SECTION-I

CHAPTER- 6 -FORM (S)/PROFORMA (S)

Form No. 1 - PROFORMA FOR "ROLLING - PERFORMANCE BANK GUARANTEE BOND (R-PBG)"

(To be stamped in accordance with stamp act)

(To be used by approved Indian scheduled commercial banks)

(To be customized and use for bank guarantee for financial closure and for operational bank guarantee as well)

1. In consideration of the RailTel Corporation Of India Ltd, Corporate Office, Plot No. 143,Sector 44, Gurgaon, Haryana -122003 (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…… and …….. for (hereinafter called " the said Agreement") of total cost of ownership for the due fulfillment by the said contractor)s) of the terms and conditions contained in the said Agreement, or 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.

2. We, …….. Bank do hereby undertake to pay the amount due and payable under this Guarantee without any demur, merely on demand from the RailTel stating that the amount is 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. ……

3. We, …….. 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.

4. 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.

5. We, …… Bank further agree that the Guarantee here in 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 ……. (A*) …… We shall be discharged from all liability under this Guarantee thereafter.

6. We, …… (indicate the 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 of 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 affect of so relieving us.

7. This Guarantee will not be discharged due to the change in the Constitution of the Bank or the Contractor(s) Supplier(s).We, ……(indicate 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 the day of 2021

for …….

(Indicate the name of the Bank)
Witness

1. Signature

Name

2. Signature

Name

Form No. 2 - PROFORMA FOR "SYSTEM PERFORMANCE GUARANTEE"

(On Stamp Paper of Rs. One Hundred)
(To be signed by the Bidder as well as the OEM's)

To

The Executive Director,
RailTel Corporation of India Limited
6th Floor, IIIrd Block,
Delhi Technology Park, Shastri Park,
New Delhi-110053

Tender Reference No.:

Dear Sir,

I / We ……. hereby guarantee that the design on the basis of which we have submitted our tender no. …… has been carefully made to conform to the end objectives in the tender documents and to technical specification therein. We further guarantee that in the event of the performance of the system, when installed, not complying with the end objectives or with the specifications contained in the tender documents, we shall provide further inputs to enable the RailTel to realize the end objectives contained in these documents without any additional payment for any additional equipment which may be required in this regard. We further guarantee that all the expenses for providing the additional inputs under the System Guarantee will be borne by us. We further guarantee that these additional inputs will be provided by us to make the system workable within 1 month from the date on which this guarantee is invoked by the Purchaser. The guarantee is valid for a period of one year from the date of commissioning of the system.

(Signature of Firm's Authorized Officer)
Seal

Signature of witness:

1. ……

2. …….

Form No. 3 - PROFORMA FOR "LONG TERM MAINTENANCE SUPPORT"
(To be signed by the Bidder as well as the OEM's)

To

The Executive Director,
RailTel Corporation of India Limited
6th Floor, IIIrd Block,
Delhi Technology Park, Shastri Park,
New Delhi-110053

Tender Reference No.:

Applicable for OEM directly participating in the tender

I / We ……. hereby confirm that we have read specifications & tender conditions of RailTel Tender No. ……..and accept that the requirement of Long Term Maintenance Support as per Clause 4.A.3 of Chapter-4(Section-I),shall be met **by us directly or through our subsidiary in India** as per rates quoted in the Price Bid. I / We shall provide services as per terms and conditions pertaining to Long Term Maintenance Support of tender document.

OR

Applicable for Authorized Distributor/Partner of OEM

I / We ……. hereby confirm that we have read specifications & tender conditions of RailTel Tender No. ……..and accept that the requirement of Long Term Maintenance Support as per Clause 4.A.3 of Chapter-4(Section-I)shall be met **by Authorized Distributor/Partner of OEM. However, if Authorized Distributor/Partner fails to fulfill the support obligation due to any un-foreseen circumstances, the same shall be provided by us directly or through our subsidiary in India for the mentioned/remaining period at the quoted prices by the bidder. I/We have gone through the requirement mentioned in the Tender Document and shall provide services as per terms and conditions** pertaining to Long Term Maintenance Support of tender document.

(Signature of Firm's Authorized Officer)
Seal

Signature of witness:

3. ……

4. …….

Note: Please Strike out whichever is not applicable.

Form No. 4 -PROFORMA FOR AFFIDAVIT TO BE UPLOADED BY TENDERERALONG-WITH THE TENDER DOCUMENTS

(To be signed by the Bidder)

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

I……..(Name and designation)** appointed as the attorney/authorized signatory of the tenderer (including its constituents),
M/s._____ (hereinafter called the tenderer) for the purpose of the Tender documents for the work of _____
as per the tender No._____ of (-------RailTel Region), do hereby solemnly affirm and state on the behalf of the tenderer including its constituents as under:

1. I/We the tenderer (s), am/are signing this document after carefully reading the contents.

2. I/we the tenderer(s) also accept all the conditions of the tender and have signed all the pages in confirmation thereof.

3. I/We hereby declare that I/We have downloaded the tender documents from electronic-tender portal. I/We have verified the content of the document from the website and there is no addition, no deletion or no alteration to the content of the tender document. In case of any discrepancy noticed at any stage i.e. evaluation of tenderers, execution of work or final payment of the contract, the master copy available with the railway Administration shall be final and binding upon me/us.

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

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

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

7. I/We undersigned that if the certificates regarding eligibility criteria submitted by us are found to be forged/false or incorrect at any time during process for evaluation of tenders, it shall lead to banning of business for five year on entire RailTel. Further, I/we (*insert name of the tenderer*)** _____ and all my/our constituents understand that my/our offer shall be summarily rejected.

8. I/we also understand that 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 SD and Performance Guarantee besides any other action provided in the contract including banning of business for five year on entire RailTel.

DEPONENT
SEAL AND SIGNATURE
OF THE TENDERER

VERIFICATION

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

DEPONENT
SEAL AND SIGNATURE
OF THE TENDERER

Place:
Dated:

** The contents in Italics are only for guidance purpose. Details as appropriate, are to be filled in suitably by tenderer. Attestation before Magistrate/Notary Public.

Form No. 5 - PROFORMA FOR "SIGNING THE INTEGRITY PACT"
(To be signed by the Bidder)

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 for ……The 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) / Sub contractor(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.

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

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

Place ——————————

Date ——————————
Witness 1:

Annexure-A of INTEGRITY PACT

GUIDELINES FOR INDIAN AGENTS OF FOREIGN SUPPLIERS

1.0 There shall be compulsory registration of agents for all global (Open) Tender and Limited Tender. An agent who is not registered with RailTel Units shall apply for registration in the prescribed Application-Form.

1.1 Registered agents will file an authenticated Photostat copy duly attested by a Notary Public/ Original certificate of the principal confirming the agency agreement and giving the status being enjoyed by the agent and the commission/ remuneration/retainer-ship being paid by the principal to the agent before the placement of order by RailTel.

1.2 Wherever the Indian representatives have communicated on behalf of their principals and the foreign parties have stated that they are not paying any commission to the Indian agents, and the Indian representative is working on the basis of salary or as retainer, a written declaration to this effect should be submitted by the party (i.e. Principal) before finalizing the order.

2.0 DISCLOSURE OF PARTICULARS OF AGENTS/ REPRESENTATIVES IN INDIA, IF ANY.

2.1 Tenderers of Foreign nationality shall furnish the following details in their offer:

2.1.1 The name and address of the agents/representatives in India, if any and the extent of authorization and authority given to commit the Principals. In case the agent/representative be a foreign Company, it shall be confirmed whether it is real substantial Company and details of the same shall be furnished.

2.1.2 The amount of commission/ remuneration included in the quoted price(s) for such agents/representatives in India.

2.1.3 Confirmation of the Tenderer that the commission/ remuneration if any, payable to his agents/ representatives in India, may be paid by RAILTEL in Indian Rupees only.

2.2 Tenderers of Indian Nationality shall furnish the following details in their offers:

2.2.1 The name and address of the foreign principals indicating their nationality as well as their status, i.e. whether manufacturer or agents of manufacturer holding the Letter of Authority of the Principal specifically authorizing the agent to make an offer in India in response to tender either directly or through the agents/representatives.

2.2.2 The amount of commission /remuneration included in the price(s) quoted by the tenderer for himself.

2.2.3 Confirmation of the foreign principals of the Tenderer that the commission/ remuneration, if any, reserved for the Tenderer in the quoted price(s), may be paid by RAILTEL in India in equivalent Indian Rupees on satisfactory completion of the Project or supplies of Stores and Spares in case of operation items.

2.3 In either case, in the event of contract materializing, the terms of payment will provide for payment of the commission/ remuneration, if any payable to the agents/representatives in India in Indian Rupees on expiry of 90 days after the discharge of the obligations under the contract.

2.4 Failure to furnish correct and detailed information as called for in paragraph 2.0 above will render the concerned tender liable to rejection or in the event of a contract materializing, the same liable to termination by RAILTEL. Besides this there would be a penalty of banning business dealings with RAILTEL or damage or payment of a named sum.

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Annexure-B of INTEGRITY PACT

GUIDELINES ON BANNING OF BUSINESS DEALINGS

CONTENTS

1. **Introduction**

1.1 RailTel Corporation of India Ltd (RAILTEL), being a Public Sector Enterprise, under the administrative control of the Ministry of Railways and therefore being an authority deemed to be 'the state' within the meaning of Article 12 of Constitution of India, has to ensure preservation of rights enshrined in Chapter III of the Constitution. RAILTEL has also to safeguard its commercial interests. RAILTEL deals with Agencies, who have a very high degree of integrity, commitments and sincerity towards the work undertaken. It is not in the interest of RAILTEL to deal with Agencies who commit deception, fraud or other misconduct in the execution of contracts awarded / orders issued to them. In order to ensure compliance with the constitutional mandate, it is incumbent on RAILTEL to observe principles of natural justice before banning the business dealings with any Agency.

1.2 Since banning of business dealings involves civil consequences for an Agency concerned, it is incumbent that adequate opportunity of hearing is provided and the explanation, if tendered, is considered before passing any order in this regard keeping in view the facts and circumstances of the case.

2. Scope

2.1 The General Conditions of Contract (GCC) of RAILTEL generally provide that RAILTEL reserves its rights to remove from list of approved suppliers/ contractors or to ban business dealings if any Agency has been found to have committed misconduct and also to suspend business dealings pending investigation. If such provision does not exist in any GCC, the same may be incorporated.

2.2 Similarly, in case of sale of material there is a clause to deal with the Agencies/ customers/ buyers, who indulge in lifting of material in unauthorized manner. If such a stipulation does not exist in any Sale Order, the same may be incorporated.

2.3 However, absence of such a clause does not in any way restrict the right of Company (RAILTEL) to take action / decision under these guidelines in appropriate cases.

2.4 The procedure of (i) Removal of Agency from the List of approved suppliers/ contractors; (ii) Suspension and (iii) Banning of Business Dealing with Agencies, has been laid down in these guidelines.

2.5 These guidelines apply to Corporate Office, all Regions and Subsidiaries of RAILTEL.

2.6 It is clarified that these guidelines do not deal with the decision of the Management to avoid entertaining any particular Agency due to its poor / inadequate performance or for any other reason.

2.7 The banning shall be with prospective effect, i.e., future business dealings.

3. Definitions

In these Guidelines, unless the context otherwise requires:

i) 'Party / Contractor / Supplier / Purchaser / Customer' shall mean and include a public limited company or a private limited company, a firm whether registered or not, an indi-

vidual, a cooperative society or an association or a group of persons engaged in any commerce, trade, industry, etc. 'Party / Contractor / Supplier / Purchaser / Customer' in the context of these guidelines is indicated as 'Agency'.

ii) 'Inter-connected Agency' shall mean two or more companies having any of the following features:

a) If one is a subsidiary of the other;

b) If the Director(s), Partner(s), Manager(s) or Representative(s) are common;

c) If management is common;

d) If one owns or controls the other in any manner;

iii) 'Competent Authority' and 'Appellate Authority' shall mean the following:

For Company (entire RAILTEL) wide Banning: The Director shall be the 'Competent Authority' for the purpose of these guidelines. CMD, RAILTEL shall be the 'Appellate Authority' in respect of such cases except banning of business dealings with Foreign Suppliers of imported items.

b) For banning of business dealings with Foreign Suppliers of imported items, RAILTEL Directors Committee (RDC) shall be the 'Competent Authority'. The Appeal against the Order passed by RDC, shall lie with CMD, as First Appellate Authority.

c) In case the foreign supplier is not satisfied by the decision of the First Appellate Authority, it may approach Railway Board as Second Appellate Authority.

d) For RailTel Regions only: Any officer not below the rank of General Manager appointed or nominated by the Executive Director of concerned Region shall be the 'Competent Authority' for the purpose of these guidelines. The Executive Director of the concerned Region shall be the 'Appellate Authority' in all such cases.

e) For Corporate Office only: For procurement of items / award of contracts, to meet the requirement of Corporate Office only, Concerned Group General Manager / General Manager shall be the 'Competent Authority' and concerned Director shall be the 'Appellate Authority'.

f) CMD, RAILTEL shall have overall power to take suo-moto action on any information available or received by him and pass such order(s) as he may think appropriate, including modifying the order(s) passed by any authority under these guidelines.

iv) 'Investigating Department' shall mean any Department or Unit investigating into the conduct of the Agency and shall include the Vigilance Department, Central Bureau of Investigation, the State Police or any other department set up by the Central or State Government having powers to investigate.

v) 'List of approved Agencies - Parties / Contractors / Suppliers/ Purchaser/ Customers' shall mean and include list of approved /registered Agencies - Parties/ Contractors / Suppliers / Purchasers / Customers, etc.

4. Initiation of Banning / Suspension

Action for banning / suspension of business dealings with any Agency should be initiated by the department having business dealings with them after noticing the irregularities or misconduct on their part. Besides the concerned department, Vigilance Department of each Region / Unit/ Corporate Office may also be competent to initiate such action.

5. Suspension of Business Dealings

5.1 If the conduct of any Agency dealing with RAILTEL is under investigation by any department (except Foreign Suppliers of imported items), the Competent Authority may consider whether the allegations under investigation are of a serious nature and whether pending investigation, it would be advisable to continue business dealing with the Agency. If the Competent Authority, after consideration of the matter including the recommendation of the Investigating Department, if any, decides that it would not be in the interest to continue business dealings pending investigation, it may suspend business dealings with the Agency. The order to this effect may indicate a brief of the charges under investigation. If it is decided that inter-connected Agencies would also come within the ambit of the order of suspension, the same should be specifically stated in the order. The order of suspension would operate for a period not more than six months and may be communicated to the Agency as also to Investigating Department. The Investigating Department may ensure that their investigation is completed and whole process of final order is over within such period.

5.2 The order of suspension shall be communicated to all the departmental heads within the unit/ region/ Corporate Office as the case may be. During the period of suspension, no business dealing may be held with the agency.

5.3 As far as possible, the existing contract(s) with the Agency may continue unless the Competent Authority, having regard to the circumstances of the case, decides otherwise.

5.4 If the gravity of the misconduct under investigation is very serious and it would not be in the interest of RAILTEL, as a whole, to deal with such an Agency pending investigation, the Competent Authority may send his recommendation to Chief Vigilance Officer (CVO), RAILTEL Corporate Office alongwith the material available. If Corporate Office considers that depending upon the gravity of the misconduct, it would not be desirable for all the units/ regions of RAILTEL to have any dealings with the Agency concerned, an order suspending business dealings may be issued to all the units/ Regions / Corporate Office by the Competent Authority of the Corporate Office, copy of which may be endorsed to the Agency and all concerned. Such an order would operate for a period of six months from the date of issue.

5.5 For suspension of business dealings with Foreign Suppliers of imported items, following shall be the procedure:

i) Suspension of the foreign suppliers shall apply throughout the Company/ Regions including Subsidiaries.

ii) Based on the complaint forwarded by ED / GGM / GM or received directly by Corporate Vigilance, if gravity of the misconduct under investigation is found serious and it is felt that it would not be in the interest of RAILTEL to continue to deal with such agency, pending investigation, Corporate Vigilance may send such recommendation on the matter to Executive Director / GGM / GM, to place it before a Committee consisting of the following:

1. ED / GGM/ GM (viz. Representative of Corporate Finance).
2. ED / GGM/ GM (viz. Representative of Department concerned with
3. procurement of imported items)- Convener of the Committee.
4. ED / GGM/ GM (to be nominated on case to case basis).
5. ED / GGM/ GM ((viz. Representative of Corporate Law).

The committee shall expeditiously examine the report and give its comments / recommendations within twenty one days of receipt of the reference by ED/ GGM/ GM.

iii) The comments / recommendations of the Committee shall then be placed by ED/GGM/GM, before RAILTEL Directors' Committee (RDC) constituted for import of items. If RDC opines that it is a fit case for suspension, RDC may pass necessary orders which shall be communicated to the foreign supplier by the ED/GGM/GM.

5.6 If the Agency concerned asks for detailed reasons of suspension, the Agency may be informed that its conduct is under investigation. It is not necessary to enter into correspondence or argument with the Agency at this stage.

5.7 It is not necessary to give any show-cause notice or personal hearing to the Agency before issuing the order of suspension. However, if investigations are not complete in six months time, the Competent Authority may extend the period of suspension by another three months, during which period the investigations must be completed.

6. Ground on which Banning of Business Dealings can be initiated

6.1 If the security consideration, including questions of loyalty of the Agency to the State, so warrants;

6.2 If the Director / Owner of the Agency, proprietor or partner of the firm, is convicted by a Court of Law for offences involving moral turpitude in relation to its business dealings with the Government or any other public sector enterprises or RAILTEL, during the last five years;

6.3 If there is strong justification for believing that the Directors, Proprietors, Partners, owner of the Agency have been guilty of malpractices such as bribery, corruption, fraud, substitution of tenders, interpolations, etc;

6.4 If the Agency continuously refuses to return / refund the dues of RAILTEL without showing adequate reason and this is not due to any reasonable dispute which would attract proceedings in arbitration or Court of Law;

6.5 If the Agency employs a public servant dismissed / removed or employs a person convicted for an offence involving corruption or abetment of such offence;

6.6 If business dealings with the Agency have been banned by the Govt. or any other public sector enterprise;

6.7 If the Agency has resorted to Corrupt, fraudulent practices including misrepresentation of facts;

6.8 If the Agency uses intimidation/ threatening or brings undue outside pressure on the Company (RAILTEL) or its official in acceptance/ performances of the job under the contract;

6.9 If the Agency indulges in repeated and / or deliberate use of delay tactics in complying with contractual stipulations;

6.10 Willful indulgence by the Agency in supplying sub-standard material irrespective of whether pre-dispatch inspection was carried out by Company (RAILTEL) or not;

6.11 Based on the findings of title investigation report of CBI / Police against the Agency for malafide/ unlawful acts or improper conduct on his part in matters relating to the Company (RAILTEL) or even otherwise;

6.12 Established litigant nature of the Agency to derive undue benefit;

6.13 Continued poor performance of the Agency in several contracts;

6.14 If the Agency misuses the premises or facilities of the Company (RAILTEL), forcefully occupies tampers or damages the Company's properties including land, water resources, etc.

(Note: The examples given above are only illustrative and not exhaustive. The Competent Authority may decide to ban business dealing for any good and sufficient reason).

7. Banning of Business Dealings

7.1 Normally, a decision to ban business dealings with any Agency should apply throughout the Company including subsidiaries. However, the Competent Authority of the Region/ Unit except Corporate Office can impose such ban Region-wise only if in the particular case banning of business dealings by respective Region/ Unit will serve the purpose and achieve its objective and banning throughout the Company is not required in view of the local conditions and impact of the misconduct/ default to beyond the Region/ Unit. Any ban imposed by Corporate Office shall be applicable across all Regions/ Units of the Company including Subsidiaries.

7.2 For Company-wide banning, the proposal should be sent by ED of the Region/ Unit to the CVO/RailTel setting out the facts of the case and the justification of the action proposed along with all the relevant papers and documents except for banging of business dealings with Foreign Suppliers of imported items.

The Corporate Vigilance shall process the proposal of the concerned Region/ Unit for a prima-facie view in the matter by the Competent Authority nominated for Company-wide banning.

The CVO shall get feedback about that agency from all other Regions/ Units. Based on this feedback, a prima-facie decision for banning / or otherwise shall be taken by the Competent Authority.

If the prima-facie decision for Company-wide banning has been taken, the Corporate Vigilance shall issue a show-cause notice to the agency conveying why it should not be banned throughout RAILTEL.

After considering the reply of the Agency and other circumstances and facts of the case, a final decision for Company-wide banning shall be taken by the competent Authority.

7.3 There will be a Standing Committee in each Region/ Unit to be appointed by Chief Executive Officer for processing the cases of "Banning of Business Dealings" except for banning of business dealings with foreign suppliers. However, for procurement of items/ award of contracts, to meet the requirement of Corporate Office only, the committee shall be consisting of General Manager/ Dy. General Manager each from Operations, Finance, Law & Project. Member from Project shall be the convener of the committee. The functions of the committee shall, inter-alia include:

(i) To study the report of the investigating Agency and decide if a prima-facie case for Company-wide / Region wise banning exists, if not, send back the case to the Competent Authority.

(ii) To recommend for issue of show-cause notice to the Agency by the concerned department.

(iii) To examine the reply to show-cause notice and call the Agency for personal hearing, if required.

(iv) To submit final recommendation to the Competent Authority for banning or otherwise.

7.4 If the Competent Authority is prima-facie of view that action for banning business dealings with the Agency is called for, a show- cause notice may be issued to the Agency and an enquiry held accordingly.

7.5 Procedure for Banning of Business Dealings with Foreign Suppliers of imported items.

i) Banning of the agencies, shall apply throughout the Company including subsidiaries.

ii) Based on the complaint forwarded by Executive Director or received directly by Corporate Vigilance, an investigation shall be carried out by Corporate Vigilance. After investigation, depending upon the gravity of the misconduct, Corporate Vigilance may send their report to Executive Director/ GGM/ GM, to be placed before a Committee consisting of the following:

1. ED / GGM/ GM (viz. Representative of Corporate Finance).

2. ED / GGM/ GM (viz. Representative of Department concerned with procurement of imported items)- Convener of the Committee.

3. ED / GGM/ GM (to be nominated on case to case basis).

4. ED / GGM/ GM ((viz. Representative of Corporate Law).

The Committee shall examine the report and give its comments/ recommendations within 21 days of receipt of the reference by ED.

iii) The comments/recommendations of the Committee shall be placed by ED/ GGM/ GM before RAILTEL Directors' Committee (RDC) constituted for import of foreign items. If RDC opines that it is a fit case for initiating banning action, it will direct ED/ GGM/ GM to issue show-cause notice to the agency for replying within a reasonable period.

iv) On receipt of the reply or on expiry of the stipulated period, the case shall be submitted by ED to RDC for consideration & decision.

v) The decision of the RDC shall be communicated to the agency by ED/GGM/GM concerned.

8. Removal from List of Approved Agencies – Suppliers/ Contractors, etc.

8.1 If the Competent Authority decides that the charge against the Agency is of a minor nature, it may issue a show-cause notice as to why the name of the Agency should not be removed from the list of approved Agencies - Suppliers / Contractors, etc.

8.2 The effect of such an order would be that the Agency would not be disqualified from competing in Open Tender Enquiries but LTE (Limited Tender Enquiry) may not be given to the Agency concerned.

8.3 Past performance of the Agency may be taken into account while processing for approval of the Competent Authority for awarding the contract.

9. Show-cause Notice

9.1 In case where the Competent Authority decides that action against an Agency is called for, a show-cause notice has to be issued to the Agency. Statement containing the imputation of misconduct or misbehavior may be appended to the show-cause notice and the Agency should be asked to submit within 15 days a written statement in its defence.

9.2 If the Agency requests for inspection of any relevant document in possession of RAILTEL, necessary facility for inspection of documents may he provided.

9.3 The Competent Authority may consider and pass all appropriate speaking order:

a) For exone rating the Agency if the charges are not established.

b) For removing the Agency from the list of approved Suppliers/ Contactors, etc.

c) For banning the business dealing with the Agency.

9.4 If it decides to ban business dealings, the period for which the ban would be operative may be mentioned. The order may also mention that the ban would extend to the inter-connected Agencies of the Agency.

10. Appeal against the Decision of the Competent Authority

10.1 The agency may file an appeal against the order of the Competent Authority banning business dealing, etc. The appeal shall lie to Appellate Authority. Such an appeal shall be preferred within one month from the date of receipt of the order banning business dealing, etc.

10.2 Appellate Authority would consider the appeal and pass appropriate order which shall be communicated to the Agency as well as the Competent Authority.

11. Review of the Decision by the Competent Authority

Any petition / application filed by the Agency concerning the review of the banning order passed originally by Chief Executive / Competent Authority under the existing guidelines either before or after filing of appeal before the Appellate Authority or after disposal of appeal by the Appellate Authority, the review petition can be decided by the Chief Executive / Competent Authority upon disclosure of new facts / circumstances or subsequent development necessitating such review. The Competent Authority may refer the same petition to the Standing Committee for examination and recommendation.

12. Circulation of the names of Agencies with whom Business Dealings have been banned

12.1 Depending upon the gravity of misconduct established, the Competent Authority of the Corporate Office may circulate the names of Agency with whom business dealings have been banned, to the Government Departments, other Public Sector Enterprises, etc. for such action as they deem appropriate.

12.2 If Government Departments or a Public Sector Enterprise requests for more information about the Agency with whom business dealings have been banned, a copy of the report of the Inquiring authority together with a copy of the order of the Competent Authority / Appellate Authority may be supplied.

12.3 If business dealings with any Agency have been banned by the Central or State Government or any other Public Sector Enterprise, RAILTEL may, without any further enquiry or investigation, issue an order banning business dealing with the Agency and its inter-connected Agencies.

12.4 Based on the above, Regions / Units may formulate their own procedure for implementation of the guidelines.

****

Form No. 6 - PROFORMA FOR "NIL DEVIATION COMPLIANCE UNDERTAKING"
(To be signed by the Bidder)

To

GGM (O&M)/NR
RailTel Corporation of India Limited
6th Floor, IIIrd Block,
Delhi Technology Park, Shastri Park,
New Delhi-110053

Tender Reference No.:

Sub: NIL Deviation Compliance

Over and above all our earlier conformations and submissions as per your requirements of the RFP, we confirm that,

1. All proposed in scope supplies (Cameras, Servers, Storage, Switches, VMS and VA etc.) are compliant to the technical specifications of the equipment as mentioned in the latest version of the specifications for IP-based video surveillance system issued by RDSO dated DD-Month-YYYY.

2. We hereby certify that the hardware and software mentioned in our technical solution and Bill of Material (BOM) are complete.

3. We confirm that there is no requirement of any other hardware and software to fulfill requirements as per scope against the RFP. If any additional hardware and software is required to meet in scope requirements, then it would be procured by us at no extra cost to RailTel.

4. We will also ensure our unconditional compliance of all the terms and conditions as mentioned in the Tender document including all corrigenda and RDSO specifications

Seal and signature of the bidder

Place:
Date:

(This letter should be on the letterhead of the bidder duly signed by an authorized signatory)

Form No. 7 - PROFORMA FOR "NO MALICIOUS CODE UNDERTAKING LETTER BY BIDDER and OEM"

To

GGM (O&M)/NR
RailTel Corporation of India Limited
6th Floor, IIIrd Block,
Delhi Technology Park, Shastri Park,
New Delhi-110053

Tender Reference No.:

Sub: Undertaking for No Malicious Code

Dear Sir,

Over and above all our earlier conformations and submissions as per your requirements of the RFP, we confirm that,

1. All proposed hardware and software components in scope of supplies (Cameras, Servers, Video Recording & Processing Unit,Software etc.) when shipped by _____, does not contain embedded malicious code that would activate procedures to:-

   a. Inhibit the desired and designed function of the equipment.
   b. Cause physical damage to the user or equipment during the exploitation.
   c. Tap information resident or transient in the equipment/networks.

2. We, _____ will be considered to be in breach in case physical damage or malfunctioning is caused due to activation of any such malicious code in embedded software and thus be liable to repair, replace or refund the price of the infected software if reported (or, upon request, return) to the party supplying the software to Customer, if different than _____

3. Security breach or damages to system, if any, so caused by any embedded malicious code or otherwise, due to the act of either OEM or bidder or both, the OEM as well as the bidder would be considered liable jointly or severally and shall be banned for conducting any business with RailTel. Also the present contract, may liable to be terminated by the purchaser.

Place:
Date: Seal and signature of the bidder

(This letter should be on the letterhead of the Bidder&OEM duly signed by an authorized signatory)

Form No. 8 - PROFORMA FOR "MANUFACTURER's AUTHORIZATION FORM"

Note: This authorization letter should be printed on the letterhead of all the original equipment manufacturer (OEM) and should be signed by a competent person having the power of attorney to bind the manufacturer.

GGM (O&M)/NR
RailTel Corporation of India Limited
6th Floor, IIIrd Block,
Delhi Technology Park, Shastri Park,
New Delhi-110053
Dated: …….
……....
……....

Subject: Manufacturer Authorization form (MAF) to M/s …… for ……
Ref: Bid No……..……..dated…….
Dear Sir,

We, M/s……, are established and reputed manufacturer and service provider of ……. (Product details), having our registered office at ……..

We hereby authorize M/s …….. (bidder name), Office ……. to participate in bid and subsequently upon award of the bid to execute the supply and Installation & Commissioning of our range of products against your above said bid.

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

Thanking you,

Best regards,

Authorized Signatory

Form No. 9 - Deleted

Form No. -10 –ANNEXURE AFFIDAVIT

(To be given separately by each Consortium/Joint Venture member of the Bidder on Stamp Paper of appropriate value)
I, _ S/o , Resident of _ ,
, the [insert designation] of the [insert name of single bidder / Consortium/Joint Venture member if Consortium/Joint Venture] do solemnly affirm and state as follows:

1) I say that I am the authorized signatory of [insert name of company/Consortium/Joint Venture member] (hereinafter referred to as "Bidder/Consortium/Joint Venture Member") and I am duly authorized by the Board of Directors of the Bidder/Consortium/Joint Venture Member to swear and depose this Affidavit on behalf of the Bidder/Consortium/Joint Venture Member.
2) I say that I have submitted information with respect to our eligibility for RailTel Corporation of India Ltd. (hereinafter referred to as "RCIL") (NAME OF WORK) (hereinafter referred to as 'Project') Request for Proposal ('RFP') document and I further state that all the said information submitted by us is accurate, true and correct and is based on our records available with us.
3) I say that, we hereby also authorize and request any bank, authority, person or firm to furnish any information, which may be requested by RCIL to verify our credentials / information provided by us under this tender and as may be deemed necessary by RCIL.
4) I say that if at any point of time including the extension period, in case RCIL requests any further/additional information regarding our financial and/or technical capabilities, or any other relevant information, we shall promptly and immediately make available such information accurately and correctly to the satisfaction of RCIL.
5) I say that, we fully acknowledge and understand that furnishing of any false or misleading information by us in our RFP shall entitle us to be disqualified from the tendering process for the said Project. The costs and risks for such disqualification shall be entirely borne by us.
6) I state that all the terms and conditions of the Request for Proposal (RFP) document has been duly complied with.

DEPONENT

VERIFICATION

I, the above-named deponent, do very that the contents of paragraphs 1 to 6 of this affidavit are true and correct to my own knowledge. No part of it is false and nothing material has been concealed. Verified at , on this day of .

DEPONENT

Form No. -11 - JOINT VENTURE AGREEMENT/MEMORANDUM OF AGREEMENT
(On Stamp Paper of Rs fifty)

This Joint Venture Agreement/Memorandum of Agreement is executed at (place)on this _____ day of _____, 2020.

BETWEEN

M/s. _____, a Company incorporated under the Companies Act, 1956 and having its Registered Office at _____ acting through its Managing Director, _____ duly authorized by a resolution of the Board of Directors dated ____ (hereinafter referred to as the 'LEAD MEMBER' which expression unless excluded by or repugnant to the subject or context be deemed to mean and include its successors in interest, legal representatives, administrators, nominees and assigns) of the ONE Part;

AND

M/s. _____, a Company incorporated under the Companies Act, 1956 and having its Registered Office at _____ and Office at _____, acting through its Joint President, _____, duly authorized by a resolution of the Board of Directors dated _____ (hereinafter referred to as the ('Participant member') which expression unless excluded by or repugnant to the subject or context be deemed to mean and include its successors in interest, legal representatives, administrators, nominees and assigns) of the 'OTHER PART'

AND

M/s. _____, a Company incorporated under the Companies Act, 1956 and having its Registered Office at _____ and Office at _____, acting through its Joint President, _____, duly authorized by a resolution of the Board of Directors dated _____ (hereinafter referred to as the ('Participant member') which expression unless excluded by or repugnant to the subject or context be deemed to mean and include its successors in interest, legal representatives, administrators, nominees and assigns) of the 'OTHER PART'

Whereas RailTel Corporation of India Ltd. (hereinafter referred to as 'RCIL') has invited tenders for the **"(NAME OF WORK)**" in terms of the tender documents issued for the said purpose and the eligibility conditions required that the applicants bidding for the same should meet the conditions stipulated by RCIL for participating in the bid by the Joint Venture for handling the project for which the tender has been floated by RCIL.

AND WHEREAS in terms of the bid documents both the parties jointly satisfy the eligibility criteria laid down for a bidder for participating in the bid process by forming a Joint Venture between themselves.

AND WHEREAS both the parties hereto have discussed and agreed to form a Joint Venture for participating in the aforesaid bid and have decided to reduce the agreed terms to writing.

NOW THIS JOINT VENTURE AGREEMENT/Memorandum of Agreement hereby WITNESSES:

1. That in the premises contained herein the Lead Member and the Participant Member having decided to pool their technical know-how, working experiences and financial resources, have formed themselves into a Joint Venture to participate in the tender process

for "**(NAME OF WORK)**" in terms of the tender invited by RailTel Corporation of India Ltd., (RCIL).

2. That the members of the Joint Venture have represented and assured each other that they shall abide by and be bound by the terms and conditions stipulated by RCIL for awarding the tender to the Joint Venture so that the Joint Venture may take up the aforesaid "**(NAME OF WORK)**" in case the Joint Venture turns out to be the successful bidder in the bid being invited by RCIL for the said purpose.

3. That the members of the Joint Venture have satisfied themselves that by pooling their technical know-how and technical and financial resources, the Joint Venture fulfills the prequalification/ eligibility criteria stipulated for a bidder, to participate in the bid for the said tender process for "**(NAME OF WORK)"**

4. That the Joint Venture have agreed to nominate any one of_____, _____ and _____ as the common representative who shall be authorized to represent the Joint Venture for all intents and purposes for dealing with the Government and for submitting the bid as well as doing all other acts and things necessary for submission of bid documents such as Tender Application Form etc., Mandatory Information, Financial Bid. Etc., and such other documents as may be necessary for this purpose.

5. That the share-holding of the members of the Joint Venture for this specified purpose shall be as follows:
   (i) The Lead Member shall have _____ per cent (___ %) of share-holding/participation with reference to the Joint Venture for this specified project.
   (ii) The Participant Member shall have _____ (___ %) of share-holding/participation with reference to the Joint Venture for this specified project.
   (iii) The Participant Member shall have _____ (___ %) of share-holding/participation with reference to the Joint Venture for this specified project.

6. That in order to fulfill the requirement of the tender process and also keep an altogether separate legal entity of the Joint Venture, the Members of the Joint Venture undertake to provide their own nominees as share-holders to the extent of their respective share-holding for the purpose of formation of a Special Purpose Company (SPC) through which the Joint Venture proposes to undertake the _____ of RCIL.

7. That if any change in the membership of the Joint Venture be required to be made by the members of the Joint Venture, the same shall be done with the consent of RCIL subject to the conditions as may be stipulated by them in this regard.

8. That in case to meet the requirements of bid documents or any other stipulations of RCIL, it becomes necessary to execute and record any other documents amongst the members of the Joint Venture, they undertake to do the needful and to participate in the same for the purpose of the said project.

9. That it is clarified by and between the members of the Joint Venture that execution to this Joint Venture Agreement/Memorandum of Agreement by the members of the Joint Venture does not constitute any type of partnership for the purposes of provisions of the Indian Partnership Act and that the members of the Joint Venture shall otherwise be free to carry on their independent business or commercial activities for their own respective ben-

efits under their own respective names and styles. This Joint Venture Agreement is limited in its operation to the specified project.

10 That the Members of the Joint Venture undertake to specify their respective roles and responsibilities for the purposes of implementation of this Joint Venture Agreement and the said project if awarded to the Joint Venture in the Memorandum & Articles of Association of the proposed Special Purpose Company to be got incorporated by the Joint Venture Members to meet the requirements and stipulations of RCIL.

IN FAITH AND TESTIMONY WHEREOF, THE PARTIES HERETO HAVE SIGNED THESE PRESENTS ON THE DATE, MONTHS AND YEAR FIRST ABOVE WRITTEN.

1. (_____) Managing Director (_____) For (Name of company)	2. (_____) Managing Director (_____) For (Name of company)	3. (_____) Managing Director (_____) For (Name of company)

WITNESSES:
1. _____
2. _____

Enclosure:

Board resolution of each of the Joint Venture Members authorizing:
(i) Execution of the Joint Venture Agreement, and
(ii) Appointing the authorized signatory for such purpose.

Form No. -12 - CONSORTIUM AGREEMENT /MEMORANDUM OF AGREEMENT
(On Stamp Paper of appropriate value)

This Consortium Agreement is executed at on this _ day of ____.

BETWEEN

M/s. , a Company incorporated under the Companies Act, 1956 and having its Registered Office at acting through its Managing Director, duly authorized by a resolution of the Board of Directors dated (hereinafter referred to as the „LEAD MEMBER" which expression unless excluded by or repugnant to the subject or context be deemed to mean and include its successors in interest, legal representatives, administrators, nominees and assigns) of the ONE Part;

AND

M/s . . . . . , a Company having its Office at and Office at .....
acting through its Joint President/ MD/.., , duly authorized by a resolution of the Board of Directors dated _ (hereinafter referred to as the („Participant member") which expression unless excluded by or repugnant to the subject or context be deemed to mean and include its successors in interest, legal representatives, administrators, nominees and assigns) of the OTHER PART"

AND

M/s. . . . .. , a Company having its Office at and Office at .....
, acting through its Joint President/ MD/.., , duly authorized by a resolution of the Board of Directors dated (hereinafter referred to as the ("Participant member") which expression unless excluded by or repugnant to the subject or context be deemed to mean and include its successors in interest, legal representatives, administrators, nominees and assigns) of the OTHER PART"

Whereas RailTel Corporation of India Ltd. (hereinafter referred to as „RCIL") has invite tenders for the "(NAME OF WORK)" in terms of the tender documents issued for the said purpose and the eligibility conditions required that the applicants bidding for the same should meet the conditions stipulated by RCIL for participating in the bid by the Consortium for handling the project for which the tender has been floated by RCIL.

AND WHEREAS in terms of the bid documents the parties jointly satisfy the eligibility criteria laid down for a bidder for participating in the bid process by forming a Consortium between themselves.

AND WHEREAS the parties hereto have discussed and agreed to form a Consortium for participating in the aforesaid bid and have decided to reduce the agreed terms to writing.

NOW THIS CONSORTIUM Agreement hereby WITNESSES:

8. That in the premises contained herein the Lead Member and the Participant Member having decided to pool their technical know-how, working experiences and financial resources, have formed themselves into a Consortium to participate in the tender process for "(NAME OF WORK)" in terms of the tender invited by RailTel Corporation of India Ltd., (RCIL).

9. That the members of the Consortium have represented and assured each other that they shall abide by and be bound by the terms and conditions stipulated by RCIL for awarding the tender to the Consortium so that the Consortium may take up the aforesaid "(NAME OF WORK)" in case the Consortium turns out to be the successful bidder in the bid being invited by RCIL for the said purpose.

10. That the members of the Consortium have satisfied themselves that by pooling their technical know-how and technical and financial resources, the Consortium fulfills the prequalification/ eligibility criteria stipulated for a bidder, to participate in the bid for the said tender process for "(NAME OF WORK)"

11. That the Consortium have agreed to nominate any one of , and as the common representative who shall be authorized to represent the Consortium for all intents and purposes for dealing with the Government and for submitting the bid as well as doing all other acts and things necessary for submission of bid documents such as Tender Application Form etc., Mandatory Information, Financial Bid. Etc., and such other documents as may be necessary for this purpose.

12. That if any change in the membership of the Consortium be required to be made by the members of the Consortium, the same shall be done with the consent of RCIL subject to the conditions as may be stipulated by them in this regard.

13. That in case to meet the requirements of bid documents or any other stipulations of RCIL, it becomes necessary to execute and record any other documents amongst the members of the Consortium, they undertake to do the needful and to participate in the same for the purpose of the said project.

14. That it is clarified by and between the members of the Consortium that execution to this Consortium Agreement by the members of the Consortium does not constitute any type of partnership for the purposes of provisions of the Indian Partnership Act and that the members of the Consortium shall otherwise be free to carry on their independent business or commercial activities for their own respective benefits under their own respective names and styles. This Consortium Agreement is limited in its operation to the specified project.

15. That the Members of the Consortium undertake to specify their respective roles and responsibilities for the purposes of implementation of this Consortium Agreement and the said project, if awarded to the Consortium, to meet the requirements and stipulations of RCIL.

16. The consortium formed will not be subject to alteration with regard to change in constituting firms and/or reorientation of roles. Any changes, if proposed by Consortium to take advantage of certain developments during evaluation stage will render the bid liable to be rejected.
17. All partners of the consortium shall be jointly and severally liable to RailTel for the execution of the entire contract in accordance with its terms.
18. Each Consortium member has minimum 20% contribution in the work and role/scope of each member is enclosed.
19. Power of Attorney by all members of the Consortium in favor of the Lead Member is also enclosed.

IN FAITH AND TESTIMONY WHEREOF, THE PARTIES HERETO HAVE SIGNED THESE PRESENTS ON THE DATE, MONTHS AND YEAR FIRST ABOVE WRITTEN

1. ( )	2. ( )	3. ( )
Managing Director	Managing Director	Managing Director
For (Name of company)	For (Name of company)	For (Name of company)

WITNESSES:

1.

2.

Enclosure:

Board resolution of each of the Consortium Members authorizing:

(i) Execution of the Consortium Agreement, and

(ii) Appointing the authorized signatory for such purpose.

****

FormNo. 13 - PAST EXPERIENCE FORM

SN	Item	Details
1.	**General Information**	
1	Customer Name	
2	Details of Contact Person	
	Name	
	Designation	
	Email	
	Mailing Address	
	Phone	
	Fax	
2.	**General Information**	
3	Name of the Project	
4	Government/Private/PSU/Others please specify	
5	Start Date and End Date	
6	Current Status (Completed/Work in Progress)	
7	Contract Tenure	
8	Geographical Coverage (No. of locations the project covers)	
9	Effort involved in person-months in each phase with average/peak number of resources deployed in each phase	
3.	**Size of the Project**	
	Order Value of the project	
	Capital Expenditure involved	
	Cost of services provided by the bidder	
	Cost of services provided by the partners if involved	
	Approximate number of concurrent users	
	No of Video Cameras implemented (if applicable)	
	No of Network Devices managed (if applicable)	
	Please Provide customer certificate/Work order for executed Scope	
4.	**Brief description of scope of Project**	
	Highlights of the Key Result Areas expected and achieved	
	List of modules and sub-modules implemented	
	Narrative description of Project including technology deployed	
	Description of actual services provided by your firm	

Certification: I, the undersigned, certify that these data correctly describe the Projects implemented by our Company.

(Signature)
(Name of Authorized Signatory)
(Designation)
(Date)
(Name and address of the bidder)
(Company Seal)

Form No. 14 - Deleted

Form No. 15 - Deleted

Form No. 16 - PROFORMA FOR UNDERTAKING TO PROVIDE CMMI LEVEL-3 CERTIFICATION AT THE TIME OF DELIVERY

To

GGM (O&M)/NR
RailTel Corporation of India Limited
6th Floor, IIIrd Block,
Delhi Technology Park, Shastri Park,
New Delhi-110053

Tender Reference No.:

Sub: Undertaking to provide CMMI Level-3 Certification at the time of delivery
Ref: Tender no. RailTel/Tender/OT/NR/O&M/2021-22/VSS/02

Dear Sir,

We hereby explicitly undertake to provide CMMI Level-3 Certification at the time of delivery for the quoted _____ (OEM) products in terms of compliance to tender clause 4.A.14.2 (7).

Place:
Date:

Seal and signature of the SI/OEM

(This letter should be on the letterhead of the SI as well as software OEM duly signed by an authorized signatory)

Form No. 17 - PROFORMA FOR SELF CERTIFICATION REGARDING LOCAL CONTENT (LC) FOR TELECOM PRODUCT, SERVCIES OR WORKS

(For OEM's claiming preference as Domestic Manufacturer under PMI policy)

Date:

……..S/o, D/o, W/o ……. , Resident of ……. do hereby solemnly affirm ---------- and declare as under:

That I agree to abide by the terms and conditions of Department of Telecommunications, Government of India issued vide Notification No: ……..dated ……...

That the information furnished hereinafter is correct to best of my knowledge and belief and I undertake to produce relevant records before the procuring entity or any other authority so nominated by the Department of Telecommunications, Government of India for the purpose of assessing the LC.

That the LC for all inputs which constitute the said Telecom Product/Services/Works has been verified by me and I am responsible for the correctness of the claims made therein.

That in the event of the LC of the Telecom Product/Services/Works mentioned herein is found to be incorrect and not meeting the prescribed LC norms, based on the assessment of
an authority so nominated by the Department of Telecommunications, Government of India
and I will be liable as under clause 9 (f) of Public Procurement (Preference to Make in India) Order 2017.
1 agree to maintain all information regarding my claim for LC in the Company's record for a period of 2 years and shall make this available for verification to any statutory authorities.

i) Name and details of the Local supplier (Registered Office, Manufacturing unit location, nature of legal entity)
ii) Date on which this certificate is issued
iii) Telecom Product/Services/Works for which the certificate is produced
iv) Procuring agency to whom the certificate is furnished
v) Percentage of LC claimed
vi) Name and contact details of the unit of the manufacturer
vii) Sale Price of the product
viii) Ex-Factory Price of the product
ix) Freight, insurance and handling
x) Total Bill of Material
xi) List and total cost value of inputs used for manufacture of the Telecom Product/Services/Works
xii) List and total cost of inputs which are locally sourced. Please attach LC certificates from local suppliers, if the input is not in-house.
xiii) List and cost of inputs which are imported, directly or indirectly

For and on behalf of …….(Name of firm/entity)

Authorized signatory (To be duly authorized by the Board of Directors resolution)
<Insert Name, Designation and Contact No. and date>

Form No. 18 - CONTRACT AGREEMENT

(CA No. …….)

This AGREEMENT is made at <Location of RO Office> on this day of _____ two thousand and twenty one by and between RailTel Corporation of India Limited (A Govt. of India Undertaking) having its Registered & Regional office at Plat-A, 6th Floor, Office Block-II, East Kidwai Nagar, New Delhi-110023, acting in the premises through RGM/ED or his authorized representative (hereinafter referred to as 'RailTel', which expression should unless repugnant to the context or meaning thereof include its successors and permitted assigns) of the one part;

And _____having its registered office at ---------- acting in the premises through……. (hereafter referred to as "Contractor", which expression should unless repugnant to the context or meaning thereof include its successor and permitted assigns) of the other part.

Whereas in response to a call for Tender by RailTel for the work of "……..……..." for RailTel Corporation of India Limited as per tender papers at Annexure 'A' read with Corrigendum…….. issued by RailTel hereto, the Contractor has submitted offer letter as per Annexure 'B' hereto

AND WHEREAS the said Tender of the Contractor has been accepted for the work of "……" for RailTel Corporation of India Limited as per copy of Letter of Acceptance of Tender No. _____dated_____ complete with enclosures at the accepted rates and agreed deviations from tender papers as per Annexure-C hereto at contract value of Rs._____(Rupees _____ Only) duly accepted by the contractor.

Now this agreement witnesses that in consideration of the premises and the payment to be made by the Purchaser (RailTel) to the Contractor provided for herein, the Contractor shall supply all equipment and materials and execute and perform all works for which the said Tender of the Contractor has been accepted strictly according to the various provisions in Annexure 'B' and 'C' hereto and upon such supply, execute and performance to the satisfaction of the purchaser (RailTel) and the purchaser (RailTel) shall pay to the Contractor at the rates accepted as per the said Annexure 'C' and in terms of the provisions therein.

IN WITNESS whereof both the parties have hereunto set and subscribed their respective hands and/or seals on the day and year respectively mentioned against their respective signatures.

Signed and delivered by Shri _____ for and on behalf of RailTel Corporation of India Ltd.

The contract within named in the presence of:

1. Signatures
   Date

Name in Block Capitals
Address:

2. Signatures
Date
Name in Block Capitals
Address:

Signed and delivered by Shri. _____ for and on behalf of _____

The contractor within named in the presence of :

1. Signatures
Date
Name in Block Capitals
Address:

2. Signature
Date
Name in Block Capitals
Address:

Annexure 'A' :	Tender Document No……. with Corrigendum(s), if any.
Annexure 'B' :	Contractor's offer letter.
Annexure 'C' :	Letter of Acceptance No…….. with all enclosures.
Annexure 'D' :	Copy of Rolling Performance Bank Guarantee (R-PBG)

Form No. 19–EMD Declaration letter: (to be submitted by bidder)

To

GGM (O&M)/NR
RailTel Corporation of India Limited
6th Floor, IIIrd Block,
Delhi Technology Park, Shastri Park,
New Delhi-110053

Tender Reference No.:

Sub: EMD Declaration letter
Ref: Tender no. RailTel/Tender/OT/NR/O&M/2021-22/VSS/02

Dear Sir,

I/we M/s (name of bidder) ……..am/are aware that I/we have been exempted from submission of EMD in lieu of EMD declaration letter. I/We understand and accept that if I/we withdraw my/our bid within bid validity period or if awarded the tender and on being called upon to submit the Performance Guarantee/performance security fail to submit the same within the stipulated time period mentioned in tender documents or on being called upon to sign contract agreement fail to sign the same within stipulated period mentioned in tender documents. I/we i.e the bidder…… shall be banned from the submission of bids in any works/Service Tender issued by RailTel for period of 01 year from the date of such banning letter issued.

……
Bidder's Authorized representative.

****

SECTION-I
CHAPTER-7

Annexure-I - List of Divisional and Headquarter Control Offices covered under present Tender

SN	Railway Zone	Headquarters	Divisional Control Office	Region
1	North Central Railway	Allahabad	Allahabad, Tundla, Agra, Jhansi	Northern
2	North Eastern Railway	Gorakhpur	Izzatnagar, Lucknow, Varanasi	Northern
3	North Western Railway	Jaipur	Jaipur, Ajmer, Bikaner, Jodhpur	Northern
4	Northern Railway	Delhi	Delhi, Ambala, Firozpur, Lucknow, Moradabad	Northern

Annexure-II - Details of Existing VSS Stations/RPF Thanas having existing VSS Infra (either installed or under Installation)

SN	Name of Controlling RPF Thana/Post (Cluster)	Name of Station	Rail-way Zone	Stn Code	Cat ego ry of Sta-tion s	State	Project Phase (IA/IB/IBV)	Dome	Fixed Box Type	PTZ	4K UHD	VMS SW	UPS (2x10KVA)	Server with 36TB usable Storage	PC Workstation with1 KVA UPS	LFD 55"	Rack 19" 42U	Switch Type-III
1	Aburoad	Aburoad	NWR	ABR	A	Raja-sthan	IB	6	27	3	4	40	1	36	1	2	1	1
2	Adarshna-gardelhi	Adarsh-na-gardelhi	NR	ANDI	A	Delhi	IA		15				0	36	0	1	1	
3	Agra Cantt	Raja Ki Mandi	NCR	RKM	A	UP	IB	6	27	3	2	38	1	36	1	2	1	1
4	Agra Fort	Agra Fort	NCR	AF	A	UP	IB	6	27	3	4	40	1	36	1	2	1	1
5	Aligarh	Aligarh	NCR	ALJN	A	UP	IA	6	27	3	4		0	36	1	1	1	
6	Alwar	Alwar	NWR	AWR	A	Raja-sthan	IB	6	27	3	4	40	1	36	1	2	1	1
7	Azamgarh	Azamgarh	NER	AMH	A	UP	IB	6	27	3	4	40	1	36	1	2	1	1
8	Balia	Ballia	NER	BUI	A	UP	IB	6	27	3	4	40	1	36	1	2	1	1
9	Banda	Banda	NCR	BNDA	A	UP	IB	6	27	3	4	40	1	36	1	2	1	1
10	Bandikui	Bandikui	NWR	BKI	A	Raja-sthan	IB	6	27	3	4	40	1	36	1	2	1	1
11	Dausa	Dausa	NWR	DO	B	Raja-sthan	IBV	5	20	3	3	31	1	36	1	2	1	1
12	Barabanki	Barabanki	NR	BBK	A	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
13	Barmer	Barmer	NWR	BME	A	Raja-sthan	IBV	5	19	2	3	29	1	36	1	2	1	1
14	Basti	Basti	NER	BST	A	UP	IB	6	27	3	4	40	1	36	1	2	1	1
15	Khalilabad	Khalila-bad	NER	KLD	A	UP	IB	6	27	3	4	40	1	36	1	2	1	1
16	Beas	Beas	NR	BES	A	Punjab	IB	6	27	3	4	40	1	36	1	2	1	1
17	Beawar	Beawar	NWR	BER	B	Raja-sthan	IBV	5	20	3	3	31	0.5	36	1	2	1	1
18	Pali Marwar	Pali Marwar	NWR	PMY	A	Raja-sthan	IB	6	27	3	4	40	1	36	1	2	1	1
19	Bhilwara	Bhilwara	NWR	BHL	A	Raja-sthan	IB	6	27	3	4	40	1	36	1	2	1	1

20	Bhiwani	Bhiwani	NWR	BNW	A	Haryana	IB	6	27	3	4	40	1	36	1	2	1	1
21	Chandausi	Chandau-si	NR	CH	A	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
22	Dehradun	Dehradun	NR	DDN	A1	Ut-tranchal	IA		15				0	36	1	2	1	
23	Delhi Kishanganj	SUBZI MANDI	NR	SZM	B	Delhi	IA		15				0	36	0	2	1	
24	Deoria Sadar	Deoria Sadar	NER	DEOS	A	UP	IB	6	27	3	4	40	1	36	1	2	1	1
25	Etawah	Etawah	NCR	ETW	A	UP	IB	6	27	3	4	40	1	36	1	2	1	1
26	Falna	Falna	NWR	FA	A	Raja-sthan	IB	6	27	3	4	40	1	36	1	2	1	1
27	Falna	Rani	NWR	RN	A	Raja-sthan	IBV	5	19	2	3	29		36	1	2	1	
28	Faridabad	FARIDA-BAD	NR	FDB	A	Haryana	IB	4	31	3	4	42	1	36	1	2	1	1
29	Faridabad	BAL-LABGAR H	NR	BVH	A	Haryana	IB	6	27	3	4	40	1	36	1	2	1	1
30	Firozabad	Firozabad	NCR	FZD	B	UP	IB	6	27	3	4	40	1	36	1	2	1	1
31	Firozpur Cantt.	Firozpur Cantt.	NR	FZR	A	Punjab	IB	6	27	3	4	40	1	36	1	2	1	1
32	Amroha	Amroha	NR	AMRO	B	Uttar Pradesh	IBV	6	20	3	4	33	1	36	1	2	1	1
33	Gandhina-gar	Gandhi-nagar-Jp	NWR	GADJ	A	Raja-sthan	IB	6	27	3	4	40	1	36	1	2	1	1
34	Gonda Jn	Gonda Jn.	NER	GD	A	UP	IB	6	27	3	4	40	1	36	1	2	1	1
35	Gurgaon	GURGA-ON	NR	GGN	A	Haryana	IB	6	27	3	4	40	1	36	1	2	1	1
36	Gwalior	Gwalior	NCR	GWL	A1	MP	IA		15				0	36	1	2	1	
37	Hanuman-garh	Hanu-mangarh Jn.	NWR	HMH	A	Raja-sthan	IB	6	27	3	4	40	1	36	1	2	1	1
38	Suratgarh	Suratgarh	NWR	SOG	A	Raja-sthan	IB	6	27	3	4	40	1	36	1	2	1	1
39	Hapur	Hapur	NR	HPU	A	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
40	Hisar	Hisar	NWR	HSR	A	Haryana	IB	6	27	3	4	40	1	36	1	2	1	1
41	Jagadhri	Jagadhri	NR	JUD	A	Haryana	IB	6	27	3	4	40	1	36	1	2	1	1
42	Jaisalmer	Jaisalmer	NWR	JSM	A	Raja-sthan	IB	6	27	3	4	40	1	36	1	2	1	1

43	Jalandhar Cant	Jalandhar Cant	NR	JUC	A	Punjab	IB	6	27	3	4	40	1	36	1	2	1	1
44	Jalandhar Cant	Phagwara	NR	PGW	A	Punjab	IB	6	27	3	4	40	1	36	1	2	1	1
45	Janghai	Janghai	NR	JNH	A	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
46	Bhadohi	Bhadohi	NR	BOY	A	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
47	Datia	Datia	NCR	DAA	B	MP	IBV	6	20	3	4	33	0.5	36	1	2	1	1
48	Jaunpur	Jaunpur	NR	JNU	A	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
49	Jind	JIND	NR	JHI	B	Haryana	IBV	5	18	2	3	28	1	36	1	2	1	1
50	Kathgodam	Kathgo-dam	NER	KGM	A	Uttarak-hand	IB	6	27	3	4	40	1	36	1	2	1	1
51	Nazibabad	Naziba-bad	NR	NBD	B	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
52	Roorkee	Roorkee	NR	RK	A	Ut-tranchal	IBV	6	20	3	4	33	1	36	1	2	1	1
53	Lalgarh	Lalgarh	NWR	LGH	A	Raja-sthan	IB	6	27	3	4	40	1	36	1	2	1	1
54	Lalitpur	Lalitpur	NCR	LAR	A	UP	IB	6	27	3	4	40	1	36	1	2	1	1
55	Babina	Babina	NCR	BAB	B	UP	IBV	6	20	3	4	33	1	36	1	2	1	1
56	Rudrapur City	Rudrapur City	NER	RUPC	A	Uttarak-hand	IB	6	27	3	4	40	1	36	1	2	1	1
57	Bad-shahnagar	Bad-shahna-gar	NER	BNZ	B	UP	IBV	6	20	3	4	33	0.5	36	1	2	1	1
58	Mahoba	Mahoba	NCR	MBA	A	UP	IB	6	27	3	4	40	1	36	1	2	1	1
59	Mankapur Jn	Mankapur Jn.	NER	MUR	B	UP	IBV	6	20	3	4	33	1	36	1	2	1	1
60	Marwar Jn.	Marwar Jn.	NWR	MJ	A	Raja-sthan	IB	6	27	3	4	40	1	36	1	2	1	1
61	Mau Jn	Mau Jn.	NER	MAU	A	UP	IB	6	27	3	4	40	1	36	1	2	1	1
62	Mau Jn	Belthara Road	NER	BLTR	A	UP	IB	6	27	3	4	40	1	36	1	2	1	1
63	Meerut City	MEERUT CITY	NR	MTC	A	Uttar Pradesh	IA		15				0	36	0	2	1	
64	Meerut City	MEERUT CANTT.	NR	MUT	A	Uttar Pradesh	IA		15				0	36	0	1	1	
65	Nagaur	Nagaur	NWR	NGO	A	Raja-sthan	IB	6	27	3	4	40	1	36	1	2	1	1

66	Morena	Morena	NCR	MRA	A	MP	IB	6	27	3	4	40	1	36	1	2	1	1
67	Morena	Orai	NCR	ORAI	A	UP	IB	6	27	3	4	40	1	36	1	2	1	1
68	Ghazipur City	Ghazipur City	NER	GCT	B	UP	IA		15				0	36	1	2	1	
69	Faridabad	FARIDA-BAD TOWN	NR	FDN	B	Haryana	IB	6	27	3	4	40	1	36	1	2	1	1
70	Hardoi	Hardoi	NR	HRI	A	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
71	**LDH**	Phillaur	NR	PHR	B	Punjab	IBV	5	20	3	4	32	1	36	1	2	1	1
72	Panipat	PANIPAT	NR	PNP	A	Haryana	IB	6	27	3	4	40	1	36	1	2	1	1
73	KUN	KARNAL	NR	KUN	A	Haryana	IB	6	27	3	4	40	1	36	1	2	1	1
74	Partapgarh	Partapgarh	NR	PBH	A	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
75	Amethi	Amethi	NR	AME	B	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
76	Pathankot	Pathankot	NR	PTK	A	Punjab	IB	6	27	3	4	40	1	36	1	2	1	1
77	Phaphund	Phaphund	NCR	PHD	A	UP	IB	6	27	3	4	40	1	36	1	2	1	1
78	Phulera	Phulera	NWR	FL	A	Raja-sthan	IB	6	27	3	4	40	1	36	1	2	1	1
79	Kishangarh	Kishangarh	NWR	KSG	B	Raja-sthan	IBV	5	19	2	3	29	1	36	1	2	1	1
80	Phul Pur	Phul Pur	NR	PLP	B	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
81	Raebareli	Rae - Bareli Jn.	NR	RBL	A	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
82	Rajpura Jn.	Rajpura Jn.	NR	RPJ	A	Punjab	IB	6	27	3	4	40	1	36	1	2	1	1
83	Rampur	Rampur	NR	RMU	A	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
84	Rewari	Rewari	NWR	RE	A	Haryana	IB	6	27	3	4	40	1	36	1	2	1	1
85	Rohtak	ROHTAK	NR	ROK	A	Haryana	IB	6	27	3	4	40	1	36	1	2	1	1
86	Shahganj	Shahganj	NR	SHG	A	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
87	Shahjahan-pur	Shahja-hanpur	NR	SPN	A	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
88	Shakurbasti	SHAKUR BASTI	NR	SSB	B	Delhi	IA		15				0	36	0	1	1	

89	Shakurbasti	NANGLOI	NR	NNO	B	Delhi	IA		15				0	36	1	2	1	
90	Shikohabad	Shiko-habad	NCR	SKB	B	UP	IB	6	27	3	4	40	1	36	1	2	1	1
91	Sirhind Jn.	Sirhind Jn.	NR	SIR	A	Punjab	IB	6	27	3	4	40	1	36	1	2	1	1
92	Sitapur	Sitapur	NER	STP	B	UP	IBV	6	20	3	4	33	0.5	36	1	2	1	1
93	Siwan Jn	Siwan Jn.	NER	SV	A	Bihar	IB	6	27	3	4	40	1	36	1	2	1	1
94	Sonipat	SONIPAT	NR	SNP	A	Haryana	IB	6	27	3	4	40	1	36	1	2	1	1
95	Sri Gan-ganagar	Sri Gan-ganagar	NWR	SGNR	A	Raja-sthan	IB	6	27	3	4	40	1	36	1	2	1	1
96	Sultanpur	Sultanpur	NR	SLN	A	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
97	Tundla	Tundla	NCR	TDL	A	UP	IB	6	27	3	4	40	1	36	1	2	1	1
98	Udaipur City	Udaipur City	NWR	UDZ	A	Raja-sthan	IB	6	27	3	4	40	1	36	1	2	1	1
99	Unnao	Unnao	NR	ON	A	Uttar Pradesh	IB	6	27	3	4	40	1	36	1	2	1	1
							TOTAL	**531**	**2466**	**266**	**352**	**3440**	**86**	**3564**	**94**	**194**	**99**	**88**

Note:- 0.5 in UPS means 1unit of UPS of 1+1 configuration.

List of Divisional controls and Headquarter controls **having existing VSS Infra (either installed or under Installation)**

SN	Location (Division/Headquarter)	Railway Zone	Qty of PC Workstation	Qty of Large Format Display	Qty of GUI License (VMS)
1	**Baroda House Delhi N.Rly**	NR	1	2	1
2	Delhi division		1	2	1
3	Moradabad division		1	2	1
4	Firozpur division		1	2	1
5	Ambala division		1	2	1
6	Lucknow division		1	2	1
7	**Allahabad North central Rly**	NCR	1	2	1
8	Allahabad Division		1	2	1
9	Jhansi Division		1	2	1
10	Agra Division		1	2	1
11	**Gorakh pur North Eastern Rly**	NER	1	2	1
12	Varanasi Division		1	2	1
13	Lucknow Division		1	2	1
14	Izzatnagar Division		1	2	1
15	**Jaipur North West Rly**	NWR	1	2	1
16	Jaipur Division		1	2	1
17	Jodhpur Division		1	2	1
18	Bikaner Division		1	2	1
19	Ajmer Division		1	2	1
		Total	**19**	**38**	**19**

Annexure-III - List of stations covered under the scope of present tender

SN	Name of Controlling RPF Thana/Posts (Cluster)	Name of station	Stn Code	Category of Stations	Division	Railway Zone	State
1	Aburoad	Aburoad	ABR	A	Ajmer	NWR	Rajasthan
2	Adarshnagardelhi	Adarshnagardelhi	ANDI	A	DLI	NR	Delhi
3	Agra Cantt	Raja Ki Mandi	RKM	A	AGC	NCR	UP
4	Agra Fort	Agra Fort	AF	A	AGC	NCR	UP
5	Akbar Pur	Akbar Pur	ABP	A	LKO	NR	Uttar Pradesh
6	Aligarh	Aligarh	ALJN	A	ALD	NCR	UP
7	Alwar	Alwar	AWR	A	Jaipur	NWR	Rajasthan
8	Azamgarh	Azamgarh	AMH	A	Varanasi	NER	UP
9	Azamgarh	Khorasan Road	KRND	B	Varanasi	NER	UP
10	Balia	Ballia	BUI	A	Varanasi	NER	UP
11	Balia	Suraimanpur	SIP	B	Varanasi	NER	UP
12	Banda	Banda	BNDA	A	JHS	NCR	UP
13	Banda	Atarra	ATE	B	JHS	NCR	UP
14	Bandikui	Bandikui	BKI	A	Jaipur	NWR	Rajasthan
15	Dausa	Dausa	DO	B	Jaipur	NWR	Rajasthan
16	Barabanki	Barabanki	BBK	A	LKO	NR	Uttar Pradesh
17	Bareilly City	Bareilly City	BC	B	Izzatnagar	NER	UP
18	Barmer	Balotra	BLT	B	Jodhpur	NWR	Rajasthan
19	Barmer	Barmer	BME	A	Jodhpur	NWR	Rajasthan
20	Basti	Basti	BST	A	Lucknow	NER	UP
21	Khalilabad	Khalilabad	KLD	A	Lucknow	NER	UP
22	Beas	Beas	BES	A	FZR	NR	Punjab
23	Beawar	Beawar	BER	B	Ajmer	NWR	Rajasthan
24	Pali Marwar	Pali Marwar	PMY	A	Jodhpur	NWR	Rajasthan
25	Bhatinda	Abohar Jn.	ABS	B	UMB	NR	Punjab
26	Bhatni	Bhatni Jn.	BTT	B	Varanasi	NER	UP
27	Bhatni	Salempur Jn.	SRU	B	Varanasi	NER	UP
28	Bhilwara	Bhilwara	BHL	A	Ajmer	NWR	Rajasthan
29	Bhiwani	Bhiwani	BNW	A	Bikaner	NWR	Haryana
30	Chandausi	Chandausi	CH	A	MB	NR	Uttar Pradesh

31	Chitrakutdham Karwi	Chitrakutdham Karwi	CKTD	A	JHS	NCR	UP
32	Dabra	Dabra	DBA	B	JHS	NCR	MP
33	Dehradun	Dehradun	DDN	A1	MB	NR	Uttranchal
34	Delhi Kishanganj	SUBZI MANDI	SZM	B	DLI	NR	Delhi
35	Delhi Shahdara	SAHIBABAD	SBB	B	DLI	NR	Uttar Pra-desh
36	Deoria Sadar	Deoria Sadar	DEOS	A	Varanasi	NER	UP
37	Dholpur	Dholpur	DHO	B	JHS	NCR	Rajasthan
38	Etawah	Etawah	ETW	A	ALD	NCR	UP
39	Falna	Falna	FA	A	Ajmer	NWR	Rajasthan
40	Falna	Jawaibandh	JWB	B	Ajmer	NWR	Rajasthan
41	Falna	Rani	RN	A	Ajmer	NWR	Rajasthan
42	Faridabad	FARIDABAD	FDB	A	DLI	NR	Haryana
43	Faridabad	BALLABGARH	BVH	A	DLI	NR	Haryana
44	Faridabad	FARIDABAD TOWN	FDN	B	DLI	NR	Haryana
45	Farrukhabad Jn.	Farrukhabad Jn.	FBD	B	Izzatnagar	NER	UP
46	Farrukhabad Jn.	Fatehgarh	FGR	B	Izzatnagar	NER	UP
47	Fatehpur	Fatehpur	FTP	A	ALD	NCR	UP
48	Firozabad	Firozabad	FZD	B	ALD	NCR	UP
49	Firozpur Cantt.	Firozpur Cantt.	FZR	A	FZR	NR	Punjab
50	Amroha	Amroha	AMRO	B	MB	NR	Uttar Pra-desh
51	Gandhinagar	Gandhinagar-Jp	GADJ	A	Jaipur	NWR	Rajasthan
52	Gonda Jn	Gonda Jn.	GD	A	Lucknow	NER	UP
53	Gurgaon	GURGAON	GGN	A	DLI	NR	Haryana
54	Gwalior	Gwalior	GWL	A1	JHS	NCR	MP
55	Hanumangarh	Hanumangarh Jn.	HMH	A	Bikaner	NWR	Rajasthan
56	Suratgarh	Suratgarh	SOG	A	Bikaner	NWR	Rajasthan
57	Hapur	Hapur	HPU	A	MB	NR	Uttar Pra-desh
58	Haridwar	Raiwala	RWL	B	MB	NR	Uttranchal
59	Rishikesh	Rishikesh	RKSH	B	MB	NR	Uttranchal
60	Hisar	Hisar	HSR	A	Bikaner	NWR	Haryana
61	Jagadhri	Jagadhri	JUD	A	UMB	NR	Haryana
62	Jaisalmer	Jaisalmer	JSM	A	Jodhpur	NWR	Rajasthan
63	Jalandhar Cant	Jalandhar Cant	JUC	A	FZR	NR	Punjab
64	Jalandhar Cant	Phagwara	PGW	A	FZR	NR	Punjab
65	Janghai	Janghai	JNH	A	LKO	NR	Uttar Pra-desh
66	Bhadohi	Bhadohi	BOY	A	LKO	NR	Uttar Pra-

							desh
67	Datia	Datia	DAA	B	JHS	NCR	MP
68	Jaunpur	Jaunpur	JNU	A	LKO	NR	Uttar Pra-desh
69	Jaunpur	Jaunpur City	JOP	B	LKO	NR	Uttar Pra-desh
70	Jind	JIND	JHI	B	DLI	NR	Haryana
71	Jodhpur	Rai Ka Bagh Palace Jn	RKB	B	Jodhpur	NWR	Rajasthan
72	Kannauj	Kannauj	KJN	B	Izzatnagar	NER	UP
73	Kannauj	Kanpur (Anwarganj)	CPA	B	Lucknow	NER	UP
74	Kasganj Jn	Kasganj Jn.	KSJ	B	Izzatnagar	NER	UP
75	Kashipur Jn.	Kashipur Jn.	KPV	B	Izzatnagar	NER	Uttarakhand
76	Kathgodam	Kathgodam	KGM	A	Izzatnagar	NER	Uttarakhand
77	Kathgodam	Haldwani	HDW	B	Izzatnagar	NER	Uttarakhand
78	Kathua	Kathua	KTHU	B	FZR	NR	Jammu & Kashmir
79	Kotkapura	Faridkot	FDK	B	FZR	NR	Punjab
80	Laksar	Laksar	LRJ	B	MB	NR	Uttar Pra-desh
81	Nazibabad	Nazibabad	NBD	B	MB	NR	Uttar Pra-desh
82	Roorkee	Roorkee	RK	A	MB	NR	Uttranchal
83	Lalgarh	Lalgarh	LGH	A	Bikaner	NWR	Rajasthan
84	Lalitpur	Lalitpur	LAR	A	JHS	NCR	UP
85	Babina	Babina	BAB	B	JHS	NCR	UP
86	Lalkuan	Lalkuan	LKU	B	Izzatnagar	NER	Uttarakhand
87	Rudrapur City	Rudrapur City	RUPC	A	Izzatnagar	NER	Uttarakhand
88	Badshahnagar	Badshahnagar	BNZ	B	Lucknow	NER	UP
89	Lucknow City	Aishbagh	ASH	B	Lucknow	NER	UP
90	Mahoba	Mahoba	MBA	A	JHS	NCR	UP
91	Mahoba	Khajuraho	KURJ	B	JHS	NCR	MP
92	Lakhimpur	Lakhimpur	LMP	B	Lucknow	NER	UP
93	Manduadih	Manduadih	MUV	B	Varanasi	NER	UP
94	Manikpur	Manikpur	MKP	B	JHS	NCR	UP
95	Mankapur Jn	Mankapur Jn.	MUR	B	Lucknow	NER	UP
96	Marwar Jn.	Marwar Jn.	MJ	A	Ajmer	NWR	Rajasthan
97	Mau Jn	Mau Jn.	MAU	A	Varanasi	NER	UP
98	Mau Jn	Belthara Road	BLTR	A	Varanasi	NER	UP
99	Meerut City	MEERUT CITY	MTC	A	DLI	NR	Uttar Pra-desh
100	Meerut City	MEERUT CANTT.	MUT	A	DLI	NR	Uttar Pra-desh
101	Merta Road	Merta Road	MTD	B	Jodhpur	NWR	Rajasthan
102	Merta Road	Nokha	NOK	B	Jodhpur	NWR	Rajasthan
103	Makrana	Makrana	MKN	B	Jodhpur	NWR	Rajasthan

104	Nagaur	Nagaur	NGO	A	Jodhpur	NWR	Rajasthan
105	Mirzapur	Mirzapur	MZP	A	ALD	NCR	UP
106	Mirzapur	Vindhyachal	BDL	B	ALD	NCR	UP
107	Morena	Morena	MRA	A	JHS	NCR	MP
108	Morena	Orai	ORAI	A	JHS	NCR	UP
109	Muzaffarnagar	MUZAFFARNAGAR	MOZ	A	DLI	NR	Uttar Pradesh
110	Muzaffarnagar	DEOBAND	DBD	B	DLI	NR	Uttar Pradesh
111	Nangaldam	Una Himachal	UHL	B	UMB	NR	Himachal Pradesh
112	Nihal Garh	Nihal Garh	NHH	B	LKO	NR	Uttar Pradesh
113	Ghazipur City	Ghazipur City	GCT	B	Varanasi	NER	UP
114	Hardoi	Hardoi	HRI	A	MB	NR	Uttar Pradesh
115	**LDH**	Phillaur	PHR	B	FZR	NR	Punjab
116	Palwal	PALWAL	PWL	B	DLI	NR	Haryana
117	Panipat	PANIPAT	PNP	A	DLI	NR	Haryana
118	KUN	KARNAL	KUN	A	DLI	NR	Haryana
119	Partapgarh	Partapgarh	PBH	A	LKO	NR	Uttar Pradesh
120	Amethi	Amethi	AME	B	LKO	NR	Uttar Pradesh
121	Pathankot	Pathankot	PTK	A	FZR	NR	Punjab
122	Phaphund	Phaphund	PHD	A	ALD	NCR	UP
123	Phulera	Phulera	FL	A	Jaipur	NWR	Rajasthan
124	Kishangarh	Kishangarh	KSG	B	Jaipur	NWR	Rajasthan
125	Pilibhit Jn.	Pilibhit Jn.	PBE	B	Izzatnagar	NER	UP
126	Prayag	Pryag	PRG	B	LKO	NR	Uttar Pradesh
127	Phul Pur	Phul Pur	PLP	B	LKO	NR	Uttar Pradesh
128	Raebareli	Rae - Bareli Jn.	RBL	A	LKO	NR	Uttar Pradesh
129	Rajpura Jn.	Rajpura Jn.	RPJ	A	UMB	NR	Punjab
130	Rampur	Rampur	RMU	A	MB	NR	Uttar Pradesh
131	Rewari	Rewari	RE	A	Jaipur	NWR	Haryana
132	Sikar	Sikar	SIKR	B	Jaipur	NWR	Rajasthan
133	Rohtak	ROHTAK	ROK	A	DLI	NR	Haryana
134	Rohtak	BAHADURGARH	BGZ	B	DLI	NR	Haryana
135	Shahganj	Shahganj	SHG	A	LKO	NR	Uttar Pradesh
136	Shahjahanpur	Shahjahanpur	SPN	A	MB	NR	Uttar Pradesh
137	Shakurbasti	SHAKURBASTI	SSB	B	DLI	NR	Delhi

138	Shakurbasti	NANGLOI	NNO	B	DLI	NR	Delhi
139	Shikohabad	Shikohabad	SKB	B	ALD	NCR	UP
140	Sirhind Jn.	Sirhind Jn.	SIR	A	UMB	NR	Punjab
141	Sirsa	Sirsa	SSA	B	Bikaner	NWR	Haryana
142	Sitapur	Sitapur	STP	B	Lucknow	NER	UP
143	Siwan Jn	Siwan Jn.	SV	A	Varanasi	NER	Bihar
144	Siwan Jn	Mairwa	MW	B	Varanasi	NER	Bihar
145	Sonipat	SONIPAT	SNP	A	DLI	NR	Haryana
146	Sri Ganganagar	Sri Ganganagar	SGNR	A	Bikaner	NWR	Rajasthan
147	Sultanpur	Sultanpur	SLN	A	LKO	NR	Uttar Pra-desh
148	Tundla	Tundla	TDL	A	ALD	NCR	UP
149	Udaipur City	Mavli Jn.	MVJ	B	Ajmer	NWR	Rajasthan
150	Udaipur City	Udaipur City	UDZ	A	Ajmer	NWR	Rajasthan
151	Unnao	Unnao	ON	A	LKO	NR	Uttar Pra-desh

Note:
Above list of stations also include stations having existing (either installed or under installation) VSS Infra.

Annexure– IV - CALCULATION OF LOCAL CONTENT

1. Under present DIPP PPP-MII policy issued vide their order No. P-45021/2/2017-PP (BE-II) dated 28-05-2018, Notification of DoT issued vide No. 18-10/2017-IP dated 29-08-2018 and PPO 2017 by MeitY issued vide Notification No. 33(1)/2017-IPHW dated 14.09.2017 and Notification No. 33(5)/2017-IPHW dated 01.08.2018), following products, covered under the RFP, are protected:

   a) Routers (PMI- 50%, LC - 60%)
   b) Ethernet Switches (PMI -50%, LC -60%)
   c) Security and Surveillance Communication Systems (video and sensors based) including Perimeter Security Systems (PMI -100%, LC -40%)
   d) Optical Fiber (PMI -50%, LC -50%)
   e) Optical Fiber Cable (PMI -75%, LC -55%)
   f) Telecom Power System (PMI -50%, LC -55%)
   g) Telecom Battery (PMI -50%, LC -55%)
   h) Servers – by MeitY (PMI -50%, LC-40%)

   PMI – Minimum preference in % (of total quantity being procured) for Make in India Telecom Products, Services or Works as indicated against each financial year

   LC – Minimum Local Content as a percentage of total Bill of Material (cost of production) to qualify as Make in India Telecom Products, Services or Works as indicated against each financial year

2. Item no. 24 of Table-A of DoT Notification dated 29-08-2018, i.e. Security and Surveillance Communication Systems (video and sensors based) including Perimeter Security Systems, has not been defined by DoT. The item shall include, for the purpose of this tender/RFP, following sub-items:

   a) Cameras (of all types),
   b) Application software VMS
   c) Application software VA
   d) Application software FR.
   e) Any other Application software such as AI etc. offered as part of above sub-items to improve the performance of the system

3. Domestic manufacturers of items in para 1 above shall be protected if they meet minimum local content requirement. This RFP being a composite tender, where System Integrators (SIs) are supposed to bid with most economic cost to them. Under such circumstances, the SIs are free to choose various products depending upon the solution, convenience, economy or any other reason.

4. OEM for any product required for the work, covered under PPP-MII, has to submit a certificate against meeting the requirement of local content, as per PPP-MII guidelines, either as self declaration (if value of procurement is less than 10 crore) or as a certificate issued by their statutory auditors or cost auditors (if value of procurement is more than 10 crore).

5. As item against "Security and Surveillance Communication Systems (video and sensors based) including Perimeter Security Systems" does not include products from one OEM, the Local Content shall be calculated as

Value of Local Content in %	=	(Total offered Value of all sub-items in the bid) – (Total value of Non-LC sub-items)
		Total offered Value of all sub-items in the bid

If the value of Local Content, calculated above, is more than 40% (for FY 2019-20), the total value of the combined product (to qualify against item no. 24 of Table-A of DoT Notification) shall be considered as Local Content.

Bidder has to submit calculation as per the above formula duly certified by their statutory auditor or cost auditor. This has to be submitted with the technical bid.

6. If any product covered under protected list has not been offered as domestically manufactured product with requisite local content, total value of the offered product will not be considered as Local Content in the overall bid. Total value of all such protected domestically manufactured products, not offered with requisite Local Content, (say Non-LC items) along with other foreign items shall be deducted from the overall value of the bid to calculate the LC Value. The same is reproduced as under:

Value of Local Content in %	=	(Total Bid Value) – (Total value of all Non-LC items)
		Total Bid Value

Further, as per notification of DoT issued vide No. 18-10/2017-IP dated 29-08-2018, the proposed work is considered as Telecom Services/Works (S.No. 36 of Table-A). Therefore, if the value of Local Content, calculated above, is more than 70%, the bid shall be considered for preference under PPP-MII policy.

Bidder has to submit calculation as per the above formula duly certified by their statutory auditor or cost auditor. This has to be submitted with the technical bid.

7. Bidder is also required to declare against each SOR item, whether, the offered product is falling under domestic/foreign category. If the offered product is a notified domestic item then bidder has to submit all documents as mentioned in the notifications/guidelines of GoI regarding domestic product/s along with the bid to qualify offered product/s as a domestic product/s and consideration in evaluation of domestic bid. In case of non-submission of required documents, offered product will not be treated as domestic product.

Annexure-V - Deleted

Annexure-VI - Indicative list of Number of Cameras to be installed at Stations

SN	Type of Camera	A1 Category Station	A Category Station	B Category Station	C Category Station	D & E* Category Station
1	**Dome**	7	6	5	2	0
2	**PTZ**	9	6	4	3	1
3	**Fixed Bullet**	68	42	25	17	9
4	**4k UHD Bullet**	8	6	4	4	0
	Total	**92**	**60**	**38**	**26**	**10**

**D&E Category Stations not covered in the Scope of tender.*

Note:- Bidders to take a note that these numbers are assumed to estimate the infrastructure requirement like cameras, servers, storage capacity etc. at each RPF Thana/ Post, however the actual number of cameras deployed may vary as per the actual site requirements and design approved by Indian Railways and RailTel.

Annexure-VII - List of RPF Thana wise number of cameras for VMS & VA server sizing

SN	Name of Controlling RPF Thana/Post (Cluster)	Railway Zone	Stn Code	Category of Stations	State	Name of station	Division	Total Number of Cameras at Cluster stations for VMS server	20% of Total Number of Cameras at Cluster stations for VA server	Total Number of 4K UHD Cameras at Cluster stations for FRS
1	Aburoad	NWR	ABR	A	Rajasthan	Aburoad	Ajmer	60	12	6
2	Adarshnagardelhi	NR	ANDI	A	Delhi	Adarshnagardelhi	DLI	60	12	6
3	Agra Cantt	NCR	RKM	A	UP	Raja Ki Mandi	AGC	60	12	6
4	Agra Fort	NCR	AF	A	UP	Agra Fort	AGC	60	12	6
5	Akbar Pur	NR	ABP	A	Uttar Pradesh	Akbar Pur	LKO	60	12	6
6	Aligarh	NCR	ALJN	A	UP	Aligarh	ALD	60	12	6
7	Alwar	NWR	AWR	A	Rajasthan	Alwar	Jaipur	60	12	6
8	Azamgarh	NER	AMH	A	UP	Azamgarh	Varanasi	98	20	6
9	Azamgarh	NER	KRND	B	UP	Khorasan Road	Varanasi			4
10	Balia	NER	BUI	A	UP	Ballia	Varanasi	98	20	6
11	Balia	NER	SIP	B	UP	Suraimanpur	Varanasi		0	4
12	Banda	NCR	BNDA	A	UP	Banda	JHS	98	20	6
13	Banda	NCR	ATE	B	UP	Atarra	JHS		0	4
14	Bandikui	NWR	BKI	A	Rajasthan	Bandikui	Jaipur	60	12	6
15	Dausa	NWR	DO	B	Rajasthan	Dausa	Jaipur	38	8	4
16	Barabanki	NR	BBK	A	Uttar Pradesh	Barabanki	LKO	60	12	6
17	Bareilly City	NER	BC	B	UP	Bareilly City	Izzatnagar	38	8	4
18	Barmer	NWR	BLT	B	Rajasthan	Balotra	Jodhpur	98	20	4
19	Barmer	NWR	BME	A	Rajasthan	Barmer	Jodhpur		0	6
20	Basti	NER	BST	A	UP	Basti	Lucknow	60	12	6
21	Khalilabad	NER	KLD	A	UP	Khalilabad	Lucknow	60	12	6
22	Beas	NR	BES	A	Punjab	Beas	FZR	60	12	6
23	Beawar	NWR	BER	B	Rajasthan	Beawar	Ajmer	38	8	4
24	Pali Marwar	NWR	PMY	A	Rajasthan	Pali Marwar	Jodhpur	60	12	6
25	Bhatinda	NR	ABS	B	Punjab	Abohar Jn.	UMB	38	8	4
26	Bhatni	NER	BTT	B	UP	Bhatni Jn.	Varanasi	76	15	4
27	Bhatni	NER	SRU	B	UP	Salempur Jn.	Varanasi		0	4
28	Bhilwara	NWR	BHL	A	Rajasthan	Bhilwara	Ajmer	60	12	6
29	Bhiwani	NWR	BNW	A	Haryana	Bhiwani	Bikaner	60	12	6
30	Chandausi	NR	CH	A	Uttar Pradesh	Chandausi	MB	60	12	6

31	Chitrakutdham Karwi	NCR	CKTD	A	UP	Chitrakutdham Karwi	JHS	60	12	6
32	Dabra	NCR	DBA	B	MP	Dabra	JHS	38	8	4
33	Dehradun	NR	DDN	A1	Uttranchal	Dehradun	MB	92	18	8
34	Delhi Kishanganj	NR	SZM	B	Delhi	SUBZI MANDI	DLI	38	8	4
35	Delhi Shahdara	NR	SBB	B	Uttar Pradesh	SAHIBABAD	DLI	38	8	4
36	Deoria Sadar	NER	DEOS	A	UP	Deoria Sadar	Varanasi	60	12	6
37	Dholpur	NCR	DHO	B	Rajasthan	Dholpur	JHS	38	8	4
38	Etawah	NCR	ETW	A	UP	Etawah	ALD	60	12	6
39	Falna	NWR	FA	A	Rajasthan	Falna	Ajmer	158	32	6
40	Falna	NWR	JWB	B	Rajasthan	Jawaibandh	Ajmer			4
41	Falna	NWR	RN	A	Rajasthan	Rani	Ajmer			6
42	Faridabad	NR	FDB	A	Haryana	FARIDABAD	DLI	158	32	6
43	Faridabad	NR	BVH	A	Haryana	BALLABGARH	DLI			6
44	Faridabad	NR	FDN	B	Haryana	FARIDABAD TOWN	DLI			4
45	Farrukhabad Jn.	NER	FBD	B	UP	Farrukhabad Jn.	Izzatnagar	76	15	4
46	Farrukhabad Jn.	NER	FGR	B	UP	Fatehgarh	Izzatnagar			4
47	Fatehpur	NCR	FTP	A	UP	Fatehpur	ALD	60	12	6
48	Firozabad	NCR	FZD	B	UP	Firozabad	ALD	38	8	4
49	Firozpur Cantt.	NR	FZR	A	Punjab	Firozpur Cantt.	FZR	60	12	6
50	Amroha	NR	AMRO	B	Uttar Pradesh	Amroha	MB	38	8	4
51	Gandhinagar	NWR	GADJ	A	Rajasthan	Gandhinagar-Jp	Jaipur	60	12	6
52	Gonda Jn	NER	GD	A	UP	Gonda Jn.	Lucknow	60	12	6
53	Gurgaon	NR	GGN	A	Haryana	GURGAON	DLI	60	12	6
54	Gwalior	NCR	GWL	A1	MP	Gwalior	JHS	92	18	8
55	Hanumangarh	NWR	HMH	A	Rajasthan	Hanumangarh Jn.	Bikaner	60	12	6
56	Suratgarh	NWR	SOG	A	Rajasthan	Suratgarh	Bikaner	60	12	6
57	Hapur	NR	HPU	A	Uttar Pradesh	Hapur	MB	60	12	6
58	Haridwar	NR	RWL	B	Uttranchal	Raiwala	MB	38	8	4
59	Rishikesh	NR	RKSH	B	Uttranchal	Rishikesh	MB	38	8	4
60	Hisar	NWR	HSR	A	Haryana	Hisar	Bikaner	60	12	6
61	Jagadhri	NR	JUD	A	Haryana	Jagadhri	UMB	60	12	6
62	Jaisalmer	NWR	JSM	A	Rajasthan	Jaisalmer	Jodhpur	60	12	6
63	Jalandhar Cant	NR	JUC	A	Punjab	Jalandhar Cant	FZR	120	24	6
64	Jalandhar Cant	NR	PGW	A	Punjab	Phagwara	FZR			6
65	Janghai	NR	JNH	A	Uttar Pradesh	Janghai	LKO	60	12	6
66	Bhadohi	NR	BOY	A	Uttar Pradesh	Bhadohi	LKO	60	12	6
67	Datia	NCR	DAA	B	MP	Datia	JHS	38	8	4

68	Jaunpur	NR	JNU	A	Uttar Pra-desh	Jaunpur	LKO	98	20	6
69	Jaunpur	NR	JOP	B	Uttar Pra-desh	Jaunpur City	LKO			4
70	Jind	NR	JHI	B	Haryana	JIND	DLI	38	8	4
71	Jodhpur	NWR	RKB	B	Rajasthan	Rai Ka Bagh Palace Jn	Jodhpur	38	8	4
72	Kannauj	NER	KJN	B	UP	Kannauj	Izzatnagar	76	15	4
73	Kannauj	NER	CPA	B	UP	Kanpur (Anwarganj)	Lucknow			4
74	Kasganj Jn	NER	KSJ	B	UP	Kasganj Jn.	Izzatnagar	38	8	4
75	Kashipur Jn.	NER	KPV	B	Uttarakhand	Kashipur Jn.	Izzatnagar	38	8	4
76	Kathgodam	NER	KGM	A	Uttarakhand	Kathgodam	Izzatnagar	98	20	6
77	Kathgodam	NER	HDW	B	Uttarakhand	Haldwani	Izzatnagar			4
78	Kathua	NR	KTHU	B	Jammu & Kashmir	Kathua	FZR	38	8	4
79	Kotkapura	NR	FDK	B	Punjab	Faridkot	FZR	38	8	4
80	Laksar	NR	LRJ	B	Uttar Pra-desh	Laksar	MB	38	8	4
81	Nazibabad	NR	NBD	B	Uttar Pra-desh	Nazibabad	MB	38	8	4
82	Roorkee	NR	RK	A	Uttranchal	Roorkee	MB	60	12	6
83	Lalgarh	NWR	LGH	A	Rajasthan	Lalgarh	Bikaner	60	12	6
84	Lalitpur	NCR	LAR	A	UP	Lalitpur	JHS	60	12	6
85	Babina	NCR	BAB	B	UP	Babina	JHS	38	8	4
86	Lalkuan	NER	LKU	B	Uttarakhand	Lalkuan	Izzatnagar	38	8	4
87	Rudrapur City	NER	RUPC	A	Uttarakhand	Rudrapur City	Izzatnagar	60	12	6
88	Badshahnagar	NER	BNZ	B	UP	Badshahnagar	Lucknow	38	8	4
89	Lucknow City	NER	ASH	B	UP	Aishbagh	Lucknow	38	8	4
90	Mahoba	NCR	MBA	A	UP	Mahoba	JHS	98	20	6
91	Mahoba	NCR	KURJ	B	MP	Khajuraho	JHS			4
92	Lakhimpur	NER	LMP	B	UP	Lakhimpur	Lucknow	38	8	4
93	Manduadih	NER	MUV	B	UP	Manduadih	Varanasi	38	8	4
94	Manikpur	NCR	MKP	B	UP	Manikpur	JHS	38	8	4
95	Mankapur Jn	NER	MUR	B	UP	Mankapur Jn.	Lucknow	38	8	4
96	Marwar Jn.	NWR	MJ	A	Rajasthan	Marwar Jn.	Ajmer	60	12	6
97	Mau Jn	NER	MAU	A	UP	Mau Jn.	Varanasi	120	24	6
98	Mau Jn	NER	BLTR	A	UP	Belthara Road	Varanasi			6
99	Meerut City	NR	MTC	A	Uttar Pra-desh	MEERUT CITY	DLI	120	24	6
100	Meerut City	NR	MUT	A	Uttar Pra-desh	MEERUT CANTT.	DLI			6
101	Merta Road	NWR	MTD	B	Rajasthan	Merta Road	Jodhpur	76	15	4
102	Merta Road	NWR	NOK	B	Rajasthan	Nokha	Jodhpur			4
103	Makrana	NWR	MKN	B	Rajasthan	Makrana	Jodhpur	38	8	4
104	Nagaur	NWR	NGO	A	Rajasthan	Nagaur	Jodhpur	60	12	6
105	Mirzapur	NCR	MZP	A	UP	Mirzapur	ALD	98	20	6
106	Mirzapur	NCR	BDL	B	UP	Vindhyachal	ALD			4
107	Morena	NCR	MRA	A	MP	Morena	JHS	120	24	6

108	Morena	NCR	ORAI	A	UP	Orai	JHS			6
109	Muzaffarnagar	NR	MOZ	A	Uttar Pra-desh	MUZAFFARNAGAR	DLI	98	20	6
110	Muzaffarnagar	NR	DBD	B	Uttar Pra-desh	DEOBAND	DLI			4
111	Nangaldam	NR	UHL	B	Himachal Pradesh	Una Himachal	UMB	38	8	4
112	Nihal Garh	NR	NHH	B	Uttar Pra-desh	Nihal Garh	LKO	38	8	4
113	Ghazipur City	NER	GCT	B	UP	Ghazipur City	Varanasi	38	8	4
114	Hardoi	NR	HRI	A	Uttar Pra-desh	Hardoi	MB	60	12	6
115	**LDH**	NR	PHR	B	Punjab	Phillaur	FZR	38	8	4
116	Palwal	NR	PWL	B	Haryana	PALWAL	DLI	38	8	4
117	Panipat	NR	PNP	A	Haryana	PANIPAT	DLI	60	12	6
118	KUN	NR	KUN	A	Haryana	KARNAL	DLI	60	12	6
119	Partapgarh	NR	PBH	A	Uttar Pra-desh	Partapgarh	LKO	60	12	6
120	Amethi	NR	AME	B	Uttar Pra-desh	Amethi	LKO	38	8	4
121	Pathankot	NR	PTK	A	Punjab	Pathankot	FZR	60	12	6
122	Phaphund	NCR	PHD	A	UP	Phaphund	ALD	60	12	6
123	Phulera	NWR	FL	A	Rajasthan	Phulera	Jaipur	60	12	6
124	Kishangarh	NWR	KSG	B	Rajasthan	Kishangarh	Jaipur	38	8	4
125	Pilibhit Jn.	NER	PBE	B	UP	Pilibhit Jn.	Izzatnagar	38	8	4
126	Prayag	NR	PRG	B	Uttar Pra-desh	Pryag	LKO	38	8	4
127	Phul Pur	NR	PLP	B	Uttar Pra-desh	Phul Pur	LKO	38	8	4
128	Raebareli	NR	RBL	A	Uttar Pra-desh	Rae - Bareli Jn.	LKO	60	12	6
129	Rajpura Jn.	NR	RPJ	A	Punjab	Rajpura Jn.	UMB	60	12	6
130	Rampur	NR	RMU	A	Uttar Pra-desh	Rampur	MB	60	12	6
131	Rewari	NWR	RE	A	Haryana	Rewari	Jaipur	60	12	6
132	Sikar	NWR	SIKR	B	Rajasthan	Sikar	Jaipur	38	8	4
133	Rohtak	NR	ROK	A	Haryana	ROHTAK	DLI	98	20	6
134	Rohtak	NR	BGZ	B	Haryana	BAHADURGARH	DLI			4
135	Shahganj	NR	SHG	A	Uttar Pra-desh	Shahganj	LKO	60	12	6
136	Shahjahanpur	NR	SPN	A	Uttar Pra-desh	Shahjahanpur	MB	60	12	6
137	Shakurbasti	NR	SSB	B	Delhi	SHAKURBASTI	DLI	76	15	4
138	Shakurbasti	NR	NNO	B	Delhi	NANGLOI	DLI			4
139	Shikohabad	NCR	SKB	B	UP	Shikohabad	ALD	38	8	4
140	Sirhind Jn.	NR	SIR	A	Punjab	Sirhind Jn.	UMB	60	12	6
141	Sirsa	NWR	SSA	B	Haryana	Sirsa	Bikaner	38	8	4
142	Sitapur	NER	STP	B	UP	Sitapur	Lucknow	38	8	4
143	Siwan Jn	NER	SV	A	Bihar	Siwan Jn.	Varanasi	98	20	6
144	Siwan Jn	NER	MW	B	Bihar	Mairwa	Varanasi		0	4
145	Sonipat	NR	SNP	A	Haryana	SONIPAT	DLI	60	12	6

146	Sri Ganganagar	NWR	SGNR	A	Rajasthan	Sri Ganganagar	Bikaner	60	12	6
147	Sultanpur	NR	SLN	A	Uttar Pra-desh	Sultanpur	LKO	60	12	6
148	Tundla	NCR	TDL	A	UP	Tundla	ALD	60	12	6
149	Udaipur City	NWR	MVJ	B	Rajasthan	Mavli Jn.	Ajmer	98	20	4
150	Udaipur City	NWR	UDZ	A	Rajasthan	Udaipur City	Ajmer		0	6
151	Unnao	NR	ON	A	Uttar Pra-desh	Unnao	LKO	60	12	6
							Total	**7628**	**1526**	**774**

NOTE: Total no. of RPF Thana for 151 stations are 126 as mentioned in the table above.

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SECTION-I
CHAPTER- 8

TECHNICAL, FUNCTIONAL REQUIREMENTS & SPECIFICATIONS

Note 1: The proposed solution must meet all technical and functional specifications mentioned in the latest Technical specification released by RDSO or else otherwise defined the tender document.

RDSO or TEC specification shall be the base specifications wherever available, where these are not available the equipment/software/application etc. shall conform to standard ITU/internationally accepted standards.

However, in case of any conflict on the solution design parameters, system functional requirements and technical specification of a system/item between RDSO specification and the tender conditions, the tender conditions will prevail over RDSO specifications.

Note 2: It may kindly be noted that in the specification wherever support for a feature has been asked for, it will mean that the feature should be available without RailTel requiring any other hardware/software/licenses. Thus all hardware/software/licenses required for enabling the support/feature shall be included in the offer.

Note 3: VSS, being a turnkey project, any additional hardware, software/license required for integration of the existing VSS infra with the proposed VSS infra (to be supplied under this contract) shall be supplied by the selected bidder without any additional cost to RailTel.

Note 4: The below mentioned technical specifications for the supply items are bare minimum requirements of the purchaser, the supply items quoted by bidder must comply with these technical specifications. However, the bidder can quote the items with higher technical specifications catering to the futuristic requirements of the proposed solution.

8.1 Video Surveillance System (VSS)/CCTV System

8.1.1 **Broadly, the system functionality, technical requirement and hardware specifications shall be as per RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0or latest with all amendments for IP based CCTV at Stations.**

8.1.2 **General Requirement**

8.1.2.1 The Video Surveillance System shall be based on non-proprietary open architecture where the Video Management Software, Video Recording Software and AI based Video Analytics Software can work and integrate with any make of IT hardware like Server, Storage, Workstation, Network Video Recorder and Switches etc.

8.1.2.2 The System i.e. IP Cameras, Network Video Recorders and Software (Video Management and Video Recording) shall be compliant to global standards ON VIF Profile'S'&'G'fortheinterfaceofnetworkvideoproduct(ONVIF–OpenNetwork VideoInterfaceForum).ThequotedmodelsshouldappearontheONVIFwebsite and a confirmation certificate for the offered models should be available at the time of supply.

8.1.2.3 IP Camera and Software (Video Management, Video Recording and Video Analytic Software) may be from the same manufacturer or from different manufacturers. In case, IP Cameras and Software are from different manufacturers, then all features of Cameras shall be available through the Software for viewing, recording and analytics.

8.1.2.4 Either Server based solution or Network Video Recorder based solution or combinationofbothcanbeacceptedforVideoManagementandVideoRecording for the implementation schemes as per **Schematic Diagram-2** of RDSO Specification.

Note: In case, Video Management and Video Recording is deployed on Network Video Recorders (NVRs), then NVRs shall integrate seamlessly with Video Analytics Software deployed on Servers or at Cloud.

8.1.2.5 The Video Recording and Management System shall provide secured recording for evidence purposes and user authentication to protect data integrity.

8.1.2.6 The equipment shall be able to work in the temperature range and humidity as specified in the corresponding clauses of the specification.

8.1.3 **Design parameters**

8.1.3.1 **General Parameters**

8.1.3.1.1 Implementation scheme for Video Surveillance system will be RPF Thana/ Post Clustered based architecture as mentioned in RDSO specification no. RDSO/SPN/TC/65/2021 Rev 6.0 or latest will all amendments. For implementation of the proposed system, RPF Thana/ Post would be receiving video feeds from group of stations based on jurisdiction of that respective RPF Thana/ Post through MPLS/ IP network for Video Management (Viewing and Monitoring) and Video Recording. Therefore, bidder is required to propose a cluster based solution at RPF Thana/Post locations on the basis of following design parameters.

8.1.3.1.2 **Bidder is required to study the existing VSS Infra deployed at many stations before planning their solution. Proposed solution to be integrated with existing VSS System deployed at Stations. Bidder may use existing Servers, Storage at RPF Thana/ Post as per their solution.**

8.1.3.1.3 Following assumptions have been considered while calculating the SOR Quantities of following major items, however, same may vary during implementation:

SN	Item/Location	Assumptions
1)	**Cameras**	
i)	Identified Locations for PTZ Type Cameras	One for each Platform and One for Parking Area/Taxi Stand
ii)	Identified Locations for Bullet Type Cameras	To cover Platform area and Foot Over Bridges
iii)	Identified Locations for Fixed Dome Type Cameras	Waiting Halls, Ticketing counters, Refreshment Areas etc.
iv)	Identified Locations for 4K UHD Bullet Type Camera	Each entry and Exit Gate
2)	**RPF Thana/Post (Local Monitoring Center)**	
i)	Location for Local Monitoring Center	Nearest RPF Thana
ii)	Number of PC workstation	1
iii)	Number of LFD Monitor	2
iv)	Number of PTZ Controller enabled Digital Keyboard	1
v)	Video Management and Recording Software as per Cameras	For all cameras installed in the stations
vi)	Video Analytic Software as per Cameras	For 20% of cameras installed in the stations. Supplied licenses should support both online (for 20% of cameras) and offline mode (same licenses supplied for 20% of cameras for online mode should be used for the remaining cameras in offline mode).
vii)	Facial Recognition System Software as per Cameras (to be provided by RailTel)	For each entry and exit points of A1/A/B/C category Stations i.e. with 4K UHD Cameras. FRS licenses will support both online and offline mode (same licenses supplied for entry/exit cameras for online mode will be used for the remaining cameras at stations in offline mode).
viii)	VMS Cum Analytic Servers with Redundancy	For cameras with VMS/VA software installed in all the cluster stations of the RPF Thana as per RDSO Specification

SN	Item/Location	Assumptions
ix)	Facial Recognition Servers (to be provided by RailTel)	For cameras with FRS software installed in all the cluster stations of the RPF Thana.
x)	External Storage Requirement	Recording for 30 days. In addition, 10% space as spare.
3)	**Divisional Monitoring Center**	
i)	Location for Divisional Monitoring Center	At Divisional Control Offices
ii)	Number of PC work-station	1
iii)	Number of LFD Monitor	2
iv)	Number of PTZ Controller enabled Digital Keyboard	1
4)	**Zonal Monitoring Center**	
i)	Location for Zonal Monitoring Center	At Zonal Control Offices
ii)	Number of PC work-station	1
iii)	Number of LFD Monitor	2
iv)	Number of PTZ Controller enabled Digital Keyboard	1
5)	**Railway Board**	
i)	Location for Railway Board	Railway Board
ii)	Number of PC work-station	1
iii)	Number of LFD Monitor	2
iv)	Number of PTZ Controller enabled Digital Keyboard	1
6)	**DC-DR for VSS**	
i)	VMS Cum VA Server with Redundancy	All alerts, video on demand from RFP/ Thana/ Post VMS will be stored at this site. There will be no viewing at this level. Video Management cum Analytic server with 1:1 redundancy (HA mode) in RailTel Data center
ii)	Deleted	
iii)	Storage Requirement	All processed alerts will be stored at the data center where 240 TB of storage has been envisaged in the RFP.

SN	Item/Location	Assumptions
7)	**Command Control Centre (CCC)**	To be provided by RailTel separately.
	CCC	
8)	**Enterprise Management System (EMS)**	
	EMS	EMS will be installed at DC and DR for monitoring of VSS Equipment installed/ planned to be installed at Railway Stations & RPF Thanas/DC-DR for all the Regions (Eastern, Northern Southern and Western). This centralized EMS will be common for Stations under scope of work (including for existing VSS infra).
9)	**Switches**	
i)	**Type-I Switch**	As per Field Requirement
ii)	**Type-II Switch**	As per Field Requirement
iii)	**Type-III Switch**	As per Field Requirement
iv)	**Type-IV Switch**	As per Field Requirement
10)	**Panic Switch**	Two numbers at each Platform
11)	**19" 42U Rack**	As per Field Requirement
12)	**19" 9U Rack**	As per Field Requirement
13)	**1KVA UPS**	As per Field Requirement
14)	**2KVA UPS**	As per Field Requirement
15)	**2x 10KVA UPS**	One Set of UPS for RPF Thana, if required.
16)	**12F FMS**	As per Field Requirement
17)	**24F FMS**	As per Field Requirement
18)	**AC Distribution Box**	As per Field Requirement

Note: Existing LAN Infra installed at Stations to be used by bidder as advised by RailTel and integration to be done with existing VSS Infra in consultation with RailTel's engineer.

8.1.3.2 **Video Surveillance System Hardware sizing**

8.1.3.2.1 **Servers at DC-DR**

i) Bidder to propose server(s) as Video Management cum Analytic servers with 1:1 redundancy (HA mode) in RailTel Datacenter for centralized management of such multiple clusters.

ii) Deleted.

iii) The VMS system shall also provide live streaming of at least 4 to 5 Cameras per station covering platform, circulating area, ticketing area, entry/exit point or other important location on eDrishti Portal of Indian Railways. Bidder shall provision sufficient no. of Streaming Servers in their bid.

8.1.3.2.2 **Storage at DC-DR**

Bidder to propose storage solution at RailTel Datacenter for keeping flagged/ marked video data by RPF personnel for longer retention, VA alerts across all stations within the jurisdiction of RailTel Region for 30 days, Audit trail logs, application data etc. as per solution requirement. For this, 240 TB of storage has been provisioned.

8.1.3.2.3 **Servers/NVRs at RPF Thana/Post**

(i) The bidder to propose Servers/NVRs as Video Management cum Analytic servers at RPF Thana/Post for all cluster stations with N:1 redundancy (value of N will be decided by the bidder based on the configuration of Server as per RDSO specification)as per total number of cameras installed at cluster stations - details given in Annexure-VII (Chapter-7).

Note: Bidder may reorganize the existing Server installed at RPF Thanas/Posts without any additional cost to RailTel

(ii) Deleted

8.1.3.2.4 **Storage at RPF Thana/Post**

Bidder to calculate the storage requirement for recording of video feeds for 30 days at each RPF Thana/Post. The bidder must ensure that the capacity of storage system supplied at the RPF Thana/ Post should be supplied with an additional 10% capacity over and above the capacity required for 30 days recording computed on the basis of cameras mentioned for RPF Thana/Post from day one. In case, during implementation, if the bidder solution requires additional storage capacity as per their solution requirement same shall be provided by the bidder without any extra cost.

8.1.3.2.5 In case of failure of any Server/NVR, the recording and playback availability should not be affected. The recording of last 30 days at any given point of time should be available through redundant Server/NVR in case of Server/NVR failure.

8.1.3.2.6 Station and RPF Thana/ Post wise details are given in Chapter-7. Under one RPF Thana/ Post, cluster stations of A1, A, B and C Type Stations are also mentioned. From that detail, total nos. of Cameras to be recorded at that particular RPF Thana/ Post may be calculated.

In future, D & E Category Stations are also to be monitored from these existing/planned RPF Thana/ Post, accordingly, **itemized BOM for Hardware and Software items** has been asked in the tender.

8.1.3.2.7 At each cluster i.e. RPF Thana/ Post location, bidder is required to size Server/NVRs for VA/VMS without any impact on the performance of the system and overall solution requirement as detailed in para 8.1.3.2.3 of Chapter-8 (Section-I).

8.1.3.2.8 The bidder to submit calculations done to reach the quoted servers, NVRs numbers, storage capacity etc. with supported document. In case any additional server(s), NVRs, other hardware are required to meet the above requirement, same shall be provided by the bidder without any cost to the purchaser.

8.1.3.2.9 To integrate proposed Hardware for server & storage with the existing VSS server cum storage and to optimize the hardware requirement, the bidder is allowed to use virtualization software. Necessary licenses for virtualization software (as per site requirement) shall be supplied by the bidder with no additional cost to the RailTel.

8.1.3.3 **Recording Parameter**

8.1.3.3.1 Recording shall be stored for at least 30 days at 25 FPS and Full HD resolution for Full HD cameras and 25 FPS Ultra HD resolution for 4K UHD Cameras with H.265 or higher video compression at RPF Thana/ Posts. The indicative storage capacities per camera with H.265 or higher video compression and 25 FPS shall be as under:

Days	Full HD Camera	4K UHD Camera
30 Days	750 GB after RAID 5/6	3TB after RAID 5/6

Note: The bidder is allowed to further reduce the above mentioned indicative storage capacity per Camera at 25 FPS with applicable resolution by using non-proprietary compression.

8.1.3.3.2 The bidder must ensure that the capacity of storage system supplied at the RPF Thana/ Post should be supplied with an additional 10% capacity over and above the capacity required for 30 days recording computed on the basis of cameras mentioned for RPF Thana/ Post from day one. Storage capacity requirement as discussed above, should be considered as minimum requirement, however, bidder may propose higher storage capacity, if required.

8.1.3.3.3 The additional capacity is required to meet the compliance requirement of keeping the flagged/marked images/video footage as a evidence required by the RPF Appropriate authority for investigation purpose and also to cater the requirements of provision of any new cameras on the station.

8.1.3.3.4 In case of any failure or interruption of MPLS/IP network, the camera shall automatically start recording on Edge Storage Memory Card at resolution and frames

per second as required and when the network recovers, the video data shall automatically be transferred to the Server/NVR installed at respective RPF Thana/ Post without any impact on the system operations.

8.1.3.3.5 The FRS will get the UHD feed from Recording Server/NVR at RPF Thana/ Post for running Face Recognition algorithm and send alarms to designated clients at RPF/Div. HQ (Control Room)/others.

8.2 Existing Infra already installed at RPF Thana/Post

8.2.1 Existing VSS infra has been installed by RailTel at few Stations/RPF Thanas. Details of existing VSS infra is given in Annexure-II, Chapter-7.Bidder has to use the existing VSS infra as per the scope of work and integrate the existing infra with the proposed VSS infra under the scope of this tender.

8.2.2 The selected bidder shall integrate the proposed VSS infra with the existing VSS infra (including Camera, VMS software, Server cum Storage etc.) without any additional cost to RailTel.

8.2.3 The selected bidder is free is either use both existing and new VMS at any particular RPF Thana/ Post or use either of them. However, the selected bidder shall ensure that integration of existing VSS infra and the proposed VSS infra is seamless at that RPF Thana/ Post as per the terms and condition of the tender document. In case bidder decides to use only one of the VMS system, then it is the responsibility of the selected bidder to shift existing VMS licenses at the required RPF Thana/ Post (as per his plan) without any additional cost to RailTel. The selected bidder is also at his liberty to replace the existing VMS system completely at all RPF Thanas/Posts with his own VMS system without any additional cost to RailTel.

At RPF Thana/ Post locations, where new VMS is required to be installed as per the scope of work, the selected bidder shall configure the existing VSS infra (including cameras, servers, storage etc.) with supplied VMS by him without any additional cost to RailTel.

8.2.4 The selected bidder is free to use existing Server cum Storage installed at RPF Thana/Post according to his solution. To meet the tender requirement, bidder is also free to shift the Server from one location to any other location, if required without any additional cost to RailTel.

8.2.5 Make/model of Equipment/System already installed at RPF Thana/Post

Following are the technical details of existing VSS infra available at stations:

SN	Item name (make)	RDSO Specification
1	Camera (CP Plus)	SPECIFICATION NO. RDSO/SPN/TC/65/2016 Revision 4.0

2	Server cum Storage (Netweb)	SPECIFICATION NO. RDSO/SPN/TC/65/2016 Revision 4.0
3	Large format Display (LG)	SPECIFICATION NO. RDSO/SPN/TC/65/2019 Revision 5.0
4	Workstation (Dell)	SPECIFICATION NO. RDSO/SPN/TC/65/2019 Revision 5.0
5	VMS Software 9HFCL)	SPECIFICATION NO. RDSO/SPN/TC/65/2019 Revision 5.0
6	Rack (19" 42U)	RailTel specification
7	Switch (D-link) – Type-III	
8	UPS(Make - ProstarM)	

8.2.5.1 Camera

CP plus make cameras {(i) Full HD Fixed Dome (Model No.: - CP-UNC-VB21FL3-VMD), (ii) Full HD Bullet Type (Model No.: CP-UNC-TB21ZL6S-VMD), (iii) Full HD PTZ camera (Model No.: CP-UNP-F3021L20-DAP), (iv)4k UHD Bullet Type (Model No.: CP-UNC-TB81ZL6-VMDS)}as per RDSO specification no. RDSO/SPN/TC/65/2019 Revision 4.0.

8.2.5.2 Server cum Storage

Netweb make Server (Model no. Tyrone Camarero DS300TR-28RL) as per RDSO specification no. RDSO/SPN/TC/65/2019 Revision 4.0. Following is the configuration(s):

a) In Phase-IB and Phase-IB(V) VSS Work

SN	**Component**	Product Code	Qty
1	CPU	Intel® Xeon® E5-2620 v4 (8-Cores, 2.1GHz, 20MB Cache, 85W)	2
2	Memory	32GB DDR4 ECC RDIMM (Total Memory)	1
3	Drives	1 TB SAS 7200 RPM (3.5")	4
		6TB SAS 3.0 12.0Gb/s 7200RPM – 3.5"	3
4	OS & S/W	CentOS 7.0 Enterprise Linux (64-bit)	1
5	Storage	36 TB Usable Storage	1

b) In Phase-IA VSS Work

SN	**Component**	**Product Code**	**Qty**
1	CPU	Intel® Xeon® E5-2620 v4 (8-Cores, 2.1GHz, 20MB Cache, 85W)	2
2	Memory	32GB DDR4 ECC RDIMM (Total Memory)	1
3	Drives	1 TB SAS 7200 RPM (3.5")	4
4	OS & S/W	CentOS 7.0 Enterprise Linux (64-bit)	1
5	Storage	36 TB Usable Storage	1

8.2.5.3 Large Format Display

LG make Large format Display (55") as per RDSO specification no. RDSO/SPN/TC/65/2019 Revision 5.0.

8.2.5.4 PC Work Stations

Dell Make PC Workstation (Model DELL Precision 3430 SFF & 3431 SFF) as per RDSO specification no. RDSO/SPN/TC/65/2019 Revision 5.0 with all amendments (Windows-10 Pro-2019 is installed).

8.2.5.5 Video Management Software

HFCL make Video Management Software ($M3S^{+}$ VMS) as per RDSO specification no. RDSO/SPN/TC/65/2019 Revision 5.0 with all amendments.

8.2.6 All the Warranty and Long Term Maintenance (AMC) support/obligation of existing Infra installed will be done by the existing vendors only.

8.3 Technical Specification

The below mentioned technical specifications for the supply items are bare minimum requirements of the purchaser, the supply items quoted by bidder must comply with these technical specifications. However, the bidder can quote the items with higher technical specifications catering to the futuristic requirements of the proposed solution.

The technical specifications for different components/items of IP based Video Surveillance System shall be as below:

SN	Components/Items	Specifications
i)	Full HD Bullet type IP Colour Camera	As per Clause no. 5.4 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments.
ii)	4K UHD Bullet type IP Colour Camera	As per Clause no. 5.5 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments.
iii)	Full HD Fixed Dome Type IP Colour Camera	As per Clause no. 6.0 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments.
iv)	Full HD P, T, Z (Pan/Tilt/Zoom) IP Colour Camera	As per Clause no. 7.0 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments.

v)	Digital Keyboard	As per Clause no. 8.0 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments.
vi)	Large Format Display Monitor	As per Clause no. 9.0 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments.
vii)	Server / Workstation Hardware (for Video Management & Recording and Video Analytics Software)	As per Clause no. 10.1 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments.
viii)	Network Video Recorder (NVR)	As per Clause no. 10.2 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments. Note: Bidder is allowed to offer either External or Internal storage for cameras as per the scope of work.
ix)	PC Workstation	As per Clause no. 11.0 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments. **Note:** (i) PC Work Station should also have atleast 2 nos. of HDMI Port to connect LFD Monitor.
x)	External Storage Device	As per Clause no. 12.0 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments.
xi)	Core Switches as per Clause no. 13.0	As per specifications at clause 8.3.5.3 for Type-IV Switch (MPLS Tier-4 Router)
xii)	Type-I Switch (8 port Field Switch)	As per Clause no. 14.0(III) of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments. Note: It should support either RSTP (802.1w) or ERPS (G.8032) to support Ring protection.
xiii)	Type-II Switch (Aggregation Switches)	As per Clause no. 14.0(I) of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments. Note: It should support either RSTP (802.1w) or ERPS (G.8032) to support Ring protection.
xiv)	Type-III Switch (24 Port Layer 2 Switch)	As per Clause no. 14.0(II) of RDSO Specification of IP Based Video Surveillance System Specification no.

		RDSO/SPN/ TC/65/2021 Revision 6.0 or latest with all amendments (Non PoE 24 x 10/100/1000 BASE-T ports - 4 x10 G (Minimum) SFP+ ports).
xv)	Deleted	Deleted.
xvi)	Wireless Transmitter/Receiver Unit	As per Clause no. 15 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments.
xvii)	Copper to Fiber Media Convertor	As per Clause no. 16.0 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments.
xviii)	Various types of cables	As per Clause no. 17.0 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments.
xix)	Video Management Software	As per Clause no. 18.1 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments.
xx)	Graphical User Interface Client Software	As per Clause no. 18.2 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments.
xxi)	Video Recording Software	As per Clause no. 18.3 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments.
xxii)	Artificial Intelligence (AI) enabled Video Analytics Software	As per Clause no. 18.4 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments. Moreover, Performance Indicators for the Video Analytics should be as per below mentioned KPI's: • Detection Rate (> 99%) • True Positive Rate + True Negative Rate (>95%) • False Positive Rate (<5%) • False Negative Rate (<5%)

xxiii)	Remote viewing on Web and Mobile App	As per Clause no. 18.5 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments. i. For Trains Coaches a. Description of Event b. Train number along with Coach Number c. Date and Time of Event d. Remarks Above details are only indicative in nature and RailTel reserves the right to add/delete/modify these details. For retrieval of uploaded content, there shall be a separate page on web and mobile app for access of video clips and images by authorized users. User should be able to select different options for viewing uploaded content based on description/train/station/time & date. On web page and mobile app, there should be provision to search video clips and images based on the description, location, station/train, date, time, remarks etc.
xxiv)	Deleted	Deleted
xxv)	Software License	As per Clause no. 20.0 of RDSO Specification of IP Based Video Surveillance System Specification no. RDSO/SPN/TC/65/2021 Revision 6.0 or latest with all amendments.
xxvi)	HDPE Duct	As per TEC GR No. GR/TX/CDS-008/03/March 11 with latest amendment
xxvii)	SFP(s)	Specifications are given in Para 8.3.1 below.
xxviii)	UPS(s)	Specifications are given in Para 8.3.2 below.
xxix)	FMS	Specifications are given in Para 8.3.3 below.
xxx)	Patch Cords	Specifications are given in Para 8.3.4 below.
xxxi)	Rack(s)	Specifications are given in Para 8.3.5 below.
xxxii)	EMS	Specifications are given in Para 8.3.6 below.
xxxiii)	CCC	Deleted
xxxiv)	ACDB	Specifications are given in Para 8.3.8 below.
xxxv)	Earthing	Specifications are given in Para II.5.1 of Section-II below.

Note:

(i) Above mentioned specifications are applicable for bidder's proposed VSS system including its integration with existing VSS Infrastructure like Cameras, VMS, Server, Storage, PC Workstation, Display etc.

(ii) Deleted.

(iii) Deleted

(iv) **Security Verification Certification for Hardware (all type of Cameras) and Software (Video Management Software, Graphical User Interface Client Software , Video Recording Software, Video Analytics Software, Remote viewing on Web & Mobile App Software):** All type of quoted hardware and software shall have security features which can be deployed meeting the security assurance requirements as per "Appendix C: Internet of Things Verification Requirements" of OWASP Application Security Verification Standard version 4.0 - Level 2.

Note: The selected bidder after issue of LOA will offer its VSS solution to STQC (Ministry of Electronics & Information Technology) or any other Government Agency from the list of CERT-In empanelled Information Security Auditing Organization for arranging security verification certification after installation of first station having existing VSS Infra.

Before issue of FAC, the bidder will offer its complete VSS work for sample testing of any randomly selected station by STQC (Ministry of Electronics & Information Technology) or any other Government Agency from the list of CERT-In empanelled Information Security Auditing Organization for arranging security verification certification. FAC shall be issued only after submission of security verification certification by the bidder.

(v) The security of information/feed data available on the edge storage device in all types of Cameras needs to be suitably protected to prevent unauthorized access.

(vi) The entire communication from cameras to recording servers shall be over SSL/TLS protocol and any additional license required for its implementation shall be supplied by the bidder.

8.3.1 SFPs – All SFPs should be bidirectional single Fiber.

8.3.1.1 SFP-BX (10 KM) Single Fiber:

SN	Description
i)	SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment.
ii)	Should support 10 km optical distance on single fiber
iii)	Should have LC type connector.
iv)	Should provide the cost in Pair (BX U & D).
v)	Should have 1 Gigabit Ethernet capacity on single mode fiber.
vi)	Should support DDMI/DOM feature.Option should be available for SFP+/XFP
vii)	OEM should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid.
viii)	Should have CE and FCC regulatory compliances.
ix)	Operating Temperature of the SFP Should be mini 0 to 65 °C (23 to 149

	°F)

8.3.1.2 SFP+ (10 Km):

SN	Description
i)	SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment.
ii)	Should support 10 km optical distance (1550/1310 nm).
iii)	Should have LC type connector
iv)	Should have 10 Gigabit Ethernet capacities on single mode fiber.
v)	Should support DDMI/DOM feature. Option should be available for SFP+/XFP
vi)	Should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid.
vii)	Should have CE and FCC regulatory compliances.
viii)	Operating Temperature of the SFP Should be mini 0 to 65 °C (23 to 149 °F)

8.3.1.3 SFP+ (40 Km):

SN	Description
i)	SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment.
ii)	Should support 40 km and 16dB link budget optical distance on single fiber.
iii)	Should have LC type connector.
iv)	Should have 10 Gigabit Ethernet capacities on single mode fiber.
v)	Should support DDMI/DOM feature. Option should be available for SFP+/XFP.
vi)	Should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid.
vii)	Should have CE and FCC regulatory compliances.
viii)	Operating Temperature of the SFP Should be mini 0 to 65 °C (23 to 149 °F).

8.3.1.4 SFP+ (350mtrs)

SN	Description
i)	SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment.
ii)	Should support 350m optical distance.
iii)	Should have LC type connector
iv)	Should have 10 Gigabit Ethernet capacities on single/multi-mode fiber.
v)	Should support DDMI feature. Option should be available for both SFP+ and XFP
vi)	Should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid.
vii)	Should have CE and FCC regulatory compliances.

viii)	Operating Temperature of the SFP Should be mini 0 to 65 °C (23 to 149 °F)

Note:All SFPs must support DDMI feature.

8.3.2 UPS

8.3.2.1 1KVA UPS

SN	Specification	
i)	Capacity	1KVA/900 W, better as per actual requirement
ii)	Technology	IGBT
iii)	Wave form	Pure Sine wave
iv)	Display	LCD/LED
v)	Input power factor correction	0.9
vi)	Input configuration	1Ph, L-N+PE
vii)	Output Power factor	0.9 or better
viii)	frequency (Input)	50Hz frequency
ix)	frequency (output)	50Hz +/- 0.5Hz frequency
x)	Voltage Range (By-pass)	230VAC+/-15%
xi)	V threshold	3% max full linear load, 6% max on Non-linear load
xii)	Crest factor	3.0 or batter
xiii)	AC-AC Efficiency	85% or batter
xiv)	Transfer time Main-Battery	0
xv)	Transfer time Inverter-Bypass	4 m sec
xvi)	Emergency Power off function	Yes
xvii)	Monitoring software for	Battery, health of UPS, any critical parameter change
xviii)	Communication	SNMP V1/V2/V3
xix)	Port	USB
xx)	Battery Type	SMF
xxi)	Battery backup	1 Hrs. on full load (Single bank) with 1500 VAH battery size (Battery to be installed in separate wall mount cabinet)
xxii)	**Environmental Parameter**	
A	Operating Temperature Range	0-55 deg
B	Over Temperature, Load on Battery, Bat-	Indication required

SN	Specification	
	tery on Charge, Battery low, Mains on	
C	Input AC mains and output power supply surge protection	inbuilt
D	Humidity	0% to 95% non-condensing
E	Noise Level	50 dBA max
F	Size	not more than 2U rack mountable
xxiii)	**Protection**	IP20
A	Mechanical Parameter	EMI or equivalent BIS/IS standard
B	Safety	EN or equivalent BIS/IS/IEC standard
C	Performance	IEC/EN or equivalent BIS/IS standard
xxiv)	Voltage Range	175-280 VAC (1-phase) @ 100% load

8.3.2.2 2KVA UPS

SN	Specification	
i)	Capacity	2KVA/1800 W
ii)	Wave form	Pure Sine wave
iii)	Rectifier	IGBT based
iv)	Display	LCD/LED
v)	Input power factor correction	0.9
vi)	Input configuration	1Ph,L-N+PE
vii)	Output Power factor	0.9or better
viii)	Frequency (Input)	50Hz frequency
ix)	Frequency (output)	50Hz+/- 0.5Hz
x)	V threshold	3%max full linear load, 6% max on Nonlinear load
xi)	Crest factor	3.0 or better
xii)	AC-AC Efficiency	85% or better
xiii)	Transfer time Main-Battery	0
xiv)	Transfer time Inverter-Bypass	4 msec
xv)	Emergency Power off function	Yes
xvi)	Monitoring software for	Battery, health of UPS, any critical parameter change
xvii)	Communication	SNMP V1/V2/V3
xviii)	Port	USB
xix)	Battery Type	SMF
xx)	Battery backup	1 Hrs. with full load with 3000 VAH battery size (Battery to be installed in separate wall mount cabinet)

SN	Specification	
xxi)	**Environmental Parameter**	
A	Operating Temperature range	0-55 deg
B	Over Temperature, Load on Battery, Battery on Charge, Battery low, Mains on	Indication required
C	EPO function	Yes
D	Input AC mains and output power supply surge protection	inbuilt
E	Humidity	0% to 95% non-condensing
F	Noise Level	50 dBA max
G	Size	not more than (2U+/-0.5U) rack mountable
xxii)	**Protection**	IP20
A	Mechanical Parameter	EMI or equivalent BIS/IS standard
B	Safety	EN or equivalent BIS/IS/IEC standard
C	Performance	IEC/EN or equivalent BIS/IS standard
xxiii)	Voltage Range (By-pass)	230VAC+/-15%
xxiv)	Voltage Range	175-280 VAC (1-phase) @ 100% load

8.3.2.3 2X 10KVA UPS connected in parallel redundant mode in separate chassis

SN	Specifications	
i)	Capacity	10000VA/9000 W
ii)	Phase	3 phase in / 1 phase out
	INPUT Characteristics	
iii)	Power Factor	0.9 or better
iv)	Voltage Range	175-280 VAC (1-phase) @ 100% load
v)	Wave form	Pure Sine wave
vi)	Nominal Voltage	3 x 400 VAC (3Ph+N)
	OUTPUT Characteristics	
vii)	Output Voltage Rates	208/220/230/240V(L-N)
viii)	Voltage Accuracy	±1%
ix)	Transfer Time	0
x)	Load Crest Ratio	3:1 max
xi)	AC Mode Efficiency	>90%
xii)	Output Frequency @ Line mode	50Hz +/-0.5Hz@50Hz system
xiii)	Output Frequency@ Battery mode	50Hz +/-0.5Hz@50Hz system

SN	Specifications	
xiv)	Frequency Converter Mode (CVCF)	50Hz
xv)	UPS status, Load level, Battery level, Input /Output voltage, Discharge timer, and Fault conditions	Indication required
xvi)	Over Load Memory	Default: Yes
xvii)	Transient recovery	100 ms recover to 90% of nominal Voltage
xviii)	Efficiency	>90% Battery Mode @100%R/RCD Load
xix)	UPS Type	Tower
xx)	Monitoring software support	Battery , health of UPS, change in any critical parameter
xxi)	Port	USB/RS-232,RJ45
xxii)	Batter Type	SMF preferred
xxiii)	Generator Compatible	Yes
xxiv)	Battery backup	2 Hrs. on full load with each UPS System with 28800 VAH battery size
xxv)	Acoustic Noise	<60 db
xxvi)	Operating Temperature	0-40 deg C
xxvii)	Nominal Battery Input Voltage	Vendor to specify
xxviii)	Battery Low Warning	10.8V X nos. of batteries
xxix)	Battery Shutdown Voltage	10.5V X nos. of batteries
xxx)	Battery Type	VRLA,12V
	Battery Charger	
xxxi)	Nominal Recharging current	minimum 10% of the offered battery AH capacity
xxxii)	Maximum Charge Voltage	13.5V X nos. of batteries
	Regulatory Standards	
xxxiii)	ESD	IEC/EN61000-4-2 Level 4 or equivalent BIS/IS standard
xxxiv)	Safety	IEC/EN62040-1-1 or equivalent BIS/IS standard
xxxv)	Leakage Current	IEC/EN62040-1-1or equivalent BIS/IS standard

SN	Specifications	
xxxvi)	Protection	IP20
xxxvii)	Certification	CE or equivalent BIS/IS standard
xxxviii)	Communication	SNMP V1/V2/V3
xxxix)	Input AC mains and output power supply surge protection	Inbuilt

8.3.3 Fiber Management System (FMS) (12/24 Fiber)

The FMS should be confirming to TEC NO.: GR/FDM-01/02/APR-2007 (Type-I) with latest amendment No. TEC/T/OFC-FDMS/149/2012. However, the FMS should have the following:

i) It should be mountable in standard 19" rack and of slider type.

ii) There should be arrangement of termination of 48/24/12/6 Nos. of fibers (as per SOR).

iii) It should be supplied with 48/24/12/6 Nos. of pigtails of respective type of connector (as per SOR) of minimum 3 meter length.

iv) Color coded pigtails (900 µn tight jacket) shall be provided for easy identification.

v) The FMS should be supplied with arrangement of required Nos. of adapters (as per SOR).

vi) The adaptors shall be fixed in such a way that these shall be easily accessible protecting the eye from direct exposure to laser.

vii) There should be minimum two nos. of trays for the provision of termination of the fibers & sufficient space for routing of the fibers in the trays.

viii) Trays shall be numbered bottom to top (tray no. 1 is lower most).

ix) Pigtails shall follow tray numbering.

x) Pigtails shall be labeled through colour coding/ferruling.

xi) Adaptors shall be numbered Bottom to Top or Left to Right in ascending order.

xii) All adaptors shall be provided with dust protection caps.

xiii) Important Do's and Don'ts about the operation of the FMS shall be clearly indicated at convenient place on the FMS.

xiv) Insertion Loss: ≤ 0.3 dB

xv) Return Loss: ≥ 45 dB

xvi) The FMS shall be manufactured as per latest state of art technology.

xvii) The FMS shall be protected against the entry of dust and insects, rodents etc.

xviii) Body should be of MS steel; powder coating painting (min. 70 micrometer thickness) shall be provided with rust resistance paint.

xix) **Marking:** The marking on the system shall be indelible and following minimum information shall be provided by way of engraving or Laser printing method:
- a) "RAILTEL" should be written on each FMS to be visible from front.
- b) Manufacturer's name & date/ year of production.
- c) Model No./Batch No./ Serial No.
- d) Capacity i.e. No. of cables and the fibers.
- e) Identification details/ cables/ Fiber/ labeling facility.

xx) Preferred type of connector is SC/APC for all connectors.

8.3.4 Patch Cords

The Patch cords should be confirming to TEC NO.: TEC/GR/TX OFJ-01/05/NOV-09 with latest amendment No. TEC/T/OFC-OFJ/155/2013. However, the Patch cords should have the following:

i) Operating Temperature: -40ºC to +85ºC.
ii) Insertion Loss:
- a) Insertion Loss of complete patch cord including adapter when tested from each direction in all conditions of operations: ≤ 0.3 dB
- b) Insertion Loss of Adaptors: ≤ 0.1 dB

iii) Return Loss for each connector of patch cord:
- a) Type-I FC-PC : ≥ 50 dB
- b) Type-II SC-PC : ≥ 50 dB
- c) Type-III SC-APC : ≥ 65 dB
- d) Type-IV LC :≥ 50 dB
- e) E2K/APC : ≥ 60 dB

iv) The length and type of connector of each Patch Cord: As per SOR.
v) The connectors must be make of reputed OEMs 3M, Huber-Shuner, R&M, TE Connectivity/Raychemany other CACT approved Manufacturer/s having a valid approval against specification number TEC/GR/TX/OFJ-01-NOV.09 for the tendered connected type.
vi) Connector Body:
- a) FC-PC: Ni plated brass body (Ni plating shall be as per BIS Standards)
- b) SC-PC & SC-APC: Engineering thermoplastic (Glass filled PBT: Polybutylene Terephthalate)
- c) LC: PEI (Polyetherimide)/ PPS (Polyphenylene Sulphide)

vii) Color of connector body:
- a) FC-PC connector: Ni plated Brass
- b) SC-PC connector: Blue
- c) SC-APC connector: Green
- d) LC connector: Blue

viii) Radius of curvature:
- a) FC-PC :10 to 25 mm
- b) SC-PC :10 to 25 mm
- c) SC-APC : 5 to 12 mm
- d) LC :10 to 25 mm

ix) Minimum bending radius of the cable:
- a) Loaded : 50 mm
- b) Unloaded : 30 mm

xx.) Preferred type of connector is SC/APC for all connectors.

Note: The bidder/OEM has to give compliance for the TEC specifications for above mentioned items, offered in this bid.

8.3.5 Telecom Rack

8.3.5.1 19" 9 U Rack (Wall mounted)

SN	Item	Description
1.	Type	Closed Telecom Rack wall/Pole mounted
2.	Dimension	500 mm(Height)X600mm(Width)X 600 mm(Depth)
3.	Mounting	Rack should have **wall/channel/beam mounting with heavy brackets and fasteners of required shape and size as per site condition.**
4.	Front door	Rackshouldhavefrontdoortoughandtransparentglassfittedon MS/CRCAsheet on sides with Lock and key.
5.		MS/CRCA door plain having ventilation holes bottom side with dust filters.
6.	Top & Bottom	Rack top and bottom should be MS/CRCA steel made with cable entry provision with glands at both side.
7.	Fan module	Compact fan module of 90 CFM working on 230VAC 2nos.with each rack properly fitted at top of rack.
8.	Earthing Provision	Rack Should have earthing provisions.
9.	Cable manager	1no.horizontal and 1no.vertical cable manager with cable loops to be provided with each rack.
10.	Power Distribution Unit(PDU)	PDU is of 6 Sockets of branded make such as Havells or equivalent with 6Amp with switch.
11.	The rack should be fitted with one modem tray19". **Back side of the rack should be closed with a removable panel.**	
12.	Thegoodqualitypowdercoatinglightgreyincolourshallbeusedforpaintingoftherack.	
13.	"INDIAN RAILWAYS LOGO along with Year" in bold and easily recognizable fonts should be written at the front top of the rack preferably in black or blue color.	
14.	OEM should have a valid ISO 9001 certification on the date of opening of bid.	

SN	Item	Description
15.	Rack should be minimum IP54 certified. Rack should also comply with EIA 310/DIN 41494 standards.	

8.3.5.2 19" 42U Rack

19" 42U Racks shall be used at Station/RPF Thana/Chowki for housing servers, storage, switches, and NGFW

SN	Item	Description
1.	Dimension	As per requirement
2.	Side panels	To be provided across whole heigh of the rack should be openable with latching arrangement at top and bottom.
3.	Front door	Rackshouldhavefrontdoortoughandtransparentglassfittedon MS/CRCAsheet on sides with Lock and key.
4.	Rear side	Shall be perforated for appropriate level as per industry standard.
5.	Top & Bottom	Racktopandbottomshouldbe MS/CRCAsteelmadewithcableentryprovisionwithglandsatbothside.
6.	Fan module	Compactfanmoduleof90CFMworkingon AC power supply 4 Nos teach rack properly fitted at top of rack.
7.	Earthing Provision	Rack Should have earthing provisions.
8.	Cable manager	2nos.horizontaland2nos.verticalcablemanagerwith cableloopstobeprovidedwitheachrack.
9.	Power Distribution Unit(PDU)	Adequate and Redundant power distribution units with electronically controlled circuits for surge and spike protection, isolated input to ground and output to ground.
10.	Material used	CRCA/MS with Thickness varying from 1.6 Mm to 2.0 mm
11.	The rack should be fitted with one modem tray 19"	
12.	The earthing kit consisting of copper bus bar with dimensions 20 inch length, 1.0 inch breadth & 5mm thickness (min.) having appropriate number of M6 tapped holes and 3 brass nut bolts and washers for fixing of earthing cables shall be fixed near the bottom of the rack.	
13.	Thegoodqualitypowdercoatinglightgreyincolourshallbeusedforpaintingoftherack	
14.	The rack should be fitted with dual source power supply distribution board.	
15.	"INDIAN RAILWAYS Logo along with Year" in bold and easily recognizable fonts should be written at the front top of the rack preferably in black or blue color.	
16.	OEM should have a valid ISO 9001 certification on the date of opening of bid.	
17.	Rack should be minimum IP20 certified. Rack should also comply with	

SN	Item	Description
	EIA 310/DIN 41494 standards.	

8.3.5.3 Type-IV Switch –(MPLS Router Tier-4)

SN	Specifications of Type-IV Switch (MPLS Tier-4 Router)	Requirements
1	Router should support minimum 1G/10G SFP+ ports from day one (Including required 10G SFP+ module).	8
2	Router should have support for 100G Interfaces (Excluding XFP/SFP/QSFP).	4
3	Total throughput (Full duplex).	Minimum 280 Gbps
4	MAC Table Size	64K
5	IPv4 RIB/FIB	Minimum 1M/128K
6	IPv6 RIB/FIB	Minimum 512K/32K
7	MPLS Labels	Minimum 32K
8	Label Stack	Minimum 5
9	L2 / L3 VPN VRF	Minimum L2 1000, Minimum L3 256
10	Packet Forwarding Rate (IMIX traffic) in Mpps	Minimum 300

11	Support of number of queues per system	Minimum 4K
12	Number of VLAN support	1000
13	Operating Temperature	(0 to 40 degree C or better)
14	Storage Temperature	(-10 to 60 degree C or better)
15	Router can be of either modular/fixed type and shall have modular Operating system where it shall support individual restart of critical processes without affecting other processes or rebooting the entire operating system.	
16	All 10G interfaces should support LR, ER, and ZR .	
17	Router shall have option checking configuration before committing and option of rolling back to at least five configurations.	
18	Router should have redundant DC (with the operating range of -40 to -72 VDC) power supplies	
19	Digital Optical Monitoring (DOM) should be supported, optics information retrievable including RX/TX-power, threshold-monitoring/alarming, inventory.	
20	It shall support role based privileges for the system access and radius authentication for the System admin.	
21	The router should have a Console or Out-of-band Management.	
22	Alerts for environmental or other hardware based alarms should be visibly implemented on the chassis.	
23	All interfaces shall support services like L2VPN, L3VPN, VPLS and multicast VPN for both IPv4 and IPv6	

24	The router should have mechanism to protect itself from DDoS attack.	
25	The router should be IPv6 ready from day one.	
26	The router should support filtering based on different parameters like: src ip, dst ip, src port, dst port, protocol etc	
27	The router should support Netflow, Jflow or equivalent	
28	The router should support IP SLA or RPM (or equivalent) for performance measurements, it should also support monitoring of IP SLA/RPM (or equivalent) probes using SNMP polling (OEM has to provide SNMP MIB information)	
29	Shall support QoS, option of traffic shaping per Interface based.	
30	Shall support following class of service features:	
	a) Classification, policing, marking, shaping, filtering	
	b) Manage congestion using a weighted random early detection (WRED) algorithm	
	c) RFC 2474, Definition of the Differentiated Services Field in the IPv4 and IPv6 Headers	
	d) Single Rate Three Color Policer RFC 2697	
	e) RFC 2698, A Two Rate Three Color Policer	
	f) congestion Management through CBWFQ , Round-Robin or equivalent , WFQ or equivalent	

	g) RFC 2597, Assured Forwarding PHB Group	
	h) RFC 2598, An Expedited Forwarding PHB	
	i) Router should be able to classify based on 802.1 ad, 802.1 p, EXP and DSCP bits	
	j) The router shall support traffic interface mirroring in both ingress & egress directions for both IPv4 & IPv6	
31	The router shall support provision for event based scripts that shall be capable of performing actions based on certain triggers	
32	The router shall support aggregated Ethernet and it shall be possible to bundle Upto 16 links.	
33	Shall support following MPLS features	
	a) LDP and RSVP signalling	
	b) RFC 5036, LDP Specification	
	c) RFC 3212 OR Constraint-Based LSP Setup using LDP	
	d) RFC 3215, LDP State Machine	
	e) RFC 3478, Graceful Restart Mechanism for LDP	
	f) RFC 2858, Multiprotocol Extensions for BGP-4	

	g) RFC 3063, MPLS Loop Prevention Mechanism	
	h) RFC 3031, Multiprotocol Label Switching Architecture	
	i) RFC 3032, MPLS Label Stack Encoding	
	j) The router should be able to do load-balancing over multiple equal cost MPLS LSP	
34	The Router shall support MPLS Fast Reroute both link protection and Node protection.	
35	MPLS Ping, MPLS Trace Route	
36	Fast Reroute Extensions to RSVP-TE for LSP Tunnels	
37	The router shall Support of Sync-E & PTP technology (License price to be quoted separately)	
38	Shall support MPLS based VPN services	
	a) L3VPN, L2VPN (Kompella BGP/ Martini LDP),	
	b) Internet draft, draft-ietf-l2vpn-vpls-bgp-08.txt, Virtual Private LAN Service (VPLS) Using BGP for Auto-discovery and Signaling	
	c) RFC 4762 Virtual Private LAN Service (VPLS) Using Label Distribution Protocol (LDP) Signaling	
	d) Next Generation mVPN (P2MP) based on (Draft-ietf-13vpn-2547bis-mcast-01.txt) & mVPN (draft-rosen-vpn-mcast).	

39	The router shall support the following routing features	
	a) BGPv4, BGP confederations and route reflector	
	b) Dynamic Host Configuration Protocol (DHCP)	
	c) RFC 3101, The OSPF NSSA Option	
	d) RFC 2328, OSPF Version 2	
	e) RFC 3623, OSPF Graceful Restart	
	f) RFC 3630, Traffic Engineering (TE) Extensions to OSPF Version 2	
	g) RFC 1195, Use of OSI IS-IS for Routing in TCP/IP and Dual Environments	
	h) RFC 2104, HMAC: Keyed-Hashing for Message Authentication	
	i) RFC 2973, IS-IS Mesh Groups	
	j) RFC 3358, Optional Checksums in IS-IS	
	k) RFC 3359, Reserved Type, Length and Value (TLV) Code points in IS-IS	
	l) RFC 3373, Three-Way Handshake for IS-IS Point-to-Point Adjacencies	

	m) RFC 5305, IS-IS Extensions for Traffic Engineering	
	n) RFC 3847, Restart Signalling for IS-IS	
	o) RFC 3590, Source Address Selection for Multicast Listener Discovery Protocol	
	p) IGMP v2 and v3 as described in RFC 2236 and RFC 3376 with IGMP Routing Policies to filter IGMP requests.	
40	The router shall support Virtual Router Redundancy Protocol (VRRP) as per IETF RFC 3768	
41	Router shall support SNMP v2/v3 and NTP	
42	Shall support BFD for both single hop and multi hop sessions	
43	Shall support the following OAM features and actions such as syslog/link down should be configurable on OAM event trigger:	
	a) 802.3ah	
	b) 802.1ag	
	c) Y.1731	
44	Shall support Multi-chassis LAG	
45	IPv6 Features	

	a) IPv6 Ping	
	b) IPv6 trace route	
	c) OSPF v3	
	d) IS-IS	
	e) VRRPv3	
	f) IPv6 CoS (classification & rewrite, scheduling based on TC)	
	g) IPv6 ACL	
	h) 6PE and 6VPE	
46	Multicast Feature: It shall support following:	
	a) It shall support IGMP snooping v2/v3	
	b) The router shall support PIM Sparse Mode, RFC 4601(optional)	
	c) Rendezvous Point (RP) - ability to be configured as an RP	
	d) RFC 3569, Source Specific Multicast (SSM)	

	e) RFC 2365, Administratively Scoped IP Multicast	
	f) RFC 3446, Anycast Rendezvous Point (RP) Mechanism using Protocol Independent Multicast (PIM) and Multicast Source Discovery Protocol (MSDP).	
	g) RFC 3618, Multicast Source Discovery Protocol (MSDP).	
47	The proposed router should be NEBS level 3 compliant. NEBS Certification is not required for PMA. However OEM has to produce certificate from standard lab approved or authorized by Govt. of India that the supplied Products are equivalent to NEBS and meet all standard and specification of NEBS.	
48	The device should comply to the following safety standards	
	a) EN 55022 Class A Emissions (Europe)	
	b) FCC Class A (USA) Radiated Emissions	
	c) UL 60950-1 Information Technology Equipment - Safety	
	d) EN 60825-1 Safety of Laser Products	
	e) EN-61000-4-11 Voltage Dips and Sags	
	f) ETS-300386 Electromagnetic Compatibility Requirements	

	g) The device will conform to the following EN/IEC standard: i. 61000-4-2 - ESD ii. 61000-4-3 Radiated Immunity iii. 61000-4-4 - EFT iv. 61000-4-5 - Surge v. 61000-4-6 – Low Frequency common immunity	
49	The offered devices must support following functionalities to support 3rd party SDN (in future)	
	(a) The router should support RFC 6020, YANG - A Data Modelling Language for the Network Configuration	
	(b) Protocol (NETCONF)	
	(c) The solution should support the network configuration protocol (NETCONF) that provides mechanisms to install, manipulate, and delete the configuration of network devices, RFC 6241	
	(d) The router should be able to act as Path computation client in the PCE architecture defined in RFC 4655.	
	(e) The router should support PCECP as defined in RFC5440.	
	(f) The router should support BGP link-state (BGP-LS), RFC 4655	
	(g) The router should support SPRING **(optional)**	
50	Devices shall support following for Provisioning	
	(a) Use NETCONF (RFC 6241, RFC 6242, RFC 5277)	

	(b) REST based CRUD operations for configuration and management.	
	(c) Web Services based operations for configuration and management **(optional)**	
51	The offered devices must support API/NBIs for auto discovery of Services and Physical & Logical Topology	
52	TELEMETRY Function: It shall support following:	
	a) The router should support telemetry based on push model for monitoring network devices	
	b) The router should support various software models/sensors for capturing different health parameters from the devices	
	c) The router should support sending telemetry data to multiple consumers simultaneously	
	d) The router shall support GPB/GRPC/KAFKA encoding for telemetry data	
	e) The software model/sensors should be based on either yang, xml or open config	
	f) The solution shall use either UDP or GRPC for transport of telemetry data	
	g) The system should support streaming granularity of atleast 10 sec	
	h) The router shall have the ability to interact with open standard based tools	
	i) The system should support REST API for communication with third party tools and applications	

	j) Enabling telemetry should not have any adverse impact on the performance of the device/router	
	k) Some of the streaming models/sensors the router should support are:	
	System	
	Chassis Environment	
	Line card utilization (memory , processor, QoS, Temp, Port utilization), errors counters	
	Controller Card sensors (memory, CPU, Temp etc)	
	Fabric statistics **(optional)**	
	ARP table state **(optional)**	
	Routing prefix information **(optional)**	
	Interface	
	Interface statistics (Physical and logical interfaces)	
	Interface optical diagnostic **(optional)**	
	Congestion and latency **(optional)**	

	Filter statistics **(optional)**	
	Protocol **(optional)**	
	BGP peer information **(optional)**	
	ISIS State, Interface, Adjacency statistics, LSDB **(optional)**	
	ISIS SPRING / Segment Routing Statistics **(optional)**	
	RSVP Interface Statistics	
	LSP statistics	
	LSP Event Export, Experimental	
	IP SLA/RPM (or equivalent) reporting	
	Segment Routing statistics	
	DHCP statistics **(optional)**	
53	Router should support Dual Image/Partition with USB flash drive booting option for OS recovery	
54	Router should support jumbo frame.	

55	Router should support port mirroring	
56	Router should support security features of Broadcast/Mulitcast/Unicast Storm control.	
57	Router should comply to following Temperature performance parameters: i. Operating Temperature: 0 to 40 degree C or better ii. Storage Temperature : -10 to 60 degree C or better	
58	Routers should support following Metro Ethernet Features: i. ITU-T G.8032 Ethernet Ring Protection designed for loop protection or alternate mechanism to achieve ring protection in less than 50 ms. ii. Should support multiple Ring up to 8 ring(main and sub ring) protection failover with in 50 ms or ITU-T G.8032 v2.	
59	The operating system of the Routers category/series/family should be MEF-9/14 or CE(Carrier Ethernet) Certified.	
60	The Router shall be designed for continuous operations with dual fan system.	
61	Router should support CFM and LFM alarms.	
62	Shall support HQoS, option of traffic shaping per VLAN based. i. Shall support at least 4K Queues. ii. Per-VLAN policing. iii. Per-VLAN rewrite iv. Per-VLAN two-rate tri-color marking. v. Per-VLAN classification vi. Per-VLAN filtering	
63	Support for P and PE router functionality for MPLS on the same router simultaneously and on all the interfaces.	
64	Router shall support E-Line or E-LAN MEF standards.	
65	Routers should be rack mountable to fit into a standard 19-inch rack	

66	OEM shall ensure that use of third party optics shall not be explicitly blocked on the Router. Router must support all MSA complied Optics available in market.	
67	Segment Routing	
i	Router should be able to support SR standards on IPv6 whenever it is firmed upto without any cost to RCIL.	
ii	The router should support SR-MPLS dataplane and protocols OSPF,IS-IS and BGP Segment routing extensions	
iii	Traffic Steering of SR policies with Autoroute Include and Segment Routing TI-LFA SRLG Protection **(optional)**	
iv	LSP ping, trace-route, Pseudo wire Ping over Segment Routing, trace route for binding-SID	
v	MPLS-LDP interworking with SR-ISIS and SR-OSPF	
vi	TI-LFA with IGP (Link, Node, Local SRLG, Remote SRLG protection) **(optional)**	
vii	Controller instantiated SR Policy (PCEP, BGP) and SR policy based on On demand next hop **(optional)**	
viii	Router should have capability to calculate Bandwidth based path using centralized controller.	
ix	Shall support SR and MPLS (LDP) Interworking Mapping Server	
x	The router shall support dynamic point-to-point interface latency performance measurement. The measurement must be integrated in the IGP and BGP LS for SDN Controller Analysis. **(optional)**	
xi	Label distribution protocol and segment routing should coexist and there should support option to prefer LDP over segment routing.	

68	EVPN Features	
i	Router should have support of Ethernet VPN (EVPN with single homing, multi homing	
ii	Router should have support of following features on EVPN: EVPN-IRB, EVPN VPWS, EVPN VPWS Preferred Path over SR-TE Policy **(option-al)**	
69	Router to support GRE tunnels (RFC 2784).	

8.3.6 Enterprise Management System (EMS)

8.3.6.1 General

i) The EMS Solution (Hardware & Software) shall provide monitoring of 20,000 devices from day 1 with future scalability upto 50,000 devices without major architectural changes. Whenever required, the additional device licenses can be procured & added respectively.

ii) Solution shall be open, distributed, scalable, and multi-platform and open to third party integration.

iii) Consolidate IT event management activities into a single operations bridge/dashboard that allows NOC operator quickly identify the cause of the IT incident, reduces duplication of effort and decreases the time it takes to rectify IT issues.

iv) Consolidated dashboard of the proposed EMS solution shall be the manager of managers window and capable of receiving events/alerts from multiple monitoring systems including system, network, storage, hardware, and application.

8.3.6.2 Consolidated Dashboard

SN	Features
1.	The tool should provide complete cross-domain visibility of IT infra-structure issues
2.	Integrate events from ALL domain managers
3.	Automatically relate events to impacted Configuration Items (CIs) like services, servers etc
4.	Automated discovery of the infrastructure CIs and relationships
5.	The tool should Classify events based on business impact of Video Sur-veillance System service levels
6.	Offer relevant tools, run books, graphs in context of a selected event
7.	Instruction Text (knowledge base) integrated into events /alarms for

SN	Features
	which incident tickets were created with ability to define trouble shooting steps.
8.	Guided creation of correlation rules for administrators
9.	Tool should provide superior view of infrastructure health across system, networks, IT infrastructure and end-user into a consolidated, central console
10.	Tool should allow for customizable operator perspectives
11.	Powerful correlation capabilities to reduce number of actionable events. Topology based and event streambased correlation should be made available.
12.	Tool should provide support for maintenance windows and scheduled downtimes
13.	End-to-end visibility of infrastructure and alerts by showing relationships of events to CIs and business service SLAs that are impacted
14.	Tool should be able to highlight Priority of an event. Priority is based on both the event severity and the business impact. CI Business Impact is calculated based on Business Criticality of all affected business services, applications and business process CIs and eg. SLAs.
15.	The operator should be able to analyze priority, business impact and affected CIs by selecting each event and checking the automatically updated Health Top View, Business Impact View etc.
16.	Tool should allow to browse performance metrics by selecting CIs or events. Tool should allow to compare different performance matrix of a device/CI in GUI/ Model Explorer.
17.	Ability to launch in-context to performance graphs or reports.
18.	The adaptive threshold capability automatically calculates a baseline from the historic samples to identify previous trends in performance. Based on these trends the threshold values are automatically and dynamically calculated. Once the automatic threshold values are set, comparing the current performance data with the adaptive thresholds indicates if the current infrastructure resource utilization is normal or not. An alert is generated when abnormal behavior is detected. "
19.	The Event Correlation Engine shall use detailed, comprehensive, and automatically updated discovery and relationship information to analyze alerts and events and ultimately determine the event that is most likely the cause of an incident.
20.	When many a combination of many events occurs in the monitored environment, the system must be able to automatically categorize them into causes and symptoms. The system needs to provide a single interface to view multiple layers of cause and symptoms.
21.	The system must allow modification and enhancement events during event processing.

8.3.6.3 Service Level Reporter

SN	Features
1.	Should provide reporting templates for performance, availability, inventory, operation, virtualization and configuration

2.	Should provide reports that can prove IT service quality levels, such as application response times and server resource consumption
3.	Reports should be accessible via web browser
4.	Reports can be scheduled to publish automatically or they can be produced on demand
5.	Reports can be applied to all systems, to a group of systems, to a customer group of systems, or to a single system.
6.	Reports can be published in HTML, PDF, Microsoft Word, and Microsoft Excel formats.
7.	Should be possible to send reports via email from the Reporter GUI or from command line.
8.	Automated report generation and publishing
9.	Server reporting tool should be able to collect and collate specific information regarding the resource utilization, relationship of a business service with infrastructure elements and its SLA performance
10.	Tool should be able to report in the context of the business service SLAs that the infrastructure elements support—clearly showing how the infrastructure impacts business service levels
11.	Tool should be able to deliver comprehensive, long-term, and customizable cross-domain reporting.
12.	Tool should support long-term data retention and aggregation upto 24 months.
13.	Tool should provide a library of predefined reports that can be cross-launched in the context of business services.
14.	Tool should provide reports from both Network devices and Servers from the same console.
15.	Tool should provide development environment where more Content/Reports can be created and data sources such as — Generic .csv files, and, — Databases supporting JDBC. Should also be included to pull data and create reports from such data.
16.	Tool should allow to configure downtime for Configuration Items and view the configured downtime in the reports

8.3.6.4 Network Automation

SN	Features
1.	Should be able to generate a graphical representation of your network. Identify which devices are inactive or out of compliance. Detecting non-compliance, issuing alerts. The ability to compare configurations is invaluable; system changes must be logged.
2.	Manage network compliance by comparing devices to defined, best-practice standards. Speed audit processes with network compliance reports for ITIL and more. Validate device operating states in real time to stay in compliance.
3.	In real time, detect configuration and asset information changes made across a multi-vendor device network, regardless of how each change is made and also support configuration deployment/rollback and configuration templates.
4.	Recording every access to a device including not only scripted and au-

	tomated access, but a full keystroke log. Who made what change, the reason for the change and associated ticket number must be captured.
5.	Manage dual-stack and pure IPv6 environments. Manage SNMPv3 configurations and communicate over SNMPv3.
6.	In real time, store a complete audit trail of configuration changes, (hardware, and software,) made to network devices, including critical change information.
7.	Configure granular, customizable user roles to control permissions on device views, device actions, and system actions. Support common authentication systems, such as TACACS+, Radius, SecurID, Active Directory and LDAP.
8.	Manage device access and authorization through a centralized control model that is integrated with your standard workflow and approval processes.
9.	Automate routine configuration tasks for updates, such as password or community string changes, configuration upload and download, compare configs, bulk configurations, config backup.
10.	Deploy and monitor operating system images from a centralized network management system. Create a repository, and synchronize all device software images across your enterprise network.
11.	Enforce change processes in real time. Model complex approval processes with flexible rules. Force approvals for changes, including changes made by a direct command line interface (CLI) session.
12.	The system must support heavily NAT environment and environments where network devices may have the same IP address.
13.	The system must provide an automated method to configure devices for real-time change detection via syslog (either direct syslog or syslog via a relay).
14.	Scalability – The network configuration management solution should be highly scalable with the largest tier capable of supporting upto 100K devices and carrying out upto 400K tasks per day.

8.3.6.5 Service Management (Help Desk) and SLA Management

SN	Features
1.	The proposed Helpdesk tool should be Axelos Gold level/Pink Elephant/ Service certified on at least 2 ITIL 2011 processes and complying at least 11 **(undertaking on OEM's letter head to be submitted)**of all the ITIL processes that are the most mature way to demonstrate that at least three IT organizations : Incident management, Problem Management, Change Management, Knowledge Management, Service Level Management, Service Asset and Configuration management, Service Catalogue and Request Fulfillment, etc. The certification copy to be submitted.
2.	Should be able to control access rights to modules and information by user profiles.
3.	The CMDB should provide visualization (graphical view) as well as support federation (seamlessly federates information from other distributed data sources), reconciliation and synchronization.

4.	Should provide predefined categorization, as well as routing and escalation workflows that can be triggered based on criteria such as SLA, impact, urgency, CI, location or customer.
5.	The Change Management module should provide a rule-based workflow system for controlling changes throughout their lifecycle: from initial request to approval, to planning and implementation, and to monitoring and evaluation.
6.	Should include automated impact analysis, calculated risk analysis, collision detection, and unplanned change detection and validation.
7.	The tool should automatically alert the responsible persons when a maintenance task is due or a scheduling conflict arises.
8.	If multiple SLAs are triggered, the strictest one must drive the workflow
9.	The product must monitor SLAs against Service, Problem, and Change Management
10.	The solution should show immediate (real-time) status of tickets
11.	Should support KCS (Knowledge Centered Support) best practices.
12.	Provide out of box and customizable reporting and personalized dashboard

8.3.6.6 Network Fault Management

SN	Features
1.	The solution should allow for discovery to be run on a continuous basis which tracks dynamic changes near real-time; in order to keep the topology always up to date. This discovery should run at a low overhead, incrementally discovering devices and interfaces.
2.	The NMS must allow immediately determining the impact of a component failure and thus helping in prioritizing problem-solving efforts.
3.	The NMS should provide very powerful event correlation engine and thus must filter, correlate & process, the events that are created daily from network devices. It should assist in root cause determination and help prevent flooding of non-relevant console messages.
4.	Polling intervals should be configurable on a need basis through a GUI tool, to ensure that key systems are monitored as frequently as necessary.
5.	The topology of the entire Network should be available in a single map along with a Network state poller with aggressive/customizable polling intervals.
6.	The NMS application should provide a Unified Fault, Availability and Performance function from a single station only to reduce network and device loads with unified fault & performance polling.
7.	The NMS performance system must provide predefined and highly customizable reporting across the network domain.
8.	The Network performance operator console should provide operators with seamless transitions from fault data to performance reports and back. For example - select a node in NMS fault mgmt system and cross launch it for historical and near real time data.
9.	Should have MIB browsing, MIB loading, and MIB expression collection features.
10.	NMS should be cloud ready, should have dynamic Root Cause Analysis

	capability
11.	NMS should have Global Management capability, where in it can work in distributed environment.
12.	NMS should support application based failover over the WAN.
13.	NMS should have support for SNMPv3 & IPv6, including dual-stack IPv4 & IPv6 to provide flexibility in protocol strategy and implementation.
14.	It should be able to correlate multiple occurrences of a specific fault on a device within a specified time frame to enable detection of chronic problems. At any given point in time there may not exist a fault for a chronic issue, but we need to know that the condition continues to happen. For example: Circuit down 20 times in last 24 hour, bandwidth thresholds exceeded 30 times in last month, etc.
15.	The system should support a variety of discovery protocols. The system should take advantage of available information to aid in discovery of the network. Protocols should include ARP, DNS, SNMP, BGP, EIGRP, OSPF, CDP (Cisco), EDP (Extreme), NDP (SONMP-Nortel), FDP (Foundry), EnDP (Enterasys), and LLDP (link-level discovery protocol).
16.	Support for discovering and monitoring router redundancy groups using HSRP (Hot Standby Router Protocol) / VRRP (Virtual Router Redundancy Protocol) & recognizing situations that can result in multi-path conditions.
17.	Support for port aggregation protocols like LACP (Link Aggregation Control Protocol)including visual map-based views & automatic impact assessment based on the relationships between physical and virtual links.
18.	Scalability – Network Management Tool should be capable of managing upto 30K devices from a single instance , should be able to have 1 mil discovered interfaces.

8.3.6.7 Network Performance Management

SN	Features
1.	Should establish the status of network devices and interfaces with unified status calculation and visualization of network fault & performance data.
2.	Should enable efficient workflows using contextual navigation between reports and rich interactive report configuration capabilities.
3.	Network Performance reporting tool must provide the following capabilities: i) Data collection and thresholding of network device ports (any that support MIB2 including virtual interfaces): Bytes In, Bytes Out, Discards, Errors, Network Delay ii) Data collection and threshold setting of network devices: CPU, Memory, Buffers, Component statistics iii) A variety of reports summarizing the data including: Home page summary/trend summary, Calendar, Heat chart, Headline, Dashboard, Managed inventory report, Top ten, Most changed/occurring events, Data explorer
4.	Should honours network fault management tools' secure grouping and multi-tenancy settings

	i) Secure reports by group ii) Secure reports by tenant
5.	Should be able to schedule key reports for automated delivery i) Distribute reports by email in HTML, Excel or pdf formats. ii) Single station scalability up to 2,00,000 performance polled interfaces iii) Store as-polled data for up to 12 months

8.3.6.8 Server Monitoring

SN	Features
1.	Should offer service driven operations management of the IT environment to manage distributed, heterogeneous systems - Windows, LINUX from a single management station.
2.	Centralized view for Agent-based and agent-less monitoring managed from one central console.
3.	Should provide a centralized point of control with predefined policy-based management intelligence for easy deployment for the servers, operating systems, applications and services for correlating and managing all the IT infrastructure components of a business service.
4.	Should support Virtual platforms - Vmware and Microsoft Virtual Server, Citrix and provide capability to manage both Microsoft .NET and J2EE applications from the same platform.
5.	Should provide in built correlation to reduce the number of messages presented to the operators and to determine the root cause.
6.	The system must be agent based for managing the nodes and have the capability of storing events / data locally if communication to the management server is not possible due to some problem. This capability will help to avoid losing critical events.
7.	Complex dependencies between managed elements must be captured, allowing IT management staff to interpret lower level data in terms of its importance to the higher-level service.
8.	Alarms with meaningful message text, instruction text, operator / automatic actions / linked graphs, duplicate message suppression.
9.	Should be configurable to suppress events at the agent or managed node level itself and be configurable to suppress events for key systems/devices that are down for routine maintenance or planned outage.
10.	The system should allow for enriching of messages with incremental information and should allow for customization of message attributes.
11.	There should be a single agent on the managed node that provides the system performance data, and for event management it should be able to prioritize events, do correlation & duplicate suppression ability to buffer alarms and provide automatic actions with capability to add necessary annotations.
12.	Should provide console and a web browser interface that can be accessed from anywhere using industry-standard web browsers.
13.	Each operator should be provided with user roles that should include operational service views enabling operators to quickly determine impact and root cause associated with events.

14.	Highly scalable, and can manage in excess of 1000 managed nodes from a single server.
15.	There should be secured communication between Management server and Managed nodes avoiding the need to open unsecure firewall ports.
16.	The system should integrate with Helpdesk / Service desk tool for automated incident logging and also notify alerts or events via e-mail or SMS.
17.	The system should have management polices to monitor and manage WMI, Performance, SNMP, Application, Log Files and Event logs and support automatic action in various forms like running a script to be taken on alerts from managed nodes.

8.3.6.9 Asset Management

SN	Features
1.	Asset Manager enables IT organizations to manage the physical, financial and contractual aspects of all IT assets—from request and procurement to retirement and disposal—making it easy to optimize costs, mitigate security and compliance risks and drive business decisions. It should automatically discover and inventory enterprise IT assets which reduces compliance risks, enable software license optimization & chargeback & constantly track changing asset configurations.
2.	AM should provide a built-in workflow to suggest to the software asset managers in user organization that they should request more licenses or remove installed software that is not in use or assign rights to others users rather than procuring more licenses.
3.	AM will directly alert users whenever a software installation exceeds the purchased volume. AM will also automatically ensure that no additional users are able to subscribe to that software until additional licenses are made available.
4.	**Inventory Management** • Able to manage inventory as individual or bulk items, set re-order levels and amounts and keep a history of transactions • Able to provide ability to account for assets and components in inventory and facilitates maintaining appropriate levels of stock
5.	**Asset record detail:** • Provide a general tab that stores specific information about the device depending on the device type. • Provide a Components tab that stores sub-components information of the asset. E.g. ID, Serial Number, Licenses, Version, Status, Category, Type, Item. • Provide an Additional Details tab that stores various types of detail for the respective type of asset. E.g. how much memory the printer has which might assist in a Help Desk call. • Provide a Contracts tab that stores different types of contracts: Lease, Support, Warranty, Software, Maintenance. • Provide a People tab that stores individuals or groups who are owners and users of the asset. • Provide a Financials tab that stores associated costs by cost center,

	budget code, project. Static and incident costs. Provide Straight line depreciation cost calculation. • Able to track the total cost of ownership for an asset.
6.	**Software License Management** • Should manage all types of software license and hence software compliance. • Should be able to recover software licenses when hardware is retired, returned (for leases). • Should track version, status, and upgrade information for each installed software package. • The tool must be able to reconcile the number of installed copies of an application with the number of permitted licenses. • Should be able to track the end-user's right to utilize software or hardware assets. • Should be able to manage and count software entitlement separately from license counters as software is installed, removed and auto discovered. • Software Asset Management should be capable of doing license compliance for vendors being offered in the subject work.
7.	**Auto-Discovery** i) Proposed solution should have the auto-discovery tool, which should have tight Integration with the proposed ITAM (IT Asset Management) solution. ii) Should be able to collects information from routers, switches, load balancers, storage, servers, and firewalls. iii) Should have the ability to verify inventory data changes with current asset details before permanently updating the system of record. iv) Discovery should be automatic and continuous to detect real time changes in the IT infrastructure. v) Discovery should work without requiring agent installation (that is, agent-less discovery) while discovery Layers 2 through Layers 7 of OSI model. vi) Should use Industry-standard protocols such as WMI, SNMP, JMX, SSH to perform discovery without requiring the installation of an agent. vii) Discovery system should have ability to modify out-of-box discovery scripts, create customized discovery scripts. viii) Discovery system should have the ability to capture configuration files for the purposes of comparison and change tracking. ix) Discovery system should be capable of supporting role-based access to various aspects of CMDB administration.

8.3.6.10 Service Management (Help Desk) and SLA Management under Enterprise Management System(EMS)

i) Auto assignment of tickets to field engineer to cut time to allocate ticket to the respective field engineer. Auto Assignment of Tickets based on availability of engineer; as per shift & as per ongoing repairs for resolution.
ii) Auto Assignment of Tickets as per Roster management of Field staff to enable auto allocation of relevant tickets.
iii) Auto Assignment of Tickets as per Supervisors/Territory Manager of respective Territory to be given rights to manage (write/modify) shift duty of field engineers of their respective clusters.
iv) Offered system must have mobile web interface (with screen adaptation and notification) or App for field engineers for Work Order Issuance, ERT & resolution.
v) Solution should provide a Framework to create SLA Templates.
vi) Solution should offer collection framework for ease of integration with Alarm Management.
vii) Solution should provide Hourly, Daily, Weekly, Monthly and yearly asset wise & Station wise failure position along with SLA calculation (as per 4.A.8, Chapter-4, Section-I).

8.3.7 Command Control Center (CCC) - Deleted

8.3.8 AC Distribution BOX with Required number of MCB's (as per site condition), AC SPD, Enclosure with IP67 rating and lock & key arrangement.

8.3.9 Details of additional features of Video Analytics Software (in addition to RDSO specification)

a) Smoke and Fire Detection

AI based video analytics should be able to detect Smoke and Fire in defined area.

***b)* Loitering Detection**

The operator shall be able to define area and detection time in software. The software shall give an alarm as soon as a person is detected in a defined area above a predefined time limit.

***c)* Humans and Vehicles Detection**

The software shall be able to detect and classify humans and vehicles in live viewing and give alert only when the classified objects break a rule.

It should sort through hours of video across all the station cameras with ease, to quickly locate the specified person across cameras based on his Attribute, reducing search time from day and hours down to minutes.

***d)* Search of Humans based on Attribute**

The AI should be able to sorts through hours of video with ease, to quickly locate a specific person of interest. Attribute Search should improve incident response

time and enhance forensic investigations by helping operators compile robust video evidence, create a powerful narrative of events, and reveal an individual's route or last-known location.

AI software should allow operator to mark a person who has been identified as a suspect in any playback video or in live mode. It should then have the capability to track and search the objects movements across multiple cameras based on the Attribute of the person and show the results so that the user can track the movement of the person across cameras.

In the event when a suspect's face is not captured clearly or not recognizable due to any reason, the AI software should allow operators to search a Person based on a person's Attribute characteristics and retrieve intelligent information to locate a specific person or vehicle of interest across multiple recorded video streams from FHD Bullet/Box, Dome and PTZ cameras.

e) **Colour Search**

In the event when suspect face is not clearly visible, in such case a colour base detection and search should be available with AI based video analytics.

f) **Fallen Person Detection**

In the areas like Waiting room / hall, Tracks, Ticket Counter etc in case of any person falling due to any reason should be detected

g) **Combination Search(Human/Vehicle and Colour)**

AI based video analytics should be able to search for suspects with combination of search criteria like Colour and Object (Human / Car).

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SECTION-I
Chapter-9
CHECK LIST (To be filled up & uploaded)

Technical Bid			
SN	Have you submitted the following documents	Submitted /complied or Not	Page No./ref No. of Offer
1.	Cost of Tender Document (NIT Page)(to be submitted online through IREPS portal only) and Offer Letter as per Chapter-1 (Section-I)		
2.	Schedule of Requirements with quantities but with prices blanked out (this will be a replica of price bid with prices blanked out).		
3.	Breakup of individual itemized BOM but prices blanked out (as per Format given in SOR) as per Note-VI of Chapter-2(Section-I) of SOR.		
4.	Submission of Earnest Money Deposit (EMD) declaration letter.(Form No 19)		
5.	Audited balance sheet duly attested by Notary Public		
6.	Constitution of Firm and Power of Attorney.		
7.	Compliance to Technical Requirements as mentioned in Clause **3.A.1.15** of Chapter-3 of Section-I **and Clause 4.A.26 of Chapter-4 of Section-I**.		
8.	Copies of purchase orders and other documents in support of meeting qualifying criteria.		
9.	Complete technical data and particulars of the equipment offered, as specified in the Tender papers together with descriptive literature, leaflets, Drawings, if any, complete with list etc.		
10.	Documentary proof of equipment being proven and working for more than 12 months in India or outside India along with user certificate and Contact Details of user/firm.		
11.	Technical proposal of tenderer in conformity with system design or alternative proposal of the tenderer, if any.		
12.	System Performance Guarantee as per Chapter 6, Form no. 2 (Section-I).		
13.	The manufacturer claiming to qualify under the scope of rules for PMA (Preferential Market Access) must submit the declaration of VA (Value Addition) as required under the issued notification for the specified period (2018-19, 2019-20 & 2020-21).		
14.	NIL Deviation certificate – Form No. 6 of Chapter-6 (Section-I)		
15.	Integrity Pact - Form No. 5 of Chapter-6 (Section-		

	I)		
16.	All Form as mentioned in Chapter-6(Section-I) including Form-4.		
17.	Any other information required to be submitted by the bidder as per technical and eligibility criteria.		
18.	Relaxation to Start-ups as per Eligibility clause 4.A.14 of Chapter-4 (Section-I).		
19.	OEM undertaking as per clause 8.3.6.5, SN-1 of Chapter-8 (Section-I)		
Price Bid			
1.	Schedule of Requirements with quantities and priced filled up (this will be a replica of technical bid with prices).		
2.	**Breakup of individual itemized BOM (as per Format given in SOR) as per Note-VI of Chapter-2 (Section-I) of SOR.**		
3.	Any other information required to be submitted by the tenderer as per technical and eligibility criteria.		

DETAILS OF CREDENTIALS SUBMITTED AGAINST ELIGIBILITY CRITERIA OF Bidder as per Clause 4.A.14of Chapter-4 (Section-I)

SN	Clause	Supporting documents	Details/Remarks	Page no of the Bid
1				
2				
3				
-	-	-	-	-

DETAILS OF CREDENTIALS SUBMITTED AGAINST ELIGIBILITY CRITERIA OF OEM as per Clause 4.A.14 of Chapter-4 (Section-I):

SN	Clause	Supporting documents	Details/Remarks	Page no of the Bid
1				
2				

3				
4				
5				

Note: Non submission/ non-compliance of above documents as deliberated in Check List will make the offer liable to be rejected.

SECTION – II

TECHNICAL REQUIREMENTS & SUPPLEMENT

INDEX

SECTION - II

CHAPTER - 1

Precautions TO BE TAKEN IN 25 KV A.C. Traction aREA:

II.1.1 GENERAL

Any Telecommunication circuits in the vicinity of AC Traction running parallel to 25 KV lines are liable to be affected by AC induced voltage. Therefore precautions should be taken to eliminate the possibility of induced voltage affecting equipment and humans.

Crossing of track, if any, should be negotiated by underground cables running at right angles to the track as far as practicable.

Special protective measures (viz. provision of G.D tubes, fuses and earthing etc) are required to be taken for telecommunication lines entering 25 KV sub-station /switching posts.

For the human safety considerations the safe working voltages should be 60 V under normal conditions and 150 V with special precautions and 430 V under fault conditions.

Instructions for protection of railway staff/working personals on signaling and telecommunications installations on 25 kV AC traction shall be strictly adhered to. Precautions are required to be taken on account of following,

(i) Proximity of live conductor.
(ii) Pressure of return current in Rails.
(iii) Induction in all metallic bodies situated closed to over head equipment.

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SECTION - II

CHAPTER - 2

PREPARATION OF AS-BUILT ROUTE PLANS

II.2.0 SCOPE:

The scope of this is to prepare a final set of As-Built drawings of route plans, based on the actual cable route (which in turn shall be based on a preliminary & approved drawings of route plans, already supplied to the contractor).

II.2.1 Points to be taken care of for laying the OFC cable:

II.2.1.1 Avoid underground structures, signaling cable, power cables and pipe lines etc.

II.2.1.2 Avoid rodent/termite infested or infected side of the alignment.

II.2.1.3 Avoiding areas prone to water logging.

II.2.1.4 For the straight runs as far as possible a separation of 10 Meter should be kept from the nearest track. This is as per CCITT recommendation K.8.

As a rule a minimum distance of 5.75 M should be maintained between the OHE masts and the cable. In Yards etc. where observance of this rule may be difficult, a minimum distance of 3 Meter should be maintained. In exceptional cases where the cable trench depth is less than 0.5 M the lateral distance may be reduced to 1 M.
Make the route of OFC cable within 1 meter of Railway boundary normally.

II.2.2 As-Built Cable Route plan.

Based on above actual route, the as-built cable route plan should be prepared:

II.2.3 Preparation of Drawings

All the plans and drawings shall be neatly prepared using Computer Aided Design System & plotter etc. The drawings shall be in A3 size & suitably filed for ease of handling.
Further, a soft copy of Auto-CAD drawings in CD shall be submitted.

II.2.4 Information in Cable route plan:-

The cable route plan shall contain following information:-

II.2.4.1 Whether the cable route is on the **up** or **down** side of the Railway Tracks.Exact locations and lengths where the cable is laid in RCC/DWC/G.I. pipes/ troughs and under the bed on culverts.Location of track crossing and the number of tracks be-

ing crossed. Location of road crossing and the no. of RCC/DWC/GI pipes provided.Locations of Pull Chambers/Joint Pits.

II.2.5 Protective works for Cable/ Ducts:-

II.2.5.1 For building, masonry platforms, crossing of tracks and roads etc. special protection for the cables are required. Some of the methods adopted for different types of protective works are specified in the following drawings:-

For Girder bridges M.S. Troughing Drg. S&T/RE/78/2/76 Page 1 & 2 and RE/42/172. (P-160 & 163).
For cable entries to Cabins, ASM's Offices etc. through HDPE pipe Drg.No. RE/S&T/ALD/SK/161/81 (P-174).
For unconsolidated embankments Shoring for the cable trench as perDrg.No. RDSO/TC/35003. (P-168).For laying cables over the culverts in DWC pipes Drg. No. RE/S&T/ALD/SK/160/81. (P-162).

For laying cables over arch bridges brick channeling Drg. No.RE/S&T/ALD/SK/162/81. (P-173).

For route over rocky area through chase Drg.No. RE/S&T/SK/303/85withAlteration 'A'. (P-167).

For routes under bed of culverts in DWC pipes Drg.No. RE/S&T/ALD/SK/184/81.(P-165).For cable laying under railway track Drg. RE/S&T/ALD/SK/159/81 (P-169).For cable laying under road drg. No. RE/S&T/ALD/SK/497/2000 (P-157). For Stone/RCC cable route marker drg no. RCIL/NR/01 (P-172).

Note1: In non-RE area, wherever distances are reckoned with reference to overhead alignment, the distances from the nearest KM-post provided along the track, may also be mentioned.

Note 2: If any of the above-mentioned drawings are illegible or not clear, the clarifications may be sought from the office of Executive Director, RailTel.

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SECTION – II
CHAPTER - 3

TECHNICAL SPECIFICATION AND INSTRUCTIONS FOR TRENCHING AND LAYING OF OPTICAL FIBRE CABLE:

II.3.1 SCOPE:

This chapter deals with the specifications under which the various work for trenching & laying of optical fibre cable coming under the purview of the contract are to be executed by the contractor.

II.3.2 SUPPLY OF ROUTE PLAN:

Approved Cable Route plan and jointing schedule for mid section splicing of cable will be prepared and supplied by the RailTel. This shall give a preliminary idea of the number & locations and the quantities and type of various equipment to be fixed, wired and commissioned.

II.3.3 LEADING OF CABLE IN MASONRY BUILDINGS

II.3.3.1 The cable will have to be led inside any masonry building such as Cable hut, ASM's room at a depth of 0.75 meters by cutting the masonry structure of the wall as per Drg.No. RE/S&T/ALD/SK/161/81 as given at Annexure- 3.12. After the cable has been led inside the masonry wall, the floor inside shall be duly repaired and plastered.

II.3.4 LAYING OF CABLE IN SPECIAL CASES:

II.3.4.1 Near Power Cable

When the proposed cable route comes across any other cable already laid, the contractor shall first report the fact to the Engineer. Should the cable be identified by the Engineer as a power cable (LT or HT), the trench shall be dug as far away from the route of the power cable as practicable.

II.3.4.2 Crossing of Optical Fibre Cable with another cable

Crossing of the Optical Fibre cable with another cable shall be avoided wherever possible. Where, however, this is not possible, the Optical Fibre cable shall be laid in cement or asbestos cement pipes. The length of the pipe to be provided on either side of the crossing shall be atleast one meter.

II.3.4.3 Laying other than optical fibre cables in the same Trench

No cable other than quad cable shall be laid in the trench made for the Optical Fibre cable. Even in such cases, both the cables are to be laid as per approved drawing. Where, however, exceptional circumstances exist, the optical fibre cable may be laid along with another cable in the same trench provided a specific permission

of each such case is obtained in writing from Engineer. When optical fibre cable and L.T. power cable have to be laid in the same trench they shall be separated by placing a layer of second class bricks between them vertically (approx. 16 bricks/meter) or laid in RCC pipe.

II.3.4.4 Laying of cable through RCC/GI/DWC pipes

The cable shall be laid through RCC/GI/DWC pipes at the locations marked on the route plan and as advised by the Engineer or his representative.

For laying the cable through pipes galvanised steel wires of a cross section not less than 10 SWG shall be used as a lead wire. Two such lengths of wires shall be laid through the pipes, so that after the cable is threaded through the pipe, one lead wire is permanently left in the pipe with a suitable overlay at two ends, to enable the cable to be pulled out at a later stage if required to do so.

On arch bridges and culvert bridges the cables will be threaded through DWC pipes etc. While threading the cable through these pipes the Contractor shall do the trenching to the required depth wherever necessary for which no extra charge will be paid.

II.3.4.5 Laying cable near feeding post:

In the vicinity of feeding posts, as far as possible the cable shall be laid on the side of the track opposite to the feeding post. Further the Optical fibre cable shall be at least one metre away from any metallic part of the O.H.E. and other equipment at the sub station which is fixed on the ground and at least one metre away from the sub - station earthing. In addition, the cable shall be laid in RCC pipes 150 mm dia (standard 2 metre length) complete or capable of being split into two half as per specn. No. ISS-458 latest for a length of 300 metres on either side of the feeding point.

II.3.4.6 Running of cables at foundations others than OHE Masts and from pipe outlets.

Damages to cable is likely to occur if care is not taken in laying cable where the bed changes from solid support such as a foundation pipe or bridge to soft support such as soft soil. The cable must not press against the edge of the solid support. The soft soil near the edge must be tamped and the cable raised slightly.

II.3.5 HANDLING OF CABLE DRUMS & PAYING OF CABLES:

II.3.5.1 While collecting OFC/HDPE from RailTel depot the contractor must ensure that the materials should be received in good condition. The drums shall be unloaded by the side of the Railway Track/Road from 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. The cable must be tested before and after laying.

II.3.5.2 On each drum there are two ends, A & B. The 'B' end of one cable length shall meet 'A' end of the next cable at a joint. The 'A' end shall be normally on the top unless indicated otherwise on a drum.

II.3.5.3 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 unrolling.

II.3.5.4 The drums shall normally be unrolled at the same place and the cable carried by workmen near the trench. The drums shall not be dragged in any case. But where drums of cable have to be moved, would always be rolled in the direction of the arrow, otherwise the coils tend to unwind and the cable may get battered. In case no direction arrow is marked on the drum, remove several battens and determine the direction in which the cable is coiled. The arrow should then be painted on the drum pointing in the opposite direction in which the upper cable end is coiled so that future handling of the cable drum is facilitated and then replace the battens carefully.

II.3.5.5 The drum should be properly mounted on jacks (or on a cable wheel) making sure that the spindle is large enough to carry the weight without bending and that it is laying horizontally in the bearings so as to prevent the drum creeping to one side or the other while it is rotating. Before attempting to pull off the cable, remove the end protection box attached to the flange of the drum and cut the security ropes so as to leave the cable free to move.

II.3.5.6 If a portion of the cable only is taken out from the cable drum, the battens should be immediately replaced to prevent damage to the balance of the cable. This is important.

II.3.5.7 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.

II.3.5.8 All care should be taken in handling cable drums with a view to ensure safety not only of the cables but also of the working party handling them. The man should not be allowed to brake the cable drum by standing in front but only from side.

II.3.5.9 Rewinding and Redrumming of cables

(a) If for any reason it is found necessary to rewind a cable on a drum, cable drum with a proper barrel diameter not less than of the original drum should be chosen.

(b) 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.

(c) 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.

(d) Replace all the lagging on the cable drum.

II.3.6 MINIMUM BENDING RADIUS:

Cables should always be bent (or straightened) slowly, they should never be bent to small radius while handling. The minimum safe bending radius for optical fibre cables should be 30 times the diameter of the cable but wherever possible larger radius should be used.

II.3.7 TOOLS REQUIRED FOR TRENCHING, CABLE LAYING AND FILLING.

TOOL'S NAME

Cable Jack
Cable Grip
Reopening Device
Free Hood Hook
Shackle free head hook
Grouling Hook
Pulling Bolt
Tension meter
Pulley
Anti Twist Device (swivel)
Roller
Flexible Cable
Pulling Rope
Brush
Mandrel
Chain
Measuring cord for strain gauge
Slip Winch
Wire rope
Portable VHF set
Measuring tape
Phowrah
Iron plate
Loader Backhoe for Drilling
Warning Tape
Caterpillar tractor
Fork Lifter
Vehicle Van type
Tacho- meter
Road measurer.

II3.8 Blowing /Drawing of Optical Fibre Cable:

II.3.8.1 **OFC** shouldnormally be **blown** through the ducts by standard blowing machines Only in exceptional cases drawing may be adopted in short lengths with the permission of the site engineer of RailTel.

SECTION - II

CHAPTER - 4

JOINTING AND TERMINATION OF FIBRE OPTIC CABLE

II.4.1 TECHNIQUE FOR JOINTING OF OPTICAL FIBRE CABLE

Fusion splicing shall be used for splicing fibres. This is accomplished by applying localized heating (i.e. by electric arc or flame) at the interface between two butted, pre-aligned fibre ends, causing them to soften and fuse together.

II.4.2 STRAIGHT JOINT FOR FIBRE OPTIC CABLE

II.4.2.1 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:

Material inside joint closure kit

Installation tools required

Detailed procedure for cable jointing

Procedure for re-opening the closure.

II.4.2.2 The Optic Fibre straight through joint closure shall be as per specn. TEC TO 910 G92 (latest) or a proven design approved by RCIL .The joint shall be protected in RCC Joint Pitas per drawing given in Annexure 2.14. (The Optic Fibre straight through joint closure shall be of TVSE, R&M, Raychem, 3M make and shall be approved in advance by RailTel. The joint shall be protected in concrete chamber as approved by engineer- in-charge.)

II.4.2.3 Generally, the following steps are involved for jointing of the cable:

- Preparation of cable for jointing
- Stripping/cutting the cable
- Preparation of Cable and joint closure for splicing
- Stripping and Cleaving of Fibres
- Fibre splicing
- Organising fibres and Finishing joints
- Sealing of joint closure and
- Placing joint in the Jointing Chamber/Pit.

II.4.3 STRIPPING/CUTTING OF THE CABLE

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

Proper care must be taken when removing the inner sheath to ensure the fibres are not scratched or cut with the stripping knife or tool. To prevent this, it is best to only score the inner sheath twice on opposite 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.

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

II.4.4 STRIPPING AND CLEAVING OF FIBRE

Prior to splicing each fibre must have approximately 50mm of its primary protective U.V. cured coating removed, using fibre stripper which are manufactured to fine tolerances and only score the coating without contacting the glass fibre.

The bare fibre is then wiped with a lint free tissue doused with ethyl alcohol. Cleaving of the fibre is then performed to obtain as close as possible to a perfect 90 degree face on the fibre.

II.4.5 SPLICING OF THE FIBRES

The fusion splicing shall be used for fibre splicing. Some of the basic steps for fusion splicing are as given in 4.8 below.

II.4.6 FUSION SPLICING OF FIBRE

Some of the general steps with full automatic micro processor control splicing machine are as under

Wash hands thoroughly prior to commencing this procedure.

Dip the clean bare fibre in the beaker of ethyl alcohol of the ultrasonic cleaver. Switch on ultrasonic cleaver for 5-10 seconds (Some of the manufacturers do not prescribe the above cleaning).

Place the bare fibre inside 'V' grove of the splicing machine by opening clamp handle such that the end of fibre is app. 1 mm. over the end of the "V" groove towards the electrodes.

Repeat the same procedure for other fibre, however, first insert heat shrink splice protector.

Press the start button on the splice controller.

The machine will pre fuse, set align both in 'X' and 'Y' direction and than finally fuse the fibre.

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.

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.
Repeat for other fibres.

II.4.7 FUSION SPLICER AND OTDR

The fusion splicer and Optical Time Domain Reflecto meter (OTDR), to be used for splicing and measurements of parameters respectively, shall be of approved design and quality. The contractor shall submit
Specification of fusion splicer and OTDR
Certificate from the users, who have used the splicer and OTDR of the make, the contractor intends to use, regarding their satisfactory performance.

The RCIL reserves the right to direct the contractor to use the same or any other proven design of fusion splicer and OTDR if in the opinion of RCIL the specification of Fusion splicer and OTDR are not suitable

II.4.8 ORGANISING FIBRE AND FINISHING JOINTS

After each fibre is spliced, the heat shrink protection sleeve must be slipped over the bare fibre before any handling of fibre takes place, as uncoated fibres are very brittle and cannot withstand small radius bends without breaking.

The fibre is then organized into its tray by coiling the fibres on each side of the protection sleeve using the full tray side to ensure the maximum radius possible for fibre coils.

The tray are placed in the position.

OTDR reading taken for all splices in this organized state and recorded on the test sheet to confirm that all fibres attenuation are within specification. This OTDR test confirms fibres were not subjected to excessive stress during the organizing process.

After this the joint can be closed with necessary sealing etc. and ready for placement in the pit.

II.4.9 TERMINATION JOINT FOR FIBRE OPTIC CABLE.

II.4.9.1 This joint is provided in the cable hut for terminating the outdoor fibre optic cable of both the sides, splicing through fibres, connecting fibres to pigtails for connection to Optical Line Terminal Equipment etc.

II.4.9.2 The OFC Cables shall be dressed up on teak wood plank/Aluminum ladder inside cable hut. The armour of the OFC Cable shall be cut before taking the cable in the equipment rack. The cables shall be terminated on FDMS and derive required pigtails.

Two pairs of fibres shall be derived from either side cable at every OFC cable hut through pigtails with FC/PC connectors. The remaining fibres shall be looped through.

II.4.9.3 The procedure for installation of termination joint box depend upon the type of joint enclosure. The installation manual supplied gives the step-by-step procedure for installation. However, the general steps are as under:-

- Marking the cable
- Stripping/cutting the cable
- Gripping cable in sheath/clamp
- Treatment of tension member
- Fibre splicing
- Enclosing fibre
- Fixing strength member
- Closing the cover
- Fixing termination box
- Fixing the cable.

II.4.10 MARKING THE CABLE

Determine the cable length up to the proposed location of termination box. It is also to be ensured that at least 10 meters of cable is coiled in the cable pit.

Determine the cutting point and mark the cable

Determine the sheath peeling point and mark the cable

II.4.11 CUTTING / STRIPPING THE CABLE

Cut the cable as per the marking
Remove the sheath from cable ends. During sheath stripping care should be taken not to damage the fibres.

The length and the steps for various sheath cutting shall be as per the instruction given in the manual.

II.4.12 GRIPPING THE CABLE

Wind PVC tape around the cable core just beside edge of the sheath.

Insert the bushing inside sheath by cutting the cable sheath for about 25mm.

Place the sheath grip (lower half and upper half) and tighten it with the help of torque wrench.

II.4.13 FIXING OF TENSION MEMBER

a) Mark the tension member for the specified length and cut it.

b) Clean the tension member thoroughly by Alcohol and cotton cloth.

c) Fix tension member holder with the help of instant adhesive at the end of tension member.

II.4.14 FIBRE SPLICING

The procedure for splicing is same as described for straight joint closure in Clause 4.7 above.

II.4.15 ENCLOSING FIBRES

a) Set the fibre cassette on the base

b) Arrange excess length of fibre to make double figure of eight.

c) Enclose the spliced fibre and its excess length carefully.

d) Repeat the procedure for other fibres.

e) After this, the box can be closed. However, a packet of silica gel may be placed inside for protection from entry of moisture.

II.4.16 MOUNTING OF TERMINATION BOX

Termination box can be fixed either on wall or on equipment rack. Mark the fixing holes on the walls/bracket/frame

a) Place the termination box and tightened the nuts inside the base box.
b) Put the covers.

II.4.17 FIXING THE CABLE

Secure the cable on wall/frame at two places within one meter from termination box keeping in view straight entry of cable in termination box.

II.4.18 ACCEPTANCE TEST FOR FIBRE OPTIC CABLE

The Procedure for Testing of Fibre Optic Cable shall be jointly finalized by Contractor with Engineer of the RCIL. The parameters in the concerned specification shall be taken as reference. The Test shall be conducted from cable hut to cable hut, after the Splicing & termination Joints are completed. The length of cable (as per marking in cable & as measured by OTDR), loss in cable, average loss per Km., No. of Splices, Splice loss, etc. shall be recorded and jointly signed as per pro-forma given in para 4.24 below.

II.4.19 TEST PROTOCOL FOR OPTICAL FIBRE 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----------

1)
2) Optical measurements (On Line):

Measurement	**Fibre – number 1 2 3 4 ……22 23 24**	**Accepted Value**
1.1 Total attenuation at 1300/1550 nm with OTDR		
1.2 Total attenuation per Km at 1300/1550 nm:		<0.40 dB/Km at 1300 nm &<0.25 at 1550 nm
1.3 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, no splice should have loss >0.2 db

NOTE : ALSO ATTACH OTDR RESULTS |----|

2) 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:
S.No. LENGTH

1. ----------M

2. ----------M

3. ----------M

4. ----------M

5. ----------M
2.3 Location of Isolation Sleeves:

1.

2.

3.

Contractor's Representative RCIL's Representative

II.4.20 TOOLS AND EQUIPMENTS REQUIRED FOR JOINTING AND TERMINATION OF FIBRE OPTIC CABLE.

S.No.	TOOL's Name
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 k. oil generator
25.	Umbrella's 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 30 times the diameter of the cable.

SECTION-II

CHAPTER – 5

TECHNICAL SPECIFICATION OF MAINTENANCE FREE EARTHING

II.5.1 **Maintenance Free Earthing –** Earthing should be as per RDSO Specification No. RDSO/SPN/197 (Version-1.0) or latest.

Note:- Bidder to ensure appropriate Surge Protection Device (SPD) arrangement to protect IT infrastructure i.e. switches, server, storage, NGFW etc. system being installed at platforms and RPF Thana/Post. Further, this proposed SPD arrangement should be connected with earthing system of the stations.

SECTION - II
CHAPTER –6

List of Address for Specification

II.6.1. Address from where specification copy can be purchased:

The copy of IRS, RDSO, TEC and BIS specification used in the tender documents can be purchased from following sources.

II.6.2 IRS Specification: i) Manager Publications,
Government of India
Civil Lines, New Delhi- 110054

ii) Government of India Book Depot,
8 - S.K. Roy Road, Calcutta – 700001

II.6.3 RDSO Specification : RDSO, Manak Nagar, Lucknow

II.6.4 DOT/TEC/ITD Specification : Khurshid Lal Bhavan, Janpath,
New Delhi- 110001

II.6.5 B.I.S. Specification :

Directorate General,
Indian Standards Institution,
9- Bahadur Shah Zafar Marg,
New Delhi -110002
F- block, Unity Building,
Narsimhraja Square,
Bangalore- 560002

534- Sardar Vallabh Bhai Patel Raod , Mumbai.
5- Choweringhee Approach, PO Princep Street, Calcutta- 700072
Ahinsa Building (1st floor) , SCO 82-83, Sector 27-C, Chandi-garh- 160017
5-8-56/57, L.N. Gupta Marg, Hyderabad- 208005.
117/418-B, Sarvoday Nagar, Kanpur – 208005
C.I.T. Campus, Adyar, Madras – 600020.

6. If any specifications and drawings referred but not enclosed in the tender documents may be seen in the RCIL's office on any working day.

…END of Tender Document…