

Dt. 04-AUG-2021

To,

Dear BA/ SI Partner

Sub: Expression of Interest (EOI) for Selection of Business Associate (BA) from RailTel's empanelled BA's for the requirement of customer of RailTel (CoR) for "Design, Supply, Installation, Wiring, Testing & Commissioning of Integrated communication system VHF (Simplex) as per RDSO specification RDSO/SPN/TC/109/2019 with latest Amendment/Revision, for Tunnels with associated equipments inside tunnels and in between tunnel & adjacent stations for section covering Tunnels T8/9, T10, T1, T2/T2-E & T3 connectivity from Katra (SVDK) & Reasi stations, Tunnels T5/T5-E connectivity from Reasi & Salal-A stations, Tunnels T6, T9, T10, T11 & T12 connectivity from Salal-A & Dugga stations, Tunnels T13/T13-E connectivity from Dugga & Basindadhar stations, Tunnels T14/14-E, T15/15-E & T40/41 connectivity from Basindadhar & Sangaldan station (including Tunnels being executed by IRCON in Basindadhar- Sangaldan section) on Katra - Dharam section in KRCL Jurisdiction of USBRL Project of Northern Railway."

1. Schedule of Events

1	EOI No	RailTel/EOI/NR/BA/21-22/Business Delivery/RO/KRCL
2	Publishing of EoI for empanelled SI's/BA	04-AUG-2021
3	Last Date for Submission of EOI documents	07-AUG-2021 on 15:00 Hrs
4	Opening of EOI documents	07-AUG-2021 on 15:30 Hrs
5	Mode of Submission	E-Bid submission only at https://railtel.enivida.com
6	Estimated Cost of EOI	₹ 88.13 Crores
*Note: This EOI complies the extant policy of Preference to Make In India. Please refer EOI for details.		

Note: RailTel reserves the right to change the above dates at its discretion.

2. Introduction:

With reference to the above subject, RailTel Corporation of India Ltd. (RCIL) calls your attention to the Selection of Systems Integrator & Implementation Partner for "Design, Supply, Installation, Wiring, Testing & Commissioning of Integrated communication system VHF (Simplex) as per RDSO specification RDSO/SPN/TC/109/2019 with latest Amendment/Revision, for Tunnels with associated equipments inside tunnels and in between tunnel & adjacent stations for section covering Tunnels T8/9, T10, T1, T2/T2-E & T3 connectivity from Katra (SVDK) & Reasi stations, Tunnels T5/T5-E connectivity from Reasi & Salal-A stations, Tunnels T6, T9, T10, T11 & T12 connectivity from Salal-A & Dugga stations, Tunnels T13/T13-E connectivity from Dugga & Basindadhar stations, Tunnels T14/14-E, T15/15-E & T40/41 connectivity from Basindadhar & Sangaldan station (including Tunnels being executed by IRCON in Basindadhar- Sangaldan section) on Katra - Dharam section in KRCL Jurisdiction of USBRL Project of Northern Railway on back to back basis"

a. The rates should be inclusive of taxes, however, breakup of all the taxes charged by the BA/SI shall be shown separately. The BA/SI has to submit the breakup of all taxes at the time of submission of their “Tax invoices” also. The BA/SI has also to submit their GSTIN No. at the time of submissions of their “Tax invoices”. In addition to it, the BA/SI should submit a copy of the GSTIN registration certificate for the states wherever applicable. In case of the successful BA/SI is not liable to be registered under CGST/IGST/UTGST/SGST Act, the RailTel shall deduct the applicable GST from his/their bill under RCM and deposit the same to the concerned tax authority. Vendors should file GST return and transfer credit of GST in RailTel account as per GST procedure.

b. The offers shall be opened on above said date, in the presence of those BA/SI, who choose to be present. If the above said date happens to be a holiday, the same shall be opened on the next working day.

c. This tender is covered under the Integrity Pact Programme of RailTel and the bidders are required to sign the Integrity Pact and submit the same to RailTel along with the bid. Tender received without signed copy of the Integrity Pact document shall be liable to be REJECTED.

3. Background Information :

- a. No information of this document or related to this work shall be shared with anyone without permission of the RCIL-Northern Region office.

3.1 Scope of Work and Partner Selection:

3.1. A: The broad responsibility of the BA/SI under the scope of work for this EOI shall be as per Appendix-A

3.2: Interested partners needs to submit their EoI response:

You are requested to submit the complete ‘Technical and Commercial Proposal’ online mode only.

The offer shall be submitted for this EOI with a Lowest Cost Based Selection Criterion. The bid should have a ‘Index’ at the starting and all pages of bid should be serially numbered and should be traceable as per the ‘Index’.

Any document submitted must be duly signed & stamped by the bidder in each page.

- I. The bidder should take into account any Corrigendum to this EOI document that may have been published (on RailTel website) before submitting their bids. The bid is to be submitted online on e-nivida portal or before due date.
- II. Bidders in their own interest are advised to submit the bid well before the last date and hence to avoid any inconvenience at the last moment.
- III. The bidder may modify or withdraw its bid after submission, prior to the deadline date and time prescribed for the bid submission in this EOI. Bid withdrawal notices received after the bid submission deadline will be ignored, and the submitted bid will be deemed to be a validly submitted bid. No bid may be withdrawn in the interval between the bid submission last date and the expirations of the bid validity period. Withdrawal of a bid during this interval period may result cancellation of empanelment of BA/SI with RailTel.

- IV. Bidder can submit only 'One Bid'. Submission of multiple bids by a bidder will lead to rejection of all of its bid.
- V. DELETED
- VI. BA/ SI shall quote in SOR provonsortiid in EOI only. In case the schedule of requirement quoted by BA/SI is incomplete with reference to EOI document, the offer is liable to be rejected. Schedule of requirement (Price Bid) is placed at Annexure-1.
- VII. The rates quoted should be written both in words and figures. The unit of rates should be mentioned for each SoR item separately & shall be in metric system and as per EOI specification/schedule. In case of difference between words and figures, the rate in words will prevail. If there is a discrepancy between the unit price and total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected by the purchaser accordingly.
- VIII. BA/SI are requested to go through all the conditions of the EOI document and note that, by submitting the EOI documents, duly signed, they have accepted these conditions and undertake to abide by these conditions (unless specifically disagreed to clause wise).
- IX. ATTESTATION OF ALTERATION: No scribbling is permissible in the EOI documents. EOI containing erasures and alterations in the EOI documents are liable to be rejected. Any correction made by the BA/SI in his/their entries must be signed (not initiated) by him/them.

3.3 The Bidder, who have submitted lowest commercial bid for complete 'Scope of Work' will be declared as '**Commercially Suitable Partner (hereafter referred to as 'CSP')**'. It is re-mentioned that the final selection of CSP will be on the L-1 basis only among the technically qualified bidder. Further, RailTel reserves the right to have negotiation with the CSP.

3.4 As of now, EoI responses from interested partners are invited considering that the selected partner will be responsible for delivering of complete 'Scope of Work' as mentioned in the EOI document. However, RailTel at its discretion, may take-up a certain portion / percentage of 'Scope of Work' by communicating to the CSP at any point of time during the engagement period. In this scenario, commercial engagement with the CSP will be for that portion / percentage only, which has not been taken by RailTel. Accordingly, resultant value of work will be derived on the basis of negotiated (*in case*) financial bid of the CSP.

4. Selection Criteria :

a. Stage-I: Sealed proposals of only those BA/SIs will be entertained who are empanelled with RCIL. The PBG for empanelment should be valid on date of opening of the bids. A copy of PBG or proof of empanelment fee should be submitted along with the technical-commercial bid alongwith letter of empanelment.

b. Stage-II:

Qualification criteria:

1. There should not be any ongoing or past arbitration case(s) between RailTel/REL/Customer of RailTel and bidder for the past two years on the last date of submission of EOI. Self-Declaration is to be submitted in this regard.
2. The bidder should submit 'Acknowledgment Copy' of Income Tax Returns for last three Financial Years.
3. The bidder should have a valid Corporate Identification Number (CIN), Permanent Account Number (PAN), Goods and Service Tax Identification Number (GSTIN), on the last date of submission of EOI. Copy of documents in this regard is to be submitted.
4. The Applicant should not be blacklisted by any State / Central Government / PSU / Autonomous Body on the last date of submission of EOI. Self-Declaration is to be submitted in this regard.
5. Bidder must clearly identify the full title and authorization of the designated official and provide a statement of offer commitment with the accompanying signature of the official and submit the copy of power of attorney/authority letter authorizing the signatory to sign the bid.
6. MAF in the name of RailTel is mandatory from the major original equipment manufacturing (OEM).
7. Bidder has to submit the No Deviation Certificate. (as per Annexure-2).
8. "The BA/SI shall submit a notarized affidavit (as per Annexure-3) on a non-judicial stamp paper stating that they meet the 100% compliance requirements & all their statements/documents submitted along with the bid are true and factual. Standard format of the affidavit to be submitted by the bidder is given in the EOI document. Non submission of an affidavit by the bidder shall result in rejection of his/their bid and it shall be mandatorily incumbent upon the BA/SI to identify, state and submit the supporting documents duly self-attested by which they/he are/is qualifying the work experience / Qualifying Criteria mentioned in the EOI Document. It will not be obligatory on the part of the EOI Evaluation Committee to scrutinize beyond the submitted document of the BA/SI as far as his qualification for the EOI is concerned.
9. The BA shall submit a declaration/undertaking regarding their compliance with GOI Ministry of Finance OM No. F. No. 6/18/2019-PPD, dated 23-07-2020 regarding restrictions on procurement from a bidder of a country which shares a land border with India. Undertaking on the bidder's Letter Head duly Signed and stamped by the Authorized Signatory.
10. The tenderer must have successfully completed One similar work costing not less than the amount equal to Rs. 52.88 lakhs or two similar work order each of Rs. 35.25 lakhs or 3 similar work order each of Rs. 26.44 lakhs during last 07 (seven) years, ending last day of month previous to the one in which EOI is invited. Work Experience Certificate from private individual shall not be considered. However, in addition to work experience certificates issued by any Government organization, work experience certificate issued by Public listed company having average annual turnover of Rs. 500 Crore and above in last three financial years excluding the current financial year listed on National Stock Exchange or Bombay Stock Exchange incorporated / registered at least 5 years prior to the date of opening of Tender shall also be considered provided the work experience certificate has been issued by a person authorized by the public listed company to issue such certificate. 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.

Similar project / works / experience means: Works shall be considered as similar if executed work involves "Design, Supply, Installation, Testing & Commissioning of Signalling and Telecommunication or Telecommunication work".

11. The bidder should have a minimum cumulative turnover of Rs. 132.20 crores in previous three financial years as per audited balance sheet. The bidder has to submit the audited balance sheets for the last three financial years in support of their eligibility.

12. The interested partner should submit 'Bid Security Declaration' for Exemption from Deposition of Earnest Money Deposit (EMD). EoI response without 'Bid Security Declaration' is liable for rejection without assigning any further notice. (As per Annexure-6)

13. Payment terms will be back-to-back basis and as mentioned in the EOI document. Payment will be released on receipt of Tax Invoice for the work and after RailTel receives the payment from Customer for the same work. Acceptance certificate to be submitted along with bid by the bidder.

14. The service level arrangement will be back to back and all the penalties deducted by Customer will impose on the selected bidder on actual basis. Acceptance certificate to be submitted along with bid by the bidder.

15. The bidders are required to submit a copy of the EOI document duly signed by Authorized Signatories as a token of acceptance of terms & conditions of contract.

16. Bidder has to submit the Integrity Pact (in 2 copies) on a non-judicial stamp paper of Rs. 100/- duly signed by the person signing the bid.

17. Bidder has to signed and submit the NDA enclosed.

18. Bidder to submit the Affidavit of Self certification regarding Minimum Local Content as per annexure- for Class 1 local Supplier.

19. Bidder has to submit the EOI cover letter.

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

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

- c. **Stage-III :** Those BA/SIs whose PBG is in place and those are fully complying with Stage-II, will be further evaluated on Financial Parameter as per the Price Bid- Annexure-1. The BA/SIs meeting the Technical compliance of RailTel's customer 100% & quoting the lowest price shall be adjudged '**Successful BA/SI**'. No upward price revision is allowed at a later stage.

5. Duration of Engagement :

- (a) The contract will be governed on back to back basis as per the contract between RailTel and CoR.

6. RCIL's Right to Accept/Reject Bids :

RCIL reserves the right to accept or reject any bid and annul the bidding process or even reject all bids at any time prior to award of contract, without thereby incurring any liability to the affected BA/SI or without any obligation to inform the affected BA/SI about the grounds of rejection by RailTel.

7. Bidding Document

- (a) The BA/SI is expected to examine all instructions, forms, terms and conditions and specifications in the bidding documents. Submission of bids, not substantially responsive to the bidding document in every aspect, will be at the BA/SI's risk and may result in rejection of its bid without any further reference to the BA/SI.
- (b) All pages of the EOI documents shall be signed by the BA/SI including the closing page in token of his having studied the EOI document. Signed copy of the EOI document is also to be submitted along with the offer.

8. Bid Validity

Bids shall remain valid for a period of 90 days from the date of opening of the bids. RCIL shall at its own discretion reject a bid validity of shorter period. The same shall be further extended, if need be based on request from the purchaser.

9. Bid Currency

The prices in the bid document shall be expressed in Indian Rupees only and price figures quoted wherever will be considered as expressed in Indian Rupees only.

10. Performance Bank Guarantee (PBG) :

- 10.1 On receipt of the Letter of Acceptance from the RailTel, the successful BA/SI should give a Performance Guarantee in the form of irrevocable bank guarantee from any 10.1 On receipt of the Letter of Acceptance of Tender from the RailTel, the successful BA/SI should give a Performance Guarantee in the form of irrevocable bank guarantee from any Nationalized Bank or Scheduled Bank in the Form given in Tender document amounting to **3% of the contract value**. It is mandatory that all the Bank Guarantees submitted under this EOI must be routed through Structured Financial Messaging System (SFMS) from issuing Bank to RailTel Bank by sending IFN 760 COV Bank Guarantee Advice Message. Thereafter only physical Bank Guarantee will be acted upon. Format of PBG is as per **annexure-4**.
- 10.2 The Instruments for Performance Guarantee should be valid for one year beyond the Completion period.
- 10.3 The successful BA/SI shall have to submit a Performance Guarantee (PG) within 30 (thirty) days from the date of issue of Letter of Acceptance (LOA). Extension of time for submission of PG beyond 30 (thirty) days and up to 60 days from the date of issue of LOA may be

given by the Authority who is competent to sign the contract agreement. However, a penal interest of 15% per annum shall be charged for the delay beyond 30 (thirty) days, i.e. from 31st day after the date of issue of LOA, a notice shall be served to the contractor to deposit the PG immediately (however not exceeding 60 days from the date issue of LOA). In case the contractor fails to submit the requisite PG even after 60 days from the date of issue of LOA, the contract shall be terminated duly forfeiting EMD and other dues, if any payable against that contract. The failed contractor shall be debarred from participating in re-tender for that work.

- 10.4 A separate advice of the BG will invariably be sent by the BG issuing bank to the RailTel's bank through SFMS and only after this the BG will become acceptable to RailTel. It is therefore in own interest of bidder to obtain RailTel's bank IFSC code, its branch and address and advise these particulars to the BG issuing bank and request them to send advice of BG through SFMS to the RailTel's Bank.
- 10.5 Performance Guarantee shall be released after satisfactory completion of the work contract.
- 10.6 Wherever the contracts are rescinded, the security deposit should be forfeited, and the Performance Guarantee shall be encashed by RailTel.
- 10.7 The balance work shall be got done independently by RailTel.
- 10.8 The original contractor shall be debarred from participating in the tender for executing the balance work.

11. Modification and/or Withdrawal of Bids :

Bids once submitted will be treated, as final and no modification will be permitted. No correspondence in this regard will be entertained.

No BA/SI shall be allowed to withdraw the bid after the deadline for submission of bids.

If successful BA/SI withdraw or back out from the bid commitments, the BG submitted or empanelment fee in reference to empanelment shall be forfeited and all interests/claims of such BA/SI shall be deemed as foreclosed/rejected. Such BAs withdrawal may be considered for further action as may be deemed fit by RailTel.

12. Variation in Quantity Clause :

Variation in quantity will be governed as per the contract between RailTel and Customer of RailTel (CoR).

13. Negotiation :

RCIL reserves the right to negotiate with the successful BA/SI in order to make the bid competitive.

14. Payment Terms :

Payment terms will be back-to-back basis and on receipt of payment from the customer of RailTel.

(a) The following procedure shall be followed for paying the BA/SI the charges for the services rendered by the BA/SI under the contract:-

(i) The payment shall be made to the BA/SI as per details mentioned in Appendix 'A'

(ii) All payments shall be made by the RailTel Northern Region, New Delhi after deducting penalties if any as deducted by the customer of RailTel. Due date of payment for an Invoice raised by SI/BA shall be from the date of acceptance of payment by KRCL i.e. COR (Customer of RailTel) for respective work.

(iii) RAILTEL OR CUSTOMER OF RAILTEL reserves the right to adjust any over-payment of charges any time during the period of AMC.

(iv) It is mandatory for the firm to indicate their bank account numbers and other relevant e-payment details so that payments could be made through ECS/EFT mechanism instead of payment through cheques wherever feasible. A copy of the model mandate form prescribed by RBI to be submitted by firm for receiving payments through ECS.

(v) Declaration in relation to section 206AB of the income tax Act 1962 ('the Act') and document related to labour cess.

vi) E-invoice or Declaration for non-applicability of e-invoicing as per Notification No. 05/2021 – Central Tax.

vii) Declaration for non-deduction of labour cess.

(viii) Paying Authority: The payment will be through JGM-Finance /NR Delhi on submission of necessary document. Bill passing authority will be GM-Marketing/NR.

15. Agreement & Restrictions on 'Transfer of Agreement' :

- (1) A agreement shall need to be signed for successful completion of the contract at the quoted/ agreed rate as per RailTel terms & conditions.
- (2) The successful BA/SI shall not assign or transfer its right in any manner whatsoever under the agreement to a third party or enter into any agreement for subcontracting and/or partnership relating to any subject matter of the agreement to any third party either in whole or in any part i.e. no subcontracting/partnership/third party interest shall be created with reference work/project assigned through this EoI.

16. Delivery Timeline:

The deliveries and supplies and performance of the services shall commence from the effective date of the Advance LOA/PO.

17. Liquidated Damage (LD):

In the event of the BA/SI's failure to submit the Bonds, Guarantees and Documents, supply the stores/goods /services and conduct trials, installation of equipment, training, testing etc as specified in this contract, the RailTel or Customer of RailTel may, at his discretion, withhold

any payment until the completion of the contract. Besides this the penalty shall be back to back as actuals from COR (Customer of RailTel) should be applicable.

18. Liability under Agreement/EoI:

Except as provided in the EoI document, neither party i.e. RCIL and successful BA/SI shall be liable to each other party or any other party by virtue of termination of the EoI for any reason whatsoever for any claim for loss or profit or on account for any expenditure, investment, leases, capital improvements or any other commitments made by the other party in connection with their business made in reliance upon or by virtue of the EoI document.

19. Suspension, Revocation or Termination of agreement /EoI :

19.1 RailTel reserves the right to suspend the operation of the EoI, at any time, due to change in its own license conditions or upon directions from the competent government authorities, In such a situation, RailTel shall not be responsible for any damage or loss caused or arisen out of aforesaid action. Further, the suspension of the EoI will not be a cause or ground for extension of the period of the EoI and suspension period will be taken as period spent. During this period, no charges for the use of the facility of the successful BA/SI shall be payable by RailTel.

19.2. RailTel may, without prejudice to any other remedy available for the breach of any conditions of EoI, by a written notice of Three month issued to the Successful BA/SI at its registered office, terminate/or suspend the agreement under any of the following circumstances :

19.2.1 The successful BA/SI failing to perform any obligation(s) under the agreement.

19.2.2 The successful BA/SI failing to rectify, within the time prescribed, any defect as may be pointed out by RailTel

19.2.3 The successful BA/SI going into liquidation or ordered to be wound up by competent authority.

19.2.4 If the successful BA/SI is wound up or goes into liquidation, it shall immediately (and not more than a week) inform about occurrence of such event to RailTel in writing. In that case, the written notice can be modified by RailTel as deemed fit under the circumstances. RailTel may either decide to issue a termination notice or to continue the agreement by suitable modifying the conditions, as it feels fit under the circumstances.

19.2.5 It shall be the responsibility of the successful BA/SI to maintain the agreed Quality of Service, even during the period when the notice for surrender/termination of agreement is pending and if the Quality of Performance of Solution is not maintained, during the said notice period, it shall be treated as material breach liable for termination at risk and consequent of successful BA/SI and Performance Bank Guarantee submitted along with empanelment letter shall be forfeited, without any further notice. Also, the PBG submitted for the EoI in context shall be forfeited, without any further notice.

19.2.6 Breach of non-fulfilment of Agreement conditions may come to the notice of RailTel through complaints or as a result of the regular monitoring. Wherever considered

appropriate RailTel may conduct an inquiry either suo-moto or on complaint to determine whether there has been any breach in compliance of the terms and conditions of the agreement by the successful BA/SI or not. The successful BA/SI shall extend all reasonable facilities and shall endeavor to remove the hindrance of every type upon such inquiry. In case of default by the selected BA/SI in successful implementation and thereafter maintenance of work as per the conditions mentioned in the Scope of work and EoI, the PBG of successful BA/SI available with RailTel will be forfeited.

20. Dispute Settlement:

Any dispute or difference whatsoever arising between the parties out of or relating to the construction, meaning, scope, operation or effect of this contract or the validity or the breach thereof shall be settled by arbitration in accordance with the Arbitration and Conciliation Act, 1996 as amended and the award made in pursuance thereof shall be binding on the parties. The venue of such arbitration or proceedings thereof shall be New Delhi. All arbitration proceedings shall be conducted in English. Recourse against any Arbitral award so rendered may be entered into court having jurisdiction or application may be made to such court for the order of enforcement as the case may be.

21. Force-Majeure under Agreement/EoI:

If at any time, during the continuance of this agreement, the performance in whole or in any part, by either party i.e RCIL and successful BA/SI, of any obligation under this is prevented or delayed, by reason of war, or hostility, acts of the public enemy, civic commotion, sabotage, Act of State or direction from Statutory Authority, explosion, epidemic, quarantine restriction, strikes and lockouts (as are not limited to the establishments and facilities of the successful BA/SI, fire, floods, natural calamities or any act of God (hereinafter referred to as event), provided notice of happenings of any such event is given by the affected party to the other, within 21 Calendar days from the date of occurrence thereof, neither party shall, by reason of such event, be entitled to terminate the agreement, nor shall either party have any such claims for damage against the other, in respect of such non-performance or delay in performance. Provided service under the agreement shall be resumed as soon as practicable, after such event comes to an end or ceases to exist. The decision of RailTel as to whether the service may be so resumed (and the time frame within which the service may be resumed) or not, shall be final and conclusive. However, the force-majeure events noted above will not in any way cause extension in the period of the agreement.

22. Labour Laws to be complied by the successful BA/SI:

The successful BA/SI shall obtain a valid licence under the Contract Labour (RA) Act, 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, before the commencement of the work, and continue to have a valid license until the completion of the work. The BA/SI shall also comply with the provisions of the Inter-State Migrant Workmen(Regulation of Employment and Conditions of Service) Act 1979. The successful BA/SI shall also comply with the provisions of the building and other Construction Workers (Regulation of Employment Conditions of Service) Act, 1996 and the building and other Construction Workers Welfare Cess Act, 1996. Any failure to fulfil these requirements shall attract the penal provisions of this contract arising out of the resultant non-execution of the work.

23. EoI Submission Details :

You are requested to submit the complete 'Technical and Commercial Proposal' online using e-Procurement Portal <https://railtel.enivida.com>.

23.1. Single Packet Bid systems will be followed for this EOI with a Lowest Cost Based Selection Criterion. The bid should have a 'Index' at the starting and all pages of bid should be serially numbered and should be traceable as per the 'Index'.

23.2. The bidder should take into account any Corrigendum to this EOI document that may have been published before submitting their bids. The bid is to be submitted online i.e. at RailTel's e-Tender portal (www.railtel.enivida.com). Physical / Offline submitted bid will not be entertained.

23.3. Bidders in their own interest are advised to submit the bid well before the last date and hence to avoid any inconvenience at the last moment.

23.4. The bidder may modify or withdraw its bid after submission, prior to the deadline date and time prescribed for the bid submission in this EOI. Bid withdrawal notices received after the bid submission deadline will be ignored, and the submitted bid will be deemed to be a validly submitted bid. No bid may be withdrawn in the interval between the bid submission last date and the expirations of the bid validity period. Withdrawal of a bid during this interval may result in the forfeiture of the bidders EMD or cancellation of empanelment of BA/SI with RailTel.

23.5. An Organization / Bidder can submit only 'One Bid'. Submission of multiple bids by a bidder will lead to rejection of all of its bids.

23.6 Tenderer shall quote in SOR provided in eNivida portal only. In case the schedule of requirements quoted by the tenderer is incomplete with reference to the EOI document, the offer is liable to be rejected.

23.7 The rates quoted should be written both in words and figures. The unit of rates should be in the metric system and as per EOI specification/schedule. In case of difference between words and figures, the rate in words will prevail. If there is a discrepancy between the unit price and total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected by the purchaser accordingly.

23.8 BA/SI are requested to go through all the conditions of the EOI document and note that, by submitting the EOI documents, duly signed, they have accepted these conditions and undertake to abide by these conditions (unless specifically disagreed to clause wise).

23.9 ATTESTATION OF ALTERATION: No scribbling is permissible in the EOI documents. EOI containing erasures and alterations in the EOI documents are liable to be rejected. Any correction made by the BA/SI in his/their entries must be signed (not initialed) by him/them.

In reference to the above, Bid Proposal should consist of:

1. Copy of PBG submitted to RailTel in reference to their empanelment letter and LOA copy. The PBG should be valid on the date of opening of bids for the EOI in context.
2. PBG as a EMD
3. The bidders are required to submit copy of the EOI document duly signed by Authorized Signatories as a token of acceptance of terms & conditions of contract.
4. Price Bid in the format as per Annexure-1
5. Documents as per clause 4 b.

24. **Compliance to the EOI Document:** BA/SIs should ensure compliance to all clauses of this EOI. Any deviation will lead to rejection of the bid of BA/SI.

25. **Local Content Compliance:**

1. Only 'Class-I local supplier' and Class-II local supplier', as defined under the order no.- P-45021/2/2017 -PP (BE-II) dt. 4th June 2020 issued by Ministry of Commerce and Industry and reiterated by Railway Board Order no.- 2020/RS (G)/779/2 dt.12.06.2020, shall be eligible to bid in this tender. Subsequent OM no. P-45021 dt.21.06.2017, PP-(BE-II) (E-1588) dt. July 27, 2020, OM No. P-45021/130/2020PP(BE-II)(E-435185) dt. July 9, 2020, OM No. P-45021/2/2017-PP(BE-II) dated September 16, 2020 of Ministry of Commerce and Industry shall also be applicable.

2. Class-I local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content equal to or more than 50% , as defined in the aforesaid order.

3. 'Class-II local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content more than 20% but less than 50% , as defined in the aforesaid order.

4. 'Non local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content less than or equal to or 20%, as defined in the aforesaid order. Any offer submitted entity shall not be considered and summarily rejected.

5. The margin of Purchase Preference to 'Class-I local supplier' shall be 20%, 'Class-II local supplier', 'Non local supplier' shall not be eligible for any purchase preference in this tender.

5(a) The Subject tender is not divisible in nature and the 'Class-I local supplier' shall get purchase preference over 'Class-II local supplier' as well as 'Non local supplier'.; Class-II local supplier' will not get any purchase preference.

5(b) The procedure to be followed in this tender shall be as per para 3 A (c) of the aforesaid order.

5(c) Verification of local content:-

The bidders are required to furnish required certificate as defined in Para-9 of the order no.- P-45021/2/2017-PP (BE-II) dt. 4th June 2020. Submission of the requisite certificate as defined in Para-9 as mentioned above is mandatory.

26. Updation of Labour data on Railway's shramikkalyan Portal:

A. Contractor is to abide by the provisions of Payment of Wages Act & Minimum Wages Act in terms of clause 54 and 55 of Indian Railways General Condition of Contract. In order to ensure the same, an application has been developed and hosted on website 'www.shramikkalyan.indianrailways.gov.in'. Contractor shall register his firm/company etc. and upload requisite details of labour and their payment in this portal. These details shall be available in public domain. The Registration/updation of Portal shall be done as under:

(a) Contractor shall apply for one-time registration of his company/firm etc. in the Shramikkalyan portal with requisite details subsequent to issue of Letter of

Acceptance. Engineer shall approve the contractor's registration on the portal within 7 days of receipt of such request.

- (b) Contractor once approved by any Engineer, can create password with login ID (PAN No.) for subsequent use of portal for all LOAs issued in his favour.
- (c) The contractor once registered on the portal, shall provide details of his Letter of Acceptance (LoA)/Contract Agreements on shramikkalyan portal within 15 days of issue of any LoA for approval of concerned engineer. Engineer shall update (if required) and approve the details of LoA filled by contractor within 7 days of receipt of such request.
- (d) After approval of LOA by Engineer, contractor shall fill the salient details of contract labours engaged in the contract and ensure updating of each wage payment to them on shramik kalyan 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.

B. 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.

27. Consortium among BA/SI empanelled with RailTel Corporation of India Limited is allowed.

28. Contact Details

In case of any query/issue you may contact the following officers.

S. No.	Officer Name	Designation	Mobile No.	E-mail ID
1	Sh. Hemant Yadav	DGM/ Marketing	97176 44137	hemantyadav@railtelindia.com
2	Sh. Abhishek Kumar	Sr. Mgr-Marketing	9717644170	abhishek.kumar@railtelindia.com

It is advised that queries may be raised through e-mail communication for unambiguous revert cum clarification.

Price BID

	<p>RailTel Corporation of India Ltd. 6th Floor, Block III, Delhi IT Park, Shastri Park, New Delhi-110053 P:011-011-22185933, 34</p>
Price BID Format	

EOI No. - RailTel/EOI/NR/BA/21-22/Business Delivery/RO/KRCL

Name of work : Design, Supply, Installation, Wiring, Testing & Commissioning of Integrated communication system VHF (Simplex) as per RDSO specification RDSO/SPN/TC/109/2019 with latest Amendment/Revision, for Tunnels with associated equipments inside tunnels and in between tunnel & adjacent stations for section covering Tunnels T8/9, T10, T1, T2/T2-E & T3 connectivity from Katra (SVDK) & Reasi stations, Tunnels T5/T5-E connectivity from Reasi & Salal-A stations, Tunnels T6, T9, T10, T11 & T12 connectivity from Salal-A & Dugga stations, Tunnels T13/T13-E connectivity from Dugga & Basindadhar stations, Tunnels T14/14-E, T15/15-E & T40/41 connectivity from Basindadhar & Sangaldan station (including Tunnels being executed by IRCON in Basindadhar- Sangaldan section) on Katra - Dharam section in KRCL Jurisdiction of USBRL Project of Northern Railway.

Sr	Description of Item	Unit	Rate (Rs.)	Quantity	Amount	Inspection Authority
	Schedule-A: Supply of Equipment / Materials					
	Radio Re-Broadcast System Components					
1	Supply of Off-Air Channelized repeater (Bi-Directional Amplifier) along with required power supply unit as per RDSO specifications No. RDSO/SPN/TC/109/2019 with latest Amendment/Revision.	Nos		1		RDSO
2	Supply of Optical Remote Unit along with required power supply unit as per RDSO specifications No. RDSO/SPN/TC/109/2019 with latest Amendment/Revision.	Nos		182		RDSO
3	Supply of Optical Master Unit along with required power supply unit as per RDSO specifications No. RDSO/SPN/TC/109/2019 with latest Amendment/Revision. With suitable interface, it should be able to connect to Tunnel ventilation control room/divisional control room.	Nos		10		RDSO

Sr	Description of Item	Unit	Rate (Rs.)	Quantity	Amount	Inspection Authority
4	Supply of Voice Recording equipment as per RDSO Specification No. RDSO/SPN/TC/038/2002 with latest Amendment/Revision of approved quality.	Nos		10		RDSO
	RF & Radiating Cable & Connectors					
5	Supply of 1/2" RF Feeder Cable (Coxial Transport Cable) as per Technical Specification mention in SCC (Part-B) Clause 5.4.5 (c).	KM		9		Third Party
6	Supply of N-Type Connectors suitable for 1/2"RF feeder cable as per Technical Specification mentioned in SCC (Part-B) Clause 5.4.5 (d).	Nos		412		Third Party
7	Supply of 7/8" Leaky Cable as per RDSO specification no. RDSO/SPN/TC/109/2019 with latest Amendment/Revision	KM		190		RDSO
8	Supply of N-Type Connectors suitable for 7/8" Leaky Cable as per Technical Specification mentioned in SCC (Part-B) Clause 5.4.5 (e).	Nos		765		Third Party
9	Supply of Stainless Steel Clamps suitable for 7/8" Leaky Cable anchored using SS Bolts and SS Anchor Fastners (Stainless steel shall be a Cr-Ni-Mo alloy or Cr-Ni-Mo-Ti alloy), material No. 1.4404 equivalent to SS 316, as per Technical Specification mentioned in SCC (Part-B) Clause 5.4.5 (f).	Nos		20,100		Third Party
10	Supply of Nylon Clamps suitable for 7/8" Leaky Cable using Stainless Steel Self-Anchoring Expansion Bolts, as per Technical Specification mentioned in SCC (Part-B) Clause 5.4.5 (g).	Nos		2,01,000		Third Party
11	Supply of Jumper Cables 1 mtr Cable with N-N & DM NM Terminations for VHF communication, as per Technical Specification mentioned in SCC (Part-B) Clause 5.4.5 (h).	Nos		965		Third Party
12	Supply of Weather-Proofing and Heat Shrink Wrap tapes, as per Technical Specification mentioned in SCC (Part-B) Clause 5.4.5 (i).	Per connector		765		Third Party

Sr	Description of Item	Unit	Rate (Rs.)	Quantity	Amount	Inspection Authority
	CBC, Directional couplers, RF terminations and RF Accessories					
13	Supply of 2 way splitter for VHF communication, as per Technical Specification mentioned in SCC (Part-B) Clause 5.4.5 (j).	Nos		370		Third Party
14	Supply of 30dB coupler VHF communication, as per Technical Specification mentioned in SCC (Part-B) Clause 5.4.5 (k).	Nos		220		Third Party
15	Supply of 2W Termination Load VHF communication as per Technical Specification mentioned in SCC (Part-B) Clause 5.4.5 (l).	Nos		60		Third Party
	Safe Climbing System & Log Periodic Antennas / Handover Systems					
16	Supply of Log Periodic Antenna for VHF Frequency Band mentioned in clause 5.2 of SCC part (B) and para 1.4 of RDSO specifications No. RDSO/SPN/TC/109/2019, as per Technical Specification mentioned in SCC (Part-B) Clause 5.4.5 (m).	Nos		12		Third Party
	Fibre Optic Connectivity and associated work for Integrated Communication System for Tunnel - VHF (Simplex) Radio					
17	Supply of 48 Core Armoured Optical Fiber Cable (Fire Retardant – Low Smoke Zero Halogen) as per RDSO specifications No. RDSO/SPN/TC/110/2020 with latest Amendment/Revision	KM		70		RDSO
18	Supply of permanently lubricated HDPE pipe 40/33mm dia. As per RDSO specifications no. RDSO/SPN/TC/45/2013 with latest Amendment/Revision, suitable for armoured 24/48 fiber OFC cable including its accessories like plastic coupler, end plug, cable sealing plug and end cap etc. as required for theOFC system.	KM		12		RDSO
19	Supply of Fibre Patch Panel as per Technical Specification mentioned in SCC (Part-B) Clause 5.4.5 (n)..	Nos		195		Third Party
20	Supply of SC/PC to SC/PC SM Simplex each of 10 mtr length as per Technical Specification mentioned in SCC (Part-B) Clause 5.4.5 (o).	Nos		365		Third Party

Sr	Description of Item	Unit	Rate (Rs.)	Quantity	Amount	Inspection Authority
21	Supply of SC/PC to SC/PC SM Simplex each of 5 mtr length as per Technical Specification mentioned in SCC (Part-B) Clause 5.4.5 (p).	Nos		365		Third Party
	Sub Total for Schedule A					
	Schedule- B: Supply and Installation of Equipment / Materials					
1	Supply, Installation and Configuration of Network Monitoring system for VHF (Simplex) Communication System, including all Hardware and Software as per Technical Specification in tender document and of approved quality.	Nos		1		CONSIGNEE
2	Supply and installation of OFC cable joint enclosure as per TEC No.G/OJC-01/03 Jan.99 or latest RDSO specification RDSO/SPN/TC/68/2007, Rev 1 or latest and splicing of optical fibre cables (24 fiber) & testing (RVNL-40601)	Nos		33		CONSIGNEE
3	Supply, Installation and testing & commissioning including earthing of 42U 19" covered racks for housing equipment complete with all fittings. The rack should be of APW President/Rittal make. The components of the rack are specified below. Broad description of the rack is given below. Rack size 2200(mm) H x 600(mm) W x 600(mm) D, fixed side panels 42U x 600(mm) D front glass door plain 42U x 600 (mm) rear MS door plain 42U x 600(mm) D levelling screws- 4 nos. Fan directly mounted on top 48V DC 90 CFM- 2nos. Earth connectivity kit- 1 no, Cable manager with cable loops- 2 nos of approved quality. (RVNL-40605)	Nos		6		CONSIGNEE

Sr	Description of Item	Unit	Rate (Rs.)	Quantity	Amount	Inspection Authority
4	Supply and installation of Rack mounted 24/48 fiber Fiber Distribution management system (FDMS) part no 1U 24/48FS 24/48FP including 24/48 nos 0.2db SC/PC adaptors 24/48 Nos 900 micron 1.5m SCPC pigtails RDSO Specification RDSO/SPN/TC/037-2000 (Rev.3) or latest (RVNL-40606)	Nos		12		CONSIGNEE
5	Supply and Installation of Unit Maintenance Free Earthing as per RDSO specification RDSO/SPN/197/2008 or latest inside Tunnel consisting of: (i) Copper bonded steel electrode of 3.0m long, 17.2 mm dia with copper bonding thickness of min. 250 microns and UL listed and marked = 1 no. (ii) Earth enhancement material supplied in sealed bags of min.10 kg = 3bags (iii) Copper strip of 200x25x6mm for Earth Terminal = 1 no. (iv) 35 sq mm copper cable to connect unit earth to 25X3 mm copper strip (10 mtrs) (v) Exothermic Joint to connect 35 sq mm Copper Cable to Earth Terminal Busbar (vi) Exothermic Joint to connect 35 sq mm Copper Cable to 25X3 mm Copper Strip (vii) For achieving the desired earth resistance value, if required sufficient quantity of soil refilling with lower resistivity soil and further compacting is to be done and then earthing is to be done.	Set		200		RDSO for Supply portion and CONSIGNEE for execution
6	Supply and installation of 100 KA built in grounding /earthing devices (Intelligent Grounding Module) 4 wire, for surge and transient over voltage protection with grounding /earthing system without buried earth pit for equipments. It shall tested, certified and approved as per standard IEC 61000, as per Technical Specification mention in SCC (Part-B) Clause 5.4.5 (q).	Nos		5		Third Party for Supply portion and CONSIGNEE for execution
	Sub Total for Schedule B					

Sr	Description of Item	Unit	Rate (Rs.)	Quantity	Amount	Inspection Authority
Schedule- C: Installation of Equipment / Materials and Services						
1	System Architecture Design & Documentation with project team/ interfacing and client discussion for formalising design document. Design document for in-principle approval of KRCL/ consultant. Scope of design also includes defining the system values, parameters, block diagrams, drawings, flow charts, location-wise equipment details etc., for VHF systems and the same shall be submitted by the contractor. After testing if any change in design required the same shall be incorporated and submitted to KRCL for approval.	Lumpsum per Block section along with Stns on either side		5		CONSIGNEE
2	Laying of ½" RF Feeder cable including labelling along with required accessories, with contractor's tools, plant, labour etc. complete.	KM		9		CONSIGNEE
3	Laying of 7/8" Leaky Cable along with required accessories, with contractor's tools, plant, labour etc. complete.	KM		190		CONSIGNEE
4	Installation, configuration, testing, monitoring & Commissioning of Master unit (with Off-Air Bi-Directional Antenna) with mounting, alignment, and installing of Antennas along with required accessories. This also includes installation & configuration of Network Management System	Nos		10		CONSIGNEE
5	Installation, configuration, testing, monitoring and Commissioning of Remote Optical unit along with required accessories. This also includes installation & configuration of Network Management System	Nos		182		CONSIGNEE
6	Conducting Acceptance Tests with KRCL as per Para 6.5.1 SCC Part-B. This includes Testing with KRCL, preparation of As-Built Report and submission of final Design Document Submission of product manuals and training and testing documentation	Lumpsum per Block section along with Stns on either side		5		CONSIGNEE

Sr	Description of Item	Unit	Rate (Rs.)	Quantity	Amount	Inspection Authority
7	Laying of signaling / power / telecom / quad /OFC cable of various sizes in trench/pipes/cable tray/HDPE. 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 includes unwinding of cable drum using proper jigs without causing damage to cable.	Per Cable per Km		70		CONSIGNEE
8	Submission of Documentation like Plans (as per Para 6.3.2 SCC Part-B), Drawings and As-Built Drawings submissions in soft copy (*) on Storage Device and hard copy submission minimum 06 copies in A3 size or as directed by Engineer-in-charge. *: Drawings prepared in Auto CAD shall be submitted in Auto CAD format	Lumpsum per Block section along with Stns on either side		5		
Sub Total for Schedule C -						
Grand Total of Schedule - A+B+C						

- (i) The quoted rate shall include third party inspection charges to be borne by SI/BA.
- (ii) Third Party inspecting agency shall mean any agency nominated by KRCL to carry out the inspection including RDSO/RITES.
- (iii) In case, RDSO/RITES/Third party do not inspect the material for any reason, such material may be inspected by Consignee and inspection charges shall be deducted from SI/BA as per actuals deducted by COR (Customer of RailTel).

All the terms & conditions will be applicable on back-to-back basis as it is applicable to RailTel by the customer.

SCOPE OF WORK

1. **Brief Description of Work:** “Provision of Communication system through leaky coaxial cable for Tunnels on Katra-Dharam Section (KRCL jurisdiction) of Udhampur-Srinagar-Baramulla Rail Link Project in the Union Territories of Jammu & Kashmir”.
2. **Description of the Project:** 290 Kms of Udhampur-Srinagar-Baramulla Rail Link (USBRL) Project is being constructed by Indian Railways as National Project in Jammu & Kashmir. The Railway Board, Government of India has entrusted the construction of part of Katra-Dharam Section of USBRL project to KRCL through Northern Railway. A Contract Agreement has been executed between KRCL and Northern Railway on 9th August 2005. KRCL is executing this project in terms of above agreement on behalf of Northern Railway. The works are already in progress at various portions of the alignment. As a part of this project under the present tender, it is proposed to award the work. “Expression of Interest for obtaining Offer from RailTel’s empaneled business partners meeting minimum eligibility criteria for the work of Design, Supply, Installation, Wiring, Testing & Commissioning of Integrated communication system VHF (Simplex) as per RDSO specification RDSO/SPN/TC/109/2019 with latest Amendment/Revision, for Tunnels with associated equipments inside tunnels and in between tunnel & adjacent stations for section covering Tunnels T8/9, T10, T1, T2/T2-E & T3 connectivity from Katra (SVDK) & Reasi stations, Tunnels T5/T5-E connectivity from Reasi & Salal-A stations, Tunnels T6, T9, T10, T11 & T12 connectivity from Salal-A & Dugga stations, Tunnels T13/T13- E connectivity from Dugga & Basindadhar stations, Tunnels T14/14-E, T15/15-E & T40/41 connectivity from Basindadhar & Sangaldan station (including Tunnels being executed by IRCON in Basindadhar-Sangaldan section) on Katra - Dharam section in KRCL Jurisdiction of USBRL Project of Northern Railway”.
3. **Completion Period:** The total time for completion of above work is 18 months from date of issue of Letter of Acceptance (LOA) to the successful bidder.
4. The system of e-tendering will be of “Single Packet System”. The bidder has to submit bid online only in the prescribed format given in the e-nivida portal.
5. **Documents to be submitted by bidder/s:**
 - i) Bidder/s shall note that original tender documents (all pages including drawings), addendum, corrigendum issued (if any) should be submitted intact without detaching any pages at the time of submission of tender.
 - ii) Bidder/s has to submit all the documents required as per EOI conditions at the time of submission of bid. Documents submitted for any other EOI(s) or submitted for any

other purpose and available with RailTel will not be entertained or considered against present EOI.

- iii) The documents required under the EOI conditions for submission along with the EOI are listed below. The bidder/s are advised to examine the various conditions and submit their offer with following details.
- iv) Statement of similar works executed during last 07 (seven) years, ending last day of month previous to the one in which EOI is invited.
- v) In addition, required document as mentioned in clause 4 (Selection Criteria) above.
- vi) Statement of works in progress: The list of works in hand and in progress indicating the details, should be submitted duly Certified by a Chartered Accountants indicating 'B' Value as defined in clause 5.4 (Appendix-3).
- vii) Statement of works abandoned/left Incomplete works: Appendix-4.
- viii) Contract amount received: Appendix-5, should be submitted along with supporting documents.
- ix) List of available Personnel for key positions: Appendix-6A.
- x) List of Personnel for key positions proposed to be deployed on this project along with CVs: Appendix-6B.
- xi) Curriculum Vitae (CV) for Proposed Personnel for key positions: Appendix-6C.
- xii) Compliance Certificate: Appendix-6D.
- xiii) List of Plant & Machinery available: Appendix-7A.
- xiv) List of Plant and Machinery proposed to be deployed for the work: Appendix-7B.
- xv) List of equipment proposed to be deployed: Appendix-8.
- xvi) Litigation History: Appendix-10.
- xvii) Undertaking by Tenderer: Appendix-11.
- xviii) Certificate Regarding Compliance of Instructions issued by Govt. of India for Restrictions under Rule 144 (xi) of General Financial Rules: Appendix-13.
- xix) Joint Venture / Consortium Agreement: Appendix-14. If bidding in JV or Consortium.
- xx) Method Statement: Appendix-15.
- xxi) Certificate of Familiarization : Appendix-17.
- xxii) Documents like Partnership deed, pertaining to status/ Constitution of firm, affidavit/partnership deed and power to attorney & copies of connected legal documents.
- xxiii) EOI document.
- xxiv) BOQ duly filled in all respects.
- xxv) Indemnity Bond against Clause No. 26.7 under INSURANCE of Special conditions of contract.
- xxvi) Non Disclosure Agreement (NDA)

Note: The relevant documents shall be submitted in accordance with E-Tender Notice and Instructions to bidder/s.

PROFORMA FOR STATEMENT OF DEVIATIONS

(1) The following are the particulars of deviations from the requirements of the EOI specification.

Clause	Deviation	Remarks (including justification)

**Signature and seal
of the BA/SI**

Note: Where there is no deviation, the statement should be returned duly signed with an endorsement indicating “No Deviations”.

FORMAT FOR AFFIDAVIT TO BE SUBMITTED BY BA/SI ALONGWITH THE EOI DOCUMENTS
(To be executed in presence of Public notary on non-judicial stamp paper of the value of Rs.100/-. The stamp paper has to be in the name of the BA/SI)**

I.....(Name and Designation)** appointed as the attorney/authorized signatory of the BA/SI (including its constituents),

M/s_____ (hereafter called the BA/SI) for the purpose of the EOI documents for the work of _____ as per the EOI No. _____ of (-----RailTel), do hereby solemnly affirm and state on the behalf of the BA/SI including its constituents as under:

1. I/we the BA/SI (s), am/are signing the document after carefully reading the contents.
2. I/We the BA/SI(s) also accept all the conditions of the EOI and have signed all the pages in confirmation thereof.
3. I/We hereby declare that I/we have downloaded the EOI documents from RailTel website www.railtelindia.com. 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 EOI Document. In case of discrepancy noticed at any stage i.e. evaluation of EOIs, execution of work or final payment of the contract, the master copy available with the RailTel 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 alongwith the offer and the same shall be binding upon me/us.
6. I/We declare that the information and documents submitted along with the EOI 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 undersigned that if the certificates regarding eligibility criteria submitted by us are found to be forged/false or incorrect at any time during the process for evaluation of EOIs, it shall lead to forfeiture of the EOI EMD besides banning of business for five years on entire RailTel. Further, I/we (insert name of the BA/SI)**_____ and all my/our constituents understand that my/our offer shall be summarily rejected.
8. I/we also understand the if the certificates 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, alongwith forfeiture of EMD/SD and Performance guarantee besides any other action provided in the contract including banning of business for five years on entire RailTel.

DEPONENT SEAL AND SIGNATURE OF THE BA/SI VERIFICATION

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

DEPONENT SEAL AND SIGNATURE OF THE BA/SI

Place: Dated:

PROFORMA FOR PERFORMANCE BANK GUARANTEE

(On Stamp Paper of ₹ One Hundred)

To,

Executive Director
RailTel Corporation of India
Northern Region, 6th Floor,
Block Tower-III, DMRC IT Park Shastri Park, Delhi - 110053

In consideration of the RailTel Corporation of India Limited, Northern Region, 6th Floor, Block III, Delhi IT Park, Shastri Park, Delhi-110053 (Hereinafter called the RailTel) having agreed to exempt (Hereinafter called "the said Contractor(s)") from the demand, under the terms and conditions of an Agreement No. dated made between RailTel Corporation of India Limited and for (hereinafter called "the said Agreement") of security deposit for the due fulfillment by the said Contractor (s) of the terms and conditions contained in the said Agreement, on production of a Bank Guarantee for Rs. (Rs. only). We, (indicate the name of the Bank) hereinafter referred to as "the Bank") at the request of Contractor(s) do hereby undertake to pay the RailTel an amount not exceeding Rs. against any loss or damage caused to or suffered or would be caused to or suffered by the RailTel by reason of any breach by the said Contractor(s) of any of the terms or conditions contained in the said Agreement.

We, (name of Bank) do hereby undertake to pay the amounts due and payable under this Guarantee without any demur, merely on demand from the RailTel stating that the amount as claimed is due by way of loss or damage caused to or would be caused to or suffered by the RailTel by reason of breach by the said Contractor(s) of any of terms or conditions contained in the said Agreement or by reason of the Contractor(s) failure to perform the said Agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. only.

We, (name of bank) undertake to pay to the RailTel any money so demanded notwithstanding any dispute or disputes raised by the Contractor(s) / Supplier(s) in any suit or proceedings pending before any court or Tribunal relating thereto our liability under this present being, absolute and unequivocal.

The payment so made by us under this Bond shall be a valid discharge of our liability for payment thereunder and the Contractor(s) / Supplier(s) shall have no claim against us for making such payment.

We,(name of bank) further agree that the Guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of the RailTel under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till RailTel certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this Guarantee. Unless a demand or claim under the Guarantee is made on us in writing on or before the We shall be discharged from all liability under this Guarantee thereafter.

We,.....(name of bank) further agree with the RailTel that the RailTel shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the Agreement or to extend time or to postpone for any time or from time to time any of the powers exercisable by the RailTel against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation, or extension to the said Contractor(s) or for any forbearance, act or omission on the part of RailTel or any indulgence by the RailTel to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

This Guarantee will not be discharged due to the change in the Constitution of the Bank or the Contractor(s)/ Supplier(s).

We (the name of Bank) lastly undertake not to revoke this Guarantee during its currency except with the previous consent of the RailTel in writing.

Dated theday of 2021

for

(indicate the name of the Bank)

Witness

Signature

Name

Signature

Name

Format for Bid Security Declaration
(On Non-judicial stamp paper of Rs. 100/-)

To,
Executive Director,
RailTel Corporation of India
Northern Region, 6th Floor,
Block Tower-III, DMRC IT Park Shastri Park, Delhi - 110053

Ref : EOI No. RailTel/Eol/NR/BA/2021-22/Business Delivery/RO/2 dated XX-Jun-21

Whereas, I/We _____(Name of Agency) has submitted bid for _____ (Name of Work and Tender No.) and whereas Earnest Money Deposit is being exempted in the aforesaid tender to give relief to the bidders as per Govt. of India guidelines due to severe financial crunch on account of slowdown in the economy due to the pandemic,

I/We hereby submit the following "Bid Security Declaration" in lieu of exemption from submitting Earnest Money Deposit :-

1) If I/We withdraw or modify my/our bid during the bid validity period (including extended validity of tender) specified in the tender documents;

Or

2) If, after the award of work, I/We fail to accept LOA/LOI, or to sign the contract agreement or fail to submit performance guarantee or fail to commence the work within stipulated time period prescribed in tender documents;

Or

3) If I/We furnish any incorrect or false statement / information/ document;

Or

4) If I/We hide any relevant information or do not disclose any material fact in the tender;

Or

5) If I/We commit any breach of integrity Pact;

I/We may be disqualified and banned for a period of three years and shall not be eligible to bid for future tenders in RailTel Corporation of India Ltd. for the period of three years from date of issue of such orders.

(Signed by the Authorized Representative of Firm)

Name of Authorized Representative Name of Firm Date

Integrity Pact Program: RailTel has adopted Integrity Pact Program and for implementation thereof all tenders relating to procurement of OFC, quad cable, pre-fab shelters, electronic equipment and its installation and/or commissioning etc and other item(s) or activity/activities proposed to be carried out or required by the Company for the value exceeding Rs. 15 crores at a time including for repair and maintenance of cable/network and any other items required for special works assigned to RailTel will be covered under the Integrity Pact Program and the vendors are required to sign the IP document and submit the same to RailTel before or along with the bids.

a) Only those vendors who have purchased the tender document and signed the IP document can send their grievances, if any, to the Independent External Monitors (IEMNs) through the nodal officer, i.e. Chief Vigilance Officer (CVO), RailTel.

Name of IEMs and contact details:

- | | |
|----------------------------|---------------------------------|
| 1. Mrs. Vijaya Kanth | E-Mail: vkanthmrl2003@yahoo.com |
| 2. Sh. Vinayaka Rao Turaga | E-mail: tvrao56@gmail.com |

Name & contact details of Nodal Officer (IP) in RailTel:

Chief Vigilance Officer
RailTel Corporation of India Ltd 6th Floor,
Office Block Tower-2, NBCC Complex,
East Kidwai Nagar, New Delhi-110023
E-Mail: cvo@railtelindia.com

b) If the order, with total value equal to or more than the threshold value, is split to more than one vendor and even if the value of PO placed on any/each vendor(s) is less than the threshold value, IP document having been signed by the vendors at bid stage itself, the Pact shall continue to be applicable.

c) Bidder of Indian origin shall submit the Integrity Pact (in 2 copies) on a non-judicial stamp paper of Rs. 100/- duly signed by the person signing the bid. If the bidder is a partnership or a consortium, the Integrity Pact shall be signed by all the partners or consortium members. Format of integrity pact is as per **annexure 6A**.

d) Bidder of foreign origin may submit the Integrity Pact on stamp paper, duly signed by the person signing the bid.

e) The 'Integrity Pact' shall be submitted by the Bidder duly signed in all pages along with the Bid in a separate envelope, duly superscripted with 'Integrity Pact'. Tender received without signed copy of the Integrity Pact document will be liable to be rejected. Performa for signing the Integrity Pact is available in Chapter-6 (Section-I) of this tender document (Form No. 11).

f) One copy of the Integrity Pact shall be retained by RailTel and the 2nd copy will be issued to the representative of the bidders during bid opening. If the Bidders representative is not present during the Bid opening, the 2nd copy shall be sent to the bidder by post/courier.

g) The Integrity Pact is applicable in this tender vide CVC circular no. 10/05/09 dated 18.05.09 and revised guideline of CVC circular no. 015/VGL/091 dated 13.01.17 or the latest updated from time to time shall be followed.

RailTel Corporation of India Limited, hereinafter referred to as “The Principal”.

And

....., hereinafter referred to as “The Bidder/ Contractor”

Preamble

The Principal intends to award, under laid down organizational procedures, contract/s forThe Principal values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relations with its Bidder(s) and /or Contractor(s).

In order to achieve these goals, the Principal will appoint an Independent External Monitor (IEM), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

1. The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-
 - a. No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - b. The Principal will during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/additional information through which the Bidder(s) could obtain an advantage in relation to the process or the contract execution.
 - c. The Principal will exclude from the process all known prejudiced persons.
2. If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the IPC/PC Act, or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition can initiate disciplinary actions.

Section 2- Commitments of the Bidder(s) / Contractor(s)

- 1 The Bidder(s)/Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

- a. The Bidder(s)/contractor(s) will not, directly or through any other persons or firm, offer promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage during tender process or during the execution of the contract.
 - b. The Bidder(s)/Contractor(s) will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
 - c. The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act; further the Bidder(s) /Contractors will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
 - d. The Bidder(s)/Contractor(s) of foreign origin shall disclose the name and address of the Agents/representatives in India, if any. Similarly, the bidder(s)/contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any. Further details as mentioned in the "Guidelines on Indian Agents of Foreign Suppliers" shall be disclosed by the Bidder(s)/Contractor(s). Further, as mentioned in the Guidelines all the payments made to the Indian agent/representative have to be in Indian Rupees only. Copy of the "Guidelines on Indian Agents of Foreign Suppliers" as annexed and marked as Annexure A.
 - e. The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
2. The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3: Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/Contractor(s), before award or during execution has committed a transgression through a violation of Section 2, above or in any other form such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/Contractor(s) from the tender process or take action as per the procedure mentioned in the "Guidelines on Banning of business dealings". Copy of the "Guidelines on Banning of business dealings" is annexed and marked as Annex-"B".

Section 4: Compensation for Damages

1. If the Principal has disqualified the Bidder(s) from the tender process prior to the award

according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/Bid Security.

2. If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to be terminated the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages of the Contract value or the amount equivalent to Performance Bank Guarantee.

Section 5: Previous Transgression

1. The Bidder declares that no previous transgressions occurred in the last three years with any other company in any country conforming to the anti corruption approach or with any other public sector enterprise in India that could justify his exclusion from the tender process.
2. If the bidder makes incorrect statement on this subject, he can be disqualified from the tender process for action can be taken as per the procedure mentioned in “Guidelines on Banning of business dealings”.

Section 6: Equal treatment of all Bidders / Contractors/Subcontractors.

1. The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.
2. The Principal will enter into agreements with identical conditions as this one with all bidders, contractors and subcontractors.
3. The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section 7: Criminal charges against violation by Bidder(s) / Contractor(s) / Subcontractor(s)

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer.

Section 8: Independent External Monitor / Monitors

1. The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
2. The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, RailTel.
3. The Bidder(s)/Contractor(s) accepts that the Monitor has the right to access without restriction to all project documentation of the Principal including that provided by the Contractor. The Contractor will also grant the Monitor, upon his request and

- demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/Contractor(s)/Subcontractor(s) with confidentiality.
4. The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.
 5. As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or to take other relevant action. The monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.
 6. The Monitor will submit a written report to the CMD, RailTel within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.
 7. Monitor shall be entitled to compensation on the same terms as being extended to / provided to Independent Directors on the RailTel Board.
 8. If the Monitor has reported to the CMD, RailTel, a substantiated suspicion of an offence under relevant IPC/PC Act, and the CMD, RailTel has not, within the reasonable time taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner.
 9. The word 'Monitor' would include both singular and plural.

Section 9: Pact Duration

This pact begins when both parties have legally signed it. It expires for the Contractor 10 months after the last payment under the contract, and for all other Bidders 6 months after the contract has been awarded.

If any claim is made / lodged by either party during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged / determined by CMD of RailTel.

Section 10: Other Provisions

1. This agreement is subject to Indian Law, Place of performance and jurisdiction is the Registered Office of the Principal, i.e. New Delhi.
2. Changes and supplements as well as termination notices need to be made in writing.
3. If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
4. Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

5. The parties signing the IP shall not approach the Courts while representing the matters to the IEMs and he/she will await the decision in the matter.
6. Principal contractor shall take the responsibility of the adoption of IP by the sub-contractor

(For & on behalf of the Principal)
(Office Seal)

(For & On behalf of Bidder/Contractor)
(Office Seal)

Place _____

Date _____

Witness 1:

(Name & Address)

Witness 2:

(Name & Address)

Instructions to Bidders

e-Procurement is the complete process of eTendering from publishing of tenders online, inviting online bids, evaluation and award of contract using the system. You may keep a watch of the tenders floated under <https://railtel.enivida.com>. The link of e-procurement portal is also given on our official railtel portal i.e. www.railtelindia.com under TENDER TAB.

These will be invited for online Bids. Bidder Enrolment can be done using "**Online Bidder Enrolment**".

The instructions given below are meant to assist the bidders in registering on the e-tender Portal, and submitting their bid online on the e-tendering portal as per uploaded bid.

More information useful for submitting online bids on the eNivida Portal may be obtained at: <https://railtel.enivida.com>

GUIDELINES FOR REGISTRATION:

1. Bidders are required to enrol on the e-Procurement Portal (<https://railtel.enivida.com/bidderRegistration/newRegistration>) or click on the link "**Bidder Enrolment**" available on the home page of e-tender Portal by paying the Registration fee of Rs.2000/-+Applicable GST. Once Paid, the Registration Fee is 'Non-Refundable'.
2. As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
3. Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication with the bidders.
4. Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (**Only Class III Certificates with signing + encryption key usage**) issued by any Certifying Authority recognized by CCA India (e.g. Sify / TCS / nCode / eMudhra etc.), with their profile.
5. Only valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's to others which may lead to misuse.
6. Bidder then logs in to the site through the secured log-in by entering their user ID /password and the password of the DSC / e-Token.
7. The scanned copies of all original documents should be uploaded in pdf format on e-tender portal.
8. After completion of registration payment, bidders need to send their acknowledgement copy on our help desk mail id eprourement@railtelindia.com for activation of account.

SEARCHING FOR TENDER DOCUMENTS

1. There are various search options built in the e-tender Portal, to facilitate bidders to search active tenders by several parameters.
2. Once the bidders have selected the tenders they are interested in, you can pay the Tender fee and processing fee (both NOT REFUNDABLE) (*the amount of Tender Processing Fee to be paid is displayed with the respective tender*) by net-banking / Debit / Credit card then you may download the required documents / tender schedules, Bid documents etc. Once you pay both fees tenders will be moved to the respective 'requested' Tab. This would enable the e- tender Portal to intimate the bidders through SMS / e-mail in case there is any

corrigendum issued to the tender document.

PREPARATION OF BIDS

1. Bidders should take into account any corrigendum published on the tender document before submitting their bids.
2. Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid.
3. Bidders, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF formats. Bid Original documents may be scanned with 100 dpi with Colour option which helps in reducing size of the scanned document.
4. To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, GST, Annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use “My Documents” available to them to upload such documents.
5. These documents may be directly submitted from the “My Documents” area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for the bid submission process. Already uploaded documents in this section will be displayed. Click “New” to upload new documents.

SUBMISSION OF BIDS

1. Bidders should log into the website well in advance for the submission of the bid so that it gets uploaded well in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
2. The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document as a token of acceptance of the terms and conditions laid down by Railtel.
3. Bidder has to select the payment option as “e-payment” to pay the tender fee / EMD as applicable and enter details of the instrument.
4. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BOQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BOQ file, open it and complete the white Colored (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BOQ file is found to be modified by the bidder, the bid will be rejected.
5. The server time (which is displayed on the bidders’ dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.
6. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
7. Upon the successful and timely submission of bid click “Complete” (i.e. after Clicking “Submit” in the portal), the portal will give a successful Tender submission acknowledgement & a bid summary will be displayed with the unique id and date & time of submission of the bid with all other relevant details.
8. The tender summary has to be printed and kept as an acknowledgement of the submission of the tender. This acknowledgement may be used as an entry pass for any bid opening

meetings.

For any clarification in using eNivida Portal:

1. Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.
2. Any queries relating to the process of online bid submission or queries relating to e-tender Portal in general may be directed to the Helpdesk Support.

Please feel free to contact eNivida Helpdesk (as given below) for any query related to e-tendering.

Phone No. 011-49606060/8448288988

Mail id: - eprocmnt@railtelindia.com

Annexure-7

CONFIDENTIAL AND MUTUAL NON- DISCLOSURE AGREEMENT

THIS AGREEMENT MADE ON THIS DAY OF __, 2021 AT New Delhi

BETWEEN

_____ a company incorporated in India under the provisions of the Companies Act, 1956 and having its Registered Office at (hereinafter referred to as "Company") represented by its Managing Director / CEO Mr./Ms _____ duly authorized for the same which expression shall unless repugnant to the meaning or context thereof be deemed to mean and include, its Directors, affiliates, successors and permitted assigns of the **FIRST PART**

AND

RailTel Corporation of India Limited, is a Government of India undertaking under the Ministry of Railways duly incorporated under the provisions of the Companies Act, 1956 and having its registered office and Corporate office at Plat-A, 6th Floor, Office Block Tower-2, East Kidwai Nagar, New Delhi- 110023 (hereinafter referred to as "RailTel") , represented by Dy. General Manager/Law & CS Mr. J.S. Marwah duly authorized for the same which expression shall mean and include unless repugnant to the context, its successors, representative and permitted assigns of the **SECOND PART**

WHEREAS

- A. Company is poised to provideservices to..... forproject.
- B. RAILTEL is a Public Sector Undertaking (PSU under the Ministry of Railways), setup interalia to exploit Indian Railway's large telecom infrastructure.
- C. COMPANY and RAILTEL are working-out/ negotiating a possible commercial and strategic business relationship (hereinafter Purpose)
- D. During the course of the above negotiations RAILTEL and COMPANY (including their affiliates may in conjunction with the purpose and for their mutual benefit, disclose to each other certain information being proprietary and/or of confidential nature, and/or RAILTEL and COMPANY may receive and share or be grant access by the other to such confidential and/or proprietary information which is considered trade secret, proprietary, confidential and/ or sensitive;
- E. The parties and its affiliates wish to ensure the protection and secrecy of their respective confidential information which may be disclosed, received or granted access to by the other party and wish to reduce to writing, their agreement in this respect.

NOW THEREFORE in consideration of the mutual promises, covenants and representations recorded herein by the parties hereto and such additional promises and understanding as are hereinafter set forth, the parties agree as follows:

- 1) Definition

For the purpose of this agreement, the term 'Confidential Information' shall mean and include any information or data of a scientific, technical, commercial or financial nature disclosed by the Disclosing party to the Receiving Party or which is obtained by a party from the other whether in writing, pictorially, in machine readable form, on disc, mail or orally, or by any other means/ modes of disclosure and including without limitation any information contained in any written or printed document, hardware, firmware and software, information related to technology and business activities (including, but not limited to, communication systems, telecommunication, business outlooks, revenue, pricing, trade secrets), computer programs, software (including, without limitations, code, software output, screen displays, file hierarchies and user interfaces), formulas, data, inventions, techniques, technology, know-how, processes, ideas, (whether patentable or not), schematics, specifications, drawings, product designs, product plants, programming, services, strategies, third party confidential information, and corporate and personnel statistics, customer lists (potential or actual) and other customer-related information, supplier information, sales statistics, market intelligence, marketing, business working, operations, parent, subsidiaries, affiliates and other business strategies and other commercial information of a confidential nature.

(a) The party disclosing the Confidential Information is referred herein to as "Disclosing Party" and the party to which such Confidential Information is disclosed is referred to herein as "Recipient Party".

(b) "Affiliate" of the Party shall mean the Company or other person who or which is either controlled by the respective Party or who controls the respective Party or who or which is controlled by same person/ entity who controls the respective Party, either by way of significant shareholding, voting rights or technical collaboration whether directly or indirectly through its affiliate.

- 2) Neither party shall be required to disclose any particular information (including but not limited to Confidential Information) to the other and disclosure of any such information shall be entirely voluntary and at the sole discretion of the parties and to the extent deemed necessary by it and is not intended to, and shall not, create any contractual or other relationship or obligation of any kind beyond the terms of this Agreement nor any provision or disclosure of information (including but not limited to Confidential Information) as contemplated hereunder, shall be construed as creating, conveying, transferring by one party on the other any rights, license or authority in or to the information provided. The parties hereto shall use the Confidential Information only for the limited purpose of exploring/ finalizing the possible business relationship between the parties hereto and for no other purpose whatsoever.
- 3) Both the parties acknowledge and understand that any exchange of confidential Information of any nature shall not commit or bind the other to enter into a contract or otherwise and that neither party shall rely on any information provided by the other as a commitment or an inducement to act or not to act in any given manner. Further neither party shall be liable to the other in any manner whatsoever for any decisions, obligation, costs or expenses incurred, changes in business practices, plans, organization, products, services or

otherwise of the other, as a result of this Agreement or any exchange of Confidential Information hereunder.

- 4) Both the Parties agrees and undertake to regard and preserve as Confidential Information provided by each to the other or which may be disclosed, received or granted access to by either party or come to the knowledge of either party in any manner in connection with the negotiations for the possible business relationship.
- 5) (a) In maintaining the Confidential Information hereunder both parties agree that they shall not, without first obtaining the written consent of the other, disclose or make available to any person, firm or enterprise, reproduce or transmit, or use (directly or indirectly) for its own benefit or the benefit of others, any Confidential Information save and except that either party may disclose any Confidential Information to its Directors, officers, employees, or advisors on a "need to know" basis to enable them to evaluate such "Confidential Information" in connection with the negotiation for the possible business relationship between the Parties hereto.

(b) Both parties shall ensure that the said employee(s) and / or the said person(s) shall maintain confidentiality with regard to the disclosed Confidential Information, if any, and shall issue two suitable instructions and/or get two suitable written undertakings or agreements executed to binds its employees and/or the said person(s) to the same obligations of confidence and safeguarding as the parties hereto and to adhere to the confidentiality/ non disclosure terms contained in this Agreement.

(c) Save and except for the purposes mentioned in clause (a) above both parties further agree that neither party will part with/ disclose any "Confidential Information" received by it to any other person directly or indirectly nor make copy(s) or reproduce in any way (including without limitation store in any computer or electronic system any written material/ documents containing "Confidential Information" and such written material/ documents will be retained under strict confidentiality by the receiving party.

(d) Both parties further agree that the confidential information which may pertain to or touch upon any regulatory aspects and/or dealings of either party with any statutory / government/ related agencies/ bodies, whether the said information is received verbally or in writing, will not be disclosed in any manner, either directly or indirectly, to any other persons except to its Directors, employees or advisors on a strictly 'need to know' basis.

(e) Both parties further agree to exercise the same degree of care that it exercises to protect its own Confidential Information of a like nature from unauthorised disclosure, but in no event shall a less than reasonable degree of care be exercised by either party.
- 6) It is mutually acknowledged and agreed that information shall not be considered "Confidential Information" to the extent, that such information : (a) at the time of disclosure was in the public domain or (b) is already known to the receiving party

free of any confidentiality obligation at the time it is obtained from other party; or (c) after disclosure is or becomes publicly known or available through no wrongful act of the receiving party; or (d) is rightfully received from a third party without restriction or (e) is approved for release, disclosure, dissemination or use by written authorization from the Disclosing Party; or (f) is required to be disclosed pursuant to a requirement of a governmental agency or law so long as the parties provide each other with timely prior written notice of such requirement and provide all reasonable co-operation in regard to taking protective action against such disclosure requirement; or (g) is disclosed after expiry of 5 (five) years from the date of expiry or earlier termination of this agreement.

However, before any party discloses any Confidential Information under clause 6, either party (to the extent permitted by law) uses its best endeavour to:

- (a) inform other party of any circumstances and the information that will be disclosed
- (b) give the other party a copy of a legal opinion indicating that disclosure is necessary
- (c) consult with the other party as to possible steps including without limitation, protective orders or other appropriate remedy to avoid or limit disclosure and take those steps where they would not result in significant adverse consequences to the other party and
- (d) gain assurances as to the confidentiality from the body to whom the information is to be disclosed.

If either party is unable to inform the other party before confidential information is disclosed it will (to the extent permitted by law) inform the other party of the full circumstances of the disclosure and information that has been disclosed immediately after disclosure.

- 7) Both parties further agree and undertake not to disclose the information marked "Confidential Information" of the other to their agents or contractors without prior written approval from the other and without having first obtained from each agent or contractor a separate written agreement or undertaking binding them to the same obligations of confidence and safeguarding.
- 8) The parties further recognize that it may be necessary or appropriate for COMPANY to disclose Confidential Information to other Group Companies not named herein. For this purpose, COMPANY guarantees the observance and proper performance of other Group Company to whom Confidential Information is disclosed as above, of the terms and conditions of this agreement.
- 9) Both parties further agree to indemnify and keep indemnified each other against all actual loss and damage which the Disclosing Party may suffer as a result of any breach of this agreement by the Recipient Party of the Confidential Information. Provided always that
 - a. the Disclosing Party shall forthwith give written notice to the recipient Party of the loss and damage; and

b. the Recipient Party shall be furnished with satisfactory documentary evidence of such actual loss and damage.

- 10) Both parties further agree that upon termination/ expiry of this Agreement or at any time during its currency, at the request of the Disclosing Party the Recipient Party shall promptly (and in any case, within 15 days of request), deliver to the Disclosing Party all copies of the Confidential Information in its possession or under its direct or indirect control or shall destroy all memoranda, notes and other writings prepared by the recipient party or its affiliates, Directors, officers, employees or advisors to the extent the same are based on the confidential information with a written statement to the effect that upon such return the Receiving Party has not knowingly retained in its possession or under its control, either directly or indirectly, any Information or copies of such (other than Confidential Information embedded in the Receiving Party's records).

The confidentiality obligations set out herein above shall survive any such return or destruction of Information. Further The provisions set out herein above shall not apply to copies of electronically exchanged Information made as a matter of routine information technology backup and to Information or copies thereof which must be stored by the receiving Party, its Affiliates or its advisers according to provisions of mandatory law, provided that such Information or copies thereof shall be subject to an indefinite confidentiality obligation according to the terms and conditions set forth herein.

- 11) Both parties acknowledge that the confidential information coming to the knowledge of the other may relate to and/or have implications regarding the future strategies, plans, business activities, methods, processes and or information of the parties which afford them certain competitive and strategic advantage. Accordingly neither party will use the confidential information or strategies, plans, business activities, methods, process, information, and /or competitive and strategic advantage to the other.
- 12) Each party understands that the other party may currently or in the future be developing information internally, or receiving information from third parties that may be similar to the "confidential Information" Accordingly, nothing in this agreement will be construed as a representation or inference that either party will not develop products, or have products developed for it, or enter into joint ventures, alliances, or licensing arrangements that, without violation of this agreement, compete with the products or systems embodying the "confidential Information".
- 13) Except as specifically provided herein, disclosure of confidential information by either party pursuant hereto shall not be deemed to grant to the Recipient party, any rights, interest or property in such confidential information and accordingly both parties agree that they will not directly or indirectly claim or submit any application for grant of any patent, copyright, design right or other intellectual property Rights in, to or on the basis of the confidential information.
- 14) The parties hereto acknowledge and agree that in the event of a breach or

threatened breach by the other of the provisions of this Agreement, the party not in breach will have no adequate remedy in money or damages and accordingly notwithstanding anything contained in clause 18 hereof, the party not in breach shall be entitled to injunctive relief against such breach or threatened breach by the party in breach : provided , however, no specification in this confidentiality Agreement of a specific legal or equitable remedy shall be construed as a waiver or prohibition of any other legal or remedies in the event of a breach or threatened breach of this Agreement and the remedies specified herein shall be in addition to all other reliefs and remedies available to the parties under prevailing laws.

- 15) No failure or delay by either party in exercising or enforcing any right, remedy or power hereunder shall operate as a waiver thereof, nor shall any single or partial exercise or enforcement of any right, remedy or power preclude any further exercise or enforcement of any right, remedy or power preclude any single or partial exercise or enforcement thereof or the exercise or enforcement of any of any other right, remedy or power.
- 16) Each Party acknowledges that the other Party makes no representation or warranty as to the accuracy or completeness of any of the Information furnished by or on its behalf. Only those representations and warranties which are made in a final definitive agreement relating to the purpose of the disclosure of the Information will have legal effect.

Each party represents and warrants to the other that it is a corporation duly organised and validly existing in the jurisdiction of its incorporation. Each party represents that it has full corporate power and authority to enter into this Agreement and to do all things necessary for the performance of this Agreement. The Disclosing Party warrants that the Confidential Information has not been provided in breach of any other agreements having legal binding of any nature with the third party(s).

Unless documented and agreed otherwise in respect of any individual disclosure of Confidential Information, each party warrants that it will use its best endeavors to ensure that any Confidential Information it discloses or it intends to disclose to the other party under the provisions of this agreement is complete and accurate but PROVIDED ALWAYS that the disclosing party has exercised such best endeavors:

The parties acknowledge that:

- (a) such Confidential Information as is disclosed by the Disclosing party under this Agreement is accepted by the Receiving Party at its own risk; and
- (b) it releases the Disclosing party from all claims, actions and suits in relation to such Confidential Information (including its use under this Agreement).

- 17) This agreement will be governed by the laws of India and jurisdiction shall be exclusively vested in the courts at New Delhi, India only.

- 18) If any matter arises between the parties about this agreement then the parties shall meet to discuss the matter and shall negotiate in good faith to endeavour to resolve the matter arising the matter however.
- a. If any matter arising has not been resolved by the parties within thirty (30) days after the date the party raising the matter gave notice of it to the other party: then
 - b. the matter shall be submitted by either party to Arbitration. Arbitration shall be held in New Delhi, India. The arbitration shall be conducted as per the provisions of Indian Arbitration and Conciliation Act 1996 and any statutory modification or reenactment thereof.
 - c. Each party to the dispute shall appoint one Arbitrator each and the two Arbitrators shall appoint the third or the presiding Arbitrator. The arbitration proceedings shall be conducted in the English language. The courts of law at New Delhi, India alone shall have the jurisdiction. The arbitration award shall be final and binding upon the parties and judgement may be entered thereon, upon the application of either party to a court having jurisdiction.
 - d. Each party shall bear the cost of preparing and presenting its case, and the cost of arbitration, including fees and expenses of the arbitrators, shall be shared equally by the parties unless the award otherwise provides.
- 19) This agreement shall not be assignable or transferable by either party without the written consent of the other party.
- 20) No license to a Party hereto, under any trademark, patent, copyright or any other intellectual property right, is either granted or implied by the conveying of Information to such party.
- 21) This agreement shall remain valid for a period of 3 (three) years from the date of execution of this Agreement which term may be extended by mutual consent in writing of both the parties. This agreement may be terminated by either party by giving 30 (thirty) days notice in writing to the other party without assigning any reason whatsoever. However, the obligations of each party hereunder shall survive the termination or earlier determination or expiry of this Agreement and shall continue and be binding upon the parties irrespective of whether the discussion between the parties materialize into a specific understanding/business relationship or not for a further period of 5 (five) years after termination / expiry of the Agreement.
- 22) All notices required by this Agreement shall be in writing, and shall be personally delivered, sent by registered post or by commercial courier, addressed as follows:

To Company: Mr/Ms

To RAILTEL:

Attn: Mr. J. S. Marwah

RailTel Corporation of India Limited, Plat-A, 6th Floor,

Office Block Tower-2, East Kidwai Nagar, New Delhi- 110023

Nothing in this provision shall be construed to prohibit communication by more expedient means, such as by telephone or facsimile transmission, to accomplish timely communication. However, to constitute effective notice, written confirmation of a telephone conversation or an original of facsimile transmission must be sent by registered post, by commercial carrier, or hand-delivered. Each party may change the address by written notice in accordance with this paragraph. Notices delivered personally shall be deemed communicated as of actual receipt; mailed notices shall be deemed communicated as of four days after mailing, unless such date is a date on which there is no mail service. In that event communication is deemed to occur on the next mail service day.

- 23) This agreement supersedes all prior discussions and writings with respect to the confidential information and constitutes the entire Agreement between the parties with respect to the subject matter hereof and no modifications of this Agreement or waiver of the terms and conditions hereof shall be binding upon either of the parties hereto, unless approved in writing by an authorized representative of each party. In the event that any of the provisions of this Agreement shall be held by court or other Tribunal of competent jurisdiction to be unenforceable, the remaining portions hereof shall remain in full force and effect and this Agreement shall be interpreted and construed accordingly.
- 24) This Agreement is executed in duplicate, each of which shall be deemed to be the original and both when sent together shall be deemed to form one and single document.

IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement as of the date and year written above.

For
Sign:

For RailTel Corporation of India Ltd.
Sign:

Name:
Title:

Authorized Signatory

AUTHORIZATION LETTER FROM OEMS

Date:

To,

The General Manager-Marketing
RailTel Corporation of India Ltd.
6th Floor, Block-3, DMRC IT Park
Shastri Park Delhi-110053

Subject: Manufacturer Authorization Form (MAF)

EOI No.: RailTel/EOI/NR/BA/21-22/Business Delivery/RO/KRCL Dated 04-AUG-21

Dear Sir,

We, M/sestablished and reputed manufacturer and service provider of (Product details), having our registered office at We hereby authorize M/s (bidder name), Office at to participate in bid and subsequently upon award of the bid to execute the Design, supply, Installation, Commissioning & AMC of our range of products against your above said bid.

We further extend our warranty for years for our range of products offered by M/s against the above said bid.

Yours faithfully,

For and on behalf of M/s _____(Name of the manufacturer)

Signature:

Name:

Designation:

Address:

Date:

**SPECIAL CONDITIONS OF
CONTRACT (Part A)**

(A) **DEFINITIONS**

1.0 Definitions

- 1.1 “Approval or Approved”** means approval in writing of the Competent Authority.
- 1.2 A Defect** is any part of the Works not executed/completed in accordance with the requirements under the Contract.
- 1.3 A Sub-contractor** is a person/firm/company or corporate body who with the express permission in writing by KRCL / RAILTEL has a Contract with the Contractor to carry out a part of the work in the Contract.
- 1.4 BIS :** Bureau of Indian Standards.
- 1.5 BOQ:** Bill Of Quantity.
- 1.6 CMD:** Chairman and Managing Director of Konkan Railway Corporation Ltd.
- 1.7 Chief Engineer/Co-ordination:** shall mean the officer overall in charge of J&K Project Division of Konkan Railway Corporation Ltd. at Head office, Jammu.
- 1.8 Chief Engineer:** shall mean the Officer in charge of the Engineering Department of the Konkan Railway in the Project Division of Corporate Office or in Jammu & Kashmir field office and shall include Chief Engineer Works & Planning, Chief Electrical Engineer, Chief Signal & Telecom Engineer.
- 1.9 Competent Authority:** An officer/official of Employer’s organization vested with requisite administrative authority or designated by the Corporation as the Competent Authority.
- 1.10 Construction Machinery:** It shall mean all appliances or equipments of whatsoever nature required for the execution, completion or maintenance of the work or temporary work (as hereinafter defined) which requires RTO registration and does not include materials or other things intended to form or forming part of the permanent work.
- 1.11 Construction Plant:** It shall mean all appliances or equipments of whatsoever nature required for the execution, completion or maintenance of the work or temporary work (as hereinafter defined) and does not require RTO registration and does not include materials or other things intended to form or forming part of the permanent work.
- 1.12 Contract** shall mean and include the Agreement or Letter of acceptance, the accepted Schedule of Items, Rates and Quantities, the Indian Railways Standard General Condition of Contract July 2020, the Special Conditions of Contract, the drawings, the specifications, the special specifications if any, tender forms, instructions to tenderers, Notice Inviting Tender, Addendum(s), Corrigendum(s) and other tender documents.
- 1.13 Contractor:** shall mean the person or firm or company or joint venture/Consortium who enters into contract with the Corporation as a consequence of acceptance of his bid by the Corporation and shall include their executors, administrators, and assigns expressly permitted under the terms of the contract.

- 1.14 Contractor's vehicles:** The vehicles for carriage of manpower/labour, staff etc. owned/engaged by Contractor, in connection with the work.
- 1.15 The Completion Date is the Date of Completion (DOC) of the Works** ascertified by the Engineer-in-charge under the contract between the Corporation and the Contractor to execute, complete and maintain the Works.
- 1.16 The Contract Data** means information and data contained in the documents comprising the Contract.
- 1.17 The Contractor's Bid** is the completed Bidding documents submitted by the Contractor to the Employer.
- 1.18 The Contract Price** is the price stated in the letter of acceptance (LOA) and thereafter as arrived at in accordance with the provisions of the Contract.
- 1.19 D (W&W):** Director (Way & Works) of Konkan Railway Corporation Ltd.
- 1.20 DDC:** Detailed Design Consultant.
- 1.21 Drawing(s)** shall mean the maps, drawings, plans and tracings or prints thereof annexed to the tender/contract (including drawings prepared by contractor & consultant) and shall include any modifications of such drawings and any further drawings as may be issued by the Engineer-in-charge from time to time.
- 1.22 Days** are English calendar days, months are English calendar months.
- 1.23 D/S:** Down Stream.
- 1.24 EMD :** Earnest Money Deposit.
- 1.25 Employer** means the **KONKAN RAILWAY CORPORATION LIMITED / RailTel Corporation of India Limited**, A Govt. of India Undertaking (KRCL / RAILTEL in abbreviation) acting through its Chairman and Managing Director or any other authorized officer and shall include their legal successors in title and permitted assignees.
- 1.26 Engineer/Engineer-in-charge (EC):** shall mean the Executive Engineer or Divisional/ District Engineer in executive charge of the works and shall also include the superior Officers of the Engineering Departments of the Corporation, i.e. the Deputy Chief Engineer/Deputy Chief Electrical Engineer, Dy. Chief Signal & Telecom Engineer, Dy. General Manager responsible for supervising the work of Contractor, administering the Contract, certifying the payments due to the Contractor, issuing and evaluating Variations to the Contract, awarding extensions of time and evaluation of Compensation.
- 1.27 Engineer's Representative:** shall mean the Assistant Engineer / Senior Engineer in direct charge of the works and shall include Inspector of the Civil Engineering, Electrical or Signal & Telecommunication Department of the Corporation.
- 1.28 GCC:** Indian Railways Standard General Condition of Contract July 2020, along with latest correction slips.
- 1.29 GST:** Goods & Services Tax.

- 1.30 Headings & Marginal Headings:** The top headings and marginal headings/notes in the tender or contract documents are solely for the purpose of facilitating reference and shall not be deemed to be part thereof and shall not be taken into consideration in the interpretation or consideration thereof.
- 1.31 The Initial Contract Price** is the Contract Price listed in the Employer's Letter of Acceptance.
- 1.32 The Intended Completion Date** means the Completion Date specified in the Contract.
- 1.33 IRC :** Indian Roads Congress
- 1.34 IREPS:** Indian Railways E-Procurement System
- 1.35 IRS :** Indian Railway Standards
- 1.36 IS Code :** Indian Standard Codes issued by BIS
- 1.37 JV:** Joint Venture
- 1.38 KRCL / RAILTEL / Corporation / Railway :** Konkan Railway Corporation Limited
- 1.39 LOA :** Letter of Acceptance
- 1.40 The Maintenance period or Defects Liability Period** means such period as stipulated in the relevant clauses of the Contract and calculated from the Completion Date.
- 1.41 Materials** are all supplies, including consumables, used by the contractor in the Works under the Contract.
- 1.42 NIT:** Notice Inviting Tender.
- 1.43 OD:** Outer Diameter
- 1.44 RDSO:** Research Design Standards Organization
- 1.45 RITES:** Rail India Technical and Economic Services
- 1.46 RTO:** Regional Transport Office of State Govt.
- 1.47 Schedule of Items, Rates & Quantities/Bill of Quantities** means the Schedule to the contract containing Items, Rates & Quantities.
- 1.48 Singular and Plural:** The singular includes the plural, the masculine includes the feminine, and vice versa where the context requires.
- 1.49 Site** shall mean the land and/or structures or places on, under, in or through which the works are carried out and any other lands or places provided by the Corporation for the purposes of the contract.
- 1.50 Specification** means the Specification for materials and Works described in the Contract and any modification or addition under written instructions and **approval** of the Engineer-in-charge or his nominee as per the terms of the Special Conditions.

- 1.51 Temporary Works** are works which are required for temporary and not permanent use by the Contractor, for construction or installation or maintenance of the Works under the Contract.
- 1.52 Tender or Bid** means the offer (Technical and/or Financial) made by tenderer for the execution of the works in response to the Corporation's Invitation to Tender.
- 1.53 Tenderer :** means, the person/the firm or company, entity or joint venture whether incorporated or not who in response to the Invitation of EOI issued by the RAILTEL, submits or tenders an offer in the prescribed form, to execute the works and sign contract with KRCL / RAILTEL and shall include their representatives, and permitted assignees.
- 1.54 Technical Building** means station buildings, control rooms, Tunnel control rooms and any structure/rooms where equipment is required to be installed.
- 1.55 The Works** are what the Contract requires the contractor to execute, construct, install, commission handover to the Employer and maintain under the terms of the Contract
- 1.56 U/S: Up Stream.**

(B) GENERAL OBLIGATIONS

2.0 Safety Procedures

- 2.1 Health, Safety & Environment (HSE):** The contractor shall formulate a **Health, Safety & Environment (HSE)** manual, using the services of competent and experienced consultants and submit to KRCL / RAILTEL for approval. The provisions of approved manual in addition to statutory regulations shall be complied with by the Contractor.
- 2.2** The contractor has to submit Health Safety and Environment (HSE) manual within 21 days from the date of issue of LOA to the Engineer-in charge for approval. The rates quoted shall deem to include above expenses to be incurred under this clause.
- 2.2.1** In addition to clause 30, 34 and such other clauses of GCC, regarding safety, the contractor/Tenderer shall be bound to carry out the other instructions of Engineer-in-charge, as he may, deem necessary, for Safety arrangements. The contractor shall at all times be responsible to take all precautions and adopt such safe methods of working as will ensure safety of public, structures, equipment and workers.
- 2.2.2** If at any time KRCL / RAILTEL finds the safety arrangements as inadequate or unsafe, the contractor shall take immediate corrective action as directed by KRCL / RAILTEL's representative.
- 2.2.3** The contractor's responsibility for safe working shall not be restricted to the discharge of instructions if any of the Engineer-in-charge and the contractor/tenderer shall on his own adopt all necessary precautions.
- 2.2.4** The contractor shall provide all necessary safety appliances such as safety goggles, helmets, gumboots, safety belts, ear plugs, masks etc. to the workers, staff and also for consultants, employer, visiting officers/guests etc.

- 2.2.5 The cost of all Safety arrangements including cost of all labour and material is deemed to have been included in the item rates given and percentage rate quoted by the tenderer in Schedule of Items, Rates and Quantities and nothing extra shall be payable under this contract.
- 2.3 All the Safety precautions for open shall be observed & followed as per relevant statutory regulations IS Codes as well as 'HSE Manual'.
- 2.4 The Employer may, at their discretion undertake such corrective measures as deemed fit for immediate restoration of safe conditions at the work place at the cost of the Contractor and recover the cost from Contractor's running bills. The contractor will keep the Employer indemnified against any corrective action by the Employer. In addition to such recourse, the penalty for each violation will be enforced as under, without issuing any show cause notice for the same:

Sr.	Nature of violation	Penalty
1	Non preparation of Site Safety Plan before the first running bill.	Rs.10,000/-
2	Violation of safety norms pointed out by inspecting officials, such as deficient documentations or safety gadgets or lack of supervision/ process control etc.	Rs.10,000/- for each violation subject to maximum 1% of the contract value in all.
3	Injury to worker leading to stoppage of work.	Rs.25,000/- for each case.
4	Fatalities to workers at work related accidents.	Rs.5.00 Lakh for each mortality
5	Repetition of violation	May lead to termination of work.

3.0 Quality Assurance Plan (QAP)

- 3.1 The Contractor has to submit a detailed Quality Assurance Plan on the basis of technical specifications in Special Conditions of Contract - Part B and referred Codes/ Manuals, best engineering practices etc. using the services of competent and experienced consultants and submit to KRCL / RAILTEL for approval. The provisions of approved manual in addition to respective contract condition, codes, specifications shall be complied with by the contractor.
- 3.2 The contractor has to submit **Quality Assurance Plan (QAP)** within 21 days from the date of issue of LOA to the Engineer-in charge for approval. The rates quoted shall deem to include above expenses to be incurred under this clause.

- 3.3** If the contractor fails to submit QAP as stipulated above, the same may be got prepared by KRCL / RAILTEL. The cost towards the same shall be recovered from the Contractor at twice the expenditure incurred by KRCL / RAILTEL. This QAP shall be binding on the contractor.

4.0 Publicity

- 4.1** The contractor or his sub-contractor or his consultant shall not publish or otherwise circulate, alone or in conjunction with any person, any paper/booklet/sketch/ any articles, photographs or other materials relating to the Contract, the Site, the Works, the Project or any part thereof, nor impart to any third party any information relating thereto, nor allow any representative of the media access to the Site, contractor's Works Areas, or off-Site place of manufacture, or storage except with the permission, in writing, of the Employer. The contractor shall ensure that his sub-contractors of any tier shall be bound by a like obligation and shall, if so required by the Corporation, enforce the same at his own expense. The provisions of this Clause shall not exempt the contractor from complying with any statutory provision in regard to the taking and publication of photographs.

5.0 Official Secrets Act 1923

- 5.1** Indian Official Secrets Act 1923 (XIX of 1923) shall apply to the contractor and persons employed by him for this contract.

6.0 Royalties and Patent Rights

- 6.1** Unless otherwise stated in the special conditions, the contractor shall defray the cost of all royalties, fees and other payments in respect of patent rights and licenses which may be payable to any patentee, licensee or any other person or corporation and shall obtain all necessary licenses. In case of any breach (whether willfully or inadvertently) by the contractor of this provision, the contractor shall, indemnify the Railway/KRCL / RAILTEL and their officers, staff, representatives against all claims, proceedings, damages, cost, charges, pecuniary loss and liability which they or any of them sustain, incur or be put by reason or in consequence directly or indirectly for any such breach and against payment of any royalties, damages and other monies which the Railway/KRCL / RAILTEL may have to make to any person for any machine, instruments, process, articles, matters, or thing constructed, manufactured, supplied or delivered by the contractor to his order under this contract.

7.0 Dissolution of Contractor's Firm

- 7.1** If the contractor's firm is dissolved due to the death or retirement of any partner or for any reasons whatsoever before fully completing the whole work under the Contract or any part thereof, the remaining partners shall remain jointly, severally and personally liable to complete the entire work under the Contract to the satisfaction of KRCL / RAILTEL.

- 7.2** If after acceptance of the offer and / or signing of the Works Contract, the Contractor expires, or in case of a Firm, any partner expires or in case of a firm or a corporate entity, the composition changes, the KRCL / RAILTEL shall have an option to either treat the contract / acceptance as cancelled or treat the same as subsisting. The Contractor whether a person, firm or a corporate entity shall be liable to discharge its obligations under the contract unless the KRCL / RAILTEL exercises its option to treat the Contract / Acceptance as cancelled. No compensation / loss / damages shall be payable on account of such cancellation.

8.0 Documentation of Works and Final Submissions:

- 8.1** Site inspection register will be maintained by the Engineer-in-charge or his representative in which the contractor or his agent will be bound to sign day to day entries made by the Engineer-in-charge or his representative. The contractor is required to take note of the instructions given to him in site inspection register and should comply within a reasonable time. The contractor will also arrange to receive all the letters etc. issued to him at the site of work. The Contractor is deemed to have due and adequate notice of all the entries made in the Register by the Engineer-in-charge or his Representative and failure on the part of the Contractor to counter sign the Register shall not exonerate the contractor from complying with the noting.
- 8.2** Contractor shall purchase at his own cost all the registers required at site for various purposes. All the registers required to be maintained at work sites for recording various measurements, daily activities or for other purposes, shall be authenticated by the Engineer-in-charge. Before making use of any register, Engineer-in-charge will authenticate the same by signing first and last page with his stamp. The Contractor shall ensure that all the pages have been machine numbered serially. The register(s) which have not been authenticated by Engineer-in-charge should not be used at site.
- 8.3** The contractor shall submit to the Corporation, three sets of booklets for final bill as per directives of Engineer-in-charge, containing all the relevant details of up to date work done, typed in electronic media, using an office software and printed, jointly signed by contractors and Engineer-in-charge or his representatives. The submitted booklets will be property of the Corporation. Contractor shall also submit the same in electronic storage device of adequate capacity. No additional payment shall be made for submitting such submissions.
- 8.4** All the original registers, files, level books, balance measurement sheets, abstract sheets, drawings, tracings or any other records maintained at site during construction shall be submitted by contractor to KRCL / RAILTEL forthwith after completion / termination of work.

9.0 Change in Address

- 9.1** Any change in the address of the Contractor shall be forthwith intimated in writing to KRCL / RAILTEL and KRCL / RAILTEL's acknowledgement in writing should be obtained. Unless the change has been duly intimated to KRCL / RAILTEL and acknowledged by KRCL / RAILTEL all correspondence shall be addressed on the address specified in the Contract and shall be deemed to be delivered to the Contractor. KRCL / RAILTEL will not be responsible for any loss or inconvenience suffered by the contractor on account of his failure to comply with this clause.

(C) EXECUTION OF WORKS

10.0 Site Clearance at start of work

- 10.1** The contractor shall clear all the grass, shrubs, garbage, deadwood, fallen wood and other such materials etc., to the extent needed for the works and as directed by the Engineer-in-charge.

11.0 Occupation and Use of Land

- 11.1** Use or occupation of land as per clause 6 of GCC, shall not confer upon the contractor any rights whatsoever including tenancy / easements / license over the land.

12.0 Land

- 12.1** The land for the commencement of work is available. Any additional requirement of land by the contractor for their own purpose may be arranged by his own resources. Any assistance required in this regard may be requested to KRCL / RAILTEL. KRCL / RAILTEL may provide such assistance if possible, without any liability or responsibility on the corporation.

13.0 Felling of trees

- 13.1** Work site is already clear of trees. In normal circumstances the felling of trees will be done by State Forest Corporation (SFC). However, if SFC does not cut the tree, and in turn permits KRCL / RAILTEL/ N. Rly to cut the tree, the felling of tree will be done by the contractor. The logs will be stacked and handover to KRCL / RAILTEL. The cost incurred in tree cutting and stacking etc by the contractor will be reimbursed. The Contractor shall have no claim due to delay on above account.

14.0 Working Hours

- 14.1** If the Engineer-in-charge is satisfied that under the circumstances, round the clock working is expedient, he may permit the contractor(s) to carry out the works accordingly. No extra payment shall be payable to the Contractor for working round the clock.

15.0 Survey

- 15.1** The contractor shall, from time to time and before interfering with the surface of any portion or the site or before the work thereon begins, take and record such levels as the Engineer-in-charge may direct in his presence or any person

authorized by him in writing. Such levels approved and checked by him or such authorized persons shall be recorded in writing and signed by the contractor and shall form the basis of the measurements. Immediately before any portion of the work below water level is started, the existing water levels are to be taken and recorded in a similar manner.

16.0 Setting out works : ‘Deleted’

17.0 Enabling Works

- 17.1** Unless otherwise specified in the tender documents, rates given in the schedule to the Contract and percentage rate quoted in the contract shall be inclusive of all enabling works. The Contractor shall have no claim on above account.

18.0 Urgent Work

- 18.1** If any Urgent work in the event of accident or failure occurring in or about the work or arising out of or in connection with the construction becomes necessary in the opinion of the Engineer-in-charge, and the contractor is unable or unwilling at once to carry it out, the Engineer-in-charge may through another agency or on his own, carry it out as he may consider necessary. If the urgent work shall be such that the contractor is liable under the contract to carry out at his expenses, all expenses incurred on it by KRCL / RAILTEL shall be recoverable from the contractor and be adjusted or set off against any sum payable to him. The decision of the Engineer- in-charge as regards the existence and nature of urgency and necessity of work shall be **final and binding** on the Contractor.

19.0 Duties and Powers of Engineer-in-charge’s Representative

- 19.1** The duties of the representative of the Engineer-in-charge are to monitor and supervise the works and to test and examine any materials to be used and the workmanship in connection with the works. He shall have no authority to order any work involving any extra payment by KRCL / RAILTEL or make any variation in the works.
- 19.2** The Engineer-in-charge may from time to time delegate to his representative any of the powers and authorities vested in the Engineer-in-charge. A copy of all such delegation of powers and authorities shall be furnished to the contractor, by him.
- 19.3** For supervision of all the works pertaining under this contract KRCL / RAILTEL has engaged Resident Engineers on contract basis. They may be deployed to assist in supervision of works. The Contractor shall facilitate such supervision.
- 19.4** KRCL / RAILTEL reserves the right to deploy an agency for providing Project Management Consultancy (PMC) to augment its supervision capabilities.
- 19.5** Contractors shall provide facilities for inspection of works to Resident Engineers as in Clause 19.3 above and agency of PMC as in Clause 19.4 above as provided in GCC clause 28.

20.0 Priority of Documents and specifications.

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

- i) The Agreement for the works executed on stamp paper.
- ii) The Letter of Acceptance
- iii) Schedule of Items, Rates and Quantities/Bill of Quantities (BOQ)
- iv) Special Conditions of Contract
- v) Referred Technical Specifications
- vi) Approved Drawings
- vii) Indian Railway Standard General Condition of Contract 2020
- viii) Instructions to tenderer/s

20.2 Any error in description, quantity or rate in Schedule of Quantities or any omission there from shall not vitiate the contract or release the contractor from the execution of the whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the contract.

If there are varying or conflicting provisions made in any documents forming part of the Contract or in the event of a conflicting view as to the interpretation of the contents thereof; the documents shall take priority in accordance with the list given in clause 20.1 above. When there is any conflict between the specifications given in this contract and the IRS, BIS, IRC specifications or specifications of any other body/Institution/Authority as the case may be, the specifications given in this contract shall prevail over the other specifications. However, in case of any ambiguity, the decision of the Engineer-in-charge in this regard shall be **final and binding**.

21.0 Programme of Construction

In partial modification to clause 19 (3) of GCC, the contractor shall submit detailed programme of work not later than 30 days after the date of receipt of Letter of Acceptance. All other provisions of Clause 19 (3) of GCC shall remain the same.

22.0 Drawings for works

The drawings attached with the tender are indicative only and the work will be carried out as per approved drawings. Contractor will have no claim on account of deviation in approved drawing with reference to tender drawing.

22.1 The Corporation reserves the right to modify the plans and drawings referred to in the tender documents without assigning any reasons as and when considered necessary by the Corporation. The Contractor shall have no claim on account of such modifications.

22.2 It should be specifically noted that some of the detailed drawings may not have been finalized by the Corporation and will, therefore, be supplied to the contractor, progressively as per site requirements. No compensation whatsoever on this account shall be payable. No claim shall be entertained in this regard by KRCL / RAILTEL.

23.0 TRAINING: Training of KRCL / RAILTEL/Railway officials shall be imparted as per the following:

23.1 Training on major subjects/equipment for KRCL / RAILTEL/Indian Railway official shall be organized. The training shall be imparted to get construction/operation details of the equipment. This should also help in maintenance of the materials/equipments by KRCL / RAILTEL/Indian Railway officials.

23.2 The contractor should train KRCL / RAILTEL/Indian Railway Engineer/Supervisor in different aspects of the various systems, equipment, its functioning, field installation, testing, commissioning, maintenance and repairs.

23.3 The training should be comprehensive for transfer of complete know-how, so as to impart full knowledge and confidence to independently and successfully execute the installation testing, commissioning, maintenance and repairs of the complete system and equipment.

- i. The training should be completed within a period of 6 months from the date of issue of acceptance letter.
- ii. The venue of the training shall be finalized in consultation with Engineer-in-charge at a suitable place.
- iii. Expenses on travel and other incidental expenditure on training of Railway personnel, deputed for training will be borne by the Railways.
- iv. To impart training, the contractor shall make arrangements for Projector, Slides, Equipment /instruments, documents at his own cost.
- v. The detailed training, programme indicating the topics to be covered, practical / demonstrations to be conducted during training shall be approved by the Engineer-in-charge prior to commencement of training.
- vi. Engineer-in-charge will take adequate measure to ensure that Rly officials are trained properly. To judge the same, he may conduct the test.
- vii. Training shall also be imparted as per clause 11 of RDSO specification RDSO/SPN/TC/109/2019.

23.4 SUPPLY OF TECHNICAL MANUAL & SPARES:

The contractor shall supply 2 copies of manuals of each equipment supplied indicating procedures for installation, testing and commissioning of the system. Chart indicating the probable nature of fault, Guidelines for the localisation of fault and remedial action to be taken for system equipments.

23.5 Necessary RDSO, IRS/TEC/DOT/ Specification / drawing, if any, required shall be obtained by the contractor at his own cost.

24.0 Delay and Extension of Contract Period

24.1 Works under the Contract is a part of the Project of National Importance and is undertaken by KRCL / RAILTEL under the Contract Agreement dated 9th August 2005 between the Northern Railway and KRCL / RAILTEL. If at any time, the Ministry of Railways

/ Railway Board / Northern Railway / KRCL / RAILTEL, come to a conclusion and decide that in the interest and / or for the reason of National Security, public safety, National Interest or Public Interest, changes in the Works under the Contract or the Contract itself are required to be made or any other decision in respect of the Works under the Contract or the Contract itself, the Contractor shall accept the decision as final and not open to any challenge. In such an eventuality, the Contractor will be entitled to the actual costs incurred by him on account of such decision which shall be kept to the minimum possible. Such costs shall be paid after verification of vouchers, relevant records. The decision of Engineer-in charge on the admissibility of such documents shall be final and binding.

24.2 If at any time during the continuance of this contract, the performance in whole or in part is required to be prevented due to the constraints and compulsions faced in the interest of National Security, Safety, public interest, such prevention shall be understood and accepted as beyond the control of the Corporation and a Force Majeure. Provided notice of the happening of such event is given by KRCL / RAILTEL to the Contractor, within seven days from the occurrence of such eventuality the contractor shall not be by reason of such event be entitled to terminate this Contract, nor shall he be entitled to claim any damages in respect of non-performance. The works under the Contract shall be resumed as soon as possible. The decision of the Chief Engineer as to whether the work has commenced or not shall be final. Provided that if the performance of this Contract is prevented for more than ninety days, either party may terminate the Contract by giving notice to the other party.

24.3 In case of Force Majeure, price variation is payable as per price variation clause.

24.4 Competent Authority of KRCL / RAILTEL while granting extension to the currency of contract under clause 17 (B) of GCC may also levy liquidated damages including token liquidated damages as deemed fit based on the facts of the case.

25.0 Maintenance/Defects Liability Period

25.1 The “**maintenance period**”/ “**defect liability period**” as and where referred to in this tender document shall mean the same. The maintenance period shall be **12 months** from the date of issue of completion certificate by the Engineer-in-charge to the contractor after satisfying himself that the works have been carried out by the contractor fully according to specifications and quality requirements and are suitable for the intended purpose.

- 25.2** The Contractor shall maintain, rectify and make good at his own cost any defect/deficiencies, which may develop in the work or as notified by the Engineer-in-charge during Defect Liability Period. Defect Liability Period will be 12 months from the date of issue of completion certificate i.e. date of issue of the Provisional Acceptance Certificate. However, maintenance during Defect Liability Period shall not include day to day upkeep, cleaning, custody and security of the work. Any defect arising due to defective construction/material/workmanship in any structure(s) during the period(s) specified above and due to causes enumerated above, the contractor shall rectify the same at no extra cost. In case of failure of the Contractor to do so within a fortnight from the date of notice given by Client / Engineer-in-charge, the same shall get rectified at the risk and cost of the Contractor.
- 25.3** The Contractor shall be responsible for removing all the defects during the defect liability period. If required, fresh construction shall also be done by the Contractor for defective works at his own cost. Defect liability period shall start after issuance of Completion Certificate for that station. If Contractor fails to commence rectification of defects within 14 days from the date of notice by Employer or does not complete the said rectification with diligence and within mutually agreed time period, Employer shall be entitled to carry out such work by his own workmen or by other agency at the cost of Contractor. The issue of Employer's completion certificate shall in no way exempt the Contractor from the provisions under this Schedule.
- 25.4** The contract shall not be considered as completed, until a Defect Liability Certificate has been issued by the Engineer-in-charge stating that the works have been completed and maintained to his satisfaction. Defect Liability certificate shall be issued by the Engineer-in-charge, upon expiry of Defect Liability period or as soon thereafter as any works ordered during such period, have been completed to the satisfaction of the Engineer-in-charge. No certificate other than "Defect Liability Certificate" shall be deemed to constitute final approval of the work or part of the work for which it is issued.

25.5 GUARANTEE:

- 25.5.1** The Contractor(s) shall Guarantee satisfactory working of the materials supplied and/or the installation erected by him under this contract, to be free of any defects in material and workmanship for a period of 12 months beginning from the date of issue of completion certificate i.e. issue of "Provisional Acceptance Certificate" by the Corporation. He/they shall agree to replace any items failing the requirements specified under this contract.
- 25.5.2** During this period, the Contractor shall keep all materials, tools and other requisite equipment at site, and shall carry out at his own expenses all modifications, additions or substitutions that may be considered necessary for

the satisfactory working of the work or equipments done under this contract Final decision in respect of unsatisfactory working or faulty use of materials, design or workmanship etc., shall rest, with the Chief Signal & Telecom. Engineer

- 25.5.3 During the aforesaid period of guarantee, the Contractor shall be liable for all repairs or replacement of any parts that may be found defective in the contract work or equipments, irrespective of whether such parts be of his own manufactures or those of the sub-contractor or whether any defect arose as a result of a faulty design, materials, workmanship, installation or otherwise. Provided always that such defective parts as are not repairable at site are promptly removed to the contractor's works for repairs if so required by him and such defective parts should be replaced by him by new ones in order to remove the defects at his (Contractor's) own expenses. In case any minor repairs are carried out by the Corporation at site, the cost of such repairs plus the departmental charges shall be borne by the Contractor.
- 25.5.4 In order to fulfill, the guarantee conditions satisfactorily, it is expected that contractor will enter into AMC for requisite period with the parent manufacturer of equipment at his own cost, in case contractor himself is not able to fulfill the necessary guarantee conditions due to non possession of spares and/or trained technical manpower.

25.6 WARRANTY:

- 25.6.1 The contractor shall warrant that every equipment shall be free from defects and faults in design, materials, workmanship and manufacture and shall be of highest grade and consistent with the established and generally accepted standards for goods of the type ordered.
- 25.6.2 The warranty of the products shall be for a period of 12 months from the date of completion of the work i.e. dates of issue of the Provisional Acceptance Certificate.
- 25.6.3 At the time of release of Security deposit at the end of Warranty Period, the Contractor shall give a Guarantee certificate he shall support the system for a period of 10 years after expiry of warranty.
- 25.6.4 The Corporation reserves the right to enter into AMC at the end of Warranty Period. In case the firm refuses to enter into AMC at the end of warranty period, the Security deposit shall be forfeited.

(D) INSURANCE

26.0 Insurance

- 26.1** Before commencing of works, it shall be obligatory for the Contractor to obtain, at his own cost, insurance cover in the joint name of the Contractor and KRCL / RAILTEL from reputed companies for the following requirements:

- (i) Contractor's All Risk (CAR) Policy, with Third party Claim,
- (ii) Liability for death of or injury to any person or loss of or damage to any property (other than the work) arising out the performance of the Contract.
- (iii) Construction Plant, Machinery and Equipment brought to site by the Contractor.
- (iv) Any other insurance cover as may be required by the law of the land.

All insurance covers referred to in the Contract shall be effected with an Indian Insurance Company incorporated and registered in India.

- 26.2** The Contractor shall provide documentary evidence to the Employer/Engineer-in-charge before commencement of work at site that the third party liability insurance have been effected and shall within 30 days of the commencement date, provide the insurance policy to the Employer/Engineer-in-charge. The Contractor shall, whenever, called upon, produce to the Engineer-in-charge or his representative the evidence of payment of premiums paid by him to ensure that the policy indeed continue to be in force.
- 26.3** The Insurance Policies of the Contractor shall remain in force throughout the period of execution of the works and till the expiry of the defect liability period except for any specific insurance covers necessary for shorter period.
- 26.4** On the event of any damage to the property/life of third party, the contractor has to make immediate payment and relief measures as per the directions of the Engineer-in charge. The decision of Engineer-in-charge is final and binding.
- 26.5** If the Contractor fails to effect or keep in force or provide adequate cover as acceptable to the Engineer-in-charge in the third party liability insurance policy mentioned above, then in such cases, the Engineer-in-charge may effect and keep in force any such insurance or further insurance on behalf of the Contractor. The recovery shall be made at the rate of 1.5 times the premium / premiums paid by the Engineer-in-charge in this regard from the payment due to the Contractor or from the Contractor's Security Deposit / Performance Security. However, the Contractor shall not be absolved from his responsibility and / or liability in this regard.
- 26.6** Contractor at his own cost and without involving any obligations on part of Corporation, shall also take any additional necessary insurance policies for his men, materials, construction plants, machineries, equipments or any other insurance cover as may be required under the Contract
- 26.7** The Employer / Engineer-in-charge shall not be liable for or in respect of any damages to construction Plant, Machinery and Equipment brought to site by the contractor or compensations payable to any workman or other person in the employment of the Contractor or his sub-contractor or petty contractor. The Contractor shall indemnify and keep indemnified the Employer / Engineer-in-charge against all such damages and compensation for which the Contractor is liable.

(E) PRICE VARIATION

27.0 Price Variation Clause (PVC):

27.1 Applicability: Materials supplied free of cost by Railway to the Contractors and any extra NS item(s) included in subsequent variation falling outside the purview of the Schedule of Items of tender shall fall outside the purview of Price Variation Clause. If, in any case, accepted offer includes some specific payment to be made to consultants or some materials supplied by KRCL / RAILTEL free or at fixed rate, such payment shall be excluded from the gross value of the work for the purpose of payment/recovery of price variation.

27.2 Index numbers for Base Month: The index number for the Base Month will be the index number as month 28 days prior to opening of tender (Technical bid) including extensions, if any, unless otherwise stated elsewhere and the quarter will commence from the month following the Base Month. The month of opening of tender referred in the previous sentence shall be replaced by the 'month of opening of the concerned negotiated offer' in the event of accepting the tender by the Corporation is on the basis of negotiated offer. The price variation will be based on the average price index of the 3 months of the quarter under consideration.

27.3 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 of GCC,
- (b) Payment/recovery for overall market situation as per Price Variation Clause given hereunder.

27.4 Adjustment for variation in prices of several components like material, labour, fuel, etc. shall be determined in the manner prescribed below

27.5 Components of various items in a contract on which variation in prices be admissible, shall be Material, Labour, Fuel etc. However, for fixed components, no price variation shall be admissible.

27.6 Price variation Bills: The bills for variation in prices shall be allowed on the basis of provisional indices made available by the Reserve Bank of India. Any further adjustments needed to be done based on the finally published indices shall be made as and when they become available or in the final bills.

27.7 The adjustment for variation in prices: The adjustment for variation in prices if required shall be made once every quarter in the "on account" payments. If more than one "on account" payment is made to the contractor in a quarter, the adjustment, if required, shall be made in each bill.

27.8 General Price Variation

27.8.1 Percentage component: The percentage component of various items in a Contract on which variation in prices shall be admissible are as given below:

Description of Component	Percentage Component
Labour	20
Other Materials	20
Plant Machinery & Spares	30
Fuel & Lubricants	15
Fixed Component *	15

* Fixed component will not be considered for any price variation.

27.8.2 Materials supplied by Corporation: If, in any case, the accepted offer includes some specific payment to be made to consultants or some materials supplied by Corporation at fixed rate, such payments should be excluded from the gross value of the work for purpose of payment/recovery for variations.

27.8.3 The Relevant categories of steel for the purpose of operating Price Variation formula as mentioned in this Clause shall be as under :

Sr	Category of Steel supplied in Railway Work	Category of Steel Items as mentioned in Office of Economic Adviser, Govt. of India, Ministry of Commerce & Industry Department of Industrial Policy & Promotion (DIPP).
1	Reinforcement bars and other rounds	‘MS Bright Bars’ individual commodity of group item (d) Mild Steel-Long Products under (N) MANUFACTURE OF BASIC METAL
2	All types and sizes of angles, channels and joists	‘Angles, Channels, Sections, Steel’ individual commodity of group item (d) Mild Steel- Long Products under (N) MANUFACTURE OF BASIC METAL.
3	All types and sizes of plates	‘e. Mild Steel – Flat Products’ of (N) MANUFACTURER OF BASIC METAL.
4	Any other section of steel not covered in the above categories and excluding HTS	Average of price for the 3 categories covered under SL 1, 2 & 3 above

27.8.4 The amount of variation in prices payable/recoverable for the components of Labour, Material and Fuel shall be worked out by the following formulae:-

$$i) L = \frac{W \times (L_Q - L_B)}{L_B} \times \frac{L_C}{100}$$

$$ii) M = \frac{W \times (M_Q - M_B)}{M_B} \times \frac{M_C}{100}$$

$$\text{iii) } F = \frac{W \times (F_Q - F_B)}{F_B} \times \frac{F_C}{100}$$

$$\text{iv) } PM = \frac{W \times (PM_Q - PM_B)}{PM_B} \times \frac{PM_C}{100}$$

$$\text{v) } S = S_W \times \frac{(S_Q - S_B)}{S_B}$$

L = Amount of Price variation in labour

M = Amount of Price variation in materials

F = Amount of Price variation in fuel

PM = Amount of price variation in Manufacture of machinery for mining, Quarrying and Construction

W = Gross value of work done by Contractor as per on-account bill(s) excluding cost of materials supplied by Corporation at fixed price. This will also exclude specific payment, if any, to be made to the consultants engaged by Contractors.

L_B = Consumer price index number for industrial workers – All India :Published in R.B.I. Bulletin for the base period

L_Q = Consumer price index No. 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 = Wholesale Price Index for the group Fuel & Power as published in the R.B.I. Bulletin for the base period.

F_Q = Index Number of Wholesale Price Index – By Groups and Sub-Groups for the group Fuel & Power as published in the R.B.I. Bulletin for the average price index of the 3 months of the quarter under consideration.

PM_B = Index number of Monthly Whole Sale Price Index for the category 'k. Manufacture of machinery for mining, quarrying and construction' under (R) MANUFACTURE OF MACHINERY AND EQUIPMENT, published by Office of Economic Adviser, Govt. of India, Ministry of Commerce & Industry, Department of Industrial Policy & Promotion(DIPP), for the base period.

PM_Q = Index number of Monthly Whole Sale Price Index for the category 'k. Manufacture of machinery for mining, quarrying and construction' under (R) MANUFACTURE OF MACHINERY AND EQUIPMENT, published by Office of Economic Adviser, Govt. of India, Ministry of Commerce & Industry, Department of Industrial Policy & Promotion(DIPP), for the average price index of 3 months of the quarter under consideration.

Sw = Gross value of steel supplied by the Contractor as per the 'on account' bill for the month under consideration.

SB = Index number of Monthly Whole Sale Price Index for the relevant category of mild steel item as mentioned in Clause 46A.9, published by office of Economic Advisor, Govt.of India, Ministry of Commerce & Industry Department of Industrial Policy & Promotion (DIPP),for the base period.

SQ= Index number of Monthly Whole Sale Price Index for the relevant category of mild steel item as mentioned in Clause 46A.9, published by office of Economic Advisor, Govt.of India, Ministry of Commerce & Industry Department of Industrial Policy & Promotion (DIPP), for the average price index of the 3 months of the quarter under consideration.

Lc = % of labour component

Mc = % of material component

Fc = % of fuel component

PMc = % of Manufacture of machinery for mining, Quarrying and Construction Component.

Note: Incase of any ambiguity, GCC July 2020 shall prevail.

27.9 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 17-A of the Standard General Conditions of Contract. However, where extension of time has been granted due to Contractor's failure under Clause 17-B of the Standard General Conditions of Contract, price adjustment shall be done as follows.

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

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

28.0 Commencement of Contract

Date of issue of Letter of Acceptance (LOA) shall be considered as the commencement date of Contract.

29.0 Sub-Contractor

- a. The contractor may sub-let a part of the work under this contract and enter into contract with suppliers for supply of material.
- b. The name of all Sub-Contractor proposed to be employed for execution of work or any part thereof including manufacture of component and fittings shall be submitted by the contractor to KRCL / RAILTEL and got approved, before the contractor enters into an arrangement with the Sub-Contractor for the purpose.
- c. The contractor shall arrange for effective supervision of Sub-Contractor's work and remain solely responsible for material supplied and for works carried out on his behalf by the Sub-Contractor/s.

30.0 Completion Period

30.1 The work is required to be completed within 18 (Eighteen) months from the date of issue of Letter of Acceptance (LOA).

The entire work to be carried out as per the following schedule.

Sr	Description of Milestone	Completion Target (Month)
1	Mobilization & establishing Camp office at Site	D+1
2	Placing of purchase order for various supply items	D+2
3	Supply of Material	D+10
4	Installation of Tower for Antenna and Laying of OFC & leaky cables in tunnels	D+12
5	Installation of all equipment in Tunnels and station	D+14
6	Testing (SAT)	D+16

Sr	Description of Milestone	Completion Target (Month)
7	Commissioning	D+17
8	Observation Period of one month	D+18

Note: D stands for Date of LOA

The above programme is indicative; however, the Contractor shall submit a detailed time programme to the Engineer-in-charge within 30 days in line with the above after receiving the LOA, strictly adherence to the above completion period

i.e. 18 months. The program shall be provided in both Bar Chart & PERT/CPM chart and it shall indicate all relevant activities (both major & minor) related to telecom work. The program shall take due account of the contractor's obligations to co-ordinate and to plan the work to meet the stipulated time for completion for the whole of the works and the time for completion of various works and to accommodate the requirements of the contract.

The program must identify the milestones, interface requirements and program reporting elements and shall include:

- a. the order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage of design (if any), procurement, delivery to Site, construction, erection and testing,
- b. sequence and timing of inspections and tests specified in the Contract, and
- c. a supporting report which includes:
- d. a general description of the methods which the Contractor intends to adopt, and of the major stages, in the execution of the Works, and
- e. the physical and Financial Progress vis-à-vis program and forecast cash flow
- f. Installation of temporary facilities
- g. Procurement of Construction Resources
- h. Preparation of Construction Drawings
- i. Construction sequence of the permanent works
- j. Availability of material and equipment at site for construction
- k. The work shall be separately shown for each major component of the work and Maintenance manual.

The program shall be computer based adopting Project Management Software Primavera/Sure Track/MS Project or as mutually agreed.

This programme shall be updated every month. The Contractor shall also submit a revised programme whenever the previous programme is inconsistent with respect to actual progress or with the Contractor's reasons thereof.

30.2 Provisional Acceptance Test

- 30.2.1 As soon as the Contractor informs the Corporation and the Engineer-in-charge determines that the works are completed from end to end including commissioning, Corporation shall carry out all tests as per the acceptance test schedule. Any component, modules, sub-assemblies or equipment failing during the commissioning test shall be replaced/repared free of cost by the tenderer. When all the tests are successfully completed end to end, the provisional test report will be jointly prepared.
- 30.2.2 Railway will also carry out all the tests as per the Technical Specifications and the approved Acceptance test schedule. Any component, modules, sub-assemblies or equipment failed during the commissioning test shall be replaced/repared at free of cost by the contractor. A full record of test conducted shall be maintained by the contractor and handed over to Railway along with commissioning
- 30.2.3 All tests and measuring instruments and other arrangements required for final acceptance test shall be provided by the contractor at his own cost. If it becomes necessary for the contractor to replace/renew only defective module/system /component under this clause, the warranty provision shall continue for a period of six months from the date of such replacement/renewal or until the end of original warranty period whichever may be later.
- 30.2.4 The completion certificate in accordance with General conditions of contract and special condition of contract shall only be issued by the Engineer-in-charge after the installation is satisfactorily commissioned.

30.3 Observation Period

After the completion of provisional acceptance test, system shall be put under observation for period of 30 days. During this period Corporation may at their discretion connect the user equipment and observe the performance from the end user point of view. If any defects or failures are noticed during this period the contractor will replace or rectify such modules and additional test or repetition of some of the tests will be carried out to make sure that all parameters are within specified values.

30.4 Provisional Acceptance Certificate

After completion of provisional acceptance test and if no problems are noticed during observation period, Engineer-in-charge shall issue a Provisional Acceptance Certificate for successfully commissioning of whole system covering all materials and services included in the Schedule of works, after the acceptance test have been completed as per the approved test procedure and the performance has been found to meet the specifications. Corporation's decision in this respect shall be final. The date of issue of the Provisional Acceptance Certificate will be treated as the date of Completion of the work.

30.5 Part Commissioning

If the works are not completed as per the program of work and there is a deviation from the milestones to be achieved, Corporation will be free to make use of the partially commissioned work. Making such use of partially commissioned work will not be deemed as provisional acceptance from the Corporation.

31.0 Progress Reports

31.1 Monthly progress **reports** shall be prepared by the Contractor and submitted to the Engineer-in-charge in three copies. The first report shall cover the period up to the end of the first calendar month following the Commencement Date. Reports shall be submitted monthly thereafter, each within 7 days after the last day of the period to which it relates.

Each report shall include:

- a. Charts and detailed descriptions of progress, including each stage of design (if any), Contractor's Documents, procurement, manufacture, delivery to Site, construction, erection and testing; and including these stages for work by each nominated Subcontractor, If any.
- b. Photographs showing the status of manufacture and of progress on the Site;
- c. for the manufacture of each main item of Plant and Materials, the name of the manufacturer, manufacture location, percentage progress, and the actual or expected dates of:
 - i. commencement of manufacture,
 - ii. Contractor's inspections,
 - iii. tests, and
 - iv. Shipment and arrival at the Site.
- d. The detail Records of Contractor's Personnel Tool, Plant, Machinery and Equipment etc. at site.
- e. copies of quality assurance documents, test results and certificates of Materials;
- f. Comparisons of actual and planned progress of all activities, with details of any events or circumstances which may jeopardise the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome delays.

32.0 Specifications:

The work shall be carried out as per standard technical specifications of RDSO/IS with latest Amendments.

33.0 Freight/Transport Charges

The Tenderer shall quote their all-inclusive rates including prices for freight/transportation, handling, loading, Unloading, insurance etc. for delivery of materials at site. The contractor has to inspect the site, road up to site including

road, bridge, via duct, curves. The transport of all the material at site is in the scope of contractor at no extra cost.

34.0 Payment of Bills

- 34.1** The measurements for payment of 'on account', 'pre-final' and 'final' bills have to be taken by the contractor's Engineer in the presence of the Engineer-in-charge or his representative. Joint measurements shall be taken continuously and need not be connected with billing stage. Based on the above measurements, the contractor has to submit his 'on-account' / 'pre-final' / 'final' bills along with the details of measurement and calculation of quantities in Performa approved by the Engineer-in-charge duly certified by the qualified Engineer of the contractor authorized in this behalf.
- 34.2** Subject to any deductions or recovery which the Corporation may be entitled to make under contract, the Contractor shall be entitled to be paid from time to time by way of 'On Account' payment as per conditions of General Conditions of Contract.
- 34.3** On submission of bills by the contractor, the payments will be paid after scrutiny (technical check) and acceptance of the bill.
- 34.4** The bill of Quantities (BOQ) shall be read in conjunction with the instruction to bidders, Railways Standard general conditions of contract, special condition of contract, works requirements, Technical specifications, explanatory notes, payment conditions, pre-bid clarifications, agenda and corrigenda if any.
- 34.5** The unit price for "Supply system" in the bill is the all-inclusive price of material and all incidental charges for transport, loading/unloading and handling. The price also includes RITES/RDSO or other agencies inspection and testing charges unless otherwise specified in the bill of quantities or Technical specification. In case of change of inspection from RDSO/RITES to KRCL /Consignee, inspection charges shall be deducted from SI/BA on actuals as deducted by KRCL i.e. COR (Customer of RailTel).
- 34.6** "On Account Payment" will be made for supply of equipment, materials indicated in the supply Schedule on receipt of material at Consignee's depot/ site. On Account payments made will subsequently be adjusted against payments due on Provisional Acceptance or Final Acceptance.
- 34.7** All payments shall be made by the RailTel Northern Region, New Delhi after deducting penalties if any as deducted by the customer of RailTel. Due date of payment for an Invoice raised by SI/BA shall be from the date of acceptance of payment by KRCL i.e. COR (Customer of RailTel) for respective work. The payments schedule of COR (Customer of RailTel) is as detailed under:

Sr	Stage of Payment	For Purely Supply Items	For Supply & Installation Items	For Execution/ Installation Items
1	After Supply of Items	85%	80%	-
2	Successful Completion of Site Acceptance Test	10%	15%	90%
3	Successful CRS Inspection Bill	05%	05%	
4	Issue of handing over certificate by Northern Railway			10%

Note:

- (i) 95% payment will be paid for “Office furniture” & “Special tools and plant” and other spares, tool kits etc. on receipt of equipment, duly inspected by inspecting agency/consignee. Balance 5% will be released after successful CRS inspection.

34.7.1 Payment for Supply of Goods

- (a) Payment at 85% of the accepted rate for the quantity inspected, passed and received at nominated place at Project shall be made on submission of following documents:
 - (i) Vendor approval by the Engineer-in-charge.
 - (ii) Approved FAT & SAT document by the Engineer-in-charge (not applicable for items inspected by RDSO).
 - (iii) Inspection certificate in original.
 - (iv) Indemnity bond for of 100% value of material brought to site. The indemnity bond shall be submitted on a non-judicial stamp paper of minimum value of Rs. 100 duly notarized as per format approved by the Engineer-in-charge.
- (b) 10% of the accepted rate for the subsystem shall be made on successful completion of Site Acceptance Test of the complete subsystem duly verified by the Engineer-in-charge and submission of SAT certificate.
- (c) Balance 5% of the accepted rate for the complete system shall be made after successful CRS inspection.

34.7.2 Payment for items involving Supply and Installation of Goods

- (a) In respect of items involving supply and installation, 80% of the accepted rate for the schedule item will be paid for quantity inspected, passed and received at nominated place at Project and other formalities as applicable to othersupply items in the schedule.
- (b) 15% of the accepted rate for the subsystem shall be made on successful completion of Site Acceptance Test of the complete subsystem duly verified by the Engineer-in-charge and submission of SAT certificate.

- (c) Balance 5% of the accepted rate for the complete system shall be made after successful CRS inspection.

34.7.3 Payment for items involving Installation/Execution

- (a) 90% payment at the accepted rate for the item shall be made on successful completion of Site Acceptance Test of the complete subsystem duly verified by the Engineer-in-charge and submission of SAT certificate.
- (b) Balance 10% payment at the accepted rate for the item shall be made after issue of handing over certificate by Northern Railway after successful Installation & commissioning of complete tunnel communication system.

34.8 PROPORTIONATE PAYMENTS FOR TRENCHING:

For areas where it is not possible to dig trenches upto 1.2 meter for telecom/1 meter for signaling as specified in the BOQ item due to unavoidable circumstances for reason not envisaged like presence of high water table at a particular area etc., the depth of the trench shall be decided by the Engineer-in-Charge's Representative at site. The contractor shall get the proportionate rate (according to the formula as defined below) of trenching of BOQ item for depth upto which the trenching has been done.

- (a) For Signalling trench (normal depth 1 meter) If 'a' is the depth of which trenching has been done, R is the per meter rate of trenching for depth 1 meter; Then Total rate admissible per meter of trenching shall be = $R \times [1.25 \times (a - 0.25)]$
- (b) For Telecom trench (normal depth 1.2 meter), If 'a' is the depth of which trenching has been done, R is the per meter rate of trenching for depth 1.2 meter; Total rate admissible per meter of trenching shall be = $R \times [1.25 \times (a - 0.3)] / (1.2)$.

34.9 Final Payment:

- 34.9.1 On the basis of completion certificate issued by the Engineer-in-charge for all the works in all the sections covered in this contract, the final bill for the balance payment for each item/sub-item of work shall be submitted by the Contractor along with a clear '**NO CLAIM CERTIFICATE**'. The completion certificate shall be issued by the Engineer-in-charge only when he has accepted the work wholly after conducting the acceptance tests on each item of work.
- 34.9.2 '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 such have been signed by the contractor) and shall in no respect be considered or used as if evidence of any particular quantity, of work having been executed nor of the manner of its execution being satisfactory.

- 34.9.3 The security deposit, however shall be released only after the expiry of the maintenance period and after passing the final bill based on “No Claim Certificate”.

34.10 Mobilization Advance
DELETED.

35.0 Inspection and Testing

Inspection & Testing within the specified Contract price, the Contractor shall institute a quality assurance system to demonstrate compliance with the requirements of the Contract. The system shall cover all such Inspections/Tests and Quality Control checks and measures at appropriate stages of execution of Contract, as specified in Contract Technical Specifications and/or under the Contract and/or any document referred to therein. The Engineer-in-charge shall be entitled to audit any aspect of the system.

Details of all procedures and compliance documents shall be submitted to the Engineer-in-charge for information before each execution stage is commenced.

Compliance with the quality assurance system shall not relieve the Contractor of any of his duties, obligations or responsibilities under the Contract.

- a) The vendor shall arrange for inspection of material/equipments at the manufacturers premises in accordance with relevant BIS or international standards before delivery of the material at site.
- b) KRCL / RAILTEL or his duly authorized representative shall have at all reasonable Times access to the Contractor’s premises or Works sites and shall have the power at all reasonable times to examine, inspect and call for Tests of the materials and workmanship during the execution, manufacture and assembly in the Contractor’s premises or works site. All tests shall be carried out at manufacturer’s works under his care & expense.

- c)** The Contractor on being requested by KRCL / RAILTEL or his duly authorized representatives shall present sufficient documentary evidence that the materials used for the Works will meet the specification requirements. With respect to materials used for the Works, the Contractor shall produce requisite Test certification as specified in the Contract. Such Test shall be carried out free of Cost to KRCL / RAILTEL and should the Contractor himself be not in a position to carry out the Test, he shall arrange to get these Tests done by Government approved Test house/Labs and the Cost for such Tests shall be to Contractor's account.
- d)** All routine tests as specified by the relevant standards/codes shall be conducted
- e)** KRCL / RAILTEL or his duly authorized representatives shall have the right to be present at all Tests carried out and arranged by the Contractor, if called for.
- f)** No material shall be dispatched without inspection as per approved quality assurance plan (QAP) unless waived by the Konkan Railway. Inspection may be carried out by Konkan Railway /RITES/ third party agency (to be appointed by Konkan Railway). At least fifteen (15) days prior notice shall be given by the Contractor for carrying out inspection at manufacturer's/supplier's premises. All costs / expenses incurred in carrying out inspection and tests at manufacturer's / supplier's premises including travel cost to manufacturer place, accommodation, food, local transport shall be borne and paid by the Contractor and no separate payment shall be made. All inspection facilities, gadgets, instruments, testing equipment, utilities and man-power, etc. for carrying out inspection at manufacturer's/supplier's premises shall be provided by the Contractor at no extra cost to the KRCL / RAILTEL.
- g)** The price quoted also includes RITES/RDSO representative inspection and testing charges unless otherwise specified in the bill of quantities or Technical Specification. In case of change of inspection from RDSO/RITES to KRCL/CONSIGNEE, inspection charges shall be deducted from SI/BA on actuals as deducted by KRCL i.e. COR (Customer of RailTel).
- h)** The unit price indicated under "Erection" in the bills should be inclusive of the cost of erection and testing and also include all cost of administration of the contract, insurance premium, banker's charges, cost of stamps/storage/loading/unloading and handling of materials and also include the cost of transportation which the contractor may incur for carriage of material to the site of works. The unit prices should also include cost of works and adjustment that may become necessary during or after the tests for commissioning.
- i)** In all cases, where examination, inspection and Testing are to be carried out whether at the premises of Contractor or sub-Contractor, the Contractor except where otherwise specified shall provide, free of charges to the Engineer-in-charge, such Labor, materials, electricity, fuel, water, stores, apparatus and instruments as may be reasonably required to carry out efficiently such Tests

of the plant, in accordance with the Contract and shall give facilities to the Engineer-in-charge or his authorized representative to accomplish witness such Testing.

- j) When the Tests have been satisfactorily completed at the Contractor's or sub-Contractor's works, the Engineer-in-charge shall forth with issue a Certificate to that effect. If a final Certificate cannot be issued, a preliminary or Provisional Certificate shall be issued. If the Tests were not witnessed by the Engineer-in-charge or his representative, the Certificate shall be issued on receipt and scrutiny of the Test report from the Contractor but not later than fifteen (15) days after the receipt of the Test report by the Engineer-in-charge. No structure/ plant/ facility shall be assembled or painted with prime coat or dispatched before such Certificates have been issued. The satisfactory completion of these Tests or the issue of the Certificates shall not bind the Engineer-in-charge to accept the plant should it on further Tests, after erection be found not to comply with the Contract.
- k) The commissioning shall be conducted only after obtaining fitness certificate from the state inspection agencies or any other person authorized by the Northern Railway.
- l) The contractor should liaison with Northern Railways for same and submit all required documentation for approval. However Mandatory fees (if any) shall be reimbursement to Contractor on production of Original Receipt.

36.0 Performance Guarantee

36.1 The Performance Guarantee shall be furnished by the successful tenderer after the Letter of Acceptance (LOA) has been issued, but before signing of the contract agreement. The agreement shall normally be signed within seven days on receipt of notice issued by the Railway that such documents are ready. The Performance Guarantee arranged by any entity other than successful tenderer shall not be accepted.

36.2 The contractor shall give a Performance Bank Guarantee in the form of an irrevocable bank guarantee amounting to 3% of the Contract value. In case of award of contract to a JV Firm, a single Performance Bank Guarantee shall be submitted by the JV Firm as per tender conditions. Performance Guarantee shall be acceptable in the form of Deposit Receipts, Pay Orders, Demand Drafts and Guarantee Bonds. These forms of Performance Guarantee could be either of the State Bank of India or of any of the Nationalized Banks or Scheduled Bank. This Guarantee shall be initially valid upto the stipulated date of completion plus 60 days beyond that. In case, the time for completion for work gets extended, the contractor shall get the validity of Performance Guarantee extended to cover such extended time for completion of work plus 60 days.

36.3 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 incompetent to sign the contract agreement. However, a penal interest of 12% per annum shall be charged for the delay beyond 21 (Twenty one) days, i.e. from 22nd day after the date of issue of LOA. Further, if the 60th day happens to be a declared holiday in the concerned office of the Railway, submission of PG can be accepted on the next working day.

In all other cases, if the Contractor fails to submit the requisite PG even after 60 days from the date of issue of LOA, the contract is liable to be terminated. In case contract is terminated RailTel shall be entitled to cancel the BA/SI empanelment and forfeit the BG submitted for empanelment with RailTel.

The failed Contractor shall be debarred from participating in any EOI floated by RailTel for next 5 Years.

36.4 The successful bidder should give a Performance Guarantee amounting to 3% of contract value in any of the following forms:-

- i) A deposit of cash,
- ii) Irrevocable Bank Guarantee

36.5 The value of PBG to be submitted by the contractor **will not change for variation up to 25% (either increase or decrease)**. In case during the course of execution, value of the contract increases by more than 25% of the original contract value, an additional Performance Bank Guarantee amounting to 3% (Three percent) for the excess value over the original contract value shall be deposited by the contractor. On the other hand, if the value of contract decreases by more than 25% of the original contract value, Performance Guarantee amounting to 3% (Three percent) of the decrease in the contract value shall be returned to the Contractor. The PG amount in excess of required PG for decreased contract value, available with Railways, shall be returned to Contractor as per his request duly safeguarding the interest of railways.

Performance Guarantee shall be released after the **physical completion** of the work based on the 'Completion Certificate' issued by the Competent Authority stating that the contractor has completed the works in all respects satisfactorily.

Whenever the contract is rescinded, the Performance Guarantee already submitted for the contract shall be encashed in addition to forfeiture of Security Deposit available with railway.

36.6 All the Guarantees like Performance Bank Guarantee etc. shall be accepted only in the name of the JV Firm and no splitting of Guarantees amongst the members of the JV Firm shall be permitted.

36.7 Performance Bank Guarantee from International Banks will not be accepted.

36.8 Deleted (Ref: ACS No. 1 to GCC issued vide Rly Bd letter No. 2020/CE-I/CT/3E/GCC/Policy dt. 20.11.2020)

37.0 Security Deposit

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

Further, in case of contracts having value equal to or more than ₹(Rs Fifty crore) the Security Deposit may be deposited as Bank Guarantee Bond also, issued by a scheduled bank after execution of contract documents, but before payment of 1st on account bill. Provided further that the validity of Bank Guarantee Bond shall be extended from time to time, depending upon extension of contract granted in terms of Clause 17 of the Standard General Conditions of Contract.

Further, in case Security Deposit has been submitted as Term Deposit Receipt/Bank Guarantee Bond in full amount, the Earnest Money deposited by the Contractor with his tender will be returned by the Railways.

37.2 Refund of Security Deposit: Security Deposit mentioned in sub clause 37.1 above shall be returned to the Contractor along with or after, the following:

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

37.3 Forfeiture of Security Deposit: Whenever the contract is rescinded as a whole under clause 62 (1) of GCC, the Security Deposit already available with railways under the contract shall be forfeited. However, in case the contract is rescinded in part or parts under clause 62 (1) of GCC, the Security Deposit shall not be forfeited. No interest shall be payable upon the Earnest Money and Security Deposit or amounts payable to the Contractor under the Contract.

38.0 Taxes and Duties

38.1 Goods and Services Tax (GST), as applicable upto to the date of opening of tender /negotiated offer whichever is later shall be considered to have been included in the percentage rates quoted by tenderer/s in the Schedule of Items, Rates & Quantities. In case of any increase /decrease in the GST during the later period upto the completion of the work, the net increase/decrease for the balance portion of the work shall be reimbursable / recovered by the Corporation.

38.2 Corporation shall deduct the any other tax from the Contractor's bill at the rate as applicable as per rules framed by concerned Govt./ Local bodies from time to time and remit it to concerned department and shall issue a certificate regarding Tax/Duties/Levies so deducted on demand by the Contractor.

38.3 Implementation of – The Building and Other Construction Workers (RECS) Act, 1996 and The Building and Other Construction Workers Welfare Cess Act, 1996 in Railway Contracts:

“The tenderer for carrying out any construction work in Jammu & Kashmir (name of the UT) must get themselves registered from the Registering Officer under Section-7 of the Building and other Construction Workers Act, 1996 and rules made thereto by the Jammu & Kashmir (name of the UT) Govt. and submit certificate of Registration issued from the Registering Officer of the Jammu & Kashmir (name of the UT) Govt. (Labour Deptt.). **As per this Act, the tenderer shall be required to pay cess at the rate of 1% of the cost of construction work to be deducted from each bill.** The same shall be considered to have been included in the percentage rates quoted by tenderer/s in the Schedule of Items, Rates & Quantities.

In case of any increase /decrease in the above cess, the modality shall be similar as for GST mentioned in clause 38.1 above.

- 38.4** In terms of section 194 C inserted by the Finance Act 1972 in the Income Tax Act 1961, KRCL / RAILTEL shall at the time of arranging payments to the contractor, be entitled to deduct income tax at source. The deductions towards income tax to be made at source from the payments due to the non-residents shall continue to be governed by Section 195 of the Income Tax Act, 1961.

(F) VARIATION & MISCELLANEOUS

39.0 Variation in Quantities

- 39.1** The quantities of item(s) including foundations in the Schedule of Items, Rates & Quantities for the work to be executed are only approximate. The quantities have been as far as possible assessed correctly, but the same are likely to vary during the execution of work.
- 39.2** 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.
- 39.3** 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:
- 39.3.1 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;
- 39.3.2 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;
- 39.3.3 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.
- 39.4** Variation to quantities of Minor Value Item: The limit for varying quantities for minor value items shall be 100% (as against 25% prescribed for other items). A minor value item for this purpose is defined as an item whose original agreement value is less than 1 % of the total original agreement value.
- (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;
- (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;
- (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.

- 39.5** For negative variation, the contractor shall not be entitled to any compensation but shall be paid only for the actual quantity of work at accepted rate.
- 39.6** In case of earthwork, the variation limit of 25% shall apply to the gross quantity of earthwork and variation in the quantities of individual classifications of soil shall not be subject to this limit.
- 39.7** In case of foundation work, no variation limit shall apply and the work shall be carried out by the Contractor on agreed rates irrespective of any variation.
- 39.8** As far as SOR items are concerned, the limit of 25% would apply to the value of SOR schedule as a whole and not on individual SOR items. However, in case of NS items, the limit of 25% would apply on the individual items irrespective of the manner of quoting the rate (single percentage rate or individual item rate).
- 39.9** The contractor shall not be entitled for any compensation or claims whatsoever on account of non-operation of any BOQ item during execution of work.

39.10 Items Not Included In The Bill Of Quantities

- 39.10.1 If any item of work not provided for in the accepted Bill of quantities and required to be executed for completion of work, the Contractor on receipt of instructions from the Engineer-in-charge, shall be bound to carry out such items of work at the rates to be decided as per sub-clause 39.10.2 and 39.10.3
- 39.10.2 In case item(s) as described in sub paragraph 39.10.1 above is/are available in the “Standard Bill of Quantities” (updated upto 28 days prior to deadline for submission of bids)”, new rate or price for such items shall be the rate as available in the “Standard Bill of Quantities” (updated upto 28 days prior to deadline for submission of bids)”, modified by the percentage above/below accepted in this contract for the respective schedule and also price variation shall be applicable in the same manner as applicable to items specified in the contract.
- 39.10.3 In case item(s) as described in sub paragraph 39.10.1 above is/are not available in the “Standard Bill of Quantities”, the assessment of reasonable cost of executing the work (except over heads and profit which shall be 15%) shall be arrived at based on the prevailing rates and by taking guidance from the following documents. The priority of the documents shall be in accordance with the following sequence:
- a. Analysis of Unified SOR of Indian Railway
 - b. Analysis issued by MORTH
 - c. Analysis of Delhi Schedule of Rates issued by CPWD
 - d. Market analysis.

- 39.10.4 In all cases where extra items of work are involved, for which there are no rates in the accepted Bill of quantities, the Contractor shall give a notice to the Engineer-in-charge, of at least 7 days before the need for their execution arises. Such a notice shall not however be necessary if the Engineer-in-charge has already instructed in writing to take up such an item of work. To decide the rate, the Contractor shall furnish detailed analysis of the rates on the lines mentioned in sub-clause 39.10.2 and 39.10.3 above and attend a meeting with Engineer-in-charge to settle the rate as and when called for. The Contractor shall be bound to furnish the requisite details and to attend the meeting.

(G) MATERIALS, TOOLS, PLANTS & MACHINERY & POWER SUPPLY

40.0 Transport, Custody and Storage of Material

- 40.1** The contractor shall be responsible for the safe transport custody and storage of all materials issued to/arranged by him and he will be liable to make good the loss due to any cause whatsoever that may be suffered by the Corporation on this account. Special precautions should be taken in respect of Cables, Pipes, Cable Tray and all other S&T Materials etc. while transporting. Steps should be taken to safeguard against mentioned S&T materials becoming wet due to moisture or rain. The contractor will also be responsible for storing S&T material damp/wet proof conditions at site of work at his own cost in accordance with the standard specifications. The Engineer-in-charge shall decide whether mentioned the S&T materials stored in the godowns is fit for the work and his decision shall be **final and binding** on the contractor/s.

- 40.2** No petroleum spirit within the meaning of the Indian Petroleum Spirit (Motor-Vehicles etc.) Regulation 1929 shall be stored at site or adjacent to it, until the approval of the KRCL / RAILTEL and necessary license under the Act has been obtained by the contractor.

41.0 Material Procurement and Reconciliation Statement

- 41.1** The successful bidder, at the time of design approval, must accompany the following submission for equipment proposed:
- (i) Certified proof of which country the “Intellectual Property Rights” reside.
 - (ii) OEM certificate confirming the country of manufacturing.
- 41.2** The “Intellectual Property Rights” of equipment must not reside in any country that shares an International Land Border with India. No equipment and cable(s) should be supplied which is manufactured by any entity having an origin in a country which shares an international land border with India. No equipment and cable(s) should be supplied which is manufactured by any entity in which the majority shareholding of the entity is from any country that shares an International Land border with India.
- 41.3** The equipment not adhering to the above conditions shall out rightly be rejected.
- 41.4** The tenderer is prevented from using any patented detailed drawings, process or patents without the previous consent of the owner of such patent etc. The tenderer for

the use of such patented drawings, process should bear the royalties payable to the patents.

- 41.5** The tenderer is also required to indemnify the Railway against all costs and expenses arising from any claim or action being brought against the Railway for infringement of letters of patents.
- 41.6** The contractor can procure the materials from any source except as provided otherwise in the contract. The material shall conform to laid down specifications. The contractor shall furnish requisite test certificates as per approved Quality Assurance Plan / Inspection and Testing Plan (QAP / ITP). However, the equipment/materials as per RDSO specifications are to be procured from the RDSO approved sources only. The guidelines stipulated for store's procurement will hold good for procuring these items from RDSO approved sources.
- 41.7** The material mentioned in the schedule shall be supplied at the Contractor stores. For this purpose, the contractor shall construct suitable godowns/stores at the site of work/ at suitable location at his own cost. In case the Railway is not able to make space available for construction of godown/ stores, the contractor shall make his own arrangements for storing material (by hiring godown/ store) at his own cost. The Contractor make all arrangements to save the material from damage due to sun, rain, dampness, fire, theft etc. at his own cost.
- 41.8** Alternatively if the site is ready and the work is in progress physically, the material can be brought to the site directly with specific approval of competent authority. However custody and security of the material brought to the site of work will remain with the Contractor till the materials taken over are duly erected and accepted by the Corporation. The contractor shall construct suitable godowns at the site of work/ at suitable location (if Rly is not able to make space available) for storing material to save from damage due to sun, rain, dampness, fire, theft etc. He should also employ necessary staff to watch the materials at his cost.
- 41.9** The contractor shall submit material reconciliation statement duly verified by representative of Engineer-in-charge, with every "on account bills" duly showing consumption & balance of all materials either purchased by contractor or issued by Corporation (if any) and used during construction.
- 42.0 Materials used or issued in excess of requirement**
- 42.1** The contractor shall be responsible for using the correct quantity of materials required for the work and return the balance, if any issued by the Corporation, after the completion of the work.
- 42.2** Materials required to carry out this work, if supplied by the Corporation, will be issued at the nominated Depots. The contractor will have to load, transport these materials to the site of work and unload at his own cost. Empty cable drums and balance materials after completion of work, if any should be returned back at Nominated stores Depot or as directed by Engineer-In-Charge.

- 42.3** The cost of transit insurance required as per rules will be borne by the tenderer.
- 42.4** The contractor will be responsible for the safety of the material at site from the date of issue till the date of commissioning of the system.
- 42.5** In case of materials under relevant clause are issued to the contractor for the work under terms of contract, the supply thereof shall be made in stages limited to the quantity/quantities computed by the Corporation according to the prescribed specification and approved drawings as per the agreement.
- 42.6** If work is suffering due to shortage of material and if KRCL / RAILTEL makes the arrangement for the same for smooth functioning of the work, the cost of such material shall be recovered at the rate of two times of the landing cost to KRCL / RAILTEL.
- 42.7** Any materials, if issued by the Corporation, used in excess over the correct quantity arrived at as per specification will be charged against the contractor at twice the market rate or twice the book value whichever is higher.
- 42.8** The materials issued in excess of the requirement(s) as above shall be returned perfectly in good condition by the contractor to the Corporation immediately after completion or determination of the contract. If the contractor fails to return the said stores, then the cost of the materials issued in excess of the requirement computed by the Corporation according to the specification and approved drawings will be recovered from the contractor at twice the market rate or twice the book rate whichever is higher.
- 42.9** The recovery is stipulated in clause 42.6 to 42.8 will be without prejudice to the rights of the Corporation to take action against the contractor under the conditions of the contract for not doing/completing the work according to the prescribed specification and approved drawing.
- 43.0 Materials used less than the requirement**
- 43.1** Any material either issued by the Corporation or arranged by contractor at his own cost and used in less than the correct quantity arrived at as per specification and approved drawings will be viewed as improper work and dealt in accordance clause 27(2) of GCC. In addition, the cost of material issued by Corporation and used in improper work may be recovered from the contractor at twice the market rate or twice the book rate whichever is higher. Decision of the Engineer-in-charge in this regard will be **final and binding** on the contractor.
- 44.0 Tools, Plants and Machinery**
- 44.1** The contractor will be entirely responsible to arrange on his own cost all necessary machinery, tools and plants and their spare parts required for efficient and methodical execution of the work and transport them to the site of work. Delay in procurement of such items due to their non-availability on account of import difficulties or any other cause whatsoever will not be entertained for slow or non-performance of the work..

44.2 The initial and periodical calibration of all instruments, equipment's, devices, gauges etc. shall be ensured as per the manufacturer's specifications **by the contractor at his own cost** and the certificate shall be available at site for inspection on demand.

45.0 Deployment of Plant and Machinery

45.1 The deployment of all plant and machinery including moving machines shall be such as not to infringe or cause damage any other Government or private properties. Operation of such equipment involving infringement to moving dimensions prescribed in the handbook of the Schedule of Dimensions of the Railway shall not be undertaken without the prior approval of the Engineer-in-charge. For any loss or damage resulting from violation of this clause, the contractor(s) shall be wholly responsible.

46.0 Workmanship and Testing

46.1 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 likemanner 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 may be found requisite to be given during the carrying on of the works and to the entire satisfaction of Engineer-in-charge according to the instructions and directions which the Contractors may from time to time receive from the Engineer-in-charge. The materials may be subjected to tests by means of such machines, instruments and appliances as the Engineer-in-charge may direct and wholly at the expense of the contractor.

47.0 Removal of Improper Works, Materials and plant & Machinery:

47.1 The Engineer-in-charge or 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 thereof, 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 the clause 62 of GCC.
- (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.

- (e) The removal from the site of any plant and machinery which in his opinion are not in accordance with the specifications and site requirements.

48.0 Sufficiency of Construction Plants and Equipments

- 48.1** It will entirely be the responsibility of the contractor to mobilize sufficient construction plant and construction machinery in very good working condition and to the satisfaction of Engineer-in-charge. All the machinery, tools and plant including spare parts, fuel, consumable stores and labour that are required for the efficient and methodical execution of the works. However, the main construction equipment must be accepted by the Engineer-in-charge before they are deployed on the project for the start of the construction works.
- 48.2** Any delay resulting from improper selection of equipment by the Contractor, their rejection of the Service and resubmission with new data will not constitute grounds for the Contractor to an extension of the contractual deadline for completion of the Project, or any compensation thereof.
- 48.3** If during the course of execution of works, it is found that such plant and machinery mobilized by the contractor are inadequate for the timely completion of works, the contractor shall undertake to augment the plant and equipment to the satisfaction of Engineer- in- charge.
- 48.4** The contractor should also make sure that he has ready access to expert manpower to operate these plant and machinery efficiently and effectively.

49.0 Power Supply

- 49.1** The responsibility to procure adequate power supply is that of the Contractor. Corporation may only assist contractor to get grid power for their bonafide use at works from State/Union Government but without any liability or responsibility on the Corporation. The requirement of power shall be substantial to operate all electrical equipments. Standby D.G. Sets will also be provided by the contractor at his own cost to have uninterrupted power for 24 hours a day for 100% connected load and contractors facilities.
- 49.2** Contractor shall provide adequate lighting facilities during execution of work and special lighting for inspection.

50.0 Site Office / Rest house/Site laboratory for Railway :

- 50.1** The contractor shall provide temporary site office for use of KRCL / RAILTEL officials. The other logistic shall be arranged by KRCL / RAILTEL.
- 50.2 Site Laboratory: Deleted**

51.0 Site inspection register

- 51.1** A site inspection register will be maintained by the Engineer-in-charge or his representative in which the contractor will be bound to sign day to day entries made by the Engineer-in-charge or his representative. The contractor is required to take note of the instructions given to him through the site inspection register and should comply with the same within reasonable time. The contractor will also arrange to receive all the letter etc. issued to him at the site of works.
- 51.2** Site order books, progress register, material issue register and Hindrance register shall be maintained at site and entries will be recorded on day-to-day basis in the registers and signed jointly by Engineer's representative and by contractor or his authorized representative.

52.0 Inspection of materials:

- 52.1** All materials shall be procured from RDSO Listed Firms/ suppliers (Approved vendors and vendors listed for fields trial) only. In case of non-availability of RDSO vendors for certain items, material shall be procured from TEC approved vendors. The materials which are not approved by RDSO and do not have TEC specification shall be procured from reputed firms with prior approval of KRCL / RAILTEL.
- 52.2** Materials put up for inspection shall be exactly for the type and quantity laid down in the Bill of Quantities (BOQ). Any variation shall require the prior approval of the competent Authority before the material is manufactured or tendered for inspection.
- 52.3** Material having RDSO/TEC specification shall be inspected by RDSO as per Indian Railway Practice. Materials which do not have RDSO/TEC specifications shall be procured from reputed manufacturers or their authorized dealers and Factory Acceptance Test (FAT) by Third party/ KRCL / RAILTEL, at the manufacturer's test facility or any facility as decided by KRCL / RAILTEL and material shall be dispatched only after getting approval of KRCL / RAILTEL.

For Factory and Site Acceptance Test the contractor shall submit the following plans for KRCL / RAILTEL's approval.

Sr	Description
1	Detailed Factory Acceptance Test (FAT) Plan for Tunnel Radio Communication system
2	Detailed Site Acceptance Test (SAT) Plan for, Tunnel radio Communication system

- 52.4** All mechanical signaling items are to be procured from valid recommended list of firms for manufacture and supply of mechanical signaling items issued by RDSO. Inspection of such mechanical signaling items to be carried out by RITES.

- 52.5** The Engineer-in-charge shall have full power to reject any material that it may consider to be defective or inferior in quality, workmanship, design or otherwise not in accordance with RDSO Specification. Engineer's decision shall be final, even though they might have been inspected by RDSO/RITES. The contractor shall remove forthwith any such material and replace them at his own cost.
- 52.6** All necessary facilities (Test and Measuring equipment's and other arrangements) to carry out inspection by RDSO/RITES/KRCL / RAILTEL or their representative to carry out test/witness, inspection shall be provided by the Contractor free of cost.
- 52.7** The inspection charges shall be paid by the contractor to the Inspecting Agencies & shall be included in the quoted rates.
- 52.8** In case the material/equipment offered for inspection fails during inspection, the contractor shall replace the same and get the inspection completed. However, if the Contractor is not able to replace defective material/equipment and the inspecting agency has again visited the supplier/manufacturer's premises for conducting the inspection, the entire cost of re-inspection including travel, lodging and boarding etc. shall be borne by the contractor.
- 52.9** In case of any ambiguity or clarification regarding inspection/inspecting agency, decision of KRCL / RAILTEL shall be final and binding on the contractor/firm.
- 52.10** Even in case of RDSO/RITES/any third party inspection, before placing the call letter for inspection to respective inspection agency, the contractor shall advise the date, time, place of inspection to KRCL / RAILTEL. KRCL / RAILTEL's authorized representative may witness test/sample test/type approval etc. The contractor may start the inspection only after getting the approval of KRCL / RAILTEL for inspection.
- 52.11** In case of Signaling & Telecom Cables, after RDSO inspection, samples of adequate size from the inspection lot may be sent to third party inspecting agency or govt. approved labs to ensure compliance of LSZH feature as decided by competent authority.
- 52.12** For material/equipment not inspected by RDSO/RITES, the contractor shall submit for approval of Engineer-in-charge, tests to be carried out along with parameters to be achieved for successful test results. This shall be submitted before placing order on the vendor for supply of material.
- 52.13 Consignee Inspection**
- (a) For all the material to be inspected by consignee, the contractor shall submit manufactures guarantee certificate stating that the concerned material is in accordance with the specification and as per drawing approved by KRCL / RAILTEL. The contractor shall also submit the inspection pro forma to be approved by KRCL / RAILTEL before inspection.
 - (b) The contractor shall submit catalogues of all the equipment as well as a list of tests proposed for all the equipments. A general overview of each of proposed tests shall be included in the documents.

- (c) Any of these pre given description or documents shall not limit in any way the contractor's obligation to complete each and every test as specified and necessary to demonstrate the satisfactory performance of the system.
- (d) The Contractor shall submit for the client/ employer's approval all detailed test procedures and final schedule for the test.

53.0 Rejection

If, as a result of an examination, inspection, measurement or testing, any Plant, Materials or workmanship is found to be defective or otherwise not in accordance with the Contract, the Engineer-in-charge may reject the Plant, Materials or workmanship by giving notice to the Contractor, with reasons. The Contractor shall then promptly make good the defect in accordance with the Contract.

If the Engineer-in-charge requires any Plant, Materials or workmanship to be retested, the tests shall be repeated under the same terms and conditions. In case of rejection, **retesting** cost of the material will be borne by the contractor.

54.0 Remedial Work

54.1 Notwithstanding any previous test or certification, the Engineer-in-charge may instruct the Contractor to:

- 54.1.1 remove from the Site and replace any Plant or Materials which is not in accordance with the Contract,
- 54.1.2 remove and re-execute any other work which is not in accordance with the Contract, and
- 54.1.3 Execute any work which is urgently required for the safety of the Works, whether because of an accident, unforeseeable event or otherwise.
- 54.1.4 The Contractor shall comply with the instruction within a reasonable time, which shall be the time (if any) specified in the instruction, or immediately if urgency is specified.
- 54.1.5 If the Contractor fails to comply with the instruction, the Employer shall be entitled to employ and pay other persons to carry out the work. Except to the extent that the Contractor would have been entitled to payment for the work, the Contractor shall pay to the Employer all costs arising from this failure.

(H) TELECOMMUNICATION AND OTHER FACILITIES

55.0 Telecommunication Facilities

55.1 The contractor shall install and maintain telecommunication facilities in perfect working order at all times during the period of the work concerned connecting all work sites with a responsible employee of the contractor sitting at an accessible place so as to afford prompt telecommunications over such telephone throughout the full working hours every day. The contractor shall also install, maintain and operate such other telecommunication as may be necessary for safe and efficient execution of the work. All such facilities shall comply with statutory requirement and be subject to the

approval of the Engineer in charge. Authorized representatives of Corporation shall have free use of such telecommunication and signal facilities.

55.2 The entire cost of providing and maintaining such a telecommunication shall be deemed to have been included in the percentage rate tendered in Schedule of Items, Rates and Quantities. The telecommunication facilities should be provided where ever required.

55.3 The contractor shall have to provide facility for monitoring work site through CCTV/Drone camera. The system shall be able to provide live feed of desired work site. The system shall be such that it shall be possible to view live feed on mobile/laptop/desktop from remote location. The contractor shall also provide the required manpower for operating the system. All the arrangements shall be made by the Contractor at his own cost and no extra amount shall be payable on this account. Suggested specification are as under :

- (i) Wireless type with SIM
- (ii) Inbuilt memory of 32 GB or more
- (iii) Trigger: Remote Trigger to click photo /Videos from ground
- (iv) Flight Duration: min.15minutes
- (v) Camera Coverage Radius: 1.5 Km or better
- (vi) Video: Live Video (HD and up to 30 frames per sec) should be possible with the help of Wi-Fi DSLR HD Camera. Video should be seen on LCD or Laptop or mobile
- (vii) Battery: 6000 mAh lithium or better
- (viii) Automatic return home Function: Required
- (ix) Compatibility with PC and Bluetooth interface is required.
- (x) Remote access through mobile/laptop/PC

(I) PROTECTION OF ENVIRONMENT

56.0 Protection of Environment

56.1 General

During execution of works, the Contractor and permitted his sub-contractors, petty contractors shall abide at all times by all existing enactment on environmental protections and rules made there under, regulations, notifications and bye-laws of the State or Central Government or local authorities and any other law, bye-law, regulation that may be issued in this respect in future by the State or Central Government or local authority. Salient features of some of the laws that are applicable are given below:

56.1.1 The Water (Prevention and Control of Pollution) Act, 1974

This provides for the prevention and control of water pollution and maintaining and restoring of wholesomeness of water. "Pollution" means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade

effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms.

56.1.2 The Air (Prevention and Control of Pollution) Act, 1981

This provides for prevention, control and abatement of air pollution. “Air Pollution” means the presence in the atmosphere of any “air pollutant”, which means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.

56.1.3 The Environment (Protection) Act, 1986

This provides for the protection and improvement of environment and for matters connected therewith, and the prevention of hazards to human beings, other living creatures, plants and property. Environment includes water, air and land and the inter-relationship which exists among and between water, air and land, other living creatures, plants, micro-organism and property.

56.1.4 The Public Liability Insurance Act, 1991

This provides for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances and for matters connected herewith or incidental thereto. Hazardous substance means any substance or preparation, which is defined as hazardous substance under the Environment (Protection) Act, 1986, and exceeding such quantity as may be specified by notification by the Central Government.

56.1.5 Environmental & Forest clearances

Environmental & Forest clearances for the project will be obtained by the Railways. The contractor must organize his work in such a way that the ecology of the area is least affected adversely. The instructions issued in this regard will have to be carefully followed. Particular attention is required in case of making the pits for taking out the earth from the quarries and also in the dumping of cut spoils, etc.

56.2 Environmental Management Plan during construction: Contractor shall take adequate care at his own cost for the following measures:

- 56.2.1 Avoid generation of dust due to construction activities. Construction site should be watered adequately and periodically to minimize fugitive dust generation.
- 56.2.2 All possible and practicable measures to control dust emission during drilling operations.
- 56.2.3 Exhaust emissions from all construction equipments shall adhere to vehicle emission norms laid out by Central Pollution Control Board.
- 56.2.4 Chassis, engine and body of all vehicles used at site shall be clean, free from surplus oil and grease. Regular maintenance of all vehicles shall be ensured. Fuel

tank, feed lines, lights, brakes, steering mechanism, other parts shall be in good working order. Damaged silencers of construction vehicles shall be promptly replaced. Vehicles shall be in proper maintained condition in all respects for the safe driving, transportation and working.

- 56.2.5 No lubricants, oil, solvents or paint products should be allowed to discharge into water courses, either by direct discharge, or as contaminants carried in surface water runoff from construction site.
- 56.2.6 Domestic sewage generated from site toilets and washing facilities provided for construction workers should be collected separately and disposed off or appropriately treated to comply with statutory requirements and as per instructions of Engineer-In-Charge.
- 56.2.7 Labour force in the labour camps should use LPG cylinders to avoid encroachment on forest area during construction phase.
- 56.2.8 The contractor is required to comply with all precautions as required for the safety of workmen as per the applicable labour law.
- 56.2.9 Adequate precautions shall be taken to prevent danger from electrical equipments.
- 56.2.10 All machines/equipments used shall conform to the standards/codal provisions and shall be regularly inspected and calibrated.
- 56.2.11 The electric wirings shall be well insulated and firmly secured.
- 56.2.12 A readily available first aid unit including an adequate supply of sterilized dressing material and appliances shall be provided as per the requirements under the Factory Act. Depending upon the number, the health facilities shall be arranged as WHO Norms.
- 56.2.13 Anti-malarial measures shall be complied. Regular cleaning of drains carrying waste water shall be ensured.

(J) MANPOWER

57.0 Employment of Qualified Engineers

- 57.1** The contractor shall employ at site sufficient number of technical staff such as qualified Construction Leader/Project Manager, Site Engineers and Site Supervisor etc. as mentioned in clause 57.2.4 below. The minimum number required to be deployed for these positions is stated in Clause No. 57.2.4 below.

57.2 Organisation

- 57.2.1 The contractor shall submit to the Engineer-in-charge, not later than 30 days from the date of award of contract, the organization chart showing following key positions, and CV's of the incumbents and the brief job descriptions. The Engineer-in-charge shall issue Notice of "No-objection" or otherwise for the appointment of "key positions" within 5 working days of such submission.
- 57.2.2 The performance of personnel shall be under observation by Engineer-in-charge. In case the performance of any personnel is not upto the mark, as decided by Engineer-in-charge, a report shall be put up by him to Chief

Engineer and the decision of Chief Engineer shall be final and binding. In case replacement is required, contractor shall be responsible for replacement of such personnel; duly following the procedure as in clause 57.2.1.

57.2.3 If KRCL / RAILTEL finds that any of the Personnel has committed serious misconduct or has been charged with having committed a criminal offence, then KRCL / RAILTEL shall order in writing for replacement of such personnel. Contractor shall, provide the replacement with the procedure prescribed in clause no. 57.2.1

57.2.4 The number of key positions and their eligibility criteria are as below:-

Sr	Position and Minimum Eligibility	Requirement in Nos.
1	Site Engineer – Electronics or Electrical Engineering Graduates with 2 years of relevant experience	1
2	Site Supervisors – Electronics or Electrical Diploma engineering with 4 or more years of relevant experience.	1

57.2.5 The contractor shall submit the list of personnel (clause 57.2.4) available at site with every “on account” monthly bills.

57.2.6 No objection by Engineer-in-charge to the Contractor’s organization, shall not absolve the contractor of his responsibility, in any way, under the contract.

57.2.7 In case the contractor fails to employ the technical staff as aforesaid to the satisfaction of the Engineer-in-charge, the recovery shall be as mentioned below per each calendar month or part thereof of default.

Sr	Post and desired date of deployment	Amount to be recovered per person per each calendar month or part thereof of default. (Rs)
1	Site Engineer to be deployed within D+1M.	1.0 lakh
2	Site Supervisor to be deployed within D+1M	0.75 Lakh

D= Date of issue of Letter of Acceptance for the work

M= Month

57.2.8 The Contractor's technical staff should be available at site to take instructions from the Engineer-in-charge.

57.2.9 The list of names, qualification and experience of these personnel should be furnished along with the tender documents.

(K) LABOUR

58.0 Payment of Wages act & Minimum wages

58.1 Contractor is to abide by the provisions of Payment of Wages act & Minimum Wages act in terms of clause 54 and 55 of Indian Railways General Condition of Contract. In order to ensure the same, an application has been developed and hosted on website www.shramikkalyan.indianrailways.gov.in. Contractor shall register his firm/company etc. and upload requisite details of labour and their payment in this portal. These details shall be available in public domain. The Registration/updation of Portal shall be done as under:

- a) Contractor shall apply for onetime registration of his company/firm etc. in the Shramikkalyan portal with requisite details within 7 days from issue of Letter of Acceptance. Engineer-in-charge shall approve the contractor's registration on the portal within 7 days of receipt of such request.
- b) Contractor once approved by any Engineer-in-charge, can create password with login ID (PAN No.) for subsequent use of portal for all LOAs issued in his favour.
- c) The contractor once registered on the portal, shall provide details of his Letter of Acceptances (LOA)/Contract Agreements on "Shramikkalyan" portal within 15 days of issue of any LOA for approval of concerned Engineer-in-charge. Engineer-in-charge 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-in-charge, 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.

58.2 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-in-charge 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.

59.0 Contractor to indemnify Corporation

The Contractor shall keep the Corporation indemnified in case any action is taken against the Corporation by the competent authority on account of contravention of any of the provisions of any Act or rules made thereunder, regulations or notifications including amendments. If the Corporation is caused to pay or reimburse such amounts as may be necessary to cause or observe, or for non-

observance of the provisions stipulated in the notifications/bye laws/Acts/Rules/regulations including amendments, if any, on the part of the Contractor, the Engineer-in-charge or his representative/Corporation shall have the right to deduct any money due to the Contractor including his amount of performance security. The corporation/Engineer-in-charge or his representatives shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the corporation.

60.0 Claims on account of violation of labour laws

60.1 If any money shall as a result of any instructions, directions or decisions from the authorities or claim or application made under any of the labour laws or regulations be directed to be paid by the Engineer-in-charge because of any failure of the Contractor, such money shall be deemed to be money payable to the Engineer-in-charge by the Contractor and on failure of the Contractor to repay the Engineer-in-charge any money paid or to be paid as aforesaid within seven days after the same shall have been demanded, the Engineer-in-charge shall be entitled to recover the amount from any money due or becoming due to the Contractor under this or any other contract with the Employer. The Engineer-in-charge shall not be bound to contest any such claim or demand unless the Contractor makes a written request for it, and Contractor's reasons for contesting are considered reasonable by the Engineer-in-charge and the Contractor deposits the full cost that the Engineer-in-charge may have to incur in contesting the case.

60.1.1 The employees of the Contractor and the Sub-Contractor in no case shall be treated as the employees of the Corporation at any point of time.

60.1.2 Some major laws applicable to establishments engaged in building and other construction work are given hereunder for reference. These shall be applicable within the latest statutory amendment as on the date of cause of action.

- (i) Workmen Compensation Act 1923
- (ii) Payment of Gratuity Act 1972
- (iii) Employees P.F and Miscellaneous Provision Act 1952
- (iv) Maternity Benefit Act 1951
- (v) Provision of Contract Labour (Regulation & Abolition) Act 1970.
- (vi) The Building & other Construction workers welfare cess Act, 1996.
- (vii) Minimum Wages Act 1948
- (viii) Payment of Wages Act 1936
- (ix) Equal Remuneration Act 1979
- (x) Payment of Bonus Act 1965
- (xi) Industrial Disputes Act 1947
- (xii) Industrial Employment's (Standing Orders) Act 1946
- (xiii) Trade Unions Act 1926
- (xiv) Child Labour (Prohibition & Regulation) Act 1986
- (xv) Inter-State Migrant workmen's (Regulation of Employment and Conditions of service) Act 1979

61.0 Employees Provident Fund

- 61.1** As Per Section 36(b) of the Employee Provident Fund Scheme 1952, every contractor shall within seven days of the close of every month, submit to the principal employer a statement showing the recoveries of contributions in respect of employees employed by or through him and shall also furnish to him such information as the principal employer is required to furnish under the provisions of the scheme to the Provident Fund Commissioner.
- 61.2** The Contractor shall be liable to pay before the due date his contribution, employee's contribution and other administrative charges as per provisions of the Employees Provident Fund Act as amended from time to time, in respect of all the staff and labour employed by him for the execution of the contract. In the event of his failure to follow the above provisions, the Corporation has to pay the said amount of contribution as assessed to the Provident Fund Commissioner and the Corporation will recover from the Contractor the amount paid to the Provident Fund Commissioner, out of the sums due and payable to the Contractor.
- 61.3** In such case of failure on the part of Contractor, Contractor shall indemnify and save harmless the Corporation from and against all actions, suits, proceedings, losses, costs, damages, charges, claims and demands of every nature and description brought or recovered against the Corporation by reasons of any act or omission of the Contractor, his agents or employees in connection with complying the provisions of the Employees Provident Fund & Miscellaneous Provisions Act, 1952 as amended from time to time. All sums payable by way of compensation / penalty / damages / interest on the outstanding amounts payable by the Contractor shall be considered as reasonable and be payable by the Contractor to the Corporation immediately and if the Contractor does not pay the amount immediately the same will be deducted from the security deposit or earnest money or any other amount available with the Corporation or any money payable to the Contractor by the Corporation.
- 61.4** Contractor should submit a Compliance Certificate along with the details of employees and recoveries made to the Konkan Railway Corporation as per the Proforma (**Appendix-6D**) mentioned every month within seven days of the close of every month as per the provisions of the Employees Provident Fund and Miscellaneous Provisions Act, 1952 as amended from time to time.

62.0 Employees Pension Scheme

- 62.1** As per section 22 of the Employees Pension Scheme, 1995, every contractor shall submit to the principal employer within seven days of the close of every month a statement showing the particulars in respect of employees employed by or through him in respect of whom contributions to the Employees Pension Fund are payable and shall also furnish to him such information as the principal employer is required to furnish under the provisions of this scheme to the Commissioner.

63.0 Engagement of local labour, land oustees, transporter and other service facilitators

63.1 As far as possible, local vehicles to be hired and employment shall be given to local youths of J&K state for skilled, unskilled categories of workmen like drivers, cooks, computer operators, labours etc. by the contractor as per their requirement. Contractor shall regularly clear the payment of employees, transporters, sub- contractors etc.

64.0 A formal agreement not limited to the terms & conditions mentioned herein shall be required to be executed by the SI/BA with RailTel Corporation of India before release of LOA / PO.

**SPECIAL CONDITIONS OF
CONTRACT (Part B)**

SPECIAL CONDITIONS OF CONTRACT (PART B)

1.0 Introduction:

- 1.1** This section deals with the technical specifications of the work. The Work shall be carried out to the satisfaction of the Engineer-in-charge and conform to the location, lines, dimensions, grades and cross-sections shown in the drawings or as directed by Engineer-in-Charge. The salient features, quality of materials and finished work shall comply with the requirements set forth in the succeeding sections. Where the drawings and specifications describe a portion of the work in only general terms, and not in complete detail, it shall be understood that only the best general practice is to prevail, materials and workmanship of the best quality are to be employed and instructions of the Engineer-in-charge are to be fully complied with. Specifications for some of the items of work are based on current specifications and recommended codes of practice.

2.0 Geological Condition

- 2.1** The schedule items for the execution of the work have been proposed based on the geological data and approximate quantities are mentioned in the schedule accordingly. If the nature of strata varies, there may be a likely change in the quantities of the proposed schedule items. Furthermore, there is a possibility of non-operation of certain items of schedule based on the actual strata met with during the execution of the work. Further, in Himalayan geology there are chances of unusual occurrences taking place during the execution of work. The contractor has to consider these adverse factors and quote accordingly. No claims on this account are admissible. However, if certain additional items are required to be executed to deal with the adverse geology and unusual occurrences, the same shall be paid as per the actual input of the resources and with the prior approval of the Competent Authority of KRCL / RAILTEL.
- 2.2** The project alignment traverses through young Himalaya, which are very steep. The regional geology and tectonic framework of the area indicates that the region is capable of generating earthquake of severe intensity. The area falls in seismic zone-V of Indian Standard seismic zoning map of the country. The J&K State climatically is distinctly divided in three parts namely the Jammu region, the valley region and the Leh - Ladakh region. The climate in the project area for most parts of the year is temperate. During the winter season depending upon the amount of snowfall on the high mountains surrounding the valley the minimum temperature drops down below zero degree. The rainfall in the project is affected by western disturbances from December to May. March is generally the wettest month and November is the driest.

3.0 Scope of work:

- 3.1** Provision of Radio Communication system (VHF) through leaky coaxial cable for Tunnels on Katra-Dharam Section (KRCL / RAILTEL jurisdiction) of Udhampur-Srinagar-Baramulla Rail Link Project in the Union Territories of Jammu & Kashmir’.
- 3.2** The work involves “**Design, Supply, Installation, Wiring, Testing & Commissioning of Integrated communication system VHF (Simplex) as per RDSO specification RDSO/SPN/TC/109/2019 with latest Amendment/Revision, for Tunnels with associated equipments insidetunnels and in between tunnel & adjacent stations for section coveringTunnels T8/9, T10, T1, T2/T2-E & T3 connectivity from Katra (SVDK) & Reasi stations, Tunnels T5/T5-E connectivity from Reasi & Salal-A stations,Tunnels T6, T9, T10, T11 & T12 connectivity from Salal-A & Dugga stations, Tunnels T13/T13-E connectivity from Dugga & Basindadhar stations, Tunnels T14/14-E, T15/15-E & T40/41 connectivity from Basindadhar & Sangaldan station (including Tunnels being executed by IRCON in Basindadhar-Sangaldan section) on Katra - Dharam section in KRCL / RAILTEL Jurisdiction of USBRL Project of Northern Railway.”.**
- 3.3** This work includes Supply of equipment as per schedule items, supply and fixing of various types of cables inside tunnel, erection of tower and installation of antenna over tower/Structure/Tunnel wall etc wherever required, as per specifications in tender documents and commissioning of complete system.
- 3.4** VHF Simplex are to be extended as per Railway Requirement in Tunnels for communication during maintenance and constructional blocks, communication in the train in between Guard & Driver, Emergency radio communication between driver, guard, station master & Cabin etc.
- 3.5** The system shall be so designed to be compatible for three categories of tunnels i.e. tunnels less than 500 meters per Bore, more than 500 meters to 5000 meters per Bore and tunnel more than 5000 meters length per Bore. When a tunnel length is less than 500 meters but is one of the cluster of many tunnels, this should be considered as length more than 500 meters and continued as the part of nearby tunnels of the cluster. Accordingly, redundant master unit as per para 1.7 of RDSO specification is to be deployed for complete redundancy.
- 3.6** The leaky cable and equipment should be compatible for upgradation of VHF system for frequency bands for LocoTrol, GSM-R/LTE & TCAS communication as and when required by Railway.
- 3.7** OFC cable to be laid in existing Tray provided in Tunnels by re-opening the same and re-fixing after laying of cable.
- 3.8** Track crossing of cable wherever required with prior approval.
- 3.9** The contractor shall provide a Tunnel Radio System, which guarantees a complete radio Capability in the entire tunnel and in block section falling outsidetunnels.

- 3.10** The complete Tunnel Radio System shall be as uniform as possible. Further, devices which are easy to expand and change shall be used. The different parts of the Tunnel Radio System shall be arranged by easy changeable, pluggable units with very accessible operator's controls.
- 3.11** The section where work is to be executed is Katra- Dharam Section (From Katra station to Sangaldan station Km 24.8 to km 93.3) which has Five stations other than Katra Station (SVDK) viz., Reasi, Salal-A, Dugga, Basindadhar and Sangaldan.
- 3.12** Section details including details of chainages of tunnels, bridges, stations are given in Annexure-1.
- 3.13** The information and data stated and incorporated in the Tender documents elsewhere is for the general guidance only and may vary as a result of more detailed site investigation and construction drawings.
- 3.14** Any other incidental/ancillary works for successful completion of works and as directed by the Engineer-in-charge the cost shall be borne by contractor. Co-ordination with concerned State/Central Govt. authorities for shifting various existing utilities, if required. Submission of Videos and digital photographs of various work sites (both hard and soft copies).
- 3.15** The works(s) specified under this contract shall include all general works, compliance with all general/special conditions of contract, whether specifically mentioned or not, all materials, apparatus, plants, machinery, tools, fuel, water, power supply, strutting, timbering, scaffolding, formwork, shuttering and tackling problems of every description, transport, offices, stores, workshop, staff, labour and the provision of proper and sufficient protection works, diversion, temporary fencing, lighting and watching required for safety of the public and protection of the works and adjoining land, first aid equipment, sanitary, accommodation of the staff and workmen, the effecting and maintenance of all insurances, the payment of all wages, salaries, fees, royalties, duties or the other charges arising out of the erection of works and regular clearance of rubbish, clearing up and leaving site clean on completion.
- 3.16** The cost of all such items required for successful completion of the work and as described above shall be deemed to have been included in the rates given in the Schedule for various items and percentage rate quoted by contractor and nothing extra shall be payable.
- 3.17** The contractor shall facilitate and do all the necessary co-ordination/ liasoning with WPC for obtaining WPC license for the work

4.0 Codes and Specifications

4.1 Indian Standards Codes & Specifications

Sr	Item	Specification
1	Integrated Communication System for Tunnels	Specification No RDSO/SPN/TC/109/2019
2	24 F OFC	IRS Telecom Spec IRS:TC 55-2006, Amendment-1, 2 & 3

5.0 Integrated Communication System for Tunnels- VHF (Simplex):

Shall conform to RDSO Specification No RDSO/SPN/TC/109/2019 with latest Amendment/Revision. Further, in the event of any contradiction between these Technical specifications and RDSO specification No RDSO/SPN/TC/109/2019 with latest Amendment/Revision, the latter shall prevail.

Frequency Band 146-163MHz for VHF Simplex communication are allotted for use in Indian Railways.

5.1 General Requirement:

- (a) Original Equipment Manufacturer (OEM) of Communication Systems for Tunnels or its authorized representative shall have service facility in India.
- (b) All software and firmware upgrades shall be free of cost for a minimum period of Ten years.
- (c) The integrated communication system shall be connected to centralized tunnel control room which shall be either at adjacent Railway station or at Divisional Control HQ controlling 2 or more tunnels through suitable interface.
- (d) The Tunnel Radio System shall provide an uninterrupted radio communication inside tunnel with the headquarters (through suitable interface) /adjacent station and operation centres' and handheld devices of the tunnel operator's staff, emergency staff and trains which pass the tunnel.
- (e) The communication of all channels in the tunnel shall be independent, simultaneous and failure-free.
- (f) It shall be possible for continuous coverage (VHF) over the entire length of the tunnel, clear audio through-put through out with no interference, reliable system operation under harsh tunnel environmental conditions, trunked radio channels across many bands and ease of system operation and maintenance.
- (g) Voice recording arrangement as per RDSO/SPN/TC/38/2002 with latest Amendment/ Revision for all communication through the Master unit should be provided at the location of the Master unit for analysis and accountability.

- (h) The VHF simplex communication being the lifeline of train operations, Tunnel Radio System shall be able to provide uninterrupted radio communication between the radios located anywhere inside a tunnel and also between radios of other tunnels / master unit location of the same network.

5.2 Tunnel Radio System:

This article covers the Tunnel Radio equipment of all the required equipment, material, accessories and all labour.

The Tunnel Radio System shall be based on RDSO specifications No. RDSO/SPN/TC/109/2019 with latest Amendment/Revision.

The tunnel radio re-broadcasting system will allow a continuous radio contact inside and between tunnels, cut & cover portion and local/remote Control Center, technical buildings. This Technical Specification shall collectively refer to all Tunnels, cut & cover and intermediate open spaces as “**Tunnel**”.

Radio re-broadcasting system will be characterized by:

- i. Antennas as required to seamlessly connect the inside tunnel radios to outdoor radios on both sides of tunnel.
- ii. Leaky feeder (coaxial radiating cable) provided along the complete length of main tunnel(s) and escape tunnel(s).
- iii. Signal amplifier at regular intervals located in tunnels cross passage/niches. Communications apparatus/Master Units located inside technical building.
- iv. Network devices for signal transmission characterized by fiber optic patch panel and electro/optical converters including OFC cable.
- v. Coaxial cable for connecting leaky feeder to signal amplifier.
- vi. Testing and commissioning of Tunnel Radio system.
- vii. The contractor shall provide a Tunnel Radio System which guarantees complete radio capability in the complete length of Main tunnel including connected Escape tunnel, Accesses/Adits/Cross Passages. The realization of these shall be calculated into the prices of the Tunnel Radio System.
- viii. The Transmitter and receiver frequencies required for railway and emergency staff as given below:

Sr	To be used for	Frequency in MHz
1	Standardized Department VHF Simplex Communication Frequencies for Indian Railways	147.975 (ART frequency)
		160.400 (Common frequency)
		161.150 (Driver Guard Communication)
		146.400 (Security Department)
		To be defined in VHF frequency band
		To be defined in VHF frequency band

A slot broadband leaky feeder cable inside the main and escape tunnel will be installed along the complete length of main and escape tunnels (including in Accesses/Adits/Cross Passages).

The radio re-broadcasting system will be fed by separate amplifiers located in correspondence of cross passages, niches and at the technical buildings as required

Through the radio re-broadcasting system central unit and operator's workplace located in local/remote Control Centre/station premise will be possible to transmit communications to rescue teams through handheld units, related to emergency procedures. The operation stations of the Tunnel Radio System shall be provided in the Control Centre and in the buildings.

If any coordination is necessary, all coordination (even with the local fire brigade, rescue service, police, military, telecom operators etc.) shall be included in the prices of the Tunnel Radio System. All permissions, letters, applications required to be done on end-users behalf or in name of end-user shall be provided by tenderer.

Connection to Control Centre

The Signals of the Tunnel Radio System shall be transmitted from the connecting network to the tele control system with OFC cabling. Supply and installation of all patch panels, pig tails etc. and OFC media for tunnel radio is in the scope of contractor.

5.3 DETAILS OF WORK INCLUDES

- i. Radio Service and Channels
- ii. OFC network and media Amplifier
- iii. Tunnel Antenna - Leaky Feeder Cable
- iv. Antennas Cabling
- v. Control Station

5.4 TECHNICAL SPECIFICATIONS

5.4.1 FUNCTIONALITY OF VHF TUNNEL RADIO SYSTEM

The Tunnel Radio System shall provide an uninterruptable radio connectivity between the following:

- (a) Between the handheld radios inside tunnel to the base stations at Tunnel Control Rooms and SM rooms of adjacent stations i.e. for Tunnels
 - i. T9, T10, T1, T2/T2E & T3 connectivity will be extended from Katra (SVDK) & Reasi
 - ii. T5/T5E connectivity will be extended from Reasi & Salal-A,
 - iii. T6, T9, T10, T11 & T12 connectivity will be extended from Salal-A & Dugga
 - iv. T13/T13E connectivity will be extended from Dugga & Basindadhar
 - v. T14/T14E, T15/T15E & T40/41 connectivity will be extended from Basindadhar & Sangaldan.

- (b) Between (i) handheld radios inside the tunnel, (ii) between handheld radios inside tunnel and handheld radios in adjacent tunnels and (iii) handheld radios inside the tunnel and adjacent stations of the concerned block section. However, it should not be possible for radios of two different block sections to communicate with one another.
- (c) The Tunnel Radio System shall provide an uninterrupted radio communication inside tunnel with the headquarters (through suitable interface) /adjacent station and operation centres' and handheld devices of the tunnel operator's staff, emergency staff and trains which pass the tunnel
- (d) Communication between the adjacent stations.

5.4.2 OTHER FUNCTIONALITY OF TUNNEL RADIO SYSTEM

The communication of all channels in the tunnel shall be independent, simultaneous and failure-free.

No disturbing interferences shall occur at the tunnel portals; there are the crossovers from the field radio area to the tunnel radio area.

The radio signals of the outdoor field area shall be handed over with the outdoor antennas and shall be transferred to the radio central unit at the buildings. The contractor shall measure the best location for the antenna column. The measurement protocol shall be handed over to the employer. In accordance with the employer and the measurement, the exact location of the radio column shall be determined.

Malfunction information shall be available in the tunnel radio cabinets as potential free two-way contacts. Also malfunction information of the tunnel radio system including the malfunctions of their power supply units shall be indicated at Technical Building.

The tunnel antenna system shall be a wide-band system; able to cater the frequencies mentioned in clause 5.2 above and para 1.4 of RDSO specifications No. RDSO/SPN/TC/109/2019. -The provision shall be made for tuning additional two channels in VHF band.

The transmitting of the individual channels must not be influenced by each other. The antennas in the free field/outdoor area shall be situated on the antenna column. It shall be situated near the buildings, depending on the best receiving frequencies. These antennas shall be preferably directional antennas, which shall be directed to the respective bases and relay-stations.

To avoid a coupling between the Antennas and the tunnel antenna, a decoupling, which is as high as possible, shall be realized. If the decoupling of the individual channels is not enough, additional methods shall take place, to guarantee a fully functional Radio System.

At the time of commissioning the radio system, the decoupling of the radio system shall be verified metrologically.

The Tunnel Radio System shall work automatically and without external support.

In the tunnel the transmitting probability of the radio signals shall be uninterrupted between the radios located anywhere inside a tunnel (inner tunnel) and also between radios of other tunnels/master unit location (inter tunnel) of the same network.

All radio equipment inside the tunnel shall be provided with 12 hour battery backup arrangement. The power supply units required for Tunnel Radio system to work shall be 230V AC 50Hz or -48V DC power supply and separately protected by miniature circuit breakers. Railway will provide state Electricity board /AT Supply of 230V AC 50Hz at portal/niches of tunnel

All housings of devices and distributors shall be connected to the earthing system with contractors material (Earthing shall provided by S&T contractor).

5.4.3 RADIO SERVICE AND CHANNELS

The number of channels and frequencies have been mentioned in clause 5.2 above and para 1.4 of RDSO specifications No. RDSO/SPN/TC/109/2019). The provision shall be made for tunning additional two channels in VHF band.

For security reasons the leaky feeder inside the tunnel shall be divided into parts and maximum length of each part shall not be more than 500 m. The equipment of the Tunnel Radio System in the tunnel tube shall be placed in the (control) cabinets at the cross passages or at any suitable place as per site condition as approved by Engineer-in-charge. The telecom contractor shall coordinate with the site engineer and Electrical E&M contractor working inside the tunnels to plan the space available in the niches/Accesses/Adits/Cross Passages

5.4.4 DETAILS OF TUNNEL RADIO SYSTEM

i. REQUIREMENTS

The devices of radio system shall not cause a sound pressure level in the working and recreation rooms, which shall ideally be not more than 50 dB(A).

All equipment of the Tunnel Radio System shall guarantee a simultaneous and disturbing free operation. It shall be verified, if the foreseen frequencies are free of inter-modulation among themselves. If they are not free of it, corresponding actions shall be taken.

In case of power loss, the devices of the radio system shall not be damaged. If the power supply returns, the radio plant shall start and work automatically and self-acting again.

ii. OTHER REQUIREMENTS

The interconnections of the leaky feeder and coaxial transport cables shall be extensively silvered inside (at the contact areas) and have a protection against oxidation outside.

All coaxial interconnections shall be protected by shrinkable tubes or else, if there are shared connections, multi-terminals shall be used. If litz-wires shall be connected, wire end ferrules shall be used.

iii. GENERAL MECHANIC STRUCTURE

All switches, pilot lamps, control sockets and other operator's controls shall be very accessible after opening of the distributor's door (and) the swing frame in the distributors.

The lettering of the radio plant shall be un-detachable and unmistakable. The indication also shall be in accordance with the documentations.

The equipment, which is necessary for signal conditioning, shall be situated in the niches and cabinets in the tunnel tube and in the buildings. They shall be located in distribution cabinets.

The cost of all such items required for successful completion of the work and as described above shall be deemed to have been included in the rates given in the Schedule for various items and percentage rate quoted by contractor and nothing extra shall be payable.

5.4.5 DETAILS AND SPECIFICATIONS OF DEVICES - VHF COMMUNICATION

(a) MASTER UNIT

The Master Unit is used to convert signals from RF to light when fibre fed repeaters is used at the remote end of the optical link. The Master Unit shall comply with requirements of clause 3.1.1 of RDSO Specifications RDSO/SPN/TC/109/2019 with latest Amendment/Revision.

With suitable interface, it shall be able to connect to Tunnel ventilation control/Divisional control room.

Master unit shall be tuned for 4 frequencies i.e. (i) 161.150 (Driver - Guard Communication), (ii) 147.975 (ART frequency), (iii) 146.400 (Security Department) and (iv) 160.400 (common frequency). The provision shall be made for tuning additional two channels in VHF band.

(b) OPTICAL REMOTE UNIT

Optical Remote unit is used at the remote end to convert Optical Signal to RF Signal and then transmit it into Leaky cable in the particular area to cover the tunnel for the wireless communication. It is connected to Master Unit. The optical remote unit shall comply with requirements of clause 3.1.3 of RDSO specifications RDSO/SPN/TC/109/2019 with latest Amendment/Revision.

(c) 1/2” RF Feeder Cable (Coaxial Transport Cable)

Sr.	Description	Specification required
Construction		
1	Inner Conductor	Copper Clad Aluminum 4.80±0.05 mm
2	Insulation / Dielectric	Foamed PE 12.20±0.30 mm
3	Outer Conductor	Corrugated Copper 13.80±0.20 mm
4	Jacket	PE or Fire retardant PE 15.80±0.20 mm
Mechanical		
1	Minimum Bending Radius	125mm
2	Minimum Crush Resistance	1.6 kg/mm
3	Maximum Pulling Force	113 kg
4	Operating Temperature	-30 to +80°C
Electrical		
1	Impedance	50Ω
2	Propagation Velocity	88%
3	DC Breakdown Voltage	4kV
4	Insulation Resistance	>5000 MΩ.km
5	Peak Power Rating	40 KW
6	DC Resistance	Inner Conductor: ≤ 1.6 Ω/km Outer Conductor: ≤ 3.0 Ω/km
7	Cut-off frequency	8.8GHz

RF		
Frequency (MHz)	Attenuation dB/100m (@20 °C)	Average Power Rating (kW) (@20 °C)
150	2.67	2.74
400	4.37	1.75
450	4.75	1.56
700	6	1.2
900	6.87	1.05

(d) N-Type Connector for 1/2” RF feeder Cable

Sr.	Description	Specification required
1	Should have excellent VSWR (as detailed at Sr. ‘8’) performance, very Low intermodulation, Environment resistant for Long Life	
2	Transmission Line Type	Coaxial Cable
3	Cable Size	1/2”
4	Frequency Range	DC~3GHz
5	Mating Interface	N-Type

Sr.	Description	Specification required
6	Gender	Male or Female as required by Design
7	Impedance	50Ω
8	VSWR (0~2.5GHz)	≤ 1.15
9	Material / Plating Outer Conductor	Brass / Ni or Brass / Three material Alloy (Cu-Zn-Sn)
10	Material / Plating Coupling Nut (Adapter)	Brass / Ni
11	Material / Plating Center (Inner) Conductor	Brass / Ag or Beryllium Copper / Ag
12	Material Insulator	PTFE
13	Material Gasket (Seal Circle)	Silicon Rubber
14	Insulation Resistance	≥ 5000MΩ
15	Contact Resistance	Outer Contact: ≤ 1.0mΩ Inner Contact: ≤ 1.0mΩ
16	Operating Temperature	-40 to +85°C

(e) N-Type Connector for 7/8” Leaky Cable

Sr.	Description	Specification required
1	Should have excellent VSWR (as detailed at Sr. ‘8’) performance, very Low inter-modulation, Environment resistant for Long Life	
2	Transmission Line Type	Coaxial Cable
3	Cable Size	7/8”
4	Frequency Range	DC~3GHz
5	Mating Interface	N-Type
6	Gender	Male or Female as required by Design
7	Impedance	50Ω
8	VSWR (0~3GHz)	≤ 1.15
9	Material / Plating Outer Conductor	Brass / Ni or Brass / Three material Alloy (Cu-Zn-Sn)
10	Material / Plating Coupling Nut (Adapter)	Brass / Ni
11	Material / Plating Center (Inner) Conductor	Brass / Ag or Beryllium Copper / Ag

Sr.	Description	Specification required
12	Material Insulator	PTFE
13	Material Gasket (Seal Circle)	Silicon Rubber
14	Insulation Resistance	$\geq 5000\text{M}\Omega$
15	Contact Resistance	Outer Contact: $\leq 1.0\text{m}\Omega$ Inner Contact: $\leq 1.0\text{m}\Omega$
16	Operating Temperature	-40 to 85°C

(f) Stainless Steel Clamps (confirming to SS316) for 7/8" Radiating Cable anchored using Stainless steel self-anchoring fastners

Sr.	Description	Specification required
Composition		
1	Self-locking Clamp – 1 pcs	Stainless Steel
2	Expansion Screws -1 pcs	Stainless Steel self-Anchoring
3	Round Base – 1 pcs	PP
Characteristics		
1	Type	7/8" Leaky Feeder Cable Clamp/Hanger
2	Material	SS, PP, SS
3	Axial Load Capability	8 times the 7/8" LCX cable weight
4	Corrosion Resistance	≥ 500 hours of salt spray chamber
5	UV Resistance	≥ 100 hours of accelerated UV life chamber
6	Operating Temperature	-30 to +75°C

(g) Nylon Clamps for 7/8" Radiating Cable using Stainless steel (conforming to SS316) self-anchoring bolts

Sr.	Description	Specification required
Composition		
1	Self-locking Clamp – 1 pcs	Nylon 7/8"
2	Expansion Screws -1 pcs	Stainless Steel self-Anchoring
3	Round Base – 1 pcs	PP
Characteristics		
1	Type	7/8" Leaky Feeder Cable Clamp/Hanger

Sr.	Description	Specification required
2	Material	SS, PP, Nylon
3	Axial Load Capability	8 times the 7/8" LCX cable weight
4	Corrosion Resistance	≥ 500 hours of salt spray chamber
5	UV Resistance	≥ 100 hours of accelerated UV life chamber
6	Operating Temperature	-30 to +75°C

(h) Jumper Cables 1 mtr Cable with N-N & DM NM Terminations OR as per requirements

Sr.	Description	Specification required
Construction		
1	Type	RF Cable Assembly
2	RF Cable Type	Low insertion loss flexible cable
3	Frequency Range	DC~2200MHz
4	Cable Diameter	1/2"
5	Cable Impedance	50Ω
6	Cable Length	1 m
7	End Connectors Type	N, DIN etc. as per design requirement
8	End Connectors Gender	Male or Female as per design requirement
9	Operating Temperature	-30 to +75°C

(i) Weather proofing and heat shrink wrap tapes

Sr.	Description	Specification required
Features		
1	It provides a multi-layer, long terms environmental seal over antenna and cable multiple connections. This protects the joints from weather conditions, moisture penetration and loosening of connections caused by strong winds	
Composition		
1	UV resistant Butyl Rubber Tape – 6 pcs	2.5”, 2 ft
2	19 mm PVC Tape – 2 pcs	3/4" , 50 ft
3	51 mm PVC Tape – 1 pcs	2”, 15 ft

(j) Two - Way Splitter

Sr.	Description	Specification required
1	Should be High power, low pass band ripple, low insertion loss, suitable to be used in wide band coverage systems.	
2	Frequency Range	100-1000MHz
3	Insertion Loss	3.6dB Typical
4	Power Rating	100W (as Splitter) and 10W(as combiner)
5	Isolation	12dB(<108MHz) 20db (130-1000MHz)
6	Impedance	50Ω
7	VSWR	≤ 1.4:1
8	Connector	N-F
9	Operating Temperature	- 40 to +85°C

(k) 30db Coupler

Sr.	Description	Specification required
1	Frequency Range	130~1000MHz
2	Coupling Loss	30dB
3	Coupling Loss Tolerance	±3dB
4	Max Insertion loss	0.5dB
5	Directivity	≥20dB
6	VSWR	≤1.3:1
7	Connector	N-F
8	Impedance	50Ω
9	Operating temperature	-30 to +60°C
10	Input Power	≥10W
11	IP Rating	IP65

(l) 2W Terminal Load

Sr.	Description	Specification required
1	It provides termination to the RF transmission line with minimum reflection. This is performed by RF power absorption	
2	VSWR 0~3GHz	≤ 1.2
3	Power Rating	≥ 2W
4	Connector	N Type
5	Impedance	50Ω
6	Operating temperature Range	-30 to +85°C

(m) Log Periodic Antenna

Sr.	Description	Specification required
1	Yagi Antenna should be specially designed for directional long distance communication. Should be heavy duty passivated aluminum/stainless steel or any non-corrosive material, high reliability design for long life.	
2	Frequency Range	146-163MHz
3	Operation Bandwidth	Minimum 10MHz
4	Connector	N Type
5	Impedance	50Ω
6	Polarization	Vertical
7	Power Rating	Minimum 10W

(n) Fiber Patch Panel

Sr.	Description	Specification required
1	Material	ABS or CRCA/Aluminum with powder coating
2	Weight	≤2.5 kg
3	Design	Single door Hinged Type
4	IP Rating	IP 65
5	Number of cores loaded	Minimum 2
6	Adapter panel connectors	LC/UPC or as per design
7	Splice Holder material	ABS
8	Internal Fiber cable strands	Single mode
9	Operating temperature	-30 to +60°C
10	Insertion Loss	≤0.2dB
11	Dimensions	310*250*60 mm (H*W*D) approximately

(o) 10 Mtrs Fiber patch cord with connector

Sr.	Description	Specification required
1	Cable assembly Length	10m
2	Cable Type	Simplex
3	Total fiber quantity	1
4	Jacket Color	Any
5	Fiber Mode	Single Mode
6	Interface Connector A	LC/UPC or SC/APC or as required by design
7	Interface Connector B	LC/UPC or SC/APC or as required by design
8	Operating temperature	-10 to +60°C

(p) 5 Mtrs Fiber patch cord with connector

Sr.	Description	Specification required
1	Cable assembly Length	5m
2	Cable Type	Simplex
3	Total fiber quantity	1
4	Jacket Color	Any
5	Fiber Mode	Single Mode
6	Interface Connector A	LC/UPC or SC/APC or as required by design
7	Interface Connector B	LC/UPC or SC/APC or as required by design
8	Operating temperature	-10 to +60°C

(q) Intelligent Grounding Module for S&T Applications

The 4 wire, built in grounding /earthing devices (Intelligent Grounding Module) for surge and transient over voltage protection with grounding /earthing system without buried earth pit for equipments. It shall tested, certified and approved as per standard IEC 61000

It shall ensures defense from reverse surges, indirect lightning surges, Ground potential rise, etc. This shall protects effectively from lightning cum surges. Shall not require any installation of additional grounding rods.

Neutral-ground potential difference within 0.2 Volt.

It shall have low earthing resistance.

It shall be Resistant to corrosion or extreme atmospheric conditions.

5.4.6 RADIO SYSTEM

The complete transmitting and receiving devices of the free field area radio system shall have an adjustable output power

The free field area/outdoor area radio system shall be designed in that way, that no disturbance may occur between the tunnel radio system and the free field area/outdoor area radio system.

The transmitting and receiving device shall be delivered with all cable couplings and connectors. The device shall be situated in distributors in the buildings.

5.4.7 DESIGN OF SYSTEM

System Architecture Design & Documentation (after meeting project team/ interfacing and client discussion) of design. Design document for in-principle approval of KRCL / RAILTEL/consultant. Scope of design also includes defining the system values, parameters, block diagrams, diagrams, drawings, flow charts, location-wise equipment details etc., for VHF (Simplex) systems and the same

shall be submitted by the contractor. After testing if any change in design required the same shall be incorporated and submitted to KRCL / RAILTEL for approval.

The tenderer/contractor shall design the complete radio VHF communication in accordance with RDSO specification no. RDSO/SPN/TC/109/2019 and as per industry standards. The design report shall include detail of equipment, accessories to be installed for the above systems.

With design the contractor shall submit detail specification of the equipment with procedure for testing and recommended standard parameter. While designing the contractor shall take the consideration of space in tunnels for placing of equipment.

5.4.8 NETWORK MONITORING SYSTEM (NMS)

Network Monitoring System shall be capable of monitoring VHF (Simplex) Radio system remotely (from Technical building/Control centre/station over WAN/Wireless) including vital parameters of the system, communication links, Power supply equipment etc for un-interrupted service. Minimum One month data/Log's shall be available for verification. Email and SMS alert facility.

- Built on an open access platform
 - Non proprietary solutions - future proof
 - Allowing to integrate their own applications
 - Build own reports and tools
 - A large online user community
 - Ability to integrate other vendor's equipment in the same NMS
 - Scripting facilities included
 - Ability to automate common tasks
 - Script and / or batch jobs execution (i.e. frequency re-planning)
 - Customizable user interface
- It should have open API for northbound access as well as SNMP
 - Develop own functions on the same platform
 - A strict and available API with predictable functionality
 - Integration with other systems - inventory management tools integration
- It should support user management synchronisation with LDAP and Active Directory
 - Easier management of users through standard tools already existing in the network
 - Mapping function with ability to zoom in and out.
 - Network topology maps for logical representation of nodes in complex systems.

5.4.9 FIBRE JUNCTION BOX (OFC Joint Enclosure)

Fibre Junction Box should be as per specification no. RDSO/SPN/TC/68/2014 with latest Amendment/Revision.

5.4.10 SYSTEM VALUES

The system values, parameters etc., to be achieved for Radio (VHF) Communication Systems shall be submitted after design finalization. The contractor shall calculate and measure all values of the radio system on implementation during Acceptance Tests.

5.4.11 Power Supply unit:

- (a) The power supply equipment to be provided for **Master Unit** shall be as per provided as per clause 3.1.8 of RDSO specification No. RDSO/SPN/TC/109/2019, with latest Amendment/Revision.
- (b) The power supply equipment to be provided for **Optical Remote Unit/Repeater in Tunnels** shall be as per provided as per clause 3.1.9 of RDSO specification No. RDSO/SPN/TC/109/2019, with latest Amendment/Revision

5.4.12 TUNNEL ANTENNA — LEAKY FEEDER CABLE

In the Main, Escape (if any) tunnel tube and in the accesses/Adits/Cross Passages, the leaky feeder cable shall be used as antenna.

It consists of a coaxial structure with gaps or slots in it, at regular span in its outer conductor for radiating or receiving signals along its entire length. Those gaps / slots ensure repeating coupling and decoupling of the energy.

The sections of the leaky feeder cable shall be supplied with a wide-band amplifier in a T-system (in the tunnel tube to the accesses) and in a L-system (from the technical buildings to the tunnel portals).

For transmitting and receiving of the frequencies in the tunnel tube, as well as in the accesses two leaky feeder cables shall be foreseen. One is for TX-signal and the other one for RX-signal.

A disconnection of the leaky feeder cable shall not stop or interfere the operation of radio.

Each amplifier of the Tunnel Radio System shall supply leaky feeders upto a length of maximum 500m to the left and right side combined. If the leaky feeder cables is squeezed or pinched off, the radio connection from the amplifier to the sectioning point shall be sustained.

Depending on the installation site, the cable shall be mounted with cable holder, spacer, cable clamps, plain washers, and so on. The cable shall be fixed with Nylon clamps at interval of every 1.0 m.

Additionally to the common fixings, fire proofed cable clamps, made of stainless steel, shall be installed in a regularly span (10 m). The course of the leaky feeder cable shall be straight. "Stainless steel" shall be a Cr-Ni-Mo alloy or Cr-Ni-Mo-

atTi alloy, material No. 1.4404 equivalent to SS 316.

The leaky feeder cable network shall support the transmission and reception of spot frequencies mentioned in clause 5.2 and para 1.4 of RDSO specifications No. RDSO/SPN/TC/109/2019). The provision shall be made for tuning additional two channels in VHF band.

5.4.13 ANTENNA COLUMN

All antennas shall be situated on the antenna column. The height of this column shall be suitable as per the site requirement. The column shall be fixed on a foundation and the column shall be made of galvanized steel material.

The antenna column shall have a protection against lightning. Therefore, a lightning rod shall be provided, and the contractor shall connect all metallic parts with the earthing system. All cables along the column shall be installed by C-section rails, which are separately fixed with cable clamps. The C- section rails shall be fixed permanently with spacer in a span of 50 cm.

The location of the antenna column shall be near the buildings. The exact location depends on the results of the measurements. The contractor shall deliver static calculations for the foundation, the column and the mounting structures of the column. The calculations shall be handed out to the KRCL / RAILTEL. All costs, which are combined with the delivering and mounting (also for the foundation) of the column, shall be calculated into the price of the Tunnel RadioSystem. Also, the total erection and the static calculations of the foundation and the antenna column shall be included in the price of the Tunnel Radio System.

5.4.14 ANTENNAS

Antennas for the corresponding frequency band shall be provided and installed. The antennas shall be designed as a professional type inclusive protection against icing.

Frequency Band - As specified in clause 5.2 above and para 1.4 of RDSO specifications No. RDSO/SPN/TC/109/2019). The provision shall be made for tuning additional two channels in VHF band.

5.4.15 CABLING

(a) ANTENNA CABLE

The antenna cable shall be delivered inclusive of all plug-in connectors, surge voltage protectors and required installation material. The outer conductor of the antenna cable shall have a tight structure. The antenna cable shall be for connecting the antennas in the free field area with the radio system and the radio central unit equipment (at the technical buildings).

(b) COAXIAL TRANSPORT CABLE

This cable shall be used as a feeder from the amplifier to the leaky feeder cable inclusive all necessary connectors.

(c) OPTICAL FIBER CABLE

The individual radio units situated in the buildings/ main, Escape tunnel tube (if any), in the accesses / Adits/ cross passage and niches.

Cabinets shall be connected with a single mode RDSO approved OFC cable with LSZH-FR sheath. This optical fiber cable shall be laid in the tray/conduit/duct/trench and shall transfer the signals to the technical buildings, where the information will be processed. OFC shall be supplied as part of radio system along with the OFC network equipment such as patch panel, pig tails etc.

6.0 GENERAL CONDITIONS

6.1 GENERAL INFORMATION

These specifications shall be regarded as general specifications describing the required material, equipment, labor, etc. for the required installation such as tunnel Radio communication.

The contractor shall check the accordance of the offered material, equipment, etc. with the requirements and standards presented in these specifications.

So, the contractor shall make the shop drawings according to the offered material, equipment, labor, etc. where the actual values such as cable diameters, voltage drop, power, etc. shall be shown with the actually used material resp. equipment.

Therefore, the contractor shall send detailed information of the used material (such as catalogues, instruction manuals, data sheets, etc.) to the Engineer-in-charge for his approval.

All systems and equipment supplied and installed by Telecom Bidders should be tested and proven in similar long tunnels with history of installation supplied thereof.

6.2 OPERATIONAL SAFETY RELIABILITY CONDITIONS

When a tunnel length is less than 500 meters but is one of the cluster of many tunnels, this should be considered as length more than 500 meters and continued as the part of nearby tunnels of the cluster.

Accordingly, in a section between two stations, all the remote units inside the tunnels shall be connected to two master units (one for redundancy) as per clause 1.8 of RDSO specification RDSO/SPN/TC/109/2019 with latest Amendment/Revision, irrespective of the individual length of the tunnel. The main and standby master shall be located on either side of the stations.

6.3 TECHNICAL CONDITION

6.3.1 QUALITY OF MATERIAL AND WORKMANSHIP

All goods, materials, plant and equipment incorporated in the contract shall be of approved reliability, well established design, of best quality of their respective kinds and shall comply with all relevant standards. The Contractor shall ensure Quality Assurance program of adequate standard. The appropriate site conditions are between - 5° C and + 55° C, relative humidity 95%.

All equipment shall be approved by KRCL / RAILTEL Engineer/ Agency nominated by KRCL / RAILTEL; the contractor shall be responsible for any delays, caused due to submission of unacceptable materials in connection with such approvals.

Wherever different materials are used, attention shall be paid to the electrochemical reactions (electrolytic corrosion) of these different materials (e.g. copper/steel, aluminium/steel and so on). However, suitable measures are adopted to prevent any of these electrochemical reactions.

"Stainless steel" shall be a Cr-Ni-Mo alloy or Cr-Ni-Mo-Ti alloy, material No. 1.4404 equivalent to SS 316.

Galvanized steel shall be used only when specified. "Galvanized steel" shall always be hot dip galvanized steel with zinc cover according to BS EN ISO 1461.

6.3.2 LIGHTNING PROTECTION

The contractor shall take all the necessary and adequate precautions against influences and damages, which may occur due to lightning strikes in the region, on all the equipment.

All low voltage and communication metallic cables entering the Technical buildings, electrical rooms or the Control Centers shall be protected against over voltages with special surge arrestor banks for control cables.

The contractor shall provide all measures of lightning protection and shall obtain the approval of the Engineer-in-charge.

6.3.3 GROUND AND BONDING

All exposed metal work and metal which is not current-carrying part of the electrical circuitry, including equipment enclosures, panels and supports shall be bonded together and to ground. Substantial non-ferrous ground lugs or studs shall be fitted for bonding cable shields or other adjacent equipment.

Where sections of distribution cabinets / panels shall be placed together to form a composite unit, a bonding strip shall be provided through the intermediate sections to provide a complete bonding between all sections.

It is necessary to keep special attention on avoiding electrochemical corrosion. The connections of grounding and bonding shall be stud or clamp type.

These requirements shall apply irrespective of the operating voltage and purpose of the equipment.

All required suppression chokes/filters shall be included and shall be capable of withstanding fault conditions. All cable shields shall be bonded together and shall be connected to the ground electrode. Particular attention shall be paid to the correct bonding and grounding of single core cable shields.

The earthing bus bar for the Telecommunication equipment shall be permanently connected to the main earthing bus bar.

6.3.4 MINOR WORKS INCLUDED

All mechanical and electrical parts shall be adequately protected to ensure the safety of anyone in the danger area.

Those areas, which are accessible to the public, the equipment shall be completely enclosed; such enclosures shall be made to resist intentional damage and shall have smooth exteriors free from avoidable irregularities and crevices, where dust and damp might get lodged/deposited.

Equipment like panels, desks, boxes etc. shall be of a high quality, strongly braced construction. Access doors and covers shall have properly turned and formed edges for stability. All burrs shall be removed, and all welds shall be neat, clean and smooth.

Printed circuit boards shall be built on stable insulating materials with permanent adhesion of the circuit to the board under all conditions. The board and the circuit shall be protected against climatic conditions, dirt, moisture etc. by approved finishing techniques.

Throughout the contract works, all items and equipment, including connection compartments, interface compartments and other parts shall have legend labels as described below, to facilitate their identification for operation and maintenance. All labels shall be clearly readable and attached by pins, screws or rivets.

The cost of all such items required for successful completion of the work and as described above shall be deemed to have been included in the rates given in the Schedule for various items and percentage rate quoted by contractor and nothing extra shall be payable.

Circuit breakers, terminals etc

These shall be numbered and a chart giving the function shall be fixed inside the distribution cabinet's door. These charts shall be prepared in an approved manner, clearly drawn and protected by clear plastic material.

Components

If an equipment case or cubicle contains more than one item of similar kind, each shall have an engraved plastic label stating its function.

Distribution cabinets

Each cabinet shall have an external engraved plastic or metal label showing its function and identity code.

All equipment shall have a radio interference suppression to prevent interference with satisfactory operation of other equipment whether the interference is due to radiation, induction or conduction.

All danger and warning labels shall be of permanent materials securely fitted by pins, screws or rivets and clearly and indelibly worded in Hindi and English language. The word "DANGER" shall be prominent and shall have larger characters than other parts of the inscription. The size of characters, the nature of the warning and the whole layout shall be to the approval of the Engineer-in-charge. The color of all lettering shall be red. Identical components within sets of equipment shall be made to the same nominal value / gauge and shall be interchangeable.

The contractor shall make his own precautions to protect complete portions of the work and stored equipment against damage and thefts.

6.3.5 DAMAGE TO SURFACES

All constructional plant used adjacent/near to finished surface or to block-work or concrete surfaces shall be in such a way that it does not discharge dirt, oil and other deleterious matter and all construction plant shall be adequately fitted or adapted to ensure this.

6.3.6 PACKING

Goods, materials, plant and equipment shall be carefully packed for transport and storage in such a manner, that they are protected against rough handling, vibration and climatic conditions. They shall arrive, be transported and stored at the site without deterioration / damage.

6.3.7 WARRANTY, MAINTENANCE, SPARES

The contractor shall provide a warranty according to the conditions of the contract.

Additionally, full maintenance services, i.e. breakdown maintenance, etc. including all required spare parts shall be provided by the contractor up to the end of the maintenance period. The contract price shall be deemed to cover the warranty and full maintenance services together with all spare parts during the maintenance period.

All costs, associated with returning any material or equipment, which cannot be repaired on site, to the factory or other places of repair shall be included in the contract price.

The contractor shall state which local maintenance facilities shall be available and whether these facilities shall be short or long term.

The contractor through OEM certificate shall guarantee the availability of the spare parts for a minimum period of **Ten years** following the end of the maintenance period.

6.4 ORDER OF PRECEDENCE OF CODES AND STANDARDS

IS Indian Standards

UIC Codex 779-9

BS British Standards

EN European Standards

IEC International Electro technical Commission

IEE Institution of Electrical Engineers

CISPR International Special Committee on Radio Interference

CENELEC Comité Européen de Normalisation Elektrotechnique

ITU-R Comité Consultatif International des Radio communications

ITU-T Comité Consultatif International Télégraphique et Téléphonique

IS-ETD Indian Standards -Electro technical Division Council

Unless another standard is specifically mentioned in these specifications, all materials used and provided under the contract and all equipment, calculations and tests shall be in accordance with the standards mentioned before or in accordance with such authorities' standards appropriate to the country of manufacture as in the opinion of the Engineer-in-charge to ensure an equivalent or higher quality.

If the contractor offers materials, equipment, calculations or tests which conform to standards other than the standards mentioned before (as approved), full details of differences between the proposed standard and the before said standards (as approved), as far as they affect the design or performance of the equipment, shall be submitted.

The works and all plant, equipment and materials forming part of these specifications shall comply (in all respects) with the rules and regulations of the supply authority and any other authorities having jurisdiction over any part of the work and on the method of performing such work.

6.5 ACCEPTANCE TESTS

Acceptance Tests shall include but not be limited to para 6.3 of RDSO specification no.RDSO/SPN/TC/109/2019

The system values, parameters, block diagrams, diagrams, drawings, flow charts, location-wise equipment details, values and parameters for test checking etc., for VHF systems shall be submitted by the contractor after design finalization. Based on proof checking, approval and on submission of as-made documents/diagrams following test shall be performed.

6.5.1 GENERAL

- i. The materials that are not inspected by RDSO shall be subjected to tests that can be generally divided into three sections:

- (i) Factory Acceptance Tests (F.A.T) shall be carried out before the delivery of the plant / Equipment
 - (ii) Site Acceptance Tests (S.A.T.) shall be carried out after the plant / equipment is delivered and installed on site
 - (iii) Tests on completion
- ii. The contractor shall submit catalogues of all equipment as well as a list of the tests proposed for all equipment. A general overview of each of the proposed tests shall be included in these documents. Any of these pre-given descriptions or documents shall not limit in any way the contractor's obligations to complete each and every test as specified and necessary to demonstrate the satisfactory performance of the system.
- iii. The schedules of each test, as well as the test procedures itself shall be prepared, based on the detailed description of the test previously submitted in accordance with the final system proposal and as approved by the Engineer-in-charge. No deviations are allowed without prior approval by the Engineer-in-charge.
 The contractor shall submit for the approval of Engineer-in-charge all detailed test procedures and final schedules for the tests described in items 6.0 of RDSO/SPN/TC/109/2019 with latest Amendment/Revision and elsewhere in the specification at least eight weeks prior to the scheduled commencement of the Factory Acceptance Tests.
- iv. Prior to this the draft procedures shall be submitted and agreed by the Engineer-in-charge. The contractor shall indicate when these draft procedures shall be submitted.
- v. In case of a defect being detected during one of the tests, the nature of the defect shall be explained in detail to the Engineer-in-charge. Based upon this information, the Engineer-in-charge shall decide, whether the defect is a minor fault or whether it must be corrected before testing can continue.
- vi. Minor faults are defects, which are found during testing and which do not adversely affect the operation of the system in a broad sense and thus don't need be rectified / corrected before a test can be continued and successfully completed. If the defect is not a minor fault, the Engineer-in-charge shall decide which section of the test (or tests) must be repeated. The Engineer-in-charge shall have the right to require all tests to be re-run / repeated, if he decides that the defect has wide consequences.
- vii. All costs involved in any retesting shall be at the expense of the contractor including supervisory and KRCL / RAILTEL's costs.
 The Engineer-in-charge or his appointed representative shall have unrestricted access to the contractor's and supplier's premises for purposes of inspection and tests at all times and the contractor shall specify this requirement when placing all orders.

- viii. If considered necessary, the Railway will carry out inspection of materials to be supplied under this contract prior to delivery at the premises of OEM. The cost of inspection, testing and expenses (transportation and accommodation) of Inspecting Authorities (KRCL / RAILTEL Engineer and at least one additional representative of Northern Rly) shall be borne by the contractor. The contractor shall give at least 4 weeks notice to the Engineer-in-charge or his nominee to enable him to arrange necessary inspection.

6.5.1.1 FACTORY ACCEPTANCE TESTS (F.A.T)

Factory Acceptance Tests are divided into three parts:

- Environmental tests
- Technical tests
- System tests

Factory acceptance tests shall be conducted under the supervision of the employer and the Engineer-in-charge. The contractor shall group tests to minimize travel expenses if the Engineer-in-charge and / or the employer attend the tests.

After completion of the tests the results, certified by the Engineer-in-charge or the Engineer's representative, if present in any of such tests, shall be forwarded to the Engineer-in-charge. When the Engineer-in-charge has received the results and states that the plant / equipment have passed the tests, he will write to the contractor to inform him and the contractor then may ship the plant.

If the Engineer-in-charge deems that the plant/equipment is not in accordance with the specifications, he may reject the plant / equipment and shall inform the contractor of the reasons in a writing within a reasonable time limit.

The Engineer-in-charge shall also inform the contractor in a writing if any minor faults are detected and which of these minor faults shall be corrected before shipment.

(a) Environmental Tests

One piece/unit of the specified equipment shall undergo Environmental test well before the Factory Acceptance Tests.

General

The equipment shall pass all of these tests as specified. A declaration that the offered equipment has successfully passed these environmental tests, signed by an approved testing authority, shall be supplied.

The engineer-in-charge reserves the right to amend any or all of the tests during the equipment acceptance testing. The contractor shall state what arrangement shall be available for these tests if required.

Unless otherwise specified, the environmental tests shall be carried

out with the equipment in its normal housing and maintained in full operational conditions.

(b) Technical Tests

Unless specified otherwise throughout the specification, full performance tests including such standard tests as appropriate shall be carried out to demonstrate that it meets the technical specification requirements.

(c) System Tests

System performance tests shall be carried out on a representative part of the system to demonstrate that the plant/equipment is fully compliant with the technical and operational requirements specified. Unless specified otherwise, the contractor shall submit details on the number and type of equipment to be assembled to represent the system (at least 50% of each scope that means at least every second equipment/piece).

Long cable connections shall be simulated using cable simulation boxes/attenuators etc. (test device) or Optical fiber transmission systems shall be tested with the transmission cable of complete required length being rolled up on the cable drums.

6.5.1.2 SITE ACCEPTANCE TESTS (S.A.T)

If each section of plant is installed, commissioning tests for each section shall be carried out on site.

At least six weeks in advance of any site testing, the contractor shall submit details of tests and details for the test equipment he proposes to use for that testing to the Engineer-in-charge for his approval.

As installation proceeds, 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, in the case of communication, alarm and control cabling, from end to end of each circuit. Tests on cables shall be completed and accepted by the Engineer-in-charge before the testing of the associated equipment starts.

All tests for statutory requirements and insurances including arrangements for such tests, inspections by authorized bodies, persons or insurers, as necessary and the provision of certificates in the prescribed and approved forms necessary to enable plant and equipment to be put into service, shall be made by the contractor.

On-site commissioning tests being subject to acceptance by the Engineer-in-charge shall include:

- (a) All equipment, cabling, distribution etc. is electrically and mechanically safe
- (b) All interlocks, isolators and door and cover securing mechanisms shall be properly fitted and adjusted
- (c) All exposed metal work is properly bonded and grounded and that

all connections and points required to be grounded for a safe and satisfactory operation shall be properly grounded in accordance with the manufacturer's requirements

- (d) All cables, cores and terminations shall be secure, properly fitted and correctly identified and colored
- (e) All phases, polarities, neutral and common connections shall be correctly switched / connected as required, so that the power is correctly available at all points and that the voltage and frequency at all equipment is correct and in accordance with the requirements for correct work
- (f) All supplies shall be properly fused or otherwise protected, to give successfully discrimination and safe disconnection under fault conditions
- (g) All contacts shall be properly aligned/adjusted and not subject to excessive wear or corrosion
- (h) Batteries shall be correctly installed, connected and fitted and checked that the battery chargers are working correctly
- (i) The insulation-resistance of all cabling and equipment shall not be less than specified
- (j) All instruments and meters shall be energized with correct polarity and working properly
- (k) All fault indications and alarms shall be working correctly
- (l) In addition to all operational tests, required for a successful hand-over, the operation of all interlocks, sequences and protections which are not utilized in normal operations shall be subject of acceptance by the Engineer-in-charge.

The on-site commissioning tests shall be conducted under the supervision of the Engineer-in-charge.

The final acceptance tests shall begin after all on-site commissioning tests have been successfully completed and all defects detected during those tests have been rectified / corrected, which is accepted by the Engineer-in-charge. The tests shall include full operation tests on the works and selected technical tests on some or all of the equipment.

On completion of the site acceptance tests, the contractor shall forward the test results certified by him to the Engineer-in-charge. When the Engineer-in-charge has received the results and deems that the plant has successfully passed the tests, he will write to the contractor to that effect. During the site acceptance tests the Engineer-in-charge shall inform the contractor of any minor faults detected and which of these minor faults shall be corrected before the beginning of the tests on completion.

6.5.1.3 TESTS ON COMPLETION

The contractor shall notify the Engineer-in-charge, when the tests on completion shall be made. All minor faults detected during the previous tests shall be corrected to the satisfaction of the Engineer-in-charge, prior to the start of the tests on completion.

The system shall be fully operational and shall operate successfully. During these periods, the whole system shall be available to the Engineer-in-charge.

Testing Schedule

A detailed testing schedule shall be provided. Appropriate check-lists and detailed test procedures shall be enclosed.

6.5.2 TRIAL OPERATION

The trial operation shall occur with full responsibility of the contractor. The trial operation shall take place after finishing the tests on completion. For starting the trial operation, it is required, that all tests on completion are finished positive for the entire installation and shall occur within 21 days.

The trial operation shall show the evidence of a fully functional operation of the tunnel and that security is given during operation. Therefore, the trial operation shall occur without significant malfunctions.

The contractor shall test different operation cases during the trial operation (e.g. loss of different equipment etc.).

The contractor shall make organizational measurements during the trial operation, so that malfunctions can be rectified as soon as possibly (within max. 2 days).

The results of the different tests during trial operation shall be shown in a protocol. This protocol shall be signed by the contractor and the employer. If the protocol shows, that all contractual conditions are kept, the tunnel shall be taken over by the employer.

- 6.6 STAFF TRAINING :** Training of KRCL / RAILTEL/Northern Rly shall be in accordance of para 11 of RDSO Specification RDSO/SPN/TC/109/2019 with latest Amendment/Revision.

6.6.1 GENERAL

During the contract period, the contractor shall provide training manuals, as well as on-site training and training courses to ensure that the employer's staff associated with this project may acquire full knowledge and appreciation / understanding of all aspects of the design, day to day operation, breakdown and routine maintenance and fault diagnosis of the control equipment as well as the belonging hard- and software.

The contractor shall train the employer's personnel about all equipment in

theoretical and practical way including maintenance.

The employer will nominate staff, who are attending the training courses.

The contractor shall nominate qualified instructors.

The contractor shall provide all relevant and necessary facilities which are needed for complete and effective staff training (such as video, TV, slide-and film-projectors and others).

Within two months after the signing of the contract, the contractor shall submit a detailed syllabus for the training courses and Period of training for approval by the Engineer-in-charge.

6.7 DRAWINGS AND DOCUMENTS REQUIREMENTS

Working detail drawings and descriptions of materials and equipment shall be submitted and shall include sizes, details and arrangements of numbers, method of assembly and testing, lists of materials and such other data as required, to check the adequacy of the proposed installation.

Submittals shall include the documents as per clause 12 of RDSO Specs RDSO/SPN/TC/109/2019 with latest Amendment/Revision and any other document asked elsewhere in technical specification or as advised by Site Engineer/Engineer-in-charge.

Apart from documentation in para 12 of RDSO specification No. RDSO/SPN/TC/109/2019, following additional drawings and documents are required to be submitted:

Sr	Document Name	Applicable For	Stage of Submission
1.	Detailed Interface Document	All VHF communication subsystems for entire scope of work.	Before procurement of material.
2	Detailed Design (*): The detailed design submitted will be proven and tested and will comprise of the technical specification of the proposed equipment with catalogues (which may include operational parameters, testing procedures) etc.	Complete VHF communication system in the section	Before procurement of material.
3	FAT Plan	All VHF communication subsystems for entire scope of work.	Before procurement of material

Sr	Document Name	Applicable For	Stage of Submission
4	Installation Drawing - Equipment and cable layout plan, method statement etc. (*)	All sub systems for entire scope of work	Before start of installation
5	Commissioning and Configuration plan	All sub systems for entire scope of work	Before commissioning
6	Operating manual	All sub systems for entire scope of work	Before commissioning
7	SAT Plan	All sub systems for entire scope of work	Before commissioning
8	Maintenance Manual	All sub systems for entire scope of work	Before commissioning
9	Handover Report & Document	All sub systems for entire scope of work	Before commissioning

Note (*):

The list of Detailed Design documents and Installation drawings to be submitted by the contractor includes:

- General Arrangement Drawings
- Schematic Drawings
- Electromagnetic compatibility report
- General assembly showing mounting arrangement and overall dimension
- Summary report of the design
- Schematic and wiring diagram with explanation sheet
- Name / Rating plate of the equipment

The following documents shall be provided before the procurement:

- List of Sub-contractors / Suppliers / Vendors for all the items
- List of supplies and performance report for the tendered equipment from user

The following document shall be submitted during installation

- Weekly/ Monthly Progress Report.

In addition to the hard copies as specified, the contractor shall submit three set of their soft copies in suitable storage device (USB/HDD).

6.7.1 STAGE OF DOCUMENTATION

The documentation shall be submitted at three different stages as followed:

- Project for execution
- As-built documentation
- Manuals for operation and maintenance

6.7.1.1 PROJECT FOR EXECUTION

6.7.1.1.1 FINAL SYSTEM PROPOSAL

The purpose for the final system proposal shall be to form a complete basis on which detailed work can proceed. Without the specific written approval by the engineer-in-charge, the contractor shall not place any equipment on order or begin with the manufacture of any plant/equipment until the Engineer-in-charge has approved the final system proposal.

This final system proposal phase shall include specifications of:

- VHF Tunnel Communication sub-systems
- Acceptance testing

The final system proposal specification shall ensure all interfaces are considered with other system.

6.7.1.1.2 SOFTWARE FINAL SYSTEM PROPOSAL

The software final system proposal shall contain flow charts and descriptions of the complete software structure explaining the operation and interaction of the various programs. All operation functions and interfaces to be provided in each central and local system(s) shall be specified. The interfaces between single programs and data structures shall be designed. Critical timings shall be evaluated and displayed.

The document shall concentrate on producing and describing an adequate overall system design with unified systems of data modification, etc.

If standard programs are used, the detailed documentation for each program shall be provided. This shall include a functional description of the program(s), with flow charts, table structures, interfaces, definitions, timings, storage and the source listings etc.

For off-the-shelf software packages, which shall be part of the completed application software, off the shelf software package's detailed documentation shall be supplied.

The final system proposal specification shall ensure all interfaces are considered with other system.

6.7.1.1.3 HARDWARE FINAL SYSTEM PROPOSAL

The hardware final system proposal shall be written in conjunction with the standard items for the component processor and associated peripherals. If any of the hardware shall be designed or modified for this specification, the specified technical details shall be defined. The proposal shall include a detailed description of the processor system, the method of connection of the peripherals and the transfer of information, including the data transmission system. A full breakdown of the equipment shall be presented with physical layout, interconnections and power supply arrangements.

The final system proposal specification shall ensure all interfaces are considered with other system.

6.7.1.1.4 ACCEPTANCE TESTING

All test specifications, schedules for acceptance tests to be performed at the various stages described above in item 6.5 (“Tests”), shall be finalized during the final system proposal stage. These shall form the basis on which detailed test procedures can be written.

- **Hardware Tests:** All hardware test schedules shall be defined. This definition shall include reviews and modifications from the contractor’s standard factory tests if required. A review of the standard diagnostics shall be undertaken.
- **Software and System Tests:** This shall include all acceptance tests to be performed on the individual programs and the complete system. Detailed test specifications, schedules for all tests described elsewhere in these specifications and any other tests as necessary for demonstration of the performance, correct operation of the system, etc. shall be provided. The sequence of tests and the grouping of equipment for each test shall also be defined.

6.7.1.2 AS-BUILT DRAWINGS

Preparation of the as-built drawings shall be part of these specifications. As-built drawings will be revised final design drawings of the project showing the actual work done.

The contractor shall provide the as-built drawings in one original and one reproducible negative produced from the original, with the names of the signature authorities of the employer, the Engineer-in-charge and the contractor. After they are signed for approval, five prints shall be taken from the signed original of each drawing. Also all as-built drawings shall be handed to the employer in storage device (USB/ HDD).

Together with the as-built drawings, the contractor shall provide six sets of reduced size (e.g. A3 size) booklets of the as-built drawings. All details, dimensions, texts, etc., on the reduced size drawings shall be clearly recognizable and readable.

The contractor shall complete and obtain the approval of Engineer-in-charge on the as-built drawings and make the final submission of the as-built drawings together with the A3 size booklets latest within three months following the date of the Certificate of Completion.

All costs associated with the provisions mentioned above shall be deemed to be included in the contract price.

6.7.1.3 FINAL SYSTEM MANUALS AND INSTRUCTIONS FOR OPERATION AND MAINTENANCE OF EXECUTED WORKS

In order to maintain the liaison between the contractor's organization and the Engineer-in-charge, documentation concerning each part of the specifications shall be produced as part of each component job /

work, in such a form which can be issued immediately.

The contractor shall propose a modular system of build-up of this information.

Sections issued during the contract shall be regarded as a draft form, as subsequent jobs shall inevitably interact and require modification, documentation is vital even if several re-issues are necessary.

The contractor's proposal shall include provision for resources to produce the documentation throughout the contract.

Effort shall be given on recording and familiarity with the presentation of information maintained, by writing documentation issued during the contract in a form suitable for inclusion in the relevant final manuals.

A copied set of the standard, proprietary documentation of all the equipment supplied under this contract shall be provided within the first five months of the contract. It shall be acceptable if such standard documentation is submitted as part of the documentation forming the final system proposal. But finally, a number of at least 5 pieces of copied sets shall be handed over to the employer.

6.7.1.3.1 FINAL DOCUMENTATION - SYSTEM MANUALS

The final documentation shall consist of the following parts:

- SW manual
- Programming Manual
- Hardware maintenance and servicing manuals, including all equipment

Where appropriate, standard documentation and project documentation submitted during the contract shall be included in the final system manuals.

Not less than six weeks before the commencement of the site acceptance tests, three draft issues of the final system manuals shall be submitted to the Engineer-in-charge for information and approval. This draft issue shall have the same number of parts and format as the final system manual. Re-issues shall be provided if site commissioning and tests make this necessary.

When approved, one copy of the draft documentation, amended as required, shall be returned to the contractor.

Six complete sets of the final system manuals together with six copies of complete subject index shall be supplied before the issue of the taking

6.7.1.3.1.1 SOFTWARE MANUAL

The software manual shall include the system's programs and the system's data records. The information shall follow the specification of the final system proposals.

The manual shall explain the overall software structure with flow

charts and descriptions, with particular attention to the points at which further user programs can be interfaces. It shall be essential that the complete operating structure is explained in such a way that it may be clearly understood, especially by any competent programmer who wishes to specify or interface a new program into the system. Each program shall have a general description with a related flow chart. In the overall description, the allocation of the addressable storage of the component's jobs shall be listed, with limits of spare capacity. A detailed description of each component's job in the operating system shall follow, including the executive-, handler- and user-programs (the newest version and inclusive updates).

The format of all data structures shall be described as a second part to the manual. The data records of diagram formats, variables etc., shall be listed in a form compatible with the data updating system.

Source listings for all software supplied, including standard and application program libraries, shall form part of this manual, except for off-the-shelf software packages for which only a right of use can be purchased.

6.7.1.3.1.2 HARDWARE, MAINTENANCE AND SERVICING MANUAL

The manual shall contain a description of the complete hardware system followed by maintenance procedures. The maintenance procedure for tunnel shall be such that in case of maintenance or accident, the tunnel management shall be done manually by the maintenance people at the Control Centers. For standard equipment, proprietary documentation shall be included.

The hardware description shall start with the overall configuration of the system, with layouts showing the location of every unit, with block diagrams and explanation of the operation. Detailed descriptions of component units shall explain their operation. Block diagrams (showing the flow and interaction of data), logic diagrams, circuit diagrams (with component values) and layout diagrams including cabling diagrams (showing the interconnection between equipment) shall be provided. Part- and cable-lists shall be provided, but care shall be taken to avoid these obscuring the operational description. Maintenance procedures shall cover the diagnosis of faults, testing and set-up adjustments, replacement of units, routine mechanical servicing and operation of test equipment.

The use of test programs shall be explained with step-by-step instructions. The detailed listing of the programs itself shall be provided separately.

Step-by-step-description for the replacement of plug-in units of the computer system shall be given, with set-up values and checking of

power supply voltages etc. where appropriate. Routine mechanical servicing shall be covered.

Sections on the following equipment shall be bound in separate volumes, for easier of use by the maintenance personnel:

6.7.1.4 PRESENTATION OF DOCUMENTATION

All documentation shall be in English language.

All documentation shall carry an unique issue number and date.

All documentation shall be indexed, with a complete subject index in the final issue.

All documentation shall be produced in a uniform format in compliance with the employer's requirements. All diagrams relating to the final documentation shall be reduced to page height, bound and correctly referenced to the text.

The final documentation shall be delivered in durable hard cover-bindings. The bindings shall be in a loose-leaf form (ring-binders) and permit easy interchange or replacement of pages. Each ring binder shall be identified by an easily readable title applied / attached to both, the front face and the spine of the ring-binder.

Seven copies of each document shall be provided.

6.7.1.5 CONTRACTOR'S DRAWINGS

The contractor shall submit drawings in such a form as the Engineer-in-charge will require them for approval, copies as required of all drawings, diagrams and details of all equipment in part or in whole. The contractor shall make any drawings available to the Engineer-in-charge at all reasonable times. Wiring diagrams and other drawings as the Engineer-in-charge deems shall not be finally settled until satisfactory installation and testing has been made, this shall be approved in principle.

The contractor shall submit a schematic block diagram of the equipment showing the manner, in which the functional requirements of this specification shall work together.

Before the contractor begins installing of his parts of the contract, the contractor himself shall check all civil works ensuring all equipments can be installed.

Within one month after the signing of the contract, the contractor shall submit a schedule for the production, submission and approval of drawings/registers/indexes/any information including details of numbering, required for the Engineer-in-charge in connection with the design of the works.

7.0 General specification for Installation and Execution part:

All of the execution works shall be done as per extant practices on Northern Railway, site conditions and instructions of the Engineer-in-Charge. The Contractor shall not execute the work that may interfere with train traffic until adequate protection has been arranged as per the instructions of the site in charge. Contractor will be himself responsible for the safety of his personnel during execution of work. Railway will not be responsible for making payment for any type of compensation. The Contractor shall make his own arrangement for accommodation for his staff during execution, testing and commissioning period. Water for drinking purpose if available at the station will be given. However, Railways take no guarantee for this facility. Power supply will be given for installation work including battery charging, wherever available on chargeable basis. Non-availability of Power will not be a reason for the slow progress of work. If power is not available the contractor shall make his own arrangement for portable Generator set /Electrical power.

Note: All of the execution work shall be done as per standard practices of Railways, according to site conditions and as per the instructions of site in-charge nominated by Railways.

7.1 Installation of Master unit

- 7.1.1** The master unit should be installed in 42 u rack mount at station or at the location specified in the drawing or by the site supervisor.
- 7.1.2** This covers installation of master unit, installation of software (if any) and configuring the set to work in the system as per railway requirement, Termination of all cables with proper cabling arrangement as per site supervisor, Extending local power supply available up to the equipment.
- 7.1.3** If any additional accessories or interfaces are required for proper installation of system, which is not covered in tender schedule and specification, the contractor need to provide the same at his own cost.

7.2 Installation of Remote unit

- 7.2.1** The Remote unit should be installed at the location specified by the Engineer-in-charge as long as it is meeting technical requirements.
- 7.2.2** This covers installation of Remote unit, installation of software (if any) and configuring the unit to work in the system as per railway requirement, Termination of all cables with proper cabling arrangement as directed by Engineer-in-charge, Extending local power supply available up to the equipment.
- 7.2.3** If any additional accessories or interfaces are required for proper installation of system, which is not covered in tender schedule and specification, the contractor need to provide the same at his own cost.

7.3 Guidelines for Leaky cable installation

- 7.3.1** The unit cost of installation of leaky cable shall include any additional accessories or interfaces required for proper laying, fixing, terminating and protection of cable, which is not covered in tender schedule, the contractor need to provide the same at his own cost.
- 7.3.2** For transmitting and receiving of the frequencies in the tunnel tube, as well as in the accesses two leaky feeder cables shall be foreseen. One is for TX-signal and the other one for RX-signal.
- 7.3.3** A disconnection of the leaky feeder cable shall not stop or interfere the operation of the System. Each amplifier of the System shall supply leaky feeders upto a length of approximately 500 m to the left and right side combined depending upon the system specifications.
- 7.3.4** Depending on the installation site, the cable shall be mounted with cable holder, spacer, cable clamps, plain washers, and so on.
Fixing arrangement of Leaky Coaxial Cable (LCC) consists of stainless-steel clamp of approved design spaced at every 10 mtr and Nylon Clamp at every 01 mtr. fixed to the ceiling/wall of tunnel shall hold the LCC. The LCC for VHF shall be provided on tunnel wall/ceiling at both sides of alignment in the tunnel in view of UP Link/Down Link segregation at Bi-Directional Antenna and Optical Remote Unit level up to Optical Master Unit.
- 7.3.5** The course of the leaky feeder cable shall be straight.
- 7.3.6** In those areas, where concrete (concrete is a cement-sand mortar that is sprayed onto formwork, walls, or rock by a compressed air ejector giving a very dense strong concrete layer: used to repair reinforced concrete, to line tunnel walls or mine airways, etc) is used in the tunnel, first a steel-wire rope shall be fixed to share load of leaky cable. Onto this steel-wire rope the leaky feeder cables shall be fixed. The unevenness of the tunnel walls shall be leveled by using corresponding spacers, so that the steel-wire rope runs straight. The cost of steel-wire rope shall be included in the cost of installation of the leaky feeder cable.
- 7.3.7** The instructions of the cable producer and the Indian Standards, which pertain to the installation of the leaky feeder cable shall be considered. Furthermore, actions for mechanical protection (e.g. guide roller) shall be used. The cables shall not be pulled on the concrete, edges, etc. so that they are not damaged
- 7.3.8** The leaky feeder cable shall be mounted on the walls/roof of the tunnel tube. The exact location of the leaky feeder cables will be finalized after joint inspection with contractors and railway representatives.
- 7.3.9** Terminal resistors, which are situated in the tunnel tube or accesses, shall be made moisture proof with shrink tubes. These shrink tubes shall be coated with adhesive inside.
- 7.3.10** For transmitting of control signals, the leaky feeder cable shall not be used. The power supply must not run through/via the leaky feeder cable.
- 7.3.11** The functionality of the whole system shall be verified with calculations. These calculations shall be handed over to the employer.

7.4 Installation of 19" 42 U rack

- 7.4.1** Rear door shall be perforated appropriately as per industry standards.
- 7.4.2** Compact fan module of 90 CFM working on AC power supply 4 nos. with each rack properly fitted at top of rack.
- 7.4.3** The earth termination kit consisting of copper bus bar with dimensions 20 inch length, 1.0 inch breadth & 5mm thickness (min.) having 12 holes and 3 Brass nut bolts and washers for fixing of earthing cables shall be fixed near the bottom of the rack.
- 7.4.4** The rack should be preferably fixed to the floor with bolts embedded securely in the floor with cement. Alternatively, at locations where desired, racks should have wheels so that they can be moved easily.

7.5 Installation of Class 'B' type & Class 'C' type protection

- 7.5.1** All the wiring connections should be in TT configuration.
- 7.5.2** Installation to be done as per standard practice in Northern Railway.
- 7.5.3** Installation cost should include cost of all necessary cables, connectors, fixtures required for installation and connectivity as per site requirements.

7.6 All Consumables and Hardware

- 7.6.1** The contractor shall provide all consumables, hardware and erection material as is required for the complete installation of the system at his own cost as below. These materials shall include but not limited to the following.
 - Consumables: Drilling and metal/wood cutting accessories, soldering equipment and accessories, welding accessories like rods and gas, oil & grease, cleaning fluids, paints, cotton waste, electrical tape, etc.
 - Hardware: Nuts & bolts, washers, screws, nails, brackets, supports, hangers, saddles, cleats, clamps etc.
 - Materials: Conduits and accessories, junction boxes, terminal blocks, various types of cards like USB, HDMI, VGA, RCA, Audio etc. as per site condition, connectors, lugs, ferrules, brass glands, ground wires etc.
- 7.6.2** Any other material required for complete installation of the system, but not mentioned in the estimate has to be included under this item and needs to be supplied by contractor at no additional cost.

7.7 OFC Work

- 7.7.1** This section deals with blowing/laying of OFC specifications under which the various work for trenching, laying of HDPE Duct, termination and testing of optical fiber cable coming under the purview of the contract are to be executed by the contractor.

7.7.2 Laying of OFC through DWC/HDPE pipe/ Cable Tray/Duct/Trench

The S&T cable in tunnel shall be laid inside cable tray/Duct/Conduit/Trench. The OFC cable shall be laid inside covered metal Cable tray or HDPE duct (wherever duct is provided instead of cable tray).

OFC cable laid shall be aligned properly and firmly secured at interval of not more than 100 meters with tie/clamps in the cable tray.

7.8 Handling of Cable Drums & HDPE Duct

- 7.8.1** Before commencement of the laying, inspection of the trench and inspection of protection works should be carried out so as to ensure their conformity with the specification. The trench bottom should be clean, smooth and free of small stone. When the soil contains stone or pieces of rock, sieved earth about 10 cm. thick should be used both for the bedding on which the HDPE duct is laid and for covering the cables.
- 7.8.2** The drums shall be unloaded by 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.
- 7.8.3** 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 otherwise indicated on a drum.
- 7.8.4** The drums shall always be kept upright, i.e. axle in parallel position to the base. The drums shall not be set by jerks but shall be handled slowly and with care. The walls of the drums should not be damaged while moving the drums if required for un-rolling.
- 7.8.5** 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 cable drums 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 re-fix the battens carefully.
- 7.8.6** The drum should be properly mounted on jacks (or on a cable wheel) (RDSO drawing -SDO/CABLE LAYING/021) 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 seal attached to the flange of the drum and cut the security ropes so as to leave the cable free to move.
- 7.8.7** If a portion of the cable only is taken out from the cable drum, the battens should be immediately re-fix to prevent damage to the balance of the cable.

7.8.8 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.

7.8.9 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 break the cable drum by standing in front but only from side.

7.8.10 Rewinding and Re-drumming of cables

1	If for any reason if it is found necessary to rewind the cable on a drum, drum of a proper barrel diameter not less than of the original drum should be chosen.
2	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 lead. The cable should not be bent opposite to the set it is having already.
3	In the re-drumming operations, drums should be so turned that the cable passes from the bottom of the original set with as little gap as possible.
4	Replace all the lagging on the cable drum.

7.9 Joint Enclosure

Splicing of 24/48C OFC has to be done as per requirement, complete to the finished item of work and as directed by the Engineer-in-charge. Splicing of OFC has to be done using joint enclosure in open area/Tunnel/Bridges or using “Splicing Tray” of 24/48 fibers and same should be kept inside metal box of suitable size and same should be fixed on tunnel wall with all accessories.

7.9.1 Splicing

7.9.1.1 Straight / Branch Joint for Fiber Optic Cable

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

7.9.1.2 The Optic Fiber joint closure shall be of reputed make like TVSE, Raychem, 3M etc. and the same may be approved by KRCL / RAILTEL before use. All the 24/48 fibers are required to be terminated at locations specified by Engineer-in-charge. The joint shall be protected in concrete chamber.

7.9.1.3 However, generally, the following steps are involved for jointing of the cable

- (a) Preparation of cable for jointing
- (b) Stripping/cutting the cable
- (c) Preparation of cable and joint closure for splicing
- (d) Fiber splicing
- (e) Organizing fibers and finishing joints
- (f) Sealing of joint closure and
- (g) Placing joint in pit

7.9.2 Preparation of Cable for Jointing

7.9.2.1 During the installation, a minimum of 5 meters 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.

7.9.2.2 The pit size must be chosen carefully to ensure the length of the way on which joint is mounted is greater than closure length plus twice the minimum bending radius of the cable. A pit length of 1 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.

7.9.2.3 The cable is then coiled on to the pit wall in the same position as required after the joint is complete. The marking is done on all the loops so that it will be easier to install it later.

7.9.2.4 The distance from the last center to the end of the cable must be at least 1.8 meter. This is being the minimum to be stripped for preparation of joint.

7.9.2.5 Sufficient cable at each end up to the jointing vehicle/enclosure is then uncoiled from the pit for jointing.

7.9.3 Stripping / Cutting of the Cable

7.9.3.1 The cables are stripped of their outer and inner sheath with each sheath staggered approximately 10mm from the one above it.

7.9.3.2 Proper care must be taken when removing the inner sheath to ensure the fibers 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 sides of the cable, rather than cut completely through it. The two scores marking on either side of the cable are then stripped of the inner sheath by hand quite easily

7.9.3.3 The fibers are then removed from cable one by one and each fiber is cleaned individually using Kerosene to remove the jelly.

7.9.4 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 fiber organizer used. However, the following steps are usually common:

- 7.9.4.1** The strength member of each cable is joined to each other and/or the central frame of the joint closure.
- 7.9.4.2** The joint closure is assembled around the cable.
- 7.9.4.3** The sealing compound or heat shrink sleeve is applied to the cables and closure or prepared for application after splicing is complete.
- 7.9.4.4** The fibers are protected (usually with plastic tubing) in their run from the cable core to the Fiber organizer trays (particularly if cable construction is slotted core type).
- 7.9.4.5** Tags which identify the fibers nos. are attached at suitable locations on the Fibers.
- 7.9.4.6** Splice protectors are slipped over each fiber in readiness for splicing over the bare Fiber after splicing.

7.9.5 Stripping and Cleaving of Fiber

- 7.9.5.1** Prior to splicing each fiber must have approximately 50mm of its primary protective U.V. cured coating removed, using Fiber stripper which are manufactured to fine tolerances and only score the coating without contacting the glass Fiber.
- 7.9.5.2** The bare fiber is then wiped with a lint free tissue doused with ethylalcohol.
- 7.9.5.3** Cleaving of the fiber is then performed to obtain as close as possible to a perfect 90 degrees face on the Fiber.

7.9.6 Method of Fusion Splicing of the Fiber

Some of the general steps with full automatic microprocessor control splicing machine is as under:

- 7.9.6.1** Wash hands thoroughly before start of splicing.
- 7.9.6.2** Dip the clean bare fiber 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).
- 7.9.6.3** Place the bare fiber inside 'V' groove of the splicing machine by opening clamp handle such that the end of fiber is app.1 mm. over the end of the 'V' groove towards the electrodes.
- 7.9.6.4** Repeat the same procedure for other fiber, however first insert heat shrink splice protector.
- 7.9.6.5** Press the start button on the splice controller.
- 7.9.6.6** The machine will pre fuse, set align both in 'X' and 'Y' direction and then finally fuse the fiber.

- 7.9.6.7** Inspect the splice on monitor if provided on the fusion splicing machine and assure no nicking, bulging is there and cores appear to be adequately aligned if the splice does not visually look good repeat the above procedure.
- 7.9.6.8** Slide the heat shrink protector over the splice and place in tube heater. Heat is complete when soft inner layer is seen to be ‘oozing’ out of the ends of the outer layer of the protector.
- 7.9.6.9** Repeat the same procedure for all the other fibers.

7.9.7 Organizing Fiber and finishing Joints

- 7.9.7.1** After each fiber is spliced, the heat shrink protection sleeve must be slipped over the bare fiber before any handling of fiber takes place, as uncoated fibers are very brittle and cannot withstand small radius bends without breaking.
- 7.9.7.2** The fiber is then organized into its tray by coiling the fibers on each side of the protection sleeve using the full tray side to ensure the maximum radius possible for fiber coils.
- 7.9.7.3** The tray is placed in the position.
- 7.9.7.4** OTDR reading taken for all splices in this organized state and recorded on the test sheet to confirm that all fibers attenuation are within 0.02 dB per splice. This OTDR test confirms fibers were not subjected to excessive stress during the organizing process.
- 7.9.7.5** After this the joint can be closed with necessary sealing etc. and ready for placement in the pit.

7.10 Termination of OFC in FDMS

The OFC has to be terminated in the FDMS as directed by the Engineer-in- Charge as per site requirement.

7.10.1 Testing of fibers and submission of as made drawings

The contractor has to do the testing and commissioning of OFC system from Cable hut to cable hut with proper lead in and lead out through G.I Pipe, splicing and termination as directed by KRCL / RAILTEL Engineer-in-charge. Testing and commissioning after defect rectification if any defects located during the testing, obtaining the clearance from KRCL / RAILTEL in the form of acceptance certificate, preparation of test reports, as build drawings of cable route plan and OFC jointing location schedules in CAD format and submission of 2 soft copies in CDs and 3 hard copies in A3 size etc., complete to the finished item of work and as directed by the KRCL / RAILTEL Engineer-in-charge.

- (i) Testing consists of OTDR reading and power meter reading of all fibers. Station to station testing is required for fibers terminated at block stations. Run through fibers may be tested from end-to-end terminations only. OTDR readings are to be taken in 1310 nm and 1550nm windows and one set of readings to be recorded in soft as well as hard copy and submitted

duly counter signed by contractor's authorized representative and Engineer-in-charge.

- (ii) Reports: The reports consists of (a) tabulation of all events reported by OTDR of more than 0.2 db over the section for all fibers tested, (b) Tabulation of power loss from A-B & B-A direction, average and loss per **km in both 1310 & 1550 nm for all the fibers tested.**

7.10.2 Test Protocol for Optical Fiber Cable

SYSTEM TEST PROTOCOL – OPTICAL FIBRE CABLE – FIELD TEST		
Route: _____	Date: _____	
Station: _____	No. of mid-section splices: _____	
Section: _____	Measured by: _____	
Length (by OTDR): _____	Length as per meter marking on cable sheath: _____	
Optical measurements (On Line): _____		
Measurement	Fiber – number 1 2 3 4 22 23 24	Accepted Value
Total attenuation at 1300 / 1550 nm with OTDR		
Total attenuation per Km at 1300 / 1550 nm		<0.40 dB/Km at 1300 nm & <0.25 dB/Km at 1550 nm
Splice Loss in dB with OTDR Location		Average splice loss
OHE Mast No. / Overhead alignment post no. A. B. C. D. E		
Average Splice Loss		0.15 dB/Splice

Note: Also attach OTDR Results ---	
Visual Inspection (On Line):	
2.1 No. of Cable drum used in the section: _____	
2.2 S.No. of cable and length of each drum:	
<u>S.No.</u>	<u>Length</u>
1.	_____Mtr
2.	_____Mtr
3.	_____Mtr
4.	_____Mtr
5.	_____Mtr
2.3 Location of Isolation Sleeves: 1.	
2.	
3.	
Contractor's Representative	KRCL / RAILTEL's Representative

7.10.3 Tools and Equipments required for Jointing and Termination of Fiber Optic Cable

- 1) Branch 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 Generator
- 25) Umbrella (2 Nos)
- 26) Dust protection for splicing machine

Note: Wherever cable has to be coiled/looped, the diameter of the coil/loop shall be greater than 50 times the diameter of the cable.

7.10.4 Replacement of Defective OFC: No defects like high loss events and fiber breaks are permitted and the contractor shall at his cost replace the entire drumlength of cable of KRCL / RAILTEL's specification and in any case not less than the length of the drum being re-laid. The contractor also at his cost blows the cable again including the splicing/Termination of the cable. No joints with pieces of OFC are permitted. In case of any deviation, specific approval from Competent Authority of KRCL / RAILTEL should be obtained.

8.0 TEST & MEASURING INSTRUMENTS, SPECIAL TOOLS AND INSTALLATION MATERIAL:

- 8.1** All tests and measuring instruments and other arrangements required for all the acceptance tests shall be made available by the contractor free of cost for conducting the tests.
- 8.2** Special tools required for installation and maintenance of all the equipments shall be arranged by the contractor in adequate quantities. The contractor shall provide all installation material for complete commissioning of the system.

Details of Section

Sr	Station/Tunnel/Bridge	Code	Ch. Km		Bridge Length	Tunnel Length	Cutting /Open Length
			From	To			
1	Shri Mata Vaishno Devi Katra	SVDK	24.806				
2	Cutting		24.806	26.500			1694
3	Tunnel No.9	T-9	26.5	27.986		1486	
4	Tunnel Approach		27.986	28.004			18
5	Bridge 32	Br.32	28.004	28.278	274		
6	Tunnel No.10	T-10	28.278	29.25		972	
7	Tunnel Approach		29.25	29.28			30
8	Bridge No.33	Br.32	29.28	30	720		
	Northern Railway Portion				994	2458	1742
9	Tunnel No.1	T-1	30	33.159		5072	
10	Open space		33.159	33.18			21
11	Bridge No.34	Br-34	33.18	33.212	32		
12	Tunnel No.2	T-2	33.219	38.415		5196	
13	Escape Tunnel	ET-2	33.225	38.415		5190	
14	Open space		38.415	38.487			72
15	Bridge No.35 (Anji)		38.487	39.174	687		
16	Tunnel No.3	T-3	39.201	42.21		3009	
17	Bridge No.38	Br-38	42.21	42.349	139		
18	Open Space		42.349	42.475			126
19	Bridge No.39	Br-39	42.475	42.658	183		
	Reasi Station		C/L 42.740				
20	Open Space		42.658	42.861			203
21	Bridge No.40 (Culvert Br.)	Br-40	42.861	42.865	4		
22	Open space		42.865	42.978			113
23	Tunnel No.5	T-5	42.978	48.937		5959	
24	Escape Tunnel	ET-5	43.012	48.944		5932	
25	Open space		48.937	48.988			51
26	Bridge No.41 (Culvert Br.)	Br-41	48.988	48.993	5		
27	Open space		48.993	49.232			239
28	Bridge No.42 (Culvert Br.)	Br-42	49.232	49.247	15		
	Salal-A Station		C/L 49.200				
29	Open space		49.247	49.478			231
30	Bridge No.43	Br-43	49.478	50.255	777		
31	Open space		50.255	50.4			145
32	Bridge No.44 (Chenab Br.)	Br-44	50.4	51.715	1315		
	Salal-B (Halt Station)						
33	Open Space		51.715	51.935			220
34	Tunnel No.6	T-6	51.935	55.428		3493	
35	Open Space		55.428	55.446			18
38	Bridge No.53	Br-53	55.446	55.543	97		
39	Open Space		55.543	55.559			16
40	Tunnel No.9	T-9	55.559	56.018		459	
41	Open Space		56.018	56.273			255
42	Bridge No.55	Br-55	56.273	56.298	25		
43	Open Space		56.298	56.316			18

Sr	Station/Tunnel/Bridge	Code	Ch. Km		Bridge Length	Tunnel Length	Cutting /Open Length
			From	To			
44	Tunnel No.10	T-10	56.563(56.316)	57.573		1010	
45	Open Space		57.573	57.582			9
46	Bridge No.56	Br-56	57.582	57.607	25		
47	Open Space		57.607	57.62			13
48	Tunnel No.11	T-11	57.62	58.451		831	
49	Open Space		58.451	58.482			31
50	Bridge No.57	Br-57	58.482	58.508	26		
51	Open Space		58.508	58.522			14
52	Tunnel No.12	T-12	58.522	60.645		2123	
53	Open Space		60.645	60.68			35
54	Bridge No.58	Br-58	60.68	60.778	98		
	Dugga Station		C/L 60.815				
55	Open Space		60.778	60.87			92
56	Bridge No.59	Br-59	60.87	60.984	114		
57	Open Space		60.984	61.013			29
58	Tunnel No.13	T-13	61.013	70.381		9368	
59	Escape Tunnel	ET-13	61.067	70.176		9109	
	Basindadhar Station		C/L 70.386				
60	Open Space		70.381	70.404			23
61	Bridge No.60	Br-60	70.404	70.645	241		
62	Open Space		70.645	70.667			22
63	Tunnel No.14 (*) Including IRCON tunneling section	T-14	70.667	76.951		6284	
64	Escape Tunnel	ET-14	70.661	76.951		6290	
65	Open Space		76.951	77.072			121
66	Tunnel No. 15 (IRCON)	T-15	77.072	86.828		9756	
67	Escape Tunnel	ET-15	77.072	86.828		9756	
68	Tunnel No.40/41 (continuation in IRCON Tunnel T15)	T-40/41	91.2	92.548		1348	
69	Open Space		92.548	92.645			97
70	Bridge No.81 (Culvert Br.)	Br-81	92.645	92.651	6		
71	Open Space		92.651	93.24			589
72	Bridge No.82 (Culvert Br.)	Br-82	93.24	93.246	6		
71	Open Space		93.246	93.3			54
	Sangaldan Station		C/L 93.300				
					4789	92643	4599

APPENDICIES

Appendix -1

Tenderer's Information

All individual firms and each partner of a joint venture are requested to complete the information in this form.

1. Name of Tenderer

2. Head office Address

3. Address on which correspondence should be done with Tel. Nos., Fax No. & E-mail address

4. Place of incorporation / registration

5. Year of incorporation / registration

6. Constitution of Tenderer

I) Specify, if the Tenderer is

- a. An individual
- b. A proprietary firm
- c. A firm in partnership
- d. A Limited Company or Corporation
- e. A group of firms / joint venture

(If yes, give complete information in respect of each member)

II) Attach a copy of Proprietorship or Partnership Deed or Article of Association or Incorporation of Company or JV Agreement as the case may be.

7. Give particulars of registration with Govt./Semi Govt./Public Sector Undertakings/Local Bodies

8. PAN No -----

9. PF No -----

10. GST No. -----

11. Bank details -----

Appendix - 2

Statement of Similar Works (as defined clause 5.2 of Instruction to Tenderer) successfully completed during last 07 (seven) years, ending last day of month previous to the one in which tender is invited.

Name of Work	Contract No. & Date	Name & Address of client (Including Tel./Fax No.)	Contract Value in Rs. Original/ Revised	Date of Award of work	Date of actual start of work	Date of scheduled completion	Actual date of completion	Completion cost including cost of cement and steel	Remarks explaining reasons for delay in work completion, if any	Reference to Certificate supporting the information
1	2	3	4	5	6	7	8	9	10	11

Note :-

- (1) Tenderer should provide information as per this proforma for the firm/company and for each member in case of joint venture for all completed for all completed **Similar Works (as defined clause 5.2 of Instruction to Tenderer)**
- (2) Certificate from principal client for the above information should be attached with the offer, for work to be considered for fulfillment of clause 5.2 of Instructions to Tenderer/s. The client's certificate should inter-alia indicate the date of award, scheduled date of completion, actual date of start and completion, details of work completed during last 07 (seven) years, ending last day of month previous to the one in which tender is invited.

Appendix -3**Statement of Works in Progress**

Tenderer should provide information as per this proforma for the firm/company and for each member in case of joint venture on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate is yet to be issued.

Sr. No.	Name of the work	Date of Award	Contract No. & Date	Name & Address of Client (including Tel./Fax No.)	Contract value (Rupees) Original /Revised	Date of completion Original /Revised	Total payment received till the date of opening of tender	Reference to Certificate supporting the information
1	2	3	4	5	6	7	8	9

Note :

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

Appendix – 4**Statement of Works Abandoned/left Incomplete**

Tenderer should provide information as per this proforma for the firm/company and for each member in case of joint venture for last five financial years ending 31.03.2021								
Sr.	Name of the work	Date of Award of work	Contract No. & Date	Name & Address of Client (including Tel./Fax No.)	Contract value (Rupees) Original /Revised	Percentage of work executed	Month & Year since abandoned	Reason for abandoning the work
1	2	3	4	5	6	7	8	9

Appendix – 5

Total contract amount received : Tenderer should provide information as per this proforma for the firm/company for the contractual payments received in the previous three financial years and the current financial year upto the date of opening of tender.

Sr.	Financial Year	Contract amount received (in Rs.)
1	2018 – 2019	
2	2019 – 2020	
3	2020 – 2021	
4	2021 – 2022 (Upto date of opening of Tender)	

Note: Submit documentary proof as mentioned in Financial eligibility criteria, along with the offer.

Appendix - 6 A

[illegible]

Appendix - 6 B

List of personnel for key positions proposed to be deployed on this project					
Sr. No.	Name	Designation	Qualification	Professional Experience in works as per clause 57.2 of special condition of contract	Name of Work and location where working

Note: - Tenderer/s shall submit curriculum vitae of above personnel

**FORMAT OF CURRICULUM VITAE (CV)
FOR
PROPOSED PERSONNEL FOR KEY POSITIONS**

Proposed Position: _____

Name Firm: _____

Name of Staff: _____

Profession: _____

Date of Birth: _____

Years with Firm / Entity: _____ Nationality: _____

Membership in Professional Societies: _____

Detailed Tasks Assigned: _____

Key Qualifications:

[Give an outline of staff member's experience and training most pertinent to tasks on assignment. Describe degree of responsibility held by staff member on relevant previous assignments and give dates and locations. Use about half a page.]

Education:

[Summarize college / university and other specialized education of staff member, giving names of schools, dates attended and degrees obtained. Use about one quarter of a page]

Employment Record:

[Starting with present position, list in reverse order every employment held. List all positions held by staff member since graduation, giving dates, names of employing organizations, titles of positions held and locations of assignments. For experience in last ten years, also give type of activities performed and client references, where appropriate. Use about three quarters of a page]

Languages:

[For each language indicate proficiency: excellent, good, fair or poor; in speaking, reading and writing.]

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe me, my qualification and my experience.

Date: _____

**[Signature of staff member and authorized representative of the Firm]
Day/Month/Year**

Article I. **Full name of staff member:**

Full name of authorized representative: _____

COMPLIANCE CERTIFICATE

We _____, Contractors of Konkan Railway Corporation Limited do hereby certify that we have complied all the provisions of the Employees Provident Fund & Miscellaneous Provisions Act, 1952 in respect of employees employed by or through us. We are enclosing herewith statement showing the recoveries of contributions in respect of employees employed by us u/s 36(b) of the Employees Provident Fund Scheme, 1952 towards Provident Fund and section 22 of the Employees Pension Scheme, 1995 towards Pension Fund for the month of _____ and deposited the same with PF authorities. Our Provident Fund Account Number is _____.

Place:

Signature of the Contractor

Date:

Seal

Appendix -7 A

[illegible]

Appendix -7 B

[illegible]

Appendix -

List of Measuring Equipment proposed to be deployed for the work

[illegible]

Litigation History

Tenderer should provide information as per this Performa for the firm/company and for each member in case of joint venture on any history of litigation or arbitration resulting from contracts executed in the last 5 financial years ending **31.03.2021** or currently in execution. A separate sheet should be used for each partner of the joint venture.

A) ARBITRATION CASES

Year	Name of Work	Name & address of client	Cause of litigation and matter in dispute	Disputed amount in Rs.	Actual Awarded Amount (in Rs.)

B) COURT CASES

Year	Name of Work	Name & address of client	Cause of litigation and matter in dispute	Name of Court	If judgement given whether for or against the Tenderer

C) Information Regarding Current Litigation, Debarring/Expelling of Tenderer or Abandonment of Work By Tenderer

1	(a)	Has the Applicant or its constituent partners consistent history of litigation.	Yes / No
	(b)	If yes, give details	
2	(a)	Has the Applicant or any of its constituent partner been debarred/expelled by any Agency in India, during the last 5 financial years ending 31.03.2021 and upto the date of application except on account of reasons other than non- performance, such as rescinding of joint venture due to one of the member of joint venture pulling out, court directions leading to breaking up of a joint venture before start of work.	Yes / No
	(b)	If yes, give details	
3	(a)	Has the Applicant or any of its constituent partners abandoned any contract work in India during the last 5 financial years and upto the date of application	Yes/No
	(b)	If yes, give details	
4	(a)	Has the Applicant or any of its constituent partner been declared bankrupt during the last 5 financial years ending 31.03.2021 and upto the date of application	Yes/No
	(b)	If yes, give details, including present status	
5	(a)	Has the Applicant or any of its constituent partner been debarred by any employer/client, KRCL or by any Railway	Yes/No
	(b)	If yes, give details	

NOTE :

1. Separate sheet may be used for giving detailed information.
2. If it is found at any time before finalization of tender, that any tenderer/s has/have furnished misleading/wrong or fraudulent information/documents, his/their tender shall not be considered and the EMD of the tenderer/s will be forfeited. If it is found at any time after finalization of tender, that any tenderer/s has have furnished misleading/wrong or fraudulent information/documents, such case will attract criminal proceedings and work will be terminated and balance work carried out independently and Security deposit shall be forfeited and the Performance Guarantee shall be encashed.

Certificate Regarding Compliance of Instructions issued by Govt. of India for Restrictions under Rule 144 (xi) of General Financial Rule

“I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on Sub-contracting to contractors from such countries,' I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. I hereby certify that this bidder fulfills all requirements in this regard and is eligible to be considered.

[Where applicable, evidence of valid registration by the Competent Authority shall be attached.]

Signature of Tenderer(s)

Date: _____

Seal: _____ .

**To Be Executed on a Non-Judicial Stamp Paper of Rs. 100/- duly signed by
authorised notary**

JOINT VENTURE AGREEMENT

This Joint Venture Agreement executed at on Day of
....., 2021 between M/s
..... (Name of JV)
wherein Registered office of first, second and third party is at
..... and represented through
their constituted attorney Shri.
..... S/o Shri
..... for the first party
and Shri..... S/o Shri.
..... for the second party and Shri.
..... S/o Shri.
..... for the third party (The expression and words of the first and
second and third party shall mean and include their heirs, successors, assigns, nominees
execution, administrators and legal representative respectively)

WHEREAS all the parties are engaged mainly in the business of Civil Engineering and
General Contracts for various Government departments and Organizations.

WHEREAS the parties herein above mentioned are desirous of entering into a Joint Venture
for submitting bid document and if contract awarded, carrying on Engineering and/or
contract works, in connection with
..... and other
works mentioned in tender notice no..... dtd.
..... of Konkan Railway Corporation Limited, in connection with Katra - Dharam
New Rail Line Project or any other work or works, as mutually decided between the parties
of this Joint Venture.

NOW THIS AGREEMENT WITNESSES AS UNDER:

1. That in and under this Joint Venture Agreement the work will be done jointly in the
name & style of M/s
..... (Joint Venture of
M/s....., M/s
..... and M/s).

* clarify whether a company or a partnership firm or a sole proprietary firm.

2. That all the parties shall be legally liable, severally and jointly responsible for the satisfactory/successful execution/completion of the work in all respects in accordance with terms & conditions of the contract irrespective of share and role specified in JV agreement. All the parties shall be jointly and severally liable & responsible for fulfilling the obligations of the tender/bid document.

3. That the role and responsibility of each constituent of the said Joint Venture in details, covering all aspects of the planning and successful completion of the work shall be as under

The first party i.e. the **“Lead Partner”** shall be responsible for the overall execution of all the works under the scope of the contract.

The second party shall be responsible for of the contract work.

The third party shall be responsible for of the contract work.

4. The share of Profit & Loss of each constituent of the said Joint Venture shall be as under

(JV partners have to indicate here)

5. That all the parties of this Joint Venture shall depute sufficient no. of experienced staff as committed to commensurate with their role and responsibilities and as required for the successful completion of the works in close consultation with each other.

6. That the financial investment and other resources required for the successful execution/completion of work under this Joint Venture shall be brought in by the parties as per mutual agreement/understanding between them from time to time.

7. That all the Bank Guarantees shall be furnished jointly by all the parties in the name of Joint Venture.

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8. That the party number M/s to this Joint Venture shall be the prime (lead partner) contractor and will be responsible for timely completion of work and to coordinate with the Konkan Railway Corporation Limited to receive payments and also to make all correspondence on behalf of this Joint Venture. The prime contractor (lead partner) shall incur all liabilities and receive instructions for and on behalf of all partners of the joint venture.

9. That all the above noted parties i.e.do not make any changes in this Joint Venture agreement or terminate this Joint Venture agreement, after the submission of the tender, till finalisation of the tender, and also if the contract is awarded to the Joint Venture of above parties, till successful completion of all the works under the contract, without prior written consent of the Konkan Railway Corporation Limited.

10. This agreement shall not be assignable by any party without the prior consent, at first instances of all other parties & finally without consent of KRCL.

NOW THE PARTIES HAVE JOINED HANDS TO FORM THIS JOINT VENTURE ON THIS DAY OFTWO THOUSAND WITH REFERENCE TO AND IN CONFIRMATION OF THEIR DISCUSSIONS AND UNDERSTANDING BROUGHT ON RECORD ON

IN WITNESS THEREOF THE ABOVE NAMED PARTIES HAVE SET THEIR RESPECTIVE HANDS ON THIS JOINT VENTURE AGREEMENT ON THE DAY, MONTH AND YEAR, ABOVE MENTIONED IN THE PRESENCE OF THE FOLLOWING WITNESSES:

WITNESSES

1. First Party
2. Second Party
3. Third Party

Note:

1. Joint Venture (JV) shall not have more than 3 partners (including the lead partner).
2. In case of a company, please submit the article of association along with power of attorney/board resolution authorizing the person signing the agreement.

Appendix – 14

3. In case of a partnership firm, please submit the partnership deed along with the power of attorney.
4. In case of a sole proprietary firm, please submit an affidavit authorizing the signatory to the JV.
5. In case of joint venture, authorization of lead partner to incur all liabilities and receive instructions for and on behalf of all partners of the joint venture, shall be evidenced by submitting a power of attorney signed by legally authorised representative of all the partners of JV with further stipulation that it shall be valid for the entire period of the completion/extended period of the work including maintenance period.
6. The Joint Venture Agreement shall be executed on non-judicial stamp paper duly attested by Notary public with seal and revenue stamp affixed thereon.
7. **JV formed after the submission of the tender bid will not be accepted.**
8. In the event of default/withdrawal of any partner, arrangement for providing the required indemnities shall be spelt out and shall be binding on each partner of the joint venture.

**DETAILS TO BE SUBMITTED BY TENDERER ALONG WITH TECHNICAL
BID AS PART OF THEIR METHOD STATEMENT**

- i) Overall construction programme as per latest scheduling programme (Primavera) and/or as path time diagram including all main activities within the specified construction time and milestone dates. **Construction programme shall be submitted for works to complete all works within the completion period as specified in tender document.**
- ii) List of specification of survey and measuring equipment and description of survey and calculation methods to achieve required accuracy as per specifications.
- iii) Preliminary plan of site installations (roads, workshops, plants, officers, housing etc.)
- iv) Power supply including stand by equipment.
- v) Safety and emergency plan-outline.
- vi) Outline organization chart to perform works as specified.
- vii) CVs of key personnel.

All information of the Method Statement has to be complete along with calculations and supporting data, so that comprehensive information as given indicate how the Tenderer intends to perform the works within the time schedule and sequence of operations.

The bid with unsatisfactory and unacceptable method statement is liable to be rejected.

CERTIFICATE OF FAMILIARISATION

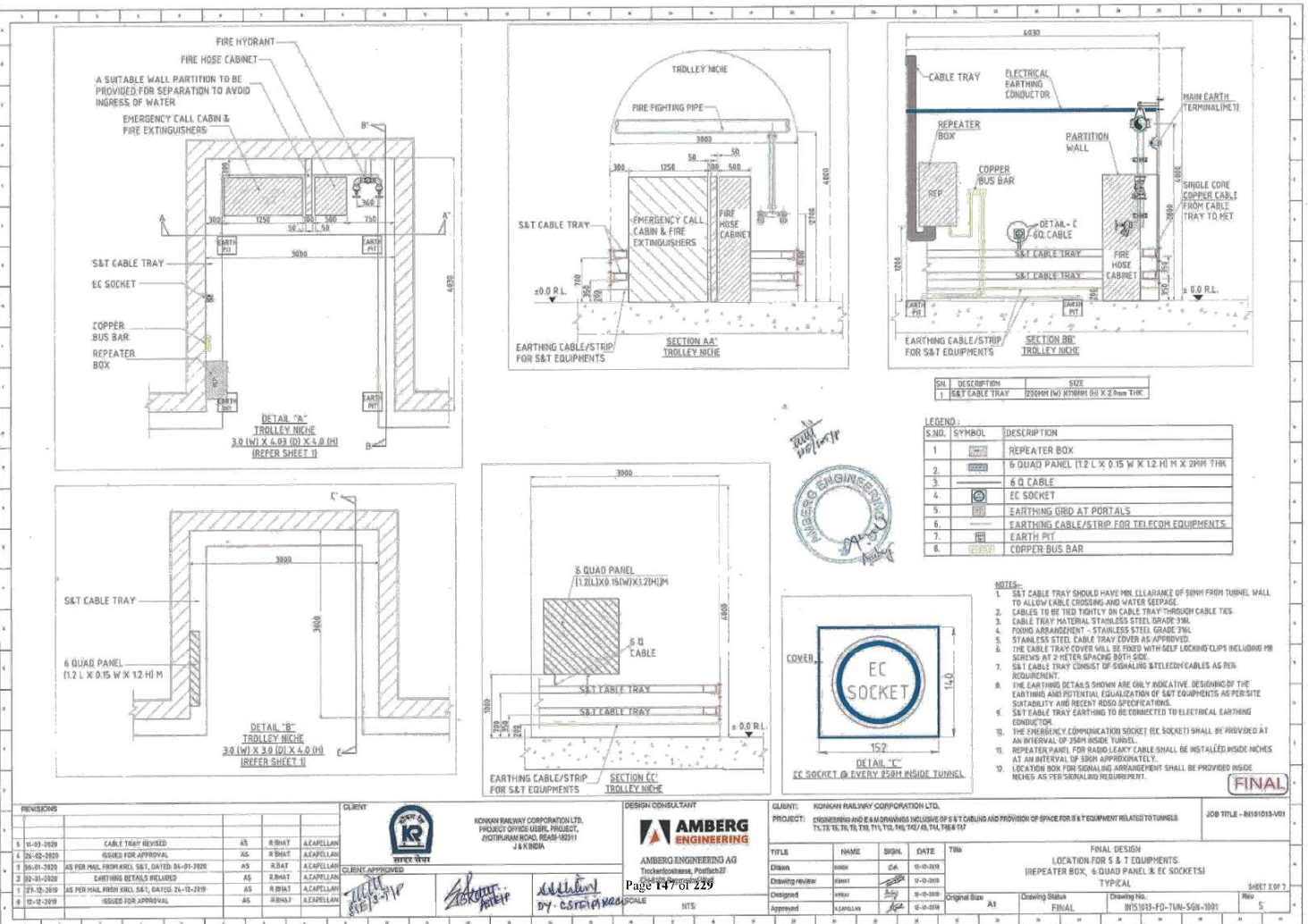
(Tenderer should fill the blank spaces)

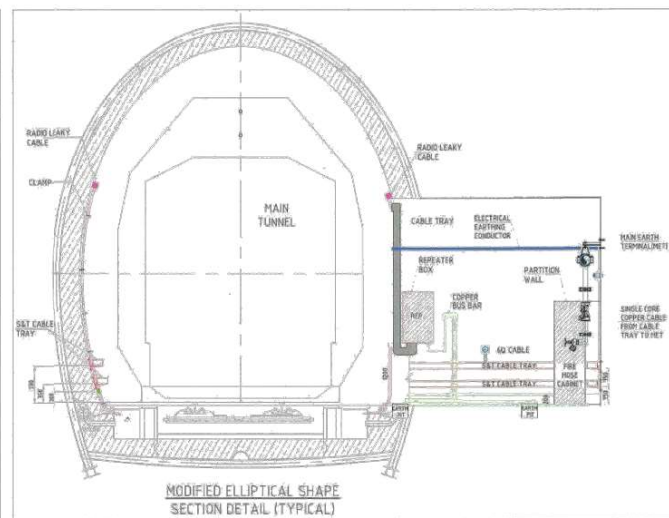
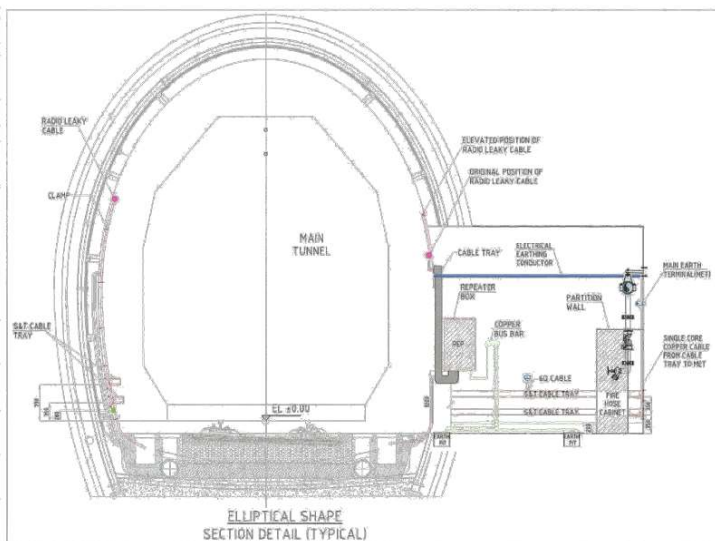
- A) I/We hereby solemnly declare and certify that I/We have actually inspected/investigated the site(s) of work on ----- by our representative Shri. and have fully familiarized myself/ourselves with all aspects of constructional features such as accessibility, working conditions, geo-physical / terrain conditions, security related issues, transshipment problems of machinery, sources and availability of construction materials, rates for construction materials, availability of water and electricity including all local taxes, royalties, octrois, availability of local labour (both skilled and unskilled), relevant labour rates and labour laws, availability and rates of private land required for various purposes, land for dumping ground, climatic conditions, availability of working space, main approach roads and feeder roads (if any) including their approximate lengths required to be constructed, whereupon only percentage rate have been quoted by me/us.
- B) I/we have kept myself/ourselves fully informed of the provisions of this tender document comprising E-Tender notice, Tender Form (Form of Bid), Instructions to Tenderer/s and Appendices, Indian Railway Standard General Condition of Contract 2019, Special Conditions of Contract, Annexures, Schedule of Items, Rates and Quantities (Bill of Quantities), Addendum(s), Corrigendum(s), Drawings, Northern Railway Standard Specifications for works, Northern Railway Standard Schedule of Rates, apart from information conveyed to me/us through various other provisions in this tender document.
- C) I/We have quoted my/our percentage rate for the items in Schedule of Items, Rates and Quantities (Bill of Quantities) taking into account all the factors given above and else where in the tender document.

Signature of Tenderer(s)

Date:

Seal:



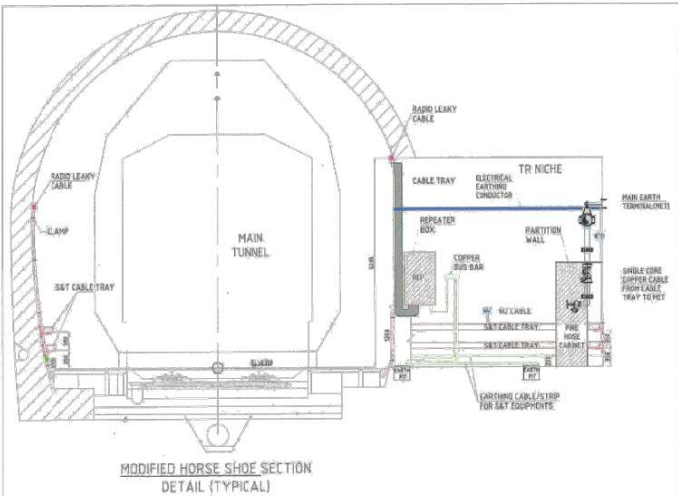
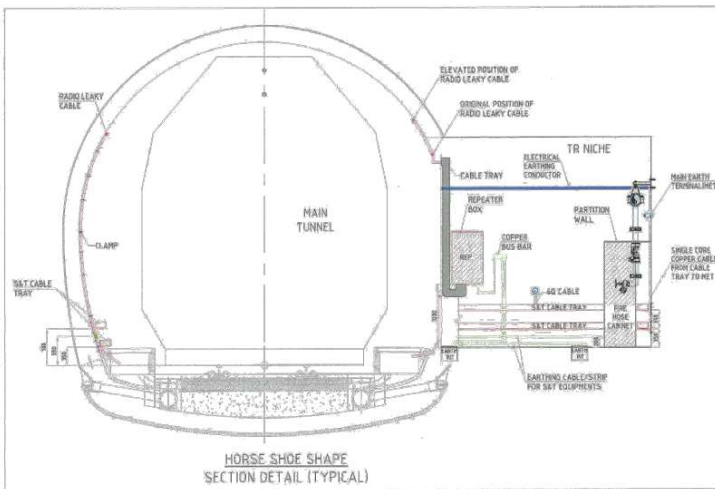


SL. NO.	DESCRIPTION	SIZE
1	SAT CABLE TRAY	200MM (W) X 100MM (H) X 2.0mm THK.

S.NO.	SYMBOL	DESCRIPTION
1	[Symbol]	REPEATER BOX
2	[Symbol]	4 QUART PANEL (22 L X 3.5 W X 12.5 H X 200 THK)
3	[Symbol]	4 D CABLE
4	[Symbol]	EC SOCKET
5	[Symbol]	EARTHING BRD AT PORTALS
6	[Symbol]	EARTHING CABLE/STRIP FOR TELECOM
7	[Symbol]	EARTH PIT
8	[Symbol]	RADIO LEAKY CABLE (BOTH SIDE OF TUNNEL)
9	[Symbol]	COPPER BUS BAR
10	[Symbol]	CATEGORY AND CONTACT WIRE

- NOTES:
- SAT CABLE TRAY SHOULD HAVE MIN. CLEARANCE OF 50MM FROM TUNNEL WALL TO ALLOW CABLE CROSSING AND WATER SEPARATE.
 - CABLES TO BE TIED TIGHTLY ON CABLE TRAY THROUGH CABLE TIES.
 - CABLE TRAY MATERIAL - STAINLESS STEEL GRADE 304.
 - FIXING ARRANGEMENT - STAINLESS STEEL GRADE 304.
 - STAINLESS STEEL CABLE TRAY COVER AS APPROVED.
 - THE CABLE TRAY COVER WILL BE FIXED WITH SELF LOCKING CLIPS INCLUDING WIRE SCREWS AT 2 METER SPACING BOTH SIDE.
 - SAT CABLE TRAY CONSIST OF SIGNALING & TELECOM CABLES AS PER REQUIREMENT.
 - THE EARTHING DETAILS SHOWN ARE ONLY INDICATIVE. DESIGNING OF THE EARTHING AND POTENTIAL EQUALIZATION OF SAT EQUIPMENTS AS PER SITE SUITABILITY AND RECENT SOSS SURVEILLANCE.
 - SAT CABLE TRAY EARTHING TO BE CONNECTED TO ELECTRICAL EARTHING CONDUCTOR.
 - THE EMERGENCY COMMUNICATION SOCKET (EC SOCKET) SHALL BE PROVIDED AT AN INTERVAL OF 50M INSIDE TUNNEL.
 - REPEATER PANEL FOR RADIO LEAKY CABLE SHALL BE INSTALLED INSIDE NICHES AT AN INTERVAL OF 50M APPROXIMATELY.
 - LOCATION BOX FOR SIGNALING ARRANGEMENT SHALL BE PROVIDED INSIDE NICHES AS PER SIGNALING REQUIREMENT.

REVISIONS 1. 16-01-2024 THE DETAILS AS R.BAT A.CAPPELLAN 2. 10-03-2024 CABLE TRAY REVISED AS R.BAT A.CAPPELLAN 3. 04-05-2024 ISSUED FOR APPROVAL AS R.BAT A.CAPPELLAN 4. 06-01-2024 AS PER MAIL FROM MSIL SBT, DATED 04-01-2024 AS R.BAT A.CAPPELLAN 5. 20-05-2024 EARTHING DETAILS INCLUDED AS R.BAT A.CAPPELLAN 6. 17-10-2024 AS PER MAIL FROM MSIL SBT, DATED 26-10-2024 AS R.BAT A.CAPPELLAN 7. 12-10-2024 ISSUED FOR APPROVAL AS R.BAT A.CAPPELLAN				CLIENT KORAN RAILWAY CORPORATION LTD. PROJECT OFFICE: USUAL PROJECT, JYOTIRAM ROAD, RAJAHMUNDRY J.B.K. ROAD				DESIGN CONSULTANT AMBERG ENGINEERING AP T.01, T.2, T.3, T.4, T.5, T.6, T.7, T.8, T.9, T.10, T.11, T.12, T.13, T.14, T.15, T.16, T.17, T.18, T.19, T.20, T.21, T.22, T.23, T.24, T.25, T.26, T.27, T.28, T.29, T.30, T.31, T.32, T.33, T.34, T.35, T.36, T.37, T.38, T.39, T.40, T.41, T.42, T.43, T.44, T.45, T.46, T.47, T.48, T.49, T.50, T.51, T.52, T.53, T.54, T.55, T.56, T.57, T.58, T.59, T.60, T.61, T.62, T.63, T.64, T.65, T.66, T.67, T.68, T.69, T.70, T.71, T.72, T.73, T.74, T.75, T.76, T.77, T.78, T.79, T.80, T.81, T.82, T.83, T.84, T.85, T.86, T.87, T.88, T.89, T.90, T.91, T.92, T.93, T.94, T.95, T.96, T.97, T.98, T.99, T.100, T.101, T.102, T.103, T.104, T.105, T.106, T.107, T.108, T.109, T.110, T.111, T.112, T.113, T.114, T.115, T.116, T.117, T.118, T.119, T.120, T.121, T.122, T.123, T.124, T.125, T.126, T.127, T.128, T.129, T.130, T.131, T.132, T.133, T.134, T.135, T.136, T.137, T.138, T.139, T.140, T.141, T.142, T.143, T.144, T.145, T.146, T.147, T.148, T.149, T.150, T.151, 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PROJECT: ENGINEERING AND S.A. VENDOR INCLUSIVE OF S.A. CABLE AND PROVISION OF SPACE FOR S.A. EQUIPMENT RELATED TO TUNNELS T.1, T.2, T.3, T.4, T.5, T.6, T.7, T.8, T.9, T.10, T.11, T.12, T.13, T.14, T.15, T.16, T.17, T.18, T.19, T.20, T.21, T.22, T.23, T.24, T.25, T.26, T.27, T.28, T.29, T.30, T.31, T.32, T.33, T.34, T.35, T.36, T.37, T.38, T.39, T.40, T.41, T.42, T.43, T.44, T.45, T.46, T.47, T.48, T.49, T.50, T.51, T.52, T.53, T.54, T.55, T.56, T.57, T.58, T.59, T.60, T.61, T.62, T.63, T.64, T.65, T.66, T.67, T.68, T.69, T.70, T.71, T.72, T.73, T.74, T.75, T.76, T.77, T.78, T.79, T.80, T.81, T.82, T.83, T.84, T.85, T.86, T.87, T.88, T.89, T.90, T.91, T.92, T.93, T.94, T.95, T.96, T.97, T.98, T.99, T.100, T.101, T.102, T.103, T.104, T.105, T.106, T.107, T.108, T.109, T.110, T.111, T.112, T.113, T.114, T.115, T.116, T.117, T.118, T.119, T.120, T.121, T.122, T.123, T.124, T.125, T.126, T.127, T.128, T.129, T.130, T.131, T.132, T.133, T.134, T.135, T.136, T.137, T.138, T.139, T.140, T.141, T.142, T.143, T.144, T.145, T.146, T.147, T.148, T.149, T.150, T.151, T.152, T.153, T.154, 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SN	DESCRIPTION	SIZE
1	S&T CABLE TRAY	200MM (W) X 100MM (H) X 2.0mm THK.

SL. NO.	SYMBOL	DESCRIPTION
1	[Symbol]	REPEATER BOX
2	[Symbol]	40 CABLE, 1/2" L X 0.15" W X 1/2" H X 0.001" THK.
3	[Symbol]	S&T CABLE
4	[Symbol]	EC SOCKET
5	[Symbol]	EARTHING GND AT PORTALS
6	[Symbol]	EARTHING CABLE/STRIP FOR TELECOM
7	[Symbol]	RADIO LEAKY CABLE
8	[Symbol]	RADIO LEAKY CABLE BOTH SIDE OF TUNNEL
9	[Symbol]	COPPER BUS BAR
10	[Symbol]	CATERNARY AND CONTACT WIRE

NOTES:

- S&T CABLE TRAY SHOULD HAVE MIN. CLEARANCE OF 50MM FROM TUNNEL WALL TO ALLOW CABLE CROSSING AND WATER SEEPAGE.
- CABLES TO BE TIED TIGHTLY ON CABLE TRAY THROUGH CABLE TIES.
- CABLE TRAY MATERIAL STAINLESS STEEL GRADE 304.
- FIXING ARRANGEMENT - STAINLESS STEEL GRADE 304.
- STAINLESS STEEL CABLE TRAY COVER AS APPROVED.
- THE CABLE TRAY COVER WILL BE FIXED WITH SELF LOCKING CLIPS INCLUDING THE SCREWS AT 2 METER SPACING BOTH SIDE.
- S&T CABLE TRAY CONSIST OF SIGNALING & TELECOM CABLES AS PER REQUIREMENT.
- THE EARTHING DETAILS SHOWN ARE ONLY INDICATIVE. DESIGNING OF THE EARTHING AND POTENTIAL EQUALIZATION OF S&T EQUIPMENTS AS PER SITE SUSTAINABILITY AND RECENT RDSG PREPARATIONS.
- S&T CABLE TRAY EARTHING TO BE CONNECTED TO ELECTRICAL EARTHING CONDUCTOR.
- THE EMERGENCY COMMUNICATION SOCKET (EC SOCKET) SHALL BE PROVIDED AT AN INTERVAL OF 250M INSIDE TUNNEL.
- REPEATER PANEL FOR RADIO LEAKY CABLE SHALL BE INSTALLED INSIDE TUNNEL AT AN INTERVAL OF 500M APPROXIMATELY.
- LOCATION BOX FOR SIGNALING ARRANGEMENT SHALL BE PROVIDED INSIDE TUNNEL AS PER SIGNALING REQUIREMENT.

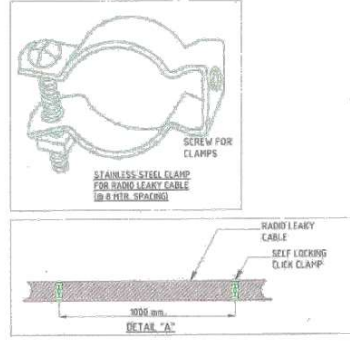
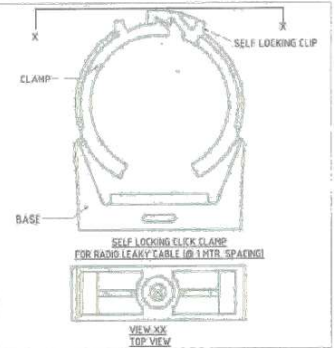
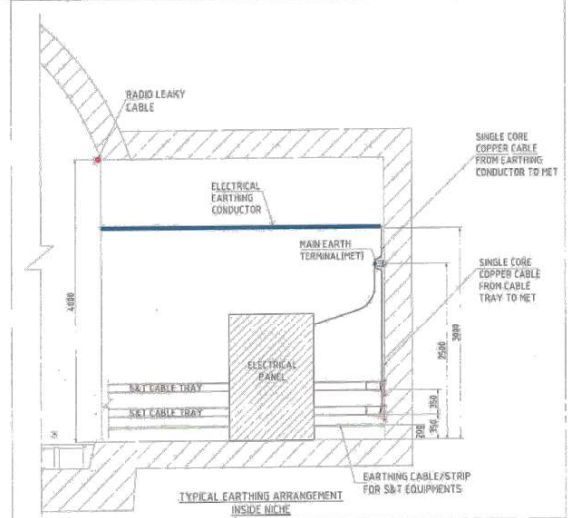
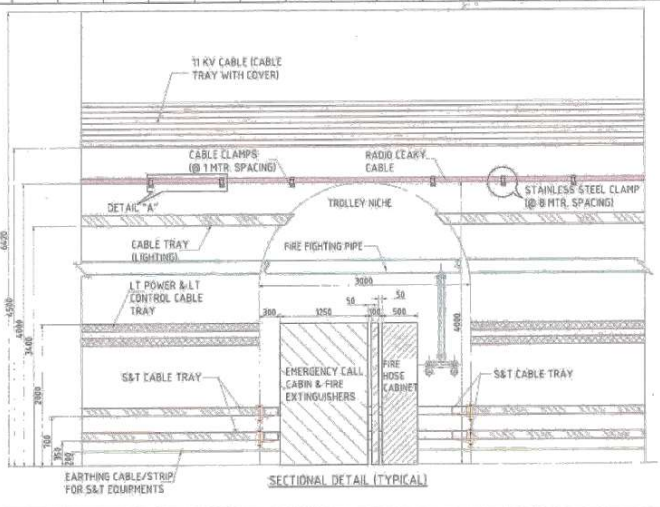
REVISIONS	DATE	BY	CHKD	APPD
1	15-03-2019	AS	R. BHAT	ACAPPELLAN
2	15-03-2019	AS	R. BHAT	ACAPPELLAN
3	15-03-2019	AS	R. BHAT	ACAPPELLAN
4	15-03-2019	AS	R. BHAT	ACAPPELLAN
5	15-03-2019	AS	R. BHAT	ACAPPELLAN
6	15-03-2019	AS	R. BHAT	ACAPPELLAN
7	15-03-2019	AS	R. BHAT	ACAPPELLAN
8	15-03-2019	AS	R. BHAT	ACAPPELLAN
9	15-03-2019	AS	R. BHAT	ACAPPELLAN
10	15-03-2019	AS	R. BHAT	ACAPPELLAN



KORAN RAILWAY CORPORATION LTD.
PROJECT OFFICE: KORAN PROJECT,
JYOTIRAM ROAD, RAJAHMUNDRY
J&K RDSG

DESIGN CONSULTANT
AMBERG ENGINEERING
Tirunelveli, Tamil Nadu
09485000000 / 09485000001

CLIENT: KORAN RAILWAY CORPORATION LTD.					JOB TITLE: J&K RDSG				
PROJECT: ENGINEERING AND E&M DRAWINGS INCLUDING OF S&T CABLE TRAY AND PROVISION OF SPACE FOR S&T EQUIPMENT RELATED TO TUNNELS.					LOCATION & FIXING ARRANGEMENT OF S&T EQUIPMENTS (RADIO LEAKY CABLE, REPEATER BOX & EC SOCKET)				
TITLE	NAME	DATE	THK	REV	TITLE	NAME	DATE	THK	REV
Drawn	AS	15-03-2019			Drawn	AS	15-03-2019		
Checked	AS	15-03-2019			Checked	AS	15-03-2019		
Designed	AS	15-03-2019			Designed	AS	15-03-2019		
Approved	AS	15-03-2019			Approved	AS	15-03-2019		
Original Date					Drawing Status				
15-03-2019					FINAL				
Drawing No.					BVS/013-JD-TUN-SGN-1001				
Rev					Rev				
6					6				



- NOTES:-
1. S&T CABLE TRAYS SHALL BE INTER CONNECTED WITH EARTHING LINKS/WIRES AT SUITABLE INTERVALS AS PER SITE SUITABILITY.
 2. S&T CABLE TRAYS AND PANELS SHALL BE CONNECTED TO COPPER BUSBAR WITH AN INSULATED COPPER CABLE FOR EQUIPOTENTIAL EARTHING REQUIREMENTS.
 3. THE EARTHING DETAILS SHOWN ARE ONLY INDICATIVE. DESIGNERS OF THE EARTHING AND POTENTIAL EQUALIZATION OF S&T EQUIPMENTS AS PER SITE SUITABILITY AND RECENT 10000 SPECIFICATIONS.
 4. S&T CABLE TRAY EARTHING TO BE CONNECTED TO ELECTRICAL EARTHING CONDUCTOR.
 5. THE EMERGENCY COMMUNICATION SOCKET (IE SOCKET) SHALL BE PROVIDED AT AN INTERVAL OF 200M INSIDE TUNNEL.
 6. REPEATER PANEL FOR RADIO LEAKY CABLE SHALL BE INSTALLED INSIDE NICHE AT AN INTERVAL OF 500M APPROXIMATELY.
 7. LOCATION BOX FOR SIGNALING ARRANGEMENT SHALL BE PROVIDED INSIDE NICHE AS PER SIGNALING REQUIREMENT.



Signature valid

Digitally signed by SHARDUL K. ADTE Date: 2021.05.14 16:36:53 +05'30' Reason: PEPS-CRIS Location: New Delhi

REVISIONS				CLIENT		DESIGN CONSULTANT		CLIENT:		JOB TITLE - RVS0103-001	
1	2021-05-14	CABLE TRAY REVISED	AS	R BHAT	ACAPPELLAN	AMBERG ENGINEERING	Amberg Engineering AG	ENGINEERS AND ARCHITECTS	ENGINEERS AND ARCHITECTS	ENGINEERS AND ARCHITECTS	ENGINEERS AND ARCHITECTS
2	2021-05-14	ISSUED FOR APPROVAL	AS	R BHAT	ACAPPELLAN	Amberg Engineering AG	Amberg Engineering AG	ENGINEERS AND ARCHITECTS	ENGINEERS AND ARCHITECTS	ENGINEERS AND ARCHITECTS	ENGINEERS AND ARCHITECTS
3	2021-05-14	EXISTING DETAILS INCLUDED	AS	R BHAT	ACAPPELLAN	Amberg Engineering AG	Amberg Engineering AG	ENGINEERS AND ARCHITECTS	ENGINEERS AND ARCHITECTS	ENGINEERS AND ARCHITECTS	ENGINEERS AND ARCHITECTS
4	2021-05-14	AS PER MAIL FROM KRL SAT, DATED 05-05-2020	AS	R BHAT	ACAPPELLAN	Amberg Engineering AG	Amberg Engineering AG	ENGINEERS AND ARCHITECTS	ENGINEERS AND ARCHITECTS	ENGINEERS AND ARCHITECTS	ENGINEERS AND ARCHITECTS
5	2021-05-14	ISSUED FOR APPROVAL	AS	R BHAT	ACAPPELLAN	Amberg Engineering AG	Amberg Engineering AG	ENGINEERS AND ARCHITECTS	ENGINEERS AND ARCHITECTS	ENGINEERS AND ARCHITECTS	ENGINEERS AND ARCHITECTS



- DISTANCE BETWEEN CONTACT WIRE TO C/L OF S&T CABLE TRAY
A TO B - 5857
A TO C - 5857

NOTE:-

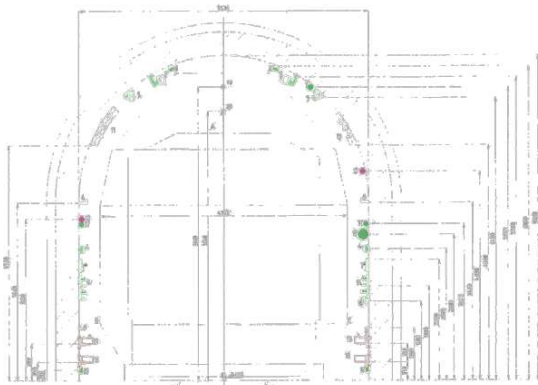
1. THE TYPICAL ARRANGEMENT OF SETTABLE TRAYS AND RADIO LEAKY CABLE IS SHOWN.
2. THE DRAWING SHOULD BE READ IN-LINE WITH ERM DRAWINGS.
3. THE EARTHING DETAILS SHOWN ARE ONLY INDICATIVE. DESIGNER OF THE EARTHING AND POTENTIAL EVALUATION OF EAT EQUIPMENTS AS PER SITE SUITABILITY AND RECENT RDS SPECIFICATIONS.
4. CATEGORY AND CONTACT WIRE SHOWN IN TUNNEL PROFILE OF DRG. NO. INTER-D-TUN-500-1003 Rev 3 AND IT IS ONLY INDICATIVE.
5. ALL DIMENSIONS ARE IN MM.

<p>CLIENT</p>  <p>संयुक्त निदेश</p>	<p>KONKAN RAILWAY CORPORATION LTD. PROJECT OFFICE USRIL PROJECT, JYOTIPURAM ROAD, NERAB-152111 J&K INDIA</p>
<p>CLIENT APPROVED</p> <p><i>Shetty</i> 31/6/13 1P</p>	<p><i>Shetty</i> 31/6/13 1P</p> <p><i>Shetty</i> 31/6/13 1P</p>

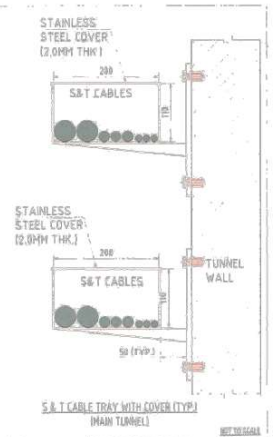
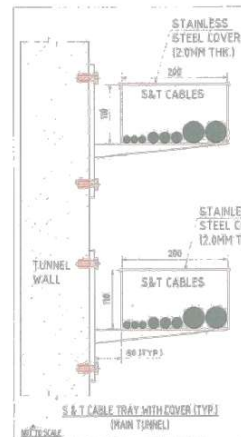
SCALE

TITLE	NAME	SIGN.	DATE	Title FINAL DESIGN SHOWING S&M EQUIPMENTS AND S&T EQUIPMENTS IN D SHAPE TUNNEL TYPICAL		
Drawn	SEBIO		11-03-2019	Original Size A1	Drawing Status FINAL	Drawing No. DYSMD-00-TUN
Drawing review	SEBIO		11-03-2019			
Designed	AMBU		11-03-2019			
Approved	A. DOWLANE		11-03-2019			

SEN-1003		Rev 4
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TYPICAL TUNNEL SECTION
MODIFIED D-SHAPE



LEGEND:

1. LIGHT HEAT DETECTION CABLE
2. CCTV CAMERA
3. AT FAN
4. LIGHT
5. VENTILATION EQUIPMENT
6. CABLE TRAY (SUS304)
7. ILLUMINATED PHOTOGRAPHIC EQUIPMENT SIGN
8. *25 X 50 MM THIN LEE SIGNAGE
9. SPREADER PUMP
10. HORIZONTAL
11. RADIO EQUIPMENT WITH SIDE
12. S&T CABLE TRAY WITH CABLE TRAY AND COVER
13. S&T CABLE TRAY WITH CABLE TRAY AND COVER
14. S&T CABLE TRAY WITH COVER
15. 1" CABLE TRAY
16. FIRE FIGHTING PIPE
17. HORIZONTAL POWER SOCKET
18. THREE PHASE 5 WIRE (3PH/5W)
19. EARTHING (GROUND) FOR S&T FOR ELECTRICAL EQUIPMENTS
20. EARTHING CABLE (STRIP FOR S&T EQUIPMENTS)
21. INDICATIVE CATCHWIRE WIRE (1000 B, 65.55 MM)
22. INDICATIVE CONTACT WIRE (1000 B, 107.50 MM)

DISTANCE BETWEEN CONTACT WIRE TO C/L OF S&T CABLE TRAY
A TO B - 5957
A TO C - 5957

SN	DESCRIPTION	SIZE
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1	S&T CABLE TRAY	200MM THK 300MM DS 12 3.0MM THK
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- NOTE:-
1. THE TYPICAL ARRANGEMENT OF S&T CABLE TRAYS AND RADIO LEADY CABLE IS SHOWN.
 2. THE DRAWING SHOULD BE READ IN LINE WITH E&H DRAWINGS.
 3. THE EARTHING DETAILS SHOWN ARE ONLY INDICATIVE. DECIDING UP THE EARTHING AND POTENTIAL EQUALIZATION OF S&T EQUIPMENTS AS PER SITE SUSTAINABILITY AND RESISTANCE SPECIFICATIONS.
 4. CATERGARY AND CONTACT WIRE SHOWN IN TUNNEL PROFILE OF DRG. NO. R/S&H-FD-TUN-SEG-003 Rev 3 AND IT IS ONLY INDICATIVE.
 5. ALL DIMENSIONS ARE IN MM.

REVISIONS	DATE	BY	CHKD	APPD	DESCRIPTION
01	14-08-2014	AS	REHAT	ASAPILLAI	CABLE TRAY REVISION
02	14-08-2014	AS	REHAT	ASAPILLAI	EARTHING DETAILS REVISION
03	14-08-2014	AS	REHAT	ASAPILLAI	COVER RAIL FROM DRG. NO. R/S&H-FD-TUN-SEG-003 Rev 3
04	14-08-2014	AS	REHAT	ASAPILLAI	COVER RAIL FROM DRG. NO. R/S&H-FD-TUN-SEG-003 Rev 3

CLIENT
KONKAN RAILWAY CORPORATION LTD.
PROJECT OFFICE (S&H) PROJECT,
JYOTIPURAM ROAD, KANDIVLI
MUMBAI

DESIGN CONSULTANT
AMBERG ENGINEERING
Technocon House, Puzhich 27
CH 6102 Regenderoddi
Tamil Nadu

CLIENT: KONKAN RAILWAY CORPORATION LTD.
PROJECT: ENGINEERING AND E&H DRAWINGS INCLUDING OF S&T CABLES AND PROVISION OF SPACE FOR S&T EQUIPMENT RELATED TO TUNNELS
TUNNEL NO. R/S&H-FD-TUN-SEG-003 Rev 3

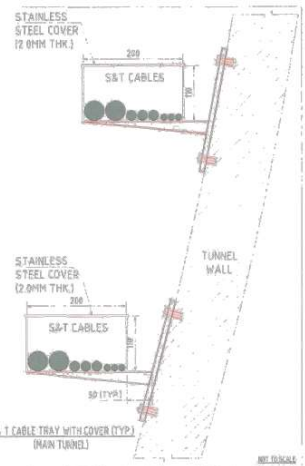
JOB TITLE - CIVIL ENGINEER

TITLE	NAME	SIGN.	DATE	TIME
Drawn	ASAPILLAI	ASAPILLAI	14-08-2014	10:30 AM
Checked	REHAT	REHAT	14-08-2014	10:30 AM
Designed	ASAPILLAI	ASAPILLAI	14-08-2014	10:30 AM
Approved	ASAPILLAI	ASAPILLAI	14-08-2014	10:30 AM

FINAL DESIGN
SHOWING S&T EQUIPMENTS AND
S&T EQUIPMENTS IN D SHAPE TUNNEL
TYPICAL

DATE: 14-08-2014

Signature valid
Digitally signed by SHARADUL K. MADHE
Date: 2023.08.14
16:37:59
Reason: I am CRIS
Location: New Delhi



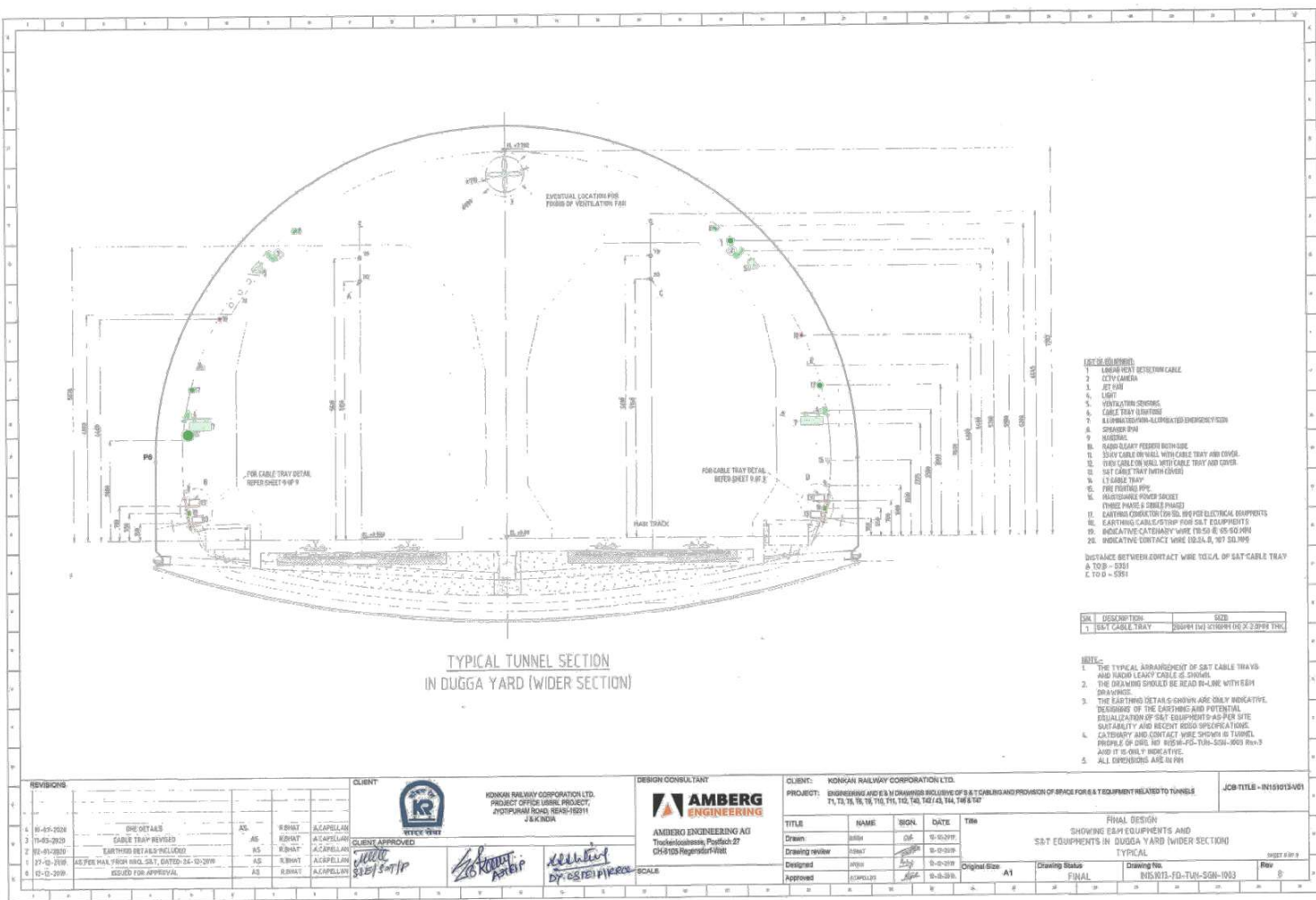
- LIST OF EQUIPMENT
1. LINEAR HEAT DETECTION LASER
 2. CCTV CAMERA
 3. 871 MP
 4. LIGHT
 5. VISUALIZATION SCHEMATIC
 6. CABLE TRAY & BRACKET
 7. ILLUMINATION-EXPLUSTER EVIDENCE SIGN
 8. SMOKEPANEL
 9. MISC. ETC.
 10. BUCKLE-UP FLUORESCENT SIGN
 11. 30 V CABLE ON BOARD ATTACHABLE TRAY AND COVER
 12. 12 V DC POWER SUPPLY ON BOARD ATTACHABLE TRAY AND COVER
 13. CABLE TRAY TRAIL COVER
 14. TRAIL LIGHT
 15. FIRE EXTINGUISHER
 16. PARTICULATE POWDER SMOKE
 17. THREE PHASE & SINGLE PHASE
 18. CABLE CONDUIT FOR 100, 500 AND ELECTRICAL EQUIPMENT
 19. BANDING CABLES/STRIPS FOR SBT EQUIPMENTS
 20. INDICATIVE CABLEMARKS: MEAS 50, 100, 200
 21. INDICATIVE CONTACT WIRE (200A, 8, 1000 AMP)
- DISTANCE BETWEEN CABLE MARKS NOT TO EXCEED 500 FT
- TO C - 5108

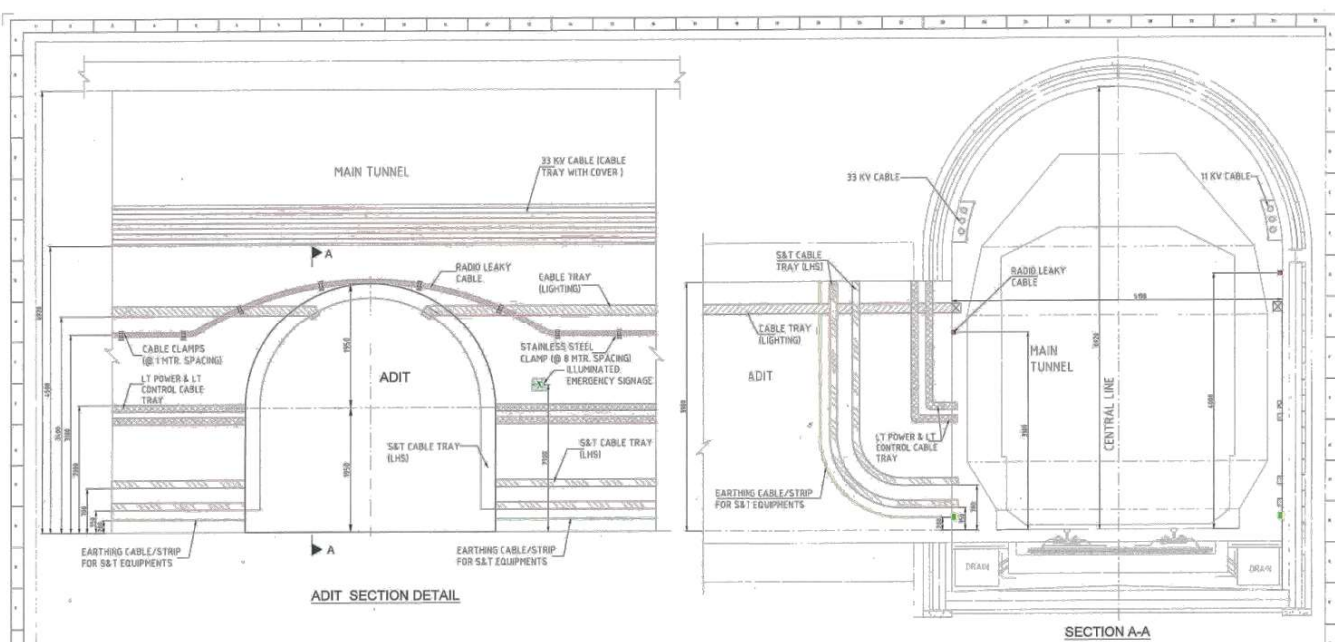
NOTE:

1. THE TYPICAL ARRANGEMENT OF 50/1 CABLE TRAYS AND RADIO LEAKY CABLE IS SHOWN.
2. THE DRAWING SHOULD BE READ IN-LINE WITH ERM DRAWINGS.
3. THE EARTHING DETAILS SHOWN ARE ONLY INDICATIVE DESIGNS OF THE EARTHING AND POTENTIAL EQUALIZATION OF SBT EQUIPMENTS AS PER SITE FEASIBILITY AND SELECTED RDS SPECIFICATIONS. CATEGORY 4 ARE CONTACT WELD SHOWN IN TUNNEL.
4. PROFILE OF DSD NO. 10054-FD-TUN-SM-003 Rev:3 AND IT IS ONLY INDICATIVE.
5. ALL DIMENSIONS ARE IN MM.

JOB TITLE - INF51013-V01

TITLE	NAME	SIGN.	DATE	FINAL DESIGN SHOWING ERM EQUIPMENTS AND S&T EQUIPMENTS IN MODIFIED ELLIPTICAL SHAPE TUNNEL TYPICAL						SHEET 9 OF 9
Drawn	WONG	<i>Wong</i>	12-12-2007	Original Size	A1	Drawing Status	FINAL	Drawing No.	RVS 110-FD-TUN-S&T-003	Rev
Checking/revise	LEUNG T	<i>Leung T</i>	12-12-2007							4
Designed	WONG	<i>Wong</i>	12-12-2007							
Approved	HEUNG LAM	<i>Heung Lam</i>	12-12-2007							





LEGEND:-

	CABLE TRAY (LIGHTING)		33 KV CABLE (WIRE PROTECTED COVER WITH CABLE TRAY)
	LT POWER & LT CONTROL CABLE TRAY		BADLY LEAKY CABLE
	SAT CABLE TRAY		EARTHING CABLE/STRIP FOR SAT EQUIPMENTS

- NOTES:-**
- SAT CABLE TRAY SHOULD HAVE MIN. CLEARANCE OF 50MM FROM TUNNEL WALL TO ALLOW CABLE CROSSING AND WATER SEEPAGE.
 - CABLES TO BE TIED THROUGHT CABLE TRAY THROUGH CABLE TIES.
 - CABLE TRAY MATERIAL: STAINLESS STEEL, GRADE 304.
 - FIXING ARRANGEMENT - STAINLESS STEEL, GRADE 304.
 - STAINLESS STEEL CABLE TRAY COVER AS APPROVED.
 - THE CABLE TRAY COVER WILL BE FIXED WITH SELF LOCKING CLIPS INCLUDING PB SCREWS AT 2 METER SPACING BOTH SIDE.
 - SAT CABLE TRAY CONSIST OF SIGNALING & TELECOM CABLES AS PER REQUIREMENT.
 - THE EARTHING DETAILS SHOWN ARE ONLY INDICATIVE. DESIGNING OF THE EARTHING AND POTENTIAL EQUALIZATION OF SAT EQUIPMENTS AS PER SITE SUSTAINABILITY AND RECENT RDSO SPECIFICATIONS.

REVISIONS <table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> <th>CHECKED BY</th> </tr> <tr> <td>2</td> <td>14-05-2019</td> <td>ISSUED FOR APPROVAL</td> <td>AS</td> <td>SRINAT</td> </tr> <tr> <td>1</td> <td>03-05-2019</td> <td>EARTHING DETAILS INCLUDED</td> <td>AS</td> <td>SRINAT</td> </tr> <tr> <td>0</td> <td>01-10-2018</td> <td>ISSUED FOR APPROVAL</td> <td>AS</td> <td>SRINAT</td> </tr> </table>		NO.	DATE	DESCRIPTION	BY	CHECKED BY	2	14-05-2019	ISSUED FOR APPROVAL	AS	SRINAT	1	03-05-2019	EARTHING DETAILS INCLUDED	AS	SRINAT	0	01-10-2018	ISSUED FOR APPROVAL	AS	SRINAT	CLIENT INDIAN RAILWAY CORPORATION LTD. PROJECT OFFICE: URBEL PROJECT, JYOTIPUR ROAD, KENDRA-102011 JALPAIGURI.	DESIGN CONSULTANT AMBERG ENGINEERING AG Trodenholzallee, Postfach 27 048100 Regensburg (Rat)	CLIENT'S INDIAN RAILWAY CORPORATION LTD. PROJECT: ENGINEERING AND E&M SERVICES INCLUDING OF S&T DRINKING AND PROVISION OF SPACE FOR S&T EQUIPMENT RELATED TO TUNNELS T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11, T12, T13, T14, T15, T16, T17, T18, T19, T20, T21, T22, T23, T24, T25, T26, T27, T28, T29, T30, T31, T32, T33, T34, T35, T36, T37, T38, T39, T40, T41, T42, T43, T44, T45, T46, T47, T48, T49, T50, T51, T52, T53, T54, T55, T56, T57, T58, T59, T60, T61, T62, T63, T64, T65, T66, T67, T68, T69, T70, T71, T72, T73, T74, T75, T76, T77, T78, T79, T80, T81, T82, T83, T84, T85, T86, T87, T88, T89, T90, T91, T92, T93, T94, T95, T96, T97, T98, T99, T100, T101, T102, T103, T104, T105, T106, T107, T108, T109, T110, T111, T112, T113, T114, T115, T116, T117, T118, T119, T120, T121, T122, T123, T124, T125, T126, T127, T128, T129, T130, T131, T132, T133, T134, T135, T136, T137, T138, T139, T140, T141, T142, T143, T144, T145, T146, T147, T148, T149, T150, T151, T152, T153, T154, T155, T156, T157, T158, T159, T160, T161, T162, T163, T164, 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NO.	DATE	DESCRIPTION	BY	CHECKED BY																				
2	14-05-2019	ISSUED FOR APPROVAL	AS	SRINAT																				
1	03-05-2019	EARTHING DETAILS INCLUDED	AS	SRINAT																				
0	01-10-2018	ISSUED FOR APPROVAL	AS	SRINAT																				

