(b) The Tenderer(s) shall keep the offer open for a minimum period of 60 days (in case of two packet system of tendering 90days) from the date of closing of the Tender. It is understood that the tender documents have been issued to the Tenderer(s) and the Tenderer(s), is / are permitted to tender in consideration of the stipulation on his / their part that after submitting his / their tender subject to the period being extended further, if required by mutual agreement from time to time, he will not resile from his offer or modify the terms and conditions thereof in a manner not acceptable to _____ Railway. Should the tenderer fail to observe or comply with the foregoing stipulation, the amount deposited or Bank guarantee bond submitted as Bid Security for the due performance of the above stipulation, shall be forfeited to the Railway.

(c) If his tender is accepted,

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

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

(d) In case Contractor submits the Term Deposit Receipt/Bank Guarantee Bond towards either the Full Security Depositor the Part Security Deposit equal to or more than Bid Security, the Railway shall return the Bid Security so retained as per sub para(c) above, to the Contractor.

7. Rights of the Railway to deal with Tender: The authority for the acceptance of the tender will rest with the Railway. It shall not be obligatory on the said authority to accept the lowest tender or any other tender, and tenderer(s) shall neither demand any explanation for the cause of rejection of his/ their tender nor the Railway to assign reasons for declining to consider or reject any particular tender or tenders.

8. If the tenderer(s) deliberately gives / give wrong information in his / their tender or creates / create circumstances for the acceptance of his / their tender, the Railway reserves the right to reject such tender at any stage.

9. If any partner(s) of a partnership firm expires after the submission of its tender or after the acceptance of its tender, the Railway shall deem such tender as cancelled/contract as terminated under clause 61 of the Standard General Conditions of Contract, unless the firm retains its character as per partnership agreement. If a sole proprietor expires after the submission of tender or after the acceptance of tender, the Railway shall deem such tender as cancelled / contract as terminated under clause 61 of the Standard General Conditions of Contract.

10. Eligibility Criteria:

10.1 Technical Eligibility Criteria:

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

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

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

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

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

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

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

However, if required in tender documents by way of Special Conditions, a formal agreement duly 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. Such subcontractor must fulfill technical eligibility criteria as follows:

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

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

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

Note for Item 10.1:

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, incorporated/registered at least 5 years prior to the date of closing of tender, shall also be considered provided the work experience certificate has been issued by a person authorized by the Public listed company to issue such certificates.

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

10.2. Financial Eligibility Criteria: The tenderer must have minimum average annual contractual turnover of 1.5 V/N crores; where

V= Advertised value of the tender in crores of Rupees

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

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

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

10.3 Bid Capacity: The tender/technical bid will be evaluated based on bid capacity formula detailed as Annexure-VI.

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

10.5 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 or entity authorized by RBI to do so for the relevant date or immediately previous date for which rates have been published. 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 shall 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 or immediately previous date for which rates have been published.

[*Explanation for Para 10 of the Tender Form (Second Sheet) including Para 10.1 to 10.5 - Eligibility Criteria:*

1. *Substantially Completed Work means an ongoing work in which payment equal to or more than 90% of the present contract value (excluding the payment made for adjustment of Price variation (PVC), if any) has been made to the contractor in that ongoing contract and no proceedings of termination of contract on Contractor's default has been initiated. The credential certificate in this regard should have been issued not prior to 60 days of date of invitation of present tender.*
2. *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 fulfillment of credentials.*
3. *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 fulfillment of credentials*
4. *In case of completed work, the value of final bill (gross amount) including the PVC amount (if paid) shall be considered as the completion cost of work. In case final bill is pending, only the total gross amount already paid including the PVC amount (if paid) shall be considered as the completion cost of work.*

   In case of substantially completed work, the total gross amount already paid including the PVC amount (if paid), as mentioned in the certificate, shall be considered as the cost of substantially completed work.
5. *If a bidder has successfully completed a work as subcontractor and the work experience certificate has been issued for such work to the subcontractor by a Govt. Organization or public listed company as defined in Note for Item 10.1 Para 10 of the Tender Form (Second Sheet), the same shall be considered for the purpose of fulfillment of credentials.*
6. *In case a work is considered similar in nature for fulfillment of technical credentials, the overall cost including the PVC amount (if paid) of that completed work or substantially completed work, shall be considered and no separate evaluation for each component of that work shall be made to decide eligibility.*
7. *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.*
8. *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.

9. *In case of existing partnership firm if any new partner(s) joins the firm without any modification in the name and PAN/TAN no. of 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.*
10. *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.*
11. *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.*
12. *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.*
13. *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.*
14. *In case a tenderer is LLP, the credentials of tenderer shall be worked out on above lines similar to a partnership firm.*
15. *In case company A is merged with company B, then company B would get the credentials of company A also.*]

11. Tenderer Credentials:

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

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

(i) Certificates and testimonials regarding contracting experience for the type of job for which tender is invited with list of works carried out in the past.

(ii) Audited Balance Sheet duly certified by the Chartered Accountant regarding contractual payments received in the past.

(iii) The list of personnel / organization on hand and proposed to be engaged for the tendered work. Similarly list of Plant & Machinery available on hand and proposed to be inducted and hired for the tendered work.

(iv) A copy of certificate stating that they are not liable to be disqualified and all their statements/documents submitted along with bid are true and factual. Standard format of the certificate to be submitted by the bidder is enclosed as Annexure-V. Non submission of a copy of certificate by the bidder shall result in summarily rejection of his/their bid. It shall be mandatorily incumbent upon the tenderer to identify, state and submit the supporting documents duly self attested / digitally signed by which they/he are/is qualifying the Qualifying Criteria mentioned in the Tender Document.

(v) The Railway reserves the right to verify all statements, information and documents submitted by the bidder in his tender offer, and the bidder shall, when so required by the Railway, make available all such information, evidence and documents as may be necessary for such verification. Any such verification or lack of such verification, by the Railway shall not relieve the bidder of its obligations or liabilities hereunder nor will it affect any rights of the Railway there under.

(vi) (a) In case of any information submitted by tenderer is found to be false, forged or incorrect at any time during process for evaluation of tenders, it shall lead to forfeiture of the tender Bid Security besides banning of business for a period of upto five years.

(b) In case of any information submitted by tenderer is found to be false, forged or incorrect after the award of contract, the contract shall be terminated. Bid Security, Performance Guarantee and Security Deposit available with the railway shall be forfeited. In addition, other dues of the contractor, if any, under this contract shall be forfeited and agency shall be banned for doing business for a period of upto five years.

12. Non-compliance with any of the conditions set forth therein above is liable to result in the tender being rejected.

13. Execution of Contract Documents: The successful Tenderer(s) shall be required to execute an agreement with the President of India acting through the _____, _____ Railway for carrying out the work according to the Standard General Conditions of Contract, Special Conditions / Specifications annexed to the tender and Standard Specifications (Works and Materials) of Railway as amended/corrected upto latest correction slips, mentioned in tender form (First Sheet).

14. Documents to be Submitted Along with Tender

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

(ii) Following documents shall be submitted by the tenderer:

(a) Sole Proprietorship Firm:

(i) All documents in terms of Para 10 of the Tender Form (Second Sheet) above.

(b) **HUF:**

(i) A copy of notarized affidavit on Stamp Paper declaring that he who is submitting the tender on behalf of HUF is in the position of 'Karta' of Hindu Undivided Family (HUF) and he has the authority, power and consent given by other members to act on behalf of HUF.

(ii) All other documents in terms of Para 10 of the Tender Form (Second Sheet) above.

(c) **Partnership Firm:**

(i) All documents as mentioned in para18 of the Tender Form (Second Sheet).

(d) **Joint Venture (JV):** All documents as mentioned in para 17 of the Tender Form (Second Sheet).

(e) **Company registered under Companies Act2013:**

(i) The copies of **MOA (Memorandum of Association) / AOA (Articles of Association)** of the company

(ii) A copy of Certificate of Incorporation

(iii) A copy of Authorization/Power of Attorney issued by the Company (backed by the resolution of Board of Directors) in favour of the individual to sign the tender on behalf of the company and create liability against the company.

(iv) All other documents in terms Para 10 of the Tender Form (Second Sheet) above.

(f) **LLP (Limited Liability Partnership):**

(i) A copy of LLP Agreement

(ii) A copy of Certificate of Incorporation

(iii) A copy of Power of Attorney/Authorization issued by the LLP in favour of the individual to sign the tender on behalf of the LLP and create liability against the LLP.

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

(v) All other documents in terms of Para 10 of the Tender Form (Second Sheet).

(g) **Registered Society & Registered Trust:**

(i) A copy of Certificate of Registration

(ii) A copy of Memorandum of Association of Society/Trust Deed

(iii) A copy of Power of Attorney in favour of the individual to sign the tender documents and create liability against the Society/Trust.

(iv) A copy of Rules & Regulations of the Society

(v) All other documents in terms of Para 10 of the Tender Form (Second Sheet) above.

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

(iv) After opening of the tender, any document pertaining to the constitution of Sole Proprietorship Firm / Partnership Firm / Registered Company/ Registered Trust / Registered Society / HUF/LLP etc. shall be neither asked nor considered, if submitted. Further, no suo moto cognizance of any document available in public domain (i.e., on internet etc.) or in Railway's record/office files etc. will be taken for consideration of the tender, if no such mention is available in tender offer submitted.

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

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

15. The tenderer whether sole proprietor / a company or a partnership firm / joint venture (JV) / registered society / registered trust / HUF / LLP etc if they want to act through agent or individual partner(s), should submit along with the tender, a copy of power of attorney duly stamped and authenticated by a Notary Public or by Magistrate in favour of the specific person whether he/they be partner(s) of the firm or any other person, specifically authorizing him/them to sign the tender, submit the tender and further to deal with the Tender/ Contract up to the stage of signing the agreement except in case where such specific person is authorized for above purposes through a provision made in the partnership deed / Memorandum of Understanding / Article of Association /Board resolution, failing which tender shall be summarily rejected.

A separate power of attorney duly stamped and authenticated by a Notary Public or by Magistrate in favour of the specific person whether he/they be partner(s) of the firm or any other person, shall be submitted after award of work, specifically authorizing him/them to deal with all other contractual activities subsequent to signing of agreement, if required.

Note: A Power of Attorney executed and issued overseas, the document will also have to be legalized by the Indian Embassy and notarized in the jurisdiction where the Power of Attorney is being issued. However, the Power of Attorney provided by Bidders from countries that have signed the Hague Legislation Convention 1961 are not required to be legalized by the Indian Embassy if it carries a conforming Appostille certificate.

16. Employment/Partnership etc. of Retired Railway Employees:

(a) Should a tenderer

i) be a retired Engineer of the gazetted rank or any other gazetted officer working before his retirement, whether in the executive or administrative capacity or whether holding a pensionable post or not, in the Engineering or any other department of any of the railways owned and administered by the President of India for the time being, OR

ii) being partnership firm / joint venture (JV) / registered society / registered trust etc have as one of its partners/members a retired Engineer of the gazetted rank or any other gazetted officer working before his retirement, OR

iii) being an incorporated company have any such retired Engineer of the gazetted rank or any other gazetted officer working before his retirement as one of its directors

AND

in case where such Engineer or officer had not retired from government service at least 1 year prior to the date of submission of the tender

THEN

the tenderer will give full information as to the date of retirement of such Engineer or gazetted officer from the said service and as to whether permission for taking such contract, or if the Contractor be a partnership firm or an incorporated company, to become a partner or director as the case may be, has been obtained by the tenderer or the Engineer or officer, as the case may be from the President of India or any officer, duly authorized by him in this behalf, shall be clearly stated in writing at the time of submitting the tender.

b) In case, upon successful award of contract, should a tenderer depute for execution of the works under or to deal matters related with this contract, any retired Engineer of gazette rank or retired gazetted officer working before his retirement in the Engineering or any other department of any of the railways owned and administered by the President of India for the time being, and now in his employment, then the tenderer will ensure that retired Engineer or retired gazetted officer had retired from government service at least 1 year prior to the date of his employment with tenderer and in case he had retired from service within a year then he possesses the requisite permission from the President of India or any officer, duly authorized by him in this behalf, to get associated with the tenderer.

c) Should a tenderer or Contractor being an individual, have member(s) of his family or in the case of partnership firm/ company / joint venture (JV) / registered society / registered trust etc. one or more of his partner(s)/shareholder(s) or member(s) of the family of partner(s)/shareholder(s) having share of more than 1%in the tendering entity employed in gazetted capacity in the Engineering or any other department of the railway, then the tenderer at the time of submission of tender, will inform the authority inviting tenders the details of such persons.

Note: -If information as required as per 16.a), b), c) above has not been furnished, contract is liable to be dealt in accordance with provision of clause 62 of the Standard General Condition of contract.

JOINT VENTURE (JV) IN WORKS TENDERS

17. Participation of Joint Venture (JV) in Works Tender: This para shall be applicable for works tenders wherein tender documents provide for the same.

17.1 Separate identity/name shall be given to the Joint Venture.

17.2 Number of members in a JV shall not be more than three, if the work involves only one department (say Civil or S&T or Electrical or Mechanical) and shall not be more than five, if the work involves more than one Department. One of the members of the JV shall be its Lead Member who shall have a majority (at least 51%) share of interest in the JV. The other members shall have a share of not less than 20% each in case of JV with upto three members and not less than 10% each in case of JV with more than three members. In case of JV with foreign member(s), the Lead Member has to be an Indian firm/company with a minimum share of 51%.

17.3 A member of JV shall not be permitted to participate either in individual capacity or as a member of another JV in the same tender.

17.4 The tender form shall be purchased and submitted only in the name of the JV and not in the name of any constituent member. The tender form can however be submitted by JV or any of its constituent member or any person authorized by JV through Power of Attorney to submit tender.

17.5 Bid Security shall be submitted by JV or authorized person of JV either as :

(i) Cash through e-payment gateway or as mentioned in tender document, or

(ii) Bank Guarantee bond either in the name of JV, or in the name of all members of JV as per MOU irrespective of their share in the JV if the JV has not been constituted legally till the date of submission of tender.

17.6 A copy of Memorandum of Understanding (MoU) duly executed by the JV members on a stamp paper, shall be submitted by the JV alongwith the tender. The complete details of the members of the JV, their share and responsibility in the JV etc. particularly with reference to financial, technical and other obligations shall be furnished in the MoU.

17.7 Once the tender is submitted, the MoU shall not normally be modified / altered / terminated during the validity of the tender. In case the tenderer fails to observe/comply with this stipulation, the full Bid Security shall be liable to be forfeited.

17.8 Approval for change of constitution of JV shall be at the sole discretion of the Railway. The constitution of the JV shall not normally be allowed to be modified after submission of the bid by the JV, except when modification becomes inevitable due to succession laws etc., provided further that there is no change in qualification of minimum eligibility criteria by JV after change of composition. However, the Lead Member shall continue to be the Lead Member of the JV. Failure to observe this requirement would render the offer invalid.

17.9 Similarly, after the contract is awarded, the constitution of JV shall not be normally allowed to be altered during the currency of contract except when modification become inevitable due to succession laws etc. and minimum eligibility criteria should not get vitiated. Failure to observe this stipulation shall be deemed to be breach of contract with all consequential penal action as per contract conditions.

17.10 On award of contract to a JV, a single Performance Guarantee shall be submitted by the JV as per tender conditions. All the Guarantees like Performance Guarantee, Bank Guarantee for Mobilization Advance, Machinery Advance etc. shall be accepted only in the name of the JV and no splitting of guarantees amongst the members of the JV shall be permitted.

17.11 On issue of LOA (Letter of Acceptance), the JV entity to whom the work has been awarded, with the same shareholding pattern as was declared in the MOU/JV Agreement submitted alongwith the tender, shall be got registered before the Registrar of the Companies under 'The Companies Act - 2013' (in case JV entity is to be registered as Company) or before the Registrar/Sub-Registrar under the 'The Indian Partnership Act, 1932' (in case JV entity is to be registered as Partnership Firm) or under 'The LLP Act 2008' (in case JV entity is to be registered as LLP). A separate PAN shall be obtained for this entity. The documents pertaining to this entity including its PAN shall be furnished to the Railways before signing the contract agreement for the work. In case the tenderer fails to observe/comply with this stipulation within 60 days of issue of LOA, contract is liable to be terminated. In case contract is terminated railway shall be entitled to forfeit the full amount of the Bid Security and other dues payable to the Contractor under this contract. The entity so registered, in the registered documents, shall have, inter-alia, following Clauses:

17.11.1 Joint and Several Liability - Members of the entity to which the contract is awarded, shall be jointly and severally liable to the Railway for execution of the project in accordance with General and Special Conditions of Contract. The members of the entity shall also be liable jointly and severally for the loss, damages caused to the Railways during the course of execution of the contract or due to non-execution of the contract or part thereof.

17.11.2 Duration of the Registered Entity - It shall be valid during the entire currency of the contract including the period of extension, if any and the maintenance period after the work is completed.

17.11.3 Governing Laws - The Registered Entity shall in all respect be governed by and interpreted in accordance with Indian Laws.

17.12 Authorized Member - Joint Venture members in the JV MoU shall authorize Lead member on behalf of the Joint Venture to deal with the tender, sign the agreement or enter into contract in respect of the said tender, to receive payment, to witness joint measurement of work done, to sign measurement books and similar such action in respect of the said tender/contract. All notices/correspondences with respect to the contract would be sent only to this authorized member of the JV.

17.13 No member of the Joint Venture shall have the right to assign or transfer the interest right or liability in the contract without the written consent of the other members and that of the Railway in respect of the said tender/contract.

17.14 Documents to be enclosed by the JV alongwith the tender:

17.14.1 In case one or more of the members of the JV is/are partnership firm(s), following documents shall be submitted:

(i) A notarized copy of the Partnership Deed or a copy of the Partnership deed registered with the Registrar.
(ii) A copy of consent of all the partners or individual authorized by partnership firm, to enter into the Joint Venture Agreement on a stamp paper,
(iii) A notarized or registered copy of Power of Attorney in favour of the individual to sign the MOU/JV Agreement on behalf of the partnership firm and create liability against the firm.

(iv) An undertaking by all partners of the partnership firm that they are not blacklisted or debarred by Railways or any other Ministry / Department of the Govt. of India from participation in tenders / contracts as on the date of submission of bids, either in their individual capacity or in any firm/LLP in which they were / are partners/members. Any Concealment / wrong information in regard to above shall make the bid ineligible or the contract shall be determined under Clause 62 of the Standard General Conditions of Contract.

17.14.2 In case one or more members is/are Proprietary Firm or HUF, the following documents shall be enclosed:

(i) A copy of notarized affidavit on Stamp Paper declaring that his Concern is a proprietary Concern and he is sole proprietor of the Concern OR he who is signing the affidavit on behalf of HUF is in the position of 'Karta' of Hindu Undivided Family (HUF) and he has the authority, power and consent given by other members to act on behalf of HUF.

17.14.3 In case one or more members of the JV is/are companies, the following documents shall be submitted:

(i) A copy of resolutions of the Directors of the Company, permitting the company to enter into a JV agreement,
(ii) The copies of MOA (Memorandum of Association) / AOA (Articles of Association) of the company
(iii) A copy of Certificate of Incorporation
(iv) A copy of Authorization/copy of Power of Attorney issued by the Company (backed by the resolution of Board of Directors) in favour of the individual**,** to sign the tender, sign MOU/JV Agreement on behalf of the company and create liability against the company

17.14.4 In case one or more members of the JV is/are LLP firm/s, the following documents shall be submitted:

(i) A copy of LLP Agreement
(ii) A copy of Certificate of Incorporation of LLP
(iii) A copy of resolution passed by partners of LLP firm, permitting the Firm to enter into a JV agreement
(iv) A copy of Authorization /copy of Power of Attorney issued by the LLP firm (backed by resolution passed by the Partners) in favour of the individual**,** to sign the tender and/or sign the MOU/ JV agreement on behalf of the LLP and create liability against the LLP.
(v) An undertaking by all partners of the LLP that they are not blacklisted or debarred by Railways or any other Ministry / Department of the Govt. of India from participation in tenders / contracts as on the date of submission of bids, either in their individual capacity or in any firm/LLP or JV in which they were / are partners/members. Any Concealment / wrong information in regard to above shall make the contract liable for determination under Clause 62 of the Standard General Conditions of Contract.

17.14.5 In case one or more members of the JV is/are Society/s or Trust/s, the following documents shall be submitted:

(i) A copy of Certificate of Registration
(ii) A copy of Memorandum of Association of Society/Trust Deed

(iii) A copy of Rules & Regulations of the Society
(iv) A copy of Power of Attorney**,** in favour of the individual to sign the tender documents and create liability against the Society/Trust.

17.14.6 All other documents in terms of Para 10 of the Tender Form (Second Sheet) above.

17.15 Credentials & Qualifying Criteria**:** Technical, financial eligibility and Bid capacity of the JV shall be adjudged based on satisfactory fulfillment of the following criteria:

17.15.1 Technical Eligibility Criteria ('a' or 'b' mentioned hereunder)**:**

(a) For Works without composite components

The technical eligibility for the work as per para 10.1 above, shall be satisfied by either the 'JV in its own name & style' or 'Lead member of the JV'.

Each other (non-lead) member(s) of JV, who is/ are not satisfying the technical eligibility for the work as per para 10.1 above, shall have technical capacity of minimum 25% of the cost of work i.e., each non-lead member of JV member must have satisfactorily completed or substantially completed during the last 07 (seven) years, ending last day of month previous to the one in which tender is invited, one similar single work for a minimum of 25% of advertised value of the tender.

(b) For works with composite components

The technical eligibility for major component of work as per para 10.1 above, shall be satisfied by either the 'JV in its own name & style' or 'Lead member of the JV' and technical eligibility for other component(s) of work as per para 10.1 above, shall be satisfied by either the 'JV in its own name & style' or 'any member of the JV'.

Each other (non-lead)member(s) of JV, who is/ are not satisfying the technical eligibility for any component of the work as per para 10.1 above, shall have technical capacity of minimum 25% of the cost of any component of work mentioned in technical eligibility criteria. i.e., each other (non-lead) member of must have satisfactorily completed or substantially completed during the last 07 (seven) years, ending last day of month previous to the one in which tender is invited, one similar single work for a minimum of 25% of cost of any component of work mentioned in technical eligibility criteria.

Note for Para 17.15.1:

a) The *Major component of the work for this purpose shall be the component of work having highest value. In cases where value of two or more component of work is same, any one work can be classified as Major component of work.*

b) Value *of a completed work done by 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 technical eligibility criteria in the tender under consideration.*

17.15.2 Financial Eligibility Criteria

The JV shall satisfy the requirement of "Financial Eligibility" mentioned at para 10.2 above. The

"financial capacity" of the lead member of JV shall not be less than 51% of the financial eligibility criteria mentioned at para 10.2 above.

The arithmetic sum of individual "financial capacity" of all the members shall be taken as JV's "financial capacity" to satisfy this requirement.

Note: Contractual payment received by 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 compliance of the above mentioned financial eligibility criteria in the tender under consideration.

17.15.3 Bid Capacity

The JV shall satisfy the requirement of "Bid Capacity" requirement mentioned at para 10.3 above. The arithmetic sum of individual "Bid capacity" of all the members shall be taken as JV's "Bid capacity" to satisfy this requirement.

18. Participation of Partnership Firms in works tenders:

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

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

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

18.4 Once the tender has been submitted, the constitution of the firm shall not normally be allowed to be modified / altered / terminated during the validity of the tender as well as the currency of the contract except when modification becomes inevitable due to succession laws etc., in which case prior permission should be taken from Railway and in any case the minimum eligibility criteria should not get vitiated. The re-constitution of firm in such cases should be followed by a notary certified Supplementary Deed. The approval for change of constitution of the firm, in any case, shall be at the sole discretion of the Railways and the tenderer shall have no claims what-so-ever. Any change in the constitution of Partnership firm after submission of tender shall be with the consent of all partners and with the signatures of all partners as that in the Partnership Deed. Failure to observe this requirement shall render the offer invalid and full Bid Security shall be forfeited.

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

conditions liable for determination of the contract under Clause 62 of the Standard General Conditions of Contract.

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

18.6 The tender form shall be submitted only in the name of partnership firm. The Bid Security shall be submitted by partnership firm. The Bid Security submitted in the name of any individual partner or in the name of authorized partner (s) shall not be considered.

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

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

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

(a) Joint and several liabilities:

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

(b) Duration of the partnership deed and partnership firm agreement:

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

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

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

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

(i) A notarized copy of the Partnership Deed or a copy of the Partnership deed registered with the Registrar.

(ii) A notarized or registered copy of Power of Attorney in favour of the individual to tender for the work, sign the agreement etc. and create liability against the firm.

(iii) An undertaking by all partners of the partnership firm that they are not blacklisted or debarred by Railways or any other Ministry / Department of the Govt. of India from participation in tenders / contracts as on the date of submission of bids, either in their individual capacity or in any firm/LLP in which they were / are partners/members. Any Concealment / wrong information in regard to above shall make the bid ineligible or the contract shall be determined under Clause 62 of the Standard General Conditions of Contract.

(iv) All other documents in terms of Para 10 of the Tender Form (Second Sheet) above.

18.11 **Evaluation of eligibility of a partnership firm:**

Technical and financial eligibility of the firm shall be adjudged based on satisfactory fulfillment of the eligibility criteria laid down in Para 10 of the Tender Form (Second Sheet) above.

19.0 Advances to Contractor –

If specifically provided in Tender Documents of tender having advertised value more than Rs 50 Crores, Railway shall make payment, as an Interest bearing advances, as per Contractor's request. These advances shall carry a simple interest _____ as indicated in the Tender documents. The payment and recovery of such advances shall be made as per manners prescribed in Clause 46.4 of the Standard General Conditions of Contract.

(Signature)

(Designation)

Signature of Tenderer(s) _____Railway Date _____

Date _____

ANNEXURE - I (Contd. …)

TENDER FORM (Third Sheet)

Name ofWork: _____

BILL OF QUANTITIES

1. Standard Schedule of Rates (SSOR) Items:

SL	Item No. of SSOR	Description of Item of Work	Approximate Quantity	Unit	Rates in Figures and Words to be filled by tenderer (₹)	Amount (₹)
1	2	3	4	5	6	7

2. Non Standard Schedule of Rates (SSOR) Items:

SL	Item No.	Description of Item of Work	Approximate Quantity	Unit	Rates in Figures and Words to be filled by tenderer (₹)	Amount (₹)
1	2	3	4	5	6	7

The quantities shown in above Bill of Quantities are approximate and are as a guide to give the tenderer(s) an idea of quantum of work involved. The Railway reserves the right to increase/ decrease and/or delete or include any of the quantities given above and no extra rate will be allowed on this account.

I/We undertake to do the work at _____ % above/below the Standard Schedule of Rates (SSOR) of the _____ Railway as applicable to _____ Division or at the rates quoted above for each item.

Dated _____

Signature of the Tenderer(s)

Note: Columns 1 to 5 shall be filled by the office of the Authority inviting tender. Columns 6 & 7 shall be filled by the Tenderer(s) only when percentage tenders are not invited.

ANNEXURE – II

AGREEMENT FOR ZONE CONTRACT

CONTRACT AGREEMENT No._____ DATED _____. ARTICLES OF AGREEMENT made this _____ day of _____ between the President of India acting through the _____, _____ Railway hereinafter called the "Railway" of the one part and _____ hereinafter called the "Contractor" of the other part.

WHEREAS the Contractor has agreed with the Railway during the period of _____ months from _____ to _____ for the performance of:

(a) New Works, additions and alterations to existing structures, special repair works and supply of building materials subject to the contract value for such works not exceeding ₹ _____.

(b) All ordinary repair and maintenance works at any site between kilometer _____ and kilometre _____ as will be set forth in the work orders (which work orders shall be deemed and taken to be part of this contract) that will be issued during the said period at _____% above/below the Standard Schedule of Rates (SSOR) of the _____ Railway, corrected up to the latest correction slips and Standard Specifications of the _____ Railway corrected upto latest correction slips and the Special Conditions and Special Specifications, if any in conformity with the drawings (if any) that will be issued with the work order, aforesaid AND WHEREAS the performance of the said work is an act in which the public are interested.

NOW THIS INDENTURE PRESENTS WITNESSETH That in consideration of the payment to be made by the Railway, the Contractor will duly perform the works set forth in the said Work Order and shall execute the same with great promptness, care and accuracy, in a workman like manner to the satisfaction of the Railway and will complete the same on or before the respective dates specified therein in accordance with the said specifications and said drawings (if any) and said conditions of contract and will observe, fulfill and keep all the conditions therein mentioned, (which shall be deemed and taken to be part of this contract as if the same had been duly set forth herein), AND the Railway both here-by agree that if the Contractor shall duly perform the said work in the manner aforesaid and observe and keep the said terms and conditions, the Railway will pay or cause to be paid to the Contractor for the said works on the completion thereof the amount due in respect thereof at the rates specified above.

Contractor _____ Designation

Address _____ Railway _____

(For President of India)

Witnesses (to signature of Contractor):

Signature of witnesses with address _____

Date _____ _____

Signature of witnesses with address _____

Date _____ _____

_____

ANNEXURE - III

WORK ORDER UNDER ZONE CONTRACT

WORK ORDER NO._____, DATED _____ UNDER CONTRACT AGREEMENT

NO._____ DATED _____.

Name of Work _____ (SITE) _____

Schedule of Drawings _____

Authority_____ Allocation _____

The Contractor(s) _____ is / are hereby ordered to carry out the following works at _____% above/below the Standard Schedule of Rates (SSOR) of _____, updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents under Zone Contract Agreement here-in-before referred to:

SL	Item No.	Description of Item of Work	Approximate Quantity	Unit	Rates in Figures and Words (₹)	Amount (₹)
1	*2*	*3*	*4*	*5*	*6*	*7*
					Total Approximate Value of Work = ₹ _____	

The works herein mentioned are required to be completed on or before _____ (Date). The quantities provided herein are approximate and subject to variation under Clause 42 of the Standard General Conditions of Contract updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents.

Divisional Railway Manager/Divisional _____ Engineer

_____ Division

_____ Railway

Date _____ for President of India

I agree to complete the works herein set forth on or before the date specified under the Zone Contract Agreement herein before referred to in conformity with the drawings hereto annexed and in accordance with the General and Special (if any) Conditions of Contract updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents and the Standard Specifications of _____ Railway updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents .

I also agree to maintain such works for the period specified below from the date of completion:

(a) Repair and maintenance work including white/color washing: three calendar months from date of completion.

(b) All new works except earth work: Six calendar months from date of completion.

Contractor _____ (Signature) Railway: Designation _____

Address _____

For President of India)

Date _____ Date _____

Signature of Witnesses (to Signature of Contractor) with address

1. _____ _____

_____ _____

_____ _____

2. _____ _____

_____ _____

_____ _____

ANNEXURE - IV

_____ RAILWAY

CONTRACT AGREEMENT OF WORKS

CONTRACT AGREEMENT NO. _____ DATED _____

ARTICLES OF AGREEMENT made this _____ day of _____ 20_____ between President of India acting through the Railway Administration hereafter called the "Railway" of the one part and _____herein after called the "Contractor" of other part.

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

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

Contractor _____ (Signature) Railway: Designation _____

Address _____ (For President of India)

Date _____ Date _____

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

Witnesses:

_____ _____

_____ _____

ANNEXURE-V

Reference -Para 6.1 of ITT

FORMAT FOR CERTIFICATE TO BE SUBMITTED / UPLOADED BY TENDERER ALONGWITH THE TENDER DOCUMENTS

I……(*Name and designation*)**appointed as the attorney/authorized signatory of the tenderer (including its constituents),

M/s_____ (hereinafter called the tenderer) for the purpose of the Tender documents for the work of _____ as per the tender No._____ of _____(*Railway*)**, do hereby solemnly affirm and state on the behalf of the tenderer including its constituents as under:

1. I/we the tenderer (s) am/are signing this document after carefully reading the contents.
2. I/We the tenderer(s) also accept all the conditions of the tender and have signed all the pages in confirmation thereof.
3. I/we hereby declare that I/we have downloaded the tender documents from Indian Railway website www.ireps.gov.in . I/we have verified the content of the document from the website and there is no addition, no deletion or no alteration to the content of the tender document. In case of any discrepancy noticed at any stage i.e. evaluation of tenders, execution of work or final payment of the contract, the master copy available with the railway Administration shall be final and binding upon me/us.

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

5. **I/We also understand that my/our offer will be evaluated based on the documents/credentials submitted along with the offer and same shall be binding upon me/us.**

6. **I/We declare that the information and documents submitted along with the tender by me/us are correct and I/we are fully responsible for the correctness of the information and documents, submitted by us.**

7. I/we certify that I/we the tenderer(s) is/are not blacklisted or debarred by Railways or any other Ministry / Department of Govt. of India from participation in tender on the date of submission of bids, either in individual capacity or as a HUF/ member of the partnership firm/LLP/JV/Society/Trust.

8. I/we understand that if the contents of the affidavit submitted by us are found to be forged/false or incorrect at any time during process for evaluation of tenders, it shall lead to forfeiture of the Bid Security besides banning of business for a period of upto five year. Further, I/we (*insert name of the tenderer*) **_____and all my/our constituents understand that my/our offer shall be summarily rejected.

9. I/we also understand that if the contents of the affidavit submitted by us are found to be false/forged or incorrect at any time after the award of the contract, it will lead to termination

of the contract, along with forfeiture of Bid Security/Security Deposit and Performance guarantee besides any other action provided in the contract including banning of business for a period of upto five year.

10. I/We have read the clause regarding restriction on procurement from a bidder of a country which shares a land border with India and certify that I am/We are not from such a country or,
    if from such a country, have been registered with the competent Authority. I/We hereby certify that I/we fulfil all the requirements in this regard and am/are eligible to be considered (evidence of valid registration by the competent authority is enclosed)

SEAL AND SIGNATURE
OF THE TENDERER

Place:
Dated:

**The contents in Italics are only for guidance purpose. Details as appropriate are to be filled in suitably by tenderer.

This affidavit is to be given by each member of JV.

ANNEXURE – VI

Reference -Para 10.3 & 17.15.3 of Tender Form (Second Sheet) of Annexure I of ITT

TENDERER'S CREDENTIALS (BID CAPACITY)

_____ RAILWAY

For tenders having advertised value 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] – 0.33xNxB

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 as on date one month prior to the tender closing date to be completed in next 'N' years.

Note:

(a) The Tenderer(s) shall furnish the details of -
   (i) 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) for calculating A, and
   (ii) 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 for calculating B. In case of no works in hand, a 'NIL' statement should be furnished.

   The submitted details for (i) and (ii) above should be duly verified by Chartered Accountant.

(b) In case if a bidder is JV, the tenderer(s) must furnish the details of
   (i) 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) by each member of JV for calculating A, and
   (ii) Existing commitments and balance amount of ongoing works with each member of JV either in individual capacity or as a member of other JV as per the prescribed proforma of Railway for statement of all works in progress and also the works which are awarded to each member of JV either in individual capacity or as a member of other JV but yet not started upto the date of inviting of tender for calculating B. In case of no works in hand, a 'NIL' statement should be furnished.

   The submitted details for (i) and (ii) above should be 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 "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.

Annexure –VIA

Para 5 of the Instructions to Tenderers

(Bid Security)

Bank Guarantee Bond from any scheduled commercial bank of India

(On non-judicial stamp paper, which should be in the name of the Executing Bank).

Name of the Bank: ----------

President of India,

Acting through ……,

…….. Railway,

Beneficiary: ……. Railway

Date:.....

Bank Guarantee Bond No.: **Date:---------**

In consideration of the President of India acting through----- ***(Designation & address of Contract Signing Authority***), …….. Railway, ……., …. (hereinafter called "The Railway") having invited the bid for_____through Notice inviting tender (NIT) No.._____, We have been informed that . . . . . ***[Insert name of the Bidder]***..... (**hereinafter called "the Bidder"**) intends to submit its bid (hereinafter called "the Bid") .

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

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 Railway full amount in the sum of ***[Insert required Value of Bid Security]*** as above stated.

2. The Bank undertakes to immediately pay on presentation of demand by the Railway any amount up to and including aforementioned full amount without any demur, reservation or recourse. Any such demand made by the Railway 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 Railway without any reference to the Bidder and without the Railway 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 Railway 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 Railway at any time.

6. This guarantee will remain valid and effective from***…….……..[insert date of issue]***till *……..**[insert date, which should be minimum 90 days beyond the expiry of validity of Bid]*. 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 Railway 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 Railway. This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No.758.

10. The Bank hereby confirms that it is on the SFMS (Structured Financial Messaging System) and shall invariably send the advice of this Bank Guarantee to the following bank details –

IFSC CODE	SBIN000RAIL
IFSC TYPE	BRANCH
BANK NAME	STATE BANK OF INDIA
BRANCH NAME	RAIL
CITY NAME	NAVI MUMBAI
ADDRESS	SECTOR-11, CBD BELAPUR, NAVI MUMBAI
DISTRICT	NAVI MUMBAI
STATE	MAHARASHTRA
BG ENABLED	YES

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

Date …… ……

Place…….

Bank's Seal and authorized signature(s)

[Name in Block letters] ……....

[Designation with Code No.]……..……

[P/Attorney] No.

Witness:

1 Signature, Name & Address & Seal

2 Signature, Name& address & Seal

Bank's 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.

Annexure –VIB

Reference -Para 10.2 & 17.15.2 of Tender Form (Second Sheet) of Annexure I of ITT

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

NAME OF BIDDER/JV PARTNER:

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

1. The average annual contractual turnover shall be calculated as an average of "total contractual payments" in the previous three financial years. However, in case balance sheet of the previous year is yet to be prepared/ audited, the audited balance sheet of the fourth previous year shall be considered for calculating average annual contractual turnover.
2. The information supplied shall be substantiated by data in the audited balance sheets and profit and loss accounts for the relevant years in respect of the bidder or all members constituting the bidder.
3. Contents of this form should be certified by a Chartered Accountant duly supported by Audited Balance Sheet duly certified by the Chartered Accountant.

SEAL AND SIGNATURE OF THE BIDDER

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

(Signature of Chartered Accountant)

Name of CA:_____

Registration No: _____

(Seal)

Part II

STANDARD GENERAL CONDITIONS OF CONTRACT

1. (1) Definitions: In these Standard General Conditions of Contract, the following terms shall have the meaning assigned hereunder except where the context otherwise requires:

(a) "Railway" shall mean the President of the Republic of India or the Administrative Officers of the Railway or of the Successor Railway authorized to deal with any matters which these presents are concerned on his behalf.

(b) "General Manager" shall mean the Officer in-charge of the General Superintendence and Control of the Railway and shall also include Addl. General Manager, the General Manager (Construction) and shall mean and include their successors, of the successor Railway.

(c) "Chief Engineer" shall mean the Officer in-charge of the Engineering Department of Railway and shall also include Chief Engineer (Construction), Chief Signal & Telecommunication Engineer, Chief Signal & Telecommunication Engineer (Construction), Chief Electrical Engineer, Chief Electrical Engineer (Construction), Chief Mechanical Engineer and shall mean & include their successors, of the Successor Railway.

(d) "Divisional Railway Manager" shall mean the Officer in-charge of a Division of the Railway and shall mean and include the Divisional Railway Manager of the Successor Railway.

(e) “Engineer” shall mean the Divisional Engineer or the Executive Engineer, Divisional Signal & Telecom Engineer, Divisional Electrical Engineer, Divisional Mechanical Engineer in executive charge of the works and shall include the superior officers of Open Line and Construction organisations on the Railway of the Engineering, Signal & Telecom, Electrical and Mechanical Departments, i.e. the Senior Divisional Engineer/Deputy Chief Engineer, Senior Divisional Signal & Telecom Engineer / Dy.Chief Signal & Telecom Engineer, Senior Divisional Electrical Engineer / Deputy Chief Electrical Engineer, Senior Divisional Mechanical Engineer and shall mean & include the Engineers of the Successors Railway.

(f) "Engineer's Representative" shall mean the Assistant Engineer, Assistant Signal & Telecommunication Engineer and Assistant Electrical Engineer, Assistant Mechanical Engineer in direct charge of the works and shall include any Sr. Section/Junior Engineer of Civil Engineering/Signal and Telecommunication Engineering/Mechanical Engineering/Electrical Engineering Departments appointed by the Railway and shall mean and include the Engineer's Representative of the Successor Railway.

(g) "Contractor" shall mean the Person/Firm/LLP/Trust/Co-operative Society or Company whether incorporated or not who enters into the contract with the Railway and shall include their executors, administrators, successors and permitted assigns.

(h) "Contract" shall mean and include the Agreement, the Work Order, the accepted Bill(s) of Quantities or Chapter(s) of Standard Schedule of Rates (SSOR) of the Railway modified by the tender percentage for items of works quantified, or not quantified, the Standard General Conditions of Contract, the Special Conditions of Contracts, if any; the Drawing, the Specifications, the Special Specifications, if any and Tender Forms, if any.

(i) "Works" shall mean the works to be executed in accordance with the contract.

(j) "Specifications" shall mean the Standard Specifications for Materials &Works of Railway as specified by Railway under the authority of the Chief Engineer or as amplified, added to or superseded by Special Specifications, if any.

(k) Standard Schedule of Rates (SSOR) shall mean the schedule of Rates adopted by the Railway, which includes-

1. "Unified Standard Schedule of Rates of the Railway (USSOR)" i.e. the Standard Schedule of Rates of the Railway issued under the authority of the Chief Engineer from time to time, updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents;
2. "Delhi Schedule Of Rates (DSR)" i.e. the Standard Schedule of Rates published by Director General/ Central Public Works Department, Government of India, New Delhi, as adopted and modified by the Railway under the authority of the Chief Engineer from time to time, updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents.

(l) "Drawing" shall mean the maps, drawings, plans and tracings or prints there of annexed to the contract and shall include any modifications of such drawings and further drawings as may be issued by the Engineer from time to time.

(m)"Constructional Plant" shall mean all appliances or things of whatsoever nature required for the execution, completion or maintenance of the works or temporary works (as hereinafter defined) but does not include materials or other things intended to form or forming part of the permanent work.

(n)"Temporary Works" shall mean all temporary works of every kind required for the execution completion and/or maintenance of the works.

(o) "Site" shall mean the lands and other places on, under, in or through which the works are to be carried out and any other lands or places provided by the Railway for the purpose of the contract.

(p) "Period of Maintenance" shall mean the specified period of maintenance from the date of completion of the works, as certified by the Engineer.

(q) 'Contractor's authorized Engineer' shall mean a graduate Engineer or equivalent, having more than 3 years experience in the relevant field of construction work involved in the contract, duly approved by Engineer.

(r) Date of inviting tender shall be the date of publishing tender notice on IREPS website if tender is published on website or the date of publication in newspaper in case tender is not published on website.

(s)"Bill of Quantities" shall mean Schedule of Item(s) included in the tender document along with respective quantities and rates, accepted by the Railway.

1. (2) Singular and Plural: Words importing the singular number shall also include the plural and vice versa where the context requires.

1.(3) Headings and Marginal Headings: The headings and marginal headings in these Standard General Conditions are solely for the purpose of facilitating reference and shall not be deemed to be part thereof or be taken into consideration in the interpretation or construction thereof the contract.

GENERAL OBLIGATIONS

2. (1) Execution Co-Relation and Intent of Contract Documents: The contract documents shall be signed in triplicate by the Railway and the Contractor. The contract documents are complementary and what is called for by anyone shall be as binding as if called for by all, the intention of the documents is to include all labour and materials, equipments and transportation necessary for proper execution of work. Materials or works not covered by or properly inferable from any heading or class of the specifications shall not be supplied by the Railway to the Contractors unless distinctly specified in the contract documents. Materials or works described in words which so applied have a well-known technical or trade meaning, shall be held to refer to such recognized standards.

2.(2) If a work is transferred from the jurisdiction of one Railway to another Railway or to a Project authority or vice versa while contract is in subsistence, the contract shall be binding on the Contractor and the Successor Railway/Project in the same manner & take effect in all respects as if the Contractor and the Successor Railway/Project were parties thereto from the inception and the corresponding officer or the Competent Authority in the Successor Railway/Project will exercise the same powers and enjoy the same authority as conferred to the Predecessor Railway/Project under the original contract/agreement entered into.

2. (3) If for administrative or other reasons the contract is transferred to the Successor Railway, the contract shall, notwithstanding any things contained herein contrary there to, be binding on the Contractor and the Successor Railway in the same manner and take effect in all respects as if the Contractor and the Successor Railway had been parties thereto from the date of this contract.

3. (1) Law Governing the Contract: The contract shall be governed by the law for the time being in force in the Republic of India.

3.(2) Compliance to Regulations and Bye-Laws: The Contractor shall conform to the provision of any statute relating to the works and regulations and bye-laws of any local authority and of any water and lighting companies or undertakings, with whose system the work is proposed to be connected and shall before making any variation from the drawings or the specifications that may be necessitated by so confirming give to the Engineer notice specifying the variation proposed to be made and the reason for making the variation and shall not carry out such variation until he has received instructions from the Engineer in respect thereof. The Contractor shall be bound to give all notices required by statute, regulations or bye-laws as aforesaid and to pay all fees and taxes payable to any authority in respect thereof.

3.(3) Environmental and Forest clearances:

The Railway represents and warrants that the environmental and forest clearances pertaining to the work commensurate with the progress of work/agreed programme, will be obtained by Engineer. In

the event of any delay in securing respective clearances leading to delay in execution of work, the Contractor shall be entitled to Extension of Time for the period of such delay in accordance with the provisions of Clause-17A(ii).

4. Communications to be in Writing: All notices, communications, reference and complaints made by the Railway or the Engineer or the Engineer's Representative or the Contractor inter-se concerning the works shall be in writing or *e*-mail on registered *e*-mail IDs i.e. the e mail id provided for correspondence in the contract agreement, otherwise *e*mail id registered with IREPS and no notice, communication, reference or complaint not in writing or through e-mail, shall be recognized.

5. Service of Notices on Contractors: The Contractor shall furnish to the Engineer the name, designation and address of his authorized agent and all complaints, notices, communications and references shall be deemed to have been duly given to the Contractor, if delivered to the Contractor or his authorized agent or left at or posted to the address so given and shall be deemed to have been so given in the case of posting on day on which they would have reached such address in the ordinary course of post/ *e*-mail or on the day on which they were so delivered or left. In the case of contract by partners, any change in the constitution of the firm shall be forthwith notified by the Contractor to the Engineer.

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

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

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

(a) (i) Total value of work to be assigned to sub-contractor(s) shall not be more than 50% of total contract value.

(ii) The subcontractor shall have successfully completed at least one work similar to work proposed for subcontract in last 5 years, ending date of submission of proposal by Contractor to Railway, costing not less than 35% value of work to be subletted, through a works contract. For fulfilment of above, Work Experience Certificate issued by a Govt. Department/Organisation shall be considered. Further, Work Experience Certificate issued by a Public listed company shall be considered provided the company is 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, registered at least 5 years back from the date of

submission of proposal by Contractor to Railway and work experience certificate issued by a person authorised by the Public Listed Company to issue such certificates.
Note: for subletting of work costing up to Rs 50 lakh no previous work experience shall be asked for by the Railway.

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

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

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

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

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

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

(f) The Contractor shall indemnify railway against any claim of subcontractor.

(g) The Contractor shall release payment to the Sub-contractor(s) promptly and shall endeavour to resolve all issues amicably and speedily with the Sub-contractor(s), so that the execution of work is not affected in any manner whatsoever.

(h) In addition to issuance of work experience certificate to Contractor, the Engineer, when, based on documents, is satisfied that subcontracted work has been carried out by subcontractor, shall issue work experience certificate to the subcontractor also for the portion of work subcontracted and successfully completed by the sub-contractor.
Note: Work Experience Certificate to the subcontractor shall be issued only when the contractor's work is complete and contractor is entitled for the issuance of Work Experience Certificate. However, in the same contract, when the Chief Engineer, based on documents, is satisfied that the subcontractor has successfully carried out subletted work; without issuance of work experience certificate to subcontractor at this stage, the Chief Engineer can, ***only once****, consider the successfully completed subletted work for the fulfilment of eligibility for further subletting of work to the subcontractor in the same contract. When the contractor's work is complete and contractor is entitled for the issuance of work experience certificate, the subcontractor shall be issued one Work Experience Certificate for the total scope of work executed by the subcontractor in the contract.*

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

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

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

8. Assistance by Railway for the Stores to be obtained by the Contractor: Owing to difficulty in obtaining certain materials (including Tools & Plant) in the market, the Railway may have agreed without any liability therefore to endeavour to obtain or assist the Contractor in obtaining the required quantities of such materials as may be specified in the Tender. In the event of delay or failure in obtaining the required quantities of the aforesaid material, the Contractor shall not be deemed absolved of his own responsibility and shall keep in touch with the day to day position regarding their availability and accordingly adjust progress of works including employment of labour and the Railway shall not in any way be liable for the supply of materials or for the non-supply thereof for any reasons whatsoever nor for any loss or damage arising in consequence of such delay or non-supply.

9. Railway Passes: No free railway passes shall be issued by the Railway to the Contractor or any of his employee/worker.

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

11. Use of Ballast Trains: The Railway may agree to allow the Contractor use of the ballast or material trains under such conditions as shall be specially prescribed, provided that the Contractor shall pay for the use thereof charges calculated at public tariff rates on the marked carrying capacity of each vehicle subject to specified minimum charge per day or part of day and provided further that the Contractor shall indemnify the Railway against any claims or damages arising out of the use or misuse thereof and against any liabilities under the Workmen's Compensation Act, 1923 or any statutory amendments thereto.

12. Representation on Works: The Contractor shall, when he is not personally present on the site of the works place, keep a responsible agent at the works during working hours who shall on receiving reasonable notice, present himself to the Engineer and orders given by the Engineer or the Engineer's representative to the agent shall be deemed to have the same force as if they had been given to the Contractor. Before absenting himself, the Contractor shall furnish the name and address of his agent for the purpose of this clause and failure on the part of the Contractor to comply with this

provision at any time will entitle the Railway to rescind the contract under Clause 62 of these Conditions.

13. Relics and Treasures: All gold, silver, oil, other minerals of any description, all precious stones, coins, treasures relics antiquities and other similar things which shall be found in or upon the site shall be the property of the Railway and the Contractor shall duly preserve the same to the satisfaction of the Railway and shall from time to time deliver the same to such person or persons as the Railway may appoint to receive the same.

14. Excavated Material: The Contractor shall not sell or otherwise dispose of or remove except for the purpose of this contract, the sand, stone, clay ballast, earth, trees, rock or other substances or materials which may be obtained from any excavation made for the purpose of the works or any building or produced upon the site at the time of delivery of the possession thereof but all the substances, materials, buildings and produce shall be the property of the Railway provided that the Contractor may, with the permission of the Engineer, use the same for the purpose of the works either free of cost or pay the cost of the same at such rates as may be determined by the Engineer.

15. Indemnity by Contractors: The Contractor shall indemnify and save harmless the Railway from and against all actions, suit, proceedings, losses, costs, damages, charges, claims and demands of every nature and description brought or recovered against the Railways by reason of any act or omission of the Contractor, his agents or employees, in the execution of the works or in his guarding of 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.

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

Balance of Security Deposit may be deposited by the Contractor in cash or Term Deposit Receipt issued from Scheduled commercial bank of India or irrevocable Bank Guarantee bond issued from Scheduled commercial bank of India, or may be recovered at the rate of 6% of the bill amount till the full Security Deposit is recovered. Provided also that in case of defaulting Contractor, the Railway may retain any amount due for payment to the Contractor on the pending "on account bills" so that the amounts so retained (including amount guaranteed through Performance Guarantee) may not exceed 10% of the total value of the contract.

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

Note: Security Deposit deposited in cash by the Contractor or recovered from the running bills of a Contractor or submitted by contractor as Term Deposit Receipt(s) can be refunded/returned to the

contractor, in lieu of irrevocable Bank Guarantee bond issued from scheduled commercial bank of India, to be submitted by him, for an amount equal to or more than the already available Security Deposit, provided however that, in a contract of value less than Rs. 50 Crore, such refund/ return of the already available Security Deposit is permitted up to two times and in a contract of value equal to or more than Rs. 50 Crore, such refund / return of the already available Security Deposit is permitted up to three times.

16.(2) (i) Refund of Security Deposit: Security Deposit mentioned in sub clause (1) above shall be returned to the Contractor along with or after, the following:

(a) Final Payment of the Contract as per clause 51.(1) **and**
(b) Execution of Final Supplementary Agreement or Certification by Engineer that Railway has No Claim on Contractor **and**
(c) Maintenance Certificate issued, on expiry of the maintenance period as per clause 50.(1), in case applicable.

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

16.(3) 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 16.(4)(b) of this clause will be payable with interest accrued thereon.

16.(4) Performance Guarantee

The procedure for obtaining Performance Guarantee is outlined below:

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

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

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

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

(i) A deposit of Cash;

(ii) Irrevocable Bank Guarantee;

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

(iv) Pay Orders and Demand Drafts tendered by any Scheduled Commercial Bank of India;

(v) Guarantee Bonds executed or Deposits Receipts tendered by any Scheduled Commercial Bank of India;

(vi) Deposit in the Post Office Saving Bank;

(vii) Deposit in the National Savings Certificates;

(viii) Twelve years National Defence Certificates;

(ix) Ten years Defence Deposits;

(x) National Defence Bonds and

(xi) Unit Trust Certificates at 5% below market value or at the face value whichever is less. Also, FDR in favour of FA&CAO (free from any encumbrance) may be accepted.

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

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

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

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

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

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

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

(iii) The Contract being determined or rescinded under clause 62 of these conditions.

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

shall be final and conclusive, PROVIDED FURTHER that if the performance in whole or in part of any obligation under this contract is prevented or delayed by reason of any such event for a period exceeding 120 days, either party may at its option terminate the contract by giving notice to the other party.

17A Extension of Time in Contracts: Subject to any requirement in the contract as to completion of any portion or portions of the works before completion of the whole, the Contractor shall fully and finally complete the whole of the works comprised in the contract (with such modifications as may be directed under conditions of this contract) by the date entered in the contract or extended date in terms of the following clauses:

(i) **Extension due to Modification:** If any modifications have been ordered which in the opinion of the Engineer have materially increased the magnitude of the work, then such extension of the contracted date of completion may be granted as shall appear to the Engineer to be reasonable in the circumstances, provided moreover that the Contractor shall be responsible for requesting such extension of the date as may be considered necessary as soon as the cause thereof shall arise.

(ii) **Extension for Delay not due to Railway or Contractor:** If in the opinion of the Engineer, the progress of work has any time been delayed by any act or neglect of Railway's employees or by other Contractor employed by the Railway under Sub-Clause (4) of Clause 20 of these Conditions or in executing the work not forming part of the contract but on which Contractor's performance necessarily depends or by reason of proceeding taken or threatened by or dispute with adjoining or to neighbouring owners or public authority arising otherwise through the Contractor's own default etc. or by the delay authorized by the Engineer pending arbitration or in consequences of the Contractor not having received in due time necessary instructions from the Railway for which he shall have specially applied in writing to the Engineer or his authorized representative then upon happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer within 15 days of such happening, but shall nevertheless make constantly his best endeavours to bring down or make good the delay and shall do all that may be reasonably required of him to the satisfaction of the Engineer to proceed with the works. The Contractor may also indicate the period for which the work is likely to be delayed and shall be bound to ask for necessary extension of time.

(iii) **Extension for Delay due to Railways:** In the event of any failure or delay by the Railway to hand over the Contractor possession of the lands necessary for the execution of the works or to give the necessary notice to commence the works or to provide the necessary drawings or instructions or any other delay caused by the Railway due to any other cause whatsoever, then such failure or delay shall in no way affect or vitiate the contract or alter the character thereof or entitle the Contractor to damages or compensation therefor, but in any such case, the Railway may grant such extension or extensions of the completion date as may be considered reasonable.

The Contractor shall indicate the period for which the work is likely to be delayed and shall seek extension of time as may be considered necessary under clause 17A(i) or/and 17A(ii) or/ and 17A(iii) above, as soon as the cause thereof shall arise and, in any case, not less than one month before the expiry of the date fixed for completion of the works. The Engineer shall consider the same and shall grant and communicate such extension of time as in his opinion is reasonable having regard to the nature and period of delay and the type and quantum of work affected thereby. No other compensation shall be payable for works so carried forward to the extended period of time; the same rates, terms and conditions of contract being applicable, as if such extended period of time was originally provided in the original contract itself.

The non-submission of request for extension or submission of request within less than one month before the expiry of the date fixed for completion of the works, shall make him ineligible for extension under these sub clauses, subject to final decision of Engineer.

17B Extension of Time with Liquidated Damages (LD) for delay due to Contractor: The time for the execution of the work or part of the works specified in the contract documents shall be deemed to be the essence of the contract and the works must be completed not later than the date(s) as specified in the contract. If the Contractor fails to complete the works within the time as specified in the contract for the reasons other than the reasons specified in Clause 17 and 17A, the Railway may, if satisfied that the works can be completed by the Contractor within reasonable short time thereafter, allow the Contractor for further extension of time (Proforma at Annexure-VII) as the Engineer may decide. On such extension the Railway will be entitled without prejudice to any other right and remedy available on that behalf, to recover from the Contractor as agreed damages and not by way of penalty for each week or part of the week, a sum calculated at the following rates of the contract value of the works.

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

S.No.	Duration of extension of time under Clause 17B	Rate of Liquidated Damages
(i)	Up to Twenty Five percent of original period of completion including period of extension of time granted under Section 17A(i)	As decided by Engineer, between 0.01% to 0.05% of contract value for each week or part of the week
(ii)	Above Twenty Five percent but upto Fifty percent of original period of completion including period of extension of time granted under Section 17A(i)	0.10 % of contract value for each week or part of the week
(iii)	Above Fifty percent of original period of completion including period of extension of time granted under Section 17A(i)	0.30 % of contract value for each week or part of the week

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

NOTE:

In a contract, where extension(s) of time have been allowed once under clause 17B, further request(s)

for extension of time under clause 17A can also be considered under exceptional circumstances. Such extension(s) of time under clause 17A shall be without any Liquidated damages, but the Liquidated damages already recovered during extension(s) of time granted previously under clause 17B shall not be waived. However, Price variation during such extension(s) shall be dealt as applicable for extension(s) of time under clause 17B.

17C Bonus for Early Completion of Work: In open tenders having advertised value more than Rs.50 crore and original period of completion 12 months or more, when there is no reduction in original scope of work by more than 10%, and no extension granted on either railway or Contractor's account, Contractor shall be entitled for a bonus of 1% for each 30 days early completion of work. The period of less than 30 days shall be ignored while working out bonus. The maximum bonus shall be limited to 5% of original contract value. The completion date shall be reckoned as the date of issuance of completion certificate by Engineer.

18.(1) Illegal Gratification: Any bribe, commission, gift or advantage given, promised or offered by or on behalf of the Contractor or his partner or agent or servant or anyone on his behalf, to any officer or employee of the Railway or to any person on his behalf in relation to obtaining or execution of this or any other contract with the Railway shall, in addition to any criminal liability which he may incur, subject Contractor to the rescission of the contract and all other contracts with the Railway and to the payment of any loss or damage resulting from such decision and the Railway shall be entitled to deduct the amounts so payable from the Contractor's bills/Security Deposit or any other dues of Contractor with the Government of India.

18.(2) The Contractor shall not lend or borrow from or have or enter into any monitory dealings or transactions either directly or indirectly with any employee of the Railway and if he shall do so, the Railway shall be entitled forthwith to rescind the contract and all other contracts with the Railway. Any question or dispute as to the commission of any such offence or compensation payable to the Railway under this Clause shall be settled by the General Manager of the Railway, in such a manner as he shall consider fit & sufficient and his decision shall be final & conclusive. In the event of rescission of the contract under this Clause, the Contractor will not be paid any compensation whatsoever except payments for the work done upto the date of rescission.

EXECUTION OF WORKS

19.(1) Contractor's understanding: It is understood and agreed that the Contractor has, by careful examination, satisfied himself as to the nature and location of the work, the conformation of the ground, the character, quality and quantity of the materials to be encountered, the character of equipment and facilities needed preliminary to and during the progress of the works, the general and local conditions, the labour conditions prevailing therein and all other matters which can in any way affect the works under the contract.

19.(2) Commencement of Works: The Contractor shall commence the works within 15 days after the receipt by him of an order in writing to this effect from the Engineer and shall proceed with the same with due expedition and without delay

19.(3) Accepted Programme of Work: The Contractor who has been awarded the work shall as soon as possible but not later than 30 days after the date of receipt of the acceptance letter in respect

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

In Contracts for works of New Line/Gauge Conversion/Doubling/Railway Electrification, finalized through Tenders having advertised value more than Rs.50crores, the Contractor shall submit a detailed time programme to the Engineer within 30 days after issue of LOA. The program shall include the physical and Financial Progress vis-à-vis program and forecast cash flow adopting Project Management Software such as **Primavera/Sure Track/MS Project etc.** 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. Each programme shall include:

The order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage, Contractor's Documents, procurement, manufacture of Plant, delivery to Site, construction, erection and testing, each of these stages for work by each Subcontractor, if any, the sequence and timing of inspections and tests specified in the Contract, and a supporting report which includes:

a general description of the methods which the Contractor intends to adopt, and of the major stages, in the execution of the Works, and

details showing the Contractor's reasonable estimate for the number of each class of Contractor's Personnel &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 Engineer shall be entitled to rely upon the programme when planning their activities.

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.

19.(4) Setting out of Works: The Contractor shall be responsible for the correct setting out of all works in relation to original points, lines and levels of reference at his cost. The Contractor shall execute the work true to alignment, grade, levels and dimensions as shown in the drawing and as

directed by the Engineer's representative and check these at frequent intervals. The Contractor shall provide all facilities like labour and instruments and shall co-operate with the Engineer's representative for checking of all alignment, grades, levels and dimensions. If, at any time, during the progress of the works any error appear or arise in any part of the work, the Contractor, on being required so to do by the Engineer's representative shall, at his own cost rectify such errors, to the satisfaction of the Engineer's representative.

Such checking shall not absolve the Contractor of his own responsibility of maintaining accuracy in the work. The Contractor shall carefully protect and preserve all bench marks, sight rails, pegs and other things used in setting out the work.

20.(1) Compliance to Engineer's Instructions: The Engineer shall direct the sequence in which the several parts of the works shall be executed and the Contractor shall execute without delay all orders given by the Engineer from time to time; but the Contractor shall not be relieved thereby from responsibility for the due performance of the works in all respects.

20.(2) Alterations to be Authorized: No alterations in or additions to or omissions or abandonment of any part of the works shall be deemed authorised, except under written instructions from the Engineer.

20.(3) Extra Works: Should works over and above those included in the contract require to be executed at the site, the Contractor shall have no right to be entrusted with the execution of such works which may be carried out by another Contractor or Contractors or by other means at the option of the Railway.

20.(4) Separate Contracts in Connection with Works: The Railway shall have the right to let other contracts in connection with the works. The Contractor shall afford other Contractors reasonable opportunity for the storage of their materials and the execution of their works and shall properly connect and coordinate his work with theirs. If any part of the Contractor's work depends upon proper execution or result upon the work of another Contractor(s), the Contractor shall inspect and promptly report to the Engineer any defects in such works that render it unsuitable for such proper execution and results. The Contractor's failure so-to inspect and report shall constitute an acceptance of the other Contractor's work as fit and proper for the reception of his work, except as to defects which may develop in the other Contractor's work after the execution of his work.

21. Instruction of Engineer's Representative: Any instructions or approval given by the Engineer's representative to Contractor in connection with the works shall bind the Contractor as though it had been given by the Engineer provided always as follows:

(a) Failure of the Engineer's representative to disapprove any work or materials shall not prejudice the power of the Engineer thereafter to disapprove such work or material and to order the removal or breaking up thereof.

(b) If the Contractor shall be dissatisfied by reason of any decision of the Engineer's representative, he shall be entitled to refer the matter to the Engineer who shall there upon confirm or vary such decision.

22.(1) Adherence to Specifications and Drawings: The site and the detailed drawings shall be made available to the contractor commensurate with the accepted programme of work submitted under clause 19(3). The whole of the works shall be executed in perfect conformity with the specifications and drawings of the contract. If Contractor performs any works in a manner contrary to the specifications or drawings or any of them and without such reference to the Engineer, he shall bear all the costs arising or ensuing therefrom and shall be responsible for all loss to the Railway.

22.(2) Drawings and Specifications of the Works: The Contractor shall keep one copy of Drawings and Specifications at the site, in good order, and such contract documents as may be necessary, available to the Engineer or the Engineer's Representative.

22.(3) Ownership of Drawings and Specifications: All Drawings and Specifications and copies thereof furnished by the Railway to the Contractor are deemed to be the property of the Railway. They shall not be used on other works and with the exception of the signed contract set, shall be returned by the Contractor to the Railway on completion of the work or termination of the Contract.

22.(4) Compliance with Contractor's Request for Details: The Engineer shall furnish with reasonable promptness, after receipt by him of the Contractor's request, additional instructions by means of drawings or otherwise, necessary for the proper execution of the works or any part thereof. All such drawings and instructions shall be consistent with the Contract Documents and reasonably inferable there from.

22.(5) Meaning and Intent of Specification and Drawings: If any ambiguity arises as to the meaning and intent of any portion of the Specifications and Drawings or as to execution or quality of any work or material, or as to the measurements of the works the decision of the Engineer thereon shall be final subject to the appeal (within 7 days of such decision being intimated to the Contractor) to the Chief Engineer who shall have the power to correct any errors, omissions, or discrepancies in aforementioned items and whose decision in the matter in dispute or doubt shall be final and conclusive.

23. Working during Night: The Contractor shall not carry out any work between sun-set and sun-rise without the previous permission of the Engineer. However, if the Engineer is satisfied that the work is not likely to be completed in time except by resorting to night work, he may order the same without confirming any right on the Contractor for claiming any extra payment for the same.

24. Damage to Railway Property or Private Life and Property: The Contractor shall be responsible for all risk to the work and for trespass and shall make good at his own expense all loss or damage whether to the works themselves or to any other property of the Railway or the lives, persons or property of others from whatsoever cause in connection with the works until they are taken over by the Railway, although all reasonable and proper precautions may have been taken by the Contractor. In case the Railway shall be called upon to make good any costs, loss or damages, or to pay any compensation, including that payable under the provisions of the Workmen's Compensation Act or any statutory amendments thereof to any person or persons sustaining damages as aforesaid by reason of any act, or any negligence or omissions on the part of the Contractor; the amount of any costs or charges including costs and charges in connection with legal proceedings, which the Railway may incur in reference thereto, shall be charged to the Contractor. The Railway

shall have the power and right to pay or to defend or compromise any claim of threatened legal proceedings or in anticipation of legal proceedings being instituted consequent on the action or default of the Contractor, to take such steps as may be considered necessary or desirable to ward off or mitigate the effect of such proceedings, charging to Contractor, as aforesaid; any sum or sums of money which may be paid and any expenses whether for reinstatement or otherwise which may be incurred and the propriety of any such payment, defence or compromise, and the incurring of any such expenses shall not be called in question by the Contractor.

25. Sheds, Storehouses and Yards: The Contractor shall at his own expense provide himself with sheds, storehouses and yards in such situations and in such numbers as in the opinion of the Engineer is requisite for carrying on the works and the Contractor shall keep at each such sheds, storehouses and yards a sufficient quantity of materials and plant in stock as not to delay the carrying out of the works with due expedition and the Engineer and the Engineer's representative shall have free access to the said sheds, store houses and yards at any time for the purpose of inspecting the stock of materials or plant so kept in hand, and any materials or plant which the Engineer may object to shall not be brought upon or used in the works, but shall be forthwith removed from the sheds, storehouses or yards by the Contractor. The Contractor shall at his own expenses provide and maintain suitable mortar mills, soaking vats or any other equipments necessary for the execution of the works.

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

26.1 The Contractor shall place and keep on the works at all times efficient and competent staff to give the necessary directions to his workmen and to see that they execute their work in sound & proper manner and shall employ only such supervisors, workmen & labourers in or about the execution of any of these works as are careful and skilled in the various trades.

26.2 The Contractor shall at once remove from the works any agents, permitted sub-contractor, supervisor, workman or labourer who shall be objected to by the Engineer and if and whenever required by the Engineer, he shall submit a correct return showing the names of all staff and workmen employed by him.

26.3 In the event of the Engineer being of the opinion that the Contractor is not employing on the works a sufficient number of staff and workmen as is necessary for proper completion of the works within the time prescribed, the Contractor shall forthwith on receiving intimation to this effect deploy the additional number of staff and labour as specified by the Engineer within seven days of being so required and failure on the part of the Contractor to comply with such instructions will entitle the Railway to rescind the contract under Clause 62 of these conditions.

26A. Deployment of Qualified Engineers at Work Sites by the Contractor:

26A.1 The Contractor shall also employ qualified Graduate Engineer(s) or equivalent, or qualified Diploma Engineer(s), as prescribed in the tender documents.

26A.2 In case the Contractor fails to employ the Engineer, as aforesaid in Para 26A.1, he shall be liable to pay liquidated damages at the rates, as prescribed in the tender documents.

26A.3 No. of qualified Engineers required to be deployed by the Contractor for various activities contained in the works contract shall be specified in the tender documents as 'Special Condition of Contract'.

27.(1) Workmanship and Testing: The whole of the works and/or supply of materials specified and provided in the contract or that may be necessary to be done in order to form and complete any part thereof shall be executed in the best and most substantial workman like manner with materials of the best and most approved quality of their respective kinds, agreeable to the particulars contained in or implied by the specifications and as referred to in and represented by the drawings or in such other additional particulars, instructions and drawings given during the carrying on of the works and to the entire satisfaction of the Engineer according to the instructions and directions which the Contractors may from time to time receive from the Engineer. The materials may be subjected to tests by means of such machines, instruments and appliances as the Engineer may direct and wholly at the expense of the Contractor.

27.(2) Removal of Improper Work and Materials: The Engineer or the Engineer's Representative shall be entitled to order from time to time:

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

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

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

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

28. Facilities for Inspection: The Contractor shall afford the Engineer and the Engineer's Representative every facility for entering in and upon every portion of the work at all hours for the purpose of inspection or otherwise and shall provide all labour, materials, planks, ladders, pumps, appliances and things of every kind required for the purpose and the Engineer and the Engineer's Representative shall at all times have free access to every part of the works and to all places at which materials for the works are stored or being prepared.

29. Examination of Work before Covering Up: The Contractor shall give 7 days' notice to the Engineer or the Engineer's Representative whenever any work or materials are intended to be covered up in the earth, in bodies or walls or otherwise to be placed beyond the reach of measurements in order that the work may be inspected or that correct dimensions may be taken before being so covered, placed beyond the reach of measurement in default whereof, the same shall at the option of

the Engineer or the Engineer's Representative be uncovered and measured at the Contractor's expense or no allowance shall be made for such work or materials.

30. Temporary Works: All temporary works necessary for the proper execution of the works shall be provided and maintained by the Contractor and subject to the consent of the Engineer shall be removed by him at his expenses when they are no longer required and in such manner as the Engineer shall direct. In the event of failure on the part of the Contractor to remove the temporary works, the Engineer will cause them to be removed and cost as increased by supervision and other incidental charges shall be recovered from the Contractor. If temporary huts are provided by the Contractor on the Railway land for labour engaged by him for the execution of works, the Contractor shall arrange for handing over vacant possession of the said land after the work is completed; if the Contractor's labour refuse to vacate, and have to be evicted by the Railway, necessary expenses incurred by the Railway in connection therewith shall be borne by the Contractor.

31.(1) Contractor to Supply Water for Works: Unless otherwise provided in the Contract, the Contractor shall be responsible for the arrangements to obtain supply of water necessary for the works.

31.(2) Water Supply from Railway System: The Railway may supply to the Contractor part or whole of the quantity of the water required for the execution of works from the Railway's existing water supply system at or near the site of works on specified terms and conditions and at such charges as shall be determined by the Railway and payable by the Contractor, provided that the Contractor shall arrange, at his own expense, to effect the connections and lay additional pipelines and accessories on the site and that the Contractor shall not be entitled to any compensation for interruption of failure of the water supply.

31.(3) Water Supply by Railway Transport: In the event of the Railway arranging supply of water to the Contractor at or near the site of works by travelling water tanks or other means, the freight and other charges incurred thereby, including demurrage charges that may be levied, shall be paid by the Contractor in addition to the charges referred to in Sub-Clause (2) of the Clause provided that the Contractor shall not be entitled to any compensation for interruption or failure of the water supply.

31.(4)(a) Contractor to Arrange Supply of Electric Power for Works: Unless otherwise provided in the contract, the Contractor shall be responsible for arrangements to obtain supply of Electric Power for the works.

(b) Electric Supply from the Railway System: The Railway may supply to the Contractor part or whole of the electric power wherever available and possible, required for execution of works from the Railway's existing electric supply systems at or near the site of works on specified terms and conditions and such charges as shall be determined by the Railway and payable by the Contractor provided the cost of arranging necessary connections to the Railway's Electric Supply systems and laying of underground/overhead conductor, circuit protection, electric power meters, transmission structure, shall be borne by the Contractor and that the Contractor shall not be entitled to any compensation for interruption or failure of the Electric supply system.

32. Property in Materials and Plant: The materials and plant brought by the Contractor upon the site or on the land occupied by the Contractor in connection with the works and intended to be

used for the execution thereof shall immediately be deemed to be the property of the Railway. Such of them as during the progress of the works are rejected by the Engineer under Clause 25 of these conditions or are declared by him not to be needed for the execution of the works or such as on the grant of the certificate of completion remain unused shall immediately on such rejection, declaration or grant cease to be deemed the property of the Railway and the Contractor may then (but not before) remove them from the site or the said land. This clause shall not in any way diminish the liability of the Contractor nor shall the Railway be in any way answerable for any loss or damage which may happen to or in respect of any such materials or plant either by the same being lost, stolen, injured or destroyed by fire, tempest or otherwise.

33.(1) Tools, Plant and Materials Supplied by Railway: The Contractor shall take all reasonable care of all tools, plant and materials or other property whether of a like description or not belonging to the Railway and committed to his charge for the purpose of the works and shall be responsible for all damage or loss caused by him, his agents, permitted sub-contractor, or his workmen or others while they are in his charge. The Contractors shall sign accountable receipts for tools, plants and materials made over to him by the Engineer and on completion of the works shall hand over the unused balance of the same to the Engineer in good order and repair, fair wear and tear excepted, and shall be responsible for any failure to account for the same or any damage done thereto.

33.(2) Hire of Railway's Plant: The Railway may hire to the Contractor such plant as concrete mixers, compressors and portable engines for use during execution of the works on such terms as may be specified in the special conditions or in a separate agreement for Hire of Plant.

34.(1) Precaution During Progress of Works: During the execution of works, unless otherwise specified, the Contractor shall at his own cost provide the materials for and execute all shoring, timbering and strutting works as is necessary for the stability and safety of all structures, excavations and works and shall ensure that no damage, injury or loss is caused or likely to be caused to any person or property.

34.(2) Roads and Water Courses: Existing roads or water courses shall not be blocked cut through, altered, diverted or obstructed in any way by the Contractor, except with the permission of the Engineer. All compensations claimed for any unauthorized closure, cutting through, alteration, diversion or obstruction to such roads or water courses by the Contractor or his agent or his staff shall be recoverable from the Contractor’s bills/Security Deposit or any other dues of Contractor with the Government of India.

34.(3) Provision of Access to Premises: During progress of work in any street or thoroughfare, the Contractor shall make adequate provision for the passage of traffic, for securing safe access to all premises approached from such street or thoroughfare and for any drainage, water supply or means of lighting which may be interrupted by reasons of the execution of the works and shall react and maintain at his own cost barriers, lights and other safeguards as prescribed by the Engineer, for the regulation of the traffic, and provide watchmen necessary to prevent accidents. The works shall in such cases be executed night and day, if so ordered by the Engineer and with such vigour so that the traffic way be impeded for as short a time as possible.

34.(4) Safety of Public: The Contractor shall be responsible to take all precautions to ensure the safety of the public whether on public or railway property and shall post such look out men as may,

in the opinion of the Engineer, be required to comply with regulations appertaining to the work. Contractor shall ensure placement of barricading / partitions at the place of work to ensure safety of habitants of adjacent area, failing which Engineer may advise stoppage of work as per his discretion.

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

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

36.(1) Suspension of Works: The Contractor shall on the order of the Engineer, suspend the progress of the works or any part thereof for such time or times and in such manner as the Engineer may consider necessary and shall during such suspension properly protect and secure the work so far as is necessary in the opinion of the Engineer. If such suspension is:

(a) Provided for in the contract, or

(b) Necessary for the proper execution of the works or by the reason of weather conditions or by some default on the part of the Contractor, and or

(c) Necessary for the safety of the works or any part thereof, or

(d) Necessary for the safety of adjoining public or other property or safety of the public or workmen or those who have to be at the site, or

(e) Necessary to avoid disruption of traffic and utilities, as also to permit fast repair and restoration of any damaged utilities, or

(f) Due to instruction of The National Green Tribunal or any other statutory authority due to high level of pollution in the city of worksite.

36.(2) The Contractor shall not be entitled to the extra costs, if any, incurred by him during the period of suspension of the works, but in the event of any suspension ordered by the Engineer for reasons other than aforementioned and when each such period of suspension exceeds 14 days, the Contractor shall be entitled to such extension of time for completion of the works as the Engineer may consider proper having regard to the period or periods of such suspensions and to such compensations as the Engineer may consider reasonable in respect of salaries or wages paid by the Contractor to his employees during the periods of such suspension.

36.(3) Suspension Lasting More than 3 Months: If the progress of the works or any part thereof is suspended on the order of the Engineer for more than three months at a time, the Contractor may serve a written notice on the Engineer requiring permission within 15 days from the receipt thereof to proceed with the works or that part thereof in regard to which progress is suspended and if such permission is not granted within that time the Contractor by further written notice so served may, but is not bound to, elect to treat the suspension where it affects part only of the works as an omission of such part or where it affects the whole of the works, as an abandonment of the contract by the Railway.

37. Rates for Items of Works:

(i) The rates, entered in the accepted Bill(s) of Quantities of the Contract are intended to provide for works duly and properly completed in accordance with the General and Special (if any) Conditions of the Contract and the Specifications and drawings together with such enlargements, extensions, diminutions, reductions, alterations or additions as may be ordered in terms of Clause 42 of these conditions and without prejudice to the generality thereof and shall be deemed to include and cover superintendence and labour, supply, including full freight of materials, stores, patterns, profiles, moulds, fittings, centerings, scaffolding, shoring props, timber, machinery, barracks, tackle, roads, pegs, posts, tools and all apparatus and plant required on the works, except such tools, plant or materials as may be specified in the contract to be supplied to the Contractor by the Railway, the erection, maintenance and removal of all temporary works and buildings, all watching, lighting, bailing, pumping and draining, all prevention of or compensation for trespass, all barriers and arrangements for the safety of the public or of employees during the execution of works, all sanitary and medical arrangements for labour camps as may be prescribed by the Railway, the setting of all work and of the construction, repair and upkeep of all center lines, bench marks and level pegs thereon, site clearance, all fees duties, royalties, rent and compensation to owners for surface damage or taxes and impositions payable to local authorities in respect of land, structures and all material supplied for the work or other duties or expenses for which the Contractor may become liable or may be put to under any provision of law for the purpose of or in connection with the execution of the contract and all such other incidental charges or contingencies as may have been specially provided for in the Specifications.

However, if rates of existing GST or cess on GST for Works Contract is increased or any new tax /cess on Works Contract is imposed by Statute after the date of opening of tender but within the original date of completion/date of completion extended under clause 17 & 17A and the Contractor thereupon properly pays such taxes/cess, the Contractor shall be reimbursed the amount so paid.

Further, if rates of existing GST or cess on GST for Works Contract is decreased or any tax/cess on Works Contract is decreased / removed by Statute after the date of opening of tender, the reduction in tax amount shall be recovered from Contractor’s bills/Security Deposit or any other dues of Contractor with the Government of India.

38. Demurrage and Wharfage Dues: Demurrage charges calculated in accordance with the scale in force for the time being on the Railway and incurred by the Contractor failing to load or unload any goods or materials within the time allowed by the Railway for loading as also wharfage charges, of materials not removed in time, as also charges due on consignments booked by or to him shall be paid by the Contractor, failing which such charges shall be debited to the Contractor's

account in the hands of the Railway and shall be deducted from any sums which may become due to him in terms of the contracts.

39.(1) Rates for Extra Item(s) of Works:

(a) Standard Schedule of Rates (SSOR) Items: Any item of work carried out by the Contractor on the instructions of the Engineer which is not included in the accepted Bill(s) of Quantities but figures in the Standard Schedule of Rates (SSOR), shall be executed at the rates set forth in the "Standard Schedule of Rates (SSOR)" modified by the tender percentage as accepted in the contract for that chapter of Standard Schedule of Rates (SSOR). However, the cumulative value of all such extra item(s) together (modified by the respective tender percentage) shall not exceed 10 % of the original contract value.

For item(s) not covered in this sub clause, the rate shall be decided as agreed upon between the Engineer and the Contractor before the execution of such items of work as per sub clause (b).

(b) Other Items: For any item of work to be carried out by the Contractor but not included in the accepted Bill(s) of Quantities and also not covered under sub clause (a) above, the Contractor shall be bound to notify the Engineer at least seven days before the necessity arises for the execution of such items of works that the accepted Bill(s) of Quantities does not include rate or rates for such extra work involved. The rates payable for such items shall be decided at the meeting to be held between the Engineer and Contractor, in as short a period as possible after the need for the special item has come to the notice. In case the Contractor fails to attend the meeting after being notified to do so or in the event of no settlement being arrived at, the Railway shall be entitled to execute the extra works by other means and the Contractor shall have no claim for loss or damage that may result from such procedure.

The assessment of rates for extra item(s) shall be arrived at based on the prevailing market rates of labour, machinery & materials and by taking guidance from the following documents in order of priority:

i. Analysis of Rates for “Unified Standard Schedule of Rates of Indian Railways (USSOR)”
ii. Analysis of Rates for “Delhi Schedule of Rates issued by CPWD (DSR)”
iii. Market Analysis

.**39.(2)** Provided that if the Contractor commences work or incurs any expenditure in regard thereto before the rates as determined and agreed upon as lastly hereuntofore-mentioned, then and in such a case the Contractor shall only be 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 fixed by the Engineer. However, if the Contractor is not satisfied with the decision of the Engineer in this respect, he may appeal to the Chief Engineer within 30 days of getting the decision of the Engineer, supported by analysis of the rates claimed. The Chief Engineer's decision after hearing both the parties in the matter would be final and binding on the Contractor and the Railway.

40.(1) Handing over of Works: The Contractor shall be bound to hand over the works executed under the contract to the Railway complete in all respects to the satisfaction of the Engineer. The Engineer shall determine the date on which the work is considered to have been completed, in support of which his certificate shall be regarded as sufficient evidence for all purposes. The Engineer shall determine from time to time, the date on which any particular section of the work shall

have been completed, and the Contractor shall be bound to observe any such determination of the Engineer.

40.(2) Clearance of Site on Completion: On completion of the works, the Contractor shall clear away and remove from the site all constructional plant, surplus materials, rubbish and temporary works of every kind and leave the whole of the site and works clean and in a workman like condition to the satisfaction of the Engineer. No final payment in settlement of the accounts for the works shall be paid, held to be due or shall be made to the, Contractor till, in addition to any other condition necessary for final payment, site clearance shall have been affected by him, and such clearance may be made by the Engineer at the expense of the Contractor in the event of his failure to comply with this provision within 7 days after receiving notice to that effect. Should it become necessary for the Engineer to have the site cleared at the expenses of the Contractor, the Railway shall not be held liable for any loss or damage to such of the Contractor's property as may be on the site and due to such removal there from which removal may be affected by means of public sales of such materials and property or in such a way as deemed fit and convenient to the Engineer.

40A Offloading of Part(s) of Work: At the final stage of completion/ commissioning of work, in case the contractor fails to complete the final part(s) of the work and the value of such part(s) of the work is limited to 5% of the original contract value, the Engineer may allow/decide for offloading of such part(s) of works, either after the Contractor's request in writing to do so or after serving a 14 (Fourteen) days suo-moto notice (as per annexure- VIIA), if the Engineer is of the opinion that :-

(i) Such Offloading of works (up to 5% of original contract value) would enable successful completion of contract/work,

(ii) Termination/ Part termination of the contract at this stage is not be in the interest of the Railway/work;, and

(iii) The anticipated additional cost for execution of such works through other mode would not be substantial and can be recovered from the pending dues of the contractor;

The Contractor shall be informed, in due course, by the Engineer of the mode and cost of execution of such offloaded work through other agency(ies) (as per annexure- VIIB). The extra expenditure so incurred in execution of the offloaded work, shall be recovered from subsequent Bill(s) or any other dues of the Contractor, but not exceeding the value of Performance Guarantee available in the contract. There shall be no other repercussion of such offloading on execution of the balance contract. The Contractor shall have no claim on account of above mentioned offloading of works.

VARIATIONS IN EXTENT OF CONTRACT

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

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

42.(2) (i) Unless otherwise specified in the special conditions of the contract, the accepted variation in quantity of each individual item of the contract would be upto 25% of the quantity originally contracted, except in case of foundation work (in which no variation limit shall apply). However, the rates for the increased quantities shall be as per sub- para (iii) below.

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

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

a. Quantities operated in excess of 125% but upto 140% of the agreement quantity of the concerned item, shall be paid at 98% of the rate awarded for that item in that particular tender;
b. Quantities operated in excess of 140% but upto 150% of the agreement quantity of the concerned item shall be paid at 96% of the rate awarded for that item in that particular tender;
c. Variation in quantities of individual items beyond 150% will be avoided and would be permitted only in exceptional unavoidable circumstances and shall be paid at 96% of the rate awarded for that item in that particular tender.
d. Variation to quantities of Minor Value Item:
   The limit for varying quantities for minor value items shall be 100% (as against 25% prescribed for other items). A minor value item for this purpose is defined as an item whose original agreement value is less than 1 % of the total original contract value.
   d.(i) Quantities operated upto and including 100% of the agreement quantity of the concerned minor value item, shall be paid at the rate awarded for that item in that particular tender;
   d.(ii) Quantities operated in excess of 100% but upto 200% of the agreement quantity of the concerned minor value item, shall be paid at 98% of the rate awarded for that item in that particular tender;
   d.(iii) Variation in quantities of individual minor value item beyond 200% will be avoided and would be permitted only in exceptional unavoidable circumstances and shall be paid at 96% of the rate awarded for that item in that particular tender.

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

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

the individual items irrespective of the manner of quoting the rate (single percentage rate or individual item rate).

42.(3) Valuation of Variations: The enlargements, extensions, diminution, reduction, alterations or additions referred to in Sub-Clause (2) of this Clause shall in no degree affect the validity of the contract; but shall be performed by the Contractor as provided therein and be subject to the same conditions, stipulations and obligations as if they had been originally and expressively included and provided for in the Specifications and Drawings and the amounts to be paid therefor shall be calculated in accordance with the accepted Bill(s) of Quantities. Any extra item(s)/quantities of work falling outside the purview of the provisions of Sub-Clause (2) above shall be paid for at the rates determined under Clause-39 of these Conditions.

CLAIMS

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

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

MEASUREMENTS, CERTIFICATES AND PAYMENTS

44. Quantities in Bill(s) of Quantities Annexed to Contract: The quantities set out in the accepted Bill(s) of Quantities with items of works quantified are the estimated quantities of the works and they shall not be taken as the actual and correct quantities of the work to be executed by the Contractor in fulfillment of his obligations under the contract.

45(i). Measurement of Works by Railway: The Contractor shall be paid for the works at the rates in the accepted Bill(s) of Quantities and for extra works at rates determined under Clause 39 of these Conditions on the measurements taken by the Engineer or the Engineer's representative in accordance with the rules prescribed for the purpose by the Railway. The quantities for items the unit of which in the accepted Bill(s) of Quantities is 100 or 1000 shall be calculated to the nearest whole number, any fraction below half being dropped and half and above being taken as one; for items the unit of which in the accepted Bill(s) of Quantities is single, the quantities shall be calculated to two places of decimals. Such measurements will be taken of the work in progress from time to time and at such intervals as in the opinion of the Engineer shall be proper having regard to the progress of works. The date and time on which ‘on account’ or ‘final’ measurements are to be made shall be communicated

to the Contractor who shall be present at the site and shall sign the results of the measurements (which shall also be signed by the Engineer or the Engineer's representative) recorded in the official measurements book as an acknowledgement of his acceptance of the accuracy of the measurements. Failing the Contractor's attendance, the work may be measured up in his absence and such measurements shall, notwithstanding such absence, be binding upon the Contractor whether or not he shall have signed the measurement books provided always that any objection made by him to measurement shall be duly investigated and considered in the manner set out below:

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

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

45(ii). **Measurement of Works by Contractor's Authorized Representative (in case the contract provides for the same):**

(a) The Contractor shall be paid for the works at the rates in the accepted Bill(s) of Quantities and for extra works at rates determined under Clause 39 of these Conditions on the measurements taken by the Contractor's authorized Engineer in accordance with the rules prescribed for the purpose by the Railway. The quantities for items the unit of which in the accepted Bill(s) of Quantities is 100 or 1000 shall be calculated to the nearest whole number, any fraction below half being dropped and half and above being taken as one; for items the unit of which in the accepted Bill(s) of Quantities is single, the quantities shall be calculated to two places of decimals. Such measurements will be taken of the work in progress from time to time. The date and time on which 'on account' or 'final' measurements are to be made shall be communicated to the Engineer.

The date and time of test checks shall be communicated to the Contractor who shall be present at the site and shall witness the test checks, failing the Contractor's attendance the test checks may be conducted in his absence and such test checks shall not withstanding such absence be binding upon Contractor provided always that any objection made by Contractor to test check shall be duly investigated and considered in the manner set out below:

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

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

(i) On first occasion of noticing exaggerated/ false measurement, Engineer shall recover liquidated damages equal to10% of claimed gross bill value.

(ii) On any next occasion of noticing any exaggerated/false measurement, railway shall recover liquidated damages equal to 15% of claimed gross bill value. In addition, the facility of recording of measurements by Contractor as well as release of provisional payment shall be withdrawn. Once withdrawn, measurements shall be done by railway as per clause 45(i) above.

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

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

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

46.(4) If payment(s) of Advances are applicable in the contract, as mentioned in the Tender Documents, Railway shall make payment(s) of Interest bearing advances, on the request of contractor. The payment and recovery of such Advances shall be made as under:

(a): Mobilisation Advance –

This shall be limited to 10% of the Contract value and shall be paid in 2 stages :

Stage 1– 5% of Contract Value on signing of the contract agreement.

Stage 2 – 5% on mobilization of site-establishment, setting up offices, bringing in equipment and actual commencement of work.

The stage 1 of advance shall be payable immediately after signing of contract agreement.

The stage 2 of advance shall be payable at the time of mobilisation, only after submission of an utilization certificate by the contractor that the Stage 1 advance has been properly utilized in the contract.

These Advances shall be payable against irrevocable guarantee (Bank Guarantee, FDRs) from a scheduled commercial bank of India of at least 110% of the value of the sanctioned advance amount (covering principal plus interest).

(b): Advance Against Machinery and Equipment –

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

The advances under sub clause (a) and (b) above, are subject to the following conditions -

(i) The full amount of Advances shall be recovered from contractor dues. The recovery shall commence when the value of contract executed reaches 15% of original contract value and shall be completed when the value of work executed reaches 85% of the original contract value. The installments on each "on account bill" will be on pro-rata basis.

Interest shall be recovered on the advance outstanding for the period commencing from the date of payment of advance till date of particular on-account bill (through which recovery of principal is effected) and adjusted fully against on-account bill along with pro-rata principal recovery. In the event of any short-fall, the same shall be carried forward to the next on-account bill and shall attract interest.

(ii) The advances shall be used by the Contractor 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. The Contractor, if required by the Engineer shall provide the details of utilisation of Mobilisation advance.

(iii) If the Contractor is found to have contravened the provision, it will constitute a breach of contract and Railway shall be entitled to terminate the contract and forfeit his Performance Guarantee as well as Security Deposit.

(iv) In cases, where the Contract is rescinded as per clause 62 of the contract or short closed under any other condition(s) of the contract, without making full recovery of advances and accrued interest thereon, by the Railway, such balance of advances and accrued interest thereon shall immediately become due and payable by the Contractor to the Railway. The same shall be recovered from any due of Contractor with the Government of India.

46.(5) Manner of Payment: Unless otherwise specified payments to the Contractor will be transferred electronically to his bank account.

46A. Price Variation Clause (PVC):

46A.1 Applicability: Price Variation Clause (PVC) shall be applicable only in tender having advertised value above **Rs. 2 Crores and having completion period above 12 months**. Provided further that, in a contract where PVC is applicable, following shall be outside the purview of price adjustments (i.e. shall be excluded from the gross value of the work for the purpose of price variation) :

a) Materials supplied by Railway to the Contractors, either free or at fixed rate;
b) Any extra item(s) included in subsequent variation falling outside the purview of the Bill(s) of Quantities of tender, under clause 39. (1)(b) of these Standard General Conditions, unless applicability of PVC and 'Base Month' has been specially agreed, while fixing the rates of such extra item(s).

46A.2 Base Month: The Base Month for 'Price Variation Clause' shall be taken as the one month prior to closing of tender, unless otherwise stated elsewhere. The quarter for applicability of PVC shall commence from the month following the Base month. The Price Variation shall be based on the average Price Index of the quarter under consideration.

46A.3 Validity:

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.

46A.4 Components of various items in a contract on which variation in prices be admissible, shall be steel, cement, ferrous material, non-ferrous material, insulators, zinc and other materials, labour, plant & machinery, fuel, explosives, detonators etc. Adjustment for variation in prices of these items shall be determined in the manner prescribed.

46A.5 No price variation shall be admissible for fixed components.

46A.6 The percentages of various components in various type of works shall be as specified for all item (s)/ Bill(s) of Quantities in tender document and the same shall be fixed as per table & classifications given below:

(I). For Civil Engineering Works

SN	Classification / Components		1A, 2 & 3A	4A	5A	6A	7	8A	9A	1B, 3B, 4B, 5B, 6B 8B & 9B	1C, 3C, 4C, 5C, 6C, 8C & 9C	3D, 4D, 5D, 6D, 8D & 9D	3E, 4E, 5E, 6E, 8E & 9E
1	*Fixed*	*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*
2	Labour	L_c	15	20	25	15	15	15	20	5	5	10	25
3	Steel	S_c	0	0	20	0	0	0	0	75	0	50	0
4	Cement	C_c	0	0	15	0	0	0	0	0	75	0	0
5	Plant Machinery & Spares	PM_c	35	15	0	20	20	20	30	0	0	10	30
6	Fuel & Lubricants	F_c	25	15	10	35	35	35	15	5	5	10	20
7	Other materials	M_c	10	15	15	15	15	15	20	0	0	5	10
8	Detonators & Explosive	E_c	0	20	0	0	0	0	0	0	0	0	0
Total			100	100	100	100	100	100	100	100	100	100	100

* It shall not be considered for any price variation.

The classification mentioned in the table above represents following type of item(s) in the work(s) –

1 Earthwork in Formation

1A All Item(s) excluding 1B or/and 1C

1B Item(s) for supply of Steel

1C Item(s) for supply of Cement

2 Ballast Supply Works

3 Tunnelling Works (Without Explosives)

3A All Item(s) excluding 3B or/and 3C or/and 3D or/and 3E

3B Item(s) for supply of Steel

3C Item(s) for supply of Cement or/and Grout

3D Item(s) for Fabrication & Erection of Structures including supply of Steel

3E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

4 Tunnelling Works (With explosives)

4A All Item(s) excluding 4B or/and 4C or/and 4D or/and 4E

4B Item(s) for supply of Steel

4C Item(s) for supply of Cement or/and Grout

4D Item(s) for Fabrication & Erection of Structures including supply of Steel

4E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

5 Building Works

5A All Item(s) excluding 5B or/and 5C or/and 5D or/and 5E

5B Item(s) for supply of Steel

5C Item(s) for supply of Cement

5D Item(s) for Fabrication & Erection of Structures including supply of Steel

5E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

6 Bridges & Protection work

6A All Item(s) excluding 6B or/and 6C or/and 6D or/and 6E

6B Item(s) for supply of Steel

6C Item(s) for supply of Cement

6D Item(s) for Fabrication, Assembly, Erection& Launching of Girders including supply of Steel

6E Item(s) for Fabrication, Assembly, Erection &Launching of Girders excluding supply of Steel

7 Permanent Way linking

8 Platform, Passenger Amenities

8A All Item(s) excluding 8B or/and 8C or/and 8D or/and 8E

8B Item(s) for supply of Steel item/fittings

8C Item(s) for supply of Cement Item

8D Item(s) for Fabrication & Erection of Structures including supply of Steel

8E Item(s) for Fabrication & Erection of Structures excluding supply of Steel

9 Any Other Works not covered in Classification 1 to 8

9A All Item(s) excluding 9B or/and 9C or/and 9D or/and 9E

9B Item(s) for supply of Steel

9C Item(s) for supply of Cement or/and Grout

9D Item(s) for Fabrication & Erection of Structures including supply of Steel

9E Item(s) for Fabrication & Erection of Structures excluding supply of Steel

46A.7 Formulae: The Amount of variation in prices in various components (labour, material etc.) shall be worked out by the following formulae:

(i) $$L = \frac{(W \text{ or } W_S \text{ or } W_C \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (L_Q - L_B) \times L_C}{L_B \times 100}$$

(ii) $$M = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (M_Q - M_B) \times M_C}{M_B \times 100}$$

(iii) $$F = \frac{(W \text{ or } W_S \text{ or } W_C \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (F_Q - F_B) \times F_C}{F_B \times 100}$$

(iv) $$E = \frac{(W \text{ or } W_S \text{ or } W_C \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (E_Q - E_B) \times E_C}{E_B \times 100}$$

(v) $$PM = \frac{(W \text{ or } W_S \text{ or } W_C \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (PM_Q - PM_B) \times PM_C}{PM_B \times 100}$$

(vi) $$S = \frac{(W \text{ or } W_S \text{ or } W_{SF}) \times (S_Q - S_B) \times S_C}{S_B \times 100}$$

(vii) $$C = \frac{(W \text{ or } W_C) \times (C_Q - C_B) \times C_C}{C_B \times 100}$$

(II) For Railway Electrification Works:

(viii) $T = [0.4136x(C_Q – C_B) / C_B] \times 85$

(ix) $R = [0.94x(R_T - R_O) / R_O + 0.06x(Z_T - Z_O) / Z_O] \times 85$

(x) $N = [(P_T - P_O) / P_O] \times 85$

(xi) $I = [(I_T – I_O) / I_O] \times 85$

(xii) $G = [(M_Q - M_B) / M_B] \times 85$

(xiii) $Er = [(L_Q - L_B) / L_B] \times 85$

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 Plant, Machinery and Spares
S	Amount of price variation in Steel Supply Item
C	Amount of price variation in Cement Supply Item
T	Percentage variation payable on the gross value of bill of Concreting (Bill(s) of Quantities for concrete items)
R	Percentage variation payable on the gross value of bill of Ferrous Items (Bill(s) of Quantities for ferrous items)
N	Percentage variation payable on the gross value of bill of Non-Ferrous Items (Bill(s) of Quantities for non-ferrous items)
I	Percentage variation payable on the gross value of bill of Insulator (Bill(s) of Quantities for Insulator items)
G	Percentage variation payable on the gross value of bill of General Works (Bill(s) of Quantities for General items)
Er	Percentage variation payable on the gross value of erection (Bill(s) of Quantities for Erection Item)
L_C	% of Labour Component in the item(s)
M_C	% of Material Component in the item(s)
F_C	% of Fuel Component in the item(s)
E_C	% of Explosive Component in the item(s)
PM_C	% of Plant, Machinery and Spares Component in the item(s)
S_C	% of Steel Supply item Component in the item(s)
C_C	% of Cement Supply item Component in the item(s)
W	Gross value of work done by Contractor as per on-account bill(s) excluding the Gross value of work under W_S or/and W_C or/and W_{SF} or/and W_F or/and W_{SFL} or/and W_{FL} and cost of materials supplied by Railway either free or at fixed rate,

W_S Gross value of work done by Contractor for item(s) of supply of steel.

W_C Gross value of work done by Contractor for item(s) of supply of cement and /or supply of grout material.

W_{SF} Gross value of work done by Contractor for item(s) of Fabrication & Erection of Structures including supply of Steel.

W_F Gross value of work done by Contractor for Fabrication & Erection of Structures excluding supply of Steel.

W_{SFL} Gross value of work done by Contractor for item(s) of Fabrication, Assembly, Erection / Launching of Girders including supply of Steel.

W_{FL} Gross value of work done by Contractor for item(s) of Fabrication, Assembly, Erection / Launching of Girders excluding supply of Steel.

L_B Consumer Price Index for Industrial Workers - All India: Published in R.B.I. Bulletin for the base period

L_Q 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

M_B Wholesale Price Index: All commodities – as published in the R.B.I. Bulletin for the base period

M_Q 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

F_B The average of official prices of Diesel available on the official website of 'Petroleum Planning and Analysis cell' under Ministry of Petroleum and Natural Gas for Delhi, Kolkata, Mumbai &Chennai, for the base period

F_Q The average of official prices of Diesel available on the official website of 'Petroleum Planning and Analysis cell' under Ministry of Petroleum and Natural Gas for Delhi, Kolkata, Mumbai &Chennai, for the 3 months of the quarter under consideration

E_B 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.

E_Q 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.

PM_B Index Number of Wholesale Prices in India by Groups and Sub Groups (Averages) for 'Manufacture of machinery for mining, quarrying and construction'– published in RBI (Reserve Bank of India) Bulletin, for the base period.

PM_Q Index Number of Wholesale Prices in India by Groups and Sub Groups (Averages) for 'Manufacture of machinery for mining, quarrying and construction'– published in RBI (Reserve Bank of India) Bulletin, for the average price index of 3 months of

the quarter under consideration.

S_B The average rate provided by the Joint Plant Committee for the relevant category of steel item as mentioned in Clause 46A.9; for the base period.

S_Q The average rate provided by the Joint Plant Committee for the relevant category of steel item as mentioned in Clause 46A.9; for the 3 months of the quarter under consideration.

C_B Index No. of Wholesale Price Index of sub-group Cement, Lime & Plaster as published in RBI Bulletin for the base period

C_Q 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

R_T IEEMA price index for Steel Blooms (size 150mmx150mm) for the month which is two months prior to date of inspection of material.

R_O IEEMA price index for Steel Blooms (size 150mmx150mm)for the month which is one month prior to date of opening of tender.

P_T IEEMA price index for Copper wire rods for the month which is two months prior to date of inspection of material.

P_O IEEMA price index for Copper wire rods for the month which is one month prior to date of opening of tender.

Z_T IEEMA price index for Zinc for the month which is two months prior to date of inspection of material

Z_O IEEMA price index for Zinc for the month which is one month prior to date of opening of tender

I_T RBI wholesale price index for the sub-group “Insulators” for the month which is two months prior to date of inspection of material

I_O RBI wholesale price index for the sub-group “Insulators” for the month which is one month prior to date of opening of tender

(III) <u>SIGNALING & TELECOMMUNICATION WORKS:</u>

(a) The following expressions and meanings are assigned to the value of the work done for signalling and telecommunication works:

SIGWK = Value of signalling works for a stage payment of the item signalling works;

INVSIG = Value of inventory for signalling works for a stage payment of the item inventory for signalling works;

INTGTESTSIG = Value of integrated testing and commission for signalling works of the Railway Project;

COMWK= Value of telecommunication works for a stage payment of the item telecommunication works;

INVCOM = Value of inventory for telecommunication works for a stage payment of the item inventory for telecommunication works; and

INTGTESTCOM = Value of integrated testing and commission for telecommunication

works of the Railway Project.

(b) Price adjustment for changes in cost of signalling works and telecommunication works shall be paid in accordance with the following formula:

(i) VSIGWK = 0.85 SIGWK x [PELEX x (ELEXi – ELEXo)/ ELEXo + POFC x (OFCi – OFCo)/OFCo + PLB x (LBi – LBo)/LBo + POTH x (OTHi - OTHo)/OTHo + S30C x ($P30C_i$ – $P30C_o$)/ $P30C_o$ + S24C x ($P24C_i$ – $P24C_o$)/ $P24C_o$ + S19C x ($P19C_i$ – $P19C_o$)/ $P19C_o$ + S12C x ($P12C_i$ – $P12C_o$)/ $P120C_o$ + S9C x ($P9C_i$ – $P9C_o$)/ $P9C_o$ + S6C x ($P6C_i$ – $P6C_o$)/ $P6C_o$ + S4C x ($P4C_i$ – $P4C_o$)/ $P4C_o$ + S2C x ($P2C_i$ – $P2C_o$)/ $P2C_o$ + S12C2.5 x ($P12C2.5_i$ – $P12C2.5_o$)/ $P12C2.5_o$ + S2C2.5 x ($P2C2.5_i$ – $P2C2.5_o$)/ $P2C2.5_o$ + S2C25 x ($P2C25_i$ – $P2C25_o$)/ $P2C25_o$ + QC x (PQC_i – PQC_o)/ PQC_o;

(ii) VINVSIG = 0.85 SIGWK x [PELEX x (ELEXi – ELEXo)/ ELEXo + POTH x (OTHi - OTHo)/OTHo];

(iii) VINTGTESTSIG = 0.85 INTGTESTSIG x [PLB x (LBi – LBo)/LBo + POTH x (OTHi- OTHo)/OTHo];

(iv) VCOMWK = 0.85 COMWK x [PELEX x (ELEXi – ELEXo)/ ELEXo + POFC x (OFCi – OFCo)/OFCo + PLB x (LBi – LBo)/LBo + POTH x (OTHi - OTHo)/OTHo + S30C x ($P30C_i$ – $P30C_o$)/ $P30C_o$ + S24C x ($P24C_i$ – $P24C_o$)/ $P24C_o$ + S19C x ($P19C_i$ – $P19C_o$)/ $P19C_o$ + S12C x ($P12C_i$ – $P12C_o$)/ $P120C_o$ + S9C x ($P9C_i$ – $P9C_o$)/ $P9C_o$ + S6C x ($P6C_i$ – $P6C_o$)/ $P6C_o$ + S4C x ($P4C_i$ – $P4C_o$)/ $P4C_o$ + S2C x ($P2C_i$ – $P2C_o$)/ $P2C_o$+ S12C2.5 x ($P12C2.5_i$ – $P12C2.5_o$)/ $P12C2.5_o$ + S2C2.5 x ($P2C2.5_i$ – $P2C2.5_o$)/ $P2C2.5_o$ + S2C25 x ($P2C25_i$ – $P2C25_o$)/ $P2C25_o$ + QC x (PQC_i – PQC_o)/ PQC_o+ PCEQP x (CEQPi – CEQPo)/CEQPo];

(v) VINVCOM = 0.85 SIGWK x [PELEX x (ELEXi – ELEXo)/ ELEXo + PCEQP x (CEQPi – CEQPo)/CEQPo + POTH x (OTHi - OTHo)/OTHo]; and

(vi) VINTGTESTCOM = 0.85 INTGTESTCOM x [PLB x (LBi – LBo)/LBo + POTH x (OTHi - OTHo)/OTHo].

Where

VSIGWK = Increase or decrease in the cost of signalling works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (h);

VINVSIG = Increase or decrease in the cost of inventory for signalling during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (h);

VINTGTESTSIG = Increase or decrease in the cost of integrated testing and commissioning of signalling works of the Railway Project during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (h);

VCOMWK = Increase or decrease in the cost of communication works during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (h);

VINVCOM = Increase or decrease in the cost of inventory for telecommunications works

during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (h);

VINTGTESTCOM = Increase or decrease in the cost of integrated testing and commissioning of telecommunication works of the Railway Project during the period under consideration due to changes in the rates for relevant components as specified in sub-paragraph (h);

PCEQP, PELEX, PIC, PLB, POFC, and POTH are the percentages of communication equipment, electronics, PVC insulated cables, labour, optical fibre cables, and other materials respectively;

CEQPo = The wholesale price index as published by the Ministry of Commerce and Industry, Government of India (hereinafter called "**WPI**") for communication equipment for the month of the Base Month;

CEQPi = The WPI for communication equipment for the average price index of the 3 months of the quarter under consideration;

ELEXo = The WPI for electronics for the month of the Base Month;

ELEXi = The WPI for electronics for the average price index of the 3 months of the quarter under consideration;

$P30C_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 30C x 1.5 sq mm signalling cable

$P30C_o$ = Price per Km of cable as per purchase order/ Contract agreement.

S30C = Percentage of size 30C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

$P24C_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 24C x 1.5 sq mm signalling cable

$P24C_o$ = Price per Km of cable as per purchase order/ Contract agreement.

S24C = Percentage of size 24C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

$P19C_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 19C x 1.5 sq mm signalling cable

$P19C_o$ = Price per Km of cable as per purchase order/ Contract agreement.

S19C = Percentage of size 19C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

$P12C_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 12C x 1.5 sq mm signalling cable

$P12C_o$ = Price per Km of cable as per purchase order/ Contract agreement.

S12C = Percentage of size 12C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

$P9C_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 9C x 1.5 sq mm signalling cable

$P9C_o$ = Price per Km of cable as per purchase order/ Contract agreement.

S9C = Percentage of size 9C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

$P6C_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 6C x 1.5 sq mm signalling cable

$P6C_o$ = Price per Km of cable as per purchase order/ Contract agreement.

S6C = Percentage of size 6C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

$P4C_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 4C x 1.5 sq mm signalling cable

$P4C_o$ = Price per Km of cable as per purchase order/ Contract agreement.

S4C = Percentage of size 4C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

$P2C_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 2C x 1.5 sq mm signalling cable

$P2C_o$ = Price per Km of cable as per purchase order/ Contract agreement.

S2C = Percentage of size 2C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

$P12C2.5_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 12C x 2.5 sq mm signalling cable

$P12C2.5_o$ = Price per Km of cable as per purchase order/ Contract agreement.

S12C2.5 = Percentage of size 12C x 2.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

$P2C2.5_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 2C x 2.5 sq mm signalling cable

$P2C2.5_o$ = Price per Km of cable as per purchase order/ Contract agreement.

S2C2.5 = Percentage of size 2C x 2.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

$P2C25_i$ = Price payable per Km as adjusted in accordance with price variation Clause for size 2C x 25 sq mm signalling cable

$P2C25_o$ = Price per Km of cable as per purchase order/ Contract agreement.

S2C25 = Percentage of size 2C x 25 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

PQC_i = Price payable per Km as adjusted in accordance with price variation Clause for size 0.9mm dia, 6 Quad cable.

PQC_o= Price per Km of cable as per purchase order/ Contract agreement.

QC = Percentage of size 0.9mm dia, 6 Quad cable shall govern the price.

LBo = The consumer price index for industrial workers – All India, published by Labour Bureau, Ministry of Labour, Government of India, (hereinafter called "**CPI**") for the month of the Base Month;

LBi = The CPI for industrial workers – All India for the average price index of the 3 months of the quarter under consideration;

OFCo = The WPI for fibre cables for the month of the Base Month;

OFCi = The WPI for fibre cables for the average price index of the 3 months of the quarter under consideration;

OTHo = The WPI for all commodities for the month of the Base Month; and

OTHi = The WPI for all commodities for the average price index of the 3 months of the quarter under consideration.

(c) The following percentages shall govern the price adjustment of the Contract Price for signalling and telecommunication works:

Works / Component	Signalling			Telecommunication		
	Signalling Works	Signalling inventory	Integrated testing and Commissioning	Telecommunication Works	Telecomm inventory	Integrated testing and Commissioning
Electronics (PELEX)	***%	***%	_	***%	***%	_
Communication Equipment (PCEQP)	_	_	_	***%	***%	_
Optical Fibre Cable (POFC)	***%	_	_	***%	_	_
30C x 1.5 sq mm signalling cable(S30C)	***%	_	_	***%	_	_
24C x 1.5 sq mm signalling cable (S24C)	***%	_	_	***%	_	_
19Cx 1.5 sq mm signalling cable (S19C)	***%	_	_	***%	_	_
12C x 1.5 sq mm signalling cable (S12C)	***%	_	_	***%	_	_
9C x 1.5 sq mm signalling cable (S9C)	***%	_	_	***%	_	_
6C x 1.5 sq mm signalling cable (S6C)	***%	_	_	***%	_	_
4C x 1.5 sq mm signalling cable (S4C)	***%	_	_	***%	_	_

2C x 1.5 sq mm signalling cable (S2C)	***%	_	_	***%	_	_
12C x 2.5 sq mm signalling cable (S12C2.5)	***%	_	_	***%	_	_
2C x 2.5 sq mm signalling cable (S2C2.5)	***%	_	_	***%	_	_
2C x 25 sq mm signalling cable (S2C25)	***%	_	_	***%	_	_
0.9 mm dia, 6Quad cable (QC)	***%	_	_	***%	_	_
Labour (PLB)	***%	_	***%	***%	***%	***%
Other materials	***%	***%	***%	***%	***%	***%
Total	100%	100%	100%	100%	100%	100%

(Note- the percentages may be finalized by tendering authority depending on BOQ)

FORMULAE FOR SIGNALING & TELECOM CABLE

The price payable for signalling cables is variable as per Price Variation Formula given below:

For Signalling Copper Cables:

P_i= Po+CuF (Cu-Cuo) + CCFcu(CC-CCo) + FeF (Fe-Feo)

For Telecom Copper Cables For Jelly Filled, 0.9 mm dia, 6 quad cable

P_i= Po+CuF (Cu-Cuo) + AlFcu(Al-Alo) + CCFcu (CC-Cco) + FeF (Fe-Feo)

For Aluminium Power Cables:

P_i= Po+AlF (Al-Alo) + CCFAl(CC-CCo) + FeF (Fe-Feo)

Where,

P_i= Price payable per KM as adjusted in accordance with Price variation clause.

Po= Price per KM of cable as per Purchase order.

CuF= Variation factor for Copper

Cuo= Price of copper Rod in Rs. Per MT

CCFCu= Variation factor for PVC Compound for Copper Signalling & Telecom cable

CCo= Price of PVC Compound in Rs. Per MT

AlF= Variation factor for Aluminium

Alo= Price of EC grade LME Aluminium rods (Properzi rods) in Rs. Per MT.

CCFAl = Variation factor for PVC Compound for Aluminium power cable

FeF= Variation factor for Steel

Feo= Price of Steel for Armour (Flat strip 4 mm. x 0.8mm/ Round 1.4mm dia) in Rs. Per MT

(Prices per MT for Cuo, CCo, Feo, Alo as applicable on the 1st working day of the month, one month prior to the deadline for submission of bids. The above prices and indices are as published by IEEMA vide circular reference no. IEEMA (PVC) /CABLE --/--/-- one month prior to the deadline for submission of bids.)

Cu= Price of Copper Rod in Rs. Per MT.

C_C= Price of PVC Compound in Rs. Per MT.

Fe= Price of Steel for Armouring (Flat strip 4mm x 0.8 mm/ Round 1.4mm dia) in Rs. Per MT.

Al = Price of EC grade LME Aluminium rods (Properzi rods) in Rs. Per MT.

(Prices per MT for Cu, CC, Fe, Al as prevailing on 1st working day of the calendar month covering the date One month prior to the date of inspection call letter will be applicable for the calculation of updated price. The above prices and indices are as published by IEEMA vide circular reference no. IEEMA (PVC) /CABLE --/--/-- one month prior to the date of inspection.)

The value of variation factors for copper, steel and PVC Compound are different for different sizes of signalling cables. Accordingly, the PVC formula for some of the types of signalling cable is as given under:-

Underground Railway Signalling Cable unscreened and armoured copper conductor

(i) Size 30 C x 1.5 sq.mm.

$P30C_i$=P30Co+0.391(Cu-Cuo) +0.557(CC-CCo) +0.425(Fe-Feo)

For armouring, price of steel flat strip of size 4mmx0.8mm is to be taken into consideration.

(ii) Size 24C x 1.5 sq.mm

$P24C_i$= P24Co+0.313(Cu-Cuo) + 0.481 (CC-CCo) +0.398(Fe-Feo)

For armouring, value of steel flat strip of size 4mmx0.8mm is to be taken into consideration.

(iii) Size 19C x 1.5 sq.mm

$P19C_i$= P19Co+0.248(Cu-Cuo) + 0.395(CC-CCo) +0.343(Fe-Feo)

For armouring, value of steel flat strip of size 4mmx0.8mm is to be taken into consideration.

(iv) Size 12C x 1.5 sq.mm

$P12C_i$=P12Co+0.157(Cu-Cuo) + 0.277(CC-CCu) +0.289(Fe-Feo)

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

(v) Size 9C x 1.5 sq.mm

$P9C_i$= P9Co+0.117(Cu-Cuo) +0.241(CC-CCu) +0.383(Fe-Feo)

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

(vi) Size 6Cx 1.5 sq.mm

$P6C_i$= P6Co+0.078(Cu-Cuo) +0.199(CC-CCu) +0.329(Fe-Feo)

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

(vii) Size 4Cx1.5 sq.mm

$P4C_i$=P4Co+0.052(Cu-Cuo) +0.152(CC-CCo) +0.277(Fe-Feo)

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

(viii) Size 2C x 4 sq.mm(multistrand)

$P2C_i$= P2Co+0.073(Cu-Cuo) +0.156(CC-CCo) +0.3(Fe-Feo)

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

(ix) Size 12C x 2.5 sq.mm

$P12C2.5_i$= P12C2.5o+0.282 (Cu-Cuo) +0.371 (CC-CCo) +0.342 (Fe-Feo)

For armouring, value of steel flat strip of size 4mmx0.8mm is to be taken into consideration.

(x) Size 2C x 2.5 sq.mm

$P2C2.5_i$= P2C2.5o+0.047 (Cu-Cuo) +0.139 (CC-CCo) +0.277 (Fe-Feo)

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

(xi) Size 2C x 25 sq.mm PVC insulated, armoured, Aluminium power cable

$P2C25_i$= P2C25o+0.146 (Al-Alo) +0.303 (CC-CCo) +0.306 (Fe-Feo)

For armouring, value of steel flat strip of size 4mmx0.8mm is to be taken into consideration.

(xii) For Jelly filled, 0.9mm dia, 6 quad cable

PQC_i = PQCo + 0.135 (Al-Alo) + 0.139 (Cu-Cuo) + 0.515 (CC-Cco) + 0.693 (Fe-Feo).

For PVC Compound Grade CW-22, is to be taken into consideration.

46A.8 The demands for escalation of cost shall be allowed on the basis of provisional indices as mentioned above in Clause 46A.7. Any adjustment needed to be done based on the finally published indices shall be made as and when they become available.

46A.9: (1) Relevant categories of steel for the purpose of operating Price Variation formula as mentioned in this Clause shall be as under:

SL	Classification	Rates to be used for calculating S_Q or S_B
1.	Reinforcement bars and other rounds	Average of per tonne rates of 10mm dia TMT & 25mm dia TMT; confirming IS1786; Fe 500
2.	All types and sizes of angles, channels and joists	Average of per tonne rates of 'Angle 75x75x6mm, Mild Steel Plate 10mm thickness and Channel 150x75mm; confirming IS2062, E250 Gr "A"
3.	All types and sizes of plates	Average of per tonne rates of 'MS Plates 10mm thickness and 25mm thickness; confirming IS2062, E250 Gr "A"

4.	Any other section of steel not covered in the above categories	Average of price for the 3 categories covered under SL 1, 2 & 3 in this table.

(2). Relevant city for referring "JPC (Joint Plant Committee)"rates of steel items (SQ /SB) in different Zonal Railways shall be as under :

SL	City	Railway
1.	Delhi	Northern , North Central, North Eastern, North Western
2.	Kolkata	Eastern, East Central, East Coast, Northeast Frontier, South Eastern, Southeast Central
3.	Mumbai	Central, Western, West Central
4.	Chennai	Southern, South Central&South Western

46A.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 17A of the Standard General Conditions of Contract. However, where extension of time has been granted due to Contractor's failure under Clause 17B 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 17A, the price adjustment for the period of extension granted under Clause 17B shall be limited to the amount payable as per the Indices applicable to the last month of the original completion period or the extended period under Clause 17A of the Standard General Conditions of 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 17A, as the case may be; then the lower indices shall be adopted for the price adjustment for the period of extension under Clause 17B of the Standard General Conditions of Contract.

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

48.(1) Certificate of Completion of Works: As soon as in the opinion of the Engineer, the work has been completed and has satisfactorily passed any final test or tests that may be prescribed, the

Engineer shall issue a certificate of completion duly indicating the date of completion in respect of the work and the period of maintenance of the work shall commence from the date of completion mentioned in such certificate. The certificate, inter alia, should mention that the work has been completed in all respects and that all the contractual obligations have been fulfilled by the Contractor and that there is no due from the Contractor to Railways against the contract concerned.

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

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

48(3) Final Supplementary Agreement: After the work is completed or otherwise concluded by the parties with mutual consent, and taken over by the Railway as per terms and conditions of the contract agreement, and there is unequivocal no claim on either side under the Contract other than as mentioned in item 4 of Annexure XIV, the parties shall execute the Final Supplementary Agreement as per Annexure XIV.

49. Approval only by Maintenance Certificate: No certificate other than Maintenance Certificate, if applicable, referred to in Clause 50 of the Conditions shall be deemed to constitute approval of any work or other matter in respect of which it is issued or shall be taken as an admission of the due performance of the contract or any part thereof.

50.(1) Maintenance Certificate: The Contract shall not be considered as completed until a Maintenance Certificate, if applicable, shall have been signed by the Engineer stating that the works have been completed and maintained to his satisfaction. The Maintenance Certificate shall be given by the Engineer upon the expiration of the period of maintenance or as soon thereafter as any works ordered during such period pursuant to Sub Clause (2) to Clause 48 of these Conditions shall have been completed to the satisfaction of the Engineer, and full effect shall be given to this Clause notwithstanding the taking possession of or using the works or any part thereof by the Railway.

The Competent Authority to issue above Maintenance Certificate shall normally be the authority who is competent to sign the contract. If this Competent Authority is of the rank lower than JA Grade, then a JA Grade Officer (concerned with the work) should issue the Certificate. The Certificate, inter

alia, should mention that the work has been completed in all respects and that all the contractual obligations have been fulfilled by the Contractor and that there is no due from the Contractor to Railways against the contract concerned

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

50.(3) Unfulfilled Obligations: Notwithstanding the issue of the Maintenance Certificate the Contractor and (subject to Sub-Clause (2) of this Clause) the Railway shall remain liable for the fulfillment of any obligation incurred under the provision of the contract prior to the issue of the Maintenance Certificate which remains unperformed at the time such Certificate is issued and for the purposes of determining the nature and extent of any such obligations, the contract shall be deemed to remain in force between the parties thereto.

51.(1)Final Payment: On the Engineer's certificate of completion in respect of the works, adjustment shall be made and the balance of account based on the Engineer or the Engineer's representative's certified measurements or Engineer's certified "contractor's authorized engineer's measurements" of the total quantity of work executed by the Contractor upto the date of completion and on the rates accepted in Bill(s) of Quantities and for extra works on rates determined under Clause 39 of these Conditions shall be paid to the Contractor subject always to any deduction which may be made under these presents and further subject to the Contractor having signed delivered to the Engineer enclosing either a full account in detail of all claims he may have on the Railway in respect of the works or having delivered No Claim Certificate and the Engineer having after the receipt of such account given a certificate in writing that such claims are not covered under excepted matter i.e. Clauses 7(j), 8, 18, 22(5), 39.1, 39.2, 40A, 43(2), 45(i)(a), 55, 55-A(5), 57, 57A, 61(1), 61(2) and 62(1), 63(iv) and 63.2.11 of the Standard General Conditions of Contract or in any Clause (stated as excepted matter) of the Special Conditions of the Contract, that the whole of the works to be done under the provisions of the Contracts have been completed, that they have been inspected by him since their completion and found to be in good and substantial order, that all properties, works and things, removed, disturbed or injured in consequence of the works have been properly replaced and made good and all expenses and demands incurred by or made upon the Railway for or in the respect of damage or loss by from or in consequence of the works, have been satisfied agreeably and in conformity with the contract.

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

51-A. Production of Vouchers etc. by the Contractor:

(i) For a contract of more than one crore of rupees, the Contractor shall, whenever required, produce or cause to be produced for examination by the Engineer any quotation, invoice, cost

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

(ii) If any portion of the work in a contract of value more than one crore of rupees be carried out by a sub-contractor or any subsidiary or allied firm or company (as per Clause 7 of the Standard General Conditions of Contract), the Engineer shall have power to secure the books of such sub-contract or any subsidiary or allied firm or company, through the Contractor, and such books shall be open to his inspection.

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

52. Withholding and Lien in Respect of Sums Claimed: Whenever any claim or claims for payment of a sum of money arises out of or under the contract against the Contractor, the Railway shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the security, if any, deposited by the Contractor and for the purpose aforesaid, the Railway shall be entitled to withhold the said cash Security Deposit or the Security if any, furnished as the case may be and also have a lien over the same pending finalization or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the Contractor, the Railway shall be entitled to withhold and have a lien to the extent of the such claimed amount or amounts referred to supra, from any sum or sums found payable or which at any time thereafter may become payable to the Contractor under the same contract or any other contract with this or any other Railway or any Department of the Central Government pending finalization or adjudication of any such claim.

It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above, by the Railway will be kept withheld or retained as such by the Railways till the claim arising out of or under the contract is determined by the arbitrator (if the contract governed by the Arbitration Clause) or by the competent court as the case may be and that the Contractor will have no claim for interest or damages whatsoever on any account in respect of such withholding or retention under the lien referred to supra and duly notified as such to the Contractor. For the purpose of this clause, where the Contractor is a partnership firm or a company, the Railway shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable to any partner / company, as the case may be whether in his individual capacity or otherwise.

52-A Lien in Respect of Claims in other Contracts:

(i) Any sum of money due and payable to the Contractor (including the Security Deposit returnable to him) under the contract may be withheld or retained by way of lien by the Railway, against any claim of this or any other Railway or any other Department of the Central

Government in respect of payment of a sum of money arising out of or under any other contract made by the Contractor with this or any other Department of the Central Government.

(ii) However, recovery of claims of Railway in regard to terminated contracts may be made from the Final Bill, Security Deposits and Performance Guarantees of other contract or contracts, executed by the Contractor. The Performance Guarantees submitted by the Contractor against other contracts, if required, may be withheld and encashed. In addition, 10% of each subsequent 'on-account bill' may be withheld, if required, for recovery of Railway's dues against the terminated contract.

(iii) It is an agreed term of the contract that the sum of money so withheld or retained under this Clause by the Railway will be kept withheld or retained as such by the Railway till the claim arising out of or under any other contract is either mutually settled or determined by arbitration, if the other contract is governed by Arbitration Clause or by the competent court as the case may be and Contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this Clause and duly notified as such to the Contractor.

53. Signature on Receipts for Amounts: Every receipt for money which may become payable or for any security which may become transferable to the Contractors under these presents, shall, if signed in the partnership name by anyone of the partners of a Contractor's firm be a good and sufficient discharge to the Railway in respect of the moneys or security purported to be acknowledged thereby and in the event of death of any of the Contractor, partners during the pendency of the contract, it is hereby expressly agreed that every receipt by anyone of the surviving Contractor partners shall if so signed as aforesaid be good and sufficient discharge as aforesaid provided that nothing in this Clause contained shall be deemed to prejudice or effect any claim which the Railway may hereafter have against the legal representative of any Contractor partner so dying for or in respect to any breach of any of the conditions of the contract, provided also that nothing in this clause contained shall be deemed to prejudice or effect the respective rights or obligations of the Contractor partners and of the legal representatives of any deceased Contractor partners interse.

LABOUR

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

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

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

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

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

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

55-A. Provisions of Contract Labour (Regulation and Abolition) Act, 1970:

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

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

55-A.(3) The Contractor shall pay to the labour employed by him directly or through sub-contractors the wages as per provision of the aforesaid Act and the Rules wherever applicable. The

Contractor shall notwithstanding the provisions of the contract to the contrary, cause to be paid the wages to labour, indirectly engaged on the works including any engaged by sub-contractors in connection with the said work, as if the labour had been immediately employed by him.

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

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

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

55-C (i) Contractor is to abide by the provisions of various labour laws in terms of above clause 54, 55, 55-A and 55-B of the Standard General Conditions of Contract. In order to ensure the same, an application has been developed and hosted on website 'www.shramikkalyan.indianrailways.gov.in'. Contractor shall register his firm/company etc. and upload requisite details of labour and their payment in this portal. These details shall be available in public domain. The registration/ updationin 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. Engineer shall approve the contractor's registration in the portal within 7 days of receipt of such request.
(b) Contractor once approved by any Engineer, can create password with login ID (PAN No.) for subsequent use of portal for all Letter of Acceptances (LoAs) issued in his favour.
(c) The contractor once registered on the portal, shall provide details of his Letter of Acceptances (LoAs) / Contract Agreements on shramikkalyan portal within 15 days of issue

of any LoA for approval of concerned Engineer. Engineer shall update (if required) and approve the details of LoA filled by contractor within 7 days of receipt of such request.

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

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

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

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

The tenderers, for carrying out any construction work, shall get themselves registered with the Registering Officer under Section-7 of the Building and Other Construction Workers Act, 1996 and Rules made thereto by the concerned State Govt., and submit Certificate of Registration issued by Registering Officer of the concerned State Govt. (Labour Dept.). The Cess shall be deducted from contractor's bills as per provisions of the Act.

56. Reporting of Accidents: The Contractor shall be responsible for the safety of all employees directly or through petty Contractors or sub-contractor employed by him on the works and shall report serious accidents to any of them however and wherever occurring on the works to the Engineer or the Engineers Representative and shall make every arrangement to render all possible assistance.

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

57-A. Provision of Mines Act: The Contractor shall observe and perform all the provisions of the Mines Act, 1952 or any statutory modifications or re-enactment thereof for the time being in force

and any rules and regulations made thereunder in respect of all the persons directly or through the petty Contractors or sub-contractors employed by him under this contract and shall indemnify the Railway from and against any claims under the Mines Act, or the rules and regulations framed thereunder, by or on behalf of any persons employed by him or otherwise.

58. Railway not to Provide Quarters for Contractors: No quarters shall normally be provided by the Railway for the accommodation of the Contractor or any of his staff employed on the work. In exceptional cases where accommodation is provided to the Contractor at the Railway's discretion, recoveries shall be made at such rates as may be fixed by the Railway for the full rent of the buildings and equipments therein as well as charges for electric current, water supply and conservancy.

59.(1) Labour Camps: The Contractor shall at his own expense make adequate arrangements for the housing, supply of drinking water and provision of latrines and urinals for his staff and workmen, directly or through the petty Contractors or sub-contractors and for temporary creche (Bal-Mandir) where 50 or more women are employed at a time. Suitable sites on Railway land, if available, may be allotted to the Contractor for the erection of labour camps, either free of charge or on such terms and conditions that may be prescribed by the Railway. All camp sites shall be maintained in clean and sanitary conditions by the Contractor at his own cost.

59.(2) Compliance to Rules for Employment of Labour: The Contractor(s) shall conform 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 petty contractors or sub-contractors on the works.

59.(3) Preservation of Peace: The Contractor shall take requisite precautions and use his best endeavours to

(i) Prevent any riotous or unlawful behaviour by or amongst his workmen and other employed directly or through the petty Contractors or sub-contractors on the works and for the preservation of peace and protection of the inhabitants and

(ii) Security of property in the neighbourhood of the works. In the event of the Railway requiring the maintenance of a Special Police Force at or in the vicinity of the site during the tenure of works, the expenses thereof shall be borne by the Contractor and if paid by the Railway shall be recoverable from the Contractor.

59.(4) Sanitary Arrangements: The Contractor shall obey all sanitary rules and carry out all sanitary measures that may from time to time be prescribed by the Railway Medical Authority and permit inspection of all sanitary arrangements at all times by the Engineer, the Engineer's Representative or the Medical Staff of the Railway. Should the Contractor fail to make the adequate sanitary arrangements, these will be provided by the Railway and the cost thereof recovered from the Contractor.

59.(5) Outbreak of Infectious Disease: The Contractor shall remove from his camp such labour and their families as refuse protective inoculation and vaccination when called upon to do so by the Engineer or the Engineer's Representative on the advice of the Railway Medical Authority. Should cholera, plague, or other infectious disease break out, the Contractor shall burn the huts, beddings,

clothes and other belongings of or used by the infected parties and promptly erect new huts on healthy sites as required by the Engineer, failing which within the time specified in the Engineer's requisition, the work may be done by the Railway and the cost thereof recovered from the Contractor.

59.(6) Treatment of Contractor's Staff in Railway Hospitals: The Contractor and his staff, other than labourers and their families requiring medical aid from the railway hospital and dispensaries will be treated as private patients and charged accordingly. The Contractors' labourers and their Families will be granted free treatment in railway hospitals and dispensaries where no other hospitals or dispensaries are available provided the Contractor pays the cost of medicines, dressing and diet money according to the normal scale and additional charges for special examinations such as pathological and bacteriological examination, X-Ray, etc. and for surgical operation.

59. (7) Medical Facilities at Site: The Contractor shall provide medical facilities at the site as may be prescribed by the Engineer on the advice of the Railway Medical Authority in relation to the strength of the Contractor's resident staff and workmen.

59. (8) Use of Intoxicants: The sale of ardent spirits or other intoxicating beverages upon the work or in any of the buildings, encampments or tenements owned, occupied by or within the control of the Contractor or any of his employees shall be forbidden and the Contractor shall exercise his influence and authority to the utmost extent to secure strict compliance with this condition.

59.(9) Restrictions on the Employment of Retired Engineers of Railway Services Within One Year of their Retirement: The Contractor shall not, if he is a retired Government Engineer of Gazetted rank, himself engage in or employ or associate a retired Government Engineer of Gazetted rank, who has not completed one year from the date of retirement, in connection with this contract in any manner whatsoever without obtaining prior permission of the President and if the Contractor is found to have contravened this provision it will constitute a breach of contract and administration will be entitled to terminate the contract and forfeit his Performance Guarantee as well as Security Deposit.

60.(1) Non-Employment of Labourers below the age of 15: The Contractor shall not employ children below the age of 15 as labourers directly or through petty Contractors or sub-contractors for the execution of work.

60.(2) Medical Certificate of Fitness for Labour: It is agreed that the Contractor shall not employ a person above 15 and below 19 years of age for the purpose of execution of work under the contract unless a medical certificate of fitness in the prescribed form (Proforma at Annexure-VIII) granted to him by a certifying surgeon certifying that he is fit to work as an adult, is obtained and kept in the custody of the Contractor or a person nominated by him in this behalf and the person carries with him, while at work; a token giving a reference to such certificate. It is further agreed that the responsibility for having the adolescent examined medically at the time of appointment or periodically till he attains the age of 19 years shall devolve entirely on the Contractor and all the expenses to be incurred on this account shall be borne by him and no fee shall be charged from the adolescent or his parent for such medical examination.

60.(3) Period of Validity of Medical Fitness Certificate: A certificate of fitness granted or renewed for the above said purposes shall be valid only for a period of one year at a time. The

certifying surgeon shall revoke a certificate granted or renewed if in his opinion the holder of it, is no longer fit for work in the capacity stated therein. Where a certifying surgeon refuses to grant or renew a certificate or revoke a certificate, he shall, if so required by the person concerned, state his reasons in writing for doing so.

60.(4) Medical Re-Examination of Labourer: Where any official appointed in this behalf by the Ministry of Labour is of the opinion that any person employed in connection with the execution of any work under this contract in the age group 15 to 19 years is without a certificate of fitness or is having a certificate of fitness but no longer fit to work in the capacity stated in the certificate, he may serve on the Contractor, or on the person nominated by him in this regard, a notice requiring that such persons shall be examined by a certifying surgeon and such person shall not if the concerned official so directs, be employed or permitted to do any work under this contract unless he has been medically examined and certified that he is fit to work in the capacity stated in the certificate.

EXPLANATIONS:

(1) Only Qualified Medical Practitioners can be appointed as "Certifying Surgeons" and the term "Qualified Medical Practitioners" means a person holding a qualification granted by an authority specified in the Schedule to the Indian Medical Degrees Act, 1916 (VII to 1916) or in the Schedule to the Indian Medical Council Act, 1933 (XXVII) of 1933.

(2) The Certifying surgeon may be a medical officer in the service of State or Municipal Corporation.

DETERMINATION OF CONTRACT

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

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

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

62.(1) Determination of Contract owing to Default of Contractor:

If the Contractor should:

(i) Becomes bankrupt or insolvent, or

(ii) Make an arrangement for assignment in favour of his creditors, or agree to carry out the contract under a Committee of Inspection of his creditors, or

(iii) Being a Company or Corporation, go into liquidation (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), or

(iv) Have an execution levied on his goods or property on the works, or

(v) Assign the contract or any part thereof otherwise than as provided in Clause 7 of these Conditions, or

(vi) Abandon the contract, or

(vii) Persistently disregard the instructions of the Engineer, or contravene any provision of the contract, or

(viii) Fail to adhere to the agreed programme of work by a margin of 10% of the stipulated period, or

(ix) Fail to Execute the contract documents in terms of Para 8 of the Instructions to Tenderers.

(x) Fail to submit the documents pertaining to identity of JV and PAN in terms of Para 17.11 of Tender Form (Second Sheet) of Annexure I available in the Instructions to Tenderers.

(xi) Fail to remove materials from the site or to pull down and replace work after receiving from the Engineer notice to the effect that the said materials or works have been condemned or rejected under Clause 25 and 27 of these Conditions, or

(xii) Fail to take steps to employ competent or additional staff and labour as required under Clause 26 of these Conditions, or

(xiii) Fail to afford the Engineer or Engineer's representative proper facilities for inspecting the works or any part thereof as required under Clause 28 of these Conditions, or

(xiv) Promise, offer or give any bribe, commission, gift or advantage either himself or through his partner, agent or servant to any officer or employee of the Railway or to any person on his or on their behalf in relation to the execution of this or any other contract with this Railway.

(xv) Fail to adhere to the provisions of Para 16 of Tender Form (Second Sheet) of Annexure I of the Instructions to Tenderers, or provision Clause 59(9) of these Conditions.

(xvi)Submits copy of fake documents / certificates in support of credentials, submitted by the tenderer

Then and in any of the **said Clause**, the Engineer on behalf of the Railway may serve the Contractor with a notice (Proforma at Annexure-IX) in writing to that effect and if the Contractor does not within seven days after the delivery to him of such notice proceed to make good his default in so far as the same is capable of being made good and carry on the work or comply with such directions as aforesaid of the entire satisfaction of the Engineer, the Railway shall be entitled after giving 48 hours' notice (Proforma at Annexure-X or XII, as the case may be) in writing under the hand of the Engineer to rescind the contract as a whole or in part or parts (as may be specified in such notice) and after expiry of 48 hours' notice, a final termination notice (Proforma at Annexure-XI or XIII, as the case may be) should be issued.

Note: Engineer at his discretion may resort to the part termination of contract with notices (Proforma at Annexure- IX, XII and XIII), only in cases where progress of work is more than or equal to 80% of the original scope of work.

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

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

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

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

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

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

(ii) The Security Deposit of part terminated contract shall be dealt as per clause 16(2) of these Conditions.

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

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

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

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

(e) The Engineer shall as soon as may be practicable after removal of the Contractor fix and determine ex-parte or by or after reference to the parties or after such investigation or enquiries as he may consider fit to make or institute and shall certify what amount (if any) had at the time of rescission of the contract been reasonably earned by or would reasonably accrue to the Contractor in respect of the work then actually done by him under the contract and what was the value of any unused, or partially used materials, any constructional plant and any temporary works upon the site. The legitimate amount due to the Contractor after making necessary deductions and certified by the Engineer should be released expeditiously.

SETTLEMENT OF DISPUTES – INDIAN RAILWAY ARBITRATION AND CONCILIATION RULES

63. Conciliation of Disputes:

(i) This clause is applicable in the tender having advertised value less than or equal to Rs 50 Crore.

(ii) All disputes and differences of any kind whatsoever arising out of or in connection with the contract, whether during the progress of the work or after its completion and whether before or after the determination of the contract, shall be referred by the Contractor to the "Chief Engineer" or "Divisional Railway Manager" through “Notice of Dispute” provided that no such notice shall be served later than 30 days after the date of issue of Completion Certificate by the Engineer. Chief Engineer or Divisional Railway Manager shall, within 30 days after receipt of the Contractor’s “Notice of Dispute”, notify the name of conciliator(s) to the Contractor.

(iii) The Conciliator(s) shall assist the parties to reach an amicable settlement in an independent and impartial manner within the terms of contract.

(iv) If the parties reach agreement on a settlement of the dispute, they shall draw up and sign a written settlement agreement duly signed by Engineer In-charge, Contractor and conciliator(s). When the parties sign the settlement agreement, it shall be final and binding on the parties.

(v) The parties shall not initiate, during the conciliation proceedings, any arbitral or judicial proceedings in respect of a dispute that is the subject matter of the conciliation proceedings.

(vi) The conciliation proceedings shall be terminated as per Section 76 of ‘The Arbitration and Conciliation Act, 1996.

63.1 Matters Finally Determined by the Railway: All disputes and differences of any kind whatsoever arising out of or in connection with the contract, whether during the progress of the work or after its completion and whether before or after the determination of the contract, shall be referred by the Contractor to the GM and the GM shall, within 120 days after receipt of the Contractor’s representation, make and notify decisions on all matters referred to by the Contractor in writing provided that matters for which provision has been made in Clauses 7(j), 8, 18, 22(5),39.1, 39.2, 40A,43(2), 45(i)(a), 55, 55-A(5), 57, 57A,61(1), 61(2),62(1), 63(iv) and 63.2.11of the Standard General Conditions of Contract or in any Clause (stated as excepted matter) of the Special Conditions of the Contract, shall be deemed as ‘excepted matters’ (matters not arbitrable)and

decisions of the Railway authority, thereon shall be final and binding on the Contractor; provided further that 'excepted matters' shall stand specifically excluded from the purview of the Dispute Adjudication Board (DAB) and Arbitration.

63.2 Dispute Adjudication Board (DAB): This clause is applicable in the tender having advertised value more than Rs 50 Crore.

63.2.1 Any dispute/s if not settled with the Engineer, shall be referred to DAB.

The DAB shall consist of a panel of three Retired Railway Officers, retired not below senior administrative grade (SAG). The DAB shall be formed within 90 days of signing of Contract Agreement. For this purpose, a panel of DAB members shall be maintained in the General Manager's office. The complete panel, which shall not be less than five members, shall be sent by Chief Engineer to the Contractor to nominate one member of the DAB from the panel as Contractor's nominee within two weeks of receipt of the panel. On receipt of Contractor's nominee, the Chief Engineer shall nominate one member from the same panel as Railway nominee for the DAB. Both above nominees shall jointly select presiding member of the DAB from the same panel.

63.2.2 The appointment of DAB shall be effectuated by way of a tri-partite agreement among the Railway, Contractor and the respective DAB members. The terms of the remuneration of each member shall be as fixed by Ministry of Railways from time to time. Each party shall be responsible for paying one-half of this remuneration.

63.2.3 If one or more of the members appointed refuses to act as DAB member, or is unable or unwilling to perform his functions as DAB member for any reason whatsoever or dies or in the opinion of the Chief Engineer fails to act without undue delay, the parties shall terminate the mandate of such DAB member and thereupon new DAB member shall be appointed in the same manner, as the outgoing DAB member had been appointed.

63.2.4 The appointment of any member may be terminated by mutual agreement of both Parties, but not by the Railway or the Contractor acting alone. Unless otherwise agreed by both the Parties, the appointment of the DAB (including each member) shall expire upon expiry of this Contract Agreement.

63.2.5 Before start of DAB proceedings, each DAB member shall give the following certificate to the Railway and the Contractor:

"I have no any past or present relationship in relation to the subject matter in dispute, whether financial, business, professional or other kind. Further, I have no any past or present relationship with or interest in any of the parties whether financial, business, professional or other kind, which is likely to give rise to justifiable doubts as to my independence or impartiality."

63.2.6 DAB proceedings shall be conducted as decided by the DAB. The DAB shall give its decision within 90 days of a Dispute referred to it by any of the Parties, duly recording the reasons before arriving at the decision. The DAB shall decide the issue within terms and conditions of the contract. This time limit shall be extendable subject to the Parties mutual agreement.

63.2.7 The DAB decision shall not be binding on both the Parties. In case any party is not satisfied by the decision of DAB, then the aggrieved party may approach Arbitral Tribunal for arbitration proceedings.

63.2.8 No dispute shall be referred to Arbitral Tribunal unless the same has been referred to DAB for adjudication. However, in case DAB is not formed due to any reason, the disputes can be directly referred to Arbitral Tribunal to adjudicate the dispute.

63.2.9 In the specific cases of any misconduct by any of the members of the DAB, the parties shall have the right to specifically bring it to the notice of the DAB such conduct, through a statement filed with necessary documents in proof of such misconduct and the DAB, after taking NOTICE of such conduct initiate the replacement of the member concerned, in the same manner the member to be replaced was appointed.

63.2.10 Once the decision is given by DAB, DAB cannot review the decision at its own or on the request of one party, unless both parties agree for review of decision by DAB.

63.2.11 In case DAB decision is not challenged by either party within 180 days of receipt of decision of DAB, the decision shall be considered as final and parties would be barred for referring the same to Arbitral Tribunal for adjudication.

63.2.12 The obligation of the Railway and the Contactor shall not be altered by reasons of issue being or under reference to DAB.

63.2.13 The DAB shall conduct the proceedings at any convenient venue which shall be decided by DAB in consultations with parties.

63.2.14 It is a term of this contract that the Parties shall not approach any Court of Law for settlement of such disputes or differences unless an attempt has first been made by the parties to settle such disputes or differences through DAB and Arbitral Tribunal.

64.(1) : Demand for Arbitration:

64.(1)(i): In the event of any dispute or difference between the parties hereto as to the construction or operation of this contract, or the respective rights and liabilities of the parties on any matter in question, dispute or difference on any account or as to the withholding by the Railway of any certificate to which the Contractor may claim to be entitled to, or if the Railway fails to make a decision within 120 days, then and in any such case, but except in any of the "excepted matters" referred to in Clause 63.1 of these Conditions, the Contractor, after 120 days but within 180 days of his presenting his final claim on disputed matters shall demand in writing that the dispute or difference be referred to arbitration.

64.(1)(ii)(a): The demand for arbitration shall specify the matters which are in question, or subject of the dispute or difference as also the amount of claim item-wise. Only such dispute or difference, in respect of which the demand has been made, together with counter claims or set off, given by the Railway**,** shall be referred to arbitration and other matters shall not be included in the reference.

64.(1)(ii)(b): The parties may waive off the applicability of Sub-Section 12(5) of Arbitration and Conciliation (Amendment) Act 2015, if they agree for such waiver in writing, after dispute having arisen between them, in the format given under Annexure XV of these conditions.

64.(1)(iii)(a): The Arbitration proceedings shall be assumed to have commenced from the day, a written and valid demand for arbitration is received by the Railway.

64.(1)(iii)(b): The claimant shall submit his claims stating the facts supporting the claims alongwith all the relevant documents and the relief or remedy sought against each claim within a period of 30 days from the date of appointment of the Arbitral Tribunal.

64.(1)(iii)(c): The Railway shall submit its defence statement and counter claim(s), if any, within a period of 60 days of receipt of copy of claims from Tribunal, unless otherwise extension has been granted by Tribunal.

64.(1)(iii)(d): Place of Arbitration: The place of arbitration would be within the geographical limits of the Division of the Railway where the cause of action arose or the Headquarters of the concerned Railway or any other place with the written consent of both the parties.

64.(1)(iv): No new claim shall be added during proceedings by either party. However, a party may amend or supplement the original claim or defense thereof during the course of arbitration proceedings subject to acceptance by Tribunal having due regard to the delay in making it.

64.(1)(v): 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 Railways that the final bill is ready for payment, he/they will be deemed to have waived his/their claim(s) and the Railway shall be discharged and released of all liabilities under the contract in respect of these claims.

64.(2): Obligation During Pendency of Arbitration: Work under the contract shall, unless otherwise directed by the Engineer, continue during the arbitration proceedings, and no payment due or payable by the Railway shall be withheld on account of such proceedings, provided, however, it shall be open for Arbitral Tribunal to consider and decide whether or not such work should continue during arbitration proceedings.

64.(3) : Appointment of Arbitrator:

64.(3)(a) : Appointment of Arbitrator where applicability of section 12 (5) of Arbitration and Conciliation Act has been waived off:

64.(3)(a)(i): In cases where the total value of all claims in question added together does not exceed ₹ 1,00,00,000/- (Rupees One Crore), the Arbitral Tribunal shall consist of a Sole Arbitrator who shall be a Gazetted Officer of Railway not below Junior Administrative Grade, nominated by the General Manager. The sole arbitrator shall be appointed within 60 days from the day when a written and valid demand for arbitration is received by General Manager.

64.(3)(a)(ii): In cases not covered by the Clause 64(3)(a)(i), the Arbitral Tribunal shall consist of a panel of three Gazetted Railway Officers not below Junior Administrative Grade or 2 Railway Gazetted Officers not below Junior Administrative Grade and a retired Railway Officer, retired not below the rank of Senior Administrative Grade Officer**,** as the arbitrators. For this purpose, the

Railway will send a panel of at least four (4) names of Gazetted Railway Officers of one or more departments of the Railway which may also include the name(s) of retired Railway Officer(s) empanelled to work as Railway Arbitrator to the Contractor within 60 days from the day when a written and valid demand for arbitration is received by the General Manager.

Contractor will be asked to suggest to General Manager at least 2 names out of the panel for appointment as Contractor's nominee within 30 days from the date of dispatch of the request by Railway. The General Manager shall appoint at least one out of them as the Contractor's nominee and will, also simultaneously appoint the balance number of arbitrators either from the panel or from outside the panel, duly indicating the 'presiding arbitrator' from amongst the 3 arbitrators so appointed. General Manager shall complete this exercise of appointing the Arbitral Tribunal within 30 days from the receipt of the names of Contractor's nominees. While nominating the arbitrators, it will be necessary to ensure that one of them is from the Accounts Department. An officer of Selection Grade of the Accounts Department shall be considered of equal status to the officers in Senior Administrative Grade of other departments of the Railway for the purpose of appointment of arbitrator.

64.3.(a).iii: The serving railway officer working in arbitral tribunal in the ongoing arbitration cases as per clause 64.(3)(a)(i) and clause 64.(3)(a)(ii) above, can continue as arbitrator in the tribunal even after his retirement.

64.(3)(b): Appointment of Arbitrator where applicability of Section 12 (5) of Arbitration and Conciliation Act has not been waived off:

(i) In cases where the total value of all claims in question added together does not exceed ₹ 50,00,000/- (Rupees Fifty Lakh), the Arbitral Tribunal shall consist of a Retired Railway Officer, retired not below the rank of Senior Administrative Grade Officer, as the arbitrator. For this purpose, the Railway will send a panel of at least four (4) names of retired Railway Officer(s) empanelled to work as Railway Arbitrator duly indicating their retirement dates to the Contractor within 60 days from the day when a written and valid demand for arbitration is received by the General Manager.

Contractor will be asked to suggest to General Manager at least 2 names out of the panel for appointment as arbitrator within 30 days from the date of dispatch of the request by Railway. The General Manager shall appoint at least one out of them as the arbitrator within 30 days from the receipt of the names of Contractor's nominees.

(ii) In cases where the total value of all claims in question added together exceed ₹ 50,00,000/- (Rupees Fifty Lakh), the Arbitral Tribunal shall consist of a Panel of three (3) retired Railway Officer, retired not below the rank of Senior Administrative Grade Officer**,** as the arbitrators. For this purpose, the Railway will send a panel of at least four (4) names of retired Railway Officer(s) empanelled to work as Railway Arbitrator duly indicating their retirement date to the Contractor within 60 days from the day when a written and valid demand for arbitration is received by the General Manager.

Contractor will be asked to suggest to General Manager at least 2 names out of the panel for appointment as Contractor's nominee within 30 days from the date of dispatch of the request by Railway. The General Manager shall appoint at least one out of them as the Contractor's nominee and will, also simultaneously appoint the balance number of arbitrators either from the panel or from

outside the panel, duly indicating the 'Presiding Arbitrator' from amongst the 3 arbitrators so appointed. General Manager shall complete this exercise of appointing the Arbitral Tribunal within 30 days from the receipt of the names of Contractor's nominees. While nominating the arbitrators, it will be necessary to ensure that one of them has served in the Accounts Department.

64.(3)(c)(i): 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 General Manager fails to act without undue delay, the General Manager shall appoint new arbitrator/arbitrators to act in his/their place in the same manner in which the earlier arbitrator/arbitrators had been appointed. 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).

64.(3) (c) (ii): (a) The Arbitral Tribunal shall have power to call for such evidence by way of affidavits or otherwise as the Arbitral Tribunal shall think proper, and it shall be the duty of the parties hereto to do or cause to be done all such things as may be necessary to enable the Arbitral Tribunal to make the award without any delay. The proceedings shall normally be conducted on the basis of documents and written statements.

(b) Before proceeding into the merits of any dispute, the Arbitral Tribunal shall first decide and pass its orders over any plea submitted/objections raised by any party, if any, regarding appointment of Arbitral Tribunal, validity of arbitration agreement, jurisdiction and scope of the Tribunal to deal with the dispute (s) submitted to arbitration, applicability of time 'limitation' to any dispute, any violation of agreed procedure regarding conduct of the arbitral proceedings or plea for interim measures of protection and record its orders in day to day proceedings. A copy of the proceedings duly signed by all the members of tribunal should be provided to both the parties.

64.3(c)(iii): (i) Qualification of Arbitrator (s):

(a) Serving Gazetted Railway Officers of not below JA Grade level.

(b) Retired Railway Officers not below SA Grade level, one year after his date of retirement.

(c) Age of arbitrator at the time of appointment shall be below 70 years.

(ii) An arbitrator may be appointed notwithstanding the total number of arbitration cases in which he has been appointed in the past.

(iii)While appointing arbitrator(s) under Sub-Clause 64.(3)(a)(i), 64.(3)(a)(ii), 64.(3)(b)(i) & 64.(3)(b)(ii) above, due care shall be taken that he/they is/are not the one/those who had an opportunity to deal with the matters to which the contract relates or who in the course of his/their duties as Railway servant(s) expressed views on all or any of the matters under dispute or differences. A certification to this effect as per annexure- XVI shall be taken from Arbitrators also. The proceedings of the Arbitral tribunal or the award made by such Tribunal will, however, not be invalid merely for the reason that one or more arbitrator had, in the course of his service, opportunity to deal with the matters to which the contract relates or who in the course of his/their duties expressed views on all or any of the matters under dispute.

64.(3)(d)(i): The arbitral award shall state item wise, the sum and reasons upon which it is based. The analysis and reasons shall be detailed enough so that the award could be inferred therefrom.

64.(3)(d)(ii): A party may apply for corrections 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 a specific point of award to Tribunal within 60 days of receipt of the award.

64.(3)(d)(iii): 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.

64.(4): In case of the Tribunal, comprising of three members, 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.

64.(5): 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.

64. (6): The cost of arbitration shall be borne by the respective parties. The cost shall inter-alia include fee of the arbitrator(s), as per the rates fixed by Railway Board from time to time and the fee shall be borne equally by both the parties, provided parties sign an agreement in the format given at Annexure XV to these conditions after/ while referring these disputes to Arbitration. Further, the fee payable to the arbitrator(s) would be governed by the instructions issued on the subject by Railway Board from time to time irrespective of the fact whether the arbitrator(s) is/are appointed by the Railway Administration or by the court of law unless specifically directed by Hon'ble court otherwise on the matter.

64.(7) Subject to the provisions of the aforesaid Arbitration and Conciliation Act 1996 and the rules thereunder and relevant para of the Standard General Conditions of Contract and any statutory modifications thereof shall apply to the appointment of arbitrators and arbitration proceedings under this Clause.

64.(8) In case arbitration award is challenged by a party in the Court of Law, 75% of award amount, pending adjudication by Court of Law, shall be made by party to other party. In case payment is to be made by Railway to Contractor, the terms & conditions as incorporated in the Ministry of Railways letter No. 2016/CE(I)/CT/ARB/3(NITI Aayog)/Pt. dated 08th Mar,2017 as amended from time to time, shall be followed. In case Contractor has to pay to the Railway, then 75% of the award amount shall be deducted by the Railway from the Contractor's bills, Performance Guarantee/ Security Deposit or any other dues of Contractor with the Government of India.

PART-II ANNEXURES

ANNEXURE – VII

Reference Para 17B

Registered Acknowledgement Due

PROFORMA FOR TIME EXTENSION

No. _____ Dated: _____

Sub: (i) _____*(name of work)*.

(ii) Acceptance letter no. _____

(iii) Understanding/Agreement no. _____

Ref: _____ *(Quote specific application of Contractor for extension to the date received)* _____

Dear Sir,

1. The stipulated date for completion of the work mentioned above is _____. From the progress made so far and the present rate of progress, it is unlikely that the work will be completed by the above date (or 'However, the work was not completed on this date').

2. Expecting that you may be able to complete the work if some more time is given, the competent authority, although not bound to do so, hereby extends the time for completion from _____ to _____.

3. Please note that an amount equal to the liquidated damages for delay in the completion of the work after the expiry of _____ *(give here the stipulated date for completion with/without any liquidated damage fixed earlier)* will be recovered from you as mentioned in Clause 17B of the Standard General Conditions of Contract for the extended period, notwithstanding the grant of this extension. You may proceed with the work accordingly.

4. The above extension of the completion date will also be subject to the further condition that no increase in rates on any account will be payable to you.

5. Please intimate within a week of the receipt of this letter your acceptance of the extension of the conditions stated above.

6. Please note that in the event of your declining to accept the extension on the above said conditions or in the event of your failure after accepting or acting upto this extension to complete the work by _____ (*here mention the extended date*), further action will be taken in terms of Clause 62 of the Standard General Conditions of Contract.

Yours faithfully

For and on behalf of the President of India

ANNEXURE – VIIA
(Reference Clause 40(A)
Registered Acknowledgement Due

PROFORMA OF 14 DAYS NOTICE FOR OFFLOADING OF PART OF CONTRACT WORK

_____ RAILWAY

(Without Prejudice)

To

M/s _____

_____

Dear Sir,

Contract Agreement No. _____

In connection with _____

In spite of repeated instructions to you by the subordinate offices as well as by this office through various letters of even no. _____, dated _____; you have failed to show adequate progress of work so as to complete the contract within the original / extended date of completion of contract and part(s) of contract work are yet to be started/ still lagging behind the agreed program of work, listed as under:

(Details of part(s) of work which is delayed and can be executed independently, to be mentioned).

2. Your attention is invited to this office/Chief Engineer's office letter no. _____ _____, dated _____ in reference to your representation, dated _____.

3. As you have failed to abide by the instructions issued to commence the work /to show adequate progress of work, you are hereby given 14 days' notice in accordance with Clause 40A of the Standard General Conditions of Contract to deploy adequate resources i.e. *(the details of resource requirement, to be mentioned)* and commence / to make good the progress for part(s) of works detailed above, failing which action as provided in Clause 40A of the Standard General Conditions of Contract shall be commenced after expiry of 14 days' notice period viz. to offload few/ all part(s) of work mentioned above to any of the existing or new contractor without your participation and at your Risk & Cost, not exceeding the value of Performance Guarantee of this contract, which may please be noted.

Kindly acknowledge receipt.

Yours faithfully

For and on behalf of the President of India

ANNEXURE – VIIB

(Reference Clause 40(A)

Registered Acknowledgement Due

NOTICE FOR PART OF CONTRACT WORK OFFLOADED

_____ RAILWAY

(Without Prejudice)

To

M/s _____

_____

Dear Sir,

Contract Agreement No. _____

In connection with _____

1. Fourteen days' notice under Clause 40A of the Standard General Conditions of Contract was given to you under this office letter of even no., dated _____; but you have taken no/inadequate action to deploy adequate resources to commence the part(s) of work/show adequate progress of the part(s) of work, mentioned therein.

As you have failed to abide by the instructions issued to commence the part(s) of work/show adequate progress of the part(s) of work even at the lapse of 14 days' notice period under Clause 40A of the Standard General Conditions of Contract, few part(s) of the work under the contract have been offloaded and being executed by other mode(s) at the cost detailed below:

Or,

1. Please refer your request letter no….. dated ….., wherein it was requested under clause 40 A of the Standard General Conditions of Contract to offload part(s) of works at your risk & cost. The details of part(s) of the work under the contract which have been offloaded and being executed by other mode(s) at the cost detailed below:

(List of Part(s) of work offloaded, Details of mode of execution of such offloaded work alongwith approximate cost thereof to be mentioned)

2. The final measurement of work(s) already executed for above part(s) of work recorded as per clause 45 (A) or/and 45 (B) of the Standard General Conditions of Contract is enclosed herewith.

3. The Bill(s) of Quantities for Part(s) of work offloaded is enclosed herewith.

4. The additional cost in execution of offloaded work through mode(s) mentioned in para (1) above is determined as Rs. _____, over& above the cost of execution under this contract (including the

PVC amount payable as per contract, as on the date of issue of this notice). This additional cost shall be recovered from your next on account bill(s) or any other dues payable to you under contract.

5. The Contract value gets reduced to Rs……..:

6. You are requested to continue with the balance work in the contract subsequent to offloading of above part(s) of work.

Kindly acknowledge receipt.

Yours faithfully

For and on behalf of the President of India

ANNEXURE – VIII

Reference Para 60.(2)

CERTIFICATE OF FITNESS

1. (a) Serial Number_____
   (b) Date _____
2. Name of person examined _____
3. Father's Name: son/daughter of _____
   Residing at _____
4. Sex _____
5. Residence:
   _____
6. Physical fitness
7. Identification marks _____
8. Date of birth, if available, and/or certified age _____
   I certify that I have personally examined (name) _____who is desirous of being employed in a factory or on a work requiring manual labour and that his/her age as nearly as can be ascertained from my examination, is _____ years.

   I certify that he/she is fit for employment in a factory or on a work requiring manual labour as an adult/child.

9. Reasons for :
   (a) Refusal to grant certificate, or _____
   (b) Revoking the certificate _____

Signature or left hand

Thumb impression of the person examined.

Signature of Certifying Surgeon

Note: In case of physical disability, the exact details and cause of the physical disability should be clearly stated.

ANNEXURE – IX

(Reference Clause 62. (1)

Registered Acknowledgement Due

PROFORMA OF 7 DAYS NOTICE FOR WORKS AS A WHOLE/ IN PARTS

(DETAILS OF PART OF WORK TO BE MENTIONED)

_____ RAILWAY

(Without Prejudice)

To

M/s _____

_____

Dear Sir,

Contract Agreement No. _____

In connection with _____

In spite of repeated instructions to you by the subordinate offices as well as by this office through various letters of even no. _____, dated _____; you have failed to start work/show adequate progress and/or submit detailed programme for completing the work/ part of work (details of part of work to be mentioned).

2. Your attention is invited to this office/Chief Engineer's office letter no. _____ _____, dated _____ in reference to your representation, dated _____.

3. As you have failed to abide by the instructions issued to commence the work /to show adequate progress of work you are hereby given 7 days' notice in accordance with Clause 62 of the Standard General Conditions of Contract to commence works / to make good the progress, failing which further action as provided in Clause 62 of the Standard General Conditions of Contract viz. to terminate your Contract and complete the balance work without your participation will be taken.

Kindly acknowledge receipt.

Yours faithfully

For and on behalf of the President of India

ANNEXURE – X

Reference Para 62(1)

Registered Acknowledgement Due

PROFORMA OF 48 HRS. NOTICE FOR WHOLE WORK

_____ RAILWAY

(Without Prejudice)

To

M/s _____

_____

Dear Sir,

Contract Agreement No. _____

In connection with _____

Seven days' notice under Clause 62 of the Standard General Conditions of Contract was given to you under this office letter of even no., dated _____; but you have taken no action to commence the work/show adequate progress of the work.

2. You are hereby given 48 hours' notice in terms of Clause 62 of the Standard General Conditions of Contract to commence works / to make good the progress of works, failing which and on expiry of this period your above contract will be rescinded and the work under this contract will be carried out independently without your participation and your Security Deposit shall be forfeited and Performance Guarantee shall also be encashed and any other consequences which may please be noted.

Kindly acknowledge receipt.

Yours faithfully

For and on behalf of the President of India

ANNEXURE – XI

Reference Para 62.(1)

Registered Acknowledgement Due

PROFORMA OF TERMINATION NOTICE

_____ RAILWAY

(Without Prejudice)

No. _____ Dated _____

To

M/s _____

_____

Dear Sir,

Contract Agreement No. _____

In connection with _____

Forty eight hours (48 hrs.) notice was given to you under this office letter of even no., dated _____; but you have taken no action to commence the work/show adequate progress of the work.

Since the period of 48 hours' notice has already expired, the above contract stands rescinded in terms of Clause 62 of the Standard General Conditions of Contract and the balance work under this contract will be carried out independently without your participation. Your participation as well as participation of every member/partner in any manner as an individual or a partnership firm/JV is hereby debarred from participation in the tender for executing the balance work and your Security Deposit shall be forfeited and Performance Guarantee shall also be encashed.

Kindly acknowledge receipt.

Yours faithfully

For and on behalf of the President of India

ANNEXURE – XII

Reference Para 62.(1)

Registered Acknowledgement Due

PROFORMA OF 48 HRS. NOTICE FOR PART OF THE WORK…….

(DETAILS OF PART OF WORK TO BE MENTIONED)

_____ RAILWAY

(Without Prejudice)

To

M/s _____

_____

Dear Sir,

Contract Agreement No. _____

In connection with _____

1. Seven days' notice under Clause 62 of the Standard General Conditions of Contract was given to you under this office letter of even no., dated _____; but you have taken no action to commence the work/show adequate progress of the part of work……..(details of part to be mentioned).

2. You are hereby given 48 hours' notice in terms of Clause 62 of the Standard General Conditions of Contract to commence works / to make good the progress of works, failing which and on expiry of this period your above part of work……(Details of part to be mentioned) in contract will be rescinded and the work will be carried out independently without your participation.

3. Your full Performance Guarantee for the contract shall be forfeited and you shall not be issued any completion certificate for the contract. However, no additional Performance Guarantee shall be required for balance of work being executed through the part terminated contract.

4. The contract value of part terminated contract shall stands reduced to ……..

Kindly acknowledge receipt.

Yours faithfully

For and on behalf of the President of India

ANNEXURE – XIII

Reference Para 62.(1)

Registered Acknowledgement Due

PROFORMA OF TERMINATION NOTICE FOR PART OF THE WORK…….
(DETAILS OF PART OF WORK TO BE MENTIONED)

_____ RAILWAY

(Without Prejudice)

No. _____ Dated _____

To

M/s _____

_____

Dear Sir,

Contract Agreement No. _____

In connection with _____

1. Forty eight hours (48 hrs.) notice was given to you under this office letter of even no., dated _____; but you have taken no action to commence the work/show adequate progress of the part of work……..(details of part to be mentioned).

2. Your above part of work in contract …….(details of part to be mentioned) stands rescinded in terms of Clause 62 of the Standard General Conditions of Contract and the same will be carried out independently without your participation. Your participation as well as participation of every member/partner in any manner as an individual or a partnership firm/JV is hereby debarred from participation in the tender for executing the balance work

3. Your full Performance Guarantee for the contract shall be forfeited and you shall not be issued any completion certificate for the contract. However, no additional Performance Guarantee shall be required for balance of work being executed through the part terminated contract.

4. The contract value of part terminated contract stands reduced to ……..

Kindly acknowledge receipt.

Yours faithfully

For and on behalf of the President of India

ANNEXURE – XIV

Reference Para 48.(3)

FINAL SUPPLEMENTARY AGREEMENT

1. Articles of agreement made this day _____ in the year _____ between the President of India, acting through the _____ Railway Administration having his office at _____ herein after called the Railway of the one part and _____ of the second part.

2. Whereas the party hereto of the second part executed an agreement with the party hereto of the first part being agreement Number _____dated ____for the performance _____herein after called the 'Principal Agreement'.

3. And whereas it was agreed by and between the parties hereto that the works would be completed by the party hereto of the second part on _____date last extended and whereas the party hereto of the second part has executed the work to the entire satisfaction of the party hereto of the first part.

4. And whereas the party hereto of the first part already made payment to the party hereto of the second part diverse sums from time to time aggregating to ₹ _____ including the Final Bill bearing voucher No._____ dated_____of value _____ duly adjusted as per price variation clause, if applicable (the receipt of which is hereby acknowledged by the party hereto of the second part in full and final settlement of all his /its claims under the principal agreement.

   And whereas the party hereto of the second part have received sum of ₹ _____ through the Final Bill bearing voucher No._____ dated _____duly adjusted as per price variation clause (PVC), if applicable (the receipt of which is hereby acknowledged by the party thereto of the second part) from the party hereto of the first part in full and final settlement of all his/its disputed claims under principal agreement.

   Now, it is hereby agreed by and between the parties in the consideration of sums already paid by the party hereto of the first part to the party hereto of the second part against all outstanding dues and claims for all works done under the aforesaid principal agreement excluding the Security Deposit, the party hereto of the second part have no further dues of claims against the party hereto of the first part under the said Principal Agreement. It is further agreed by and between the parties that the party hereto of the second part has accepted the said sums mentioned above in full and final satisfaction of all its dues and claims under the said Principal Agreement.

   (Applicable in case Final Supplementary Agreement is signed after release of Final Payment)

   Or

   And whereas the party hereto of the first part already made payment to the party hereto of the second part diverse sums from time to time aggregating to ₹ _____ through various On Account Bills (the receipt of which is hereby acknowledged by the party hereto of the second part).

   And whereas the party hereto of the second part have received sum of ₹ _____ through various On Account Bills (the receipt of which is hereby acknowledged by the party thereto of the second part) from the party hereto of the first part and party hereto of the second part have accepted final measurements recorded on Page No….. to Page No…. of Measurement Book No……and corresponding Final Bill duly adjusted as per price variation clause (PVC), if applicable, for full and final settlement of all his/its disputed claims under principal agreement.

Now, it is hereby agreed by and between the parties in the consideration of sums already paid through various On Account Bills and sums to be paid through Final Bill duly adjusted as per price variation clause (PVC), if applicable, based on accepted final measurements including the Security Deposit by the party hereto of the first part to the party hereto of the second part against all outstanding dues and claims for all works done under the aforesaid principal agreement, the party hereto of the second part have no further dues of claims against the party hereto of the first part under the said Principal Agreement.

(Applicable in case Final Supplementary Agreement is signed before release of Final Payment)

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

Signature of the Contractor/s for and on behalf of the President of India

Witnesses

_____

ADDRESS:_____

ANNEXURE-XV

Reference Para 64.3 & 64.6

Agreement towards Waiver under Section 12(5) and Section 31A (5) of Arbitration and Conciliation (Amendment) Act

I/we..... (Name of agency/Contractor) with reference to agreement no..... raise disputes as to the construction and operation of this contract, or the respective rights and liabilities, withholding of certificate and demand arbitration in respect of following claims :

Brief of claim:

(i) Claim 1- Detailed at Annexure-
(ii) Claim 2 –
(iii) Claim 3 –

I/we..... (post of Engineer) with reference to agreement no..... hereby raise disputes as to the construction and operation of this contract, or the respective rights and liabilities, withholding of certificate and demand arbitration in respect of following claims:

I/we.....do/do not agree to waive off applicability of section 12(5) of Arbitration and Conciliation (Amendment) Act.

Signature of Claimant_____ Signature of Respondent _____

Agreement under Section 31(5)

I/we..... (Name of claimant) with reference to agreement no..... hereby waive off the applicability of sub section 31-A (2) to 31-A (4) of the Arbitration and Conciliation (Amendment Act. We further agree that the cost of arbitration will be shared by the parties as per Clause 64(6) of the Standard General Conditions of Contract.

.

Signature of Claimant_____ Signature of Respondent_____

*Strike out whichever not applicable.

ANNEXURE-XVI

Reference Para 64.(3)

Certification by Arbitrators appointed under Clause 63 & 64 of Indian Railways General Conditions of Contract

1. Name:

2. Contact Details:

3. Prior experience (Including Experience with Arbitrations):

4. **I do not have more than ten on-going Arbitration cases with me**.

5. I hereby certify that I have retired from Railways w.e.f. _____ and empanelled as Railway Arbitrator as per 'The Arbitration and Conciliation Act- 1996'.

6. I have no any past or present relationship in relation to the subject matter in dispute, whether financial, business, professional or other kind.

   Or

   I have past or present relationship in relation to the subject matter in dispute, whether financial, business, professional or other kind. The list of such interests is as under:

7. I have no any past or present relationship with or interest in any of the parties whether financial, business, professional or other kind, which is likely to give rise to justifiable doubts as to my independence or impartiality in terms of The Arbitration and Conciliation Act-1996.

   Or

   I have past or present relationship with or interest in any of the parties whether financial, business, professional or other kind, which is likely to give rise to justifiable doubts as to my independence or impartiality in terms of The Arbitration and Conciliation Act-1996. The details of such relationship or interests are as under:

8. There are no concurrent Circumstances which are likely to affect my ability to devote sufficient time to the arbitration and in particular to finish the entire arbitration within twelve months.

   Or

There are Circumstances which are likely to affect my ability to devote sufficient time to the arbitration and in particular to finish the entire arbitration within twelve months. The list of such circumstances is as under:

आज़ादी का अमृत महोत्सव

भारत सरकार Government of India
रेल मंत्रालय Ministry of Railways
(रेलवे बोर्ड Railway Board)

Azadi Ka Amrit Mahotsav

No. 2022/CE-I/CT/GCC-2022/Policy **New Delhi, Dated 14.07.2022**

To,
As per list attached

Sub: Indian Railways Standard General Conditions of Contract, April-2022 (Advance Correction Slip No. 1)

Enclosed herewith please find **Advance Correction Slip No. 1** to Indian Railways Standard General Conditions of Contract, April-2022.

2) This shall be applicable to Works Contract of Indian Railways with prospective effect.

3) This issues with concurrence of the Finance Directorate of the Ministry of Railways.

DA: As above.

14.7.22

(अजीत कुमार झा)
कार्यपालक निदेशक/सिविल इंजी.(जी)/रेलवे बोर्ड
[Phone: 030-44803: Rly: 011-23383379:MTNL]
e-mail address : edceg2022@gmail.com

No. 2022/CE-I/CT/GCC-2022/Policy **New Delhi, Dated 14.07.2022**

Copy forwarded for information to:

(i) The PFAs, All Indian Railways.

(ii) Dy. Comptroller and Auditor General of India (Railways), Room No. 224, Rail Bhawan, New Delhi.

For Member Finance

(Advance Correction Slip No. 1)

A. Para 10.2., Part I of GCC shall be read as under:

10.2. Financial Eligibility Criteria:
The tenderer must have minimum average annual contractual turnover of V/N or 'V' whichever is less; where

V= Advertised value of the tender in crores of Rupees

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

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

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

B. Para 17.15.1, Part I of GCC shall be read as under:

17.15.1 Technical Eligibility Criteria ('a' or 'b' mentioned hereunder):

(a) For Works without composite components

The technical eligibility for the work as per para 10.1 above, shall be satisfied by either the 'JV in its own name & style' or 'Lead member of the JV'.
Each other (non-lead) member(s) of JV, who is/ are not satisfying the technical eligibility for the work as per para 10.1 above, shall have technical capacity of minimum **10%** of the cost of work i.e., each non-lead member of JV member must have satisfactorily completed or substantially completed during the last 07 (seven) years, ending last day of month previous to the one in which tender is invited, one similar single work for a minimum of **10%** of advertised value of the tender.

(b) For works with composite components

The technical eligibility for major component of work as per para 10.1 above, shall be satisfied by either the 'JV in its own name & style' or 'Lead member of the JV' and technical eligibility for other component(s) of work as per para 10.1 above, shall be satisfied by either the 'JV in its own name & style' or 'any member of the JV'.
Each other (non-lead)member(s) of JV, who is/ are not satisfying the technical eligibility for any component of the work as per para 10.1 above, shall have technical capacity of minimum **10%** of the cost of any component of work mentioned in technical eligibility criteria. i.e., each other (non-lead) member of must have satisfactorily completed or substantially completed during the last 07 (seven) years, ending last day of month previous to the one in which tender is invited, one similar single work for a minimum of **10%** of cost of any component of work mentioned in technical eligibility criteria.

Note *for Para 17.15.1:*

a) The *Major component of the work for this purpose shall be the component of work having highest value. In cases where value of two or more component of work is same, any one work can be classified as Major component of work.*

b) Value *of a completed work done by 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 technical eligibility criteria in the tender under consideration.*

14.7.22

e. Annexure-V, Part I of GCC shall be read as under:

ANNEXURE-V

Reference -Para 6.1 of ITT

FORMAT FOR CERTIFICATE TO BE SUBMITTED / UPLOADED BY TENDERER ALONGWITH THE TENDER DOCUMENTS

I.....(*Name and designation*)**appointed as the attorney/authorized signatory of the tenderer (including its constituents),
M/s_____ (hereinafter called the tenderer) for the purpose of the Tender documents for the work of _____ as per the tender No._____ of _____(*Railway*)**, do hereby solemnly affirm and state on the behalf of the tenderer including its constituents as under:

1. I/we the tenderer (s) am/are signing this document after carefully reading the contents.
2. I/We the tenderer(s) also accept all the conditions of the tender and have signed all the pages in confirmation thereof.
3. I/we hereby declare that I/we have downloaded the tender documents from Indian Railway website www.ireps.gov.in . I/we have verified the content of the document from the website and there is no addition, no deletion or no alteration to the content of the tender document. In case of any discrepancy noticed at any stage i.e. evaluation of tenders, execution of work or final payment of the contract, the master copy available with the railway Administration shall be final and binding upon me/us.
4. I/we declare and certify that I/we have not made any misleading or false representation in the forms, statements and attachments in proof of the qualification requirements.
5. **I/We also understand that my/our offer will be evaluated based on the documents/credentials submitted along with the offer and same shall be binding upon me/us.**
6. **I/We declare that the information and documents submitted along with the tender by me/us are correct and I/we are fully responsible for the correctness of the information and documents, submitted by us.**
7. I/we certify that I/we the tenderer(s) is/are not blacklisted or debarred by Railways or any other Ministry / Department of Govt. of India from participation in tender on the date of submission of bids, either in individual capacity or as a HUF/ member of the partnership firm/LLP/JV/Society/Trust.
8. I/we understand that if the contents of the **certificate** submitted by us are found to be forged/false or incorrect at any time during process for evaluation of tenders, it shall lead to forfeiture of the Bid Security besides banning of business for a period of upto five year. Further, I/we (*insert name of the tenderer*) **_____and all my/our constituents understand that my/our offer shall be summarily rejected.
9. I/we also understand that if the contents of the **certificate** submitted by us are found to be false/forged or incorrect at any time after the award of the contract, it will lead to termination of the contract, along with forfeiture of Bid Security/Security Deposit and Performance guarantee besides any other action provided in the contract including banning of business for a period of upto five year.
10. I/We have read the clause regarding restriction on procurement from a bidder of a country which shares a land border with India and certify that I am/We are not from such a country or,
    if from such a country, have been registered with the competent Authority. I/We hereby certify that I/we fulfil all the requirements in this regard and am/are eligible to be considered (evidence of valid registration by the competent authority is enclosed)

SEAL AND SIGNATURE
OF THE TENDERER

Place:
Dated:

**The contents in Italics are only for guidance purpose. Details as appropriate are to be filled in suitably by tenderer.

This certificate is to be given by each member of JV or Partners of Partnership firm/LLP/etc.

14.7.22

D. Annexure-VI, Part I of GCC shall be read as under:

ANNEXURE – VI

Reference -Para 10.3 & 17.15.3 of Tender Form (Second Sheet) of Annexure I of ITT

TENDERER'S CREDENTIALS (BID CAPACITY)

_____ RAILWAY

For tenders having advertised value 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 value of the present tender. The available bid capacity shall be calculated as under:

Available Bid Capacity = [A x N x 2] – 0.33xNxB

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= 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.

Note:

(a) The Tenderer(s) shall furnish the details of -

(i) 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) for calculating A, and

(ii) 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 for calculating B. In case of no works in hand, a 'NIL' statement should be furnished.

The submitted details for (i) and (ii) above should be duly verified by Chartered Accountant.

(b) In case if a bidder is JV, the tenderer(s) must furnish the details of

(i) 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) by each member of JV for calculating A, and

(ii) Existing commitments and balance amount of ongoing works with each member of JV either in individual capacity or as a member of other JV as per the prescribed proforma of Railway for statement of all works in progress and also the works which are awarded to each member of JV either in individual capacity or as a member of other JV but yet not started upto the date of inviting of tender for calculating B. In case of no works in hand, a 'NIL' statement should be furnished.

The submitted details for (i) and (ii) above should be 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 "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.

14.7.22

E. Clause 17 A, Part II of GCC shall be read as under:

17A Extension of Time in Contracts: Subject to any requirement in the contract as to completion of any portion or portions of the works before completion of the whole, the Contractor shall fully and finally complete the whole of the works comprised in the contract (with such modifications as may be directed under conditions of this contract) by the date entered in the contract or extended date in terms of the following clauses:

(i) **Extension due to Modification:** If any modifications have been ordered which in the opinion of the Engineer have materially increased the magnitude of the work, then such extension of the contracted date of completion may be granted as shall appear to the Engineer to be reasonable in the circumstances, provided moreover that the Contractor shall be responsible for requesting such extension of the date as may be considered necessary as soon as the cause thereof shall arise.

(ii) **Extension for Delay not due to Railway or Contractor:** If in the opinion of the Engineer, the progress of work has any time been delayed by any act or neglect of Railway's employees or by other Contractor employed by the Railway under Sub-Clause (4) of Clause 20 of these Conditions or in executing the work not forming part of the contract but on which Contractor's performance necessarily depends or by reason of proceeding taken or threatened by or dispute with adjoining or to neighbouring owners or public authority arising otherwise through the Contractor's own default etc. or by the delay authorized by the Engineer pending arbitration or in consequences of the Contractor not having received in due time necessary instructions from the Railway for which he shall have specially applied in writing to the Engineer or his authorized representative then upon happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer within 15 days of such happening, but shall nevertheless make constantly his best endeavours to bring down or make good the delay and shall do all that may be reasonably required of him to the satisfaction of the Engineer to proceed with the works. The Contractor may also indicate the period for which the work is likely to be delayed and shall be bound to ask for necessary extension of time.

(iii) **Extension for Delay due to Railways:** In the event of any failure or delay by the Railway to hand over the Contractor possession of the lands necessary for the execution of the works or to give the necessary notice to commence the works or to provide the necessary drawings or instructions or any other delay caused by the Railway due to any other cause whatsoever, then such failure or delay shall in no way affect or vitiate the contract or alter the character thereof or entitle the Contractor to damages or compensation therefor, but in any such case, the Railway may grant such extension or extensions of the completion date as may be considered reasonable.

The Contractor shall indicate the period for which the work is likely to be delayed and shall seek extension of time as may be considered necessary under clause 17A(i) or/and 17A(ii) or/ and 17A(iii) above, as soon as the cause thereof shall arise and, in any case, not less than **15 days** before the expiry of the date fixed for completion of the works. The Engineer shall consider the same and shall grant and communicate such extension of time as in his opinion is reasonable having regard to the nature and period of delay and the type and quantum of work affected thereby. No other compensation shall be payable for works so carried forward to the extended period of time; the same rates, terms and conditions of contract being applicable, as if such extended period of time was originally provided in the original contract itself.

The non-submission of request for extension or submission of request within less than **15 days** before the expiry of the date fixed for completion of the works, shall make him ineligible for extension under these sub clauses, subject to final decision of Engineer.

14.7.22

F. Clause 17B, Part II of GCC shall be read as under:

17B Extension of Time with Liquidated Damages (LD) for delay due to Contractor: The time for the execution of the work or part of the works specified in the contract documents shall be deemed to be the essence of the contract and the works must be completed not later than the date(s) as specified in the contract. If the Contractor fails to complete the works within the time as specified in the contract for the reasons other than the reasons specified in Clause 17 and 17A, the Railway may, if satisfied that the works can be completed by the Contractor within reasonable short time thereafter, allow the Contractor for further extension of time (Proforma at Annexure-VII) as the Engineer may decide. On such extension the Railway will be entitled without prejudice to any other right and remedy available on that behalf, to recover from the Contractor as agreed damages and not by way of penalty for each week or part of the week, a sum calculated at the ***rate of Liquidated Damages as decided by Engineer, between 0.05% to 0.30 % of contract value of the works for each week or part of the week.***

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

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

NOTE:

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

14.7.22

G. Clause 19 (3), Part II of GCC shall be read as under:

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

In Contracts for works of New Line/Gauge Conversion/Doubling/Railway Electrification, finalized through Tenders having advertised value more than **Rs.100 crores**, the Contractor shall submit a detailed time programme to the Engineer within 30 days after issue of LOA. The program shall include the physical and Financial Progress vis-à-vis program and forecast cash flow adopting Project Management Software such as **Primavera/Sure Track/MS Project etc.** 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. Each programme shall include:

The order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage, Contractor's Documents, procurement, manufacture of Plant, delivery to Site, construction, erection and testing, each of these stages for work by each Subcontractor, if any, the sequence and timing of inspections and tests specified in the Contract, and a supporting report which includes:

a general description of the methods which the Contractor intends to adopt, and of the major stages, in the execution of the Works, and

details showing the Contractor's reasonable estimate for the number of each class of Contractor's Personnel &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 Engineer shall be entitled to rely upon the programme when planning their activities.

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.

14.7.22

H. Clause 39(1), Part II of GCC shall be read as under:

39.(1) Rates for Extra Item(s) of Works:

(a) Standard Schedule of Rates (SSOR) Items: Any item of work carried out by the Contractor on the instructions of the Engineer which is not included in the accepted Bill(s) of Quantities but figures in the Standard Schedule of Rates (SSOR), shall be executed at the rates set forth in the "Standard Schedule of Rates (SSOR)" modified by the tender percentage as accepted in the contract for that chapter of Standard Schedule of Rates (SSOR).

For item(s) not covered in this sub clause, the rate shall be decided as agreed upon between the Engineer and the Contractor before the execution of such items of work as per sub clause (b).

(b) Other Items: For any item of work to be carried out by the Contractor but not included in the accepted Bill(s) of Quantities and also not covered under sub clause (a) above, the Contractor shall be bound to notify the Engineer at least seven days before the necessity arises for the execution of such items of works that the accepted Bill(s) of Quantities does not include rate or rates for such extra work involved. The rates payable for such items shall be decided at the meeting to be held between the Engineer and Contractor, in as short a period as possible after the need for the special item has come to the notice. In case the Contractor fails to attend the meeting after being notified to do so or in the event of no settlement being arrived at, the Railway shall be entitled to execute the extra works by other means and the Contractor shall have no claim for loss or damage that may result from such procedure.

The assessment of rates for extra item(s) shall be arrived at based on the prevailing market rates of labour, machinery & materials and by taking guidance from the following documents in order of priority:

i. Analysis of Rates for "Unified Standard Schedule of Rates of Indian Railways (USSOR)"

ii. Analysis of Rates for "Delhi Schedule of Rates issued by CPWD (DSR)"

iii. Market Analysis

I. Clause 46A.1., Part II of GCC shall be read as under:

46A.1 Applicability: Price Variation Clause (PVC) shall be applicable only in tender having advertised value above **Rs. 2 Crores**. Provided further that, in a contract where PVC is applicable, following shall be outside the purview of price adjustments (i.e. shall be excluded from the gross value of the work for the purpose of price variation) :

a) Materials supplied by Railway to the Contractors, either free or at fixed rate;

b) Any extra item(s) included in subsequent variation falling outside the purview of the Bill(s) of Quantities of tender, under clause 39. (1)(b) of these Standard General Conditions, unless applicability of PVC and 'Base Month' has been specially agreed, while fixing the rates of such extra item(s).

J. Clause 46A.6, Part II of GCC shall be read as under:

46A.6 The percentages of various components in various type of works shall be as specified for all item (s)/ Bill(s) of Quantities in tender document and the same shall be fixed as per table & classifications given below:

(I). For Civil Engineering Works

SN	Classification / Components		1A, 2 & 3A	4A	5A	6A	7	8A	9A	1B, 3B, 4B, 5B, 6B 8B & 9B	1C, 3C, 4C, 5C, 6C, 8C & 9C	3D, 4D, 5D, 6D, 8D & 9D	3E, 4E, 5E, 6E, 8E & 9E
1	*Fixed*	*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*
2	Labour	L_c	20	25	30	20	50	20	20	0	0	10	25
3	Steel	S_c	0	0	0	0	0	0	0	85	0	50	0
4	Cement	C_c	0	0	15	0	0	0	0	0	85	0	0
5	Plant Machinery & Spares	PM_c	30	15	5	20	15	20	30	0	0	10	30
6	Fuel & Lubricants	F_c	25	15	5	15	15	20	15	0	0	10	20
7	Other materials	M_c	10	15	30	30	5	25	20	0	0	5	10
8	Detonators & Explosive	E_c	0	15	0	0	0	0	0	0	0	0	0
Total			100	100	100	100	100	100	100	100	100	100	100

* It shall not be considered for any price variation.

The classification mentioned in the table above represents following type of item(s) in the work(s) –

1 Earthwork in Formation

1A All Item(s) excluding 1B or/and 1C

1B Item(s) for supply of Steel

1C Item(s) for supply of Cement

2 Ballast Supply Works

3 Tunnelling Works (Without Explosives)

3A All Item(s) excluding 3B or/and 3C or/and 3D or/and 3E

3B Item(s) for supply of Steel

3C Item(s) for supply of Cement or/and Grout

3D Item(s) for Fabrication & Erection of Structures including supply of Steel

3E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

4 Tunnelling Works (With explosives)

4A All Item(s) excluding 4B or/and 4C or/and 4D or/and 4E

4B Item(s) for supply of Steel

4C Item(s) for supply of Cement or/and Grout

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4D Item(s) for Fabrication & Erection of Structures including supply of Steel

4E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

5 Building Works

5A All Item(s) excluding 5B or/and 5C or/and 5D or/and 5E

5B Item(s) for supply of Steel

5C Item(s) for supply of Cement

5D Item(s) for Fabrication & Erection of Structures including supply of Steel

5E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

6 Bridges & Protection work

6A All Item(s) excluding 6B or/and 6C or/and 6D or/and 6E

6B Item(s) for supply of Steel

6C Item(s) for supply of Cement

6D Item(s) for Fabrication, Assembly, Erection& Launching of Girders including supply of Steel

6E Item(s) for Fabrication, Assembly, Erection &Launching of Girders excluding supply of Steel

7 Permanent Way linking

8 Platform, Passenger Amenities

8A All Item(s) excluding 8B or/and 8C or/and 8D or/and 8E

8B Item(s) for supply of Steel item/fittings

8C Item(s) for supply of Cement Item

8D Item(s) for Fabrication & Erection of Structures including supply of Steel

8E Item(s) for Fabrication & Erection of Structures excluding supply of Steel

9 Any Other Works not covered in Classification 1 to 8

9A All Item(s) excluding 9B or/and 9C or/and 9D or/and 9E

9B Item(s) for supply of Steel

9C Item(s) for supply of Cement or/and Grout

9D Item(s) for Fabrication & Erection of Structures including supply of Steel

9E Item(s) for Fabrication & Erection of Structures excluding supply of Steel

14.7.22

K. Clause 46A.7 Formulae, Part II of GCC shall be read as under:

46A.7 Formulae: The Amount of variation in prices in various components (labour, material etc.) shall be worked out by the following formulae:

(i) $L = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (L_Q - L_B) \times L_C}{L_B \times 100}$

(ii) $M = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (M_Q - M_B) \times M_C}{M_B \times 100}$

(iii) $F = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (F_Q - F_B) \times F_C}{F_B \times 100}$

(iv) $E = \frac{(W) \times (E_Q - E_B) \times E_C}{E_B \times 100}$

(v) $PM = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (PM_Q - PM_B) \times PM_C}{PM_B \times 100}$

(vi) $S = \frac{(W \text{ or } W_S \text{ or } W_{SF}) \times (S_Q - S_B) \times S_C}{S_B \times 100}$

(vii) $C = \frac{(W \text{ or } W_C) \times (C_Q - C_B) \times C_C}{C_B \times 100}$

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14.7.22

LIST FOR DISTRIBUTION (Letter 2022/CE-I/CT/GCC-2022/Policy, Dated 14.07.2021)

1. General Managers, All Indian Railways & Production Units
2. General Manager (Con), N.F. Railway, Guwahati
3. General Manager /CORE, Allahabad.
4. Chief Administrative Officers (Con), All Indian Railways (Except N.F. Railway)
5. Principal Chief Engineers, All Indian Railways

(A)

1. CAO, COFMOW, Tilak Bridge, New Delhi
2. Principal CAO, Diesel Loco Modernization Works, Patiala (Punjab)
3. CAO (Workshop Projects), Chamber Bhawan, Judge's Court Road, Anta Ghat, Patna-800001, Bihar

(B)

1. Director General, RDSO, Manak Nagar, Lucknow
2. Director General, NAIR, Vadodara
3. Director, IRICEN, Pune – 411 001 (Maharashtra)
4. Director, IRIEEN, PB No.-233, Nasik Road-422101 (Maharashtra)
5. Director, IRISET, Taa Naka Road, Lalla Guda, Secunderabad-500017
6. Director, IRIMEE, Jamalpur Distt-Jamalpur, PIN-811214 (Bihar).
7. Director, IRITM, Sarswati Residential Estate, IRITM Campus, Manak Nagar, Lucknow

(C)

1. MD, CONCOR, Concor Bhawan, C-3, Mathura Road, Opp. Apollo Hospital, New Delhi- 110076.
2. IRCON International Limited, C-4, District Centre, Saket, New Delhi- 110017
3. MD, RITES Ltd., RITES Bhawan, Plot No.1, Sector-29, Gurgaon.
4. CMD, RVNL, August Kranti Bhawan,Plot No.25, 1st Floor, Bhikaji Cama Place, New Delhi.
5. MD, MRVC Ltd., Churchgate Station Bldg, Mumbai- 400020
6. CMD, KONKAN Railway Corporation Ltd, Rail Bhawan, New Delhi-110001.
7. MD, DFCCIL, 5th Floor, Pragati Maidan Metro Station Building Complex, New Delhi-110001
8. MD, RLDA, Near Safdarjung Railway Station, Moti Bagh, Phase-I, New Delhi- 110021
9. MD, CRIS, Chanakyapur, New Delhi.
10. CMD, RailTel Corporation of India Ltd. Plot No. 143, Institutional Area, Sector-44, Gurgaon – 122003.
11. CME, IROAF, 12th Floor, Core-1, Scope Minar, Distt. Centre, Laxmi Nagar, Delhi- 110092
12. Managing Director, IRFC Limited, UG Floor, EastTower, NBCC Place, Bhisham Pitamah Marg, LodhiRoad, Pragati Vihar, New Delhi.
13. CMD, IRCTC Ltd., B-148, 11th Floor, Statesman House, Barakhamba Road, New Delhi 110001
14. CMD, Braithwaite & Co. limited, 5 Hide Road Kolkata 700043.

Copy to:

(A)

1. General Secretary, IRCA, DRM Office, New Delhi.
2. General Secretary, AIRF, Rail Bhawan, New Delhi
3. General Secretary, NFIR, Rail Bhawan, New Delhi
4. General Secretary, IRPOF, Rail Bhawan, New Delhi
5. General Secretary, FROA, Rail Bhawan, New Delhi
6. General Secretary, AIRPA, Rail Bhawan, New Delhi
7. General Secretary, AISC & STREA, Rail Bhawan, New Delhi
8. The Secretary, RBSS, Group (A) Offices Association, Rail Bhawan
9. The Secretary, RBSS, Group (B) Offices Association, Rail Bhawan
10. General Secretary, RBSSS Association, Rail Bhawan
11. The Secretary, RBMSA, Rail Bhawan
12. The Secretary, Railway, Group (D) Employees Association, Rail Bhawan

(B)

1. Concerned PSO for kind information of Chairman cum CEO, M/Infra, M/T&RS M/O&BD, M/Finance, Railway Board
2. Adv./MR, EDPG/MR, OSD/MR, OSR(Co-ord)/MR
3. Chief Vigilance Officers, All Indian Railways.
4. DG(RHS), DG(RPF), AM(CE), AM(Works), AM(B), AM(Elec.), AM(RS), AM(ME), AM/Tele, AM/C&IS, AM/Sig., AM(Plg.), PED(B&S), PED(Vigilance), PEDCE(P), EDCE(G), EDTK(M&MC), EDCE(B&S), EDF(X)-I, EDF(X)-II, ED(Works), EDW(Plg.), ED/Project(Mon.), ED(L&A), ED(PSU), EDVE, ED(Safety), ED(Sig. Dev.), ED(Tele), EDRS(G), EDRE, EDEE(G), EDFE, EDE(N), ED(Accounts), ED/T&MPP, EDME(Chg.), EDME(Frt.), ED/Plg., JS(conf), JS(P), JS(G), JS(D), Vigilance-III, Vig(Conf) of Railway Board.

14.7.22

आज़ादी का अमृत महोत्सव

भारत सरकार Government of India
रेल मंत्रालय Ministry of Railways
(रेलवे बोर्ड Railway Board)

Azadi Ka Amrit Mahotsav

No. 2022/CE-I/CT/GCC-2022/Policy **New Delhi, Dated 14.07.2022**

To,
As per list attached

Sub: Indian Railways Standard General Conditions of Contract, April-2022 (Advance Correction Slip No. 1)

Enclosed herewith please find **Advance Correction Slip No. 1** to Indian Railways Standard General Conditions of Contract, April-2022.

2) This shall be applicable to Works Contract of Indian Railways with prospective effect.

3) This issues with concurrence of the Finance Directorate of the Ministry of Railways.

DA: As above.

14.7.22

(अजीत कुमार झा)
कार्यपालक निदेशक/सिविल इंजी.(जी)/रेलवे बोर्ड
[Phone: 030-44803: Rly: 011-23383379:MTNL]
e-mail address : edceg2022@gmail.com

No. 2022/CE-I/CT/GCC-2022/Policy **New Delhi, Dated 14.07.2022**

Copy forwarded for information to:

(i) The PFAs, All Indian Railways.

(ii) Dy. Comptroller and Auditor General of India (Railways), Room No. 224, Rail Bhawan, New Delhi.

For Member Finance

(Advance Correction Slip No. 1)

A. Para 10.2., Part I of GCC shall be read as under:

10.2. Financial Eligibility Criteria:
The tenderer must have minimum average annual contractual turnover of V/N or 'V' whichever is less; where

V= Advertised value of the tender in crores of Rupees

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

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

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

B. Para 17.15.1, Part I of GCC shall be read as under:

17.15.1 Technical Eligibility Criteria ('a' or 'b' mentioned hereunder):

(a) For Works without composite components

The technical eligibility for the work as per para 10.1 above, shall be satisfied by either the 'JV in its own name & style' or 'Lead member of the JV'.
Each other (non-lead) member(s) of JV, who is/ are not satisfying the technical eligibility for the work as per para 10.1 above, shall have technical capacity of minimum **10%** of the cost of work i.e., each non-lead member of JV member must have satisfactorily completed or substantially completed during the last 07 (seven) years, ending last day of month previous to the one in which tender is invited, one similar single work for a minimum of **10%** of advertised value of the tender.

(b) For works with composite components

The technical eligibility for major component of work as per para 10.1 above, shall be satisfied by either the 'JV in its own name & style' or 'Lead member of the JV' and technical eligibility for other component(s) of work as per para 10.1 above, shall be satisfied by either the 'JV in its own name & style' or 'any member of the JV'.
Each other (non-lead)member(s) of JV, who is/ are not satisfying the technical eligibility for any component of the work as per para 10.1 above, shall have technical capacity of minimum **10%** of the cost of any component of work mentioned in technical eligibility criteria. i.e., each other (non-lead) member of must have satisfactorily completed or substantially completed during the last 07 (seven) years, ending last day of month previous to the one in which tender is invited, one similar single work for a minimum of **10%** of cost of any component of work mentioned in technical eligibility criteria.

Note *for Para 17.15.1:*

a) The *Major component of the work for this purpose shall be the component of work having highest value. In cases where value of two or more component of work is same, any one work can be classified as Major component of work.*

b) Value *of a completed work done by 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 technical eligibility criteria in the tender under consideration.*

14.7.22

e. Annexure-V, Part I of GCC shall be read as under:

ANNEXURE-V

Reference -Para 6.1 of ITT

FORMAT FOR CERTIFICATE TO BE SUBMITTED / UPLOADED BY TENDERER ALONGWITH THE TENDER DOCUMENTS

I.....(*Name and designation*)**appointed as the attorney/authorized signatory of the tenderer (including its constituents),
M/s_____ (hereinafter called the tenderer) for the purpose of the Tender documents for the work of _____ as per the tender No._____ of _____(*Railway*)**, do hereby solemnly affirm and state on the behalf of the tenderer including its constituents as under:

1. I/we the tenderer (s) am/are signing this document after carefully reading the contents.
2. I/We the tenderer(s) also accept all the conditions of the tender and have signed all the pages in confirmation thereof.
3. I/we hereby declare that I/we have downloaded the tender documents from Indian Railway website www.ireps.gov.in . I/we have verified the content of the document from the website and there is no addition, no deletion or no alteration to the content of the tender document. In case of any discrepancy noticed at any stage i.e. evaluation of tenders, execution of work or final payment of the contract, the master copy available with the railway Administration shall be final and binding upon me/us.
4. I/we declare and certify that I/we have not made any misleading or false representation in the forms, statements and attachments in proof of the qualification requirements.
5. **I/We also understand that my/our offer will be evaluated based on the documents/credentials submitted along with the offer and same shall be binding upon me/us.**
6. **I/We declare that the information and documents submitted along with the tender by me/us are correct and I/we are fully responsible for the correctness of the information and documents, submitted by us.**
7. I/we certify that I/we the tenderer(s) is/are not blacklisted or debarred by Railways or any other Ministry / Department of Govt. of India from participation in tender on the date of submission of bids, either in individual capacity or as a HUF/ member of the partnership firm/LLP/JV/Society/Trust.
8. I/we understand that if the contents of the **certificate** submitted by us are found to be forged/false or incorrect at any time during process for evaluation of tenders, it shall lead to forfeiture of the Bid Security besides banning of business for a period of upto five year. Further, I/we (*insert name of the tenderer*) **_____and all my/our constituents understand that my/our offer shall be summarily rejected.
9. I/we also understand that if the contents of the **certificate** submitted by us are found to be false/forged or incorrect at any time after the award of the contract, it will lead to termination of the contract, along with forfeiture of Bid Security/Security Deposit and Performance guarantee besides any other action provided in the contract including banning of business for a period of upto five year.
10. I/We have read the clause regarding restriction on procurement from a bidder of a country which shares a land border with India and certify that I am/We are not from such a country or,
    if from such a country, have been registered with the competent Authority. I/We hereby certify that I/we fulfil all the requirements in this regard and am/are eligible to be considered (evidence of valid registration by the competent authority is enclosed)

SEAL AND SIGNATURE
OF THE TENDERER

Place:
Dated:

**The contents in Italics are only for guidance purpose. Details as appropriate are to be filled in suitably by tenderer.

This certificate is to be given by each member of JV or Partners of Partnership firm/LLP/etc.

14.7.22

D. Annexure-VI, Part I of GCC shall be read as under:

ANNEXURE – VI

Reference -Para 10.3 & 17.15.3 of Tender Form (Second Sheet) of Annexure I of ITT

TENDERER'S CREDENTIALS (BID CAPACITY)

_____ RAILWAY

For tenders having advertised value 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 value of the present tender. The available bid capacity shall be calculated as under:

Available Bid Capacity = [A x N x 2] – 0.33xNxB

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= 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.

Note:

(a) The Tenderer(s) shall furnish the details of -

(i) 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) for calculating A, and

(ii) 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 for calculating B. In case of no works in hand, a 'NIL' statement should be furnished.

The submitted details for (i) and (ii) above should be duly verified by Chartered Accountant.

(b) In case if a bidder is JV, the tenderer(s) must furnish the details of

(i) 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) by each member of JV for calculating A, and

(ii) Existing commitments and balance amount of ongoing works with each member of JV either in individual capacity or as a member of other JV as per the prescribed proforma of Railway for statement of all works in progress and also the works which are awarded to each member of JV either in individual capacity or as a member of other JV but yet not started upto the date of inviting of tender for calculating B. In case of no works in hand, a 'NIL' statement should be furnished.

The submitted details for (i) and (ii) above should be 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 "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.

14.7.22

E. Clause 17 A, Part II of GCC shall be read as under:

17A Extension of Time in Contracts: Subject to any requirement in the contract as to completion of any portion or portions of the works before completion of the whole, the Contractor shall fully and finally complete the whole of the works comprised in the contract (with such modifications as may be directed under conditions of this contract) by the date entered in the contract or extended date in terms of the following clauses:

(i) **Extension due to Modification:** If any modifications have been ordered which in the opinion of the Engineer have materially increased the magnitude of the work, then such extension of the contracted date of completion may be granted as shall appear to the Engineer to be reasonable in the circumstances, provided moreover that the Contractor shall be responsible for requesting such extension of the date as may be considered necessary as soon as the cause thereof shall arise.

(ii) **Extension for Delay not due to Railway or Contractor:** If in the opinion of the Engineer, the progress of work has any time been delayed by any act or neglect of Railway's employees or by other Contractor employed by the Railway under Sub-Clause (4) of Clause 20 of these Conditions or in executing the work not forming part of the contract but on which Contractor's performance necessarily depends or by reason of proceeding taken or threatened by or dispute with adjoining or to neighbouring owners or public authority arising otherwise through the Contractor's own default etc. or by the delay authorized by the Engineer pending arbitration or in consequences of the Contractor not having received in due time necessary instructions from the Railway for which he shall have specially applied in writing to the Engineer or his authorized representative then upon happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer within 15 days of such happening, but shall nevertheless make constantly his best endeavours to bring down or make good the delay and shall do all that may be reasonably required of him to the satisfaction of the Engineer to proceed with the works. The Contractor may also indicate the period for which the work is likely to be delayed and shall be bound to ask for necessary extension of time.

(iii) **Extension for Delay due to Railways:** In the event of any failure or delay by the Railway to hand over the Contractor possession of the lands necessary for the execution of the works or to give the necessary notice to commence the works or to provide the necessary drawings or instructions or any other delay caused by the Railway due to any other cause whatsoever, then such failure or delay shall in no way affect or vitiate the contract or alter the character thereof or entitle the Contractor to damages or compensation therefor, but in any such case, the Railway may grant such extension or extensions of the completion date as may be considered reasonable.

The Contractor shall indicate the period for which the work is likely to be delayed and shall seek extension of time as may be considered necessary under clause 17A(i) or/and 17A(ii) or/ and 17A(iii) above, as soon as the cause thereof shall arise and, in any case, not less than **15 days** before the expiry of the date fixed for completion of the works. The Engineer shall consider the same and shall grant and communicate such extension of time as in his opinion is reasonable having regard to the nature and period of delay and the type and quantum of work affected thereby. No other compensation shall be payable for works so carried forward to the extended period of time; the same rates, terms and conditions of contract being applicable, as if such extended period of time was originally provided in the original contract itself.

The non-submission of request for extension or submission of request within less than **15 days** before the expiry of the date fixed for completion of the works, shall make him ineligible for extension under these sub clauses, subject to final decision of Engineer.

14.7.22

F. Clause 17B, Part II of GCC shall be read as under:

17B Extension of Time with Liquidated Damages (LD) for delay due to Contractor: The time for the execution of the work or part of the works specified in the contract documents shall be deemed to be the essence of the contract and the works must be completed not later than the date(s) as specified in the contract. If the Contractor fails to complete the works within the time as specified in the contract for the reasons other than the reasons specified in Clause 17 and 17A, the Railway may, if satisfied that the works can be completed by the Contractor within reasonable short time thereafter, allow the Contractor for further extension of time (Proforma at Annexure-VII) as the Engineer may decide. On such extension the Railway will be entitled without prejudice to any other right and remedy available on that behalf, to recover from the Contractor as agreed damages and not by way of penalty for each week or part of the week, a sum calculated at the ***rate of Liquidated Damages as decided by Engineer, between 0.05% to 0.30 % of contract value of the works for each week or part of the week.***

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

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

NOTE:

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

14.7.22

G. Clause 19 (3), Part II of GCC shall be read as under:

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

In Contracts for works of New Line/Gauge Conversion/Doubling/Railway Electrification, finalized through Tenders having advertised value more than **Rs.100 crores**, the Contractor shall submit a detailed time programme to the Engineer within 30 days after issue of LOA. The program shall include the physical and Financial Progress vis-à-vis program and forecast cash flow adopting Project Management Software such as **Primavera/Sure Track/MS Project etc.** 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. Each programme shall include:

The order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage, Contractor's Documents, procurement, manufacture of Plant, delivery to Site, construction, erection and testing, each of these stages for work by each Subcontractor, if any, the sequence and timing of inspections and tests specified in the Contract, and a supporting report which includes:

a general description of the methods which the Contractor intends to adopt, and of the major stages, in the execution of the Works, and

details showing the Contractor's reasonable estimate for the number of each class of Contractor's Personnel &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 Engineer shall be entitled to rely upon the programme when planning their activities.

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.

14.7.22

H. Clause 39(1), Part II of GCC shall be read as under:

39.(1) Rates for Extra Item(s) of Works:

(a) Standard Schedule of Rates (SSOR) Items: Any item of work carried out by the Contractor on the instructions of the Engineer which is not included in the accepted Bill(s) of Quantities but figures in the Standard Schedule of Rates (SSOR), shall be executed at the rates set forth in the "Standard Schedule of Rates (SSOR)" modified by the tender percentage as accepted in the contract for that chapter of Standard Schedule of Rates (SSOR).

For item(s) not covered in this sub clause, the rate shall be decided as agreed upon between the Engineer and the Contractor before the execution of such items of work as per sub clause (b).

(b) Other Items: For any item of work to be carried out by the Contractor but not included in the accepted Bill(s) of Quantities and also not covered under sub clause (a) above, the Contractor shall be bound to notify the Engineer at least seven days before the necessity arises for the execution of such items of works that the accepted Bill(s) of Quantities does not include rate or rates for such extra work involved. The rates payable for such items shall be decided at the meeting to be held between the Engineer and Contractor, in as short a period as possible after the need for the special item has come to the notice. In case the Contractor fails to attend the meeting after being notified to do so or in the event of no settlement being arrived at, the Railway shall be entitled to execute the extra works by other means and the Contractor shall have no claim for loss or damage that may result from such procedure.

The assessment of rates for extra item(s) shall be arrived at based on the prevailing market rates of labour, machinery & materials and by taking guidance from the following documents in order of priority:

i. Analysis of Rates for "Unified Standard Schedule of Rates of Indian Railways (USSOR)"

ii. Analysis of Rates for "Delhi Schedule of Rates issued by CPWD (DSR)"

iii. Market Analysis

I. Clause 46A.1., Part II of GCC shall be read as under:

46A.1 Applicability: Price Variation Clause (PVC) shall be applicable only in tender having advertised value above **Rs. 2 Crores**. Provided further that, in a contract where PVC is applicable, following shall be outside the purview of price adjustments (i.e. shall be excluded from the gross value of the work for the purpose of price variation) :

a) Materials supplied by Railway to the Contractors, either free or at fixed rate;

b) Any extra item(s) included in subsequent variation falling outside the purview of the Bill(s) of Quantities of tender, under clause 39. (1)(b) of these Standard General Conditions, unless applicability of PVC and 'Base Month' has been specially agreed, while fixing the rates of such extra item(s).

J. Clause 46A.6, Part II of GCC shall be read as under:

46A.6 The percentages of various components in various type of works shall be as specified for all item (s)/ Bill(s) of Quantities in tender document and the same shall be fixed as per table & classifications given below:

(I). For Civil Engineering Works

SN	Classification / Components		1A, 2 & 3A	4A	5A	6A	7	8A	9A	1B, 3B, 4B, 5B, 6B 8B & 9B	1C, 3C, 4C, 5C, 6C, 8C & 9C	3D, 4D, 5D, 6D, 8D & 9D	3E, 4E, 5E, 6E, 8E & 9E
1	*Fixed*	*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*
2	Labour	L_c	20	25	30	20	50	20	20	0	0	10	25
3	Steel	S_c	0	0	0	0	0	0	0	85	0	50	0
4	Cement	C_c	0	0	15	0	0	0	0	0	85	0	0
5	Plant Machinery & Spares	PM_c	30	15	5	20	15	20	30	0	0	10	30
6	Fuel & Lubricants	F_c	25	15	5	15	15	20	15	0	0	10	20
7	Other materials	M_c	10	15	30	30	5	25	20	0	0	5	10
8	Detonators & Explosive	E_c	0	15	0	0	0	0	0	0	0	0	0
Total			100	100	100	100	100	100	100	100	100	100	100

* It shall not be considered for any price variation.

The classification mentioned in the table above represents following type of item(s) in the work(s) –

1 Earthwork in Formation

1A All Item(s) excluding 1B or/and 1C

1B Item(s) for supply of Steel

1C Item(s) for supply of Cement

2 Ballast Supply Works

3 Tunnelling Works (Without Explosives)

3A All Item(s) excluding 3B or/and 3C or/and 3D or/and 3E

3B Item(s) for supply of Steel

3C Item(s) for supply of Cement or/and Grout

3D Item(s) for Fabrication & Erection of Structures including supply of Steel

3E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

4 Tunnelling Works (With explosives)

4A All Item(s) excluding 4B or/and 4C or/and 4D or/and 4E

4B Item(s) for supply of Steel

4C Item(s) for supply of Cement or/and Grout

14.7.22

4D Item(s) for Fabrication & Erection of Structures including supply of Steel

4E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

5 Building Works

5A All Item(s) excluding 5B or/and 5C or/and 5D or/and 5E

5B Item(s) for supply of Steel

5C Item(s) for supply of Cement

5D Item(s) for Fabrication & Erection of Structures including supply of Steel

5E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

6 Bridges & Protection work

6A All Item(s) excluding 6B or/and 6C or/and 6D or/and 6E

6B Item(s) for supply of Steel

6C Item(s) for supply of Cement

6D Item(s) for Fabrication, Assembly, Erection& Launching of Girders including supply of Steel

6E Item(s) for Fabrication, Assembly, Erection &Launching of Girders excluding supply of Steel

7 Permanent Way linking

8 Platform, Passenger Amenities

8A All Item(s) excluding 8B or/and 8C or/and 8D or/and 8E

8B Item(s) for supply of Steel item/fittings

8C Item(s) for supply of Cement Item

8D Item(s) for Fabrication & Erection of Structures including supply of Steel

8E Item(s) for Fabrication & Erection of Structures excluding supply of Steel

9 Any Other Works not covered in Classification 1 to 8

9A All Item(s) excluding 9B or/and 9C or/and 9D or/and 9E

9B Item(s) for supply of Steel

9C Item(s) for supply of Cement or/and Grout

9D Item(s) for Fabrication & Erection of Structures including supply of Steel

9E Item(s) for Fabrication & Erection of Structures excluding supply of Steel

14.7.22

K. Clause 46A.7 Formulae, Part II of GCC shall be read as under:

46A.7 Formulae: The Amount of variation in prices in various components (labour, material etc.) shall be worked out by the following formulae:

(i) $L = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (L_Q - L_B) \times L_C}{L_B \times 100}$

(ii) $M = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (M_Q - M_B) \times M_C}{M_B \times 100}$

(iii) $F = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (F_Q - F_B) \times F_C}{F_B \times 100}$

(iv) $E = \frac{(W) \times (E_Q - E_B) \times E_C}{E_B \times 100}$

(v) $PM = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (PM_Q - PM_B) \times PM_C}{PM_B \times 100}$

(vi) $S = \frac{(W \text{ or } W_S \text{ or } W_{SF}) \times (S_Q - S_B) \times S_C}{S_B \times 100}$

(vii) $C = \frac{(W \text{ or } W_C) \times (C_Q - C_B) \times C_C}{C_B \times 100}$

*****

14.7.22

LIST FOR DISTRIBUTION (Letter 2022/CE-I/CT/GCC-2022/Policy, Dated 14.07.2021)

1. General Managers, All Indian Railways & Production Units
2. General Manager (Con), N.F. Railway, Guwahati
3. General Manager /CORE, Allahabad.
4. Chief Administrative Officers (Con), All Indian Railways (Except N.F. Railway)
5. Principal Chief Engineers, All Indian Railways

(A)

1. CAO, COFMOW, Tilak Bridge, New Delhi
2. Principal CAO, Diesel Loco Modernization Works, Patiala (Punjab)
3. CAO (Workshop Projects), Chamber Bhawan, Judge's Court Road, Anta Ghat, Patna-800001, Bihar

(B)

1. Director General, RDSO, Manak Nagar, Lucknow
2. Director General, NAIR, Vadodara
3. Director, IRICEN, Pune – 411 001 (Maharashtra)
4. Director, IRIEEN, PB No.-233, Nasik Road-422101 (Maharashtra)
5. Director, IRISET, Taa Naka Road, Lalla Guda, Secunderabad-500017
6. Director, IRIMEE, Jamalpur Distt-Jamalpur, PIN-811214 (Bihar).
7. Director, IRITM, Sarswati Residential Estate, IRITM Campus, Manak Nagar, Lucknow

(C)

1. MD, CONCOR, Concor Bhawan, C-3, Mathura Road, Opp. Apollo Hospital, New Delhi- 110076.
2. IRCON International Limited, C-4, District Centre, Saket, New Delhi- 110017
3. MD, RITES Ltd., RITES Bhawan, Plot No.1, Sector-29, Gurgaon.
4. CMD, RVNL, August Kranti Bhawan,Plot No.25, 1st Floor, Bhikaji Cama Place, New Delhi.
5. MD, MRVC Ltd., Churchgate Station Bldg, Mumbai- 400020
6. CMD, KONKAN Railway Corporation Ltd, Rail Bhawan, New Delhi-110001.
7. MD, DFCCIL, 5th Floor, Pragati Maidan Metro Station Building Complex, New Delhi-110001
8. MD, RLDA, Near Safdarjung Railway Station, Moti Bagh, Phase-I, New Delhi- 110021
9. MD, CRIS, Chanakyapur, New Delhi.
10. CMD, RailTel Corporation of India Ltd. Plot No. 143, Institutional Area, Sector-44, Gurgaon – 122003.
11. CME, IROAF, 12th Floor, Core-1, Scope Minar, Distt. Centre, Laxmi Nagar, Delhi- 110092
12. Managing Director, IRFC Limited, UG Floor, EastTower, NBCC Place, Bhisham Pitamah Marg, LodhiRoad, Pragati Vihar, New Delhi.
13. CMD, IRCTC Ltd., B-148, 11th Floor, Statesman House, Barakhamba Road, New Delhi 110001
14. CMD, Braithwaite & Co. limited, 5 Hide Road Kolkata 700043.

Copy to:

(A)

1. General Secretary, IRCA, DRM Office, New Delhi.
2. General Secretary, AIRF, Rail Bhawan, New Delhi
3. General Secretary, NFIR, Rail Bhawan, New Delhi
4. General Secretary, IRPOF, Rail Bhawan, New Delhi
5. General Secretary, FROA, Rail Bhawan, New Delhi
6. General Secretary, AIRPA, Rail Bhawan, New Delhi
7. General Secretary, AISC & STREA, Rail Bhawan, New Delhi
8. The Secretary, RBSS, Group (A) Offices Association, Rail Bhawan
9. The Secretary, RBSS, Group (B) Offices Association, Rail Bhawan
10. General Secretary, RBSSS Association, Rail Bhawan
11. The Secretary, RBMSA, Rail Bhawan
12. The Secretary, Railway, Group (D) Employees Association, Rail Bhawan

(B)

1. Concerned PSO for kind information of Chairman cum CEO, M/Infra, M/T&RS M/O&BD, M/Finance, Railway Board
2. Adv./MR, EDPG/MR, OSD/MR, OSR(Co-ord)/MR
3. Chief Vigilance Officers, All Indian Railways.
4. DG(RHS), DG(RPF), AM(CE), AM(Works), AM(B), AM(Elec.), AM(RS), AM(ME), AM/Tele, AM/C&IS, AM/Sig., AM(Plg.), PED(B&S), PED(Vigilance), PEDCE(P), EDCE(G), EDTK(M&MC), EDCE(B&S), EDF(X)-I, EDF(X)-II, ED(Works), EDW(Plg.), ED/Project(Mon.), ED(L&A), ED(PSU), EDVE, ED(Safety), ED(Sig. Dev.), ED(Tele), EDRS(G), EDRE, EDEE(G), EDFE, EDE(N), ED(Accounts), ED/T&MPP, EDME(Chg.), EDME(Frt.), ED/Plg., JS(conf), JS(P), JS(G), JS(D), Vigilance-III, Vig(Conf) of Railway Board.

14.7.22

भारत सरकार Government of India
रेल मंत्रालय Ministry of Railways
(रेलवे बोर्ड Railway Board)

आज़ादी का अमृत महोत्सव

Azadi Ka Amrit Mahotsav

No. 2022/CE-I/CT/GCC-2022/Policy **New Delhi, Dated 13.12.2022**

To,
As per list attached

Sub: Indian Railways Standard General Conditions of Contract, April 2022 (Advance Correction Slip No. 2)

Enclosed herewith please find **Advance Correction Slip No. 2** to Indian Railways Standard General Conditions of Contract, April-2022.

2) This shall be applicable to Works Contract of Indian Railways with prospective effect.

3) This issues with concurrence of the Finance Directorate of the Ministry of Railways.

DA: As above.

(अजीत कुमार झा) 13.12.22
कार्यपालक निदेशक/सिविल इंजी.(जी)/रेलवे बोर्ड
[Phone: 030-44803: Rly: 011-23383379:MTNL]
e-mail address : edceg2022@gmail.com

No. 2022/CE-I/CT/GCC-2022/Policy **New Delhi, Dated 13.12.2022**

Copy forwarded for information to:

(i) The PFAs, All Indian Railways.
(ii) Dy. Comptroller and Auditor General of India (Railways), Room No. 224, Rail Bhawan, New Delhi.

For Member Finance

LIST FOR DISTRIBUTION (Letter 2022/CE-I/CT/GCC-2022/Policy, Dated 13.12.2022)

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6. General Secretary, AIRPA, Rail Bhawan, New Delhi
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10. General Secretary, RBSSS Association, Rail Bhawan
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12. The Secretary, Railway, Group (D) Employees Association, Rail Bhawan

(B)

1. Concerned PSO for kind information of Chairman cum CEO, M/Infra, M/T&RS M/O&BD, M/Finance, Railway Board
2. Adv./MR, EDPG/MR, OSD/MR, OSR(Co-ord)/MR
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13.12.22

(Advance Correction Slip No. 2)

A. Para 5(3) ii. Part I of GCC shall be read as under:

ii. The original Bank Guarantee should be delivered in person to the official nominated as indicated in the tender document within 5 working days before closing date for submission of bids.

B. Para 6.1 Part I of GCC shall be read as under:

6.1. The tenderers shall submit a copy of certificate stating that all their statements/documents submitted alongwith bid are true and factual. Standard format of certificate to be submitted by the bidder is enclosed as **Annexure-V.** In addition to Annexure-V, in case of other than Company/Proprietary firm, Annexure –V(A) shall also be submitted by the each member of a Partnership Firm / Joint Venture (JV) / Hindu Undivided Family (HUF) / Limited Liability Partnership (LLP) etc. as the case may be. Non submission of above certificate(s) by the bidder shall result in **summarily** rejection of his/their bid. It shall be mandatorily incumbent upon the tenderer to identify, state and submit the supporting documents duly self attested/digitally signed by which they/he is qualifying the Qualifying Criteria mentioned in the Tender Document.

C. Para 11 (iv) of Annexure-I, Part I of GCC shall be read as under:

(iv) A copy of certificate stating that they are not liable to be disqualified and all their statements/documents submitted along with bid are true and factual. Standard format of the certificate to be submitted by the bidder is enclosed as Annexure-V. In addition to Annexure-V, in case of other than Company/Proprietary firm, Annexure –V(A) shall also be submitted by the each member of a Partnership Firm / Joint Venture (JV) / Hindu Undivided Family (HUF) / Limited Liability Partnership (LLP) etc. as the case may be. Non submission of a copy of certificate by the bidder shall result in summarily rejection of his/their bid. It shall be mandatorily incumbent upon the tenderer to identify, state and submit the supporting documents duly self attested / digitally signed by which they/he are/is qualifying the Qualifying Criteria mentioned in the Tender Document.

13.12.22

D. Annexure-V Part I of GCC shall be read as under:

ANNEXURE-V

Reference -Para 6.1 of ITT

FORMAT FOR CERTIFICATE TO BE SUBMITTED / UPLOADED BY TENDERER ALONGWITH THE TENDER DOCUMENTS

I.....(*Name and designation*)**appointed as the attorney/authorized signatory of the tenderer,

M/s_____ (hereinafter called the tenderer) for the purpose of the Tender documents for the work of _____ as per the tender No._____ of _____(*Railway*)**, do hereby solemnly affirm and state on the behalf of the tenderer including its constituents as under:

1. I/we the tenderer (s) am/are signing this document after carefully reading the contents.

2. I/We the tenderer(s) also accept all the conditions of the tender and have signed all the pages in confirmation thereof.

3. I/we hereby declare that I/we have downloaded the tender documents from Indian Railway website www.ireps.gov.in . I/we have verified the content of the document from the website and there is no addition, no deletion or no alteration to the content of the tender document. In case of any discrepancy noticed at any stage i.e. evaluation of tenders, execution of work or final payment of the contract, the master copy available with the railway Administration shall be final and binding upon me/us.

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

5. **I/We also understand that my/our offer will be evaluated based on the documents/credentials submitted along with the offer and same shall be binding upon me/us.**

6. **I/We declare that the information and documents submitted along with the tender by me/us are correct and I/we are fully responsible for the correctness of the information and documents, submitted by us.**

7. I/we certify that I/we the tenderer(s) is/are not blacklisted or debarred by Railways or any other Ministry / Department of Govt. of India from participation in tender on the date of submission of bids, either in individual capacity or as a HUF/ member of the partnership firm/LLP/JV/Society/Trust.

8. I/we understand that if the contents of the **certificate** submitted by us are found to be forged/false or incorrect at any time during process for evaluation of tenders, it shall

13.12.22

lead to forfeiture of the Bid Security besides banning of business for a period of upto five year. Further, I/we (*insert name of the tenderer*) **_____and all my/our constituents understand that my/our offer shall be summarily rejected.

9. I/we also understand that if the contents of the **certificate** submitted by us are found to be false/forged or incorrect at any time after the award of the contract, it will lead to termination of the contract, along with forfeiture of Bid Security/Security Deposit and Performance guarantee besides any other action provided in the contract including banning of business for a period of upto five year.

10. I/We have read the clause regarding restriction on procurement from a bidder of a country which shares a land border with India and certify that I am/We are not from such a country or, if from such a country, have been registered with the competent Authority. I/We hereby certify that I/we fulfil all the requirements in this regard and am/are eligible to be considered (evidence of valid registration by the competent authority is enclosed)

SEAL AND SIGNATURE
OF THE TENDERER

Place:
Dated:

**The contents in Italics are only for guidance purpose. Details as appropriate are to be filled in suitably by tenderer.

13.12.22

E. New Annexure-V(A), Part I of GCC shall be read as under

ANNEXURE-V(A)

Reference -Para 6.1 of ITT

(***This certificate is to be given by attorney/authorized signatory/each member of Partnership firm/Joint Venture (JV) / Hindu Undivided Family (HUF) / Limited Liability Partnership (LLP) etc.***)

I/We.....(Name), attorney/authorized signatory of the ..... (constituent firm/constituent partner) and member/partner of the .....(tenderering firm) hereby solemnly affirm and state as under:

1. I/we certify that ..... (constituent firm/constituent partner) is/are not blacklisted or debarred by Railways or any other Ministry / Department of Govt. of India from participation in tender on the date of submission of bids, either in individual capacity or as a HUF/ member of the partnership firm/LLP/JV/Society/Trust.
2. I/We have read the clause regarding restriction on procurement from a bidder of a country which shares a land border with India and certify that I am/We are not from such a country or, if from such a country, have been registered with the competent Authority. I/We hereby certify that I/we fulfil all the requirements in this regard and am/are eligible to be considered (evidence of valid registration by the competent authority is enclosed),

SEAL AND SIGNATURE
OF THE CONSTITUENT FIRM/CONSTITUENT PARTNER

Place:
Dated:

*****

13.12.22

SECTION-VII

TECHNICAL SPECIFICATION

TABLE OF CONTENTS

1.0 INTRODUCTION:

1.1 IRCON has been entrusted with the work of EI based Signaling at **Bargawan & Majhauli** along with associated at adjoining stations/sections in connection with Doubling work in Katni - Singrauli section and Design, Alterations, Supply, Installation, Testing & Commissioning of Electronic Interlocking based Signalling System at **UP & DN IBS** between **NMWP & NKJ C Cabin** alongwith associated works at adjoining stations/sections and Alteration & modification at **NMWP & NKJ C cabin** in connection with Grade Separator work at Katni alongwith associated works at adjoining stations/sections.

1.2 IRCON proposes to award the work of **"**Design, Alterations, Supply, Installation, Testing & Commissioning of Electronic Interlocking based Signalling System at UP DN IBS between NMWP & NKJ C Cabin alongwith associated works at adjoining stations/sections and Alteration & modification at NMWP & NKJ C cabin in connection with Grade Separator work at Katni alongwith associated works at adjoining stations/sections. Design, Alterations, Supply, Installation, Testing & Commissioning of Electronic Interlocking based Signalling System at Bargawan & Majhauli alongwith associated works at adjoining stations/sections in connection with Doubling work in Katni - Singrauli section"

2.0 GENERAL:

2.1 The Signalling system shall be designed, supplied and executed to comply with the existing operating principle, rules and regulations of Indian Railways.

2.2 Indian Railways standards shall be adopted but all the design shall be checked and verified by the IRCON/WC Railway.

2.3 Technical Specifications contained herein shall be read in conjunction with other Tender conditions as specified in tender document.

2.4 All the materials shall be procured from RDSO approved vendors only. The material for which vendors are not approved by RDSO or do not have RDSO specifications shall be procured from reputed firms as per practice followed on Indian Railways with prior approval from IRCON/WC RAILWAY.

2.5 In the BOQ, items required for the completion of the work are detailed up to a reasonable level. However, it is not possible to describe each item to the minutes detail. Contractor must understand that sundry supplies and works such as supply of connecting wires, fuses, fasteners, supports, mounting, consumables etc. and related jobs of blacksmith, carpentry, fitting, lacing and dressing etc. required for execution of work have to be carried out as part of the relevant items of the BOQ. The rates mentioned in BOQ are inclusive of such items, hence nothing extra shall be payable on such account.

2.6 Any addition/alterations in the wiring of Signalling Interlocking System i.e. relay racks, VDU, cable termination racks, power rack, power supply system and apparatus cases should be carried out by the Contractor free of cost during testing/commissioning.

2.7 In case of any alteration in the approved Signalling Interlocking Plan, before commissioning, no extra cost shall be paid for extra requirement of indoor wiring

materials like relays, wires etc., design and alteration in circuits. The SIP provided herein are indicative. The contractor shall obtain approved SIP's from IRCON/Railways before execution of work. If there are any amendments/ alterations in SIP, before commissioning the contractor shall make the necessary alternations/additions in software & hardware of the EI system without any extra cost. Any additional work on revision of SIP because of corresponding revision in approved ESP, will be paid extra at mutually agreed rates.

2.8 Specifications are intended for general description of work, quality and workmanship. Specifications are not, however, intended to cover the minutest details and every aspect.

2.9 In the absence of any definite provisions on any particular issue in these Technical Specifications, reference may be made to the latest Codes, Manuals and relevant Specifications. In case of any dispute arising out of interpretation of above, the decision of Engineer shall be final and binding on the contractor.

2.10 This Specification covers the standards to be adapted for broad gauge railway track system.

2.11 Wherever Indian Railway standards are specified, they shall mean the latest revision, amendment, or supplement and shall include all directives, memorandum bulletins and such other stipulations as may be issued by the Indian Railways and/or the Railway Board as well as the Zonal Railway from time to time.

2.12 All modification work at station if any, shall be done after obtaining due permission from Railway & to ensure the smooth operation of interlocking & Communication system without any disruption. If any block/disconnection is required for necessary modification as defined in the scope of works, it shall be planned in a manner to execute in minimum possible time after following due procedure of the Railway.

3.0 SCOPE OF WORK:

The Contractor's scope of work shall include, but not limited to:

Design, Alterations, Supply, Installation, Testing & Commissioning of Electronic Interlocking based Signalling System at UP DN IBS between NMWP & NKJ C Cabin alongwith associated works at adjoining stations/sections and Alteration & modification at NMWP & NKJ C cabin in connection with Grade Separator work at Katni alongwith associated works at adjoining stations/sections. Design, Alterations, Supply, Installation, Testing & Commissioning of Electronic Interlocking based Signalling System at Bargawan & Majhauli alongwith associated works at adjoining stations/sections in connection with Doubling work in Katni - Singrauli section

The Distributed EI system with one central location and two end Cabin / Goomties shall be provided at Bargawan. At Majhauli station there will be Central EI to cater for field gears.

At Majhauli the existing Metal-Metal Relay Interlocking is to be replaced with new EI system. Work of 25 KV AC railway electrification is in progress on the section, and installation of all S&T equipment's planning, design & drawing along with execution shall

be planned & executed accordingly.

The scope includes Design, Supply, Installation, Testing and Commissioning of Indoor equipment like EI, MSDAC, HASSDAC, BPAC, UFSBI based block panel, IPS, Data loggers, CT rack, Relay rack, Relays, ELD, Fire alarm system, IOT, VHF Communication System, Ducts and Accessories for OFC, OFC Transmission System, Tools & Plants etc. for commissioning of all signaling system as per enclosed yard layout in Drawing section. And outdoor work like trenching, Cable laying, termination of cables, Earthings, Point machines, Signals, Location boxes, LC gates, MSDAC, Painting, Dismantling Work, etc.

The scope also includes: -

(i) Supply, Installation, Testing and Commissioning of Automatic Fire Detection & Alarm System (RDSO type) at Majhauli & Bargawan & UP DN IBS between NMWP & NKJ C.

(ii) Deleted

(iii) Deleted

(iv) Design, Supply, Installation, Testing and Commissioning of Remote Diagnostic and Predictive Maintenance System (IOT) at Majhauli & Bargawan.

3.2 **Major activities are given as under:**

a) Supply of SSI/EI equipment complete (Hot standby configuration) conforming to specs given in the BOQ with latest amendment & directive issued by Railway Board & RDSO, as applicable on the date of supply/installation of the SSI equipment. Complete interface equipment between SSI & outdoor gears and SSI and dual VDU.

b) Supply, Installation, Testing and Commissioning of Indoor work for SSI/EI system including design and drawing, UFSBI based block panel, BPAC, HASSDAC, IPS, Data loggers, CT Rack, Relay Rack, Relays, MSDAC, ELD, LC Gate, Fire Alarm system etc. at various stations.

c) The operations of all field gears are to be done from dual Video Display Unit terminal of industrial grade as per latest RDSO specification with latest guidelines provided at a central place at the station. The EI/SSI system should be able to interface to dual VDU. The complete interlocking system shall work from dual VDU in accordance with Selection table in a failsafe manner.

d) Networking between central EI location and VDU location will be through OFC cables with route diversity arrangement. All the cables and connectors, switches, patch chord etc. for the same to be provided by the contractor.

e) Track vacancy detection of complete yards shall be done through Digital Axle Counter (Multi-section type).

f) Any other material/equipment/accessories required for installation & commissioning of the complete EI system to function efficiently, including supply of protocol converter for interfacing of external Data Logger with EI System.

g) Excavation of Trench, cable laying & backfilling, Testing and Termination of under-

ground Signaling and Quad Cables including termination, testing & all protective works. It also includes Supply, Installation, Testing and Commissioning of MSDAC, Points and Point machines, Signals, Location Boxes, LC Gates etc.

h) Design drawings and preparation of cable route plan, cable core plan, SWR, SWRD, Panel Diagram, Interface design, Applications logic, FAT, SAT, Bell testing, cable termination plan, wiring diagram of various circuits etc. as per extent practice of Railway.

i) Supply, Installation, Testing & Commissioning of Maintenance Free Earthing, & Normal Earthing as per schedule.

j) Supply, Installation, Testing & Commissioning of Remote Diagnostic and Predictive Maintenance System (IOT) as per schedule.

k) Removal, Shifting/ lifting of existing location boxes/ signals/ Track lead boxes, junction boxes etc. along with foundation to adjacent place to facilitate earth work/ clearing infringement.

l) The work is to be carried out in accordance with Interlocking Plans for the station issued by West Central Railways. All works related to any alteration in the SIP, without alteration in approved ESP of that station, during the course of execution of this work, shall be carried out by the Contractor expeditiously without any extra cost wherever additional equipment is not required. All alteration owing change in approved ESP, shall be paid extra at mutually negotiated rates. In case of increase/change in quantity of equipment, design & circuit alteration shall be done without extra cost whereas additional equipment cost may be paid.

m) Supply of all manuals, as planned & completion drawings etc.

n) Cleaning, painting and lettering of various gears as advised by engineer.

o) Temporary work, if required, for Installation, Testing and Commissioning of the S&T gears at various stations along with associated section as the double line/ single line with absolute system of working is already in operation in the section.

p) All transportation, handling, stacking materials, watching protection of the listed material from the manufacturer's works to the sites of use.

q) Maintenance and supervision of various equipment for three months from the date of commissioning of station, as per details given in Para 40 of SCC.

r) Tenderer should note that the interface equipment/device for Trackside signalling gears and VDU panels to be supplied should be complete and compatible with the signalling equipment, in use for Interlocking on WC Railway. The contractor shall ensure that the interface equipment match with the outdoor signalling equipment provided, be it through provision of any additional equipment required and/or any work required to be done.

s) Any other work required for completion of the work under this contract as per direction of Engineer-in-charge.

t) Training for operation, maintenance and troubleshooting of EI and other S&T equipment etc.

u) Preparation and planning of NI, Pre-NI, Post NI work, simulation panel arrangement for the same to complete the complete work. Making lighting and power arrangements for night working as per instruction of site engineer.

v) Extension of 230V selected power supply from Auto Changeover Panel to IPS room and to various S&T equipment with suitable power cable for the same.

w) The digital information between Central EI and its peripherals and also between two Central Evaluator of DAC and wheel sensors will be transmitted through duplicated/diversified routes.

x) To ensure preventive measures (SOP) issued by central/state government from time to time to contain spread of COVID-19.

3.3 The EI system shall be scalable and designed in such a way that it will be possible to use the EI system provided for future modifications in the yard with minimum alteration works in Hardware and Software of EI to reduce NI period to minimum possible time.

3.4 In case of any ambiguity or clarification regarding activities to be executed under scope of work, decision of employer shall be final and binding on the contractor/firm.

3.5 Safety is the responsibility of the Contractor and his staff / employees/ workmen engaged/ deployed for execution of work under the Contract, individually and collectively. For this purpose, the Contractor staff means and includes all his associates and sub-contractors / vendors/ sub-vendors and their staff/ employees / workmen deployed for execution of the work covered under the contract. The Contractor shall ensure that his workmen participate in the safety awareness, health care and safety training programs whenever such programs are organized by the employer or the Contractor. The Contractor shall take suitable measures like use of Flags /Banners etc. while working in the vicinity of Railway track and use all possible means to ensure the smooth movement of train and various instructions issued by Ministry of Railway time to time in this regard shall be followed by the Contractor.

3.6 While executing the Contract, the Contractor / his supervisor has to ensure safety of the surroundings with regard to employer's work place/ site and other contractor's men/ machine/ materials/ system etc.

3.7 The Contractor's scope of work shall include, but not limited to execution of work/ contract, adequate safety arrangements for men machinery etc. engaged during the execution of the Contract.

3.8 Since this is joint work in which completion of the work depends upon the progress of Engineering Department. However, the completion period of the existing work is **06 months** from the date of issue of letter of acceptance with following milestone.

SL	Station/Section	Milestone/Completion

NO.		Period
1.	Bargawan	D+3 months
2.	Majhauli	D+4 months
3.	UP DN IBS between NMWP & NKJ C & alteration and modification at NMWP & NKJ C in connection with Grade Separator work.	D+6 months

The contractor should mentally prepare to mobilize manpower and materials including drawings etc. to complete the work within stipulated joint target of Engineering and S&T. The contractor shall be ready to deploy adequate no. of competent Engineers / qualified staff at short notice as per requirement of site, otherwise penalty clause will be dealt as per clause 17 of IR GCC Part-II, April 2022.

3.9 Since the Supply and Execution of the work by the contractor is to achieve the end objective of providing suitable equipment and facilities to the specifications given in the tender for the ultimate objective as detailed in the tender, the tenderer shall give unqualified and unconditional guarantee that the supply of materials and work as designed and/or executed by him will achieve the desired objective and that in the event of the performance of the system not complying with the end objective or with the specifications, he shall provide further inputs to enable the Railways to realize the end objective with full compliance of the specifications contained in these documents and no additional payment will be made to the contractor for the supply of any additional inputs required in this regard. Delivery of material is to be synchronized with usage at site.

3.10 The contractor shall do all the necessary co-ordination during CRS sanction including paper submission, required number of copies of documents etc. No additional payment will be made to the contractor.

3.11 Annexure-VI of GCC pertaining to bid capacity is not applicable in the present tender.

3.12 Agency should visit the site before submission of their bid to understand the existing Rail Infrastructure and site conditions.

4.0 SUPPLY OF MATERIALS BY IRCON:

4.1 Contractor shall make his own arrangement at his own cost for all material required for the execution, completion and maintenance of all items of work included in his scope of work to the complete satisfaction of the Engineer/ Employer. Engineer shall not supply any material nor shall assist for procurement of any material required for execution, completion and maintenance of work. The contractor shall bear the cost of loading at Engineer stores, transporting to site, unloading at site and storing safely under cover, as required. This is applicable only for the material supplied by the contractor in this contract.

For transportation of IRCON's material from locations other than five stations where work is to be done, loading/unloading and freight changes shall be reimbursed by IRCON at actuals on submission of bills in originals.

4.2 Before the start of work, the Contractor shall give a month wise schedule of requirement of the above material along with indemnity bond indemnifying Engineer against any loss/damage to the material.

4.3 For stacking and storing of the material issued by Engineer, Contractor shall, at his own cost, build suitable warehouse at the site of work and make necessary arrangements to ensure that the materials do not get damaged.

4.4 The Contractor shall be liable to render full account of all the material issued by Engineer and keep a proper record regarding their use which should be made available for inspection whenever required.

4.5 If any material issued by the Engineer, is in excess or wasted or damaged or lost or otherwise, the recovery for the same shall be made from the Contractor's dues.

5.0 SYSTEM DESIGN:

5.1 GENERAL

General	Design, Alterations, Supply, Installation, Testing & Commissioning of Electronic Interlocking based Signalling System at UP DN IBS between NMWP & NKJ C Cabin alongwith associated works at adjoining stations/sections and Alteration & modification at NMWP & NKJ C cabin in connection with Grade Separator work at Katni alongwith associated works at adjoining stations/sections. Design, Alterations, Supply, Installation, Testing & Commissioning of Electronic Interlocking based Signalling System at Bargawan & Majhauli alongwith associated works at adjoining stations/sections in connection with Doubling work in Katni - Singrauli section
Type of Interlocking:	STD.II (R), Electronic Interlocking with dual VDU
Block Working	Absolute Block system working in the section.
Power Supply System:	Integrated Power Supply System at each station, as per attached Tentative drawing, and any modification to which will have to be adhered to without extra cost)
Signals	LED based signals.
Axle Counter	MSDAC
Data Logger	At all EI Rooms, End Cabins.
Point Operation	Electric Point Machine

Note: In case of any failure during defect liability period/warranty period, engineer of respective original equipment manufacturer should be arranged by contractor at his own

cost to rectify the failure.

5.2 Scope of design shall cover complete Signalling System design including design of LC Gate if any. It mainly includes but not limited to:

a. Detail survey of Bargawan, Majhauli, NMWP & NKJ C in block section along-with associated works at adjoining stations/sections.

b. Designing of Selection table/Route Control chart, Interface circuits, Application logic Equivalent circuits, Cable Core Plan, Cable Route Plan, MSDAC, CT rack chart, relay disposition chart, signal lighting circuits, point operation circuits, location termination chart, location plans, block working, station working rule, station working diagram, circuit diagrams, design etc. Approved Signal Interlocking Plan (SIP) will be provided by IRCON. Before start of EI and other system design and drawings work, contractor shall take approval of IRCON/Railway.

c. Detail load calculation for Integrated Power Supply System including battery capacities to validate the IPS block diagram. This is not required, if the IPS block diagrams are approved by WC Railway.

d. Any other calculations as required by IRCON/WC RAILWAY.

Note: All Drawings/Circuits shall be signed by Licensed Signal Engineer/Ex Railway Officer not below the rank of Dy. CSTE.

6.0 DRAWINGS & DOCUMENTATION:

6.1 The contractor shall prepare a complete set of following “as planned “documents in duplicate for the complete scope of work and submit to IRCON/WC Railways for approval.

(i) Room Equipment layout plan for Equipment/Relay Room/EI Room, Power Rooms, ASM / SM’s Room etc.
(ii) Selection Table
(iii) Complete set of Circuit Diagrams
(iv) Station Working Rule Diagram
(v) VDU Diagram
(vi) Relay Contact Analysis Chart
(vii) Details of contacts to be fed to data logger as input
(viii) Fuse Particulars
(ix) Relay disposition chart
(x) Relay particulars
(xi) Condensers and Resistance Particulars
(xii) CT rack termination chart
(xiii) Location wiring diagram, termination and cable chart
(xiv) Relay contact-to-contact wire list chart both page wise and rack wise
(xv) Power supply wiring diagram
(xvi) Power supply load calculation details.
(xvii) Relay Interlocking design
(xviii) Point operation indoor and outdoor wiring circuits including KLCR circuits
(xix) Signal unit lighting circuits
(xx) Cable Route Plan with Location placement diagram over yard layout
(xxi) Cable Core Plan/ Location/JBs Particulars
(xxii) DP Plan for MSDAC system/Track Circuit Bonding Plan

(xxiii) Earthing Particulars
(xxiv) Station Working Rules & Station Working Rule Diagram (SWRD) with Board.
(xxv) Interface & logic circuits along with outdoor circuits like point circuit, signal lighting circuits etc.
(xxvi) Detailed circuits of Axle counter system.
(xxvii) Channeling Plan for Telecommunication.
(xxviii) Any other drawing as required by client/ WC RAILWAY.

NOTE: Station Working Rule Diagram board for station master's room should be made of white sun mica sheet over 12 mm thick particle/laminated/wooden board covered with 5 mm thick perplex transparent sheet in Aluminum steel frame of adequate size as per WCR practice.

6.2 All the drawings/explanations etc. shall be in English Language, and all abbreviations must be explained.

6.3 Drawings submitted shall be of size as per extant practice of the Indian Railway. As per the current practice and instructions, Application Logic Equivalent Circuit, Interface circuit, location charts and selection tables shall be prepared and submitted in A-3 (297mm x 420mm) size of paper/tracings and other plan on A-2 (420mm x 594 mm) size of paper/tracing.

6.4 Tracing paper for A-3 size drawings/circuits should be double matte film of 100 micron or better and for A-2 size drawings 75 micron.

6.5 Contractor shall neither be allowed to do wiring nor shall start the wiring at site without approved copy of the circuit diagrams

6.6 Before commissioning the system, following reports/charts (as applicable) shall be prepared by Contractor and jointly signed by Contractor and engineer.

- MSDAC/Track circuit History card
- EI pre-commissioning check list
- IPS pre- commissioning check list.
- Solar Photovoltaic pre- commissioning check list.
- Data logger pre-commissioning check list
- Battery history card
- Signal History card
- Point History card
- Cable insulation records
- Earth resistance records
- Any other record as per requirement of client/engineer

6.7 Immediately on completion of work, but not later than one month after commissioning of station, contractor shall prepare station-wise as-built documents, such as Indoor Circuits (Selection Table, Interface Circuits & Application Logic, Equivalent Circuits, Relay Contact Analysis Chart etc.), Outdoor Circuits (Cable Route Plan, Cable Core Plan, Bonding Plan, Location Chart etc.), with Licensed software of latest version of Auto CAD and shall submit for approval. After getting approval, following set shall be prepared and submitted.

I. One set of documents on tracing paper.
II. Six sets of documents on good quality of paper in binding form/transparent Folder.

III. Soft copies of all documents in CDs/DVDs.

6.8 Alteration column should be shown on every sheet and sufficient space should be left for further alterations on each sheet.

6.9 All costs associated with the provisions mentioned above shall be deemed to be included in the contract price.

6.10 The contractor shall do all the necessary co-ordination during CRS sanction including paper submission, required number of copies of documents etc. No additional payment will be made to the contractor

6.11 All the drawings shown in Section XI of tender documents are indicative. IRCON/Railway reserves the right for alteration of these drawings as per requirement during execution of works. The contractor shall take prior approved copy of these drawings before starting the design & drawings of the EI system and execution of works.

7.0 DOCUMENTATION:

7.1 Contractor shall supply two sets of the following documents:

7.1.1 Instruction Manuals from original equipment manufacturer.

7.2 Installation and Maintenance Manual including Dos & Don'ts from original equipment manufacturer.

7.3 Maintenance procedures shall cover the diagnosis of faults, testing and set-up adjustments, replacement of units, routine mechanical servicing and operation of test equipment.

7.4 All documentation shall be in English language.

7.5 All documentation shall carry a unique issue number and date.

7.6 Detailed explanation of working of each circuits/Relays (Indoor- outdoor) in Standard booklet form on good quality paper of A-4 size to be prepared and supplied by Contractor.

8.0 INTERNAL WIRING:

8.1 All the wiring material i.e. wires, fuses, fuse bases, ladder etc. required for wiring of EI relay room, power room, IPS room etc. shall be supplied by contractor.

8.2 Relay circuit wiring should be carried out using 16/0.2 mm dia single core, multi strand, and flexible annealed tinned copper wire to IS: 694.

8.3 Indoor execution item in Schedule-C & Schedule-H shall include complete indoor wiring i.e. wiring of CT rack excluding termination of outdoor cable, installation and interfacing of VDU, interfacing of maintenance console, interfacing of data-logger and Axle-counters etc.

8.4 The ladder arrangements provided should be of suitable capacity and manufactured by the contractor, fixed neatly and firmly with proper supports. Cable details, functions

allotted to each core and terminal numbers should be prepared and handed over to the Railways.

8.5 All indoor cables required for wiring of various equipment, assemblies, power supply, racks, etc., like indoor cable 1x60x0.6 mm dia, 1x40x0.6 mm dia, 1x24x1 mm dia, tinned jumper wire 1x0.6mm dia, multi-strand 1x2.5 sq mm, insulated flexible wire 16/0.2 mm, 1x10 sq mm, 1x25 sq mm, 1x16 sq mm, 1x6 sq mm, jumper wire 1x1 mm dia etc., conforming to specs IRS: S:76/89 with latest amendments shall be supplied by contractor

8.6 All connections/terminations should be tested by the contractor and after satisfying himself and then to be tested jointly with IRCON's representatives.

8.7 Any addition/alterations in the wiring of relay racks control panel and cable termination racks, power rack, battery room and in apparatus cases involving safety should be carried out by the contractor at free of cost during testing/ commissioning and for a period of 3 months after commissioning of system.

8.8 Nylon cable tags should be used for dressing of cables wherever required.

8.9 Power distribution within EI/relay room from rake to rake should be done by 10 Sq. mm Copper conductor & as per RDSO/Railway practice.

8.10 Power supply should be extended from power distribution board to relay room shall be used 25 sq mm wire for connecting Batteries from IPS, 16 sq. mm power cable is to be used for wiring of 110V DC, 110V AC & 24V DC (internal) and for balance power supply 10 sq, mm power cable is to be used with copper conductor.

8.11 Complete Indoor material shall be supplied, installed, wired tested & commissioned by the contractor under Sch-A of BOQ. Items to be supplied are as under but not limited to-

i) Microprocessor Equipment (having hot standby system provided with facility of automatic changeover), other cards and assemblies/sub-assemblies.

ii) All type of interface Relays such as TPR's, WKR's, WCR's, KLCRs, ECR suitable for LED signals, point operation of Relays, other interface Relays etc. shall be as Railway Practice to suit 25 KV RE area.

iii) Industrial grade Operator Console min 52" VDU (2 Nos) & Industrial grade Maintenance console 42" VDU as per latest RDSO Guideline & technical advisory note (TAN), online Dot matrix printer with power supply etc. Also the furniture like table of reputed make etc. required for mounting the VDU shall be provided by the contractor.

iv) Equipment racks, Relay racks, Rack fixture mounting arrangements and accessories.

v) Interconnecting cables and interfacing equipment required for interfacing the EI with outdoor gears, Data Logger system, MSDAC, monitoring of Power Supply for IPS system, cable for simulation testing from EI Room to SM Room etc.

vi) Optical cables along with interfacing equipment.

vii) Protective Devices like Fuses, Lightning arrestors and surge protection arrangement, equipotential bonding as per latest RDSO guidelines, etc.

viii) All the consumables, wiring materials, fixtures, tag blocks of various sorts, mounting arrangements and necessary accessories to install and make the EI system

functional.

ix) Software as per design for Electronic Interlocking System conforming to latest versions of relevant RDSO specifications to suit enclosed Signalling Interlocking Plans (SIP's), including FAT, design documentation such as application logic interface circuits, selection table, route control chart etc.

x) Supply of Fuse Alarm System as per relevant RDSO specification.

xi) Supply, Installation, Testing and commissioning of the EI and other equipment of System shall be planned and executed to suit 25 KV AC.

xii) Documents/manuals as per RDSO Specification no. RDSO/SPN/192/2005 or latest.

xiii) 10% spares as mentioned in BOQ shall be supplied.

NOTE:

The EI shall be commissioned as per enclosed SIP. The bidder has to design, supply, install & commission the hardware & software for the station as per approved SIPs.

The EI equipment offered for the complete EI system shall be installed, wired under the supervision of OEM's Engineer & tested and commissioned by OEM's engineer as per latest guidelines of RDSO **Technical Advisory Note** & RDSO specifications. The Pre-commissioning checklist issued by RDSO for EI System will be prepared by OEM's engineer and signed jointly with Employer's Site Engineer. Before commissioning of EI, OEM will submit Site Installation Certificate to Employer by mentioning that EI has been installed, wired tested and commissioned as per latest RDSO Technical Advisory Note & RDSO Specification (i.e., by OEM).

The EI equipment offered for the complete EI system shall cater for 20% increase in field input quantities in future. The necessary hardware provided shall be such that it shall be possible to incorporate 20% increase in field input quantities without requirement of any additional hardware other than relays, cables etc.

9.0 CABLE TERMINATION RACK

9.1 Powder coated Main Cable Termination rack shall be complete with scaffolding, fixtures & accessories including square bars for mounting 8-way terminal / WAGO - make terminal blocks, ladders, string rods, frame, base assembly, insulators, J bolt, nut/bolts & fasteners (Bakelite strips), Rack arrangement etc. as per extant practice on WC Rly for Electronic Interlocking. Rack should be made of first class steel powder coated painting and rack manufacturer's certificate should be submitted. All runway for cables / wires shall be provided with PVC sleeve of proper size.

9.2 The CT Rack can be supplied & erected as per OEM's of EI requirement & Indian Railway practice.

9.3 Suitable cable ducts wherever required should be provided to bring all outsides cables to the termination rack. All the cables are to be neatly skinned, fixed on the cable bracket and terminate in order. The cable armours and the rack should be earthed. Internal wiring and termination particulars are to be written with paint.

9.4 Cable conductors of both ends of the station should be terminated separately on 4-conductor screw-less disconnect terminal blocks (0.4 sq mm- 4 sq mm).

9.5 The cable armours and the CT rake shall be earthed.

9.6 The incoming cables to the relay room are to be neatly arranged and fixed to the cable supporting and guiding rack.

10.0 RELAY RACK

10.1 Relay rack shall be Powder coated & as per EI OEM's requirement & WCR practice.

10.2 Not more than 48 relays of Q-style (8 rows of 6 relays) shall be mounted on 1-way rake. The last row of the relays on the relay rake shall be at least 600 mm above floor level. The clearance between two rows shall be 75 mm for visual inspection of contacts and cleaning purpose.

10.3 Neoprene rubber pads should be provided at the base to provide insulation as well as shock resistance to the rack.

10.4 Relay rake shall have space for to accommodate Minimum 10% Relay for future alterations.

10.5 The rack shall be fixed firmly on triangular bases after correct leveling. The base of relay rack is anchored to the ground by means of 'J' type foundation bolts 12x100mm with washer and spring washer.

10.6 The Relay rake should be fixed with minimum clearance of 90 cm from the wall.

10.7 The nomenclature of each relay should be painted both in front and rear side of each relay with contact configuration. The relay index sheet duly painted of details of relay and their position in the relay rack should be manufactured out of mica sheet and fixed in the relay room.

10.8 All circuits should be carefully protected by individual fuses in the relay room and locations grouped preferably to facilitate easy fault location. Fuses should be so arranged that they can be easily be placed without causing interference of fuses and the circuits in which they are used should be prepared and kept in the relay room. Fuses for all Signalling circuits should be of the non-deteriorating type and as per latest RDSO specification.

11.0 ELECTRONIC INTERLOCKING (EI) SYSTEMS:

11.1 The system should be designed, supplied, installed and commissioned as per relevant RDSO specifications with latest amendments and latest guidelines issued by RDSO/ Indian Railways.

11.2 The EI system at Bargawan will be distributed type having one central and two End Cabin/Goomty and Majhauli station will be Central EI to cater for field gears. The Cabin/Goomty should act as I/O gatherers for the central EI. They should be connected with each other in a ring network through two OFC cables with route diversity.

11.3 The System shall provide all the interlocking, control and indication functions as per approved interlocking plan, selection tables of the yard.

11.4 The system should be capable of working in conjunction with dual VDU.

11.5 The system shall have capability to interface with DAC, and data logger.

11.6 In case of any alteration in the approved Signalling Interlocking plan before commissioning, no extra cost shall be paid for extra requirement of hardware/material, labour and design of software**.** The SIP provided herein are indicative. The contractor shall obtain approved SIP's from IRCON/Railways before execution of work. If there are any alterations in SIP, before commissioning the contractor shall make the necessary alternations/additions in software & hardware of the EI system without any extra cost.

11.7 The contractor shall supply to the IRCON free of cost all software updates, data and specifications that may result from developments of/by him as suggested by RDSO in the period of currency of contract.

11.8 **The contractor shall supply to the IRCON all type of interface Relays,** such as TPR's, WKR's, WCR's, LED ECRs, Point Operation Relays, Interface Relays as per WC Railway practice to suit 25 KV RE area.

11.9 The system shall be provided in a dust protected cabinet.

11.10 Bidder has to supply, install, commission the hardware & software for the station. SIP and designing of software shall be done accordingly.

11.11 All indoor relays to be provided to suit 25KV RE.

11.12 Various type of protection/protective arrangements as given in RDSO specification no. RDSO/SPN/192/2019 Ver. 2.0 shall be provided by the contractor.

11.13 Industrial grade embedded fan less PCs along with Industrial Grade Monitor shall be used for EI installation for VDU & maintenance/diagnostic terminals as per latest RDSO guidelines & Technical Advisory Note (TAN) issued by RDSO.

Note:

The VDUs and PCs provided at SM Room and Maintainer's room shall be provided with furniture of reputed make as per BOQ for mounting them with sufficient space for other Equipment such as Registers, other stationery, Control phones, magneto phones, etc. and maintaining the aesthetics of the setup.

Based on attached SIP, a list of material to be supplied with make, quantity and rates shall be attached by bidder as an Annexure with BOQ. This list of material is only indicative. Contractor has to supply the complete material for the Commissioning of Interlocking System. This also includes supply of 10% spares as per BOQ. List of spares shall be attached as separate Annexure.

All accessories, even if not mentioned in BOQ, necessary to make the system functional for all stations, including supply of protocol convertor, if required for interfacing of data-logger with EI system shall be provided by contractor.

11.14 Portable workstation (laptop) to run along-with EI configuration tools, data inputs, simulation and functional testing, diagnostic, troubleshooting & commissioning of EI System should be as per the following specifications or better:

Software	All software should be licensed version.
Recovery CD	Containing station/yard data.
Make	Dell/Sony
System manual	Soft copy of Operation & maintenance Manual for hardware and software used in the system.

CPU	Intel core i5-8250U or higher.
RAM	8GB, 2400MHz DDR4
HARD Disk	1 TB, 5400 RPM
Sound card with speaker	As per OEM
DVD drive	DVD +/-WR
Operating System	Window-10 or latest, Ms office 2013 or latest
Anti-virus	Single user with CD/DVD
Wireless Network card	Intel Wi-Fi
Mic In	Yes
RJ45	Yes
USB Port	Min 1 x USB 2.0, 2 x USB 3.1
HDMI Port	Min 1 x HDMI Port (v1.4b) with 10Mtr.cable
Display	Min 15.6 inch display

12.0 DATA LOGGER:

12.1 Supply, Installation, Wiring, Testing & Commissioning shall be done as per RDSO specification no. IRS S 99/2006 (Amdt. 3) or latest, and to comply with latest guideline issued by RDSO / Railways. It shall monitor various analog input and complete digital inputs as per BOQ from EI through Protocol Converter & status of important Relay contacts through Digital input card along-with monitoring of Relay Room Door locking checking arrangement, commercial power supply monitoring arrangement & DG Sets, Interlinking & Networking of Data-logger as per WC Railway practice.

12.2 Protocol converter shall be of latest version.

12.3 In addition to conformance to RDSO spec, the Data Logger should comply the following:

a. In event of total power failure/inadvertent switching off, the data already stored in the data logger should not get lost and should be retrievable after resumption of power.

b. Data logger should have networking feature so that data logger contents as well as alarms and usual features can be monitored with a supervisory console from remote location.

c. Major alarm condition and unsatisfactory features which are to be extracted out of Data logger data should be programmed as per requirement of IRCON.

d. The supervisory software should be GUI based and MENU driven. It should be easy for the Supervisor to modify/ customize programmes to set a new alarm feature without help of the manufacturer/supplier.

e. Supervisory software should have facility to automatically generate MIS reports in easily comprehensible format. The reports so generated should be in Microsoft Word or Excel format for easy transportability.

f. The maintenance terminal should be connected to the Data Logger. Necessary interfacing arrangements for connecting maintenance terminal should be provided by contractor. Also, any interfacing equipment required for connecting data logger to Electronic system shall be provided by contractor free of cost.

12.4 The complete installation of data logger shall consists wiring, installation, testing, interfacing with maintenance console, supply & loading of all software as per requirement of client and Standard practice of Indian Railways.

12.5 The data-loggers at stations should be networked to Data-logger RTUs at IBS locations on existing dark fibers. All data at IBS locations should be transferred to the controlling station and available for analysis.

12.6 All software to be supplied by contractor and shall be original along with recovery CDs.

12.7 Maintenance Terminal with display key board, printer and shall be supplied as per OEM's specifications, following minimum specifications:

Make	Dell/Sony/HP
System manual	Bound copy of Operation & maintenance Manual for hardware and software used in the system.
CPU	Intel Core7i-860 or higher.
RAM	8GB or higher
HARD Disk	500GB or higher
Monitor(Industrial grade)	22 inch LED
Mouse	Optical scroll mouse
Sound card with speaker	As per OEM
Optical Drive	16XSATA DVD +/- RW Drive
Operating System	Window 10 or higher & Antivirus.
LAN card	10/100/1000 with additional Gigabit
Printer	Impact printer LQ-300+II or higher
UPS	i ball NIRANTAR UPS-1080V (1 KVA)
Computer table with chair	Godrej or superior

Note:

Data Logger shall be installed, wired, tested and commissioned by OEM's engineer as per guidelines issued by RDSO. The Pre-commissioning checklist issued by RDSO for Data Logger System will be prepared by OEM's engineer and signed jointly with Employer's Site Engineer. Before commissioning of Data Logger, OEM will submit Site Installation Certificate to Employer by mentioning that Data Logger has been installed, wired tested and commissioned by approved vendor of RDSO (i.e., by OEM).

13.0 INTEGRATED POWER SUPPLY SYSTEM:

13.1 Supply of SMPS Based Integrated Power Supply System for RE area with SMPS charger (suitable for 6-lines) as per specification nos. RDSO/SPN/165/2012 with latest amendments and as per the tentative drawing attached in Section XI of the Tender document. It mainly consists of but not limited to:

a) SMPS based float cum boost charger (FRBC) panel.
b) AC distribution panel.
c) DC distribution panel.

d) DC-DC converters for Axle counters, data logger etc.
e) Status monitoring panel for ASM's room.
f) LMLA stationary cells as per RDSO specification no. IRS: S-88/2004 or latest.
g) Battery racks (if required).
h) Tool kit.
i) Exhaust fan.
j) A set of spares as per RDSO specification.

13.2 Status monitoring panel shall supplied and installed in station master's room. The panel shall have LED indication and alarm with resetting switch conforming to RDSO specifications.

Block schematic diagram for supply of integrated power supply system is attached with this document. Current and voltage ratings mentioned in the diagram may change as per actual load requirement. Contractor should replace the module free of cost as per actual load requirement.

13.3 In addition to 110VDC for Point machines, two separate 110V DC supply for EI System as per RDSO guidelines.

13.4 All cables including power cables, connecting cables etc. required from battery to IPS, IPS to Relay room and ASM/SM Room's shall be supplied by contractor.

13.5 A standard tool kit of standard brand containing all type of tools required for maintenance of IPS shall be supplied along with IPS, and placed inside the IPS rack in a suitable bag.

13.6 Instructions in the Installation Manual of Original Equipment manufacturer (OEM) and relevant para of specn no. RDSO/SPN/165/2012 (Ver3.0) should be strictly followed.

13.7 Wiring, installation, testing and commissioning of IPS system shall be as per latest guidelines/check list issued by RDSO & by Original Equipment Manufacturer.

13.8 Earthing of IPS shall be as per RDSO specification. All the racks of IPS should be connected to REB (Room Earth Bar) by stranded copper conductor. REB should be connected to maintenance free earth of EI as per RDSO technical advisory note.

13.9 All the cables and wires used for wiring and interconnections of module shall conform to IRS-S-76/89/IS 694 of grading 1100 V. Aluminum wires shall not be used. The gauge of the wire shall be such that the current density does not exceed 3 amperes/ sq mm.

13.10 Fabrication and erection of battery stand (if required) out of MS angle 50mm x 50mm x 5mm in two steps of width 25cm each step, as per room requirement. The steps are to be completely provided with hard wood planks of size 25mm wide and 50mm thickness of suitable length fixed by 10 x 60mm bolts and nuts at intervals of not more than 300mm between two stands. The angles and hard wood are to be painted with acid proof black enamel paint in two coats. The battery stand should be given anti-corrosive black paint before installation of battery and should be mounted on porcelain insulation. The cells should be arranged neatly with sufficient working space for maintenance.

13.11 Cells are to be connected with suitable links sufficient to carry full load. Immediately, after connection, petroleum jelly should be applied on battery terminals. The wiring should be carried out by PVC 7/1.4mm copper wire/10 Sq.mm multi strand copper wire

and terminated in the terminal board in the battery room. The details of batteries and the capacity, circuit, date of installation etc., should be painted. The voltage reading should be recorded for each cell in a separate register, along with the guarantee certificate of the supplier and handed over to IRCON duly signed.

13.12 All connections terminations should be tested by the contractor and after satisfying himself and then to be tested jointly with IRCON's representative. Any alterations should be carried out by the contractor before commissioning of installation.

13.13 The date of installation and cell no. of a battery bank shall be marked on each battery. Initial charging of battery for IPS shall be in contractor's scope & all necessary electric power required for this charging shall be arranged by contractor at his own cost.

13.14 Red & Black coloured wires shall be used for positive and negative wires respectively. The wires shall be crimped/soldered to appropriate terminals. The battery terminals and connections shall be coated with petroleum jelly to prevent corrosion/sulphation. Grease/Vaseline shall not be used.

Note:
IPS shall be installed, wired, tested and commissioned by OEM's engineer as per guidelines issued by RDSO. The Pre-commissioning checklist issued by RDSO for IPS will be prepared by OEM's engineer and signed jointly with Employer's Site Engineer.

14.0 DG SETS: Not Applicable

15.0 BLOCK PROVING WITH BLOCK PANEL USING UFSBI and High Availability Single Section Digital Axle Counter (HASSDAC):

15.1 The Block working should be through Block Proving System as per RDSO Specn. No. IRS:S-105/2012(Ver.0) or latest with Axle Counter using UFSBI(Universal Fail Safe Block Interface) & Block Panel for Single line operation complete with Relays(QN1, QNA1, QT1/latch Relays, timers etc). It mainly consists of the following but not limited to:

a) Electronic Signalling Equipments: Universal Fail-Safe Block Interface complete with all accessories as per RDSO Specn. No. IRS:S-104/2012 (Ver.0) or latest.

b) Relay Rack with locking and sealing arrangement including Relays duly wired (as per RDSO/S/32020 – Latest Amendment).

c) SM's Panel/Block Panel with accessories as per RDSO Drg. No. RDSO/S/32019 (Latest Amendment).

d) Block Telephone with accessories as per RDSO's Specification No. RDSO/SPN/191/2006.

The entire system shall work on OFC/Quad. The block telephones also provided shall have the provision of working on OFC/Quad.

15.2 All materials required for commissioning of UFSBI system shall be supplied by the Contractor.

15.3 For data transmission on OFC/Quad for seamless operation of UFSBI over multiple media, Automatic Media Changeover system is to be provided as per RDSO spec. no. RDSO/SPN/147/2005 with Amendment 1 or latest.

15.4 Modem compatible with existing UFSBI System to work on backup media is to be provided along with it. The back media can either be unframed 2 Mbps E1 Channel from STM or on VF-channel from P-Mux or direct dark Single mode optic Fiber Cable upto 30 Km.

15.5 System shall be capable to work satisfactory for block section length. The equipment shall be compatible with push button tokenless block working system and shall be capable of working on quad cable /optical fiber cable systems. Any interfacing equipment required for working with OFC or quad cable shall be supplied by contractor.

15.6 System shall be capable to change over from quad cable to OFC and vice a versa automatically through Media change over arrangement.

15.7 The equipment shall be housed in a standard rack with a transparent front panel. The rack shall have provision for natural ventilation. Ventilation openings shall be louvers of less than 3mm size covered with wire mesh for protection against entry of rodents, lizards etc. The rack should be corrosion free. The protection shall conform to IP63 type protection. The front & backsides of the cabinets shall have the facility for completely locking and sealing the equipment.

15.8 In case of disruption of communication link between two stations or failure or interface equipment, there shall be no out of correspondence in indications of the block instruments at two stations.

15.9 A reset button with a veeder counter shall be provided for safe resetting of UFSBI when the system goes to an error due to any major error.

15.10 The system shall be capable of working in non-air-conditioned environment.

15.11 The equipment shall be so constructed as to prevent unauthorized access to the system.

Note: Block proving System using UFSBI shall be installed, wired, tested and commissioned by OEM's engineer as per guidelines issued by RDSO. The Pre-commissioning checklist issued by RDSO for Block proving System using UFSBI will be prepared by OEM's engineer and signed jointly with Employer's Site Engineer.

High Availability Single Section Digital Axle Counter (HASSDAC):

15.12 High Availability Single Section Digital Axle Counter (HASSDAC) System with DUAL track sensor devices conforming to RDSO spec no. RDSO/SPN/177/2012 (ver.3) or latest. It mainly consists of the following but not limited to:

a) Dual Track Sensor device.

b) Supply of all Manuals, Maintenance Schedule etc.

c) Training and Technology transfer.

15.13 The installation, testing & commissioning shall be done by professionals of Original Equipment Manufacturer.

15.14 Commissioning of Axle-counter system shall be done as per RDSO pre-commissioning checklist, which shall be signed by OEM engineer and IRCON's engineer.

15.15 It shall be possible to modify the system configuration to suit yard layout changes at later stage.

15.16 The cable provided to connect wheel sensors to track side electronics, must be duly protected by HDPE pipes as per RDSO / Manufacturer's recommendations.

15.17 A combination of Hard Reset and/or Preparatory Reset and/or any other type of Reset may be used, as per requirement at site. All required material for this, except cables, shall be supplied by the contractor.

15.18 Axle counter should withstand the effect of lightening & surges incorporating lightening and surge protection as per RDSO spec. no. RDSO/SPN/144.

15.19 110V/24V/60 DC Power supply shall be made available by IRCON in Power Supply Room.

15.20 Earthing shall be as per RDSO specification.

15.21 HASSDAC(High Availability Single Section Digital Axle Counter) should be provided with its Tool Kit as mentioned below but not limited to:-

a) Portable Data Analyzer (Downloading Event Logger Data for analysis and report generation) - 1 No.

b) Pure Sine Wave Digital Multimeter Fluke Make (Model-1871) or Rishab Make(Model-28S)- 1No.

c) Train Simulator Mode 11TS267P)- 1 No.

d) Extender Card- 1 No.

e) Dummy Wheel- 1 No.

f) Ring Spanner- 1 No. each

g) Open End Spanner- 1 No. each

h) Socket Spanner with handle- 1 No.

i) Torque Wrench (Jaicom JPR 65 or equivalent 88NM)- 1 No.

j) Screw Driver no.902- 1 No.

k) Screw Driver no.935- 1 No

l) Marking Jig for drilling as applicable

m) Dummy Load to check Power Supply (Resistive)- 1 No.

16.0 CABLE LAYING:

16.1 CABLE PLAN

Cable plan with distribution chart for each cable should be prepared for by the contractor leaving adequate spare conductors in each cable as laid down in SEM Part-II i.e. 20% of working conductors on each cable should be left spare up to outer most points and 10% beyond outer most points. The necessary approval of layout plan and cable core distribution chart etc., should be obtained from IRCON before start of cable laying work.

16.2 The work should be carried out according to the cable route plan approved by IRCON/WC Railway and should conform to the provisions of Indian Railway Signal Engineering Manuals & Schedule of Dimensions.

16.3 Cable drums mounted jackscrew stand shall be used for cable laying to avoid any kinks or pressure on the cable during cable laying.

16.4 Before the cables are laid, a visual inspection of cable should be made and it should be tested for insulation and continuity of cores. The cables shall be meggered before and after it is laid by the contractor under the supervision of IRCON. The insulation resistance of new cable should not be below 500M Ohms per Km at 20 degrees centigrade. The cable meggering record should be maintained in a cable meggering register and should be signed by contractor's representative & IRCON's official.

16.5 While rolling a cable drum for laying, the drum shall be supported on an axle running through its centre, the height of the axle being such that the end frames are free to rotate and do not touch the ground at any point. The cable shall be carefully uncoiled by gently pulling the cable assisted as necessary by carefully turning the drums, quick pulling of the cable or turning the drums shall be avoided at all costs. Each cable drum shall be braked while laying is in progress to prevent sharp bending or buckling, particularly when the cable coils are sticking together.

16.6 The following personnel shall be employed near the drum:

1 Man : for handling the brakes.
1 Man : for permanent observation of the uncoiling of cable.
2 Men : for uncoiling close to the drums.

16.7 In case where the wheels are not available or the area is not convenient for rolling the wheels along with route, the drum should be mounted on the axle at one end of trench and cable paved out. It should be carried out by adequate number of men ensuring that the insulation of the cable is not damaged and no kink/twist is formed. In no case should the drum be rolled on the road for laying of cables and the cable dragged on the ground for laying purposes. The cables should be laid gently into the trench and not thrown out under any circumstances.

16.8 When the cable drums are exposed to great heat before laying, then danger exists that the individual coils and layers stick together in spite of the half overlay. Special attention should be paid to see that no buckling of the cable occurs while pulling the cable. A man should stand near the drum and loosen the cable carefully by hand and shout a warning whenever the cable cannot be loosened.

16.9 Excavation of cable trench should be made in all kinds of soils including clearing roots of trees, rock etc., to a depth of 1.0/1.2 m and to a width of not less than 0.30 m.

16.10 During excavation of the trenches, the earth should not be thrown on the ballast. The earth should be thrown by the side of the trenches, away from the track. Complete excavated earth should be back filled in the trench after laying the cable and well rammed.

16.11 The bottom of the trench where HDPE pipe is to be laid shall be thoroughly prepared and shall be free from any stones. The bottom of the trench shall be horizontal and shall in no case be undulating. When the trench bed changes from solid to soft surface or from the bridge to soft soil, tamped fill at the transition point shall be provided so that HDPE pipe/cable is not pressed against the edge of a hard surface.

16.12 It is desirable that the excavation of trenches is not done in long lengths and does not remain uncovered overnight. It is preferable that trenches are dug, cable laid and refilling done on the same day.

16.13 Wherever rock formation is encountered and trenching cannot be done to a depth of one meter, the cutting of rock from ground level to 200mm to be done and protective measures to be taken to avoid damages of cable as per attached drawing.

16.14 A distance of approximately 10 cm. must be maintained between Signalling cables and Telecommunications. Wherever Power Cables are to be laid along with other cables, approximately five bricks are to be laid lengthwise for separating Power Cables from other Signalling Cables.

16.15 Signalling/Power cables should be laid as close to the track as possible in the station limit but not less than 3 m from the nearest track centre. The cable track separation distance both within station limits and in the block section generally not to exceed 6 meters or as per WCR practice. However, outside the station limits, the cables should generally be laid at not less than 5.5 meters from the centre or the nearest track.

16.16 If there is wide disparity between insulation of different conductors, the conditions of the cable should be thoroughly checked before permitting its use. Bedding and armoring should be inspected to see that there has been no damage during transit or in storage.

16.17 Cable laying should be commenced only after the relay room and cable termination box on the route at the respective stations are ready, and the cable should be duly terminated at the relay room/Location Boxes, immediately after the cables are laid. However, if for any reasons the cables are to be laid in advance, special care should be taken to ensure that the coiled cable near the relay room/location box is fully protected before and during final termination. The coiled cable should be fully covered with a layer of bricks in its entire length and provided with adequate number of cable markers. On no occasion the ends of the cable should be left unprotected. The cable ends should be sealed with cable compound.

16.18 Armoured fibre optic cable shall be drawn/blown into HDPE pipe already laid into the trench on the soil. The trenching and laying method is dependent on both ground configuration and nature of the soil at site.

16.19 From specifications and drawings, ascertain the route of the cable, requirements of the materials, labour and work period etc.

16.20 Cable laying should commence only after the depth and width of trench, quality of bricks and sand are jointly inspected by the Site Engineer and Contractor's representative and approved. The necessary record of such approvals should be maintained in a register.

16.21 The cable shall be gently drawn by pulling the cable which may be assisted as required by smoothly and slowly turning the winch. The cable shall not be twisted on any account.

16.22 At each end of the main cable/tail cable/power cables an extra coil length of 6 to 8 meters should be kept.

16.23 After the signaling cable/power cables are laid, one layer of country bricks of size 220mm x 100mm x 60mm approximately, should be placed closely in breadth wise, as per instructions of engineer in-charge.

16.24 Contractor should be fully responsible for making necessary preventive arrangements to avoid theft/damage to cables, during construction period and also up to handing over of station after commissioning.

16.25 Wherever signalling / power cable has to cross the track/road/ pipe lines/gas lines etc., proper protection as required by Site Engineer should be provided while crossing. The bottom of the trench should be levelled and got rid of any sharp materials. Trenches should be straight as far as possible and steep angles should be avoided. Alignment of the main cable route as well as track/road crossings will be indicated in the cable layout plan it should be ensured that:

a. The track road crossings to be carried out as per the Standard drawings.
b. The cable crosses the track/road at right angles to track as for as feasible.
c. The cable normally does not cross in between or inside points and crossings.
d. The track/road crossings to be carried out as per the standard drawings.
e. The work includes removal of ballast, cutting of trench across track/road at the places indicated by the Site Engineer and covering the trenches after placing DWC pipe / pipes in position.
f. HDPE/DWC pipes 120/103 mm dia. as per drawing should be provided for track/road crossings. For each road crossing, required number of DWC pipes should be provided depending upon the width of the road and number of cables.

16.26 Contractor should supply the completion cable layout/termination plan and cable route plan showing the distance of cables from the nearest track centre at every 30-meter interval and location of location boxes. The distance of location box from nearest track centre should be indicated.

16.27 **CABLE ROUTE MARKERS**: Refilling of the cable trenches with the earth and placing and concreting of cable markers as per standard drawings and WC Railway practice, or Electronic Markers, at an interval of 50 meter throughout the cable route, at places wherever route of the cable change, at cable joints and also on either side of track crossings, along the cable route should be done. The cable marker should be concreted to a depth of 0.3 meter from the top of the cable marker to avoid theft and should be provided with cement coping as per standard drawing.

16.28 It is advisable to employ the same people at the same place or job while cable is being laid.

16.29 **MINIMUM BENDING RADIUS:**

Cables should always be bent (or straightened) slowly, they should never be bent to small radius while handling. The minimum safe bending radius for cables should be **30 times** the diameter of the cable but wherever possible larger radius should be used.

16.30 **CABLE RESERVE:**

At following locations, it will be necessary to provide reserve cable for future possible use.

a. Where a change to cable line is expected, the reserve to be allowed depends on circumstances.

b. In freshly banked soil to allow for slipping of the bank an allowance of 30 cm. should be provided for every 10 mtr of trench (3 %). The cable should be laid in a sinusoidal form.

c. Near roadways, buildings and culverts, reserve of 5 mtr

d. should be allowed at drum end.

e. On each side of major girder bridge, a reserve of 10 meters should be left. For minor bridges, 5 meters shall be left.

f. Where remodeling works on culverts, bridges and track doubling work are going on, it may be necessary to keep loops of cable as an extra reserve pending finalization of its future route.

g. At the buildings, a loop of 10 meters in the cable pit.

h. At every joint, a loop of 10 meters on either side.

16.31 PRECAUTION DURING TRENCHING

16.31.1 **Traffic Safety**:

At the site of cable installation, take the under mentioned measures for traffic safety:-

a) Provide "WORK IN PROGRESS" plate wherever necessary at both end of the site and provide lighting devices.

b) Wherever necessary, provide suitable fences at the end and side of the trenches to keep vehicle and pedestrians away. At night, use warning lamps or equivalent at adequate distances.

16.31.2 CABLING BY HDD MACHINE/BORING METHOD

All works pertaining to Horizontal Directional Drilling (HDD)/Boring and trenchless cabling shall be done by using HDD machine. The depth of horizontal boring should be minimum 1 meter from the rail flange/road level.

16.31.3 PREPARATION FOR LAYING OUT CABLE

a) Check the drum number and length of the cable etc.

b) Entrust cable drum to the contractor after testing and to ensure that no mechanical damage of the Cable exists while handing over the cable to the contractor.

c) Place the cable jack (to support cable drum) on a flat surface.

d) Put cable spindle through drum and adjust cable jacks so that the drum may be clear 3-5 cm from the ground and that the spindle may become horizontal. Remove carefully lags of drum with bar or other means by taking care that no damage to the cable takes place.

e) Pull out nails from lags or bend them so that operation can be done safely.

f) Normally both end of the cable is provided with cable grip and pulling eye. In case, it is not already provided, fit the cable grip/pulling eye to the survival and pull the wires by means of shackle.

16.31.3.1 LAYING OF CABLE BY WINCH

a) When all the things are ready for cable laying, put rollers at a intervals of 2-3 meter in the trench. Put them in fix position with longer rollers support portion facing the direction in which cable is to be pulled.

b) At curved point put rollers in slanting position towards outside so that it may not tumble down during operation.

c) Stretch pulling rope on rollers and fix its end on to winch.

d) Use 2-3 tone winch and put it near the dug-up trench. The winch shall be fastened at the back with wire to a pile driven into the ground to prevent it from moving out of place due to pulling tension that may arise during operation.

e) After all is ready, post workmen at winch, cable drum and in the trench and using communication, pull cable slowly into the trench by means of winch.

16.31.3.2 LAYING OF CABLE BY HAND

a) The cable is stretched by workmen without the use of winch and rollers, 2 or 3 man on the pulling rope and other standing at intervals of 2 to 10 meters depending upon the cable weight.

b) When the cable is held on the shoulder, a suitable protection is needed to prevent its sharp bend.

16.32 The rates of laying DWC pipe shall be same as laying of HDPE pipe.

16.33 **DUCT INTEGRITY TEST (DIT):**

16.33.1 Duct Integrity Test (DIT) is to be carried before OFC cable blowing. Purpose of DIT is to ascertain and ensure the suitability of the duct for cable installation through jetting. It is first necessary to ensure that the duct into which cable is to be installed is continuous over the length of the duct. Some reasons for lack of continuity are:

- Missing Sections of Duct.
- Couplers not connected.
- Over lapping of Ducts.

16.33.2 The Air Test establishes the duct continuity. Air is introduced from one end of the duct. If air comes out from the other end of the duct, then it is established that the duct is continuous. If no air emerges, then the fault is to be identified and corrected before proceeding further. Duct overlap can lead to potentially very dangerous situation and should be corrected promptly.

16.33.3 Second step in the DIT Test is to establish that there is a clear passage for the cable to go through the duct. Possible reasons for lack of clear passageway are:

- Kink in the Duct.
- Blockage in the Duct.

16.33.4 These deficiencies are to be corrected before proceeding further. Kink in the duct may be caused at the duct laying stage when back filling may have been done without taking care to keep boulders out of the way and out of the trench. A fallen boulder on top of a laid duct can cause the problem. The kink may also have been caused at the de-coiling stage, when this is attempted without use of a de-coiler.

16.33.5 The kink in the buried duct is located through the shuttle Test. A suitable shuttle is first passed through the duct. The shuttle will get stuck at the point where the duct is either kinked or blocked. Next a transmitter is passed through the duct. It gets stuck behind the shuttle. The path of the duct is then tracked with a receiver. As the receiver passes over the transmitter, the signal from the transmitter is heard loud and clear. In this way the transmitter, and just a head the shuttle, and just ahead the kink is located. The spot is marked and the trench has to be dug up again. The boulder responsible for the kink is removed. The portion of the damaged pipe is cut and replaced with good duct of equal length. Joint with laid duct is made with push-fit coupler.

16.33.6 Cable installation through jetting can be carried out successfully only under a pressure of 10 bar. Before cable installation is attempted it is necessary to verify that the duct can hold this pressure. This is the major purpose of the pressure Test.

16.33.7 Possible reasons for failure of DIT pressure test are:
- Leakage at Couplers.
- Puncture in Duct.

16.33.8 Coupler leakage is caused by improper installation of coupler. A puncture in the duct can result from improper handling of the duct. A sharp-edged boulder if it should come to rest on top of the buried duct can also puncture the duct. Air leakage from the leaking coupler or the punctured duct is the tale sign of the problem which can then be rectified.

16.33.9 Thus, in summary, the DIT Test is conducted prior to cable blowing/pulling with a view to check and if necessary rectify so it is made suitable for cable blowing/pulling. The possible duct faults that may show up during the DIT Test process are:

- Missing sections of duct.
- Couplers not connected.
- Overlapping of Ducts.
- Kink in the Duct.
- Blockage in the Duct.
- Leaking at Couplers.
- Puncture in Duct.

16.33.10 These faults are to be corrected before proceeding further. The DIT Test consists of the following 4 important steps:

1) Air blowing purpose is to ensure that there are no discontinuities (or missing sections) in the duct.

2) Shuttle of a diameter 80% of the duct inside diameter and of 150 mm length is passed through the duct. Purpose is to check for bends, kinks, crush and deformity in the duct.

3) Sponge of a diameter two times the duct inside diameter, and length of 100 mm is blown through the duct. Purpose of passing, the sponge through the duct is to clean

the duct.

4) Pressure test is conducted at 5 bar pressure for 30 Minutes with maximum permissible drop of 0.5 bar.

16.33.11 **Air blowing:**

Air is introduced into the duct and a check is made at the end of the 2 Km section of duct. Possibilities are:

- Normal flow of air is perceived at the other end. So far, so good, proceed further with the DIT Test.
- No flow of air at the other end of the duct. Trouble is indicated, Leakage at couplers, puncture in duct, missing duct, duct overlap, blockage in the duct.
- Less than normal flow of air. Leakage at couplers, puncture in duct.

If there is no flow of air at the other end, check the pressure at the point where air is introduced into the duct. If the pressure is less than normal this would rule out blockage in the duct. It would indicate leakage from the duct or at a coupler location. Higher than normal pressure, would indicate in the duct.

The problem can be localized by opening the coupler at the 1 Km point and introducing air once again through the duct. This will help identify whether the problem exists in the first kilometer of the duct under check or in the second kilometer.

16.33.12 **Shuttle Test:**

Once the air test has been successfully concluded, a shuttle of a diameter 80% of duct inside diameter and of 150 mm length is passed through the duct. Purpose is to check for bends, kinks, crush and deformity in the duct. If the shuttle passes through successfully this confirms that the bends in the duct are gradual and there are no kinks or deformity that would hinder the progress of the cable during the installation process. The shuttle should pass through the 2 Km of duct length in a space of three minutes.

In case there is a problem and the shuttle does not emerge from the other end of the duct even after 5 to 6 minutes, then a transmitter is to be blown through the duct to identify where the shuttle is stuck. A receiver at the 1 km point will pick up the signal from the transmitter as it goes by, and in this way it will be known that the shuttle is stuck in the second kilometer of duct. If no signal is picked up then the problem would have been localized as existing in the first kilometer, shuttle, and the kink in the duct would be identified, and the duct can be suitably rectified.

Oftentimes the shuttle gets stuck due to a minor kink, and when the transmitter is blown the shuttle and transmitter both come out the same time.

16.33.13 **Sponge Blowing:**

Purpose of blowing sponge through the duct is to clean it. A sponge of a diameter twice the inside diameter of the duct, and 100 mm in length, is blown through the duct. The time required for the sponge to pass through the 2 Km duct length is three minutes.

16.33.14 **Pressure Test:**

The pressure test is conducted at 5 bar pressure. Over a 30 minutes period the pressure loss should not exceed 0.5 bar. Once this pressure test passed, the duct is pronounced ready and fit for cable blowing/pulling.

16.34 The following additional tools are required for jointing of the ducts and installation of optical fibre cable.

1) Rotatry Duct Cutter: This is required to cut the duct ends squarely without any burr or notch.

2) C-Spanner: This is required to tighten Plastic Coupler properly so as to ensure air/ water tightness as specified above.

3) Chamfering Tool: This is required to give slight chamfer to the ends of PLB Ducts, to facilitate installation of coupler for jointing purpose.

16.35 **Packing Requirement Of Duct**

1) The stores shall be supplied in duct coils of suitable size for delivery such that minimum inner bending diameter of the coiled duct shall be 20 times the outer diameter of the duct.

2) The duct should be sealed with tight end caps.

3) If transportation is by road, the air tight sealed duct shall be transported in a vehicle exclusively used for it and no other consignments shall be loaded with it in the same vehicle.

16.36 **CABLE DUCTS/ CHANNEL (POLYOLEFIN) FOR THE PROTECTION OF CABLES**

1. **Technical Specifications are as follow:**

Properties	Requirements
Width (Internal / External)	240mm/340mm
Height (Internal / External)	155mm/ 230mm
Weights per Mt/ PC (Including Bottom and top cover)	9.00 kg (Minimum)
Length per pc / per mtr -	1000mm (appx)
Material	Polyolefin / polymers/Engineering plastics
Fire Behavior	Fire Protection Class K 1 in accordance with DIN 53438 part-2
Breaking Load (Minimum)	≥ 10 KN at room Temperature
Thermal Characteristics (Type Test– Frequency 6 months)	Thermal stability from -30 degree to + 85 degree As per IS 9000- part- 2 & part- 3 :1977

Electrical Characteristics (Type Test– Frequency 6 months)	Dielectric Strength: 48 kV/mm as per IEC-60243-1-2013
Tolerance in Dimensions	2 %

2. The cable Ducts should be horizontally attachable to each other with male/female swallow tail connections with suitable detachable/ push fit cover.

3. The supplier of the cable Ducts should also provide required accessories / Earth pins etc. for fixing if required at the time of installations

4. The cable Ducts should have Predetermined breaking points / perforated opening / outlet on the sides for outgoing / removing of cables

5. Whenever required the supplies of the cable Ducts should provide third party Inspection and test reports

NOTE: Pre-Fabricated tray to be used to lay Signalling & Telecommunication Cables in station section and at locations where trenching is not possible due to congested Railway boundaries.

17.0 BRIDGE CROSSING:

17.1 On bridges, the cables are to be laid through GI pipe/HDPE pipe and taken through GI pipe on either ends suitably buried on both sides of the bridges for a sufficient depth so as to meet the bottom of the cable trench, then fixing the pipe in concrete of size 0.5m x 0.5m in both abutments. Separate pipes/troughs should be used for power/ signalling cables. Suitable supporting clamps should be manufactured as required by IRCON at the rate of 1 clamp/meter depending upon the type of girder. Before fixing GI pipes, perforated holes of 20mm dia should be drilled at an interval of 0.3 Mts. to avoid theft of GI pipes.

17.2 In case cables/cable is laid through trough, it should be filled in with cable compound / bitumen compound to prevent theft of cables. In theft prone area a special concreting arrangement should be developed in consultation with site engineer in both sides of the bridge from where cable leaves the pipe.

17.3 **Crossing of Cables from Foot Over Bridge**

Wherever it is possible cables should be taken from the foot over bridge for the purpose of bridge crossing. Cable should be laid inside DWC pipe of suitable diameter and the DWC pipe should be properly clamped to the FOB structure. It should be ensured the DWC pipe doesn't hang below the FOB structure.

18.0 LOCATION AND SIGNAL FOUNDATIONS

18.1 Foundation shall be as per approved drawings.

18.2 The work consists of pit excavation, casting foundations with bolts of adequate size having cement concrete of ratio of 1:3:6(cement, sand and ballast respectively) with stone ballast as per standard drawing applicable in WC Railway. The concrete proportion will be cured for a period of not less than 7 days.

18.3 Fine aggregate must consist of sand, stone ballast (not exceeding 40mm x 40mm size for location foundation and 25mm x 25mm size for signal foundation) and cement. The sand and ballast must be clean and free from soil, clay, shells, soft or flaky materials or any vegetable. Ballast must be washed when necessary to ensure cleanliness.

18.4 The top level of the foundations should be in level with the existing rail level or as per WCR practice.

18.5 The depth of the foundation below the ground level shall be 50mm minimum and foundation bolt shall invariably be used.

18.6 Sand used must be tidal river sand and must be free from any salts.

18.7 Water used for mixing must be clean and free from any oil, alkali, and acid.

18.8 Materials for concrete must be carefully and accurately measured for every batch.

18.9 Mixing must be done in a mixing trough or a M.S. Sheet which should not be more than half full at the time of mixing. Two men should use square ended shovels and not phowrahs. Water must be added by pouring, water must be continuous until all materials and water are thoroughly mixed and uniformly combined.

18.10 When batch if fully mixed, it must be used without any delay. The aggregate should be deposited in uniform layer not exceeding 15cms. Tamping and spreading of each layer to be done as to cause it to settle thoroughly in the form and produce a dense mass. Forms must be drenched with water before the concrete is placed against them and must not be removed in less than 36 hours afterwards.

18.11 A template for each foundation should be prepared suiting the holes in the base of the location box in order to hold the anchor bolts in position till the foundation is cured. The template should be removed before the top of the foundation is given fine finishing.

18.12 The exterior surface of the foundation should be finely finished leaving 4 cms of thread portion of the anchor bolt free to enable erection of signal post or location boxes. All foundations should be cast under the direct supervision of the Site Engineer of the work. Curing must be done for all foundation for not less than 7 days.

18.13 No payment should be made for any extra excavation carried out in the slope and width of the pit, including for foundations where soil is loose and pit is to be dug for more depth.

19.0 INSTALLATION OF LOCATION BOXES/APPARATUS CASES:

19.1 All Location Boxes should be erected on concrete foundation and plumbed. It should be clear of infringement when the doors kept open perpendicular to the track. All foundations should be plastered on all sides and earthwork should be made up to the required level. All the Location Box/battery boxes used should be painted on inner side with white paint before fixing the shelf planks and terminal board after a primary coating with red oxide and with aluminum paint after a primary coating with red oxide on outer side after installation at site. Location box installation will be as per practice of WC Railway.

19.2 Location boxes should be installed after applying bitumen at the bottom surface to avoid

corrosion. The Bitumen compound should be poured over bolts to achieve this purpose.

19.3 All Location Boxes should be provided with 'E' type lock arrangements. Contractor should procure material and fabricate for fixing of 'E' type lock if such provision did not exist on the Location boxes.

19.4 The Phenolic (Hylam) sheet grade P-3 as per IS 2036/1974 of size suitable for full location & half location shall be fixed on angle iron pieces inside the Apparatus Cases for fixing the M6 type ARA/ disconnected type /Wago terminals. The size of angle iron frame should be 25mmx25mmx3mm conforming to specification No. IS: 2062 or similar. Angle iron frame shall be secured by galvanized nut and bolts.

19.5 Square bars shall be fixed inside the Apparatus cases for fixing the Fuses, Relays.

19.6 The wires shall be connected to the ARA/Wago terminals using thimbles, sleeves etc.

19.7 The cables should be neatly skinned, bunched and terminated. All cores of cable should be terminated on the terminal board at locations and in Relay rack at the required places in the order as approved by Site Engineer. All the power cables should be provided with aluminium lugs using crimping tool.

19.8 After all the Signalling cables are taken inside the Location Boxes the side opening should be closed with masonry work and plastered. The inner side is then filled with sand and plastered with the cement.

19.9 Track relays, battery chargers, charged secondary cells, track feed resistance, telephone plugs etc., should be fixed neatly in the Location Box as required by the Site engineer if available in BOQ. The wiring should be carried out in a neat manner with PVC copper wires and terminated, bunched and tested. The relays wherever fixed should be fixed in such a manner that they can't be easily removed or tilted. Details of cable terminations and wiring particulars should be painted inside the Location Boxes door in addition to documentation. Contractor should procure and fabricate MS flats/angle for relay fixing, inside Location Box. The design of such fabrication will be issued by Site Engineer. Relay fixing arrangements should be firm and rigid to avoid any chance of vibration due to train movements.

19.10 Anti corrosive black paint to be coated inside the Location Box. Additional ventilation arrangements should be made. The date of installation, capacity and serial number should be painted on each cell and the inner side of the door. The record should be maintained in a proper format for each battery set as per railways laid down practice.

19.11 Petty materials required for fixing, clamping & mounting arrangement including wiring material (different types of wires etc.) for location boxes shall be supplied and installed by contractor.

20.0 TRACK CIRCUITS:

20.1 Track circuits shall be provided to conform to para-8 of IRS specification S-36/89.

20.2 The work includes alteration of existing DC track circuit to suit RE. Only cable from Battery/Relay in Location Box to TLJB shall be issued by IRCON from store. Rest of the material such as TLJB, track lead cable etc. shall be supplied by contractor.

20.3 Any alteration suggested by client to track circuits should be done by the contractor at his own cost.

20.4 The work includes bonding of rail joints, which shall made with 8 SWG GI soft wires 7.2 mm holes are to be drilled close to fish plates on the web of rail and bond wires are fixed by driving channel bond pin tightly. Two-bond wires clip is to be provided for each joint in

parallel. One bond wire clip is to be provided for each joint to keep the bond wire intact. In point track circuit, parallel jumpers/bond wires/cables shall be provided with proper supporting arrangements as per approved Track Circuit Bonding Plan.

20.5 TLJB boxes shall be fixed clear of infringement and the respective track circuit tail cable 2 x 2.5 sq.mm. PVC, copper conductor from the apparatus case shall be terminated. The connection from the TLJB boxes to the rail should be through insulated lead wires which should be fixed on the rail both at feed and relay ends. All the track lead junction boxes shall be fixed on 50mm X 75mm MS channel as per the Standard drawing**.** It should be painted and track circuits should be neatly numbered as required by WCR.

20.6 After completing the installation of track circuit, it should be energized, tested, adjusted and readings recorded in a register/track circuit history cards. The bonding and jumping plan should be prepared for each track circuit**.**

20.7 Battery links (lead) with suitable bolts and nuts should be used for connecting cells. Petroleum jelly is to be applied on terminals immediately after connection. The voltage reading should be recorded in a separate register and handed over to IRCON duly signed jointly by Contractor's supervisor & Engineer-in-Charge.

20.8 Track circuit work includes fixing of track feed and track relay equipments in the locations at each apparatus case. Track relay details shall be painted on the inner- side of the apparatus case door. PVC flexible copper wire shall be used for wiring the track relay and track feed equipment and finally terminated at the terminal block. For each track circuit, three/Four charged LMLA secondary cells of 80 AH shall be installed in the apparatus case and wired with 3/0.75 mm PVC copper wire. Anti-corrosive white paint shall be coated inside the apparatus case wherever the secondary cells are installed. Additional ventilation arrangements shall be done wherever necessary. Date of installation with capacity of cells shall be painted on each cell.

20.9 Testing shall be carried out as under

a. All the track circuits should be energized and outgoing TPR voltage checked.

b. Check whether cross protection wiring is done for TPR circuit.

c. Shunt the track circuit at various places on the track and check whether the track relay drops every time it is shunted (especially near fouling marks).

d. Check the correspondence between TR and TPR in relay room.

e. Track circuit should be adjusted properly and readings recorded. TSR value should be recorded.

f. Check whether the track circuit is protecting the fouling point.

g. Ensure that at least one polarity rail is in series connection.

h. Check up input AC voltage to the track feed chargers is sufficient and batteries getting charged.

21. SIGNALS:

a. Contractor shall supply Signal units as per RDSO drawing and drawing no. WC RAILWAY/S&T/SIG/01.

b. All the signal posts and signals should be installed clear of infringements as per schedule of dimensions**.**

c. The signal post should be securely fixed to surface base and erected on signal

foundation and plumbed. The gap between the signal pole and surface base should be filled up with lead wool or any other approved substance to avoid tilting. Multi unit colour light Signal units should be properly mounted on Signal post with or without route indicator. Soon after installation, the pole should be painted with aluminum/white enamel paint after giving a coat of primer and the Signal unit should also be painted as per the Standard practice of Indian Railways.

d. The signal post with offset bracket should be properly plumbed and fitted with ladder having a platform and guarding on the top. Necessary ladder supports as required should be provided.

e. To take the wires into the Multi unit, a vertical slot of not less than 25mm x 37mm in size should be made on the Signal pole. Suitable protection should be provided on the slotted pole before cable is taken through it and care should be taken that no damage to insulation of tail cable is caused.

f. Markers and number plates should be fixed wherever necessary as per signalling plan using suitable clamps. Signal No. has to be painted on the "Number plate" as well as on the door outside.

g. All fittings are to be tightened properly. Signal unit should be locked properly using hand cuff locks. The back cover of the signal should be crossed by white lines (X).

h. Wherever route indicator junction type or stencil type is to be erected, it should be mounted on the top of the Signal pole and a large off set bracket should be fixed with 'U' Bolts of 20mm dia 2 Nos. on the Signal pole for mounting multi unit colour light signal. A 21.5mm through hole should be drilled on pole just below the offset bracket and a through bolt provided to prevent the offset bracket from sliding down. The tail cable should be first terminated on the route indicator and separate wiring (PVC 3/0.75 copper) should be run to colour light multi unit signal from route indicator. The LED lamp lit on 110V AC, with inbuilt current regulator should be used for junction type route indicator.

i. Petty materials required for fixing, clamping & mounting arrangement including wiring material (different sorts of wires etc.) for Signals shall be supplied and installed by the contractor.

j. **CALLING ON SIGNALS/POST TYPE(DEPENDENT) SHUNT SIGNAL**

Offset bracket should be fixed with 'U' Bolts of suitable size on Signal pole for mounting Calling on Signals/post type shunt signals. A 21.5 mm through hole should be drilled just below the offset bracket and through bolt of diameter 20mm should be provided to prevent the offset bracket from sliding down. Vertical slotted hole not less than 25mmx50mm in size should be provided on the Signal pole to take tail cable. Care should be taken that no damage is caused to insulation.

k. **POSITION LIGHT SHUNT GROUND (INDEPENDENT) TYPE**

i. The position light shunt signal should be properly mounted on foundation casting with the cement concrete ratio should be 1:3:6 using stone ballast of 20/25mm size to be cast at location using anchor bolts of size as mentioned in the standard drawings.

ii. The position light shunt signal should be properly mounted on post and plumbed.

iii. Necessary earthwork should be made for each Position Light Shunt Signal as required by Engineer. The cables are to be taken through the post to the unit, skinned and terminated.

22. ELECTRIC POINT MACHINES:

a. Electrically operated point machines of IRS design should be fitted in level to all points as per signalling plan on long sleepers on extended gauge tie plate, clear of infringement as per the latest RDSO Drawing.

b. The point machine should be installed after cleaning both inside and outside the machine, after greasing/oiling to all moving parts. The point machines should be hand operated and, detection and motor-controlling contacts should be adjusted before taking to site. All unwanted openings should be covered with MS sheets.

c. The point machines should be fixed with proper size of hexagonal bolts, nuts and flat/spring washers with correct size of holes through the special sleepers to avoid lateral/ longitudinal play, on extended insulated Gauge Tie Plate.

d. All point connecting rods should be connected to point machines without any strain and with Min. Offset. All connecting rods should be in level and correct size of bolts and nuts should be used to avoid longitudinal play. Any changes in the connecting roddings during installation, which necessitates welding and offset should be carried out by the Contractor at site.

e. **Adjustment of Detector Contacts**: The point machine should be hand cranked to the end of the stroke to close the tongue rail. Insert 1.6 mm test piece between stock rail and switch rail at 150 mm from the toe of the switch and operate the point. Ensure that the detection contacts just make. A test piece of 3.25mm shall be inserted between switch and stock rail at a distance of 150 mm from the toe of the switch. The detector connection for the closed switch shall be adjusted till the appropriate detection contacts are just broken. The same shall be repeated at the other end of the stroke.

f. **Adjustment of Friction Clutch**: - Friction clutch should be so adjusted that slipping current is between one and half times to twice the normal operating current or specified by the manufacturer. The point machine de- clutch arrangement should be properly adjusted is that it works satisfactorily under condition of obstruction. The feed to motor should also be disconnected after a period or 9 to 11 seconds.

g. **Obstruction Test**: - The point driving rod and the lock connections of the machine must be so adjusted that with 5mm thick test piece obstruction placed between the switch and the stock rail at 150mm from the toe of the switch.

- The point can't be locked.
- The point detector contacts should not assume the position indicating point closure.

23. WARNING/ STOP BOARD / SIGHTING BOARD:

a. Warning board/stop board/Sighting board should be supplied as per drawing approved by IRCON/Railway and shall be erected and concreted at locations as indicated by site engineer and as per approved plan, and should be clear of all infringement.

b. These should be of retro-reflective design or painted with luminous paints.

c. All material like rail post and concreting material shall be provided by Contractor free of cost and painted as required by site engineer.

24. EARTHING & BONDING SYSTEM:

a. Maintenance free ring earth as per latest Technical Advisory Note (TAN) issued by RDSO & RDSO specification No. RDSO/SPN/197/2008 or latest shall be provided for all indoor equipment i.e. Relay/CT Rack, EI, IPS, HASSDAC, SDH etc.

b. Maintenance free earth (Single Electrode) as per specification No. RDSO/SPN/197/2008 or latest shall be provided at outdoor equipment, and to be installed for HASSDAC equipment as per OEM's requirement & instruction of Engineer in charge.

c. Normal Earth electrode shall be provided at the location as decided and approved by site engineer.

d. The Earth resistance at earth bus bar shall not be more than 1(one) ohm. If, it may not be possible to achieve earth resistance less than 1(one) ohm with one earth electrode/pit due to higher soil resistivity. In such case, provision of loop earth consisting of more than one electrode shall be done.

e. In case of loop earth consisting of more than one earth electrode, the distance between two successive earth electrodes shall be between 3 to 6 meter. The two successive earth electrodes shall be interlinked using 25x2 mm copper tape to form a loop using exothermic welding technique. Bonding of ring earth shall be as per typical bonding and earthing drawing issued by RDSO, copy enclosed.

f. The earthing lead shall be copper wire of minimum 29 sqmm cross sectional area (19 strands of 1.4mm dia).

g. Earthing for outdoor equipment such as signal, location boxes, LC gates etc. shall be as per RDSO drawing no. TCA 565 and earth resistance should not be more than 10 Ohm.

25. LIGHTNING & SURGE PROTECTION:

a. Grounding should be implemented to perform following functions:

- Limiting of touch voltage difference by proper bonding and grounding of panels, racks, enclosures, raceways etc.
- Providing low impedance ground fault current path to the power sources, so as to enable the actuation of over current protection devices.
- Reducing ground potential difference between various equipment to obtain a low and constant potential reference in order to minimize the effect of high frequency electrical noise on sensitive electronic circuits**.**

b. The equipment shall be suitably protected against atmospheric voltage surges both for common mode (voltage that appears between phase conductors and earth) and differential mode (voltage that appears between neutral & earth.

c. Lightning Dischargers shall not be located in the block Instrument but installed separately and shall be demarcating point for test purposes.

26. INTERLOCKED LC GATE:

a) Supply of Electrical operated lifting barrier complete set without hand generator, operating on 110VAC, with suitable boom locking conforming to specification no. RDSO/SPN/208/2012 (Rev 2.0) or latest); boom length as per site requirement upto 9.76 m (10 mtr approx). Spares shall be supplied as per RDSO specification.

b) This includes Supply of solid state Electronic Flasher 110VAC/24VDC operated,12 Volt Hooter 12 make Radix minda macony or similar /dual tone warning bell (Make: Access or similar) with flasher arrangement as per requirement of consignee and 20W horn and 15W amplifier, with operating voltage 24VDC for warning to road users at LC gates.

27. PAINTING & WRITING:

a. All Signalling equipment should be painted in accordance with colour schemes given for the respective item by Indian Railways or as per instruction of Ircon site engineer.

b. All writing work shall be done as per Standard practice of Indian Railways or as per instruction of site engineer of IRCON.

28. TESTING AND COMMISSIONING:

a. Tests shall be generally divided into three sections**:**

- Factory Acceptance Tests shall be carried out before the delivery of the plant / equipment/ software.
- Site Acceptance Tests shall be carried out after installation of equipment at site.
- Tests on completion

b. Factory acceptance tests shall be conducted at manufacturing place at the time of inspection of material/ testing of interlocking software.

c. Full testing facilities for testing of materials/ testing of software shall be provided by the contractor at its own cost.

d. **Site acceptance tests**

i. At least 15 days in advance of any particular site testing, the Contractor shall submit details of tests and details for the test equipment he proposes to use for that testing to the client/engineer for his approval.

ii. Functional testing shall be done at site with the help of simulation panel for all the signals with all routes, point operation, emergency point operation, route cancellation, emergency route cancelation as per selection table of the yard. It shall be possible to control all TPRs, NWKPRs/RWKPRs, CHLRs, KLCRs etc. from the simulation panel.

iii. Site acceptance test being conducted in the presence of client and engineer and shall include but not limited to:

i. Testing of Circuits, Power supply system, Points, Signals, track circuits, level crossing gates, crank handle etc.

ii. The insulation resistance of cables shall be checked and recorded. The identification of the cores shall be confirmed from end to end of each cable end; Tests on cables shall be completed and accepted by the engineer before the All fault indications and alarms shall be working correctly.

e. **Completion Test**

i. Faults detected during site acceptance test shall be rectified by contractor before the beginning of the tests on completion.

ii. Completion test shall be conducted with operating VDU for operation of each function. Completion certificate shall be issued only after successful testing as per Format for the completion certificated.

iii. To maintain the records of different S&T equipment and related gears suitable registers shall be opened and maintained by contractor during the period of testing and same shall be handed over to client/engineer at the time of handing over of station.

f. The different stages and procedures for testing of indoor and outdoor equipment are given below as guidance. However detail testing shall be done in consultation with client.

I. Stage -I Testing of Interlocking Logic.
II. Stage-II Testing of outdoor gears.
III. Stage-III Commissioning of EI with dual VDU by connecting outdoor gears.

TESTING OF INTERLOCKING LOGIC: Testing of relay interlocking consists of energization of relays by connecting the simulation panel, clearing of signals on the simulation panel and carrying out the following tests as per selection tables.

i. Negative tests
ii. Dead/Approach locking tests.
iii. Route/Back locking tests.
iv. Timer circuits.
v. Testing of conflicting signals.
vi. All other logic circuits viz., SM's key, CHLR, LXPR, KLCPR are provided correctly in the respective signaling logic circuits. Before taking up relay energisation, the following works shall be completed:

a) Wire to wire bell test of all sheets before soldering and after soldering.
b) Plugging of all relays as per contact configuration.
c) Connection of Power supply arrangements with batteries.
d) Connecting the simulation panel, it shall be possible to control all TPRs, NWKRs/RWKRs, CHLRs, KLCRs, LXCPRs etc., from the simulation panel by energising all the relays.
e) Simulation panel shall be adjacent to VDU so that the VDU indication can be observed simultaneously while testing.
f) Simulation panel shall consist of two boards one for depicting yard with operating switches for track, points etc. and second board having lamps to simulate the signal aspects.
g) All outdoor cables shall be disconnected through termination link at cable termination rake and simulation panel (second board) shall be connected to simulate the outdoor gears.
h) Multi core 0.6mm dia cable is used for wiring the simulation boards.

i. **TESTING OF OUTDOOR GEARS:** Testing of outdoor gears consist of:

I. Signals
II. Motor operated points
III. LC gates (Interlocked)
IV. KLCR
V. Axle-counters

VI. Electronic Magneto Telephone

1. Signals shall be initially tested from the Location Box to attend to minor troubles of wiring disconnection etc.

2. All the aspects shall be checked by giving 110 V AC feed from location box and then the test shall be repeated by giving feed from Relay room cable termination rack. This test shall be done for each aspect, route and pilot lamp.

3. Ensure that signal number plate is provided and unit back door is fastened and locked properly.

4. TESTING OF POINTS: Correspondence test to be carried out for all the points of yard as per railway practice.

5. The following tests shall be carried out on Pt. Machines:
   I. Obstruction test.
   II. Detection contact break test.
   III. Out of correspondence test.
   IV. Track locking test. This test is to be done for both N to R and R to N operations.
   V. Whether point can be hand cranked with interlocked crank handle.

6. The following tests shall be carried out on track circuits:
   i. All the track circuits shall be energized and outgoing TPR voltage checked
   ii. Check whether cross protection wiring is done for TPR circuit.
   iii. Shunt the track circuit at various places on the track and check whether the track relay drops every time it is shunted.
   iv. Check the correspondence between TR and TPR in relay room.
   v. Track circuit shall be adjusted properly and readings recorded.
   vi. TSR value shall be recorded.
   vii. Check whether the track circuit is protecting the fouling point.
   viii. Check up input AC voltage to the track feed charges are sufficient and battery is getting charged.

7. The following tests shall be carried out to check interlocking of level crossing gates.
   - Check up for the proper functioning of electrical transmission of key transmitters.
   - Check up the VDU indications.
   - Magneto telephone communication between SM and LC gate/siding.
   - Ensure that respective signals cannot be taken OFF if LC controls are not available
   - Ensure that when the signals are taken off, respective LC gate, key cannot be extracted from the EKT

ii. **COMMISSIONING OF VDU:**

1. Commissioning of VDU consists:-

   i. Testing all signals from VDU and correspondence with field functions.
   ii. Checking the correspondence between points and VDU with VDU indications.
   iii. Checking the correspondence between the track circuits and its VDU indications.
   iv. Testing of LC gates, its electrical transmission of EKT, VDU indications.

2. Check up all signals aspects by directly feeding from cable termination rack.

3. Checkup operation of points from C.T. rack and check whether NWKR/RWKR incoming feed is available.

4. Check up the incoming feed of TPRs in the C.T. rack. The above checking will confirm the pairing of cable conductors.

5. Remove the wiring connection of simulation board on cable termination rack and make through the links of all TPRs, WKRs and signal circuits.

6. First test the points from VDU individually and conduct all tests discussed earlier including track locking test, correspondence between point position and NWKR/RWKR in relay room.

7. Check whether all TPRs have picked up and checkup the VDU indication individually by dropping each track circuit that it correspond correctly.

8. Check whether all other required relays viz., CHLR, LXPR, KLCR have picked up.

9. Test all the signals from VDU.

10. Check the correspondence between relay room and signal aspects.

11. Disconnect the LED unit at site of every aspect and check whether indication disappears on the panel and WC RAILWAY drops in the relay room.

12. All the record shall be entered in the test registers.

iii. **Following registers shall be maintained by contractor:**

a. Track circuit history register,
b. Point machine parameter record register,
c. Battery maintenance register,
d. Signal record register.
e. Generator record register.
f. IPS record register.
g. Relay room record register.

29. <u>TRAINING (BOQ Item no. 3 of Schedule C & Schedule H):</u>

The tenderer shall undertake to train Railway supervisors and other staff nominated by the Railways/IRCON in different aspects of equipment functioning, field installation, testing, commissioning, operation, maintenance and repair, covering both hardware and software. The training should be comprehensive for transfer of complete know-how so as to impart full knowledge and competence to independently and successfully execute the installation, operation, maintenance and repair of all equipment. The training courses should apart from formal class room training, include hand on practical experience and visits to working installation.

The contractor shall at every stage of installation, testing and commissioning shall provide all facilities for adequate training of Railway personnel who may be deputed to work on the project. Details of training proposal shall be submitted by the tenderer.

Sets of training manual in two hard copies and two soft copies containing details of

technical specifications, installation and commissioning, troubleshooting & maintenance schedule etc. shall be supplied along with the equipment.

Training on major subjects/equipment, as per practice followed in Indian Railways, for Railway official shall be organized preferably at Stations in the section. The training shall be imparted to get construction/operation details of the equipment. This should also help in operation & maintenance of the materials/equipment by Railway officials.

The following man – hour period of training should be followed:

SN	Training Subject	No of Officials	Duration
1.	Electronic Interlocking System	As per Schedule and site requirement	
2.	Data Logger		
3.	Integrated Power Supply System		
4.	MSDAC		
5.	UFSBI using HASSDAC		

30. <u>SUPERVISION AND MAINTENANCE OF SSI/EI AT THE STATION AFTER COMMISSIONING</u>:

a. One skilled engineer preferably of OEM shall be deployed for supervision and maintenance of EI for 6 Months after commissioning of EI at the station.

b. The engineer shall immediately attend the fault if any and rectify the fault free of cost during this period. Fault shall be rectified within reasonable time.

c. The record of availability of engineer and visit of other expert Engineer and parameters of installed equipment shall be maintained by the executive at station/site.

d. For this purpose the contractor shall prepare a maintenance plan and the same shall be made available to Engineer. During this period of maintenance supervision if any lacuna is noticed in the functioning as a result of any defect in design or manufacture, the same will be rectified by the contractor at his cost.

e. During such rectification if any faulty equipment/modules need replacement or repair, they shall be provided by the contractor as his cost.

f. The contractor shall be responsible to arrange any equipment or modules in addition to all the materials supplied against this contract as spares during commissioning to circumvent any delay in commissioning on this account.

g. A monthly maintenance plan shall be submitted by the tenderer to monitor the health of installed equipment by monitoring and recording relevant parameters.

31. <u>ASSISTANCE TO RAILWAY MAINTENANCE STAFF AFTER COMMISSIONING</u>:

a. Contractor will depute suitable qualified team for assistance to Railway maintenance staff for 3 months after commissioning of the complete station as per relevant SCC clause.

b. The contractor shall deploy adequate number of staff per station. The technicians /

staff deployed by the contractor for maintenance shall have experience for maintenance of similar works in Railways.

c. Roles & Responsibilities of Technician/ artisan staff to be deployed by contractor:

a) They shall make liasioning with Railways staff at the station.

b) They shall maintain the various records in connection with schedule of maintenance for various activities.

c) Proper upkeep & maintenance of all gears at the stations/section.

d. Any other work being advised by the IRCON/Railway engineer.

32. MSDAC (Multi section Digital Axle Counter):

a. The Multi Section Digital Axle Counter with clamp type fixing arrangements, conforming to specn RDSO/SPN/176/2013 (Ver-3) with latest amendments, as Track Vacancy Detection, shall be supplied as per approved SIP, complete with Track-side electronics, Central Evaluator, Reset arrangement (LV Box, Reset Box etc.), vital relays, and necessary fittings required for fixing as per OEM's installation manual.

The MSDAC equipment should be configured to work in track vacancy detection system in Station Section and Block Section, as per approved SIPs,

The DACs at stations shall be connected to work on dark fibers of existing Optic Fiber Cables, and supplied equipment should be configured accordingly.

b. Offered MSDAC equipment shall cater for 10% increase in field as well as Central Evaluator equipment for future requirement and 10% spare cards for central Evaluator and field euipments. The Equipment must also include but not limited to: (i) Micro Controller/Event Logger Card with Required Software. (ii) Surge protection Device (iii) Installation materials.

33. EI FAT Setup:
Applicability of this clause depends on as per site suitability and WCR practice.

34. AFFECTING PROJECTS:

It is also brought out that Indian Railways works in very dynamic environment where need of both people and industry have to be catered to. To keep in sync with this, WC Rly have to change their requirement with time in a progressive manner. Work at stations and section shall be carried as defined in the scope of works. For any ambiguity in the scope of works and other future works for affecting projects, the decision of Employer/Ircon shall be final and binding on the contractor.

35. ~~RRI Modification:- Design, Supply, alteration/modification, installation, testing & Commissioning of existing RRI of Katni Murwara in connection with introduction of New Majhgawan Phatak station between Hardua and Katni Murwara.~~

36. Points to be ensured for installation and commissioning of EI system:

a. The 110V DC supply from IPS room to EI rack shall be provided with duplicated cable with suitable gauge so as to ensure that voltage drop in cable shall not be more than 1.0 Volt from integrated power supply (IPS).

b. The DC-DC converter provided shall be segregated for `A`& B system along with segregation of cabling and termination of power supply up to DC-DC converters, for all converters shall be N+1 configuration.

c. DC-DC converter shall be installed near to EI rack to avoid the line drop. The line drop shall not be more than 0.5 Volt.

d. The location of DC-DC converter shall be made in such a way that 110V DC power supply wires do not run and cut across other indoor wiring of Electronic Interlocking.

e. Supply for fan shall be fed with separate power (from IPS) supply source through separate fuse, which should be completely isolated from Electronic Interlocking supply.

f. The communication line between the CPUs and CPU to VDU shall be provided in redundant manner to avoid failure due to loss of communication due to single cut and shall be with OFC to avoid damage due to surge and lightening. Reliability and availability of EI shall be checked by creating loss of communication with single cut. The optical modem installed shall be of industrial grade with operating temperature range 0 to 70 degree Celsius. The OFC and other networks shall be provided with NMS (Network management system) for better maintenance and fault diagnosis.

g. It is advised for better reliability that the drawing circulated vide RDSO`s TAN No. STS/E/TAN/3006 dated 02.11.2012 shall be adhered to. The following shall be ensured before commissioning: -

a) Class `A` protection shall be ensured on top of building.
b) Copper tape (Bonding ring conductor) on insulated stand-off is provided to cover the maximum area in Relay room, Power room & Equipment Room and the connection to equipment shall be made at the nearest point.
c) Earthing shall be in such a way that it can cover most part of Building. It is also to be ensured that earth resistance shall be less than 1 ohm at the equipment.
d) Interlocking of all Relay as well as EI Rack shall be ensured.
e) All the cable trough and ladder shall be earthed properly.
f) Provision of relevant Surge Protection device (SPD) for power supplies used for EI and earth connection in the SPDs shall be ensured before commissioning.
g) It shall be ensured that front and back doors of all cabinets are connected to earth bus bar using copper braid with shortest path in equipment room.

h. External Data Logger shall be commissioned prior to commissioning of EI system with all external Relay contacts.

i. Synchronization of EI clock and Data Logger Clock through CMU in network condition.

j. The analog monitoring of output of DC-DC Converters of EI shall be wired into Data Logger for monitoring the healthiness of converter.

k. The input, output, data and power supply cable shall be routed in different cable troughs separated with the gap of minimum, 6 to 8 inches.

l. Input and output cable of EI shall be twisted (RDSO approved) to minimum EMI effect.

m. The fuse terminals are to be fixed with proper fuse rating, marking fuse number and should be of indicative type.

n. The lightning and surge protection devices shall be installed as per concerned EI installation documents.

o. Wiring shall not have any loose connections and wire ends shall be properly crimped with correct size of lugs.

p. Separation of 110V DC and other external power supply from the internal 12V/24V/50V power supply in the Relay Room by placing them in separate trough/ladder shall be ensured.

q. Voltage monitoring cables to the Data Logger shall be placed in a different through which does not have any internal power supplies.

r. The reliability aspects of VDU may be ensured as per RDSO`s TAN No. STS/E/TAN/3007 Ver.1.0 dated 02.12.2012.

s. It shall be particularly emphasized that complete segregation of power supplies for EI system & Networking Switches shall be ensured so that in case of one power supply, the complete system does not shut down.

t. The testing of EI units, failure of power supply etc. shall be done to note the impact on the system during such failure scenario with actual operation carried out from VDU.

u. Hot standby functionality shall be checked before commissioning.

v. The quality and integrity of the installation remains complete responsibility of the OEM. The firm must provide OEM`s certificate regarding this before commissioning. Any deficiency pointed out later, shall be done free of cost by OEM, this shall be confirmed by OEM before commissioning. The OEM certificate shall be handed over to open line after commissioning.

37. LAYING OF UNDERGROUND OFC CABLE AND PROTECTIVE WORKS.

w. This part of tender document deals with the specifications under which the various work for trenching & laying of underground OFC cables coming under the purview of the contract are to be executed by the contractor. All materials required for protection works will be supplied by the contractor.

x. OFC shall normally be blown in HDPE pipe by employing blowing machine. Pulling / drawing of OFC in HDPE pipe shall be permitted only at those locations where blowing of OFC is either infeasible or extremely difficult due to abnormal condition / location of site. Contractor shall obtain prior permission of Railways/Employer's engineer for pulling / drawing of OFC in HDPE pipe at such abnormal locations.

y. Warning tape Orange colour of 100 mm wide printed in black as "CAUTION RLY OFC CABLE" should be laid in trenches in station area at every 1 meter interval (minimum) as directed by the site engineer.

z. **HANDLING OF CABLE DRUMS & TRANSPORTATION OF OPTICAL FIBRE CABLE:**

i. While unloading the drum out from a vehicle, the drum SHALL NOT BE DROPPED ON THE GROUND directly to avoid irreparable damage to cable due to impact
or
The drums shall be unloaded by the side of the Railway Track/Road using either a crane or any other suitable means very carefully so as not to cause any damage to the cable. The drums at site shall be protected until they are laid.
or
Unload the drum with fork lift truck with forks long enough to take full width of drum so that the weight is borne by both the flanges. Same precautions as far loading are to be followed. During all stages of storage/use, it is essential that end of cable are effectively sealed by heat shrink end cap. Failure to it will make cable unfit for use.

ii. On each drum there are two ends, A & B. The 'B' end of one cable length shall meet 'A' end of the next cable at a joint. The 'A' end shall be normally on the top unless indicated otherwise on a drum.

iii. The drums shall always be kept upright, i.e. axle in parallel position to the ground. The drums shall not be set by jerks but shall be handled slowly and with care. The drums should not be damaged while moving the same.

iv. The drums shall normally be unrolled at the same place and the cable carried by workmen near the trench. The drums, shall not be dragged in any case, but where drums of cable have to be moved, would always be rolled in the direction of the arrow, otherwise the coils tend to unwind and the cable may get battered. In case no direction arrow is marked on the drum remove several battens and determine the direction in which the cable is coiled. The arrow should then be painted on the drum pointing in the opposite direction in which the upper cable end is coiled so that future handling of the cable drum is facilitated and then replace the battens carefully.

v. The drum should be properly mounted on jacks (or on a cable wheel) making sure that the spindle is large enough to carry the weight without bending and that it is laying horizontally in the bearings so as to prevent the drum creeping to one side or the other while it is rotating. Before attempting to pull off the cable, remove the end protection box attached to the flange of the drum and cut the security ropes so as to leave the cable end free to move.

vi. If a portion of the cable only is taken out from the cable drum, the battens should be immediately replaced to prevent damage to the balance of the cable. This is important.

vii. The use of steel bars between the bolt heads to 'jump' or turn the drum around is dangerous to staff and likely to damage the drums. A better method is to use two steel plates with grease between them by standing the drum on these greased plates, it can be easily elevated round to the desired position.

viii. All care should be taken in handling cable drums with a view to ensure safety not only of the cables but also of the working party handling them. The man should not be allowed to brake the cable drum by standing in front but only from side.

ix. REWINDING AND REDRUMING OF CABLES.

i. If for any reason it is found necessary to rewind a cable on a drum, cable drum with a proper barrel diameter not less than of the original drum should be chosen.

ii. The drums should be mounted on cable jacks during rewinding operations using proper size of spindles passed through the flange holes which will not buckle

under the load. The cable should not be bent opposite to the set it is having already.

iii. In the redruming operations the full and empty drums should be so turned that the cable passes from the bottom of the original set as little as possible.

iv. Replace all the laggings on the cable drum.

38. JOINTING AND TERMINATION OF FIBRE OPTIC CABLE

aa. TECHNIQUES FOR JOINTING OF FIBRE OPTIC CABLE:

i. Following types of techniques are used for splicing of fibres:-

a) Mechanical Splices - This aligns the axis of the two fibres to be joined and physically hold them together.

b) Fusion Splicing - This is accomplished by applying localized heating (i.e. by electric arc or flame) at the interface between two butted, prealigned fibre ends, causing them to soften and fuse together.

ii. Mechanical splicing can be used for temporary splicing of fibres or where fusion splicing is impractical or undesirable.

iii. At all other location and during initial installation of fibre optic cable, fusion splicing should be adopted.

bb. STRAIGHT JOINT FOR FIBRE OPTIC CABLE

i. There are various types of joint enclosures available in the market. The procedure for assembly of joint closure is described in the installation manual supplied with straight joint closure. This includes the following:

a) Material inside joint closure kit
b) Installation tools required
c) Detailed procedure for cable jointing.
d) Procedure for re-opening the closure.

ii. The Optic Fibre straight through joint closure shall be as per RDSO specn. with latest modification. The joint shall be protected in brick chamber as per drawing no. CORE/S&T/ALD/SK/435/95.

iii. However, generally, the following steps are involved for jointing of the cable:
- Preparation of cable for jointing
- Stripping/cutting the cable
- Preparation of Cable and joint closure for splicing
- Stripping and Cleaving of Fibres
- Fibre splicing
- Organising fibres and Finishing joints
- Sealing of joint closure and
- Placing joint in pit

cc. PREPARATION OF CABLE FOR JOINTING

a) During laying, a minimum of 10 meter of cable of each end is coiled in the jointing pit to provide for jointing to be carried out at convenient location as well as spare length to be available for future use in case of failures.

b) The pit size must be chosen carefully to ensure the length of the wall on which joint is mounted is greater than closure length plus twice the minimum bending radius of the cable. A pit length of 1.2 meter is sufficient for most of the cable and joint closures. Bracket to support the cable coil are also fixed on the wall of the pit.

c) The cable is then coiled on to the pit wall in the same position as required after the joint is completed. The marking is done on all the loop so that it will be easier to install it later.

d) The distance from the last centre to the end of the cable must be atleast 1.8 Metre. This is being the minimum to be stripped for preparation of joint.

e) Sufficient cable at each end up to the jointing vehicle / enclosure is then uncoiled from the pit for jointing.

dd. **STRIPPING/CUTTING OF THE CABLE**

a) The cables are stripped of their outer and inner sheath with each sheath staggered approximately 10 mm from the one above it.

b) Proper care must be taken when removing the inner sheath to ensure the fibres are not scratched or cut with the stripping knife or tool. To prevent this, it is best to only score the inner sheath twice on opposite side of the cable, rather than cutting completely through it. The two scores marking on either side of the cable are then stripped of the inner sheath by hand quite easily.

c) The fibres are then removed from cable one by one and each fibre is cleaned individually using kerosene to remove the jelly.

ee. **PREPARATION OF CABLE JOINT CLOSURE FOR SPLICING**

The type of preparation work performed on the cable prior to splicing differs on the type of joint closure and fibre organizer used. However, the following steps shall be usually common for different type of joint closure: -

a) The strength member of each cable is jointed to each other and /or the central frame of the joint closure.

b) The joint closure is assembled around the cable.

c) The sealing compound or heat shrink sleeve is applied to the cables and closure, or prepared for application after splicing is complete.

d) The fibres are protected (usually with plastic tubing) in their run from the cable core to fibre organizer trays (particularly if cable construction is slotted core type).

e) Tags which identify the fibres no. are attached at suitable location on the fibres.

f) Splice protectors are slipped over each fibre in readiness for placing over the bare fibre after spicing.

ff. **STRIPPING AND CLEAVING OF FIBRE**

a) Prior to splicing each fibre must have approximately 50 mm of its primary protective U.V. cured coating removed, using fibre stripper which are manufactured to fine tolerances and only score the coating without contacting the glass fibre.

b) The bare fibre is then wiped with a lint free tissue doused with ethyl alcohol.

c) Cleaving of fibre is then performed to obtain as close as possible to a perfect 90 degree face on the fibre.

gg. **SPLICING OF THE FIBRE**

As discussed above there are two types of methods which can be used for fibre splicing. Some of basic steps for both the type are as under:-

FUSION SPLICING OF FIBRE

Some of the general steps with full automatic microprocessor control splicing machine are as under:-

a) Wash hands thoroughly prior to commencing this procedure.
b) Dip the clean bare fibre in the beaker of ethyl alcohol of the ultrasonic cleaver. Switch on ultrasonic cleaver for 5-10 seconds (Some of the manufacturers does not prescribe the above cleaning).
c) Place the bare fibre inside 'V' grove of splicing machine by opening clamp handle such that the end of fibre is app. 1 mm over the end of 'V' groove between the electrodes and end of the fibre being spliced and heat shrink protector inserted.
d) Repeat the same procedure for other fibres, however, first insert heat shrink splice protector.
e) Press the start button on the splice controller.
f) The machine will pre fuse, set align both in 'X' and 'Y' direction and then finally fuse the fibre.
g) Inspect the splice on monitor if provided on fusion splicing machine and assure no nicking, bulging is there and cores appears to be adequately aligned. If the splice does not visually look good repeat the above procedure.
h) Slide the heat shrink protector over the splice and place in tube heater. Heat is competing when soft inner layer is seen to be 'oozing' out of the ends of outer layer of protector.
i) Repeat (a) to (h) above for other fibres.

hh. **ORGANISING FIBRE AND FINISHING JOINTS**

a) After each fibre is spliced, the heat shrink protection sleeve must be slipped over the bare fibre before any handling of fibre take place, as uncoated fibres are very brittle and cannot with stand small radius bends without breaking.

b) The fibre is then organized in to its tray by coiling the fibres on each side of protection sleeve using the fully tray side to ensure the maximum radius possible for fibre coils.

c) The tray are placed in the position.

d) OTDR reading taken for all splices in this organized state and recorded on the test sheet to confirm that all fibre's attenuation are within specification. This OTDR test confirms fibres were not subjected to excessive stress during the organizing process.

e) After this the joint can be closed with necessary sealing etc. and ready for placement in the pit.

ii. **PLACING OF COMPLETED JOINT IN PIT**

a) Joint is taken out from vehicle and placed on the tarpaulin provided near the pit.

b) The cable is laid on the ground, and looped accordingly to the marking done in beginning as mentioned above. Tape these loops together at the top of the coil.

c) The joint can now be permanently closed and sealed by heating heat shrinkable sleeve etc. However, before closing, silica gel to be kept inside for moisture protection.

d) Now the joint closure is fixed to the bracket on the pit wall and pit is closed.

jj. **RE-OPENING OF THE JOINT**

If required for attending to faults etc, manufacturers supply special kits for opening of joint and the steps to be followed. However, the general steps are as under:-

a) Using suitable knife cut heat opening shrink sleeve longitudinally along its entire length.

b) Do not damage the smaller heat shrink sleeve on the ends of joint.

c) Apply heat to the cut sleeve until it begins to separate.

d) Gently remove the cut sleeve from the joint. Now the joint can be opened.

e) Protective sleeve / cover can be removed for attending to faults etc.

kk. **TERMINATION JOINT FOR FIBRE OPTIC CABLE**

i. This joint is provided in the cable hut for terminating the outdoor fiber optic cable of both the sides, splicing through fibers, connecting fibers to pig tails for connection to optical line terminal equipment etc.

ii. The cables shall be terminated on OFC Termination Box / Fibre Distribution Management System.

The Optic Fibre termination box / Fibre Distribution Management System (FDMS) as per RDSO specification with latest amendments shall be provided in each location to terminate both optical fibre cables and deriving required pig tails.

Jumper cable (10 Metre long)

The jumper cable shall be cut into two pigtails of 5 Metre long which is considered adequate since fibre termination box / Fibre Distribution Management System is mounted on rack itself. The material may be supplied as per latest specifications.

iii. The procedure for installation of Fibre termination box / Fibre Distribution Management System depends upon the type of Fibre termination box or FDMS. The

installation manual supplied with box gives the step by step procedure for installation. However, the general steps are as under: -

- Marking the cable
- Stripping/cutting the cable
- Treatment of tension member
- Fibre splicing
- Enclosing fibre
- Fixing strength member
- Closing the cover
- Fixing the termination box
- Fixing the cable

ll. **MARKING THE CABLE**

a) Determine the cable length up to the proposed location of termination box. It is also to be ensured that at least 10 meters of cable is coiled in the cable pit.
b) Determine the cutting point and mark the cable.
c) Determine the sheath peeling point and mark the cable.

mm. **CUTTING / STRIPPING THE CABLE**

a) Cut the cable as per marking.
b) Remove the sheath from cable ends. During sheath stripping care should be taken not to damage the fibres.
c) The length and the steps for various sheath by cutting shall be as per the instruction given in the manual.

nn. **GRIPPING THE CABLE**

a) wind PVC tape around the cable core just beside edge of the sheath.
b) Insert the bushing inside sheath by cutting the cable sheath for about 25 mm.
c) Place the sheath grip (lower half and upper half) and cut tighten it with the help of torque wrench.

oo. **FIXING OF TENSION MEMBER**

a) Mark the tension member for specified length and cut it.
b) Clean the tension member thoroughly by Alcohol and cotton cloth.
c) Fix tension member holder with the help of instant adhesive at the end of tension member.

pp. **FIBRE SPLICING**

The procedure for splicing is same as described for straight joint closure in clause 22.5 above.

qq. **ENCLOSING FIBRES**

a) Set the fibre cassette on the base.
b) Arrange excess length of fibre to make double figure of eight.
c) Enclose the spliced fibre and its excess length carefully.
d) Repeat the procedure for other fibres.

e) After this, the box can be closed. However, a packet of silica gel may be placed in side for protection from entry of moisture.

rr. **MOUNTING OF TERMINATION BOX / FIBRE DISTRIBUTION MANAGEMENT SYSTEM**

Termination box / FDMS shall be fixed on 19" rack/wall.
a) Place the termination box on 19"rack/wall and tight the nuts to fix the base box.
b) Mount the covers.

ss. **FIXING THE CABLE**

Secure the cable on at two places within one meter from termination box / FDMS keeping in view straight entry of cable in termination box.

tt. **ACCEPTANCE TEST FOR FIBRE OPTIC CABLE**

The procedure for testing of Fibre optic cable shall be jointly finalised by contractor with Engineer of the Railways/Employer. The parameters specified by manufacturer shall be taken as reference. The test shall be conducted at 1310nm and 1550nm from cable hut to cable hut once the splicing and termination joints are completed. A standard calculated loss table at 1310nm and at 1550 nm is placed in para 22. The length of cable (as per marking in cable & OTDR), loss in cable, average loss per Km, No of splices, splice loss, etc shall be recorded and jointly signed as per proforma given in para 32.21 below.

uu. **TEST PROTOCOL FOR OPTICAL FIBRE CABLE**

SYSTEM TEST PROTOCOL TEST — OPTICAL FIBRE CABLE FIELD

Route : ——————— Date : ———————-
Station: ——————— No. of mid-section splices : ——
Section: ——————— Measured by : ———————
Length (By OTDR): ————— Length as per meter Marking on cable sheath : ————————

1) Optical Measurements (on Line) :

	Measurement	Fibre - number 1, 2, 3, …….. 24	Accepted Value
Fibre no. 1			
Measurements >	At 1310 nm with OTDR Total attenuation | Attenuation per Km.		At 1550 nm with OTDR Total attenuation | Attenuation per Km.

Splice locations as per OTDR	Splice loss in dB	Location of splice as per actual laying
		OHE Mast No. A. B. C.

NOTE - ALSO ATTATCH OTDR RESULTS

2. VISUAL INSPECTION (ON LINE) :

2.1 S.No. of cable and length of each drum :

S.NO.	LENGTH
1. ————————	————————M
2. ————————	————————M
3. ————————	————————M
4. ————————	————————M
5. ————————	————————M

2.2 Location of Isolation sleeve : 1. 2. 3.

( ) ( )

Contractor's Representative Railway Representative

OPTICAL LOSS VALUE AT 1310 nm

Cable length Km.	Basic fibre loss db/Km	Drum length in Km.	No. of splices	per splice Loss	Total splice Loss	Connector loss (in db)	Total theoretical loss	Standard Loss/Km
Basic value	0.38	3		0.02		0.600		
3	0.38	3	2	0.02	0.040	0.600	1.780	0.593
6	0.38	3	3	0.02	0.060	0.600	2.940	0.490
9	0.38	3	4	0.02	0.080	0.600	4.100	0.456
12	0.38	3	5	0.02	0.100	0.600	5.260	0.438
15	0.38	3	6	0.02	0.120	0.600	6.420	0.428
18	0.38	3	7	0.02	0.140	0.600	7.580	0.421
21	0.38	3	8	0.02	0.160	0.600	8.740	0.416
24	0.38	3	9	0.02	0.180	0.600	9.900	0.413
27	0.38	3	10	0.02	0.200	0.600	11.060	0.410
30	0.38	3	11	0.02	0.220	0.600	12.220	0.407
33	0.38	3	12	0.02	0.240	0.600	13.380	0.405
36	0.38	3	13	0.02	0.260	0.600	14.540	0.404
39	0.38	3	14	0.02	0.280	0.600	15.700	0.403
42	0.38	3	15	0.02	0.300	0.600	16.860	0.401
45	0.38	3	16	0.02	0.320	0.600	18.020	0.400
48	0.38	3	17	0.02	0.340	0.600	19.180	0.400
51	0.38	3	18	0.02	0.360	0.600	20.340	0.399
54	0.38	3	19	0.02	0.380	0.600	21.500	0.398
57	0.38	3	20	0.02	0.400	0.600	22.660	0.398
60	0.38	3	21	0.02	0.420	0.600	23.820	0.397
63	0.38	3	22	0.02	0.440	0.600	24.980	0.397
66	0.38	3	23	0.02	0.460	0.600	26.140	0.396
69	0.38	3	24	0.02	0.480	0.600	27.300	0.396
72	0.38	3	25	0.02	0.500	0.600	28.460	0.395

75	0.38	3	26	0.02	0.520	0.600	29.620	0.395
78	0.38	3	27	0.02	0.540	0.600	30.780	0.395
81	0.38	3	28	0.02	0.560	0.600	31.940	0.394
84	0.38	3	29	0.02	0.580	0.600	33.100	0.394
87	0.38	3	30	0.02	0.600	0.600	34.260	0.394
90	0.38	3	31	0.02	0.620	0.600	35.420	0.394
93	0.38	3	32	0.02	0.640	0.600	36.580	0.393
96	0.38	3	33	0.02	0.660	0.600	37.740	0.393
99	0.38	3	34	0.02	0.680	0.600	38.900	0.393

OPTICAL LOSS VALUE AT 1550 nm

Cable length Km.	Basic fibre loss db/Km	Drum length in Km.	No. of splices	per splice Loss	Total splice Loss	Connector loss (in db)	Total theoritical loss	Standard Loss/Km
Basic value	0.25	3		0.02		0.600		
3	0.25	3	2	0.02	0.040	0.600	1.390	0.463
6	0.25	3	3	0.02	0.060	0.600	2.160	0.360
9	0.25	3	4	0.02	0.080	0.600	2.930	0.326
12	0.25	3	5	0.02	0.100	0.600	3.700	0.308
15	0.25	3	6	0.02	0.120	0.600	4.470	0.298
18	0.25	3	7	0.02	0.140	0.600	5.240	0.291
21	0.25	3	8	0.02	0.160	0.600	6.010	0.286
24	0.25	3	9	0.02	0.180	0.600	6.780	0.283
27	0.25	3	10	0.02	0.200	0.600	7.550	0.280
30	0.25	3	11	0.02	0.220	0.600	8.320	0.277
33	0.25	3	12	0.02	0.240	0.600	9.090	0.275
36	0.25	3	13	0.02	0.260	0.600	9.860	0.274
39	0.25	3	14	0.02	0.280	0.600	10.630	0.273
42	0.25	3	15	0.02	0.300	0.600	11.400	0.271
45	0.25	3	16	0.02	0.320	0.600	12.170	0.270
48	0.25	3	17	0.02	0.340	0.600	12.940	0.270
51	0.25	3	18	0.02	0.360	0.600	13.710	0.269
54	0.25	3	19	0.02	0.380	0.600	14.480	0.268
57	0.25	3	20	0.02	0.400	0.600	15.250	0.268
60	0.25	3	21	0.02	0.420	0.600	16.020	0.267
63	0.25	3	22	0.02	0.440	0.600	16.790	0.267
66	0.25	3	23	0.02	0.460	0.600	17.560	0.266
69	0.25	3	24	0.02	0.480	0.600	18.330	0.266
72	0.25	3	25	0.02	0.500	0.600	19.100	0.265
75	0.25	3	26	0.02	0.520	0.600	19.870	0.265
78	0.25	3	27	0.02	0.540	0.600	20.640	0.265
81	0.25	3	28	0.02	0.560	0.600	21.410	0.264
84	0.25	3	29	0.02	0.580	0.600	22.180	0.264
87	0.25	3	30	0.02	0.600	0.600	22.950	0.264

90	0.25	3	31	0.02	0.620	0.600	23.720	0.264
93	0.25	3	32	0.02	0.640	0.600	24.490	0.263
96	0.25	3	33	0.02	0.660	0.600	25.260	0.263
99	0.25	3	34	0.02	0.680	0.600	26.030	0.263

vv. **TOOLS AND EQUIPMENTS REQUIRED FOR JOINTING AND TERMINATION OF FIBRE OPTIC CABLE**

S.No.	Tool's Name
1	Joint closure
2	Termination Box
3	Rubber end Block
4	Sheath Clamp
5	Bushing
6	Strength member holder
7	Heat Shrinkage tube
8	Arc fusion splicer machine.
9	Power cord AC/DC
10	walkie-talkie 12V DC source
11	Tube heater
12	Precision cleaver
13	Cable sheath stripper
14	Fibre stripper
15	Knife for HDPE cutting
16	Hexa for strength membrane
17	Isopropyl alcohol or methanol of high specific gravity
18	Johnson Buds
19	Tweezers
20	Gun heater Blower type
21	Sleeve for splice protection
22	O.T.D.R.
23	Stickers for numbering of splicers.
24	Portable k. oil generator
25	Umbrella 2 Nos.
26	Dust protection for splicing machine

39.0 Remote Diagnostic and Predictive Maintenance System (IOT):

A. Provision for Central cloud and Data Analytics application

1) Cloud based IOT application license shall be provided for real time monitoring of signalling gears like point machine, track circuit , colour light signal , IPS , batteries per station.
2) Cloud application shall support MQTT or OPC UA protocol.

3) The application shall be hosted on cloud and vendor shall manage this cloud and application for two years from the date of Installation
4) 5 users license for per station shall be provided.
5) User ID and Login credential to access application over internet shall be provided.
6) The signalling gears data shall be made available on cloud for at least 6 months.
7) Mobile application and SMS notification provision shall be provided by the vendor
8) The application shall have real time yard layout of the station for the gears which are under monitoring with the help of IOT devices and sensors.
9) Realtime dashboard shall be provided for Signals, track circuits and Point machines
10) The report module shall be given for searching date and time wise reports.
11) The Cloud application shall have following modules:

a) Streaming Data processor: The sensor data received through cloud Gateway enters to streaming data processor. Its purpose is to allow continuous flow of data and quickly and efficiently transmit data streams to data storage.

b) Data Lake: A data lake stores the data gathered by sensors. It is still raw, so it may be inaccurate, erroneous or contain irrelevant items. It is presented as a number of sets of sensor readings measured at the corresponding time. When the data is needed for insights about equipment's health, it is loaded to a big data warehouse.

c) Asset Management Module: This module shall provide digitized data of station assets along with Make, model, Date of Installation, Date of Manufacturing, Codal life.

d) Maintenance Monitoring System: It receives the predictive health information from the Data Analytics sub-system as well as has access to historical and live information of signalling gears. In addition, there shall be "Preventive maintenance Cloud" which relays the information to all handheld devices for updating the health information of each signalling gear on daily basis. Critical alerts will be sent on real time basis assisted by automated alert system and manned supervision.

e) Machine Learning / Artificial Intelligence: The platform shall be design to support following:

The data received is used by the AI algorithms to improve the failure models and predictive models. Initially, supervised learning will be done and gradually the learning will be more automated using AI techniques.

Data Analytics: The existing failure models and predictive models are updated time to time by the Machine learning above. The real-time data of signalling gears is analysed with these machine learning models. The ML algorithms are applied to reveal hidden correlations in data sets and detect abnormal data patterns. The recognized data patterns are reflected to generate the predictive health information of signalling equipment.

Machine Learning algorithm should be able to suggest and predict defects, device failure and remaining useful life (RUL). Application should be backed by intelligent health monitoring algorithms for gears using machine leaning algorithms to predict the equipment failure or errors

and send SMS alerts to the concerned official's mobile number. It is expected that accuracy of predictive alerts should be better than defined levels with time

B. Failure Analysis System / Edge Computing System along with station Local server and Software

Edge Computing system should be rugged industrial computer and work 24 x 7 without any glitch. The gateway system should be capable of collecting data from various field IOT devices through Zigbee/LORA (wireless) or wired media, store and transfer the data to cloud/server. The received data transfers to the Cloud/Server located in the Division head quarter through the existing Railway OFC / Infra.

B. Microprocessor based Mini Logger/IOT device installed outdoor to monitor point machine/track circuit/signal

IOT device in location box (Outdoor): The IOT device shall be software embedded system works on 24 V DC and 110 V AC will do the basic function of capturing the parameters from the point, and Signal devices using the required sensors and transmit the data to a Gateway system at the station. Overall quantity of IOT devices shall be based on the point and Signal devices and their parameters to be monitored in each location box.

The data of each signaling gear at the location shall be collected on real time basis by the IOT device. The sensors used for measuring the currents shall be non-intrusive.

The IOT devise shall have time synchronization with the station gateway. All the events generated at IOT shall be time stamped.

The IOT device in location boxes shall be able to communicate to the station gate way system by using Zigbee/LORA communication or wireless media. There shall be also provision of 4G/LTE/Cable interface in the IOT device.

40.0 Technical and Design consultancy

The Contractor shall appoint a qualified and experienced person(s)/firm(s) as technical consultant (the "Consultant"). The technical team will work directly under IRCON's S&T Project Incharge. The technical team will ensure implementation of all RDSO/Railway standards in project execution. The technical team will also ensure highest quality, safety, health and environment standards in project execution. The Consultant will certify Project Procedure Manual, Quality Manual, Safety Manual and Environment Manual. The Consultant will guarantee supervision for timely completion of work. The Consultant's team will also review all documents for CSTE/CRS approval application. The Contractor shall furnish the details of the key personnel of the Consultant who shall have adequate experience and qualifications with respect to the main elements of the S&T work like Commissioning of EI/RRI/PI interlocking/ Modification in Relay room in connection with RE modification work, Telecom work etc. as mentioned below. For the avoidance of doubt, no firm or person having any conflict of interest shall be engaged hereunder. Any assignments completed at least three years prior to the appointment hereunder shall not be reckoned for the purposes of conflict of interest. The consultant shall assist the Employer to implement the Project in conformity with Railways' rules and regulations; and codes Local laws, bye laws, regulations, etc.

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SNo.	Position	Requirement (in Nos.)	Total Work Experience (years)	Experience in similar signaling work with PMC or Construction in Rly signaling (years)	Minimum required level of Qualifications
1	Resident Engineer (S&T) (EI/RRI/PI)	1	15	8	BE/BSc Engg./BTech in Electronics and Comm, Electrical & Electronics, Electronics, and Instru-mentation Engg
2	S&T Expert (EI/RRI/PI/ Telecom)	1	10	5	BE/BSc Engg./BTech in Electronics and Comm, Electrical & Electronics, Electronics; and Instrumentation Engg OR
			15	10	Diploma in Electronics and Comm, Electrical & Electronics, Electronics and Instrumentation
3	Supervisor S&T (EI/RRI/PI/ Telecom)	4	5	3	Diploma in Electronics and Comm, Electrical & Electronics, Electronics and Instrumentation OR
			8	5	ITI (Electrician)
4	CAD Operator-S&T	1	5	3	CAD Operator/design engineer/Supervisor signal having relevant experience of 03 years in S&T construction to be deputed by contractor. The person will be deployed with prior approval of Engineer on submission of detailed CV and certification

The Technical Consultant/Design and management capabilities shall be provided by a relevantly experienced, person(s)/firm(s), which is member that form the Contractor's Organization, and not by a Design Unit/staff which is an integral part of any of the contractors active in the construction phase of the project.

Before appointment of above professionals, the Contractor will take prior approval for biodata and/or interview of the candidate from the Project Incharge (S&T) of Ircon. The Bidder shall provide details of the proposed personnel, their roles and experience records in Forms PER-1 and PER-2 attached as Annexure- A to this chapter.

In interest of the project, Ircon reserves the right to remove any Consultant from the project site duly giving one month's notice. Contractor has to propose another technical Consultant with duly approved bio data and/or interview by Project Incharge (S&T) of Ircon.

2. The Consultant shall:

(a) evolve a systems approach with the Head Designer (who will head the Contractor's design unit and shall be responsible for surveys, investigations, collection of data, and preparation of preliminary and detailed designs) so as to minimize the time required for final designs and construction drawings; and

(b) proof check the detailed calculations, drawings and designs, which have been approved by the Head Designer.

3. Only the office space for accommodating technical consultant's team shall be provided by Ircon. All other facilities for daily execution of work by Technical Consultant, viz., vehicles, stationary and consumables, computers and peripherals, office equipment, accommodation, assisting staff etc. shall be provided by Contractor. The Consultant shall visit site locations as per instructions of Project-in-charge (S&T) of Ircon at contractor's own cost.

4. In respect of the Contractor's obligations with respect to the design and Drawings of the S&T Project, the following shall apply:

i. The Contractor shall prepare and submit, with reasonable promptness and in such sequence as is consistent with the Project Completion Schedule, 3 (three) copies each of the design and Drawings, duly certified by the Consultant, to the Ircon's Engineer for review. Provided, however, that in respect of Important EI/PI, Circuit diagrams, SWR, Cable Route survey, railway stations and yards, the Ircon/Railway's Engineer may require additional drawings for its review in accordance with Good Industry Practice;

ii. by submitting the Drawings for review to the Ircon's Engineer, the Consultant shall be deemed to have represented that it has determined and verified that the design and engineering, including field construction criteria related thereto, are in conformity with the Scope of the Project, Specifications and Standards and the Applicable Laws;

iii. Ircon's Engineer shall review the same and convey its observations to the Consultant with particular reference to their conformity or otherwise with the Scope of the Project and the Specifications and Standards.

iv. if the aforesaid observations of the Ircon/Railway's Engineer indicate that the Drawings are not in conformity with the Scope of the Project or the Specifications and Standards, such Drawings shall be revised by the Contractor and resubmitted to the Consultant for approval of Ircon's/ Railways' Engineer for review. The Ircon/Railway's Engineer shall give its observations, if any, within 10 (ten) days of receipt of the revised Drawings. In the event the Contractor fails to revise and resubmit such Drawings to the Ircon's Engineer for review as aforesaid, the Ircon's Engineer may cause the payment for the affected works to be withheld. In case of any dispute, Project Incharge (S&T) of Ircon shall be final deciding authority;

v. no review and/or observation of the Ircon's Engineer and/or its failure to review and/or convey its observations on any Drawings shall relieve the Contractor of its obligations and liabilities under this Contract in any manner nor shall the Ircon's Engineer or Ircon be liable for the same in any manner; and if errors, omissions, ambiguities, inconsistencies, inadequacies or other Defects are found in the Drawings, they shall, along with the affected Works, be corrected at the Contractor's cost, notwithstanding any review under this Chapter;

vi. the Contractor shall be responsible for delays in submitting the Drawings,to be furnished by him, caused by reason of delays in surveys and field investigations,

and shall not be entitled to seek any relief in respect thereof from the Ircon; and

vii. the Contractor shall warrant that its designers, including any third parties engaged by it, shall have the required experience and capability in accordance with Good Industry Practice and it shall indemnify Ircon/Railway against any damage, expense, liability, loss or claim, which the Ircon/Railway might incur, sustain or be subject to arising from any breach of the Contractor's design responsibility and/or warranty as set out in this Clause.

5. The scope of the Technical Consultant includes but is not limited to the following:

i. Technical Consultant's Responsibility: The Consultant shall be responsible for the following:

ii. Developing Project Management Plan within 30 days from the Effective Date in the format specified by Employer using Project Management Software as specified in the works contract.

iii. eveloping systems and procedures to administer the construction contracts and ensure that the contractual requirements, with respect to both quality and quantity of work, are respected and the works are constructed in accordance with the provisions of the construction contract. The consultant shall finalize these within 45 days of effective date. This includes job related to proper accountal of the material both supplied by the contractor and the old released one.

iv. Maintaining copies of all reference documents, specifications, and drawings in a systematic manner in the office of the Project Manager and provide relevant documents forms and stationery to site supervision personnel.

v. Nominating a Project in Charge/Representative who will be full time resident on the Project. The consultant shall provide competent staff in full complement.

vi. Making all engineering decisions required for the successful and timely implementation of the construction contract.

vii. The consultant shall arrange to train its Personnel who are deployed for the Management of the Project, from time to time, as may be required, for efficient Management.

viii. Project Planning, Project coordination, Project interfacing or linkages using Project Management Software as specified in the works contract.

ix. Preparation and submission for Ircon's/Railways' approval all plans and documents which are required for the execution of the work but which are not covered in the construction contract.

x. Expeditious completion of work to ensure the required time schedule.

xi. Supervision of all construction work.

xii. Conflict management and Change Management.

xiii. Making all necessary measurements and certify payments. Consultant is required to certify interim payment certificate after detailed check within 14 days after receiving statement & supporting documents from the contractor. Consultant also has to help Ircon in submitting bill to client if required.

xiv. One level of checking of various drawings, plans, designs, documents prepared by construction contractor before submission to Ircon/Railway for their approval. This will include carrying out required alterations in the drawings in the process of approval. This also includes arranging various drawings (prints or tracings, as a

case may be) from railway for reference or for alterations/modification required for execution of the work. Approval of Ircon/Railways to various plans, design, documents etc. shall be arranged by the Consultant.

xv. Preparation of CRS applications and the related follow-up work in railways and CRS office.

xvi. Ensuring compliance to all safety requirements while progressing the work.

xvii. To propose a viable phase working plan for the work, if situation warrants.

xviii. Ensuring consignee inspection, receipt of materials at site, accountal, issue of materials to works Contractors, (including materials procured through Supply contractors) and proper storage by Works Contractor.

xix. Project monitoring for the implementation of the Project up to commissioning of the project or the end of the defect liability period or handing over the assets thus created to the Zonal Railway, whichever is later.

xx. Testing of installations as per the various provisions in the codes, manuals and Railways instructions and recording of complete testing data and submission same to the client.

xxi. Preparation and submission of monthly and quarterly reports as per formats specified by the Employer, required for management.

xxii. Ensuring compliance of the works contractor to all relevant laws as specified in the works contract including taking measures for alleviation of HIV/AIDS and prevention of human trafficking.

6. Activities to be taken up by Consultant before commencement of work by the works contractor:

6.1 Consultant shall study the information provided by the Employer such as drawings, designs, reference points etc. He shall also study various rules, regulations, codes, practices etc., applicable to Railway working and rules, regulations and by laws of state and central government as applicable to project under implementation including the agreement entered in to with the agency/agencies entrusted by the Employer for execution of works for project completion. He shall also study the special conditions of contract and detailed specifications to identify and decide:

(a) The Methods and the Means to be employed for execution of works.

(b) The detailed programme given by the works Contractor for implementing the various activities of the project including stage working, if any, for achieving the Employer defined mile stone progress during the execution of project leading to successful completion of all works under the project including putting the created assets to use.

(c) The requirement of men, machinery and material for the desired progress at different stages of project execution in advance, so that the project gets implemented without any hindrances as per the above mentioned programme.

(d) Planning the requirement of machinery and materials which shall be issued by Employer, scheduling and ensuring the availability of machinery and materials at site in consultation with the Employer and their proper utilization and accountal.

(e)Checking along with the works Contractor, the correctness or otherwise of the

Employer provided reference points, data, drawings and take corrective action by way of modifying/rectifying/supplementing the available reference points/data/drawings and to remove any inconsistencies/redundancies/voids (gaps) in the execution plan/schemes for safe and economical execution of works.

(f) Planning for the various checks and supervisory/managerial functions to be performed in-house for the Consultancy, and providing competent, qualified and experienced staff including support staff to ensure implementation of various obligations of the works contract.

(g) Planning for maintenance of Records to be kept e.g. checks to be carried for passing of materials/works at various stages, measurement of works/materials used, Accountal of materials etc.

(h) Planning for submitting various documents required for works requiring EIG/CRS's sanction, checking of Completion drawings, plans, work closed statements etc.

7. Review: The Consultant shall:

(i) Review the Detailed Project Reports, including the detailed construction drawings, and the contract for the project work. The review shall identify any defects or omissions that compromise the completeness or consistency of the design including checking of design or affect the viability, accuracy or implementation of the construction contract.

(ii) Review the adequacy of the contractor's quality management system and contractor's proposed personnel specified in the construction contract.

(iii) Checking of designs/drawings as to functionality, general layout, adherence to specifications and provisions of relevant codes, constructability and construction impacts, maintainability and aesthetics.

(iv) The approved Design and Drawings made available by Employer will be required to be checked by the Consultant for correlating the data shown in drawings with actual available at site, minor changes (e.g. e.g. additional siding/line/ crossover points /LC gate , change in drawing etc.). Review drawings and specifications for construction including suggestions on design changes during progress of work. Drawings not included in the construction contractor's scope including those required for phase working shall be prepared by the consultant. Further if any plan/drawings/Design (Tracing & prints) maintained by railway are required for execution of the work same shall be arranged by the consultant for reference, alteration, modification etc. He shall arrange approval of various drawings from concerned railway. The drawings and design work has to be followed till the submission of as made (i.e. completion) drawings to railways. Checking of Design and Drawings for all temporary works (except that of the launching scheme for triangulated steel girders), proof checking of Design and drawings for civil works etc. will also be done by Consultant.

(v) Liaison between various contractors, designers, such that the designs for these sub-systems, that in particular their civil works will be integrated properly into the overall project works.

(vii) Review proposal for acceptance by West Central Railways/RDSO under the guidelines of cross acceptance for any equipment or system proposed by the

contractor for execution of the work.

8. **Quality Assurance: The Consultant shall:**

(a) Prepare a Quality Assurance Manual, detailing the consultant's quality assurance/control procedures, to be submitted within 30 days of commencement of services.

(b)Assist the contractor to evolve a system of Quality Assurance for the works, including but not limited to, establishing testing frequencies and acceptance criteria for all materials and construction activities in accordance with the specifications. The system should specify the prescribed quality checks and their frequency to be performed, acceptable limits for each quality check and do's and dont's for all important activities, in appropriate format acceptable to the Employer, so that the same can be provided to the concerned field officers responsible for supervision of respective items for ready reference.
(c) Ensure that the procurement of materials and equipment are from the authorised sources and are duly inspected by the nominated agencies.

(d) Inspect and approve all materials received at site proposed to be incorporated in works.

(e) Check various designs proposed by the contractors and approve/suggest modifications to these design, sampling, testing procedures and quality control measures to ensure the required standards and consistency in quality at the commencement of activities.

(f) Inspect the quality of the works with regard to workmanship, compliance with the specifications and all necessary testing required for acceptance of any item of work.

(g) Assess and check the laboratory and field tests carried out by the contractor, and carry out independent tests in the site laboratory, wherever necessary.

(h) Maintain records of all testing, including cross referencing to items of work to which each test refers and the location from which any samples were obtained for testing.

(i) Issue orders to the contractor to remove or make good any work which is found to be:
(a) Not in accordance with the drawings.
(b) Not in accordance with the specifications in terms of either work methods or materials specifications.
(c) Covered prior to inspection for acceptance or after rejection as unacceptable.

9. Project Control

a) The consultant shall monitor the project covering all aspects of the project but not limited to:
- Progress in accordance with schedules with the objective of taking remedial measures to ensure project completion date and costs.
- Critical Interface requirements particularly when different agencies are involved whether under different contracts or within the same contract for works.
- Cost Control
- Environmental matters
- Quality Control

b) The Consultant shall develop systems to professionally manage the project implementation. The system to include the physical and Financial Progress vis-à-vis program and forecast cash flow. Project Management Software, as mutually agreed with the Contractor and the Employer. The Program must identify the milestones, interface requirements and program reporting elements. The consultant shall supply a soft copy of program (macro) developed. The output shall be updated every month.

c) Project Management control to include cost, schedule, quality control, technical performance and reporting for the entire project, up to the end of the defect liability period of the contract.

d) The consultant shall take actions as may be necessary for expeditious completion within the contract period.

10. Construction Supervision:

The Consultant shall:

(i) Ensure adequacy, stability and safety of all personnel and construction works being executed by the contractor during the construction and operation, including ensuring the safety of the running trains in the vicinity of the project site.

(ii) Ensure that the works to be carried out on running lines are coordinated, planned meticulously and executed without exceeding the traffic and engineering block, ensuring that Railway operations are not disturbed by duly coordination with Railway authorities, arrangement of power and traffic blocks from Railway will also be the responsibility of consultant. He shall also ensure safety of workers, Railway assets, Rolling stock and Railway users.

(iii) Conduct site visits to review progress in implementation, including physical progress, environmental mitigation, contractor performance, and adequacy of contractor's supervision.

(iv) Assist/ advise the Employer timely regarding handing over the site by Railway which they will hand over in stages, in the advance actions required to be taken for the handing over of the site and to achieve the milestones for completion of the construction packages.

(v) Assist the Employer in co-ordination with different agencies and hold meetings for proper and timely implementation of the Project.

(vi) Assist the Employer for liaison and co-ordination with the relevant authorities to remove all obstacles and encumbrances from the project site, including utility relocation and tree cutting, as required.

(vii) Assist the Employer in coordination with different agencies and hold meetings for proper and timely implementation of the project.

(viii) Assist the Employer in the proper monitoring of progress of the works through computer aided project management techniques.

(ix) Check contractor setting out for conformance with the drawings.

(x) Maintain close liaison with West Central Railways and if required with local

agencies and other government bodies to ensure progress of all works.

(xi) Prepare/issue modified drawings required for variation orders, or any other change, agreed by the Employer.

(xii) Approve contractor's proposed designs/drawings for all temporary works except that of the launching scheme for triangulated steel girders.

(xiii) Inspect at regular intervals the contractor's plant and facilities, including the workers' accommodation at site, to ensure conformity with the construction contract and all government/state regulations.

(xiv) Inspect the contractor's safety measures, including labour welfare, and immediately notify both the Employer and the contractor of any infringement or violation.

(xv) Maintain records, working/as-built/completion drawings, test data, details of variations, correspondence, and diaries in the formats approved/specified by the Employer.

(xvi) Verify lines and levels to ensure works are being executed as per the approved drawings/layouts, alignments and levels.

(xvii) Check all hidden measurements through Project Manager/Project In Charge which shall be recorded by Experts/PM/RE before covering the works. And test check to be carried out.

(xviii) Ensure that the materials used, meet the specifications.

(xix) Ensure that the quality of workmanship and the temporary arrangements /structures made for carrying out the works meet the requirement of specifications and safety standards.

(xx) Ensure that the reinforcement provided is as per the approved drawings tied properly with cover blocks and chairs as required.

(xxi) Inspect the works or any part of the works, at substantial completion and advise the Employer and the contractor of any outstanding work, including defect, to be completed/remedied during the defect liability period.

(xxii) Inspect the works at appropriate intervals during the Defect Liability Period.

(xxiii) Ensure "as-built/completion" drawings, as true record of the works as constructed, are documented and kept in a systematic manner by the contractor.

(xxiv) Prepare an inventory of the completed works, in a format agreed with the Employer, for use by the maintaining authority.

(xxv) Maintain accountal of various materials and machinery as stated below.

(xxvi) Maintaining material at site account for

(a)all materials to be issued by the Employer free of cost,
(b)all released materials till they are handed over to the Railway/re-used.

(xxvii) Maintaining accounts of (a) material brought to the site by the Contractor for which secured advance has been paid and the use of such material; (b) other materials brought to the site by the Contractor for which part payments are arranged and the use of such material; (c) other materials brought to the site by the Contractor for which, no payment will be made till they are laid and use of such material for execution of works.

(xxviii) Maintenance of accounts of machinery made available by the Employer to the Contractor, either free of cost or otherwise, and their effective utilization.

(xxix) Submission of monthly statement of material consumed and material balance available to employer and review the consumption.

ANNEXURE-A

Form PER -1

Resume of Proposed Personnel

Bidders should provide the names of suitably qualified personnel to meet the specified requirements stated above. The data on their experience should be supplied using the Form below for each candidate.

1.	Title of position*
	Name
2.	Title of position*
	Name
3.	Title of position*
	Name
4.	Title of position*
	Name

Form PER -2

Resume of Proposed Personnel

Name of the Bidder		
Position		
Personnel information	Name	Date of birth
	Professional qualifications	

Present employment	Name of employer	
	Address of employer	
	Telephone	Contact (manager / personnel officer)
	Fax	E-mail
	Job title	Years with present employer

Summarize professional experience over, at least the last required years, in reverse chronological order. Indicate particular technical and managerial experience relevant to the proposed position.

From	To	Company / Project / Position / Relevant technical and management experience

SECTION–VIII

CERTIFICATE OF FAMILIARISATION

CERTIFICATE OF FAMILIARISATION

A. I/We hereby solemnly declare that I/We have visited the site/place of work and have familiarized myself/ourselves of the working conditions there in all respects and in particular, the following:

a) Topography of the Area.

b) Soil conditions at the site of work.

c) Sources & availability of Construction material.

d) Borrow areas of earth.

e) Rates for construction materials.

f) Availability of local labour, both skilled and unskilled and the prevailing labour rates.

g) Availability of water & electricity.

h) The existing roads and access to the site of work.

i) Availability of space for putting labour camps. Offices, stores, go-down, sheds engineering yards etc.

j) Climatic condition and availability of working days.

k) Prevailing all taxes, VAT, duties etc.

B. I/We have kept myself/ourselves fully informed of the provisions of this bid document comprising Instructions to the Tenderers, General Conditions of the Contract, Special Conditions of Contracts and Special Technical Specifications/ Conditions of contract apart from information conveyed to me/us through various other provisions in this bid document.

C. I/We have quoted my / our rates as 'Percentage above / below / at par "and quoted against blank items by rates in figure and words, with total cost as per Schedule of Items Rates and Bill of Quantities (BOQ) in FINANCIAL BID taking into account all the factors given above.

(Signature of Bidder/s)

Date: _____

Place: _____

SECTION - IX

BILL OF QUANTITIES

(BOQ)

Name of Work : Design, Alterations, Supply, Installation, Testing & Commissioning of Electronic Interlocking based Signalling System at UP DN IBS between NMWP & NKJ C Cabin alongwith associated works at adjoining stations/sections and Alteration and modification at NMWP & NKJ 'C in connection with Grade Separator work at Katni alongwith associated works at adjoining stations/sections. Design, Alterations, Supply, Installation, Testing & Commissioning of Electronic Interlocking based Signalling System at Bargawan & Majhauli alongwith associated works at adjoining stations/sections in connection with Doubling work in Katni - Singrauli section.								
BILL OF QUANTITY								
SN	**Description of Item**	**Unit**	**Qty KSD**	**Qty KGS**	**Rate (Rs.)**	**Amount KSD (INR)**	**Amount KGS (INR)**	**Total Amount (INR)**
		1	2	3	4	5=2*4	6=3*4	7=5+6
	(1) The Materials which is to be inspected by RDSO should be supplied from RDSO Listed Firms/Suppliers (RDSO approved vendors and RDSO vendors for Developmental Order). If RDSO's Listed Firms/Suppliers are not available then from any other reputed manufacturer/firm as approved by IRCON/Railways/Client.							
	(2) All critical items as per RDSO guidelines will continue to be inspected by RDSO as per instruction contained in Board's letter No. 74/RS(G)/379/2Pt.dated;4/3/91 and 18/6/91:-0							
	(3) The materials, which are procured from RDSO Listed Firms/Suppliers (RDSO approved vendors and RDSO vendors for Developmental Order) with RDSO specification and if the cost of the material is over Rs. 5 Lakh, the inspection shall be carried out by RDSO.							
	(4) Inspection in respect of order above Rs.5 lakh, not done by RDSO, will be got done by RITES/Consignee, subject to supplies being from sources listed by RDSO.							
	(5) Signalling items which are not inspected by RDSO/RITES shall be inspected by Consignee.							
	(6) Current RDSO/TEC specifications are mentioned here. However, while procuring only the LATEST RDSO/TEC SPECIFICATION will prevail and material to be supplied & inspected as per latest specifications.							
	(7) Design, Supply,Installation, Testing and Commissioning of the Signalling & Telecom system shall be planned and to be executed as per to Suit 25 KV RE.							
SCHEDULE-A (SUPPLY-Signalling Materials)								
A	**Electronic Interlocking System**							
1	Design, Manufacture and Supply of Electronic Interlocking System (Hot standby configuration) conforming to specification no. RDSO/SPN/192/2019 ver 2.0 or latest amendment, as applicable, and directive issued by Railway Board and RDSO, till the date of supply / installation as per the enclosed Signalling Interlocking Plans (SIP)							
i	Bargawan (Distributed EI)	System	1		3,70,41,270.00	3,70,41,270.00	-	3,70,41,270.00
	Supply of additional Electronic Interlocking items for End Goomty with Distributed Architecture in connection with Bargawan station.	Per Goomty	2		6,32,666.00	12,65,332.00	-	12,65,332.00
ii	Suply of additional Electronic Interlocking items for IBS with Distributed Architecture in connection with New Majhagawan Phatak station.	IBS		1	6,95,453.00	-	6,95,453.00	6,95,453.00
iii	Majhauli (Centralized EI)	System	1		3,23,31,073.00	3,23,31,073.00	-	3,23,31,073.00
	EI system shall be designed and supplied considering the complete requirement of Ph-1 and Ph-2 but not limited to:							
a)	Microprocessor Equipment (having hot standby system with facility of automatic changeover), other cards and assemblies							
b)	All type of interface Relays such as TPR's, WKR's, WCR's, point operation relays, other interface Relays like QN1/QNA1/ QL1/ LED ECR /Flasher etc. to be provided as per extent practice of WC Rly & to suit 25 KV RE.							

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
c)	Industrial grade Operator Console with 55" VDU (2 Nos each per station) & Industrial grade Maintenance console with 42" VDU as per latest RDSO. Guideline & technical advisory note (TAN), online Dot matrix printer with power supply etc. Also the furniture like table etc required for mounting the VDU shall be provided by the contractor.							
d)	Equipment Racks, Relay Racks, Rack fixtures, mounting arrangements and accessories.							
e)	Interconnecting cables and interfacing equipments required for interfacing the EI with outdoor gears, Data Logger system, Block Instruments, Axle counters, monitoring of Power Supply for IPS system etc.							
f)	Optical cables along with interfacing equipment etc.							
g)	Protective Devices like Fuses, Active Lightning arrestors (Class - A) and surge protection arrangement, equipotential bonding as per latest RDSO guidelines, etc.							
h)	All the consumables, wiring materials, fixtures, tag blocks of various sorts, mounting arrangements and necessary accessories to install and make the EI system functional.							
i)	Supply of Software as per design for Electronic Interlocking System conforming to specn no. RDSO/SPN/192/2019 ver 2.0 or latest to suit Signal Interlocking Plans (SIP) enclosed, including FAT							
j)	Station master is to be provided with 2 VDU only. However SM Room & Equipment rooms may be situated in two different buildings and therefore may be required to be provided with augmented surge protection /optical interface by EI manufacture.							
k)	Supply of industrial grade embedded PC for Operator and Maintenance VDU as per RDSO TAN No. STS/TAN/3007 Version 1.0 or latest with adequate storage memory to work in Hot standby mode.							
l)	Supply of documents/manuals (six set per station) as per specification no. RDSO/SPN/192/2019 ver 2.0 or latest.							
m)	Supply of 10% spares on items such as relays, group relays, indoor cable, wire, tag block, terminals, cards/modules, connectors / couplers, fuses, EI tools etc., minimum of one for use in the complete EI system.							
n)	Supply & installation of Ring/Perimetric Earth for EI system shall be done by the OEM as per latest TAN and guidelines issued by RDSO.							
	Notes :-							
	a) The tenderer should indicate total cost of EI & list of 10% spares along with **break up of total cost indicating separately unit rates, quantities and total cost of each type of equipments, modules, assemblies/sub assemblies, cards etc**. as **Annexure A & Annexure B for spares.** This list of material will be only indicative. Contractor has to supply the complete material for the commissioning of Electronic Interlocking. **No Extra payment shall be made to contractor for any additional item /Cards /Modules**							
	b) The EI equipment offered for the complete EI system shall cater for 20% increase in field input quantities in future. The necessary hardware provided shall be such that it shall be possible to incorporate 20% increase in field input quantities without requirement of any additional hardware other than relays, cables.							

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
2	Supply of portable workstation to run alongwith EI configuration tools, data inputs, simulation and functional testing, diagnostic, trouble-shooting & commissioning of EI System as per Technical Specifications of the tender document. NOTE: Workstation should be capable of reconfiguring the system in case of any alterations in the yard or interlocking in future. Hardware configuration to be approved by IRCON before supply.	Nos	2	0	1,43,891.00	2,87,782.00	-	2,87,782.00
3	Supply of powder coated Main Cable Termination rack complete with scaffolding, fixtures & accessories including 10 mm thick Hylam or any other suitable arragement for mounting 8-way terminal / WAGO make terminal blocks, ladders, string rods, frame, base assembly, insulators, J bolt, nut/bolts & fasteners (Bakelite strips), Rack arrangement etc. as per extant practice on WC Rly for EI. Rack should be made of first class steel powder coated painting and rack manufacturer's certificate should be submitted. All runway for cables / wires shall be provied with PVC sleeve of proper size.	Nos.	12	4	54,150.00	6,49,800.00	2,16,600.00	8,66,400.00
4	Supply of Wago/phoneix screwless 4 conductor disconnecting terminal suitable for copper wire of 0.5 sqmm to 4 sqmm as per spec no. RDSO/SPN/189/2004 ver 1.2. This also includes end stopper, End plate, Carriage Rail, Marker Strip etc. for the fixing of terminals.	Nos.	12000	8000	92.00	11,04,000.00	7,36,000.00	18,40,000.00
5	Supply and installation of Universal Earth Leakage Detector 12 Channel AC/ DC as per RDSO/SPN/256/2002 or latest amendment.	Nos.	8	2	1,78,526.00	14,28,208.00	3,57,052.00	17,85,260.00
B	**Datalogger:**				-			
6	Supply of Microprocessor based data logger with **512** Digital & 48 Analog Inputs as per specification no. IRS:S 99/2006 (amdt. 3) with latest amendments and shall be suitable to work with electronic interlocking system. It includes all interfacing equipments like protocol converter unit etc. It also includes design, supply and installation of all software required as standard practice of WCR and as per specification no. IRS:S 99/2006 or latest. Digital input to be taken from EI through protocol converter and in addition one digital input card to be provided for digital input of important interface relays. This also includes supply of Leased line MODEM for networking of Datalogger, power supply of adequate capacity, battery and fault diagnostic software for failure analysis. Complete Data Logger & Processor Module shall be placed in President / Rittel rack of suitable size to be supplied. This also includes supply of one no. of Computer, Computer Table(Godrej make), UPS, Printer and one no. Operator Chair(Godrej make) as per Technical Specification	Nos.	4	0	4,66,991.00	18,67,964.00	-	18,67,964.00
7	Supply of Remote Terminal Units (RTUs) in 128 Digital and 32 Analog inputsas per specification no. IRS:S 99/2006 (amdt. 3) with latest amendments and shall be suitable to work with electronic interlocking system. It also includes design, supply and installation of all software required as standard practice of WCR and as per specification no. IRS:S 99/2006 or latest. Digital input to be taken from important interface relays. This also includes supply of Leased line MODEM for networking of Datalogger, power supply of adequate capacity, battery and fault diagnostic software for failure analysis. Complete Data Logger Module shall be placed in President / Rittel rack of suitable size to be supplied.	Nos.	0	1	2,52,992.00	-	2,52,992.00	2,52,992.00

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
8	Supply of Door Proximity switches along with 2 way rigid connector for wire termination between proximity switches and Datalogger Tag blocks as per specs.	Nos.	4	1	772.00	3,088.00	772.00	3,860.00
C	**Track Detection Equipment (MSDAC)**				-			
9	Supply of Multisection Digital Axle Counter system (MSDAC), including the central Evaluator/processor (s), final track clearance relay for each track section, detection points, including supply of mush room housing for Track side electronic equipments, Reset Box, LV Box, earthing & earthing material, fixing arrangement for each detection point, accessories (if required as per Installation Manual of the OEM), fully wired and fully equipped as per attached SIPs as per specn no. RDSO/SPN/176/2013 (Ver.3) or latest.	DP	65	28	3,11,000.00	2,02,15,000.00	87,08,000.00	2,89,23,000.00
	NOTE: a) Offered MSDAC equipment above shall cater for RDSO recommended spares. b) The tenderer should indicate total cost of MSDAC & list of 10% spares along with break up of total cost indicating separately unit rates, quantities and total cost of each type of equipments, modules, assemblies/sub assemblies, cards etc as per **Annexure-C & Annexure-D** for spares for each satation. This list of material will be only indicative. Contractor has to supply the complete material for the commissioning of MSDAC. No Extra payment shall be paid to contractor for any additional items/Cards/Modules/software.				-			
10	Supply of MSDAC Tool Kit, as recommended by OEM. Tentative list of each set is as under: a) Portable Data Analyzer(Downloading Event Logger Data for analysis and report generation) - 1 No. b) Pure Sine Wave Digital Multimeter Fluke Make(Model-1871) or Rishab Make(Model-28S)- 1No. c) Train Simulator Mode 11TS267P)- 1 No. d) Extender Card- 1 No. e) Dummy Wheel- 1 No. f) Ring Spanner- 1 No. each g) Open End Spanner- 1 No. each h) Socket Spanner with handle- 1 No. i) Torque Wrench(Jaicom JPR 65 or equivalent 88NM)- 1 No. j) Screw Driver no.902- 1 No. k) Screw Driver no.935- 1 No l) Marking Jig for drilling as applicable m) Dummy Load to check Power Supply(Resistive)- 1 No.	Set	1	1	2,27,319.00	2,27,319.00	2,27,319.00	4,54,638.00
	DC Track Circuit				-			
11	Supply of DC Track circuit Equipment including battery charger, `B' type choke, adjustable Track Feed Resistance, QTA2 relay, QSPA1 relay, Fuse block, ND type fuses, 80 AH batteries etc.	Nos.	0	25	25,317.00	-	6,32,925.00	6,32,925.00
a	Supply of Track feed battery charger 110V AC/6 V DC - suitable to charge 3 cells of 80 AH, to IRS-S-89/2013 or latest RDSO specification. - 1 no				-			
b	Supply of `B' type choke as per specification No.IRS-S-65/83 amndt-1 or latest RDSO specification. - One in AC RE Area, Two as per Railway Practice				-			

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
c	Supply of adjustable Track Feed Resistance (Disc type) 30 ohms as per RDSO Drg. No. SA 20166/M (Adv) with latest amendments (with Phenolic moulded base)or latest RDSO specification. - 1 no							
d	Supply of Relay DC track plug in type neutral, 9 ohms, tractive armature 2 F/1B with front contacts metal to carbon (QTA 2 type) complete with plug board, retaining clip and connector to BRS-939A, and BRS-966(appendix F-2), IRS-S-34/68 & IRS-S-23/86. Or QBAT track relay, 9 ohms, 2F/2B complete with plug board, retaining clip and connector as per RDSO/SPN/84/88 - 1 no				-			
e	Supply of Relay DC plug in neutral line slow to pickup tractive armature 24 VDC 8F/ 4B contacts, front & back contacts metal to carbon complete with plug board, retaining clips & connectors etc. to BRS-933/933A, IRS-S-34/68, IRS-S-23/86 & IRS-S-60 similar to QSPA1 interlocking code ABDEJ -1 no				-			
f	Supply of Fuse block made of PBT as per IRS:S-75/2006 Rev 2 & drg.No. SA-23748. along with supply of Non deterioting type fuses as per IRS-S-78/92 to suit the bases supplied of Capacity as per requirement and wiring diagram - in quantity as per requirement. This includes replacement of fuses blown off during testing and commissioning.				-			
g	Supply of Stationery low maintenance Secondary lead acid cells as per RDSO specification IRS-S-88/2004 with topping up frequency upto 6 months. This includes supply of inter cell connectors, bolts, nuts, acid level indicating floats and vent plugs. 2 Volts, 80 AH				-			
D	**Power Supply:**				-			
12	Supply of SMPS Based Integrated Power Supply System as per specification no. RDSO/SPN/165/2012 (Ver. 3.0) including supply of 110/300AH Low Maintenance Lead Acid (LMLA) secondary Battery for S&T installation as per IRS S-88/2004 and battery rack (if required), remote indication panel, and 05 nos of spares batteries, tool kit and spares as per RDSO specifications suitable for EI. Tentative drawing of IPS is attached with this tender document but current/voltage ratings of different modules may change as per actual load requirement.	Set	4	0	12,65,312.00	50,61,248.00	-	50,61,248.00
13	Supply of SMPS Based Integrated Power Supply System as per specification no. RDSO/SPN/165/2012 (Ver. 3.0) including supply of 110/200AH Low Maintenance Lead Acid (LMLA) secondary Battery for S&T installation as per IRS S-88/2004 and battery rack (if required), remote indication panel, and 05 nos of spares batteries, tool kit and spares as per RDSO specifications suitable for IBS. Tentative drawing of IPS is attached with this tender document but current/voltage ratings of different modules may change as per actual load requirement.	Set	0	1	8,24,773.00	-	8,24,773.00	8,24,773.00
E	**Block Working**				-			
14	Supply of SGE type double line block instrument complete with bell unit, Block bell equipment, Filter unit, DC polarized 3 position biased BPR relay, Wooden block counter, VF Transformer etc.	Nos	4	6	1,10,888.00	4,43,552.00	6,65,328.00	11,08,880.00
a	Supply of SGE type double line block instrument complete as per IRS S :22/ 2016 Ver. 1.0 along with bell unit - in quantity 01 no.				-			

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
b	Supply of Block bell equipment to Specification IRS (TC) 44/88 Amendment 1 or latest RDSO specification . in quantity 01 no per block instrument				-			
c	Supply of Filter unit to Specification IRS(S) 68/89 or latest RDSO specification - in quantity 01 no per block instrument				-			
d	Supply of DC polarized 3 position biased BPR relay IRS-S-31/80 amndt-1or latest RDSO specification- in quantity 01 no per block instrument				-			
e	Supply of Wooden block counter of size 700mm x 700mm W X 900mm H made of teak wood frame and 10mm/20mm thick water proof ply with Formica finish on top and all four sides having two compartment inside and two doors on opposite sides - in quantity 01 no per block instrument				-			
f	Supply of VF Transformer of various types 470:470, 470:600, 470:1120, 600:1120: 600:600, 1120:1120 etc as per IRS Specification No TC / 22-76 or latest RDSO specification - in quantity as per requirement.				-			
15	Supply of UFSBI (2 nos. as per RDSO/SPN/147/2005 or latest RDSO specn), SM's Panel for single line (2 nos as per RDSO/S/32019 or latest RDSO specification), block telephone & Relay Rack completely wired fully with all relays required for Block working with Axle Counter in RE area.	Set	0	1	9,01,116.00	-	9,01,116.00	9,01,116.00
16	Supply of High Availability Single section Digital Axle counter System complete with dual sensor as per Specification No. RDSO/SPN/177/2012 with version 3 or latest complete in all respect. Including reset box. It shall have dual sensors.	Set	0	4	10,26,989.00	-	41,07,956.00	41,07,956.00
17	Supply of Standard Single section Digital Axle Counter System for monitoring track section as per RDSO Spcn.No.RDSO/SPN/177/2012 Version-3.0 or latest RDSO specification. This will cover all equipments required to work the single track section clearance and consist of High Frq Tx,Rx coil, track side digital axle counter unit, vital relay with relay box duly wired, Clamp, reset box, surge protection device etc. The set stands for the equipment required at either end of track section. The manufacturer shall advise complete list of items in a set required for this system before placing demand for RDSO call letter.The reset box shall comply the resetting requirements in connection with dual detection of the track section having redundancy as per latest RDSO Guidelines.	Set	0	1	9,76,937.00	-	9,76,937.00	9,76,937.00
F	**Signals**				-			
18	Supply of FRP CLS Unit 2 Aspect (without lenses and lamps) as per spec. no. RDSO/SPN/194/2006 Ver 2.0 or latest. This includes: (a) Signal post 140 mm dia 4.6 / 3.6 mtrs. long to IRS-S-6-81.=1no (b) Signal Base C I 140 mm dia. to drg. No.S-2011.=1no (c) CLS ladder complete with platform and Signal front staging as per Drg,Base 4.5 / 3.5 mtrs. long to drg.No.SA-23153 (Adv.) Alt 1.= 1no (d) FRP CLS unit 2 aspect complete to drg.No SA – 23003 A/M to C/M (Adv.), without Lamps,transformer,Lamp holder & lenses =1no. (e) 4 nos of Anchor bolt complete with nut washer etc as per Drg no 116 A/H (f) Supply of Universal lock with key (hand cuff) & signal number plate.	Nos.	15	12	43,812.00	6,57,180.00	5,25,744.00	11,82,924.00

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
19	Supply of FRP CLS Unit 3 Aspect (without lenses and lamps) as per spec. no. RDSO/SPN/194/2006 Ver 2.0 or latest. This includes: (a) Signal post 140 mm dia 4.6 / 3.6 mtrs. long to IRS-S-6-81.=1no (b) Signal Base C I 140 mm dia. to drg. No.S-2011.=1no (c) CLS ladder complete with platform and Signal front staging as per Drg,Base 4.5 / 3.5 mtrs. long to drg.No.SA-23153 (Adv.) Alt 1.= 1no (d) FRP CLS unit 3 aspect complete to drg.No SA – 23003 A/M to C/M (Adv.), without Lamps,transformer,Lamp holder & lenses =1no. (e) 4 nos of Anchor bolt complete with nut washer etc as per Drg no 116 A/H (f) Supply of Universal lock with key (hand cuff) & signal number plate.	Nos.	4	8	51,972.00	2,07,888.00	4,15,776.00	6,23,664.00
20	Supply of FRP CLS Unit 4 Aspect (without lenses and lamps) as per spec. no. RDSO/SPN/194/2006 Ver 2.0 or latest. This includes: (a) Signal post 140 mm dia 4.6 / 3.6 mtrs. long to IRS-S-6-81.=1no (b) Signal Base C I 140 mm dia. to drg. No.S-2011.=1no (c) CLS ladder complete with platform and Signal front staging as per Drg,Base 4.5 / 3.5 mtrs. long to drg.No.SA-23153 (Adv.) Alt 1.= 1no (d) FRP CLS unit 4 aspect complete to drg.No SA – 23003 A/M to C/M (Adv.), without Lamps,transformer,Lamp holder & lenses =1no. (e) 4 nos of Anchor bolt complete with nut washer etc as per Drg no 116 A/H (f) Supply of Universal lock with key (hand cuff) & signal number plate.	Nos.	0	4	51,972.00	-	2,07,888.00	2,07,888.00
21	Supply of FRP Route Indicator 1 way with OFF set bracket and Universal lock with key as per RDSO Spec. no. RDSO/SPN/194/2006 Ver 2.0 with latest amendments.	Nos.	0	4	32,642.00	-	1,30,568.00	1,30,568.00
22	Supply of FRP Route Indicator 2 way with OFF set bracket and Universal lock with key as per RDSO Spec. no. RDSO/SPN/194/2006 Ver 2.0 with latest amendments.	Nos.	0	1	38,081.00	-	38,081.00	38,081.00
23	Supply of FRP Route Indicator 3 way with OFF set bracket and Universal lock with key as per RDSO Spec. no. RDSO/SPN/194/2006 Ver 2.0 with latest amendments.	Nos.	0	2	43,521.00	-	87,042.00	87,042.00
24	Supply of FRP Calling-on Unit & fixing arrangement.	Nos.	2	5	4,316.00	8,632.00	21,580.00	30,212.00
25	Supply of FRP Shunt signal Dependent type complete along with offset bracket (without lenses and lamps) as per spec.no. RDSO/SPN/194/2006 Ver 2.0 or latest	Nos.	12	3	8,326.00	99,912.00	24,978.00	1,24,890.00
26	Supply of FRP Shunt signal Independent type complete as per spec. no. RDSO/SPN/194/2006 Ver 2.0 or latest with steel post & CI base along with anchor bolts as per RDSO drawing (without lenses and lamps). This includes supply of Hand cuff Locks & signal number plate.	Nos.	12	2	13,896.00	1,66,752.00	27,792.00	1,94,544.00
27	Supply of LED Signal Lighting Unit (Red) for Main Signals as per specification no. RDSO/SPN/199/2010 (Rev 1.0) dated 11.04.14.	Nos.	20	20	11,735.00	2,34,700.00	2,34,700.00	4,69,400.00
28	Supply of LED Signal Lighting Unit (Yellow) for Main Signals as per specification No. RDSO/SPN/199/2010 (Rev 1.0) dated 11.04.14	Nos.	22	25	11,735.00	2,58,170.00	2,93,375.00	5,51,545.00

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
29	Supply of LED Signal Lighting Unit (Green) for Main Signals as per secification no. RDSO/SPN/199/2010 (Rev 1.0) dated 11.04.14.	Nos.	10	15	11,735.00	1,17,350.00	1,76,025.00	2,93,375.00
30	Supply of LED Signal Lighting Unit for Route Indicator as per specification no. RDSO/SPN/153/2011 (Rev 4.1).	Nos.	50	30	7,644.00	3,82,200.00	2,29,320.00	6,11,520.00
31	Supply of LED Signal Lighting Unit for Calling On Signals as per specification No. RDSO/SPN/153/2011 (Rev 4.1)	Nos.	4	10	7,644.00	30,576.00	76,440.00	1,07,016.00
32	Supply of LED Signal Lighting Unit for Shunt Signals as per specification No. RDSO/SPN/153/2011 (Rev 4.1).	Nos.	60	10	7,644.00	4,58,640.00	76,440.00	5,35,080.00
33	Supply of Various types of markers as:-P/C/G/IB markers -23 cm. Dia circular disc made of 3mm thick MS Sheet. The disc shall be painted with approved colour scheme.	Nos.	10	15	816.00	8,160.00	12,240.00	20,400.00
34	Supply & Fixing of screen on signal by expandend Metal size 20mm X 60mm (strand 3.25 mm wide and 1.6 mm thick) as per instruction at site by Engineer incharge .This includes supply of all materials including earth electrode and earthing arrangement	Nos.	4	4	3,099.00	12,396.00	12,396.00	24,792.00
35	Supply of QNA1 AC immunised relay (for outdoor), 24V DC , 8F/8B along with plug-in board, retaining clip and connectors conforming to BRS:931A,IRS:S60,IRS:S34 & IRS:S23 or latest.	Nos.	60	40	4,266.00	2,55,960.00	1,70,640.00	4,26,600.00
36	Supply of QNA1K AC immunised relay (for outdoor), 24V DC , 1000 ohm, 6F/6B along with plug-in board, retaining clip and connectors conforming to BRS:931A,IRS:S60,IRS:S34/68 & IRS:S23/86.	Nos.	16	20	4,976.00	79,616.00	99,520.00	1,79,136.00
G	**Point Machine**				-			
37	Supply of Electrical point operating machine - IRS Type, 220 mm throw (AC immunity 160 V AC), non trailable to operate on 110 V DC with lock & detector slides, Cable terminal box and Clamp lock arrangement for thick web switches (Drg no. RDSO:S-3395 & S-3454) confirming to IRS:S-24/2002 or latest RDSO specification & Motor IRS: S37/82 with complete Ground connections (P Bracket type) for thick web switches with latest amendments.	Nos.	30	6	1,95,465.00	58,63,950.00	11,72,790.00	70,36,740.00
38	Supply of Electrical point operating machine - IRS Type,143 mm throw (AC immunity 160 V AC), non trailable to operate on 110 V DC with lock & detector slides, Cable terminal box confirming to IRS:S-24/2002 or latest RDSO specification & for Motor IRS: S37/82, Assy Drg RDSO-S:10800 & S:10910 with complete Ground connection for 143 mm throw IRS type machine with latest amendments.	Nos.	0	2	90,840.00	-	1,81,680.00	1,81,680.00
39	Supply of Key Lock Relay AC immunized with different ward combinations (one extra set of ward plate for Point Machine to be supplied with each relay) of RDSO approved make working on 60/24V DC, Siemens type or equivalent.	Nos.	40	10	6,607.00	2,64,280.00	66,070.00	3,30,350.00
H	**Location Boxes**				-			

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
40	Supply of Apparatus Case full Case as per Drg Nos WS-8842/A with latest alteration along with miniature 'E' type locks with keys (1 key per 5 location boxes and handle) of ward Nos. 41 (E type lock & key as per spec. Nos IRS S 30 & RDSO Drg.Nos. SA 3376/M & 3377/M respectively with latest Amendment) on both the doors, duly painted with red oxide. This item also includes i) Supply of Hylam sheet (Bakelite industrial laminated paper based sheet), resin bonded 10 mm thick, grade P3 in standard size of 1.22 x 1.22 mtrs. as per specn. No. IS 2036 of 1974. -as per requirement for termination of cables and for shelf for fixing equipments.	Nos.	75	20	22,282.00	16,71,150.00	4,45,640.00	21,16,790.00
41	Supply of Apparatus Case Half Case as per Drg Nos WS-8842/A with latest alteration along with miniature 'E' type locks with keys (1 key per 5 location boxes and handle) of ward Nos. 41 (E type lock & key as per spec. Nos IRS S 30 & RDSO Drg.Nos. SA 3376/M & 3377/M respectively with latest Amendment) on both the doors, duly painted with red oxide. This item also includes i) Supply of Hylam sheet (Bakelite industrial laminated paper based sheet), resin bonded 10 mm thick, grade P3 in standard size of 1.22 x 1.22 mtrs. as per specn. No. IS 2036 of 1974. -as per requirement for termination of cables and for shelf for fixing equipments.	Nos.	50	15	17,975.00	8,98,750.00	2,69,625.00	11,68,375.00
42	Supply of HRC Fuses 2A / 4A / 6A (Spec. No. IRS:S-78/92) with Fuse Block (Spec. No.IRS:S-75/2006 (Rev.2) and drg. no. SA- 23748 (Alt.4)).	Nos.	110	50	267.00	29,370.00	13,350.00	42,720.00
43	Supply of 5 Amp switch, 3 pin socket , lamp holder along with 110Volt/15W LED lamp (Anchor make).	Nos.	125	35	488.00	61,000.00	17,080.00	78,080.00
44	Supply of ARA Terminal blocks with links, 6 Way, made of PBT Specn No.IRS/75/2006 (Amd - 2) or latest RDSO specification and RDSO Drg.No.SA-23756 Alt.3.	Nos.	250	100	290.00	72,500.00	29,000.00	1,01,500.00
I	**Earthing**				-			
45	Supply and intallation of normal Earth Electrode for earthing of S&T installations with all the associated materials as per extant practice of WCR	Nos.	150	50	3,434.00	5,15,100.00	1,71,700.00	6,86,800.00

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
46	Supply and installation of MAINTENANCE FREE EARTHING AND BONDING SYSTEM (Two Earth Pit) as per specification no: RDSO/SPN/197/2008 or latest RDSO specificationconsisting of (a) Earth electrodes made of high tensile low carbon steel circular rods, molecular bonded with copper on outer surface as per RDSO spn - 2 no. (b) RDSO approved Earth Enhancing compound (c) (MEEB) Main equipotential earth busbar of Copper of 300x25x6 mm(Min) and (SEEB) Sub equipotential earth busbar of copper 150x25x6 mm(Min) (d) Multistrand single core PVC insulated copper cable as per IS:694 -(i) of size 10 sqmm to connect individual equipment to SEEB using copper lugs with stainless steel nuts and bolts,(ii)of size 16 sqmm to connect SEEB to MEEB using copper lugs with stainless steel nut and bolts (iii) of size 16sqmm to connect Surge protection devices(SPD) to MEEB using copper lugs with stainless steel nut and bolts (iv) of size 35 sqmm(duplicated) to connect MEEB to main earth electrode (e) Copper tape of size 25x2mm to connect the two earth pits, (f) Earthpits x 150 mm to terminate on earth electrode, (g) Construction of earthpit and making of earth as per RDSO specification no.RDSO/SPN/197/2008 or latest RDSO specification.	Nos.	30	10	52,313.00	15,69,390.00	5,23,130.00	20,92,520.00
J	**Supply of cables protection material**				-			
47	Supply and fixing of RCC cable route marker engraving of Signal/Telecom cable one side and Zonal Rly on other side as per WCR Railway Practice and painting on both sides of marker with numbering with black paint . The markers should be fixed for a maximum of 50 mtrs to locate the Signaling/Telecom cable path and the marker should be visible about one feet above the ground for the clear visibility, the remaining portion of marker should be buried in the ground. Whererver track crossing are available, RCC markers are to be provided on both sides of the track for easy identification. All required materials (Supply, painting, transportation to site and fixing) are to be aranged by the Contractor.	Nos.	200	20	1,228.00	2,45,600.00	24,560.00	2,70,160.00
48	Supply of DWC pipe with one snap fit coupler and 'O' ring conforming to RDSO/SPN/204/2011 Ver. 1.1or latest RDSO specification , Non metallic, corrugated, multiwalled, normal duty, pliable, without protection against chemical attack and Non flame propagating in 6 meter length of size 120 mm outer dia & 102 mm inner dia.(Permitted tolerance in dia = +/- 2 mm).	Mtrs.	300	200	283.00	84,900.00	56,600.00	1,41,500.00
49	Supply of SPLIT DWC pipe conforming to RDSO/SPN/204/2011 Ver. 1.1 or latest RDSO specification, Non metallic, corrugated, multiwalled, normal duty, pliable, without protection against chemical attack and Non flame propagating in 2 meter length of size 200 mm outer dia & 175 mm inner dia.(Permitted tolerance in dia = +/-2 mm) (TWO half round pipe constitute one split pipe)	Mtrs.	6000	200	353.00	21,18,000.00	70,600.00	21,88,600.00
50	Supply of Galvanized Iron pipe 100 mm dia medium grade with screw end both side and fitted with sockets as per specn. No.IS-1239, part 1 / 1990 or latest in length of approx 6 meters	Mtrs.	200	300	1,224.00	2,44,800.00	3,67,200.00	6,12,000.00
51	Supply of RCC pipes 150mm dia, 2 Mtr long along with collars as per Specn. No. IS/458/1971or latest for use near OHE Substation for cable protection.	Mtrs.	100	100	177.00	17,700.00	17,700.00	35,400.00
K	**Tools & Plants**				-			

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
52	Supply of Signalling Maintenance tools & Plants as per Annexure-1.	Set	2	1	1,22,389.00	2,44,778.00	1,22,389.00	3,67,167.00
L	**Signal & Telecom Cable**				-			
53	Supply of PVC insulated armoured, unscreened, underground Railway signalling cable 12 Core 1.5 sqmm (copper cable) as per Specification no. IRS-S-63/2014 (Rev 4.0) or latest. Drum no. and name of consignee to be painted on the cable drum.	Km	200	35	2,31,151.00	4,62,30,200.00	80,90,285.00	5,43,20,485.00
54	Supply of PVC insulated armoured, unscreened, underground Railway signalling cable 6 Core 1.5 sqmm (copper cable) as per Specification no. IRS-S-63/2014 (Rev 4.0) or latest. Drum no. and name of consignee to be painted on the cable drum.	Km	10	5	1,47,969.00	14,79,690.00	7,39,845.00	22,19,535.00
55	Supply of underground Jelly filled 6 Quad cable of size 0.9 sqmm dia for signalling and telecom installation as per specn no. IRS:TC-30/2005 (Ver-1) with ammendment no. 5 or latest.	Km	20	20	3,49,596.00	69,91,920.00	69,91,920.00	1,39,83,840.00
56	Supply of Polythene insulated Sheathed Jelly Filled Telephone cable 20 Pair of Size 0.63 mm with poly -Al moisture Barrier as per IRS TC 41/97.	Km	2	2	1,41,574.00	2,83,148.00	2,83,148.00	5,66,296.00
57	Supply of Polythene insulated Sheathed Jelly Filled Telephone cable 5 Pair of Size 0.63 mm with poly -Al moisture Barrier as per IRS TC 41/97.	km	2	2	67,965.00	1,35,930.00	1,35,930.00	2,71,860.00
M	**Level Crossing Gate**							
N	**IOT**							
58	**Remote Diagnostic and Predictive Maintenance System (IOT)**							
a	Provision of cloud based application alongwith OPC-UA/MQTT support for monitoring of signal and telecom assets with standard protocols and analysis health data. Application shall accommodate at least 19 stations data. Use ID and login credential shall be given to S&T inspector and officers. Vendor shall maintain the cloud application for the period of 2 years for free of cost. (Suitable for 22 stations). Application Software licenses shall be perpetual. (Complied with latest RDSO FRS - RDSO/RDPM/FRS/2021 date of Issue 6th May or latest)	Nos.	2	0	93,750.00	1,87,500.00	-	1,87,500.00
b	Supply and installation of Failure Analysis System / Edge Computing System along with station Local server and Software. (Complied with latest RDSO FRS - RDSO/RDPM/FRS/2021 date of Issue 6th May or latest).	Nos.	2	0	2,49,955.00	4,99,910.00	-	4,99,910.00
c	Supply and installation of Microprocessor based Event Logger installed indoor to interface with EI and Data logger. (Complied with latest RDSO FRS - RDSO/RDPM/FRS/2021 date of Issue 6th May or latest)	Nos.	2	0	2,32,768.00	4,65,536.00	-	4,65,536.00
d	Supply and installation of Microprocessor based Mini Logger installed outdoor to monitor point machine as per Specifications. (Complied with latest RDSO FRS - RDSO/RDPM/FRS/2021 date of Issue 6th May or latest)	Nos.	15	0	89,643.00	13,44,645.00	-	13,44,645.00
e	Supply and installation of Microprocessor based interface for DAC to monitor upto 8 SSDAC in EI Room as Per specification. (Complied with latest RDSO FRS - RDSO/RDPM/FRS/2021 date of Issue 6th May or latest)	Nos.	2	0	95,536.00	1,91,072.00	-	1,91,072.00
f	Supply and installation of Microprocessor based Mini Logger installed in existing Location box For Monitoring of SSDAC parameters, as per Specifications. (Complied with latest RDSO FRS - RDSO/RDPM/FRS/2021 date of Issue 6th May or latest).	Nos.	16	0	63,125.00	10,10,000.00	-	10,10,000.00

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
g	Supply and installation of Microprocessor based Mini Logger installed in Location Boxes FOR MONITORING OF Signals as per Specifications. (Complied with latest RDSO FRS - RDSO/RDPM/FRS/2021 date of Issue 6th May or latest).	Nos.	14	0	89,821.00	12,57,494.00	-	12,57,494.00
h	Supply and installation of Microprocessor based Mini Logger installed in Location Boxes FOR MONITORING OF LC Gate as per Specifications.(Complied with latest RDSO FRS - RDSO/RDPM/FRS/2021 date of Issue 6th May or latest).	Nos.	1	0	89,821.00	89,821.00	-	89,821.00
i	Supply and installation of Microprocessor based Mini Logger installed in Indoor FOR MONITORING OF IPS as per Specifications.(Complied with latest RDSO FRS - RDSO/RDPM/FRS/2021 date of Issue 6th May or latest).	Nos.	3	0	63,125.00	1,89,375.00	-	1,89,375.00
j	Supply and installation of MSDAC Monitoring unit with installation as per Specifications. (Complied with latest RDSO FRS - RDSO/RDPM/FRS/2021 date of Issue 6th May or latest)	Nos.	5	0	63,304.00	3,16,520.00	-	3,16,520.00
k	Supply and installation of Microprocessor based Mini Logger installed in Location Boxes FOR MONITORING OF Track Circuits as per Specifications. (Complied with latest RDSO FRS - RDSO/RDPM/FRS/2021 date of Issue 6th May or latest)	Nos.	26	0	89,643.00	23,30,718.00	-	23,30,718.00
O	**Miscellaneous**				-			
	Supply of Fire Alarm system				-			
59	Supply, Installation, Testing and commissioning of Automatic Fire Detection & Alarm System (AFDAS) for Signalling installations as per specn no. RDSO/SPN/217/2016 Ver 1.0 or latest consisting of probe type bimetallic heat detector with base, UV & IR flame detectors with base, heat & smoke multisensor with base, aspirating type smoke detectors with base, linear heat sensing (LHS) cables, LHS interface module, LHS cable end of line box with modular junction box, moniter module for LHS cable alarm input to fire panel, addressable hooter, fire alarm control panel with sufficient input ports for connecting various sensors/detectors along with their interfaces, if any, and shall have sufficient output ports for controlling fire extinguishing system, operating/switching off electrical units and having provision for remote monitering network along with software, intelligent addressable Manual call points, audio visual alarm, fire survival circuit integrity cables etc. The AFDAS shall also consist of fire suppression system as per RDSO specification. The fire alarm panel should also consist of switched mode power supply system, battery backup and charger, display board which will have character display with touch key pad, RS-232/485 Networking Circuit, USB 2.0 Port, Programmable inputs, NAC's and Programmable relays, and loop card circuits, necessary software for display of fire alarm, necessary interconnecting cables etc. Power supply Board will have SMPS fully protected board, battery backup with built in charger as per RDSO specification.	No.	4	1	12,19,280.00	48,77,120.00	12,19,280.00	60,96,400.00
	a) The tenderer should indicate total cost of Automatic Fire Detection & Alarm System (AFDAS) along with break up of total cost indicating separately unit rates, quantities and total cost of each type of equipments, modules, sensors, detectors, Cables, assemblies/sub assemblies etc. as an **'Annexure 'E'**. This list of material will be only indicative. Contractor has to supply the complete material for the commissioning of Automatic Fire Detection & Alarm System.				-			

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
60	Supply of Fuse Auto Changeover System (FACS) as per RDSO specification No RDSO/SPN/209/2012 Rev-1.0 or latest.	Module	24	6	23,659.00	5,67,816.00	1,41,954.00	7,09,770.00
61	Supply of Office furniture set for relay room consisting of chairs, office table, Airy revolving & tilting cushion chair, steel almirah, steel stool of Godrej make. This includes	No.	2	1	65,997.00	1,31,994.00	65,997.00	1,97,991.00
	a) Office chairs of model no CH-1007 of Godrej or equivalent model of same make. - 2 no				-			
	b) Office tables of model no T9 of Godrej or equivalent model of same make. with 3 drawers on left hand side & one locker on the right hand side. Olive brown/green with duplicate keys. -1 no				-			
	c) Airy revolving & tilting working cushion chair with arm rests of model no PCH 7002 of Godrej make or equivalent of same make. -1 no				-			
	d) Supply of steel almirah - office storwel of Godrej make or equivalent model of same make. Size 1980 x 915 x 486 approx with 4 shelves making 5 compartments without locker having locking door. -1 no				-			
					-			
	e) Steel stool Godrej make or similar ST-2 or equivalent -4 no.				-			
62	Supply of Automatic Media changeover System of modem working on redundant channels for data transmission on OFC/ Quad for seamless operation of UFSBI over multiple media as per RDSO specification no. RDSO/SPN/147/2005 with Amendment 1 or latest.	Nos.	0	3	45,516.00	-	1,36,548.00	1,36,548.00
63	Supply and installation of invertor 1.2 KVA-Input 24V DC, Output 230 V AC (Pure sine wave). The power rating of invertor may vary as per site requirement and may be supplied agter approval of engineer-in-charge. Make Microteck, Luminous or similar reputed brand.	Nos	4	2	11,800.00	47,200.00	23,600.00	70,800.00
64	Supply of USB to Opto converter along with ribbon cable	Nos	1	1	3,000.00	3,000.00	3,000.00	6,000.00
65	Supply & installation of data concentrator along with modem.(FEP)	Set	1		1,30,000.00	1,30,000.00		1,30,000.00
66	Supply of APC Euro 2000 pigtails 1.5 meter along with adopters as per latest TEC specification.	Nos.	0	16	750.00	-	12,000.00	12,000.00
67	Supply of Patch cord APC Euro 2000 to SC connectors 5 meter long as per latest TEC specification.	Nos.	0	16	2,850.00	-	45,600.00	45,600.00
68	Supply of 3-mtr SC-SC Duplex Fibre Patch Cord SM-9/125 microns, D-link or similar	Nos	0	16	950.00	-	15,200.00	15,200.00
69	Supply of Modem compatible with existing UFSBI system to work on backup media. The back media can either unframed 2 Mbps E1 channel from P-Mux or direct dark single mode optic Fiber cable upto 30 km.	Pair	0	2	68,827.00	-	1,37,654.00	1,37,654.00
	Total of Schedule A (Supply-Signalling Materials) (without GST Rs.) =					**18,75,65,645.00**	**4,37,54,843.00**	**23,13,20,488.00**
SCHEDULE-B (SUPPLY-Telecom Materials)								
A	**OFC Transmission System:**							
1	Supply of 24 fibre Armoured Optic fibre Cable as per spec. IRS:TC:55/2006 Rev-1 Amd. 2 or with latest amendment.	KM	6	30	90,905.00	5,45,430.00	27,27,150.00	32,72,580.00

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
2	Supply of loose tube pigtail with FC-PC connector at one end each of minimum 10 mtrs. Length as per TEC Specification No. G/OFJ-01/03 JUN 99(with latest amendment) compatible with STM given above.	Nos	10	10	2,277.00	22,770.00	22,770.00	45,540.00
3	Supply and installation of rack mounted 24 fIbre Fibre Distribution Management System part no FMS - 1U 24 FS 24 FP Raychem make including 24 Nos 0.2 db SC/PC adaptors and 24 Numbers. 900 micron 1.5 meter SCPC Pigtails RDSO Specification no. : RDSO/SPN/TC/037-2000(Rev.3) or latest.	Nos	0	3	31,379.00	-	94,137.00	94,137.00
4	Supply installation testing & commisning including earthing of 42 u 19" covered racks for housing SDH and P- MUX equipments, DDF, FMS, MDF, using krone module etc. Complete with all fittings, wired and equipped with integrated protection modules for all channels and adequate numbers of cooling fans, AC/DC power supply distribution panels, U Link panels and other hardware like runway , ladders etc.It should be possible to lock all the equipments with only order wire telephone remaining outside the rack ..The rack should be of APW President/Rittal make . The components of the rack are specified below. Broad description of rack is detailed below .Rack size 2200(mm) H X 600(mm) W xX 600(mm) D .Fixed side panels 42 U X 600 (mm) D front glass door plain 42 U X 600 (mm) D rear MS door plain 42 U X 600 (mm) D leveling screws - 4 numbers .Fan directly mounted on top 48 V DC 90 CFM - 2 Nos. earth connectivity kit - 1 No. Cable manager with cable loops-2nos.	Nos	0	3	61,212.00	-	1,83,636.00	1,83,636.00
B	**Ducts and Accessories for OFC**				-			
5	Supply of HDPE duct 40/33 mm permanently lubricated in lengths of 1000 Mtrs and accessories including end caps for every drum length as perspec. No. RDSO/SPN/TC/45/2013 Rev.-2.0 Amdt.-2.0 including latest amendment. This includes the loading, unloading and transportation at the site of work. This also includes supply of HDPE Duct Accessories like 2(two) END PLUG, 2 (two) Cable sealing plug and 2 (two)Plastic coupler-slip fit push type for every KM of HDPE supplied.	Km	6	30	75,151.00	4,50,906.00	22,54,530.00	27,05,436.00
6	Supply of OFC Joint Enclosure for straight through joint with modification for 24 fibre OFC as per TEC specification no. GR/OJC-02/02 SEP 2003 (with latest amendment) or latest. It includes splicing of optical fibre cables (24 Fibre) and testing.	Nos	4	10	14,798.00	59,192.00	1,47,980.00	2,07,172.00
7	Supply of Thermoshrink jointing kit for Jely filled Six quad cable conforming to RDSO Spec. IRS:TC-77/2006(Rev 1) with latest amendment.	Nos	4	20	6,071.00	24,284.00	1,21,420.00	1,45,704.00
8	Supply and fixing of VF Tapping Transormers (1120:470) as per the Spec. IRS TC 22-76 or latest RDSO specification.	Nos	8	15	896.00	7,168.00	13,440.00	20,608.00
9	Excavation for Jointing pit and provision of joint chamber of 1.2 mtr dia of 60 cm height with 2 piece cover on top and bottom cover with holes for drainage.This includes water cooling of chamber, backfilling and ramming of trench after laying and consolidated of soil as well as disposal of soil as per plan as advised by site engineer.	Nos	4	10	5,942.00	23,768.00	59,420.00	83,188.00
10	Supply and fixing of 20 pair CT Box and fixing on Hylam board on wall and termination of quad/ telecom cable at station/ SP/ SSP/ TSS/ LC gate/ Relay room/ office/ residences as per requirement and details given by engineer at site. The CT box after termination shall be sealed by pouring paraffin wax.	Nos	2	10	5,149.00	10,298.00	51,490.00	61,788.00
11	Supply of Switch board cable 5 pair for indoor wiring.	Km	2	1	18,531.00	37,062.00	18,531.00	55,593.00

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
12	Supply, Installation wiring testing and commissioning of SPT at IBS location and adjacent stations. Each set shall comprise one no. of signal post telephone (SPT) master unit (which shall be installed on IBS post) along with one no. of slave unit being installed in SM'S office (both master and slave unit must work on 24V DC and must be suitable for 25KVAC RE area). Note: The contractor shall ensure that there is no interference in communication between the master and slave units owing to power hump due to RE induction, Cable from IB signal unit to the cable termination board in SM'S room/relay room will be provided by the railways. It shall work on OFC or quad cable & it shall ensured by contractor before supply of the items. Telephone shall be ACES make or similar.	Set	0	2	28,901.00	-	57,802.00	57,802.00
13	Supply and installation of OFC integrated access device 1U height of 15U/ 19" height rack mountable for LVCD/Digital Axle counter purpose , optical module integrated in the unit supporting dual core OFC and 100 Mbps ethernet port for surveillance/smoke detector , optical distance support distance to be Rikins, unit to support 1 E&M card supporting four 2w/4w, each port configurable to support axle counter/ UFSBI/Contal phone IECIRTU and one TELNEUSNMP part unit to support Dc/Ac power supply, unit to support changeover mechanism between Quad and optical fiber for E&M interface options, one no. cable to be provided along with E&M ; FA810/2CX/OFCIDC and module 2w/4w four port. Make : TEAM ENGG/FABIO or equivalent.	No	0	1	2,10,500.00	-	2,10,500.00	2,10,500.00
14	Supply of UPT CAT-6 Cable (4 pair) as per TIA/EIA 568.2-1 Cat-6 specification length of box not less than 1000 feet (305 mtr) make - Finolex/systimax/D-LinkfTyco. Accepted Make: D-Link. Standard IRS condition with latest amendment will be applicable.	Box	2	5	3,500.00	7,000.00	17,500.00	24,500.00
15	Supply and Installation of Desk type Electronic Magneto Telephone as per spec No IRS TC:36-97 or with latest Amendments.(Amndt.1)	Nos	4	2	3,585.00	14,340.00	7,170.00	21,510.00
16	Supply of 4/2 wire emergency light weight portable control telephone as per Spec. no. IRS-TC:78-2000 with amendment No. 3 including latest amendments with 6 pin flat plug to specn no. IRS-TC-42/87.	Nos	0	2	2,838.00	-	5,676.00	5,676.00
17	Supply of 50 pair Krone terminal complete with mounting arrangements.	Nos	0	6	2,579.00	-	15,474.00	15,474.00
	Total of Schedule B (Supply-Telecom Materials) (without GST Rs.) =					**12,02,218.00**	**60,08,626.00**	**72,10,844.00**
SCHEDULE-C (Execution of Signalling Works)								
	General Instructions:-							
	(1) For trenching, cable laying, provision of RCC/DWC/GI/RCC hume pipe/ HDD method for track/ road/ platform/ culvert/ bridge etc. to be followed as specified in tender documents.							
	(2) All the surfaces shall be repaired and brought back to its original condition, as the case may be.							
	(3) The standard ratio of cement, sand, 25mm stone chip shall be 1:3:6 respectively, wherever concreting and foundation of signal, location, etc. is involved.							
	(4) All the sundry materials will be provided by the contractor at site like:cement,sand, 25 mm or 1" stone chips for concreting, nuts, bolts, washers, sal wood shelves planks, S.W. strips, ferrules, anti corrosive/Red oxide/ Weather proof/Acid proof paint, MS plates/ angles/ flats, anchor (foundation) bolts, MS clamps, screws, eyelets, PVC bunching tape, buttons, condensor, resistance, varnish, fevicol, soldering/ welding material, copper lug, charcoal, salt, salmoniac, 6 SWG GI- wire, MS pin, boss pin, 6mm rivet, split pin, angle cleats, 1" dia GI pipe, 6/8- SWG soft bond wire, flexible wire, channel pin, heat shrinkable tape, suitable compound for fixing lead wire, 1.5" GI/HDPE pipe for point machine/ axle counter, 3/4" thick sal wood boards, transparent sheet for box, lock for box make Godrej or similar, insulated strip, sulphuric acid, distilled water, cup board, sunmica, cable fixing clamps, power sockets, plugs, connectors etc. so as to complete the individual job as per schedule description.							
	(6) The contractor has to conduct detailed site survey of the cable route, prepare a plan to get approval of the Railway, putting white lime powder marking before excavation of earth under supervision of railway/employer's authorized representative.							
	(7) GI-Pipes to be supplied by the contractor must be as per specification IS 1239, Pt-1, 1979 (grade medium).							
	(8) DAC, UFSBI/BI, IPS, Solar Panels, Data Logger, etc. shall be installed & commissioned by OEM with proper issue of Installation certificate by OEM.							
A	**Electronic Interlocking System**							

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
1	Installation, wiring, testing & commissioning of complete indoor EI system and other associated equipment as supplied in item no. 1 of Schedule -A (Station, End Goomty and IBS). It shall consists of the following but not limited to: 1. Grouting, cutting of floors, walls etc. refilling of same, re plastering, required CC/ masonry works. 2. Termination of indoor cables on disconnecting terminals on Din rail, painting/lettering on Equipment Rack, Relay Rack/Termination Rack . 3. Fixing of racks PBT terminals Disconnect Type/Wago terminals, ND Fuses, Bus Bars, Eyelets, hylam strips of required thickness (12mm, ISI mark) as per length required at site etc. 4. Fixing of VDU, all types of Relays, Wiring and testing as per wiring diagram. 5. Installation, wiring & testing of Relay Rack/Equipment Rack/CT Rack. 6. Testing of earthing arrangement as per latest RDSO guideline/Technical advisory Note. 7. Contractor organising testing of wiring as per wiring diagram with Ircon/Railway. The testing includes -Functional testing, selection table testing with contractor's simulation panel. 8. Commissioning of Electronic Interlocking system after interfacing of indoor equipments with outdoor gears in association with Railway Personnel during Non Interlock working. Competent Engineer of manufacturer must be available during Pre NI, NI and Post NI. 9. EI system shall be design, Installation, wiring, testing & commissioning considering the complete requirement of Ph-1 and Ph-2 but not limited to:							
a	Bargawan (Distributed EI) with End Goomties.	System	1		7,46,608.00	7,46,608.00	-	7,46,608.00
	Majhauli (Centralized EI)	System	1		7,46,608.00	7,46,608.00	-	7,46,608.00
2	Design, Supply, Alteration/Modification, Installation, Tesing & Commissioning of Existing Electronic Interlocking of following stations as per attached sketch and site requirement. This includes (i) supply of all interface Relays, (ii) Equipment Racks, Relay Racks, Rack fixtures, mounting arrangements and accessories. (iii) Interconnecting cables and interfacing equipments required for interfacing the EI with outdoor gears, Data Logger system, Block Instruments, Axle counters, monitoring of Power Supply for IPS system etc. (iv) Optical cables along with interfacing equipment etc. (v) Painting & lettering of all indoor & outdoor newly installed gears. (vi) Design, Preparation and submition of as planned and as built all S&T indoor and outdoor documents based on approved SIP to suit RE of WC & SEC Rly and other associated work.				-			
a	New Katni Junction 'C' cabin (EI of Kyosan make)	LS		1	99,04,202.00	-	99,04,202.00	99,04,202.00
	NMWP (EI of Seimens make)	LS		1	35,11,320.00		35,11,320.00	35,11,320.00
3	Preventive and periodic maintenace/breakdown maintenance & supervision of SSI equipment within the period of maintence for one year	LS	2	1	4,08,474.00	8,16,948.00	4,08,474.00	12,25,422.00
4	Training Consisting of training of Railway Personnel for EI system. This also includes supply of Hard and soft copies of course materials.	Man weeks	1	1	26,091.00	26,091.00	26,091.00	52,182.00

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
5	Preparation & Submission of 'as planned' and 'as made' documents for EI. It includes but not limited to: 1. Equivalent Circuit of Application logic 2. Interface circuits. 3. Selection table/Route Control Chart. 4. Video Display Diagram. 5. SWR & SWRD It should be done as per extent practice of WC Railway. The documents shall be supplied as per technical specification of tender document.	Set Per Station	2	2	2,76,306.00	5,52,612.00	5,52,612.00	11,05,224.00
6	Preparation & Submission of 'as planned' and 'as made' documents for complete indoor signalling work for IBS. It should be done as per extent practice of WC Railway. The documents shall be supplied as per technical specification of tender document.	IBS	0	2	76,904.00	-	1,53,808.00	1,53,808.00
7	Preparation & Submission of 'as planned' and 'as made' of all outdoor drawings for outdoor signalling work. It should be done as per extent practice of WC Railway. The documents shall be supplied as per technical specification of tender document.	Per Station	2	2	1,52,679.00	3,05,358.00	3,05,358.00	6,10,716.00
8	Preparation & Submission of 'as planned' and 'as made' of all outdoor drawings for outdoor signalling work for IBS. It should be done as per extent practice of WC Railway. The documents shall be supplied as per technical specification of tender document.	IBS	0	1	42,495.00	-	42,495.00	42,495.00
9	Installation, complete wiring Testing and commissioning of operating VDU including supply of station masters console for fixing telephones, Block instrument, Reset box & other equipments.	Per Station	2	2	43,826.00	87,652.00	87,652.00	1,75,304.00
10	Carrying out alteration to the existing Relay wiring at Relay rack/Location box as per the circuit Diagram. The work includes releasing the existing unused wires and wiring the relays using PVC 16/0.2 mm copper.(Wire PVC 16/0.2 mm copper for the work shall be supplied by the contractor)	Per Relay	0	40	563.00	-	22,520.00	22,520.00
11	Testing of point to point insulation / continuity test for all laid out cables, Measuring Parameters and preparing the records	Per Station	2	4	60,225.00	1,20,450.00	2,40,900.00	3,61,350.00
12	**Patching of new CT Rack** with existing CT Rack.This includes patching of cable cores from existing CT Rack from Relay Room to CT Rack of new Relay Room which includes Termination of cable cores on terminals at cable termination rack. This includes all associated works of pulling out the cable from under ground, peeling off insulation, dressing of cable core supported on sting rod with contractors own material. The work shall be done as per instructions of engineer at site.	Nos.	0	3000	12.00	-	36,000.00	36,000.00
B	**Datalogger**				-			

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
13	Installation, wiring, testing and commissioning of Data Logger/RTU as per spec. IRS: S-99/2006 with Amdt-2 or latest, including but not limited to the following: 1. Supply and loading of diagnostic software for failure analysis . 2. Interface wiring between Relay Rack to Datalogger for all the digital & Analog inputs as per standard Railway practice. 3. Relay Room Door locking checking arrangement, commercial power supply monitoring arrangement. 4. Interlinking & Networking of Datalogger. 5. Modification to Software & Hardware, if required, and networking with other Data Loggers along with fault logic design at Control Centre. 6. Training as per Railway Practice. 7. Software programming of Datalogger to enable Preventive maintenance of all S&T assets, 8. Failure analysis, GUI of Yard Layout, extract of report in common language, accident analysis as per RDSO Guideline. 9. All installation & wiring material including supply of Relay Room Door locking checking arrangement shall be supplied by contractor & shall be procured from RDSO approved sources, wherever applicable.	Job	2	1	28,070.00	56,140.00	28,070.00	84,210.00
14	Modification / reconfiguration to dataloggers at stations and Control Centre to suite the SIPs.	No. of Stns	0	2	6,045.00	-	12,090.00	12,090.00
	NOTE: Data Logger will be installed, wired, tested and commissioned by OEM's engineer as per RDSO guidelines. RDSO pre-commissioning checklist for Data Logger System will be prepared by OEM's engineer and signed jointly with Employer's Site Engineer. Before commissioning of Data Logger, OEM will submit Site Installation Certificate to Employer by mentioning that Data Logger has been installed, wired tested and commissioned by RDSO approved vendor (i.e., by OEM). Modification in Programming of Datalogger at associated stations to be done by Contactror.				-			
C	**Track Detection Equipment (MSDAC)**				-			
15	Installation , wiring, Testing and commissioning of Multi-section Digital axle counter System including but not limited to: Fixing of Track Transducers on the rails, drilling of holes ,installation of Electronic Junction Box in Location Box, termination of cables and wiring. Installation of Evaluator. Fixing of relays, bus bar & fuse. Installation, wiring, testing & commissioning of reset box/Line verification Box etc. RDSO check list for Installation are to be complied by Manufacturer's engineer. Note:- Installation to be done by OEM/Authorised Representative of OEM & precommissioning check list should be duly signed by OEM/ Representative of OEM & Railway/IRCON represntative.				-			
a	Track side electronic Unit inclusive of evaluator & earhing if required.	Nos.	65	28	17,441.00	11,33,665.00	4,88,348.00	16,22,013.00
	Track Circuits				-			
16	Fixing and wiring of track circuit equipments in location box and testing including supply of wiring material. This includes:	Per Track Circuit	0.00	25	7,960.00	-	1,99,000.00	1,99,000.00

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
a	Complete work of fixing of hylam sheet supplied with location box, fixing of track circuit equipment like battery chargers, track feed resistance, choke, relays, fuses, terminals, batteries etc. as per approved wiring diagram in location box. As per WCR Railway practice, wire for wiring of these equipments of track circuits shall be supplied by contractor.				-			
b	Supply of frame for fixing of relays - as per requirement				-			
17	Bonding of track circuits on track, track connections, installation, jumpering, charging of batteries, testing & commissioning of DC track circuits on track. including supply of Fibre glass track lead Junction boxes,etc.	Per Track Circuit	0.00	25	15,301.00	-	3,82,525.00	3,82,525.00
a	Supply of Channel bond pin (single groove,tinned or zinc coated 7mm dia), GI Bond wire soft(7 strand steel wire 8 SWG), PVC Jacketed wire rope(galvanized wire rope 6mm dia (6x19 standard wire with steel core sheathed with PVC 2 mm wall thickness, overall thickness 10 mm)				-			
b	Supply of Fibre glass track lead Junction boxes along with TLJB angle for termination of signaling cables - as per requirement				-			
c	Initial Charging of 3 nos. of batteries of 80AH capacity supplied along with supply schedule for track circuits.				-			
d	Installation, wiring, testing & commissioning of DC track circuits on track as per instruction of Site Engineer. This include all preparatory work of Glued joint bypass bonding, temporaray negetive bonding during NI and other physical adjustments before commissioning to enable existing Track circuit to continue and post commissioning bonding across old glued joint.				-			
D	**Power Supply**				-			
18	Installation, Wiring, Testing & commissioning of Integrated Power Supply system confirming to specn. no. RDSO/SPN/165/2012 (Ver. 3.0) or latest and to suit pre-commissioning Check List issued by RDSO. This includes charging, installation & commissioning of 55 Nos., 110V Low Maintenance Lead Acid (LMLA) Battery for S&T installations as per IRS: S-88/2004 and existant practice of WCR alongwith installation of Remote Indication Panel in SM/ASM's room. Any masonry work, if required, will be carried out by contractor's own material. The 25 sq mm wire shall be used for connecting Batteries from IPS, 16 sq. mm power cable is to be used for wiring of 110V DC, 110V AC & 60V DC (internal) and for balance power supply 10 sq, mm power cable is to be used. All connectors, wiring material, ladders, DWC pipes etc as per site requirement are to be arranged by contractor as per instructions of railway engineer at site. The contractor will provide supply & fitting of exhaust fan in IPS room & Battery Room including hole on wall(if not available), wire mesh and flap cover to protect the room against dust. This item includes transportation, loading & unloading of IPS system complete and battries from Store to site of installation. All wiring will be done by using flexible multi strand copper wires of suitable size as recommended by RDSO in IPS's pre commissioning checklist. This includes extending various power supplies up to bus bars in relay room and up to battery room. IPS should be connected to Ring earth of EI. This also includes supply of all materials, fabrication and fixing of fuse and supply of distribution Board required for interconnection from IPS to Relay rack, CT Rack etc. as per RDSO guidelines/Railway practice.	Nos.	4	1	2,45,774.00	9,83,096.00	2,45,774.00	12,28,870.00

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
	Note:- IPS will be installed, wired, tested and commissioned by OEM's engineer as per guidelines issued by RDSO. The pre commissioning checklist issued by RDSO for IPS will be prepared by OEM's engineer and signed jointly with Site engineer. Before commissioning of IPS, OEM will submit Site installation Certificate by mentioning that IPS has been installed, wired, tested and commissioned by approved vendor of RDSO, i.e by OEM.				-			
19	Augmentation of IPS 2X24V Converters or 24V/20A chargers for each station including wiring materials, Frame, 2 Numbers DC-DC converters,Fixing,testing and commissioning .	Nos.	2.00	4	78,571.00	1,57,142.00	3,14,284.00	4,71,426.00
E	**Block Working**				-			
20	Installation, wiring & testing of Double Line block instrumnets. The work involves supply of wiring material and wiring right from telecom DP to block Panel and Block Panel to relay room and connection with power supply including fuse wiring. This also includes Installation, wiring & testing of Block Bell units and Block Filter units supplied under BOQ schedule A.	Nos	4	6	10,760.00	43,040.00	64,560.00	1,07,600.00
21	Installation, wiring & testing of axle counter based block panel for one complete block section along with other accessories. The work involves supply of wiring material and wiring right from telecom DP to block Panel and Block Panel to relay room and connection with power supply including fuse wiring.This work may be involved along with releasing of complete existing SL block instrument and its accessory and its transportation to new location for further use.	Set	0	6	65,100.00	-	3,90,600.00	3,90,600.00
22	Installation, wiring, testing & commissioning of new Digital axle counter system (HASDAC/SSDAC). Outdoor work includes : Fixing of track transducers on the rails. Drilling of holes in rails. supply and laing of HDPE pipe, Laying of track transducers cable from rail to HASDAC/SSDAC unit in HDPE pipe, digging/trenching as per instruction of Site Engineer. Installation of HASDAC/SSDAC unit in location box. Termination of cables & wiring of HASDAC/SSDAC unit. Indoor work includes: Installation of Reset Box, wiring and termination of quad cable. Laying & termination of cable from C.T.rack to Reset Box. Fixing of relays, bus bars & fuses.Installation, wiring, testing & commissioning of reset box & line verification box in SM room / cabin. This includes: Fixing of reset box/line verification box on Wooden/hylam sheet. Supply & fixing of MS angles. RDSO Check list for installation are to be complied by manufacturer's engineer.	Set	0	4	1,36,236.00	-	5,44,944.00	5,44,944.00
F	**Signals**				-			

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
23	a) Excavation of pit, fixing of foundation scaffolding, casting & plastering of concrete foundation, removal of scaffolding, water curing and earth filling for Colour Light Main Signal and Casting of cement concrete foundation for signal ladder as per WCR practice. This includes : Supply of cement, sand, stone chip & mixing in the ratio 1:3:6. b) Erection of Multi aspect colour light signals. This includes : Erection of surface base, signal post, signal unit, junction type route indicator, and shunt signal on OFF set bracket, calling on signal, ladder with guard & platform, fixing of P/C/G marker, supply & fixing of Heat enammelled signal number plate & blanking-off signals as per the requirement. Making of holes in CLS post, supply of other minor material like clamps, nuts & bolts, wiring material etc. Fixing of signal lamps/LED's with accessories on 2/3/4 aspect signal unit, shunt, route, calling on unit as per the requirement. Termination of the tail cable in the signal units, wiring of signal and testing, focusing of signal etc.	Signal	20	15	17,330.00	3,46,600.00	2,59,950.00	6,06,550.00
24	a) Excavation of pit, fixing of foundation scaffolding, casting & plastering of concrete foundation, removal of scaffolding, water curing and earth filling for Independent Shunt Signal as per WCR practice. This includes : Supply of cement, sand, stone chip & mixing in the ratio 1:3:6. b) Erection & wiring of shunt signal. This includes : Erection of surface base, shunt signal post, shunt signal unit. Supply & fixing of Heat enammelled signal number plate, Fixing of lenses, signal/LED lamp, supply and fixing of antitheft protection etc., where ever required. Termination of the tail cable, supply of wire & wiring of signal unit. Focusing and testing of shunt signal.	Signal	12	2	5,356.00	64,272.00	10,712.00	74,984.00
25	Supply and installation of Goods Warning Board/Caution Board/Stop Board/Block Section Limit Board(BSLB)/Shunting Limit Board/Calling on Board/Change of Signalling territory board etc as per WCR practice. All the above said boards will be supplied, in sizes and dimensions as mentioned in Signal Engineering Manual & GR with luminous strips yellow as well as black. This includes burying of post atleast 1.2 mtrs and concreting of size 0.5 mtr x 0.5 mtr x 0.5 mtr with cement concrete in the ratio 1:3:6. All material will be supplied by the contractor.	Nos.	6	6	20,476.00	1,22,856.00	1,22,856.00	2,45,712.00
G	**Point Equipment (Electrical Points)**				-			
26	Installation, Wiring, Testing & Commissioning of Point Machines including wiring of point JB, fixing of GI Pipe, Ground Connections and other work related to functioning of Point Machine. The work shall be done as per practice of WCR & the instruction of Engineer. All materials related to wiring will be supplied by the contractor.	Per Point Machine	30	10	18,598.00	5,57,940.00	1,85,980.00	7,43,920.00
27	Excavation & Pulling out the old cable from existing point machines, insertion of old & additional new cable through GI bend pipe, wiring, testing and commissioning of point machine.	Per Point Machine	5	4	7,019.00	35,095.00	28,076.00	63,171.00
28	Fixing of Key Lock Relay AC immunized with different ward combinations (Two extra set of ward plate for Point Machine to be supplied with each relay) of RDSO approved Make working on 60/24V DC or functional equivalent.	Nos.	40	10	1,597.00	63,880.00	15,970.00	79,850.00

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
29	Supply & Fixing of Pre-wired Crank Handle cum key lock relay box alongwith LEDs, push buttons, 8-way terminal strips, string rod, etc. suitable for 6 crank handle relay per box. It includes supply of any minor bracket, nuts, bolts, teakwood, sunmica, lock, drilling holes as directed by engineer at site.	Nos.	4	4	12,429.00	49,716.00	49,716.00	99,432.00
H	**Location Boxes**				-			
30	Excavation, casting, concreting, curing and plastering (above ground level) of Apparatus case foundation as per practice of WCR & erection with contractors own Metal Sheet frame, cement, anchor bolts with nuts & washers and other materials. The items also include additional earth work if required as per instruction of Rly. Engineer at site for :-				-			
a	Full Location Box as per Drg No JBP/S&T/C/084	Nos.	75	25	11,517.00	8,63,775.00	2,87,925.00	11,51,700.00
b	Half Location Box as per Drg No JBP/S&T/C/085	Nos.	50	20	6,690.00	3,34,500.00	1,33,800.00	4,68,300.00
	Note: The above item includes supply and installation of petty material for fixing, clamping & mounting arrangement, fabrication and fixing of Hylam sheet in location box, by providing all fixtures as per railway drawing including fixing of PVC coated string rods at the back side for cable support with contractor's own material. The work shall be done as per as per instructions of Engineer Incharge.				-			
K	**Cable Laying**				-			
31	Digging of cable pit (minimum inside size of 2m x 2m x 1m) and construction of brick wall in the pit, width of the wall shall not be less than 200mm as per instructions given by engineer in charge. It includes supply and filling of sand before and after coiling of cables, covering top of the cable pit by stones and brick masonry work for sides and thereafter plastering.	Nos.	4	2	19,944.00	79,776.00	39,888.00	1,19,664.00
32	Excavation of trenches at the depth of 1.0 Mtr. deep and 300 mm wide at the bottom of the trench including clearing of roots, bushes, or other obstruction etc. for all types of soils including Murrum, soft rock, hard soil mixed with boulders etc. as per cable route plan. This also includes complete back filling the trench after laying required quantity of cable,protection pipes/bricks, route marker etc and ramming and consolidation of soil as well as disposal of extra soil .	Km	2	12	77,302.00	1,54,604.00	9,27,624.00	10,82,228.00
33	Excavation of trench as per cable route plan, 1.2 mtr deep, 300mm wide at the bottom along main line in normal soil, This work includes covering of cable laid in trenches by loose soil for a layer of 50 mm thickness approximately before covering by shahabad stone/bricks, clearing of route, bushes etc and refilling of the trench by excavated soil and ramming after laying of the required quantity of cables as per instructions of Engineer at site. If it is not possible to reach the required depth at any location, then the contractor shall obtain prior approval of Engineer-in-charge before commencement of cable laying process and only then shall the proportionate payment be made to the contractor.	Km	12	5	80,114.00	9,61,368.00	4,00,570.00	13,61,938.00
34	Excavation of cable trench of 1 m. depth & 300 mm. wide across the track crossing, road crossing, level crossing, platform & refilling after laying DWC pipe with collars .This does not include provision of Tiles etc in case of Platform.. The work shall be done as per existant practice of West Central Railway & Instruction of Engineer.	Km	2	1	79,409.00	1,58,818.00	79,409.00	2,38,227.00

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
35	Horizontal direction drilling/boring without damage of surface of road /Track formation. It includes supply, transportation and insertion of self lubricated HDPE pipe (Inner dia 103.5mm and outer dia 120mm). The depth of horizental boring should be min. 1m from rail flange/road level.	Mtr	200	200	2,888.00	5,77,600.00	5,77,600.00	11,55,200.00
36	Preparation of cable Duct 150mm wideX300mm deep for laying of cable in rocky area and refilling the duct(after cable laying) with concrete mixture of proportion 1:3:6 and grouting the ends at either side of the rocky portion using concrete mixture with contractor's own materials and excavated earth to its original condition.	Mtr	300	200	730.00	2,19,000.00	1,46,000.00	3,65,000.00
37	Laying & Installation of 100 mm B Class perforated **GI pipe** for Cable Protection at culverts/Bridges including cutting, suitably concreting at both ends, GI clamps, flats etc. All material to be supplied by Contractor.The work shall be done as per instruction of Engineer.	Mtr	300	300	57.00	17,100.00	17,100.00	34,200.00
38	Laying of Signalling/Power/Telecom Cables of various cores in trench and meggering of main and tail cables. This includes loading/unloading & transportation of cables to site. Whenever several cables are to be laid separation of cables should be as advised by site engineer. This also includes unwinding of cable drum using proper jigs without causing damage to cable.	km	350	60	6,375.00	22,31,250.00	3,82,500.00	26,13,750.00
39	Transportation & Laying of DWC/RCC pipes along with collars in trenches at required locations as per the instruction of engineer at site.	km	1.00	1.00	46,499.00	46,499.00	46,499.00	92,998.00
40	Placing of half round (Split DWC) pipe over the laid cable in open trenches in yards between Home signal to Home signal and tieing pipe with cable with loose armouring	km	6	10	4,135.00	24,810.00	41,350.00	66,160.00
41	Laying HDPE duct in already made trenches and through DWC/GI/RCC pipes wherever necessary	km	6	30	11,465.00	68,790.00	3,43,950.00	4,12,740.00
L	**Level Crossing Gate**				-			
42	Shifting of existing power operated lifting barrier	Per barrier		1	8,184.00	-	8,184.00	8,184.00
M	**Miscellaneous**				-			
43	Filling earth around location boxes/signal posts	Per cum	10	4	129.00	1,290.00	516.00	1,806.00
N	**Painting**				-			
44	Cleaning, scraping, Painting & lettering of all indoor& outdoor newly installed and existing gears by the contractor including supply of all materials for the work by contractor.				-			
a)	Medium Station 4/5/6 lines	Station	2	2	47,390.00	94,780.00	94,780.00	1,89,560.00
a)	IBS	IBS	0	1	13,528.00	-	13,528.00	13,528.00
O	**Dismantling Work**				-			
45	Dismantling & Releasing of the following S&T gears. The work includes transportation of released material to the store of IRCON/Railway and properly stacking the same in the store.				-			

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
a	Dismantling and Release of complete INDOOR equipment from stations / IBH/LCgates and transportation of released material after commissioning from the station/IBH/LC to the S&T store depot or to other site for reusing with contractors own transport as per direction of site Engineer. Most of the indoor released material like - Relays, relay racks, Base plates, CT rack, Terminals, IPS, Tagblock, Datalogger, ELD, Block Instruments, Filter unit, Key lock box with relays etc are proposed to be reuse at the same station or at other stations, thus releasing to be done carefully with out damaging the equipments. The quantity of released material shall be jointly recorded by the contractor and Engineer's/railway representative before releasing from site.	Stn.	2		51,193.00	1,02,386.00	-	1,02,386.00
b	Dismantling and Release of complete OUTDOOR equipment from stations/ IBH /LCgates and transportation of released material after commissioning from the station/ IBH/LC to the S&T store depot or to other site for reusing with contractors own transport as per direction of site Engineer.Most of the released material like - Signal, Point machine with ground connection, Track relays, and track equipments, axle counter, EC socket and post, gate telephone etc are proposed to be reused at the same station or at other stations, thus releasing to be done carefully with out damaging the equipments. The quantity of released material shall be jointly recorded by the contractor and Engineer's/railway representative before realesing from site.	Stn.	2		51,193.00	1,02,386.00	-	1,02,386.00
46	Shifting/ lifting of existing location boxes/ signals/Track lead boxes, junction boxes etc along with foundation to adjacent place to facilitate earth work/ clearing infringement etc at stations including IBH, LC gates etc.	Stn	1		29,037.00	29,037.00	-	29,037.00
47	Loading, unloading and transportation of additional/balance Signal and telecom materials after completion of work or during execution of work, to and from Railway/Ircon other stores depot to and from the site of work. Note: This does not include transporatation of material from nominated depot to site and back or from site to site, which is to be done by contractor free of cost.	Per 100 Ton Km	10		623.00	6,230.00	-	6,230.00
Total of Schedule C (Supply-Telecom Materials) (without GST Rs.) =						**1,30,89,768.00**	**2,21,76,110.00**	**3,52,65,878.00**
SCHEDULE-D (Execution of Telecom Works)								
A	**OFC SYSTEM**							
1	Blowing/drawing of OFC cable in the HDPE pipe duct and in protective works already provided. This includes transportation, loading/unloading of OFC from the stores to the work site with care, sealing of the duct by sealing/caps plugs. This also includes testing of cable drums in the store premises before transportation and submissions of results thereof. The cable drums with unused cable at site to be returned by the contractor from site to stores depot.	Km	6	30	14,988.00	89,928.00	4,49,640.00	5,39,568.00

SN	Description of Item	Unit	Qty KSD	Qty KGS	Rate (Rs.)	Amount KSD (INR)	Amount KGS (INR)	Total Amount (INR)
		1	2	3	4	5=2*4	6=3*4	7=5+6
2	Transportation, installation of optical fibre joint enclosure and splicing of Optical fibre cable (24 fibres) and testing, Optical fibre cable splicing shall be done in the presence of IRCON's representative. Only joint closure shall be issued by IRCON. All other tools/ test equipments required shall be arranged by the contractor. This also includes excavation of earth for construction of masonry pit of bricks (inside complete plastered), the inner size of pit 1.2m x 1.2m (depth 0.75 m) in all types of soils for keeping cable coils at the location of OFC joints, filling the pit with sand after jointing of cables, ramming and covering with RCC slab as per instructions of site incharge of IRCON.	Nos	8	10	21,786.00	1,74,288.00	2,17,860.00	3,92,148.00
3	Transportation and execution of joints on Quad cable/PIJF cable using Themoshrink jointing kit (with installation of VF transformer wherever required and advised by Engineer in Charge). This also includes excavation of cable joint pit of size 1.2mx1.2mx1.0m in all types of soil for jointing of copper cables, backfilling and ramming after jointing.	Nos	6	10	2,124.00	12,744.00	21,240.00	33,984.00
B	**VHF Tower and Shifting of Telecom Equipment:**							
Total of Schedule D (Execution of Telecom Work) (without GST Rs.) =						**2,76,960.00**	**6,88,740.00**	**9,65,700.00**
SCHEDULE-E (Provision of Vehicle and Provision of Technical & Design Consultant)								
A	**Provision of Vehicle**							
1	Provisioning of dedicated 7-seater passenger SUV for movement of Ircon S&T Engineers on the project site. The above shall include cost of driver, fastag/toll tax, fuel, etc with availability as per Ircon Engineer's requirement.	Per KM	30000	50000	21.00	6,30,000.00	10,50,000.00	16,80,000.00
B	**Provision of Technical & Design Consultant**				-			
2	Technical and Design Consultant and Project Construction Manager to be provided by the Contractor as per the following plan:-				-			
i	S&T Expert/ S&T- 1 Personnel	Man months	6	12	83,016.00	4,98,096.00	9,96,192.00	14,94,288.00
ii	Supervisor/ S&T- 4 Personnel	Man months	12	24	62,723.00	7,52,676.00	15,05,352.00	22,58,028.00
iii	CAD operator/ S&T- 1 Personnel	Man months	12	0	62,723.00	7,52,676.00	-	7,52,676.00
Total of Schedule E (Provision of Vehicle and Provision of Technical & Design Consultant)(without GST Rs.) =						**26,33,448.00**	**35,51,544.00**	**61,84,992.00**
Total of Schedule A, B, C, D, E (Without GST) (Rs.) =						**20,47,68,039.00**	**7,61,79,863.00**	**28,09,47,902.00**
18% GST (Rs.) =						**3,68,58,247.02**	**1,37,12,375.34**	**5,05,70,622.36**
Grand Total of Schedule A, B, C, D, E (With GST) (Rs.) =						**24,16,26,286.02**	**8,98,92,238.34**	**33,15,18,524.36**

Note : -
KSD:- Katni Singrauli Doubling
KGS:- Katni Grade Separator