is to be shifted to mid span of
4. The price including provision of spacer pipes to be provided in anti-falling device as per tension length and marking of temperature 15 , 350 C and 450 C marks on the mast/structures as per standard width and colour code in vogue.
5. Due to some reason or other OHE and guy rods are provided with two separate anchor fittings, no extra rates are admissible for any of the materials provided extra.
6. In regulating equipment, SS wire rope the manufacturers identification mark ferrules should be kept on cast iron weight side.
7. Erection rates under item No. 8 also includes the temporary termination of OHE/Feeder/RC wires on structures/mast during modification also during the wiring works, where temporary termination is done. – For such terminations supply rates are not admissible.
8. Anti - falling device rod shall be fixed on mast/structure as per RDSO drawing No.TI/DRG/OHE/ATD/RDSO/00009/06/0.and no extra payment is admissible for the above arrangement.

9. The insulator provided for terminations in normal zone and for polluted and red zone, shall be 9 tonne porcelain insulator (1050 mm creepage).

34. ITEM – D23 and D24

33 (a) EXTRA ON ITEM A1 REQUIRED AT A TURNOUT, DIAMOND CROSSING FOR OVERLAP

33 (b) FOR SUPPLY AND ERECTION OF ADDITIONAL FITTINGs REQUIRED AT A TURNOUT, DIAMOND CROSSING FOR OVERLAP.

The price shall cover on flat rate basis supply of additional components and fittings required at turnouts, crossings or overlaps (un-insulated overlaps) 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 or equipment conductor at a turnout, diamond crossing, Insulated and Un-Insulated overlaps or neutral section including jumper wire. The price shall cover erection of all materials including jumper wire and all adjustments required at turnouts, diamond crossing, overlaps and neutral section.

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 D4-D9,A1-A2, D15-D22 and D25-D27 respectively.

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

35. ITEM – D25: Supply and erection of porcelain cut-in-insulator.

The price is applicable to the provision of an additional 9 tonne porcelain 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, in anti-creep any additional insulators provided. The price shall cover supply of all components required for the cut-in-insulators assembly, including appropriate terminal end fittings for the conductor and the 9 tonne porcelain insulator. The price shall cover erection of all components, including the 9 tonne porcelain insulator. This price shall also be applicable as an adjustment price for non-provision of insulators under separate items.

36. ITEM – D26: Supply and erection of a Porcelain suspension insulator.

The price is applicable to the provision of a 9 tonne porcelain suspension insulator (Polluted zone type for polluted area) assembly for suspension of an all aluminum 25 KV feeder (single or double spider) 150/130 sq. mm or 65 sq. mm overhead equipment conductor or 19/2.79 mm all aluminum catenary or any other similar type of suspension. The price shall cover supply of all components. required for the suspension assembly including the appropriate suspension clamp and the 9 tonne

porcelain insulator assembly but excluding small parts steel work with bolts and nuts etc if any. The price shall cover erection of all components including the 9 tonne porcelain insulator assembly but excluding small parts steel work, with bolts and nuts etc. for fixing if any. The price shall include the cost of provision of a flat armour tape to be used in connection with suspension of SPIDER conductor.

37. ITEM – D27: Supply and erection of a 25 kV post insulator

The price is applicable to the provision of a 25 kV post insulator to support copper or aluminum jumper/ busbars. The price shall cover supply of all components and fittings/ angle iron (outrigger) to support the jumpers including supply of Post insulator but excluding supply of small parts steel works with bolts and nuts etc for fixing with mast/structure if any. The price shall cover erection of all components required for the assembly, including post insulator but excluding small parts steel work with bolts and nuts etc for fixing with mast/structure if any.

38. ITEM – D28: Supply and erection of a section insulator assembly

The price shall cover supply of all components required for a standard section insulator assembly (serving both the overhead equipment conductors) including special droppers for supporting the equipment and all terminal end fittings for conductors, the section insulator assembly and the 9 Tonne conventional porcelain insulator assembly on the catenary and dropper wires as required. The price shall cover erection and adjustment of all components including section insulator assembly 9 tonne porcelain insulator on the catenary and droppers. Stiffener rod of requisite length to be provided on both ends with contacts wire pieces

Rly Id No.	Description of the Components	Qty per Unit
1120/ETI/OHE SK/436/1360	Catenary ending clamp	2 Off
1192/ETI/OHE/ SK/333	Catenary dropper clip assembly	As required
6170	Parallel clamp for double contact wire	12 Off
6180	Section insulator dropper assembly	3 Sets
6100	Section insulator assembly	1 off
6020	Section Insulator	1 off
	9 – Tonne porcelain cut – in – insulator	1 off

39. ITEM – D29: Supply and erection of a section insulator assembly suitable for tramway type OHE (regulated)

The price shall cover supply of all components, required for a standard section insulator assembly including special arrangements for supporting the equipment and terminal fittings for conductors and the section insulators assembly as required. The price shall cover erection and adjustment of all

components including sectioning insulator assembly. The cantilever assembly at this location will be paid under item no. D6.

NOTE : Whenever 9 tonne porcelain insulators are provided on the contact wire for bifurcation /isolation of supply, or before providing section insulator assembly erection works, erection rate for provision of 9 – tonne porcelain insulators will be paid under item no. D25. as the work is to be done for sectioning purpose

40. ITEM – D30: Supply and erection of PTFE Type short neutral section assembly

The price shall cover supply, erection and adjustment of PTFE type short neutral sections assembly. The price shall also cover supply and erection of, all fittings for contact and catenary wire as necessary including supply of required dropper wires.

41. ITEM – D31

Supply and erection of 25 kV S.P. Isolators without earth contact assembly

The prices under D31 shall cover supply and erection of isolator switches of approved make complete with arcing horns, operating rods, operating rod guides operating rod insulator, Pedestal Insulators, mounting base, integral lock and 6 lever navtal lock. The provision of 160 sq mm jumper wires of required length to be paid under separate item with 2 No. of terminal connectors.(RI – 1009) bolted type to be paid under separate item is not included in the scope.

The price shall also include flexible copper earth connection between isolator handle and mast/structure.

The price shall also cover supply and erection of all small parts steel with bolts and nuts required for erection of Isolator on the mast/ structure supporting pedestal insulators, supporting operating Rods, Handle, Jumpers, number plate of approved design etc. Any other pedestal insulator fixed for Jumper with/ without rigger shall be paid under item D27.

42. ITEM – D32

Supply and erection of 25 kV Double Pole Isolator.

The price shall cover supply and erection of a double pole isolator 1250 Amp capacity complete with mounting base, operating rod, operating rod guides required for the operation of the isolator, jumper connectors. The price shall also cover supply and erection of aluminum-copper strips, a pad–lock, integral lock and interlock if required, a number plate of approved design for each isolator, supply and erection of small parts steel works for support of isolators and for support of operating rods on gantries masts including supply and erection of 25 KV Solid Core Post and Operating rod insulator.

The price shall also cover for supply and erection of an earth contact assembly in the isolator. The price shall cover the cost of supply and erection of 3 x 25 mm copper connections between earth contact assembly and the structures.

The price excludes provision of pipe electrode earthing and this schedule does not cover the supply and erection of interlock arrangements post insulator for which payment will be made on other schedules.

Note : All Isolators are to be supplied with required numbers of 25 kV operating rod insulators with complete accessories and small parts steel. Isolator key box of appropriate size shall be provided for at each station on the section, one number at the nearby OHE depot in charge of the section and one number at SSP/SP, as desired by the Engineer at site. Payment of jumper shall be payable separately under other schedule of item in OHE.

One unit of measurement for the purpose of ONA payment includes the following.

25 KV SP Isolator 1250 amps – 1 off

25 KV Post Insulator – 4 off

25 KV Operating rod insulator – 2 off

43. ITEM – D33

Provision of an interlocking device on 25 kV Isolator single / double Pole with or W/O earth contact assembly.

The price shall cover supply and erection of an inter locking mechanism on an isolator along with small parts steel if any, to permit working of two or more isolators.

44. SCHEDULE D ITEM – D34

Supply and erection of a copper jumper

The price shall cover on a flat rate basis the supply of all components and fittings required for providing a flexible copper jumper connection, including parallel grooved clamps, bimetallic and aluminum copper ALCU strips, wherever required and terminal or tee clamps at either end including jumper wire of appropriate length.

The price shall also cover the erection of the complete jumper assembly including jumper wire of appropriate length, The price shall not however be applicable for jumper connections already included under items A1-A2 and D23-D24 but shall be applicable for any jumper connections in any combination between feeders, Isolators, L. T. Transformers dropout switches, Lightning arrestors for overhead equipments and outgoing busbars for switching stations booster stations. Continuity jumper as Boom anchor anticreep will be payable under this item. For continuity jumper across the ending clamps under OLS, the supply of all components and fittings including catenary wire for erection under the over line structure as per Drg. No. ETI/OHE/SK-529 will also be payable under this item. The jumper wire shall be of RDSO's approved supply. The jumpers to be provided for continuity of supply at Feeding Post/SSP/SP and along track feeder continuity shall be of 160 sq.mm jumper of suitable length as required at site.

45. ITEM – D35

Supply and erection of an aluminum jumper

The price shall cover on a flat rate basis the supply and erection of an aluminium jumper complete with all components and fittings required for providing jumper connection, including parallel clamps, bimetallic ALCU strips wherever required and terminal or tee clamps at either end. The price shall be applicable for any aluminum jumper/ connections in any combination between feeders, return conductors, overhead equipments, and outgoing busbars or switching stations and booster stations. Jumper connections for 25 KV feeders at angle tower traction sub-stations or at feeding stations will also be paid under this item.

46. ITEM – D36

Supply and erection of a structure bond

The price shall cover supply of all materials including mild steel flat required to be provided in a structure bond connecting a traction mast or structures to the nearest non-track circuited rail, or (locations other than earth wire) earth electrode, including all fasteners at both ends, bonding should have suitable insulation sleeve in an approved manner. The price shall include shaping and drilling and paint of all materials including the bond. The price shall also include provision of heat shrinkable PVC sleeve of minimum length of 40cm 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 rate will be per bond.

47. ITEM – D37

Supply and erection of a Longitudinal bond

The price shall cover the supply of all materials including mild steel flats, fasteners etc. required to be provided in a longitudinal bond connecting 2 rails at the rail joint at the locations specified by the Purchaser. The price shall includes shaping and drilling and painting of the bond and erection of all components including the Bond. The rate will be per bond. In Feeding post area Longitudinal bonds shall be provided as per RDSO design. 'U 'shaped bonds which are provided in the points and crossing will be paid under this item.

48. ITEM – D38

Supply and erection of transverse and special bond

The price shall cover supply of all materials including mild steel flats, fasteners insulation sleeve etc required to provide Impedance bonds / Transverse Impedance bond connecting rails of the same/adjacent tracks at the locations and 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 crossings, 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, painting and erection of all materials including the bond. This will be paid per bond. The price shall also include provision of heat shrinkable PVC sleeve of minimum length of 40 cm. Whenever it is required.

1. The OHE traction bonds should be fixed to the rail and connected in such a way that they do not interfere with tamping tools during tamping as shown in drawing No. CE/570. The traction bonds shall be connected to the rail at a distance of not more than 80 mm from the adjoining sleepers.

2. Drilling of holes in the rails shall be done only with prior approval of authorized Railway official and drilling should be done in the presence of nominated Railway official..

3. All holes drilled to the rail shall be chamfered soon after drilling.

4. Drawing No. CE/570 showing the fixing arrangement of traction bonds to be followed strictly.

5 If any bonds provided and got damaged by the packing machine during track alignment work etc, the same shall be replaced for which payment shall be made at the rates given under item No. D36-D38 and the contractor shall set right/replace the same before handing over the assets to maintenance.

6. In case of yard re-modelling & signalling work being done in stages during doubling, the bonding works of the concerned yard will have to be modified at each stage as per the requirement. At each stage the payment will be made at the rate specified for that particular item.

7. Jointing of flats by welding is only permitted except in platforms where it is inevitable.

8. If old structure bonds, cross bonds/polarity bonds, longitudinal bonds from the existing line is to be released, for any purpose so desired by Railway engineer at site, erection rate under structure bond (D36) will be paid to the contractor. The bolt, nut and bond so released is to be accounted properly and handed over to the purchaser.

49. ITEM – D39: Supply and erection of single earth electrode

The price shall cover supply and erection of an earthing stations with a single pipe embedded into the ground complete with protective concrete box and lugs suitable for directly connecting two mild steel flats of minimum size 40 mm x 6 mm. The earth resistance shall be measured and stenciled in the concrete box. The concrete Box shall be, as per RDSO's Design and may not be possible to remove unless otherwise bond fasteners are removed. The rate includes provision of Charcoal and Salt to a minimum size of 0.3 x 0.3 x 2.0 mts. in alternative layers irrespective of Soil Condition at Site.

50. ITEM – D40: Supply and erection of 8 SWG G.I. wire for earthing

The price shall cover supply and erection of a 8 SWG G.I. Wire per metre, used for earthing wherever required.

51. ITEM – D41: Supply & laying of 70 sq mm XLPE insulated PVC sheathed aluminium cable

The price shall cover supply and laying of XLPE insulated PVC sheathed aluminium conductor armoured power cable of aluminum cable of size 2 core x 70 sq. mm as per ISS: 7098 heavy duty, 1100 V with IS markings for signal purpose as per latest RDSO directives. The cable shall be laid from L. T. signalling AT to the station building AT control panel or part thereof. The cable should be of RDSO approved make. The cable should be properly clamped on walls and GI pipe of required size and length is to be provided where ever cable is taken out from the earth to surface level. The price shall include testing, connecting/jointing and commissioning of cable and it will be paid / metre length. Suitable cable indicators are to be supplied and placed at 50 meters interval in an approved manner. No intermediate joint is permitted, whatever be the length of cable used. If lower [5 kVA] capacity L. T auxiliary transformers, are to be erected, then the payment is made for the supply and laying of XLPE insulated PVC sheathed aluminium conductor armoured power cable of aluminum cable of size 2 core x 25 sq. mm as per ISS: 7098 heavy duty, 1100 V with IS markings will be paid at half the rate per metre under this item. The price shall also cover supply and erection of suitable cable glands and connectors at both ends.

52. ITEM – D42: Cable trench cutting

For laying the 2 x 70 sq mm XLPE cable trench to be excavated to a depth of 3 feet and suitable width. After laying the cable sand to be filled to a depth of 20 cm and Bricks to be placed crosswise through out the length the trench to be covered with excavated mud.

The mud should be kept with a heap for future settlement. The price shall inclusive of concreting of platform area to its original shape. The rate will be paid per metre length. . The same rate is applicable for 2 x 25 sq. mm XLPE cable also.

53. ITEM – D43: Supply and erection oil filtration, testing and commissioning of 10 KVA L.T. supply transformer (**oil type**)

The price shall cover supply and erection of 10 KVA L.T. supply transformer (as desired y Engineer in-charge) complete with terminal connectors on a mast or gantry. The price shall be applicable for transformers mounted on steel pedestals at switching stations also. The price shall also cover supply and erection of an enameled number plate of approved design. The price shall also cover oil filtration and pre - commissioning tests as approved by the Railways. The Contractor shall make his own arrangement for oil filtration equipments as well as power supply required for the same. All necessary tools equipments instruments required for carrying out oil filtration/checks/tests for commissioning shall be arranged by the contractor. The price also includes the cost of L.T. fuse box with 63 Amps to be mounted on the Aux. Tr. Mast.

54. ITEM – D44: Supply and erection of LT control board for AT location as per RDSO Spec.No. TI/SPC/PSI/ CLS/0020 with A&C slip No. 4 (7/2010) or latest

The price shall cover supply, erection, testing and commissioning of LT control and distribution panel for colour light Signalling suitable for 10 kVA with automatic changeover supply facility as per RDSO specification No. TI/SPC/PSI/CLS/0020 with A & C Slip No. 4 (7/2010).

The price also shall include provision of suitable cable termination box 63 Amps for terminating the LT cable of AT & local EB supply and out going cable to signal equipment at Cabin/Station building. The price shall also cover provision of 16 sq. mm copper leads for connecting terminal board to the LT control and distribution panel.

The price shall also include supply of necessary cable glands, fasteners, grouting bolts and clamps required for fixing/grouting of panel board.

55. ITEM – D45: Supply and erection of 25 kV drop out fuse switch

The price shall cover supply and erection 25 kV Drop out fuse (5 amps/1 amp) switch complete with all mounting accessories and terminal connectors as required including the supply of 25 kV solid core insulator. The price shall include supply and erection of small parts steel work, fuse element and mounting base channel. The D.O fuse switch of 5 amps shall be provided for 100 kVA/50 kVA auxiliary transformers and 1 amp for 10 kVA auxiliary transformers. No extra rate is admissible for the fuse element whether 5 Amps or 1 Amps fuse element is provided.

56. ITEM – D46: Supply and erection of protective screen for FOB / ROB.

The price shall cover supply and erection of protective screen for one line on either side of the FOB / ROB in an approved manner as per RDSO drawing No. ETI/C/0068. The protective screen shall be painted with two coats of red oxide zinc chromate primer confirming to ISI and finished with two coats of aluminium paint.

57. ITEM – D47: Supply and erection of anti-climbing devices for L.T. supply transformer stations

The price shall cover on lump-sum basis the supply and erection of anti climbing device consisting of galvanized steel fixtures mounted on each mast below the transformer. The price shall be for each mast provided with the Anti climbing device. For mast/structure erected out side the Railway premises shall also be paid under this item.

58. ITEM – D48: Supply and erection of caution boards along with suitable fixing clamps.

The price includes the supply and erection of Enamel caution board with suitable clamps for fixing in the Mast/ structure/wall including suitable bolt and nuts as per RDSO specification.

01	Public Caution Board (Regional Language/Hindi/English)	20 No.
02	Staff Caution Board (Regional Language/Hindi/English)	20 Nos.
03	Caution unwired Track Ahead board (English/Hindi)	10 Nos.
04	Caution unwired Turnout board – (Enamel) (English/Hindi)	10 Nos.
05	Electric Engine Stop Board (English)	6 Nos.
06	LC danger Board (Regional Language/Hindi/English) with	10 Nos
07	OHE Restricted clearance board (Enamel) (English/Hindi)	20 Nos
08	Power Block Working Limit Board (Enamel) (English/Hindi)	20 Nos
09	Caution 25 kV (Retro Reflective Type) (Regional	20 Nos.
10	Danger 25 kV (Retro Reflective Type) (Regional	20 Nos

The rate will be paid as total lump sum for all the Boards as against the quantity mentioned above.

59. ITEM – D49: Modification to erected equipment transfer of equipment from one mast or support to another

The price shall cover transfer of overhead equipment to a bracket assembly on a new mast or support, and dismantling of the erected bracket assembly from the old mast or support and releasing of SPS DA etc. The dismantled equipment shall be returned to the purchaser along with steel works like MCC DA and consequent adjustment to overhead equipment required such as changing the droppers leveling etc. No extra rates are payable for providing new dropper wires, catenary / contract wire clips if any. The foundations and steel work and bracket assembly for the new mast or structure will be paid for under appropriate Item C, B and D4-D9 respectively. Where ever changing of winch type regulating equipment by modified 3 pulley type regulating equipment is carried out, in addition to supply and erection of 3 pulley type RE, transfer of OHE shall be paid for transferring OHE from old RE to new RE.

60. ITEM – D50: Provision of an additional bracket assembly/ assemblies on a mast or support

The price shall cover dismantling of an existing bracket assembly/assemblies/ along with the steel works like MCC DA and provision of a multiple cantilever cross arm SPS wherever required and erection of bracket assemblies on the multiple cantilever cross arm/SPS. The price shall include any consequential adjustments to traction overhead equipment such as re-spacing of droppers, leveling etc. This price shall not include the price for supply and erection of any additional bracket assembling which will be paid for under Item D4-D9.

61. ITEM – D51: Dismantling of overhead equipment

The price shall cover cost of dismantling of OHE equipment including terminations, tensioning devices, section insulators guy rod assemblies at

the termination and Anti creep, bracket, assemblies and associated small part steel work (excluding components embedded in concrete) the dismantled equipments shall be returned to the purchaser. This item includes releasing of Earth Wire and its termination, cut in insulator, Anti-creep wire also if any. The released catenary wire to be coiled in drums or cut into pieces for disposal as desired by the purchaser .If anti-creep wire alone is released at any location, half the length of Anti-creep wire will be paid under this item. The rate is inclusive of Guy Rods. Terminations and SPS to be released from either end of Anti-creep anchor and OHE.

The rate is also inclusive of pedestal Insulators to be released from OHEs/ Anchor Locations/ Return conductors as the case may be. The rate includes for releasing of Isolators and section insulator assembly released along with OHE if any.

62. ITEM – D52: Dismantling of Feeder/Return conductor

The price shall cover dismantling of feeder, return feeder or return conductor including guy rods, terminations, suspension assemblies, insulators super masts and associated small part steel work. Whenever feeder wire is released and transferred to new location, dismantling and erection shall be paid. The length of the feeder wire so released/erected is reckoned duly calculating half the length of the span on either side of the location.

63. ITEM – D53: Splicing and extension of anchored overhead equipment

The price shall cover splicing of terminated overhead equipment for extension and consequent adjustment of the affected equipment. The dismantled equipment shall be returned to the Purchaser's Engineer. The cost of dismantling of overhead equipment would be paid for under Item D51. The extended overhead equipment shall be deemed as starting from the centre line of the splice to the extended overhead equipment and shall be paid for under Item A1 or A2 as applicable. Half the rate shall only be paid if and only catenary or contact wire alone is spliced and extended. In case of splicing and extension of AC wire, half the rate shall be paid. The length of the AC wire spliced will be paid based on Schedule –B ,D3 rates applicable to the tender. The splicing of catenary wire with contact /insulated catenary wire using ending clamp/splice under the ROB will be paid under this item and half the rate shall be paid for each such splicing.

64. ITEM – D54: Dismantling of a Section Insulator

The price shall cover cost of dismantling of a section insulator assembly and also if required splicing of catenary and contact wires and the necessary adjustments to droppers The dismantled equipment shall be handed over to the Purchaser's Engineer at the spot of dismantling or at the Contractor's / Purchaser's depot's, as required by Purchasers Engineer

65. ITEM – D55: Slewing of equipment

The price shall cover for temporary slewing or lowering of erected OHE adjusted and/or unadjusted to ground for special works, at the request of the purchaser and restoration and readjustment of the equipment after completion of special work. Slewing of OHE shall be paid for the OHE slewed near to the new OHE to be spliced during modification work. The price shall be per location/span or part thereof including anchoring spans. This is inclusive of RC wire and earth wire if any.

66. ITEM – D56: Dismantling of an Isolator

The price shall cover cost of dismantling of an isolator including dismantling of isolator single pole or double pole or gang operated including dismantling of pedestal insulators, operating rod insulator, operating rod and connection to the overhead equipment and associated small parts steel work in isolated cases.

67. ITEM – D57: Dismantlement of OHE mast/structure by cutting

The price shall also cover the cutting and retrieving of the old steel structure as directed by the purchaser. The price shall cover the cutting and retrieving of Old mast of any type including TTU's as directed by the purchasers Engineers at site. While releasing such TTU's proper care shall be taken in such a way that no damage occurred to the Booms. However, the dismantling of the TT boom will be paid under item D61. The OHE foundation must be chipped or broken to a depth of 670mm from the tip of the foundation. All the retrieved mast shall be stacked at the places to the nearest OHE maintenance depot as decided by the purchaser in the section. On completion of cutting site clearance shall be done duly back filling if there any need be. Any small part steels available in the mast/structure shall released safely and handed over to the purchaser. No extra rate is admissible for the same.

68. ITEM – D58: Dismantlement of OHE mast/structure by breaking the foundation.

The price shall cover retrieving of steel mast/structure from the foundation after retrieving the OHE mast the mast hole may be filled with enough soil and as directed by purchaser's engineer. During the time of dismantling operation any deformation occurred it should be set right. The rate shall also applicable for retrieval of TTUs. All the retrieved mast shall be stacked at the place/ depot decided by the purchaser in the section. All the retrieved mast shall be stacked at the place to the nearest OHE maintenance depot as decided by the purchaser in the section. The deformation of mast, occurred either during the retrieval or during transport shall be removed by the contractor. If it is not removed or the mast was cut and removed by the contractor due to other reasons, then the payment will be made only under mast cutting item

Note : All the dismantlement equipment, fittings SPS steel work shall be returned to the purchaser

69. ITEM – D59: Dismantlement of Guy rod assembly

The price shall cover dismantlement of guy rod assembly including Guy Rod mast fitting with V- bolt/loop in an isolated cases where guy rod alone needs to be removed.

70. ITEM – D60: Erection of temporary mast including cantilever assembly, transfer of OHE to new mast and releasing the temporary mast under power/non-power block

The price includes the rate for insertion of 16 feet long sleepers below to the rail and erection of temp mast (Mast and sleepers will be supplied by Railways), erection of Bracket, supporting of OHE. On completion of work transfer of OHE to new mast and releasing of Temp Mast and sleepers are also included in the scope of work. The rate given includes for the work done under power block also. The Transportation, Loading, unloading with or without crane shall be paid extra under transportation of OHE material.

71. ITEM – D61: Releasing of Portal booms under power/non power block

The rate includes releasing of portal booms, TTB's, dismantling of booms and handing over of released materials to the purchaser as decided by the Purchase Engineer in charge. The rate given includes for the work done under power block also. If the contractor desires to use road crane for releasing work, he can do so and no extra payment is admissible for the crane.

72. ITEM – D62: Releasing of plinth/pole mounted. Aux Transformer **along with drop out fuse, fencing panels etc.**

The price for releasing of plinth/pole mounted. Aux Transformer from Location which includes releasing of Drop out fuse and Lightning Arrestor fencing panels, SPS if any and releasing of jumpers from OHE. The released materials are to be handed over safely to the purchaser's Engineer.

SCHEDULE- E

73. ITEM – E1: Transport of OHE material.

The tenderer shall quote the rate per MT-KM for transporting of OHE mast/structure/materials/Contact wires/Centenary and equipments supplied by Railways. The rate quoted will be applicable whether the materials transported are full load or part load of the vehicle. The distance in KM from the place where the transportation to be carried out to the place of un-loading will be based on actual Road route KM. The price shall cover loading, leading of OHE structure/mast from Railways stores/premises as directed by Railway officials and unloading of materials at contractor's depot or at site. For safe loading and un-loading of heavy and lengthy materials, contractor has to arrange cranes.

The rate under this item is inclusive of loading/un-loading by cranes. If the contractor fails to supply materials specified in B1, B2 and B3 and requested the Railways materials, no transportation charges will be payable under this item.

74. ITEM – E2: Supply and Erection of schematic diagrams and shock treatment board

The price shall include the Preparation, Supply and fixing of Sectioning / Schematic / TSWR diagram boards for stations / Cabins / SWS / RCC / Section Controller / Depot and 25 KV AC Traction Staton Working Rule instructions including supply & fixing of shock treatment chart as directed and approved by Engineer.

75. ITEM – E3: Manning of antitheft arrangements

The price shall cover the payment/wages to the staff to be deployed for antitheft transformer location as directed by Employer's Engineer on flat rate basis per month per location. Manning shall be done from 18.00 hrs to 07.00hrs on all days. The staff holding minimum ITI qualification shall be deployed. They shall be fully conversant with operation of various equipment's installed in the station premises. The staff shall be deployed after test and trial by Employer/Engineer and on issue of competency certificate. The staff deployed shall act in accordance with instructions / directions given by Traction power controller (TPC)/representative of Employer. The period of manning shall be decided by the Employer during the execution of contract and manning shall commence on receipt of intimation in writing from the Employer.

Note: Unit of the item shall be 'per month'

SCHEDULE- F (Tools and Plants)

76. ITEM-1: Tirfor 2.5T/1.5T:

The Item price includes cost of supply of Tirfor 2.5T/1.5T, as per IS :5604/1984 or latest, ISI marked (Make TRACTEL /TIRFOR or equivalent as approved by Engineer).

77. ITEM-2: Tirfor 5t /3T:

The Item price includes cost of supply of Tirfor 5T/3T, as per IS: 5604/1984 or latest, ISI marked (Make TRACTEL /TIRFOR or equivalent as approved by Engineer).

78. ITEM-3: **Pull lift 3T:**

Pull lift manual 3T capacity with steel chain 15 Mtr in length, with ISI marked and test certificate for having tested 150% of its capacity.

79. ITEM-4: **Pull lift 3/4T**

Pull lift manual 3T capacity with steel chain 12-15 Mtrs length, with ISI marked and test certificate for having tested 150% of its capacity.

80. ITEM-5: Aluminium/Light weight metal conduit platform ladder trolley

The Item price includes cost of supply of Fibre/light weight, winch type Ladder Trolley suitable to move on railway track for maintenance of 25KV AC OHE with following details:

(a) adjustable height up to 5 mtrs
(b) MS round pipe 1.5" dia,
(c) step distance 300mm of 1.5"MS pipe
(d) Ladder trolley Base size = 1676m (inner)
(e) foldable upper platform 2'x2'
(f) Ladder wheels = 4x12" dia Nylon suitable for 1676mm BG track
(g) Maximum weight of the trolley = 200kg,
(h) Paint: auto finish paint of approved quality.
(Note: - Contractor shall submit the drawing of ladder Trolley for approval by GM/KRIDE before execution of the work.)

81. ITEM-6: Earthing Discharge Rod Complete:

The Item price includes cost of supply of earthing discharge rod of fibre glass, screw type suitable for working voltage of 25KV AC traction as per RDSO specification no ETI/OHE/51(9/87) with latest A&C slip no 1(10/92). The earth discharge rod should be of complete fibre glass body screw type having spring loaded top clamp of copper suitable to fit in catenary/contact wire/ 50 mm dia bus bar, 2 nos. rail clamps having cable junction at 1.5m from rail clamp, along with single core flexible multi strand annealed copper 248/0.45mm size heat resistant PVC cable 10.5 m long (7.5m+2x1.5 = 10.5m). The whole assembly to be supplied in a suitable canvas bag.

82. ITEM-7: Aluminium Straight Ladder Extensive (11m):

The Item price includes cost of supply of Aluminium Straight ladder extendable type (11mtr): Closed height 6mtr, extended height 11 mtr. Ladder shall be made out of Aluminium 'C' shape section size 66.6x31.7mm, step of aluminium corrugated tubing 25.4 mm, as per IS :733-1983 temper-6. It shall be fitted with safety lock, pulley, rope and non-slippery rubber shoes in the bottom. (SUMER make ref-AL100/8809 or equivalent as approved by Engineer).

83. ITEM-8: Portable Electric Drill 21mm, Single Phase,230v (For Drilling) Railli Wolf, Hitachi, Black & Decker Makes Only

The Item price includes cost of supply of portable heavy-duty electric drill suitable for drilling holes of 21mm dia, working on single phase, 230 V AC supply along with 2 no's suitable spare drill bits. (make Railli wolf model WDH-12 or equivalent model of Hitachi/Black & Decker as approved by Engineer).

84. ITEM-9: First Aid Box Filled with Medicines as Per Standard

The Item price includes cost of supply of First aid box made of GI/AL sheet, ISI marked and filled with medicines as per concerned zonal Railway standard with suitable locking arrangement and as approved by Engineer.

85. ITEM-10: Stretcher Two-Fold Type Made of high-quality Aluminium Alloy Tubes:

Two-fold stretcher made of high-quality aluminium alloy tubes. Approx. dimensions: -High position 1900x560x900mm.Low position 1900x500x280mm, weight 40kg approx. suitable for load weight up to 120kg. Make uni-surge-india or equivalent as approved by engineer.

86. ITEM-11: Portable Fire Extinguisher Powder Type

The Item price includes cost of supply of Portable fire extinguisher dry chemical powder as per IS:2171, ISI marked, (10 kg 0R 2 Nos X 5 kg capacity duly filled) as required at site and as approved by engineer. The fire extinguisher shall have expiry date of not less than six months on the date of erection at site.

87. ITEM-12: **D' Shackles Set on Each (1",3/4",5/8",1/2")**

The Item price includes cost of supply of a set of D Shackles made of alloy steel. Set consisting one no. shackle of each size (1", 3/4", 5/8", 1/2"). Shackles shall have loading capacity up to 5T and made as per IS: 6132 and shall be suitable for use in TRD works as approved by Engineer.

88. ITEM-13: Set of Steel Sling 19mm Dia With Eye Each End Of 1M,2M,3M,4M, &10M

The Item price includes cost of supply of a set of Steel slings with eye on both ends. Each set shall have sling of 8mmX2M and 12mmX3M length as approved by Engineer.

89. ITEM-14: **Digital Micro Meter 0-25mm Resolution 0. 001mm.Mitutoyo Make or Equivalent as Approved by Engineer.**

Item price includes cost of supply of Stainless Steel Digital micro meter capable of measuring diameters of 0-25 mm having resolution 0.001mm and accuracy of (+/-)1µm. Mitutoyo make or superior as approved by Engineer.

90. ITEM-15: Canvass Tarpaulin 12m X 12m

The Item price includes cost of supply of Canvass Tarpaulin 12mx12m size with nylon ropes and spikes of adequate size as approved by Engineer.

91. ITEM-16: Binoculars NIKON Model-8252 Aculon A211,10-22x50:

The Item price includes cost of supply of Binoculars Nikon-8252 ACULON A211, 10-22x50 zoom Binocular or equivalent as approved by Engineer.

92. ITEM-17: Vernier Calipers Digital Type 0-200 Mm Range:

The Item price includes cost of supply of Vernier Calipers Digital, range 0-200mm.Mitutoyo make Model 500-197-30 or equivalent as approved by Engineer.

93. ITEM-18: Walkie Talkie Sets (2w Output)

Item price includes cost of supply of Trans receiver, VHF, hand held Walkie – Talkie set 5W (tuned for rated power of 2 watts), 16 channels synthesized with 2200 mAH, Ni-Mh Battery pack. Configuration VHF-3 band 136-174MHz full band (OR in between range) along with one spare battery pack of capacity 2200mAH and rapid charger. The VHF walkie-talkie shall be MIL standard compliant for 810. The battery pack to be supplied should be compatible with the set.

Technical Specification

(1) Frequency Range: 136-174 MHz (or in between frequency range)
(2) Number of Channels: 16 channels or more.
(3) Type of Operation: Simplex, press to talk with built in condenser mic and speaker.
(4) Transmitter RF Power Output: 1W/5W ±0.5dB Switchable / programmable.

Rapid Battery Charger:

(a) Input Voltage: 230v +/- 10%, 50 Hz
(b) Input Voltage: As per the set battery pack for which charger is submitted.
(c) Charging Capability: Capable of charging 1 battery set at a time.
(d) Battery charging Rate: The charging current shall be within 1Amp.
(e) Reverse polarity protection (DC input) to be provided.
(f) Reverse polarity protection (Battery Terminal) should be provided.
(g) Short Circuit protection should be provided
(h) Visual indication for all modes of charging status.
(i) DC input cable with battery eye let to be provided with DC operated charger.

Model Motorola GP-328/Kenwood TK-2000

94. ITEM-19: **Digital Multi-meter 1000V,10A Motawane Make DM352 Or Equivalent as Approved by Engineer.**

The Item price includes cost of supply of Digital multi-meter suitable for measuring DC Voltage up to 1000V, AC voltage up to 1000V true RMS, AC & DC current up to 10A, resistance up to 20 MΩ, diode & continuity test facility with battery, carry case and leads etc similar to Motwane make model DM352 or superior as approved by Engineer.

95. ITEM-20: **Drop Out Fuse Pull Rod:**

The Item price includes cost of supply of Drop out fuse pull rod made of fibre body, extension type, suitable for use on 25 KV OHE as per RDSO spec No: ETI/PSI/14 (1/86) and CORE/ALD dwg. No POWER/RLY/1849 as approved by Engineer.

96.ITEM-21: **1/2" Square Drive Socket Set Containing 22 Sockets With 5 Attachments:**

The Item price includes cost of supply of 1/2" square drive socket set containing 22 sockets with 5 attachments packed in power coated carrying case. Make Taparia Model S11MXL or equivalent as approved by Engineer.

97. ITEM-22: Transformer Oil Acidity Testing Kit:

The Item price includes cost of supply of Transformer oil Acidity testing Kit consisting of one polythene bottle of rectified spirit (ethyl alcohol), one polythene bottle of sodium carbonate solution and one bottle of universal indicator (liquid). It also consists of clear and transparent test tubes and volumetrically scaled syringes, all contained in MS box suitably painted and as approved by Engineer. The price includes the cost of site demonstration by OEM engineer with suitable training of staff.

98. ITEM-23: Pocket-Size Clip-On Tong Tester

The Item price includes cost of supply of clip-on Tong tester suitable for measuring AC current up to 600Amp, FLUKE 303 or Motwane make DCM-45A model as approved by Engineer.

99. ITEM-24: Digital Time Interval Meter 15-1000 Seconds

The Item price includes cost of supply of Digital breaker time interval meter suitable for measuring open/close time of CBs/interrupters used in TSS as per specifications given below:-(a) Display: - 4 digital LED display with 7 segment LED (b) Poles: - Three (c) Range 0.1m Sec to 9999 Sec (d) Accuracy: -±0.1% -± 1 count (e) Power: - 220-250V, AC single phase (NTPL make ref –NTT4DSA-5R OR Anuvidyut Pvt Ltd Model-1425 better or equivalent as approved by Engineer)

100. ITEM-25: Insulation Tester 2.5KV

Insulation tester 2.5KV Analog similar to CIE make Model no.CIE/444 confirming to IS:2992/1987 complete with suitable product

101. ITEM-26: Insulation Megger 500V Megger Make or Equivalents Approved by Engineer.

The Item price includes cost of supply of Insulation Megger with voltage selectable range of 250V, 500 V, 1000 V, digital numeric display and IR measurements up to 999 M Ohms in hard carrying case with all standard accessories similar to Megger make model MIT310 or superior as approved by Engineer.

102. ITEM-27: Load Cell Tester:

The Item price includes cost of supply of Load cell tester suitable for 40 AH and 200 AH battery as approved by Engineer.

103. ITEM-28: Emergency Telephone:

The item price includes cost of supply of portable Emergency Telephone 4 Wire as per Spec. no IRS:TC 75/99 with latest amendment 1,2 or latest RDSO specification

104. ITEM-29: Spanner set:

The Item price includes cost of Supply of Spanners set. One set for payment purpose shall consist of: -
(a) 4 sets of double ended Ring spanners (6mm to 42mm size, 12 pieces)
(b) 4 sets of double ended Flat spanners (6mm to 42mm size, 12 pieces)
Make: Gedore or Taparia make with ISI Mark as approved by Engineer.

105. ITEM-30: Cogex or similar 52 Piece Socket Set (box spanners)

The Item price includes cost of Supply of 52 pieces socket set (box spanners) with storage case. Cogex or similar make as approved by Engineer.

106. ITEM-31: Rail Jumpers set with Clamps at both ends along with RITES inspection certificate. Set consisting of: as per RDSO Drg.No:RE/DNR/EL/TP/07

The item price includes cost of supply of Rail jumpers made of multi-strand copper PVC Cable 248/0.457 mm size with suitable clamps at both ends as per RDSO specification no ETI/OHE/3/ (2/94) with A& C slip no 1 (04/95) or latest as approved by Engineer in specified length.

107. ITEM-32: Dropper making jig and wire straightener for 5mm dropper wire

108. ITEM-33: Come along clamps for catenary suitable for 19/2.65mm conductor

The clamp shall be of self-gripping for catenary wire, required fabricated with alloy steel, while the shackle is forged from high tensile steel

109. ITEM-34: Come along clamps for contact wire 107mm

The clamp shall be of self-gripping for contact wire, required bodies fabricated with alloy steel, while the shackle is forged from high tensile steel

110.ITEM-35: Come along clamps for aluminium “SPIDER” Conductor(20mm)

111. ITEM-36: Come along clamps for earth wire(19/2.5mm) Galvanised Steel

Bodies of these clamps are made up of alloy steel while the clamp in bolt & nuts are made up of high tensile steel

112. ITEM-37: Contact wire cutter 36” as per RDSO specification and approved vendor

113. ITEM-38: Dropper wire cutter 12”

114. ITEM-39: Single Sheave pulley block 3 1/2” x 1/2” Groove Steel

It shall open from one side of the frame which facilitate easy loading and unloading of PP rope. The frame shall be made of aluminium alloy and sheave is made up of nylon. The eye hook swing around on its pivot, Done on top of the frame. The pully shall roll on ball bearings

115. ITEM-40: **Single Sheave pulley block 3 1/2” x 1/2” Groove Fibre for drawal of contact catenary wire**

It shall open from one side of the frame which facilitate easy loading and unloading of PP rope. The frame shall be made of aluminium alloy and sheave is made up of nylon. The eye hook swing around on its pivot, Done on top of the frame. The pully shall roll on ball bearings

116. ITEM-41: **Single Sheave pulley block 6” x 1” Groove Steel**

It shall open from one side of the frame which facilitate easy loading and unloading of PP rope. The frame shall be made of aluminium alloy and sheave is made up of nylon. The eye hook swing around on its pivot, Done on top of the frame. The pully shall roll on ball bearings

117. ITEM-42: Contact wire twist-cum bender 6” as per RDSO spec and approved vendors.

118. ITEM-43: Contact wire splicing jig as per RDSO spec and approved vendors.

119. ITEM-45: Portable Electric Drill Machine 13mm

The Item price includes cost of supply of portable heavy-duty electric drill suitable for drilling holes of 13mm dia, working on single phase, 230 V AC supply along with 2 no's suitable spare drill bits. (make Railli wolf model WDH-12 or equivalent model of Hitachi/Black & Decker as approved by Engineer).

120. ITEM-46: Mobile Aluminium Ladder 36'. The vendor shall get approval before supplying this item.

121. ITEM-47: Air Cooled, regulator type welding machine (Single phase,230V, with output 250amps)

The Item price includes cost of supply of Portable arc welding machine 250A capacity, rated output current 10-250Amps, rated output voltage 28V, Rated input power-5KVA, Electrode size & welding thickness 0.5mm to 3.15mm, suitable to work on 230 V ± 15%, 50Hz single phase AC supply, Insulation class-B or higher, IP23 protection, Complete set shall be supplied along with suitable copper electrode holder, earth clamp and PVC copper multi-strand cable of 10 m length

122. ITEM-48: Aluminium Straight ladder (8m) with hook on top

Aluminium 8M Hook Ladder, Corrosive Resistant, Fitted with solid rubber shoes. The aluminium alloy shall confirm to IS:733 with Latest amendments. The rounds shall be non-slip, serration running full length. These shall be fixed by expanding and flaring and shall be placed at 25cm centre to centre. The ladder shall be as light as possible

The ladder shall be permanently printed with Manufacturer name or trade mark, Size of ladder, Year of manufacture.

123. ITEM-49: Crimping Tool up to 6 sq.mm

The item price includes cost of supply of crimping tool similar to Dowells make model-SYT-2, Crimping range (1.5-16 sqmm)

124. ITEM-50:Chain pulley block 3.0-ton cap

Chain pulley block 3T capacity manual, with mild steel standard lift 3M, hoisting speed 2mtr/minute with manufacturer, test certificate confirming to IS with ISI marking

125.ITEM-51: Safety electrical rubber hand gloves 33KV

Insulating rubber outlet class 4, voltage ≤ 36,000V the gloves shall be superior quality confirming to IS:4770/1991 with latest amendments, soft seamless latex shock proof. The glove shall be smooth both inner & outer without any patches, blisters, porosity, or any other physical defects.

Each insulated rubber hand glove shall be marked with:

Size & Type of gloves, Maximum working potential, Manufacturing name or recognized trade mark, Month & Year of Manufacture, Confirming to IS:4770. 'Tester 2' shall be marked, without impairing the quality of gloves

Copy of the test certificate from any CPRI/ERDA/NABL Accredited test lab is to be submitted

126. ITEM-52: Supply and commissioning of OLIVIR-G Plus system (Overhead Line Inspection with Video Recording and GPS making system for current collection test) as per RDSO specification No. TI/SPC/OHE/OLIVIR/0051 or latest

The Item price includes cost of supply of GPS based OHE monitoring & current collection system Oliver–G as per RDSO spec No: TI/SPC/OHE/OLIVER/0051(01/15) or latest. The price includes all accessories/authentic software required for the mapping as per mentioned RDSO specification. The price also includes the cost of site demonstration by OEM engineer with suitable number of days of training to staff.

127. ITEM-53: **Thermal infra-red vision camera Model T1-160 of ULIR Vision make or similar**

The Item price includes cost of supply and commissioning of Thermal Imaging Camera with software, minimum, resolution 384x288, with IR-optical focus system, LED flash system with minimum Temperature range of -20 to +500 degree centigrade, conforming to RDSO Spec no TI/SPC/OHE/TIPS/1031 or latest. The rate also includes the manufacturer recommended battery packs (02 numbers) and battery charging adapter / charger (one number). The price also includes all other accessories including software essential for operation, carry bag, camera case etc. The price also includes the cost of site demonstration by OEM engineer with suitable number of days of training of staff. The entire system shall be supplied as approved by Engineer (CEM make Model No. DT9885 or superior).

NOTE:

i. Trimming/cutting of trees shall be as per Rly Bd Letter No.2008 / Elect (G) /161/8 Vol II dated 05.09.2012 or latest.

ii. Splices in Large span wires shall be avoided. (Rly bd Letter no.2008/Elect (G)/161/8 Vol II dated 26.09.2012 or latest.

iii. Long Cross type G jumpers shall be provided on parallel run side of Cross overs / Turn outs as per RDSO drawing or latest.

iv. Projection of RT at Pull –off locations shall be as per RDSO drawing no. ETI/OHE/G/02106 Rev C or latest.

v. Gap between mast fitting for hook insulator and top of mast should be as per drg no.RE/33/G/000141 or latest.

vi. Wherever possible, the tower wagon shall be facilitated by K-Ride through SW railway for final Checking and alignment of OHE to measure stagger and other inspections. Contractor shall ensure qualified staff with sufficient men and materials for optimum utilization of the tower wagons.

PART - C

PAYMENT PROCEDURE

Scope:

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

SCHEDULE OF PRICES :

(a) **Prices for items from Schedule A to F:**

The rates given against various items of work in six Schedules viz., Schedule -A to F of the tender. The tenderers are required to quote a single percentage below/at par/above each schedule separately. The actual payment to be made against any item of Schedule A to F, shall be derived after loading the prices of that schedule with the tenderer's quoted percentage for the same schedule. The prices so obtained shall be the unit prices for the various items of work given in Schedule A to F.

All Unit prices shall be FIRM irrespective of minor variations in basic quantities and use of alternative types of various components and fittings approved by the purchaser. Minor changes in basic designs shall not affect the unit prices, so long as such changes are mutually agreed to by the Purchaser and the Contractor. All Unit Prices shall be in Rupees. The prices shall be for materials and erection except for the materials supplied by the purchaser for which only erection charges will be payable, and for execution of work in accordance with specifications and approved drawings and designs.

(b) UNIT PRICES FOR MATERIALS

The prices indicated for Schedule A to F supply items 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 or road from manufacturer's factory and completing all necessary formalities in this respect, such as submission of forwarding notes, collection of railway receipts, all insurance premia or any other charges, indemnity bond for the material supplied for which on-account payment exists etc. as also siding or shunting charges, if any, levied.

The prices shall include all taxes, duties and levies (including Octroi etc.) applicable on this works contract. Therefore, Bidder should quote their prices taking into account the rate of taxes as leviable in the event of sale through works contract to the Central Government Organization in that state.

The price shall also include provision for losses and wastages in transit and erection.

FOR ERECTION.

The unit prices indicated for Schedule – A to F erection items are inclusive of cost of erection and testing to be done by the Contractor to the extent indicated in Section 7 B and also cover all cost of administration of the contractor, insurance premium, banker's charges for guarantees, cost of stamps, cost of storage, loading and unloading and handling of materials and for any road transport which the contractor may use for carriage of materials between his depot and depot/s and site of work. The unit prices shall include cost of works and adjustments necessary to be done by the contractor during or after the tests carried out by the Purchaser as Section 9.

(c) Copper Items:

i. **The tenderer shall carefully note that purchaser will supply only 107 sq.mm Hard Drawn Grooved Copper (HDGC) contact wire and 65 Sq.mm cadmium copper catenary wire.**

ii. **The Tenderer has to safeguard the contact and catenary wires and he has to give Indemnity Bond.**

iii. All other items in connection with Execution of OHE shall be supplied by the tenderer.

(d) Other price adjustments:-

(i) No adjustment on account of variation in insurance and freight charges (road or rail) will be permitted.

(ii) Price variation on material: No adjustment of unit prices of fittings, materials, equipments or components on account of prices, fluctuation on raw materials will be permitted. No adjustment on account of variation in insurance and freight charges (road or rail) will be permitted. However, reimbursement on account of prices fluctuation on Ferrous, Non- Ferrous, Steel, Zinc required for Structures and small parts Steel, Cement and Erection component will be allowed as per Chapter 13 of section 6 of GCC.

NOTE:

(i) Rates accepted by K-Ride shall hold good till completion of work and no additional individual claim shall be admissible except:-

(a) payment/recovery for increase/decrease in GST on works contract or imposition/removal of any tax/cess on Works Contract.

(b) payment/recovery for overall market situation shall be made as per Price Variation Clause.

(ii) No cognizance will be given for any sort of fluctuations in taxes and other market conditions etc. for any individual items for the purpose of making adjustments in payment except as provided for in the under noted clauses.

(iii) Price Variation clause (PVC) shall be applicable only for contracts of value (contract agreement value) Rs.5 crore and more, irrespective of the contract completion period.

Materials supplied free of cost by K-Ride to the contractors shall fall outside the purview of Price Variation Clause. If, in any case, accepted offer includes some specific payment to be made to consultants or some materials supplied by K-Ride free or at fixed rate, such payments shall be excluded from the gross value of the work for the purpose of payment/recovery of price variation.

(e) **QUANTITIES**

The approximate estimated quantities of various items of work are included in Schedule -A to F, under column quantities.

(f) **Explanatory Notes:**

Explanatory notes for various items of work included in Schedule A to F, are given in Section 9 Part B.

(g) **New items of work**

i) During the execution of the work, if the Contractor is called upon to carry out any new item of work not included in Schedule A to F, the Contractor shall execute such works at such prices as may be mutually agreed upon with the Purchaser before commencement and these will be based on the rate analysis as per the current market / prevalent rates of such or similar items available with the K-Ride 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 hereon-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 decided by the Purchaser. However, if the contractor is not satisfied with the decision of the Purchaser in this respect, he may appeal to GM/Elect/KRIDE within 30 days of getting the decision of the Purchaser, supported by analysis of the rates claimed. The GM/Elect/KRIDE decision after hearing both the parties in the matter would be final and binding on the contractor and the Railway.

A. PAYMENT PROCEDURE

1. ON ACCOUNT PAYMENT AGAINST SUPPLY OF MATERIAL

On Account Payment will be made as described below:

(i) **"On Account Payment"** shall be made for the items specified in detailed terms of payment of each schedule under clause No. 4.0 as given below.

(ii) **'On Account Payment'** For Schedule A to D shall be made to the extent of 85% of the accepted supply rate, after receipt, acceptance, accountal, proper storage and protection against loss, damage or deterioration on the items mentioned in each schedule.

(iii) **'On Account Payment'** made to the contractor will subsequently be adjusted against progress payments and against payment due on provisional acceptance.

(iv) All invoices shall be accompanied with the following, for the purpose of arranging **'On Account Payment'** against the contract

NOTE: All *the invoices should be accompanied by the following:-*

⇒ Supplier's challans.

⇒ Transport challans

⇒ Inspection Certificate granted by the Purchaser's representative/RITES.

⇒ Certificate of receipt of materials at Contractor's Depot/s duly accepted by the Purchaser's Engineers.

⇒ Certificate that the stores have been insured.

⇒ Quality assurance documents

⇒ Invoice from approved vendor against our contract

⇒ Certificate that contractor stores/depot has been insured. (Insurance copy to be submitted.)

2. PROGRESS PAYMENT AGAINST SUPPLY AND ERECTION OF MATERIAL:

On completion of each item of BOQ, the contractor shall receive payment to the extent of 95% of the supply and erection costs after making any recoveries and adjusting of On Account Payment, which may be due.

3. REMAINING 5% PAYMENT:

The balance 5% of each item of the BOQ shall be paid to the contractor after commissioning and After Completion of all the work in all the respects of the portion of the work or handing over of the installation/material to the employers/Railways representative. This is applicable for all schedules.

4.0 PROCEDURE OF SCHEDULE WISE PAYMENTS

4.1 Schedule A:

(i) On Account Payment will be made only for item Nos. A3 as per terms and conditions given in clause No. A (1) under "Payment Procedure".

(ii) The **Progress Payment** to the extent of 95% of all the items in the schedule shall be paid for the supply and erection prices after final adjustment of OHE and SED checking and after adjustment of **"On Account payment"** & other recoveries, if any, wherever applicable.

4.2 Schedule B: MAST AND PORTALS

On Account Payment shall be made only for item Nos. B1-B4 as per terms and conditions given in clause No. A(1) under **"Payment Procedure"**.

(i) On completion of erection of masts and portals of each agreed sub-section, the Contractor shall receive payments to the extent of 85% of the prices for erection of masts and portals.

(ii) On completion of erection of SPS and Brackets, the Contractor shall receive payment to the extent of 95% against accepted schedule rates. However, payment conditions can be relaxed by GM/K-RIDE for Second

Stage of Progress payment to the extent of 95% if the erection of SPS and Brackets gets delayed by more than **TWO months** purely on K-Ride's account. The decision taken in this respect by the Purchaser shall be final and suitable safeguard may be provided to protect Purchaser's interest.

4.3 Schedule C: (FOUNDATION)

(i) Payment will be made on casting of foundation blocks, with or without Core holes, to the extent of 70% of the Prices for Sec.-C and on the total volume of foundation blocks inclusive of muffs, as included in the approved cross-section drawings or as installed at site with permission of the Purchaser's representative. For this purpose, the entire section to be equipped with Traction overhead equipment under contract will be divided into convenient Sub-section as may be mutually agreed to. In case the Contractor is unable to cast all the foundation blocks on a particular Sub-section, due to reasons accepted as justified by the purchaser, payments will be made to the extent of work done in the Sub-section. One more supplementary payment may be made in respect of left-over work when the work is completed.

4.4 Schedule D:

(i) Item No. D1 (Design & Drawing)

The payment shall be made as under:

(a) 50% of Scheduled rates shall be paid after "in principle approval of design/drawings by KRIDE".

(b) 45% of Scheduled rates shall be paid after the submission & acceptance of as erected/ completion drawings by K-RIDE.

(ii) Other items except item No. D1:

a. **On Account Payment** will be made only for item Nos. D15, D16, D25, D26, D27, D28, D29, D30, D31, D32, D33 and D41, D43 and as per terms and conditions given in clause No. A(1) under "Payment Procedure".

b. **On Account Payment for Item No. D4-D6 :**.The ONA Payments of Bracket Assembly is permitted only after receipt of the below mentioned parts of the Bracket Assembly

Stay arm Insulator(Porcelain/Composite) – 1 Off
Bracket arm insulator(Porcelain/Composite) – 1 Off
25 mm Stay/RT Tube – 6 mtr

40 mm/49 mm Large Bracket tube – 3 mtr
BFB Steady arm – 1 mtr
Catenary suspension bracket assembly – 1 off

After erection final adjustment of OHE and SED checking, contractor shall receive another 10% payment".

Progress Payment to the extent of 95% of all the items in the schedule shall be paid for the supply and erection prices after final adjustment of OHE and SED checking and after adjustment of **"On Account payment"** & other recoveries, if any, wherever applicable.

4.5 Schedule E:

The Payment against Schedule- E Items shall be made to the extent of 95% of the accepted price on receipt & accountal of material .

4.6 Schedule F:

Procurement of items shall be as approved by Engineer-n-charge. 95% of the accepted price shall be paid on receipt & accountal of material at site or required destination after inspection and production of documents as listed below:

(i) Supplier's Delivery Challans.
(ii) Inspection certificate granted by the authorized approved agency/Purchaser's representative as per contract.
(iii) Certificate of receipt of material at Contractor's depot/work sites duly accepted by the Engineer.
(iv) Quality Assurance Documents including Guarantee/Warrantee, if any.

5. Other items of Supply and/or erection

(i) On completion of erection of other items, Section-A to Section-D, on each agreed sub-section, the Contractor shall receive payments to the extent of 85% of the erection prices included in schedule - A to D.

(ii) On completion of stringing of catenary and contact wire the contractor shall receive payment to the extent of 95% against respective item of Schedule, Section-A to D, for that portion of work, less payment made for that item under progress payments indicated supra. However, payment conditions can be relaxed by the **GM/K-RIDE** of the project to the extent of 95% second stage of progress

payment if the stringing of catenary, contact wire gets delayed by more than TWO months purely on K-Ride's account. The decision taken in this respect by the purchaser shall be final and suitable safeguard may be provided to protect K-Ride's interests. For Schedule E upon stringing of catenary and contact wire in the relevant block section (where item has been erected) 95 % payment shall be done against respective schedule.

6. Progress payment for erected bracket assemblies , will be made even though the register arm dropper and steady arm are not erected and final revision and adjustment are not done. 85% of the progress payments due for overhead equipment, will be made when the catenary and contact wires are strung and droppers installed. 10% of the progress payment due for overhead equipment, will be made only after the catenary and contact wires are finally adjusted for proper height and/or stagger and all other items of work included in this item are fully completed (vide explanatory notes Section 9 Part B) and work in the respective section is completed. Progress payments for other items, Section-A to D, will, however, be made after the relevant/ equipments are in position even though the final revision and adjustments are not done.

However, payment conditions can be relaxed in exceptional circumstances for second stage of progress payment to the extent of 95% if adjustment activities of catenary/contact wire or completion of other subsequent works related to this payment are delayed by more than TWO months purely on K-Ride's account. The decision taken in this respect by the purchaser shall be final and suitable safeguards may be provided to protect purchasers' interests.

7. In case a portion of the work is carried out during power block, 100% extra will be paid over and above the accepted erection rate (i.e. without adding extra for manual erection) of relevant item on certification by engineer. This shall be paid only for erection of equipment in the vicinity of energized overhead equipment and feeders or erection of equipment with joints equipment already energized or on energized equipment which calls for a power block (shut off of traction power). The price payable under this item shall be 100% extra over the erection rates of the item referred against each item, provided such work is not called for on account of non-compliance with specifications, approved drawings and instructions given by the Employer from time to time.

The extra erection rate under this item will not be payable, if power block is given for a total **duration of 04 hour or more in a day**. Where the prices under this item are applicable, the contractor shall finalize the quantities of various items of work to be done under a power block, jointly with the Employer's Engineer prior to taking the work in hand."

8. OHE material shall be inspected by M/s. RITES/ RDSO representative as per the extant directives from Railway/KRIDE. The inspection charges of materials as required by RDSO/RITES shall be borne by contractor. If the inspection is carried

out other than by RDSO/RITES, 1% of the cost of material will be deducted by KRIDE as inspection charges.

9. TERMS OF PAYMENT:

9.1 All bills shall be submitted by firm/contractor only (to whom contract has been awarded) to the authority mentioned in Preamble.

RECOVERIES FROM THE CONTRACTOR:

(a) All the recoveries for materials supplied and services rendered by the Purchaser to the Contractor and other refunds due from the Contractor shall, unless otherwise specified, ordinarily be made by deductions from payments due to the Contractor covering the value of supply and erection in the progress payment for erection and from payment on provisional Acceptance.

(b) The cost of shortage of materials in case of final reconciliation will be recovered in full by the Purchaser at relevant price in or book rate or last purchase rate whichever is higher, to the extent of requirement of such materials for each sub-section.

NOTE : (1) If there are any shortages during final reconciliation, their cost will be recovered by the Purchaser from the Contractor at the book rate or the last purchase rate or the prevailing market rate, whichever is higher, plus 5% on account of initial freight, 2% on account of incidental charges together with supervision charges at 12.5% of the total cost inclusive of material freight and incidental charges. Freight between the Purchaser's source of supply and the Contractor's depot shall be to the Contractor's account.

(c) The cost of materials if supplied under Section 9 (under other railway stores). will be recovered in the manner indicated in sub-para (a) above.

(d) The materials supplied under Section 9 (under other railway stores) shall be covered by the suitable indemnity bond till the work is completed as certified by Engr.-in-charge.

(e) The Performance security shall be as per item 4.2 of the section 8 .

PAYMENT FOR ADDITIONAL SUPPLIES:

The contractor shall receive payment for additional supplies ordered if any, in accordance with the prices included in Section 9 Schedule- A-F, on delivery of such supplies to the purchaser after due adjustment against 'On account' payment made only if purchaser accepts or ask contractor to supply the same.

FINAL PAYMENT:

On the basis of Work Completion certificate issued by the Engineer for all the works in all the sections covered in this contract, the final bill for the balance payment for each item/sub-item of work shall be submitted by the Contractor along with a clear "NO CLAIM CERTIFICATE'. The provisional acceptance certificate shall be issued by the Engineer only when he has accepted the work wholly after conducting the acceptance tests on each item of work.

FINAL SETTLEMENT :

On expiry of the guarantee period and issue of the certificate of final acceptance of the entire installations, the security deposit will be refunded or Bank Guarantee released to the Contractor after adjustment of any dues payable by the Contractor.

MEASUREMENTS:

(a) Payments for field work shall be made in accordance with approved designs and drawings and measured in relevant units except where provided or 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 work are less than those shown in the approved designs and drawings and the work is accepted without being rejected, payment will be made as per work actually done.

(b) The measurements will be made generally in accordance with standard engineering practice and in conformity with the explanatory notes for schedule - A to F (Section 9 Part B).

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

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

PART -D

TECHNICAL SPECIFICATION

INTRODUCTION :

(a) This part of Tender papers contains general, technical and other specifications for design and erection of complete 25 kV A.C. 50 Hz single phase traction overhead equipment, switching stations, L.T. supply transformer stations complete with foundations, structures, return Conductors and 25 kV feeders, if any. This part also gives reference to technical specifications of materials and components, procedure for submission of designs and drawings of basic arrangements, components and fittings designs and other typical designs relating to overhead equipment, switching stations and booster transformer stations and Traction Sub-stations. A list of the standard drawings is included in Annexure-1, Part E of this section.

(b) **Indian Railways Schedule of Dimensions**:

To avoid infringements of various parts of OHE {Structures, Foundation, live parts, equipments etc. included in Para - 2.1.12(d) " INSULATION CLEARANCE", 2.1.17 (a) "CLEARANCE" and 2.6.9 (c) "INFRINGEMENT TO STANDARD DIMENSIONS"} with standard dimensions mentioned in “Indian Railways Schedule of Dimensions 1676 mm Gauge (BG) Revised - 2004 with Addendum & Corrigendum slip Nos. 1 to 26 or its latest revision issued by Railway Board " shall be followed.

SYSTEM PARTICULARS:

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

POWER SUPPLY :

(a) TRACTION SUB-STATIONS

Electric power will be supplied at 25 kV A.C. 50 Hz. single phase from traction sub-stations to feeding stations spaced 50 to 80 km apart along the track.

(b) SWITCHING STATIONS

Power supply will be controlled to the different sections of traction overhead equipment by switching stations. At these stations the switching will be effected by means of "Interrupters” which are single pole, non-automatic Oil/SF6 circuit breakers capable of repeatedly interrupting normal full load current. There are three types of switching stations :-

(1) Feeding stations;
(2) Sectioning and Paralleling Post, and

(3) Sub-sectioning and Paralleling Post.

(c) FEEDING STATIONS

Supply will be effected to the overhead equipment through switchgear installed at feeding stations. All feeding stations will be located normally near the track.

(d) SECTIONING AND PARALLELING POST

The sub-stations cannot, as a rule be paralleled and consequently a neutral section of overhead equipment with insulated overlaps on either side will be provided approximately midway between two consecutive feeding stations. Neutral sections may also be provided at feeding stations. Facilities to bridge the neutral section between feeding stations will be provided at sectioning stations.

(e) SUB-SECTIONING AND PARALLELING POST

In order to facilitate maintenance of overhead equipment and to permit isolation of faulty sections and expeditious restoration of power supply in healthy sections, sub-sectioning stations with insulated overlaps will be provided between the feeding stations and the sectioning stations.

In double line section one interrupter will be connected paralleling between two lines

TRACK :

(a) GAUGE AND TRACK CENTERS

The track gauge is 1676 mm (5'-6"). In multiple track zones, the normal distance between track centers varies between 4270 mm (14'.ft) and 4420 mm (14'-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 a maximum speed of 80 Km/h (Approx. 50 miles/h) if unregulated, unless otherwise specified in Part-III for any particular section.

Note : (i) The OHE shall be with swiveling type of cantilever having tension in the conductors regulated automatically, with a pre-sag of 100 mm.

(ii) Maximum Contact wire gradient shall be 3 mm per meter and maximum difference in contact wire gradient between two adjoining spans shall be 1.5 mm per meter.

(c) CURVES

The minimum radius permissible is 175 m (573 ft.) i.e. a 10^0 curve. Inside station limits, the curvature at a 1 in 8.5 turnout is 8 degree i.e. of radius 219m (716 ft.).

(d) SUPER ELEVATION

The maximum super elevation is 165 mm (6.5"). On curves, the minimum setting of structures shall be decided on the basis of maximum super elevation 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 (See relevant drawing listed in Annexure-1, Part E).

(g) DISPLACEMENT

The general design of overhead equipment shall permit a displacement of ± 100 mm 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.

SECTIONING:

(a) INSULATED OVERLAPS

Insulated overlaps are provided for facility of isolation. Some of the overlaps may be provided with manually operated isolators switches. In addition, for connecting the overhead equipment to booster transformers, insulated overlaps are indicated in the sectioning diagrams.

(b) YARD SUPPLY

The sectioning diagram/s also indicate the tracks in stations yards and siding whose equipment is electrically independent from those of other tracks.
The overhead equipment in yards and sidings may be fed through isolator switch or interrupter in accordance with arrangement indicated in the sectioning diagram/s.

(c) SECTION INSULATORS

Section insulators shall be provided as indicated in the sectioning diagrams, or 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 the approved drawings.

(d) FEEDERS & RETURN FEEDERS 25 KV ALONG TRACK FEEDERS

25 kV along track feeders may connect sections of overhead equipment to a switching station or an isolator switch or gantry. Such feeders will be run usually on traction structures and sometimes on independent masts. A single 'SPIDER' conductor shall be used for such feeders.

(e) RETURN CONDUCTOR

Return conductor may, be run on traction structures or masts. A single 'SPIDER' conductor shall be used for such return conductors.

(g) SCHEMATIC ARRANGEMENTS

The different arrangements of feeders, return feeders, 25 kV along track feeders and return conductors are shown in the drawing listed in Annexure-1 (Part E).

(h) SECTIONING DIAGRAM

The provisional sectioning diagram/s of the sections to be electrified will shared with the contractor after LOA is issued.

PANTOGRAPHS :

(a) The outline of the pantograph, its dimensions and its current collecting area are shown in a drawing listed in Annexure-I (Part E).

(b) NUMBER 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 15 kg.

(c) SPACING IN MULTIPLE HEADED TRAINS

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

(d) INSULATION CLEARANCE

The electrical clearances for the pantograph on tangent tracks and on curves for design and erection of overhead equipment shall be based on the schedule of Dimensions mentioned in Para - 2.1.1(c) "Indian Railways Schedule of Dimensions".

OVERHEAD EQUIPMENT:

(a) BRIEF DESCRIPTION

Essentially the traction overhead equipment shall consist of a standard catenary wire from which a grooved contact wire is suitably suspended by means of droppers. In order to cater for a speed of 160 kmph the contact wire is given a pre-sag of about 100mm for 72 m span and reduced suitably for other spans.

(b) CATENARY

The catenary wire shall be of cadmium copper 19/2.10mm, 65mm$^{2.}$

(c) CONTACT WIRE

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

(d) DROPPERS

Droppers shall be made of hard drawn round copper wire; approximately 5 mm dia. Droppers shall be spaced not more than 9 m apart (see Annexure-1 (Part E)).

(e) ENCUMBRANCE

As a general rule, the nominal "encumbrance" i.e. the center distance between the catenary and the contact wire at the support shall be 1.40 m. Deviation from this figure will be permitted in special cases (e.g. spans near over-bridges, structures with more than one cantilever etc.).

(f) JUMPERS

All jumpers connected to OHE conductors shall be of copper only. The in-span jumpers potential equaliser jumpers at insulated overlaps and neutral section, shall be of 50 mm sq. nominal, 19/1.8mm size. Flexible jumpers of nominal section 105mmsq, 19/7/1.06 mm size shall be used at overlaps, turnouts, crossings etc.

(g) BRIDDLE WIRE

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

(h) ANTI THEFT JUMPER

Anti theft jumper of 50 mm sq. nominal, 19/1.8 mm in size shall be used in out of run wire of conventional OHE and copper cadmium anticreep wire as an anti-theft measure.

The jumper connecting the AL. Conductors to any other conductors terminal or clamp shall be made with the aid of suitable bi-metallic clamps. All Aluminum jumpers of size 19/7/1.4 mm bare 3/4 hard shall be used to connect other Aluminum 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 a separate jumper wire.

TYPE OF EQUIPMENT:

The overhead equipment used shall normally be either of the regulated or unregulated type. Unregulated tramway type equipment (contact wire only) may be adopted where specially indicated by the purchaser.

(a) REGULATED

In the regulated type of overhead equipment, the tension of both the catenary and the contact wires shall be maintained at a constant value at all temperatures by means of automatic tensioning devices desired to take up the variation in the length of overhead equipment due to temperature variation.

An anti creep shall be provided at a point approximately midway between two tensioning devices and not more than 750 meters from any one of them. The general arrangement of an anti-creep is shown in a drawing listed in Annexure-1.The arrangement shall generally consist of the galvanised steel wire anchored on the masts adjacent to the anti-creep central mast in accordance with the relevant drawing listed in Annexure-1.Part E.

Alternatively, the arrangement may consist of anchoring the catenary on either side of the boom of a portal with the contact wire running through and providing a jumper connection as per general arrangement shown in typical drawing listed in Annexure-1, Part E. The Purchaser shall indicate the type of anti-creeps to be adopted in the pegging plans.

(c) TRAMWAY TYPE EQUIPMENT REGULATED CONTACT WIRE ONLY

In tramway type equipment regulated, only a contact wire is provided without a continuous catenary or droppers. The tension in the contact wire is regulated. At support, briddle wire is used for supporting the contact wire.

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 35ºC.

(c) TRAMWAY TYPE

In tramway type equipment, the contact wire will have its own natural sag when erected.

(d) DROPPER

Dropper charts to be used for standard span of regulated and unregulated overhead equipment would be supplied by the Purchaser. Dropper for non-standard spans, span with section insulators and special locations shall be calculated by the Contractor in accordance with the method indicated by the Purchaser and submitted to the Purchaser for approval.

TENSIONS:

(a) REGULATED

In regulated equipment the tension is the catenary and in the contact wire shall be 1,000 kgf in each conductor.

(b) UNREGULATED

In unregulated equipment the tension in the catenary and in the contact wire at 35 degree C without wind shall be, 1,000 kgf in each conductor.

(c) TRAMWAY TYPE

In regulated type tramway equipment, the tension shall be 1,250 kgf

CLEARANCE:

(a) GENERAL

The distance between live parts and parts at earth potential (for parts likely to be earthed) shall be as large as possible. In all cases, the clearances must not infringe the values given in schedule of Dimensions mentioned in Para - 2.1.1 (c) “Indian Railways Schedule of Dimensions".

(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 the course of checking the overhead equipment pegging plans, the Contractor shall prepare a list of platform sheds and other structures in the vicinity of track to be wired. The clearances to these structures shall be in accordance with those shown in the relevant drawings listed in Annexure-1, Part E. If these clearances are not available, the Contractor shall advise the Purchaser in time to enable the later to take up necessary modifications.

HEIGHT OF CONTACT WIRE:

(a) Normally, the minimum height of contact wire above rail level shall be 5.50 m 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 m. In electric locomotive sheds and over electric locomotive inspection pits, the minimum height shall be 5.80 m. At level, crossings the minimum height shall be 5.50 m. 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 should be made gradually and the slope should not normally exceed 3 mm/m on main lines and 10 mm/m on sidings. In no case shall the relative gradient of the contact wire in two adjacent spans be greater than 1.5 mm/m on main lines and 5 mm/m on sidings.

STAGGER:

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

TERMINATION:

(a) **GENERAL**

Traction overhead lines 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) SUPPLEMENTARY INSULATION

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

TYPES OF STRUCTURES :

(a) The overhead equipment of main tracks in case of multiple tracks section shall be electrically and mechanically independent of the one another by provision of independent cantilever masts to the maximum extent possible (see Annexure-1 for general arrangement drawings).

(c) PORTALS

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

(d) FOUNDATIONS

Foundations for all structures shall be designed in an economical manner by following the methods of design indicated by the Purchaser and observing the schedule furnished by him.

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 adjustment of the whole equipment after erection to cater for displacement of the track during maintenance upto 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-1 for drawings of the bracket assembly and components).

OVERLAPS :

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

(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-1 for general arrangement drawings).

(b) INSULATED

In the case of insulated overlaps, the separation between the two contact and the two catenary wires shall be 0.5m (See Annexure-1 for general, arrangement drawings).

POINTS & CROSSINGS :

Arrangements of overhead equipment of different types e.g. regulated, unregulated or tramway at points and crossings shall be in accordance with the standard drawings listed in Annexure -1.

SECTION INSULATORS

(a) BRIEF DESCRIPTION

In case the runners of the section insulator are facing or it is not installed within first 1 /3rd of the span the speed should be restricted to 80km/h.

On double line sections, with runners trailing, the section insulator assembly using porcelain sectioning insulators are fit for speeds up to 120km/h provided it is installed within the first one-tenth and one-third of the span.

(b) SIZE AND WEIGHT

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

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 (See Annexure-1).

BRIDGES AND TUNNELS:

(a) OVERBRIDGES

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

(b) TUNNELS AND CUTTINGS

The arrangements proposed for the equipment in tunnels and cuttings shall take into account the special features of each location and shall be in accordance with general design.

(c) SAFETY SCREENS

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

(d) **HEIGHT GAUGES AT LEVEL CROSSINGS**

Height gauges will be provided at all level crossings in accordance with the general arrangement drawings listed in Annexure-1.

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 circuited rail unless it is provided with a continuous earth wire or it is individually earthed by means of an earthing station. For general arrangement drawings, see Annexure-1.

(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 aluminum conductor consisting of 6 strands of aluminum and one strand of steel each of 4.09 mm dia.(RACCOON) [conforming to IS:398 Pt II (latest revision as indicated in Annexure-1)]. The earth wire shall be run on traction masts or structures. They shall be divided into different electrical sections not exceeding 1,000 m. long. The earth wire in each such section shall be connected at two traction structures, situated at a distance not exceeding 250 m on either side of the mid-point of the section to two 10 Ohm, earth stations which will be provided by the Contractor.

LIGHTNING ARRESTORS:

Lighting arrestors shall be provided in SP/SSP and Feeder post/TSS.

CERAMIC BEADED GLASS FIBER TYPE SHORT NEUTRAL SECTION ASSEMBLY:

Ceramic beaded glass fiber type section insulator assembly shall consist of resin bonded fiber glass(or equivalent)insulators covered with either teflon (or equivalent) or ceramic beaded with PTFE spacers (or similar) adequately dimensioned and rated for the application. The insulators shall have suitable end fitting for connections to the contact wire through end fitting. For smooth passage of pantograph without any shock from contact wire to insulator and vice-versa, suitable runners preferably of stainless steel shall be provided. The central position of the assembly along with arc trap shall be solidly earthed as the later with earthing clamp is provided to trap any arc current caused by

break of contact between pantograph and live contact wire when it passes from contact wire to insulator. The distance between arc trap and nearest line position shall be adjustable upto a maximum of 320 mm Suitable means of suspension of the components of the assembly from the catenary conductor shall be provided. The complete assembly shall be as light as possible and so constructed that adjustments of components can easily be made during erection of maintenance and also for ensuring smooth passage of pantograph.
In the catenary conductor, resin bonded fiber glass insulators with suitable covering shall be provided. The insulators shall have suitable end fittings for connections to catenary wire through end fittings. The central portion shall be solidly earthed.

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

SWITCHING STATIONS, BOOSTER TRANSFORMER STATIONS AND L.T.SUPPLY TRANSFORMER STATIONS.

DESCRIPTION :

(a) Switching Stations

Every switching station has a gantry with two or more main masts (Up-right). The interrupters are located behind the gantry. Isolators, Potential Transformers, station class lightning Arrestors and pedestal Insulators are mounted on a gantry. From the gantry, connections are made to various sections of overhead equipment by cross feeders and jumper connections. Switching stations are unattended and remote controlled from a remote control centre. A small masonry cubicle, called the control cubicle, shall be constructed at each switching station to house control equipment, batteries, battery charger, S.&T. terminal equipment, a terminal board for terminating cables from the switching station equipment, a telephone and telephone equipment and A.C. 240V distribution board. In the case of the Feeding stations that are located within the Traction sub-stations premises, all the above equipment will be provided inside the sub-station control room. The switching station and its control cubicle shall be enclosed by fencing except at feeding stations that are located within the Traction sub-stations premises.

(b) L.T. supply transformer stations

The low tension supply required at switching stations will be obtained through L.T. supply transformers included as part of switching stations, mounted on steel structures and connected to the 25 kV side through rigid bus-bars of aluminum. In special cases where the length of connection is small, 50 sq.mm copper wire may be used for connection, with the approval of the Purchaser. At locations other than at switching stations, wherever low tension supply is required, L.T. supply transformer stations included as a part of OHE may be provided along side the track at isolated location.
L.T. supply transformer stations shall essentially comprise of a mast mounted transformer connected to the traction overhead equipment through dropout fuse switches. The 240 V side shall be connected to a distribution board located at the remote control cubicle by means of 2 core 25 sq. mm, 70sqmm, 150sqmm aluminum cable according to the rating of AT . The general arrangement drawing for L.T. supply transformer stations for single double and multi-track sections is included in Annexure-1.

(a) Switching stations

The switching stations shall be complete in all respects in accordance with specifications. The work shall include:-

(i) Filling up and leveling of the ground to the extend necessary.

(ii) Provision of control cubicles for installation of remote control equipment for switching stations.

(iii) Provision of 240 V A.C. distribution board.

(iv) Provision of lights, plug points, yard lights ,Ceiling Fans and exhaust Fan inside the cubicles(v)

(v) Trench work inside the cubicles as per the specifications and drawings of the purchaser.

The work shall not include :

(i) S & T Terminal equipment, telephone and telephone equipment.

(ii) Provision of bus-bars from the traction sub-station to the feeding station in the case of these feeding stations which are located within the traction substation premises. However, the provision of a tee connector in the feeding station bus-bars would form part of the switching station work (see the relevant drawing in Annexure-1).

(iii) Provision of 110 V battery and battery chargers and terminal boards in the feeding stations.

Note : *Supply and spreading of gravel at all Switching stations is included in the scope of work of the Contractor. It shall however be noted that no extra cost for this shall be payable to the contractor.*

(b) L.T. supply transformer stations

(ii) L.T. supply transformer station shall be complete in all respects in accordance with the specifications. The work shall, however, not include (i) cable and cable connections in L.T. side except at switching stations, where this is included as a part of switching station work (ii) supply of L.T. supply transformer and other equipment as listed in Annexure-4.

CLEARANCES :

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

SETTING OF GANTRIES :

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

DATUM LEVEL :

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

MOUNTING OF EQUIPMENT AND BUSBAR ARRANGEMENT :

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

(c) The bus-bar arrangement for typical switching stations is schematically indicated in a drawing included in Annexure-1.

FENCING & ANTICLIMBING DEVICES :

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

At L.T. supply transformer stations, suitable anti-climbing devices consisting of galvanised steel clamp fixtures shall be mounted on each mast. The device shall be fitted below the transformer supporting beam or steel work. The general arrangement drawings indicating the fencing and anti-climbing devices, are indicated in Annexure-1.

NUMBERING :

Each booster transformer, interrupter, potential transformer, L.T. supply transformer and isolator shall carry an enameled number plate of approved design (see Annexure-1). The Purchaser will furnish the actual numbers to be allocated to the various equipments as per specification No. ETI/OHE/53 (Latest version as indicated in Annexure-1).

INTERLOCKING ARRANGEMENTS :

An interlock shall be provided between each interrupter and its associated double pole isolator, to prevent operation of the isolator when the interrupter in closed position .It should also be ensured that the that the interrupter can be closed be only after closing the isolator. The interlocking device shall consist of a lock combined with an electrical contact to make or break the remote control circuit on the operating mechanism of the interrupter and a lock for the isolator operating mechanism and interlock key for the two locks.

EARTHING ARRANGEMENTS :

(a) Earthing of switching stations, stations and L.T. supply transformer stations shall generally comply with the code of practice for earthing IS: 3043 (Latest version as indicated in Annexure-1) except where otherwise specified below:

(b) Earthing system

(i) Switching stations

At each switching station, two separate and independent earth circuits shall be provided, one for earthing the HT equipment and the other for earthing the L.T. equipment. The general arrangement of earthing connections at a typical switching station is shown in the relevant drawing included in Annexure-1.

(ii) Earth Circuits

Each earth circuit shall take the form of a closed ring and shall be provided with a minimum of two earth electrodes. Each earth electrode shall consist of galvanised iron pipe, 40 mm nominal bore at least 3.1 m long provided with a spike at one end and welded lug suitable for taking minimum size of 50x6 mm mild steel flat, directly at the other. The pipe shall be embedded into the ground. The earth electrodes of the HT and the LT earth circuits shall be located as far apart as it is possible. The drawing of typical earth electrode is included in Annexure-1.

(iii) HT earth circuit

The resistance to earth of the HT earth circuit shall be less than 2 ohms. If this value cannot be achieved with a maximum of four separate but inter connected earth electrodes then the additional earth electrodes shall have the surrounding earth treated with charcoal and salt filling. All masts, structures, fencing uprights and equipment pedestals shall be connected by the two separate and distinct connections to the closed loop of the earth bus. Earth bus and connections to it shall be of M.S. flats of a minimum size 50 mm x 6 mm. Potential transformers and lightning arrestors shall be bonded to masts/structures by 25 mm x 3 mm copper strips.

(iv) LT earth circuits

The LT earth circuit shall also comprise of a minimum of two inter-connected earth electrodes as described in para (iii) above and the total resistance to earth of the earth circuit shall be less than 2 ohms. This circuit will not form a part of this contract at those feeding stations that are located within the traction sub-station premises. All low tension equipment control boards, one terminal of the secondaries of the potential and LT supply transformers, metal casing of battery chargers, each connections of 8 SWG galvanised iron wire to the LT earth bus. The section of the LT earth bus shall be the same as that of the HT earth circuit.

(v) Earth strips

The earth bus and connections of HT earth circuit shall be painted with two coats of red oxide zinc chromate primer to IS 2074 (Latest version as indicated in Anexure-1) with a minimum thickness of 1.5 mils (40 microns) and with two finishing coats of bitumen 85/25 (blown grade to IS:702(Latest version as indicated in Anexure-1) with 20% mica to a thickness of about 15 mils (375 microns) either by hot application or

by brushing a solution of it with suitable viscosity to obtain the thickness in minimum number of coats and buried at a depth of 300 mm below the ground level.

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

(vi) Inter connection

The HT and LT earthing systems shall be interconnected. In Addition, at all switching stations, the HT earth shall be connected by the two independent mild steel flats each of minimum size 50 mm x 6 mm painted with two coats of red oxide zinc chromate primer to IS:2074 (Latest version as indicated in Annexure-1) and finished with two coats of bitumen 85/25 blown grade as described above, to the non-track circuited rail in a single-railtrack-circuited section and to the neutral point of an impedance bond provided by the purchaser where double-rail-track circuiting is employed so as to limit high potential gradients developing in the vicinity of switching stations in the event of fault.

(VII) L.T. supply Transformer Stations.

The earthing arrangement of a pole mounted LT supply transformer station shall comprise interconnected earth electrode/electrodes having a resistance not exceeding 10 ohms. If this value can not be achieved with two electrodes, additional electrodes shall have surrounding earth treated with charcoal and salt filling. The transformer and lightning arrestor shall be connected to the supporting steel structure by means of 2 independent connections at the top by means of 25 mm x 3 mm copper strip. At the bottom, the steel structures shall be connected to the inter-connected earth electrodes and to the nearest traction rail by means of two independent connections of mild steel flats having a minimum size of 50 mm x 6 mm. In addition, the earth electrode should be connected to the traction rail by means of a minimum size of 75 mm x 6 mm mild steel flat. The mild steel flat shall be painted with two coats of red oxide zinc chromate primer to IS:2074 (Latest version as indicated in Annexure-1) with a minimum thickness of 1.5 mils (40 microns) and with two finishing coats of bitumen 85/25 (blown grade to IS :702 (Latest version as indicated in Annexure-1) with 20% mica to a thickness of about 15 mils (375 microns) either by hot application or by brushing a solution of it with suitable viscosity to obtain the thickness in minimum number of coats.

CABLE CONNECTION :

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

(b) Termination of cables

The cable shall be terminated neatly and all the cores arranged and dressed properly. Suitable indexed terminal strips or ferrules shall be provided at all terminals to facilitate maintenance.

FOUNDATIONS

DESIGN OF FOUNDATION:

(a) SOIL PRESSURE

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

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

(b) STRUCTURES CARRYING OVER-HEAD EQUIPMENT

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

(c) ON BRIDGE PIERS

Complete design of foundations for traction structure on bridges to suit different locations and local conditions will be furnished by the Purchaser.

(d) MASTS & FABRICATED STRUCTURES AT SWITCHING STATIONS/TSS

Foundations for the masts of gantries at switching stations and TSS shall be of the pure gravity type, the base of which shall rest on consolidated soil.

(e) FENCING POSTS

Foundation for fencing posts shall rest on consolidated soil if the depth of unconsolidated soil is less than 1.5 m below the datum level and shall be rectangular parallel piped in shape. If the depth of unconsolidated soil is more than 1.5 m the foundation block shall rest on

reinforced concrete piles cast-in-site or reinforced concrete foundation may be adopted as desired by the Purchaser.

(f) TYPICAL DESIGN

Typical design and drawings of side bearing and new pure gravity and side gravity type foundations are included in the drawings listed in Annexure-1. Employment schedules for standard foundations for traction structures for various locations and types are also included in the drawings listed in Annexure-1, Part E.

(g) SPECIAL FOUNDATIONS

(i) In the case of foundations at locations not covered by the employment schedules furnished by the Purchaser, the Contractor shall prepare special designs and furnish full design calculations justifying the choice of the type of foundations for such locations. In black cotton soil especially pile foundations of under reamed type as per RDSO'S standard designs (Reference RDSO'S Drawings No.ETI/C/0062 MOD-B or latest) 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.

(ii) **Foundation in Contact/Buried under Non-aggressive Soil/Ground Water :**

The Foundation Concrete shall be of M-15 Grade. The Core concrete shall be M-20 Grade. It shall be adopted in the areas where concrete is in contact/buried under Non-aggressive soil/Ground water as per IS: 456-2000.

(iii) **Foundation in Coastal Areas:**

The Foundation Concrete shall be of M-20 Grade. The Core concrete shall also be M-20 Grade.
It shall be followed in the areas where concrete is exposed to Coastal Environment as per IS: 456-2000.

(iv) For casting the OHE foundation in Soft Rock and Hard Rock, RDSO drawings mentioned at SI. No. - 123 of LIST OF STANDARD DRAWINGS AND SPECIFICATIONS (ANNEXURE - 1 of Part E) of tender Document.

The decision of the Purchaser with regard to feasibility and suitability of adoption of the alternative design for each type of foundation will be final.

(h) EQUIPMENT PEDESTALS

Pedestals for interrupters and L.T. supply transformers where required, shall be of mass concrete with the base resting on consolidated soil. Pedestal for Power transformers shall be made of mass concrete with base resting on consolidated soil. Foundation for circuit breakers supported on steel structures and for other items of equipments such as isolator, instruments transformers, bus bar support insulators etc. shall be of the pure gravity type, the base of which shall rest on consolidated soil, and shall be left with core holes into which the legs of the supporting structures shall be suitably fixed by grouting.

(j) CABLE TRENCHES

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

BEARING PRESSURE:

(a) GUIDING INFORMATION

Subject to above para, the following allowable bearing pressures may generally be expected for various kinds of soil. The information is given for general guidance only.

(i) Average good soil in banks and cutting ... 11,000 kg/sq.m.

(ii) Moorum soil in cutting ... 22,000 kg/sq.m

(iii) New banks & bad soils in banks and cutting ... 5,500 kg/sq.m.

(iv) Black cotton soil-pure gravity foundation shall normally be adopted. However, under reamed pile foundations may be adopted at the option of the Purchaser in limited locations for trial purpose. In the case of dry black cotton soil, the soil should be subjected to a bearing pressure as close as possible but not exceeding 16,500 kg/sq.m. the depth of the foundation block being not less than 2.8m. In the case of wet black cotton soil, the soil should be subjected to a bearing pressure as close as possible but not exceeding 8,000 kg/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 / Ready mix of grade M 15 obtained by mixing cement, coarse aggregate, fine aggregate and water in accordance with proportions given vide Table 3 of IS:456 (Latest version as indicated in Annexure-1) reproduced below. For grouting, muffing, embedding of structures in foundations and for cable trenches at switching stations, nominal mix concrete M 20 obtained by mixing materials in proportions as indicated in Table-3 of IS:456 (Latest version as indicated in Annexure-1) shall be used. Volume batching may be adopted vide clause 9.2.2. of IS:456 (Latest version as indicated in Annexure-1) reproduced below :-

IS: 456-2000 (latest version)

TABLE 3: PROPORTIONS FOR NOMINAL MIX / READY MIX CONCRETE

(Clause 9.3 and 9.3.1)

Grade of concrete	Total quantity of dry aggregate by mass per 50 kg of cement, to be taken as the sum of the individual masses of the fine and coarse aggregates kg max.	Proportion of fine aggregate of coarse aggregate (by mass)	Quantity of water per 50 kg of cement (max. Liters)
1	2	3	4
M 5	800	Generally 1:2 but	60
M 7.5	625	subject to an upper limit	45

M 10	480	of 1 : 1.5 and a	34
M 15	350	lower limit of 1 : 2.5	32
M 20	250		30

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

(ii) Minimum grade of concrete shall be not less than M - 20 in reinforced concrete work.

Example:

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

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

"Volume batching may be allowed only where weigh-batching is not practical and provided accurate bulk densities of materials to be actually used in concrete have earlier been established. Allowance for bulking shall be made in accordance with IS: 2386 (Part-3) (Latest version as indicated in Annexure-1). The mass volume relationship should be checked as frequently as necessary, the frequency of the given job being determined by Engineer – In charge to ensure that the specified grading is maintained."

In judging the acceptability of the materials, quality of concrete and the method of work, the Purchaser will generally observe the provisions of the "Indian Standard code of Practice for Plain and Reinforced Concrete, IS:456 (Latest version as indicated in Annexure-1). The crushing strength of concrete shall not be less than the limits given below:-

Specified characteristic Compressive strength of 15 cm cubes at 28 days.

Grade of Concrete	At 28 days age
(a) M. 10	10 N/mm^2
(b) M. 15	15 N/mm^2
(c) M 20	20 N/mm^2

NOTE: *(a) Test specimen of works tests shall be taken at the site of work from mixture of concrete ready for pouring into the foundation hole. All tests shall be carried out in accordance with IS: 516* (Latest version as indicated in Annexure-1) *. The sample of concrete from which test specimens are made shall be representative of the entire batch.*

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

SIZE AND GRADING OF AGGREGATES :

The graded coarse aggregate 20 mm nominal size (table 2 of IS: 383 (Latest version as indicated in Annexure-1)) shall be used for foundation. A coarse aggregate for grouting muffs and embedding shall be of 20 mm graded nominal size (specification for coarse and fine aggregate from natural sources for concrete).

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

SAND CORED FOUNDATIONS :

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

SINKING OF CONCRETE SHELLS:

Where the water-table is high, one or more sections of reinforced concrete shells may have to be sunk before casting concrete. The size of each of shell shall be 1,200 mm outside dia x 50 mm thick x 600mm high reinforced with 6 mm (1/4") dia rods spaced 150 mm apart, both longitudinally and circumferentially, the concrete shall be of grade M.20 as per provisions of para 2.2.4.

TYPE OF FOUNDATION IN BLACK COTTON SOIL :

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

CEMENT:

The cement to be used in the construction of PCC / RCC structures should be of Ordinary Portland Cement to IS:269 (Latest version as indicated in Annexure-1) or Portland Pozzolana cement (fly ash based) as per IS: 1489 Pt-I (Latest version as indicated in Annexure-1).

STRUCTURES

TYPES :

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

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

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

DESIGN :

FOR OHE :

(a) STEEL STRUCTURES

Designs for steel Structures shall, except where otherwise Provided, comply with the Indian standard code of practice for use of structural steel in General Building Construction IS: 800 (Latest version as indicated in Annexure-1). The thickness of smallest steel sections used shall be 5 mm for galvanised members.

(b) All the steel Structures and small part steel for carrying overhead equipment are to be fully galvanised after drilling and fabrication as per specification **ETI/OHE/13 (4/84)** (Latest version as indicated in Annexure-1) and no painted structures are to be used.

FOR TSS :

(a) GENERAL

The steel structures may be of riveted, bolted or welded construction as convenient for installation. The thickness of smallest steel section used shall not be less than 6 mm (or 1/4"). Legs of gantry structures/portals and supporting steel work and uprights or busbar supports shall generally be embedded in concrete foundation blocks and for equipment and in special cases secured by means of holding down bolts.

(b) DESIGN

a) All the steel structures like gantries/portals, other supporting members, small part steel work etc. shall be galvanised after fabrication with a minimum value of average mass of zinc coating being not less than 610 g/m^2 as per RDSO's specification No.ETI/OHE/13 (4/84) with Amendment No.1,2 & 3.

b) All designs for special steel work shall be furnished by the Contractor, for approval of the Purchaser. Designs for steel structures shall except where otherwise provided, comply with the "Indian Standard Code of Practice for use of Structural steel in General Building Construction" - IS : 800 - 1984, other relevant IS Specifications and statutory regulations.

c) For purposes of design, all possible loads which may occur in the worst combination shall be considered.

d) **Steel Structures**

For calculation of wind load on structures, conductors and equipment, the basic wind pressure shall be taken as 112.5 Kg/sq.m.

e) For purposes of design of gantries, the tension in the 220 kV incoming/outgoing lines shall be taken as 200 kg. at 4 degree C (without wind) in each conductor and 150 kg. at 4 ^oC (without wind) in the earthwire. The tension in the 66 kV strung busbars and earth screen wire at 66/25 kV sub-stations shall not exceed 200 kg. at 4 ^oC (without wind).

f) **Uprights and fencing posts**.

Uprights carrying equipment such as potential transformers, current transformers, lightning arrestors, busbar support insulators, shall be made from standard metric steel sections viz. channels, angles or small joists, either single or fabricated.

g) Notwithstanding the provisions contained in I.S. and other regulations above regarding permissible deflection, the following should apply.

The deflection at the top of the mast or structure shall be limited to one eightieth (1/80) of its height above foundation.

h) The torsional rotation of the mast due to permanent loads shall not exceed 0.1 radian.

CANTILEVER MASTS:

(a) LOAD

For purposes of design the worst possible combination of all loads that may occur shall be considered.

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

(i) Weight of overhead equipment (1.60 kg/metre for each conventional and 1.32 kg/metre for each composite OHE).

(ii) Weight of bracket supporting the overhead equipment (60 kg/normal bracket)

(iii) Weight of a man (60 kg)

(iv) Weight of an earth wire (0.32 kg/metre).

(v) Weight of feeder, return conductor or other special equipment wherever they occur.

(vi) The effect of eccentricity of vertical and horizontal loads on the bracket due to variation in temperature.

(vii) Wind loads perpendicular and parallel to the track. The wind pressure adopted shall be taken as that indicated in part-III.

(viii) Radial forces on the mast, due to stagger, curvature, anchorage etc.

(ix) Weight of the mast itself.

(x) Any other load or loads that may occur due to special location of the Structures.

(b) DEFLECTION

Notwithstanding the provisions contained in IS:800 (Latest version as indicated in Annexure-1) referred to in para above regarding permissible deflection, the following shall apply.

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

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

(c) TORSION

The torsional rotation of the mast due to permanent loads shall not exceed 0.1 radian.

(d) TYPICAL DESIGN

The typical design of a traction mast is included in the set of standard drawings listed in Annexure-1, Part E. Employment schedules for standard masts for various locations and types are included in the standard drawings listed in Annexure-1, Part E, to enable selection of suitable type for different locations and local conditions.

ANCHOR MASTS:

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

(b) DWARF MASTS

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

HEAD SPANS :

(a) LOAD

The loads to be considered shall be as detailed in para above as far as applicable and at their worst combination.

(b) SAG FOR HEAD SPAN WIRE

The sag of the head span wire shall be approx. one-tenth (1/10) of the span.

(c) MINIMUM TENSION IN CROSS SPAN & STEADY SPAN WIRES -

For purpose of design, a minimum tension of 200 kg, shall be ensured in the span wires for worst combination of temperature and wind load.

(d) DEFLECTION OF MAST

Deflection at the top of the mast or Structure shall be limited to one-eightieth (1/80th) of its height above foundation.

(e) TYPICAL DESIGN

Typical design for head span mast carrying overhead equipment for 4 tracks will be furnished to the contractor.

PORTALS :

(a) GENERAL

Portals shall be of fabricated steel of standard types of purchaser's designs. The most important designs are covered by Drawings listed in Annexure-1, Part E.

(b) LOAD

The load shall be as detailed in para above as applicable.

STRUCTURES ON BRIDGES:

(a) The structure may be either cantilever masts or portals (hinged or fixed at base) depending on the type and condition of bridge pier capping. As far as possible cantilever masts grouted in foundations blocks on pier will be used. Where this is not possible cantilever masts with holding down bolts or suitable portals (hinged or fixed at the base) may be adopted.

(b) Designs of structures on bridges to suit different locations and local conditions will be furnished to the contractor by the Purchaser.

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 Central line of the track, on straight or curve to the face of the mast/structure of fitting located on the mast.

(b) On straight and outside of curve, the standard setting shall be as per the relevant drawing included in Annexure-1, Part E. Minimum setting of structures shall be 2.8 M plus curve allowance as required. Whenever this distance can not be provided, specific approval of Purchaser shall be obtained before erection. Setting of portal upright overlap/ turn-out structures, anchoring structures and other masts carrying more than one OHE will be 3.0 m wherever possible.

(c) EXTRA CLEARANCE ON CURVES

The minimum setting of structures on curves shall be determined by adding to the above minimum figures an extra clearance indicated in the table included in the set of standard drawings listed in Annexure-1, Part-E.

(d) STRUCTURES WITH COUNTER WEIGHTS

In case of structures carrying counter-weight assemblies, the term "setting" shall refer to the minimum distance of the counter-weight from the track center under the worst conditions of wind.

(e) STRUCTURES ON PLATFORM

The setting of structures on platform shall be not less than 4.75 m.

(f) STRUCTURES NEAR SIGNALS

In the vicinity of signals, structures shall be located in a manner which shall ensure good visibility where necessary, the setting shall be increased as per the relevant drawing included in Annexure 1, Part E.

(g) SETTING OF STRUCTURES

The value of setting of masts/structures shall be painted on each mast/ structure. The figure shall be 25 mm 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.

NUMBERING OF STRUCTURES CARRYING OVERHEAD EQUIPMENT :

All structures shall be numbered in accordance with the numbering given in the approved overhead equipment layout plans. Enameled/Retro-Reflective number plate shall be provided on each mast or structure as per approved designs (See Annexure-1, Part E).

STEEL WORK FOR SWITCHING STATIONS AND GANTRIES:

(a) HORIZONTAL MEMBERS OF GANTRY

Horizontal member of main as well as auxiliary gantry carrying isolator switches, insulators, potential transformers etc. shall be made from steel sections viz. channels, angles and small joists, single or fabricated. They shall preferably be attached to masts by means of clamps to avoid drilling of masts sections.

(b) For purpose of design, all possible loads which may occur in the worst combination shall be considered. The loads shall include the followings:-

(i) Weight of insulators, instrument transformers, isolator switches, busbars, and their accessories.

(ii) Loads caused by feeders, along and across tracks, return feeders etc.

(iii) Loads caused by anchorage due to guying of anchored masts (where applicable).

(iv) Pull or Push on the structures due to anchorage and radial tension (where applicable).

(v) Wind load on the different structures, conductors and equipment. The wind pressure shall be taken as indicated.

(vi) Weight of men working on the structures.

(vii) Weight of structure itself.

(viii) Erection loads.

(ix) Any other load or loads which may occur due to special equipment wherever they occur.

(c) TENSION OF CONDUCTORS

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

(i) Maximum tension in the cross feeders at switching stations under worst conditions:-

(1) For spans less than 18 m ... 100 kgf.

(2) For spans more than 18 m ... 200 kgf.

(ii) Maximum tension in longitudinal feeders running parallel to the track at the switching stations under worst conditions.1500 kgf.

(iii) Tension in anchored overhead equipment in case of sectioning and paralleling stations 2,000 kgf.

(d) DEFLECTION OF GANTRY MASTS

Deflection under the permanent loads (at an average temperature of 35°C without wind) at the top of the fabricated structures of mast shall be limited to one eightieth (1/80) of its height above foundation.

(e) Masts of the gantry at which feeder or overhead equipment will be anchored at the switching stations shall normally be provided with suitable guys, but struts shall not be permitted.

(f) CHAIRS AND BRACKETS

Chairs, brackets and supporting steel work carrying potential transformers, lighting arrestors, insulators, etc, shall be made of fabricated steel and be mounted on the main auxiliary gantry preferably by means of clamps to avoid drilling of mast sections.

(g) UPRIGHTS AND FENCING

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

STEEL:

Steel conforming to IS: 2062 (Latest version as indicated in Anexure-1) shall be used for all fabricated steel work.

EQUIPMENTS, COMPONENTS AND MATERIALS

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) publications.

(ii) British Standards (abbreviated as BS)

(iii) Bureau of Indian Standards (abbreviated as IS)

Tenderers may, however, offer equipment in accordance with the appropriate national standard specifications of the country of manufacture, but such offers will be treated as

deviations, in that case firm should submit English rendering of the text and illustrations of the national standard specifications and explanatory notes on the specific deviations from IEC, British or Bureau of Indian Standards in question, in the relevant Annexures. In case of doubt, the Purchaser shall decide the clause and specification applicable and the contents of the specification and standard mentioned above shall guide such decisions.

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 prototypes of components shall be supplied free of cost to the Purchaser for tests and approval. The tests will be conducted in a laboratory selected by the Purchaser.

(b) EQUIPMENTS

This comprises inspection and tests conducted on the first equipment of a specified manufacturer, which the Purchaser considers sufficient to prove that the design is in conformity with the specification at the manufacturer's factory. The type tests shall be conducted on each equipments, in the presence of the Purchaser's representative. The contractor shall arrange to get these tests conducted at his own cost.

(c) RESPONSIBILITY

Any testing and approval by the Purchaser of prototype shall in no way absolve the contractor of his responsibility under the terms of the contract for the equipment supplied and erected.

(d) EXEMPTION FROM PROTOTYPE TESTS

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

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

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

BULK MANUFACTURE:

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

INTER CHANGEABILITY :

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

TECHNICAL SPECIFICATIONS:

Please see at **Anexure-1**). List of standard RDSO drawings, RDSO specifications and IS specifications for important materials, components and equipments [As per version available as on date of opening of tender).

NOMENCLATURE AND MARKING :

(a) All components and fittings supplied by the Contractor's shall bear the respective identification number and a mark to identify the source of supply except in the case of galvanised tubes, bolts and nuts and/or any other fittings as may be agreed to by the Purchaser.

(b) In case of insulators, galvanised steel tubes, stainless steel wire rope and conductors, name of manufacturer shall be specified in "As Erected" drawings for identification.

STEEL WORK AND PROTECTION AGAINST RUST :

(a) **GALVANISING**

All ferrous materials and fittings shall be hot dip galvanised according to the specification ETI/ OHE/13 (4/84) (Latest version as indicated in Anexure-1).

(b) PAINTING

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

(c) RECTIFICATION AT SITE

In case of modifications which would damage the protective coat, repairs to such damage would be allowed only in exceptional circumstances. The part damaged shall be protected in accordance with the method indicated in specification **ETI/OHE/13 (4/84)** (Latest version as indicated in Annexure-1) or any other method approved by the Purchaser. The Contractor shall in all such cases obtain prior permission from the Purchaser before carrying out repairs.

BRACKET ASSEMBLY COMPONENTS :

(a) ARRANGEMENT FOR NORMAL OHE

The arrangement of the different fittings and structural components of bracket assemblies are shown in drawings listed in Annexure-1, Part E. The employment schedule of bracket will be furnished to the Contractor.

(b) BRACKET

Bracket tubes shall be of seamless cold drawn or electric resistance weld steel complying with **ETI/OHE/11 (5/89)** (Latest version as indicated in Annexure-1) with an insulator near the support. The length of the tubes shall be such that their is a free length of about 200 mm beyond the catenary suspension bracket. To facilitate adjustment during track maintenance.

(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 tubes or proper dimensions duly formed. It shall be suspended by a dropper from the catenary suspension clamp/bracket tube. A hook and eye arrangement shall be used at the bracket end to permit free movement in every directions.

(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)** (Latest version as indicated in Anexure-1). Steady arms of secondary tracks may be off solid galvanised steel rodding. The contact wire shall be fixed by a simple swivel clip without threaded parts. Steady arms shall normally be 1.0 m long but for special locations such as turnouts, diamond crossing etc. Steady arms shall be longer as indicated in the relevant drawings listed in Annexure-1, part- E.

Bent steady arms of aluminum alloy tube conforming to Spec.ETI**/OHE/21 (9/74**) (Latest version as indicated in Annexure-1) 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 turn buckle at only one end.

DROPPERS :

(a) GENERAL DESIGNS

The droppers shall generally be designed as shown in standard drawings and made of copper wire about 5 mm diameter conforming to **IS:282** (Latest version as indicated in Annexure-1) 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 over all length of a dropper will be ± 5 mm.

INSULATORS :

(a) All insulators except those on return conductors and earth wires shall be of the solid core type. Disc insulators shall be used on return conductors and earth wires or other locations as desired by the Purchaser. All solid core insulators shall conform to TI/SPC/OHE/INS/0070 (Latest version as indicated in Annexure-1) or Specification No.TI/SPC/OHE/INSCOM/0991 (Latest version as indicated in Annexure-1) is for Composite Insulators wherever applicable.

(b) INTER-CHANGEABILITY

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

(i) **Stay arm Insulators**: These insulators will be used in conjunction with The tubular stay arm of all bracket assemblies.

(ii) **Bracket Insulators:** These will be used at the base of each bracket assembly in conjunction with bracket tubes.

(iii) **9-Tonne Insulators:** These will be used at all places for cut-in and Terminal insulation including those in return conductors, but excluding those in earth wire.

iv) **Solid core post insulators :** These will be used at all places for supporting isolators mechanisms,-bus-bars,-jumpers etc. of 25 kV.

(v) **Disc insulators 255 mm :** Clevis type 255 mm disc insulators will be used for return conductor suspension and for earth wire cut-in insulator.

(vi) **11 kV post insulators :** These will be used at all places for supporting bus-bars, jumpers etc. In conjunction with return conductor/return feeders.

(c) The pedestal insulators for service voltage of 220/132/110 kV shall be of Solid Core type conforming to specification as indicated in Annexure-1. The pedestal insulators for service voltage of 25 kV shall be of the solid core type conforming to specification as indicated in Annexure-1.

ENDING FITTINGS AND SPLICES:

(a) GENERAL DESIGNS

(a) Terminating or ending fittings and splices on copper conductor shall be of the cone type clamping on both the inner and outer strands of conductor except for contact wire ending clamps which may be of wedge type. The arrangement shall be easy to install and also be such as would apply the clamping pressure gradually without shock (See **TI/SPC/OHE/Fittings/0130))** (Latest version as indicated in Annexure-1)**.** For Aluminum Alloy/conductor, the end fittings shall be either cone type, strain clamp type or any other type as approved by the Purchaser.

(b) LOADING

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

(c) 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 in any tension length (i.e. anchor to anchor) for which prior approval shall be taken from the Purchaser. Additional splices may, however, be provided to enable retention of conductors which are found defective during and/or after erection. Splices may also be permitted for repair of damage due to thefts or Railway accidents.

(d) STRENGTH OF ASSEMBLED FITTINGS

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

(e) ADDITIONAL TERMINATING WIRES

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

ELECTRICAL CONNECTIONS FOR OHE:
(a) GENERAL DESIGNS

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

(b) JUMPERS

Copper jumpers shall be of any of the followings:

(i) Large jumpers of annealed copper in accordance with specification **ETI/OHE/3 (2/94)** (Latest version as indicated in Annexure-1).

(ii) Small jumper of annealed copper in accordance with the specification **IS:9968 (PT.2)** (Latest version as indicated in Annexure-1).

.Aluminum jumpers wherever used, shall be of all Aluminum stranded conductor 19/7/ 1.4 mm bare 3/4 H generally conforming to IS:8130 (Latest version as indicated in Annexure-1).

(c) BUSBARS

Bus-bars or rigid jumpers of copper where used shall be of 18mm dia copper rod in accordance with RE/30/OHE/5(11/60) (Latest version as indicated in Annexure-1). Aluminium bus-bars wherever used shall be of 36/28 mm tubing (See 2.4.22). Aluminium tubular bus-bars shall be made of Al. Alloy grade 63401 (WP condition) to IS:5082 (Latest version as indicated in Annexure-1). The tolerance on diameter and thickness shall be as per class I, IS:2673 (Latest version as indicated in Annexure-1

(d) FEEDERS

Feeders shall be of all Aluminum conductor 19/3.99 mm (SPIDER).

(e) RETURN CONDUCTOR

The return conductor shall be of all Aluminum conductor 19/3.99 mm (SPIDER). The arrangement of return conductor carried on traction structures is shown in a drawings listed in Annexure-1, Part E.

(f) The general characteristics of all wires and conductors is included in a drawings listed in Annexure-1, Part E.

(g) Earth wire shall be of steel reinforced Aluminium conductor 7/4.09 mm (RACCOON) conforming to **IS:398-(part-II)** (Latest version as indicated in Annexure-1).

TERMINAL CONNECTORS FOR EQUIPMENTS:

Booster Transformer along with the terminal connectors suitable for taking jumpers/ bus bar as required shall be supplied by the Purchaser.

However, Power Transformer, Circuit Breaker, and L.T. supply Transformer shall be supplied by the Contractor along with the terminal connectors suitable for taking jumper/bus-bar as required including Al-Cu strips for bimetallic connections wherever required. The Al-Cu strips required for the connection of Booster Transformers shall also be provided by the Contractor if following equipment will be under the scope of Supply as per Annexure-4, otherwise Tenderer shall make its own arrangement to provide.

REGULATING EQUIPMENT :

(a) GENERAL

A general arrangement is shown in the standard drawings listed in Annexure-1, Part E. The regulating equipment should have a minimum adjustment range of 950 mm. Stainless steel wire rope in accordance with TI/SPC/OHE/WR/1060 (Latest version as indicated in Anexure-1) shall be used in these equipments and these shall be sufficiently flexible for the purpose.

(b) COUNTER WEIGHT

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

(c) REDUCTION RATIO

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

HEADSPAN CONSTRUCTION:

(a) SIZE AND FACTOR OF SAFETY

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

(b) TURN BUCKLES

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

(c) ADDITIONAL INSULATORS

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

ISOLATORS:

25 kV Isolator switches shall comply with Railway specifications.

INSULATION LEVEL :

(a) Interrupters, Potential Transformers line indication type, 42kV Lightning Arrestors and other equipments shall be suitable for insulation levels indicated in the relevant specifications.
(b) All equipment including insulators to be used at the traction sub-stations, feeding station and shunt capacitor banks shall be suitable for the insulation level specified below:-

		SERVICE VOLTAGE				
		220 kV	132 kV	110 kV	66 kV	25 kV
i)	Power frequency 1 min. wet withstand test-kV (rms)	460 kV	275 kV	230 kV	275 kV	100 kV
ii)	Impulse (1.2/5o microsecond) withstand test positive and negative polarity(crest value) -KV (peak)	1050 kV	650 kV	550 kV	650 kV	250 kV

BUSBARS:

(i) ACSR Conductors used as bus-bar or bus-bar connections shall be of ZEBRA ACSR size 61/3.18mm (28.62 mm dia) at 220 or 132 or 110/25 kV Traction Sub-station.

(ii) Aluminum tubes used as bus-bars or bus-bar connections shall be of dia 50X39 mm for Traction sub-station and Shunt Capacitor banks and of size 36/28 mm for Feeding

Stations. Aluminum tubular bus-bars shall be made of Al. Alloy grade 63401 (WP condition) to IS:5082 and IS: 6051-1970 (Latest version as indicated in Anexure-1). The tolerance on diameter and thickness shall be as per class I, **IS: 2673** (Latest version as indicated in Annexure-1)**.**

(iii) Bus-bar junctions and connectors shall be made with aluminum allow Grade 4600 M to IS: 617-1994 or equivalent. The bus-bar shall be clean, smooth mechanically sound and free from surface and other defects. No splices will be allowed in the bus-bar unless the length of bus-bar exceeds 6m. The ends of the tubular bus-bar shall be covered with suitable end caps. The joints in bus-bars where unavoidable, shall be mechanically and electrically sound so that the temperature rise under normal working conditions does not exceed 40 degree centigrade for a max. ambient temp. of 45 degree centigrade.

CABLING:

(a) CABLE FOR L.T. SUPPLY

240 V A.C. supply from L.T. supply transformer at switching stations shall be brought and terminated on the L.T. A.C. distribution board in the remote control cubicles at the switching stations by 1100 Volt 25 sq.mm aluminum two-core PVC insulated PVC sheathed and steel armoured heavy duty cable conforming to IS:1554(part-I) (Latest version as indicated in Anexure-1).

(b) CONTROL AND INDICATIONS CIRCUITS

All other cables for control and indication at switching stations shall be 1100-V grade PVC insulated and sheathed un-armoured (heavy duty) complying with IS: 1554(part-I (Latest version as indicated in Anexure-1). The cables shall be provided as indicated in the Table below:-

PURPOSE	RUN	CIRCUIT VOLTAGE	CORE SIZE & MATERIAL	NO OF CORES
FOR SWS:				
Control & indication of interrupters	From each Interrupter to terminal board	110 V/D.C.	2.5 sq.mm copper	7
Catenary indication	From each P.T. line indication type to terminal board	110 V/A.C.	2.5 sq.mm copper	2
Heater supply for interrupters control mechanism cabinet	i) From interrupter to interrupter	240 V A.C.	4.0 sq.mm Aluminium	2
	ii) From each interrupter to fuse box.	-do-	-do-	-do-
	iii) From fuse box. to distribution board.	-do-	-do-	-do-
Battery supply	i) 110V battery charger to 110V battery	110 V/D.C.	2.5 sq.mm copper	-do-

	ii) 110V battery to 15A, DC fuse box.	110 V/D.C.	2.5 sq.mm copper	-do-
	ii) 15A, DC fuse box to terminal board.	-do-	-do-	-do-
FOR TSS:				
Control and indication of circuit breakers	From each circuit breaker to control board.	110 V DC	7x2.5	Three cables to be used.
Transformer alarm/trip circuits & tap changer control	From each transformer to control board.	110 V DC	10x2.5	Five cables to be used.
Transformer protection (bushing transformer to current transformer connections)	From each transformer to control board.	110 V DC	4x4.0	One cable for each bushing CT to be used.
Current transformer & neutral connections	From each current transformer to control board.	110 V DC	2x4.0	One cable for each core of CT/Neutral CT
Potential transformer connections	From each potential transformer to control board.	110 V DC	2x2.5	One cable to be used
110V DC supply	(i) Connection between battery chargers & DC distribution board.	110 V DC	4x4.0	One cable to be used with two core connected in parallel
	(ii) Connection between batteries & DC distribution board.	110 V DC	4x4.0	One cable to be used with two core connected in parallel
	(iii) Connection from DC distribution board to control board.	110 V DC	4x4.0	Two cables to be used with each circuit breaker and one cable for DC supply to control boards.
Control & indication of bus coupler interrupter	From interrupter to control board.	110 V DC	7x2.5	Two cables to be used.
240V AC supply	Connection from AC distribution board to control board.	240 V AC	2x2.5	One cable to be used

c) **Cables for heater circuits**.

The 240 V AC supply to space heaters provided in control cabinets of various equipments shall be provided by means of 4 sq.mm. 2-core aluminum PVC insulated (heavy duty) cables complying with IS: 1554 (Part-I)-1988. Three circuits shall be provided on the LT A.C. distribution board for this purposes, one for the heaters in the control cabinets of 220/132/110 KV circuit breakers, the second for the heaters in the control cabinets of 25 KV circuit breakers and bridging Interrupters and the third for heaters in marshalling box of

traction transformers. Each circuit shall be provided with a fuse of approved type and suitable rating in the LT A.C. distribution Board.

d) **Cables for battery charger**.

240 V A.C. supply to each of the battery chargers in the Control Room shall be provided by means of 4 sq.mm. 2 core PVC insulated, PVC sheathed (heavy duty) copper cables complying with IS: 1554 (Part-I)-1988. Two circuits each with a fuse of approved type and suitable rating in the LT A.C. distribution board shall be provided for the two battery chargers in the Control Room. The 240 V A.C. supply to Control Board from A.C.. distribution board shall be provided by means of 2.5 sq.mm. 2- core PVC insulated PVC sheathed (heavy duty) copper cable complying with IS:1554(Part-I)-1988.

e) **Cables for blower fans**.

240 V A.C. supply to blower fans fixed on the traction transformer shall be provided by means of 2 core 25 sq.mm. aluminum conductor cables. The cables shall be PVC insulated, PVC sheathed and armored cables of 1100 V grade complying with IS:1554(Part-I)-1988. Separate cables shall be laid from the L.T. A.C. distribution board in the control room to marshalling box of each traction transformer. Individual circuits from the LT A.C. distribution board shall be provided for this purpose with each circuit protected by a fuse of suitable rating.

f) The cable shall be resistant to decay, mechanical abrasion, acids, alkaline and other corrosive materials.

NOTE: *(i) In case of feeding stations 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.*
(ii) Notwithstanding the sizes of cables given above, the Tenderer shall assure himself that various cables would suit the ratings of equipments offered by him.

(g) SPECIFICATION

The cables shall be resistant to decay, abrasion, acids, alkalies and other corrosive materials. All indoor wiring on walls shall be clamped neatly on teak wood battens fixed to the wall by means of wall plugs/wooden pegs. The cable run layout at a typical switching stations is shown in the relevant drawing already included in Annexure-1.

LITERATURE FOR EQUIPMENT:

The Contractor shall, within six months of issue of Letter of Acceptance of Tender, supply 5 copies of booklets containing manufacturer's instructions for operation and maintenance of each of the items of equipments the supply of which is, Herded by the contract. In addition, 25 copies of detailed schedule of components, catalogues and drawing of all parts of the equipment shall also be supplied.

DESIGNS AND DRAWINGS

CONTRACTOR'S DRAWINGS :

(a) The Contractor shall submit to the Purchaser for approval except where otherwise specified below, all detailed designs and drawings which are necessary to ensure correct supply of equipments, components and materials and to enable correct and complete erection of overhead equipment, switching stations, booster transformer stations and L.T. Supply transformer stations and complete supply and erection of Traction Sub-Stations in an expeditious and economic manner.

(b) RESPONSIBILITY

It is to be clearly understood that all original designs and drawings shall be based on a thorough study. General designs and dimensions shall be such that the Contractor is satisfied about the suitability of the designs for the purpose. The Purchaser's approval will be based on these considerations and notwithstanding the Purchaser's acceptance; the ultimate responsibility for the correct design and execution of the work shall rest with the Contractor in terms of the conditions of Contract.

STANDARDS FOR DRAWINGS :

All designs, legends notes on drawings and schedules of materials shall be in English and shall be prepared in the metric system. All designs and drawings shall conform to specification RE/OHE/ 25 and ETI/PSI/31(5/76)(Latest version as indicated in Annexure-1).

BASIC DESIGNS :

(a) STANDARD DESIGNS

Where the Contractor adopts designs and drawings conforming to the standard designs, drawings, and specifications of the Research, Designs and Standards Organisation. Manak Nagar, Lucknow-226 011 (RDSO) for basic arrangements, equipments, components and fittings of traction overhead equipment, switching stations booster transformer stations and LT supply transformer stations and TSS adopts employment schedules furnished by the Purchaser , he shall verify such designs, drawings and employment schedules and satisfy himself that these are correct before use. Within two months of the issue of letter of Acceptance of Tender the contractor shall indicate to the Purchaser, the list of standard basic arrangements, components and fittings drawings and employment schedules, which he will adopt for the purpose of the work. The contractor for his use and reference shall obtain copy each of such standard basic arrangement, component and fittings drawings and employment schedules from GM/Electrical/K-RIDE office.

(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 results of his experience or other development, he shall justify his proposals with supporting explanatory notes.

SPECIAL DESIGNS :

(a) In cases where standard designs, drawings or employment schedules do not cover requirement of special locations or site conditions, the Contractor shall submit his own designs

or drawings alongwith supporting calculations and notes for scrutiny and approval of the Purchaser.

(b) Such special designs shall generally by 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) PURCHASER'S PEGGING PLANS

The pegging plans for sections to be equipped indicating the type of overhead equipment, locations of masts and other general particulars prepared on the basis of the latest survey will be furnished by the Purchaser. The Contractor shall verify and check these plans at site.

(b) CONTRACTOR'S PEGGING PLANS

If the Contractor is called upon to carryout survey and prepare overhead equipment pegging plans, he shall submit such plans for approval after checking their feasibility at site.

(c) PRINCIPLES OF LAYOUT

The Contractor shall in all cases ensure that the final pegging plans are in conformity with the latest 'Principles of preparation and checking of OHE layout plans and sectioning diagram' issued by RDSO.

(d) PROVISIONAL LAYOUT PLANS

The Contractor shall prepare and submit overhead equipment layout plans incorporating the following in formations:-

(i) The run of wires in different thickness or colour in special cases and termination.

(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.

(viii) List of infringements.

(ix) Kilometer numbers and type of Structures.

(x) Location and numbers of switches.

(xi) Schematic sectioning diagram drawn to convenient scale showing section insulator, number of switches, elementary sections and connections to switches and switching stations.

(xii) Table giving references of approved profile drawings, feeder layout plans and other relevant drawings.

(e) OHE PROFILE DRAWINGS

After completion of the overhead equipment layout plans, the Contractor shall prepare an overhead equipment profile drawings showing the actual height of the contact wire under each overline Structure the gradient and height of the contact wire on either side of the Structure and the encumbrances at Structures until normal height of contact wire and encumbrances are restored.

(f) CROSS SECTION DRAWINGS

While the layout plans are being finalised, the Contractor shall submit for approval, in-so-far as yards between outer most points and crossing are concerned, cross-section drawings for each Structure showing guy rods, if any, indicating the cross-section of the formation, height and nature of soil, type of foundation block, structure proposed, reverse deflection of the Structure and all necessary particulars for erection of the foundation and the Structures. In the preparation of drawings, care shall be taken to show all obstructions such as signal wires, points rods and their correct location in references 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 at such location and necessary details of anchor foundation will be submitted.

CROSS SECTION FOR THE OPEN ROUTE SECTION ----------Km. ---------- to ----------

	Sl. No.	1 2 3 4 5 6 7 8 10 11 12 13 14 15
	LOCATION No.	
	CHAINAGE	
DETAILS	SETTING DISTANCE IN `m'	
	STEP DISTANCE IN 'm'	
	F.B.M. CODE	
	SOIL TYPE & PRESSURE	
	FOUNDATION TYPE AND SIZE	
	MAST SIZE & LENGTH IN 'm'	

	MAST EMBEDDED LENGTH 'M'	
	REVERSE DEF LECTION in cm	
	SUPER MAST LENGTH (m)	
	CROSS ARM LENGTH (m)	
	ANY OBSTRUC TION	

(g) FINAL LAYOUT PLANS

After all the cross section drawings in a section covered by the layout plan are finalised and foundations are cast, the Contractor shall revise the layout plans to take into account any modifications to the locations of Structures during the process of casting of foundations.

(h) STRUCTURE ERECTION DRAWINGS

The Contractors shall then submit Structure erection drawings for each structure incorporating all the details included in the cross section drawing for the structure and as erected at site and the details or the bracket assembly, mast extensions, isolator mounting frame and anchorage of overhead equipment, feeder or return conductors proposed for each structure together with all particulars necessary for the correct erection of overhead equipment at the structure. For structure with isolators, the details of electrical connections shall also be incorporated. In open line sections the Contractor shall submit structure erection particulars in the 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 is found necessary will be finalised at time of structure erection drawings.

Sl.No.	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
LOCATION No.	
CHAINAGE	
1. ENCUMBRANCE	
2. CONTACT WIRE HEIGHT.	
3. STAGGER i) CATENARY ii) CONTACT	
4. STAY ARM i) (a) ii) CODE	
5. BRACKET i) (b) M ii) CODE	
6. REGISTER : i) C/D (M) ii) CODE	
7. STD/BENT CODE	

8.	IDENTIFICATION MARK (SEE PARA 2.5.11)	
	OTHER REFERENCES/CODES FOR MISC. ITEMS LIKE STEEL WORK FOR STAY/BRACKET ATTACHMENT MISC. SINGLE/DOUBLE CAT. ETC. WILL BE INDICATED. ITEMS :-	

Tolerances to be adopted while Erection of Bracket Assembly, conducting SED checking & Tower Wagon checking:

Sl. No.	Item	Limits/Tolerances
(i)	Register Arm Tube Projection	150 - 200 mm in case of Push off locations. For Pull off locations, it shall project over Contact Wire Plane.
(ii)	Bracket Tube Projection	150 - 200 mm
(iii)	Dip between Register Arm Tube & Steady Arm	200 - 250 mm on Tangent Track. (BFB Steady Arm). 250 - 320 mm on Curves. (BFB Steady Arm & Bend Tubular Steady Arm).
(iv)	Encumbrance	± 50 mm
(v)	Length of 'A' Dropper (1st Dropper from Support)	± 5 mm
(vi)	Spacing of 'A' Dropper (1st Dropper from Support)	± 30 mm
(vii)	Length of Other Droppers	± 5 mm
(viii)	Spacing of Other Droppers	± 50 mm
(ix)	Stagger of Catenary Wire	± 30 mm
(x)	Height of Catenary Wire	± 50 mm
(xi)	Stagger of Contact Wire	± 10 mm
(xii)	Position of Compensation Plate	It shall be in vertical plane.
(xiii)	Difference between mainline Contact wire and the Crossover Contact Wire at Support.	50 mm (minimum)

NOTE: *The proforma for SED at individual locations shall be as per standard proforma already circulated and to be adopted in consultation with Purchasers.*

FOR TSS:

a) **Purchaser's location plans**

(A) **FOR TRACTION SUB-STATIONS**

The location plans and schematic diagram of connections for each of the traction sub-stations will be furnished by the Purchaser to the Contractor. These will indicate.

i) Position of incoming lines on the gantries to be erected inside the traction sub-station.

ii) Location of switching station gantry showing where the 25kV outgoing feeders will be terminated.

iii) Schematic diagram of connections of Transformers, Circuit breakers Isolators etc.

iv) Position of the control room with respect to the traction sub-station.

v) Fencing outline with gates.

(B) **FOR FEEDING STATIONS**

The location plans and schematic diagrams of connections for all the feeding stations will be furnished by the Purchaser to the Contractor. These will indicate the following as applicable:-

i) Overhead equipment layout in the vicinity of feeding stations.

ii) Location of main masts.

iii) Arrangement of cross feeders and longitudinal feeders to be anchored on the gantry if any, including jumper connections to the overhead equipment.

iv) Scheme of connections of interrupters.

v) Position of the remote control cubicle with respect to the feeding stations.

C) **SHUNT CAPACITOR BANK**

The location plans and schematic diagram of connections for capacitor bank installation at each of the traction sub-stations will be furnished by the Purchaser to the Contractor. These will indicate.

i) Schematic diagram of connections of circuit breakers, isolators, L.As etc.

ii) Position of the control room with respect of the traction sub-station.

iii) Fencing outline with gates.

b) Contractor's responsibility.

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

PARTICULAR DESIGNS & WORKING DRAWINGS FOR SWITCHING STATIONS & BOOSTER STATIONS:

(a) PURCHASER'S LOCATION PLAN ETC.

The location plans and schematic diagrams of connections for all the switching stations, booster transformer stations and L.T. supply transformer stations will be furnished by the Purchaser to the Contractor. These will indicate the following as applicable:-

i) Overhead equipment layout in the vicinity of switching or other stations.

ii) Location of main masts.

iii) Arrangement of cross feeders and longitudinal feeders to be anchored on the gantry if any, including jumper connections to the overhead equipment.

iv) Scheme of connections of interrupters.

v) Position of the remote control cubicle with respect to the switching stations.

vi) Fencing outline at the switching stations.

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

(b) DETAILED DRAWINGS

(A) OHE WORKS :

The Contractor shall submit for approval of the Purchaser the following drawings:-

(i) Cross-section drawings for each switching stations indicating the cross section of the formation transverse to the track at each location of main mast and longitudinal section parallel to the track along the center line of the interrupters. These drawings shall be prepared after an accurate survey at site and shall indicate the nature of the soil, its bearing capacity, compactness and in case of loose soil, transverse section of the parent soil. In the preparation of the drawings care shall be taken to show all obstructions to be removes, such as signal wires, rods and their correct location with reference to the track/s as well as under-ground constructions like pipes, cables etc. after collections such information from the site.

(ii) **GENERAL ARRANGEMENT DRAWINGS**

General arrangement drawings for switching stations indicating the general arrangement of all equipments, run of bus bars, position of pedestal insulators, steel frame work and fencing. The drawings shall also give a schematic connection/diagram and an isometric view of busbars and connections. The drawings shall include an elevation view of the switching stations from behind a transverse cross section and plan sectional views at the level of feeder anchors insulator beams, potential transformer beams and ground. Each drawing shall have a schedule of all equipments required at the switching station along with drawing references of details of these equipments.

(iii) STRUCTURAL DRAWINGS

Structural assembly drawing for switching stations indicating the steel frame work assembly. The drawings shall include one elevation view of the steel frame work assembly from behind, a transverse cross-section and plan views at various levels such as at the level of feeder anchors, insulator beams/and ground. In the assembly each component member shall be marked with its reference number. The drawing shall also have a schedule of component members alongwith drawing reference various members. The weight of the component members shall be indicated in a separate weight schedule. The drawings shall be prepared for the various structural components. An individual drawing shall be made for each component and this shall include all fixing bolts, nuts and washers whose sizes will be mentioned on the drawings. Unit isolator beams, potential transformer beams weight of the component shall also be given in the drawings.

(iv) FOUNDATION LAYOUT AND CROSS-SECTION DRAWINGS

Foundation layout & cross-section drawings for each switching station indicating layout of all foundations in plan, transverse cross-section of various foundations through center line of main masts, interrupters, fencing uprights and L.T. supply transformers, if any, and longitudinal sections parallel to tracks through the center line of the cable trench. All foundations shall be marked serially on the drawing and listed in a schedule on the drawing indicating the volume of concrete for each foundation block.

(v) FENCING LAYOUT DRAWINGS

Fencing layout drawings for each switching station indicating the layout of the entire fencing and anti-climbing device in plan. Each upright, fencing panel and fixture on the upright shall be indicated on the drawing by its reference number. A schedule of components viz. Uprights, panel's fixer, and barbed wire shall be included in the drawings indicating the drawing references of components. An individual drawing shall be made for each type panel, fencing post and fixture for mounting the anti-climbing device. The drawing of each fencing post shall indicate the unit weight of the fencing post.

(vi) EARTHING LAYOUT DRAWINGS

Earthing layout drawing for each switching station indicating the layout of full earthing system in plan. The drawing shall show the location of earth electrodes and mark the runs of earthing strips and connections to each equipment, mast, fencing post and fencing panel. All components shall be marked with their reference numbers, for further details of the run of conductors and connections, separate drawings which may be common to all switching stations may be made and references to these drawings marked on the layout. A schedule of components shall be made out in the drawing giving drawing references of components.

(vii) CABLE RUN LAYOUT.

Cable run layout of each switching station indicating inter-connection between various equipments, indoor and outdoor, along with schematic arrangements and physical disposition of equipments, colour coding or code number and the index scheme adopted for terminals. The drawings shall also indicate the cable size and grades of insulation. The quantity of various cables required shall be indicated on the drawings.

(viii) EQUIPMENT DRAWINGS

Equipment drawings applicable to all switching station except the ones for the equipments to be supplied by the Purchaser. Drawings should be dimensioned and should indicate:-

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

7. Notes explaining the operation of the equipment

(ix) MISCELLANEOUS DRAWINGS

Miscellaneous drawings applicable to all switching stations. These drawings shall include drawings or sketches made for study of clearances, isolator alignment details, scheme of interlocks, number plates of various equipments and "U" bolts for cable mounting, caution or instruction boards, outriggers for busbar supports and non-standard busbar connectors.

(x) EMPLOYMENT SCHEDULES AND CHARTS

Employment schedules and charts applicable to all switching stations. These will include:

1. Employment schedule for pure gravity type of foundations for main masts for various direct loads and bending moments;

2. Employment schedule for all other foundations for various depths of parent soil from the datum level.

3. Sag tension charts for cross feeders for various spans and tensions.

(B) FOR TSS WORKS:

Contractor shall submit for approval the following drawings.

a) **Cross section drawings**.

Cross section drawings for each traction sub-station, indicating the transverse and longitudinal cross-section of the soil along the center line of the equipments, busbar supports and cable trenches. These drawings shall be prepared after an accurate survey at site and shall indicate the nature of the soil, its bearing capacity, compactness and in case of loose soil, cross-section of the parent soil. In the preparation of the drawings, care shall be taken to show all obstructions to be removed, such as telegraph posts, underground pipes, cables etc. after collection of such information from the site.

b) **General arrangement drawings**.

General arrangement drawings for each traction sub-station shall indicate the general arrangement of all equipments, run of busbars, position of pedestal insulators and steel frame work. The drawings shall also give a schematic connection diagram and an isometric view of busbars and connections wherever required. The drawings shall include an elevation view of the traction sub-station, transverse cross section and plan views. The drawings shall have a schedule of all equipments required at the traction sub-station alongwith drawing references of the details of these equipments.

c) **Structural drawings**

Structural drawings for each supporting steel frame work of pedestal. The drawing shall include one elevation view of the steel frame work assembly from behind, a transverse cross section and plan view. In the assembly each component member shall be marked with its reference number. The drawing shall also have a schedule of components members along with drawing references of various members. The weight of the component members shall also be indicated. The drawings shall be prepared for the various structural components. An

individual drawing shall be made for each component and this shall include all fixing bolts, nuts and washers whose sizes will be mentioned on the drawing. Unit weight of the components shall also be given in the drawing.

d) **Foundation layout and cross section drawings**.

Foundation layout and cross section drawings for each traction sub-station indicating layout of all foundations in plan, longitudinal and transverse cross-sections of various foundations through centre line of gantry/portal legs, various equipment busbar supports, fencing uprights and cable trenches. All foundations shall be marked serially on the drawing indicating the volume of concrete for each foundation block.

e) **Earthing layout drawings**.

Earthing layout drawing for each traction sub-station indicating the layout of full earthing system in plan. The drawing shall show the location of earth electrodes and mark the runs of earthing leads and connections to equipment, gantry/portal columns, fencing uprights, structural supports etc. All components shall be marked with their reference numbers. For further details of the run of conductors and connections, separate drawings which may be common to all traction sub-stations may be made and references to these drawings marked on the layout. A schedule of components shall be made out in the drawing giving drawing references of components. These drawings shall be prepared duly taking into account the actual soil resistivity of the respective traction sub-station area, measured in the presence of the Purchaser's representative in accordance with the procedure laid down in IS:3043 -1966. The necessary design calculations for the proposed earthing system of the traction sub-station shall also be submitted by the Contractor for Purchaser's approval.

f) **Cabling & Wiring drawings**.

Cabling and wiring diagrams for each traction sub-station indicating the schematic arrangement and physical disposition of equipment, run of cables and wires for inter-connections between various equipments indoor and outdoor, colour coding and the index scheme adopted for terminals. The drawings shall also indicate the sizes of wires and grades of insulation. The quantity of various cables required shall be indicated on the drawings.

g) **Fencing layout drawings**.

Fencing layout drawings for each traction sub-station indicating the layout of entire fencing and anticlimbing device in plan. Each upright, fencing panel and fixture on the upright shall be indicated on the drawing by its reference number. A schedule of components viz. uprights, gates, panels fixtures and barbed wires shall be included in the drawing indicating the drawing reference of the components. Type drawings shall be prepared for the various fencing components. An individual drawing shall be made for each type of panel, fencing post, gate and fixture for mounting the anticlimbing device. The drawing of each fencing post shall indicate the unit weight of the fencing post.

h) Equipment drawings applicable to all traction sub-stations complete with drawings of components parts except the ones for the equipment to be supplied by the Purchaser. The Contractor shall submit 5 copies for distribution to field office and one transparent print for the equipments to be supplied by Contractor. Drawings should be dimensioned and should indicate.

1) Fixing or mounting hole dimensions & arrangement.
2) Net weight of the equipment.

3) Characteristics and ratings including those of motors and resistors etc.
4) Schematic and detailed circuit diagrams.
5) Overall dimensions and other important dimensions.
6) Height and disposition of all exposed live parts, height of the bottom most point of all bushings and insulators.
7) Notes explaining the operation of the equipment.

For equipment to be supplied by the Purchaser, drawings showing the above particulars will be furnished to the Contractor to enable him to carry out the installation, wiring and commissioning of such equipment.

i) **General Drawings**.

General drawings applicable to all traction sub-station. These drawings shall include the drawings or sketches made for study of clearances, Isolator alignment details, number plates of various equipments, caution or instruction boards, non-standard busbar connectors, clamps and U-bolts for cable mounting etc.

j) **Schedule of quantities**.

On receipt of approval of relevant drawings for each traction sub-station, the following schedules of quantities relating to each traction sub-station shall be submitted within a fortnight of receipt of approval.

i) Schedule of foundations, showing volume of each type and total volume.
ii) Schedule of steel work, types, weights of each member and total weight.
iii) Schedule of quantities of various items of work

(C) FOR FEEDING STATIONS

The Contractor shall submit for approval of the Purchaser the following drawings:-

a) **CROSS SECTION DRAWINGS**

Cross-section drawings for each feeding stations indicating the cross section of the formation transverse to the track at each location of main mast and longitudinal section parallel to the track along the center line of the interrupters. These drawings shall be prepared after an accurate survey at site and shall indicate the nature of the soil, its bearing capacity, compactness and in case of loose soil, transverse section of the parent soil. In the preparation of the drawings care shall be taken to show all obstructions to be removes, such as signal wires, rods and their correct location with reference to the track/s as well as under-ground constructions like pipes, cables etc. after collections such information from the site.

(b) **GENERAL ARRANGEMENT DRAWINGS**

General arrangement drawings for feeding stations indicating the general arrangement of all equipments, run of bus bars, position of pedestal insulators, steel frame work and fencing. The drawings shall also give a schematic connection/diagram and an isometric view of busbars and connections. The drawings shall include an elevation view of the feeding stations from behind a transverse cross section and plan sectional views at the level of feeder anchors insulator beams, potential transformer beams and ground.

Each drawing shall have a schedule of all equipments required at the feeding station alongwith drawing references of details of these equipments.

(c) STRUCTURAL DRAWINGS

Structural assembly drawing for feeding stations indicating the steel frame work assembly. The drawings shall include one elevation view of the steel frame work assembly from behind, a transverse cross-section and plan views at various levels such as at the level of feeder anchors, insulator beams/and ground. In the assembly each component member shall be marked with its reference number. The drawing shall also have a schedule of component members along with drawing reference various members. The weight of the component members shall be indicated in a separate weight schedule. The drawings shall be prepared for the various structural components. An individual drawing shall be made for each component and this shall include all fixing bolts, nuts and washers whose sizes will be mentioned on the drawings. Unit isolator beams, potential transformer beams weight of the component shall also be given in the drawings.

(d) FOUNDATION LAYOUT AND CROSS-SECTION DRAWINGS

Foundation layout & cross-section drawings for each feeding station indicating layout of all foundations in plan, transverse cross-section of various foundations through center line of main masts, interrupters, fencing uprights and L.T. supply transformers, if any, and longitudinal sections parallel to tracks through the center line of the cable trench. All foundations shall be marked serially on the drawing and listed in a schedule on the drawing indicating the volume of concrete for each foundation block.

(e) EARTHING LAYOUT DRAWINGS

Earthing layout drawing for each feeding station indicating the layout of full earthing system in plan. The drawing shall show the location of earth electrodes and mark the runs of earthing strips and connections to each equipment, mast, fencing post and fencing panel. All components shall be marked with their reference numbers, for further details of the run of conductors and connections, separate drawings which may be common to all feeding stations may be made and references to these drawings marked on the layout. A schedule of components shall be made out in the drawing giving drawing references of components.

(f) CABLE RUN LAYOUT

Cable run layout of each feeding station indicating inter-connection between various equipments, indoor and outdoor, along with schematic arrangements and physical disposition of equipments, colour coding or code number and the index scheme adopted for terminals. The drawings shall also indicate the cable size and grades of insulation. he quantity of various cables required shall be indicated on the drawings.

(g) EQUIPMENT DRAWINGS

Equipment drawings applicable to all feeding station except the ones for the equipments to be supplied by the Purchaser. Drawings should be dimensioned and should indicate:-

1. Fixing or mounting hole dimensions and arrangement
2. Net weight of the equipment.
3. Characteristic and rating of equipment

4. Circuit diagrams
5. Overall dimensions and other important dimensions
6. Height and vertical and horizontal dimensions of all exposed live parts
7. Notes explaining the operation of the equipment

(h) **MISCELLANEOUS DRAWINGS**

Miscellaneous drawings applicable to all feeding stations. These drawings shall include drawings or sketches made for study of clearances, isolator alignment details, scheme of interlocks, number plates of various equipments and "U" bolts for cable mounting, caution or instruction boards, outriggers for busbar supports and non-standard busbar connectors.

(i) **EMPLOYMENT SCHEDULES AND CHARTS**

Employment schedules and charts applicable to all feeding stations. These will include:

1. Employment schedule for pure gravity type of foundations for main masts for various direct loads and bending moments;

2. Employment schedule for all other foundations for various depths of parent soil from the datum level. 3. Sag tension charts for cross feeders for various spans and tensions.

(j) **SCHEDULE OF QUANTITIES**

Within a fortnight of receipt of approval of relevant drawings for each feeding station, the following schedules of quantities shall be submitted.

i) Schedule of number of foundations, types, volume of different foundation and total volume. foundations will be treated as one foundation;

ii) Schedule of number of masts, types, weight of different masts, and the total weight of masts of each gantry.

iii) Schedule of steel work, types, weight of each member and total weight; and

iv) Schedule of quantities of various items of work

(D) FOR SHUNT CAPACITOR BANK

Contractor shall submit for approval of the following drawings:-

a) **Cross section drawings**

Cross section drawings for each capacitor bank installation indicating the transverse and longitudinal cross-section of the soil along the centre line of the equipments, busbar supports and cable trenches. These drawings shall be prepared after an accurate survey at site and shall indicate the nature of the soil, its bearing capacity, compactness and in case of loose soil, cross section of the parent soil. In the preparation of the drawings, case shall be taken to show all obstructions to be removed, such as telegraph posts, underground pipes, cables etc. after collection of such information form the site.

b) **General arrangement drawings**

General arrangement drawings for each capacitor bank installation indicating the general arrangement of all equipments run of busbars, position of pedestal insulators and steel framework. The drawings shall also give a schematic connection diagram and an isometric view of busbars and connections wherever required. The drawings shall include an elevation view of the capacitor bank installation transverse cross section and plan views. The drawings shall have a schedule of all equipments required at the sub-station along with drawing references of the details of these equipments.

c) **Structural drawings**

Structural drawings for each supporting steel framework of pedestal. The drawing shall include one elevation view of the steel framework assembly from behind, a transverse cross section and plan view. In the assembly each component member shall be marked with its reference number. The drawing shall also have a schedule of components members along with drawing references of various members. The weight of the component shall also be indicated. The drawings shall be prepared for the various structural components. An individual drawing shall be made for each component and this shall include all fixing bolts, nuts and washers whose sizes will be mentioned on the drawing. Unit weight of the components shall also be given in the drawing.

d) **Foundation layout and cross-section Drawings**

Foundation layout and cross section drawings for each capacitor bank installation indicating layout of all foundations in plan, longitudinal and transverse cross-sections of various foundations through centre line of various equipment busbar supports, and cable trenches. All foundations shall be marked serially on the drawing indicating the volume of concrete for each foundation block.

e) **Earthing layout drawings**

Earthing layout drawing for each capacitor bank installation indicating the layout of full earthing system in plan. The drawing shall show the location of earth electrodes and mark the runs of earthing leads and connections to equipment, structural supports etc. All components shall be marked with their reference numbers. For further details of the run of conductors and connections, separate drawings which may be common to all traction sub-stations may be made and references to these drawings marked on the layout. A schedule of components shall be made out in the drawing giving drawing references of components. These drawings shall be prepared duly taking into account the actual soil resistivity of the respective traction sub-station area, measured in the presence of the Purchaser's representative in accordance with the procedure laid down in IS:3043 -1966. The necessary design calculations for the proposed earthing system of the traction sub-station shall also be submitted by the Contractor for Purchaser's approval.

f) Cabling and Wiring drawings

Cabling and Wiring diagrams for each traction sub-station indicating the schematic arrangement and physical disposition of equipment, run of cables and wires for inter connections between various equipments indoor and outdoor, colour coding and the index scheme adopted for terminals. The drawings shall also indicate the sizes of wires and grades of insulation. The quantity of various cables required shall be indicated on the drawings.

g) Equipment drawings applicable to all traction sub-stations complete with drawings of components parts except the ones for the equipment to be supplied by the Purchaser. Drawings should be dimensioned and should indicate:

i) Fixing or mounting hole dimensions and arrangement
ii) Net weight of the equipment.
iii) Characteristics and ratings including those of motors and resistors, etc.
iv) Schematic and detailed circuit diagrams.
v) Overall dimensions and other important dimensions.
vi) Height and disposition of all exposed live parts, height of the bottom most point of all bushings and insulators.
vii) Notes explaining the operation of the equipment.

For equipment to be supplied by the Purchaser, drawings showing the above particulars will be furnished to the Contractor to enable him to carry out the installation, wiring and commissioning of such equipment.

h) **General drawings**

General drawings shall be applicable to all capacitor bank installation. These drawings shall include the drawings of sketches made for study of clearances, isolator alignment details, number plates of various equipments, caution or instruction boards, non standard busbar connectors, clamps and U-bolts for cable mounting etc.

BOOSTER & L.T. SUPPLY TRANSFORMER STATIONS DRAWINGS:

The Contractor shall submit for approval to the purchaser L.T. supply transformer stations, similar to those detailed for switching stations. The following drawings may, however, be combined together:

(i) Cross-section and foundation layout drawings;

(ii) General arrangement, structural and earthing layout drawings.

SCHEDULE OF QUANTITIES:

(a) Within five months of issue of Letter of Acceptance of Tender, the Contractor shall assess the quantities of various items of work including various components and fittings as covered in Schedule 1 and submit Schedule 1 (Assess.1) along with the corresponding quantity of various fittings and components included in Schedule 3 for approval of the Purchaser. Such an assessment shall be revised at suitable intervals after the first assessment is approved till the work is completed. Such re-assessments denominated as Schedule 1 (Assess. 2) (Assess. 3) etc., shall also be submitted for approval of the purchaser.
On receipt of approval of each final layout plan from the Purchaser, the followings Schedules of quantities relating to each layout plan shall be submitted within a fortnight.

i) Schedules of number of masts, types, weight of different masts and total weight of masts;

ii) Schedules of number of foundation, types, volume of different foundations and total volume;

iii) Schedule of quantities of various items of work other than masts and foundation

iv) Schedule of net tension lengths of contact, catenary and feeder wires and lengths required to be ordered;

v) Schedule of lengths of other wires and conductors required to be ordered;

and

vi) Schedules of small parts steel work to be supplied; either by the Contractor or the Purchaser.

(b) SWITCHING/BOOSTER STATIONS

Within a fortnight of receipt of approval of relevant drawings for each switching/ booster station, the following schedules of quantities shall be submitted.

i) Schedule of number of foundations, types, volume of different foundation and total volume. Overlapping foundations will be treated as one foundation;

ii) Schedule of number of masts, types, weight of different masts, and the total weight of masts of each gantry;

iii) Schedule of steel work, types, weight of each member and total weight; and

iv) Schedule of quantities of various items of work of schedule1 not included in Item (i), (ii), and (iii) above.

(c) TRACTION Sub-Stations:

On receipt of approval of relevant drawings for each Traction Sub-Station, the following schedules of quantities relating to each Traction Sub-Station, shall be submitted within a fortnight of receipt of approval.

i) Schedule of foundations, showing volume of each type and total volume.
ii) Schedule of steel work, types, weights of each member and total weight.
iii) Schedule of quantities of various items of work not included in item (i) and (ii) above.

SUBMISSION OF DRAWINGS & SCHEDULES:

(a) The submission of designs and drawings for approval shall be done in the manner indicated in this tender . In case Contractor wish to deviate from standard drawings he should submit to the purchaser revised drawings with full details of deviation sought explaining the necessity of deviation, calculations and other supporting documents. The purchaser, if satisfy about the necessity and adequacy of deviations, shall refer the matter to RDSO for necessary approval. In case of deviations on working drawings¬ decision shall be communicated by the purchaser to the Contractor. The numbers of copies of drawings which shall be submitted are indicated in the following sub-paras. The purchaser will return one copy of the drawings either with approval subject to modification where necessary or with comments. The purchaser shall endeavor to return this copy within a period of fifteen days from the date of receipt and shall normally return the copy within a month. Where drawings are returned with comments or approval subject to modifications, the Contractor shall submit to the purchaser within fifteen days of receipt of such advice revised drawings for approval taking into account the comments or modifications. Also the Contractor shall as far as possible avoid correspondence on such comments and shall endeavor to settle any difference of opinion on the comments by discussions with the purchaser's Engineers. No drawings shall be resubmitted without incorporating the

modifications required by the comments of the purchaser, unless the purchaser has agreed to the deletion of such comments.

(b) DEVIATION FROM STANDARD DESIGN

In case of deviation from standard designs and drawings, copies of correspondence and drawings shall be sent in duplicate to the GM/Electrical/K-RIDE or his successor/nominee (whose address will be intimated in due course). In the particular case of deviations in the design of fittings the drawings submitted by the Contractor shall be actual manufacturing drawings complete with tolerances and full specifications of the materials used. In addition, four samples of the modified fittings shall also be submitted, after the drawings are approved.

(c) SPECIAL DESIGNS

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

(d) PURCHASER'S PEGGING PLANS

Two copies of the purchaser's pegging plans shall be sent back after verification if found correct. If modifications are required, fresh pegging plans incorporating the modifications shall be submitted in two copies for approval.

(e) CONTRACTOR'S PEGGING PLANS

When the Contractor is called upon to survey and prepare pegging Plans, he shall send three copies of such plans, while submitting them for approval.

(f) CROSS-SECTION DRAWINGS

Cross-section drawings shall be submitted for approval in two copies for a convenient section at a time separately for sections within station limits and section outside station limits. Such drawings shall be submitted progressively and as far as possible without gaps.

(g) OHE LAYOUT PLANS AND PROFILE DRAWINGS

Overhead equipment layout plans, provisional and final and profile drawings shall be submitted for approval in three copies.

(h) STRUCTURE ERECTION DRAWINGS

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

(j) SCHEDULE OF QUANTITIES

Schedules of quantities for each approved layout plan/switching station shall be submitted for approval in two copies.

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

(l) DISTRIBUTION COPIES

On receipt of purchaser's unqualified approval to the Contractor's Drawings, Schedule of quantities, the Contractor shall submit original tracings of those drawings and schedules for the signature of the purchaser in token of approval within seven days of the receipt of approval and the purchaser shall as far as possible return the same to the Contractor within 7 working days thereafter. On receipt of these tracings from the purchaser, the Contractor shall submit copies for distribution to field officers and other departments as indicated below within 7 days of receipt of approved tracings:

i) Standard designs including fittings drawings)	8 copies
ii) Special designs	8 copies
iii) Final peggings plans	4 copies
iv) Structure Cross-section drawings	6 copies
v) OHE layout plans	6 copies
vi) OHE profile drawings	6 copies
vii) Structure erection drawings	6 copies
viii) Deleted	
ix) Schedule of quantities	3 copies
x) Drawings for switching stations, booster transformer stations & L.T. transformer stations.	6 copies

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

COMPLETION DRAWINGS & SCHEDULES:

After completion of works, all drawings and designs submitted by the Contractor for OHE, TSS & SCADA works and approved by the purchaser shall be made upto date incorporation actual supply and erection particulars including the name and make of insulators, galvanised steel tubes, stainless steel wire rope, Transformers, Circuit Breakers, ATs, CTs, PTs, Interrupters, RTUs 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 four sets, one of which shall be transparencies of linen or film reproduction or any other durable material approved by the purchaser. In addition, the contractor shall also supply the soft copy of approved drawings. The soft copy shall be in Auto Cad, Coral draw or any other similar format as mutually agreed between the contractor and the purchaser.

ERECTION AND INSTALLATION OF EQUIPMENT

PRINCIPLES

METHODS OF ERECTION :

All work shall be done in accordance with methods of erection and installation of equipment approved by the Purchaser. In the case of switching station, booster transformer stations, L.T. supply transformer stations and Traction Sub-Stations, standard methods adopted for erection and installation of electrical equipment 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 centre of the formation in the case of an even number of tracks, structures on curves shall be located in the radial offset of the location as determined.

BOLTS, NUTS ETC .

All bolts, nuts, locknuts, screws, locking plates & split cotter pins etc. shall be properly tightened and secured. Contractor shall carry out systematic inspection of this aspect of work after all adjustments to overhead equipment/installation are completed and prior to offering completed sections of equipment/Sub-Station to the purchaser for inspection and testing. No bolts may project more than 10mm beyond the nut/locknut after full tightening.

DAMAGE TO GALVANISING PAINTING :

In loading, transport and erection, all galvanized/ painted materials shall be handled with care to avoid damage to galvanising/painting. If galvanising/painting is damaged inspite of all care taken, the damaged part of component shall be put up for inspection, to obtain permission from the purchaser to carry out repairs.

FOUNDATIONS :

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

(b) LOCATION

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

(c) METHOD OF INSTALLATION

As per provision in Clause 10.3 of IS: 456/2000, only mechanical mixers are to be used for mixing of concrete required anywhere in Electrification works including concrete for OHE foundation.

In exceptional circumstances, such as mechanical breakdown of mixer, work in remote areas or power breakdown and when the quantity of concrete work is very small, hand mixing may be done with the specific prior permission of the Engineer in writing subject to adding 10% extra cement. When hand mixing is permitted, it shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the concrete is uniform in colour and consistency.

He may erect traction masts or structures in the same operation as casting of foundations or erect them subsequently in cored holes left in foundation blocks and grout them separately. In any case, the method of casting of foundation blocks and erection of masts or structures shall be subject to the approval of the purchaser.

(d) EXCAVATION

Normally, excavation of soil for foundations or anchor blocks along side the tracks may be done upto length of 1 to 1.2 m and depth of 0.8 to 1 m without shoring, provided the excavated hole is concreted immediately and not left overnight. Shoring shall otherwise be done unless the hole is re-filled with soil and temped. In case the length of excavation is 1 to 1.2 m and depth of excavation for foundations and anchor blocks alongside the tracks is more 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, if the excavated hole is left overnight. All water logged 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 hours) and their edges cemented to the foundation blocks. Prior to doing so, water should be filled in the core hole so as to assist in curing. The date of casting should be inscribed on the foundation block. In case of platform areas and Level crossings, the core holes should be filled with sand before provision of core hole covers so as to prevent any injury to rail users even if the core hole cover gets damaged or is displaced. The track ballast should be restored to its original from promptly after casting of the foundation block. The excavated earth should be removed well clear of the area so as to avoid any mixing up with the track ballast or any obstruction to the track drains. In case of cuttings, the earth should be thrown well away from the shoulders so that there is no risk of its flowing back to the drain during the rains.

(e) CONCRETING

All concreting or grouting shall be done in accordance with above para (Foundations) with ballast graded for the purpose specified. The concrete shall be poured and temped properly

in accordance with the method approved by the purchaser. The Contractor shall arrange to provide concrete testing samples for tests once every week or as and when required by the Purchaser, to determine crushing strength after 7 days or 28 days curing as required. Testing shall be arranged by the Purchaser at his own cost.

(f) MUFFS

(i) FOR OHE:

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

(ii) FOR Foundation Level of TSS:

The top of all foundations and anchor blocks shall always be above the level of the ground and of adequate height, not less than 15 cm. to afford reasonable protection during rainy season. The top of foundation shall be finished to make a smooth surface sloping 1/20 outwards to drain rain water.

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

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

(i) All foundations will be cast in the presence of the Purchaser's representative with regard to fixed datum level.

MASTS AND STRUCTURES

(a) ERECTION

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

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

(b) REVERSE DEFLECTION

All traction masts and structures shall be erected with the correct reverse deflection so that they become reasonably vertical after they are loaded. The method of erection of masts with the correct reverse deflection shall be submitted to the Purchaser for approval.

(c) INFRINGEMENT TO STANDARD DIMENSIONS

In erection, care shall be taken to ensure that no part of the traction mast, structure or any fitting located on such mast or structure infringe the Schedule of Dimensions mentioned in Para - 2.1.1 (c)
" Indian Railways Schedule of Dimensions".

(d) ALINGMENT OF MAST 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 would ensure good speed and quality erection. 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 strung 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 200mm 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 90 mm in either direction except as otherwise relaxed.

(d) INSULATORS

Before insulators are used in bracket assemblies or dispatched to work site for erection from Contractor's Stores Depot, they shall be tested as specified for routine mechanical test. NO chipped or cracked insulators shall be installed. All insulators shall be cleaned before offering complete sections of equipment for inspection and testing.
For testing of all types of Insulators, RDSO’s Guidelines No. TI/MI/0011 (05/01) Rev.1 & TI/MI/ 0042 (12/2008) Rev. 0 or latest are to be followed.

(e) STRINGING CATENARY

Care shall be taken to avoid kinking or bird caging of the catenary wire in stringing and subsequent operations. While stringing the wire shall be suspended from pulley blocks hung from the suspension clamp eye of bracket 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' 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.

(f) STRINGING CONTACT WIRE

Care shall be taken to avoid formation of kinks, twists and damage to contact wire in stringing and subsequent operations. While stringing the contact wire, it shall be suspended from pulleys hung from droppers fitted to the catenary in their final position. In curves, the contact wire shall be run in pulleys located at traction masts or supports, corresponding to the approximate final position of the wire.

(g) LOCATION OF DROPPERS

Droppers shall be correctly positioned in each span to ensure correct level of contact wire as per dropper chart applicable to the span.

(h) CLIPPING DROPPERS

The dropper shall be clipped on the contact wire only after a minimum duration of 48 hours from the time the automatic tensioning device is brought into action. Shorter periods may, however, be allowed by the Purchaser.

(j) 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° C before it is connected to the overhead equipment and put into action. The installation of the device shall be such as to permit free, easy and unobstructed movement of counter-weight. RDSO's Guidelines No. TI/MI/0035 (09/01) Rev. 1 shall be followed at crossovers and short tension length ATDs.

(k) CUT-IN-INSULATORS

All insulators in out of run shall be so positioned that they are away from the swept zone of the pantographs and will not foul with them. The live parts of these insulators shall also be so located that they are at least 2 m away from Structures other than those supporting traction overhead equipment.

(l) SECTION INSULATORS

All section, insulators shall be so located that they are beyond the swept zone of the pantograph running on adjacent tracks and there is no unusual sag due to the same. Where section insulators are installed, the contact plane of the runners of the insulators as well as those of overhead equipment connected to it shall be parallel to the track plane.

(m) ANTI -WIND CLAMP

Anti-wind clamp shall be provided as shown in drawing (Annexure-1).

(n) CONNECTIONS

All jumper connections including anti-theft jumpers shall be made properly with parallel clamps and finished neatly without any loose wire or cables. The length of flexible jumpers shall be adequate to avoid any disturbance to overhead equipment or restraint in the relative movement of conductors, but the jumpers should not be excessively long. The ends of jumpers shall be tinned, including the portion inside the first parallel clamp.

(o) SEPARATION BETWEEN OHE

In erection, the physical separation required between overhead equipments and bracket assemblies on the same Structure at insulated overlaps shall be ensured.

(p) GRADIENT OF CONTACT WIRE

The gradient of the contact wire on either side of overline Structures with restricted clearances shall be correctly adjusted and adequate clearance maintained between the overline Structure and live equipment.

(q) ADJUSTMENT AT TURNOUTS ETC

Careful adjustment of equipment shall be made on equipments at Turnouts, cross overs, diamond crossings, overlaps and special Locations, for position of bracket assemblies, stay arms and height of contact wire to ensure that pantographs of electric rolling stock on the run will not foul with any parts of the bracket assemblies and change over of the contact wire is effected smoothly.

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

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.

BUS BARS AND CONNECTIONS :

a) The busbar connections on the incoming side, shall be as tight as possible, all similar connections in adjacent bays being uniformly shaped and bent to give a good appearance. The tubular Aluminium busbars shall be supported at a uniform height throughout. Wherever tubular busbars are required to be bent, the radius of the bend shall not be less than 375 mm.

b) All Aluminium busbar joints shall be made carefully. The contact surfaces of the busbars and the connectors shall be cleaned vigorously either by hand with a dry coarse emery cloth or by power driven wire wheel brush. The surfaces shall be smeared with a suitable corrosion inhibiting joint compound approved by the Purchaser. The joint closed-up as soon as possible thereafter and a final light application of joint compound shall be made. Similar procedure shall be followed while connecting the equipment terminals to be busbar by means of bi-metallic connectors.

EARTHING :

FOR OHE:

The copper earth strips or MS flats used for earthing shall be bent and shaped neatly before connection to the structure or frame work of equipment. The connection of MS flats to steel work shall be made at a height not exceeding 15 cm from the datum level of a switching station. Before making earth connections the ends shall be cleaned thoroughly and tinned for copper strips. All junctions shall be properly secured to avoid loose contact. Portions of copper earth strips which remain visible above the ground level should be painted with suitable paint to make them inconspicuous.

FOR TSS:

Typical clamping arrangement of M.S Flat inside Control Room is shown in the relevant drawing in Annexure-1. The joints on mild steel flats shall be welded type. The welds shall be treated with barium chromate before painting the welded surfaces. The connections to the various items of equipments shall be made with galvanised steel bolts (16mm dia), nuts with locknuts or spring washers as required. The earth connections to the structural members shall be made at height not exceeding 150 mm from the ground level. The steel flats shall be bent and shaped neatly before connection to the structures or frame work of equipment. The earth flats to run along the structures for connections of equipments to earth mat shall be properly supported on the structures with galvanised steel bolts (12mm dia), nuts with lock-nuts or spring washers, as required, at suitable intervals.

TOLERANCE :

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

(a) MEASUREMENTS

The span length shall not vary more than ± 50 mm as measured along the appropriate rail

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 structures shall be not less than that included in the appropriate cross section drawings, especially those with the minimum setting of 2.36m. A 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 structure erection drawings, except under over line structures where no tolerance will be permitted.

(d) STAGGER : Generally ± 200 mm will be permitted for stagger.

(e) DROPPER LENGTHS : ± 5mm will be permitted for dropper lengths.

(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 requires to be improved.

EQUIPMENT :

The installation of the equipment shall be carried out strictly in accordance with the instructions issued by the Manufacturer. The equipment shall be leveled carefully before being fixed finally in position. The bushings of insulators shall be protected adequately during erection of equipment to avoid chipping or damage to the porcelain. The following methods shall be adopted for mounting the various equipments.

	Equipment	Method of mounting.
i)	Main Power transformer	On two 90 lb/yd flat-footed rails laid on concrete foundations with a spacing of 1676 mm between the inner face of the rails
ii)	220/132/110 kV Circuit breaker	On steel supports mounted on concrete foundation with operating mechanism kiosk on concrete pedestal where necessary
iii)	25kV Circuit breakers and interrupters	On fabricated steel supports erected on concrete foundations
iv)	Isolators, potential transformers, Current transformer L.T supply transformers, 25 kV fuse Switches & Lightning arrestors.	On steel supports mounted on concrete foundations
The Circuit breakers, interrupters and Isolators shall be mounted in such a way that they can be manually operated conveniently by a person standing on the ground or on a concrete pedestal of suitable height.		
v)	Shunt capacitor bank & series reactor	On steel racks which in turn shall be mounted on a concrete plinth with suitable base frame.

CABLING :

a) Laying of cables.

All PVC cables provided out-door shall be either laid in trenches or neatly clamped to the structures as approved by the Purchaser. If it becomes necessary to take the cable connections along the steel supports for the equipment, the cables shall be laid through bent or shaped G.I. pipes embedded in concrete while the foundations are being cast. All cables in the cable trenches and along the structures shall be neatly secured with proper clamping arrangement at suitable intervals. Each cable in the cable trench/on the structure shall also be provided at suitable intervals with identification labels of durable material bearing indelible engraved or punched markings to facilitate easy identification.

b) Termination of cables.

The cables shall be terminated neatly and the cores arranged and dressed properly. Suitable terminal strips and ferrules made of PVC or other durable materials shall be provided on terminals and wire ends respectively to facilitate identification. The marking on the terminals strips and ferrules shall be either engraved or punched so as to be indelible.

c) Indoor wiring.

As far as possible all cables shall be laid in the trenches/ pipes provided for the purpose in the Control Room. Wherever necessary indoor wiring on walls shall be clamped neatly on teak wood battens/M.S flats fixed to the wall by means of rag bolts grouted in the wall. The typical clamping arrangement is shown in the relevant drawing in Annexure-1.

WIRING PROCEDURE

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

(i) Bracket assemblies (brackets) and regulating equipment are correctly installed in their final position.

(ii) The conductors are correctly tensioned, and

(iii) The need for final adjustments of overhead equipment immediately before energisation and commissioning is virtually eliminated.

GENERAL :

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

(i) The catenary is tensioned to 1,000 kgf, the stipulated tension at the mean temperature of 35^{o} C, whatever may be the ambient temperature during the stringing operations. In this case, at the time of clamping the catenary to the bracket, the brackets should be placed at angular positions corresponding to temperature at the time of clamping, and proportionate to their distance from the anti-creep.

(ii) The aluminum alloy catenary is tensioned at the calculated tension to correspond to 1000 kgf, the stipulated tension at the mean temperature of 35°C whatever may be the ambient temperature during the stringing operations.

iii) The catenary is strained to a stringing tension corresponding to the ambient temperature for the equipment span of the tension length. In this case, the brackets are placed in the mean position, i.e. at right angles to the track, when the catenary is clamped or the regulating equipment commissioned.

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

ERECTION OF BRACKETS :

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

ANTICREEP :

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

LOCKING THE REGULATING EQUIPMENT :

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

TEMPORARY ARRANGEMENT :

A pulley approximately 30 cm. dia. is attached to the overhead equipment and of the regulating equipment by means of temporary accommodation fittings at both ends of the tension length to be wired. Over this pulley a flexible stranded wire is passed over. At each end of the wire two ending clamps, one for catenary and one contact wire, are attached. The wire is also clipped in the middle by `U' clamps. The length of this temporary arrangement from the regulating equipment to the extremities of the stranded wire passing over the temporary pulley shall be a little longer than the distance between the regulating equipment and the ends of the catenary and contact wires in their final position, to permit easy clamping of terminal fittings during the final termination of the wire.

STRINGING CATENARY :

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

TENSIONING OF CATENARY :

The catenary is strained up to the `Stringing tension' corresponding to the `equivalent' span of the tension length and the ambient temperature at the time of stringing with the aid of a dynamometer, and terminated at the tension. For this purpose, the ambient temperature shall be deemed to be the temperature registered by a thermometer tied to a length of catenary wire 3 to 4 meters long, laid flat on the top platform, on one of the wagons of the wiring train. Subsequently, the tension in the wire is checked by measurement of sag with the help of leveling the attached to suspension points and to the catenary at midspan by a ladder working party. The sag shall be measured in two spans, each preferably greater than 54 meters, and situated on either side of anti-creep approximately midway between the anti-creep and the termination points. The value of sag measured by this method should be within ± 5% of the theoretical 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 re-checked as above (see note 1). After the sag is checked the catenary is terminated at the ending fitting of the temporary arrangement at the terminating point.

In order to restrict the duration of traffic blocks to the minimum, into 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 act 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 wagon of the wiring train 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 on 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.

REGULATING EQUIPMENT IN ACTION :

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

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 the droppers (in the vertical position) and on the steady arms. Contact wire height at the bracket is adjusted as also the stagger and register 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.

(iii) It obviates the necessity initial tensioning of the catenary accurately thus permitting a deduction 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 equalisation of tension in the different spans.

Before clamping the catenary to the brackets, the sag should however, be checked in two spans

(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 the catenary, with the following precaution.

(i) The contact wire is run and suspended from independent pulleys hooked on to the brackets, separately from the catenary pulleys, to avoid twisting together of the two conductors a special hook designed for this purpose.

(ii) The contact wire should not be suspended from the catenary until the latter is clamped on to the brackets.

(iii) The tension in the contact wire before termination should be about 1,500 kgf. 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 .

(4) When the contact wire is under tension, creep takes place which results in a increase in the length of wire and, consequently, the droppers and the equaliser plates would become oblique.

Though creep may continue for a long time, about a year, the bulk of it would occur during the days following stringing. If sufficient period of time is allowed the contact wire may be clipped to the droppers and the equaliser plates, all in the vertical position, and the

necessity for any further adjustments before energisation and commissioning of the OHE may be reduced to a great extent. If this precaution is not taken, at the time of energisation of the OHE, the droppers may not all be vertical and staff would have to be detailed for shifting the dropper clips which is attendant with risk of damage to the contact wire.

(5) Before the temporary arrangement is removed a reference mark should be made on each conductor. After final termination of the conductors, It should be ensure that two marks are in the same relative longitudinal position as they were before the removal of the temporary arrangement.

INSPECTIONS AND TESTING

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, upto and including the maximum specified for the design of overhead equipment, smoothly, without mechanical shocks or 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, equipment, components and fittings as specified in the tender document. Any testing and acceptance by the Purchaser of overall performance shall be subject to the general terms of guarantee which shall continue to be valid as provided.

TESTS OF OHE :

(a) GENERAL
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.

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

(c) CONTINUITY
The electrical continuity of the line and the existance of bad Contacts, if any, will be tested with a Megger.

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

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

(f) TENSION DEVICES
All automatic Tensioning devices installed shall be tested for sensitive functioning and adjustment.

(g) STAGGER AND HEIGHT
The stagger and height of contact wire over the entire section of completed overhead equipment and the clearances available shall be measured and the measurement shall be checked against approved drawings. These measurements shall be carried out at low speed with a vehicle or device to be arranged by the Purchaser, the movement of which will follow the track levels as closely as possible. Tolerance that will be permitted on the dimensions indicated in the approved drawings

The actual position of the two contact wires, relative to each other, at overlaps and turnouts shall also be checked. Special attention shall be paid to a smooth movement of Pantographs over section insulators, particularly those which are likely to be frequently traversed.

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

(i) ENERGISING
If the overhead equipment, after being subjected to the above tests in an un-energised condition, is found to be satisfactory, it will be energised with the normal 25 KV A.C. supply.

(j) Tests shall then be conducted to check if the power 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. Power collection shall be considered unsatisfactory if a long blue flash is observed, indicating that the contact between the contact wire and the pantograph is not continuous.

INSPECTION AND TESTING OF SWITCHING STATIONS ETC.:

(a) GENERAL
As soon as a switching station, booster transformer station or LT supply transformer station and Traction Sub-Station is ready for inspection and testing, the Contractor shall advise the Purchaser in writing. Testing will be carried out by the Purchaser at his cost jointly with the Contractor. These shall include the tests which the Purchaser may like to conduct with a view to assure himself of the soundness of the equipments and their erection in compliance with these specification. However, testing equipments such as those indicated below and staff required for the tests shall be provided by the Contractor free of charge.

(i) Oil testing equipment.
(ii) 5000V/2500 V & 500 V meggers.
(iii) Earth megger and accessories.
(iv) Continuity test apparatus.
(v) Avometer
(vi) Relay testing kit.
(vii) Primary injection test set.

The Contractor shall take full responsibility for these tests inter-alia his other responsibilities.

(b) VISUAL INSPECTION
Visual inspection which shall include check for satisfactory workmanship shall cover all connections, Painting, Plastering, Cleanliness of all insulators etc. and compliance with Indian Electricity Rules.

(c) OPERATIONS TEST
This tests will be conducted on every individual items of equipment such as interrupters, isolators, relays etc. to ensure that the equipment as a whole is functioning properly and is mechanically sound, i.e. in the particular case of isolators the fixed contact and knife blade have been correctly aligned and operations does not cause undue strain on the equipment. The operation tests will be carried out with the high tension installation dis-connected from the supply, but by actuating power devices where such are provided. Continuity test of high tension connections after setting such interrupter and isolator in their respective positions shall also be conducted as part of the operation test.

(d) INSULATION
The strength of insulation of the various items of equipment and of the entire installation as a whole shall be tested with a 5000V/2500 V/500 V megger, as required.

(e) DI-ELECTRIC STRENGTH OF OIL
The di-electric strength of the oil of the Instrument Transformers (except if they are of sealed construction), Booster transformer Circuit Breaker & LT supply transformer, at each station shall be tested before commissioning in accordance with IS:335 (Latest version as indicated in Annexure-1) should this be found not correct, the Contractor shall arrange at his own expenses to have it rectified.

(f) ISOLATORS
All isolators will be tested for smooth and trouble free operation. Correct functioning of interlocking device shall be checked.

(g) INTERRUPTORS
Operation of trip and close coils for interrupters shall be tested for satisfactory performance with the respective equipments de-energised.

(h) Instrument transformer
Tests shall be conducted to check the polarity of current and potential transformers.

(i) Ammeter and Voltmeter
The Calibration of ammeters and voltmeters provided on the control board shall be checked.

(j) Protective relays
The Contractor, shall arrange for all protective relays to be tested and calibrated in a recognised test laboratory at his own cost, just prior to installation on the control board, and shall submit six copies of the test certificates to the Purchaser.

(k) Primary & secondary injection tests
Operation of all protective relays, auxiliary relays and trip and close coils for circuit breakers shall be tested for satisfactory performance with the respective equipments de-energised. Correct functioning of all electrical interlocks inter- tripping etc. shall also be checked during these tests.

(I) Performance tests

To verify the performance of the complete capacitor bank, tests as specified in respective clause of RDSO specification No. TI/SPC/PSI/FC & SR/0100 (01/2010) shall be carried out at site after installation.

EARTHING :

(a) Earth wires will be checked for continuity and electrical isolation every 1000 m approx.

(b) Clearances between earth wires and out-of-run wires of overhead equipment and signals shall be checked.

(c) Earth resistance shall be measured separately for each earth electrode. In the case of interconnected earth electrodes, the nett resistance of the inter-connected electrodes shall also be measured.

(d) Earth resistance will be measured separately for each earth electrode and when they are connected together and to the equipment at each sub-station, feeding station and shunt capacitor bank.

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.

PART E

ANNEXURES

ANNEXURE - 1

LIST OF STANDARD DRAWINGS AND SPECIFICATIONS

This Annexure contains reference to drawing numbers, charts, Schedules, Specifications and other data referred to in various paragraphs of this Tender Paper.

All references to drawings, charts, schedules, specifications, IS etc. given in this Annexure or elsewhere in the tender document shall be taken to be the latest versions including all amendments. All other items not covered under the Drawing/Specification shall be referred to as per relevant IS and Railway practice in force.

The Drawing and RDSO specification can be purchased from the office of TI Directorate of RDSO, Lucknow on payment basis.

For drawings of fittings/equipments See Form-7: Part V.

(A) **LIST OF STANDARD DRAWINGS FOR "OHE"**

Sl. No	Brief Description	Drawing		Mod. No.
		Series	Number	
1	**2**	**3**	**4**	**5**
1.	Extra allowance for setting of structures on curves (1676 mm Broad gauge)	ETI/OHE/G	00111 Sh-1	C
2.	Standard setting of structures in the vicinity of signals (broad gauge)	-do-	00112	D
3.	Typical design of side bearing foundation.	-do-	00131	-
4.	Typical design of cantilever mast.	RE/33/G	00141 Sh.3	-
5.	Standard drilling schedule of OHE masts 9.5 m long RSJ and BFB	ETI/OHE/G	00144 Sh.3	C
6.	Span and stagger chart for (conventional OHE, Cad. Cu catenary & Cu cont. wire) wind pressure 75,112.5 & l50kgf/m².	ETI/OHE/G	00202	-
7.	Employment schedule for Cantilever mast Regulated OHE without return conductor and without Earth wire (WP- 112.5 kgf/m² (Cd- 65/Cu, Cont. 107/Cu)	ETI/OHE/G	00153 Sh.1	F
8.	Employment schedule for Cantilever mast Regulated OHE without return conductor and with Earth wire (WP- 112.5 kgf/m² (Cd- 65/Cu, Cont. 107/Cu)	ETI/OHE/G	00153 Sh.2	F
9.	Employment schedule for Cantilever masts Regulated OHE with return conductor and without Earth wire (WP- 112.5 kgf/m² (Cd- 65/Cu Cont. 107/Cu)	-do-	00153 Sh.3	F
10.	Employment schedule for Cantilever masts Regulated OHE with return conductor and with Earth wire (WP- 112.5 kgf/m² (Cd- 65/Cu, Cont. 107/Cu)	-do-	00153 Sh.4	E
11.	Employment schedule for Cantilever masts unregulated OHE without return conductor and without Earth wire (WP- 112.5 kgf/m² at 35°C and 28kgf/m² at 4°C (Cat- 65/Cu, Cont. 107/Cu)	-do-	00154	D
12.	Employment schedule of bracket tubes Conventional OHE (Cad Cu Caty & Cu contact wire 1000 kgf tension each) WP-75 Kgf/ m²	ETI/OHE/G	00158 sh.1 of 3	-

1	2	3	4	5
13.	Employment schedule of bracket tubes Regulated Conventional OHE (Cad. Cu Cat & Cu contact wire 1000 kgf tension in each) WP-112.5 Kgf/ m²	ETI/OHE/G	00158 sh.2 of 3	-
14.	Employment schedule of bracket tubes Regulated Conventional OHE (Cad Cu Caty & Cu contact wire 1000 kgf tension in each) WP-150 Kgf/ m²	ETI/OHE/G	00158 sh.3 of 3	-
15.	Dropper schedule for uninsulated Overlap spans	-do	00169	A
16.	Dropper schedule for insulated Overlap spans	-do	00170	A
17.	Dropper schedule for conventional regulated OHE. With Zero presag (1400/1400)	-do	00177	A
18.	Adjustment chart of Regulating equipment 3 Pulley Type (3:1 ratio)	-do	00195	A
19.	Schematic arrangement of regulated OHE	-do	02101	A
20.	Schematic arrangement of uninsulated overlap (3 & 4 span overlaps)	-do	02121 Sh.4	A
21.	Schematic arrangement of insulated overlap	ETI/OHE/G	02131 Sh.3	A
22.	Standard termination of tramway type OHE (Regulated) with Pulley type regulating equipment (3:1 ratio).	ETI/OHE/G	04212	B
23.	General distribution of droppers	ETI/OHE/G	00161	-
24.	Outline of Pantograph (Broad gauge and metre gauge).	RE/33/G	00181	A
25.	General formation of single track in Embankments and cutting (Broad gauge.)	RE/33/G	01101 Sh.1	A
26.	General formation of double track in embankments and cutting (Broad gauge).	-do-	01102 Sh.1	A
27.	General formation of multiple tracks (1676 mm gauge).	-do-	01103 Sh.1	A
28.	Standard anchor arrangement	-do-	01401	E
29.	Anchor arrangement with dwarf mast.	ETI/OHE/G	01402	B
30.	Schedule of anchor block for B.G. track.	-do-	01403 Sh.1	E
31.	Schedule of anchor block for B.G. track.	-do-	01403 Sh.2	D
32.	Schedule of anchor block for B.G. track (Black cotton soil)	-do-	01403 Sh.3	D
33.	Standard guide tube arrangement on a mast and structures.	ETI/OHE/G	01505	-
34.	Trapezoidal counter weight arrangement on OHE structures.	ETI/OHE/G	01502	-
35.	Arrangement of 3KV & 25 KV Pedestal Insulator supports on OHE masts and portals.	-do-	01601	-
36.	Standard arrangements for mounting of number plate on OHE Structures.	ETI/OHE/G	01701	A
37.	Schematic arrangement of regulated overhead equipment.	-do-	02101	A
38.	Typical arrangements of OHE on cantilever masts for double track section.	-do-	02102	-
39.	Typical arrangement for fixing of bracket assembly on 9.5 m mast and Structure to suit raising of tracks (in future)	-do	02102 Sh.3	-
40.	Mast on platforms (Metre Gauge)	RE/33/G	02104 Sh.2	A
41.	Details of bracket arrangement on tangent and curved tracks	ETI/OHE/G	02106 Sh.1	A

1	2	3	4	5
42.	Details of bracket arrangement for OHE	-do-	02106 Sh.3	C
43.	Single bracket assembly on Structures and dropped arms.	RE/33/G	02107	D
44.	Box type cantilever Arrangement.	ETI/OHE/G	02108	A
45.	Arrangement at anticreep.	TI/DRG/OHE/ GENL/RDSO/	00001/12/0	0
46.	Standard cantilever arrangement for boom anchor anticreep location.	ETI/OHE/G	02113	-
47.	Schematic arrangement of uninsulated over Lap (type-I) (3 & 4 Span overlaps)	RE/33/G	02121 Sh.1	F
48.	Schematic arrangement of insulated overlap.	ETI/OHE/G	02131 Sh.1	
49.	General arrangement of regulated OHE at turn-outs (overlap & crossed type).	ETI/OHE/G	02141	C
50.	General arrangement of regulated OHE at cross over(overlap & crossed type).	-do	02151	-
51.	Arrangement of neutral section	-do-	02161 Sh.1	C
52.	Arrangement of neutral section assembly (PTFE Type) at SWS.	-do	02162	-
53.	Arrangement of short neutral section.	-do	02161 Sh.2	-
54.	Schematic arrangement of unregulated overhead equipment.	-do	03101	-
55	Standard termination of OHE (Regulated & un-regulated).	ETI/OHE/G	03121 Pt 1 of 3	E
56	-do-	-do	03121 Pt 2 of 3	E
57	-do-	-do	03121 Pt 3 of 3	E
58.	General arrangement of Unregulated OHE at turnouts (crossed & overlap type).	-do	03151	-
59.	General arrangement of unregulated OHE at crossovers and diamond crossings (overlap and crossed type).	-do	03152 Sh.1	-
60.	General arrangement of unregulated OHE at diamond crossing.	-do	03152 Sh.2	-
61.	General arrangement of pull off	-do-	03301	A
62.	General arrangement of Head span	-do	03201	-
63.	In span jumper connection between catenary & contact wire.	-do-	05101	-
64.	Continuity jumper connection at un-insulated overlap turnouts and cross overs	-do	05102	C
65.	Anti- theft jumper	-do	05107	A
66.	Connections at turnouts	-do	05103	B
67.	Potential equalizer connection at insulated overlap and neutral section	-do-	05104	-
68.	Connections at diamond crossing.	-do-	05106	A
69.	General arrangement of connections to OHE by copper cross feeder (150).	-do	05121 Sh.1	C
70.	General arrangement of connections at switching station on double track section by copper cross feeder	ETI/OHE/G	05122 Sh.1	C
71.	General arrangement of connections at switching station on multiple track section by copper cross feeder	-do-	05123 Sh.1	C
72.	Suspension of 25kV feeder(Spider)on 25KV OHE masts	ETI/OHE/G	05143	B

1	2	3	4	5
73.	Termination of feeder, return conductor & return feeder(copper & aluminum).	ETI/OHE/G	05145-1	A
74.	Arrangement of suspension of double spider 25 KV feeder and return feeder between sub-station and feeding station	RE/33/G	05152	C
75.	Assembly of section insulators	RE/33/G	05181	C
76.	General arrangement of earth wire on OHE mast	ETI/OHE/G	05201	A
77.	General arrangement of earth wire on OHE mast	ETI/OHE/G	05201-1	-
78.	Arrangement of transverse bonds	ETI/OHE/G	05251	A
79.	Connection of return conductor to track	-do-	05306	F
80.	Suspension arrangement of aluminum return conductor (spider) on traction Structures	-do-	05307	B
81.	Suspension of return conductor (spider) from boom of Structures (with clevis type disc insulators)	-do-	05312	A
82.	Connections between OHE and aluminum return conductor at booster stations	ETI/OHE/G	05413	B
83.	Mounting of 25kv Isolators on OHE Structures (General arrangement)	ETI/OHE/G	05513 Sh.1	A
84.	Details of small part steel work for supporting 25kv Isolator on new T.T.C. boom	-do-	05513 Sh.2	A
85	Connection from Isolator to OHE	-do-	05516	A
86	Characteristics of conductors/ bus-bar for 25kv AC traction	-do-	05600	A
87	Mounting arrangement of Auxiliary Transformer on OHE masts	ETI/OHE/G	05522	-
88	Employment Schedule for Cantilever Mast regulated OHE without return conductor & without earthwire (WP- 75 kgf/ m².) (Cat. 65/Cu & Cont. 107/Cu)	ETI/C	0702 (Sh.1)	B
89	Employment Schedule for Cantilever Mast regulated OHE with earth wire but without return conductor (WP- 75 kgf/ m²) (Caty. 65/Cu & Cont. 107/Cu)	-do-	0702 (Sh.2)	B
90	Employment Schedule for Cantilever Mast regulated OHE with return conductor but without earth wire (WP- 75 kgf/ m²) (Caty. 65/Cu & Cont. 107/Cu)	-do-	0702 (Sh.3)	B
91	Employment Schedule for Cantilever Mast regulated OHE with return conductor with earth wire (WP- 75 kgf/ m²) (Caty. 65/Cu & Cont. 107/Cu)	-do-	0702 (Sh.4)	B
92	Employment Schedule for Tramway type regulated OHE RC & EW (WP- 75 kgf/m²)	-do-	0704	B
93	Employment Schedule for 8”x 8”x35 lbs BFB (9.5 M. long)(WP-112.5 kgf/m² Caty. 65/Cu & Cont. 107/Cu.	-do-	0708	B
94	Employment Schedule for OHE mast (9.5m) overlap central location with 3.0 m implantation WP-75 kgf/m² Caty. 65/Cu & Cont. 107/Cu.	-do-	0709	A
95	Employment schedule for OHE mast (9.5M) overlap central with 3.0 M implantation WP-112.5 kgf/m² (Caty 65/cu and Cont.107/Cu)	ETI/C	0710	A

1	2	3	4	5
96	Employment Schedule for OHE mast (9.5m) overlap inter with 3.0 m implantation. WP-75 kgf/ m² Caty. 65/Cu & Cont. 107/Cu.	-do-	0711	A
97	Employment schedule for OHE mast (9.5M) overlap inter with 3.0 M implantations. WP-112.5kgf/m² Caty.65/Cu and cont.107/Cu	-do-	0712	A
98	Employment Schedule for 9.5 m 200x200x49.9 kg mast WP-75 kgf/m² (Caty. 65/Cu & Cont. 107/Cu.)	-do-	0713	B
99.	Employment schedule for 9.5 m long 200x200x49.9 kg mast WP-112.5 Kgf/ m² (Caty. 65/Cu and Cont.107/Cu)	-do-	0714	B
100	Employment Schedule for OHE mast (9.5m) WP-75 kgf/ m² overlap Anchor location with 3.0 m implantation (Copper OHE)	-do-	0715	A
101	Employment schedule for OHE mast (9.5M) WP 112.5 kgf/ m² overlap anchor location with 3.0 M implantations. (Copper OHE)	-do-	0716	A
102	Employment Schedule for pre-stressed span concrete mast (PC 42) - 9.5 M long conventional OHE, normal location (WP-150),112.5 &75kgf/ m²)	ETI/C	0725	A
103	STD portals (N,O,P,R,G & Double BFB types)	-do-	0064	-
104	Volume chart and equivalent chart of foundations (Side bearing, Side gravity and W.B.C.)	TI/DRG/CIV/ FND/RDSO	00001/04/0 SH-1	B
105	Volume chart and equivalent chart of foundations (Side bearing, Side gravity and W.B.C.)	TI/CIV/FND/ RDSO	00001/12/0 SH-1	A
106	Volume chart and equivalent chart of foundations (NG type)	TI/DRG/CIV/ FND/RDSO/	00001/04/0 SH-2	B
107	Volume chart and equivalent chart of foundations (NG type)	TI/CIV/FND/ RDSO	00001/12/0 SH-2	A
108	Volume and equivalent chart of foundations for Dry black cotton soil (NBC type) (For 16500 & 11000kgf/ m²)	TI/DRG/CIV/ FND/RDSO/	00001/04/0 SH-3	B
109	Volume and equivalent chart of foundations for Dry black cotton soil (NBC type) (For 16500 & 11000kgf/ m²)	TI/CIV/FND/ RDSO	00001/12/0 SH-3	A
110	Volume chart and equivalent chart of New pure gravity foundations (500 mm exposed)	TI/DRG/CIV/ FND/RDSO/	00001/04/0 SH-4	B
111	Volume chart and equivalent chart of New pure gravity foundations (500 mm exposed)	TI/CIV/FND/ RDSO	00001/12/0 SH-4	A
112	Volume and equivalent chart of New foundations for Dry black cotton soil only (8000 kg/m²)(NBC type) 2.5 M depth	TI/DRG/CIV/ FND/RDSO/	00001/04/0 SH-5	B
113	Volume and equivalent chart of foundations for Dry black cotton soil only (8000 kg/m²) NBC type 2.5 m depth	TI/CIV/FND/ RDSO	00001/12/0 SH-5	A
114	Volume and equivalent chart of foundations (For 8000 kg/m² Direct load)	ETI/C	0058 Sh.6	B
115	Special BFB portal for 5 tracks (General arrangement)	-do-	0026 Sh.1	C
116	Protective screen of foot-over bridge and road over-bridge.	-do-	0068	H

1	2	3	4	5
117	Chart for portal foundation	-do-	0005/68	
118	Muff for OHE structures	-do-	0007/68	E
119	Structures muff for sand cored foundations	-do-	0012/69	E
120	9.5 m Standard traction mast (fabricated `K' series)	-do-	0018-2	D
121	Remote Control Cubicle at Stn, Foundation, RCC slab, Building plant & Steel door	-do-	0067	B
122	9.5 m long standard traction mast (fabricated with bottom plates `B' series)	ETI/C	0071	E
123 (a)	Details of OHE foundation in soft rock (Bearing capacity 45,000 Kgf/m²).	ETI/C	0059	C
123 (b)	Details of OHE foundation in Hard rock (Bearing capacity 90,000 Kgf/m²).	ETI/C	0060	D
124	Details of foundation for fencing upright	-do-	0032	B
125	Employment schedule for switching and booster station main masts	ETI/C	0185	B
126	Drilling schedule for S-1 mast	ETI/C	0030	F
127	Drilling schedule for S-2 mast	-do-	0031	D
128	Drilling schedule for S-3 mast (length 11. 4 m)	-do-	0180	C
129	Drilling schedule for 8" x 6" x 35 1bs. RSJ mast 8.0 m long for booster transformer station Type S-4	-do-	0036	E
130	Drilling schedule for S-5 mast (11.4m long)	-do-	0042	E
131	Drilling schedule for S-6 mast (length 12.4m)	-do-	0181	C
132	Drilling schedule for S-7 mast (length 12.4m)	-do-	0182	C
133	Drilling schedule for S-8 mast (length 12.4m)	-do-	0183	C
134	Drilling schedule for S-9 mast (length 12.4m)	-do-	0184	C
135	General arrangement & details of fencing panels & gate for switching station	-do-	0186 Sh.1	E
136	Details of fencing uprights and anti-climbing device for switching station	-do-	0186 Sh.2	E
137	S-100 fabricated mast for mounting LT supply transformer and drop out fuse switch at switching station	-do-	0043	B
138	S-101 details of mast for supporting Isolator inside switching station	ETI/C	0044	A
139	Details of anchor beam or SP, SSP, & FP	-do-	0033	D
140	Details of small part steel for switching station	ETI/C	0034 Sh.1	K
141	Details of bracing for switching & B.T. masts	ETI/C	0034 Sh.2	B
142	Details of small parts steel of out rigger for switching stations and booster transformer stations	ETI/C	0037	C
143	Details of small parts steel for booster transformer stations	ETI/C	0040	E
144	Details of pre-cast cable trench for switching station	-do-	0038	E
145	Standard 'R' type portal rod laced general arrangement	-do-	0011/69 Sh.1	C
146	'G' type portal special upright and end piece	-do-	0056	C
147	Short bored pile foundation for traction mast (permissible BM & volume)	-do-	0062	B
148	Chart for portal foundations in dry black cotton soil safe bearing capacity 16500 Kg/ M²	-do-	0063	B

1	2	3	4	5
149	Dwarf mast foundation on wet & dry black cotton soil	CORE/ALD/OHE/SK/C	02	-
150	Typical design of new pure gravity foundation.	ETI/SK/C	131	A
151	Typical design of side gravity foundation (Soil pressure=8,000 Kg/ M²)	-do-	142	A
152	Rock Anchor for B.G. Track. –	ETI/SK/C	208	-
153	Bracket fitting for PSC Mast (cap 4200 Kgm) general arrangement and SPS details	ETI/SK/C	214 Sh.1of 2	E
154	SPS details for Earth wire clamp on PSC mast	ETI/SK/C	214 Sh. 2 of 2	A
155	Special arrangement of OHE under over line structure	ETI/OHE/SK	529	--
156	Earthing and bonding of PSC mast.	ETI/OHE/SK	537 Sh.1 of 2	D
157	Typical Earthing arrangement in SPUN PSC Mast with 18mm dia rod.	-do-	537 Sh.2 of 2	B
158	Arrangement of overlap	ETI/OHE/SK	566	-
159	Catenary dropper assembly	ETI/OHE/P	1190	B
160	Parallel clamp (20/20)	ETI/OHE/P	1550	E
161	Standard guide tube assembly.	ETI/OHE/P	5060-2	C
161 A	Counter weight assembly for Regulating Equipment (3:1 Ratio)	ETI/OHE/P	5090-5	E
161 B	Trapezoidal weight assembly for Regulating Equipment (3:1 Ratio)	TI/DRG/OHE/ ATD/RDSO/	00004/00/2	-
161 C	Trapezoidal weight assembly	ETI/OHE/P/	5090-1	G
161 D	Counter weight assembly	ETI/OHE/P/	5090	F
162	Standard anti-wind clamp	-do-	2550-1/2	L
163	Multiple cantilever cross arm assembly.	RE/33/P	3120	H
164	Anchor fitting assembly on rolled sections	ETI/OHE/P	3230	C
165	Anchor fitting assembly on 'K' series, TCC masts and 'P' type portal upright.	-do-	3240	D
166	Anchor assembly on 'N' and `O' type portal upright	-do-	3250	D
167	Structure bonds	-do-	7000	F
168	Earthing station	-do-	7020	B
169	Longitudinal rail bond	-do-	7030	F
170	Short super mast assembly	ETI/C/P	8010	G
171	Long super mast assembly	-do-	8020	C
172	Bracket attachment assembly on portal upright (N,O,R,P,G &BFB Type)	-do-	8030	B
173	Super mast assembly on portals	-do-	8050	C
174	Medium super mast assembly	ETI/OHE/P	8060	C
175	Compensating plate	-do-	5191-1/2	D
176	Suspension clamp	RE/33/P	1160	J
177	Double suspension clamp	-do-	1170	K
178	Double suspension lock plate.	-do-	1172	C
179	Catenary splice (65)	ETI/OHE/P	1090	-
180	Typical location & schematic connection diagram for a three interrupter switching station	ETI/PSI	003	C
181	Typical general arrangement of a three interrupter switching station	-do-	004	F
182	Typical location plan & general arrangement for sectioning & paralleling station	-do-	005	F
183	Typical location plan and general arrangement for a feeding station	-do	006	E

1	2	3	4	5
184	Typical general arrangement at a Booster transformer station (with 4 cross feeder) Type III	-do-	013	B
185	General arrangement of 280 KVA Booster Transformer station Type III (with 4 cross feeder)	-do-	018	A
186	Typical general arrangement at a booster transformer station (without cross feeder) Type-I	ETI/PSI	011	C
187	Typical number plate for Auxiliary Transformer	ETI/PSI/P	7525	-
188	Typical fencing and anti-climbing arrangement at switching stations	ETI/PSI	104	E
189	Typical earthing layout of sub-sectioning and paralleling station	-do-	201	B
190	Typical earthing layout of a sectioning and paralleling station	-do-	202	B
191	Typical earthing layout of a feeding station	-do-	203	B
192	Earthing details for interrupter L.T. supply transformer 25 KV Lightning Arrestors P.T. Type-I (S-100 masts, S-101 mast, fencing upright and main mast)	-do-	204	C
193	Typical earthing layout at a booster transformer stations	-do-	211-1	A
194	Typical cable run layout of a sub-sectioning & paralleling station	-do-	301	C
195	Typical cable run layout of a sectioning and paralleling station	-do-	302	C
196	Typical cable run layout of a feeding station	-do-	303	B
197	Typical earthing layout at a booster transformer station (with 4 cross feeder for Type III,IV and V	ETI/PSI	212	B
198	Typical drawing for a terminal board	-do-	501	C
199	36 mm Aluminum Bus terminal for 25kv Isolator (Rigid type)	ETI/PSI/P	6480	C
200	36 mm Aluminum Bus splices	-do-	6490	B
201	36 mm Aluminum Bus Tee connector	-do-	6500	C
202	36 mm Aluminum Bus Tee terminal	-do-	6510	D
203	36/15 mm Top connector	-do-	6520	B
204	36mm Aluminum flexible bus splice	-do-	6550	B
205	36 mm Aluminum bus splice cum tee connector	-do-	6560	B
206	Typical number plate for interrupter and double pole isolator	-do-	7520	B
207	Typical number plate for potential transformer Type	-do-	7521	B
208	Typical number plate for booster transformer	-do-	7522	B
209	Caution plate 25 KV AC	ETI/OHE/P	7531	C
210	General Caution notice at entrance to railway Station (Hindi ,English & Regional language)	RE/33/P	7551	C
211	Typical details of pressed steel door, window and ventilator	RE/Civil/S	129/ 2001	R2
212	Bolted base connection for portals located in drains	ETI/C	0010	C
213	Details of base plate for mast on drains in station yards	-do-	0002/68	A
214	Height gauge for level crossings (for clear span upto 7.3 mtr) details of structure and foundation	TI/DRG/CIV/ HGAUGE/RD SO	00001/05/0	--
215	Height gauge for level crossings (for clear span above 7.3 mtr up to 12.2 mtr) details of structure and foundation	TI/DRG/CIV/ HGAUGE/RD SO	00002/05/0	--
216	Standard plan details of Height gauge for span 7.3 M to 10.0 M with rail Type	RE/CIVIL/S	146/2008	R3

1	2	3	4	5
217	Arrangement for false catenary under over line structure	ETI/OHE/SK	446	--
218	Typical arrangement of OHE with insulated copper catenary under over line structure	ETI/OHE/SK	570	--
218A	Anti Climbing Arrangement	TI/SK/OHE/ANTIMON/RDSO	00001/08/0	--
218B	Anti Climbing Arrangement	TI/SK/OHE/ANTIMON/RDSO	00001/09/0	--
218C	GSSW Assembly	TI/DRG/OHE/GSSW	0002/09/0	--
218D	18 mm Lug (Forged) (Compression type)	TI/DRG/OHE/GTBLUG/RDSO	00001/04/0	--

(B) LIST OF STANDARD DRAWINGS FOR TRAMWAY TYPE OHE (REGULATED)

1	2	3	4	5
219	Span and stagger chart for Tramway type OHE (Regulated)	ETI/OHE/G	04201	-
220	Drilling schedule of OHE mast 8.5m & 9m ling RSJ and BFB for Tramway OHE (Regulated) respectively.	ETI/OHE/G	04202 Sh.1 Sh.2	C C
221	Schematic arrangement of tramway type OHE (regulated).	-do-	04203	C
222	Arrangement of bracket assembly for Tramway Type OHE (regulated)	-do-	04204	B
223	Arrangement of anti-creep for Tramway Type OHE (Regulated)	ETI/OHE/G	04205	B
224	Arrangement of anticreep (alternative arrangement) for Tramway OHE (Regulated)	-do-	04206	B
225	Arrangement of section Insulator for Tramway Type OHE (Regulated)	-do-	04207 Sh.1	B
226	Small parts steel for supporting section insulator assembly for (regulated Tramway Type OHE)	-do-	04207 Sh.2	B
227	General arrangement of turnouts for Tramway type OHE (Regulated)	ETI/OHE/G	04208	-
228	Adjustment chart for Tramway type OHE (Regulated)	ETI/OHE/G	04209	-
229	Bridle wire clamp (6 mm) with two bolts	ETI/OHE/P	1070-1	B
230	Large suspension clamp 20mm (with Armour rod)	ETI/OHE/P	1580 Sh-2	-
231	Hook Bracket	ETI/OHE/P	2380	C
232	BFB Steady arm assembly for Tramway OHE (Regulated)	ETI/OHE/P	2540-1	-
233	Anti wind clamp for tramway OHE (Regulated)	-do-	2550-3	E
234	Counter weight assembly (light)	ETI/OHE/P	5090-3	I
235	Counter weight assembly	-do-	5090-6	D
236	Employment schedule for tramway type regulated OHE without R.C. and E.W. (W.P.112.5 kgf/sq.m)	ETI/C	0705	B
237	Protective screen at FOB/ROBs	ETI/C	0068	H

(C) STANDARD TYPICAL AND PARTICULAR DRAWINGS FOR TSS AND SHUNT CAPACITOR BANKS.

1	2	3	4	5
238	Typical layout of Remote Control cubicle at a switching station	ETI/PSI	0010	E
239	Typical layout of 132 /27kv Traction sub-station (Type-I)	TI/DRG/PSI/TSSLO/RDSO/	00001/01	0
240	Typical layout of 132 /27kv Traction sub-station (Type-II)	TI/DRG/PSI/TSSLO/RDSO/	00002/01/0	-
241	Typical layout of 132 /27kv Traction sub-station (Type-III)	TI/DRG/PSI/TSSLO/RDSO/	00003/02	0
242	Typical layout of 132/27kv Traction Sub-station (Type IV) (with outgoing feeders and metering Facilities)	TI/DRG/PSI/TSSLO/RDSO/	00004/02	0
243	Typical layout of 132/27kv Traction Sub-station (Type V)	TI/DRG/PSI/TSSLO/RDSO/	00005/02	0
244	Typical layout of 132/27kV traction sub-station (Type VI)	TI/DRG/PSI/TSSLO/RDSO/	00006/02	0
245	Typical layout of 132/27kV traction sub-station (Type VII)	TI/DRG/PSI/TSSLO/RDSO/	00007/02	0
246	Typical layout of 132/27kV traction sub-station (Type-VIII)	TI/DRG/PSI/TSSLO/RDSO/	000008/02	-
247	Typical layout of 132/27kV traction sub station with single transformer (Type -IX)	TI/DRG/PSI/TSSLO/RDSO/	00009/02	0
248	Typical layout of 132/27kv Traction Sub-station with 132kv Switching Station (Type x)	TI/DRG/PSI/TSSLO/RDSO/	00010/02	0
249	Typical layout of Control Room at traction sub-station.	TI/DRG/PSI/CPROOM/RDSO/	00001/01	0
250	Standard plan of control room at traction sub-station (General arrangement and RCC details)	RE/Civil/	S-144/06	0
251	Typical return current connection to buried rail at 132/25kv Traction sub-station	ETI/PSI	0212-1	Nil
252	Typical general arrangement of earth screen wire termination at Traction substation	ETI/PSI	0225	C
253	Typical termination arrangement for strung bus "Spider" (AAC) conductor at TSS.	ETI/PSI	0226	B
254	General arrangement & terminal connection for 25kV PT Type-II at TSS	ETI/PSI	0227	A
255	General arrangement and terminal connection for 25kV Potential Transformer at TSS (220kV)	ETI/PSI	0227-1	Nil
256	Typical layout of 220/27kV traction sub station (Type -I)	ETI/PSI	0240-1	Nil
257	Typical return current connection to buried rail at 220/25kV TSS.	ETI/PSI	0242	A
258	Typical termination arrangement for strung bus (ZEBRA ACSR) conductor at TSS (220kV)	ETI/PSI	0243	A
259	Typical general arrangement of earth screen wire termination at 220/25kV traction sub-station.	ETI/PSI	0244	Nil
260	Mounting arrangement of 100KVA 25kv/240V LT supply transformer at TSS	ETI/PSI	0312	B
261	25kv D.O. Fuse switch assembly	ETI/PSI	032	D
262	Typical fencing layout at traction Sub-station (Details of fencing panel, door, anticlimbing device etc.)	ETI/PSI	121	F
263	Typical arrangement of an earth electrode	ETI/PSI	222-1	Nil
264	Typical earthing, cable trench & foundation layout of 132/25kv TSS	ETI/PSI	224	E
265	Typical earthing arrangement for equipment/ structure at TSS	ETI/PSI	228	A

1	2	3	4	5
266	Typical earthing cable trench and foundation layout of 132/25kV traction sub-station with Shunt Capacitor bay	ETI/PSI	229	Nil
267	Typical details of cable run at a two transformer TSS	ETI/PSI	323	E
268	Part Plan for Details of position of feeder Bus coupling interrupter at TSS	ETI/PSI/SK	272	Nil
269	Terminal connector for 220kV equipments (Typical drawing)	ETI/PSI/SK	324	Nil
270	Typical schematic diagram of protection for double Transformer traction sub station	ETI/PSI	024-1	Nil
271	Typical layout for 25kv Shunt capacitor with series reactor to be installed at 132/25kv TSS	ETI/PSI	0223	E
272	High speed auto reclosing scheme for feeder circuit breaker at 25kV A.C TSS	ETI/PSI	0231-1	A
273	Typical details of cable run at a two transformer TSS with Shunt Capacitor	ETI/PSI	325	Nil
274	Typical details of cable run at two transformers Traction Sub-station with Shunt capacitor (220kV)	ETI/PSI	326	Nil
275	General Scheme of supply for 25kV, 50 Hz single phase traction system	ETI/PSI	702-1	D
276	Standard Post Insulator for clean area (Creepage path 850mm min)	ETI/OHE/P	6090-1	C
277	Typical number plate for circuit breaker	ETI/PSI/P	7523	Nil
278	Typical number plate for Auxiliary Transformer	ETI/PSI/P	7525	Nil
279	Typical number plate for Power transformer at TSS	ETI/PSI/P	7526	Nil
280	Typical number plate for PT at TSS	ETI/PSI/P	7527	A
281	Typical number plate for CT at TSS	ETI/PSI/P	7528	A
282	Typical number plate for Isolators at TSS	ETI/PSI/P	7529	A
283	Bimetallic terminal connector to suit 'ZEBRA' ACSR conductor and 30 dia Cu stud of CT/CB/traction power transformer.	ETI/PSI/P	11010	C
284	220kV system bimetallic terminal connector to suit 'ZEBRA' (28.58 Dia) ACSR conductor & Al./Cu. pad of Isolator /CT/CB.	ETI/PSI/P	11030	C
285	220kV system tee connector to suit 'ZEBRA' (28.58 dia) ACSR conductor on both ways.	ETI/PSI/P	11040	C
286	220kV system rigid connector on SI to suit ZEBRA (28.58 dia) ACSR conductor	ETI/PSI/P	11050	C
287	Details of expansion type terminal connector to suit 50 dia Al. tubular busbar to terminal pad of 25kv CT/ Isolator/ CB and Interrupter	ETI/PSI/P	11060 Sh.2 of 2	E
288	Detail of rigid type bimetallic terminal connector suitable for 50 dia Al. tubular busbar to 30 dia Cu. Stud of 25kV CT.	ETI/PSI/P	11070	B
289	Rigid bimetallic terminal connector suitable for 50 dia Al. tubular busbar to terminal pad of 25kv Isolator/ CT	ETI/PSI/P	11090	C
290	Rigid through connector to suit 50 dia Al. Tubular bus bar and ‘SPIDER’ AAC conductor for 25kv PT Type-II	ETI/PSI/P	11110	C
291	Details of Rigid terminal connector suitable for 20 dia Al. Conductor to terminal pad of 25kv PT Type I & II	ETI/PSI/P	11120	C

1	2	3	4	5
292	25kv system tee connector to suit 50 O/D Al. Tube and 'SPIDER' 'AAC' conductor	ETI/PSI/P	11140	B
293	25 K.V system Tee connector to suit 50. O/D AL. tubular busbar to 50. O/D AL. tubular busbar	ETI/PSI/P	11150	B
294	25Kv System Rigid bus splice connector to suit 50 O/D Al. tube on both ways	ETI/PSI/P	11180	B
295	25 kV System Sliding clamp for 50mm O/D Aluminium Bus bar	ETI/PSI/P	11190	C
296	25Kv System Rigid connector on S.I to suit 50 mm O/D Al. Bus bar	ETI/PSI/P	11200	C
297	25kv system expansion bus coupler on SI to suit 50 O/D Al. tube.	ETI/PSI/P	11210	D
298	Typical fencing , door and anticlimbing device details of traction sub-station	CORE/ALD/PSI	01	D
299	Structural layout of 132/25 KV traction sub-stations	ETI/C	0200, SH.No.-1	H
300	Structural layouts of 132/25kv traction sub-stations	ETI/C	0200, SH.No.-2	D
301	Details of Beam B/1 for 132/25 KV TSS	ETI/C	0201	D
302	Details of Tower T 1 for 132/25 KV TSS	ETI/C	0202	H
303	Details of Tower T 2 for 132/25 KV TSS	ETI/C	0203	G
304	Details of beam B/2 and column C/1 for 132/25kV traction sub-station.	ETI/C	0208	E
305	Typical cable trench and foundation lay out of 132/25kv TSS	ETI/C	0210	F
306	Details of baffle wall at TSS(WP-112.5kg/sq.m) and WP (75kg/sq.m)	ETI/C	0213	D
307	Details of RCC baffle Wall at TSS(WP-150kg/sq.m)	ETI/C	0214	B
308	Transformer oil drainage arrangement at sub-stations	ETI/C	0216	B
309	Line Diagram of Structural layouts of 220/25kV Traction sub-station	ETI/C	0222	Nil
310	Structural layout of 220/27kV traction sub-station (Type-I)	ETI/C	0222-1	Nil
311	Control Room for Traction substation	ETI/C	0225 Sheet-1	Nil
312	Control Room for Traction Sub-station(RCC details)	ETI/C	0225 Sheet-2	Nil
313	Details of structure for 132kv double pole Isolator	ETI/C	0310	G
314	Details of structure for 132kv support insulators	ETI/C	0320	E
315	Details of structure for 132kv Current transformer	ETI/C	0330	F
316	Details of structure for 120kv Lightning Arrestor	ETI/C	0340	F
317	Details of structure for 25kv Current transformer	ETI/C	0360	F
318	Details of structure for 42kv ,10KA LA & 25kv support insulator	ETI/C	0370 Sheet-1	J
319	Black Weight of Structure for 42kv,10KA LA & 25kv support insulator.	ETI/C	0370 Sheet-2	Nil
320	Details of structure for 25kv Single Pole isolator	ETI/C	0380	F

1	2	3	4	5
321	Details of structure for 25kv Potential transformer	ETI/C	0390	E
322	S-100 Fabricated Mast for mounting LT supply transformer and DO fuse switch at switching station	ETI/C	0043	B
323	Details of structure and foundation for 25kV DP Isolator at TSS	ETI/SK/C	0180	C
324	Gillsans Letters and Figures	RE/33	527	A
325	Typical schematic diagram of protection for single transformer traction sub-station	ETI/PSI	0228-1	Nil
326	25 kV drop out fuse switch details	ETI/PSI	038	C
327	Operating pole for 25kV drop out fuse switch	ETI/PSI	039	B
328	Typical schematic diagram for TSS, FP, SSP and SP with 21.6 MVA or 30 MVA transformer for three lines.	TI/DRG/PSI/3L-TSS/RDSO	00001/07	1
329	Scheme of locking /Interlocking arrangement of 132 kV Isolator at Traction Sub-Station.	ETI/PSI	5212	B
330	Typical return current connection to buried rail at 132 kV/25 kV Traction Sub-Station.	ETI/PSI	0212-1	Nil
331	Typical arrangement of an earth electrode.	ETI/PSI	222-1	Nil
332	Flexible connector for 25 kV circuit breaker 25kV Interrupter & 25 kV side of 13.5/20 MVA traction transformer.	ETI/PSI/P	6570	F
333	Scheme of Interlocking arrangement for 25kV circuit breakers at Traction Sub-Station	ETI/PSI	5214	B
334	Expansion type terminal connector for 25 kV, 60mm dia terminal for traction power transformer.	ETI/PSI/P	11220	D

(D) STANDARD TYPICAL AND PARTICULAR DRAWINGS FOR SCADA WORKS

The annexure contains reference to standard, typical and particular drawings & specification referred to in various paragraph of tender specification and particular specification.

1	2	3	4	5
335	General scheme of supply for 25 kV 50 Hz Single Phase AC	ETI/PSI	702-1	D
336	Typical layout of control room at TSS	TI/DRG/PSI/CPROOM /RDSO	00001/01	0
337	Typical layout of remote control cubicle at switching stations.	ETI/PSI	0010	E
338	Schematic inter connection diagram for remote control of power gear & supervision equipments at TSS.	ETI/PSI	644	C
339	Schematic inter connection diagram for remote control of power gear and supervision equipments at controlled station (SP & SSP)	ETI/PSI	645	C
340	High speed Auto reclosing Scheme for feeder Circuit Breaker at 25 kV A.C. Traction Sub-station.	ETI/PSI	0231-I	A
341	Control desk arrangement for 2 work stations of SCADA system.	ETI/PSI/SK	337	Nil
342	Setting up earthing station at switching posts (SSP & SP) with conventional earthing as per Special Maintenance No. TI/SMI/0032 Rev-1	-	-	-

(E) (a) LIST OF STANDARD DRAWING FOR HIGH RISE OHE

S.N.	Brief Description	Drawing		Mod No.
		Series	Number	
343	Design handout for Overhead equipment for running double stack containers under electrified routes (High Rise OHE) with speed potential of 140 Kmph based on revised wind zone.	TI/DESIGNS/OHE/2013/00001 (July'13)	-	-
344	Terms of reference for consultancy contract for high speed OHE and high rise OHE.	RDSO Letter No. TI/Traction policy/2013 dated 25.04.2013	-	-
345	OHE span in view of changes in wind zones in country.	RDSO Letter No. TI/OHE/GA/2013 dated 25/30.04.2013	-	-
346	SPECIAL BFB PORTAL FOR 5 TRACKS (GENERAL ARRANGEMENT)	TI/DRG/CIV/BFB-POTAL	00001/13/0	Sh No. 1
347	SPECIAL BFB PORTAL DETAILS OF UPRIGHT	TI/DRG/CIV/BFB-PORTAL	00001/13/0	Sh No. 2
348	G-TYPE PORTAL DETAILS SPECIAL UPRIGHT AND END PIECE	TI/DRG/CIV/G-PORTAL	00001/13/0	-
349	HIGH RISE OHE Employment Schedule Mast (11.4 m) (Wind Pressure 178 kgf/m^2) (Basic Wind Speed 50 m/s) (Without Return Conductor and Without Earth Wire)	TI/DRG/CIV/ES/	00001/13/0	SHEET- 1
350	HIGH RISE OHE Employment Schedule Mast (11.4 m) (Wind Pressure 155 kgf/m^2) (Basic Wind Speed 47 m/s) (Without Return Conductor and Without Earth Wire)	TI/DRG/CIV/ES/	00001/13/0	SHEET- 2
351	HIGH RISE OHE Employment Schedule Mast (11.4 m) (Wind Pressure 136 kgf/m^2) (Basic Wind Speed 44 m/s) (Without Return Conductor and Without Earth Wire)	TI/DRG/CIV/ES/	00001/13/0	SHEET- 3
352	HIGH RISE OHE Employment Schedule Mast (11.4 m) (Wind Pressure 105 kgf/m^2) (Basic Wind Speed 39 m/s) (Without Return Conductor and Without Earth Wire)	TI/DRG/CIV/ES/	00001/13/0	SHEET- 4
353	HIGH RISE OHE Employment Schedule Mast (11.4 m) (Wind Pressure 73 kgf/m^2) (Basic Wind Speed 33 m/s) (Without Return Conductor and Without Earth Wire)	TI/DRG/CIV/ES/	00001/13/0	SHEET- 5
354	TWO TRACK CANTILEVER STRUCTURE (TTC) GENERAL ARRANGEMENT	TI/DRG/CIV/TTC/	00001/13/0	SHEET- 1
355	TWO TRACK CANTILEVER STRUCTURE (TTC) DETAILS OF UPRIGHT	TI/DRG/CIV/TTC/	00001/13/0	SHEET- 2
356	11.4 M Long Standard Traction Mast "B" Series (B-150, B-175, B-200, B-225 & B-250 type Fabricated with Batten Plates)	TI/DRG/CIV/B- Mast/	00001/13/0	-
357	Volume Charts & Equivalent Charts of Foundations (Side Bearing, Side Gravity & WBC)	TI/DRG/CIV/FND/	00001/13/0	Sheet- 1
358	Volume Charts & Equivalent Charts of Foundations (NG Type)	TI/DRG/CIV/FND/	00001/13/0	Sheet- 2
359	Volume Charts & Equivalent Charts of Foundations for Dry Black Cotton Soil (NBC Type, 3.0 metre Depth)	TI/DRG/CIV/FND/	00001/13/0	Sheet- 3

360	Volume Charts & Equivalent Charts of New Pure Gravity Foundations (500 mm exposed)	TI/DRG/CIV/FND/	00001/13/0	Sheet- 4
361	Volume Charts & Equivalent Charts of Foundations for Dry Black Cotton Soil (NBC Type, 2.5 metre Depth)	TI/DRG/CIV/FND/	00001/13/0	Sheet- 5
362	Employment Schedule OHE Mast (11.4 metre) Wind Pressure 155 kgf/m^2	TI/DRG/CIV/ES/	00001/13/0	Sheet- 1
363	Employment Schedule OHE Mast (11.4 metre) Wind Pressure 136 kgf/m^2	TI/DRG/CIV/ES/	00001/13/0	Sheet- 2
364	Employment Schedule OHE Mast (11.4 metre) Wind Pressure 105 kgf/m^2	TI/DRG/CIV/ES/	00001/13/0	Sheet- 3
365	Schedule Anchor Blocks for BG Tracks	TI/DRG/OHE/GUYHR/	00001/13/0	Sheet- 1
366	Double Guy Rod Arrangement with Anchor Block for BG Tracks	TI/DRG/OHE/GUYHR/	00001/13/0	Sheet- 2
367	Schedule Anchor Blocks for BG Track Black Cotton Soil	TI/DRG/OHE/GUYHR/	00001/13/0	Sheet- 3
368	Guy Rod Ø 25 mm	TI/DRG/OHE/GUYHR/	00001/13/0	Sheet- 4
368 A	Dropper Schedule Encumbrance 1.4m/1.4m (For 25 kV AC Regulated OHE) (65 and 107 SQ. MM)	TI/DRG/OHE/DROP/	00001/10/1	Rev-1
368 B	Dropper Schedule Encumbrance 1.4m/0.9m (For 25 kV AC Regulated OHE) (65 and 107 SQ. MM)	TI/DRG/OHE/DROP/	00002/10/1	Rev-1
368 C	Dropper Schedule Encumbrance 1.4m/0.75m (For 25 kV AC Regulated OHE) (65 and 107 SQ. MM)	TI/DRG/OHE/DROP/	00003/10/1	Rev-1
368 D	Arrangement of mounting of 25kV/240V, 50kVA LT Supply Transformer for High Rise OHE (On separate mast)	ETI/OHE/HR/AT/G/	05522 Sheet-2	-
368 E	Mounting Arrangement of Auxiliary Transformer on High Rise OHE mast	ETI/OHE/HR/AT/G/	05522 Sheet-1	-
368 F	Anchor Arrangement with Dwarf Mast for conventional and High Rise OHE	ETI/OHE/HR/ G/	01402	-
368 G	Standard Arrangement of Drop Arm for supporting Cantilevers on the Booms of Portals and TTC (For Normal as well as High Rise OHE)	ETI/C/HR/	0076	-
368 H	Drilling schedule for S-6H mast (length 13.0 m) (for High Rise OHE)	ETI/C/HR/	0181	-
368 J	Drilling schedule for S-7H mast (length 13.0 m) (for High Rise OHE)	ETI/C/HR/	0182	-
368 K	Drilling schedule for S-8H mast (length 13.0 m) (for High Rise OHE)	ETI/C/HR/	0183	-
368 L	'P' Type Portal General Arrangement and details of upright & End Pieces (High Rise OHE)	TI/DRG/CIV/P-Portal/	00001/13/0	-

(E) (b) LIST OF STANDARD DRAWING AS PER NEW WIND ZONES

369	Normal OHE Employment Schedule Mast (9.5 m) (Wind Pressure 178 kgf/m^2) (Basic Wind Speed 50 m/s) (Without Return Conductor and Without Earth Wire)	ETI/C/	0758 Sheet-1	A
370	Normal OHE Employment Schedule Mast (9.5 m) (Wind Pressure 155 kgf/m^2) (Basic Wind Speed 47 m/s) (Without Return Conductor and Without Earth Wire)	ETI/C/	0758 Sheet-2	A
371	Normal OHE Employment Schedule Mast (9.5 m) (Wind Pressure 136 kgf/m^2) (Basic Wind Speed 44 m/s) (Without Return Conductor and Without Earth Wire)	ETI/C/	0758 Sheet-3	A
372	Normal OHE Employment Schedule Mast (9.5 m) (Wind Pressure 105 kgf/m^2) (Basic Wind Speed 39 m/s) (Without Return Conductor and Without Earth Wire)	ETI/C/	0758 Sheet-4	B
373	Normal OHE Employment Schedule Mast (9.5 m) (Wind Pressure 73 kgf/m^2) (Basic Wind Speed 33 m/s) (Without Return Conductor and Without Earth Wire)	ETI/C/	0758 Sheet-5	A
374	Normal OHE Employment Schedule Mast (9.5 m) (Wind Pressure 178 kgf/m^2) (Basic Wind Speed 50 m/s) (Without Return Conductor and Without Earth Wire)(1100+1100) kgf tension CAT-65 mm^2, CONT-107 mm^2.	ETI/C/	0759 Sheet-1	-
375	Normal OHE Employment Schedule Mast (9.5 m) (Wind Pressure 155 kgf/m^2) (Basic Wind Speed 47 m/s) (Without Return Conductor and Without Earth Wire) (1100+1100) kgf tension CAT-65 mm2, CONT-107 mm2.	ETI/C/	0759 Sheet-2	-
376	Normal OHE Employment Schedule Mast (9.5 m) (Wind Pressure 136 kgf/m^2) (Basic Wind Speed 44 m/s) (Without Return Conductor and Without Earth Wire) (1100+1100) kgf tension CAT-65 mm2, CONT-107 mm2.	ETI/C/	0759 Sheet-3	-
377	Normal OHE Employment Schedule Mast (9.5 m) (Wind Pressure 105 kgf/m^2) (Basic Wind Speed 39 m/s) (Without Return Conductor and Without Earth Wire) (1100+1100) kgf tension CAT-65 mm2, CONT-107 mm2.	ETI/C/	0759 Sheet-4	-
378	Normal OHE Employment Schedule Mast (9.5 m) (Basic Wind Speed 33 m/s) (Wind Pressure 73 kgf/m2) (Without Return Conductor and Without Earth Wire) (1100+1100) kgf tension CAT-65 mm2, CONT-107 mm2.	ETI/C/	0759 Sheet-5	-
379	Normal OHE Employment Schedule Mast (9.5 m) Basic Wind Speed 50 m/s Wind Pressure 178 kgf/m^2 (Without Return Conductor and Without Earth Wire) 1000 kgf tension in CAT. 65mm^2 1000 kgf tension in CONT. 107mm^2	TI/DRG/CIV/ES/RDSO/00001/18/0 Sheet-1/5		-
380	Normal OHE Employment Schedule Mast (9.5 m) (Basic Wind Speed 47 m/s) (Wind Pressure 155 kgf/m^2) (Without Return Conductor and Without Earth Wire) 1000 kgf tension in CAT. 65mm2 1000 kgf tension in CONT. 107mm2	TI/DRG/CIV/ES/RDSO/00001/18/0 Sheet-2/5		-
381	Normal OHE Employment Schedule Mast (9.5 m) (Basic Wind Speed 44 m/s) (Wind Pressure 136 kgf/m2) (Without Return Conductor and Without Earth Wire) 1000 kgf tension in CAT. 65mm2 1000 kgf tension in CONT. 107mm2	TI/DRG/CIV/ES/RDSO/00001/18/0 Sheet-3/5		-

382	Normal OHE Employment Schedule Mast (9.5 m) (Basic Wind Speed 39 m/s) (Wind Pressure 105 kgf/m^2) (Without Return Conductor and Without Earth Wire) 1000 kgf tension CAT-65 mm2, 1000 kgf tension in CONT-107 mm2.	TI/DRG/CIV/ES/RDSO/00001/18/0 Sheet-4/5	-
383	Normal OHE Employment Schedule Mast (9.5 m) (Basic Wind Speed 33 m/s) (Wind Pressure 73 kgf/m^2) (Without Return Conductor and Without Earth Wire) 1000 kgf tension in CAT. 65mm2 1000 kgf tension in CONT. 107mm2	TI/DRG/CIV/ES/RDSO/00001/18/0 Sheet-5/5	-
384	Normal OHE Employment Schedule Mast (9.5 m) Basic Wind Speed 50 m/s Wind Pressure 178 kgf/m^2 (Without Return Conductor and Without Earth Wire) 1000 kgf tension in CAT. 65mm^2 1000 kgf tension in CONT. 107mm^2 (with implantation more than 2.8 m & upto 3.8 m)	TI/DRG/CIV/ES/RDSO/00002/18/0 Sheet-5/5	-
385	Normal OHE Employment Schedule Mast (9.5 m) (Basic Wind Speed 47 m/s) (Wind Pressure 155 kgf/m^2) (Without Return Conductor and Without Earth Wire) 1000 kgf tension in CAT. 65mm2 1000 kgf tension in CONT. 107mm2 (with implantation more than 2.8 m & upto 3.8 m)	TI/DRG/CIV/ES/RDSO/00002/18/0 Sheet-4/5	-
386	Normal OHE Employment Schedule Mast (9.5 m) (Basic Wind Speed 44 m/s) (Wind Pressure 136 kgf/m2) (Without Return Conductor and Without Earth Wire) 1000 kgf tension in CAT. 65mm2 1000 kgf tension in CONT. 107mm2 (with implantation more than 2.8 m & upto 3.8 m)	TI/DRG/CIV/ES/RDSO/00002/18/0 Sheet-3/5	-
387	Normal OHE Employment Schedule Mast (9.5 m) (Basic Wind Speed 39 m/s) (Wind Pressure 105 kgf/m^2) (Without Return Conductor and Without Earth Wire) 1000 kgf tension CAT-65 mm2, 1000 kgf tension in CONT-107 mm2. (with implantation more than 2.8 m & upto 3.8 m)	TI/DRG/CIV/ES/RDSO/00002/18/0 Sheet-2/5	-
388	Normal OHE Employment Schedule Mast (9.5 m) (Basic Wind Speed 33 m/s) (Wind Pressure 73 kgf/m^2) (Without Return Conductor and Without Earth Wire) 1000 kgf tension in CAT. 65mm2 1000 kgf tension in CONT. 107mm2 (with implantation more than 2.8 m & upto 3.8 m)	TI/DRG/CIV/ES/RDSO/00002/18/0 Sheet-1/5	-
389	Normal OHE Employment Schedule Mast (9.5 m) Basic Wind Speed 50 m/s Wind Pressure 178 kgf/m^2 (Without Return Conductor and Without Earth Wire) 1000 kgf tension in CAT. 65mm^2 1000 kgf tension in CONT. 107mm^2 (with implantation more than 3.8 m & upto 4.85 m)	TI/DRG/CIV/ES/RDSO/00003/18/0 Sheet-5/5	
390	Normal OHE Employment Schedule Mast (9.5 m) (Basic Wind Speed 47 m/s) (Wind Pressure 155 kgf/m^2) (Without Return Conductor and Without Earth Wire) 1000 kgf tension in CAT. 65mm2 1000 kgf tension in CONT. 107mm2 (with implantation more than 3.8 m & upto 4.85 m)	TI/DRG/CIV/ES/RDSO/00003/18/0 Sheet-4/5	
391	Normal OHE Employment Schedule Mast (9.5 m) (Basic Wind Speed 44 m/s) (Wind Pressure 136 kgf/m2) (Without Return Conductor and Without Earth Wire) 1000 kgf tension in CAT. 65mm2 1000 kgf tension in CONT. 107mm2 (with implantation more than 3.8 m & upto 4.85 m)	TI/DRG/CIV/ES/RDSO/00003/18/0 Sheet-3/5	
392	Normal OHE Employment Schedule Mast (9.5 m) (Basic Wind Speed 39 m/s) (Wind Pressure 105 kgf/m^2) (Without Return Conductor and Without Earth Wire) 1000 kgf tension CAT-65 mm2, 1000 kgf tension in CONT-107 mm2. (with implantation more than 3.8 m & upto 4.85 m)	TI/DRG/CIV/ES/RDSO/00003/18/0 Sheet-2/5	

393	Normal OHE Employment Schedule Mast (9.5 m) (Basic Wind Speed 33 m/s) (Wind Pressure 73 kgf/m^2) (Without Return Conductor and Without Earth Wire) 1000 kgf tension in CAT. 65mm2 1000 kgf tension in CONT. 107mm2 (with implantation more than 3.8 m & upto 4.85 m)	TI/DRG/CIV/ES/RDSO/00003/18/0 Sheet-1/5	

Note: New wind pressures/speeds as per RDSO letter No TI/CIV/MS/14 dated 14.07.2014 & IS: 875 Part-III, 1987, Reaffirmed during 1997 are:

Sl No.	Design Wind Pressure (Kg/m^2)	Basic Wind Speed	
		metre / second	Km / hour
i	178	50	180.0
Ii	155	47	169.2
Iii	136	44	158.4
Iv	105	39	140.4
v	73	33	118.8

(F) LIST OF STANDARD RDSO's SPECIFICATIONS FOR OHE, TSS AND SCADA

SI.NO.	TITLE OF SPECIFICATION	SPECIFICATION NO
1	2	3
1.	Annealed stranded copper conductor for jumper wire.	ETI/OHE/3(2/94) with A&C slip No.1of (4/95)
2.	Copper busbar	RE/30/OHE/5 (11/60)
3.	Structural Steel tubes.	ETI/OHE/11 (5/89)
4.	Hot dip zinc galvanisation of steel masts (Rolled and Fabricated) tube and fittings used on 25 KV AC OHE.	ETI/OHE/13(4/84) with A&C slip No. 1of (5/86),2 of (4/90) & 3 of (4/90)
5.	Stainless steel wire ropes	TI/SPC/OHE/WR/1060 with A&C slip No 1 of (11/06) & 2 of (05/07)
6.	Solid core porcelain insulators for 25 KV 50 Hz single phase over head lines	TI/SPC/OHE/INS/0070 (04/2007)
7.	25 KV single and double pole isolators.	ETI/OHE/16(1/94) with A&C slip No.1 of (06/2000) & 2 of (3/2004)
8.	Steel fasteners & Stainless Steel fasteners	TI/SPC/OHE/Fasteners/0120
9.	Aluminum alloy section and tubes	ETI/OHE/21(9/74)
10.	Standard for drawings for Traction Overhead equipment	ETI/OHE/25(3/66)
11.	Light Weight Section Insulators assembly. OR Section Insulator assembly without sectioning insulator.	TI/SPC/OHE/LWTSI/0060 (8/2006) OR ETI/OHE/27(8/84) with A&C slip No.1 of (10/92)
12.	Enameled steel plates	ETI/OHE/33(8/85)
	Retro-reflective Structure Number Plates & Caution/Warning Boards	ETI/OHE/33A(12/97) Rev-8 (11/12)
13.	Galvanised steel wire	ETI/OHE/36(12/73) with A&C Slip No.1 of (5/98)
14.	3 pulley Type Regulating Equipment	TI/SPC/OHE/ATD/0060 (8/2006) with A&C Slip No1 of (10/2006), 2 of (5/2007) & 3 of (01/13)
15.	Fitting for 25 kV 50 Hz AC Overhead equipment.	TI/SPC/OHE/Fitting/0130(10/13) {Old ETI/OHE/49 (9/95) with A&C}
16.	Cadmium copper conductor for overhead Railway Traction	ETI/OHE/50 (6/97) with A&C slip No.1 to 3 (04/09).
17.	Principles of OHE layout plans and sectioning diagrams for 25 KV AC traction.	ETI/OHE/53(6/88) with A&C slip no.1 of (12/88), 2 of (8/89), 3 of (6/90), 4 of (8/92) & 5 of (11/2006)
18.	19/2.79mm All Aluminum alloy stranded catenary wire.	ETI/OHE/54(2/85) with A&C slip No. 1 of (11/89) &2 of (10/92)
19.	Bimetallic (Al-cu) strip	ETI/OHE/55(4/90)
20.	Short Neutral Section Assembly (Phase Break)	TI/SPC/OHE/SNS/0000 of (2/2000) with A&C slip No. 1
21.	Code for bonding and earthing for 25 KV, AC single phase, 50 Hz traction system.	ETI/OHE/71(11/90) with A&C slip no. 1 of (8/91) & 2 of (3/93)
22.	Insulated Cadmium copper catenary 19/2.10 mm dia for provision under overline structures in the 25 KV AC Electric Traction.	TI/SPC/OHE/INSCAT/0000 of (4/2000)
23.	Battery charger for 110 V battery, 40 AH.	ETI/PSI/1(6/81)
24.	Lightning arrestor- 7.5 KV	ETI/PSI/3(8/75) with A&C slip No.1 of (2/91)

1	2	3
25.	220 KV or 132 KV or 110 KV or 66 KV or 25 kV Potential transformers	TI/SPC/PSI/PTs/0990 with A&C slip No.1 to 5 (01/09)
26.	25 KV Dropout fuse switch & operating pole for use with 10 KVA and 100 kVA 25 kV/ 230 V L.T. Supply transformer.	ETI/PSI/14(1/86) with A&C slip no 1 of (4/87)
27.	25 kV/240 V, 5 kVA,10 kVA, 25 kVA & 50 kVA, 50 Hz single phase oil filled Auxiliary Transformers.	ETI/PSI/15(8/03)
28.	Low maintenance Lead Acid 40AH & 200 AH cells.	RDSO/PE/SPEC/TL/0040-2003(Rev-0) with A&C slip no 1 of (9/2005)
29.	150 KVA, 25 KV, single phase, 50 Hz. Dry type Cast resin Booster Transformers	ETI/PSI/97(6/87) with A&C slip No.1 of (9/88)
30.	100 KVA & 150 KVA, 25 KV, single phase, 50 Hz, oil filled Booster Transformers	ETI/PSI/98(8/92) with A&C slip No.1 of (9/92), 2 of (1/94) & 3 of (6/94)
31(a)	25 KV AC Single Pole, Double Pole mounted, Out Door Vacuum Circuit Breaker (VCB) and Vacuum Interrupter (BM).	TI/SPC/PSI/LVCBIN/0120 (December'2013) Revision-0)
31(b)	220 kV/132 kV/110 kV/100 kV/66 kV Double Pole, Triple Pole, Out Door SF6 Circuit Breakers.	TI/SPC/PSI/HVCB/0120 (June'2014) with A&C slip No.1(March-16)
32	Hard drawn grooved copper Contact wire	ETI/OHE/76(6/97) with A&C slip No.1 of (4/01), 3 of (03/05) , 4 of (12/06), 5 of (7/09), 6 of (5/12) & 7 of (12/13)
33	Metal Oxide Gapless type Lightning Arrestor for use on 25kV side of Rly. traction sub stations & switching stations	TI/SPC/PSI/MOGTLA/0100(07/10)
34	Technical Specification for Silicon Composite Insulators for 25 kV A.C. 50 Hz single phase over head traction lines.	TI/SPC/OHE/INSCOM/1070 (01/07) OR TI/SPC/OHE/INSCOM/1071 (04/13)
35	Specification for solid core porcelain cylindrical post insulator for systems with nominal voltage of 66kV, 110kV, 132kV & 220kV.	TI/SPC/OHE/POST/0100(01/2010)
36	25kv/240V L.T. supply Transformer, 100 KVA	ETI/PSI/15 A (7/82) with A&C Slip No.1(9/89)
37	Battery charger for 110V Battery, 200 AH	ETI/PSI/24(6/81)
38	Low tension Distribution panels for Rly. A.C traction sub-stations	ETI/PSI/29 (12/79)With A&C Slip No.1 (2/93)
39	Standard for drawings for power supply Installations.	ETI/PSI/31 (5/76)
40	Low tension distribution panels.	ETI/PSI/63(7/82)
41	Technical specification for control and relay panel for 25kV ac TSS including specification for numerical type protection relays for traction transformer, 25kV shunt capacitor bank and transmission line for 25kV ac TSS on Indian Railways.	TI/SPC/PSI/PROTCT/6071
42	Technical specification for shunt capacitor & series reactor equipment for traction sub-station	TI/SPC/PSI/FC&SR/0100(01/10)
43	Technical specification for 25kV ac, 50 Hz, single phase, oil filled, current transformer with CT ratio of I-1000-500/5A (for general purpose), II-1500-750/5A (for heavy haul duties) for Railway ac traction sub station.	ETI/PSI/90 (6/95) with A&C Slip No.1, 2,3,4,5,6,7 (08/2007) & 8 (April 2009).
44	Technical specification for two zone static relay for distance protection for 25kV ac single phase 50 Hz traction overhead equipment.	ETI/PSI/101 (8/87) with A&C Slip No.1 (09/87)

1	2	3
45	Technical specification for current transformers. I. 220kV. 200-100/5A, II. 132kV. 400-200/5A, III. 110kV. 400-200/5A, IV. 66kV. 800-400/5A for Railway A.C traction substations.	ETI/PSI/117 (7/88) with A&C Slip No.1 (11/88), 2 (3/89), 3 (12/89), 4 (4/90), 5 (6/90), 6 (9/92), 7 (8/05), 8 (08/2007) & 9 (July 2008).
46	Specification for 21.6 MVA single phase, 50 Hz. i) 220/27kV ii) 132/27kV iii) 110/27kV, iv), 66/27kV traction power transformer for Railway A.C traction sub-station.	ETI/PSI/118 (10/93) with A&C Slip No.1 to 9 & A&C slip No.10 (08/12) or latest
47	Code of practice for earthing of power supply installations for 25kV A.C., 50 Hz, single phase traction system.	ETI/PSI/120 (2/91) with A&C Slip No1 (10/93)
48	Technical specification for i) 245 kV, (ii) 145 kV, (iii) 123 kV, (iv) 72.5 kV double pole & triple pole Isolator for Railway traction sub stations.	ETI/PSI/122 (3/89) with A&C Slip No.1(4/90)
49	Specification for Metal Oxide gapless type lightning arrestors (combined) for use on 220/132/110/66 kV side of Railway A.C. traction sub station.	ETI/PSI/137 (8/89) with A&C Slip No.1,2,3 (Embodying) A&C slip No. 4(8/94) 5(04/01), 6 (9/05) & 7(07/2007)
50	Technical specification for 220 kV or 132 kV or 110 kV or 66kV or 25 kV potential transformer.	TI/SPC/PSI/PT_S/0990 with A&C Slip No.1,2,3,4,& 5 (April 09)
51	Delta I type High resistive fault selective Relay for 25 kV AC Single phase 50 Hz traction system.	TI/SPC/PSI/PROTCT/1982(12/2003) with A&C slip No.1(10/13)
52	Panto flashover protection relay for 25 kV A.C. single phase 50 Hz traction system.	TI/SPC/PSI/PROTCT/2983 (09/2001)
53	Technical Specification of SCADA system for 25kV, AC Single phase Traction supply on Indian Railway.	TI/SPC/RCC/SCADA/0130(04/2014)
54	Technical Specification for Galvanised Steel Stranded Wire for Traction Masts	TI/SPC/OHE/GSSW/0090 (10/2009)
55	Technical specification for galvanized steel stranded wire for traction bonds	TI/SPC/OHE/GALSTB/0040(09/04) Rev. 1 (08/05)
56	Setting up Earthing Station at switching posts (SSP & SP) with conventional Earthing.	Special Maintenance Instruction No. TI/SMI/0032 Rev-1
57	Design handout for Overhead equipment for running double stack containers under electrified routes (High Rise OHE) with speed potential of 140 Kmph based on revised wind zone.	TI/DESIGN/OHE/2013/00001 (July'13)
58	OHE span in view of changes in wind zones in country	TI/OHE/GA/2013 DATED 25/30.04.2013

(G) LIST OF IS SPECIFICATION

S No.	IS Code No.	Descriptions
1	IS:210-1993	Grey iron castings
2	IS:269-1989	Specification for 33 grade ordinary Portland cement (4th Rev)
3	IS:282-1982	Dropper Wire
4	IS:306-1983	Tin bronze castings
5	IS:335-1993	New Insulating oil (4th Rev) Reaffirmed 2000
6	IS:371-1999	Ceiling rose spec.((3rd Rev)
7	IS: 383-1970	Specification for coarse & fine aggregates from natural sources for concrete
8	IS:398(PT.I)-1996	All Aluminum conductor
9	IS:398 Pt.II-1996	Al. conductor for overhead transmission purposes
10	IS:398(Part-III) 1976.	Aluminum conductors galvanized steel reinforced
11	IS: 432 Pt.1-1982	Specification for mild steel & medium tensile steel bars and hard drawn steel wires for concrete reinforcement
12	IS: 456-2000	Plain & Reinforced concrete Code of practice (3rd Rev)
13	IS: 516-1959	Method of tests for strength of concrete
14	IS:617-1994	Aluminum castings
15	IS:694:1990	Al. Jumper wire
16	IS:702-1988	Specification for industrial bitumen (2nd Rev) reaffirmed 1999
17	IS:731-1971	Porcelain Insulator for overhead power lines with a nominal voltage greater than 1000V
18	IS:732-1989	Code of practice for electrical wiring installation (3rd Rev)
19	IS:800-1984	Code of practice for general construction in steel (2nd Rev)
20	IS:808-1989	Dimensions for hot rolled steel beam, column, channel & angle sections
21	IS:816-1969	Welding
22	IS:875 (Part-3) 1987 (Reaffirmed)	Code of practice for design loads (other than earthquakes) for building and structures – Part 3: Wind loads second revision.
23	IS:1293-2005	Plugs & socket outlets of rated voltage upto and including 250V and rated current up to 16 Amp(3rd Rev)
24	IS:1387-1993	General requirements for the supply of metals and metal products
25	IS: 1489 Pt. I 1991	Specification for Portland-Pozzalana cement Pt .I Fly ash based (3rd Rev)
26	IS:1554(Part-I) 1988	PVC insulated cables
27	IS:1608-1995	Mechanical testing of metal- tensile testing
28	IS:1731-1971	Dimensions for steel flats for structural & general engineering purpose
29	IS:1777-1978	Industrial Luminaries with metal reflectors (1st Rev)
30	IS:1786-1985	Specification for high strength deformed steel bars and wires for concrete reinforcement
31	IS:1897-1983	Copper strip for formed fittings
32	IS:2004-1991	Carbon steel forgings for general engineering purpose
33	IS:2062-2011	Steel for general structural purpose
34	IS: 2074-1992	Ready mix Paint, air drying, Red oxide, Zinc chrome
35	IS:2121-1981	Aluminum and steel cored Aluminum conductors for (Part I & II) overhead power lines.
36	IS:2141-2000	Galvanised stay strand
37	IS:2312-1967	Propeller type AC ventilating fans (1st Rev)
38	IS: 2386 Pt.III-1963	Method of tests for aggregates for concrete Pt. III Specific gravity, density voids, absorption & buckling
39	IS:2673-2002	Dimensions for Aluminum Tubular Busbar.
40	IS:2675-1983	Enclosed distribution fuse boards ad cut-outs for voltage not exceeding 1000V AC & 1200V DC (2nd Rev)
41	IS:3043-1987	Code of practice for earthing (1st Rev)
42	IS:3091-1999	Aluminum bronze castings

S No.	IS Code No.	Descriptions
43	IS:3188-1980	Characteristics of string insulator units
44	IS:3837-1976	Accessories for Rigid steel conduit for electrical wiring
45	IS:3854-1997	Switches for domestic & similar purposes(2nd Rev)
46	IS:4826-1979	Specification for hot dipped for galvaised coatings on round steel wires (1st Rev)
47	IS:5082-1998	Material for Aluminum tubular busbar.
48	IS: 6403-1981	Code of practice for determination bearing capacity of shallow foundations (1st Rev)
49	IS:7098 (Part I) 1988	LT XLPE cables
50	IS:7098 (Part II) 1985	HT XLPE cables
51	IS: 8130-1984	Conductor for Insulated electric cables & flexible cords (1st Rev)
52	IS:9537 Pt-I-1980	Conduits for electrical installations
53	IS:9968(Pt.2)-2002	Annealed Copper Jumper Wire
54	IS:13947 Pt. III 1993	Specification for low voltage switchgear & control gear Pt.-3, disconectors & fuse combination unit
55	IS:14329-1995	Malleable iron castings

ANNEXURE-II

UNIT QUANTITIES OF FINISHED WIRES AND CONDUCTORS FOR VARIOUS ITEMS OF WORK IF THE SAID ITEMS UNDER RAILWAY SCOPE OF SUPPLY

Wire/Conductor	Applicable Linear density kg/m	Item No of Schedule	Bare unit requirement per unit of work (m)	Allowance for erection per unit of work returnable as scrap (m)	Total requirement per unit of work (col.4& 5)	REMARKS
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Contact wire (107)	0.9512	A1	1005.0	5	1010.0	
			1005.0	5	1010.0	
		A2	1005.0	5	1010.0	
			1005.0	5	1010.0	
		D23-D24	0.5		0.5	
		D28	4.0		4.0	
		D54	3.0		3.0	
		D29	4.0		4.0	
Cadmium copper wire(65)	0.5973	D11	1.0		1.0	
		A1	1005.0	5	1010.0	
		D23	0.5		0.5	
		D29	0.65		0.65	
		D34	0.5		0.5	
		D54	3.0		3.0	
Cadmium copper wire(130)	1.1692	D11	1.0		As required	
		A1	As required		As required	
Large Jumper(105)	0.982	D23-D24	4.0		4.0	
		D34	6.0		6.0	
Cadmium copper Briddle wire	0.2187	A2	8.5		8.5	per bracket
Small Jumper (50)	0.4352	D7	4.5		4.5	
		D8	4.5		4.5	
		A1	6.0		6.0	
		D23	1.6		1.6	
		D34	1.6		1.6	
Dropper wire (5mm)	0.1746	A1	180.0	20	200.0	

		D28 & D30	5.0		5.0	
		D49	10.0	2	12.0	
		D54	10.0	2	12.0	
		A2				As required
	0.341	D4	1.8	0.2	2.0	
Dropper wire (7mm)		D29	0.80		0.80	

(1)	(2)	(3)	(4)	(5)	(6)	(7)
37/2.25(150 sq mm) Copper conductor (Feeder Wire)	1.3335	A3	1010	10	1020.0	
19/7/1.25 (160 sq mm) Copper conductor (Large Jumper)	1.504	D34	As required	-	As required	

NOTE :

1) Col.4 *of the above table indicates the bare unit requirement of the various types of wire and conductors for various items of schedule. This includes allowance for sag wherever required.*

2) Col.5 *of the above table indicates the permissible allowances for the erection which should be left over with the contractor and should be returned to the purchaser in the form of scrap on completion of work. Such working allowance has been indicated on the assumption that all wire and conductors shall be made available in tailor made lengths as shall be indicated by the contractor to suit individual employment and, further, that the actual supplies shall be made in the serial order as will be indicated by the Contractor. Should the purchaser be unable to supply the conductor as per above on account of which drums of a length longer than the ones desired by the contractor shall have to be erected, then such, extra length as shall result from the difference of the length of the drums actually employed and length of the drums ordered by the contractor shall be considered over and above the quantities admitted as allowances for erection under col. 5. Such extra length shall, in addition, be considered and shall be returned to the Purchaser in the form of scrap.*

3) Col.6 *of the above table indicates the total quantities of wires and conductors to be supplied to the contractor by the Purchaser, free of cost. Such quantities do not take into account extra quantities which may be used on account of note 2 above and quantities damaged which shall be allowed for over and above the quantities indicated in Col. 6.*

4) *Whenever cadmium copper wire (130) is required against item 5(a) (ii), the quantity of cadmium copper wire (65) against this item will be correspondingly reduced.*

When copper wire (130) is required against item 6(a) quantities of cadmium copper wire (65) and contact wire (107) against this item will be correspondingly reduced.

5) *Whenever anti-theft jumper is provided against item 15(a), the length of jumper used shall be calculated depending on the setting distance of the anchor structure and the quantity required shall be supplied by the purchaser.*

Whenever anti-creep is of the boom anchor type, catenary (cadmium copper) wire against 15(a) shall be 2 meters instead of 0.5 meters.

6) *If required by the contractor, the Purchaser will supply to the contractor wires and conductors required for replacement due to thefts, accidents etc. The cost of such wires and conductors shall be reimbursable to the Purchaser by the contractor.*